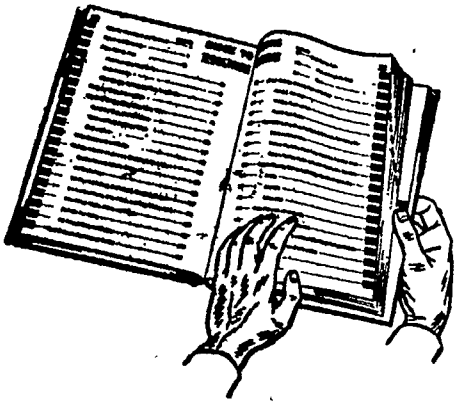
PLAINTIFF'S EXHIBIT

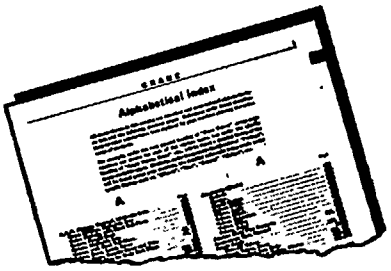
CRA 50

# 3 Easy Ways to Find What You Want in This Catalog

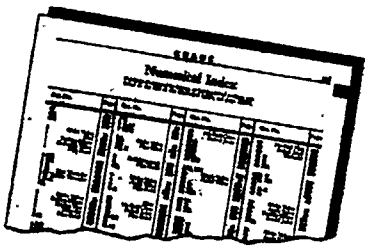


**1. THE CONDENSED SECTION INDEX** — on the inside pages of this colored paper insert — shows everything in the No. 53 Catalog, classified under condensed section headings and section numbers. The marginal section number markers — with the help of your thumb — take you to the section you want. There, on the first page is a concise table of contents for the section. This page also gives cross-references to semi-related equipment listed in other sections.

Regular users of the No. 53 Catalog — those more or less familiar with the Crane Line — will find the Section Index a real time-saver.



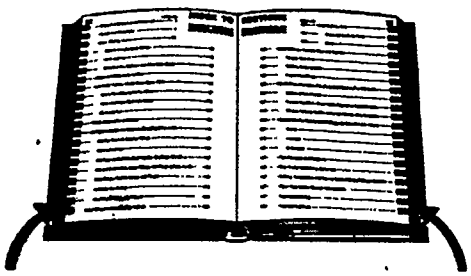
**2. THE 20-PAGE ALPHABETICAL INDEX** — starting on page I of section one — is perhaps the most complete and thoroughly cross-indexed listing of piping materials ever cataloged. This is the index to use if you're looking for something by name — if you need something new or unusual — or if you want to see all the varieties of one type of equipment available from Crane.



**3. THE NUMERICAL INDEX** — which immediately follows the alphabetical index in section one — is always popular with users who have learned to know Crane products by catalog number. Every product with a catalog number is listed here, giving the page number on which it's described. Storeroom and purchasing department personnel, specification and price checkers, etc., will also appreciate this index.

## MANY OTHER PRACTICAL FEATURES OF THE CRANE NO. 53 CATALOG

**Section Index in Center of Catalog**



Commonly used Brass, Bronze, Iron, and Steel Goods are Grouped in Front Part of Catalog.

Less Frequently Used Items are Grouped in Back Part.

**More Compact Cataloging — Less Turning of Pages**
**Items of Common Usage are Grouped Together**
**Standard Page Style Saves Needless Reading**
**Clear Cross-Section Cuts Appear Throughout**
**All Data is Concise — in Clear, Easy-to-Read Type**
**All Tables are Ruled for Convenient Use**
**Full Dimensional Data are Given with Drawings**
**Catalog Numbers are Prominently Shown**
**Handy Engineering Data Section is Included**

1 ····· **Indexes** (Alphabetical and Numerical)

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3 ····· **Brass and Bronze Valves,** Gate ····· 13

4 ····· Globe and Angle; AAR Valves ····· 23

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6 ····· Quick-Opening, Radiator, and Hose; Hose Goods ····· 53

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17 ····· Iron Unions, Union Fittings, and Flange Unions; AAR ····· 173

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Alphabetical Index in Section One. If you know the catalog number of the product, refer to the Numerical Index, Section One.


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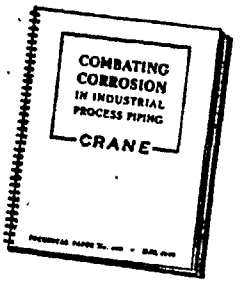
# Specifiers Available [illegible]

From time to time, Crane publishes literature of practical value to all people concerned with usage and installation of piping materials. Coming from Crane, such literature is of high authority, and well worth having. Below are typical publications currently available, without cost or obligation. Choose the ones most useful to you and request copies through your local Crane Branch, or the Crane general office. See front of this catalog — third printed page following cover — for addresses.

## 1

**"COMBATING CORROSION IN INDUSTRIAL PROCESS PIPING"**

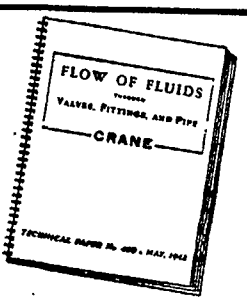
An illustrated study of more than 100 pages giving basic technical information for dealing with problems of corrosion in industrial process piping. Based on extensive experimentation in Crane Research Laboratories, and on wide field experience, this scientific report is highly dependable and helpful in its entire content.




## 2

**"FLOW OF FLUIDS THROUGH VALVES, FITTINGS, AND PIPE"**

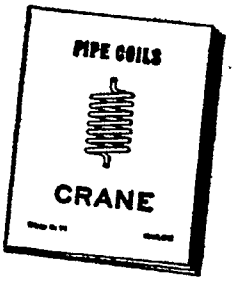
One of the most popular Crane Technical Papers — this 92-page handbook on the theory of flow, with formulas and procedures for solving flow control problems. Contains an abundance of data, presented in chart form for quick graphical calculation with a minimum of reading matter. Deals with flow of steam, water, oil, liquids other than water, air, gases, and vapors.




## 3

**"PIPE COILS"—CIRCULAR NO. 318**

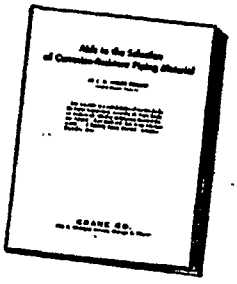
Keep this circular handy for its complete descriptions, specifications, and catalog information on all types of pipe coils and coil materials for most applications. Also covers the theory of heat transfer through pipe walls, and gives newest findings on subjects such as heating water with steam, etc. Includes much useful pipe and engineering data pertaining to coil applications. Ask for Circular 318.




## 4

**"AIDS TO SELECTION OF CORROSION-RESISTANT PIPING MATERIALS"**

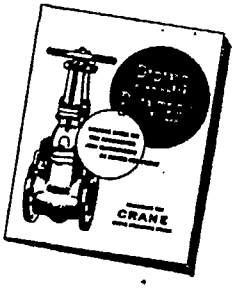
All specifiers and buyers of piping equipment in the process industries will appreciate this up-to-date condensed visual guide showing the relative efficiency of commercial alloys on more than 150 commonly used corrosive fluids. Includes an illustrated "Question and Answer" discussion of the main factors influencing the choice of materials for such services.



## 5

**"PIPING POINTERS"—FOR PRACTICAL PIPING MEN**

Here are 32 pages of basic information for piping men . . . a manual for beginners . . . a refresher piping course for veterans. One of the most popular and helpful Crane services for piping maintenance men — everyone in your plant should have a copy.



# Foundry, Forge, and Fabrication

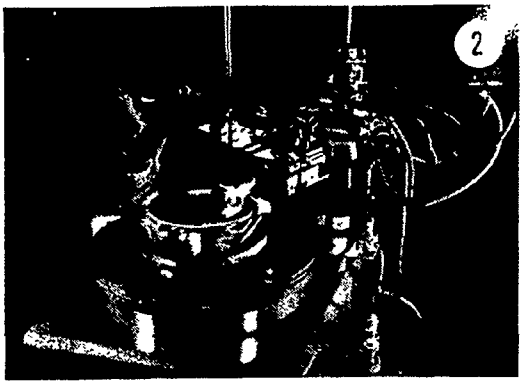
1 ***Steel Melting Facilities***—Four large and many small electric furnaces with capacities ranging from 1000 to 20,000 pounds, having an average melting rate of 24,000 pounds of steel per hour, put Crane among the largest steel foundries in industry. For melting alloy steels, irons, and brass mixtures, Crane operates 101 furnace units of the most modern and efficient design.

2 ***Acres of Casting Capacity***—Ready to convert each furnace melt into piping materials, Crane molding and casting equipment is of the finest type in any foundry. Molding, pouring and shakeout operations are mechanized to the highest degree, utilizing modern roller, belt, or overhead conveyor systems for continuous movement of castings and equipment on the large Crane foundry floors. High efficiency here is a strong factor in the high quality of Crane products.

3 ***Pipe Bending and Fabrication***—This picture tells the story of Crane Co.'s ability to produce almost any shape or size of pipe bend. With special tools and techniques, and highly skilled men, four Crane pipe shops find no specification too difficult to meet. They also produce headers and other units, incorporating valves, handling all operations such as bending, lapping, flanging, welding, etc.,—and can produce pipe coils in all sizes and shapes.

4 ***Big and Modern Forge Shop***—Nearly 45,000 square feet of space is used for steel forging at Crane Chicago Works. This shop is lined with rows of forges ranging from 600 pounds to 22,000 pounds hammer weight, to efficiently produce valve parts, fittings, and flanges. Equipment includes shears to cut billets from cold steel up to 4-in. thick in one bite. Gas-fired furnaces, heat-treating ovens, and acetylene cut-off machines complete this shop.

# Machining and Assembling



1 ***Machining Small Parts***—The Crane system of progressive manufacture reaches a high degree of efficiency with precise control of quality in the machining departments. Operations on various valve parts such as discs, stems, and glands, are accurately performed by the machine operators, each with unusual skill in his work.

2 ***Facing Discs by Continuous Welding***—One of the outstanding examples of efficient production engineering on Crane steel valves is this disc-facing operation. Here Stellite is being deposited on a disc for a Crane Pressure-Seal valve.

3 ***Fast and Accurate Machining***—Here, vertical turret lathes known for great speed and accuracy, are turning the flanges on Crane cast steel valve bodies. Hundreds of the finest machines, many designed by Crane engineers for special needs, occupy thousands of square feet in the great Chicago Works. They insure the high quality of Crane valves and fittings and produce them in ample quantity for every user.

4 ***Assembling Crane Valves a Smooth Operation***—The care given to Crane castings and forgings and the meticulous standards for machining all valve parts are reflected in the smoothness of assembly operations. In one department, 130 stations regularly handle steel valves 4 in. and larger. Brass valve assembly lines, using the progressive method, can handle as many as 20 different sizes and types at one time. Photo shows Crane diaphragm valves in process in a typical assembly department for small iron valves.

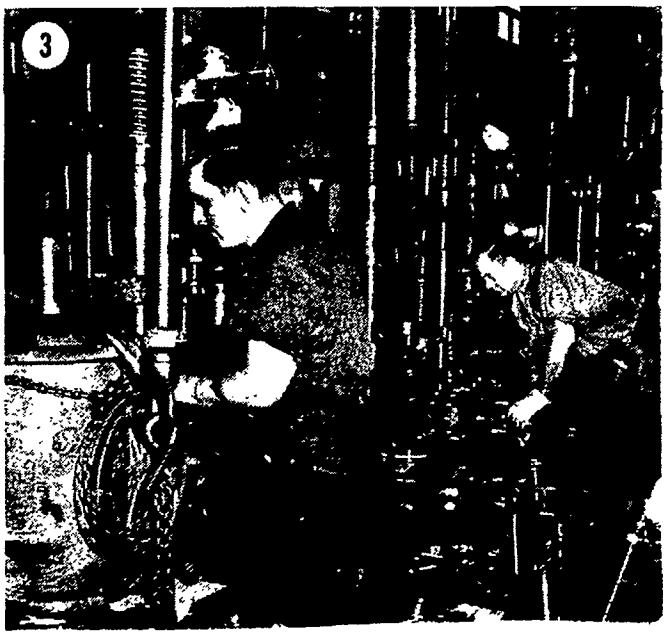
# Inspection and Testing

1 ***Large Steel Valves Get "O.K." for Service***—Here, Crane Steel gate valves get final check to insure customer satisfaction in the service for which they are intended. Hydrostatic pressure tests are made on shell and seat at prescribed pressures for each class of valve. In addition, valve seats are tested for tightness at 100 pounds, air-under-water. Crane takes great pride in its elaborate system for checking and testing the quality of all valves and fittings.

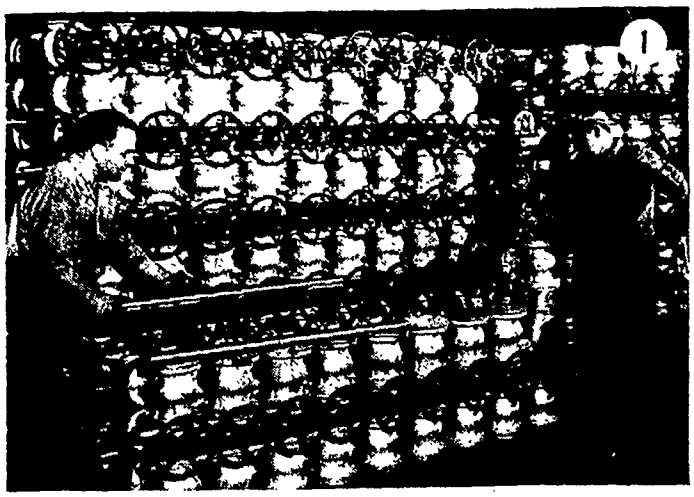
2 ***Fittings Must Measure Up***—Like valves, Crane fittings must measure up to close limits in every way. All types of fittings—steel, iron, and brass—are systematically inspected with precise instruments and gauges. Wall thickness, alignment, threading, drilling, etc., are examined at each stage in process and again before shipping to the customer or being placed in the stock room.

3 ***Check Valves Get Rigid Test***—Because check valves depend entirely on gravity or backflow pressure for tight seating, Crane engineers devised a highly critical test to assure seat tightness. Check valves are also given hydrostatic pressure tests on shell and seat, for which the 10-inch, 125-pound iron swing check in the photo is being prepared.

4 ***Pressure Testing Small Valves***— All steel and iron valves, which are produced in great quantity, are tested at a rapid rate by Crane-developed methods like this. Note the high visibility gauges. As many as 4800 valves in 80 different sizes and types can be tested daily in these departments.



# Warehousing and Distribution



1 ***In Storage at Chicago Works***—Here's just a "peek" view of the larger valve stocks normally maintained at the factory, ready for shipment to Crane Branches, Crane Wholesalers, or direct to customers. Shipments from the factory are accelerated by the skillfully planned flow of stock to packing and shipping departments, and highly efficient order-filling methods. 26 freight cars can be loaded from the main shipping platform at one time.

2 ***Branch Stock Matched to Local Needs***—More than 140 Crane Branches across the country carry a sufficient supply of staple items to permit filling many orders from stock. Branches in large industrial centers naturally carry larger stocks, as shown in this photo. Crane Wholesalers in these areas, as well as nearby Crane Branches, have access to such supplies for needs that can't await factory shipment.

3 ***No Delay of Deliveries at Crane Branches***—Shipping-platforms are usually the busiest places at Crane Branches. As fast as shipments from the factory are received and checked in, stocks move out to local customers. Crane Branches are located for convenient railroad service and rapid truck delivery.

4 ***Daily "Over the Counter" Service*** — All Crane Branches are equipped to give counter service on staple items throughout each business day. These departments, with close knowledge of such stock on hand, also handle your telephone "will call" orders with speed and efficiency.

# Alphabetical Index

All items shown in this catalog are cross-indexed alphabetically. References under broad classifications are covered by page numbers showing the entire range of products. For example, under the very general heading of "Brass Valves", group page numbers are shown for each of the various types, but under the specific heading of "Angle Valves, Brass", etc., will be found a detailed listing of the many available types. Similarly, under "Fittings", will be found group page numbers, the detailed references being made under specific listings such as, "Elbows", "Tees", "Crosses", "Unions", etc.

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# Metals and Materials

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The thousands upon thousands of items manufactured by Crane—valves, fittings, and allied products for all pressures, temperatures, and services—necessitate the use of an unusually wide variety of metals and material. The most common of these are briefly described and discussed in this section. Additional information on these and other Crane metals and material will be furnished on request.

2

# Brasses, Bronzes, Nickel Alloys, Monel, and Nitri-Hard

## Crane Steam Brass

Crane Steam Brass, widely used for valves, fittings, and other products recommended for temperatures up to 450° F. is an alloy of copper, tin, lead, and zinc. It conforms to A.S.T.M. Specification B 62 (Composition Brass or Ounce Metal Castings, 85-5-5-5) and is classified as "Leaded Red Brass" in A.S.T.M. B 119 (Standard Classification of Cast Copper-Base Alloys).

| Physical properties at 70° F. | | Average |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 36,000 |
| Yield point | lbs. per sq. in. | 16,000 |
| Elongation in 2 inches | per cent | 26 |

## Crane Special Bronze

Crane Special Bronze, commercially termed "bronze", is a high grade alloy used in valves, fittings, and other products recommended for the higher pressures and for temperatures up to 550° F. It conforms to A.S.T.M. Specification B 61 (Steam or Valve Bronze Castings) and is classified as "Leaded Tin Bronze" in A.S.T.M. B 119 (Standard Classification of Cast Copper-Base Alloys).

| Physical properties at 70° F. | | Average |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 38,000 |
| Yield point | lbs. per sq. in. | 17,000 |
| Elongation in 2 inches | per cent | 30 |

## Crane No. 44 Nickel Alloy

Crane No. 44 Nickel Alloy is a copper-base nickel-tin alloy, having a hardness superior to that of ordinary bronze.

Its particular application is as a seating material in valves which are to be subjected to services requiring the use of non-ferrous trim but where brass or bronze is inadequate.

Strong, tough, and hard, Crane No. 44 Nickel Alloy not only offers good resistance to wear, but resists as well, the corrosive action of dilute acids and alkalies which are common on refinery sludge service where various concentrations of sulphuric acid and alkalies are encountered.

## Crane No. 49 Nickel Alloy

Crane No. 49 Nickel Alloy is a nickel-base copper-tin alloy, having excellent bearing qualities and corrosion resistance. With Brinell number up to 235, it withstands wear and erosion at steam temperatures up to 850° F. unusually well.

The combination of Crane No. 49 Nickel Alloy and Crane Exelloy used in steel valves (known as "XR" trim) has been found particularly satisfactory for steam, water, air, gas, and other non-lubricating and relatively non-corrosive gases or liquids such as gasoline, fuel oil, etc. Such valves are also well suited for oil having low viscosity such as is used in hydraulic systems, especially where seating loads are extremely high.

## Crane Cast Manganese Bronze

Crane Cast Manganese Bronze was developed in order to procure a stem metal that would withstand the great torsional and tensile strains to which this valve part is subjected. Its unusually good bearing qualities offer excellent resistance to wear, and this, combined with strength and the good corrosion resistance typical of copper-base alloys, has extended its use to yoke sleeves, yoke bushings, and glands of iron and steel valves for a wide variety of services.

Crane Cast Manganese Bronze is made in two alloys, Alloy A and Alloy B, with minimum tensile strengths of 60,000 and 80,000 pounds per square inch, respectively. They conform to the requirements of A.S.T.M. Specification B 132, Leaded High-Strength Yellow Brass (Manganese Bronze) Sand Castings.

## Cast Monel

Monel is a high strength nickel-copper alloy containing approximately two-thirds nickel and one-third copper. It has excellent resistance to corrosion by many acids, alkalies, salt solutions, food products, organic substances, and many other miscellaneous fluids. Among non-ferrous alloys, Monel is an outstanding material for handling solutions of the alkalies and it is widely used wherever the avoidance of copper contamination is not imperative.

Monel Valves are shown in Section 33 (Corrosion-Resistant Valves and Fittings). The average physical properties of this alloy are:

| Physical properties at 70° F. | | Average |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 67,000 |
| Yield point | lbs. per sq. in. | 35,000 |
| Elongation in 2 inches | per cent | 30 |

## Crane Nitri-Hard

Crane Nitri-Hard is used for plug type discs and seats in brass, bronze, iron, and small size steel globe and angle valves. In the steel valves, this metal is designated as "W" trim.

The parts are either forged or machined from bar stock and after machining are heat treated to provide the desired hardness.

Seats and discs made of Crane Nitri-Hard withstand high temperatures and offer unusual resistance to wear, cutting, scoring, erosion, seizure, and galling.

# 18-8 Mo, Hastelloy, Exelloy, Stellite, and Ihrigized Steel

2

## Crane 18-8 Mo Alloy Cast Steel

Crane 18-8 Mo Alloy (18 to 22% chromium, 10 to 12% nickel, and 2.5 to 3% molybdenum) is an exceptionally high grade stainless steel that is highly resistant to corrosion and finds wide application in many industries.

The addition of molybdenum to regular chromium-nickel steel has been found to increase materially the corrosion resistance of this alloy, and, in recognition of this fact, Crane has adopted 18-8 Mo Alloy in preference to other types of 18-8 chromium-nickel steels.

Valves and fittings made of this material, shown in Section 33, may be recommended for use in services handling food products as well as for a large number of industrial chemicals.

Crane 18-8 Mo Alloy Steel is a casting material corresponding to A.I.S.I. (American Iron and Steel Institute) Type 316 wrought stainless steel. It conforms to, and substantially exceeds, the minimum requirements of A.S.T.M. Specification A 296, Grade CF-8M, as shown below, and is heat-treated to obtain maximum corrosion resistance.

| Physical properties at 70° F. | A.S.T.M. Minimum | Crane Average |
|---|---|---|
| Tensile strength.....lbs. per sq. in. | 70,000 | 75,000 |
| Yield point.....lbs. per sq. in. | 30,000 | 33,000 |
| Elongation in 2 inches.....per cent | 30 | 50 |
| Reduction of area.....per cent | 40 | 60 |

## Hastelloy "C"

Hastelloy "C" trim, used in Crane Chlorine Valve discs, disc stem rings, and body seat rings, is a nickel-molybdenum-chromium-iron alloy. Its tensile strength and hardness are comparable to that of alloy steel. It withstands strong oxidizing conditions such as those encountered with free chlorine and aqueous solutions containing chlorine.

Hastelloy is the registered trade-mark of the Haynes Stellite Division of the Union Carbide and Carbon Corporation.

## Crane Stellite Trim

Crane Stellite trim, used in high-pressure-temperature steel valves and known as "U" trim, is a cobalt-chromium-tungsten alloy. Facings of this material are deposited on steel discs or body seat rings by welding.

Stellite is recommended where service conditions are especially severe, particularly in modern steam power plants operating at elevated temperatures. Its extreme hardness when cold (Brinell number 375 minimum) is maintained almost unimpaired at red heat. Stellite withstands corrosion and erosion unusually well, and it displays excellent resistance to wear, seizure, galling, and abrasion.

## Crane Exelloy for Stems

Crane Exelloy is a specially processed chromium iron having a chromium content of about 12 per cent and a carbon content of about 0.10 per cent.

For valve stems, it is carefully heat-treated to provide superior strength and excellent resistance to tension, compression, shear, and other strains attending stem service. Crane Exelloy withstands wear unusually well and offers liberal resistance to corrosion by atmosphere; by mildly alkaline water; and by steam, gas, air, oil, and hot oil vapors.

The remarkable properties of Crane Exelloy as a stem material have resulted in its adoption for regular use in nearly all Crane Steel Valves.

| Physical properties at 70° F. | Minimum | Crane Average |
|---|---|---|
| Tensile strength.....lbs. per sq. in. | 100,000 | 115,000 |
| Yield point.....lbs. per sq. in. | 80,000 | 90,000 |
| Elongation in 2 inches.....per cent | 20 | 22 |
| Reduction of area.....per cent | 60 | 65 |
| Brinell hardness number (range)..... ..... | | 225–250 |
| Charpy impact strength (keyhole notch) . ft. lbs..... | | 40 |

## Crane Exelloy for Seating Surfaces

Crane Exelloy for seating surfaces is the same as Crane Exelloy for stems, but is heat-treated to secure greater hardness—minimum Brinell hardness number ranging up to 350, depending upon the valve part. With this high hardness—resisting scratching, scoring, or indentation by hard particles—is combined adequate strength and ductility; excellent resistance to wear, seizure, galling, and erosion; and high resistance to oxidation and to the corrosive action of hot sulfur-bearing oils.

Crane Exelloy seating surfaces, used in steel valves and known as "X" trim, are especially recommended for oil and oil vapor at temperatures over 500° F. and for most corrosive and unrefined oils regardless of temperature. Exelloy combined with Crane No. 49 Nickel Alloy makes an ideal combination for steam, water, gas, and similar services; see "Crane No. 49 Nickel Alloy", page 2.

Crane Exelloy has been more universally suitable for valve seats in oil service than any other single material. Because of its remarkable properties, thousands of tons are in valve service.

## Crane Ihrigized Steel

Ihrigized Steel is resistant to wear and corrosion and has good bearing qualities. A typical application of this material is its use for packing glands in some iron and steel valves.

The surface of Ihrigized Steel is impregnated with silicon (approximately 15% Si) and is made by a patented process known as Ihrigizing.

# Cast, Malleable, Alloy, and Ni-Resist Irons

2

## Crane Cast Irons

Crane Cast Iron is regularly produced in three grades — Cast Iron, Ferrosteel, and High Tensile Iron; they are recommended for temperatures up to 450° F.

All of these grades conform to and exceed the minimum requirements of the A.S.T.M. Specification A 126 for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

Each grade is particularly suited to provide uniform density, soundness, and close grain within a specific range of thicknesses of sections employed in the production of Crane cast iron valves and fittings.

Cast Iron, used for small valves and fittings having light metal sections, conforms to the requirements of A.S.T.M. Specification A 126 for Class A Castings.

Ferrosteel, used for sections of medium metal thicknesses, conforms to the requirements of A.S.T.M. Specification A 126 for Class B higher strength Gray Iron Castings.

High Tensile Iron, used for the heavier metal sections, conforms to the requirements of A.S.T.M. Specification A 126 for Class C High-Test Cast Iron.

| | Crane Cast Iron Average | ASTM A 126 Class A Minimum | Crane Ferro-steel Average | ASTM A 126 Class B Minimum | Crane High Tensile Iron Average | ASTM A 126 Class C Minimum |
|---|---|---|---|---|---|---|
| Tensile Strength, pounds per square inch | 26,000 | 21,000 | 35,000 | 31,000 | 50,000 | 41,000 |
| Transverse Test, load at center, pounds | 3,000 | 2,200 | 3,600 | 3,300 | 4,200 | 4,000 |
| Transverse Test, deflection at center, inches | 0.12 | 0.10 | 0.14 | 0.12 | 0.14 | 0.12 |

## Crane Malleable Iron

Crane Malleable Iron is particularly suited for use in screwed pipe fittings, valves, and flanges. It is characterized by pressure tightness, stiffness, and toughness, the latter property being an especially valuable one for pipe line materials subjected to expansion and contraction stresses and shock.

This iron has a tensile strength of from 40,000 to 50,000 pounds per square inch. Through improved practices in casting and annealing, a superior line of malleable iron products is assured.

Crane Malleable Iron conforms to the requirements of the A.S.T.M. Specification A 197 for Cupola Malleable Iron.

Analysis of the crystal structure of materials by means of an X-Ray Diffraction machine.

The comparable ability of malleable iron to resist shock or impact as well as bending stresses due to piping weight, expansion, etc., is shown in the following table. Note that because of their exceptional ductility, the malleable iron and cast steel bars were reversed after each blow.

Tests for Shock or Impact (Bars 1"x1"x13")

| Material | Blows of a 25-pound Drop Hammer to Break | Shock Test Foot Pounds |
|---|---|---|
| Cast Iron | 7 | 102 |
| Ferrosteel | 11 | 206 |
| *Malleable Iron | 22 | 1580 |
| *Cast Steel | 92 | 10,112 |

*Reversed after each blow because of bending.

## Crane Alloy Cast Irons

Crane Alloy Cast Irons, a development of the Crane Engineering Laboratory, are offered to meet the need for iron having better physical properties and resistance to corrosion when subjected to services where ordinary gray iron is not adequate.

These materials, having a nickel low alloy composition, are suited for valves or fittings in specialized services of pulp or paper or petroleum industries.

## Crane Ni-Resist Cast Iron

Ni-Resist Cast Iron is used as material where the physical properties of cast iron suffice but where greater resistance to corrosion is required.

Ni-Resist is an alloy cast iron containing 14% nickel, 6% copper, and 2% chromium; it has an average tensile strength of approximately 25,000 pounds per square inch.

# Packing Materials



## C.C. Rubber Sheet Packing

C.C. Rubber Sheet Packing is a superior grade of rubber composition packing, which is manufactured solely for Crane. This material is exceptionally tough, durable, and resilient. It is compounded according to a special formula, and it is subjected to frequent and careful tests to assure that the high quality is strictly maintained.

C.C. Rubber is available in rolled sheets or finished cut gasket shapes. It is recommended for all pressures in services such as saturated steam, hot and cold water, air, and gas.

C.C. Rubber Sheet Packing.....page 473
C.C. Rubber Gaskets.....pages 472 and 474

## Cranite Sheet Packing

Cranite is a superior gasket material prepared from selected long fiber asbestos, cross-laminated to secure exceptional strength and durability. It has a high and uniform compressive strength, does not deteriorate with age, and is ideally suited for use with water, air, gas, gasoline, ammonia, steam, and other fluids at temperatures up to 750° F.

Cranite has been approved by the Underwriters' Laboratories, Inc. (National Board of Fire Underwriters), for use on hazardous liquids.

Cranite Sheet Packing.....page 473
Cranite Gaskets.....pages 472 and 474 to 476
Cranite Union Gaskets.....pages 416 and 476

## Corrugated Metallic Gaskets

Corrugated metallic gaskets are recommended for service where temperatures exceed 750° F.; they are available in copper, of No. 27 B&S Gauge, and in soft iron of No. 24 U.S. Gauge.

Crane Corrugated Metallic Gaskets are of good quality, having proper strength, ductility, and toughness.

To secure a smaller bearing surface with the resulting increase in unit compressive load, the inside diameter of these gaskets is made larger than the port diameter of the joint, providing assurance of tightness.

Prices and dimensions on application.

## Composition Discs

Crane Composition Discs are furnished in a variety of materials, sizes, and styles to cover a wide range of service conditions. Through years of constant study, research, and testing, this line of Composition Discs was developed to fill the need for suitable renewable type discs in globe and angle valves.

These materials are made for use in steam, hot and cold water, oil, air, gas, and gasoline services. Users are urged to choose the type and material recommended on page 133, in order to obtain the best results.

Composition Discs.....page 133

## Rings for Ring Joints

Ring Joints can be utilized as connections for all pressure classes of Crane Steel Valves, Fittings, and Flanges. They require the use of a metal ring, which seats in an especially prepared groove in each flange face, to seal the joint.

Crane rings for ring joints are the result of extensive research and field and laboratory testing. They are of unusually high quality, being purchased under exceptionally rigid specifications; each shipment is carefully inspected and tested before being admitted to stock.

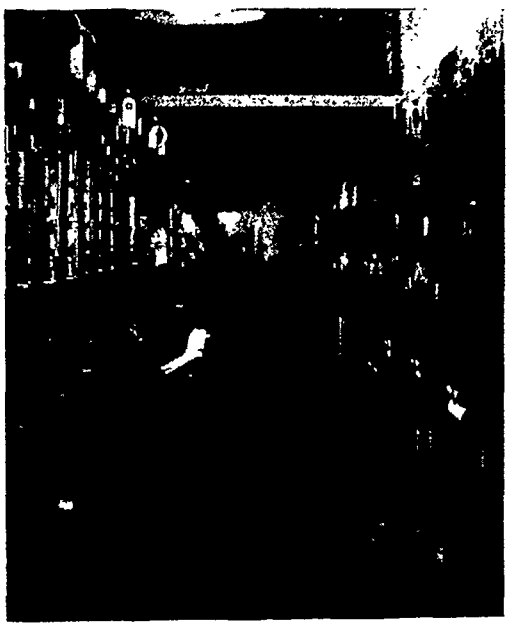
Crane rings are furnished in two types, as follows:

Type A . . . of soft steel, with a maximum Brinell hardness number of 90.

Type B . . . of 4 to 6% chrome and ½% molybdenum, with a maximum Brinell hardness number of 130.

Crane rings and ring joints are recommended for high pressure hydraulic installations and for high pressure-temperature steam and hot oil lines.

Rings for Ring Joints.....page 472



Minute measurements give the inside story on creep.

# Crane Cast Steels

2

To provide adequately for the widely varied services to which steel valves and fittings are subjected, Crane regularly produces several different types of cast steel. The individual characteristics and recommendations for each are described below and on the opposite page.

## Crane Carbon Cast Steel

Crane Carbon Cast Steel is ideally suited for a multitude of services that are beyond the scope of bronze or iron. Its superior strength and toughness, and its resistance to piping strains, vibration, shock, freezing, and damage by fire, afford reliable protection when safety and utility are desired.

It is suitable for use on saturated or superheated steam, cold or hot water, cold or hot non-corrosive oil, gas, air, or other fluids. It has a carbon content not exceeding 0.35%, which assures good welding qualities. All castings are carefully heat treated.

Crane Carbon Cast Steel conforms to and substantially exceeds the minimum requirements of A.S.T.M. Specification A 216, Grade WCB, covering carbon steel castings for valves, flanges, and fittings for high-temperature service.

| Chemical Composition | | Maximum | Crane average |
|---|---|---|---|
| Carbon | per cent | 0.35 | 0.25 |
| Manganese | per cent | 0.70* | 0.65 |
| Silicon | per cent | 0.60 | 0.40 |
| Phosphorus | per cent | 0.05 | 0.03 |
| Sulfur | per cent | 0.06 | 0.03 |

*Note: Maximum manganese content may be as high as 1.10 per cent provided it is accompanied by an appropriate decrease in the carbon content.

| Physical Properties at 70° F. | | Minimum | Crane average |
|---|---|---|---|
| Tensile strength | lbs. per sq. in. | 70,000 | 76,000 |
| Yield point | lbs. per sq. in. | 36,000 | 45,000 |
| Elongation in 2 inches | per cent | 22 | 30 |
| Reduction of area | per cent | 35 | 50 |
| Brinell hardness number | | .. | 155 |
| Bend test | degrees | 90 | 180 |
| Charpy impact strength (keyhole notch) | ft. lbs. | | 15 |

## Crane No. 4 Carbon-Molybdenum Alloy Cast Steel

Crane No. 4 Carbon-Molybdenum Cast Steel, containing approximately ½% of molybdenum, has many unusually desirable characteristics. At room temperature, its strength is slightly greater than that of Crane Carbon Steel, and this strength is retained to a marked degree at elevated temperatures. At temperatures to 1000° F., its resistance to creep is equal to that of more highly alloyed steels. Unlike most alloy steels, its weldability compares favorably with that of carbon steel.

It is admirably suited for use on steam, water, oil, gas, air, or other services when superior strength and toughness are essential. It is especially recommended for high-pressure, high-temperature service when valves and fittings are welded into the piping.

Crane No. 4 Carbon-Molybdenum Steel castings are carefully heat treated, by normalizing and drawing.

Crane No. 4 Carbon-Molybdenum Cast Steel conforms to and substantially exceeds the minimum requirements of A.S.T.M. Specification A 217-46T, Grade WC 1, covering alloy steel castings for valves, flanges, and fittings.

| Chemical Composition | | Minimum | Maximum | Crane average |
|---|---|---|---|---|
| Carbon | per cent | 0.15 | 0.30 | 0.25 |
| Molybdenum | per cent | 0.40 | 0.60 | 0.50 |
| Manganese | per cent | 0.50 | 0.70* | 0.65 |
| Silicon | per cent | 0.20 | 0.60 | 0.35 |
| Phosphorus | per cent | .... | 0.05 | 0.03 |
| Sulfur | per cent | .... | 0.06 | 0.03 |

*Note: Maximum manganese content may be as high as 1.10 per cent provided it is accompanied by an appropriate decrease in the carbon content.

| Physical Properties at 70° F. | | Minimum | Crane average |
|---|---|---|---|
| Tensile strength | lbs. per sq. in. | 70,000 | 80,000 |
| Yield point | lbs. per sq. in. | 45,000 | 50,000 |
| Elongation in 2 inches | per cent | 22 | 26 |
| Reduction of area | per cent | 35 | 50 |
| Brinell hardness number | | .. | 165 |
| Bend test | degrees | 90 | 180 |
| Charpy impact strength (keyhole notch) | ft. lbs. | | 25 |

## Crane No. 3 Nickel Alloy Cast Steel

Crane No. 3 Nickel Cast Steel provides excellent tensile and impact strength at sub-zero temperatures and is especially recommended for use at extremely low atmospheric temperatures, or for refrigerating processes down to −100° F., such as in the dewaxing of lubricating oil. All castings are carefully heat treated.

| Physical Properties at 70° F. | | Minimum | Crane average |
|---|---|---|---|
| Tensile strength | lbs. per sq. in. | 67,500 | 75,000 |
| Yield point | lbs. per sq. in. | 45,000 | 55,000 |
| Elongation in 2 inches | per cent | 25 | 32 |
| Reduction of area | per cent | 45 | 55 |
| Charpy impact strength (keyhole notch) | | | |
| At 70° F. | ft. lbs. | 25 | 35 |
| At −100° F. | ft. lbs. | 15 | 20 |

## Crane "Arctic" Nickel Alloy Cast Steel

***(Trademark "Arctic" registered in U.S. Patent Office)***

For sub-zero temperatures substantially lower than those for which Crane No. 3 Nickel Cast Steel is recommended, Crane Metallurgists developed Crane "Arctic" Nickel Cast Steel. All castings are heat treated to develop the required physical properties. Inquiries for Crane "Arctic" Nickel Cast Steel should include specifications of the contemplated service.

| Physical Properties at 70° F. | | Minimum |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 65,000 |
| Yield point | lbs. per sq. in. | 40,000 |
| Elongation in 2 inches | per cent | 25 |
| Reduction of area | per cent | 45 |
| Charpy impact strength (keyhole notch) | | |
| At 70° F | ft. lbs. | 30 |
| At −175° F. | ft. lbs. | 15 |

## Crane No. 7 Chrome-Molybdenum Alloy Cast Steel

Crane No. 7 Chrome-Molybdenum Alloy Cast Steel was introduced when it became apparent that steels need a substantial chromium content to stabilize them against graphitization under the operating conditions of welded power piping systems. For the purposes of welded piping systems operating up to 1050° F., Crane No. 7 Chrome-Molybdenum Alloy Cast Steel has been found highly satisfactory for its weldability and, when operating at high temperatures, for its stability and high strength.

The use of 1.00 to 1.50 per cent chromium and of 0.45 to 0.65 per cent molybdenum as the principal alloying elements establishes the stability of the steel against graphitization and, at the same time, assures excellent strength retention at elevated temperatures. Combined with these qualities is ready weldability, not usually associated with chromium-bearing steels, but made possible by the low carbon content comparable to that of the pipe.

Crane No. 7 Chrome-Molybdenum Alloy Cast Steel is regularly used in the Crane Pressure-Seal Bonnet Valves and Lip-Seal Bonnet Valves, recommended for steam service at temperatures up to 1050° F., and is available on special order for other Crane steel valves and fittings. All castings receive heat treatment proper to their design and chemical composition. The steel conforms to A.S.T.M. Specification A-217, Grade WC6, covering alloy steel castings suitable for fusion welding for high-temperature service.

| Chemical Composition | Minimum | Maximum | Crane average |
|---|---|---|---|
| Carbon.....per cent | .... | 0.20 | 0.13 |
| Chromium.....per cent | 1.00 | 1.50 | 1.25 |
| Molybdenum.....per cent | 0.45 | 0.65 | 0.55 |
| Manganese.....per cent | 0.50 | 0.80 | 0.65 |
| Phosphorus.....per cent | .... | 0.05 | 0.03 |
| Sulphur.....per cent | .... | 0.06 | 0.03 |
| Silicon.....per cent | .... | 0.60 | 0.45 |

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength.....lbs. per sq. in. | 70,000 | 78,000 |
| Yield point.....lbs. per sq. in. | 40,000 | 52,000 |
| Elongation in 2 inches.....per cent | 20 | 28 |
| Reduction of area.....per cent | 35 | 60 |
| Brinell hardness number..... | ... | 165 |
| Bend test.....degrees | ... | 180 |
| Charpy impact strength (keyhole notch).ft. lbs. | ... | 30 |

**Note:** A forging grade of this steel, having comparable characteristics, is available for forged valve parts.

## Crane No. 9 Chrome-Molybdenum Alloy Cast Steel

Crane No. 9 Chrome-Molybdenum Alloy Cast Steel was developed for high-temperature service, particularly at 1050° F., and higher, where it possesses strength and steam corrosion resistance somewhat greater than Crane No. 7 Steel.

The characteristics of Crane No. 9 Steel are attributable to its higher chromium content (2.00 to 2.75 per cent) and higher molybdenum content (0.90 to 1.20 per cent).

Crane No. 9 is a weldable steel and is available for Crane Pressure-Seal Bonnet Valves, Lip-Seal Bonnet Valves, and for other Crane valve and fitting products.

Crane No. 9 Chrome-Molybdenum Alloy Cast Steel conforms to the requirements of A.S.T.M. Specification A217, Grade WC9.

| Chemical Composition | Minimum | Maximum | Crane average |
|---|---|---|---|
| Carbon.....per cent | .... | 0.18 | 0.14 |
| Chromium.....per cent | 2.00 | 2.75 | 2.50 |
| Molybdenum.....per cent | 0.90 | 1.20 | 1.00 |
| Manganese.....per cent | 0.40 | 0.70 | 0.60 |
| Phosphorus.....per cent | .... | 0.05 | 0.03 |
| Sulphur.....per cent | .... | 0.06 | 0.02 |
| Silicon.....per cent | .... | 0.60 | 0.50 |

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength.....lbs. per sq. in. | 70,000 | 85,000 |
| Yield point.....lbs. per sq. in. | 40,000 | 60,000 |
| Elongation in 2 inches.....per cent | 20 | 25 |
| Reduction of area.....per cent | 35 | 55 |
| Brinell hardness number..... | ... | 180 |
| Bend test.....degrees | ... | 180 |
| Charpy impact strength (keyhole notch).ft. lbs. | ... | 30 |

## Crane No. 5 Chrome-Molybdenum Alloy Cast Steel

Crane No. 5 Chrome-Molybdenum Cast Steel is unusually strong at normal temperatures and possesses exceptional strength and creep resistance at high temperatures. It offers excellent resistance to erosion and to scaling at temperatures up to 1100° F. It is relatively economical in cost when compared with more highly alloyed steels.

Crane No. 5 Steel is ideal for severe service on steam, water, oil, or gas lines, particularly when corrosion resistance is essential as in oil refinery service. Since heat treatment after welding is necessary, it is best adapted to products having flanged or threaded ends. All castings are carefully heat treated by normalizing and drawing. Crane No. 5 Cast Steel conforms to and substantially exceeds the minimum requirements of A.S.T.M. Specification A217, Grade C5, covering alloy steel castings for pressure containing parts suitable for high-temperature service.

| Chemical Composition | Minimum | Maximum | Crane average |
|---|---|---|---|
| Carbon.....per cent | .... | 0.20 | 0.16 |
| Chromium.....per cent | 4.00 | 6.50 | 4.87 |
| Molybdenum.....per cent | 0.45 | 0.65 | 0.52 |
| Manganese.....per cent | 0.40 | 0.70 | 0.65 |
| Phosphorus.....per cent | .... | 0.05 | 0.02 |
| Sulphur.....per cent | .... | 0.06 | 0.02 |
| Silicon.....per cent | .... | 0.75 | 0.55 |

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength.....lbs. per sq. in. | 90,000 | 105,000 |
| Yield point.....lbs. per sq. in. | 60,000 | 78,000 |
| Elongation in 2 inches.....per cent | 18 | 22 |
| Reduction of area.....per cent | 35 | 55 |
| Brinell hardness number..... | ... | 200 |
| Bend test.....degrees | 90 | 180 |
| Charpy impact strength (keyhole notch).ft. lbs. | ... | 25 |

# Crane Forged Steels

2

Paralleling the variety of Cast Steels produced by Crane to provide for widely varied services, is a corresponding group of Crane Forged Steels. While the chemical composition and physical properties of the forged steels are not exactly the same as those of the cast steels, in general characteristics and ultimate utility the forged material is the full equivalent of the cast.

The recommendations for Crane Cast Steels and the comparisons thereof, are, therefore, equally applicable to Crane Forged Steels; see pages 6 and 7. From the standpoint of life and service there is no difference; both are component parts of a complete line. Forgings have a highly refined grain, with physical properties well in excess of recognized minimum requirements.

## Crane Carbon Forged Steel

For a greater diversity of service, Crane Carbon Forged Steel is furnished in two classes, Grade I and Grade II. Grade I, with a maximum carbon content of 0.30 per cent, has unusually good welding properties and is used for Welding Neck Flanges. Grade II, with slightly higher carbon content (0.35 per cent maximum) is used for all other types of steel flanges, and for flange unions, yokes on steel valves, socket-welding fittings, etc.

Crane Carbon Steel forgings possess such a highly mechanically refined grain structure and such generally excellent physical properties that heat treatment is confined to flanges in the 400-Pound and higher steel pressure classes.

Crane Carbon Forged Steels conform to A.S.T.M. Specifications A 105 covering Forged and Rolled Steel Pipe Flanges, Forged Fittings and Valves and Parts for High Temperature Service; A 181 covering Forged and Rolled Steel Pipe Flanges for General Service; and A 234 covering Factory Made Wrought Carbon Steel Welding Fittings.

The Crane average physical properties, substantially exceeding A.S.T.M. minimums, are shown below.

| Physical Properties at 70° F. | Crane Average Grade I Heat treated | Grade I As forged | Grade II Heat treated | Grade II As forged |
|---|---|---|---|---|
| Tensile strength, psi | 75,000 | 77,000 | 80,000 | 80,000 |
| Yield point, psi | 45,000 | 46,000 | 47,000 | 48,000 |
| Elongation in 2 inches, % | 32 | 25 | 30 | 25 |
| Reduction of area, % | 60 | 50 | 55 | 45 |
| Brinell hardness number | 155 | 160 | 160 | 160 |
| Charpy impact strength, (keyhole notch) ft. lbs. | 25 | 20 | 25 | 20 |

## Crane No. 4 Carbon-Molybdenum Alloy Forged Steel

Crane No. 4 Carbon-Molybdenum Forged Steel has the same good welding properties, high strength retention at elevated temperatures, and excellent resistance to creep as Crane No. 4 Carbon-Molybdenum Cast Steel. Its mechanically refined grain structure is further refined by a careful heat treatment, consisting of normalizing and drawing.

This steel exceeds the minimum requirements of A.S.T.M. Specification A 182, Grade F 1.

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength ... lbs. per sq. in. | 70,000 | 78,000 |
| Yield point ... lbs. per sq. in. | 40,000 | 50,000 |
| Elongation in 2 inches ... per cent | 25 | 30 |
| Reduction of area ... per cent | 35 | 60 |
| Brinell hardness number | ... | 155 |
| Charpy impact strength (keyhole notch). ft. lbs | | 30 |

## Crane No. 5 Chrome-Molybdenum Alloy Forged Steel

Crane No. 5 Chrome-Molybdenum Forged Steel, like the cast material, offers unusually high retention of strength on elevated temperature service, superior corrosion resistance, and excellent resistance to erosion and scaling.

All forgings are carefully heat treated, by normalizing and drawing.

This steel exceeds the minimum requirements of A.S.T.M. Specification A 182, Grade F 5.

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength ... lbs. per sq. in. | 90,000 | 100,000 |
| Yield point ... lbs. per sq. in. | 65,000 | 75,000 |
| Elongation in 2 inches ... per cent | 22 | 25 |
| Reduction of area ... per cent | 50 | 60 |
| Brinell hardness number | ... | 200 |
| Charpy impact strength (keyhole notch). ft. lbs. | | 35 |

## Crane No. 3 Nickel Alloy Forged Steel

Crane No. 3 Nickel Forged Steel is characterized by its outstanding suitability for service on sub-zero temperatures. All forgings of this steel are carefully heat treated, by normalizing and drawing.

| Physical Properties at 70° F. | Minimum | Crane average |
|---|---|---|
| Tensile strength ... lbs. per sq. in. | 62,500 | 68,000 |
| Yield point ... lbs. per sq. in. | 36,000 | 42,000 |
| Elongation in 2 inches ... per cent | 25 | 35 |
| Reduction of area ... per cent | 40 | 60 |
| Charpy impact strength (keyhole notch), at 70° F. . ft. lbs. | 25 | 35 |
| at −100° F. . ft. lbs. | 15 | 20 |

# Bolting Materials

In the manufacture of Crane Valves and in bolting flanged valves, fittings, and flanges together to form a complete piping system, four classes of bolting materials are regularly used. These materials, open hearth steel, cold rolled steel, chrome-molybdenum steel, and chrome-molybdenum-vanadium steel, are described as follows:

## Machine Bolts and Bolt-Studs

Bolts and studs for temperatures up to 500° F. are made from steel complying with A.S.T.M. Specification A 107, Open Hearth free-cutting grade, having the following physical properties:

| Physical Properties at 70° F. | | Minimum |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 60,000 |
| Yield point | lbs. per sq. in. | 35,000 |
| Elongation in 2 inches | per cent | 25 |
| Reduction of area | per cent | 50 |

Nuts regularly used with machine bolts or studs are made from free-cutting or resulfurized nut stock which conforms to A.S.T.M. Specification A107.

Studs and bolt-studs for temperatures up to 500° F., primarily for high pressure hydraulic service, are made from cold rolled steel complying with A.S.T.M. Specification A 108, Open Hearth free-cutting grade, having the following physical properties:

| Physical Properties at 70° F. | | Minimum |
|---|---|---|
| Tensile strength | lbs. per sq. in. | 70,000 |
| Yield point | lbs. per sq. in. | 60,000 |
| Elongation in 2 inches | per cent | 18 |
| Reduction of area | per cent | 45 |

Nuts regularly used on cold rolled steel studs and bolt-studs are cold made of material in accordance with A.S.T.M. Specification A 107.

## Alloy Steel Bolt-Studs

Crane pioneered in the development of alloy steel bolting. For many years, Crane Triplex Steel has been recognized as the highest quality bolting material for services at temperatures beyond the range of carbon steel.

Crane Templex Steel resulted from much study and experience with high-temperature composition, and stands as the highest quality bolting material for services at temperatures beyond the range of other ferritic alloy steels.

### Crane Triplex Steel

Crane Triplex Steel, a chrome-molybdenum steel having marked stability, retains its strength unusually well at elevated temperatures. It offers better resistance to creep than most high grade alloy steel bolting materials. Responding readily to heat treatment, it is carefully processed to secure liberal strength, hardness, and other desirable properties.

The uniformly satisfactory results secured with Triplex Steel Bolt-Studs in thousands of steel valve and fitting installations, many of which — particularly in oil refineries — have been operating under extreme pressures and temperatures, is a fitting testimonial of their excellence.

Crane Triplex Steel is regularly used for the bonnet bolting of Crane "XR", "X", "XW", and "W" trimmed bolted bonnet steel valves and Pressure-Seal Bonnet steel valves.

The steel is specially heat treated by quenching and drawing, producing a dense, uniform, and fine grain with superior physical properties.

Crane Triplex Steel substantially exceeds the minimum requirements of A.S.T.M. Specification A 193, Grade B 7.

| Physical Properties at 70° F. | Minimum | Crane Triplex average | Crane Templex average |
|---|---|---|---|
| Tensile strength...lbs. per sq. in. | 125,000 | 134,000 | 145,000 |
| Yield point.....lbs. per sq. in. | 105,000 | 116,000 | 118,000 |
| Elongation in 2 inches...per cent | 16 | 20 | 20 |
| Reduction of area.....per cent | 50 | 57 | 57 |
| Brinell hardness number (range). | 260–320 | 270–300 | 285–320 |

### Crane Templex Steel

Crane Templex Steel is a chrome-molybdenum-vanadium alloy developed by Crane. Its unusual strength and remarkable stability at elevated temperatures is the result of the molybdenum and vanadium combined with special heat treatment. Crane Templex Steel has greater resistance to creep than other bolting steels offered on the market today.

For exceptionally high temperature service, this steel is ideal. It is regularly used in the bonnet bolting of Crane "U" trimmed bolted bonnet steel valves.

The secret of the superiority of Crane Templex Steel lies in the exactin heat treatment developed by Crane laboratories. In addition to uniform grain and excellent physical properties, it produces a definite carbide size in the microstructure of the material, resulting in maximum creep resistance.

Crane Templex Steel substantially exceeds the minimum requirements of A.S.T.M. Specification A 193, Grade B 14.

### Nuts for Alloy Steel Bolt-Studs

Crane Triplex and Templex Steel Bolt-Studs are regularly fitted with hot forged, medium carbon, oil-quenched nuts, made to American Standard Semi-Finished Heavy Hexagon dimension, ASA B18.2. Having a Brinell hardness number of 250 minimum, they are capable of developing the full strength of the stud. They conform to A.S.T.M. Specification A 194, Class 2 H.

# Marking of Crane Products

2

The marking and identification of Crane products conform to the Manufacturers Standardization Society Standard Marking System for Valves, Fittings, Flanges, and Unions (MSS SP-25).

## Distinguishing Marks

All products are marked for identification with either the name "CRANE", the letter "C", or the letters "CC", depending on the size and type of the article as well as the method of manufacture.

In addition, certain unions and union fittings have specific markings, such as "RAILROAD", etc. Unions, fittings, and valves made in accordance with the specifications adopted by the American Association of Railroads are marked with either the letters "ARA" or "AAR".

Supplementing the markings that are an integral part of castings or forgings, most regular Crane valves are now equipped with identification plates. These are made of a variety of materials and are mounted in different positions on valves, sometimes under the wheel nut, sometimes on the yoke, etc., depending upon the type and size of valve. The plates carry identifying material appropriate to the particular product, including in each case, at least the size and catalog number of the valve and a part number.

All identifying markings, including the information on these identification plates, should always be specified when corresponding about Crane valves in service or when ordering repair parts.

## Designation of Material

Cast iron products have no marking indicating the material.

Malleable iron products are marked with either the letters "MI" or "MALL", except for unions, union fittings, and 150-pound screwed fittings which have no such marking.

150-Pound Malleable Iron Screwed Fittings have an open crotch between the bands, and are so distinguished from 125-Pound Cast Iron Screwed Fittings which have joining bands. Unions and union fittings are not made in cast iron.

Brass and bronze products can be readily distinguished from cast iron by their color, and therefore have no material marking; special bronze alloys, however, have special markings.

Steel products, if space permits, are marked with the word "STEEL", which definitely distinguishes them from cast iron. Likewise, alloy steels are marked with a symbol to identify the alloy. Steel castings of pressure containing parts have the heat number stamped on a raised pad.

Cast stainless steels and other corrosion-resistant alloys have special markings.

## Designation of Service Pressure Ratings

Nearly all Crane products are now designated by their general or primary pressure class, such as "25-Pound", "100-Pound", "125-Pound", etc., the use of ambiguous terms such as "Low Pressure", "Standard", "Heavy", etc., having been discontinued as obsolete and misleading. The use of the new pressure designations, however, should not be construed to mean that the product is recommended for those pressures. Such names are only descriptive of the general class of product, and do not necessarily imply that all items within a given class or that all sizes of a given product are rated for the same primary pressure.

The recommended pressure ratings for Crane products are specified on the catalog page listing the product. Nearly all of the products, with the exception of Gas Stops and 125 or 150-Pound Screwed Fittings, are marked with the recommended basic working pressure.

Where the numerals are not followed by any suffix symbols, they represent the basic steam service pressure rating at the maximum temperature which is given for the line on the corresponding page of this catalog, or, where the maximum temperature is not specified, at the temperature of saturated steam.

Ammonia Valves and Fittings are an exception to the foregoing in that they are marked "300" without any suffix symbol to indicate ammonia service pressure. Valves with leather or rubber faced discs are another exception in that they use bodies regularly marked with a basic steam rating, yet should only be used on the service for which this type of disc face is recommended.

Where the numerals are followed by the letters "WOG", they represent the water, oil, or gas service pressure rating at or near atmospheric temperature. Where two sets of numerals are shown, the steam service pressure is followed by the letter "S", and the water, oil, or gas service pressure, by the letters "WOG". Test pressure marking, where used, is followed by the word "TEST".

# Air Testing

The fact that many Crane products are recommended for water, oil, and gas does not necessarily indicate that all such products are air tested. It has been found commercially that our regular stock valves have proven quite generally satisfactory for air or gas service without an air test; therefore, if an air test is required, it must be definitely specified.

Any valve intended for air, gas, or very volatile fluids, where absolute tightness is essential, should be ordered air tested unless the catalog definitely states the valve is regularly air tested.

Where iron and steel gate valves are to be used in pipe lines on natural dry gas service, orders should so specify and valves will be suitably packed. All valves which are air tested are provided with protectors placed over the openings.

# Hydrostatic and Shock Working Pressures

All valves, fittings, and flanges in this catalog are suitable for the liquid working pressures specified only when used in hydraulic installations in which shock is absent or negligible.

The sudden closure of a valve in a hydraulic system causes the body of liquid, which may be moving at a rate generally in excess of 1 foot per second, to stop instantaneously. As a liquid is relatively incompressible, the effect of the sudden cessation of flow is to raise the pressure considerably above the static working pressure. This increase in pressure is called "SHOCK" and may, in some cases, be sufficient to cause valves or piping to fail.

The increase in pressure due to shock is not dependent upon the working pressure of the system but upon the velocity at which the liquid is flowing. For example: An installation having a working pressure of 100 pounds per square inch with a velocity of 3 feet per second will be subject to the same increase in pressure due to ***instantaneous closure*** of a valve as one having a working pressure of 1000 pounds per square inch and the same velocity.

Shock is generally prevalent in lines which are equipped with check valves, quick closing valves, or in lines supplied by reciprocating pumps. Shock, however, may also be produced in any line to a lesser degree by the rapid closure of regular globe or gate valves, and it is therefore recommended that care must always be used in closing valves in lines transporting liquids.

It is recommended that, where shock is likely to occur, the maximum shock pressure be added to the working pressure of the line to determine the working pressure of the valves, fittings, or flanges which should be used.

It is also recommended that all hydraulic installations be equipped with air chambers or other types of shock absorbers to eliminate, as much as possible, the increase in pressure due to shock.

# Increase in Pressure Due to Expansion of Liquids

If a vessel is completely filled with a liquid so that there is no space available for volumetric expansion, any rise in temperature of the liquid will cause an increase in internal pressure. This increase in pressure is due to the tendency of the liquid to change in volume, and as liquids are relatively incompressible, the pressure builds up rapidly with only a slight change in temperature. The rise in temperature may be due to the sun's rays or to an increase in atmospheric temperature.

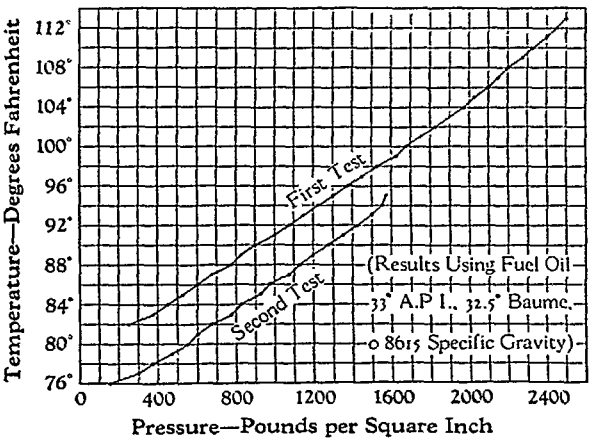
Crane has conducted tests which indicate that when vessels are completely filled with fuel oil of 33° A.P.I., a temperature rise of one degree Fahrenheit causes the internal pressure to increase approximately 75 pounds per square inch. Refer to chart at right.

In the first test, the temperature was increased a total of 31 degrees (from 82 to 113) and caused a total rise in pressure of 2250 pounds (from 250 to 2500), averaging approximately 73 pounds per degree. In the second test, the temperature was increased a total of 19 degrees (from 76 to 95) and caused a total rise in pressure of 1425 pounds (from 150 to 1575), averaging 75 pounds per degree.

While results may vary slightly under actual service conditions, depending upon the kind of oil, its cubical coefficient of expansion, the flexibility, if any, of the vessel, the presence of air in the oil, and other variables, the tests prove conclusively that dangerously high pressures can build up in an oil containing vessel with only a moderate temperature increase, such as might be caused by the sun's rays.

It is recommended, therefore, where valves are installed in lines carrying liquids (particularly oil), that some means be employed to prevent entrapping the liquid in the valve bonnet, to eliminate the possibility of pressure building up due to a rise in the temperature.

**Thermo-Piezo Effects of Oil at Constant Volume**

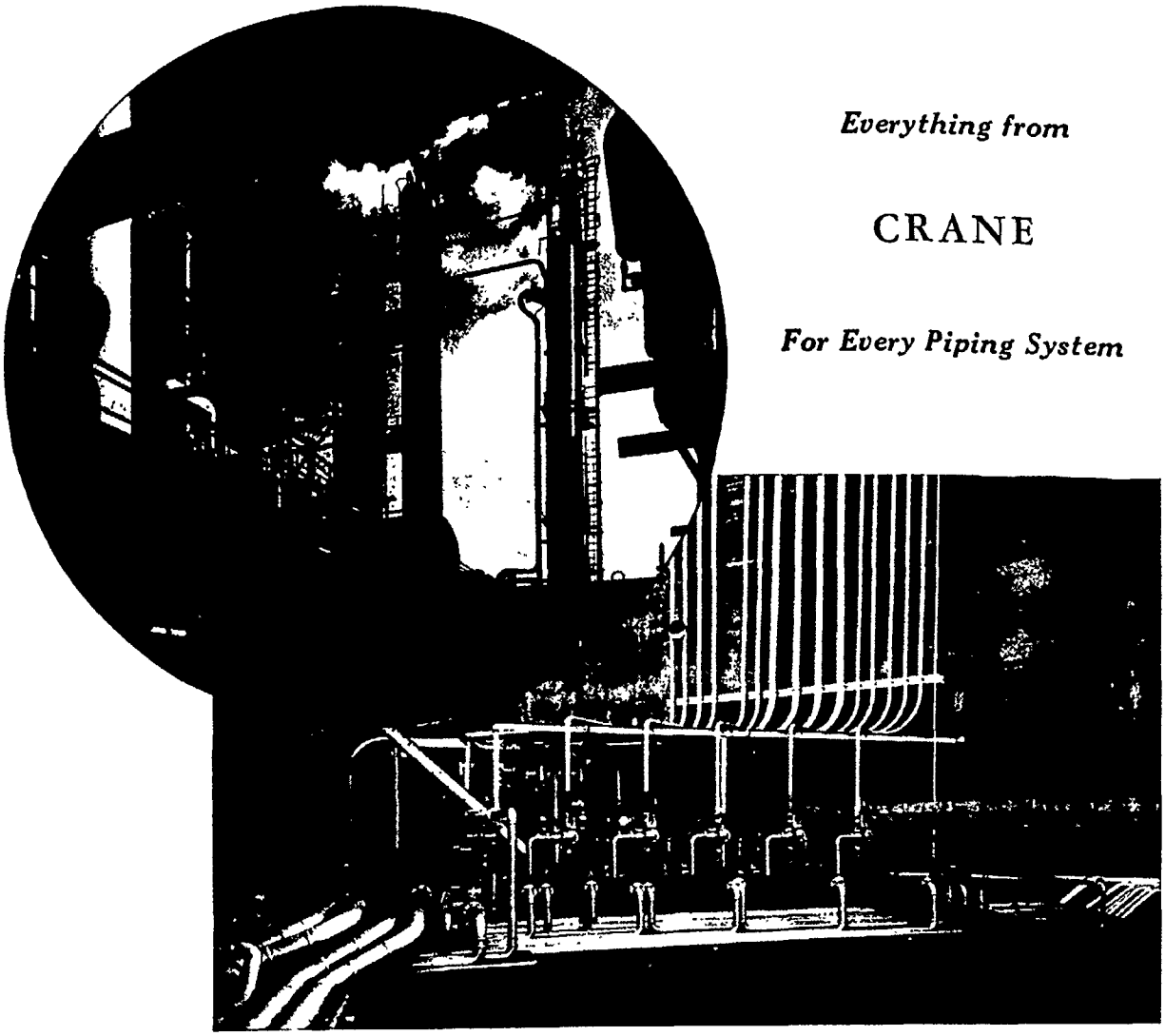


2

*Everything from*

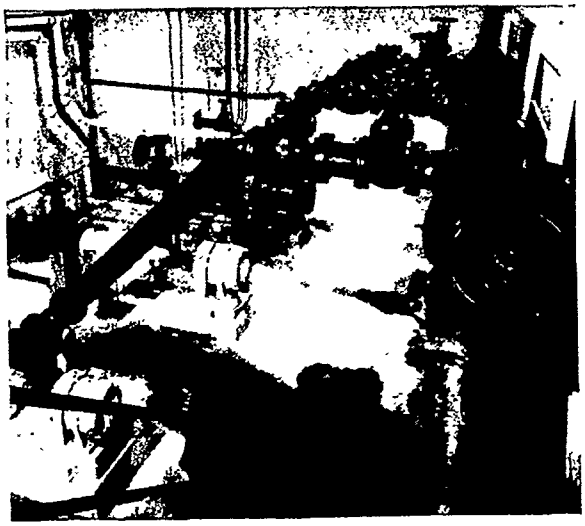
# CRANE

*For Every Piping System*



Oil piping manifold at terminal.

The base of a petroleum fractionating tower equipped with Crane valves and fittings.



A sewage treatment plant. Crane-equipped, for dependable performance—for long service.

Brass Gate Valves

# Brass and Bronze Gate Valves



Names of Parts.....page 14

Gate Valves
100-Pound.....page 15
125-Pound.....pages 16 and 17
150-Pound.....page 17
200-Pound.....pages 18 and 19
300-Pound.....pages 20 and 21

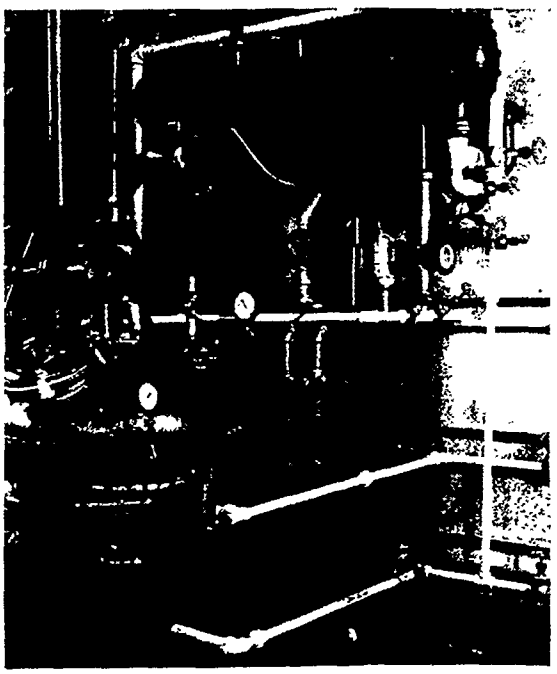
With Lock Shield.....pages 16 and 17
For Liquefied Petroleum Gases.....page 18

The Crane line includes a valve for every commercial requirement. The uniformly superior quality that distinguishes all Crane products has been maintained in this line. Excellence of design, high grade materials, and workmanship of the highest order assure dependability in service.

Other types of brass and bronze valves, supplementing the gate valves indexed above, are shown on the following pages:

Globe and Angle Valves.....pages 23 to 42
Check and Foot Valves.....pages 43 to 52
Hose Valves.....pages 60 and 61
Lever-Operated Quick-Opening Valves..pages 54 to 57
Radiator Valves.....page 58
Diaphragm Valves.....pages 388 to 391

The lists above do not include all Crane Brass and Bronze Valves. Those that perform a special duty or those made for special services such as Float Valves, Pop Safety Valves, Relief Valves, Pressure Regulators, Pressure Reducing Valves, Solder-Joint Valves, and Valves for Marine Service are described in other sections of this catalog. Refer to the index.

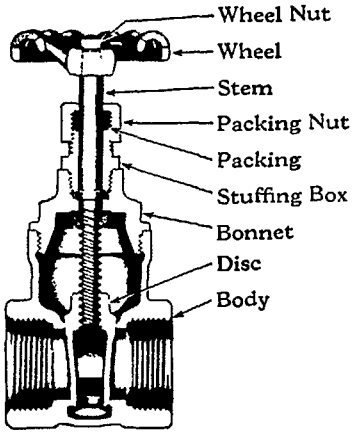


Crane Brass Gate Valves are widely used on experimental and laboratory installations.

# Brass and Bronze Gate Valves

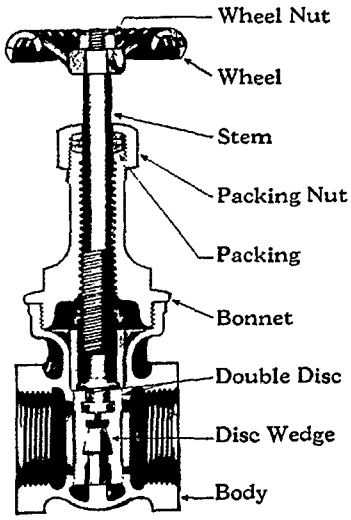
## Names of Parts

3



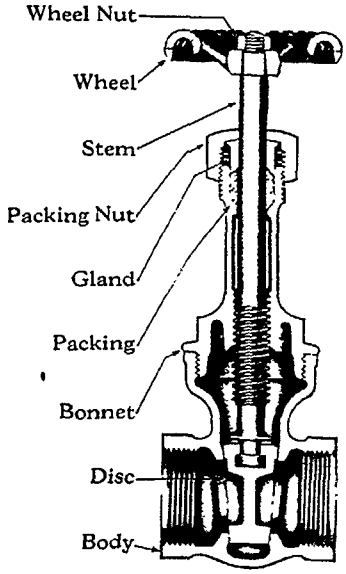

Brass Gate Valve
Non-Rising Stem
Wedge Disc

No. 410
(see page 15)



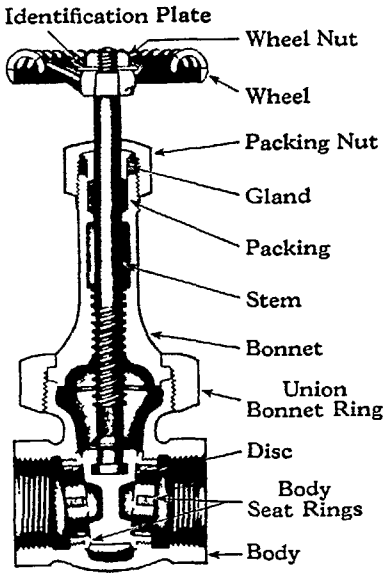

Brass Gate Valve
Rising Stem
Double Disc

No. 440
(see page 16)



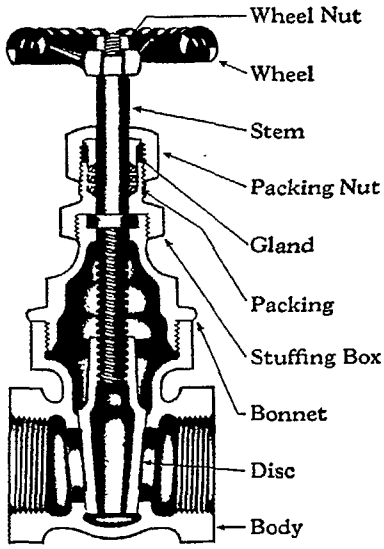

Brass Gate Valve
Rising Stem
Wedge Disc

No. 431
(see page 17)



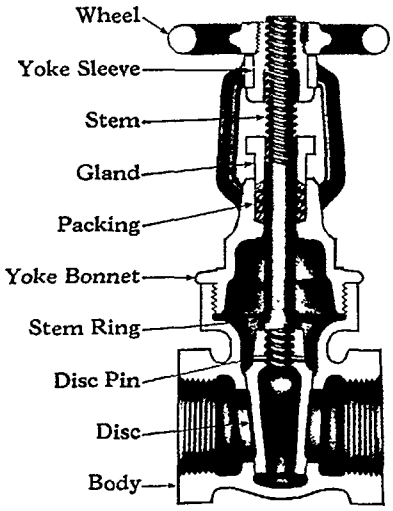

Bronze Gate Valve
Rising Stem, Union Bonnet
Wedge Disc, Renewable Seats

No. 423
(see page 18)




Bronze Gate Valve
Non-Rising Stem
Wedge Disc

No. 458
(see page 19)

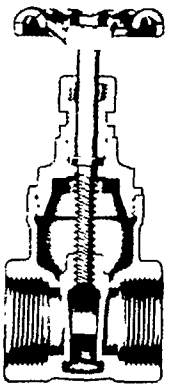



Bronze Gate Valve
Outside Screw and Yoke
Wedge Disc

No. 459
(see page 19)

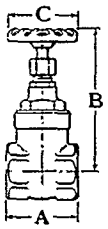
# 100-Pound Brass Gate Valves

## Wedge Disc—Non-Rising Stem



Cross Section
No. 410

No. 410
Screwed




### With Screwed Bonnet

WORKING PRESSURES
100 pounds saturated steam
150 pounds water, 200° F.
150 pounds oil or gas, 150° F.

No. 410 Valves comprise a modernized line of 100-Pound Brass Wedge Disc Gate Valves.

The valves are excellently suited for low pressure service, such as city water lines, domestic hot and cold water lines, domestic gas and fuel oil lines, heating systems, exhaust steam, low pressure condensate or steam process piping, and similar services.

**Materials:** The body, bonnet, disc, stem, stuffing box, and packing nut are made of brass.

**Design features:** The valves feature wide-faced hexagons at the pipe ends, accurately cut threads, ample metal sections, and long disc guides for correct seating.

The upper portion of the body, cylindrical in shape, combines strength with light weight and reinforces the seats against the wedging action of the disc.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

### With Bolted Bonnet

WORKING PRESSURES
100 pounds saturated steam
125 pounds water, 200° F.
125 pounds oil or gas, 150° F.

**Nos. 4436 and 4437** are liberally proportioned, bolted bonnet wedge gate valves of unusually high quality. Their body, bonnet, disc, stem, renewable body seat rings, stuffing box, and gland are made of brass.

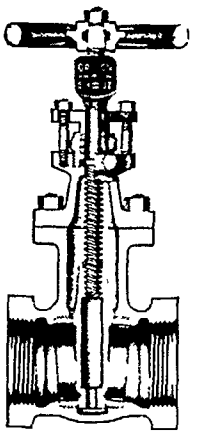
The stuffing box is deep, is filled with high grade packing, and on sizes 2½-inch and larger has a bolted gland; 2-inch valves have a screwed type stuffing box with a gland.

**Repacking:** The valves, when wide open, can be repacked under pressure.

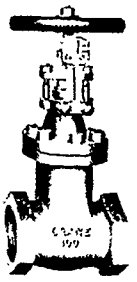
**Indicator:** The valves are regularly furnished with an indicator to show whether the valve is open or closed. They will be furnished without an indicator when orders so specify.

**Flanged valves:** End flanges and drilling conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). The flanges are plain faced with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling to the MSS 150-Pound Standard; no deduction is made if valves are ordered faced only.

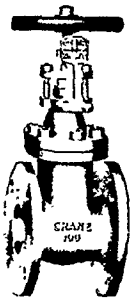
Full face gaskets should be used; see page 472.



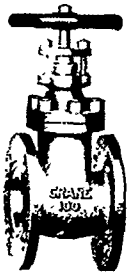
Cross Section
No. 4436
With Indicator



No. 4436, Screwed
With Indicator



No. 4437, Flanged
With Indicator



*No. 4436 or 4437 will be furnished without indicator if so specified.*

### List Prices and Dimensions

**No. 410 Screwed**

| Size Inches | List Prices Each | Dimensions, in Inches A | B | C |
|---|---|---|---|---|
| ¼ | 3.00 | 1¾ | 3¼ | 1½ |
| ⅜ | 3.00 | 1 13/16 | 3¼ | 1½ |
| ½ | 3.50 | 1 15/16 | 3¾ | 1¾ |
| ¾ | 4.10 | 2 1/16 | 4⅜ | 2 1/16 |
| 1 | 4.90 | 2 7/16 | 5⅛ | 2 9/16 |
| 1¼ | 6.60 | 2⅞ | 5¾ | 2¾ |
| 1½ | 8.40 | 3 | 6⅜ | 3 1/16 |
| 2 | 12.00 | 3¼ | 7⅜ | 3⅝ |

*Marine Hose Valves.....page 403*
*Solder-Joint Valves.....page 420*
*Templates for drilling....page 458*

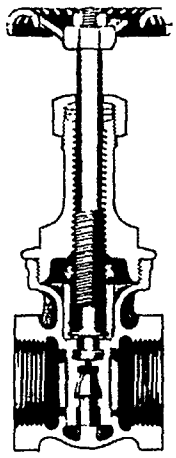
**Bolted Bonnet Valves**
*(Furnished with Indicator unless otherwise specified)*

| Valve No. and Type | Size Inches | List Prices, Each: With Indicator | Without Indicator *Specify* | Dimensions, in Inches: End to end or face to face | Center to top of stem: With Indicator | Less Indicator | Diameter of wheel |
|---|---|---|---|---|---|---|---|
| No. 4436 Screwed | 2 | 63.00 | 61.00 | 4 5/16 | 9¾ | 8⅝ | 4½ |
| | 2½ | 76.00 | 72.00 | 5½ | 11½ | 10¼ | 6 |
| | 3 | 111.00 | 107.00 | 6 | 13¾ | 12⅛ | 7 |
| No. 4437 Flanged F. & D. | 2 | 74.00 | 72.00 | 4⅝ | 9¾ | 8⅝ | 4½ |
| | 2½ | 94.00 | 90.00 | 5 | 11½ | 10¼ | 6 |
| | 3 | 128.00 | 124.00 | 5½ | 13¾ | 12⅛ | 7 |
| | 3½ | 170.00 | 165.00 | 6 | 14½ | 12⅞ | 7 |
| | 4 | 186.00 | 181.00 | 6½ | 16 | 14⅜ | 8 |
| | 5 | 266.00 | 260.00 | 7 | 18¼ | 16½ | 9 |
| | 6 | 342.00 | 336.00 | 7½ | 20 | 18⅛ | 9 |
| | 8 | 602.00 | 593.00 | 8½ | 25 | 23⅛ | 10 |
| | 10 | 833.00 | 821.00 | 9½ | 30 | 28⅛ | 12 |

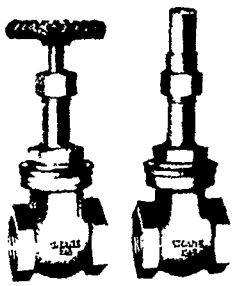
# 125-Pound Brass Gate Valves

## Rising Stem

**3** Double Disc Parallel Seats



Cross Section No. 440



No. 440, Screwed
With Wheel — With Lock Shield

***No. 440 Valves are furnished with wheels unless orders specify "with lock shield".***

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

***Three Disc Types — A Choice To Suit Every Service Requirement***

This unusually fine assortment of 125-Pound Rising Stem Valves, featuring three distinctive disc types, offers a style for every service or preference. The valves are recommended for general service on steam, water, oil, or gas lines. Ruggedly constructed and accurately designed throughout, they assure the user long, dependable service.

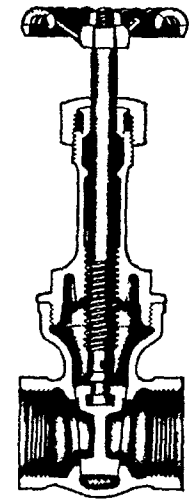
The rising stem clearly indicates whether the valve is open or closed.

**No. 440** have a rising stem, a double disc guided in the body, and parallel seats. When closing, the last turn of the wheel forces the discs against the seats; when opening, the first turn releases the discs.

**No. 428** have a rising stem and a solid wedge disc, reversible in the body. The disc slips onto a strong head on the stem end; accurate guiding prevents contact at the seating surfaces until the valve is almost closed.

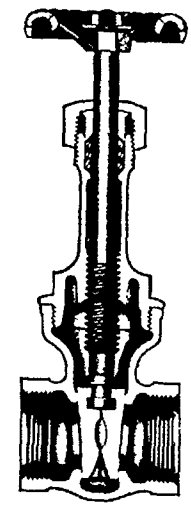
**No. 430** have a rising stem and a double wedge disc, reversible in the body. The disc (see inset) is well guided and is carefully machined to assure positive, easy operation. When closing, the last turn of the wheel forces the discs against the seats; when opening, the first turn releases the discs from their seats. The disc-stem connection is of the slip-on type.

Solid Wedge Disc

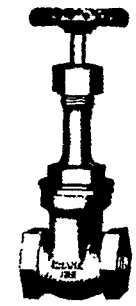


Cross Section No. 428

Double Wedge Disc



Cross Section No. 430



No. 428, Screwed

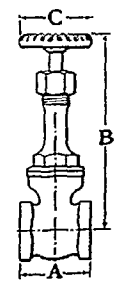
No. 430, Screwed

**Materials:** Except for the wheel and packing, all parts are made of high grade brass. The parts, carefully designed and liberally proportioned, assure a high safety factor.

**Repacking:** These valves, when wide open, can be repacked while under pressure. Nos. 428 and 430 have a gland in their stuffing box.

### List Prices and Dimensions

| Size | List Prices, Each | | | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. 440 Double Disc | | No. 428 | No. 430 | No. 440 | | | | No. 428 or 430 | | |
| Inches | With Wheel | With Lock Shield | Solid Wedge Disc | Double Wedge Disc | A | B open | B with lock shield | C | A | B open | C |
| 1/4 | 3.90 | | 4.30 | 4.50 | 1 5/8 | 4 1/8 | | 1 3/4 | 1 3/4 | 4 7/8 | 1 3/4 |
| 3/8 | 3.90 | | 4.30 | 4.50 | 1 3/4 | 4 1/8 | | 1 3/4 | 1 13/16 | 4 7/8 | 1 3/4 |
| 1/2 | 4.50 | 5.70 | 5.00 | 5.20 | 1 7/8 | 4 3/4 | 4 3/8 | 2 1/16 | 2 | 5 1/4 | 2 1/16 |
| 3/4 | 5.30 | 6.80 | 5.90 | 6.20 | 2 1/8 | 5 7/8 | 5 5/8 | 2 9/16 | 2 1/4 | 6 1/4 | 2 9/16 |
| 1 | 6.30 | 8.00 | 7.00 | 7.40 | 2 1/2 | 6 7/8 | 6 | 2 3/4 | 2 11/16 | 7 5/8 | 2 3/4 |
| 1 1/4 | 8.50 | 10.80 | 9.40 | 9.90 | 2 13/16 | 8 1/4 | 7 3/8 | 3 1/16 | 3 | 9 | 3 1/16 |
| 1 1/2 | 10.80 | 13.80 | 12.00 | 12.60 | 3 1/16 | 9 3/8 | 8 7/8 | 3 5/8 | 3 1/4 | 10 1/2 | 3 5/8 |
| 2 | 15.30 | 19.30 | 17.00 | 18.70 | 3 1/2 | 11 5/8 | 11 1/4 | 4 1/16 | 3 11/16 | 12 5/8 | 4 1/16 |
| 2 1/2 | 24.80 | | 27.60 | 30.40 | 4 1/16 | 14 | | 4 3/4 | 4 1/4 | 14 7/8 | 4 3/4 |
| 3 | 37.00 | | 41.00 | 45.00 | 4 9/16 | 16 1/4 | | 5 3/8 | 4 11/16 | 17 1/4 | 5 3/8 |



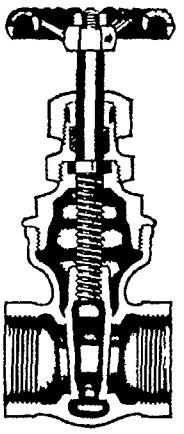

*Keys for operating Lock Shield Valves....page 137* *Thread engagement....page 494*

# Brass Gate Valves

## Wedge Disc

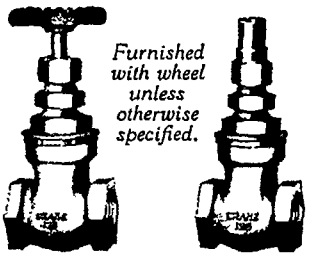
## 125-Pound

### Non-Rising Stem



Cross Section
No. 438

WORKING PRESSURES
125 pounds
saturated steam
200 pounds cold water,
oil, or gas, non-shock



*Furnished with wheel unless otherwise specified.*

No. 438, Screwed
With Wheel — With Lock Shield

**No. 438** Valves are a companion line to the 125-Pound Rising Stem Valves shown on page 16. Except for the wheel and packing, all parts are high grade brass. The valves, when wide open, can be repacked while under pressure. The stuffing box has a gland.

### List Prices and Dimensions—125-Pound

| Size Inches | Prices, Each No. 438 With Wheel | Prices, Each No. 438 With Lock Shield | Dimensions, in Inches: End to end | Center to top: With wheel | Center to top: With lock shield | Diameter of wheel |
|---|---|---|---|---|---|---|
| 1/4 | 4.30 | | 1 3/4 | 3 5/8 | | 1 3/4 |
| 3/8 | 4.30 | | 1 13/16 | 3 5/8 | | 1 3/4 |
| 1/2 | 5.00 | 6.20 | 2 | 4 | 3 3/4 | 2 1/16 |
| 3/4 | 5.90 | 7.40 | 2 1/4 | 4 5/8 | 4 3/8 | 2 9/16 |
| 1 | 7.00 | 8.80 | 2 11/16 | 5 3/8 | 5 1/4 | 2 3/4 |
| 1 1/4 | 9.40 | 11.70 | 3 | 6 5/16 | 6 1/4 | 3 1/16 |
| 1 1/2 | 12.00 | 15.00 | 3 1/4 | 7 1/8 | 7 3/8 | 3 5/8 |
| 2 | 17.00 | 21.00 | 3 11/16 | 8 3/8 | 8 3/4 | 4 1/16 |
| 2 1/2 | 27.60 | | 4 1/4 | 9 3/4 | | 4 3/4 |
| 3 | 41.00 | | 4 11/16 | 11 1/8 | | 5 3/8 |

## 150-Pound

### Non-Rising Stem

WORKING PRESSURES
150 pounds saturated steam
Cold water, oil, or gas, non-shock
Screwed valves—300 pounds
Flanged valves—225 pounds

Crane 150-Pound Valves, available with non-rising or rising stem, are recommended for steam, water, oil, or gas service where conditions require a heavier, more massive construction than that found in "Standard" or 125-Pound Valves.

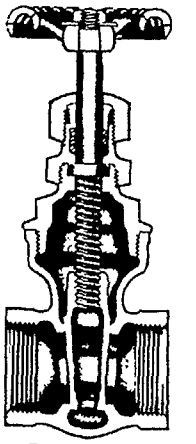
Except for the wheel and packing, all parts are high grade brass. The valves have a gland in the stuffing box. When wide open, they can be repacked while under pressure.

**No. 437** are the non-rising type and have a wedge disc.

**Nos. 431** and **429** are the rising stem type. Their solid wedge disc slips onto the stem, and is accurately guided in the body.

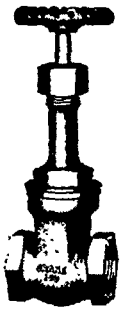
**Flanged valves:** End flanges of the No. 429 conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling to the MSS Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

No. 437
Screwed

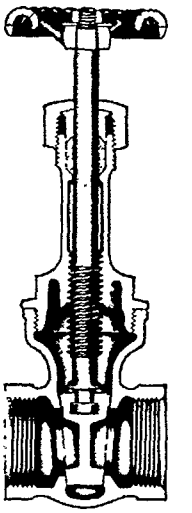


Cross Section
No. 437

### Rising Stem



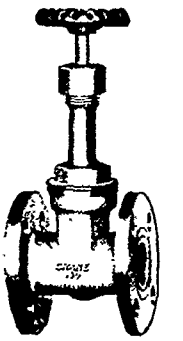
No. 431
Screwed



Cross Section
No. 431

### List Prices and Dimensions—150-Pound

| Size Inches | Prices, Each: No. 437 Screwed | No. 431 Screwed | No. 429 Flanged F. & D. | Dimensions, in Inches: End to end | Face to face | Center to top: No. 437 | Center to top: No. 431 No. 429 (open) | Diameter of wheel | Diameter of flange | Thickness of flange |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 4.70 | 4.70 | | 1 7/8 | | 3 5/8 | 4 7/8 | 1 3/4 | | |
| 3/8 | 4.70 | 4.70 | | 1 15/16 | | 3 5/8 | 4 7/8 | 1 3/4 | | |
| 1/2 | 5.50 | 5.50 | | 2 1/8 | | 4 | 5 1/4 | 2 1/16 | | |
| 3/4 | 6.50 | 6.50 | | 2 3/8 | | 4 5/8 | 6 1/4 | 2 9/16 | | |
| 1 | 7.70 | 7.70 | 26.00 | 2 7/8 | 3 3/8 | 5 3/8 | 7 5/8 | 2 3/4 | 4 1/4 | 3/8 |
| 1 1/4 | 10.30 | 10.30 | 30.00 | 3 3/16 | 3 7/8 | 6 3/8 | 9 | 3 1/16 | 4 5/8 | 13/32 |
| 1 1/2 | 13.20 | 13.20 | 37.00 | 3 7/16 | 4 3/8 | 7 1/8 | 10 1/2 | 3 5/8 | 5 | 7/16 |
| 2 | 18.70 | 18.70 | 62.00 | 3 7/8 | 5 1/2 | 8 3/8 | 12 5/8 | 4 1/16 | 6 | 1/2 |
| 2 1/2 | 33.00 | 33.00 | 85.00 | 4 1/2 | 6 1/2 | 9 3/4 | 14 7/8 | 4 3/4 | 7 | 9/16 |
| 3 | 49.00 | 49.00 | 103.00 | 4 15/16 | 7 1/2 | 11 1/8 | 17 1/4 | 5 3/8 | 7 1/2 | 5/8 |



No. 429
Flanged

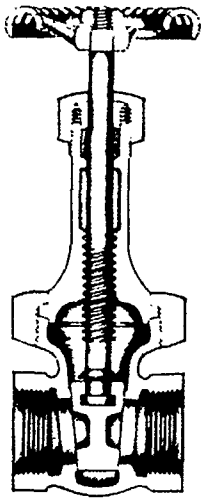
*Keys for operating Lock Shield Valves . . . . page 137* *Templates for drilling . . . . page 458*

# 200-Pound Bronze Gate Valves

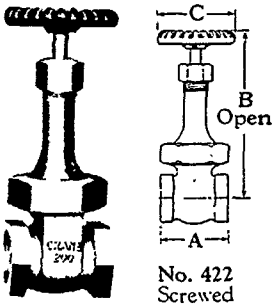
## Wedge Disc—Rising Stem

3

### Integral Seats



Cross Section
No. 422




No. 422
Screwed

Solid Wedge Disc is
Crane Nickel Alloy
Integral Seats
Union or Bolted Bonnet
Slip-on Disc-Stem
Connection

WORKING PRESSURES*
200 pounds steam, 500° F.
400 pounds, non-shock
Cold water, oil, gas, volatile fluids, or air

TEST PRESSURE
600 pounds hydrostatic

***Air Tested***

***Integral and Renewable Seat Gate Valves Suitable for Many Services***

****No. 422 Valves, 2-inch and Smaller, Approved For Butane, Propane, and other LP-Gases***

No. 422 and No. 423 are unusually sturdy, dependable valves. They are excellent for use on steam, water, oil, gas, gasoline, air, light oils, volatile fluids, and similar services. No. 423 are particularly suitable where service conditions are severe.

*No. 422 Valves, 2-inch and smaller, have been approved by the Underwriters' Laboratories, Inc., for the safe handling of all liquefied petroleum gases such as butane, propane, propylene, etc., provided the valves are installed in a branch or by-pass line where a positive shut-off is not essential and where pressures do not exceed 250 pounds. An attached identification plate is marked "Butane-UL-Propane."

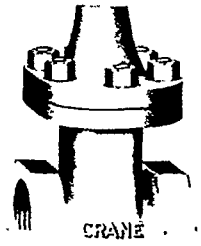
**Construction:** The valves are the inside screw, rising stem type. Their solid wedge disc slips onto a strong head on the stem end. The disc is accurately guided in the body to prevent contact between the seating surfaces until the valve is practically closed.

No. 422 Valves have the seats cast integral with the body and No. 423 Valves have Crane Nickel Alloy renewable seats; otherwise the valves are similar.

**Materials:** The body and bonnet are Crane Special Bronze, a high grade leaded tin bronze. Crane Nickel Alloy, used for the disc and renewable seats, is hard, tough, and highly resistant to wear. The stem is brass.

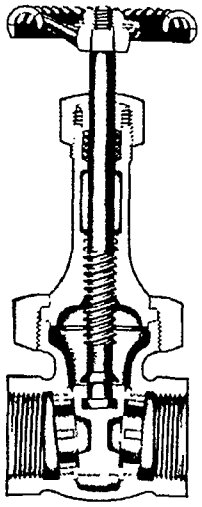
**Interchangeability:** Corresponding parts of these valves are interchangeable. The bodies, however, are not interchangeable in a line, the No. 423 having slightly longer end to end dimensions than the No. 422.

**Bonnets:** Sizes 2-inch and smaller have a union bonnet as shown above. Sizes 2½ and 3-inch have a compact, inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Cranite gasket, as shown at the right. Both types provide a strong, tight joint, yet they can easily be dismantled and reassembled without danger of injuring the valve.

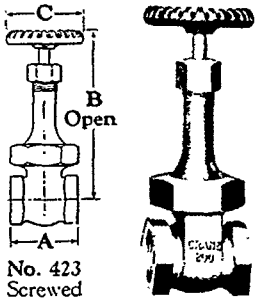



**Stuffing box; repacking:** The stuffing box is large and deep, and is filled with high grade packing; sizes 1½-inch and larger have a gland. The valves, when wide open, can be repacked while under pressure.

### Renewable Seats



Cross Section
No. 423




No. 423
Screwed

Solid Wedge Disc and
Renewable Seats are
Crane Nickel Alloy
Union or Bolted Bonnet
Slip-on Disc-Stem
Connection

### List Prices and Dimensions

| Size | List Prices, Each Screwed | | Dimensions, in Inches | | | |
|---|---|---|---|---|---|---|
| | No. 422 | No. 423 | A | | B | C |
| Inches | Integral Seats | Renewable Seats | No. 422 | No. 423 | | |
| ¼ | 6.10 | 8.00 | 1¾ | 1 15/16 | 3⅞ | 1¾ |
| ⅜ | 6.10 | 8.00 | 2 | 2 1/16 | 4¼ | 2 1/16 |
| ½ | 7.30 | 9.30 | 2¼ | 2⅜ | 5⅜ | 2 9/16 |
| ¾ | 8.70 | 11.30 | 2 9/16 | 2¾ | 6⅝ | 2¾ |
| 1 | 12.10 | 15.50 | 2⅞ | 3 | 7¾ | 3 1/16 |
| 1¼ | 15.50 | 20.00 | 3 3/16 | 3⅜ | 9⅛ | 3⅝ |
| 1½ | 19.40 | 25.00 | 3½ | 3¾ | 10¼ | 4 1/16 |
| 2 | 30.00 | 37.00 | 4 | 4 5/16 | 12½ | 4¾ |
| 2½ | 57.00 | 65.00 | 4 11/16 | 5 | 15⅛ | 5⅜ |
| 3 | 77.00 | 96.00 | 5¼ | 5 11/16 | 17½ | 6 |

***Other Bronze Valves for LP-Gases:***
***Globe and Angle.....page 30***
***Check.....page 47***

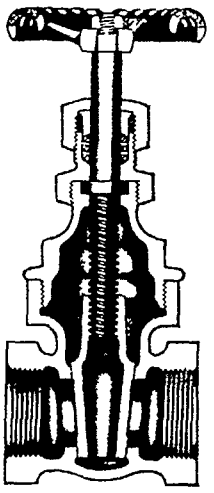
***For Valves for Marine Service, see page 400.***

# 200-Pound Bronze Gate Valves

## Wedge Disc

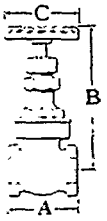
3

### Non-Rising Stem



Cross Section
Non-Rising
Stem
No. 458

No. 458
Screwed




No. 458

**Repacking:** The No. 458 Gate Valves, when wide open, can be repacked while under pressure.

WORKING PRESSURES
200 pounds steam, 500° F.
400 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
600 pounds hydrostatic

**Service recommendations:** No. 458 and No. 459 are sturdy, ruggedly constructed bronze gate valves recommended for service on steam, water, oil, or gas lines. They have been carefully designed to give long service under severe operating conditions. All parts are liberally proportioned to assure a high factor of safety against pressure, operating strains, and expansion and contraction of piping.

**Non-rising stem valves:** The No. 458 Valves have a non-rising stem and a wedge disc. The body and disc are made of Crane Special Bronze, a strong, hard, leaded tin bronze. The stuffing box is equipped with a gland and is filled with high grade packing.

**Outside screw and yoke valves:** The No. 459 Valves are of the outside screw and yoke type. Their body, bonnet, and wedge disc are made of Crane Special Bronze. The stuffing box is equipped with a bolted gland and is filled with high grade packing.

The valves are especially suitable on services where the action of the fluid might affect inside stem threads. In addition, the stem threads can be easily lubricated when necessary, thereby minimizing wear.

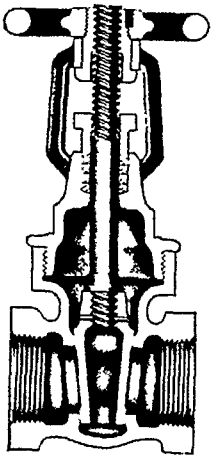
**Underwriters' Specifications:** No. 459 Valves, ¾ to 2-inch inclusive, have been approved by the Underwriters' Laboratories, Inc., and Factory Mutual Laboratories. They are marked "CU" and "FM".

### List Prices and Dimensions

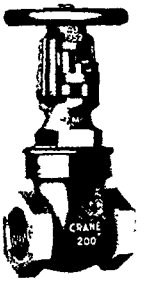
| Valve No. and Type | Size Inches | List Prices Each | Dimensions, in Inches A | B | C |
|---|---|---|---|---|---|
| No. 458 Screwed Non-Rising Stem | ¼ | 6.10 | 2 | 4⅛ | 2 1/16 |
| | ⅜ | 6.10 | 2 | 4⅛ | 2 1/16 |
| | ½ | 7.30 | 2⅜ | 4⅞ | 2 9/16 |
| | ¾ | 8.70 | 2⅝ | 5½ | 2¾ |
| | 1 | 12.10 | 3 | 6¼ | 3 1/16 |
| | 1¼ | 15.50 | 3½ | 7¼ | 3⅝ |
| | 1½ | 19.40 | 4 | 8⅛ | 4 1/16 |
| | 2 | 30.00 | 4¾ | 9⅝ | 4¾ |
| | 2½ | 57.00 | 5⅜ | 11¼ | 6 |
| | 3 | 77.00 | 6 | 12¾ | 7 |
| No. 459 Screwed Outside Screw and Yoke | ½ | 16.80 | 2⅝ | 6⅜ | 3 5/16 |
| | ¾ | 18.20 | 2⅝ | 6⅜ | 3 5/16 |
| | 1 | 21.00 | 3 | 7⅜ | 3⅝ |
| | 1¼ | 26.00 | 3½ | 8¾ | 3⅞ |
| | 1½ | 32.00 | 4 | 9¾ | 4⅜ |
| | 2 | 48.00 | 4¾ | 11⅝ | 4 13/16 |
| | 2½ | 68.00 | 5⅜ | 13⅞ | 5¾ |
| | 3 | 107.00 | 6 | 16⅛ | 6 11/16 |

### Outside Screw and Yoke

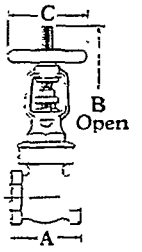
*Underwriters' Pattern*
*Sizes ¾ to 2-inch*



Cross Section
Outside Screw
and Yoke
No. 459



No. 459
Screwed




No. 459

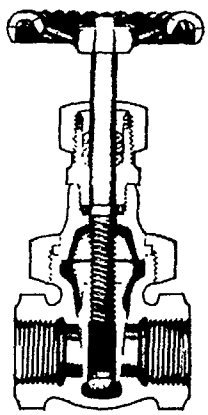
**Repacking:** The No. 459 Gate Valves, when wide open, can be repacked while under pressure.

# 300-Pound Bronze Gate Valves

## Wedge Disc—Non-Rising Stem

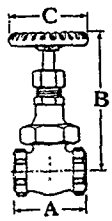
3

Integral Seats



Cross Section
No. 624 E

No. 624 E
Screwed




| Valve Size | Working Pressures: Steam 550° F. | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|
| ¼ to 2-inch | 300 pounds | 1000 pounds | 1500 pounds |
| 2½ and 3-inch | 300 pounds | 600 pounds | 900 pounds |

*Air Tested*

**Features**
Union or Bolted Bonnet
Interchangeable Parts
Crane Nickel Alloy Wedge Disc
Crane Nickel Alloy Renewable Seats in the No. 625 E Valve

**Service recommendations:** These ruggedly constructed non-rising stem bronze gate valves are ideal for high pressure service. No. 625 E Valves, having nickel alloy renewable seats, are particularly suitable where operating conditions are severe.

The valves are a companion line to the 300-Pound Rising Stem Gate Valves shown on page 21.

**Construction:** These valves are the inside screw, non-rising stem type. Except for their seats, they are similar. No. 624 E Valves have integral seats; No. 625 E Valves have Crane Nickel Alloy renewable seats.

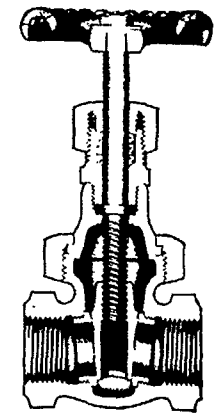
The valves have unusually heavy metal sections and are ruggedly constructed. Their body ends are made with lugs, permitting a secure wrench grip and presenting a neat, compact appearance.

Long, clean-cut threads engage the disc and stem, assuring accurate and easy operation. The disc is thoroughly guided throughout its travel; the seating surfaces do not come into contact until the valve is practically closed.

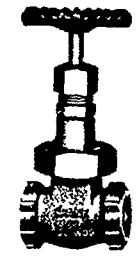
**Materials:** The body and bonnet are made of Crane Special Bronze, a high grade leaded tin bronze. Crane Nickel Alloy, used for the disc and the renewable seats, is especially resistant to wear, being hard and tough.

**Interchangeability:** All parts are interchangeable. The bodies, however, are not interchangeable in a line, the No. 625 E having slightly longer end-to-end dimensions than the No. 624 E.

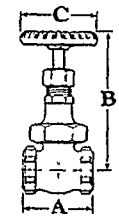
Renewable Seats



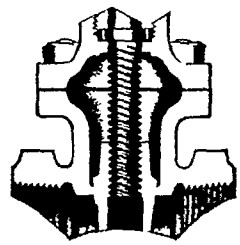
Cross Section
No. 625 E



No. 625 E
Screwed




**Bonnets:** Sizes 1-inch and smaller have a union bonnet as shown above; larger sizes have a compact inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Granite gasket, as shown at the right.



Both types provide a strong, tight joint, yet they can be easily dismantled and reassembled without danger of injuring the valve.

**Stuffing box:** The stuffing box is large and deep, and is filled with high grade packing. Sizes ⅜-inch and larger are equipped with a gland.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

### List Prices and Dimensions

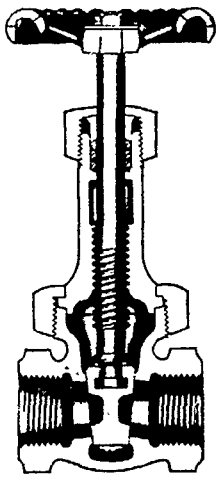
| Size | List Prices, Each Screwed | | Dimensions, in Inches | | | |
|---|---|---|---|---|---|---|
| | No. 624 E | No. 625 E | A | | B | C |
| Inches | Integral Seats | Renewable Seats | No. 624 E | No. 625 E | | |
| ¼ | 9.70 | 12.80 | 1 15/16 | 2⅛ | 3⅝ | 2 1/16 |
| ⅜ | 9.70 | 12.80 | 2 1/16 | 2 3/16 | 4⅜ | 2 9/16 |
| ½ | 11.30 | 14.70 | 2⅜ | 2½ | 4 13/16 | 2¾ |
| ¾ | 13.60 | 17.70 | 2¾ | 2 15/16 | 5⅜ | 3 1/16 |
| 1 | 17.00 | 21.80 | 3¼ | 3 5/16 | 6⅜ | 3⅝ |
| 1¼ | 28.00 | 37.00 | 3½ | 3 11/16 | 7 3/16 | 4 1/16 |
| 1½ | 36.00 | 46.00 | 3¾ | 4 | 8 | 4¾ |
| 2 | 50.00 | 62.00 | 4 5/16 | 4⅝ | 9 15/16 | 5⅜ |
| 2½ | 77.00 | 89.00 | 5 3/16 | 5½ | 10⅜ | 5⅜ |
| 3 | 108.00 | 124.00 | 5⅝ | 6 | 11⅞ | 6 |

# 300-Pound Bronze Gate Valves

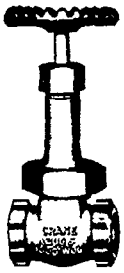
## Wedge Disc—Rising Stem



### Integral Seats



Cross Section No. 622 E



No. 622 E, Screwed

| Valves | | Working Pressures: Steam 550°F. | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|---|
| Screwed | ¼ to 2-inch | 300 pounds | 1000 pounds | 1500 pounds |
| | 2½ and 3-inch | 300 pounds | 600 pounds | 900 pounds |
| Flanged | All sizes | 300 pounds | 500 pounds | 900 pounds |

***Air Tested***

**Features**

Union or Bolted Bonnet—Slip-on Disc-Stem Connection
Crane Nickel Alloy Wedge Disc—Interchangeable Parts
Crane Nickel Alloy Renewable Seats in Nos. 623 E and 623½ E Valves

**Service recommendations:** These valves, exceptionally durable and rugged, are recommended for high pressure service. Body ends are made with lugs to permit a better wrench grip.

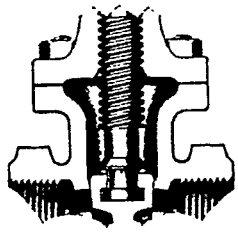
**Construction:** Except for the seats, the valves are similar. No. 622 E have seats integral with the body; Nos. 623 E and 623½ E have Crane Nickel Alloy renewable seats.

The valves have a Crane Nickel Alloy solid wedge disc that slips onto a strong head on the stem end. The disc is accurately guided in the body to prevent contact between the seating surfaces until the valve is practically closed. All parts are interchangeable. The bodies, however, are not interchangeable in a line.

**Materials:** The body and bonnet are made of Crane Special Bronze, a high grade, leaded tin bronze. Crane Nickel Alloy, used for the disc and renewable seats, is especially resistant to wear, being very hard and tough.

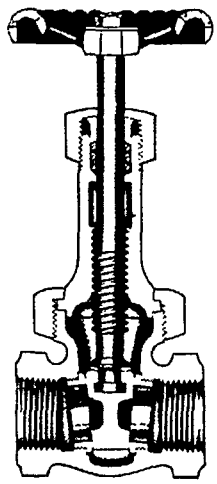
**Stuffing box; repacking:** The stuffing box is large and deep and is filled with high grade packing. In sizes ⅜-inch and larger, the stuffing box is equipped with a gland. All of these valves, when wide open, can be repacked while under pressure.

**Bonnets:** Sizes 1-inch and smaller have a union bonnet as shown along the margins; larger sizes have a compact, inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Cranite gasket, as shown at the right. Both types provide a strong, tight joint which is easy to dismantle and reassemble without injury to the valve.

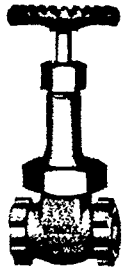


**Flanged valves:** End flanges conform to the MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1946). Plain faced, they have two V-shaped concentric grooves between the port and bolt holes.

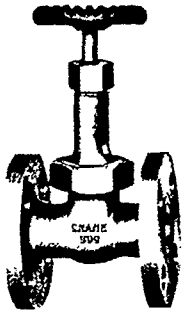
### Renewable Seats



Cross Section No. 623 E



No. 623 E, Screwed

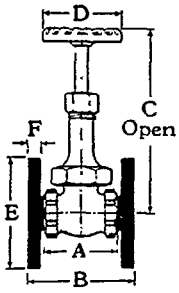


No. 623½ E, Flanged

**Flanged Valve Prices**

Prices of flanged valves include drilling to the MSS 300-Lb. Standard; no deduction is made for valves ordered faced only. Full face gaskets should be used; see page 472.

### List Prices and Dimensions




Screwed and Flanged Valves

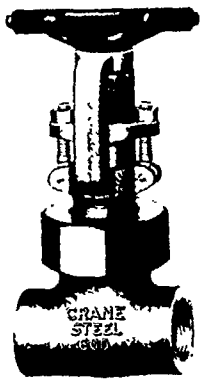
| Size Inches | List Prices, Each: No. 622 E Screwed | No. 623 E Screwed | No. 623½ E Flanged F. & D. | Dimensions, in Inches: A No. 622 E | A No. 623 E | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|
| ¼ | 9.70 | 12.80 | | 1 15/16 | 2⅛ | | 4⅛ | 2 1/16 | | |
| ⅜ | 9.70 | 12.80 | | 2 1/16 | 3 3/16 | | 5¼ | 2 9/16 | | |
| ½ | 11.30 | 14.70 | | 2⅜ | 2½ | | 6 | 2¾ | | |
| ¾ | 13.60 | 17.70 | | 2¾ | 2 15/16 | | 7⅛ | 3 1/16 | | |
| 1 | 17.00 | 21.80 | 39.00 | 3¼ | 3 5/16 | 4¾ | 8⅜ | 3⅝ | 4⅞ | 19/32 |
| 1¼ | 28.00 | 37.00 | 52.00 | 3½ | 3 11/16 | 5¼ | 9¾ | 4 1/16 | 5¼ | ⅝ |
| 1½ | 36.00 | 46.00 | 73.00 | 3¾ | 4 | 6 | 11 | 4¾ | 6⅛ | 11/16 |
| 2 | 50.00 | 62.00 | 100.00 | 4 5/16 | 4⅝ | 6½ | 13½ | 5⅜ | 6½ | ¾ |
| 2½ | 77.00 | 89.00 | 158.00 | 5 3/16 | 5½ | 7½ | 15½ | 5⅜ | 7½ | 13/16 |
| 3 | 108.00 | 124.00 | 230.00 | 5⅝ | 6 | 8 | 18⅛ | 6 | 8¼ | 29/32 |

*Valves for Marine Service....page 400* *Templates for drilling....page 458*

3

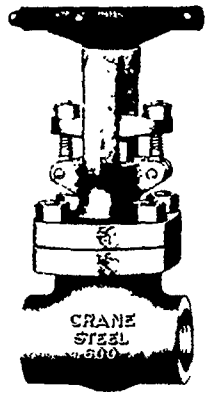
# *Crane Steel Gate Valves*

## *For High Pressures And High Temperatures*



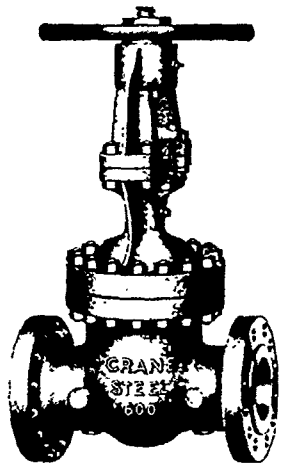

No. 3602 X
Cast Steel
Wedge Gate Valve
Union Bonnet
Screwed

*See page 223*




No. 3607 X
Cast Steel
Wedge Gate Valve
Bolted Bonnet
Screwed

*See page 225*




No. 76 X
Cast Steel
Wedge Gate Valve
Flanged

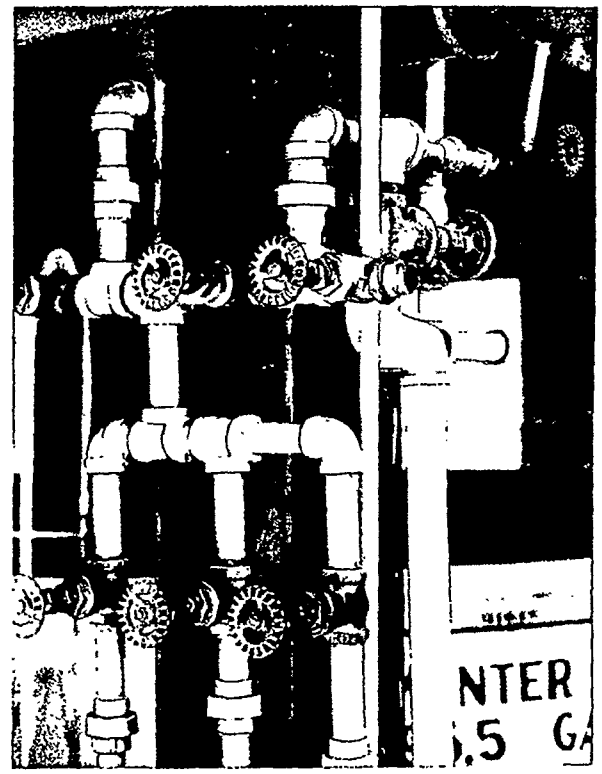
*See page 229*

When gate valves are required for steam pressures above 300 pounds or temperatures exceeding 550° F., use Crane Steel Gate Valves.

They are made in a wide range of sizes and types for all service conditions and include the new design Crane Pressure-Seal Bonnet Gate Valves, which utilize the pressure in the valve to seal the bonnet joint and are streamlined to conserve space. Valves with pressure-seal bonnets are especially recommended for extremely high steam pressures and temperatures.

Crane Steel Gate Valves are described in detail on pages 205 to 211 and pages 221 to 234.

Crane Brass Gate Valves used to control flow in a turpentine plant.




Distilleries are important users of Crane Brass and Bronze Gate Valves.

Brass Globe
& Angle Valves;
AAR Valves

# Brass and Bronze Globe and Angle Valves

(Including AAR Valves)

Names of Parts.....page 24

Globe and Angle Valves
- 100-Pound.....page 25
- 125-Pound.....page 26
- 150-Pound.....pages 28 and 29
- 200-Pound.....pages 32 to 34
- 300-Pound.....pages 35 to 37
- 2000-Pound Hydraulic.....page 41
- 2500-Pound Hydraulic (Globe only).....page 42
- Needle Point.....pages 26 and 27
- For Liquefied Petroleum Gases.....page 30
- For Light Oils and Gases.....page 31

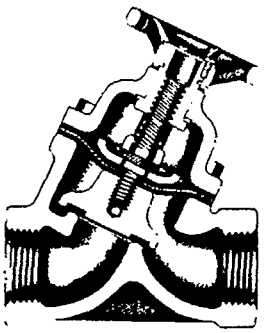
AAR Globe and Angle Valves
- Inside Screw Type.....page 38
- Outside Screw and Yoke Type.....page 39
- Listing of AAR Valve Parts.....page 40

Cab Hose Valves.....page 40

Vent or Sampling Valve
- For Transformer Oil Service.....page 31

Other commonly used brass and bronze valves, supplementing those above, are described in Sections 3, 5, and 6. Brass and bronze valves that perform a special duty, or made for special services, such as Float Valves, Pop Safety Valves, Relief Valves, Pressure Regulators, Pressure Reducing Valves, Solder-Joint Valves, and Valves for Marine Service are shown in other sections of the catalog; refer to the main index.

## *Tight Seating, "Packless" Type Crane Brass Body Y-Pattern Diaphragm Valves*



Sectional View
Y-Pattern Diaphragm Valve

***Unexcelled for a Wide Variety of General and Corrosive Services***

Crane Brass Body, Y-Pattern Diaphragm Valves, built for hard usage, are excellent for a wide variety of corrosive, as well as ordinary, piping systems. The flexible diaphragm mounted between the body and bonnet (eliminates the need for a stuffing box) and the tight-seating disc facing make the valves ideal for conveying liquids, compressed air, gases, volatile fluids, etc.

Brass Diaphragm Valves, suitable for pressures ranging up to 150 pounds and a maximum temperature of 180° F., are available with screwed ends in sizes ½ to 2-inch. They are regularly furnished with the diaphragm and disc insert made of neoprene, Buna N, or natural rubber.

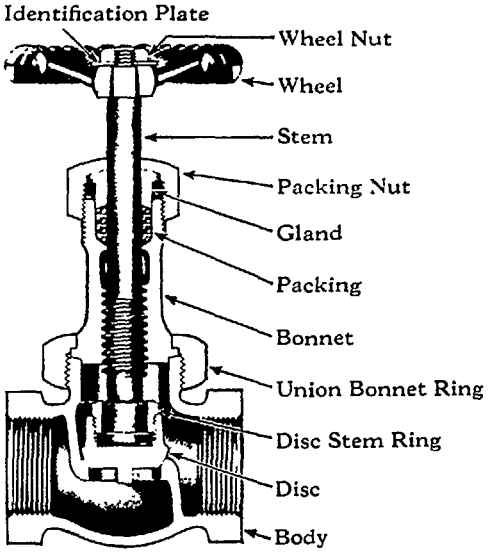
In addition to brass, the complete diaphragm line includes both screwed and flanged valves having the body and disc holder made of cast iron, aluminum, or 18-8 Mo. The cast iron flanged valves are also available with the body lined, and the disc coated, with neoprene or natural rubber.

***For the complete Crane line of Diaphragm Valves, see pages 388 to 391.***

# Brass and Bronze Globe and Angle Valves

## Names of Parts

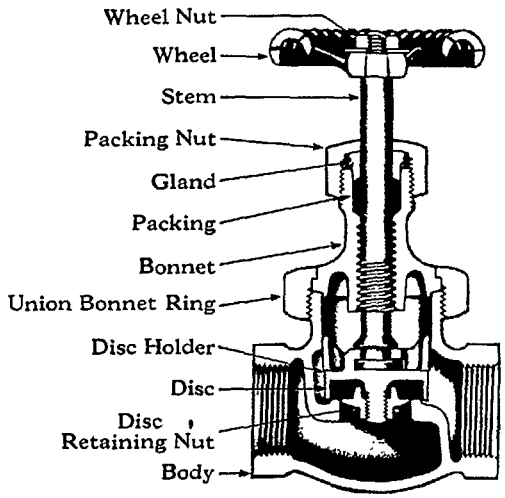
4




***Above***

Bronze Globe Valve
with Union Bonnet
and Metal Disc

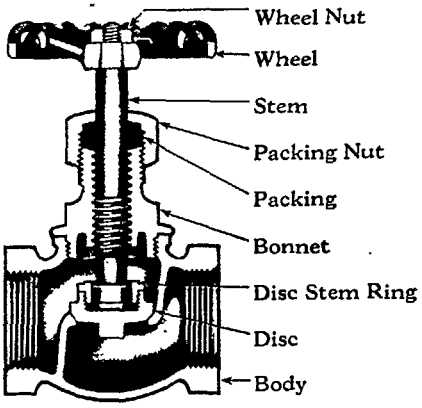
No. 362 E
(see page 35)




***Below***

Brass Globe Valve
with Screwed Bonnet

No. 1
(see page 26)




***Above***

Brass Globe Valve
with Union Bonnet
and Composition Disc

No. 7
(see page 28)

***Below***

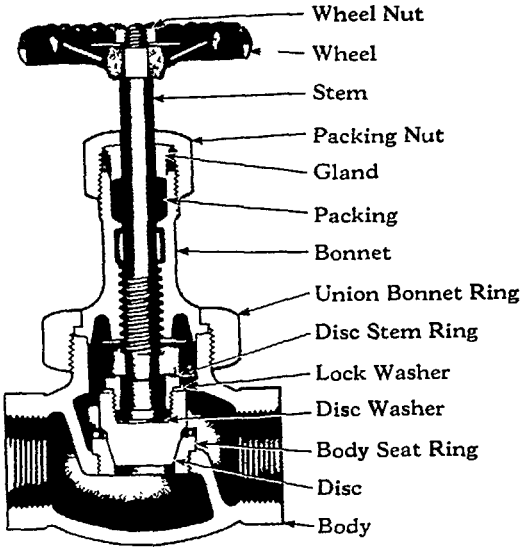
Bronze Globe Valve
with Union Bonnet, Metal Disc,
and Renewable Seat

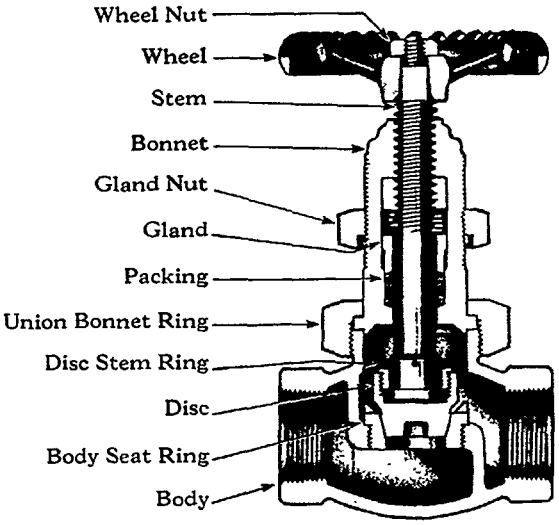
No. 382 P
(see page 36)

***Below***

Bronze Globe Valve
with Union Bonnet, Metal Disc,
and Renewable Seat
Outside Screw and Yoke
AAR Design

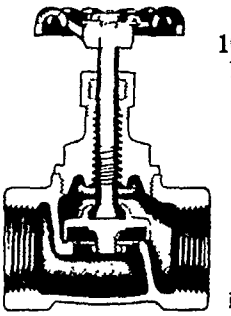
No. 396 P
(see page 39)



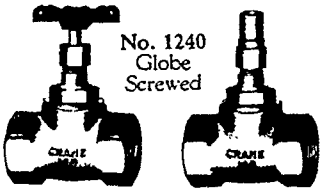



# 100-Pound Brass Globe and Angle Valves

## With Composition Disc

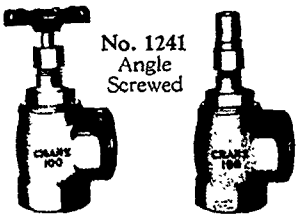


Cross Section No. 1240



No. 1240 Globe Screwed

With Wheel — *With Lock Shield



No. 1241 Angle Screwed

With Wheel — *With Lock Shield

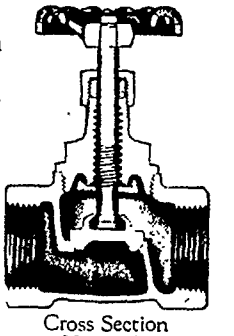
*Nos. 1240 and 1241 are regularly furnished wheel operated. Specify when sizes ¼ to 1¼-inch are wanted with lock shield.

WORKING PRESSURES

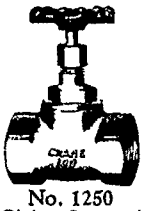
100 pounds saturated steam
150 pounds water, 200° F.
Domestic Gas Service

100 pounds saturated steam
150 pounds water, 200° F.
150 pounds oil or gas, 150° F.

## With Brass Disc



Cross Section No. 1250



No. 1250 Globe, Screwed

No. 1251 Angle, Screwed

**Service recommendations:** This diversified line of 100-Pound Brass Globe and Angle Valves combines wide utility with moderate cost. Well proportioned and sturdily constructed, the valves offer ample strength and durability for any low pressure installation. They are especially recommended for domestic water or gas lines, steam heating systems, for piping on equipment operated at low pressures, and for similar services.

**Construction:** Nos. 1240 and 1241 Valves have a composition disc, whereas Nos. 1250 and 1251 Valves have a brass disc. Otherwise, the two types of valves are similar. Long hexagons on the body reinforce the openings and afford a good wrench grip. The seat is integral with the body. The bonnet is screwed into the body and has liberal thread engagement with the stem.

The disc holder or disc is spun onto the end of the stem, except on the ⅜ and ½-inch brass disc valves which have the stem and disc integral. The stuffing box is amply deep to prevent leakage at the stem.

**Composition disc valves:** Composition disc valves are regularly supplied with a No. 12 Disc suitable for 150 pounds hot or cold water (maximum temperature of 200° F.) and for domestic gas service. When so ordered, the valves will be furnished with a No. 10 Disc, making them suitable for 100 pounds saturated steam.

An identification plate under the wheel nut identifies the valve and the disc with which it is equipped. For extra composition discs, see page 133.

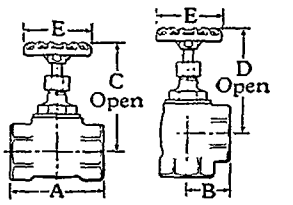
**Brass disc valves:** Brass disc valves have a ball-to-angle seat. They are suitable for 100 pounds saturated steam, for 150 pounds cold or hot water, 200° F., and for 150 pounds cold oil or gas service.

**A complete line:** Crane manufactures a complete assortment of 100-Pound Brass Valves. Gate valves are shown on page 15; check valves, on page 45. For solder-joint gate, globe, angle, and check valves, see pages 420 and 421.

### List Prices and Dimensions

| Valve No. and Type | Size | List Prices, Each | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | With Wheel | With Lock Shield | A | B | C | | D | | E |
| | | | | | | With Wheel | With Lock Shield | With Wheel | With Lock Shield | |
| | Inches | | Specify | | | | | | | |
| No. 1240, Globe or No. 1241, Angle Composition Disc | ⅛ | 2.10 | | 1⅞ | ⅞ | 2¾ | | 2½ | | 1½ |
| | ¼ | 2.10 | 2.60 | 1⅞ | ⅞ | 2¾ | 2¾ | 2½ | 2¼ | 1½ |
| | ⅜ | 2.20 | 2.70 | 2 | 15/16 | 2⅞ | 2¾ | 2⅜ | 2½ | 1½ |
| | ½ | 2.90 | 3.60 | 2⅜ | 1⅛ | 3½ | 3¼ | 3⅛ | 2⅞ | 1¾ |
| | ¾ | 3.90 | 4.90 | 2¾ | 15/16 | 4 | 3⅝ | 3¾ | 3⅜ | 2 1/16 |
| | 1 | 5.50 | 6.90 | 3¼ | 1½ | 4½ | 4⅛ | 4¼ | 3⅞ | 2 9/16 |
| | 1¼ | 7.00 | 8.70 | 3⅞ | 1 13/16 | 4⅞ | 4½ | 4⅝ | 4¼ | 2¾ |
| | 1½ | 9.60 | | 4¼ | 2 | 5½ | | 5¼ | | 3 1/16 |
| | 2 | 15.00 | | 5 | 2¼ | 6 | | 5⅞ | | 3⅝ |
| No. 1250, Globe or No. 1251, Angle Brass Disc | ⅜ | 2.05 | | 2 | 15/16 | 3 | | 2⅝ | | 1½ |
| | ½ | 2.60 | | 2⅜ | 1⅛ | 3½ | | 3¼ | | 1¾ |
| | ¾ | 3.40 | | 2¾ | 15/16 | 4⅛ | | 3⅞ | | 2 1/16 |
| | 1 | 4.70 | | 3¼ | 1½ | 4¾ | | 4⅜ | | 2 9/16 |
| | 1¼ | 6.10 | | 3⅞ | 1 13/16 | 5 | | 4⅞ | | 2¾ |
| | 1½ | 8.60 | | 4¼ | 2 | 5⅝ | | 5⅜ | | 3 1/16 |
| | 2 | 12.70 | | 5 | 2¼ | 6¼ | | 6⅛ | | 3⅝ |

*Keys for Lock Shield Valves....page 137* *Composition Discs....page 133*

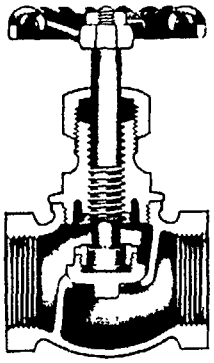



Globe — Angle

Composition Disc or Brass Disc Valves

# 125-Pound Brass Globe and Angle Valves

## Brass Disc



Cross Section, Globe

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

**Service recommendations:** Crane 125-Pound Brass Globe and Angle Valves are recommended for general service on steam, water, oil, or gas lines.

**Construction:** The valves are sturdy and unusually well constructed. They are heavier and more rugged than is usual with "Standard" or 125-Pound Valves.

All parts are liberally proportioned to assure a high factor of safety against pressure, operating strains, and expansion and contraction of the piping.

The disc in sizes ⅛ to ½-inch is integral with the stem. In the larger sizes, the disc swivels on the stem as shown in the cross section at the left.

**Repacking:** These valves, when wide open, can be repacked while under pressure. The stuffing box is amply deep to prevent leakage at the stem.

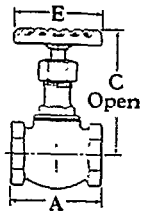
**Flanged valves:** When flanged valves are required, use the No. 71 Globe or Angle Valves described and illustrated on page 33.

No. 1, Globe Screwed

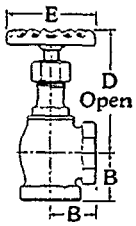
No. 2, Angle Screwed

### List Prices and Dimensions

| Size | List Prices | | Dimensions, in Inches | | | | | |
|---|---|---|---|---|---|---|---|---|
| | No. 1 Globe | No. 2 Angle | Globe | | | Angle | | |
| Inches | Each | Each | A | C | E | B | D | E |
| ⅛ | 2.10 | 2.10 | 1 7/16 | 2¾ | 1½ | ¾ | 2⅝ | 1½ |
| ¼ | 2.10 | 2.10 | 1⅝ | 3 | 1¾ | 13/16 | 2⅞ | 1¾ |
| ⅜ | 2.40 | 2.40 | 1⅞ | 3¼ | 2 1/16 | 15/16 | 3⅛ | 2 1/16 |
| ½ | 3.40 | 3.40 | 2 3/16 | 3¾ | 2 9/16 | 1⅛ | 3⅝ | 2 9/16 |
| ¾ | 4.50 | 4.50 | 2 11/16 | 4¼ | 2¾ | 1⅜ | 4¼ | 2¾ |
| 1 | 6.20 | 6.20 | 3 3/16 | 4⅞ | 3 1/16 | 1⅝ | 4¾ | 3 1/16 |
| 1¼ | 8.00 | 8.00 | 3 11/16 | 5⅜ | 3⅝ | 1 13/16 | 5⅜ | 3⅝ |
| 1½ | 11.30 | 11.30 | 4 3/16 | 6¼ | 4 1/16 | 2 1/16 | 6⅛ | 4 1/16 |
| 2 | 17.50 | 17.50 | 5⅛ | 7⅜ | 4¾ | 2½ | 7⅜ | 4¾ |
| 2½ | 25.50 | 25.50 | 6 1/16 | 7½ | 5⅜ | 3 1/16 | 7⅞ | 5⅜ |
| 3 | 38.00 | 38.00 | 7 1/16 | 9¼ | 6 | 3 11/16 | 9¼ | 6 |




Globe




Angle

# Brass Needle Air Valve

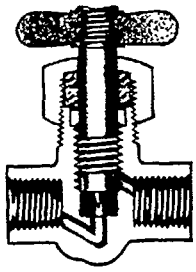
WORKING PRESSURE
300 pounds cold water, oil, or gas, non-shock

**Service recommendations:** The No. 57 Needle Air Valve is ideal for service on water lines to air drills, on air or water lines in garages, filling stations, and industrial plants, and for similar service.

**Installation:** The valve should always be installed with the pressure above the seat.

**Construction:** This valve is heavy and rugged. The body and packing nut are brass. The malleable iron tee handle is threaded onto the brass stem which has the end spun over to lock the handle in place.

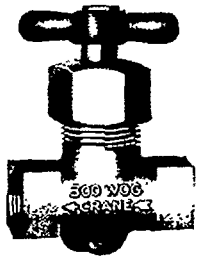
The valve has an extra thick fibre seat that can be easily renewed should it become worn.



Cross Section

### List Price and Dimensions

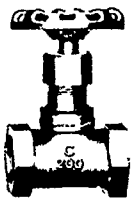
| Size | | | Inches | ⅜ |
|---|---|---|---|---|
| No. 57 Needle Air Valve | List Price | | Each | 3.40 |
| | Dimensions, in Inches | Diameter of seat opening | | ⅛ |
| | | End to end | | 2 5/16 |
| | | Center to top of stem, open | | 2½ |



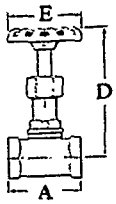
No. 57 Needle Air Valve

# Brass Globe and Angle Valves

## Needle Point



No. 88
Globe, Screwed




WORKING PRESSURES
200 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock

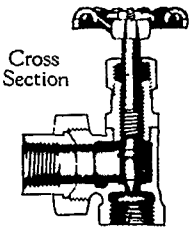
**Service recommendations:** Crane Globe and Angle Needle Point Valves are especially suitable where very close and delicate regulation of flow is desired.

They are recommended for steam, water, oil, gas, for light liquid lines, for fuel oil, and for similar services.

**Construction:** The valves, well proportioned throughout, are compact and unusually rugged in construction. They are furnished with a brass stem. Their stuffing box is large, and on the ¾-inch size, is equipped with a gland.

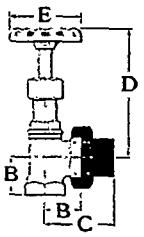
**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Seat opening:** The diameter of the seat opening in these valves is included in the dimensions shown in the table below. The ⅛-inch size has a nominal seat opening; the larger sizes have a reduced seat opening.




No. 85
Angle, Screwed
With Female
Union Outlet

No. 89
Angle, Screwed




### List Prices and Dimensions

| Size Inches | List Prices, Each Screwed: No. 85 Angle with Union | No. 88 Globe | No. 89 Angle | Dimensions, in Inches: A | B | C | D open | E | Diameter of seat opening |
|---|---|---|---|---|---|---|---|---|---|
| ⅛ | 3.10 | 2.30 | 2.40 | 13/16 | ⅝ | 15/16 | 2⅜ | 1½ | ⅛ |
| ¼ | 3.50 | 2.50 | 2.60 | 19/16 | 13/16 | 19/16 | 2⅜ | 1½ | 3/16 |
| ⅜ | 4.20 | 2.70 | 3.00 | 1 13/16 | ⅞ | 1¾ | 2¾ | 1¾ | ¼ |
| ½ | 5.40 | 3.20 | 3.70 | 2 1/16 | 1 1/16 | 2 | 3⅛ | 2 1/16 | 5/16 |
| ¾ | 6.70 | 4.50 | 5.00 | 2 5/16 | 1¼ | 2 3/16 | 4 | 2 9/16 | 7/16 |

## Hose Valves

No. 117
Angle Hose Valve
with
Cap and Chain

*See pages 60 and 61*

Crane offers a variety of brass hose valves in a wide range of sizes. Among these are Angle and Chicago Hose Valves, widely used on standpipes, hose racks, and similar services; Hose Gate including the Underwriters' type; and Garden Hose Valves. A variety of hose threads are available at no extra charge.

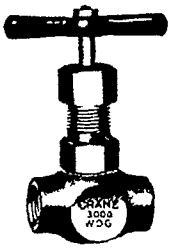
## Solder-Joint Valves

No. 1310
Globe Valve
Solder-Joint

*See pages 420 and 421*

Sturdily built Crane Solder-Joint Valves, for use with copper tubing, include globe, angle, gate, and check types. The valves are particularly adaptable to plumbing and heating systems, low pressure steam and water lines in industrial plants, and for other similar services. Available in sizes ⅜ to 2-inch.

## Steel Valves



No. 222 H
Globe Valve
Female
Steel Bar Stock

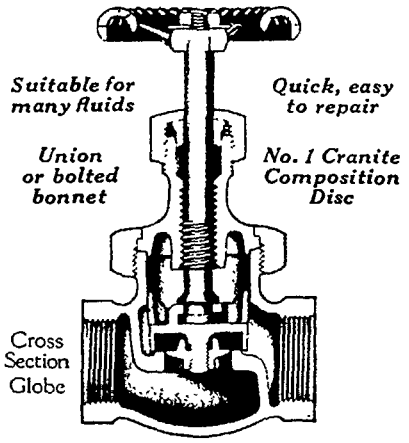
*See page 236*

The Crane line of bar stock valves includes small, rugged globe and angle valves made of steel, Exelloy, or Crane 18-8 Mo. They are ideal for use on orifice meters, regulator leads, by-passes, gauges, and many similar services. Available with female ends or with male and female ends in sizes ⅛ to 1-inch.

# 150-Pound Brass Globe and Angle Valves

## No. 1 Cranite Composition Disc

4




WORKING PRESSURES

Screwed valves—**150** pounds saturated steam
**300** pounds cold water, oil, or gas, non-shock

Flanged valves—**150** pounds saturated steam
**225** pounds cold water, oil, or gas, non-shock

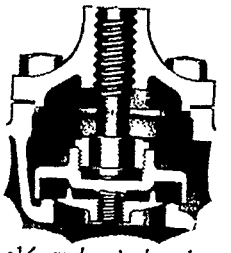
**Service recommendations:** These valves are recommended for a wide range of service when equipped with the proper disc. They will give excellent results on steam, hot water, cold water, oil, air, or gas lines and are unexcelled where quick disc replacement is necessary.

**Quick repairs:** A leak is easily repaired by replacing the disc holder with an extra complete disc holder and disc, or by inserting a new disc into the original holder. Extra disc holders and discs should be kept on hand for this purpose.

**Construction:** All parts are unusually rugged to withstand severe operating strains.

Valves 2-inch and smaller have a slip-on disc holder and a union bonnet as illustrated in the cross section at the upper left. Larger sizes have the disc and stem fastened with a disc stem ring and are furnished with an inside screw, bolted bonnet; see the illustration at the right.

Both types of bonnets provide a strong, tight joint, yet they can be easily dismantled and reassembled without danger of injuring the valve.



*2½ and 3-inch valves have a disc stem ring and are made with a bolted bonnet.*

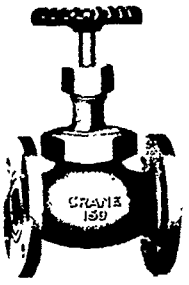
**Discs:** The valves are regularly equipped with a No. 1 Cranite Disc suitable for saturated steam or for hot water up to 300° F. Valves ordered for cold water, air, gas, oil, or gasoline are furnished with a No. 6 Disc. On hot water under 200° F., especially for frequent operation or easy seating, a No. 6 Disc is preferred to the No. 1. For list prices and description of discs, see page 133.

**Stuffing box; repacking:** The stuffing box is deep and has a gland. The valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

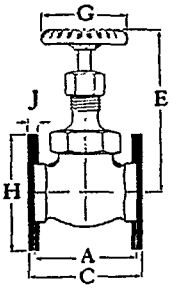
No. 7, Globe Screwed

No. 7, Angle Screwed

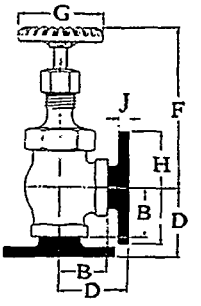


No. 9, Globe Flanged

No. 9, Angle Flanged




Globe Valves




Angle Valves

### List Prices, Each

| Size Inches | Globe or Angle: No. 7 Screwed | Globe or Angle: No. 9 Flanged F. & D. | Dimensions, in Inches: A | B | C | D | E open | F open | G | H | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ⅛ | 3.30 | | 2 | 15/16 | | | 3¾ | 3⅝ | 1¾ | | |
| ¼ | 3.[illegible]0 | | 2 | 15/16 | | | 3¾ | 3⅝ | 1¾ | | |
| ⅜ | 4.10 | | 2 5/16 | 1 1/16 | | | 4 5/16 | 4 3/16 | 2 1/16 | | |
| ½ | 5.20 | | 2 11/16 | 1¼ | | | 4¾ | 4⅝ | 2 9/16 | | |
| ¾ | 7.20 | | 3 3/16 | 1 7/16 | | | 5⅜ | 5¼ | 2¾ | | |
| 1 | 9.80 | 26.00 | 3¾ | 1 11/16 | 4⅜ | 2 9/16 | 6 1/16 | 5 15/16 | 3 1/16 | 4¼ | ⅜ |
| 1¼ | 13.40 | 33.00 | 4¼ | 2 | 4 13/16 | 2⅞ | 6¾ | 6⅝ | 3⅝ | 4⅝ | 13/32 |
| 1½ | 16.70 | 40.00 | 4¾ | 2 3/16 | 5½ | 3 3/16 | 7 9/16 | 7 5/16 | 4 1/16 | 5 | 7/16 |
| 2 | 27.00 | 60.00 | 5¾ | 2 11/16 | 6½ | 3¾ | 8⅝ | 8⅜ | 4¾ | 6 | ½ |
| 2½ | 49.00 | 91.00 | 6¾ | 3¼ | 7½ | 4 5/16 | 10½ | 10⅜ | 7 | 7 | 9/16 |
| 3 | 69.00 | 126.00 | 8 | 3 13/16 | 8⅞ | 4⅝ | 11 13/16 | 11 9/16 | 8 | 7½ | ⅝ |

*When ordering, specify whether Globe or Angle type is wanted.*

*List prices of composition discs....page 133*

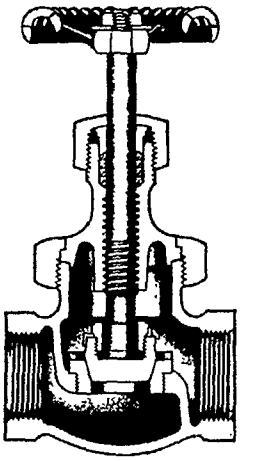
*Templates for drilling....page 458*

# 150-Pound Brass Globe and Angle Valves

## Plug Type Disc

WORKING PRESSURES
150 pounds saturated steam
300 pounds cold water, oil, or gas, non-shock
***Air Tested***

**Features**
Crane Nitri-Hard Seating Surfaces
Plug Type Disc—Renewable Body Seat Ring
Union or Bolted Bonnet



Cross Section Globe

**Service recommendations:** These valves are recommended for throttling, for soot blower, blow-off, boiler feed, drip, and drain lines, and for other hard services. Having extremely hard stainless steel seating surfaces, the valves are unusually well suited for installations where operating conditions are severe.

**Plug type disc valves for moderate pressures:** High pressure valves are often used on much lower pressures in order to secure the better seat construction usually associated with higher pressures.

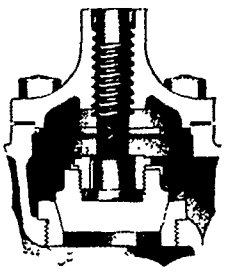
These valves are unique in that while only recommended for 150 pounds saturated steam and 300 pounds cold water, oil, or gas, they are made with a seat and disc that will stand up under extremely hard operating conditions. For severe and exacting services on moderate pressures, such as throttling, blow-off, boiler feed, frequent operation, etc., they are ideal, affording abundant seat life without the higher initial cost of a high pressure valve.

No. 14½ P Screwed Globe

No. 16½ P Screwed Angle

**Disc and seat:** The valves have a plug type disc and seat whose excellent design characteristics for rigorous service are well known. The wide seating surface is not easily ruined by foreign matter or by wiredrawing, and the tapered disc permits close regulation of flow when throttling.

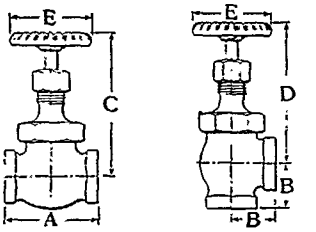
Both the disc and seat are made of Crane Nitri-Hard, a stainless steel that withstands high temperatures and has an extremely hard surface. The design of the disc and seat and the unusual resistance of Crane Nitri-Hard to wear, cutting, scoring, erosion, seizure, and galling produce a superior seating combination. It will withstand severe operating conditions unusually well.



*2½ and 3-inch valves have a bolted bonnet.*

**Sturdy construction:** The valves are ruggedly constructed throughout. The brass body, bonnet, and stem are proportioned to provide liberal strength and safety under the recommended working pressures.

**Bonnet construction:** Sizes 2-inch and smaller have a union bonnet as shown on illustrations at the right; 2½ and 3-inch sizes have a low-type, compact bolted bonnet, inside screw, as illustrated at the left.




Both types of bonnet construction provide a strong, tight joint, yet they can be easily dismantled and reassembled without danger of injuring the valve.

**Stuffing box:** The valves have a stuffing box which is large and deep; it is equipped with a gland and is filled with high grade packing.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

### List Prices and Dimensions

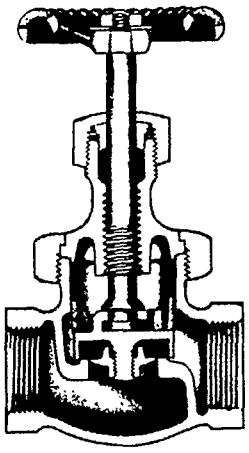
| Size | List Prices, Each | | Dimensions, in Inches | | | | |
|---|---|---|---|---|---|---|---|
| Inches | No. 14½P Globe | No. 16½P Angle | A | B | C open | D open | E |
| ⅛ | 5.40 | 5.40 | 2 | 15/16 | 4 | 3⅞ | 1¾ |
| ¼ | 5.40 | 5.40 | 2 | 15/16 | 4 | 3⅞ | 1¾ |
| ⅜ | 6.70 | 6.70 | 2 5/16 | 1 1/16 | 4½ | 4⅜ | 2 1/16 |
| ½ | 7.60 | 7.60 | 2 11/16 | 1¼ | 5 | 4⅞ | 2 9/16 |
| ¾ | 9.50 | 9.50 | 3 3/16 | 1 7/16 | 5¾ | 5⅝ | 2¾ |
| 1 | 12.50 | 12.50 | 3¾ | 1 11/16 | 6⅝ | 6½ | 3 1/16 |
| 1¼ | 17.80 | 17.80 | 4¼ | 2 | 7 | 6¾ | 3⅝ |
| 1½ | 24.00 | 24.00 | 4¾ | 2 3/16 | 8 | 7¾ | 4 1/16 |
| 2 | 35.00 | 35.00 | 5¾ | 2 11/16 | 9⅛ | 8⅞ | 4¾ |
| 2½ | 63.00 | 63.00 | 6¾ | 3¼ | 10½ | 10⅜ | 7 |
| 3 | 94.00 | 94.00 | 8 | 3 13/16 | 11⅞ | 11⅝ | 8 |

*Valves for Marine Service... page 400*

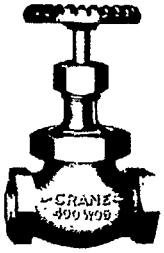
# Bronze Globe and Angle Valves

## For Liquefied Petroleum Gases

4



Cross Section Globe



No. 130 Globe Screwed

No. 131 Angle Screwed

WORKING PRESSURE
400 pounds, 150° F.
LP-gases, light oils, volatile fluids, or air

TEST PRESSURE
600 pounds hydrostatic
*Air Tested*

***New, Easy-Seating, Safety-Tight Valves***
****Underwriters' Approved for Efficient Handling Of Liquefied Petroleum Gases***

**Service recommendations:** These valves are especially designed and recommended for safe handling of all common commercial forms of liquefied petroleum gases, such as butane, iso-butane, propane, propylene, butylenes, etc. The gases can be handled separately or mixed, and in a liquid or gaseous state.

*The valves have been approved by the Underwriters' Laboratories, Inc. for use on all types of piping systems carrying liquefied petroleum gases, provided the system is subject to working pressures no greater than 250 pounds. Their identification plate is marked "Butane-UL-Propane."

In addition, they are excellently used for hot water (up to 200° F.), cold water, compressed air, gasoline, light oils, volatile fluids, and similar services operating at pressures up to 400 pounds.

**Safety-tight:** Precision design and the use of high quality materials have produced a valve that is completely tight throughout, assuring safer, more efficient handling of LP-gases, even under rigorous service conditions.

With reasonable attention and occasional replacement of the disc, the valves can be kept in a tight condition indefinitely.

**Body and bonnet:** The body is made of Crane Special Bronze, a high grade, leaded tin bronze. The union bonnet provides a strong, tight joint, yet it can be easily dismantled and reassembled without danger of injury to the valve.

**Durable composition disc:** The valves have a Crane No. 6 Disc. Made of a specially formulated composition, the disc is particularly suited for use with petroleum products. It is soft enough to make a tight seat, but sufficiently stiff and resilient to withstand hard wear.

The disc is secured to the underside of a slip-on disc holder by means of a disc retaining nut. The nut also serves to reinforce and protect the disc from strain and distortion ordinarily resulting from tight closure of the valve. As added precaution against leakage, the disc is sealed into the disc holder.

**Quick disc repairs:** A leak is easily and inexpensively repaired. Simply replace the disc holder with an extra complete disc holder and disc, or insert a new disc into the original holder.

A supply of extra disc holders and discs kept on hand for this purpose assures long, practically uninterrupted valve service.

**Stuffing box:** The deep stuffing box is equipped with a gland and is filled with one-piece molded asbestos packing to provide a long lasting, tight stem seal.

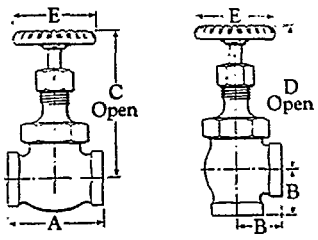
**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Installation:** Wherever conditions permit, the valves should be installed with the pressure under the disc. An arrow cast on the body indicates the correct direction of flow.

### List Prices and Dimensions

| Size | List Prices, Each | | Dimensions, in Inches | | | | |
|---|---|---|---|---|---|---|---|
| Inches | No. 130 Globe | No. 131 Angle | A | B | C | D | E |
| 1/4 | 3.75 | 3.75 | 2 | 15/16 | 3 3/4 | 3 5/8 | 1 3/4 |
| 3/8 | 4.60 | 4.60 | 2 5/16 | 1 1/16 | 4 5/16 | 4 3/16 | 2 1/16 |
| 1/2 | 6.00 | 6.00 | 2 11/16 | 1 1/4 | 4 3/4 | 4 5/8 | 2 9/16 |
| 3/4 | 8.00 | 8.00 | 3 3/16 | 1 7/16 | 5 3/8 | 5 1/4 | 2 3/4 |
| 1 | 11.00 | 11.00 | 3 3/4 | 1 11/16 | 6 1/16 | 5 15/16 | 3 1/16 |
| 1 1/4 | 15.00 | 15.00 | 4 1/4 | 2 | 6 3/4 | 6 5/8 | 3 5/8 |
| 1 1/2 | 18.00 | 18.00 | 4 3/4 | 2 3/16 | 7 9/16 | 7 5/16 | 4 1/16 |
| 2 | 30.00 | 30.00 | 5 3/4 | 2 11/16 | 8 5/8 | 8 3/8 | 4 3/4 |

*For list prices of composition discs, see page 133.*




***Other Bronze Valves for LP-Gases:***

*Gate.....page 18*
*Check.....page 47*

# Bronze Globe and Angle Valves

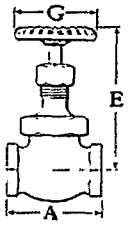
## For Light Oils and Gases

WORKING PRESSURE
400 pounds oil, air, gas, or gasoline, 250° F.

*Air Tested*

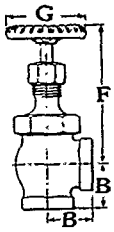
***Tight, Easy-Seating Cranoil Disc***
***Sturdy Union Bonnet Construction***

**Recommendations:** These are definitely superior to valves ordinarily used on light oils and gases. They seat perfectly tight, close easily, and withstand wear exceptionally well. They are especially recommended for refined oils such as transformer oil, for gases, and for solvents, which, in many cases, attack rubber composition discs but do not corrode brass, and which are difficult to hold with metal to metal seat valves.



Globe

Boss on body of globe valve, sizes 1¼-inch and larger only.



Angle

**Construction:** The valves are ruggedly constructed. Their body is made of Crane Special Bronze, a strong, hard, leaded tin bronze. The union bonnet provides a strong, tight joint which can be easily dismantled or reassembled without danger of injuring the valve.

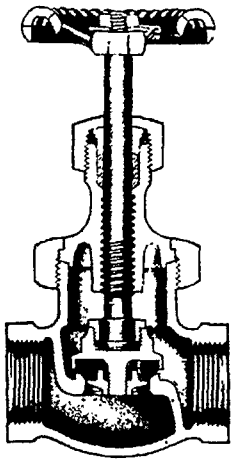
Sizes ¼ and ⅜-inch have a slip-on disc holder; larger sizes (see cross section) have the disc and stem fastened with a disc stem ring.

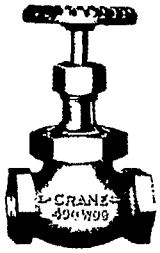
**Disc and seat:** The specially fabricated No. 5 Cranoil Disc will not swell, harden, nor break down. It is permanently cemented into the disc holder, eliminating seepage; see page 133 for description.

The seat and disc form a line to line contact. The narrow bearing area disc material, ideal for light oils and gases, provide absolute tightness and easy seating.

**Stuffing box:** The stuffing box is equipped with a gland and is filled with high grade packing.

**Boss on globe body:** Globe valve bodies 1¼-inch and larger have a boss cast on one side. When ordered tapped, or with a No. 211 Valve for transformer oil service (shown below), the boss is drilled and tapped with a ¼-inch pipe thread at no extra charge.


Cross Section, Globe


No. 207, Globe Screwed

No. 209, Angle Screwed

### List Prices and Dimensions

| Size | List Prices, Each | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 207 Globe | No. 209 Angle | Globe Valve | | | | | Angle Valve | | |
| Inches | Screwed | Screwed | A | C | D | E open | G | B | F open | G |
| ¼ | 5.80 | 5.80 | 2 | | | 3¾ | 1¾ | 15/16 | 3⅝ | 1¾ |
| ⅜ | 6.20 | 6.20 | 2 5/16 | | | 4⅜ | 2 1/16 | 1 1/16 | 4¼ | 2 1/16 |
| ½ | 6.70 | 6.70 | 2 11/16 | | | 5 | 2 9/16 | 1¼ | 4⅞ | 2 9/16 |
| ¾ | 8.70 | 8.70 | 3 3/16 | | | 5¾ | 2¾ | 1 7/16 | 5⅝ | 2¾ |
| 1 | 12.80 | 12.80 | 3¾ | | | 6⅝ | 3 1/16 | 1 11/16 | 6½ | 3 1/16 |
| 1¼ | 16.00 | 16.00 | 4¼ | 15/16 | 1 7/16 | 7½ | 3⅝ | 2 | 7⅜ | 3⅝ |
| 1½ | 22.00 | 22.00 | 4¾ | 1⅛ | 1½ | 8⅜ | 4 1/16 | 2 3/16 | 8⅛ | 4 1/16 |
| 2 | 32.00 | 32.00 | 5¾ | 1½ | 1¾ | 9⅜ | 4¾ | 2 11/16 | 9⅛ | 4¾ |

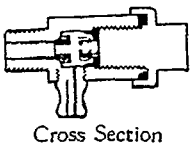
***Wherever conditions permit, these valves should be installed with the pressure under the disc. An arrow cast on the body indicates the direction of flow.***

# Brass Vent or Sampling Valve

## For Transformer Oil Service

For 400 pounds transformer oil, 250° F.

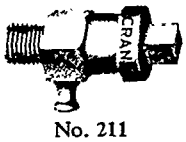
*Air Tested*


Cross Section

The No. 211 uses the same disc material and seat design as the No. 207 described above.

**List Price**

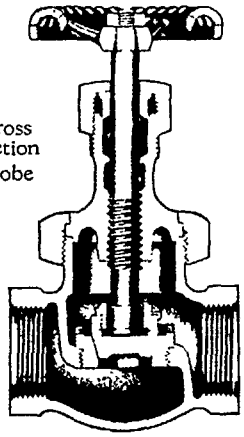
| Size of male thread | Inches | ¼ |
|---|---|---|
| No. 211 | Each | 4.20 |


No. 211

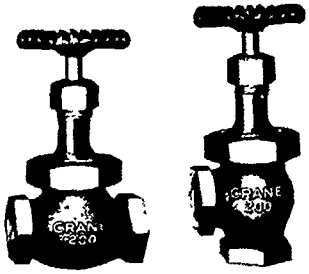
**Uses:** This valve is used on transformer oil, as a Vent Valve or as a Sampling Valve, in conjunction with the No. 207. When installed at the top of oil immersed electrical equipment, the valve is opened to vent air. When installed at a low point, the valve is opened to draw off samples of oil.

# 200-Pound Bronze Globe and Angle Valves

## Plug Type Disc



Cross Section Globe



No. 212 P Globe, Screwed — No. 214 P Angle, Screwed

***With Crane Nitri-Hard Plug Type Disc and Renewable Body Seat Ring***

**WORKING PRESSURES**
200 pounds steam, *500° F.
400 pounds cold water, oil, or gas, non-shock
*Maximum temperature rating with No. 4 Cranite Disc is 450° F.

**TEST PRESSURE**
600 pounds hydrostatic

Plug Type Disc Valves are air tested.

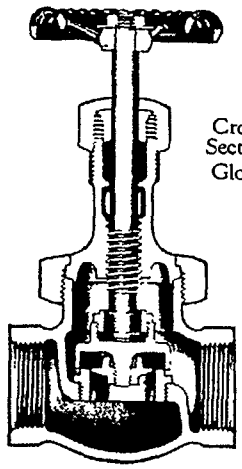
**Rugged construction:** These valves are ruggedly constructed, the body being made of Crane Special Bronze, a high grade leaded tin bronze. Except for the seat and disc, the valves are similar; a metal plate under the wheel nut identifies the type of disc.

**Plug type disc valves:** Nos. 212 P and 214 P are recommended for severe services such as for throttling, and for blow-off, boiler feed, soot blower, drip, and drain lines.

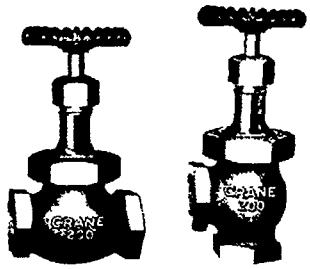
Their plug type disc and seat are designed for exacting service. The wide seating surface is not easily affected by foreign matter or wiredrawing and the tapered disc permits close regulation of flow when throttling. Made of Crane Nitri-Hard, a stainless steel having an extremely hard surface, the disc and seat offer high resistance to seizure, erosion, galling, and scoring.

**Composition disc valves:** Nos. 212 C and 214 C can be utilized for a wide range of fluids when equipped with the proper disc. They are especially suitable where discs must be quickly and easily renewed. The body seat ring is Crane Nickel Alloy.

## No. 4 Cranite Disc



Cross Section Globe

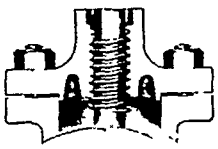


No. 212 C Globe, Screwed — No. 214 C Angle, Screwed

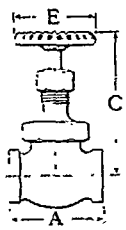
***With No. 4 Cranite Disc and Crane Nickel Alloy Renewable Body Seat Ring***

Composition disc valves are regularly equipped with a No. 4 Cranite Disc, suitable for high pressure steam up to 450° F., or for hot water up to 420° F. Valves ordered for cold water, air, gas, oil, or gasoline are furnished with a No. 6 Disc. On hot water under 200° F., especially for frequent operation or easy seating, a No. 6 Disc is preferred to the No. 4. See page 133 for discs.

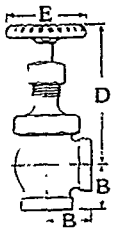
**Bonnet:** All valves 2-inch and smaller have a union bonnet as shown above; 2½ and 3-inch plug type valves have a bolted bonnet, inside screw as shown below. Both types provide a strong tight joint, yet they can be easily dismantled and reassembled without danger of injury to the valve.



**Stuffing box; repacking:** The stuffing box is unusually deep, has a gland, and is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.




Globe




Angle

### List Prices and Dimensions

| Valve No. and Type | Size Inches | List Prices Each | Dimensions, in Inches A | B | C open | D open | E |
|---|---|---|---|---|---|---|---|
| No. 212 P Globe or 214 P Angle | ¼ | 6.00 | 2 | 15/16 | 3 15/16 | 3 15/16 | 1¾ |
| | ⅜ | 7.40 | 2 5/16 | 1 1/16 | 4½ | 4⅜ | 2 1/16 |
| | ½ | 8.50 | 2 11/16 | 1¼ | 5 1/16 | 4 15/16 | 2 9/16 |
| | ¾ | 10.60 | 3 3/16 | 1 7/16 | 5¾ | 5⅝ | 2¾ |
| | 1 | 13.80 | 3¾ | 1 11/16 | 6 5/16 | 6 3/16 | 3 1/16 |
| | 1¼ | 19.70 | 4¼ | 2 | 7¼ | 7⅛ | 3⅝ |
| | 1½ | 27.00 | 4¾ | 2 3/16 | 8 5/16 | 8 3/16 | 4 1/16 |
| | 2 | 39.00 | 5¾ | 2 11/16 | 9½ | 9¼ | 5⅜ |
| | 2½ | 70.00 | 7¼ | 3⅝ | 10¾ | 9¾ | 7 |
| | 3 | 104.00 | 8¼ | 4⅛ | 12 5/16 | 11 5/16 | 8 |
| No. 212 C Globe or 214 C Angle | ¼ | 5.40 | 2 | 15/16 | 4 | 4 | 1¾ |
| | ⅜ | 6.70 | 2 5/16 | 1 1/16 | 4⅝ | 4½ | 2 1/16 |
| | ½ | 7.60 | 2 11/16 | 1¼ | 5⅛ | 5 | 2 9/16 |
| | ¾ | 9.50 | 3 3/16 | 1 7/16 | 5¾ | 5⅝ | 2¾ |
| | 1 | 12.50 | 3¾ | 1 11/16 | 6½ | 6⅜ | 3 1/16 |
| | 1¼ | 17.80 | 4¼ | 2 | 7⅜ | 7¼ | 3⅝ |
| | 1½ | 24.00 | 4¾ | 2 3/16 | 8⅜ | 8¼ | 4 1/16 |
| | 2 | 35.00 | 5¾ | 2 11/16 | 9½ | 9¼ | 5⅜ |

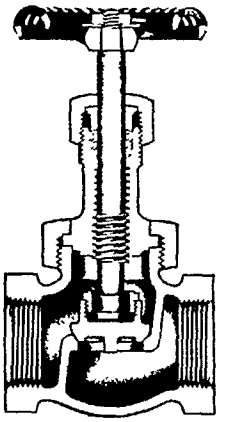
*For list prices of composition discs, see page 133.*

*Valves for Marine Service....page 400*

# 200-Pound Bronze Globe and Angle Valves

## Regrinding

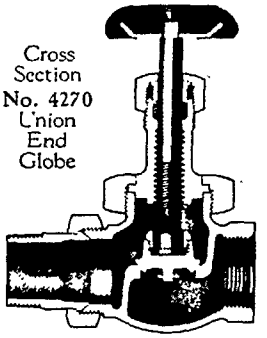
| Valve Ends | Working Pressures: Steam 500° F. | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|
| Screwed | 200 pounds | 400 pounds | 600 pounds |
| Flanged | 150 pounds | 225 pounds | 450 pounds |



Cross Section Globe

### *Valves with Union End*

Users having need for a male union connection can conveniently install heavy duty No. 4270 Globe or Angle Radiator Valves. Their design and proportions are the same as the No. 70 Valves.



Cross Section No. 4270 Union End Globe

*No. 4270 Valves are available in sizes 3/8 to 1-inch; see page 58 for list prices and description.*

**Service recommendations:** These sturdily constructed 200-Pound Bronze Globe and Angle Valves are recommended for service on steam, water, oil, or gas lines. All parts are of liberal proportions.

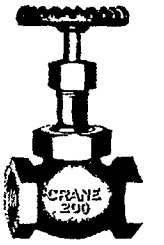
**Body:** The body is made of Crane Special Bronze, a strong, hard, leaded tin bronze.

**Regrinding:** The valves can be reground without removing the body from the line. Instructions for regrinding are furnished with each valve.

**Union bonnet:** The union bonnet ring reinforces the bonnet joint and facilitates dismantling and reassembling. When the valves are being reground, the ring centers and guides the valve trimmings.

**Disc connection:** The disc in sizes 1/8 to 1 1/2-inch is integral with the stem. In larger sizes, the disc swivels on the stem, as shown in the cross section at the right.

**Stuffing box:** The stuffing box is deep and is filled with high grade packing. Sizes 1 1/2-inch and larger are equipped with a gland; smaller sizes do not have a gland.



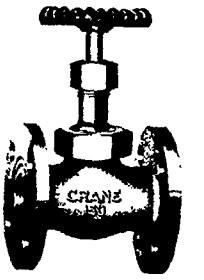
No. 70, Globe Screwed

No. 70, Angle Screwed

**Repacking:** These valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced with two V-shaped concentric grooves between the port and the bolt holes.

Prices include drilling to the MSS 150-Pound Standard; no deduction is made for valves ordered faced only. Full face gaskets should be used; see page 472.



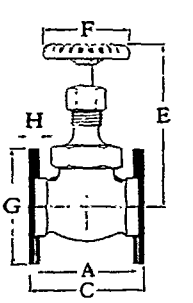
No. 71, Globe Flanged

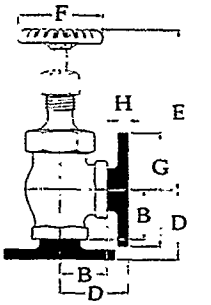
No. 71, Angle Flanged

### List Prices and Dimensions

| Size Inches | List Prices, Each Globe or Angle: No. 70 Screwed | No. 71 Flanged F. & D. | Dimensions, in Inches: A | B | C | D | E open | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 2.70 | | 1 11/16 | 13/16 | | | 3 1/2 | 1 3/4 | | |
| 1/4 | 2.70 | | 1 11/16 | 13/16 | | | 3 1/2 | 1 3/4 | | |
| 3/8 | 3.40 | | 1 15/16 | 1 | | | 3 7/8 | 2 1/16 | | |
| 1/2 | 4.40 | | 2 1/4 | 13/16 | | | 4 1/4 | 2 9/16 | | |
| 3/4 | 5.70 | | 2 3/4 | 1 3/8 | | | 5 | 2 3/4 | | |
| 1 | 8.30 | 19.00 | 3 5/16 | 1 11/16 | 4 3/16 | 2 5/8 | 5 3/4 | 3 1/16 | 4 1/4 | 3/8 |
| 1 1/4 | 11.20 | 22.00 | 3 7/8 | 1 15/16 | 4 9/16 | 2 7/8 | 6 5/8 | 3 5/8 | 4 5/8 | 13/32 |
| 1 1/2 | 14.80 | 29.00 | 4 1/2 | 2 1/4 | 5 5/16 | 3 3/16 | 7 5/8 | 4 1/16 | 5 | 7/16 |
| 2 | 22.50 | 41.00 | 5 1/4 | 2 5/8 | 6 | 3 3/4 | 8 3/8 | 4 3/4 | 6 | 1/2 |
| 2 1/2 | 37.00 | 61.00 | 6 5/16 | 3 3/16 | 6 3/4 | 4 5/16 | 9 1/4 | 6 | 7 | 9/16 |
| 3 | 55.00 | 94.00 | 7 1/4 | 3 13/16 | 7 15/16 | 4 5/8 | 11 | 7 | 7 1/2 | 5/8 |

***When ordering, specify whether Globe or Angle Valves are wanted.***



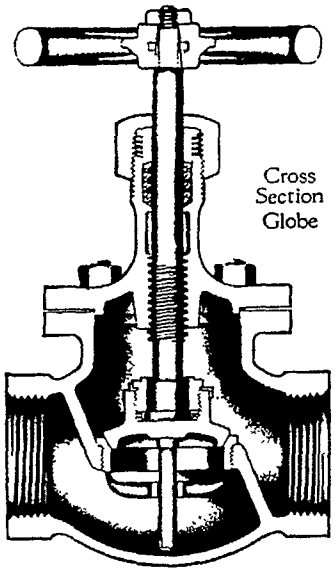

*Valves for Marine Service....page 400*
*Templates for drilling.....page 458*

4

# 200-Pound Bronze Globe and Angle Valves

## Bolted Bonnet

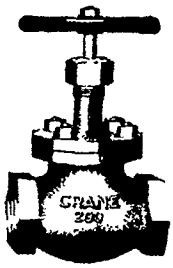
4



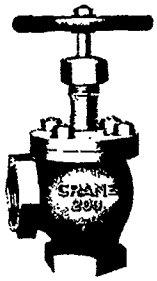
Cross Section Globe

| Valve Ends | Working Pressures | | Hydrostatic Test Pressures |
|---|---|---|---|
| | Steam 500° F. | Cold water, oil, or gas, non-shock | |
| Screwed | 200 pounds | 400 pounds | 600 pounds |
| Flanged | 150 pounds | 225 pounds | 450 pounds |

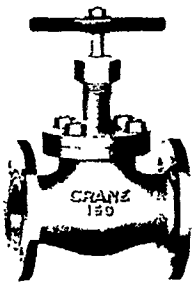
***Sizes 3½-inch and larger have outside stem threads and a bolted gland (not illustrated).***



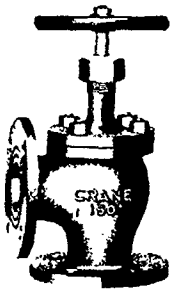
No. 4196, Globe Screwed



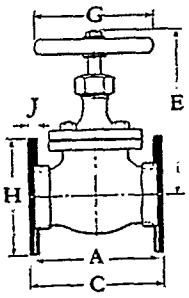
No. 4198, Angle Screwed

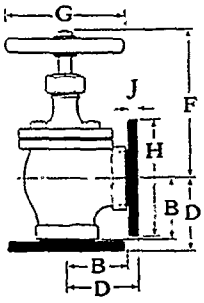


No. 4197, Globe Flanged



No. 4199, Angle Flanged




**Service recommendations:** These are high quality valves, especially intended for use in large size pipe lines. They are recommended for general service on steam, water, oil, or gas.

**Construction:** The valves are strong, rugged, and durable. The bolted bonnet makes a tight joint and assures liberal strength. The disc is accurately guided by a guide stem which operates in a bridge cast integral with the body seat ring; the body seat ring is renewable.

Sizes 3-inch and smaller have inside stem threads, a screwed packing nut, and a gland, as illustrated.

Sizes 3½-inch and larger have outside stem threads with a crosshead type yoke and a one-piece bolted gland and flange (not illustrated).

**Materials:** The body, bonnet, disc, and body seat ring are made of Crane Special Bronze, a strong, hard, leaded tin bronze.

**Stuffing box:** The stuffing box is unusually deep and is filled with high grade packing.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 150-Lb. SP Bronze Flange Standard (No. SP-2-1946). They are plain faced with two V-shaped concentric grooves between the port and the bolt holes.

Prices include drilling to the MSS 150-Lb. Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

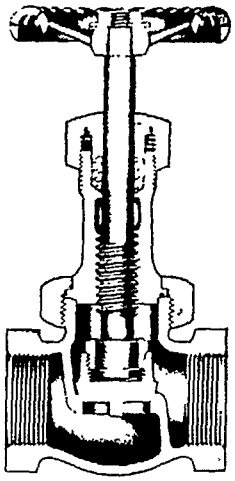
### List Prices and Dimensions

| Valve No. | Size Inches | List Prices Each | Dimensions, in Inches A | B | C | D | E open | F open | G | H | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 4196 or No. 4198 Screwed | 1½ | 41.00 | 5 5/16 | 2 11/16 | | | 8 | 7½ | 4 1/16 | | |
| | 2 | 55.00 | 6 | 3 | | | 9¼ | 8 15/16 | 5⅜ | | |
| | 2½ | 76.00 | 7¼ | 3⅝ | | | 11 | 10½ | 7 | | |
| | 3 | 105.00 | 8¼ | 4⅛ | | | 12⅜ | 11¾ | 8 | | |
| No. 4197 or No. 4199 Flanged F. & D. | 1½ | 54.00 | | | 5⅞ | 3⅛ | 8 | 7½ | 4 1/16 | 5 | 7/16 |
| | 2 | 68.00 | | | 6⅞ | 3¾ | 9¼ | 8 15/16 | 5⅜ | 6 | ½ |
| | 2½ | 111.00 | | | 8 | 4¼ | 11 | 10½ | 7 | 7 | 9/16 |
| | 3 | 132.00 | | | 9⅛ | 4⅝ | 12⅜ | 11¾ | 8 | 7½ | ⅝ |
| | 3½ | 221.00 | | | 10⅜ | 5¼ | 12¼ | 11¼ | 9 | 8½ | 11/16 |
| | 4 | 282.00 | | | 11 | 5½ | 13¾ | 12½ | 10 | 9 | 11/16 |
| | 5 | 402.00 | | | 12¼ | 6¼ | 16½ | 15 | 10 | 10 | ¾ |
| | 6 | 553.00 | | | 14 | 7 | 18⅛ | 16¼ | 12 | 11 | 13/16 |

*Valves for Marine Service..page 400* *Templates for drilling..page 458*

# 300-Pound Bronze Globe and Angle Valves

## Regrinding



Cross Section
No. 362 E, Globe

WORKING PRESSURES
300 pounds steam, 550° F.
600 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
900 pounds hydrostatic

**Service recommendations:** These valves are recommended for severe operating conditions at high pressures. They combine serviceability with moderate cost.

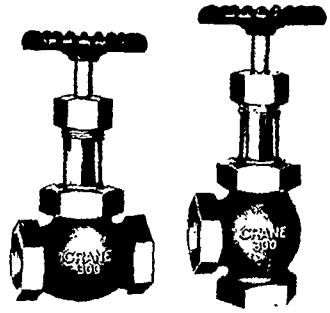
**Body and disc:** The body and disc are made of Crane Special Bronze, a strong, hard, leaded tin bronze.

**Union bonnet:** The bonnet is made of a special bronze. Its unusually good wear-resisting properties, combined with the long and accurately machined threads on the stem, materially lengthen the life of both the stem and the bonnet.

In addition to making a sturdy, tight joint, the union bonnet construction facilitates dismantling and reassembling the valve. The union ring reinforces the bonnet joint, and when the valve is being reground, it centers and guides the valve trimmings.

**Regrinding:** These valves can be reground without removing the body from the line. Complete instructions for regrinding are furnished with each valve.

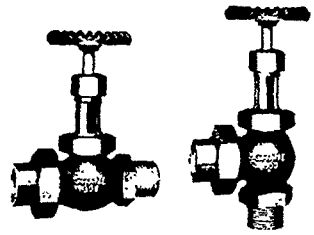
**Stuffing box; repacking:** The stuffing box is unusually deep and is filled with high grade packing. It is equipped with a gland. The valves, when wide open, can be repacked while under pressure.



No. 362 E Globe Screwed — No. 364 E Angle Screwed

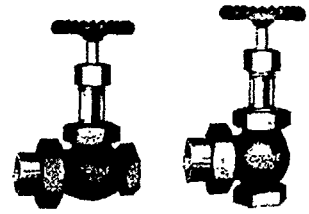
### Valves with Female Union Outlet

The union end valves shown below are part of the regular Crane line. Prices and dimensions are included in the table.



With Male Inlet and Female Union Outlet
No. 1834 Globe — No. 1835 Angle

*Male end is one pipe size larger than female union end.*



With Female Inlet and Female Union Outlet
No. 1836 Globe — No. 1837 Angle

*Both ends are the same size.*

**Interchangeability:** All parts, except the bodies, of union end valves interchange with corresponding parts of Nos. 362 E and 364 E Valves.

### List Prices and Dimensions

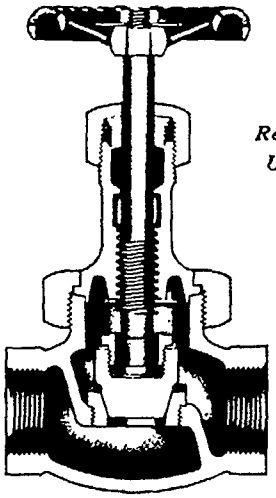
| Valve No. and Type | Size Inches | List Prices Each | Dimensions, in Inches: Globe End to end | Globe Center to top, open | Angle Center to female end | Angle Center to male end | Angle Center to union end | Angle Center to top, open | Diameter of wheel Globe or Angle |
|---|---|---|---|---|---|---|---|---|---|
| No. 362 E Globe or No. 364 E Angle | 1/4 | 4.80 | 2 | 4 | 15/16 | | | 3 7/8 | 1 3/4 |
| | 3/8 | 5.60 | 2 5/16 | 4 1/2 | 1 1/16 | | | 4 3/8 | 2 1/16 |
| | 1/2 | 7.00 | 2 11/16 | 5 | 1 1/4 | | | 4 7/8 | 2 9/16 |
| | 3/4 | 8.80 | 2 15/16 | 6 1/8 | 1 1/2 | | | 6 | 3 1/16 |
| | 1 | 11.80 | 3 1/2 | 6 5/8 | 1 3/4 | | | 6 5/8 | 3 5/8 |
| | 1 1/4 | 14.80 | 4 1/16 | 7 5/8 | 2 1/16 | | | 7 5/8 | 4 1/16 |
| | 1 1/2 | 20.00 | 4 5/8 | 8 1/2 | 2 5/16 | | | 8 1/2 | 4 3/4 |
| | 2 | 31.00 | 5 3/4 | 10 1/8 | 2 7/8 | | | 10 1/2 | 6 |
| No. 1834 Globe or No. 1835 Angle | 1/2 × 3/8 | 11.00 | 4 1/4 | 4 1/2 | | 2 1/16 | 2 3/16 | 4 3/8 | 2 1/16 |
| | 3/4 × 1/2 | 13.80 | 4 13/16 | 5 | | 2 3/8 | 2 7/16 | 4 7/8 | 2 9/16 |
| | 1 × 3/4 | 17.30 | 5 1/2 | 6 1/8 | | 2 3/4 | 2 3/4 | 6 | 3 1/16 |
| | 1 1/4 × 1 | 22.00 | 6 1/8 | 6 5/8 | | 3 | 3 1/8 | 6 5/8 | 3 5/8 |
| | 1 1/2 × 1 1/4 | 29.00 | 6 7/8 | 7 5/8 | | 3 5/16 | 3 9/16 | 7 5/8 | 4 1/16 |
| | 2 × 1 1/2 | 43.00 | 7 13/16 | 8 1/2 | | 3 13/16 | 4 | 8 1/2 | 4 3/4 |
| | 2 1/2 × 2 | 55.00 | 9 1/16 | 10 1/8 | | 4 3/8 | 4 11/16 | 10 1/2 | 6 |
| No. 1836 Globe or No. 1837 Angle | 1/4 | 9.60 | 2 15/16 | 4 | 1 | | 1 15/16 | 3 7/8 | 1 3/4 |
| | 3/8 | 10.20 | 3 3/8 | 4 1/2 | 1 3/16 | | 2 3/16 | 4 3/8 | 2 1/16 |
| | 1/2 | 12.00 | 3 13/16 | 5 | 1 3/8 | | 2 7/16 | 4 7/8 | 2 9/16 |
| | 3/4 | 15.30 | 4 1/4 | 6 1/8 | 1 1/2 | | 2 3/4 | 6 | 3 1/16 |
| | 1 | 20.00 | 4 7/8 | 6 5/8 | 1 3/4 | | 3 1/8 | 6 5/8 | 3 5/8 |
| | 1 1/4 | 27.00 | 5 5/8 | 7 5/8 | 2 1/16 | | 3 9/16 | 7 5/8 | 4 1/16 |
| | 1 1/2 | 40.00 | 6 5/16 | 8 1/2 | 2 5/16 | | 4 | 8 1/2 | 4 3/4 |
| | 2 | 52.00 | 7 9/16 | 10 1/8 | 2 7/8 | | 4 11/16 | 10 1/2 | 6 |

*Cab Hose Valves....page 40* *AAR Valves....pages 38 to 40* *Valves for Marine Service....page 400*

# 300-Pound Bronze Globe and Angle Valves

## Plug Type Disc

4



Cross Section Globe

*Crane Nitri-Hard Plug Type Seat and Renewable Body Seat Ring*

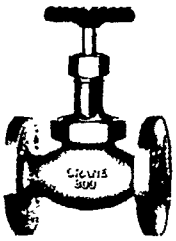
*Union or Bolted Bonnet*

*Air Tested*

| Valve Ends | Sizes | Working Pressures: Steam 550° F | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|---|
| Screwed | ¼ to 2-inch | 300 pounds | 1000 pounds | 1500 pounds |
| | 2½ and 3-inch | 300 pounds | 600 pounds | 900 pounds |
| Flanged | All sizes | 300 pounds | 500 pounds | 900 pounds |

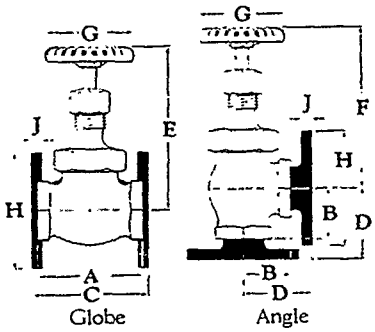
No. 382 P, Globe Screwed

No. 384 P, Angle Screwed



No. 383 P, Globe Flanged

No. 385 P, Angle Flanged




*Valves for Marine Service . page 400*
*Templates for drilling . . . . page 458*

**Service recommendations:** These valves are recommended for exceptionally severe service, such as for throttling, and soot blower, blow-off, boiler feed, drip and drain lines.

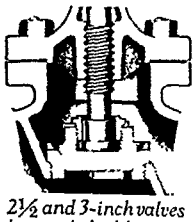
**Body:** The strong, durable body is made of Crane Special Bronze, a high grade leaded tin bronze.

**Disc and seat:** The valves have a plug type disc and seat especially designed for rigorous service. The wide seating surface is not easily damaged by foreign matter or by wiredrawing, and the tapered disc permits close regulation of flow when throttling.

Both the disc and seat are Crane Nitri-Hard, a stainless steel having an extremely hard surface. The design of the disc and seat combined with the excellent resistance offered by the high hardness to wear, cutting, scoring, erosion, seizure, and galling produce a superior seat. It will withstand severe operating conditions unusually well.

**Stuffing box:** The stuffing box is unusually deep; it is equipped with a gland and is filled with high grade packing.

**Bonnet construction:** Sizes 2-inch and smaller have a union bonnet as shown in the illustrations at the left; 2½ and 3-inch sizes have a compact bolted bonnet, inside screw, as illustrated at the right.



*2½ and 3-inch valves have a bolted bonnet.*

Both bonnet types provide a strong, tight joint, yet either can be easily dismantled and reassembled without danger of injuring the valve.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

Prices of flanged valves include drilling to the MSS 300-Pound Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

### List Prices and Dimensions

| Size Inches | List Prices, Each: No. 382 P or No. 384 P Screwed | List Prices, Each: No. 383 P or No. 385 P Flanged F. & D. | Dimensions, in Inches: A | B | C | D | E open | F open | G | H | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ¼ | 7.20 | | 2¼ | 1⅛ | | | 4¼ | 4⅛ | 2 1/16 | | |
| ⅜ | 7.80 | | 2½ | 1¼ | | | 4⅞ | 4½ | 2 9/16 | | |
| ½ | 9.60 | | 2 15/16 | 1½ | | | 5¼ | 5 | 2¾ | | |
| ¾ | 13.30 | | 3½ | 1¾ | | | 6⅜ | 6⅛ | 3 1/16 | | |
| 1 | 18.40 | 37.00 | 4⅛ | 2 1/16 | 5⅜ | 3¼ | 7 | 6¾ | 3⅝ | 4⅞ | 19/32 |
| 1¼ | 24.00 | 52.00 | 4¾ | 2⅜ | 6¼ | 3½ | 8 | 7¾ | 4 1/16 | 5¼ | ⅝ |
| 1½ | 31.40 | 69.00 | 5¼ | 2⅝ | 7¼ | 4 | 9⅛ | 8¾ | 4¾ | 6⅛ | 11/16 |
| 2 | 48.00 | 98.00 | 6⅜ | 3 3/16 | 8 | 4 5/16 | 10⅜ | 10 | 6 | 6½ | ¾ |
| 2½ | 81.50 | 145.00 | 7½ | 3¾ | 9 | 4¾ | 11½ | 10½ | 7 | 7½ | 13/16 |
| 3 | 126.00 | 220.00 | 8½ | 4¼ | 10 5/16 | 5 7/16 | 13⅜ | 12⅜ | 8 | 8¼ | 29/32 |

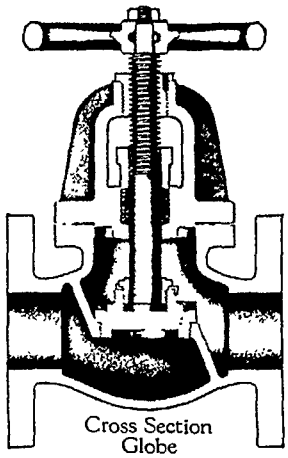
# 300-Pound Bronze Globe and Angle Valves

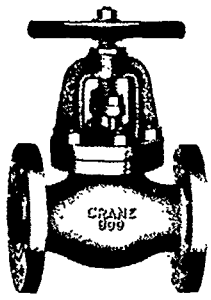
## Outside Screw and Yoke—Bolted Bonnet

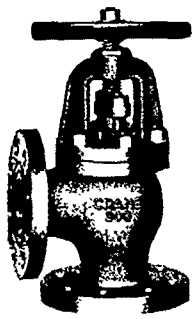
WORKING PRESSURES
300 pounds steam, 550° F.
500 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
900 pounds hydrostatic
Seat is Air Tested

***Body and Bolted Bonnet made of Crane Special Bronze***
***Crane Nitri-Hard***
***Plug Type Disc and Renewable Body Seat Ring***


Cross Section Globe


No. 87 P Globe, Flanged


No. 87½ P Angle, Flanged

**Service recommendations:** These valves are recommended for throttling, soot blower lines, and for exceptionally severe services.

**Body and bonnet:** The valves are unusually heavy and rugged. Their body and bonnet are made of Crane Special Bronze, a high grade leaded tin bronze. The bolted type bonnet provides liberal strength at the bonnet joint.

**Disc and seat:** The plug type disc and seat are designed for rigorous service. The wide seating surface is not easily ruined by foreign matter or wiredrawing. The tapered disc permits close regulation of flow when throttling.

Both the disc and seat are made of Crane Nitri-Hard, a stainless steel having an extremely hard surface with high resistance to seizure, erosion, galling, and scoring.

**Outside stem threads:** The outside stem threads are particularly well suited for services where action of the fluid might affect inside threads. The stem is liberal in diameter and strong.

**Stuffing box:** The stuffing box is deep and is filled with a high grade packing. It is equipped with a bolted gland.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1946). The flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

Prices include drilling to the MSS 300-Pound Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

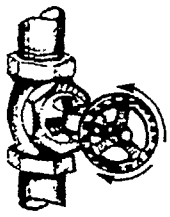
### List Prices and Dimensions

| Size | List Prices, Each Flanged, F. & D. | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Globe | | Angle | | Diameter of wheel | Diameter of flanges | Thickness of flanges |
| Inches | No. 87 P Globe | No. 87½ P Angle | Face to face | Center to top of stem, open | Center to face | Center to top of stem, open | | | |
| 1½ | 87.00 | 87.00 | 7 | 9⅛ | 3⅞ | 8⅜ | 6 | 6⅛ | 1 .s |
| 2 | 115.00 | 115.00 | 8 | 10¼ | 4¼ | 9½ | 7 | 6½ | ¾ |
| 2½ | 155.00 | 155.00 | 9 | 11⅝ | 4¾ | 10⅝ | 8 | 7½ | 13/16 |
| 3 | 228.00 | 228.00 | 10 5/16 | 13 | 5 7/16 | 12 | 9 | 8¼ | 29/32 |

*Valves for Marine Service....page 400* *Templates for drilling....page 458*

### *Closing a Valve!*

When a valve starts to leak, don't try to make it tight by brute force. And never put a wrench on the wheel for extra leverage; the chances are that won't stop the leak, and you may break the wheel or the stem.



Instead, bring the disc to its seat gently, back it off a turn, and repeat this operation two or three times. A piece of dirt or scale has probably lodged on the seat, and this action may flush it away. If the leak persists, take the valve apart and clean and inspect it.

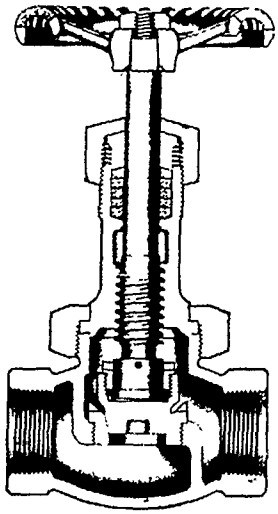
If the seat and disc are cut, they will have to be refinished or replaced. Valve reseating tools are available, and new parts can be secured through your Crane Branch.

4

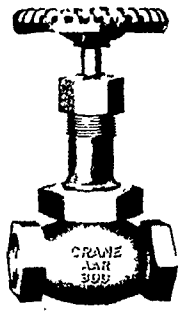
# 300-Pound—Inside Screw Type
# AAR Bronze Globe and Angle Valves

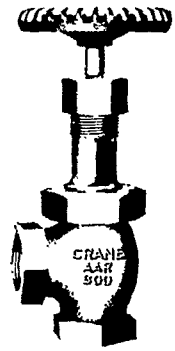
WORKING PRESSURE
300 pounds steam

TEST PRESSURE
800 pounds hydrostatic

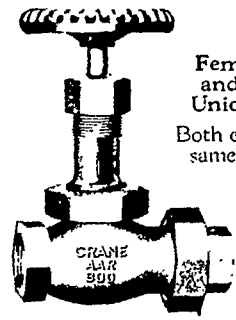


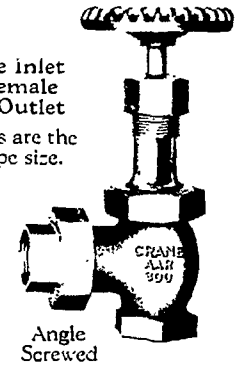
Cross Section
No. 376 P, Globe
Plug Type Disc





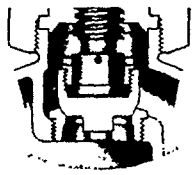
Globe, Screwed — Angle, Screwed
With Plug Type Disc
No. 376 P — No. 377 P
With Ball Type Disc
No. 376 E — No. 377 E





**Female inlet and Female Union Outlet**
Both ends are the same pipe size.

Globe Screwed — Angle Screwed
With Plug Type Disc
No. 1870 P — No. 1871 P
With Ball Type Disc
No. 1870 E — No. 1871 E

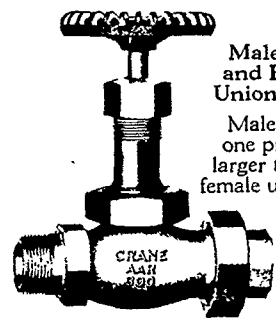


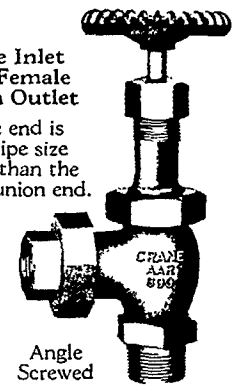
Partial Section
Showing Ball Type
Disc and Seat
(No. 376 E)

**Association of American Railroads:** These valves conform to the recommended practice of the Association of American Railroads (AAR) for 300-Pound Globe and Angle Valves for Steam Locomotives.

**Interchangeability:** Except for the body and the type of seat and disc, the valves are identical. In addition, all parts except the stem, packing nut, gland, and bonnet are interchangeable with corresponding parts of the Outside Screw and Yoke Valves shown on the opposite page.

**Materials:** The body, union ring, and tail-piece are made of Crane Special Bronze. The bonnet is a special wear-resisting bronze. The disc is Monel in sizes ½-inch and smaller and Crane Nickel Alloy in the larger sizes. The plug type seat ring is Exelloy in all sizes. The ball type seat ring is Exelloy in sizes ½-inch and smaller and Crane Nickel Alloy in sizes ¾-inch and larger.





**Male Inlet and Female Union Outlet**
Male end is one pipe size larger than the female union end.

Globe Screwed — Angle Screwed
With Plug Type Disc
No. 1874 P — No. 1875 P
With Ball Type Disc
No. 1874 E — No. 1875 E

## List Prices and Dimensions

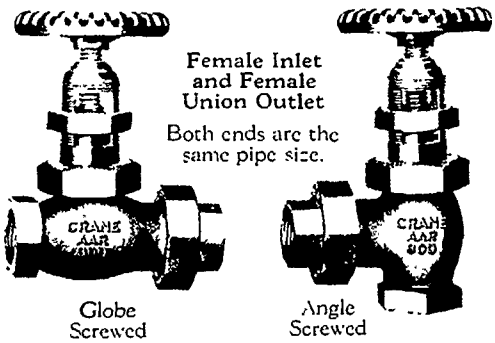
| Size, Inches | | List Prices, Each | | | | | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Plug Type | | | Ball Type | | | | | Union End Valves | | | | |
| Female End Valves | Male Inlet Valves | Nos. 376 P 377 P | Nos. 1870 P 1871 P | Nos. 1874 P 1875 P | Nos. 376 E 377 E | Nos. 1870 E 1871 E | Nos. 1874 E 1875 E | End to end Globe | Center to end Angle | Center to male end | Center to male end | Center to union end | Center to top of wheel, open | Diameter of wheel |
| ¼ | ⅜ × ¼ | 7.60 | 11.20 | 12.00 | 7.20 | 10.80 | 11.60 | 2 5/16 | 1 5/32 | 1 5/32 | 1 31/32 | 2⅛ | 4⅞ | 2¾ |
| ⅜ | ½ × ⅜ | 8.20 | 12.40 | 13.30 | 7.80 | 12.00 | 12.90 | 2½ | 1¼ | 1¼ | 2 1/16 | 2 5/16 | 4⅞ | 2¾ |
| ½ | ¾ × ½ | 10.10 | 15.20 | 17.20 | 9.60 | 14.70 | 16.70 | 2⅞ | 1 7/16 | 1 7/16 | 2 9/16 | 2½ | 5 9/16 | 3 1/16 |
| ¾ | 1 × ¾ | 14.00 | 19.70 | 22.60 | 13.30 | 19.00 | 21.90 | 3 9/16 | 1 25/32 | 1 25/32 | 3 1/32 | 3⅛ | 6 7/16 | 3⅝ |
| 1 | 1¼ × 1 | 19.40 | 26.00 | 31.20 | 18.40 | 25.00 | 30.20 | 4⅛ | 2 1/16 | 2 1/16 | 3 5/16 | 3 9/16 | 7 9/16 | 4 1/16 |
| 1¼ | 1½ × 1¼ | 25.30 | 33.20 | 39.10 | 24.00 | 31.90 | 37.80 | 4¾ | 2⅜ | 2⅜ | 3⅝ | 4⅛ | 8⅜ | 4¾ |
| 1½ | 2 × 1½ | 33.00 | 42.30 | 49.50 | 31.40 | 40.70 | 47.90 | 5¼ | 2⅝ | 2⅝ | 4⅛ | 4 11/16 | 9¼ | 5⅜ |
| 2 | 2½ × 2 | 50.60 | 67.50 | 84.50 | 48.00 | 64.90 | 81.90 | 6⅜ | 3 3/16 | 3 3/16 | 4 11/16 | 5 5/16 | 10⅝ | 6 |
| 2½ | 3 × 2½ | | | | 73.00 | 107.00 | 140.50 | 7⅜ | 3 11/16 | 3 11/16 | 5 3/16 | 5 15/16 | 12 1/16 | 7 |
| 3 | | | | | 112.50 | | | 8⅜ | 4 3/16 | | | | 14 3/16 | 8 |

*List prices of parts page 40 Cab Hose Valves....page 40 Locomotive Steam Heat End Valves....page 309*

# 300-Pound—Outside Screw and Yoke
# AAR Bronze Globe and Angle Valves

WORKING PRESSURE
300 pounds steam

TEST PRESSURE
800 pounds hydrostatic



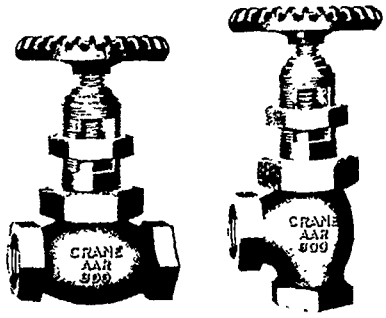
Female Inlet and Female Union Outlet

Both ends are the same pipe size.

Globe Screwed — Angle Screwed

With Plug Type Disc
No. 1890 P — No. 1891 P

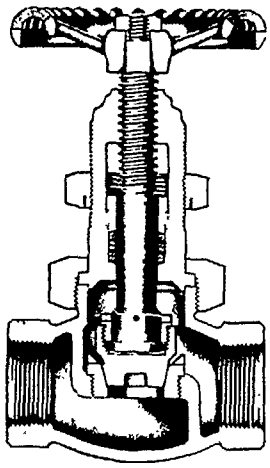
With Ball Type Disc
No. 1890 E — No. 1891 E



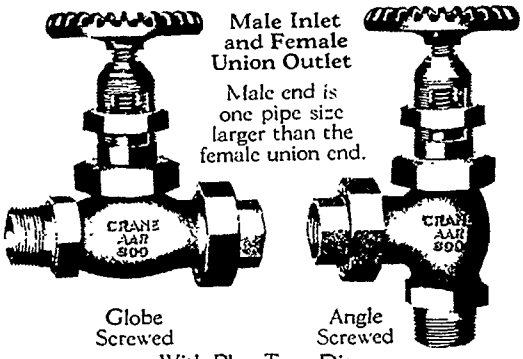
Globe, Screwed — Angle, Screwed

With Plug Type Disc
No. 396 P — No. 397 P

With Ball Type Disc
No. 396 E — No. 397 E



Cross Section
No. 396 P, Globe
Plug Type Disc



Male Inlet and Female Union Outlet

Male end is one pipe size larger than the female union end.

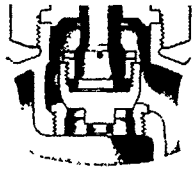
Globe Screwed — Angle Screwed

With Plug Type Disc
No. 1894 P — No. 1895 P

With Ball Type Disc
No. 1894 E — No. 1895 E

**Association of American Railroads:** These valves conform to the recommended practice of the Association of American Railroads (AAR) for 300-Pound Globe and Angle Valves for Steam Locomotives.

**Interchangeability:** Except for the body and the type of seat and disc, the valves are identical. In addition, all of the parts except the stem, gland nut, gland, and yoke bonnet are interchangeable with the corresponding parts of the Inside Screw Type Valves described and listed on the preceding page.



Partial Section
Showing Ball Type
Disc and Seat
(No. 396 E)

### *Stem End for Universal Joint*

AAR Inside Screw Valves shown on the preceding page and the O. S. & Y. Valves shown above can be furnished at no extra charge with the stem end machined for a Universal Joint connection; dimensions follow AAR Recommended Practice.

**Materials:** The body, union ring, and tail-piece are made of Crane Special Bronze. The yoke bonnet is made of Crane Cast Manganese Bronze and the stem is Crane 18-8 Mo Chrome-Nickel Alloy. The seat and disc materials are the same, size for size, as those used for the Inside Screw Valves shown on page 38.

## List Prices and Dimensions

| Size, Inches | | List Prices, Each | | | | | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Plug Type | | | Ball Type | | | | | Union End Valves | | | | |
| Female End Valves | Male Inlet Valves | Nos. 396 P 397 P | Nos. 1890 P 1891 P | Nos. 1894 P 1895 P | Nos. 396 E 397 E | Nos. 1890 E 1891 E | Nos. 1894 E 1895 E | End to end Globe | Center to end Angle | Center to female end | Center to male end | Center to union end | Center to top of wheel, open | Diameter of wheel |
| 1/2 | 3/4 × 1/2 | 19.40 | 24.50 | 26.50 | 18.90 | 24.00 | 26.00 | 2 7/8 | 1 7/16 | 1 7/16 | 2 9/16 | 2 1/2 | 5 5/16 | 3 1/16 |
| 3/4 | 1 × 3/4 | 23.30 | 29.00 | 31.90 | 22.60 | 28.30 | 31.20 | 3 9/16 | 1 25/32 | 1 25/32 | 3 1/32 | 3 1/8 | 5 11/16 | 3 5/8 |
| 1 | 1 1/4 × 1 | 28.80 | 35.40 | 40.60 | 27.80 | 34.40 | 39.60 | 4 1/8 | 2 1/16 | 2 1/16 | 3 5/16 | 3 9/16 | 6 9/16 | 4 1/16 |
| 1 1/4 | 1 1/2 × 1 1/4 | 35.20 | 43.10 | 49.00 | 33.90 | 41.80 | 47.70 | 4 3/4 | 2 3/8 | 2 3/8 | 3 5/8 | 4 1/8 | 7 1/2 | 4 3/4 |
| 1 1/2 | 2 × 1 1/2 | 44.00 | 53.30 | 60.50 | 42.40 | 51.70 | 58.90 | 5 1/4 | 2 5/8 | 2 5/8 | 4 1/8 | 4 11/16 | 8 7/16 | 5 3/8 |
| 2 | 2 1/2 × 2 | 78.80 | 95.70 | 112.70 | 76.20 | 93.00 | 110.00 | 6 3/8 | 3 3/16 | 3 3/16 | 4 11/16 | 5 5/16 | 10 | 6 |

*List prices of parts page 40* *Cab Hose Valves .. page 40* *Locomotive Steam Heat End Valves page 309*

# List Prices of Valve Parts

## For 300-Pound AAR Bronze Globe and Angle Valves

### Inside Screw and O. S. & Y. Types

4

Through the application of uniform dimensions and tolerances, a wide degree of interchangeability of parts is maintained among the AAR Bronze Globe and Angle Valves illustrated on the two preceding pages. The table of list prices of parts shown below indicates this interchangeability.

**Union bonnet ring:** Sizes 1½-inch and smaller have a hexagon bonnet ring; larger sizes have a round spanner-type ring. ½ and ¾-inch O.S. & Y. Valves have an integrally cast union ring and yoke bonnet.

**Disc construction:** Valves ½-inch and smaller have the disc spun onto the stem. In larger sizes these two parts are held together with a disc stem ring. In ball-type valves 2, 2½, and 3-inch, the disc has a bottom pin guide which operates through a bridge in the body seat ring.

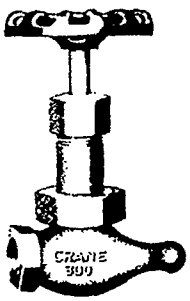
**List Prices, Each**

| Size of Valve | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ⅜x¼ | ½x⅜ | ¾x½ | 1x¾ | 1¼x1 | 1½x1¼ | 2x1½ | 2½x2 | 3x2½ | |
| For Inside Screw Type Valves and Outside Screw and Yoke Valves | Wheel Nut | | .05 | .05 | .05 | .06 | .06 | .09 | .09 | .14 | .14 | .27 |
| | Wheel | | .24 | .24 | .30 | .33 | .48 | .50 | .79 | 1.82 | 2.12 | 2.22 |
| | Union Bonnet Ring | | .52 | .52 | *.79 | *1.07 | 1.81 | 2.07 | 2.71 | 4.23 | 5.98 | 9.39 |
| | Disc Stem Ring | | None Used | | | .55 | .64 | .73 | .92 | 1.12 | 2.07 | 2.44 |
| | Disc: Plug Type | | Spun on Stem | | | 2.28 | 3.28 | 3.96 | 5.62 | 8.47 | | |
| | Disc: Ball Type | | | | | 1.95 | 2.96 | 3.62 | 5.10 | 7.69 | 10.58 | 14.44 |
| | Body Seat Ring: Plug Type | | 1.65 | 1.65 | 1.84 | 2.50 | 4.90 | 5.35 | 6.81 | 8.40 | | |
| | Body Seat Ring: Ball Type | | 1.45 | 1.45 | 1.60 | 2.00 | 4.01 | 4.13 | 5.41 | 6.06 | 7.60 | 11.49 |
| | †Body, Globe or Angle: Female Inlet and Outlet | | 1.74 | 2.45 | 2.97 | 4.41 | 5.43 | 8.65 | 11.50 | 21.46 | 34.72 | 58.91 |
| | †Body, Globe or Angle: Female Inlet, Union Outlet | | 4.76 | 5.66 | 6.96 | 8.67 | 10.35 | 13.95 | 17.38 | 33.09 | 59.63 | |
| | †Body, Globe or Angle: Male Inlet, Union Outlet | | 5.72 | 6.74 | 9.36 | 12.15 | 16.59 | 21.03 | 26.02 | 53.49 | 99.83 | |
| | Union Ring | | .55 | .73 | .94 | 1.22 | 1.47 | 2.03 | 2.43 | 4.04 | 7.09 | |
| | Female Tail-Piece | | .75 | 1.11 | 1.20 | 1.37 | 1.54 | 2.15 | 2.85 | 4.61 | 8.80 | |
| | Brazing Tail-Piece | | .75 | 1.11 | 1.20 | 1.37 | 1.54 | 2.15 | 2.85 | 4.61 | 8.80 | |
| | Packing | | .20 | .20 | .21 | .23 | .32 | .38 | .44 | .59 | .70 | 1.32 |
| For Inside Screw Type Valves Only | Stem: With Plug Type Disc | | 2.75 | 2.75 | 3.49 | | | | | | | |
| | Stem: With Ball Type Disc | | 2.47 | 2.47 | 3.17 | | | | | | | |
| | Stem Only | | | | | 2.02 | 2.71 | 3.08 | 3.72 | 5.29 | 6.83 | 9.92 |
| | Packing Nut | | .26 | .26 | .40 | .70 | .76 | 1.64 | 1.74 | 1.92 | 2.42 | 3.96 |
| | Gland | | .10 | .10 | .18 | .25 | .28 | .33 | .39 | .63 | 2.92 | 3.89 |
| | Bonnet | | 1.61 | 1.61 | 1.88 | 2.39 | 2.61 | 3.58 | 4.87 | 6.65 | 11.52 | 16.75 |
| For Outside Screw and Yoke Valves Only | Stem: With Plug Type Disc | | | | 8.58 | | | | | | | |
| | Stem: With Ball Type Disc | | | | 8.22 | | | | | | | |
| | Stem Only | | | | | 7.39 | 9.45 | 10.85 | 12.50 | 22.09 | | |
| | Gland Nut | | | | 1.56 | 1.60 | 1.66 | 1.94 | 2.20 | 5.64 | | |
| | Gland | | | | 1.43 | 1.43 | 1.55 | 1.69 | 2.02 | 3.50 | | |
| | Yoke Bonnet | | | | ‡6.34 | ‡7.18 | 4.99 | 6.03 | 7.20 | 17.10 | | |

*Not used on O.S. & Y. Valves in ½ and ¾-inch sizes.
†Prices are for bodies only and do not include body seat rings, union rings, nor tail-pieces.
‡Includes the union ring which is cast integral with the yoke bonnet in ½ and ¾-inch sizes.

# Cab Hose Valves

### Female Inlet—Hose End Outlet




No. 1878 P
Plug Type Disc

All parts of the No. 1878 P Cab Hose Valve except the body are AAR design and are interchangeable with the corresponding parts of AAR Plug Type Disc Inside Screw Valves shown on page 38.

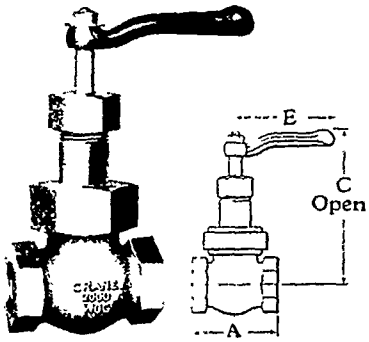
**List Prices and Dimensions**

| Size | Inches | ⅜ female × ½ hose | ½ female × ½ hose |
|---|---|---|---|
| No. 1878 P | Each | 9.00 | 11.20 |
| Center to female end | Inches | 1¼ | 1 7/16 |
| Center to hose end | Inches | 2⅛ | 2⅛ |
| Center to top, open | Inches | 4⅞ | 5 9/16 |
| Diameter of wheel | Inches | 2¾ | 3 1/16 |

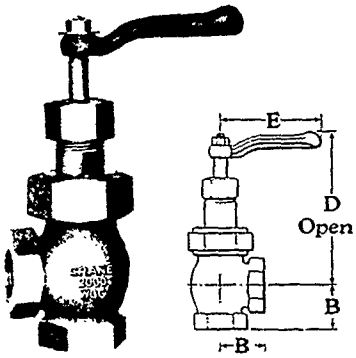
*Wrenches for removing body seat rings . . . . page 137*
*AAR Malleable Iron Screwed Fittings . . . page 148*
*AAR Unions and Union Fittings . . . . . pages 178 to 180*
*600-Pound Steel Valves for Locomotive Service . . page 240*
*300-Pound Locomotive Steam Heat End Valves . . . page 309*

# 2000-Pound Hydraulic
# Bronze Globe and Angle Valves
## Union Bonnet






Globe, Screwed
No. 232 H—With 45° Seat
No. 233 H—With Plug Type Disc




Angle Screwed
No. 232 H—With 45° Seat
No. 233 H—With Plug Type Disc

*Note—Globe and Angle Valves have the same catalog number. Orders must specify whether "Globe" or "Angle" is wanted.*

WORKING PRESSURE
2000 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
3000 pounds hydrostatic

***Available with Either 45° Seat or Plug Type Disc***

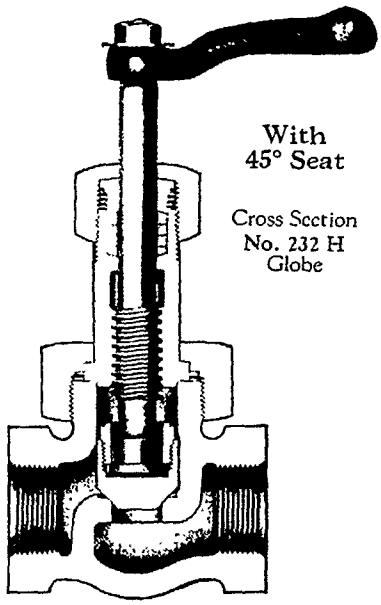
Features
Union Bonnet Construction
Crane Special Bronze Body and Disc

**Valves with 45° seat:** The No. 232 H Globe and Angle Valves are made with a 45° seat. They are suitable for general stop valve service on high pressure hydraulic lines that are not subject to shock and on high pressure gas lines.

All sizes have the disc stem ring construction illustrated in the cross section at the upper right.

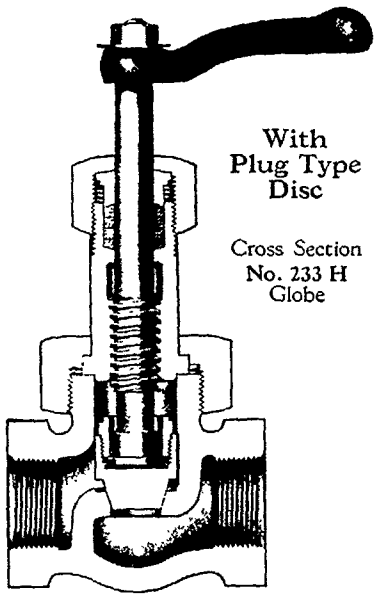
**Valves with plug type disc:** The No. 233 H Globe and Angle Valves have a plug type disc and seat. They are especially recommended for severe service, such as throttling. The wide seating surfaces have excellent resistance to wiredrawing and to foreign matter, and the tapered disc permits easy regulation of flow.

The valves in the 1¼-inch size have the disc stem ring construction shown in the cross section at the lower right; in smaller sizes, the disc is cast integral with the stem.



With 45° Seat

Cross Section
No. 232 H
Globe



With Plug Type Disc

Cross Section
No. 233 H
Globe

**Body and disc:** All valves have the body and disc cast of Crane Special Bronze, a leaded tin bronze having high strength and hardness and offering liberal resistance to wear.

**Rugged construction:** The valves are well proportioned throughout and are exceptionally heavy. Their union bonnet joint is strong and serviceable; it holds a tight joint readily. It facilitates dismantling and reassembling the valve and simplifies regrinding.

**Seat opening:** The diameter of the seat opening in the valves is slightly larger than the inside diameter of Double Extra Strong Pipe.

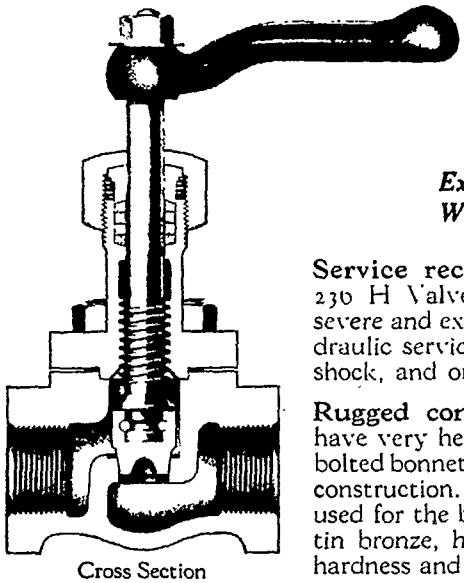
**Repacking:** These valves, when wide open, can be repacked while under pressure.

### List Prices and Dimensions

| Size | List Prices, Each | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 232 H Globe or Angle With 45° Seat | No. 233 H Globe or Angle With Plug Type Disc | Globe Valves | | | | Angle Valves | | | |
| | | | A | C | | E | B | D | | E |
| Inches | | | | No. 232 H | No. 233 H | | | No. 232 H | No. 233 H | |
| ⅜ | 13.00 | 13.00 | 2 13/16 | 6⅛ | 6⅜ | 3⅞ | 1⅜ | 5¾ | 6⅛ | 3⅞ |
| ½ | 15.00 | 15.00 | 2 13/16 | 6⅛ | 6⅜ | 3⅞ | 1⅜ | 5¾ | 6⅛ | 3⅞ |
| ¾ | 19.00 | 19.00 | 3 7/16 | 6¾ | 7 | 4¼ | 1¾ | 6⅜ | 6½ | 4¼ |
| 1 | 24.00 | 24.00 | 4 | 8⅛ | 8⅜ | 4⅝ | 2 1/16 | 7½ | 7¾ | 4⅝ |
| 1¼ | 33.00 | 33.00 | 4 11/16 | 9⅞ | 9½ | 5 | 2⅜ | 9⅛ | 8¾ | 5 |

# 2500-Pound Hydraulic
# Bronze Globe Valves
## Bolted Bonnet

4



Cross Section

WORKING PRESSURE
2500 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
3750 pounds hydrostatic

***Exceptionally Heavy, Rugged, Bolted Bonnet Valves With Crane Special Bronze Body and Plug Type Disc***

**Service recommendations:** No. 236 H Valves are recommended for severe and extremely high pressure hydraulic service on lines not subject to shock, and on high pressure gas lines.

**Rugged construction:** The valves have very heavy metal sections; their bolted bonnet provides a sturdy, rugged construction. Crane Special Bronze, used for the body and disc, is a leaded tin bronze, having high strength and hardness and offering liberal resistance to wear.

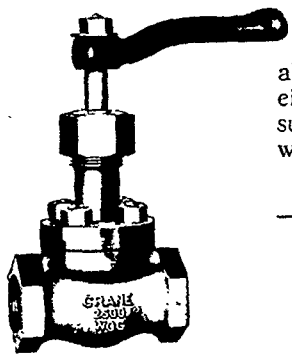
**Plug type disc and seat:** The plug type disc and seat are unusually resistant to wiredrawing and foreign matter. The wide tapered seating surface permits easy flow regulation when throttling.

**Disc-stem connection:** 1-inch valves have the disc and stem cast integral; 1¼ and 1½-inch sizes have the disc and stem cast separately and fastened together with two disc pins as shown in the cross section; on 2-inch valves, the two parts are cast separately and fastened together with a disc stem ring.

**Handle or wheel:** 1 and 1¼-inch valves have lever handles as illustrated; larger sizes have wheels.

**Seat opening:** The diameter of the seat opening in these valves is slightly larger than the inside diameter of Double Extra Strong Pipe.

**Repacking:** These valves, when wide open, can be repacked while under pressure.



No. 236 H
Globe, Screwed
Plug Type Disc

**List Prices and Dimensions**

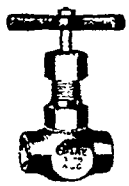
| | Size | List Prices | Dimensions, in Inches | | | |
|---|---|---|---|---|---|---|
| | Inches | Each | End to end | Center to top, open | Center to end of handle | Diameter of wheel |
| No. 236 H Globe Screwed | 1 | 40.00 | 4½ | 8⅛ | 5 | |
| | 1¼ | 54.00 | 4 15/16 | 9 | 5¾ | |
| | 1½ | 71.00 | 5½ | 10⅛ | | 8 |
| | 2 | 94.00 | 6⅜ | 11½ | | 9 |

## *For Higher Pressures—Use Crane Steel Valves*

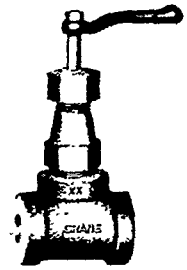
When globe and angle valves are required for hydraulic pressures higher than 2500 pounds, or for high pressure—high temperature lines, use dependable Crane Steel Valves. The complete line includes a wide range of sizes and types for all service conditions.

Especially desirable for extremely high steam pressures and temperatures are Crane Pressure-Seal Bonnet and newly introduced Lip-Seal Bonnet Globe and Angle Valves.

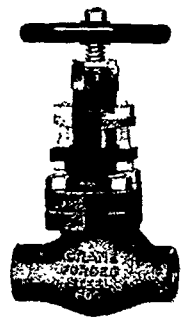
For detailed description and prices of Crane Steel Globe and Angle Valves, refer to pages 212, 218, and 235 to 248.



**3000-Pound W.O.G.**
No. 222 X
Globe



**6000-Pound Hyd.**
No. 225 H, Globe
Forged Steel



**600-Pound**
No. 3644 W, Globe
Forged Steel

# Brass Check
# & Foot Valves

# Brass and Bronze Check Valves

## Brass Foot Valves

Names of Parts.....page 44

**Lift Check Valves**
100-Pound.....page 45
125-Pound.....page 46
150-Pound.....page 47
200-Pound.....pages 48 to 50
300-Pound.....page 51
2000-Pound Hydraulic.....page 52
2500-Pound Hydraulic.....page 52
For Liquefied Petroleum Gases.....page 47

**Vertical Lift Check Valves**
125-Pound.....page 46

**Swing Check Valves**
125-Pound.....page 46
200-Pound.....pages 48 and 50
300-Pound.....page 51

**Foot Valves**.....page 45

5

The check and foot valves shown in this section, like other Crane products, are characterized by quality. The line is complete and includes a valve for every commercial requirement. Designs are carefully developed based on an accurate knowledge of valve use, and are practical and serviceable.

Other types of brass and bronze valves, supplementing the check and foot valves indexed above, are shown on the following pages:

Gate Valves.....pages 13 to 21
Globe and Angle Valves.....pages 23 to 42
Hose Valves.....pages 60 and 61
Lever-Operated Quick-Opening Valves.....pages 54 to 57
Radiator Valves.....page 58

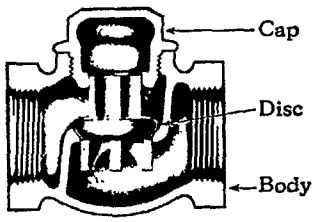
* * * * * * * * *

The lists shown above do not include all Crane Brass and Bronze Valves. Valves that perform a special duty or those made for special services such as Float Valves, Pop Safety Valves, Relief Valves, Pressure Regulators and Reducing Valves, Solder-Joint Valves, and Valves for Marine Service are described in other sections of this catalog. Refer to the index.

# Brass and Bronze Check and Foot Valves

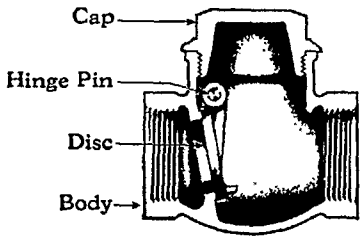
## Names of Parts

5



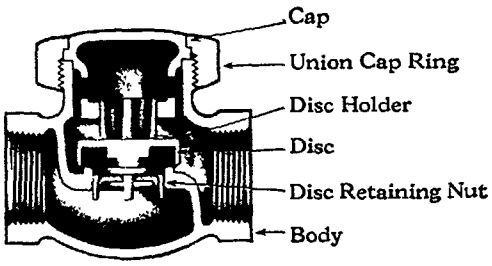

Brass
Horizontal Lift Check Valve
With Brass Disc

No. 20
(see page 46)



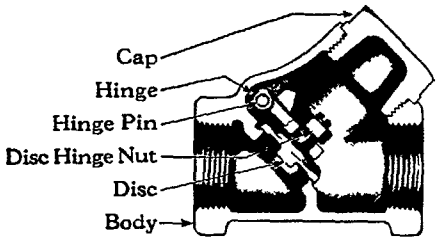

Brass
Swing Check Valve
With Brass Disc

No. 34
(see page 46)



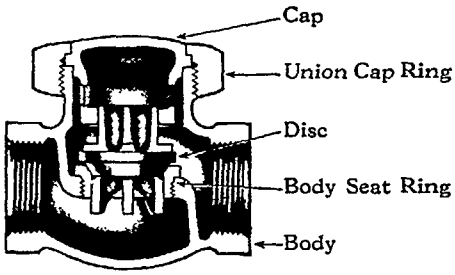

Brass
Horizontal Lift Check Valve
With Composition Disc

No. 27
(see page 47)



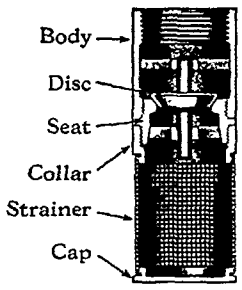

Bronze Y-Pattern
Swing Check Valve
Regrinding Type

No. 36
(see page 48)




Bronze
Horizontal Lift Check Valve
With Metal Disc and Renewable Seat

No. 218
(see page 49)

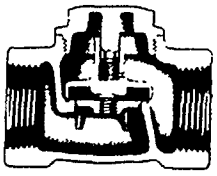



Brass
Foot Valve
With Strainer

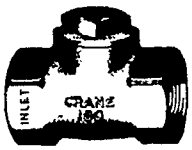
No. 33½
(see page 45)

# 100-Pound Brass Lift Check Valves

## With Composition Disc



Cross Section



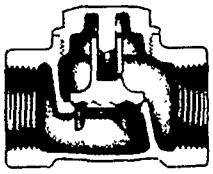

No. 1246
Horizontal
Screwed

WORKING PRESSURES

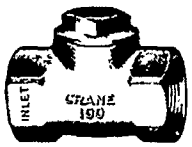
100 pounds saturated steam
150 pounds water, 200° F.
Domestic Gas Service

## With Brass Disc

100 pounds saturated steam
150 pounds water, 200° F.
150 pounds oil or gas, 150° F.



Cross Section




No. 1256
Horizontal
Screwed

**Service recommendations:** These well proportioned, sturdily constructed 100-Pound Brass Lift Check Valves combine wide utility with moderate cost. The valves are particularly recommended for domestic water or gas lines and for other piping and equipment operated at low pressures.

**Construction:** No. 1246 Valves are furnished with a composition disc. No. 1256 Valves in sizes ½-inch and larger are furnished with a brass disc as illustrated in the cross section at the right; the ⅜-inch size has a metal ball disc. Otherwise, the two valves are alike. In both valves, the seat is integral with the body. Long hexagons on the body reinforce the openings and provide a good wrench grip.

**Composition disc:** No. 1246 Valves are regularly furnished with a No. 12 Composition Disc suitable for 150 pounds hot or cold water up to a maximum temperature of 200° F., and also, for domestic gas service.

When so ordered, the valves will be furnished with a No. 10 Disc suitable for 100 pounds saturated steam.

**Other 100-Pound Brass Valves:** Crane manufactures a complete assortment of 100-Pound Brass Valves suitable for a variety of purposes. For screwed end gate valves, see page 15; for globe and angle valves, see page 25; and for solder-joint gate, globe, angle, and check valves, see pages 420 and 421.

### List Prices and Dimensions

| Size | No. 1246 Horizontal Check With Composition Disc | | | No. 1256 Horizontal Check With Brass Disc | | |
|---|---|---|---|---|---|---|
| | List Prices | End to end | Center to top | List Prices | End to end | Center to top |
| Inches | Each | Inches | Inches | Each | Inches | Inches |
| ⅛ | 2.10 | 1⅞ | 1⅛ | | | |
| ¼ | 2.10 | 1⅞ | 1⅛ | | | |
| ⅜ | 2.20 | 2 | 1⅛ | 2.05 | 2 | 1⅛ |
| ½ | 2.80 | 2⅜ | 1⅜ | 2.60 | 2⅜ | 1⅜ |
| ¾ | 3.70 | 2¾ | 1½ | 3.40 | 2¾ | 1½ |
| 1 | 4.90 | 3¼ | 1¾ | 4.50 | 3¼ | 1¾ |
| 1¼ | 6.10 | 3⅞ | 1⅞ | 5.70 | 3⅞ | 1⅞ |
| 1½ | 8.40 | 4¼ | 2⅛ | 7.50 | 4¼ | 2⅛ |
| 2 | 12.50 | 5 | 2½ | 11.00 | 5 | 2½ |

*For extra composition discs for No. 1246 Valves, see page 133.*

# Brass Foot Valves

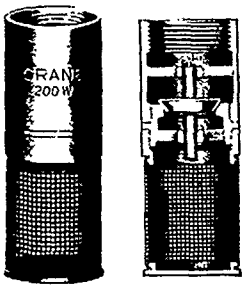
## With Strainer

WORKING PRESSURE
200 pounds cold water, non-shock

**Service recommendations:** No. 33½ Foot Valves are recommended for use on water suction lines.

**Construction and materials:** The valves are made entirely of brass and are designed to slip through Standard Wrought Pipe, two sizes larger than the nominal valve size.

The disc is accurately guided at the top and bottom to assure square seating. The strainer is perforated sheet brass with liberal area.




No. 33½
Screwed

### List Prices and Dimensions

| | Size | List Prices | End to end | Valve passes through |
|---|---|---|---|---|
| | Inches | Each | Inches | |
| No. 33½ Screwed | ½ | 3.30 | 2⅜ | 1" pipe |
| | ¾ | 3.90 | 2 13/16 | 1¼" pipe |
| | 1 | 4.70 | 3⅞ | 1½" pipe |
| | 1¼ | 5.80 | 4¾ | 2" pipe |
| | 1½ | 7.70 | 5 7/16 | 2½" pipe |
| | 2 | 10.60 | 6⅜ | 3" pipe |
| | 2½ | 23.60 | 8⅛ | 3½" pipe |
| | 3 | 30.00 | 9 5/16 | 4" pipe |

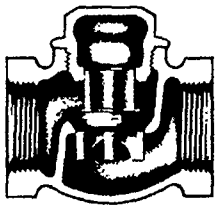
# 125-Pound Brass Check Valves

## Lift Checks

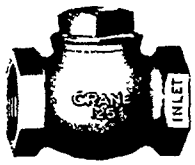
### Horizontal Type

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

5



Cross Section
No. 20




No. 20
Horizontal
Screwed

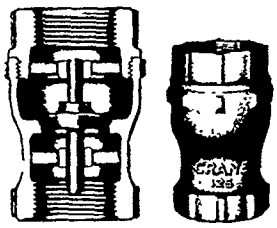
**Lift check valves:** As illustrated at the left, the Crane line of 125-Pound Brass Lift Check Valves includes both horizontal and vertical types. Both are recommended for general service on steam, water, oil, or gas lines.

The valves are heavier and more rugged than is usual with 125-Pound or "Standard" valves. All parts are liberally proportioned to withstand operating strains, and expansion and contraction of the pipe.

**Disc construction:** Lift check valves ½-inch and larger have a brass disc guided at the top and bottom. Smaller sizes have a ball disc (not illustrated).

***Installing No. 24 Valves:*** The No. 24 Vertical Check Valves are designed to operate on upward flow only. They should always be installed with the inlet end down.

### Vertical Type




No. 24, Vertical
Screwed

## Swing Checks

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, non-shock

**Swing check valves:** No. 34 Valves have a brass disc and are recommended for service on steam or water lines.

No. 34½ Valves have a leather disc and are recommended for service on cold water lines only.

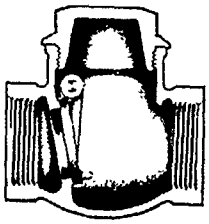
Like the lift check valves shown in the adjacent column, these 125-Pound Swing Check Valves are heavier and more rugged than is usual with 125-Pound or "Standard" valves. The valves are liberally proportioned throughout.

**Disc construction:** Except for their discs, the No. 34 and No. 34½ Valves are identical.

On sizes up to 2-inch, the disc is integral with the hinge as shown in the cross sections at the right. On 2½ and 3-inch brass disc valves, the disc swivels on the hinge.

Swing check valves in all sizes have a disc stop which prevents the disc from sticking in the open position.

### With Brass Disc

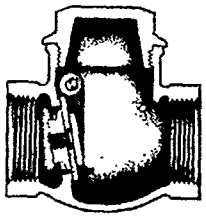


Cross Section
No. 34

No. 34
Screwed
With Brass Disc

### With Leather Disc

Recommended for cold water only



Cross Section
No. 34½

No. 34½
Screwed
With Leather Disc

***Swing check valves may be used either in a horizontal position, or in a vertical position for upward flow.***

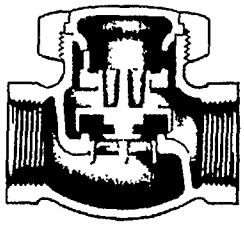
### List Prices and Dimensions

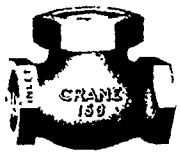
| Size | List Prices, Each | | | | Dimensions, in Inches | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lift Checks | | Swing Checks | | No. 20 | | No. 24 | | No. 34 or 34½ | |
| Inches | No. 20 Horizontal | No. 24 Vertical | No. 34 With Brass Disc | No. 34½ With Leather Disc | End to end | Center to top | End to end | Largest diameter | End to end | Center to top |
| 1/8 | 2.10 | | | | 17/16 | 15/16 | | | | |
| 1/4 | 2.10 | 2.60 | | | 1 5/8 | 1 1/16 | 1 13/16 | 1 1/8 | | |
| 3/8 | 2.30 | 2.80 | 3.80 | 5.00 | 1 7/8 | 1 3/16 | 1 3/4 | 1 3/8 | 1 7/8 | 1 3/8 |
| 1/2 | 3.20 | 3.90 | 4.30 | 5.60 | 2 1/4 | 1 3/8 | 2 5/16 | 1 1/2 | 2 1/4 | 1 9/16 |
| 3/4 | 4.30 | 4.70 | 4.90 | 6.50 | 2 11/16 | 1 5/8 | 2 3/4 | 1 3/4 | 2 11/16 | 1 13/16 |
| 1 | 5.60 | 6.20 | 6.50 | 8.50 | 3 3/16 | 1 7/8 | 3 7/16 | 2 1/8 | 3 3/16 | 2 3/16 |
| 1 1/4 | 7.20 | 7.50 | 8.00 | 10.40 | 3 11/16 | 2 3/16 | 3 13/16 | 2 9/16 | 3 11/16 | 2 9/16 |
| 1 1/2 | 9.30 | 10.30 | 9.70 | 12.60 | 4 1/4 | 2 3/8 | 4 1/8 | 2 7/8 | 4 1/4 | 2 13/16 |
| 2 | 13.80 | 15.20 | 14.70 | 18.00 | 5 1/8 | 2 13/16 | 4 11/16 | 3 5/8 | 5 1/8 | 3 1/4 |
| 2 1/2 | 23.00 | 24.00 | 24.00 | | 6 1/16 | 3 5/16 | 5 3/4 | 4 7/16 | 6 1/16 | 3 7/8 |
| 3 | 34.00 | 36.00 | 36.00 | | 7 1/16 | 3 3/4 | 6 5/16 | 5 1/4 | 7 3/8 | 4 1/8 |

*For Solder-Joint Brass Swing Check Valves, see page 420.*

# 150-Pound Brass Lift Check Valves

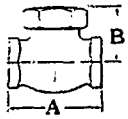
With No. 1 Cranite Composition Disc






No. 27, Horizontal Screwed

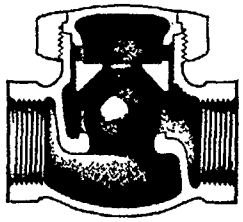
WORKING PRESSURES
**150** pounds saturated steam
**300** pounds cold water, oil, or gas, non-shock




No. 27 or No. 31

With Metal Ball Disc

No. 31, Horizontal Screwed

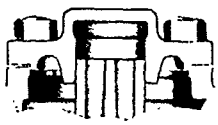


5

**No. 27** are strong, rugged, composition disc valves. Equipped with the proper disc, they will give excellent results on steam, hot water, cold water, oil, air, or gas lines. They are especially suited for use where discs must be renewed quickly.

**Quick repairs:** A leak is easily repaired by replacing the disc holder with an extra complete disc holder and disc, or by inserting a new disc in the original holder. Extra disc holders and discs should be kept on hand for this purpose.

**Cap joint:** Sizes 2-inch and smaller have a union cap as shown above; sizes 2½ and 3-inch have a compact bolted cap as shown at the left. Both types provide a strong, tight joint, easily dismantled for cleaning or disc replacement.



**Discs:** Unless otherwise ordered, No. 27 Valves are furnished with a No. 1 Cranite Disc suitable for steam, or for hot water from 200 to 300° F. When ordered for hot water up to 200° F., or for cold water, air, gas, gasoline, or oil, the valves are furnished with a No. 6 Disc.

**List Prices and Dimensions**

| Valve No. | Size Inches | List Prices Each | Dimensions in Inches A | B |
|---|---|---|---|---|
| No. 27 | ¼ | 3.00 | 2 | 1⅜ |
| | ⅜ | 3.40 | 2 5/16 | 1½ |
| | ½ | 4.10 | 2 11/16 | 1¾ |
| | ¾ | 5.70 | 3 3/16 | [illegible] |
| | 1 | 8.00 | 3¾ | 2¼ |
| | 1¼ | 11.50 | 4¼ | 2⅝ |
| | 1½ | 14.70 | 4¾ | 3 |
| | 2 | 22.00 | 5¾ | 3½ |
| | 2½ | 42.00 | 6¾ | 3½ |
| | 3 | 60.00 | 8 | 3⅞ |
| No. 31 | ½ | 4.50 | 2 11/16 | 1 11/16 |
| | ¾ | 6.20 | 3 3/16 | 1 15/16 |
| | 1 | 8.60 | 3¾ | 2¼ |
| | 1¼ | 13.00 | 4¼ | 2 9/16 |

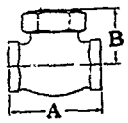
**No. 31** are sturdy brass lift check valves recommended for use on steam, water, oil, or gas lines; they have a metal ball disc.

**Smaller sizes:** If sizes smaller than ½-inch are needed, use the No. 20 Horizontal Lift Check Valves illustrated and described on page 46; in sizes ⅛ to ⅜-inch, No. 20 Valves have a ball disc.

*For list prices of composition discs for No. 27 Valves, see page 133.*

# Bronze Lift Check Valves

## For Liquefied Petroleum Gases

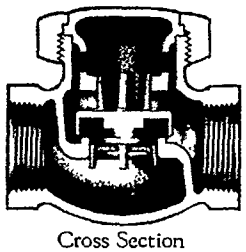



No. 132, Horizontal, Screwed

WORKING PRESSURE
**400** pounds, **150°** F.
LP-gases, light oils, volatile fluids, or air

TEST PRESSURE
**600** pounds hydrostatic
***Air Tested***

***Underwriters' Approved for all LP-Gases***



Cross Section

**List Prices and Dimensions**

| | Size Inches | List Prices Each | Dimensions in Inches A | B |
|---|---|---|---|---|
| No. 132 | ¼ | 3.30 | 2 | 1⅜ |
| | ⅜ | 3.75 | 2 5/16 | 1½ |
| | ½ | 4.50 | 2 11/16 | 1¾ |
| | ¾ | 6.25 | 3 3/16 | 2 |
| | 1 | 8.80 | 3¾ | 2¼ |
| | 1¼ | 12.60 | 4¼ | 2⅝ |
| | 1½ | 16.00 | 4¾ | 3 |
| | 2 | 24.00 | 5¾ | 3½ |

*Extra composition discs...page 133*

***Other Bronze Valves for LP-Gases***
***Gate*** ..... ..... ..... ***page 18***
***Globe and Angle*** .....***page 30***

No. 132 Valves, within the limit of the ratings specified above, are designed to safely handle liquefied petroleum gases, and are excellent for use on hot or cold water, compressed air, light oils, volatile fluids, etc.

*The valves have been approved by the Underwriters' Laboratories, Inc., (and are so marked), for the handling of all LP-gases, such as butane, propane, propylene, butylenes, etc., provided the piping system is subject to a pressure no greater than 250 pounds. The gases can be handled separately or mixed, and in the liquid or gaseous state.

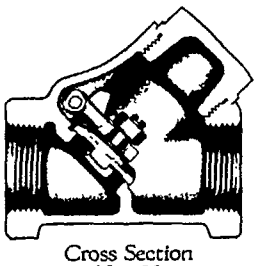
**Features:** The body is made of Crane Special Bronze, a leaded tin bronze. The union cap provides a strong, tight joint, easily dismantled when necessary. The No. 6 Disc, a specially formulated composition ideal for petroleum usage, is secured to the disc holder by means of a disc retaining nut. As added precaution against leakage, it is sealed into the disc holder. Repairs are easy. Simply replace the disc holder with an extra complete holder and disc, or insert a new disc into the original holder.

# 200-Pound Bronze Check Valves

## Regrinding

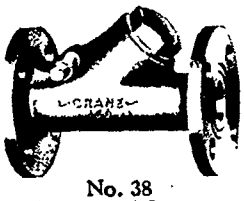
5

### Y-Pattern Swing Check



Cross Section
No. 36

No. 36
Horizontal Swing
Screwed



No. 38
Horizontal Swing
Flanged

***Swing Check Valves may also be used in a vertical position for upward flow.***

***Whether used horizontally or vertically, the valves should be installed with the pressure under the disc; an arrow cast on the body indicates the correct direction of flow.***

| Valve Ends | Working Pressures | | Hydrostatic Test Pressures |
|---|---|---|---|
| | Steam 500° F. | Cold Water, Oil, or Gas, Non-Shock | |
| Screwed | 200 pounds | 400 pounds | 600 pounds |
| Flanged | 150 pounds | 225 pounds | 450 pounds |

***New, Improved 200-Pound Swing Checks Featuring Full Area, Y-Pattern Design***

The No. 36 and No. 38 are ruggedly constructed valves recommended for severe service on steam, water, oil, or gas lines. Their Y-pattern design presents a marked improvement over conventional, regrinding type swing check valves.

The body, of Crane Special Bronze, a strong, hard, leaded tin bronze, features full area and smooth interior contours. Pressure drop and flow resistance are reduced to a minimum.

The cap and all internal parts are brass. The pressure-tight, easy seating disc has a threaded spud which passes through a hole in the lower end of the hinge; a disc nut, screwed onto the spud, retains the parts. The hinge and disc swing freely out of the path of flow. A hinge bumper prevents the disc from sticking in the open position.

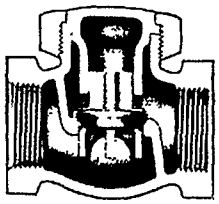
All parts are readily accessible and can be quickly replaced in the field.

The valves may be reground without removing the body from the line. A slot in the end of the disc-spud enables rotating the disc with a screw driver.

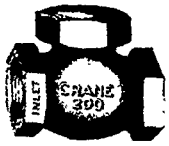
**Flanged valves:** End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling to the MSS 150-Pound Standard; no deduction is made if the valves are ordered faced only.

Use full face gaskets; see page 472.

### Lift Check



Cross Section
No. 72




No. 72
Horizontal Lift
Screwed

**Lift Check Valves:** The No. 72 are sturdily constructed horizontal lift check valves, made of high grade materials and designed for long service. They are recommended for severe service on steam, water, oil, or gas lines.

The body is made of Crane Special Bronze, a leaded tin bronze that resists wear exceptionally well.

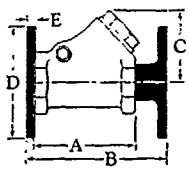
The cap, disc, and union cap ring are made of brass.

On sizes ½-inch and larger, the disc is guided at the top and bottom as illustrated at the upper right of the page; on the ¼ and ⅜-inch sizes, the disc is guided at the top only.

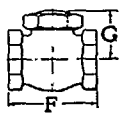
The valves can be reground without removing the body from the line.

### List Prices and Dimensions

| Size | List Prices, Each | | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Swing | | Lift | No. 36 | | No. 38 | | | | No. 72 | |
| Inches | No. 36 Screwed | No. 38 Flanged F. & D. | No. 72 Screwed | A | C | B | C | D | E | F | G |
| ¼ | 4.90 | | 2.50 | 2⅛ | 1½ | | | | | 1 11/16 | 15/16 |
| ⅜ | 4.90 | | 3.10 | 2⅛ | 1½ | | | | | 1 15/16 | 1⅛ |
| ½ | 5.20 | | 4.00 | 2½ | 1¾ | | | | | 2¼ | 1 3/16 |
| ¾ | 6.30 | | 5.40 | 3 | 2⅛ | | | | | 2¾ | 1 7/16 |
| 1 | 8.00 | 21.50 | 7.70 | 3¾ | 2½ | 5⅜ | 2½ | 4¼ | ⅜ | 3 5/16 | 1¾ |
| 1¼ | 10.00 | 27.00 | 10.00 | 4¼ | 3 | 6 | 3 | 4⅝ | 13/32 | 3⅞ | 2 |
| 1½ | 12.70 | 35.00 | 13.40 | 5 | 3½ | 6¾ | 3½ | 5 | 7/16 | 4½ | 2¼ |
| 2 | 18.40 | 54.00 | 20.50 | 6 | 4¼ | 8 | 4¼ | 6 | ½ | 5¼ | 3 5/16 |
| 2½ | 28.50 | 81.00 | 35.00 | 6⅞ | 5 | 9¼ | 5 | 7 | 9/16 | 6 5/16 | 3¾ |
| 3 | 46.00 | 107.00 | 51.00 | 8⅛ | 6 | 10⅜ | 6 | 7½ | ⅝ | 7¼ | 4 5/16 |




No. 36
or
No. 38

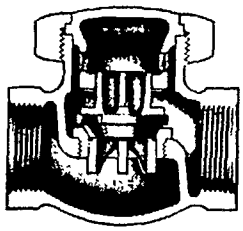



No. 72

*Valves for Marine Service....page 400* *Templates for drilling....page 458*

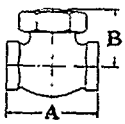
# 200-Pound Bronze Lift Check Valves

## With Crane Nickel Alloy Disc



Cross Section
No. 218
Horizontal Lift

No. 218
Horizontal Lift
Screwed




**Features of No. 218 Valves**
Crane Nickel Alloy Seat
Crane Nickel Alloy Disc
Union Cap Construction

WORKING PRESSURES
200 pounds steam, *500° F.
400 pounds cold water, oil, or gas, non-shock
*Maximum temperature rating with No. 4 Cranite Disc is 450° F.

TEST PRESSURE
600 pounds hydrostatic

These are unusually strong and rugged valves. They are liberally proportioned and will withstand severe operating strains.

Except for the design of the disc and seat, both types of valves are alike. Corresponding dimensions are the same.

**Body and cap:** The valves have a body made of Crane Special Bronze, a strong, hard, leaded tin bronze. The union cap construction facilitates dismantling and reassembling for cleaning and repairing the valves.

**Crane Nickel Alloy Disc Valves:** The No. 218 Valves are recommended where operating conditions require a high quality metal disc and seat. They are suitable for severe service on steam, water, oil, or gas lines.

The disc and seat are made of Crane Nickel Alloy, a seating material that resists wear exceptionally well. The disc is guided from above and below the seat, assuring accurate seating at all times.

**Composition Disc Valves:** The No. 218 C Valves have a composition disc and are recommended for a wide range of fluids when equipped with the proper type of disc. They are especially suitable for installations where the discs must be renewed quickly and easily. As in the No. 218, the seat is Crane Nickel Alloy.

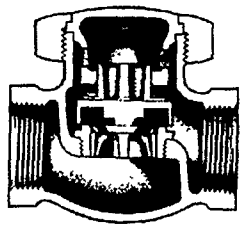
The valves are regularly equipped with a No. 4 Cranite Disc suitable for high pressure steam up to 450° F., or for hot water up to 420° F. When ordered for cold water, air, gas, oil, or gasoline, the valves are furnished with a No. 6 Disc.

On hot water under 200° F., especially where frequent operation is necessary, a No. 6 Disc is preferred to the No. 4. For list prices and description of composition discs, see page 133.

Composition disc valves have a brass disc holder guided from above and below the seat on sizes ½-inch and larger; in smaller sizes, the holder is guided in the cap only.

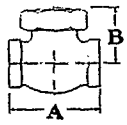
**Quick repairs:** A leak is quickly repaired on composition disc valves by replacing the disc holder with an extra complete disc holder and disc, or by inserting a new disc into the original holder. Extra disc holders and discs should be kept on hand for this purpose.

## With No. 4 Cranite Composition Disc



Cross Section
No. 218 C
Horizontal Lift

No. 218 C
Horizontal Lift
Screwed




**Features of No. 218 C Valves**
Crane Nickel Alloy Seat
No. 4 Cranite Composition Disc
Union Cap Construction

### List Prices and Dimensions

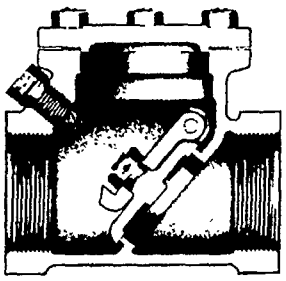
| Size Inches | List Prices, Each Screwed: No. 218 Nickel Alloy Disc | List Prices, Each Screwed: No. 218 C Composition Disc | Dimensions, in Inches: A | Dimensions, in Inches: B |
|---|---|---|---|---|
| ¼ | 5.50 | 4.80 | 2 | 15/16 |
| ⅜ | 6.80 | 6.00 | 2 5/16 | 1½ |
| ½ | 7.80 | 6.80 | 2 11/16 | 1 11/16 |
| ¾ | 9.40 | 8.20 | 3 3/16 | 2 |
| 1 | 11.00 | 9.80 | 3¾ | 2¼ |
| 1¼ | 15.30 | 14.00 | 4¼ | 2⅝ |
| 1½ | 19.50 | 18.00 | 4¾ | 2⅞ |
| 2 | 29.00 | 26.00 | 5¾ | 3½ |

*For list prices of Composition Discs, see page 133.*

# 200-Pound Bronze Check Valves

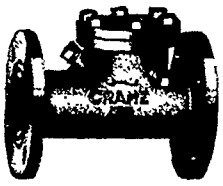
## Bolted Cap

### Swing Check



Cross Section
No. 4032

No. 4032
Horizontal Swing
Screwed



No. 4033
Horizontal Swing
Flanged

*The No. 4032 and No. 4033 Swing Check Valves may also be used in a vertical position for upward flow.*

| Valve Ends | Working Pressures: Steam 500° F. | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|
| Screwed | 200 pounds | 400 pounds | 600 pounds |
| Flanged | 150 pounds | 225 pounds | 450 pounds |

**Service recommendations:** The valves shown on this page are high quality bolted cap check valves. They are recommended for use on large pipe lines where bronze valves are wanted.

Strong and rugged, the valves are liberally proportioned to withstand severe operating strains; their bolted cap construction makes an exceptionally tight, strong, and serviceable joint.

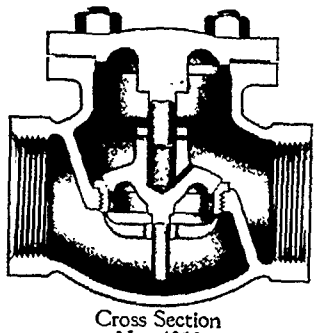
**Swing check valves:** Nos. 4032 and 4033 Swing Check Valves have a body, cap, and disc made of Crane Special Bronze, a strong, hard, leaded tin bronze. Sizes 4-inch and smaller have a separate disc and hinge, as illustrated; larger sizes have a one-piece disc and hinge (not illustrated).

Sizes 4-inch and smaller can be reground without removing the body from the line. By removing the stop plug, a screw driver can be engaged with the slot in the disc spud, making it easy to rotate the disc when regrinding.

**Lift check valves:** Nos. 4062 and 4063 Horizontal Lift Check Valves have a Crane Special Bronze body, cap, and disc. The body seat ring is also Crane Special Bronze, a strong, hard, leaded tin bronze having good resistance to wear.

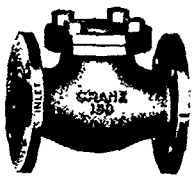
**Flanged valves:** End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to the MSS 150-Pound Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

### Lift Check



Cross Section
No. 4062

No. 4062
Horizontal Lift
Screwed



No. 4063
Horizontal Lift
Flanged

### List Prices and Dimensions

| Size | Swing Check Valves: List Prices, Each: No. 4032 Screwed | Swing Check Valves: List Prices, Each: No. 4033 Flanged F. & D. | Swing Check Valves: Dimensions, in Inches: End to end Screwed | Face to face Flanged | Center to top | Flanges: Diameter | Flanges: Thickness | Lift Check Valves: List Prices, Each: No. 4062 Screwed | No. 4063 Flanged F. & D. | Lift Check Valves: Dimensions, in Inches: End to end Screwed | Face to face Flanged | Center to top | Flanges: Diameter | Flanges: Thickness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | | | | | | | | | | | | | | |
| 1½ | | | | | | | | Prices on request | Prices on request | 5 5/16 | 5⅞ | 3⅜ | 5 | 7/16 |
| 2 | 57.00 | 69.00 | 5⅜ | 7⅜ | 3¾ | 6 | ½ | | | 6 | 6⅞ | 3⅝ | 6 | ½ |
| 2½ | 74.00 | 100.00 | 6⅜ | 8½ | 4⅜ | 7 | 9/16 | | | 7¼ | 8 | 4⅝ | 7 | 9/16 |
| 3 | 100.00 | 130.00 | 7¼ | 9⅛ | 5 | 7½ | ⅝ | | | 8¼ | 9⅛ | 5 | 7½ | ⅝ |
| 3½ | | 211.00 | | 10¼ | 6 | 8½ | 11/16 | | | | 10⅜ | 5⅛ | 8½ | 11/16 |
| 4 | | 254.00 | | 11¼ | 6½ | 9 | 11/16 | | | | 11 | 5¾ | 9 | 11/16 |
| 5 | | 305.00 | | 12⅞ | 7¼ | 10 | ¾ | | | | 12¼ | 6¾ | 10 | ¾ |
| 6 | | 408.00 | | 14⅜ | 8¼ | 11 | 13/16 | | | | 14 | 7¾ | 11 | 13/16 |

*Valves for Marine Service . page 400*

*Templates for drilling . . . . page 458*

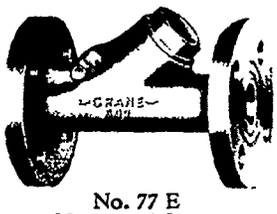
# 300-Pound Bronze Check Valves

## Regrinding

### Y-Pattern Swing Check

Cross Section
No. 76 E

No. 76 E
Horizontal Swing
Screwed



No. 77 E
Horizontal Swing
Flanged

***Swing Check Valves may also be used in a vertical position for upward flow.***

***Whether used horizontally or vertically, the valves should be installed with the pressure under the disc; an arrow cast on the body indicates correct direction of flow.***

| Valve Ends | Sizes | Working Pressures: Steam 550° F. | Working Pressures: Cold water, oil, or gas, non-shock | Hydrostatic Test Pressures |
|---|---|---|---|---|
| Screwed | ¼ to 2-inch | 300 pounds | 1000 pounds | 1500 pounds |
| | 2½ and 3-inch | 300 pounds | 600 pounds | 900 pounds |
| Flanged | All Sizes | 300 pounds | 500 pounds | 900 pounds |

***New, Improved 300-Pound Swing Checks Featuring Full Area, Y-Pattern Design***

No. 76 E and No. 77 E are heavy, ruggedly constructed valves recommended for severe service on steam, water, oil, or gas lines. Their Y-pattern design presents a marked improvement over conventional, regrinding type swing check valves.

The body, made of Crane Special Bronze, a strong, hard, leaded tin bronze, features full area and smooth interior contours. Pressure drop and flow resistance are reduced to a minimum.

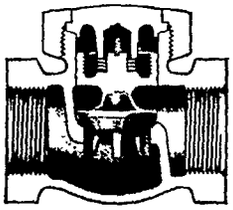
The cap and all internal parts are brass. The pressure-tight, easy-seating disc has a threaded spud which passes through a hole in the lower end of the hinge; a disc nut, screwed onto the spud retains the parts. A hinge bumper prevents the disc from sticking in the open position. All parts are readily accessible and can be quickly replaced in the field.

The valves may be reground without removing the body from the line. A slot in the end of the disc-spud enables rotating the disc with a screw driver.

**Flanged valves:** End flanges conform to the MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling to the MSS 300-Pound Standard; no deduction is made if valves are ordered faced only.

Use full face gaskets; see page 472.

### Lift Check



Cross Section
No. 366 E

No. 366 E
Horizontal Lift
Screwed

**Lift check valves:** No. 366 E Horizontal Lift Check Valves are recommended for steam, water, oil, or gas, and especially for service where pulsations in the line are apt to cause an ordinary check valve to hammer. The dashpot formed above the piston type disc effectively cushions the disc.

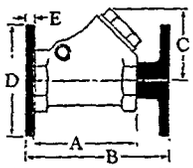
The body and disc are Crane Special Bronze, a leaded tin bronze that resists wear exceptionally well.

These valves can be reground without removing the body from the line.

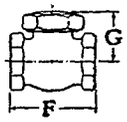
When so ordered, the valves can be equipped with a spring above the disc to keep the valve normally closed when used on air or gas; prices will be furnished on application.

### List Prices and Dimensions

| Size Inches | List Prices, Each: Swing No. 76 E Screwed | Swing No. 77 E Flanged F. & D. | Lift No. 366 E Screwed | Dimensions, in Inches: No. 76 E A | No. 76 E C | No. 77 E B | No. 77 E C | No. 77 E D | No. 77 E E | No. 366 E F | No. 366 E G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ¼ | 6.00 | | 6.30 | 2¼ | 1½ | | | | | 1 13/16 | 1 |
| ⅜ | 6.30 | | 6.90 | 2¼ | 1½ | | | | | 2 | 1⅛ |
| ½ | 7.10 | | 8.00 | 2⅝ | 1¾ | | | | | 2½ | 1⅜ |
| ¾ | 9.00 | | 10.20 | 3⅛ | 2⅛ | | | | | 2 15/16 | 1⅞ |
| 1 | 10.40 | 31.00 | 11.70 | 3⅞ | 2½ | 6¼ | 2½ | 4⅞ | 19/32 | 3½ | 2 |
| 1¼ | 14.00 | 43.00 | 15.60 | 4½ | 3 | 6⅞ | 3 | 5¼ | ⅝ | 4 1/16 | 2⅜ |
| 1½ | 18.00 | 64.00 | 20.50 | 5⅛ | 3½ | 7⅞ | 3½ | 6⅛ | 11/16 | 4⅝ | 2⅝ |
| 2 | 26.50 | 89.00 | 29.00 | 6⅜ | 4¼ | 8¾ | 4¼ | 6½ | ¾ | 5¾ | 3¼ |
| 2½ | 50.00 | 134.00 | 53.00 | 7⅛ | 5 | 10⅛ | 5 | 7½ | 13/16 | 6⅞ | 3⅞ |
| 3 | 89.00 | 174.00 | 93.00 | 8⅜ | 6 | 11⅝ | 6 | 8¼ | 29/32 | 8 | 4½ |




No. 76 E or 77 E




No. 366 E

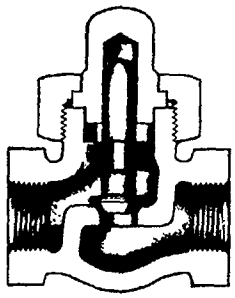
*Valves for Marine Service...page 400* *Ferrosteel Piston Type Disc Check Valves...page 412* *Templates for drilling..page 458*

# Hydraulic Bronze Lift Check Valves

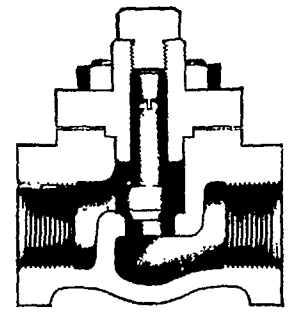
## 2000 - Pound

## 2500 - Pound





Cross Section
No. 234 H



Cross Section
No. 238 H

WORKING PRESSURES

2000 pounds cold water, oil, or gas, non-shock

2500 pounds cold water, oil, or gas, non-shock

TEST PRESSURES

3000 pounds hydrostatic

3750 pounds hydrostatic

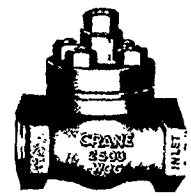
**Service recommendations:** Crane Hydraulic Bronze Check Valves are recommended for severe high pressure hydraulic service on lines not subjected to shock, and for high pressure gas lines.

**Construction:** The valves are exceptionally heavy and rugged. The top of the disc fits snugly in the valve cap, guiding the disc accurately and forming a dashpot that effectively cushions the action of the valve while in service. The No. 234 H Valves have a union cap; the No. 238 H Valves are made with a bolted cap.

**Materials:** The body and disc of these valves are made of Crane Special Bronze, a strong, hard, leaded tin bronze having excellent resistance to wear.

**Seat opening:** The diameter of the seat opening in both the No. 234 H and the No. 238 H Valves is slightly larger than the inside diameter of Double Extra Strong Pipe.

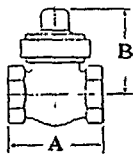
No. 234 H
Horizontal Lift
Screwed



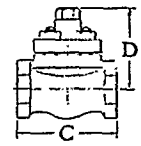
No. 238 H
Horizontal Lift
Screwed

### List Prices and Dimensions

| Size | List Prices, Each Horizontal, Screwed | | Dimensions, in Inches | | | |
|---|---|---|---|---|---|---|
| Inches | No. 234 H 2000-Pound | No. 238 H 2500-Pound | A | B | C | D |
| 3/8 | 12.00 | | 2 13/16 | 2 5/8 | | |
| 1/2 | 13.00 | | 2 13/16 | 2 5/8 | | |
| 3/4 | 16.00 | | 3 7/16 | 3 1/4 | | |
| 1 | 21.00 | 36.00 | 4 | 3 7/8 | 4 1/2 | 3 5/8 |
| 1 1/4 | 31.00 | 40.00 | 4 11/16 | 4 7/16 | 4 15/16 | 4 1/8 |
| 1 1/2 | | 55.00 | | | 5 1/2 | 4 5/8 |
| 2 | | 79.00 | | | 6 3/8 | 5 3/8 |




No. 234 H




No. 238 H

## *For Higher Pressures and Temperatures Use Crane Steel Valves*

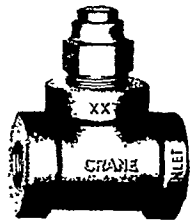
Forged Steel
600-Pound
No. 3674 X
Horizontal Lift
*(Page 251)*

Cast Steel
600-Pound
No. 3692 XS
Ball Check
*(Page 251)*

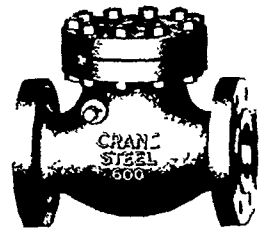
Supplementing the Crane line of bronze check valves shown above and on the preceding pages is a wide assortment of steel check valves especially designed for severe services and for pressures and temperatures beyond the scope of bronze valves. They are made in a wide range of sizes and for all service conditions; for complete data, refer to:

**Forged Steel Check Valves**
Lift.....pages 250 and 251
Marine.....page 401

**Cast Steel Check Valves**
Swing.....pages 252 to 256
Ball.....page 251
Marine.....page 401



Forged Steel
6000-Pound Hyd.
No. 227 H
Horizontal Lift
*(Page 256)*



Cast Steel
600-Pound
No. 175 X
Horizontal Swing
*(Page 255)*

# Brass and Bronze Quick-Opening, Radiator, and Hose Valves

## Hose Fittings, Racks, and Cabinets

**Quick-Opening Valves**
125-Pound Globe....page 54
125-Pound Gate....page 56
150-Pound Globe....page 55

**Butterfly Valves**....page 57
**Quick-Acting Throttle Valves**....page 57
**Radiator Valves**....page 58

**Hose Valves**
Hose Gate....page 60
Underwriters' Pattern....page 60
Chicago Hose....page 61
Angle Hose....page 61
Garden Hose....page 61

**Hose Goods**
Couplings and Clamps....page 62
Nozzles, Pipes, and Fittings....page 63
Racks and Cabinets....page 64

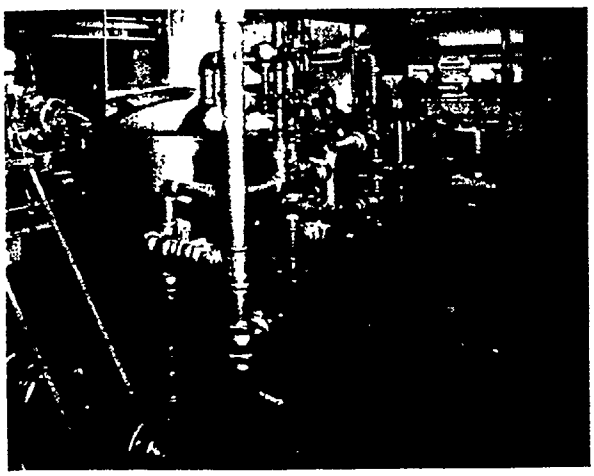
**Hose Threads,** for Hose Valves....page 59

6

* * * * * * * * * * *

In addition to the valves indexed above, Crane also manufactures an extensive line of Quick-Opening Valves made of other materials and a line of brass hose valves for marine service. These are shown in other sections of the catalog; see the pages referred to below:

Iron Body Quick-Opening Clamp Gate Valves....page 75
Iron Body Quick-Opening Wedge Gate Valves....page 80
Iron Body Butterfly Valves....page 111
Bronze Chronometer Valves....page 403
Brass Hose Gate Valves for Marine Service....page 403



*Crane brass valves and fittings in a bottling plant.*

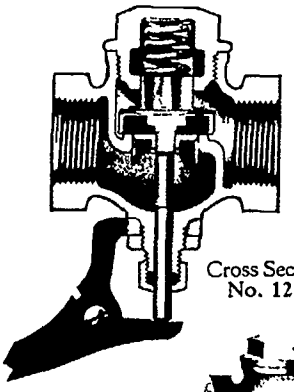
*A typical Crane installation in a turpentine plant.*

# 125-Pound Brass Globe Valves

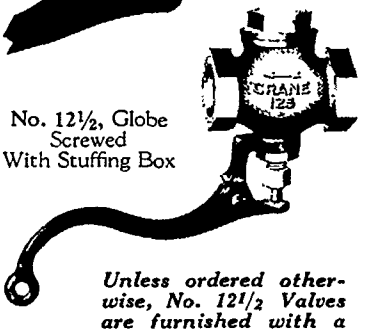
## Quick-Opening—Self-Closing

6

### Composition Disc



Cross Section No. 12½



No. 12½, Globe Screwed With Stuffing Box

***Unless ordered otherwise, No. 12½ Valves are furnished with a No. 6 Disc for air or gas.***

**WORKING PRESSURES**

**No. 12½ Valves**
125 pounds air or gas, 150° F.
(125 pounds saturated steam With No. 1 Disc)

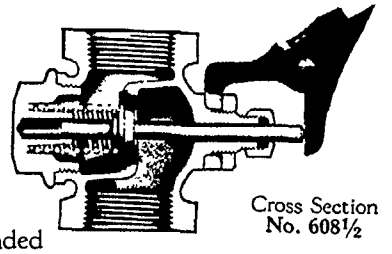
**No. 608 and No. 608½ Valves**
125 pounds saturated steam

**SERVICE RECOMMENDATIONS**

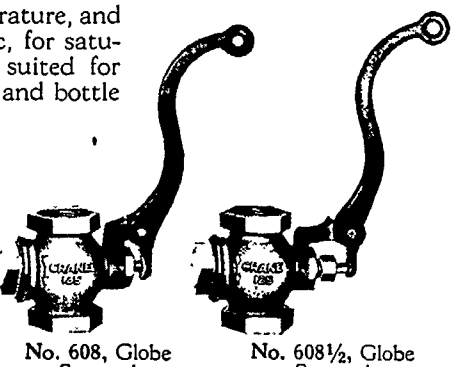
No. 12½ Valves are regularly recommended for air or gas up to 150° F. temperature, and when ordered with a No. 1 Disc, for saturated steam. They are ideally suited for cooking vats, soot blowers, can and bottle sterilizers, and similar service.

No. 608 and No. 608½ Valves are recommended for general industrial service on steam lines only. They are used to control the flow of steam to small apparatus such as steam presses, laundry machinery, can and bottle sterilizers, etc., and are often used in conjunction with whistles.

### Brass Disc



Cross Section No. 608½



No. 608, Globe Screwed Without Stuffing Box

No. 608½, Globe Screwed With Stuffing Box

**List Prices, Each**

| Size | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|
| Composition Disc | No. 12½ | 6.60 | 8.00 | 10.00 | 12.00 | 14.00 | 17.00 | 23.50 | |
| Brass Disc | No. 608, without stuffing box | | 6.00 | 7.00 | 8.30 | 10.80 | 14.50 | 18.00 | 26.00 |
| | No. 608½, with stuffing box | | 6.50 | 7.50 | 9.30 | 12.00 | 15.80 | 20.00 | 28.00 |

*For list prices of composition discs, see page 133.*

**Materials and construction:** All of these valves have a brass body and cap, a stainless steel spring, and a malleable iron lever. The lever can be turned to any desired position by loosening the locknut which holds the bracket to the valve body. The disc holder in the No. 12½ Valve is brass.

The Nos. 12½ and 608½ Valves have a stuffing box around the stem, assuring ample protection against leakage of fluid. This feature makes the valves particularly suitable for use in confined spaces and in installations requiring valves that will not leak at the stem under constant service. The stuffing box is filled with high grade packing.

**Operation:** The valves are easily operated. A short pull on the lever lifts the disc off its seat, opening the valve. When the lever is released, the spring above the disc automatically closes the valve.

Operation of larger size Nos. 608 or 608½ Valves used with whistles is facilitated when the pull is at right angles to the centerline of the whistle.

**Installation:** These valves always should be installed with the pressure above the disc. An arrow on the body indicates the direction of flow.

**Composition discs:** Unless otherwise ordered, No. 12½ Valves are furnished with a No. 6 Disc suitable for air or gas service. Valves ordered for steam service will be furnished with a No. 1 Cranite Disc. See page 133 for discs.

**Dimensions, in Inches**

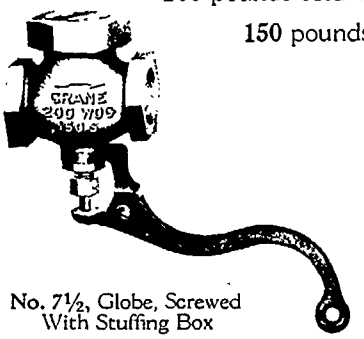
| Size | | | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 12½ | End to end of body | | 2⅛ | 2⅜ | 2¾ | 3¼ | 3¾ | 4¼ | 5 | |
| | Center to top of cap | | 1 7/16 | 1⅝ | 1 11/16 | 2 | 2 3/16 | 2½ | 2 15/16 | |
| | Center of stem to end of lever, closed | | 3⅜ | 3⅜ | 4 3/16 | 5 9/16 | 6⅜ | 8⅛ | 8¼ | |
| | Center of port to bottom of lever, open | | 3¾ | 3¾ | 5⅛ | 5⅛ | 6⅞ | 8 11/16 | 9½ | |
| Nos. 608 or 608½ | End to end of body | | | 1⅞ | 2 3/16 | 2⅝ | 3⅛ | 3⅝ | 4 1/16 | 4 15/16 |
| | Center of port to cap | | | 1¼ | 1⅜ | 1 11/16 | 2 | 2⅛ | 2⅝ | 2⅞ |
| | Center of stem to end of lever, closed | | | 3 3/16 | 3⅞ | 5⅝ | 6⅜ | 8⅛ | 8⅛ | 9¾ |
| | Center of port to bottom of lever, open | No. 608 | | 3¼ | 4¾ | 4¾ | 6¼ | 7¾ | 8½ | 10¼ |
| | | No. 608½ | | 3⅝ | 5¼ | 5⅜ | 7¾ | 8¾ | 9½ | 12⅝ |

# 150-Pound Brass Globe Valves

## Quick-Opening—Self-Closing

### With Composition Disc

WORKING PRESSURES
200 pounds hot water, 200° F.
200 pounds cold water, light oils, gasoline, air, and gas, 150° F.
150 pounds saturated steam (with No. 1 Disc)

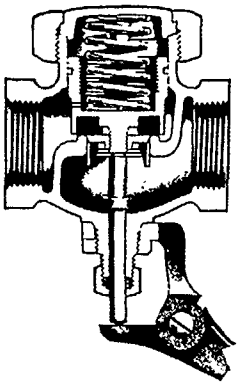


No. 7½, Globe, Screwed With Stuffing Box

***Unless otherwise ordered, No. 7½ Valves are furnished with a No. 6 Disc suitable for hot or cold water, for light oils or gasoline, or for air and gas. Orders should specify service conditions.***

SERVICE RECOMMENDATIONS

The No. 7½ Valves are regularly equipped with a No. 6 Composition Disc suitable for 200 pounds hot water up to 200° F. and for 200 pounds of cold water, light oils, gasoline, air, and gas at atmospheric temperature (150° F. maximum). They can also be furnished, when so ordered, with a No. 1 Cranite Composition Disc, making them suitable for 150 pounds saturated steam.



Cross Section No. 7½

The valves are widely used on gasoline and oil loading racks, public showers, and in other services where high quality quick-opening, self-closing globe valves are needed. Valves for heavy oil service can be furnished when desired; prices on application.

6

**List Prices**

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| No. 7½, Screwed, with Composition Disc | Each | 12.50 | 16.80 | 20.30 | 25.00 | 40.00 | 55.00 |

*For list prices of composition discs, see page 133.*

**Operation:** The valves are easily operated. A short pull on the lever lifts the disc off its seat, opening the valve. When the lever is released, the spring above the disc automatically closes the valve.

**Materials:** The body, cap, cap ring, stem, and disc holder are made of a good grade steam brass. The bracket and opening lever are malleable iron. The spring is stainless steel.

**Construction:** The No. 7½ Valves are ruggedly constructed throughout. They have a union ring cap joint which permits easy dismantling and reassembling for inspection, cleaning, or replacement of disc. The stuffing box around the stem is amply deep and large enough to remain pressure tight when the valve is open; it is filled with non-friction packing.

The top of the disc holder is piston shaped and is equipped with a piston ring. It fits snugly into the upper part of the valve body, forming a dashpot that effectively cushions the disc when closing, preventing hammering and destructive shock.

**Pilot valve on 1½ and 2-inch:** 1½ and 2-inch sizes have a pilot valve in the main valve, as illustrated here. When the valve is operated, the pilot valve opens first, equalizing the pressure around the main disc, thereby assuring easy operation. The pilot valve disc is also a composition material, having the same characteristics as the main valve disc; it is loaded for closing with a stainless steel spring.

**Discs:** Unless otherwise ordered, No. 7½ Valves are regularly furnished with a No. 6 Disc suitable for hot or cold water, for light oils or gasoline, and for air and gas.

When ordered for steam service, the valves are furnished with a No. 1 Cranite Composition Disc.

**Installation:** These valves always should be installed with the pressure above the disc. An arrow on the body indicates the direction of flow.

**Dimensions, in Inches**

| Size | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| End to end of body | 2 11/16 | 3 3/16 | 3¾ | 4¼ | 4¾ | 5¾ |
| Center to top of cap | 1¾ | 2 | 2¼ | 2⅝ | 3 | 3½ |
| Center of stem to end of lever, closed | 4⅛ | 5⅝ | 6¼ | 8⅛ | 8¼ | 9½ |
| Center of port to bottom of lever, open | 5 3/16 | 5½ | 7⅜ | 8 | 9¾ | 12⅝ |

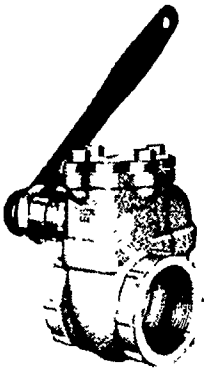
***Quick-closing valves used on liquid lines may produce shock; see page 11.***

# 125-Pound Brass Gate Valves

## Quick-Opening

6

### Cam Action



No. 432
Screwed

WORKING PRESSURES

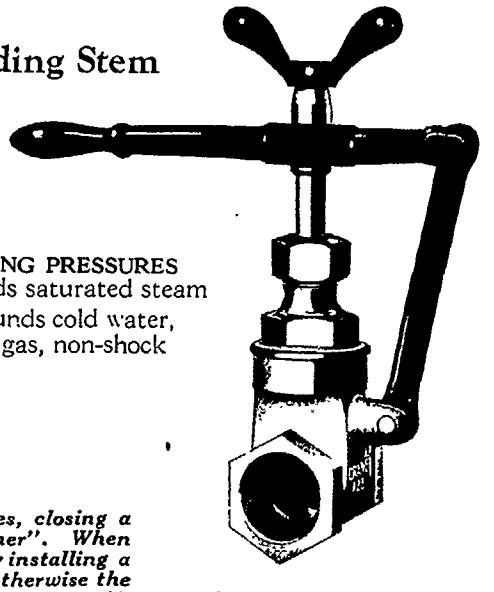
½ to 2-inch
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

2½ and 3-inch
100 pounds saturated steam
100 pounds cold water, oil, or gas, non-shock

*Air Tested*

### Sliding Stem

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock



No. 442, Screwed

***When these valves are used on liquid lines, closing a valve quickly might cause "water hammer". When severe, water hammer must be eliminated by installing a suitable cushioning device in the piping. Otherwise the shock might damage the valves or the piping; see page 11.***

**List Prices**

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|
| No. 432, Cam Action Valves | Each | 9.70 | 10.80 | 13.70 | 17.00 | 21.00 | 28.00 | 56.00 | 75.00 |
| No. 442, Sliding Stem Valves | Each | | 10.80 | 13.70 | 17.00 | 21.00 | 28.00 | 56.00 | 75.00 |

**No. 432 Cam Action Valves:** This superior line of quick opening wedge gate valves is recommended for service on steam, water, oil, or air lines.

The solid wedge disc is operated with a quick-opening lever through a specially designed cam arrangement, assuring fast and positive valve action.

Sizes 1-inch and smaller have a screwed cap; the larger sizes have a bolted cap as shown in the illustration at the top of the page.

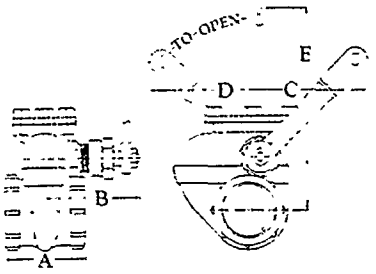
To insure proper seating when closing the valves, a snappy action with plenty of force should be applied to the lever. The disc will not jam, and there is no danger of injuring parts because the valve has been designed to withstand such action.

**Underwriters' Approval:** No. 432 Gate Valves have been approved by the Underwriters' Laboratories, Inc., for hazardous liquid service at pressures not exceeding 50 pounds; this is the maximum pressure prescribed by the Underwriters' Laboratories for hazardous liquid equipment.

**No. 442 Sliding Stem Valves:** No. 442 Quick-Opening Gate Valves are of the parallel seat construction. They have a sliding stem and a double disc.

They are of ample proportions, are sturdily constructed, and only a short movement of the lever is required to operate the valve.

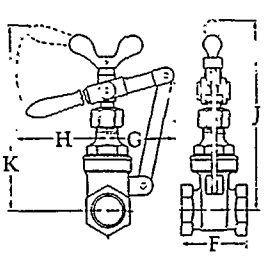
The wing nut at the top of the stem permits forcing the discs to the seats after the valve has been closed; it releases the discs before opening.




Cam Action Valve

**Dimensions, in Inches**

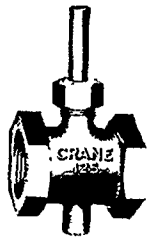
| Size | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|
| A | 1⅞ | 2⅛ | 2½ | 2¾ | 2⅞ | 3⅜ | 4 | 4¼ |
| B | 2 11/16 | 2⅞ | 3⅛ | 3½ | 3⅞ | 4¼ | 4⅞ | 5⅜ |
| C | 2⅛ | 3⅛ | 4 | 5½ | 6⅜ | 7⅝ | 8¾ | 10 |
| D | 3 | 3¼ | 3½ | 4⅝ | 5⅜ | 6⅜ | 7½ | 8⅛ |
| E | 5 9/16 | 6¼ | 6¾ | 8⅝ | 9 13/16 | 12 | 13⅞ | 15 5/16 |
| F | | 2⅝ | 2 13/16 | 3¼ | 3⅞ | 4⅛ | 4⅝ | 5⅜ |
| G | | 2⅝ | 3 | 3½ | 4 | 4⅜ | 4⅝ | 5¼ |
| H | | 4⅞ | 5¾ | 7 | 7⅜ | 8⅜ | 9½ | 10⅝ |
| J | | 7⅛ | 8⅝ | 10⅛ | 11 | 13¼ | 15 | 16⅞ |
| K | | 7½ | 8¼ | 9⅞ | 10¾ | 13⅜ | 16½ | 17 |




Sliding Stem Valve

# Brass Butterfly Valves

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock



No. 44, Screwed
Brass Body
Brass Disc
Steel Stem

Crane Butterfly Valves provide easy, smooth operation in approximately one-quarter turn from the wide open to the closed position. Because the valves are not designed to close pressure-tight, they should be used only to control or regulate flow.

The body and disc are made of brass. The stem is steel.

For Iron Butterfly Valves, see page 111.

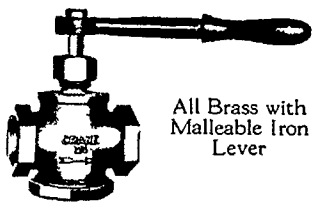
6

**List Prices and Dimensions**

| Size | | Inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|
| No. 44, Butterfly Valve | | Each | 7.20 | 8.60 | 10.00 | 12.00 | 15.60 |
| Dimensions, in Inches | End to end | | 2 1/4 | 2 9/16 | 2 3/4 | 2 15/16 | 4 1/16 |
| | Center to top | | 3 1/16 | 3 1/4 | 3 9/16 | 3 7/8 | 4 7/8 |
| | Overall height | | 4 1/16 | 4 9/16 | 5 3/16 | 5 9/16 | 6 3/4 |
| | Diameter of stem | | 11/32 | 3/8 | 7/16 | 7/16 | 1/2 |

# Brass Quick-Acting Throttle Valves

WORKING PRESSURE
125 pounds saturated steam



All Brass with Malleable Iron Lever

No. 46, Screwed

These ruggedly built throttle valves are used extensively on hoisting and traction engines. They open or close completely in one-quarter turn of the lever and have an internal stop to limit the travel of the stem.

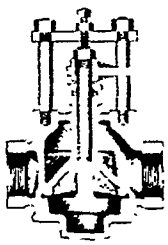
The valves are not recommended for use where pressure-tight seating is essential.

Except for the malleable iron lever, all parts are made of brass.

**List Prices and Dimensions**

| Size | | Inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|
| No. 46. Throttle Valve | | Each | 20.00 | 22.00 | 28.00 | 34.00 | 43.00 |
| Dimensions, in Inches | End to end | | 2 3/4 | 3 3/8 | 4 | 4 1/2 | 5 1/2 |
| | Center to top of stem | | 3 1/2 | 3 3/4 | 4 1/2 | 5 1/8 | 6 1/8 |
| | Center of stem to end of handle | | 6 | 6 | 8 | 10 | 11 1/4 |

# Bronze Chronometer Valves

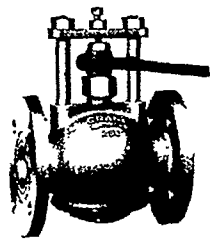


No. 4382
Screwed

Bronze Chronometer Valves are designed for regulating and governing purposes on steam lines where working pressures do not exceed 250 pounds.

The valves are available in a wide range of sizes with either screwed or flanged ends. They are easy to operate. A one-eighth turn of the lever opens or closes the valve completely. An adjusting screw at the stem end varies the pressure of the disc against the seat bearing, assuring smooth operation at all times. With proper adjustment, the valves can be operated by a float.

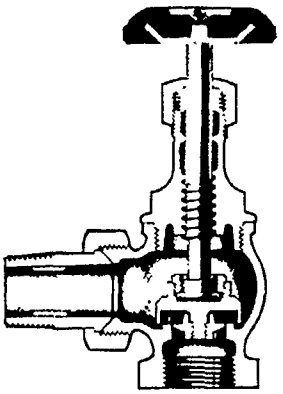
*Prices and dimensions are shown on page 403.*



No. 4383
Flanged

# 150-Pound Brass Radiator Valves

## Government Pattern With Composition Disc

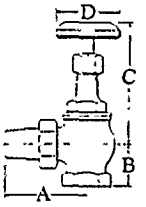


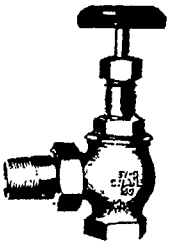
Cross Section

WORKING PRESSURE
150 pounds saturated steam

These valves are recommended for steam and hot water heating systems.

When wanted for gravity flow hot water, orders should so specify; such valves are drilled with a small hole through the seat to provide slow circulation when the valve is closed.



No. 67 G Angle

***When so ordered, No. 67 G Valves will be furnished with lock shield at no extra charge.***

**Construction:** These valves are heavy and are unusually sturdy. They have a rising stem and a gland in the stuffing box. The valves can be repacked when wide open and under pressure.

### List Prices and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|
| No. 67 G, Rough, nickel-plated | | Each | 6.00 | 7.40 | 9.40 | 12.50 | 16.00 |
| Dimensions, in Inches | A | | 2⅜ | 3¼ | 3½ | 3⅞ | 4⅜ |
| | B | | 1 3/16 | 1⅝ | 1¾ | 2 | 2¼ |
| | C—Open | | 4½ | 5¼ | 6 | 7⅛ | 7½ |
| | D | | 2¼ | 2½ | 2¾ | 3 | 3 |

*For list prices of Composition Discs, see page 133.*

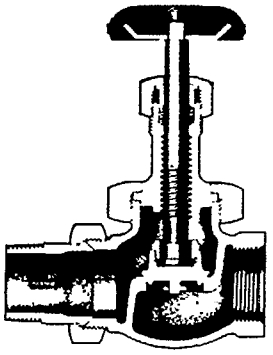
**Discs:** Unless otherwise ordered, the valves are furnished with a No. 1 Cranite Disc suitable for steam, or for hot water from 200° to 300° F. When ordered for hot water up to 200° F., they are furnished with a No. 6 Disc. For discs, see page 133.

**Government and Navy Specifications:** The valves comply with Government Specifications issued by the General Supervising Architect's Office and the Quartermaster General's Office.

The valves also comply with Navy Department (Bureau of Yards and Docks) Specification No. 66-P-1a(INT), dated September, 1944, on Power Plant Heating and Ventilating Apparatus and Piping (Shore Use).

# 200-Pound Bronze Radiator Valves

## Union Bonnet with Metal Disc



Cross Section
No. 4270, Globe

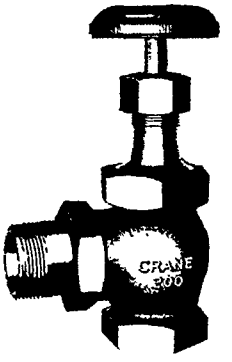
WORKING PRESSURE
200 pounds saturated steam

### List Prices and Dimensions

| Size | | Inches | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|
| No. 4270 | Globe, Rough body | Each | 5.40 | 6.00 | 8.00 | 11.00 |
| | Angle, Rough body | Each | 5.40 | 6.00 | 8.00 | 11.00 |
| Dimensions, in Inches | Center to female end | | 1 | 1 3/16 | 1⅜ | 1 11/16 |
| | Center to union end | | 2 3/16 | 2 7/16 | 3 | 3¼ |
| | Center to top, open | | 3¾ | 4⅛ | 4¾ | 5¾ |
| | Diameter of wheel | | 2 | 2¼ | 2½ | 2¾ |

***When ordering, specify whether globe or angle valves are wanted.***

***When so ordered, No. 4270 Valves will be furnished with lock shield at no extra charge.***



No. 4270
Angle

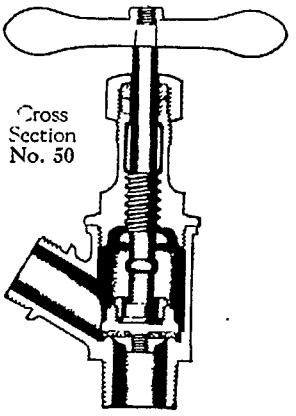
No. 4270 Valves are recommended for high pressure steam and hot water systems. They are heavy, ruggedly constructed, and are furnished with a Crane Special Bronze body. The valves have a union bonnet and can be reground without removing the body from the line. The stuffing box on sizes ½-inch and larger is equipped with a gland; the ⅜-inch size does not have a gland. The valves, when wide open, can be repacked while under pressure. ⅜ and ½-inch valves have a one-piece disc and stem.

# Brass Hose Valves

## Chicago Hose Valves

**With Leather Disc**

200 pounds cold water working pressure



Cross Section No. 50

No. 50, Screwed

The valves shown on this page are designed and constructed for long, dependable service.

**Chicago Hose Valves:** Chicago Hose Valves are excellent for use on outside standpipes.

**Garden Hose Valves:** Garden Hose Valves are ideal for garden and lawn hose service for homes, estates, greenhouses, cemeteries, golf courses, etc. They are ruggedly constructed.

**Angle Hose Valves:** Angle Hose Valves are recommended for use on standpipes and hose racks, and for similar service. They are regularly furnished with a Crane No. 6 Composition Disc; for description of discs, see page 133.

**Hose threads:** All of these valves have an American Standard Pipe Thread on the inlet. Unless otherwise ordered, they are furnished with the following thread on the male outlet:

½ to 2" sizes — Chicago Standard Hose Thread
2½" size — Chicago Fire Department Hose Thread

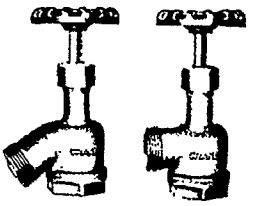
When so ordered, the outlet can be supplied with the following threads at no additional charge:

All sizes — Iron Pipe Hose Thread
All sizes — California Standard Hose Thread
1½" size — American (National) Standard Fire Protection Hose Thread
2½" size — American (National) Standard Fire-Hose Coupling Screw Thread

Orders for any other hose thread should be accompanied by a sample, preferably the male end of a hose coupling. For threads, see page 59.

## Garden Hose Valves

**With Leather Disc**



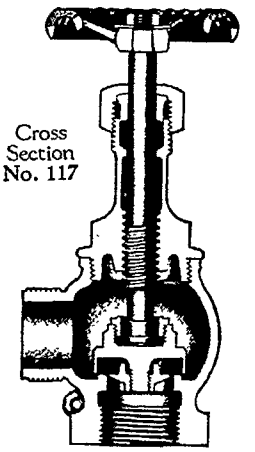
No. 56 Screwed — No. 58 Screwed

6

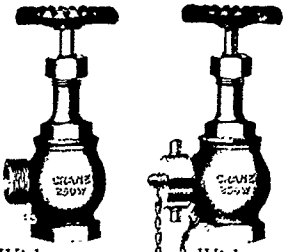
## Angle Hose Valves

**With Crane Composition Disc**

250 pounds cold water working pressure



Cross Section No. 117



Without cap and chain — With cap and chain

*No. 117, Screwed

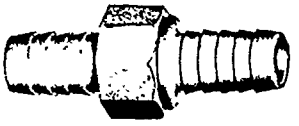
*No. 117 Valves are furnished with a brass cap and chain only if orders so specify; see extra prices in table.

*For list prices of composition discs for No. 117 Valves, see page 133.*

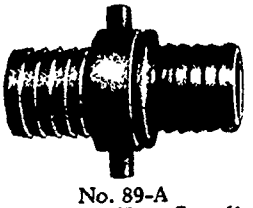
### List Price and Dimensions

| | Catalog Number and Type | Size Inches | List Prices: Per Valve | List Prices: Add for brass cap and chain, per valve | Dimensions, in Inches: Center to hose end | Over-all height, open | Length of handle or diameter of wheel |
|---|---|---|---|---|---|---|---|
| Hose Valves with Rough Body, Plain | No. 50 Chicago | 1 | 7.50 | | 2½ | 8⅛ | 5⅛ |
| | | 1¼ | 9.00 | | 3 | 9⅝ | 5¾ |
| | | 1½ | 13.00 | | 3 | 10½ | 6½ |
| | | 2 | 16.70 | | 3½ | 11⅞ | 8¼ |
| | | 2½ | 21.00 | | 4 1/16 | 13⅞ | 8¼ |
| | No. 56 Garden | ½ | 3.60 | | 1⅞ | 4 9/16 | 2 1/16 |
| | | ¾ | 4.00 | | 1⅞ | 4¾ | 2 1/16 |
| | | 1 | 5.00 | | 2¼ | 5 13/16 | 2 9/16 |
| | | 1¼ | 9.50 | | 2¾ | 7½ | 3 1/16 |
| | | 1½ | 13.00 | | 3 1/16 | 8⅝ | 3⅝ |
| | | 2 | 17.00 | | 3¾ | 9⅜ | 4 1/16 |
| | No. 58 Garden | ½ | 3.60 | | 1⅜ | 4 9/16 | 2 1/16 |
| | | ¾ | 4.00 | | 1⅜ | 4¾ | 2 1/16 |
| | | 1 | 5.00 | | 1⅝ | 5 13/16 | 2 9/16 |
| | | 1¼ | 9.50 | | 2 1/16 | 7½ | 3 1/16 |
| | | 1½ | 13.00 | | 2¼ | 8⅝ | 3⅝ |
| | | 2 | 17.00 | | 2⅝ | 9⅜ | 4 1/16 |
| | *No. 117 Angle | ¾ | 9.00 | 2.50 | 1 9/16 | 7 3/16 | 2¾ |
| | | 1 | 10.50 | 2.80 | 1¾ | 7 13/16 | 3 1/16 |
| | | 1¼ | 14.00 | 3.20 | 2¼ | 9⅛ | 3⅝ |
| | | 1½ | 17.60 | 3.90 | 2⅜ | 9⅞ | 4 1/16 |
| | | 2 | 26.00 | 5.00 | 2¾ | 12 3/16 | 5⅜ |

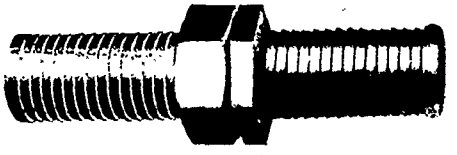
# Hose Couplings



No. 17C-A
Brass Water Hose Couplings
Sizes 1-inch and smaller—Without lugs



No. 89-A
Brass Water Hose Coupling
Sizes 1¼ to 2½-inch—Lugs on female half



No. 90-A
Brass Steam Hose Coupling

All of the couplings shown above are made of high grade cast brass.

Water hose couplings have deep, long-cut threads to effect fast connections. Larger sizes are available; they have lugs on both the male and female half.

Steam hose couplings have semi-finished swivels, recessed for washers. The tailpieces are long and extra heavy with smooth, chamfered ends.

**Sizes and Thread Connections**

| Catalog No. | Size of Hose, Inches | Connections Available, in Inches: Regular | Connections Available, in Inches: On Order |
|---|---|---|---|
| No. 17C-A | ½, ⅝, ¾ | ¾ HPT | ¾ IPT |
| | 1 | 1 IPT | — |
| No. 89-A | 1¼, 1½, 2, 2½ | IPT | As specified |
| No. 90-A | ¼, ⅜ | IPT | — |
| | ½, ⅝, ¾ | ¾ IPT | ½ IPT, —, — |
| | 1, 1¼, 1½ | IPT | —, —, — |
| | 2, 2½, 3 | IPT | —, —, — |

HPT—Chicago Hose Thread
IPT —Iron Pipe Thread

# Hose Clamps

No. 1923-A, Galvanized Steel
No. 3935-A, Stamped Sheet Brass

These clamps hold the hose evenly and completely around the outside. Easily tightened, their top is formed to prevent the nut from turning. No. 1923-A are heavy, high quality strip steel, plated to resist corrosion. No. 3935-A are stamped sheet brass.

**Sizes and Dimensions**

| Size of Hose, Inches | Hose Ply | Inside Diameter, in Inches: No. 1923-A Steel Clamp, For Water Hose | No. 1923-A Steel Clamp, For Steam Hose | No. 3935-A Brass Clamp, For Water Hose | No. 3935-A Brass Clamp, For Steam Hose |
|---|---|---|---|---|---|
| 3/16 | 3 | 7/16 | — | 7/16 | — |
| ¼ | 3 | ½ | — | ½ | — |
| ⅜ | 2 | 9/16 | — | 9/16 | — |
| | 3 | ⅝ | — | ⅝ | — |
| | 4 | 11/16 | — | 11/16 | — |
| ½ | 2 | ¾ | — | ¾ | — |
| | 3 | ⅞ | — | ⅞ | — |
| | 4 | 15/16 | 1 1/16 | 15/16 | — |
| | 5 | 1 | 1 3/16 | — | — |
| | 6 | — | 1¼ | — | — |
| ⅝ | 2 | 1 | — | — | — |
| | 3 | 1 1/16 | — | 1 1/16 | — |
| | 4 | 1⅛ | — | 1⅛ | — |
| ¾ | 2 | 1 1/16 | — | 1 1/16 | — |
| | 3 | 1⅛ | — | 1⅛ | — |
| | 4 | 1 3/16 | 1⅜ | 1 3/16 | 1⅜ |
| | 5 | 1¼ | 1 7/16 | 1¼ | 1 7/16 |
| | 6 | — | 1½ | — | 1½ |
| 1 | 2 | 1 5/16 | — | 1 5/16 | — |
| | 3 | 1⅜ | — | 1⅜ | — |
| | 4 | 1 7/16 | 1 11/16 | 1 7/16 | 1 11/16 |
| | 5 | 1½ | 1¾ | 1½ | 1¾ |
| | 6 | — | 1 13/16 | — | 1 13/16 |
| 1¼ | 2 | 1⅝ | — | — | — |
| | 3 | 1 11/16 | — | 1 11/16 | — |
| | 4 | 1 13/16 | 1 15/16 | 1 13/16 | 1 15/16 |
| | 5 | 1⅞ | 2 | — | 2 |
| | 6 | — | 2 1/16 | — | — |
| 1½ | 3 | 2 | — | 2 | — |
| | 4 | 2⅛ | 2¼ | 2⅛ | — |
| | 5 | 2 3/16 | 2 5/16 | — | — |
| | 6 | — | 2⅜ | — | 2⅜ |
| 1¾ | 3 | 2¼ | — | — | — |
| | 4 | 2⅜ | — | — | — |
| 2 | 3 | 2 7/16 | — | 2 7/16 | — |
| | 4 | 2 9/16 | 2⅝ | 2 9/16 | 2⅝ |
| | 5 | 2 11/16 | 2¾ | — | — |
| | 6 | — | 2⅞ | — | — |
| | Suction | 3 | — | — | — |
| 2¼ | 3 | 2¾ | — | — | — |
| | 4 | 2 13/16 | 2 15/16 | — | 2 15/16 |
| | 5 | — | 3 | — | 3 |
| | 6 | — | 3 1/16 | — | — |
| 2½ | 3 | 2 15/16 | — | 2 15/16 | — |
| | 4 | 3 | — | 3 | — |
| | 5 | 3⅛ | — | — | — |
| 2¾ | 4 | 3¼ | — | — | — |
| 3 | 3 | 3½ | — | 3½ | — |
| | 4 | 3½ | — | 3½ | — |

**Other Sizes Available**
Large size, extra heavy steel clamps are available with the following size inside diameters:

| | |
|---|---|
| 2¾" | 4¼" |
| 2⅞ | 4⅜ |
| 3 | 4½ |
| 3⅛ | 4⅝ |
| 3¼ | 4¾ |
| 3⅜ | 4⅞ |
| 3½ | 5 |
| 3⅝ | 5¼ |
| 3¾ | 5⅜ |
| 3⅞ | 5½ |
| 4 | 6 |
| 4⅛ | 6½ |

**Ordering Hose Clamps:** Orders for hose clamps should include the following information: catalog number, size and hose ply, quantity, and whether for water or steam hose.

*Prices on application*

# Hose Threads

**Hose Thread Standards:** The table shown below gives the basic dimensions of the American (National) Standard Hose Coupling Threads and of other hose coupling threads now in general use.

***The upper portion of the table includes:***

1. American Standard Hose Coupling Screw Threads (ASA B33.1-1935) sizes 2-inch and smaller for valves, hose couplings, nozzles, and other fittings used in direct connection with hose intended for fire protection or for domestic, industrial, and general service.

2. American (National) Standard Fire-Hose Coupling Screw Threads (ASA B26-1925) sizes 2½-inch and larger, for fire hose valves, couplings, hydrant outlets, stand-pipe connections, Siamese connections, and all other special fittings on fire lines.

The two ASA Standards mentioned above agree with the data in the Hose Thread section of the handbook of Screw-Thread Standards for Federal Services, No. H-28, 1944.

***The lower portion of the table includes:***

Other hose thread standards in general use: The Chicago Hose Thread, Chicago Fire Department Hose Thread, 2½ and 3-inch Iron Pipe Hose Threads, and the California Hose Thread.

**Form of thread:** The basic form of all Crane hose threads is the American (National) Standard, formerly known as the "U.S. Standard Form".

**Ordering:** Unless otherwise ordered, Crane Hose Valves are furnished with the threads specified on pages 60 and 61, their dimensions conforming to those shown in the table below.

**Special hose threads:** Other hose threads included in the table below but not mentioned on pages 60 and 61 can be furnished when so specified; prices on application. When orders are received for American Standard hose threads in sizes ½ or ¾-inch, the garden hose thread will be furnished, and in sizes 1 or 1½-inch the iron pipe hose thread will be furnished, unless otherwise specified. In addition, other types of special threads can be furnished at a special price; orders should be accompanied by a sample, preferably the male end of a hose coupling.

6

| General Classification | Name of Hose Thread | | Nominal Size of Hose Inches | Number of Threads per Inch | Max. Major Dia. (O.D.) of Nipple Thread Inches | Service Recommendations |
|---|---|---|---|---|---|---|
| American (National) Standard Hose Coupling and American (National) Standard Fire-Hose Coupling Screw Threads | Hose Coupling Screw Threads<br>American Standard (B33.1-1935)<br>Sizes 2-inch and smaller | Garden Hose Thread | ½ | 11½ | 1.0625 | Garden and similar service |
| | | | ⅝ | | | |
| | | | ¾ | | | |
| | | Chemical Hose Thread | ¾ | 8 | 1.3750 | Chemical engine and booster hose |
| | | | 1 | | | |
| | | Fire Protection Hose Thread | 1½ | 9 | 1.9900 | Fire protection hose |
| | | Iron Pipe Hose Thread | ½ | 14 | .8248 | Steam, water, air, oil, and all other hose connections |
| | | | ¾ | | 1.0353 | |
| | | | 1 | 11½ | 1.2951 | |
| | | | 1¼ | | 1.6399 | |
| | | | 1½ | | 1.8788 | |
| | | | 2 | | 2.3528 | |
| | American (National) Standard Fire-Hose Coupling Screw Threads (B26-1925) Sizes 2½-inch and larger | | 2½ | 7½ | 3.0686 | Fire hose |
| | | | 3 | 6 | 3.6239 | |
| | | | 3½ | | 4.2439 | |
| | | | 4½ | 4 | 5.7609 | |
| Other Hose Threads in General Use | Chicago Standard Hose Thread | | ½ or ¾ | 11½ | 1.0682 | †Note: Iron Pipe Hose Threads sizes 2-inch and smaller are included in the American Standard B33.1-1935 and are shown above. The 2½ and 3-inch sizes, shown here, are not included in the American Standard. |
| | | | 1 | | 1.2797 | |
| | | | 1¼ | | 1.6880 | |
| | | | 1½ | | 1.9272 | |
| | | | 2 | 8 | 2.5129 | |
| | | | 3 | 7 | 3.6365 | |
| | Chicago Fire Department Hose Thread | | 2½ | 7½ | 2.9916 | |
| | †Iron Pipe Hose Threads | | 2½ | 8 | 2.8434 | |
| | | | 3 | | 3.4412 | |
| | California Standard (Pacific Coast) Hose Thread | | ½ | 11 | 1.0504 | |
| | | | ¾ | | | |
| | | | 1 | | 1.3141 | |
| | | | 1¼ | | 1.8561 | |
| | | | 1½ | | 2.0870 | |
| | | | 2 | 10 | 2.5416 | |
| | | | 2½ | 7½ | 2.9916 | |

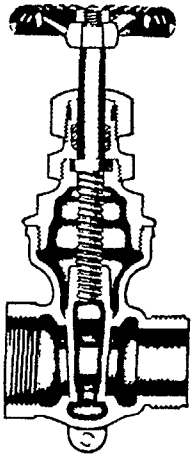
*Hose Valves . . . pages 60 and 61*

*Hose Goods . . . . pages 62 to 64*

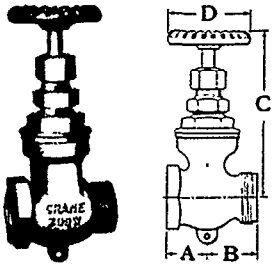
# Brass Hose Gate Valves

## Wedge Disc—Non-Rising Stem

**For 200 Pounds Cold Water Working Pressure**



Cross Section
No. 451




No. 451, Screwed

The Hose Gate Valves shown on this page are strong and ruggedly constructed. They have a non-rising stem and a wedge disc. Their deep stuffing box is fitted with a gland.

**Hose threads:** The valves have an American Standard Taper Pipe Thread on the female end. Unless otherwise ordered, they are furnished with the following thread on the male end:

**No. 451 Valves**
1 to 2" sizes — Chicago Standard Hose Thread
2½" size — Chicago Fire Department Hose Thread

**No. 453 Valves**
1½" size — Chicago Standard Hose Thread
2½" size — American (National) Standard Fire-Hose Coupling Screw Thread

When so ordered, the male end can be supplied with the following threads at no additional charge:

**No. 451 Valves**
All sizes — Iron Pipe Hose Thread
All sizes — California Standard Hose Thread
1½" size — American (National) Standard Fire Protection Hose Thread
2½" size — American (National) Standard Fire-Hose Coupling Screw Thread

**No. 453 Valves**
Both sizes — Iron Pipe Hose Thread
Both sizes — California Standard Hose Thread
1½" size — American (National) Standard Fire Protection Hose Thread
2½" size — Chicago Fire Department Hose Thread

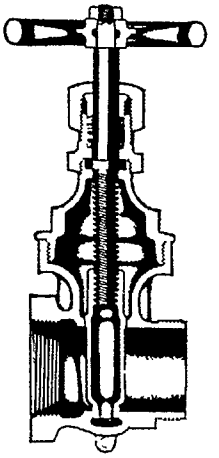
Orders for any other hose thread should be accompanied by a sample, preferably the male end of a hose coupling. For threads, see page 59.

**Valves with brass cap and chain:** When so ordered, any of the valves shown on this page will be furnished with a brass cap and chain, as illustrated at the lower left. An extra charge is made for the cap and chain. For extra prices, refer to the table shown below.

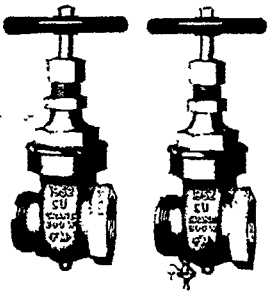
**Underwriters' Specifications:** The No. 453 Hose Gate Valves have been approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories for water working pressures up to 300 pounds. The valve body is marked "CU" and "FM".

**For 300 Pounds Cold Water Working Pressure**

**Underwriters' Pattern**

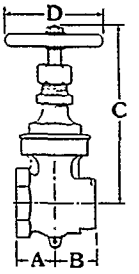


Cross Section
No. 453



Without Drain Cock — With Drain Cock
No. 453, Underwriters' Screwed

*Unless otherwise ordered, No. 453 Valves will be furnished without the drain cock.*




No. 453

### List Prices and Dimensions

| | Catalog Number | Size | List Prices: Per Valve—Without Cap and Chain: Without Drain Cock | List Prices: Per Valve—Without Cap and Chain: With Drain Cock | List Prices: Add for brass cap and chain, per valve | Dimensions, in Inches: A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|
| | | Inches | | *Specify* | *Specify* | | | | |
| Hose Gate Valves with Rough Body, Plain | No. 451 | 1 | 9.30 | | 2.80 | 1⅜ | 1⅝ | 5⅝ | 2¾ |
| | | 1¼ | 12.00 | | 3.20 | 1½ | 1⅞ | 6½ | 3 1/16 |
| | | 1½ | 15.50 | | 3.90 | 1⅝ | 2 1/16 | 7¼ | 3⅝ |
| | | 2 | 22.00 | | 5.00 | 1⅞ | 2¼ | 8⅝ | 4 1/16 |
| | | 2½ | 31.00 | | 7.70 | 2⅛ | 2⅝ | 10 | 4¾ |
| | No. 453 | 1½ | 17.00 | 20.00 | 3.90 | 1⅝ | 2¼ | 7½ | 4½ |
| | | 2½ | 40.00 | 44.00 | 7.70 | 2 5/16 | 2⅝ | 11 | 6 |

*Unless otherwise ordered, valves are furnished without cap and chain and without drain cock.*

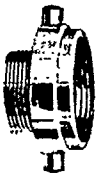
***For Marine Hose Gate Valves, see page 403.***

# Brass Hose Fittings

Male Hose Nipples No. 91-A

Male and Female Hose Nipples No. 92-A

Double Female Hose Nipples No. 9200-A



Male and Female Hose Reducers No. 9301-A (Small sizes without lugs) No. 93-A (Large sizes with lugs)

Male and Female Hose Bushings No. 94-A (Small Sizes) No. 94L-A (Large Sizes)

Sizes and Thread Connections

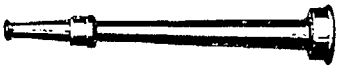
| Catalog Number | Sizes, in Inches, and Threads | |
|---|---|---|
| No. 91-A Nipples Male Ends | 3/8 IPT* × 3/8 IPT<br>1/2 IPT* × 1/2 IPT<br>1/2 IPT × 3/4 HPT | |
| | 3/4 IPT × 3/4 IPT*<br>3/4 IPT × 3/4 HPT<br>3/4 HPT × 1 IPT<br>3/4 IPT* × 1 IPT | |
| | 1 IPT* × 1 IPT<br>1 IPT × 1 1/4 IPT*<br>1 IPT × 1 1/2 IPT* | |
| | 1 1/4<br>1 1/2<br>2 | For these straight sizes, specify threads wanted |
| | 2 1/2<br>3<br>3 1/2<br>4 | |
| No. 92-A Nipples Male × Female | 3/4 HPT × 1/2 IPT<br>3/4 IPT × 3/4 HPT<br>3/4 HPT × 3/4 IPT<br>1 IPT* × 1 IPT | |
| | 1 1/4<br>1 1/2<br>2 | For these straight sizes, specify threads wanted |
| | 2 1/2<br>3<br>3 1/2 | |
| No. 9200-A Nipples Female Ends | 1/2 IPT × 3/4 HPT<br>3/4 IPT × 3/4 HPT<br>1 IPT × 1 HPT | |
| | Larger sizes available; specify threads wanted. | |
| No. 9301-A Reducers Male × Female | 1/2 IPT* × 3/4 HPT<br>3/4 HPT × 1 IPT* | |
| No. 94-A Bushings Male × Female | 3/4 HPT × 1/2 IPT*<br>1 IPT* × 3/4 HPT | |
| No. 93-A Reducers and No. 94L-A Bushings Male × Female | 1 1/4 × 1<br>× 3/4 | For these reducing sizes, specify threads wanted. |
| | 1 1/2 × 1 1/4<br>× 1<br>× 3/4 | |
| | 2 × 1 1/2<br>× 1 1/4<br>× 1<br>× 3/4 | |
| | 2 1/2 × 2<br>× 1 1/2<br>× 1 1/4<br>× 1<br>× 3/4 | |
| | 3 × 2 1/2<br>× 2 | |

HPT—Chicago Hose Thread.
IPT (without asterisk)—Taper Iron Pipe Thread.
*IPT (with asterisk)—Straight Iron Pipe Thread.

Hose fittings are made of high grade cast brass. When ordering, include the type of thread connection wanted.

# Brass Hose Nozzles

No. 97-A, Plain



No. 95-A, Screw Tip

Specify catalog number, quantity, size, thread, and length. Sizes 1 1/4-inch and larger are recessed for washers.

Sizes and Dimensions

| Sizes, Inches | | Length | Discharge |
|---|---|---|---|
| No. 97-A Nozzle | No. 95-A Nozzle | Inches | Inches |
| 3/4 | — | 3 | 1/4 |
| 3/4 | 3/4 | 6 | 1/4 |
| — | 3/4 | 7 | 1/4 |
| 1 | — | 4 | 5/16 |
| | — | 8 | 5/16 |
| 1 1/4 | — | 10 | 3/8 |
| | — | 12 | 3/8 |
| 1 1/2 | — | 10 | 1/2 |
| | — | 12 | 1/2 |
| | — | 15 | 5/8 |
| 2 | — | 12 | 9/16 |
| 2 1/2 | — | 12 | 1 |
| | — | 15 | 1 |

Nozzles are furnished with various standard hose threads, including iron pipe hose threads; specify thread desired. Other size discharges are available at additional cost.

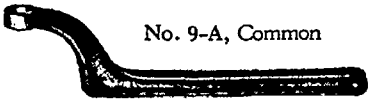
# Brass Hose Caps

No. 120-A

No. 120-A is available in sizes 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, and 4-inch.

Sizes 3/4 and 1-inch do not have spanner lugs. A chain, charged as an extra, can be furnished on sizes 1 1/2-inch and larger, when specified. When ordering Hose Caps, specify threads wanted.

# Hose Spanners



No. 9-A, Common

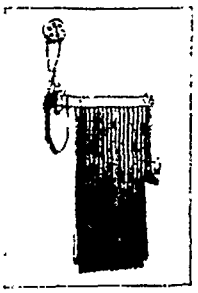
The No. 9-A Hose Spanner is furnished in sizes 1 1/2 x 9, 2 x 10, 2 1/2 x 10 3/4, 3 x 11, and 4 x 12 inches.

*Prices on application*

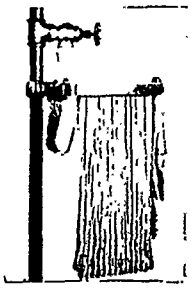
# Hose Racks and Cabinets

## Allen Bowes Swinging Hose Racks

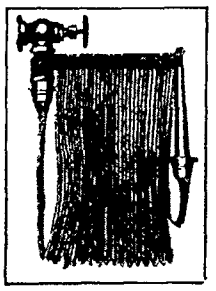
For Unlined Linen Hose



No. 137-A
Style E



No. 138-A
Style F



No. 139-A
Style G

For 1¼ to 2½-inch hose in capacities of 50, 75, and 100 feet. These racks can be furnished with pipe clamps, wall brackets, or rack nipples. When ordering, specify style, size of hose, and finish desired.

**No. 137-A:** Style E is mounted by attaching the rack to the wall.

**No. 138-A:** Style F is mounted by clamping the rack to a riser. Size of pipe clamp must be specified.

**No. 139-A:** Style G has a swivel back which swings on a nipple screwed into the valve. It is used with or without a cabinet. The swivel back size corresponds with the size of hose; i.e., a 1½-inch hose rack has a 1½-inch collar for a 1½-inch valve and nipple.

6

## Recessed Cabinet for Bowes Hose Rack

No. 262-A

Available with door labeled "Fire Hose."

The doors (front and back) of this cabinet are pressed from one piece of furniture steel without joints or rivets and are accurately fitted into a rabbet to exclude dust and dirt. The channel steel inner construction of the door assures additional rigidity, yet is adjustable so as to hold either plate glass panel, D.S.A. glass panel, or clear wire glass panel.

This cabinet is made with a 1¼-inch projecting trim or with a flat trim. The 1¼-inch projecting trim gives the maximum capacity of cabinet with a minimum of wall recess requirements. Any depth of trim can be had at additional cost.

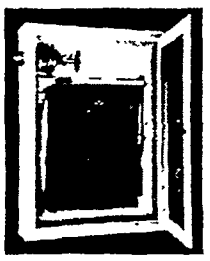
The cabinet is equipped with sturdy brass nickel-plated hinges on the right hand side, to permit full opening of the door. Hinges on the left hand side can be furnished when specified. Lever handle catch is brass, nickel-plated. Bullet catch and pull handle can be furnished.

Cabinets regularly have a baked-on white enamel finish on the inside and a white priming coat on the outside. Any special color or graining applied when specified.

Bronze cabinets, made of hard copper, bronze plated, instead of steel, bronze plated, can also be furnished.

| Capacity | | Cabinet Sizes in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hose Feet | Valve Size Inches | Inside Width | Inside Height | Inside Depth | Trim Width | Trim Height | Glass Size | Valve Inlet From Top |
| 50 | 1¼-1½ | 19¾ | 28¾ | 5½ | 24½ | 33½ | 15x24 | 3¼ |
| 75 | 1¼-1½ | 20¾ | 30¾ | 5½ | 25½ | 35½ | 16x26 | 3¼ |
| 100 | 1¼-1½ | 22¾ | 32¾ | 5½ | 27½ | 37½ | 18x28 | 3¼ |
| 50 | 2 | 19¾ | 28¾ | 6½ | 24½ | 33½ | 15x24 | 3⅝ |
| 75 | 2 | 22¾ | 32¾ | 6½ | 27½ | 37½ | 18x28 | 3⅝ |
| 100 | 2 | 24¾ | 34¾ | 6½ | 29½ | 39½ | 20x30 | 3⅝ |
| 50 | 2½ | 19¾ | 28¾ | 7½ | 24½ | 33½ | 15x24 | 4 |
| 75 | 2½ | 22¾ | 32¾ | 7½ | 27½ | 37½ | 18x28 | 4 |
| 100 | 2½ | 24¾ | 34¾ | 7½ | 29½ | 39½ | 20x30 | 4 |

## Outside Wall Fire Hose Cabinets



Outside wall cabinets are available in any size.

They are recommended for use where the protection of a hose cabinet is needed but where insufficient wall depth prohibits the use of a recessed cabinet.

The cabinets can be furnished with either a full glass panel or a duo-panel door.

Orders must specify if knockouts and hinges are to be on left or right hand side.

**No. 262A-A:** Made of Alenco Hollow Metal. In estimating wall space required, add 3¾ inches to inside dimensions.

**No. 262N-A:** Made of Nella Sheet Steel. In estimating wall space required, add 3 inches to inside dimensions.

***Prices on application***

# Brass Stops and Brass, Bronze, and Iron Cocks

**Brass Stops**
Rough....page 66
Ground Key....page 66
Hydrant....page 67
Gas Service....page 68

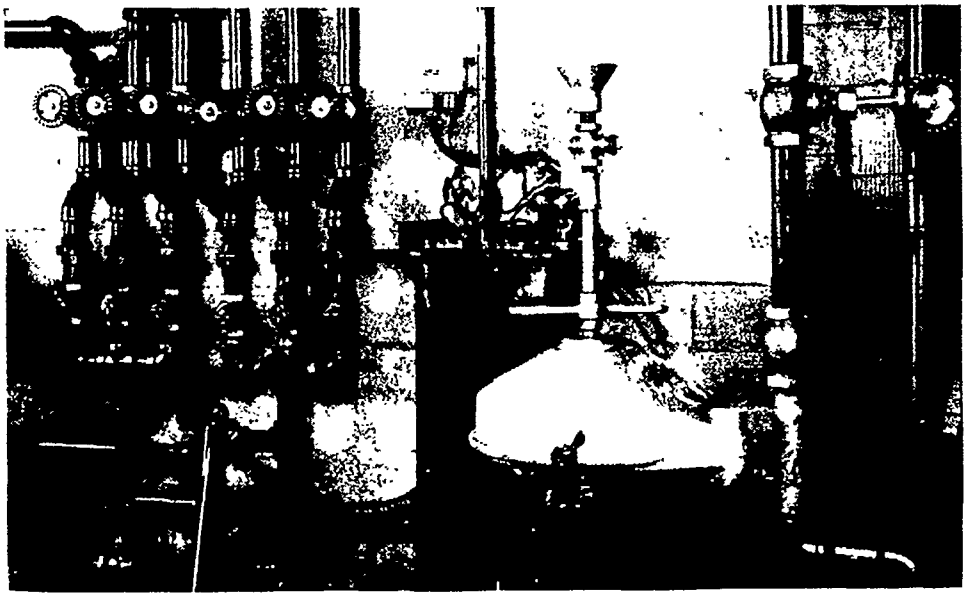
**Brass and Bronze Cocks**
Brine....page 66
Pet....page 67
Gauge....page 67
Cylinder....page 67
Spring Loaded....page 68
125-Pound....page 69
250-Pound....page 69

**Iron Cocks**
125-Pound W.O.G....page 70
200-Pound W.O.G....page 70
Essex Pattern....page 70
Gas Line....page 71
Spring Loaded....page 71

**Brass Ground Key Faucets**....page 66

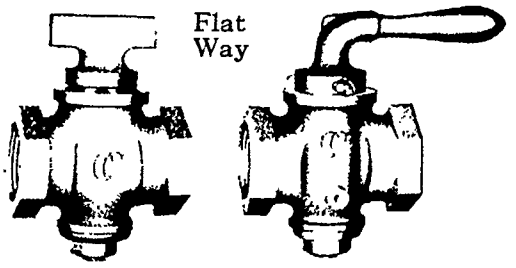
**Accessories**
Hydrant Clamps and Handles....page 67
Street Washer Keys....page 67
Wood Rod Couplings....page 67
Wrenches for Cocks....page 72

***For Brass Try Cocks, see page 361.***



Industrial plants, small and large, utilize Crane products.

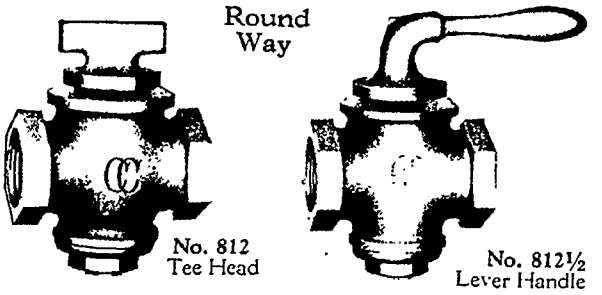
# Brass Rough Stops




Tee Head — Lever Handle

Without Check or Drain
No. 804 — No. 804½ (not shown)

With Check and Drain
No. 806 (not shown) Drilled Drain — No. 806½ Tapped Drain




No. 812 Tee Head — No. 812½ Lever Handle

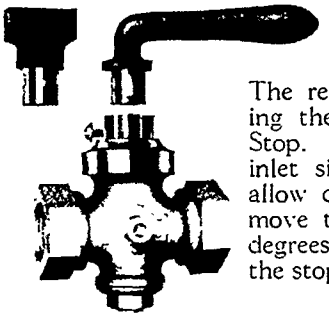
**List Prices, Each, and Dimensions, in Inches**

| Size | | Inches | ⅜ | ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Flat Way | No. 804 | | | 2.60 | | 3.40 | 4.90 | 6.80 | 9.30 | 15.40 |
| | No. 804½ | | 2.10 | 2.60 | | 3.40 | 4.90 | 6.80 | 9.30 | 15.40 |
| | No. 806 | | | 2.80 | 3.20 | 3.60 | 5.20 | 7.10 | 10.50 | 18.20 |
| | No. 806½ | | 2.50 | 2.80 | | 3.60 | 5.20 | | | |
| | End to end | | 1⅞ | 2⅛ | 2½ | 2 11/16 | 3⅛ | 3⅝ | 3 15/16 | 4 7/16 |
| Round Way | No. 812 | | | 3.10 | 4.00 | 4.50 | 6.50 | | | |
| | No. 812½ | | | 3.10 | | 4.50 | 6.50 | | | |
| | End to end | | | 2⅜ | 2 13/16 | 2⅞ | 3 9/16 | | | |

7

The drain on the Nos. 800 and 806½ is used to drain the outlet side of the line after the Stop is shut off. In this position, a small hole in the outlet side of the plug allows the water to drain into the port opening in the plug, which is now aligned with the drain hole in the body. Complete drainage of the outlet line requires proper venting, which is easily accomplished by opening a valve on the outlet side. The drain on the No. 806½ is tapped for a drain tube; drain tubes (17/64-inch O.D. with 27 threads per inch) are extra.

# Brass Ground Key Stops



No. 821, Removable Lever Handle
No. 824, Removable Tee Head

**With Reversible Check and Tapped Drain**

The reversible check permits draining the inlet or outlet side of the Stop. To effect drainage from the inlet side when the plug is set to allow drainage from the outlet, remove the collar, turn the plug 180 degrees, and then re-locate the collar; the stop will now drain from the inlet side. Drain tubes (17/64-inch O.D. with 27 threads per inch) are extra.

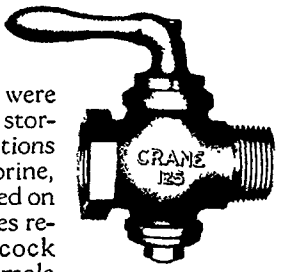
**List Prices and Dimensions**

| Size | Inches | ½ | ⅝ | ¾ | 1 |
|---|---|---|---|---|---|
| No. 821 or No. 824 | Each | 3.90 | 4.20 | 5.00 | 6.80 |
| End to end | Inches | 2⅞ | 3⅛ | 3¼ | 3 11/16 |

# Brass Brine Cocks

**With Male and Female Ends**

The No. 814 Brine Cocks with lever handle were designed for cold storage plant installations on lines handling brine, but they can be used on many other services requiring a brass cock having male and female end connections.

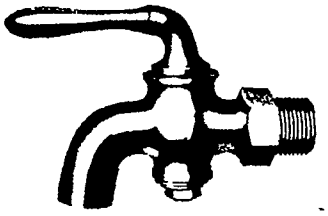



No. 814
Lever Handle

**List Prices and Dimensions**

| Size | Inches | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|
| No. 814 | Each | 2.30 | 2.80 | 3.40 | 5.00 |
| End to end | Inches | 2¼ | 2½ | 2⅞ | 3⅜ |

# Brass Ground Key Faucets



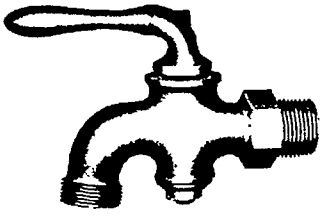
No. 800, Plain

***When ordering, specify whether Rough or Polished Faucets are wanted.***

**List Prices**

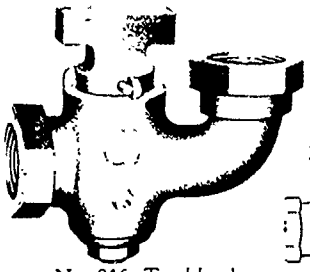
| Size | | Inches | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|
| No. 800 | Rough | Each | 2.40 | 2.80 | 3.60 | 5.40 |
| | Polished | Each | 3.70 | 4.10 | 5.00 | 6.90 |
| No. 801 | Rough | Each | | 3.20 | 4.20 | 6.30 |
| | Polished | Each | | 4.50 | 5.60 | 7.80 |
| | Size of hose thread | | | ¾" | ¾" | 1" |

No. 801 Faucets have Chicago Hose Threads on the outlet.

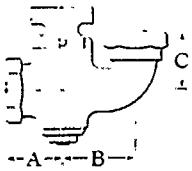


No. 801, For Hose

# Brass Hydrant Stops



No. 816, Tee Head
With Check and Drain



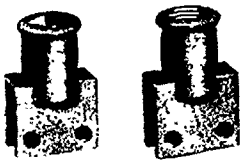

The No. 816 Brass Hydrant Stop is made primarily for underground installations. The elbow-shaped outlet permits assembly of the riser pipe for the hydrant without using any intervening fittings. When the Stop is shut off, the riser pipe and hydrant will drain through the drain hole, thereby preventing freezing in cold weather.

The hydrant should be open to vent for complete drainage.

List Prices and Dimensions

| Size | | Inches | ½ | ¾ | 1 |
|---|---|---|---|---|---|
| No. 816 | | Each | 4.20 | 5.00 | 7.00 |
| A | | Inches | 1 3/16 | 1 9/16 | 1 9/16 |
| B | | Inches | 1 13/16 | 2 1/8 | 2 7/16 |
| C | | Inches | 1 9/16 | 1 7/8 | 2 1/8 |

# Hydrant Clamps



For Square Rod — Tapped For Pipe
No. 850
Malleable Iron

Orders should specify whether with square hole or tapped for pipe.

List Prices

| | | | Square Rod | | Pipe Tap | |
|---|---|---|---|---|---|---|
| Size of rod or pipe | | Inches | ⅜ | ½ | ⅜ | ½ |
| Width of slot | | Inches | 7/16 | ½ | ½ | ½ |
| No. 850 | Black | Each | .20 | .30 | .20 | .30 |
| | Galv. | Each | | | .30 | .40 |

# Hydrant Handle

No. 860, Malleable Iron
To fit ⅜-inch Square Rod

List Price

| | | |
|---|---|---|
| No. 860 | Each | .60 |

# Street Washer Keys

No. 856
Malleable Iron
Length, 8¾ Inches

List Prices, Black

| | | | |
|---|---|---|---|
| No. 856 | To fit ⅜-inch square rod | Each | .50 |
| | To fit ½-inch square rod | Each | .60 |

# Wood Rod Couplings

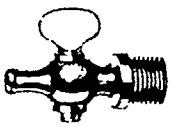
No. 854, Malleable Iron

Pipe thread is ⅜-inch; the couplings may be used with 1 or 1⅛-inch square rod.

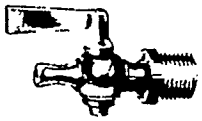
List Prices, Per Set

| | | |
|---|---|---|
| No. 854 | Black | 1.50 |
| | Galv. | 1.60 |

# Brass Pet Cocks

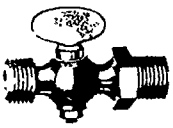


No. 700, Tee Head



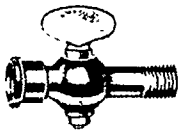
No. 702, Lever Handle

# Brass Gauge Cocks



Male
No. 708, Tee Head

Female
No. 712, Tee Head

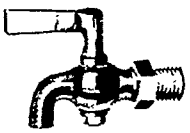


Male and Female
No. 744, Tee Head

List Prices

| Size | | | Inches | ⅛ | ¼ | ⅜ | ½ |
|---|---|---|---|---|---|---|---|
| Pet Cocks | No. 700 | Each | | 1.10 | 1.20 | 1.30 | 1.50 |
| | No. 702 | Each | | 1.40 | 1.50 | | |
| Gauge Cocks | No. 708 | Each | | 1.40 | 1.60 | | |
| | No. 712 | Each | | 1.60 | 1.90 | 2.20 | |
| | No. 744 | Each | | | 2.00 | | |
| Cylinder Cock | No. 724 | Each | | 2.70 | 3.00 | * | * |

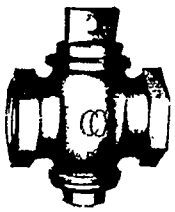
# Brass Cylinder Cocks



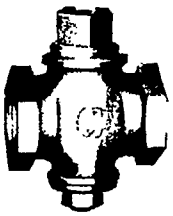
No. 724
Lever Handle

*For No. 724 Cylinder Cocks in sizes larger than ¼-inch, use No. 800 Ground Key Faucets; see page 66.

# Brass Gas Service Stops



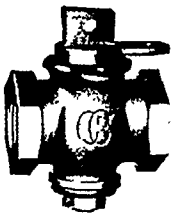
No. 270, Flat Head



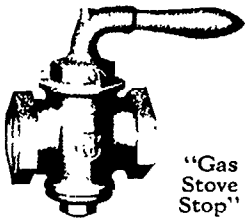
No. 272, Square Head

No. 276, Tee Head

No. 278, Tee Head With Check



No. 284, Flat Head With Lockup



"Gas Stove Stop"

No. 298, Lever Handle With Check

### List Prices and Dimensions

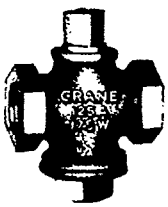
| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 270 | | Each | 1.70 | 1.90 | 2.20 | 2.80 | 3.60 | 5.00 | 6.70 | 11.00 |
| No. 272 | | Each | 1.70 | 1.90 | 2.20 | 2.80 | 3.60 | 5.00 | 6.70 | 11.00 |
| No. 276 | | Each | 1.70 | 1.90 | 2.20 | 2.80 | | | | |
| End to end | | Inches | 1⅝ | 1⅞ | 2 1/16 | 2⅜ | 2 11/16 | 3 5/16 | 3 11/16 | 4 9/16 |
| Stops with Check | No. 278 | Each | 2.00 | 2.20 | 2.60 | 3.20 | | | | |
| | No. 298 | Each | 2.10 | 2.40 | 2.70 | 3.30 | 4.30 | | | |
| | End to end | Inches | 1⅝ | 1⅞ | 2 1/16 | 2⅜ | 2 11/16 | | | |
| Stop with Lockup | No. 284 | Each | | | 2.80 | 3.60 | 4.60 | 6.00 | | |
| | End to end | Inches | | | 2⅛ | 2⅝ | 3 1/16 | 3 5/16 | | |

Crane Brass Gas Service Stops are made with flat head, square head, tee head, or lever handle, as illustrated here. The No. 284 has a lockup which permits locking the Stop in the closed position; a lock is not included in the price of the Stop.

The No. 298, often referred to as a "Gas Stove Stop", is commonly used in the gas line to gas stoves (or other appliances) so that the gas can be shut off at the appliance without shutting off the entire supply in the building.

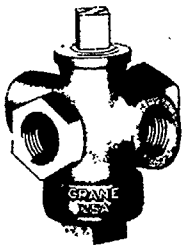
# Brass Spring-Loaded Cocks

WORKING PRESSURES
125 pounds air—175 pounds cold water, non-shock
*Air Tested*



Square Head
No. 305

Square Head
No. 306, Three-Way



Square Head
No. 307, Four-Way

### List Prices and Dimensions

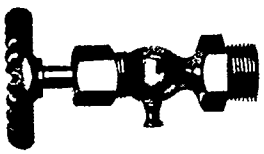
| Size | | Inches | ¼ | ⅜ | ½ |
|---|---|---|---|---|---|
| No. 305 | Price | Each | 5.00 | 5.50 | 6.20 |
| | Center to end | Inches | 31/32 | 31/32 | 1 3/32 |
| No. 306 | Price | Each | 6.00 | 7.50 | 9.50 |
| | Center to end | Inches | 31/32 | 1 1/16 | 1 3/32 |
| No. 307 | Price | Each | 7.00 | 8.70 | 11.00 |
| | Center to end | Inches | 1 1/16 | 1⅛ | 1 9/32 |

Spring loaded cocks have a steel spring between the plug and the cap. The spring compensates for wear, assures tightness between the body and plug, and permits easy operation.

*Iron Spring-Loaded Cocks....page 71*

# Brass Try Cocks

125-Pound
No. 730
(Short Pattern)



250-Pound
No. 734
With Stuffing Box

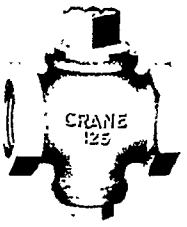
Crane manufactures a variety of brass try cocks suitable for services ranging from 15 pounds to 250 pounds steam working pressures. For complete description and list prices, see page 361.

*Wrenches....page 72*

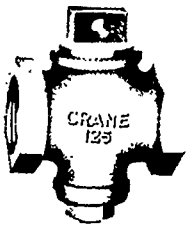
# 125-Pound Brass Cocks

125 pounds working pressure

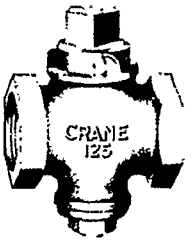
***Air Tested***



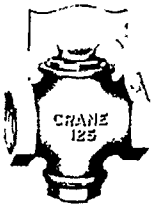

No. 250
Square Head



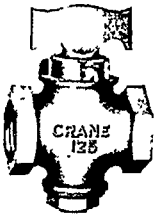

No. 252
Flat Head



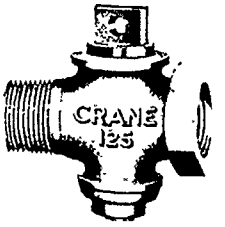

No. 254
Square Head
With Check



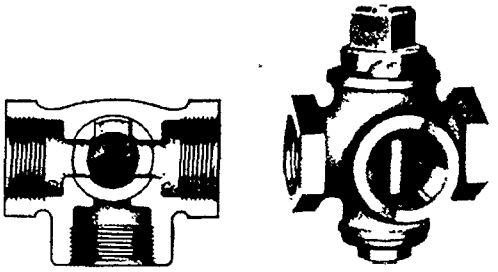

No. 256
Tee Head




No. 258
Tee Head
With Check

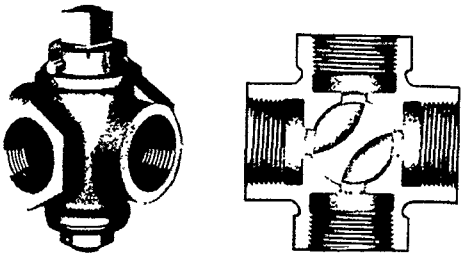



No. 266
Male and Female
Flat Head



No. 268
Square Head with Check
Three-Way

***No. 269 Four-Way Cocks are made to order only.***

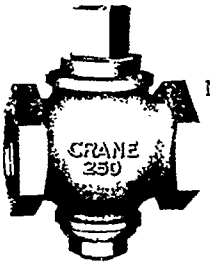


No. 269
Square Head with Check
Four-Way

### List Prices and Dimensions

| Size | | | Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Prices | | No. 250, Square Head | Each | | 2.00 | 2.30 | 3.00 | 3.90 | 5.40 | 7.00 | 9.30 | 15.00 |
| | | No. 252, Flat Head | Each | | 2.00 | 2.30 | 3.00 | 3.90 | 5.40 | 7.00 | 9.30 | 15.00 |
| | | No. 254, Square Head with Check | Each | | | | 3.60 | 4.60 | 6.30 | 8.40 | 10.80 | 17.00 |
| | | No. 256, Tee Head | Each | 2.00 | 2.00 | 2.30 | 3.00 | | | | | |
| | | No. 258, Tee Head with Check | Each | 2.30 | 2.30 | 2.70 | 3.60 | | | | | |
| | | No. 266, Flat Head, Male and Female | Each | | 2.30 | 2.60 | 3.50 | 4.40 | 6.00 | | | |
| | | No. 268, Three-Way, Square Head | Each | | 3.00 | 3.60 | 4.70 | 6.00 | 7.60 | 11.00 | 14.00 | 22.00 |
| | | No. 269, Four-Way, Square Head | Each | | | | 6.50 | 9.50 | 13.50 | 18.00 | 23.00 | 32.00 |
| Dimensions in Inches | End to end | No. 250, 252, 254, 256, or 258 | | 1 5/8 | 1 5/8 | 1 3/4 | 2 1/16 | 2 7/16 | 3 | 3 1/2 | 3 13/16 | 4 9/16 |
| | | No. 266 | | | 1 15/16 | 2 3/16 | 2 1/2 | 2 7/8 | 3 3/8 | | | |
| | Center to end | No. 268 | | | 7/8 | 31/32 | 1 1/4 | 1 17/32 | 1 5/8 | 2 | 2 3/16 | 2 19/32 |
| | | No. 269 | | | | | 1 1/4 | 1 17/32 | 1 5/8 | 2 | 2 3/16 | 2 19/32 |

# 250-Pound Bronze Cocks




No. 80 E
Square
Head

250 pounds working pressure

***Air Tested***

The body and plug are made of Crane Special Bronze, a leaded tin bronze having unusual strength and hardness.

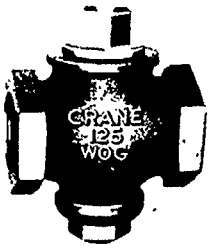
### List Prices and Dimensions

| Size | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| No. 80 E | Each | 3.00 | 4.00 | 5.50 | 7.40 | 11.00 | 16.00 | 23.00 | 33.00 |
| End to end | Inches | 1 3/4 | 2 | 2 3/8 | 2 11/16 | 3 5/16 | 4 | 4 1/2 | 5 1/4 |

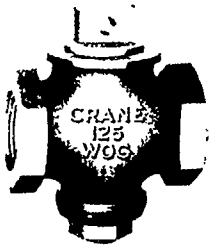
*Wrenches . . . page 72*

# 125-Pound W.O.G. Iron Cocks

WORKING PRESSURE
125 pounds cold water, oil, air, or gas, non-shock




Square Head
No. 320, All-Iron
No. 324
With Brass Plug and Washer

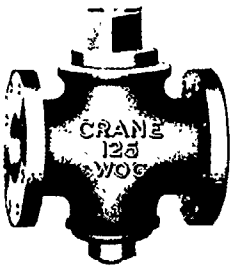



Flat Head
No. 320½, All-Iron
No. 324½

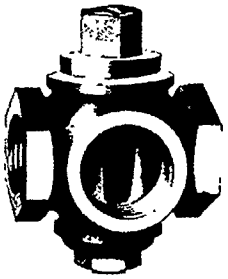
***Air Tested***

All of these Cocks are regularly fitted with an iron nut.

***When so ordered, these Cocks can be furnished with a check, at an extra price.***




Square Head
Flanged
No. 325, All-Iron



Three-Way, Square Head
No. 326, All-Iron
No. 330
With Brass Plug and Washer

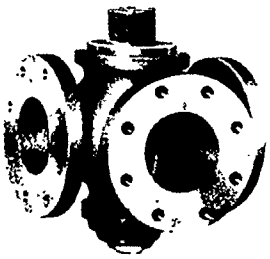
7

### List Prices, Black, and Dimensions, in Inches

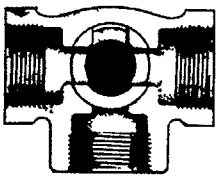
| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Screwed | No. 320 | Each | 2.50 | 2.90 | 3.30 | 4.30 | 5.30 | 7.00 | 16.00 | 26.00 | 43.00 |
| | No. 320½ | Each | 2.50 | 2.90 | 3.30 | 4.30 | 5.30 | 7.00 | | | |
| | No. 324 | Each | 3.60 | 4.30 | 5.20 | 7.00 | 10.00 | 13.50 | 28.00 | 43.00 | 75.00 |
| | No. 324½ | Each | 3.60 | 4.30 | 5.20 | 7.00 | 10.00 | 13.50 | | | |
| | No. 326 | Each | | 4.00 | 4.50 | 5.60 | 6.80 | 9.40 | 21.00 | 29.00 | 52.00 |
| | No. 330 | Each | | 5.50 | 6.50 | 8.50 | 12.00 | 16.00 | 31.00 | 47.00 | 85.00 |
| | End to end | | 2¼ | 2¾ | 3⅜ | 4⅛ | 4⅝ | 5¼ | 6⅜ | 7¾ | 9⅞ |
| | Ctr. to outlet end (3-way) | | 1 7/16 | 1 11/16 | 2 1/16 | | 2¼ | 2⅝ | 3 3/16 | 3⅞ | 5 1/16 |
| Flanged F. & D. | No. 325 | Each | | | | | | 16.00 | 24.00 | 32.00 | 51.00 |
| | No. 331 | Each | | | | | | 27.00 | 35.00 | 43.00 | 59.00 |
| | Face to face | | | | | | | 6⅜ | 8⅝ | 9⅝ | 12⅛ |
| | Center to face of side opening (3-way) | | | | | | | 4⅛ | 4 5/16 | 4 13/16 | 6 1/16 |
| | Diameter of flanges | | | | | | | 6 | 7 | 7½ | 9 |
| | Thickness of flanges | | | | | | | ⅝ | 11/16 | ¾ | 15/16 |

End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Prices include drilling to this Standard. No deduction is made if cocks are ordered faced only.

***Templates for drilling, page 459.***

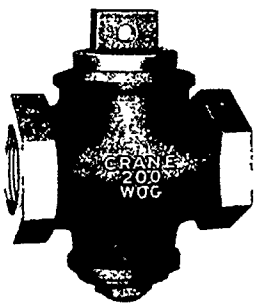


Three-Way, Square Head
No. 331, All-Iron Flanged



Cross Section Three-Way

# Iron Cocks




## 200-Pound W.O.G.

WORKING PRESSURE
200 pounds cold water, oil, air, or gas, non-shock

***Air Tested***

Flat Head
No. 334, All-Iron
No. 337
With Brass Plug and Washer

### List Prices, Black, and Dimensions

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| No. 334 | Each | 3.50 | 4.20 | 5.00 | 6.00 | 8.50 | 12.00 |
| No. 337 | Each | 4.60 | 6.00 | 7.50 | 10.30 | 14.00 | 18.00 |
| End to end | Inches | 3 | 3⅝ | 4 | 4¾ | 5⅜ | 6⅞ |

***Wrenches for Iron Cocks . . . . page 72***

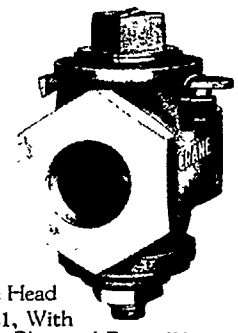
# Iron Lock Cocks

## Essex Pattern

WORKING PRESSURE
175 pounds cold water, oil, air, or gas, non-shock

***Air Tested***

Can be locked open or closed. One slotted opening in the body and two in the plug permit the hasp to be inserted in either position.

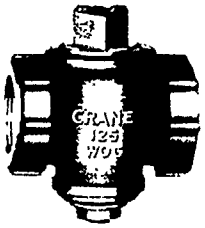



Square Head
No. 321, With
Iron Plug and Brass Washer

### List Prices, Black, and Dimensions

| Size | Inches | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| No. 321 | Each | 10.50 | 28.00 | 47.00 | Prices do not include lock. |
| End to end | Inches | 6¾ | 8⅝ | 10 | |
| Center to top | Inches | 4¼ | 5½ | 7¾ | |
| Center to bottom | Inches | 4⅝ | 6 | 6⅞ | |

# Iron Gas Line Cocks



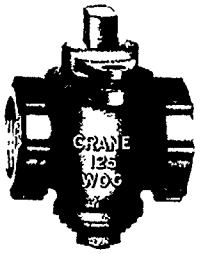

Square Head
No. 1228
With Brass Plug and Washer

WORKING PRESSURE
125 pounds cold water, oil, air, or gas, non-shock
***Air Tested***

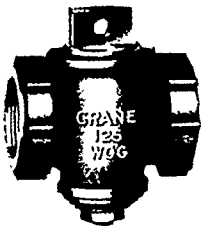
These sturdy, compact, full area cocks are especially suited for gas lines. They have a brass plug and washer, a cast iron body, and an iron nut.

All sizes of No. 1234 Cocks have a ½-inch hole for Lockup in which a padlock or sealing pin may be used.

No. 1236 Cocks, ideal for underground installations, have a ½-inch recess at each end, which protects the threads and assists in supporting the pipe.



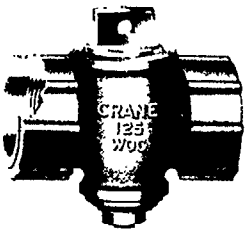

Flat Head, with Lockup
No. 1234
With Brass Plug and Washer




Flat Head
No. 1232
With Brass Plug and Washer

### List Prices, Each, and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 1228 | Black | | 2.00 | 2.30 | 2.80 | 3.70 | 5.40 | 8.00 |
| | Galv. | | 2.10 | 2.40 | 3.00 | 4.00 | 5.70 | 8.30 |
| No. 1232 | Black | | 2.00 | 2.30 | 2.80 | 3.70 | 5.40 | 8.00 |
| | Galv. | | 2.10 | 2.40 | 3.00 | 4.00 | 5.70 | 8.30 |
| No. 1234 | Black | | 2.30 | 2.70 | 3.30 | 4.30 | 6.20 | 9.00 |
| | Galv. | | 2.40 | 2.80 | 3.50 | 4.60 | 6.50 | 9.30 |
| End to end | | Inches | 2¼ | 2⅝ | 3¼ | 3¾ | 4¼ | 5 1/16 |
| No. 1236 | | Galv. | | 3.00 | 3.60 | 4.60 | | |
| End to end | | Inches | | 3⅝ | 4¼ | 4¾ | | |




Flat Head, with Recessed Ends
No. 1236
With Brass Plug and Washer

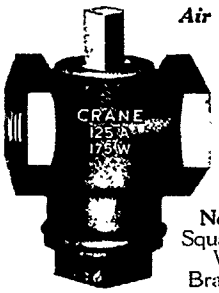
***When so ordered, the No. 1228 Cocks can be furnished with a check, at an additional price.***



# Iron Spring-Loaded Cocks

## Mine Cocks

WORKING PRESSURES
125 pounds air
175 pounds cold water, non-shock
***Air Tested***




No. 319
Square Head
With
Brass Plug

All-Iron Mine Cocks also are available; prices are furnished on application.

## Four-Way Cocks

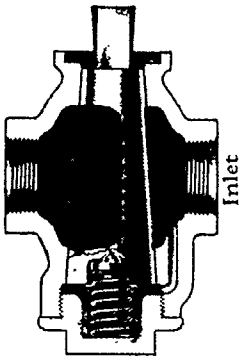
WORKING PRESSURES
250 pounds air
350 pounds cold water, non-shock
***Air Tested***

No. 339 Four-Way Cocks are used on hydraulic or air cylinders, hydraulic presses, etc. The diagrams below illustrate how they operate:

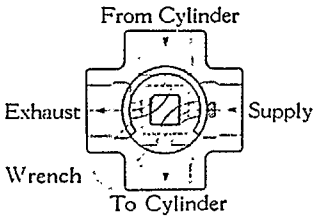
***Upper diagram:*** Supply fluid diverted to one end of cylinder; fluid from opposite end passes into exhaust line.

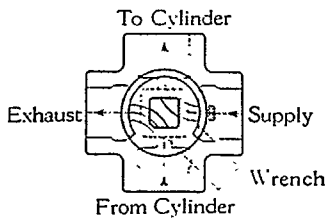
***Lower diagram:*** With wrench turned 90°, action is reversed, moving piston in opposite direction.

Installation must be as indicated. The cocks have an equalizing duct in the body which leads from the inlet port to the chamber beneath the plug. Use series "M" wrenches shown on page 72.




No. 339
Four-Way
Square Head
with
Brass Plug




### List Prices and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 319 | Price | Each | 5.10 | 5.50 | 6.00 | 8.00 | 10.50 | 15.00 |
| | End to end | Inches | 2¼ | 2⅝ | 3⅛ | 4 | 4¼ | 5⅛ |
| No. 339 | Price | Each | 8.50 | 9.70 | 14.00 | 22.00 | 32.00 | 48.00 |
| | Center to end | Inches | 1 5/16 | 1 9/16 | 1 15/16 | 2¼ | 2⅝ | 3½ |

Spring-loaded: Spring-Loaded Cocks have a steel spring between the plug and the cap. The spring compensates for wear, assures tightness between the body and plug, and permits easy operation.

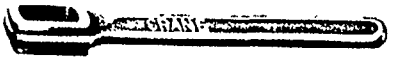
***Brass Spring-Loaded Cocks....page 68*** ***Wrenches for Cocks....page 72***

# Malleable Iron Wrenches

## For Brass, Bronze, and Iron Cocks

List Prices

Square Head


Flat Head

Square Head
For No. 319 and No. 339

7

### Square Head Wrenches

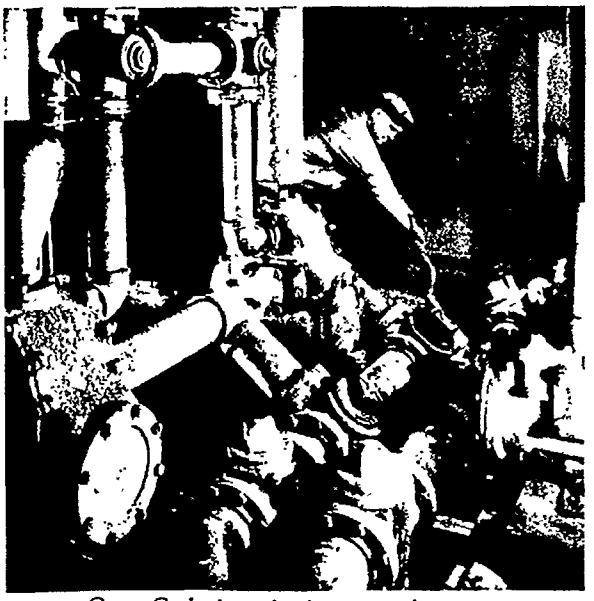
| Catalog Number of Wrench | List Price Each | Length from Center of Head to End Inches | Suitable for: Brass or Bronze Cocks: No. 80 E | Nos. 250, 254, 272 | Nos. 268, 269 | Nos. 305, 306 | No. 307 | Iron Cocks: Nos. 320, 321, 324, 325, 326, 330, 331 | No. 1228 |
|---|---|---|---|---|---|---|---|---|---|
| 1-S | .14 | 3 | ¼ | ¼ | ¼ | | | | |
| 2-S | .16 | 3½ | ⅜ | ⅜ | | ¼, ⅜, ½ | ¼, ⅜ | | |
| 3-S | .16 | 4 | | ½ | ⅜ | | ½ | | ½ |
| 4-S | .22 | 5 | ½ | ¾ | ½ | | | ½ | ¾ |
| 5-S | .28 | 6½ | ¾ | 1 | ¾ | | | ¾ | 1 |
| 6-S | .36 | 8 | 1 | 1¼ | 1 | | | | 1¼ |
| 6½-S | .42 | 7⅝ | | | | | | 1 | |
| 7-S | .54 | 9½ | 1¼ | 1½ | 1¼, 1½ | | | | 1½ |
| 7½-S | .68 | 8½ | | | | | | 1¼ | |
| 8-S | .80 | 12 | 1½ | 2 | 2 | | | 1½ | 2 |
| 9-S | 1.30 | 14½ | 2 | | | | | 2 | |
| 10-S | 2.00 | 17 | | | | | | 2½ | |
| 11-S | 2.70 | 22 | | | | | | 3 | |
| 12-S | 7.50 | 30 | | | | | | 4 | |

### Flat Head Wrenches

| Catalog Number of Wrench | List Price Each | Length from Center of Head to End Inches | Suitable for: Brass Cocks: Nos. 252, 266, 270, 284 | Iron Cocks: Nos. 320½, 324½, 334, 337 | Nos. 1232, 1234, 1236 |
|---|---|---|---|---|---|
| 1-F | .14 | 3 | ¼ | | |
| 2-F | .16 | 3½ | ⅜ | | |
| 3-F | .16 | 4 | ½ | | ½ |
| 4-F | .22 | 5 | ¾ | ½ | ¾ |
| 5-F | .28 | 6½ | 1 | ¾ | 1 |
| 6-F | .36 | 8 | 1¼ | 1 | 1¼ |
| 7-F | .54 | 9½ | 1½ | | 1½ |
| 8-F | .80 | 12 | 2 | | 2 |
| 23-F | .74 | 9¾ | | 1¼ | |
| 24-F | .94 | 10½ | | 1½ | |
| 25-F | 1.30 | 12½ | | 2 | |

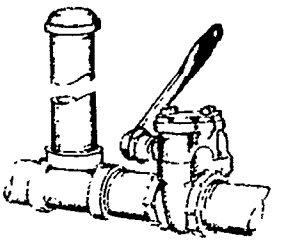
### Square Head Wrenches
(For Nos. 319 and 339 Cocks Only)

| Catalog Number of Wrench | List Price Each | Length from Center of Head to End Inches | Suitable for: No. 319 Iron Cock | No. 339 Iron Cock |
|---|---|---|---|---|
| 1-M | .50 | 5½ | ½ | |
| 2-M | .60 | 8 | ¾, 1 | ½, ¾ |
| 3-M | .70 | 11 | 1¼, 1½ | |
| 4-M | .90 | 11 | | 1 |
| 5-M | 1.20 | 14 | 2 | 1¼, 1½ |
| 6-M | 2.40 | 18 | | 2 |


Crane Cocks in an intricate pumping system.

***Shock on Liquid Lines!***

When a quick-opening valve in a liquid line is suddenly closed, thereby instantly stopping the flow, a momentary but very high pressure builds up in the line. This pressure, called "water hammer" or "shock", can do serious damage to the piping. To protect the system, install an air cushioning-chamber—an assembly of a tee, a length of pipe, and a cap—just ahead of the quick-opening valve, or use a shock absorber especially designed for this purpose.



[redacted] Body
[redacted] Gate Valves;
[redacted] Gate Valves

# Iron Body Wedge Gate Valves

Clamp Gate Valves.....pages 74 and 75

Wedge Gate Valves
- 25-Pound.....page 76
- 125-Pound.....pages 77 to 81
- 250-Pound.....pages 82 and 83
- Underwriters' Pattern.....page 80
- Quick-Opening Type.....page 80

Accessories
- By-Passes.....page 84
- Cleanouts.....page 84
- Indicators.....page 84
- Gearing.....page 85

Dimensions
- Valves with Gearing or By-Pass.....page 86

***For Valves for Marine service, see pages 400 and 405.***
***For Alloy Cast Iron Valves for Process Industries, see page 385.***

8

Crane offers the user an unusually complete line of Iron Body Wedge Gate Valves. The line includes valves for steam pressures up to 250 pounds and for water, oil, or gas pressures up to 500 pounds. It includes brass trimmed valves in all pressure classes, all-iron valves in all pressure classes except the 25-Pound, Valves with "18-8 Mo" trimmings (see Alloy Cast Iron Valves, page 385), Ni-Resist Valves (see page 384) and Valves for Marine service (see page 405).

The Crane high standard of quality in design, materials, and workmanship is maintained in these valves, assuring the user satisfactory and long-time service.

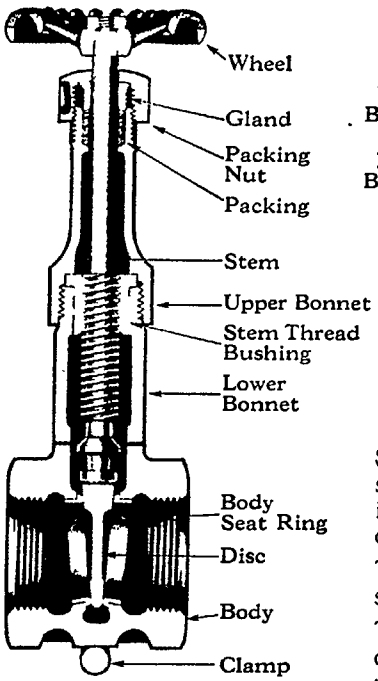
An overhead installation of Crane Iron Body Clamp Gate Valves.

Crane Clamp Gate Valves, compact and sturdy, have an especially wide acceptance among process industries, and in oil field or oil refinery installations

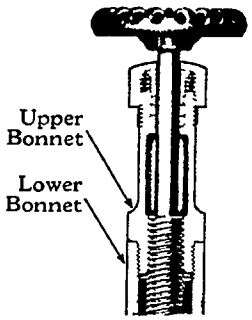
# Clamp Gate Valves

## Wedge Disc

### Brass Trimmed




Brass Trimmed
Inside Screw Valves
Sizes 1¼ to 4-inch




Brass Trimmed
Inside Screw Valves
Sizes ¼ to 1-inch
*(¼ to ½-inch sizes do not have a gland.)*

WORKING PRESSURES

| Size Inches | Saturated steam | Cold water, oil, or gas, non-shock |
|---|---|---|
| **Screwed Valves** | | |
| ¼ to 2 | 150 pounds | 225 pounds |
| 2½ to 4 | 125 pounds | 175 pounds |
| **Flanged Valves** | | |
| 1 to 2 | 125 pounds | 200 pounds |
| 2½ to 4 | 125 pounds | 175 pounds |

Air Tested

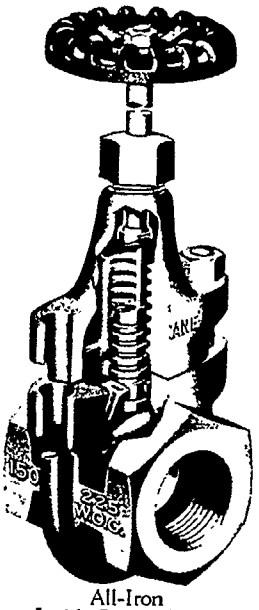
***For list prices and dimensions, see page 75.***

**Service recommendations:** These valves are suited for a wide variety of service in process industries, in oil fields or refineries, and wherever compact, sturdy valves are needed.

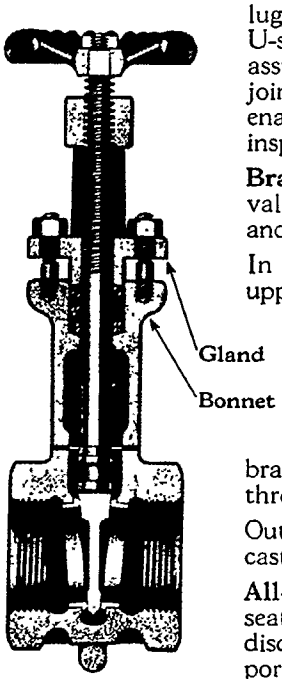
The brass trimmed valves are recommended for steam, water, air, or non-corrosive oil lines.

The all-iron valves are recommended for oil, gas, or gasoline, or for fluids that corrode brass but not iron or steel. For special corrosive services, all-iron valves can be made with a malleable iron disc; prices are furnished on application.

### All-Iron



All-Iron
Inside Screw Valves
Illustration shows partially sectioned All-Iron Inside Screw Valve, featuring free-draining bonnet. Bonnet has no flats or pockets to trap fluid.




Brass Trimmed
Outside Screw
and Yoke Valves
All Sizes

**Construction:** All valves are made with lugs on both the body and bonnet. A U-shaped clamp passes through these lugs assuring a snug, accurately aligned bonnet joint. In addition, the clamp construction enables quick dismantling of the valve for inspection, cleaning, or repairs.

**Brass trimmed valves:** Brass trimmed valves have brass body seat rings, disc, and stem.

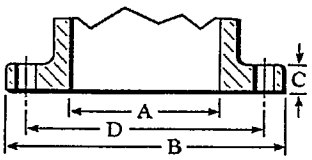
In inside screw valves ¼ to 1-inch, the upper portion of the bonnet engages the stem threads; it is made of brass and is renewable. Sizes 1¼-inch and larger have a brass renewable stem thread bushing in the bonnet. This construction provides a full stem thread engagement, brass-to-brass, and assures long life of the stem threads.

Outside screw and yoke valves have a cast iron bolted gland.

**All-iron valves:** All-iron valves have seats cast integral with the body. The disc is forged steel. The stem is steel; the portion coming in contact with the stuffing box packing is nickel-plated.

All-Iron Inside Screw Valves have a one-piece free-draining bonnet with an interrupted thread for engagement with the stem. This construction, shown at the upper right, permits free passage on either side of the stem from the upper part of the bonnet, preventing the entrapment of line fluids. The interrupted threads have a wiping action on the stem, preventing sticking in heavy fluid service.

**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced with a smooth finish.




Dimensions of Flanges, in Inches

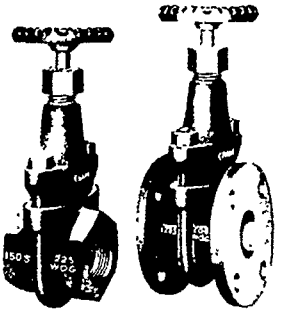
| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 1 | 1 | 4¼ | 7/16 | 3⅛ | 4 | ½ |
| 1¼ | 1¼ | 4⅝ | ½ | 3½ | 4 | ½ |
| 1½ | 1½ | 5 | 9/16 | 3⅞ | 4 | ½ |
| 2 | 2 | 6 | ⅝ | 4¾ | 4 | ⅝ |
| 2½ | 2½ | 7 | 11/16 | 5½ | 4 | ⅝ |
| 3 | 3 | 7½ | ¾ | 6 | 4 | ⅝ |
| 4 | 4 | 9 | 15/16 | 7½ | 8 | ⅝ |

8

# Clamp Gate Valves

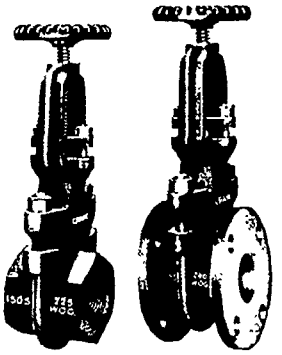
## Wedge Disc — Brass Trimmed or All-Iron

### Inside Screw Rising Stem



All-Iron
No. 488 Screwed — No. 488½ Flanged

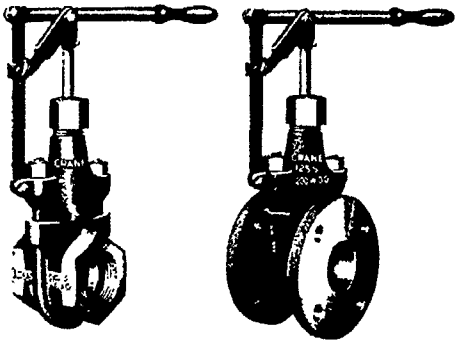
### Outside Screw and Yoke



All-Iron
No. 484½ Screwed — No. 485½ Flanged

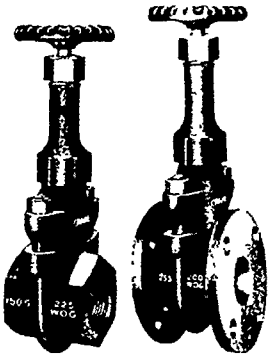
Iron Body, Brass Trimmed
No. 486½ Screwed — No. 487½ Flanged

### Quick-Opening



All-Iron
No. 492 Screwed — No. 492½ Flanged

Iron Body, Brass Trimmed
No. 494 Screwed — No. 494½ Flanged



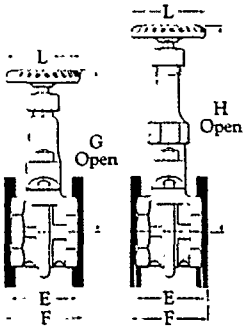
Iron Body
Brass Trimmed
No. 490 Screwed — No. 490½ Flanged

### List Prices, Each

| Size | Inside Screw, Rising Stem | | | | Outside Screw and Yoke | | | | Quick-Opening | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screwed | | Flanged, F. & D. | | Screwed | | Flanged, F. & D. | | Screwed | | Flanged, F. & D. | |
| Inches | No. 488 | No. 490 | No. 488½ | No. 490½ | No. 484½ | No. 486½ | No. 485½ | No. 487½ | No. 492 | No. 494 | No. 492½ | No. 494½ |
| ¼ | 6.70 | 7.00 | | | | | | | | | | |
| ⅜ | 6.70 | 7.00 | | | | | | | | | | |
| ½ | 7.00 | 7.40 | | | 11.60 | 12.00 | | | 13.30 | 13.70 | | |
| ¾ | 7.30 | 7.90 | | | 12.00 | 12.60 | | | 14.20 | 14.80 | | |
| 1 | 7.60 | 9.10 | 12.60 | | 12.50 | 14.00 | 17.50 | | 15.00 | 16.50 | | |
| 1¼ | 8.40 | 10.60 | 13.80 | | 13.40 | 15.60 | 18.80 | | 16.00 | 18.20 | | |
| 1½ | 9.40 | 12.20 | 16.00 | 18.70 | 15.50 | 18.40 | 22.00 | 25.00 | 17.50 | 20.50 | | |
| 2 | 12.20 | 15.80 | 19.50 | 23.00 | 18.80 | 22.50 | 26.00 | 29.50 | 21.00 | 25.00 | 28.50 | 32.00 |
| 2½ | 18.20 | 25.00 | 25.50 | 32.50 | 25.00 | 32.00 | 33.00 | 39.50 | 28.00 | 35.00 | 35.50 | 42.00 |
| 3 | 25.00 | 35.00 | 32.50 | 42.50 | 32.00 | 42.00 | 40.00 | 50.00 | 35.00 | 45.00 | 42.50 | 52.50 |
| 4 | 56.00 | 71.50 | 64.50 | 80.00 | 64.00 | 80.00 | 72.50 | 88.00 | 67.00 | 82.50 | 75.50 | 91.00 |

**Drilling:** List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made for valves ordered faced only.

**Shock:** Quick-Opening Valves used in liquid lines should be installed with a suitable cushioning device to protect against water hammer; see page 11.

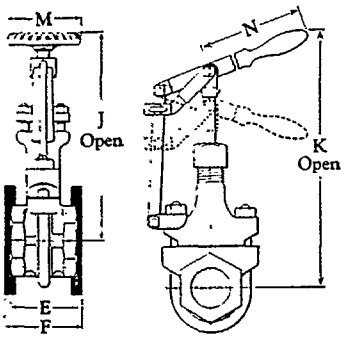



No. 488 — No. 490
No. 488½ — No. 490½
Inside Screw, Rising Stem

### Dimensions, in Inches

| Size | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|
| ¼ | 1⅞ | | 49/16 | 4⅞ | | | 1¾ | | |
| ⅜ | 2 | | 49/16 | 4⅞ | | | 1¾ | | |
| ½ | 2 1/16 | | 5 5/16 | 6¼ | 6⅝ | 7 7/16 | 2 1/16 | 2 9/16 | 6 |
| ¾ | 2 5/16 | | 6¼ | 7½ | 7½ | 8¾ | 2 9/16 | 2 9/16 | 7 |
| 1 | 2 9/16 | 3 3/16 | 7⅜ | 8½ | 9⅛ | 9⅛ | 2¾ | 2¾ | 7 |
| 1¼ | 2⅞ | 3½ | 9 | 10⅛ | 10⅛ | 12 | 3 1/16 | 3 1/16 | 7 |
| 1½ | 3⅛ | 3¾ | 9 9/16 | 11¼ | 12¼ | 13¼ | 3⅝ | 3⅝ | 9 |
| 2 | 3⅝ | 4¼ | 11¾ | 13½ | 14¼ | 15¾ | 4 1/16 | 4 1/16 | 9 |
| 2½ | 4⅛ | 4 15/16 | 13 | 15¾ | 16¼ | 18 | 4¾ | 4¾ | 10⅞ |
| 3 | 4 9/16 | 5 1/16 | 15⅛ | 18¼ | 18⅞ | 21 11/16 | 5⅜ | 5⅜ | 10⅞ |
| 4 | 5 9/16 | 6¾ | 19¾ | 24⅛ | 24 | 24⅞ | 9 | 9 | 14¾ |

Dimensions "E" (end to end) and "F" (face to face) apply also to Quick-Opening Valves.




Outside Screw and Yoke — Quick-Opening

*Templates for drilling . . . . page 459*

*For working pressures and description, see the preceding page*

*Thread engagement . . . . page 494*

# 25-Pound Iron Body Wedge Gate Valves

## Brass Trimmed

Non-Rising Stem Flanged — No. 491 Brass Stem

Outside Screw and Yoke Flanged — No. 493, Steel Stem; No. 496, Brass Stem

RATINGS IN POUNDS PER SQUARE INCH

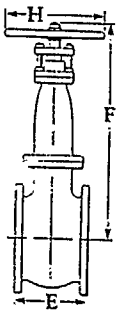
| Size of valve | Working Pressures: Saturated steam | Cold water, non-shock | Cold gas | Hydrostatic: Shell test | Seat test |
|---|---|---|---|---|---|
| 12 to 24-inch | 25 | 50 | 25 | 75 | 65 |
| 30 and 36-inch | 25 | 43 | 25 | 75 | 55 |

### List Prices and Dimensions

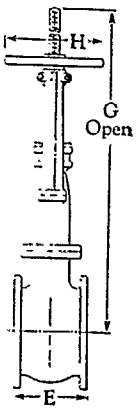
| Size Inches | List Prices, Each Faced and Drilled: Non-Rising Stem No. 491 | Outside Screw and Yoke No. 493 or No. 496 | Dimensions, in Inches: E | F | G | H | No. of turns to open |
|---|---|---|---|---|---|---|---|
| 12 | 300.00 | 360.00 | 11 | 32¾ | 59 | 16 | 25 |
| 14 | 358.00 | 452.00 | 13½ | 37¾ | 64½ | 16 | 29 |
| 16 | 537.00 | 650.00 | 14 | 42½ | 71½ | 18 | 33 |
| 18 | 805.00 | 950.00 | 14½ | 46 | 79¼ | 18 | 37 |
| 20 | 1095.00 | 1265.00 | 15½ | 50½ | 88 | 20 | 41½ |
| *24 | 1976.00 | 2170.00 | 17 | 60 | 106 | 22 | 49½ |
| *30 | 3380.00 | 3725.00 | 21 | 70 | 127¾ | 24 | 62 |
| *36 | 4920.00 | 5400.00 | 24 | 82 | 150½ | 30 | 74 |

*Should have by-pass, see page 84. For dimensions, see page 86.

***Larger sizes, 42 to 72-inch, can be made to order. Prices and dimensions furnished on application.***




Non-Rising Stem




Outside Screw and Yoke

8

25-Pound Iron Body Wedge Gate Valves are especially suited for exhaust and low pressure saturated steam, and for gas or water lines. They are well proportioned; sizes 24-inch and smaller have straight through ports.

**Brass trimmed:** The body seat rings and the disc faces are brass. Body seat rings are screwed in on sizes 24-inch and smaller and rolled in on 30 and 36-inch sizes; disc faces are rolled into the disc on all sizes.

Non-rising stem valves have a Cast Manganese Bronze stem; the disc is brass-bushed where it engages the stem threads.

Outside screw and yoke valves have a brass stem or a steel stem, as ordered. On steel stems, that portion which comes in contact with the stuffing box packing is nickel plated.

**Stuffing box:** The stuffing box is filled with high grade packing and is equipped with a two-piece ball-type gland and gland flange; the gland is made of Ihrigized steel. The valves can be repacked when wide open and under pressure.

**By-passes:** Sizes 24-inch and larger should have a by-pass to enable equalizing the pressure on both sides of the disc before opening the main valve. See page 84 for description and page 86 for dimensions.

**Gearing:** See page 85 for description and page 86 for dimensions.

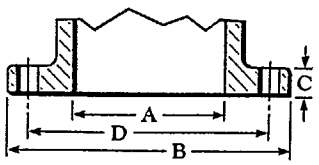
**Vacuum service:** When valves for vacuum exhaust lines are desired, orders must specify. Such valves are especially air-tested to assure absolute tightness. An extra charge is made for air-testing.

**Hub end valves:** When 25-Pound Hub End Valves are required, use the Double Disc Gate Valves described on page 90.

**Flange dimensions, facing, and drilling:** The dimensions and drilling of the end flanges conform to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931).

When so ordered, the end flanges can be drilled to the American Standard, Class 125. A full face gasket should be used.

List prices include facing and drilling to the 25-Pound American Tentative Cast Iron Flange Standard. No deduction is made if valves are ordered faced only.




Dimensions of Flanges, in Inches

| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 12 | 12 | 19 | 1 | 17 | 12 | ⅝ |
| 14 | 14 | 21 | 1⅛ | 18¾ | 12 | ¾ |
| 16 | 16 | 23½ | 1⅛ | 21¼ | 16 | ¾ |
| 18 | 18 | 25 | 1¼ | 22¾ | 16 | ¾ |
| 20 | 20 | 27½ | 1¼ | 25 | 20 | ¾ |
| 24 | 24 | 32 | 1⅜ | 29½ | 20 | ¾ |
| 30 | 30 | 38¾ | 1½ | 36 | 28 | ⅞ |
| 36 | 36 | 46 | 1⅝ | 42¾ | 32 | ⅞ |

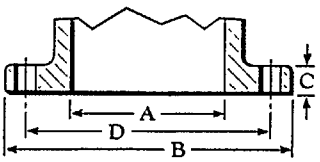
***Bottom outlet valves are made to order.***

***Motor or cylinder operation . . . pages 124 to 129*** ***Templates for drilling . . . . page 459***

# 125-Pound Iron Body Wedge Gate Valves

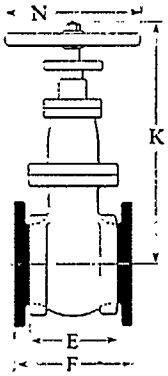
## Dimensions, in Inches

*For general description of 125-Pound Valves, see pages 77 to 80.*

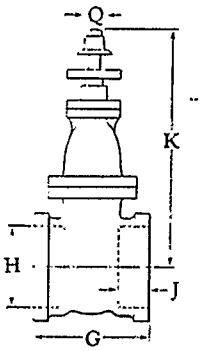



**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948).

The flanges are plain faced, with a smooth finish.

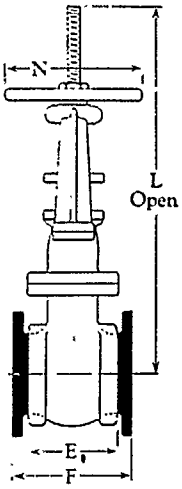



Screwed or Flanged



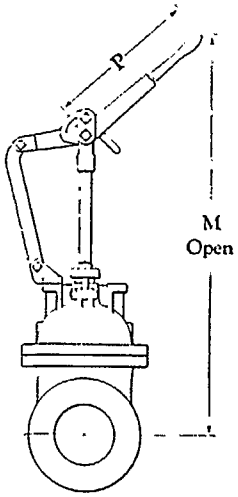

Hub Ends

Non-Rising Stem Valves Without By-Pass




Screwed or Flanged

O.S. & Y. Valves Without By-Pass




Quick-Opening Valve

Dimensions "E" and "F" apply also to Quick-Opening Valves

| Size | Flanges A | B | C | D | Bolts No. | Bolts Dia. | E | F | G | H | J | K | L | M | N | P | Q | No. of turns to open |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 6 | 5/8 | 4 3/4 | 4 | 5/8 | 6 1/8 | 7 | 8 3/4 | 3.25 | 2.75 | 12 7/8 | 14 3/4 | | 8 | | 2 | 7 |
| 2 1/2 | 2 1/2 | 7 | 11/16 | 5 1/2 | 4 | 5/8 | 6 1/2 | 7 1/2 | | | | 13 3/4 | 17 | | 8 | | | 8 1/2 |
| 3 | 3 | 7 1/2 | 3/4 | 6 | 4 | 5/8 | 6 3/4 | 8 | 9 1/4 | 4.66 | 2.75 | 15 1/2 | 19 1/2 | 27 5/8 | 9 | 12 | 2 | 10 1/2 |
| 3 1/2 | 3 1/2 | 8 1/2 | 13/16 | 7 | 8 | 5/8 | 7 3/8 | 8 1/2 | | | | 16 1/2 | 21 1/4 | | 9 | | | 12 |
| 4 | 4 | 9 | 15/16 | 7 1/2 | 8 | 5/8 | 7 5/8 | 9 | 10 3/8 | 5.70 | 3.00 | 18 5/8 | 23 3/4 | 35 1/8 | 10 | 15 1/2 | 2 | 9 |
| 5 | 5 | 10 | 15/16 | 8 1/2 | 8 | 3/4 | 8 1/2 | 10 | | | | 21 3/8 | 28 3/4 | 40 | 12 | 23 | | 11 |
| 6 | 6 | 11 | 1 | 9 1/2 | 8 | 3/4 | 8 7/8 | 10 1/2 | 11 1/4 | 7.80 | 3.00 | 23 1/8 | 32 5/8 | 45 7/8 | 12 | 23 | 2 | 13 |
| 8 | 8 | 13 1/2 | 1 1/8 | 11 3/4 | 8 | 3/4 | 10 1/4 | 11 1/2 | 13 | 10.00 | 3.50 | 27 1/2 | 41 7/8 | 59 1/8 | 16 | 29 | 2 | 17 |
| 10 | 10 | 16 | 1 3/16 | 14 1/4 | 12 | 7/8 | | 13 | 13 3/4 | 12.10 | 3.50 | 33 | 50 1/2 | 76 1/8 | 20 | 41 | 2 | 21 |
| 12 | 12 | 19 | 1 1/4 | 17 | 12 | 7/8 | | 14 | 14 1/2 | 14.20 | 3.50 | 36 1/2 | 58 | 83 1/4 | 20 | 41 | 2 | 25 1/2 |
| 14 | 14 | 21 | 1 3/8 | 18 3/4 | 12 | 1 | | 15 | | | | 39 1/4 | 67 3/4 | | 20 | | | 30 |
| 16 | 16 | 23 1/2 | 1 7/16 | 21 1/4 | 16 | 1 | | 16 | | | | 48 1/4 | 75 1/2 | | 22 | | | 34 |
| 18 | 18 | 25 | 1 9/16 | 22 3/4 | 16 | 1 1/8 | | 17 | | | | 48 3/4 | 83 1/2 | | 24 | | | 38 |
| 20 | 20 | 27 1/2 | 1 11/16 | 25 | 20 | 1 1/8 | | 18 | | | | 52 1/2 | 91 1/4 | | 24 | | | 42 1/4 |
| 24 | 24 | 32 | 1 7/8 | 29 1/2 | 20 | 1 1/4 | | 20 | | | | 63 1/2 | 109 | | 30 | | | 50 |
| 30 | 30 | 38 3/4 | 2 1/8 | 36 | 28 | 1 1/4 | | 24 | | | | 75 1/2 | [illegible] | | 36 | | | 95 |
| 36 | 36 | 46 | 2 3/8 | 42 3/4 | 32 | 1 1/2 | | 28 | | | | 92 | 160 | | 42 | | | |
| 42 | 42 | 53 | 2 5/8 | 49 1/2 | 36 | 1 1/2 | | 33 | | | | 106 | 191 | | 42 | | | |
| 48 | 48 | 59 1/2 | 2 3/4 | 56 | 44 | 1 1/2 | | 36 | | | | 114 | 209 | | 42 | | | |

**Face to face:** The face to face dimensions of flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949. This Standard includes sizes 2, 2½, 3, 4, 6, 8, 10, and 12-inch.

Flanged valves also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 125-Pound Cast Iron Wedge Gate Valves. This Standard includes sizes 2 to 24-inch inclusive.

**By-passes and gearing:** Sizes 14-inch and larger should have a by-pass to enable equalizing the pressure on both sides of the main valve before opening.

To facilitate operation, valves 24-inch and larger should be equipped with gears. For dimensions of valves equipped with by-pass or gearing, see page 86.

**Bevel geared valves with by-pass:** Bevel geared valves with by-pass have the by-pass on the bottom, with the stem of the by-pass valve parallel to the pinion shaft; see page 84 for illustration.

**Hub dimensions:** Hub ends fit Class "A", "B", "C", or "D" cast iron pipe. For hub end valves used with Transite pipe, see pages 78 and 80.

*List prices . . . pages 79 and 80* *Thread engagement . . . . page 494* *Templates for drilling . . . page 459*

# 250-Pound Ferrosteel Wedge Gate Valves

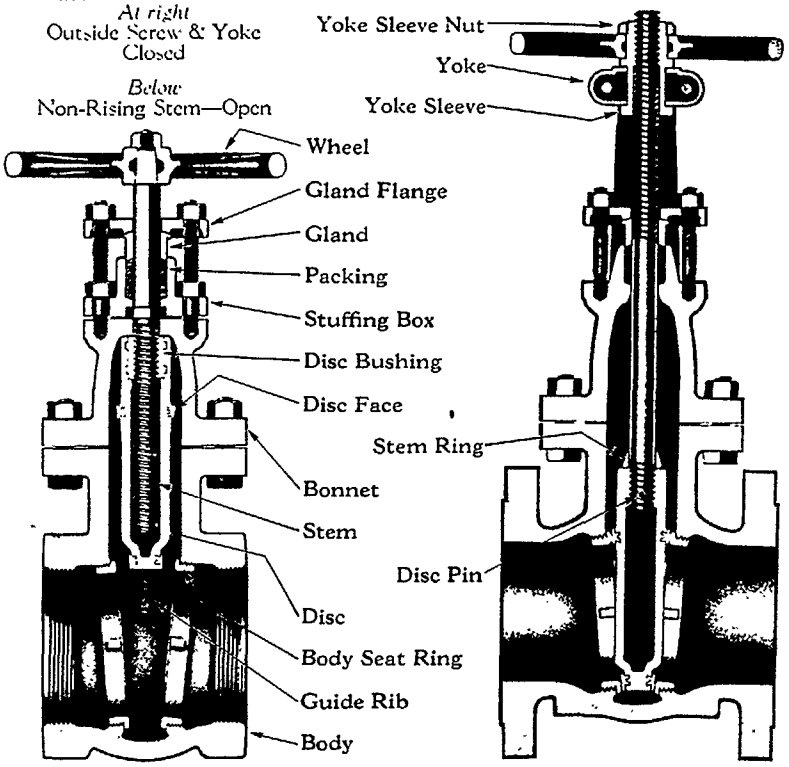
## Brass Trimmed or All-Iron

WORKING PRESSURES
250 pounds steam, 450° F.
500 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES
1000-pound shell test
550-pound seat test

Brass Trimmed Valves
*At right*
Outside Screw & Yoke
Closed

*Below*
Non-Rising Stem—Open




Crane 250-Pound Ferrosteel Wedge Gate Valves are admirably suited for a wide variety of service conditions requiring the use of rugged, substantially constructed valves. They will give excellent results on steam lines where the pressure and temperature do not require the use of steel valves, on high pressure cold water lines, on natural gas lines, oil pipe lines, etc

8

**Body and bonnet:** The body and bonnet are made of Crane Ferrosteel, a high grade iron, approximately 35 per cent stronger than cast iron. Metal sections are more than ample, and the metal is distributed to provide maximum strength.

**Wedge disc:** The disc is a single casting with tapered faces. Two ribs cast in opposite sides of the body engage machined slots in the disc. They guide the disc, and prevent contact between the seating surfaces until the valve is practically closed. In brass trimmed valves, the faces are securely rolled into machined dovetails in the disc, assuring tightness under pressure.

**Brass trimmed valves:** Brass trimmed valves are recommended for steam, water, or oil, or for other fluids that do not corrode brass or iron. The screwed-in body seat rings are made of Crane Special Bronze, a leaded tin bronze of high strength and hardness. The disc is Crane Special Bronze in the 2-inch size and cast iron faced with Crane Special Bronze in larger sizes.

The stem in non-rising stem valves is Cast Manganese Bronze; the disc is brass-bushed where it engages the stem threads, except on 2-inch valves which have a solid Crane Special Bronze disc.

Outside screw and yoke valves have a brass or a steel stem. The brass stem serves as a safeguard against corrosion.

**All-iron valves:** All-iron valves are recommended for gas or oil service, or for fluids that corrode brass but not iron. They have seats cast integral with the body and disc. Valves with screwed-in body seat rings can be supplied when ordered; prices on application. The stem is steel, the portion in contact with the packing being nickel plated.

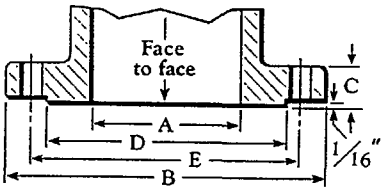
**Stuffing box:** The stuffing box has high grade packing. The valves, when wide open, can be repacked while under pressure.

**Gland:** A two-piece gland, consisting of a gland flange and a gland, prevents binding on the valve stem and assures an even load on the packing. The gland flange is made of steel or malleable iron. The gland is made of Ihrigized steel.

**Wheels:** Wheels are made of malleable iron to assure maximum strength. Their oval-shaped rim assures an easy grip.

**Flange dimensions and facing:** Dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944).

End flanges have a 1/16-inch raised face. The raised face is finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish.



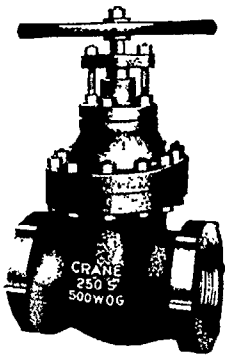

Dimensions of Flanges, in Inches

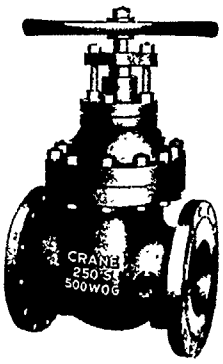
| Size | A | B | C | D | E | Bolts No. | Bolts Dia. |
|---|---|---|---|---|---|---|---|
| 2 | 2 | 6½ | ⅞ | 4 3/16 | 5 | 8 | ⅝ |
| 2½ | 2½ | 7½ | 1 | 4 15/16 | 5⅞ | 8 | ¾ |
| 3 | 3 | 8¼ | 1⅛ | 5 11/16 | 6⅝ | 8 | ¾ |
| 3½ | 3½ | 9 | 1 3/16 | 6 5/16 | 7¼ | 8 | ¾ |
| 4 | 4 | 10 | 1¼ | 6 15/16 | 7⅞ | 8 | ¾ |
| 5 | 5 | 11 | 1⅜ | 8 5/16 | 9¼ | 8 | ¾ |
| 6 | 6 | 12½ | 1 7/16 | 9 11/16 | 10⅝ | 12 | ¾ |
| 8 | 8 | 15 | 1⅝ | 11 15/16 | 13 | 12 | ⅞ |
| 10 | 10 | 17½ | 1⅞ | 14 1/16 | 15¼ | 16 | 1 |
| 12 | 12 | 20½ | 2 | 16 7/16 | 17¾ | 16 | 1⅛ |

# 250-Pound Ferrosteel Wedge Gate Valves

## Brass Trimmed or All-Iron

### Non-Rising Stem

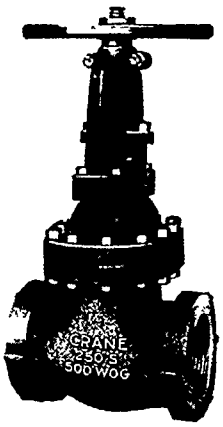


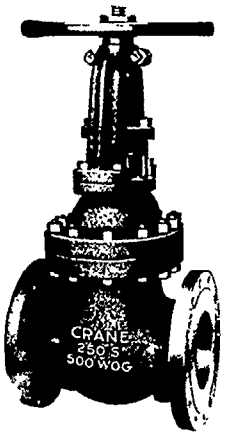




No. 2 E, Screwed No. 3 E, Flanged
Crane Special Bronze Seats
Brass Stem

*For working pressures and description, see the preceding page.*

### Outside Screw and Yoke




No. 6 E, Screwed No. 7 E, Flanged
Crane Special Bronze Seats
Steel Stem

No. 6½ E, Screwed No. 7½ E, Flanged
Crane Special Bronze Seats
Brass Stem

No. 14 E, Flanged
All-Iron

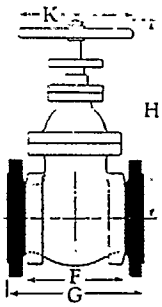
8

### List Prices, Each

| Size | Non-Rising Stem | | Outside Screw and Yoke | | | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. 2 E | No. 3 E | No. 6 E or No. 6½ E | No. 7 E or No. 7½ E | No. 14 E All-Iron | | | | | | | |
| Inches | Screwed | Flanged F. & D. | Screwed | Flanged F. & D. | Flanged F. & D. | F | G | H | J | K | L | Turns to open |
| 2 | 60.00 | 65.00 | 70.00 | 75.00 | 75.00 | 7 | 8½ | 11 | 14½ | 8 | 8 | 15 |
| 2½ | 76.00 | 82.00 | 87.00 | 93.00 | 93.00 | 8 | 9½ | 13¼ | 17½ | 9 | 9 | 15½ |
| 3 | 94.00 | 102.00 | 106.00 | 114.00 | 114.00 | 9 | 11⅛ | 14¾ | 20½ | 10 | 10 | 14 |
| 3½ | | 115.00 | | 136.00 | | | 11⅞ | 15½ | 22 | 10 | 10 | 16½ |
| 4 | 118.00 | 133.00 | 142.00 | 157.00 | 157.00 | 11 | 12 | 17½ | 24¾ | 12 | 12 | 18½ |
| 5 | | 174.00 | | 208.00 | 208.00 | | 15 | 20¼ | 29¾ | 14 | 14 | 23 |
| *6 | | 225.00 | | 260.00 | 260.00 | | 15⅞ | 23 | 34½ | 16 | 16 | 27 |
| *8 | | 403.00 | | 470.00 | 470.00 | | 16½ | 30¾ | 42¾ | 20 | 20 | 35 |
| *10 | | 542.00 | | 630.00 | 630.00 | | 18 | 36 | 52¾ | 22 | 22 | 38 |
| *12 | | 775.00 | | 900.00 | 900.00 | | 19¾ | 39¾ | 60 | 24 | 24 | 46 |

*Sizes 6-inch and larger should have a by-pass; see page 84 for description and page 86 for dimensions.

**By-passes:** A by-pass is recommended on 250-Pound Valves sizes 6-inch and larger. See page 84 for description and page 86 for dimensions.




Non-Rising Stem
Screwed or Flanged

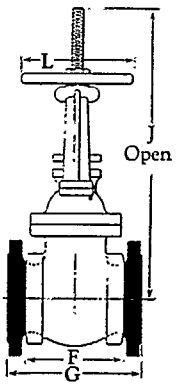
**Motor or cylinder operation:** Valves used for emergency purposes or installed in inaccessible locations should preferably be equipped with some easy means of operation, such as an electric or air motor drive or an operating cylinder. See pages 124 to 129.

**Gearing:** To facilitate operation, the larger size valves should be equipped with gears. See page 85 for description and page 86 for dimensions.

**Standards:** Flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949. The Standard does not include sizes 3½ and 5-inch.

Flanged valves also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939) for 250-Lb. Cast Iron Flanged Wedge Gate Valves.

**Drilling:** End flanges are faced and drilled to the American Standard, Class 250; no deduction for "faced only" valves.




Outside Screw
and Yoke
Screwed or Flanged

*Templates for drilling....page 460*

*Thread engagement....page 494*

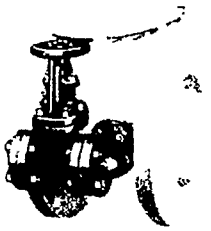
# Accessories for Iron Wedge Gate Valves

## By-Passes

### For Water Service

**By-Pass on Non-Rising Stem Gate Valve**

Non-Rising Stem Gate Valve Used in By-Pass



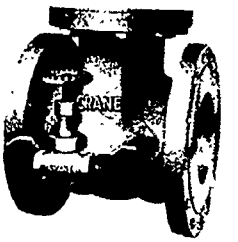
**By-Pass on Outside Screw & Yoke Gate Valve**

Outside Screw and Yoke Gate Valve Used in By-Pass

*For dimensions, see page 86.*

When so ordered, larger size Crane Flanged End and Hub End Iron Body Wedge Gate Valves can be furnished with a by-pass. A by-pass facilitates operation of the main valve by enabling equalization of the pressure on both sides of the disc, and in the case of steam service, permits slow warming up of the outlet side before opening the larger main valve.

### For Steam Service



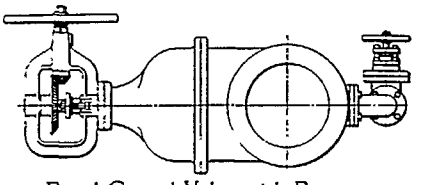
**By-Pass on Non-Rising Stem or Outside Screw & Yoke Gate Valve**

Globe Valve Used in By-Pass

8

25-Pound and 125-Pound Valves can be supplied with a large size by-pass, suitable for water (or oil or gas) service. The valve in the by-pass is a gate valve. It is of the non-rising stem construction when the main valve is non-rising stem, and outside screw and yoke construction, when the main valve is outside screw and yoke.

Unless otherwise ordered, on regular wheel operated and spur geared valves the by-pass will be attached to the side of the main valve with the stem of the main valve and of the by-pass valve parallel, pointing vertically upward. Bevel geared valves with by-pass have the by-pass on the bottom of the main valve, as shown below.



Bevel Geare ' Valve with By-pass

**Extra List Prices for By-Passes**

| Pressure Class of Main Valve | Size of Main Valve | For Water Service On Flanged or Hub End Valves | | | For Steam Service On Flanged End Valves | |
|---|---|---|---|---|---|---|
| | | Size of By-Pass | Non-Rising Stem By-Pass | Outside Screw & Yoke By-Pass | Size of By-Pass | Globe By-Pass |
| | Inches | Inches | Each | Each | Inches | Each |
| 25 Pound Page 76 | 14 | 2 | *Prices on Application* | | | |
| | 16 to 20 | 3 | | | | |
| | 24 and 30 | 4 | | | | |
| | 36 | 6 | | | | |
| 125 Pound Page 79 | 12 and 14 | 2 | *Prices on Application* | | | |
| | 16 to 20 | 3 | | | | |
| | 24 and 30 | 4 | | | | |
| | 36 and 42 | 6 | | | | |
| | 48 | 8 | | | | |
| 250 Pound Page 83 | 5 and 6 | 1¼ | *Prices on Application* | | ¾ | *Prices on Application* |
| | 8 | 1½ | | | ¾ | |
| | 10 | 1½ | | | 1 | |
| | 12 | 2 | | | 1 | |

Brass trimmed valves are furnished with a brass trimmed by-pass; all-iron valves are furnished with an all-iron by-pass.

## Cleanouts

### For 125-Pound Flanged Wedge Gate Valves

Sizes 12-inch and smaller

Side Cleanout (For Flanged Valves)

Cleanouts can be furnished for 125-Pound Iron Body Flanged Wedge Gate Valves. They should be used where sediment may accumulate in a valve. The cleanout can be installed on the side of the valve body.

***Prices on Application***

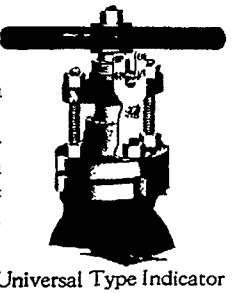
## Indicators

### For No. 460 and No. 461 Wedge Gate Valves

Sizes 12-inch and smaller

**The "Universal" type indicator,** easily applied to valves in stock or in service, consists of an indicator plate, sleeve, and pointer, all made of brass. Directions for installation are furnished with each indicator. Orders must specify the size and catalog number of the valve.

| Indicator | List Price, Each | 7.00 |
|---|---|---|

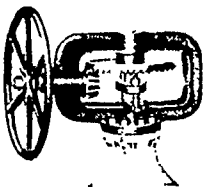


Universal Type Indicator

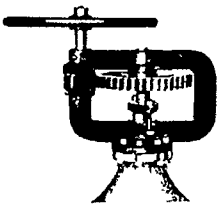
# Accessories for Iron Wedge Gate Valves

## Gearing

### Non-Rising Stem



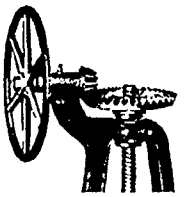
Style U
Bevel Gearing



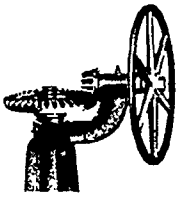
Style S
Spur Gearing

| Pressure Class of Valve | Size of Valve Inches | Extra List Price per Valve: Non-Rising Stem, Bevel | Non-Rising Stem, Spur | Outside Screw & Yoke, Bevel | Outside Screw & Yoke, Spur |
|---|---|---|---|---|---|
| 25-Pound Page 76 | 14, 16, 18, 20, 24, 30, 36 | *Prices on Application* | | *Prices on Application* | |
| 125-Pound Page 79 | 12, 14, 16, 18, 20, 24, 30, 36, 42, 48 | *Prices on Application* | | *Prices on Application* | |
| 250-Pound Page 83 | 8, 10, 12 | *Prices on Application* | | *Prices on Application* | |

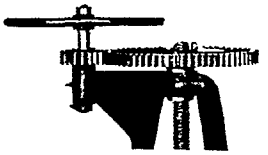
### Outside Screw and Yoke



Style N
Bevel Gearing



Style O
Bevel Gearing



Style P
Spur Gearing

When desired, larger size Crane Iron Body Wedge Gate Valves can be supplied with gears, which greatly facilitate operation.

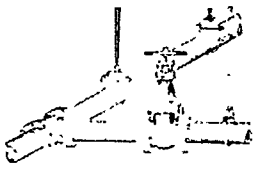
**Bevel gearing:** Unless otherwise ordered, non-rising stem bevel geared valves are furnished with the pinion shaft extending at right angles to the run of the valve. They can also be furnished with the shaft parallel to the run.

With Style N bevel gearing for outside screw and yoke valves, the pinion shaft extends at right angles to the run of the valve; with Style O, parallel to the run. Unless otherwise ordered, Style N will be furnished.

***For dimensions of geared valves, see page 86.***

8

### *Every Pipe Line Needs Support!*



Piping won't stand up and work efficiently without adequate support. Its own weight plus the weight of the fluid will cause a break in the line or will strain joints to the point of leakage and distort or ruin valve seats.

An amply strong pipe hanger or support at about 10-foot intervals is considered good practice for the average or ordinary installation, but the spacing will vary considerably with the size and type of system. Place the hangers close to valves and heavy pieces of equipment. This catalog shows many pipe hangers and supports; see pages 429 to 442. For spacing, see page 550.

### *Use Crane Steel Gate Valves For Higher Pressures and Temperatures*

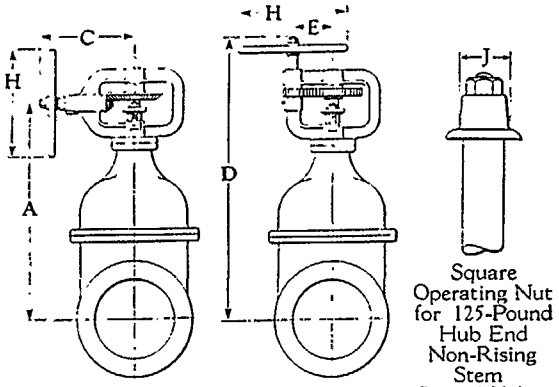
For pressures and temperatures that are beyond the scope of iron valves and for unusually severe services, Crane manufactures a complete line of Cast Steel Wedge Gate Valves.

Of outstanding quality, Crane Steel Gate Valves are made in a wide range of sizes and with screwed, flanged, butt-welding, or socket-welding ends.

The valves are available for pressures as high as 2500 pounds at 1000° F., or 6000 pounds at 100° F. See page 210 and pages 221 to 234.

# Iron Wedge Gate Valves with Gearing or By-Pass

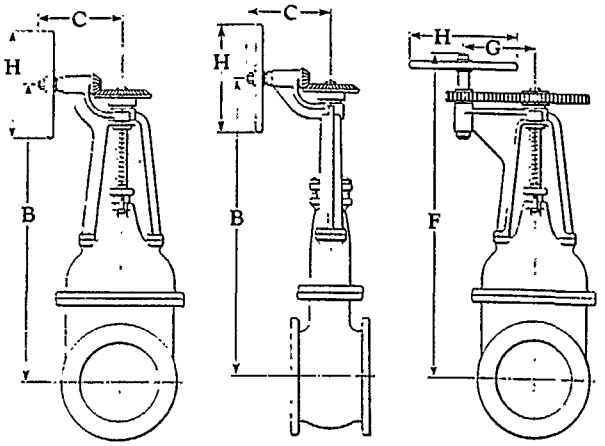
## Dimensions, in Inches




Square Operating Nut for 125-Pound Hub End Non-Rising Stem Geared Valves

**Style U** Bevel Gearing — **Style S** Spur Gearing

**Non-Rising Stem Valves with Bevel or Spur Gears**




**Style N** Bevel Gearing — **Style O** Bevel Gearing — **Style P** Spur Gearing

**Outside Screw and Yoke Valves with Bevel or Spur Gears**

8

For dimensions of valves without gearing or by-pass, refer to the following pages:

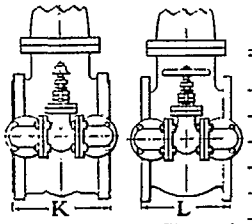
| 25-Pound | 125-Pound | 250-Pound |
|---|---|---|
| Page 76 | Page 81 | Page 83 |

**Gearing:** Face to face and end to end dimensions are the same for valves with or without gears.

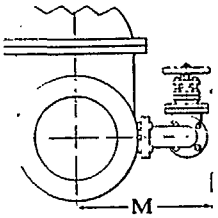
**Valves with by-pass:** The face to face dimension of valves with by-pass is the same as for valves without by-pass, except on 12-inch hub end and 36-inch flanged end 125-Pound Valves. On these sizes, 125-Pound Valves with by-pass have a longer face to face dimension.

Center to top and wheel diameter dimensions are the same for valves with or without by-pass.

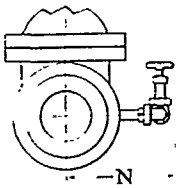
**Flanged and Hub End Valves with By-Pass**




Hub End — *Flanged




By-Pass For Water Service




By-Pass For Steam Service

| Size of Main Valve | Valves with Gears: Bevel Geared A | B | C | Spur Geared D | E | F | G | H | J | No. of turns to open | Valves with By-Pass: K | *L | By-Pass for Water Size | M | By-Pass for Steam Size | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***25-Pound Wedge Gate Valves*** | | | | | | | | | | | | | | | | |
| 14 | 33⅝ | 50¼ | 12⅝ | 43¾ | 6 | 53¾ | 10 | 14 | | 58 | | *13½ | 2 | 23¼ | | |
| 16 | 39 | 55⅜ | 13 | 50 | 6 | 59½ | 12 | 18 | | 66 | | *14 | 3 | 27¼ | | |
| 18 | 42⅝ | 61¼ | 13 | 53½ | 6 | 65⅜ | 12 | 18 | | 74 | | *14½ | 3 | 28¼ | | |
| 20 | 46⅛ | 67½ | 13 | 57¼ | 6 | 71⅝ | 12 | 18 | | 83 | | *15½ | 3 | 29¼ | | |
| 24 | 55½ | 81⅝ | 16⅞ | 69½ | 8 | 87½ | 14¾ | 22 | | 148 | | *17 | 4 | 35¼ | | |
| 30 | 64⅝ | 96⅜ | 16⅞ | 78⅝ | 8 | 102¼ | 14¾ | 22 | | 186 | | *21 | 4 | 38¼ | | |
| 36 | 75⅛ | 113⅞ | 20½ | 91¼ | 10 13/16 | 119⅜ | 17 | 27 | | 259 | | *24 | 6 | 43¾ | | |
| ***125-Pound Wedge Gate Valves*** | | | | | | | | | | | | | | | | |
| 12 | 32⅝ | 45⅞ | 13 | 43⅝ | 6 | 50¼ | 12 | 18 | 2 | 50 | 16 | *14 | 2 | 22¼ | | |
| 14 | 37¾ | 53⅝ | 13 | 48⅝ | 6 | 58 | 12 | 18 | | 60 | | *15 | 2 | 23¼ | | |
| 16 | 43⅞ | 60⅝ | 17 | 57⅞ | 8 | 66½ | 14 11/16 | 22 | | 102 | | *16 | 3 | 27¼ | | |
| 18 | 45¾ | 65¼ | 17 | 59¾ | 8 | 71 | 14 11/16 | 22 | | 114 | | *17 | 3 | 28¼ | | |
| 20 | 49⅛ | 71⅛ | 17 | 63⅛ | 8 | 77 | 14 11/16 | 22 | | 127 | | *18 | 3 | 29½ | | |
| 24 | 57⅝ | 85⅛ | 20½ | 73⅝ | 10 13/16 | 90¾ | 17 | 27 | | 175 | | *20 | 4 | 35¼ | | |
| 30 | 71⅜ | 106⅛ | 23 | 87⅞ | 12 | 112 | 19 | 30 | | 380 | | *24 | 4 | 38⅝ | | |
| 36 | 84¾ | 123 | 26¼ | 103 | 15 | 127¾ | 20⅛ | 30 | | 560 | | 32 | 6 | 45 | | |
| 42 | 101⅞ | 146 | 31½ | 123½ | 19⅜ | 151½ | 22⅞ | 36 | | 785 | | *33 | 6 | 50 | | |
| 48 | 107⅞ | 160 | 31½ | 129½ | 19⅜ | 164¾ | 22⅞ | 36 | | 900 | | *36 | 8 | 57¾ | | |
| ***250-Pound Wedge Gate Valves*** | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | *15 | 1¼ | 15 | ¾ | 11¾ |
| 6 | | | | | | | | | | | | *15⅞ | 1¼ | 14¾ | ¾ | 12½ |
| 8 | 24⅞ | 35 | 13 | 35⅞ | 6 | 39¼ | 12 | 18 | | 70 | | *16½ | 1½ | 19¼ | ¾ | 13¼ |
| 10 | 30 | 43 | 15½ | 42¼ | 7 | 47⅝ | 14 | 20 | | 95 | | *18 | 1½ | 19¼ | 1 | 16½ |
| 12 | 33½ | 48 | 15½ | 45¾ | 7 | 52¾ | 14 | 20 | | 115 | | *19¾ | 2 | 23¼ | 1 | 17¾ |

*Dimension "L", the face to face of flanged valves with by-pass, includes the 1/16-inch raised faces on 250-Pound Valves. Dimensions identified by an asterisk are the same as for valves without by-pass.

*Description of gears . . . . page 85* *Description of by-passes . . . page 84* *Templates for drilling . . . . pages 459 and 460*

Iron Body
Double Disc Gate Valves;
A.W.W.A. Valves

# Iron Body Double Disc Gate Valves

## A.W.W.A. Valves

Names of Parts.....page 88

Iron Body Valves
General Description.....pages 88 and 89
25-Pound.....pages 90 and 91
100-Pound W.O.G.....pages 92 and 93
200-Pound W.O.G.....pages 96 and 97
A. W. W. A.....pages 94 and 95

Ferrosteel Valves
General Description.....pages 88 and 89
500-Pound W.O.G.....page 98
800-Pound W.O.G.....page 99

Accessories
By-Passes.....page 102
Gearing.....page 102
Cleanouts.....pages 91, 93, and 102
Indicators.....page 102

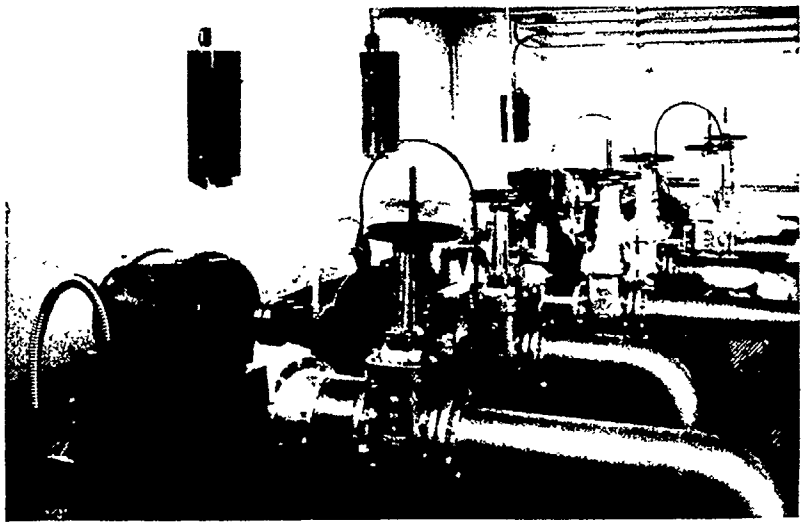
Dimensions
Valves with Gearing or By-Pass.....pages 100 and 101

*Cast Steel Pipe Line Gate Valves . . . . pages 232 and 233*



The Crane line of Iron Body Double Disc Gate Valves includes valves for water, oil, or gas pressures up to 800 pounds as well as valves for low pressure steam. Brass Trimmed, All-Iron, and A.W.W.A. Valves are available.

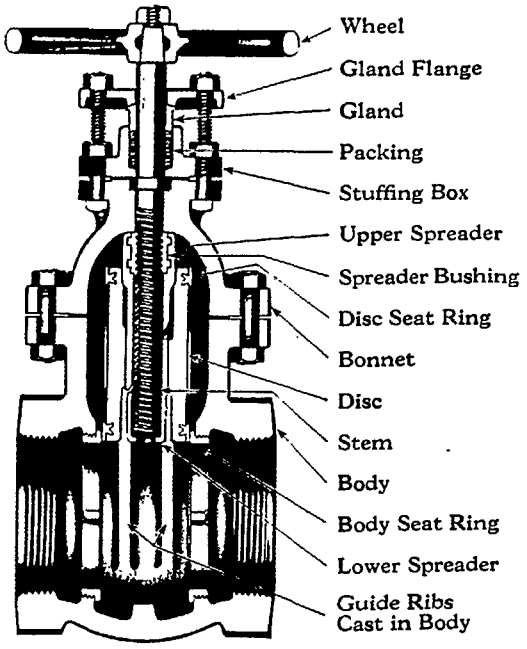
The uniformly superior quality that distinguishes all Crane products has been maintained in this line. Excellence of design, high grade materials, and workmanship of the highest order assure dependability in service.



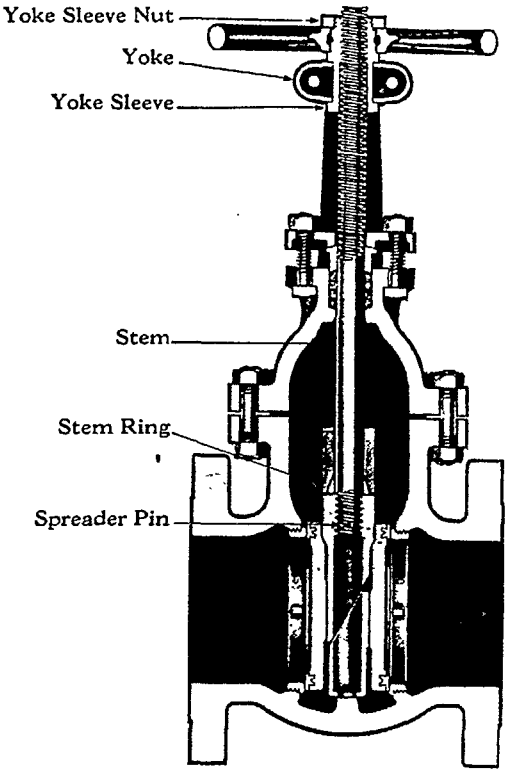
Crane iron body double disc gate valves installed in the pipe lines of a large pumping station.

# Iron Body Double Disc Gate Valves



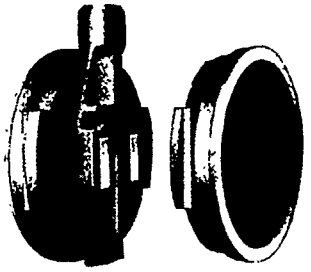



Non-Rising Stem Valve
Open

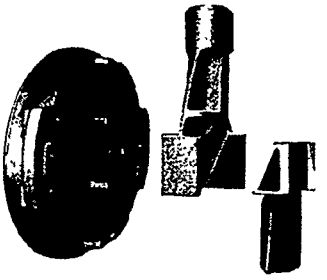



Outside Screw and Yoke Valve
Closed

***Flanged end bodies for 500 and 800-Pound W.O.G. Valves have straight through ports; see page 89.***



Discs with Spreaders



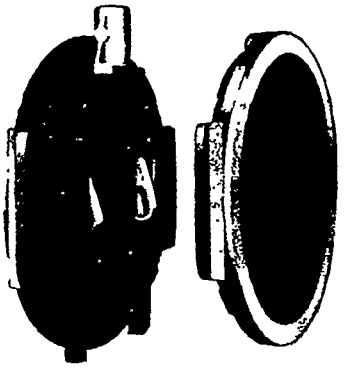
Discs with Spreaders

## *The Discs*

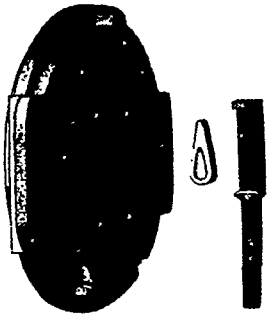
Depending upon the size of the valve and the pressure class, two types of disc construction are used in Crane Iron Body Double Disc Gate Valves.

**Discs with spreaders:** The upper spreader, engaging the valve stem, raises and lowers the discs. When the valve is being closed, the lower spreader strikes a stop in the bottom of the body; further rotation of the wheel brings the wedging surfaces of the spreaders into contact, and the spreaders force the discs outward against the seats.

**Discs with wedges:** A disc nut, engaging the valve stem, raises and lowers the discs. When the valve is being closed, two hooks, carrying Manganese Bronze wedges, strike a stop in the bottom of the body; further rotation of the wheel forces the wedges between the discs, and the wedges force the discs outward against the seats.



Discs with Wedges



Discs with Wedges

# *General Description*

The general characteristics of Crane Iron Body and Ferrosteel Double Disc Gate Valves are illustrated on the preceding page. Except for their proportions and for the materials used, the various lines are very similar in construction.

**Double discs:** The seats in the valves are parallel. The disc mechanism, illustrated and described on the preceding page, assures positive, tight seating and easy opening.

Except for certain small size valves having brass or Crane Special Bronze discs, brass trimmed valves have cast iron or Ferrosteel discs with brass or Crane Special Bronze seating faces. The faces are securely rolled into machined dovetails in the discs, assuring tightness under pressure.

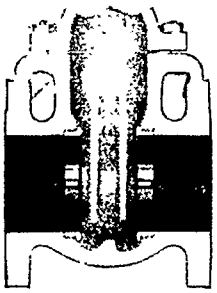
In all-iron valves, the seating faces are cast integral with the discs.

In non-rising stem brass trimmed valves, the portion of the discs that engages the stem threads is brass or brass-bushed.

In brass trimmed valves with spreader type discs, the lower spreader is brass in the smaller sizes, and cast iron with brass wedging faces in the larger sizes.

**Body and bonnet:** All lines of valves have oval-shaped bodies and bonnets. Metal sections are more than ample, and the metal is distributed to assure maximum strength.

Flanged end 500 and 800-Pound W.O.G. Valves have straight through ports, as shown in the illustration at the right. The metal sections adjacent to the bonnet and end flanges are heavily reinforced.



Straight Through Ports in Flanged End 500 and 800-Pound W.O.G. Valves

**Body seat rings:** In brass trimmed valves, the body seat rings are brass or Crane Special Bronze.

In brass trimmed 25-Pound Valves 14-inch and larger, the body seat rings are rolled into machined dovetails in the body. In 10 and 12-inch 25-Pound Valves, and in all brass trimmed valves for higher pressures, the body seat rings are screwed into the body.

All-iron valves are regularly furnished with the seats integral with the body. However, they can be furnished with screwed-in body seat rings when so ordered; prices on application.

**Stem:** The stem in non-rising stem brass trimmed valves is made of Crane Cast Manganese Bronze or rolled brass, depending upon the pressure class.

Outside screw and yoke brass trimmed valves are made with a rolled brass stem.

All-iron valves have a steel stem; the portion coming in contact with the packing is nickel plated.

**Gland and stuffing box:** All valves have a two-piece ball-type gland, consisting of an Ihrigized steel gland and a malleable iron gland flange.

This construction provides for even distribution of the compressive loading on the packing, the ball-type bearing between the gland and flange compensating for unequal adjustment of the bolts. Binding on the valve stem and frequent stuffing box maintenance are avoided.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

In non-rising stem valves, jamming the disc in the wide open position forces the stem collar against the machined top of the bonnet, making a pressure-tight joint.

In outside screw and yoke valves, when the valve is jammed wide open, the tapered stem ring engages a tapered machined surface in the under side of the top of the bonnet, forming a tight joint.

**Yoke:** In smaller size outside screw and yoke valves, the yoke is cast integral with the bonnet. In larger sizes, the yoke is made in two halves, bolted to the bonnet and bolted together at the top.

**Yoke sleeve:** The yoke sleeve is made of Crane Cast Manganese Bronze.

**Wheel:** Wheels are made of malleable iron to assure maximum strength. They have an oval-shaped rim, affording an easy grip.

In non-rising stem valves, the wheel has a tapered square hole fitting the tapered square end of the stem, and is held in place by a steel nut.

In outside screw and yoke valves, the hole in the wheel is hexagonal and tapered, and fits the tapered hexagonal top of the yoke sleeve. The wheel is held in place by a malleable iron nut.

In both types of valves, the wheel is attached securely, yet can be removed easily.

**Flange dimensions and facing:** The dimensions and drilling of the end flanges on flanged valves conform to the American Cast Iron Flange Standard for their respective working pressures.

The flanges on 25-Pound, 100-Pound W.O.G., and 200-Pound W.O.G. valves are plain faced with a smooth finish.

500-Pound W.O.G. flanged valves are regularly furnished with a raised face 1/16-inch high on the end flanges.

800-Pound W.O.G. flanged valves are regularly furnished with a 1/4-inch male face (large male) on the end flanges.

# 25-Pound Iron Body Double Disc Gate Valves

## Brass Trimmed

| Size of valve | Working pressures | | | | | Hydrostatic test pressures | |
|---|---|---|---|---|---|---|---|
| | Flanged valves | | | Hub end valves | | Flanged or hub end valves | |
| | Saturated steam | Cold gas | Cold water non-shock | Cold gas | Cold water non-shock | Shell test | Seat test |
| 10 to 24-inch | 25 pounds | 25 pounds | 50 pounds | 25 pounds | 50 pounds | 75 pounds | 65 pounds |
| 30 & 36-inch | 25 pounds | 25 pounds | 43 pounds | 25 pounds | 43 pounds | 75 pounds | 55 pounds |
| 42 & 48-inch | 25 pounds | 25 pounds | 35 pounds | | | 50 pounds | 45 pounds |

Crane 25-Pound Iron Body Double Disc Gate Valves, illustrated on the opposite page, are admirably suited for a great variety of service conditions that do not require the use of "Standard" or "125-Pound" weight valves. They will give excellent service in low pressure steam, water, or gas lines, in exhaust or condenser piping, in water works, irrigation, filtration, or sewage disposal systems, in pumping engine suction lines, or in by-product coke installations.

They are short and compact, occupying a minimum of space in the pipe line.

9

**Brass trimmed:** The body seat rings are brass. In sizes 10 and 12-inch valves, they are screwed into the body. In the larger sizes, they are rolled into the body. When so ordered, screwed-in rings can be furnished in the larger sizes; prices on application.

The discs are cast iron with brass seating faces. The stem is brass (Cast Manganese Bronze in the larger sizes of non-rising stem valves). In non-rising stem valves, the portion of the discs that engages the stem threads is brass or brass-bushed.

The valves have a two-piece ball-type gland, consisting of an Ihrigized steel gland and a malleable iron gland flange.

**Stuffing boxes:** The stuffing boxes are filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Hub end valve :** In place of a wheel, hub end valves are equipped with a square operating nut.

The hubs fit Class "A" or "B" cast iron pipe.

Sizes indicated below are suitable for use with Transite pipe; specify pipe size and class on orders.

For machined or rough end Transite pipe:
10 and 12-inch valves....for Class 50 or 100 pipe
14 to 36-inch valves....for Class 50 pipe

For machined end Transite pipe only:
14 to 18-inch valves.....for Class 100 pipe

**By-passes:** Sizes 24-inch and larger should have a by-pass, to enable equalizing the pressure on both sides of the valve before opening. See pages 100 to 102 for dimensions and description.

**Gearing:** To facilitate operation, 42 and 48-inch valves should be equipped with gears. See pages 100 to 102 for dimensions and description.

**Motor or cylinder operation:** Valves installed in inaccessible locations or used for emergency purposes should be equipped with some easy means of operation, such as an electric or air motor drive, or an operating cylinder; see pages 124 to 129.

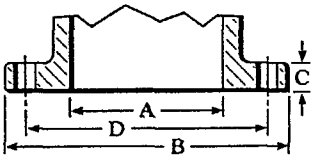
**Vacuum or air service:** Valves for vacuum exhaust lines or for air service should be specially air-tested; an extra charge is made. Unless orders specify air-tested, water-tested valves are furnished.

**Disc rollers:** Brass trimmed valves, 14-inch and larger, ordered for use in a horizontal line with the valve stem horizontal, will be equipped with a brass track in the lower side of the body, and brass rollers and brass scrapers in the lower side of the discs.

**Cleanouts:** When so ordered, these valves can be furnished with cleanouts; see the opposite page.

**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931). The flanges are plain faced, with a smooth finish.

On special order, valves can be drilled to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). When so drilled, full face gaskets should be used to avoid distorting the end flanges.



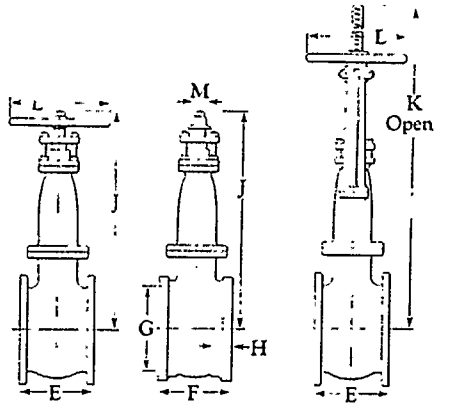

Dimensions of Flanges, in Inches

| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 10 | 10 | 16 | 7/8 | 14 1/4 | 12 | 5/8 |
| 12 | 12 | 19 | 1 | 17 | 12 | 5/8 |
| 14 | 14 | 21 | 1 1/8 | 18 3/4 | 12 | 3/4 |
| 16 | 16 | 23 1/2 | 1 1/8 | 21 1/4 | 16 | 3/4 |
| 18 | 18 | 25 | 1 1/4 | 22 3/4 | 16 | 3/4 |
| 20 | 20 | 27 1/2 | 1 1/4 | 25 | 20 | 3/4 |
| 24 | 24 | 32 | 1 3/8 | 29 1/2 | 20 | 3/4 |
| 30 | 30 | 38 3/4 | 1 1/2 | 36 | 28 | 7/8 |
| 36 | 36 | 46 | 1 5/8 | 42 3/4 | 32 | 7/8 |
| 42 | 42 | 53 | 1 3/4 | 49 1/2 | 36 | 1 |
| 48 | 48 | 59 1/2 | 2 | 56 | 44 | 1 |

*Additional description....pages 88 and 89*

# 25-Pound Iron Body Double Disc Gate Valves

## Brass Trimmed



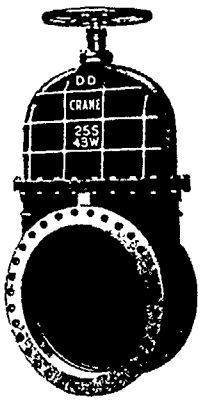

Flanged — Hub Ends — Flanged

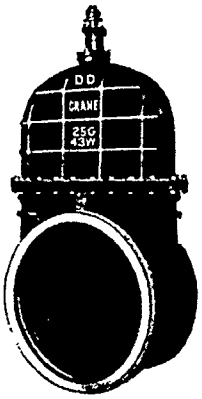
Non-Rising Stem Valves Without By-Pass

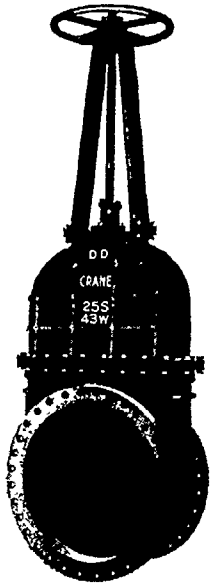
Outside Screw and Yoke Valve Without By-Pass

Hubs on hub end valves will accommodate Class "A" or "B" cast iron pipe, and in some sizes, are suitable for use with certain classes of Transite pipe; refer to the preceding page.

*For working pressures and description, see the preceding page.*




Non-Rising Stem

No. 791 Flanged — No. 798 Hub Ends

Outside Screw and Yoke

No. 793½ Flanged

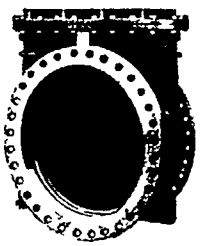
9

### List Prices and Dimensions

| Size Inches | List Prices, Each: Non-Rising Stem: No. 791 Flanged F. & D. | Non-Rising Stem: No. 798 Hub Ends | Outside Screw and Yoke: No. 793½ Flanged F. & D. | Dimensions, in Inches: E | F | G | H | J | K | L | M | No. of turns to open |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 185.00 | 173.00 | 218.00 | 9½ | 12⅜ | 12.10 | 3.50 | 27¾ | 47 | 12 | 2 | 22 |
| 12 | 230.00 | 210.00 | 276.00 | 10 | 12⅝ | 14.20 | 3.50 | 30¾ | 54¼ | 12 | 2 | 26 |
| 14 | 358.00 | 333.00 | 412.00 | 10½ | 13⅛ | 16.10 | 3.50 | 34 | 64¾ | 14 | 2 | 29 |
| 16 | 506.00 | 470.00 | 570.00 | 11 | 14⅛ | 18.40 | 4.00 | 37 | 71¾ | 14 | 2 | 33 |
| 18 | 690.00 | 640.00 | 760.00 | 11½ | 14 7/16 | 20.50 | 4.00 | 42¼ | 80¾ | 18 | 2 | 38 |
| 20 | 880.00 | 825.00 | 965.00 | 12 | 15 3/16 | 22.60 | 4.00 | 45½ | 88½ | 18 | 2 | 42 |
| *24 | 1335.00 | 1235.00 | 1460.00 | 13 | 15¾ | 26.80 | 4.00 | 52¼ | 104 | 20 | 2 | 49 |
| *30 | 2600.00 | 2450.00 | 2800.00 | 14½ | 17⅞ | 33.00 | 4.50 | 64 | 128 | 22 | 2 | 124 |
| *36 | 3950.00 | 3700.00 | 4260.00 | 16 | 18½ | 39.30 | 4.87 | 74¾ | 148½ | 27 | 3 | 147 |
| *†42 | | | 5800.00 | 17½ | | | | | 176½ | 30 | | 131 |
| *†48 | | | 7800.00 | 19 | | | | | 200¾ | 36 | | 149 |

*Sizes 24-inch and larger should have a by-pass; see pages 100 to 102 for dimensions and description.
†Sizes 42 and 48-inch should be geared; see pages 100 to 102 for dimensions and description.

***Flanged valves in sizes larger than listed above (up to 72-inch) are furnished to order; prices and dimensions on application.***



Double Cleanout

**Cleanout:** When so ordered, these valves on sizes 14-inch and larger can be fitted with two side cleanouts as illustrated at the left; prices furnished on application.

The cleanouts are useful on valves installed in gas lines. They permit passing a rod through the valve between the seats to dislodge coke or other sediment.

*Templates for drilling....page 459*

**Drilling:** Flanged valves are furnished faced and drilled (F. & D.) unless ordered faced only. List prices include facing and drilling to the 25-Pound American Tentative Cast Iron Flange Standard.

When valves are ordered faced only, they will be furnished at the same price as for faced and drilled.

*By-passes and gearing....pages 100 to 102*

# 100-Pound W.O.G.
# Iron Body Double Disc Gate Valves
## Brass Trimmed

| Size of valve | Working pressures | | Hydrostatic test pressures | |
|---|---|---|---|---|
| | Flanged valves | Hub end valves | Flanged or hub end valves | |
| | Cold water, oil, or gas non-shock | Cold water or gas non-shock | Shell test | Seat test |
| 4 to 24-inch | 100 pounds | 100 pounds | 200 pounds | 125 pounds |
| 30 and 36-inch | 80 pounds | | 150 pounds | 100 pounds |

Crane 100-Pound W.O.G. Iron Body Double Disc Gate Valves, illustrated on the opposite page, are recommended for service conditions that do not require the use of Standard or 125-Pound weight valves but that are too severe for low pressure valves. They are particularly suitable for moderate water, oil, or gas pressures.

9

**Brass trimmed:** The body seat rings are brass, screwed into the body. The discs are cast iron or Ferrosteel with brass seating faces.

The valves have a brass stem (Cast Manganese Bronze in non-rising stem valves); the bonnet and stuffing box are brass-bushed at points of contact with the stem. In non-rising stem valves, the portion of the discs that engages the stem threads is brass or brass-bushed.

The valves have a two-piece, ball-type gland consisting of an Ihrigized steel gland and a malleable iron gland flange.

**Stuffing box:** The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Hub end valves:** In place of a wheel, hub end valves are equipped with a square operating nut.

The hubs will accommodate Class "A", "B", or "C" cast iron pipe.

Sizes indicated below are suitable for use with Transite pipe:

For machined or rough end Transite pipe:
4 to 24-inch valves....for Class 50 or 100 pipe
4 to 8-inch valves....for Class 150 pipe

For machined end Transite pipe only:
4-inch valves.....for Class 200 pipe

Orders for valves intended for use with Transite pipe should specify the pipe size and class.

**By-passes:** Sizes 18-inch and larger should have a by-pass, to enable equalizing the pressure on both sides of the valve before opening. See pages 100 to 102 for dimensions and description.

**Gearing:** To facilitate operation, valves 30-inch and larger should be equipped with gears. See pages 100 to 102 for dimensions and description.

**Motor or cylinder operation:** Valves installed in inaccessible locations or used for emergency purposes should preferably be equipped with some easy means of operation, such as an electric or air motor drive, or an operating cylinder. See pages 124 to 129.

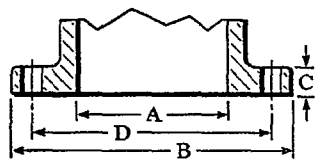
**Air service:** Valves, for air service should be specially air-tested to assure absolute tightness; an extra charge is made. Orders must specify air-tested, otherwise water-tested valves will be furnished.

**Disc rollers:** When ordered for use in a horizontal line with the valve stem horizontal, valves 14-inch and larger will be equipped with a brass track in the lower side of the body, and with brass rollers and brass scrapers in the lower side of the discs.

**Cleanouts:** When so ordered, 100-Pound W.O.G. Valves 14-inch and larger can be fitted with two side cleanouts, as shown on the opposite page.

**Indicators:** The stem of an outside screw and yoke valve indicates the position of the disc. Non-rising stem valves 12-inch and smaller can be furnished with an indicator; see page 102.

**Flange dimensions and facing:** Dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.



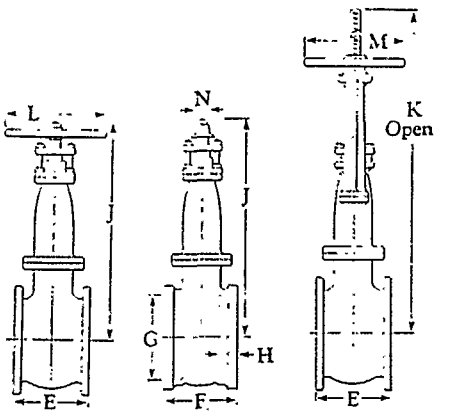

Dimensions of Flanges, in Inches

| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 4 | 4 | 9 | 15/16 | 7½ | 8 | ⅝ |
| 6 | 6 | 11 | 1 | 9½ | 8 | ¾ |
| 8 | 8 | 13½ | 1⅛ | 11¾ | 8 | ¾ |
| 10 | 10 | 16 | 1 3/16 | 14¼ | 12 | ⅞ |
| 12 | 12 | 19 | 1¼ | 17 | 12 | ⅞ |
| 14 | 14 | 21 | 1⅜ | 18¾ | 12 | 1 |
| 16 | 16 | 23½ | 1 7/16 | 21¼ | 16 | 1 |
| 18 | 18 | 25 | 1 9/16 | 22¾ | 16 | 1⅛ |
| 20 | 20 | 27½ | 1 11/16 | 25 | 20 | 1⅛ |
| 24 | 24 | 32 | 1⅞ | 29½ | 20 | 1¼ |
| 30 | 30 | 38¾ | 2⅛ | 36 | 28 | 1¼ |
| 36 | 36 | 46 | 2⅜ | 42¾ | 32 | 1½ |

*Additional description....pages 88 and 89*

# 100-Pound W.O.G.
# Iron Body Double Disc Gate Valves
## Brass Trimmed

*For working pressures and description, see the preceding page.*

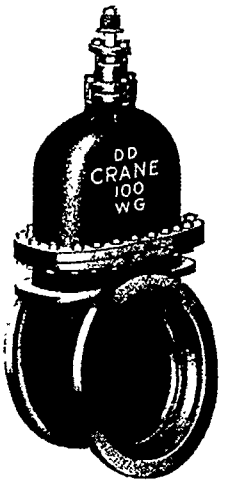


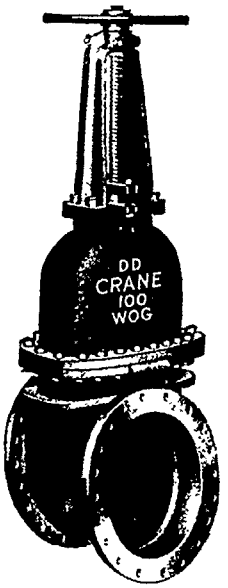

Flanged — Non-Rising Stem Valves Without By-Pass

Hub Ends — Non-Rising Stem Valves Without By-Pass

Flanged — Outside Screw and Yoke Valve Without By-Pass

Hubs on hub end valves will accommodate Class "A", "B", or "C" cast iron pipe, and in some sizes, are suitable for use with certain classes of Transite pipe; see the preceding page.




Non-Rising Stem — No. 776 Flanged; No. 777 Hub Ends

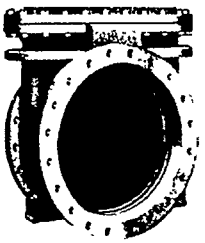
Outside Screw and Yoke — No. 778 Flanged

### List Prices and Dimensions

| Size Inches | List Prices, Each: Non-Rising Stem, No. 776 Flanged F. & D. | Non-Rising Stem, No. 777 Hubs Ends | Outside Screw and Yoke, No. 778 Flanged F. & D. | Dimensions, in Inches: E | F | G | H | J | K | L | M | N | No. of turns to open |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 55.00 | 52.00 | 63.00 | 8 | 11¾ | 5.70 | 4.00 | 15¾ | 22¾ | 9 | 9 | 2 | 13½ |
| 6 | 89.00 | 83.00 | 104.00 | 8¾ | 12½ | 7.80 | 4.00 | 20 | 31¼ | 10 | 10 | 2 | 13¼ |
| 8 | 138.00 | 128.00 | 160.00 | 10 | 13¼ | 10.00 | 4.00 | 24¾ | 40½ | 12 | 12 | 2 | 17½ |
| 10 | 235.00 | 220.00 | 270.00 | 11 | 14 | 12.10 | 4.00 | 28¼ | 47¾ | 12 | 12 | 2 | 22 |
| 12 | 330.00 | 312.00 | 380.00 | 12 | 14½ | 14.20 | 4.00 | 32⅛ | 56 | 14 | 14 | 2 | 26 |
| 14 | 445.00 | 415.00 | 500.00 | 13½ | 15¼ | 16.45 | 4.00 | 35¾ | 62½ | 14 | 14 | 2 | 30 |
| 16 | 665.00 | 622.00 | 730.00 | 15 | 15½ | 18.80 | 4.00 | 40¾ | 71¼ | 16 | 16 | 2 | 34 |
| *18 | 875.00 | 815.00 | 950.00 | 16½ | 16½ | 20.92 | 4.00 | 44 | 78¾ | 18 | 18 | 2 | 38 |
| *20 | 1090.00 | 1025.00 | 1175.00 | 18 | 18 | 23.06 | 4.00 | 48½ | 86½ | 20 | 20 | 2 | 42 |
| *24 | 1630.00 | 1500.00 | 1750.00 | 19½ | 19½ | 27.32 | 4.00 | 57 | 102½ | 24 | 24 | 2 | 50½ |
| *†30 | 4200.00 | | 4400.00 | 23 | | | | 72¼ | 130¼ | 30 | 30 | | 63½ |
| *†36 | 6100.00 | | 6450.00 | 25½ | | | | 86 | 153¾ | 36 | 36 | | 114 |

*Sizes 18-inch and larger should have a by-pass. See pages 100 to 102 for dimensions and description.
†Sizes 30-inch and 36-inch should be geared. See pages 100 to 102 for dimensions and description.

***Larger size flanged valves, 42 to 66-inch, can be made to order. Prices and dimensions will be furnished on application.***



Double Cleanout

**Cleanouts:** 100-Pound W.O.G. Valves 14-inch and larger can be fitted with two side cleanouts as illustrated at the left. Prices are furnished on application.

The cleanouts are useful on valves installed in gas lines. They permit passing a rod through the valve between the seats to dislodge coke or other sediment.

**Drilling:** Flanged valves are furnished faced and drilled (F. & D.) unless ordered faced only. List prices include facing and drilling to the American Cast Iron Flange Standard, Class 125.

When valves are ordered faced only, they will be furnished at the same price as for faced and drilled.

*By-passes and gearing....pages 100 to 102*

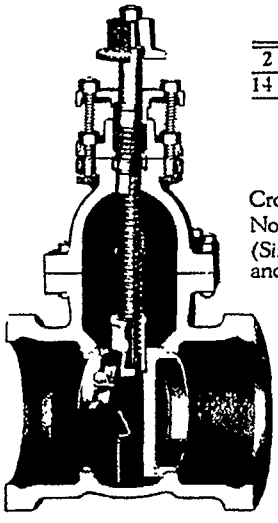
*Templates for drilling....page 459*

# A.W.W.A. Iron Body Double Disc Gate Valves

## Brass Trimmed

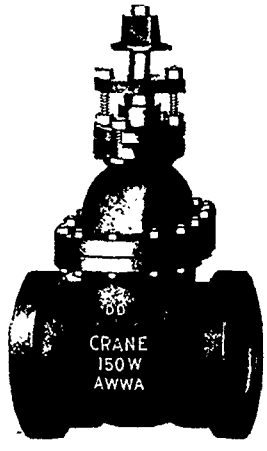
| Sizes | Working Pressures (Non-Shock) | Hydrostatic Test Pressures | |
|---|---|---|---|
| | | Shell | Seat |
| 2 to 12-inch | 200 pounds cold water | 350 pounds | 225 pounds |
| 14 to 36-inch | 150 pounds cold water | 300 pounds | 175 pounds |

*Dimensions are shown on the opposite page.*

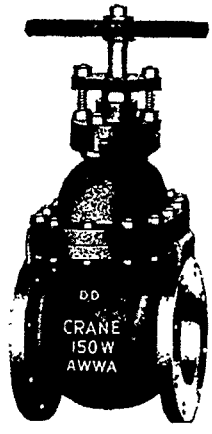


Cross Section
Non-Rising Stem
(Sizes 12-inch and smaller)

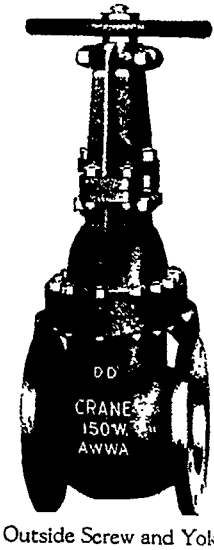
***Prices on application***




Non-Rising Stem
**No. 480½,** Hub Ends
With Square Operating Nut
Sizes 2 to 36-inch




Non-Rising Stem
**No. 2485,** Flanged
With Hand Wheel
Sizes 2 to 24-inch




Outside Screw and Yoke
**No. 2495,** Flanged
With Hand Wheel
Sizes 2 to 24-inch

***Larger sizes, up to 48-inch, can be made to order.***

9

These valves comply in design and materials with specifications for Gate Valves for Ordinary Water Works Service, 7F.1-1939, effective May 1, 1939, as adopted jointly by the American Water Works Association and the New England Water Works Association.

**Body and bonnet:** The body and bonnet, oval in shape with uniformly thick metal sections to provide maximum strength, are made of cast iron in the smaller sizes and of Ferrosteel in the larger sizes. Flanged bodies have straight-through ports permitting uninterrupted fluid flow; tie ribs between the bonnet flange and end flanges assure proper support of the body and guard against line strains.

**Double discs:** The parallel seat and double disc construction contributes to the accurate operation of these valves. Depending upon the valve size, either wedges controlled by hooks, or upper and lower spreaders force the discs outward upon seating or release the discs from their seats at the first opening movement; see page 88 for description. Wherever necessary to prevent corrosion, the operating parts are made of brass or are brass faced or bushed.

**Seats and discs:** The body seat rings, made of brass, are screwed into the body. The discs in sizes 3-inch and smaller are brass; in the larger sizes, they are made of iron with a brass face.

**Stem:** Non-rising stem valves have a stem made of Crane Cast Manganese Bronze, an alloy of unusually high tensile and torsional strength with excellent wearing quality. A brass-bushed stem collar, set between graphited stem bearings, assures long trouble-free service. Outside screw and yoke valves have a brass stem and a brass bonnet bushing.

**Gland:** The valves have a two-piece gland consisting of an Ihrigized steel gland and a malleable iron gland flange. Zinc-plated gland bolts and brass gland bolt nuts eliminate the possibility of corrosion.

**Stuffing box:** The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Hub end valves:** Hub end valves, made with a non-rising stem, have a 2-inch square operating nut.

The hubs will accommodate Class "A", "B", "C", or "D" cast iron pipe.

Sizes indicated below are suitable for use with Transite pipe; specify pipe size and class on orders.

For machined or rough end Transite pipe:
3 to 36-inch valves....for Class 50 pipe
3 to 24-inch valves....for Class 100 pipe
3 to 8-inch valves....for Class 150 pipe
For machined end Transite pipe only:
30 and 36-inch valves....for Class 100 pipe
4-inch valves....for Class 200 pipe

**Flanged valves:** Flanged valves conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 125-Lb. Cast Iron Flanged Double Disc Gate Valves. This Standard includes sizes 2 to 12-inch, inclusive.

**Disc rollers:** When valves 16-inch and larger are ordered for use in a horizontal line with the stem horizontal, they are equipped with a brass track in the lower side of the body, and with brass rollers and brass scrapers in the lower side of the discs.

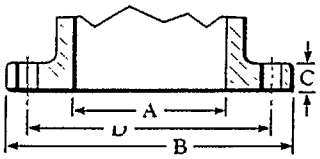
**By-passes:** Sizes 16-inch and larger can be equipped with a by-pass when so ordered.

**Gearing:** To facilitate operation, sizes 24-inch and larger should be equipped with gears. Dimensions are shown on the opposite page.

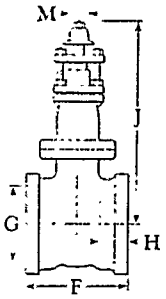
# Dimensions of A.W.W.A. Gate Valves

## Valves Without Gears

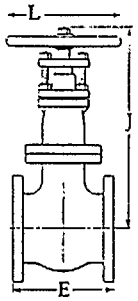
Flange Dimensions and Facing



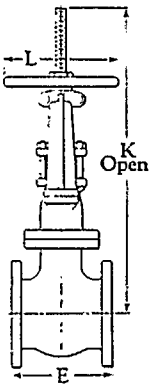

The dimensions and drilling of end flanges on flanged valves conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.



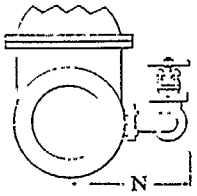

No. 480½
Non-Rising Stem
Hub Ends




No. 2485
Non-Rising Stem
Flanged




No. 2495
Outside Screw and Yoke
Flanged




By-Pass on Side

Dimension "N", showing clearance of by-pass, also applies to valves having the by-pass installed on the bottom.

Dimensions, in Inches

| Size | Flanges A | Flanges B | Flanges C | Flanges D | Bolts No. | Bolts Dia. | E Without by-pass | E With by-pass | F Without by-pass | F With by-pass | G | H | J | K | L No. 2485 | L No. 2495 | N | Size of by-pass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 6 | 5/8 | 4 3/4 | 4 | 5/8 | 7 | | 9 1/4 | | 3.38 | 3.00 | 13 1/2 | 16 1/4 | 8 | 9 | | |
| 3 | 3 | 7 1/2 | 3/4 | 6 | 4 | 5/8 | 8 | | 11 | | 4.66 | 3.50 | 16 7/8 | 21 5/8 | 9 | 12 | | |
| 4 | 4 | 9 | 15/16 | 7 1/2 | 8 | 5/8 | 9 | | 12 1/4 | | 5.70 | 4.00 | 18 1/2 | 24 5/8 | 10 | 12 | | |
| 6 | 6 | 11 | 1 | 9 1/2 | 8 | 3/4 | 10 1/2 | | 13 1/4 | | 7.80 | 4.00 | 22 1/4 | 31 1/4 | 12 | 12 | | |
| 8 | 8 | 13 1/2 | 1 1/8 | 11 3/4 | 8 | 3/4 | 11 1/2 | | 13 3/4 | | 10.00 | 4.00 | 25 3/4 | 41 1/4 | 14 | 16 | | |
| 10 | 10 | 16 | 1 3/16 | 14 1/4 | 12 | 7/8 | 13 | | 14 1/2 | | 12.10 | 4.00 | 30 1/2 | 51 1/2 | 16 | 18 | | |
| 12 | 12 | 19 | 1 1/4 | 17 | 12 | 7/8 | 14 | | 15 | | 14.20 | 4.00 | 34 | 58 5/8 | 18 | | | |
| 14 | 14 | 21 | 1 3/8 | 18 3/4 | 12 | 1 | 15 3/4 | | 17 1/4 | | 16.45 | 4.00 | 40 | 67 | 20 | | | |
| 16 | 16 | 23 1/2 | 1 7/16 | 21 1/4 | 16 | 1 | 17 | 26 1/2 | 18 | 21 1/2 | 18.80 | 4.00 | 45 1/2 | 75 5/8 | 22 | 26 | 3 | |
| 18 | 18 | 25 | 1 9/16 | 22 3/4 | 16 | 1 1/8 | 18 1/2 | 27 | 19 | 22 1/2 | 20.92 | 4.00 | 48 7/8 | 83 1/2 | 24 | 27 1/4 | 3 | |
| 20 | 20 | 27 1/2 | 1 11/16 | 25 | 20 | 1 1/8 | 20 | 28 | 20 | 23 1/2 | 23.06 | 4.00 | 52 3/4 | 93 | 24 | 28 5/8 | 3 | |
| 24 | 24 | 32 | 1 7/8 | 29 1/2 | 20 | 1 1/4 | 24 | 32 | 22 | 26 3/4 | 27.32 | 4.00 | 64 3/4 | 109 3/4 | 30 | 32 1/2 | 4 | |
| 30 | | | | | | | | | 24 | 32 3/4 | 33.74 | 4.50 | 78 | | | 37 5/8 | 4 | |
| 36 | | | | | | | | | 27 | 32 | 40.16 | 4.50 | 88 | | | 44 1/2 | 6 | |

Dimension M, the size of the square operating nut, is 2 inches for all No. 480½ Valves.

Flanged valves in sizes 30 to 48-inch and hub end valves in sizes 42 and 48-inch are made to order; dimensions on request.

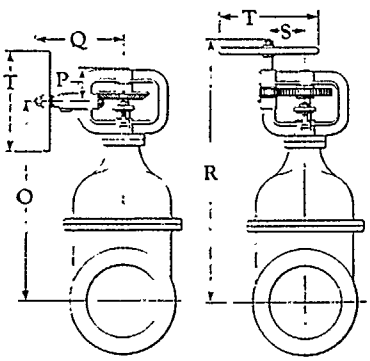
## Valves With Gears

Dimensions, in Inches

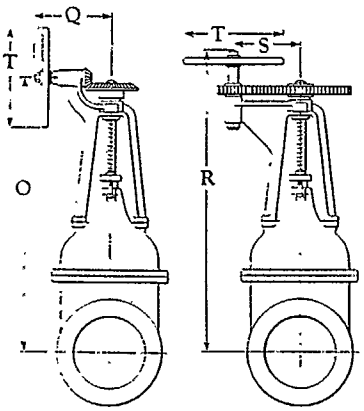
Dimensions not given for valves with gears are the same as those shown for valves without gears.

| | Size | O | P | Q | R | S | T |
|---|---|---|---|---|---|---|---|
| Non-Rising Stem | 12 | 30 3/4 | 6 | 13 | 41 3/4 | 6 | 18 |
| | 14 | 35 3/8 | 6 | 13 | 46 1/2 | 6 | 18 |
| | 16 | 40 7/8 | 7 1/2 | 17 | 55 | 8 | 22 |
| | 18 | 44 3/8 | 7 1/2 | 17 | 58 1/2 | 8 | 22 |
| | 20 | 47 1/4 | 7 1/2 | 17 | 61 1/4 | 8 | 22 |
| | 24 | 56 1/4 | 8 3/4 | 20 1/2 | 72 1/4 | 10 13/16 | 27 |
| | 30 | 67 7/8 | 9 1/4 | 23 | 84 1/2 | 12 | 30 |
| | 36 | 79 | 10 3/4 | 26 1/4 | 97 1/2 | 15 | 30 |
| Outside Screw and Yoke | 12 | 46 | | 12 3/4 | 50 1/4 | 12 | 18 |
| | 14 | 52 5/8 | | 12 3/4 | 56 7/8 | 12 | 18 |
| | 16 | 59 5/8 | | 17 | 65 1/2 | 14 3/4 | 22 |
| | 18 | 65 1/4 | | 17 | 71 | 14 3/4 | 22 |
| | 20 | 72 | | 17 | 77 3/4 | 14 3/4 | 22 |
| | 24 | 85 3/8 | | 20 1/2 | 91 | 17 | 27 |

*Templates for drilling....page 459*




Bevel Gearing Spur Gearing
Non-Rising Stem Valves




Bevel Gearing Spur Gearing
Outside Screw and Yoke Valves

***These valves, regularly made to open to the left, can be made to open to the right when so ordered.***

# 200-Pound W. O. G.
# Iron Body Double Disc Gate Valves
## Brass Trimmed or All-Iron

WORKING PRESSURES
2 to 12-inch — 200 pounds cold water, oil, or gas, non-shock
14 to 24-inch — 150 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES
2 to 12-inch—350-pound shell test
—225-pound seat test
14 to 24-inch—250-pound shell test
—175-pound seat test

*Air tested*

Crane 200-Pound W.O.G. Iron Body Double Disc Gate Valves, illustrated on the opposite page, are especially recommended for use in the oil and gas industry, and for water lines requiring rugged, substantially constructed valves. In oil or gas fields, in oil refineries, and in stations for storing and dispensing gasoline or oil, they are exceptionally well suited for general utility service in oil, gas, or water lines.

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**Brass trimmed valves:** Brass trimmed valves are recommended for water, oil, or gas lines.

The body seat rings are brass, screwed into the body. The discs in sizes 3-inch and smaller are brass; in larger sizes, they are cast iron with a brass face.

Brass trimmed valves have a brass stem (Cast Manganese Bronze in non-rising stem valves). In non-rising stem valves, the portion of the discs that engages the stem threads is brass or brass-bushed.

**All-iron valves:** All-iron valves are recommended for oil or gas, or for fluids that corrode brass.

The seats are cast integral with the body and discs. Valves with screwed-in body seat rings can be made to order; prices on application.

The stem is steel, and that portion which comes in contact with the packing is nickel plated.

**Stuffing box:** The stuffing boxes are filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Gland:** The two-piece gland consists of an Ihrigized steel gland and a malleable iron gland flange.

**Hub end valves:** Hub end valves conforming to the American Water Works Association specifications are available; see page 94 for description.

**By-passes:** Sizes 14-inch and larger should have a by-pass, to enable equalizing the pressure on both sides of the valve before opening; see pages 100 to 102 for dimensions and description.

**Gearing:** To facilitate operation, 24-inch valves should be equipped with gears; see pages 100 to 102 for dimensions and description.

**Disc rollers:** When ordered for use in a horizontal line with the valve stem horizontal, valves 10-inch and larger will be equipped with a brass track in the lower side of the body and with brass rollers and scrapers in the lower side of the discs.

**Motor or cylinder operation:** Valves installed in inaccessible locations or used for emergency purposes should preferably be equipped with some easy means of operation. An electric or air motor drive, or an operating cylinder, is ideal for this purpose. For details, see pages 124 to 129.

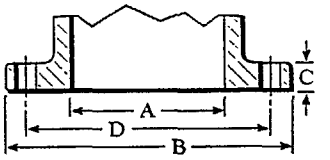
**Cleanouts:** For use on lines carrying an unusual amount of sediment, tarry fluids, etc., flanged valves 12-inch and smaller can be equipped with a side cleanout to facilitate cleaning; see page 102.

**Indicators:** The stem of the outside screw and yoke valves indicates the position of the disc. Non-rising stem valves 12-inch and smaller can be furnished with an indicator; see page 102.

**Standards:** Flanged valves without by-pass conform (except for marking) to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949. This Standard includes sizes, 2, 2½, 3, 4, 6, 8, 10, and 12-inch.

Flanged valves without by-pass also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 125-Lb. Cast Iron Flanged Double Disc Gate Valves. This Standard includes sizes 2 to 12-inch inclusive.

**Flange dimensions and facing:** The end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948).




Flanges are plain faced, with a smooth finish.

**Dimensions of Flanges, in Inches**

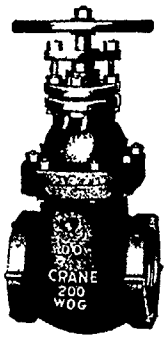
| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 2 | 2 | 6 | 5/8 | 4 3/4 | 4 | 5/8 |
| 2½ | 2½ | 7 | 11/16 | 5½ | 4 | 5/8 |
| 3 | 3 | 7½ | 3/4 | 6 | 4 | 5/8 |
| 4 | 4 | 9 | 15/16 | 7½ | 8 | 5/8 |
| 5 | 5 | 10 | 15/16 | 8½ | 8 | 3/4 |
| 6 | 6 | 11 | 1 | 9½ | 8 | 3/4 |
| 8 | 8 | 13½ | 1 1/8 | 11 3/4 | 8 | 3/4 |
| 10 | 10 | 16 | 1 3/16 | 14 1/4 | 12 | 7/8 |
| 12 | 12 | 19 | 1 1/4 | 17 | 12 | 7/8 |
| 14 | 14 | 21 | 1 3/8 | 18 3/4 | 12 | 1 |
| 16 | 16 | 23½ | 1 7/16 | 21 1/4 | 16 | 1 |
| 18 | 18 | 25 | 1 9/16 | 22 3/4 | 16 | 1 1/8 |
| 20 | 20 | 27½ | 1 11/16 | 25 | 20 | 1 1/8 |
| 24 | 24 | 32 | 1 7/8 | 29½ | 20 | 1 1/4 |

*Additional description....pages 88 and 89*

# 200-Pound W.O.G.
# Iron Body Double Disc Gate Valves
## Brass Trimmed or All-Iron

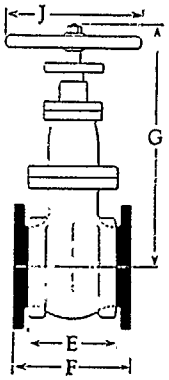
Non-Rising Stem

Outside Screw and Yoke

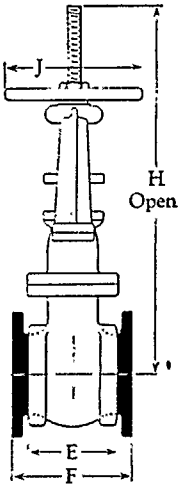



Screwed
No. 480
Brass Trimmed

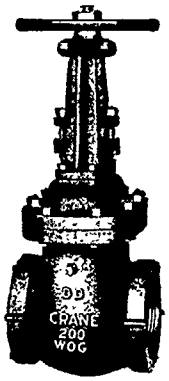
Flanged
No. 481
Brass Trimmed
No. 1081
All-Iron



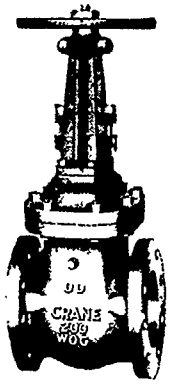

Non-Rising Stem Valves
Without By-Pass




Outside Screw and Yoke Valves
Without By-Pass




Screwed
No. 482
Brass Trimmed




Flanged
No. 483
Brass Trimmed
No. 1083
All-Iron

9

*For working pressures and description, see the preceding page.*

### List Prices and Dimensions

| Size | List Prices, Each | | | | | | Dimensions, in Inches | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-Rising Stem | | | Outside Screw and Yoke | | | | | | | | |
| Inches | No. 480 Screwed | No. 481 Flanged F. & D. | No. 1081 Flanged F. & D. | No. 482 Screwed | No. 483 Flanged F. & D. | No. 1083 Flanged F. & D. | E | F | G | H | J | No. of turns to open |
| 2 | 34.50 | 38.00 | 38.00 | 40.50 | 44.00 | 44.00 | 5½ | 7 | 12 | 14¾ | 8 | 7½ |
| 2½ | 36.00 | 40.50 | 40.50 | 43.50 | 48.00 | 48.00 | 6¼ | 7½ | 12½ | 16 | 8 | 9 |
| 3 | 40.00 | 45.00 | 45.00 | 52.00 | 57.00 | 57.00 | 7 | 8 | 14 | 19 | 9 | 10½ |
| 4 | 55.50 | 63.50 | 63.50 | 72.00 | 80.00 | 80.00 | 7½ | 9 | 17⅜ | 23⅜ | 10 | |
| 5 | | 85.50 | | | 103.00 | | | 10 | 19¾ | 28⅛ | 12 | 11 |
| 6 | 94.00 | 103.00 | 103.00 | 118.00 | 127.00 | 127.00 | 11¼ | 10½ | 21¼ | 32¾ | 12 | 13 |
| 8 | | 179.00 | 179.00 | | 212.00 | 212.00 | | 11½ | 26 | 41 | 14 | 18 |
| 10 | | 295.00 | 295.00 | | 345.00 | 345.00 | | 13 | 30 | 49¾ | 16 | 22 |
| 12 | | 420.00 | 420.00 | | 492.00 | 492.00 | | 14 | 34⅜ | 57 | 18 | 26 |
| * 14 | | 570.00 | | | 676.00 | | | 15¾ | 40 | 67 | 20 | 31 |
| * 16 | | 815.00 | | | 945.00 | | | 17 | 45¼ | 75½ | 22 | 35 |
| * 18 | | 1120.00 | | | 1275.00 | | | 18½ | 48⅞ | 83½ | 24 | 39 |
| * 20 | | 1660.00 | | | 1835.00 | | | 20 | 52¾ | 92½ | 24 | 44 |
| *†24 | | 2615.00 | | | 2845.00 | | | 24 | 63⅝ | 109½ | 30 | 52 |

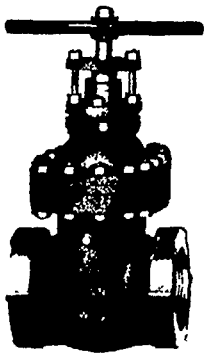
*Sizes 14-inch and larger should have a by-pass; see pages 100 to 102 for dimensions and description.
†Size 24-inch should be geared; see pages 100 to 102 for dimension and description.

**Drilling:** Flanged valves are furnished faced and drilled (F. & D.) unless ordered faced only. List prices include facing and drilling to the American Cast Iron Flange Standard, Class 125. When valves are ordered faced only, they will be furnished at the same price as for faced and drilled.

**Larger size flanged valves:** When so desired, the No. 481 and No. 483 Brass Trimmed Flanged Valves can be furnished in sizes 30 to 48-inch inclusive. In such sizes, the valves are made to order only; prices and dimensions will be furnished on application.

*By-passes and gearing . . . pages 100 to 102* *Templates for drilling . . . page 459* *Thread Engagement . . . page 494*

# 500-Pound W.O.G.
# Ferrosteel Double Disc Gate Valves
## Brass Trimmed

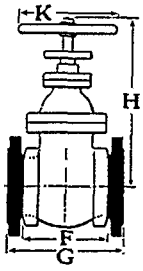


Non-Rising Stem
No. 340 E, Screwed

WORKING PRESSURE
500 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES
1000-pound shell test 550-pound seat test

*Air tested*



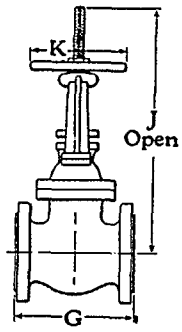

Screwed
or
Flanged

Non-Rising
Stem
Without
By-Pass

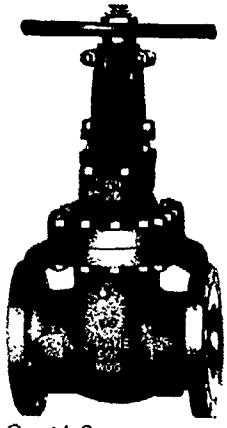
**List Prices, Each**

| Size Inches | Screwed No. 340 E Non-Rising | Flanged F. D. & S. F. No. 341 E Non-Rising | Flanged F. D. & S. F. No. 343 E O. S. & Y. |
|---|---|---|---|
| 2 | 65.00 | 80.00 | 85.00 |
| 2½ | 75.00 | 92.00 | 98.00 |
| 3 | 88.00 | 105.00 | 112.00 |
| 4 | 152.00 | 171.00 | 186.00 |
| * 6 | | 242.00 | 268.00 |
| *† 8 | | 418.00 | 472.00 |
| *†10 | | 612.00 | 690.00 |
| *†12 | | 830.00 | 930.00 |

*Sizes 6-inch and larger should have a by-pass; see pages 100 to 102 for dimensions and description.
†Sizes 8-inch and larger can be equipped with gears; see pages 100 to 102 for dimensions and description.



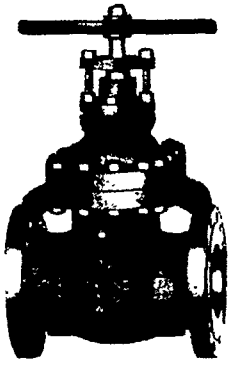

Flanged
Outside Screw
and Yoke
Without By-Pass



Outside Screw and Yoke
No. 343 E, Flanged

*For additional description, see pages 88 and 89.*

9



Non-Rising Stem
No. 341 E, Flanged

These unusually rugged valves are especially suitable for use in oil refineries, in pump houses, in pipe lines, in high pressure water lines, or for similar service requiring heavy, massive iron body valves.

**Materials:** The body and bonnet are made of Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than cast iron. The body seat rings, screwed into the body, are made of Crane Special Bronze, a hard, leaded tin bronze.

The discs in sizes 2 to 4-inch are Crane Special Bronze; in larger sizes, they are cast iron faced with Crane Special Bronze. The stem is brass (Cast Manganese Bronze in non-rising stem valves). In non-rising stem valves, the portion of the discs that engages the stem threads is brass or brass-bushed.

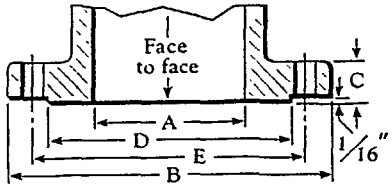
**Stuffing box and gland:** The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure. The gland is the two-piece type, consisting of an Ihrigized steel gland and a malleable iron gland flange.

**Standards:** Flanged valves without by-pass conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949.

Flanged valves without by-pass also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 250-Lb. Cast Iron Flanged Double Disc Gate Valves.

**Flange dimensions and facing:** End flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944). End flanges are regularly furnished with a 1/16-inch raised face. The raised face is finished with concentric grooves, approximately 16 per inch, known as a "serrated" finish.

***Prices of flanged valves include facing, drilling, and spot facing (F.D. & S.F.) to the American Cast Iron Flange Standard, Class 250; no deduction if valves ordered faced only.***

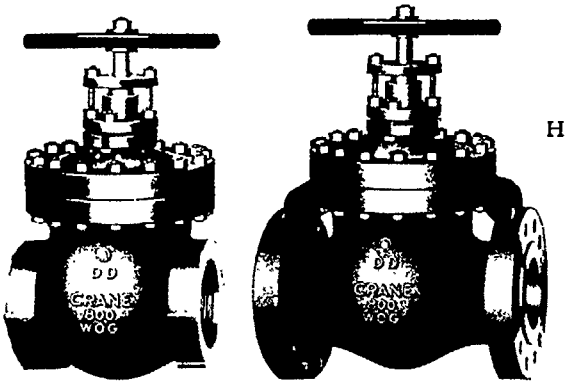



**Dimensions, in Inches**

| Size | A | B | C | D | E | F | G | H | J | K | Turns to open | No. of Bolts | Dia. of Bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 6½ | ⅞ | 4 3/16 | 5 | 8 | 8½ | 12½ | 17 | 9 | 15 | 8 | ⅝ |
| 2½ | 2½ | 7½ | 1 | 4 15/16 | 5⅞ | 8⅞ | 9½ | 14½ | 18¾ | 9 | 18 | 8 | ¾ |
| 3 | 3 | 8¼ | 1⅛ | 5 11/16 | 6⅝ | 9⅝ | 11⅛ | 15½ | 21 | 10 | 15 | 8 | ¾ |
| 4 | 4 | 10 | 1¼ | 6 15/16 | 7⅞ | 10½ | 12 | 17⅞ | 25¼ | 12 | 19 | 8 | ¾ |
| 6 | 6 | 12½ | 1 7/16 | 9 11/16 | 10⅝ | | 15⅞ | 22¾ | 34 | 16 | 28 | 12 | ¾ |
| 8 | 8 | 15 | 1⅝ | 11 15/16 | 13 | | 16½ | 28¾ | 42¾ | 20 | 36 | 12 | ⅞ |
| 10 | 10 | 17½ | 1⅞ | 14 1/16 | 15¼ | | 18 | 36 | 53¼ | 22 | 44 | 16 | 1 |
| 12 | 12 | 20½ | 2 | 16 7/16 | 17¾ | | 19¾ | 40 | 61 | 24 | 52 | 16 | 1⅛ |

*Templates for drilling....page 460* *Thread engagement... page 494*
*Motor or cylinder operation....pages 124 to 129* *600-Pound Steel Pipe Line Gate Valves....pages 232 and 233*

# 800-Pound W.O.G.
# Ferrosteel Double Disc Gate Valves
## Brass Trimmed

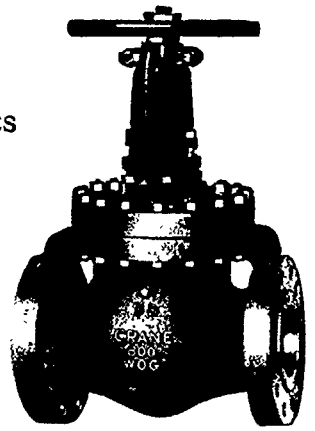


Non-Rising Stem Valves
No. 214 H, Screwed  No. 215 H, Flanged

WORKING PRESSURE
800 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES
1600-pound shell test
850-pound seat test

***Air tested***



Outside Screw and Yoke Valve
No. 217 H
Flanged

### List Prices, Each

| Size Inches | Screwed No. 214 H N-R.S. | Flanged F. D. & S. F. No. 215 H N-R. S. | Flanged F. D. & S. F. No. 217 H OS & Y |
|---|---|---|---|
| 2 | 89.00 | | |
| 2½ | 107.00 | | |
| 3 | 137.00 | 160.00 | 170.00 |
| 4 | 217.00 | 245.00 | 258.00 |
| * 6 | 330.00 | 415.00 | 458.00 |
| * 8 | | 610.00 | 700.00 |
| *†10 | | 1015.00 | 1300.00 |
| *†12 | | 1520.00 | 1940.00 |

*Sizes 6 to 12-inch should have a by-pass; see pages 100 to 102 for dimensions and description.

†Sizes 10 and 12-inch should be geared; see pages 100 to 102 for dimensions and description.

***Prices of flanged valves include facing, drilling, and spot facing (F.D. & S.F.) to the 800-Pound Hydraulic American Cast Iron Flange Standard; no deduction for valves ordered faced only.***

These valves are ideal for use in oil or gas fields, in pump houses, on pipe lines, on high pressure water lines, and for other heavy duty service.

**Materials:** The body and bonnet are Crane Ferrosteel. Threaded ends of screwed valves are recessed for lead. The screwed-in body seat rings and the discs (2 to 4-inch) are Crane Special Bronze, a hard, leaded tin bronze. In larger sizes, discs are iron, faced with Crane Special Bronze.

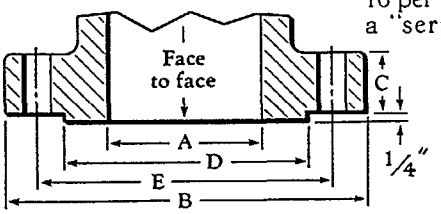
Outside screw and yoke valves have a brass stem. In non-rising stem valves, the stem is Cast Manganese Bronze, and the portion of the discs engaging the stem threads is brass or brass bushed.

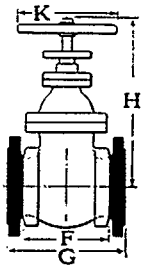
**Stuffing box and gland:** The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure. The gland is two-piece and consists of an Ihrigized steel gland and a malleable iron gland flange.

**Standards:** Flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949.

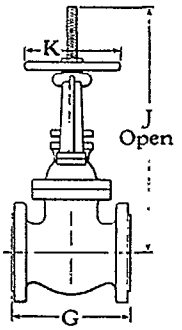
Flanged valves also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 800-Lb. Hydraulic Cast Iron Flanged Double Disc Gate Valves.

**Flange dimensions and facing:** Dimensions and drilling of end flanges conform to the 800-Pound Hydraulic American Cast Iron Flange Standard (B16b1-1931). End flanges are regularly furnished with a ¼-inch male face (large male). The male face is finished with concentric grooves, approximately 16 per inch, known as a "serrated" finish.




Screwed or Flanged
Non-Rising Stem




Flanged
Outside Screw and Yoke

### Dimensions, in Inches

| Size | A | B | C | D | E | F | G | H | J | K | Turns to open | No. of Bolts | Dia. of Bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | | | | | 7½ | | 13 | | 9 | 15 | | |
| 2½ | | | | | | 8⅞ | | 15 | | 9 | 18 | | |
| 3 | 3 | 8¼ | 1½ | 5 | 6⅝ | 9⅝ | 14 | 16¾ | 20¾ | 10 | 15 | 8 | ¾ |
| 4 | 4 | 10¾ | 1⅞ | 6 3/16 | 8½ | 10½ | 17 | 19 | 26½ | 12 | 19 | 8 | ⅞ |
| 6 | 6 | 14 | 2¼ | 8½ | 11½ | 14¾ | 22 | 23½ | 34 | 16 | 28 | 12 | 1 |
| 8 | 7⅞ | 16½ | 2½ | 10⅝ | 13¾ | | 26 | 29¼ | 42¾ | 20 | 36 | 12 | 1⅛ |
| 10 | 9¾ | 20 | 2⅞ | 12¾ | 17 | | 31 | 36½ | 53½ | 22 | 46 | 16 | 1¼ |
| 12 | 11¾ | 22 | 3 | 15 | 19¼ | | 33 | 39¾ | 61¼ | 24 | 54 | 20 | 1¼ |

***Additional description . . pages 88 and 89  Templates for drilling . page 460  Thread engagement . . . . page 494***
***Motor or cylinder operation . . . . pages 124 to 129  600-Pound Steel Pipe Line Gate Valves . . . . pages 232 and 233***

# Iron Double Disc Gate Valves With Gearing or By-pass

*For dimensions, see the following page.*

With the exception of the A.W.W.A. Valves, the dimensions of Crane Iron Body and Ferrosteel Double Disc Gate Valves equipped with gearing or by-pass are shown on the opposite page.

For dimensions of the A.W.W.A. Valves and for dimensions of the other valves without gearing or by-pass, refer to the following pages:


25-Pound Valves.....see page 91
100-Pound W.O.G. Valves.....see page 93
A.W.W.A. Valves.....see page 95
200-Pound W.O.G. Valves.....see page 97
500-Pound W.O.G. Valves.....see page 98
800-Pound W.O.G. Valves.....see page 99


**Gearing:** Equipping the larger size Double Disc Gate Valves with gears will greatly facilitate their operation. Gears, both bevel and spur, are available for a wide range of sizes in each pressure class.

9

Face to face or end to end dimensions of valves with gears are the same as those of valves without gears; see pages referred to above.

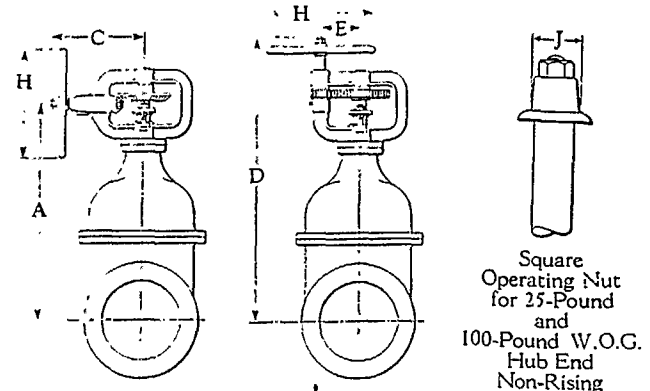
**By-passes:** Larger size flanged and hub end valves in all pressure classes can be furnished with a by-pass.

Center to top and wheel diameter dimensions of valves with by-pass are the same as those of valves without by-pass; face to face or end to end dimensions are explained below.

**Face to face or end to end with by-pass:** Crane 25-Pound, 100-Pound W.O.G., 200-Pound W.O.G., and 500-Pound W.O.G. Valves when furnished with a by-pass have a longer face to face or end to end dimension than the same valves without by-pass.

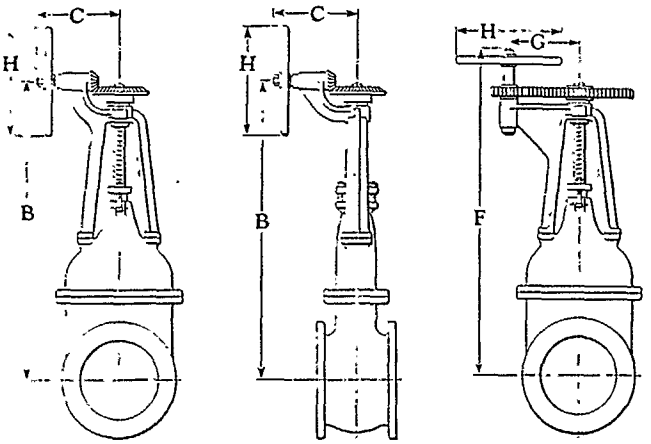
800-Pound W.O.G. Valves with by-pass have the same face to face dimension as the valves without by-pass. These dimensions are repeated on the opposite page for convenience.

**Geared valves with by-pass:** Spur-geared valves with by-pass have the by-pass connected at the side of the valve body.



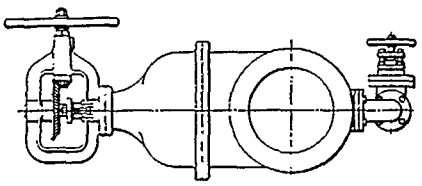

Style U Bevel Gearing — Style S Spur Gearing — Square Operating Nut for 25-Pound and 100-Pound W.O.G. Hub End Non-Rising Stem Geared Valves

**Non-Rising Stem Valves With Bevel or Spur Gears**

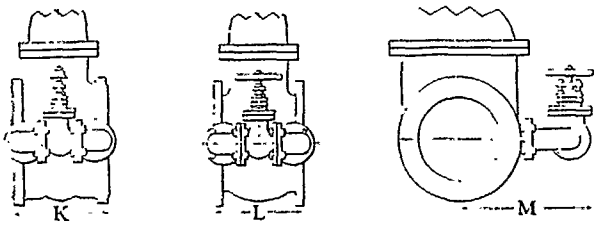



Style N Bevel Gearing — Style O Bevel Gearing — Style P Spur Gearing

**Outside Screw and Yoke Valves With Bevel or Spur Gears**



Bevel-geared valves with by-pass have the by-pass on the bottom, with the stem of the by-pass valve parallel to the pinion shaft; see illustration above.




Hub End — *Flanged — By-Pass

**Flanged and Hub End Valves with By-Pass**

*Dimension "L" includes the 1/16-inch raised faces on 500-Pound W.O.G. Flanged Valves and the 1/4-inch male faces on 800-Pound W.O.G. Flanged Valves.

# Iron Double Disc Gate Valves With Gearing or By-Pass

## Dimensions, in Inches

*For list prices, description, and dimensions of valves without gearing or by-pass, see pages 91 to 99.*

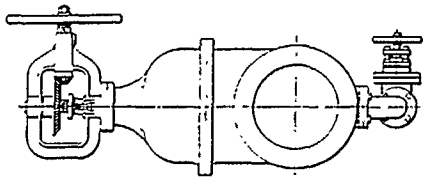
| Size of Main Valve | Valves with Gears | | | | | | | | | | Valves with By-Pass | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bevel Geared | | | Spur Geared | | | | H | J | No. of turns to open | K | *L | M | Size of by-pass |
| | A | B | C | D | E | F | G | | | | | | | |
| ***25-Pound Double Disc Gate Valves*** | | | | | | | | | | | | | | |
| 14 | 31¼ | 51⅛ | 12⅝ | 41½ | 6 | 54¾ | 10 | 14 | 2 | 58 | 18 | 16 | 23¼ | 2 |
| 16 | 34⅛ | 56⅛ | 12⅝ | 44½ | 6 | 59¾ | 10 | 14 | 2 | 66 | 21 | 18 | 27¼ | 3 |
| 18 | 39 | 62⅞ | 13 | 50¼ | 6 | 67¼ | 12 | 18 | 2 | 76 | 21 | 18½ | 28¼ | 3 |
| 20 | 42⅛ | 66⅜ | 13 | 53¼ | 6 | 70¾ | 12 | 18 | 2 | 84 | 21½ | 18½ | 29¼ | 3 |
| 24 | 49⅞ | 80¼ | 13 | 61 | 6 | 84¼ | 12 | 18 | 2 | 98 | 22½ | 20 | 32¾ | 4 |
| 30 | 58⅞ | 98⅞ | 13 | 70 | 6 | 103 | 12 | 18 | 2 | 248 | 23½ | 20½ | 34¾ | 4 |
| 36 | 70 | 113⅞ | 16⅞ | 84 | 8 | 119¾ | 14¾ | 22 | 2 | 441 | 27½ | 24 | 41¼ | 6 |
| 42 | | 133¾ | 20½ | | | 139½ | 17 | 27 | | 460 | | 25½ | 44¾ | 6 |
| 48 | | 139 | 23 | | | 157 | 19 | 30 | | 600 | | 29½ | 52 | 8 |
| ***100-Pound W.O.G. Double Disc Gate Valves*** | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | 19¼ | 19¼ | 22 | 2 |
| 14 | 32½ | 49⅛ | 12⅝ | 42¾ | 6 | 52⅝ | 10 | 14 | 2 | 60 | 20 | 20 | 23¼ | 2 |
| 16 | 37¾ | 59⅜ | 13 | 48¾ | 6 | 59¾ | 12 | 18 | 2 | 68 | 23 | 23 | 26¼ | 3 |
| 18 | 40¾ | 60¾ | 13 | 51¾ | 6 | 65 | 12 | 18 | 2 | 76 | 23½ | 23½ | 27½ | 3 |
| 20 | 44¼ | 66⅜ | 13 | 55¼ | 6 | 70¾ | 12 | 18 | 2 | 84 | 24 | 24 | 28¾ | 3 |
| 24 | 52¾ | 78¾ | 17 | 66¾ | 8 | 84¾ | 14 11/16 | 22 | 2 | 152 | 26 | 26 | 31¼ | 4 |
| 30 | 65¼ | 100¼ | 20½ | 81¼ | 10 13/16 | 105¾ | 17 | 27 | | 223 | | 26½ | 35¼ | 4 |
| 36 | 77½ | 116¾ | 23 | 94 | 12 | 122½ | 19 | 30 | | 456 | | 27½ | 43 | 6 |
| ***200-Pound W.O.G. Double Disc Gate Valves*** | | | | | | | | | | | | | | |
| 12 | 31⅛ | 44¾ | 13 | 42¼ | 6 | 49 | 12 | 18 | | 51 | | 18 | 22¼ | 2 |
| 14 | 35⅜ | 52⅝ | 13 | 46½ | 6 | 57 | 12 | 18 | | 60 | | 18½ | 23¼ | 2 |
| 16 | 41 | 59⅝ | 17 | 55 | 8 | 65¾ | 14 11/16 | 22 | | 102 | | 26½ | 26 | 3 |
| 18 | 44⅜ | 65¼ | 17 | 58½ | 8 | 71¼ | 14 11/16 | 22 | | 114 | | 27 | 27¼ | 3 |
| 20 | 47¼ | 72 | 17 | 61¼ | 8 | 78 | 14 11/16 | 22 | | 128 | | 28 | 28¾ | 3 |
| 24 | 56¼ | 85⅜ | 20½ | 72¼ | 10 13/16 | 91 | 17 | 27 | | 182 | | 32 | 32¾ | 4 |
| ***500-Pound W.O.G. Double Disc Gate Valves*** | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | 16 | 12¾ | 1¼ |
| 8 | 24⅜ | 34½ | 13 | 35¼ | 6 | 38¾ | 12 | 18 | | 72 | | 18 | 14¾ | 1½ |
| 10 | 29⅝ | 43 | 15 | 42 | 7 | 47¾ | 14 | 20 | | 110 | | 20 | 16¾ | 1½ |
| 12 | 33½ | 48¼ | 15 | 45 | 7 | 53 | 14 | 20 | | 130 | | 22 | 24½ | 2 |
| ***800-Pound W.O.G. Double Disc Gate Valves*** | | | | | | | | | | | | | | |
| 6 | 19⅝ | 28 | 12½ | 30 | 6 | 32 | 10 | 14 | | 54 | | *22 | 14 | 1¼ |
| 8 | 25¼ | 34½ | 12⅞ | 36¼ | 6 | 38¾ | 12 | 18 | | 72 | | *26 | 17 | 1½ |
| 10 | 30⅝ | 43½ | 15 | 43 | 7 | 48¼ | 14 | 20 | | 112 | | *31 | 18½ | 1½ |
| 12 | 34¼ | 48⅞ | 15 | 46½ | 7 | 53⅝ | 14 | 20 | | 133 | | *33 | 20¾ | 2 |

*Dimension "L", the face to face of flanged valves with by-pass, includes the 1/16-inch raised faces on 500-Pound W.O.G. Valves and the ¼-inch male faces on 800-Pound W.O.G. Valves. Dimensions identified by an asterisk are the same as for valves without by-pass.

*Description of gears...page 102* *Description of by-passes...page 102* *Templates for drilling...pages 459 and 460*

# Accessories for Iron Double Disc Gate Valves

## By-Passes



Bevel Geared Valve with By-Pass

When so ordered, larger size Flanged and Hub End Iron Body Double Disc Gate Valves can be furnished with a by-pass. This facilitates operation of the main valve by equalizing the pressure on both sides of the disc. The by-passes are large size, suitable for water (or oil or gas) service.

By-Passes
For Water Service on Flanged or Hub End Valves

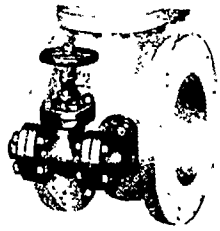
| Pressure Class of Main Valve | Size of Main Valve Inches | Size of By-Pass Inches | Price, Each: Non-Rising By-Pass | Price, Each: O. S. & Y. By-Pass |
|---|---|---|---|---|
| 25-Lb. W.O.G. Page 91 | 14 | 2 | *Prices on Application* | *Prices on Application* |
| | 16 to 20 | 3 | | |
| | 24 and 30 | 4 | | |
| | 36 and 42 | 6 | | |
| | 48 | 8 | .... | |
| 100-Lb. W.O.G. Page 93 | 12 and 14 | 2 | *Prices on Application* | |
| | 16 to 20 | 3 | | |
| | 24 and 30 | 4 | | |
| | 36 | 6 | | |
| 200-Lb. W.O.G. Page 97 | 12 and 14 | 2 | *Prices on Application* | |
| | 16 to 20 | 3 | | |
| | 24 | 4 | | |
| 500 and 800-Lb. W.O.G. Pages 98 and 99 | 6 | 1¼ | *Prices on Application* | |
| | 8 and 10 | 1½ | | |
| | 12 | 2 | | |

9

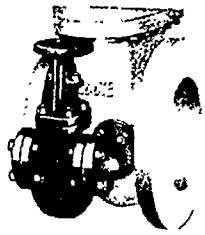
Non-rising stem valves are furnished with a non-rising stem by-pass; O.S.&Y. Valves, with an O.S.&Y. by-pass. Brass trimmed valves will have a brass trimmed by-pass; all-iron valves, an all-iron by-pass.

Unless otherwise ordered, on regular wheel operated and spur geared valves, the by-pass will be attached to the side of the main valve with the stem of the main valve and of the by-pass valve parallel, pointing vertically upward. Bevel geared valves with by-pass have the by-pass on the bottom of the main valve, as shown in the illustration at the upper left.

*Dimensions....pages 100 and 101*



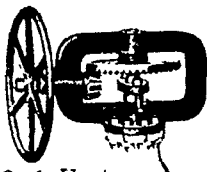
**By-Pass for Water Service on Non-Rising Stem Gate Valve**
Non-Rising Gate Valve Used in By-Pass



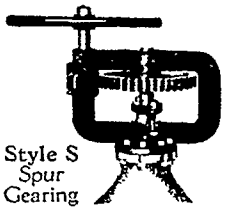
**By-Pass for Water Service on Outside Screw & Yoke Gate Valves**
Outside Screw & Yoke Gate Valve Used in By-Pass

## Gearing

### Non-Rising Stem



Style U
Bevel Gearing

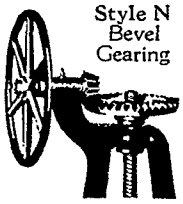


Style S
Spur Gearing

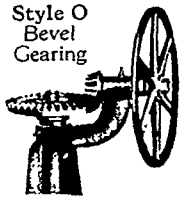
| Bevel or Spur Gearing For Non-Rising Stem Or O. S. & Y. Valves |
|---|
| 25-Lb. Valves 14-inch and larger |
| 100-Lb. W.O.G. Valves 14-inch and larger |
| 200-Lb. W.O.G. Valves 12-inch and larger |
| 500-Lb. W.O.G. Valves 8-inch and larger |
| 800-Lb. W.O.G. Valves 6-inch and larger |

The larger size Crane Iron Body Double Disc Gate Valves can be equipped with gears to facilitate operation.

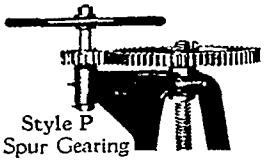
### Outside Screw and Yoke



Style N
Bevel
Gearing



Style O
Bevel
Gearing



Style P
Spur Gearing

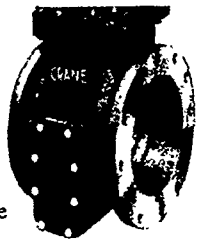
**Bevel gearing:** Unless otherwise ordered, non-rising stem and outside screw and yoke bevel geared valves are furnished with the pinion shaft extending at right angles to the run of the valve. They can also be furnished with the shaft parallel to the run.

*Prices on Application*
*Dimensions of geared valves.... pages 100 and 101*

## Cleanouts

**For 200-Pound W.O.G. Flanged Valves**
**Sizes 12-inch and smaller only**

Cleanouts should be used where sediment will accumulate in a valve. They are installed on the side of the valve body.



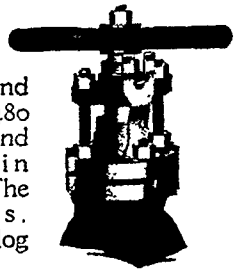
*Prices on Application*

Single Side Cleanout

## Indicators

**For 100 and 200-Pound W.O.G. Valves**
**Sizes 12-inch and smaller only**

This "Universal" type indicator is easily applied to No. 776, 100-Pound W.O.G. and No. 480 or No. 481, 200-Pound W.O.G. Valves in stock or service. The parts are brass. Specify valve catalog number and size.



| Indicator | List Price, Each |
|---|---|
| | 7.00 |

Iron Body
Globe & Angle Valves

# Iron Body Globe and Angle Valves

**Union Bonnet Globe and Angle**
150-Pound.....pages 104 and 105
1000-Pound W.O.G., Malleable Iron.....page 106
Heavy Duty All-Iron.....page 111

**Yoke-Type Bolted Bonnet Globe and Angle**
General Description.....page 107
Names of Parts.....page 107
125-Pound.....pages 108 and 109
250-Pound.....page 110

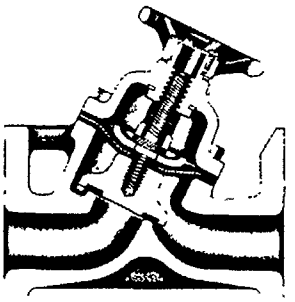
**Heavy Duty All-Iron Globe and Angle**.....page 111

**Butterfly Valves**.....page 111

Special attention is directed to the unusually complete line of 150-Pound Iron Body Union Bonnet Globe and Angle Valves shown on pages 104 and 105. These small size valves will find wide application in many industries. The wide variety of seating surfaces and trim materials available and the interchangeability of parts will appeal to users whose requirements warrant standardization and the stocking of replacement parts.

10

## *Tight Seating, "Packless" Type Crane Iron Body Y-Pattern Diaphragm Valves*



Sectional View Y-Pattern Diaphragm Valve

***Unexcelled for a Wide Variety of General and Corrosive Services***

Crane Iron Body, Y-Pattern Diaphragm Valves, built for hard usage, are excellent for a wide variety of corrosive, as well as ordinary, piping systems. The flexible diaphragm mounted between the body and bonnet (eliminates the need for a stuffing box) and the tight-seating disc facing make the valves ideal for conveying liquids, compressed air, gases, volatile fluids, etc.

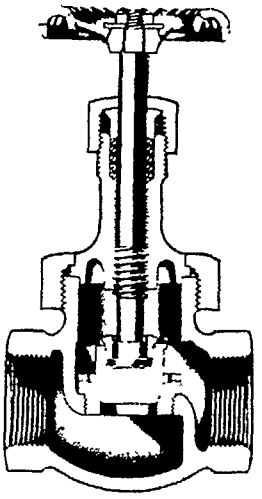
The valves, suitable for pressures ranging up to 150 pounds and a maximum temperature of 180° F., are made with screwed ends in sizes ½ to 2-inch and with flanged ends in sizes ½ to 6-inch. They are available with the diaphragm and disc insert made of neoprene, Buna N, or natural rubber. The flanged valves are also available with the body lined, and the disc coated, with neoprene or natural rubber.

In addition to cast iron, the complete diaphragm line includes valves having the body and disc holder made of brass, aluminum, or 18-8 Mo.

***For the complete Crane line of Diaphragm Valves, see pages 388 to 391.***

# 150-Pound Iron Body Globe and Angle Valves

## Plug Type Disc



Cross Section
No. 314½ P, Globe

WORKING PRESSURES
150 pounds saturated steam
250 pounds cold water, oil, or gas, non-shock

FEATURES
Crane Nitri-Hard Seating Surfaces
Renewable Body Seat Ring
Plug Type Disc
Union Bonnet
2-inch and smaller
Bolted Bonnet
2½ and 3-inch

No. 314½ P, Globe
Screwed

No. 316½ P, Angle
Screwed

***These valves are the same as the No. 350½ Globe and No. 352½ Angle shown on page 105 except that they have a plug type disc and seat instead of a 35° wide bearing seat.***

### List Prices, Each

10

| Size Inches. | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 314½ P or No. 316½ P, Screwed | 8.00 | 8.30 | 8.80 | 10.20 | 12.50 | 16.40 | 22.00 | 29.00 | 45.50 | 59.00 |

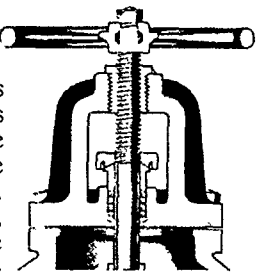
**Service recommendations:** Crane No. 314½ P Globe and No. 316½ P Angle Valves are ideally suited for installations where operating conditions are severe. Strong, compact, rugged, and durable, they are recommended for throttling and for soot blower, blow-off, boiler feed, drip, and drain lines.

**Materials:** Sizes 2-inch and smaller have a brass bonnet and a malleable iron union bonnet ring; 2½ and 3-inch sizes have a cast iron bonnet. All sizes have a cast iron body and a brass stem.

**Disc and seat:** The valves have a plug type disc and seat whose excellent design characteristics for rigorous service are well known. The wide seating surface is not easily ruined by foreign matter or by wiredrawing, and the tapered disc permits close regulation of flow when throttling.

Both the disc and seat are made of Crane Nitri-Hard, a stainless steel that withstands high temperatures and has an extremely hard surface. The design of the disc and seat combined with the excellent resistance offered by the high hardness to seizure, erosion, galling, and scoring, produce a truly superior seating combination. It will withstand severe operating condition unusually well.

**Bonnet construction:** Sizes 2-inch and smaller have a union bonnet as shown on the illustrations above; 2½ and 3-inch sizes have a bolted bonnet of the outside screw and yoke type as illustrated at the right. Both types provide a strong, tight joint, yet they can be easily dismantled and reassembled without danger of injuring the valve.



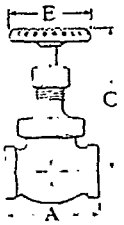
***2½ and 3-inch sizes have a bolted bonnet.***

**Stuffing box:** The stuffing box is unusually deep and is fitted with a gland. It is filled with high grade packing.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

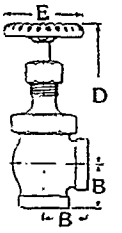
**Interchangeability:** Except for the plug type disc and seat and the materials used in these valves, the various parts of the Nos. 314½ P and 316½ P valves are completely interchangeable, size for size, with all of the 150-Pound Globe and Angle Valves shown on the opposite page.

***A metal tag, secured under the wheel nut, shows the catalog number of the valve.***




### Dimensions, in Inches

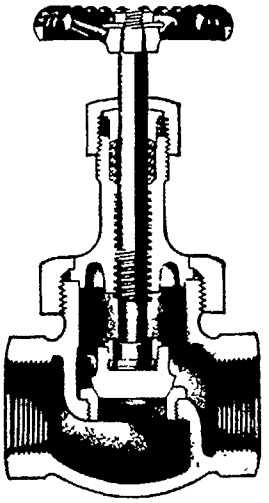
| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 2⅜ | 2⅝ | 3 | 3½ | 4⅛ | 4⅝ | 5¼ | 6⅜ | 7 | 8 |
| B | 1⅛ | 1¼ | 1⅜ | 1 9/16 | 1⅞ | 2 3/16 | 2⅜ | 3 | 3½ | 4 |
| C—open | 4⅛ | 4⅜ | 5⅛ | 5½ | 6⅝ | 7¼ | 8¼ | 9½ | 11½ | 14 |
| D—open | 4 | 4¼ | 5 | 5⅜ | 6½ | 7¼ | 8⅛ | 9¼ | 11¾ | 13¾ |
| E | 1¾ | 2 1/16 | 2 9/16 | 2¾ | 3 1/16 | 3⅝ | 4 1/16 | 4¾ | 8 | 9 |




*Thread engagement . . . page 494*

# 150-Pound Iron Body Globe and Angle Valves

## Brass Trimmed, All-Iron, or Composition Discs



Cross Section, Globe
Metal Disc

WORKING PRESSURES
150 pounds saturated steam
250 pounds cold water, oil, or gas, non-shock

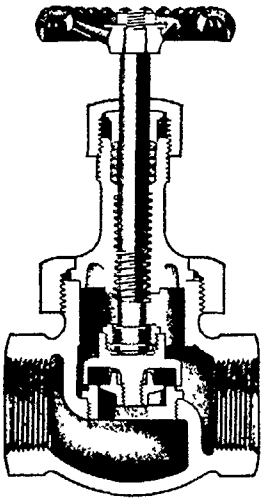
FEATURES
Interchangeable Parts
Choice of Seating Materials
Renewable Body Seat Ring

Globe, Screwed

***A metal tag, secured under the wheel nut, shows the catalog number of the valve.***

Angle, Screwed

No. 350½ —Brass Trim, Nickel Alloy Disc & Seat—No. 352½
No. 354½ —All-Iron, Nickel Alloy Disc & Seat—No 356½
No. 355½ —All-Iron, Iron or Steel Disc & Seat—No. 357½
No. 350½ C—Brass Trim, No. 1 Cranite Disc—No. 352½ C
No. 355½ C— All-Iron, No. 1 Cranite Disc —No. 357½ C



Cross Section, Globe
Composition Disc

### List Prices, Each

| Size Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 350½ or 352½ | 7.50 | 7.70 | 8.00 | 9.60 | 11.60 | 14.30 | 18.00 | 23.80 | 42.50 | 51.00 |
| No. 354½, 355½, 356½, or 357½ | 9.00 | 9.20 | 9.60 | 11.50 | 12.70 | 15.70 | 19.80 | 26.00 | Use 125-Pound Valves, pages 108 and 109. | |
| No. 350½ C or 352½ C | 7.50 | 7.70 | 8.00 | 9.60 | 11.60 | 14.30 | 18.00 | 23.80 | | |
| No. 355½ C or 357½ C | 10.80 | 11.00 | 11.50 | 13.70 | 15.30 | 18.80 | 23.80 | 31.50 | | |

**Service recommendations:** Made with a sturdy cast iron body, these rugged, compact valves are ideal for steam, water, oil, gas, and similar services. They find wide application in many industries, including oil and gas fields, oil refineries, gas plants, mines, sugar refineries, chemical plants, etc.

**Metal disc valves:** The disc and seat are finished to a 35° taper and have wide contacting surfaces; they hold pressure easily and offer good resistance to wear. Seat rings are screwed into the body.

The Nos. 350½ and 352½ are suitable for general non-corrosive service. They have a brass stem and, except on 2½ and 3-inch sizes, a brass bonnet and gland; their disc and seat are Crane Nickel Alloy.

The Nos. 354½ and 356½ have a malleable iron bonnet, a steel stem and gland, and a Crane Nickel Alloy disc and seat; they are suitable for many corrosive fluids which attack brass but not Nickel Alloy.

The Nos. 355½ and 357½ are completely all-iron, having a malleable iron bonnet, a steel stem and gland, and a steel or cast iron disc and seat.

**Composition disc valves:** These regularly have a No. 1 Cranite Disc, suitable for saturated steam or for hot water up to 300° F. Valves ordered for cold water, air, gas, oil, or gasoline will have a No. 6 Disc. On hot water under 200° F., especially for easy seating, a No. 6 Disc is preferred to the No. 1.

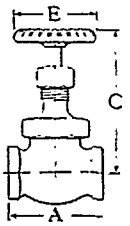
The Nos. 350½ C and 352½ C are brass trimmed, with a brass bonnet, stem, gland, disc holder, and disc nut, and a Nickel Alloy screwed-in seat ring.

The Nos. 355½ C and 357½ C are all-iron, with a malleable iron bonnet and disc holder, a steel stem and gland, and a steel or cast iron screwed-in seat ring.

**Bonnet construction:** Valves 2-inch and smaller have a union bonnet; their union bonnet ring and packing nut are tough malleable iron. Larger sizes have a cast iron yoke-type bolted bonnet with gasket, similar to the small illustration on page 104.

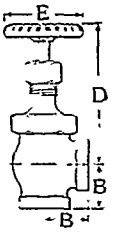
**Stuffing box:** The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Interchangeability:** Except for materials and the design of the seat and disc, the parts of the valves shown here and on page 104 are completely interchangeable, size for size. This adds to their general utility and reduces stocks maintained for repairs.




### Dimensions, in Inches

| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 2⅜ | 2⅝ | 3 | 3½ | 4⅛ | 4⅝ | 5¼ | 6⅜ | 7 | 8 |
| B | 1⅛ | 1¼ | 1⅜ | 1 9/16 | 1⅞ | 2 3/16 | 2⅜ | 3 | 3½ | 4 |
| C—open | 4½ | 4 11/16 | 5 5/16 | 6 1/16 | 7 | 7 11/16 | 8 13/16 | 10¼ | 11½ | 13⅛ |
| D—open | 4⅜ | 4⅝ | 5 3/16 | 6 | 7 | 7⅝ | 8⅝ | 10 | 11½ | 12¾ |
| E | 1¾ | 2 1/16 | 2 9/16 | 2¾ | 3 1/16 | 3⅝ | 4 1/16 | 4¾ | 8 | 9 |

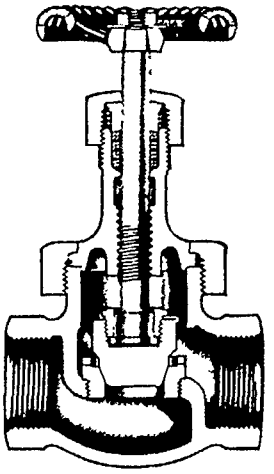



*Composition Discs....page 133* *Thread engagement .page 494*

# 1000-Pound W.O.G.
# Malleable Iron Globe and Angle Valves
## Plug Type Disc

WORKING PRESSURES
300 pounds steam or hot oil, 550° F.
1000 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
1200 pounds hydrostatic

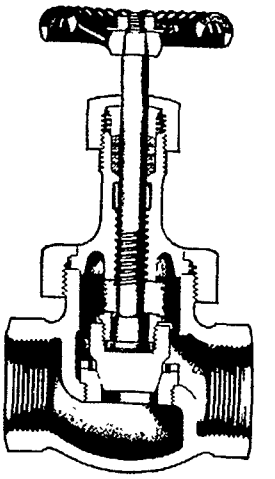


Cross Section
No. 254 P, Globe
Exelloy Stem

Globe, Screwed
No. 254 P, Exelloy Stem
No. 255 P, Steel Stem

*Air Tested*

Angle, Screwed
No. 256 P, Exelloy Stem
No. 257 P, Steel Stem



Cross Section
No. 255 P, Globe
Steel Stem

***Crane Nitri-Hard Seating Surfaces***

10

### List Prices, Each

| Size Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 254 P or No. 256 P, Screwed | 11.00 | 11.50 | 12.60 | 15.20 | 18.60 | 23.00 | 29.50 | 37.50 |
| No. 255 P or No. 257 P, Screwed | 10.20 | 10.50 | 11.30 | 13.60 | 16.60 | 20.00 | 26.00 | 33.50 |

**Service recommendations:** Crane 1000-Pound W.O.G. Malleable Iron Globe and Angle Valves are exceptionally strong, compact, and rugged. They are ideal for oil lines where fire hazard legislates against the use of cast iron and for services where a material stronger than cast iron is desired.

These valves hold pressure easily and when throttled, permit accurate regulation of flow. The wide and tapered plug type disc and seat is unusually resistant to wiredrawing and to damage from foreign matter.

**Materials and construction:** The body, bonnet, and union bonnet ring of the valves are made from high grade malleable iron. Because of the generous metal sections provided in their design and the durability of the materials used, these parts contribute unusual ruggedness to the valves. They have a very liberal factor of safety at their maximum recommended working pressure.

No. 254 P and No. 256 P Valves are equipped with an Exelloy stem; No. 255 P and No. 257 P Valves have a steel stem, nickel-plated.

**Plug type disc and seat:** The valves have a plug type disc and seat with a wide bearing surface which offers excellent resistance to wiredrawing and to damage caused by foreign particles.

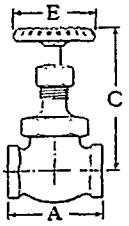
Both the disc and seat are Crane Nitri-Hard, a stainless steel having an extremely hard surface. The design of the disc and seat combined with the excellent resistance offered by the high hardness to erosion, galling, and scoring, produce a truly superior seating combination. It will withstand severe operating conditions unusually well.

**Union bonnet:** The union bonnet connection, joining the body and bonnet in a metal to metal contact, is made up with a heavy malleable iron union ring. The joint is strong, tight, simple, and practical, yet when occasion demands, it can be easily dismantled and reassembled quickly. Gaskets are not required.

**Stuffing box:** The stuffing box is unusually deep; it is fitted with a steel gland, a malleable iron packing nut, and is filled with high grade packing.

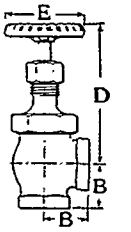
**Repacking:** These valves, when wide open, can be repacked while under pressure.

***A metal tag, secured under the wheel nut, shows the catalog number of the valve.***



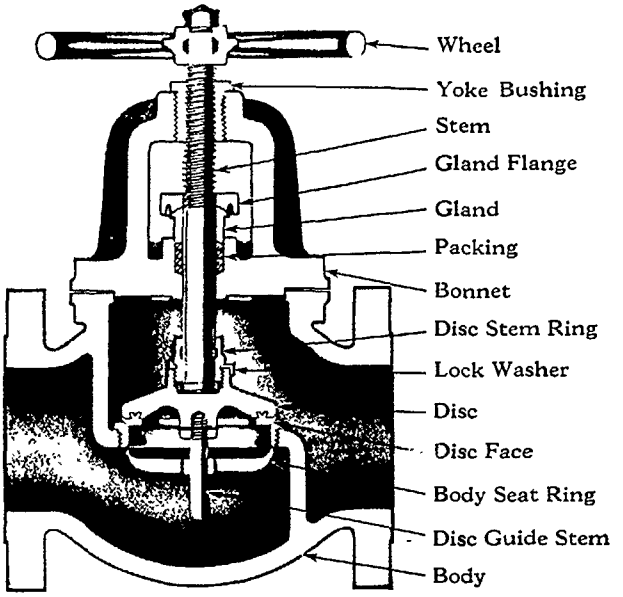

### Dimensions, in Inches

| Size | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|
| A | 2 3/8 | 2 5/8 | 3 | 3 1/2 | 4 1/8 | 4 5/8 | 5 1/4 | 6 3/8 |
| B | 1 1/8 | 1 1/4 | 1 3/8 | 1 9/16 | 1 7/8 | 2 3/16 | 2 3/8 | 3 |
| C—open | 4 7/16 | 4 9/16 | 5 3/16 | 5 9/16 | 7 | 7 5/8 | 8 3/4 | 10 |
| D—open | 4 5/16 | 4 9/16 | 5 1/8 | 5 7/8 | 6 7/8 | 7 1/2 | 8 1/2 | 9 7/8 |
| E | 1 3/4 | 2 1/16 | 2 9/16 | 2 3/4 | 3 1/16 | 3 5/8 | 4 1/16 | 4 3/4 |

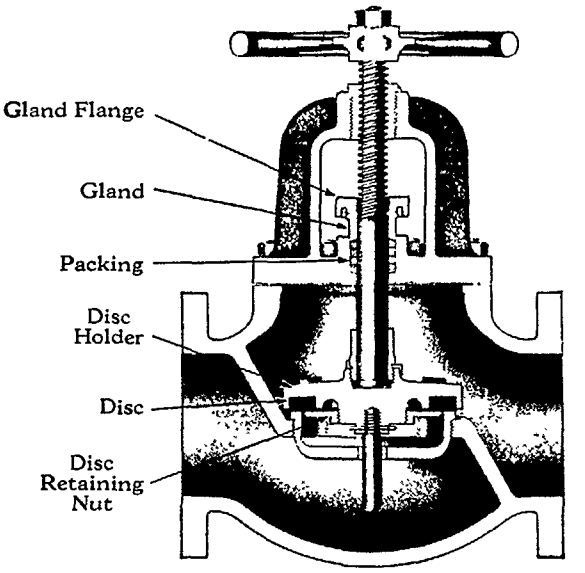



*Thread engagement....page 494*

# Iron Body Globe and Angle Valves
## With Yoke Bonnet




**Globe Valve—Brass Trimmed**
(Illustration shows No. 21E, 250-Pound, page 110)




**Globe Valve—With Composition Disc**
(Illustration shows No. 359, 125-Pound, page 109)

10

## *General Description*

The Crane line of Iron Body Globe and Angle Valves with Yoke Bonnet includes the following types:

125-Pound Valves, Brass Trimmed.....page 108
125-Pound Valves, All-Iron.....page 108
125-Pound Valves, Composition Disc.....page 109
250-Pound Valves, Brass Trimmed.....page 110

All of these valves are similar in construction, differing principally in proportions and in materials. The illustrations appearing above show cross sections of typical valves. Variations in design are covered in detail on pages 108 to 110.

**Rugged construction:** The valves are well proportioned and are ruggedly constructed. They have amply thick metal sections, and the metal is properly distributed to assure maximum strength.

**Bonnet:** The bonnet is the yoke type. Stem threads are engaged in the yoke on the outside where they are not affected by the fluid in the line and where they can be easily lubricated, thereby minimizing wear. The yoke bushing is made of Cast Manganese Bronze.

**Disc-stem connection:** All of the valves have a swivel disc or disc holder securely fastened to the stem with a disc stem ring. The connection is locked with a special lock washer.

**Guided disc:** Except for the 2-inch 125-Pound All-Iron Valves, the disc or disc holder is closely guided throughout its travel by a guide stem operating in the bridge cast integral with the body seat ring. Vibration of the internal parts is thereby minimized, and true seating of the disc is assured.

The disc guide stem is integral with the disc in the smaller sizes; in larger sizes, the disc guide stem is screwed into the disc or disc holder and pinned.

**Gland and gland flange:** All Crane Iron Body Globe and Angle Valves have a two-piece gland and gland flange.

In 125-Pound Valves, the gland is Ihrigized steel and the gland flange is malleable iron. Gland studs and nuts for brass trimmed valves are bronze; for composition disc and all-iron valves, they are steel.

In 250-Pound Valves, the gland is Ihrigized steel or brass and the gland flange is steel or malleable iron. Gland studs and nuts are steel.

**Stuffing box:** Stuffing boxes are of liberal depth and are filled with high grade packing. A brass stem hole bushing, fitted in the bottom of the stuffing box, is furnished on all 125-Pound Brass Trimmed Valves.

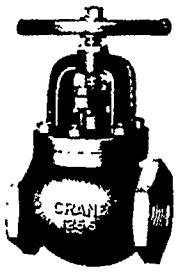
**Repacking:** These valves, when wide open, can be repacked while under pressure.

**Wheel:** The wheel, having a tapered square hole, fits snugly on the square stem end and is held in place with a steel nut. It can be easily removed. Wheels are made of malleable iron.

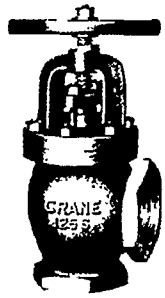
# 125-Pound Iron Body Globe and Angle Valves

## Brass Trimmed or All-Iron

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

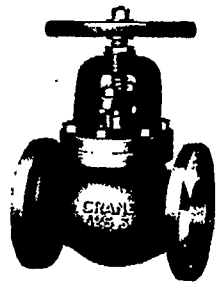


Globe, Screwed
No. 350
Brass Trimmed
No. 350¼
All-Iron

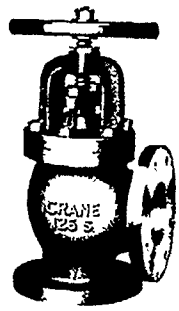


Angle, Screwed
No. 352
Brass Trimmed
No. 352¼
All-Iron

TEST PRESSURES
Shell Test
350 pounds hydrostatic
Seat Test
225 pounds hydrostatic



Globe, Flanged
No. 351
Brass Trimmed
No. 351¼
All-Iron



Angle, Flanged
No. 353
Brass Trimmed
No. 353¼
All-Iron

### List Prices, Each

| Size | | Inches | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Brass Trimmed | No. 350 or No. 352, Screwed | | 36.00 | 38.00 | 44.50 | 52.00 | 65.00 | 84.50 | 114.00 | | |
| | No. 351 or No. 353, Flanged, F. & D. | | 40.00 | 43.00 | 51.00 | 62.50 | 76.50 | 96.00 | 126.00 | 210.00 | 335.00 |
| All-Iron | No. 350¼ or No. 352¼, Screwed | | 36.00 | 38.00 | 44.50 | | | | | | |
| | No. 351¼ or No. 353¼, Flanged, F. & D. | | 40.00 | 43.00 | 51.00 | | 76.50 | | 126.00 | 210.00 | |

10

**Rugged proportions:** These are high quality valves designed to withstand severe service. They are ruggedly proportioned to provide liberal strength.

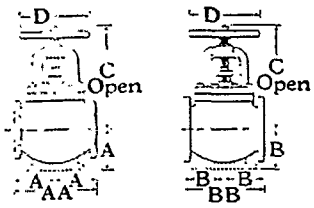
**Brass trimmed valves:** Brass trimmed valves are ideal for steam or water lines, or for fluids that do not corrode brass or iron. They have an iron body and bonnet, a brass screwed-in body seat ring, a brass stem hole bushing, and a Cast Manganese Bronze stem. A solid brass disc is furnished on sizes 6-inch and smaller; larger sizes have an iron disc with a heavy brass seating face.

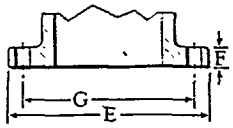
**All-iron valves:** For fluids that corrode brass but not iron, the all-iron valves are recommended. The body, bonnet, seat, and disc are iron; the stem is made of steel and is nickel plated.

**Flange dimensions and facing:** The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.

**Face to face and center to face:** The face to face and center to face dimensions of Flanged Globe and Angle Valves in sizes 8-inch and smaller conform to the American Ferrous Flanged Valve Standard (B16.10-1939) for 125-Pound Cast Iron Globe and Angle Valves. This Standard does not include the 10-inch size.

**Drilling:** List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.




### Dimensions, in Inches

| Size | | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| AA | | 6½ | 7 | 8 | 9 | 10 | 11¼ | 13 | | |
| A | | 3¼ | 3½ | 4 | 4½ | 5 | 5⅝ | 6½ | | |
| BB | | 8 | 8½ | 9½ | 10½ | 11½ | 13 | 14 | 19½ | 24½ |
| B | | 4 | 4¼ | 4¾ | 5¼ | 5¾ | 6½ | 7 | 9¾ | 12¼ |
| C | Globe | 11⅛ | 11½ | 13⅛ | 13⅜ | 15½ | 17⅜ | 19½ | 24¾ | 30¼ |
| | Angle | 11 | 11½ | 12¾ | 13¾ | 14⅞ | 17⅜ | 19⅜ | 22¾ | 24 |
| D | | 8 | 8 | 9 | 9 | 10 | 10 | 12 | 16 | 18 |
| Flange Dimensions | E | 6 | 7 | 7½ | 8½ | 9 | 10 | 11 | 13½ | 16 |
| | F | ⅝ | 11/16 | ¾ | 13/16 | 15/16 | 15/16 | 1 | 1⅛ | 1 3/16 |
| | G | 4¾ | 5½ | 6 | 7 | 7½ | 8½ | 9½ | 11¾ | 14¼ |
| | No. of bolts | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 12 |
| | Dia. of bolts | ⅝ | ⅝ | ⅝ | ⅝ | ⅝ | ¾ | ¾ | ¾ | ⅞ |

*Valves for Marine Service....pages 400 and 406*
*Additional description....page 107* *Templates for drilling....page 459*

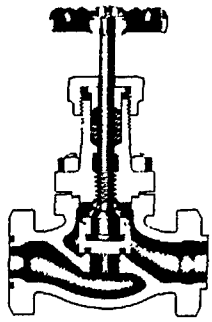
# Iron Body
# Check & Foot Valves

# Heavy Duty All-Iron Globe and Angle Valves

*For list prices and dimensions, see pages 411 and 412.*

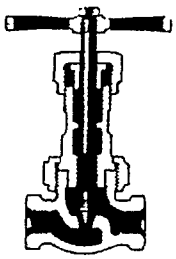
WORKING PRESSURES
500 pounds oil (non-shock), gas, or air, 100° F.
300 pounds oil (non-shock), gas, or air, 300° F.

*Tested 300 pounds air-under-water.*

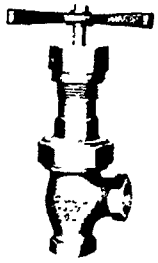


Cross Section
No. 1504, Globe
With Lead Faced Disc

## Union Bonnet

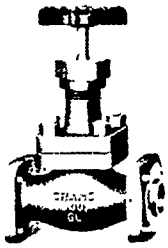


Globe
No. 1504½
Screwed
*1/4 to 1-inch*

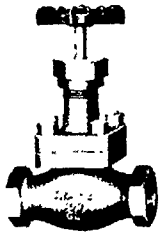


Angle
No. 1505½
Screwed
*1/4 to 1-inch*

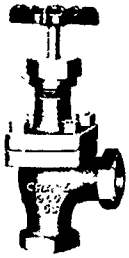
## Bolted Bonnet



Globe
No. 1501, Flanged
Tongue and Groove
*1/2 to 4-inch*



Globe
No. 1504
Screwed
*1/4 to 3-inch*



Angle
No. 1505
Screwed
*1/4 to 3-inch*

*Section of Steel Disc and Seat in Bolted Bonnet Valves*

**Service recommendations:** These valves are ideally suited for use on air, gas, or oil service, and for corrosive fluids in special process work and in chemical plants where heavy, all-iron construction is needed. They are unusually massive and rugged, providing a high margin of safety against accidents.

**Union bonnet valves:** Union bonnet valves have a plug type disc that is integral with the stem. The valves can be reground without removing the body from the line. The stuffing box is unusually deep, is filled with high grade packing, and is equipped with a threaded packing nut.

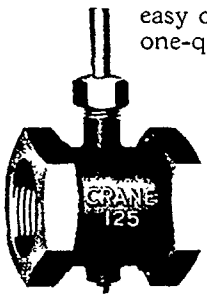
**Bolted bonnet valves:** The bolted bonnet valves are regularly furnished with a Special Lead Face rolled into a machined dovetail in the disc. The face seats upon a crowned face in the body, assuring tightness in service. Where high temperatures or corrosive action prohibit the use of lead, the valves can be furnished with a case-hardened steel disc and steel seat ring, as illustrated at the right. Be sure to order valves "with Steel Disc and Seat" when this type construction is needed.

The bonnet joint is male and female, with a Cranite gasket retained by a long lip on the bonnet. The stuffing box is extra deep to assure a good seal around the stem; sizes 1½-inch and smaller have a heavy, threaded packing nut, while the larger sizes have a one-piece bolted gland. ¼, ⅜, and ½-inch valves have a one-piece stem and disc or disc holder.

**Materials:** All of these valves have a Ferrosteel body and bonnet. They are all-iron (except for the lead faced disc described above), and have a steel stem; no copper or brass is used in their construction.

10

# Iron Body Butterfly Valves




No. 380, Screwed
No. 381, Flanged

10 and 12-inch sizes have a bolted gland. (not illustrated)

*For Brass Butterfly Valves, see page 57.*

Butterfly Valves provide easy operation in about one-quarter turn from the wide open to the closed position. They are not intended to close pressure tight and should be used only to control or regulate flow. The valves have an iron body, a steel stem, and a brass disc.

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas

On fla
dimen
of the
form
Cast
dard, Class 125 (B16.1-1
are plain faced with a sr
prices of flanged valves i
drilling to this Standard:
made when valves are orde

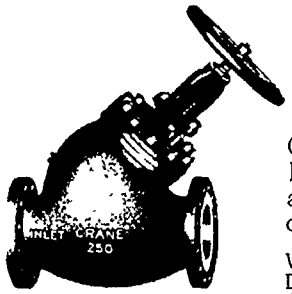
### List Prices and Dimensions

| Size | Inches | 2 | 2½ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| No. 380. Screwed | Each | 15.00 | 19.00 | 26.00 | 35.00 | | |
| No. 381. Flanged. F. & D. | Each | | | 40.00 | 56.00 | 75.00 | 97.00 |
| End to end or face to face | Inches | 4¼ | 4¾ | 5¼ | 6 | 6¾ | 7½ |
| Diameter of stem | Inches | ½ | ½ | 9/16 | ⅝ | ⅝ | ¾ |
| Center to top of stem | Inches | 6⅛ | 7 | 7⅞ | 9⅛ | 10¼ | 11½ |

A drilled hole through the upper part of the valve stem permits attaching an c

# Crane Iron Body Valves

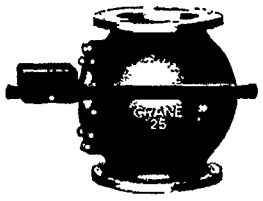
***A Variety of Types***
***For Every Service***



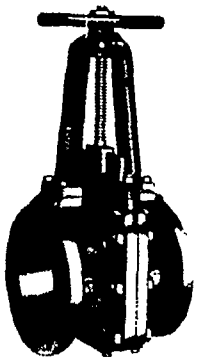
250-Pound Ferrosteel
Stop-Check
No. 28 E
*(Page 303)*

Commonly used types of Crane Iron Body Valves are illustrated and described in Sections 8 to 11 of this catalog, as follows:


Wedge Gate.....Section 8
Double Disc Gate.....Section 9
Globe and Angle.....Section 10
Check and Foot.....Section 11

Iron Body Back Pressure
No. 385 *(Page 310)*



Iron Body Pulp Stock
No. 1427 *(Page 300)*

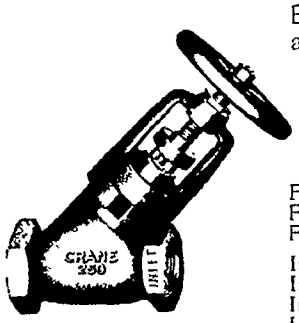
In addition to the foregoing, Crane supplies a wide assortment of Iron Body Valves for special services and in designs that will automatically perform a specified duty in piping installations.

For greater convenience, such valves are shown in other sections of this catalog, along with related products. Refer to the following pages:

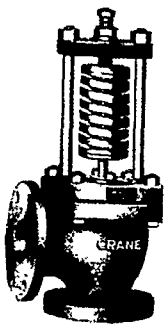

Ferrosteel Stop-Check Valves.....page 303
Ferrosteel Blow-Off Valves.....page 308
Ferrosteel Valves for Ammonia.....pages 410 to 413

Iron Body Pulp Stock Valves.....page 300
Iron Body Back Pressure Valves.....pages 310 and 311
Iron Body Float Valves.....pages 314 and 316
Iron Body Safety Valves.....pages 322 to 325
Iron Body Relief Valves.....pages 331, 332, and 334
Iron Body Diaphragm Valves.....pages 388 to 391
Iron Body Valves for Marine Service.....pages 400, 405, and 406

Alloy and Ni-Resist Iron Gate Valves.....pages 384 and 385

250-Pound
Ferrosteel
Blow-Off
No. 393
*(Page 308)*

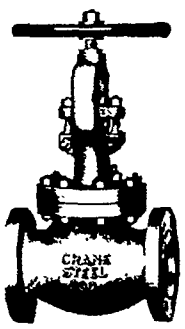


Iron Body Relief
No. 1113
*(Page 332)*

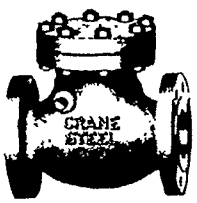
10

# Crane Steel Valves

***For High Pressures—For High Temperatures***



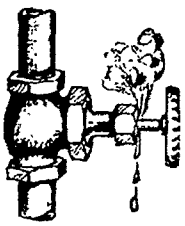
300-Pound
Cast Steel
Globe
No. 151 X
*(Page 246)*



300-Pound
Cast Steel
Swing Check
No. 159 X
*(Page 255)*


Lip-Seal Bonnet Valves..pages 205 to 219
.....pages 221 to 234
Valves.....pages 235 to 248
.....pages 249 to 256


***Leaky Valve Stuffing Boxes Are Easily Remedied!***



A slight stuffing box leak, if left unattended, gets bigger and bigger and can cause serious damage to valve parts. More important, the waste of fuel, power, or fluid is surprisingly great—often many times the cost of the entire valve in a few months of leakage.

The remedy is simple. Since packing wears gradually as it is subjected to service, it is only necessary to slightly tighten the packing nut or gland to stop a leak when it starts. And when new packing is necessary, Crane Valves can be repacked when wide open and under pressure.

# Iron Body Check and Foot Valves

**Lift Check Valves**
125-Pound.....page 115
150-Pound.....page 114
Heavy Duty All-Iron.....page 115

**Swing Check Valves**
125-Pound.....pages 116 to 118
Clearway Type, Underwriters' Pattern.....page 120
250-Pound.....page 121
1000-Pound W.O.G., Malleable Iron.....page 114
With Outside Lever and Weight.....page 118

**Foot Valves**.....page 119

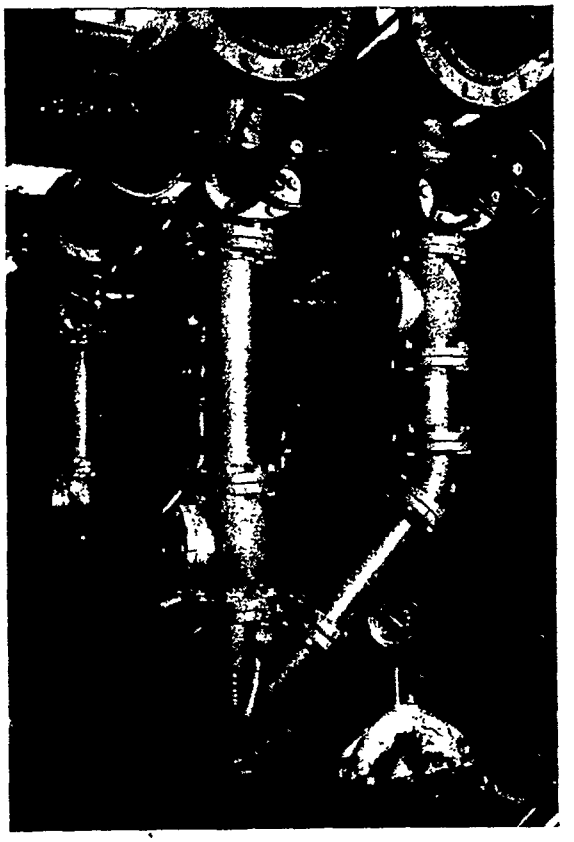


The liberal variety of sizes and types of Crane Iron Body Check and Foot Valves assures an adequate selection for all ordinary service requirements.

In addition, the Stop-Check Valves shown on pages 301 to 303 are frequently used to excellent advantage for regular check valve service in boiler feed lines, in the discharge lines from high pressure pumps, and in the discharge lines from air compressors.

The Ferrosteel Check Valves for ammonia, shown on page 115 and page 412, also are frequently used on water and air lines under pulsating service.

*Crane-Line Backflow Preventers....page 318*

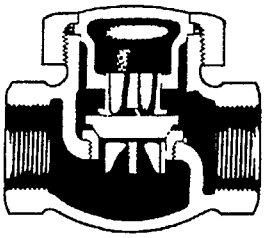


Crane iron body check and gate valves, and iron flanged fittings in an electric light and power plant.

# 150-Pound Iron Body Lift Check Valves

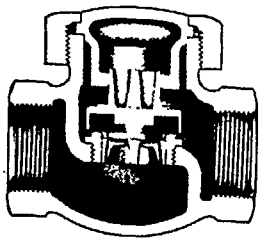
## Nickel Alloy or No. 1 Cranite Composition Disc

WORKING PRESSURES
150 pounds saturated steam
250 pounds cold water, oil, or gas, non-shock



Cross Section
No. 366½
Crane Nickel Alloy Disc
Crane Nickel Alloy Seat

Horizontal Lift, Screwed
No. 366½, Nickel Alloy Disc
No. 366½ C, Composition Disc



Cross Section
No. 366½ C
Composition Disc
Crane Nickel Alloy Seat

### List Prices and Dimensions

| Size | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|
| No. 366½, with Crane Nickel Alloy Disc | Each | 7.80 | 8.00 | 8.60 | 9.40 | 10.50 | 12.00 | 14.50 | 19.00 |
| No. 366½ C, with No. 1 Cranite Composition Disc | Each | 7.80 | 8.00 | 8.60 | 9.40 | 10.50 | 12.00 | 14.50 | 19.00 |
| End to end | Inches | 2⅜ | 2⅝ | 3 | 3½ | 4⅛ | 4⅝ | 5¼ | 6⅜ |
| Center to top | Inches | 1 7/16 | 1 9/16 | 1¾ | 2 1/16 | 2 5/16 | 2 11/16 | 3 3/16 | 3⅝ |

*For list prices of Composition Discs for No. 366½ C Valves, see page 133.*

**Service recommendations:** Crane 150-Pound Iron Body Lift Check Valves are recommended for small lines carrying steam, hot water, cold water, oil, gas, and similar fluids. They are compact and are ruggedly constructed.

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**Construction:** The valves have a union cap, providing a strong, tight joint. The disc or disc holder is guided both at the top and at the bottom, assuring square seating.

**Materials:** The body is cast iron, the cap is brass, and the cap ring is malleable iron.

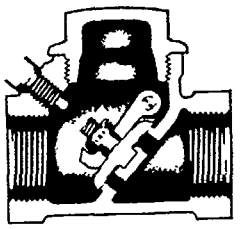
The No. 366½ Valves have a Nickel Alloy disc and body seat ring. Crane Nickel Alloy is hard and offers excellent resistance to wear.

The No. 366½ C Valves have a brass disc holder and a Nickel Alloy body seat ring.

Unless otherwise ordered, the No. 366½ C Valves are furnished with a No. 1 Cranite Disc, suitable for steam, or hot water from 200° to 300° F. When ordered for hot water up to 200° F., cold water, air, gas, oil, or gasoline, they are furnished with a No. 6 Disc. For discs, see page 133.

# 1000-Pound W.O.G.

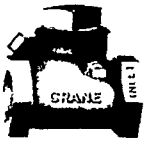
# Malleable Iron Swing Check Valves



Cross Section

WORKING PRESSURES
300 pounds oil, 550° F.
1000 pounds cold water, oil, or gas, non-shock

TEST PRESSURE
1200 pounds hydrostatic




No. 346½, Screwed

### List Prices and Dimensions

| Size | Inches | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 346½, Screwed | Each | 12.50 | 13.00 | 13.70 | 14.70 | 16.00 | 18.00 | 21.00 |
| End to end | Inches | 2¾ | 2¾ | 3 1/16 | 3⅝ | 4⅛ | 4 13/16 | 5 13/16 |
| Center to top of cap | Inches | 1⅞ | 1⅞ | 2⅛ | 2½ | 2⅞ | 3⅜ | 3⅞ |

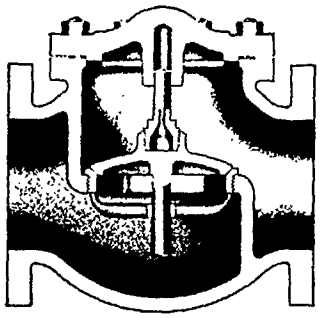
**Service recommendations:** These valves are especially suitable for oil lines where fire hazard legislates against the use of cast iron, and for corrosive services where all-iron valves are satisfactory but where a material stronger than cast iron is desired. The valves are compact and rugged.

**Materials:** The body, cap, disc, and hinge are made of tough, durable malleable iron. The hinge pin is made of Exelloy.

**Regrinding:** The valves can be reground without taking the body from the line. By removing the stop plug, a screw driver can be engaged with the slot in the disc spud, making it easy to rotate the disc when regrinding.

# 125-Pound Iron Body Lift Check Valves

## Brass Trimmed

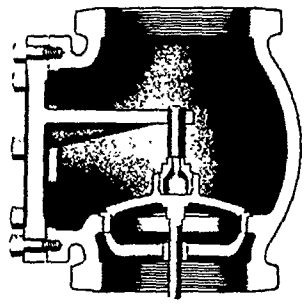


Cross Section
No. 367, Horizontal

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

TEST PRESSURES
Shell test — 350 pounds hydrostatic
Seat test — 225 pounds hydrostatic

***List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.***



Cross Section
No. 368, Vertical

### List Prices, Each, and Dimensions

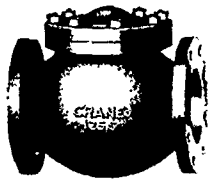
| Size | Inches | 2 | 2½ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| No. 366, Horizontal, Screwed | | 13.50 | 19.00 | 25.00 | 43.00 | | |
| No. 367, Hor., Flanged, F.&D., | | | | 29.50 | 49.50 | 74.00 | 101.00 |
| No. 368, Vertical, Screwed | | | 24.00 | 32.00 | 51.00 | | |
| Dimensions in Inches | A | 6½ | 7 | 8 | 10 | | |
| | B | | | 9½ | 11½ | 13 | 14 |
| | C | 3½ | 4¼ | 5 | 6¼ | 7 | 8¼ |
| | D | | 7 | 8 | 10 | | |
| | E | | 4¼ | 5 | 6 | | |

No. 366, Horizontal
Screwed

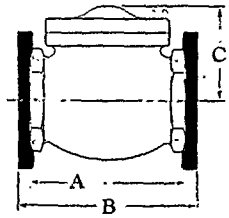
No. 368, Vertical
Screwed

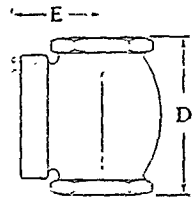
**Materials and construction:** These are rugged, well proportioned horizontal and vertical lift check valves. Their solid brass disc is accurately guided both at the top and bottom, assuring square seating. The body seat ring is brass and is screwed into the body.

No. 366 Valves, 3-inch and smaller, have a brass screwed-in cap; the 4-inch size has an iron bolted cap. No. 367 and No. 368 Valves have an iron bolted cap on all sizes.



No. 367, Horizontal
Flanged




***Templates for drilling . . . . page 459***
***Thread engagement . . . . . page 494***

**Flange dimensions and facing:** End flanges conform to the American Cast Iron Flange Standard, Class 125, (B16.1-1948). The flanges are plain faced with a smooth finish.

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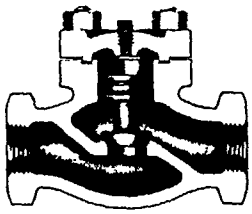
# Heavy Duty All-Iron Lift Check Valves

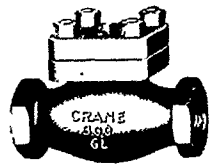


Cross
Section

WORKING PRESSURES
500 pounds oil (non-shock), gas, or air, 100° F.
300 pounds oil (non-shock), gas, or air, 300° F.
***Tested 300 pounds air-under-water***

| Sizes | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|

***For prices and dimensions, see page 412.***



No.
1507½
Screwed

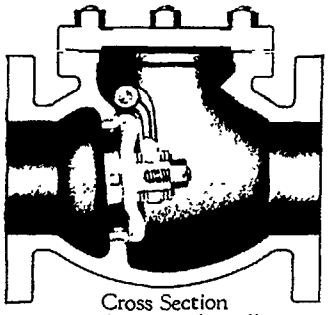
**Service recommendations:** The No. 1507½ All-Iron Lift Check Valve is ideally fitted for use on air, gas, or oil service, and for corrosive fluids in chemical plants and in special process work where heavy, all-iron construction is desired. They are especially designed for handling deadly or hazardous fluids; their rugged, unusually massive construction provides a high margin of safety against accidents.

**Construction:** The body has heavy metal sections, liberally reinforced at points of greatest stress. The cap is bolted on, using four steel stud-bolts. The cap joint is tongue and groove, assuring positive retention of the gasket, which is made from 1/16-inch thick Cranite sheet packing. The disc is piston shaped at the upper end to permit a snug fit in the body. The cushioning effect secured by this dash-pot construction makes the valve well suited for lines subject to pulsation, such as on air compressors or reciprocating type pumps. The disc is guided at both ends in valves 1¼-inch and larger, and in 1½ and 2-inch valves, is equipped with a piston ring.

**Materials:** The body and cap are made of Ferrosteel. The disc in sizes 1-inch and smaller is steel; in larger sizes it is Ferrosteel. Crane Ferrosteel is a high grade iron approximately 35 per cent stronger than cast iron.

# 125-Pound Iron Body Swing Check Valves

## Brass Trimmed or All-Iron



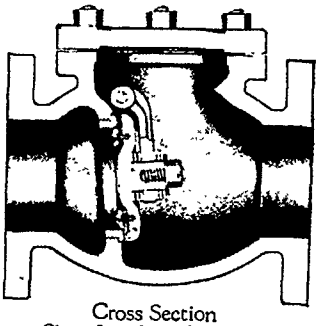
Cross Section
Sizes 8-inch and smaller
No. 373, Flanged
Brass Trimmed

| Size of Valve | Working Pressures | | | Hydrostatic Test Pressures | |
|---|---|---|---|---|---|
| | Screwed or Flanged Valves | | Hub End Valves | Screwed, Flanged, or Hub End Valves | |
| | Saturated steam | Cold water, oil, or gas, non-shock | Cold water or gas, non-shock | Shell test | Seat test |
| 2 to 12-inch | 125 pounds | 200 pounds | 200 pounds | 350 pounds | 225 pounds |
| 14 and 16-inch | 125 pounds | 150 pounds | — | 250 pounds | 175 pounds |
| 18 to 24-inch | — | 150 pounds | — | 250 pounds | 175 pounds |

### DISC-HINGE CONNECTION

Sizes 8-inch and smaller (patented) feature a flexible disc-hinge connection. Two springs are used in the disc-hinge assembly, one on each side of the hinge. When the disc nut is tightened upon assembly, these springs are compressed sufficiently to provide a flexible but semi-rigid connection which eliminates lost motion between the parts, reduces wear, and yet, permits the disc to make true, full contact with the seat. See the cross sections illustrated on this page.

Sizes 10-inch and larger (not illustrated) have the conventional swing check valve disc-hinge connection in which the spud on the disc fits into a hole in the hinge, the parts being held together by a large washer and a nut.



Cross Section
Sizes 8-inch and smaller
With Leather Faced Disc

***When so ordered, any of the brass trimmed valves can be furnished with a leather faced disc. Such valves are recommended only for cold water. Extra charges for the leather faced discs are shown on the opposite page.***

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**Brass trimmed valves:** Brass trimmed valves are recommended for steam or water, or for fluids that do not corrode brass.

The body seat ring is brass and is screwed into the body. The hinge pin, also brass, rides in brass bushings, one on each side of the valve body, thus assuring a non-corrosive, wear-resistant bearing. Unless otherwise ordered, the disc is brass in sizes 3-inch and smaller, and cast iron faced with brass in larger sizes.

**All-iron valves:** All-iron valves are recommended for gas, or for fluids that corrode brass but not iron.

The seating surfaces are cast integral with the body and disc. Valves with screwed-in body seat rings can be supplied when ordered; prices on application.

The hinge pin is Exelloy, supported at each end by iron bushings in the valve body.

**Construction:** These are well proportioned and sturdily constructed valves. The body, oval or globular in shape, provides ample flow area around the disc when the valve is wide open. The valves are designed so that the disc cannot stick in the open position.

All sizes have the hinge suspended in the body. Easy access to both ends of the hinge pin is provided by the tapped and plugged opening in each of the two bosses on the body. This feature simplifies changeover to outside lever and weight construction.

**By-passes:** A by-pass (2-inch on 12 and 14-inch valves, 3-inch on 16, 18, and 20-inch valves, and 4-inch on 24-inch valves) can be furnished; prices and dimensions on application. The valve in the by-pass is a non-rising stem wedge gate valve.

**Hub end valves:** The hubs on hub end valves accommodate Class "A", "B", "C", or "D" cast iron pipe.

In the sizes indicated below, hub end valves are suitable for use with Transite pipe. When ordering valves for such use, specify the pipe size and class.

For machined end or rough end Transite pipe:
4 to 8-inch valves.....for Class 50, 100, or 150 pipe

For machined end Transite pipe only:
4-inch valves.....for Class 200 pipe

**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.

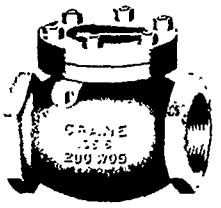
**Face to face:** The face to face dimensions of flanged valves 6-inch and smaller conform to the American Ferrous Flanged Valve Standard (B16.10-1939), for 125-Pound Cast Iron Swing Check Valves. Sizes 8-inch and larger are not included in this Standard.

**API Standard:** Flanged valves in 2, 2½, 3, 4 and 6-inch sizes conform except for marking to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949. Sizes 3½, 5, and 8-inch and larger are not included in this Standard.

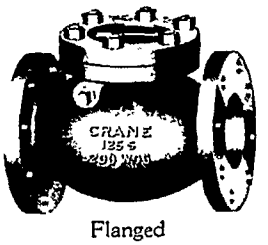
***Swing Check Valves with Outside Lever and Weight are described and illustrated on page 118.***

# 125-Pound Iron Body Swing Check Valves

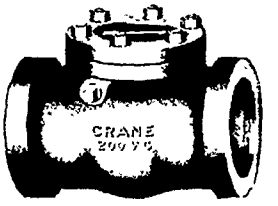
## Brass Trimmed or All-Iron



Screwed
No. 372, Brass Trimmed
No. 372½, All-Iron



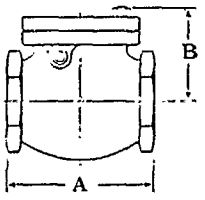
Flanged
No. 373, Brass Trimmed
No. 373½, All-Iron



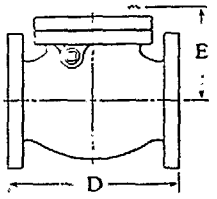
Hub Ends
No. 374¼, Brass Trimmed

***For working pressures and description, see the preceding page.***

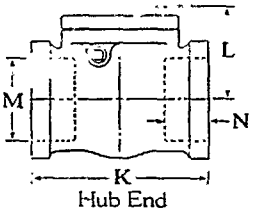
***These valves may be used either in a horizontal position, or in a vertical position for upward flow.***



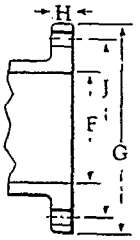

Screwed




Flanged




Hub End




End Flange

***Templates for drilling, see page 459.***

***Normal thread engagement, see page 494.***

### List Prices

| Size | Brass Trimmed Valves | | | | All-Iron Valves | |
|---|---|---|---|---|---|---|
| | No. 372 Screwed | No. 373 Flanged F. & D. | No. 374¼ Hub Ends | Extra for Leather Faced Disc | No. 372½ Screwed | No. 373½ Flanged F. & D. |
| Inches | Each | Each | Each | Per Valve | Each | Each |
| 2 | 18.00 | 21.00 | | 2.60 | 18.00 | 21.00 |
| 2½ | 19.50 | 24.00 | | 3.70 | 19.50 | 24.00 |
| 3 | 24.00 | 30.00 | | 4.10 | 24.00 | 30.00 |
| 3½ | 32.50 | 39.50 | | 4.80 | | |
| 4 | 41.00 | 48.50 | 48.50 | 5.80 | 41.00 | 48.50 |
| 5 | 53.50 | 62.00 | | 8.00 | | 62.00 |
| 6 | 67.50 | 76.50 | 76.50 | 10.70 | | 76.50 |
| 8 | | 162.00 | 162.00 | 14.70 | | 162.00 |
| 10 | | 260.00 | | 20.00 | | 260.00 |
| 12 | | 357.00 | | 32.00 | | 357.00 |
| 14 | | 638.00 | | No Extra Charge | | |
| 16 | | 890.00 | | | | |
| 18 | | 1185.00 | | | | |
| 20 | | 1380.00 | | | | |
| 24 | | 1975.00 | | | | |

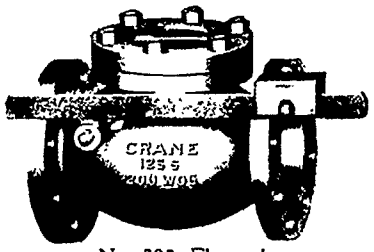
**Drilling:** The list prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

### Dimensions, Inches

| Size | Screwed Valves | | Flanged Valves | | | | | | | | Hub End Valves | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | D | E | F | G | H | J | Bolts No. | Bolts Dia. | K | L | M | N |
| 2 | 6½ | 4¼ | 8 | 4¼ | 2 | 6 | ⅝ | 4¾ | 4 | ⅝ | | | | |
| 2½ | 7 | 4 3/16 | 8½ | 4 3/16 | 2½ | 7 | 11/16 | 5½ | 4 | ⅝ | | | | |
| 3 | 8 | 5 1/16 | 9½ | 5 1/16 | 3 | 7½ | ¾ | 6 | 4 | ⅝ | | | | |
| 3½ | 9 | 5 13/16 | 10½ | 5 13/16 | 3½ | 8½ | 13/16 | 7 | 8 | ⅝ | | | | |
| 4 | 10 | 6 3/16 | 11½ | 6 3/16 | 4¼ | 9 | 15/16 | 7½ | 8 | ⅝ | 12 | 6 3/16 | 5⅝ | 3 |
| 5 | 11¼ | 7 3/16 | 13 | 7 3/16 | 5¼ | 10 | 15/16 | 8½ | 8 | ¾ | | | | |
| 6 | 12½ | 7½ | 14 | 7½ | 6 5/16 | 11 | 1 | 9½ | 8 | ¾ | 14 | 7½ | 7⅞ | 3 |
| 8 | | | 19½ | 10 3/16 | 8 | 13½ | 1⅛ | 11¾ | 8 | ¾ | 19½ | 10 3/16 | 10 | 3½ |
| 10 | | | 24½ | 12⅛ | 10 | 16 | 1 3/16 | 14¼ | 12 | ⅞ | | | | |
| 12 | | | 27½ | 13¾ | 12 | 19 | 1¼ | 17 | 12 | ⅞ | | | | |
| 14 | | | 31 | 16⅛ | 14 | 21 | 1⅜ | 18¾ | 12 | 1 | | | | |
| 16 | | | 36 | 17⅞ | 16 | 23½ | 1 7/16 | 21¼ | 16 | 1 | | | | |
| 18 | | | 36 | 17½ | 18 | 25 | 1 9/16 | 22¾ | 16 | 1⅛ | | | | |
| 20 | | | 40 | 20 | 20 | 27½ | 1 11/16 | 25 | 20 | 1⅛ | | | | |
| 24 | | | 48 | 21 | 24 | 32 | 1⅞ | 29½ | 20 | 1¼ | | | | |

# 125-Pound Iron Body Swing Check Valves

## With Outside Lever and Weight



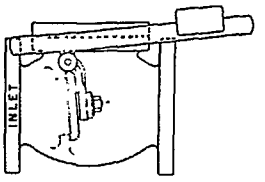

No. 383, Flanged
Brass Trimmed

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non shock

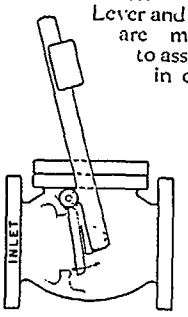
TEST PRESSURES
Shell test—350 pounds hydrostatic
Seat test—225 pounds hydrostatic

***These are swing check valves, similar, except for the lever and weight, to the No. 373 valves shown on page 117; they are not to be used as back pressure valves, unloading valves, etc.***

***For Use in Horizontal Lines***

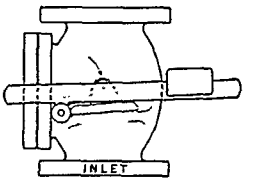



Above:
Lever and weight are mounted to assist disc in closing.




Lever and weight mounted to balance the disc.

***For Use in Vertical Lines for Upward Flow***




Lever and weight mounted to assist the disc in closing.

**Recommendations:** Lever and Weight Swing Check Valves with the lever and weight positioned to assist the disc in closing are recommended for use in pipe lines where quick action is necessary to avoid a sudden reversal of flow.

Valves with the weight balancing the disc are used in installations requiring swing check valves that will open under a minimum of pressure.

**Construction and materials:** The hinge and outside lever are made of malleable iron and are keyed to a long Exelloy hinge pin which extends out of one side of the body through a special stuffing box. The stuffing box ensures a pressure-tight connection. The lever is also locked to the end of the hinge pin and the weight is locked to the lever with setscrews. All moving parts operate together.

Other parts are the same as the No. 373 Brass Trimmed Swing Check Valves shown on page 117.

**Leather disc available:** These valves are regularly furnished with a brass or brass faced disc. When orders so specify, they can be furnished with a leather faced disc; such valves are recommended only for cold water service. Extra charges for the leather faced discs are listed in the table below.

**Position of lever and weight:** Commonly accepted positions of the lever and weight are illustrated at the right.

Valves can also be furnished for vertical lines with downward flow, or for lines on an angle, provided sound engineering practices are not violated.

**Standards:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish.

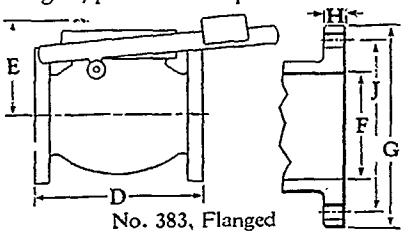
The face to face dimensions of valves 6-inch and smaller conform to the American Ferrous Flanged Valve Standard (B16.10-1939), for 125-Pound Cast Iron Swing Check Valves. Sizes 8-inch and larger are not included in this Standard.

These valves in sizes 2, 2½, 3, 4, and 6-inch conform, except for marking, to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949. Sizes 3½, 5, and 8-inch and larger are not included in this Standard.

**Drilling:** List prices include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made for valves ordered faced only.

**Ordering:** State whether for horizontal or vertical installation and, if the latter, the direction of flow; also, whether lever and weight are to assist the disc in closing or to balance it. When not specified, the lever and weight are mounted on the right side of the valve when facing the inlet.

**Other valves:** Larger sizes, as well as any other iron body, Ferrosteel, or cast steel swing check valve, can be made to order with lever and weight; prices on request.




No. 383, Flanged

### List Prices and Dimensions

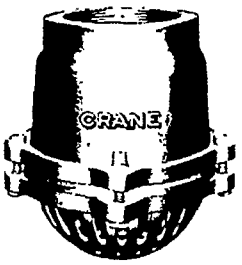
| Size Inches | No. 383 Flanged F.&D. Each | Extra for leather faced disc Per Valve | Dimensions, in Inches (Over-all dimensions furnished on request) D | E | F | G | H | J | Bolts No. | Bolts Dia. |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 38.00 | 2.60 | 8 | 4¼ | 2 | 6 | ⅝ | 4¾ | 4 | ⅝ |
| 2½ | 45.00 | 3.70 | 8½ | 4 3/16 | 2½ | 7 | 11/16 | 5½ | 4 | ⅝ |
| 3 | 55.00 | 4.10 | 9½ | 5 1/16 | 3 | 7½ | ¾ | 6 | 4 | ⅝ |
| 3½ | 70.00 | 4.80 | 10½ | 5 13/16 | 3½ | 8½ | 13/16 | 7 | 8 | ⅝ |
| 4 | 85.00 | 5.80 | 11½ | 6 3/16 | 4¼ | 9 | 15/16 | 7½ | 8 | ⅝ |
| 5 | 110.00 | 8.00 | 13 | 7 3/16 | 5¼ | 10 | 15/16 | 8½ | 8 | ¾ |
| 6 | 120.00 | 10.70 | 14 | 7½ | 6 5/16 | 11 | 1 | 9½ | 8 | ¾ |
| 8 | 200.00 | 14.70 | 19½ | 10 3/16 | 8 | 13½ | 1⅛ | 11¾ | 8 | ¾ |
| 10 | 320.00 | 20.00 | 24½ | 12⅛ | 10 | 16 | 1 3/16 | 14¼ | 12 | ⅞ |
| 12 | 450.00 | 32.00 | 27½ | 13¾ | 12 | 19 | 1¼ | 17 | 12 | ⅞ |

*Templates for drilling....page 459*

11

# Iron Body Foot Valves

## Leather or Brass Disc

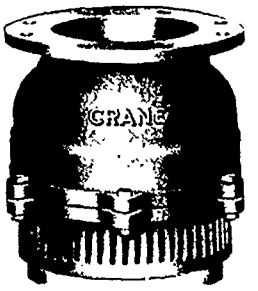



Screwed
No. 394, Leather Disc
No. 394½, Brass Disc

**Service recommendations:** Crane Iron Body Foot Valves are recommended for suction lines on shallow well pumps where the pressure does not exceed 34-foot head (approximately 15 pounds). The valves, however, will safely withstand 25 pounds pressure on priming pump service, when not subjected to the pulsations of the pump.

The leather disc valves are especially suitable for cold water; the brass disc valves, for hot water.

**Shape of strainer:** Sizes 6-inch and smaller have a semi-spherical strainer as illustrated on the screwed valve at the left; larger sizes have a flat bottom strainer as illustrated on the flanged valve at the right.




Flanged
No. 395, Leather Disc
No. 395½, Brass Disc

**Materials and construction:** Leather disc valves have a cast iron body, strainer, and seat. Sizes 6-inch and smaller have one disc; larger sizes have two discs.

Brass disc valves have a cast iron body and strainer and a brass seat. Sizes 6-inch and smaller have one disc; larger sizes have four discs.

**Flanged valves:** The dimensions and drilling of the end flange on valves 4-inch and larger conform to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931). On smaller sizes, the diameter and drilling conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flange is plain faced, with a smooth finish.

List prices of flanged valves include facing and drilling to the American Standard applying, as indicated in the preceding paragraph. No deduction is made if flanged valves are ordered faced only.

When so ordered, the flange on sizes 5-inch and larger can be drilled to the American Standard, Class 125. Full face gaskets should then be used to avoid distorting the flange.

*Brass Foot Valves, see page 45.*

*Templates for drilling, see page 459.*

11

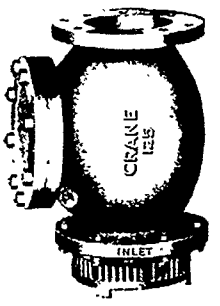
### Screwed Valves

| Size | List Prices, Each | | | Dimensions, in Inches | |
|---|---|---|---|---|---|
| | No. 394 Leather Disc | | No. 394½ Brass Disc | Over-all width | Over-all height |
| Inches | Black | Galv. | Black | | |
| ¾ | 2.30 | 2.50 | | 3¾ | 3⅝ |
| 1 | 2.40 | 2.70 | | 3¾ | 3⅝ |
| 1¼ | 2.70 | 3.00 | 14.00 | 4⅛ | 4⅛ |
| 1½ | 3.40 | 3.80 | 15.00 | 4¾ | 4¾ |
| 2 | 4.60 | 5.10 | 16.00 | 5½ | 5¾ |
| 2½ | 6.00 | 6.50 | 19.00 | 6¼ | 6⅜ |
| 3 | 8.00 | 8.80 | 22.00 | 7 | 7⅛ |
| 3½ | 10.70 | 11.80 | | 8⅞ | 9¼ |
| 4 | 13.50 | 15.00 | 28.00 | 8⅞ | 9¼ |
| 5 | 19.00 | 21.00 | 36.00 | 10½ | 11 |
| 6 | 24.00 | 27.50 | 48.50 | 11¾ | 12¼ |
| 8 | 55.00 | | 124.00 | 15⅛ | 12½ |

### Flanged Valves, F. & D.

| Size | List Prices, Each | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 395 Leather Disc | No. 395½ Brass Disc | Over-all width | | Over-all height | | End Flanges | | | |
| | | | No. 395 | No. 395½ | No. 395 | No. 395½ | Diameter | Thickness | Bolt circle dia. | No. & dia. of bolts |
| Inches | Black | Black | | | | | | | | |
| 2 | 9.40 | | 6 | | 5¾ | | 6 | ½ | 4¾ | 4-⅝ |
| 2½ | 10.80 | | 7 | | 6⅝ | | 7 | 9/16 | 5½ | 4-⅝ |
| 3 | 14.00 | 28.00 | 7½ | 7½ | 7⅜ | 7⅜ | 7½ | ⅝ | 6 | 4-⅝ |
| 4 | 19.60 | 36.50 | 9 | 9 | 9⅝ | 9⅝ | 9 | ¾ | 7½ | 8-⅝ |
| 5 | 26.00 | 47.00 | 10½ | 10½ | 11¾ | 11¾ | 10 | ¾ | 8½ | 8-⅝ |
| 6 | 32.00 | 62.00 | 11¾ | 11¾ | 13¼ | 13¼ | 11 | ¾ | 9½ | 8-⅝ |
| 8 | 65.00 | 142.00 | 15⅛ | 15⅛ | 13½ | 13½ | 13½ | ¾ | 11¾ | 8-⅝ |
| 10 | 103.00 | 228.00 | 18 | 20¼ | 15⅝ | 16¼ | 16 | ⅞ | 14¼ | 12-⅝ |
| 12 | 152.00 | 322.00 | 20¼ | 24⅛ | 18¼ | 18¼ | 19 | 1 | 17 | 12-⅝ |

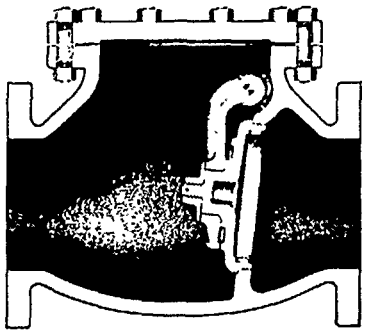
## High Pressure
# Iron Body Foot Valves




When foot valves are wanted for high pressures or for severe service, Crane No. 373 Flanged 125-Pound Iron Body Swing Check Valves having a strainer bolted on the inlet end, as illustrated at the right, are recommended. These valves are furnished with either a leather faced or a solid brass or brass faced disc. Prices will be furnished on application.

# Iron Body Clearway Swing Check Valves

## Underwriters' Pattern

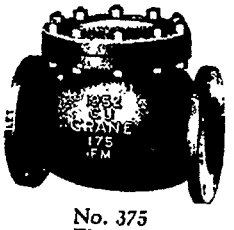


Cross Section
No. 375

WORKING PRESSURE
175 pounds cold water, non-shock

TEST PRESSURES
Shell Test
350 pounds hydrostatic
Seat Test
200 pounds hydrostatic

No. 374½
Screwed




No. 375
Flanged

***For use in a horizontal position, or in a vertical position for upward flow.***

### List Prices

| Size | Inches | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| No. 374½, Screwed | Each | 48.50 | 56.50 | 75.00 | | | | | |
| No. 375, Flanged, F. & D. | Each | 53.00 | 63.00 | 83.00 | 108.00 | 140.00 | 209.00 | 376.00 | 590.00 |
| Extra for Leather Faced Disc | Each | 3.70 | 4.10 | 5.80 | 8.00 | 10.70 | 14.70 | 20.00 | 32.00 |

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**Underwriters' approved:** Designed for fire protection service, these valves have been approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories. They are marked "CU" and "FM".

**Construction:** The body is large, providing liberal clearance around the disc. When opening, the disc swings entirely clear of the waterway; it is so constructed that it will not stick in the open position. Through bolt-studs with a nut on each end are used in the cap joint. The hinge pin is accessible from both sides of the body, being retained by brass plugs.

**Materials:** The body seat ring is brass and is screwed into the body. Sizes 6-inch and smaller have a brass disc and a brass hinge. In larger sizes, the disc is iron with a brass seating face and has a brass collar where it engages the hinge; the hinge is malleable iron, having a brass hinge-pin bushing and a brass disc-lug bushing.

All sizes have a brass hinge pin.

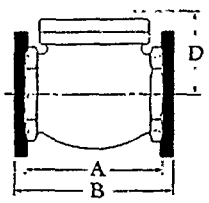
**Leather disc:** An extra charge is made for leather faced disc valves. See the list prices shown in the table above.

**Bosses on body:** Each valve is equipped with four bosses for a by-pass, two on each side of the body. An extra charge is made for drilling and tapping the bosses and for furnishing a by-pass.

**Flange dimensions and facings:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.

**Drilling:** The list prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

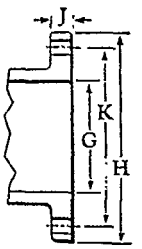
**Interconnection service:** The valves shown on this page are not recommended for "interconnection service". For such service, Crane-Line Reduced Pressure Backflow Preventers are recommended; see page 318 for illustration and description.




Screwed or Flanged

### Dimensions, in Inches

| Size | | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| A | | 10 | 11 | 13 | | | | | |
| B | | 10 | 11 | 13 | 15 | 16 | 18 | 22 | 26 |
| D | | 6¼ | 6¾ | 7½ | 8½ | 9¼ | 11¼ | 13½ | 15¼ |
| Flange Dimensions | G | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
| | H | 7 | 7½ | 9 | 10 | 11 | 13½ | 16 | 19 |
| | J | 11/16 | ¾ | 15/16 | 15/16 | 1 | 1⅛ | 1 3/16 | 1¼ |
| | K | 5½ | 6 | 7½ | 8½ | 9½ | 11¾ | 14¼ | 17 |
| | No. of bolts | 4 | 4 | 8 | 8 | 8 | 8 | 12 | 12 |
| | Dia. of bolts | ⅝ | ⅝ | ⅝ | ¾ | ¾ | ¾ | ⅞ | ⅞ |




*Templates for drilling....page 459*

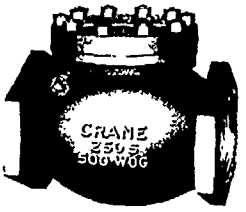
*Thread engagement....page 494*

# 250-Pound Ferrosteel Swing Check Valves

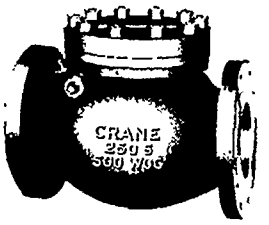
## Bronze Trimmed

WORKING PRESSURES
250 pounds steam, 450° F.
500 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES
Shell test—1000 pounds Seat test—550 pounds

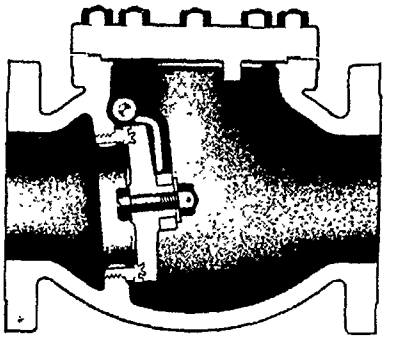


No. 38 E, Screwed



No. 39 E, Flanged

*These valves also may be used in a vertical position for upward flow.*


Cross Section
No. 39 E

### List Prices

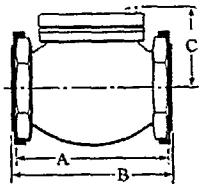
| Size | Inches | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 38 E, Screwed | Each | 48.50 | 61.50 | 76.50 | | 100.00 | | | | | |
| No. 39 E, Flanged, F. & D. | Each | 53.50 | 69.00 | 86.00 | 102.00 | 112.00 | 145.00 | 192.00 | 334.00 | 572.00 | 785.00 |

**Service recommendations:** Crane 250-Pound Ferrosteel Swing Check valves are well suited for a wide variety of services requiring the use of rugged, sturdily constructed valves.

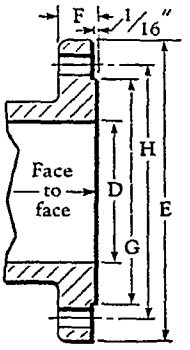
The valves will give excellent results on steam lines where the pressure and temperature do not require the use of steel valves, on high pressure water, oil, or gas lines, and on similar service.

**Construction:** The valves are heavily proportioned and are unusually rugged. The body is oval in shape, providing ample flow area when the valve is open. The valves have a disc stop which keeps the disc from sticking in the open position.

**Materials:** The body and cap are Crane Ferrosteel. The body seat ring, screwed into the body, is made of Crane Special Bronze, a hard, leaded tin bronze. Sizes 3½-inch and smaller have a solid Crane Special Bronze disc; larger sizes have an iron disc with a Crane Special Bronze seating face.



Screwed or Flanged




**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944). Flanges have a 1/16-inch raised face. The raised face is finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish.

**Drilling:** The list prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 250. No deduction in price is made when valves are ordered faced only.

**Face to face dimensions:** The face to face dimensions of the flanged valves conform to the American Ferrous Flanged Valve Standard (B16.10-1939), for 250-Pound Cast Iron Flanged Swing Check Valves.

**API Standard:** The flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949.

This Standard includes sizes 2, 2½, 3, 4, 6, 8, 10, and 12-inch.

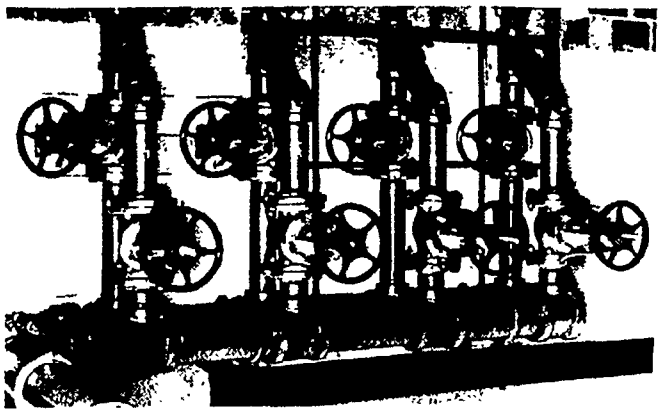
### Dimensions, in Inches

| Size | | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | 9½ | 10¾ | 11¾ | | 13 | | | | | |
| *B | | 10½ | 11½ | 12½ | 13¼ | 14 | 15¾ | 17½ | 21 | 24½ | 28 |
| C | | 5¼ | 5⅞ | 6¼ | 6¾ | 7¼ | 8¼ | 9 | 11 | 13 | 14¾ |
| Flange Dimensions | D | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
| | E | 6½ | 7½ | 8¼ | 9 | 10 | 11 | 12½ | 15 | 17½ | 20½ |
| | *F | ⅞ | 1 | 1⅛ | 13/16 | 1¼ | 1⅜ | 1 7/16 | 1⅝ | 1⅞ | 2 |
| | G | 4 3/16 | 4 15/16 | 5 11/16 | 6 5/16 | 6 15/16 | 8 5/16 | 9 11/16 | 11 15/16 | 14 1/16 | 16 7/16 |
| | H | 5 | 5⅞ | 6⅝ | 7¼ | 7⅞ | 9¼ | 10⅝ | 13 | 15¼ | 17¾ |
| | No. of bolts | 8 | 8 | 8 | 8 | 8 | 8 | 12 | 12 | 16 | 16 |
| | Dia. of bolts | ⅝ | ¾ | ¾ | ¾ | ¾ | ¾ | ¾ | ⅞ | 1 | 1⅛ |

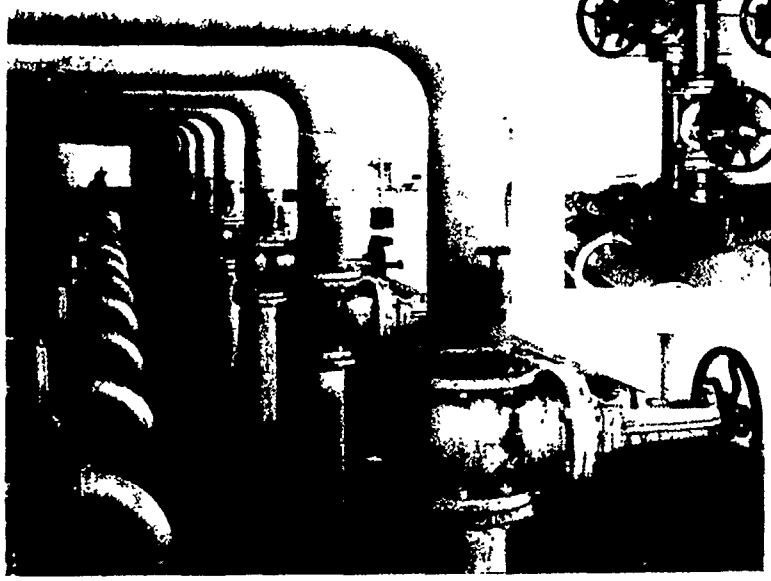
*Face to face (B) and thickness of flange (F) dimensions include the 1/16-inch raised face.

*Templates for drilling . . . page 460* *Thread engagement . . . page 494*

*Industry Supplies the Service*
*Crane Supplies the Equipment*

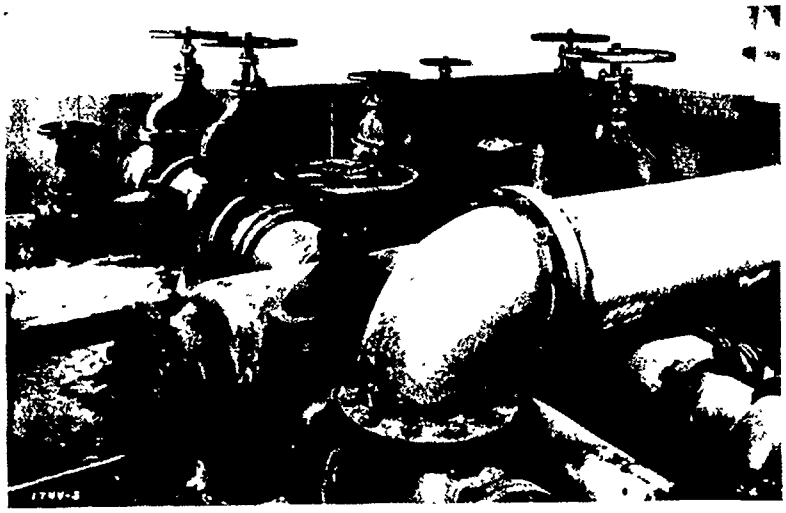


Crane valves in cooler lines of a brewery.

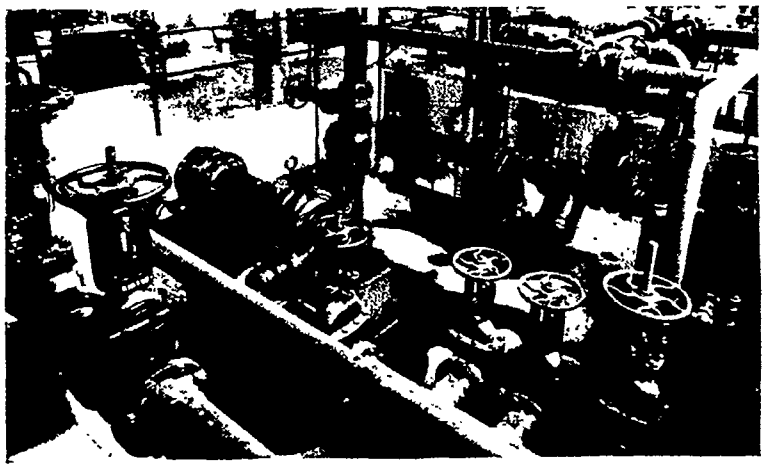


Crane iron body gate valves installed in a cooling tower manifold in a refinery.

11



In a sewage disposal plant equipped with Crane valves and fittings.



Gasoline treating plants are large users of Crane iron body gate valves.

# Valve Accessories & Parts

# Valve Accessories and Parts

Cylinder Operated Valves.....pages 124 and 125
Motor Operated Valves.....pages 126 to 129

Floor Stands.....pages 130 and 131
Extension Stems.....page 131
Indicator Posts.....page 132

Composition Discs.....page 133
Wheels for Valves.....page 134
Handles for Valves.....page 135
Size of Hole in Wheels and Handles.....page 135

Chain Wheels.....page 136
Adjustable Sprocket Rim with Chain Guide.....page 137
Keys for Lock Shield Valves.....page 137
Tee Wrenches.....page 137
Wrenches for Body Seat Rings.....page 137

For greater convenience, various valve accessories and parts, many of which are used with nearly all Crane Valves, have been grouped together on pages 124 to 137, as indexed above.

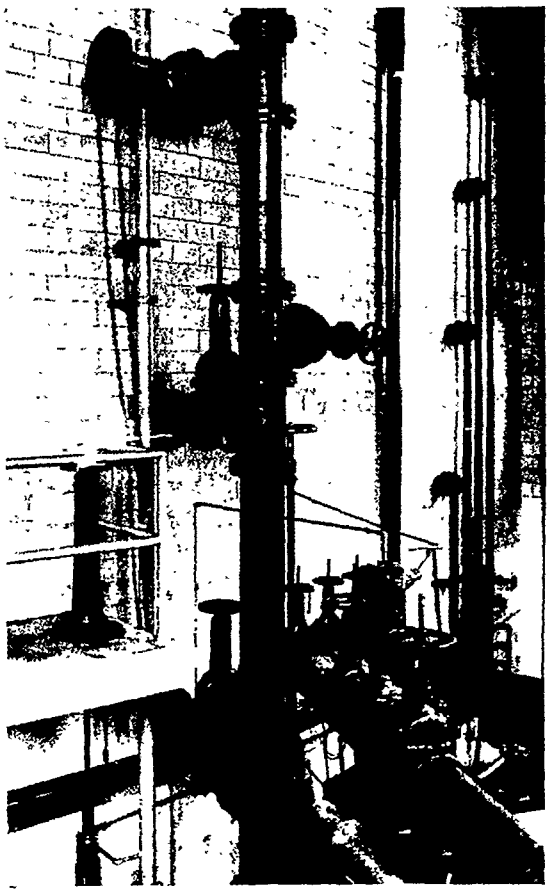
Crane regularly supplies other accessories in addition to those listed above. For complete data on these accessories, refer to the following pages:

By-Passes, Gearing, Cleanouts, and Indicators
For Iron Body Wedge Gate Valves.....pages 84 and 85
For Iron Body Double Disc Gate Valves.....page 102

By-Passes for Steel Gate Valves.....page 231
Gearing for Steel Gate Valves.....page 234
Gearing for Steel Globe and Angle Valves.....page 248
Valve Parts for AAR Valves.....page 40

## Replacement Parts for Valves

Replacement parts, such as stems, bonnets, discs, packing nuts, etc., for any Crane Valve can be furnished upon receipt of an order. When ordering parts, specify the catalog number and the size of the valve, and give the name of the part required. In addition, since the valve must be clearly identified before a part that will fit correctly can be furnished, indicate how the valve is marked and where the marking appears.



Crane accessories simplify the operation of valves in a central station.

# Cylinder Operated Gate, Globe, and Angle Valves

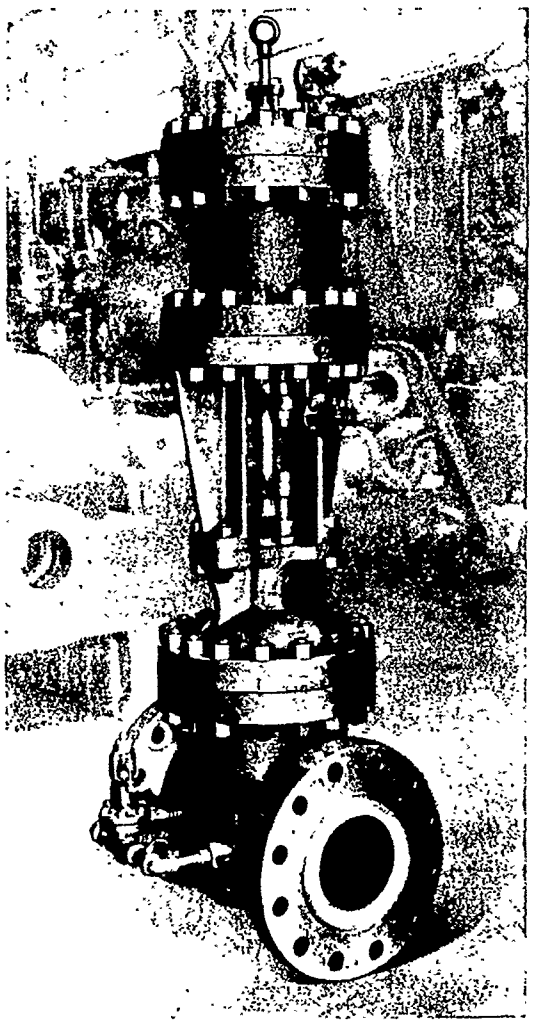
## For All Pressures and Purposes

With the ever-increasing tempo of modern industry, power operation of valves is becoming a necessity in many plants. To speed the opening and closing of valves, or for use when valves are in inaccessible locations, cylinder operation is often ideal.

Crane Cylinder Operated Gate, Globe, and Angle Valves are well suited for many installations, giving highly satisfactory service with low operating and maintenance costs. Under normal conditions and with proper care, the cylinders will last as long as the valves.

As the name implies, these valves are actuated by means of a double acting piston and cylinder, using water, air, or oil as the operating medium. Control is obtained by operating a four-way valve located in any convenient place within reasonable distance from the valve.





Shown in the above photograph is a 10-inch 900-Pound Cast Steel Flanged Gate Valve with a Cast Steel Hydraulic Cylinder. The main valve by-pass and the valved emergency booster connections on the cylinder are special equipment on this particular assembly.

**Remote control:** When remote control is required, the piping connecting the cylinder and the four-way control valve must be large enough to compensate for pressure drop and back pressure resulting from the actuating and exhausting operations of the cylinder. Proper size pipe eliminates the possibility of faulty operation of the cylinder due to the choking of the supply lines.

**Maintaining disc position:** In order to keep the valve disc in either the open or closed position, the actuating pressure must be retained in the cylinder at all times, except in the following cases:

1. On globe and angle valves when closed, if installed with the cylinder above the valve and the line pressure is on top of the disc.
2. On gate valves when fully open, if installed with the stem horizontal, or if the valve is in an inverted position with the stem pointed down.

**Cylinders:** The cylinders are made of cast iron, or steel, with or without brass liners, or of brass pipe, dependent upon the size, the operating medium, and the pressure used. The rugged construction of the heads and bases and the addition of full length tie-bolts on the brass pipe design make an integral unit having an ample safety factor.

**Piston:** Piston construction is of the double cup or piston ring type, mounted on a shouldered stem and rigidly held in position.

**Cups:** Leather cups, synthetic rubber cups, or piston rings will be furnished to meet service requirements.

**Expanders:** Finger type cup expanders are furnished on air operated cylinders as a precaution against blow-by past the piston cups.

**Stuffing boxes:** Stuffing boxes with self-sealing packing and non-adjustable glands are furnished on each end of the cylinders to prevent the braking effect on the stem obtained by tightening a conventional, adjustable, gland-type, stuffing box too tightly.

*Continued on next page*

# Cylinder Operated Gate, Globe, and Angle Valves
## For All Pressures and Purposes (Cont.)

**Speed control:** When orders specify water or oil as the operating medium, orifice fittings are furnished in the cylinder ports. These orifices are drilled with the proper size openings to permit the disc to travel at its required speed.

When air is specified as the operating medium, the cylinders are equipped with speed control valves in the lines to the cylinder ports. By regulating the rate of discharge through these valves, the required disc travel speed is obtained.

**Indicating rod:** Unless otherwise specified, all valves will be furnished with a "tail-rod" extending through the top cylinder head. This feature provides a visible indication of the position of the valve disc at all times; i.e. whether the valve is operating, is fully open, or closed.

**Control valves:** Four-way valves are not furnished with cylinder operated valves unless specified. Manual, solenoid operated, pilot controlled, hydraulic, or air operated four-way valves for adjacent or remote control can be furnished at an extra charge.

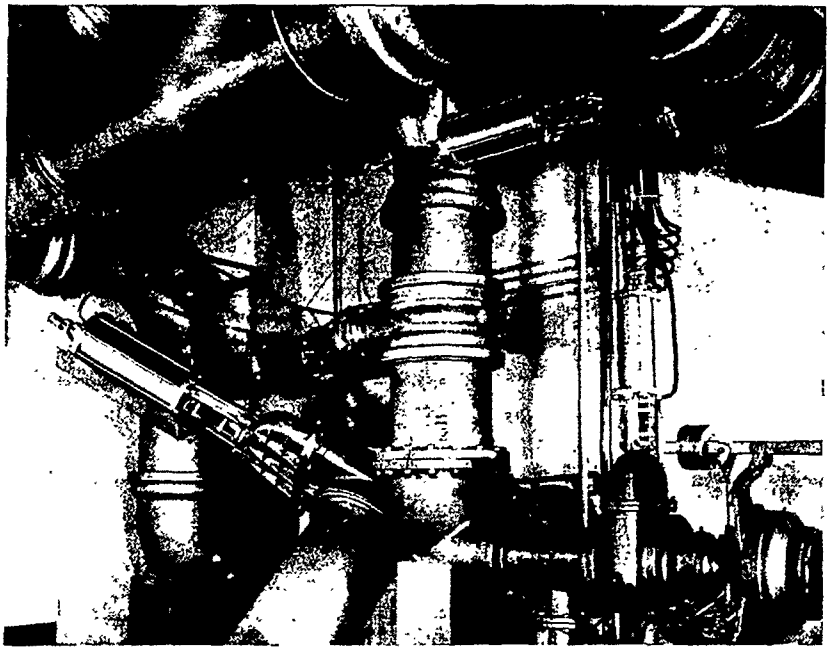
**Accessories:** Clean air, water, or oil, are requisites for proper cylinder operation.

Installation of a sediment separator is recommended in the line between the source of supply and the four-way valve. The separator will eliminate the possibility of dirt, grit, scale, or foreign matter entering the cylinder and scoring the walls, damaging the cups, or clogging the orifice openings.

If the air used is unusually dry, the piston cups will dry out and become brittle. To overcome that action, a drop oiler or other suitable device installed in the supply line is suggested; otherwise periodic oiling of the cups through the cylinder head should be maintained. A light motor oil about S.A.E. 10 is satisfactory for this purpose.

**Special equipment:** When so ordered, cylinder operated valves can be furnished with special equipment, depending upon the requirements.

Inquiries and orders must be accompanied by complete specifications and description of the proposed installation.



Remote-controlled Crane Cylinder Operated Gate Valves on pipe lines to filter tanks of modern Water Works.



### Information Required on Inquiries and Orders

1. Catalog number and size of valves wanted.
2. With or without by-pass. If by-pass is wanted, state the location of the by-pass in relation to the valve.
3. Are the valves to be installed with the stems horizontal or vertical?
4. Designate the service on which valve is to be used: steam, water, oil, gas, etc.
5. What is the maximum working pressure and maximum differential pressure to open against?
6. Designate the fluid to be used for operating the cylinder: air, hot or cold water, oil, etc.
7. What pressure is available for operating the cylinder? It is recommended that the operating pressure be as high as possible, thus allowing the use of a minimum diameter cylinder.
8. Maximum temperature, working or ambient, to which cylinder will be subjected.
9. Specify desired speed of operation. Unless otherwise specified, cylinders are factory regulated for disc travel of approximately 1-inch per second.

***Prices and complete description furnished on application.***

# Motor Operated Valves

## Electric Motor Units—Air or Gas Motor Units

30-inch Crane Low Pressure Iron Body Gate Valve with Cutler-Hammer Electrically Operated Valve Control

Valves that are to be mechanically operated by electricity, air, or gas, require a specially designed motor operator to control the valve performance.

Motor controlled valves have a wide range of application in piping systems. Their use provides a high degree of safety in emergencies, saves labor, and makes possible extreme flexibility in the operation of piping systems.

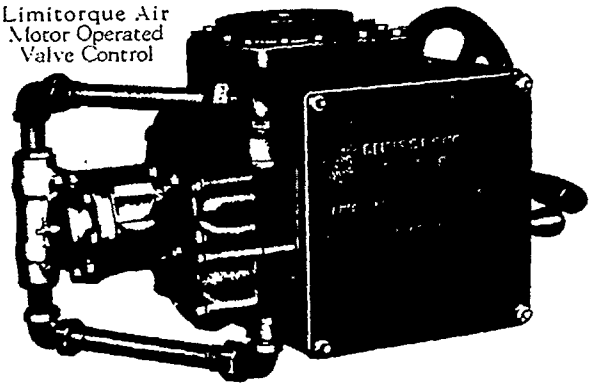
**Emergency operation:** As a matter of insurance against destruction due to mechanical failure of pipe lines or apparatus, the motor controlled valve has no equal; it can be operated instantly from remote positions, positions out of the danger zones. The valve closes rapidly and completely, and can be reopened at will. Inspection and periodical operation, however, are essential to its proper performance.

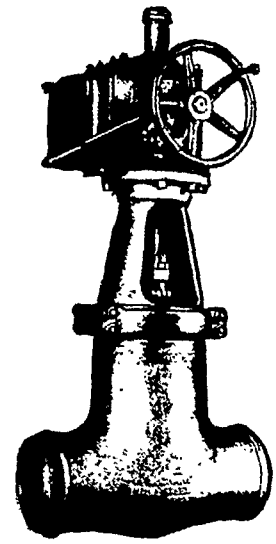
**Labor saving:** On valves operated frequently, and on especially large valves requiring considerable power and time to open or close, the motor operator is indispensable. It provides a perfect means of reducing the effort necessary to control the valves and the flow in the pipe lines.

**Flexibility:** To provide flexibility of plant operation, motor controlled valves are a necessity. Rapid operation of individual valves, and simultaneous operation of groups of valves by remote control from any number of convenient points is possible. The automatic operation through the use of pressure switches and other electrical devices provides almost unlimited means of controlling the flow in complicated and interconnected piping arrangements. Motor operated valves are the only means of securing these desirable advantages. The cost is amply justified when these elements of piping design are given full consideration.

**Motor operator assemblies:** Motor operator units consist of a special high starting torque motor, a reduction gear, limit switches (if operated by electric motors), or valves (if operated by air motors), and handwheel engaging mechanism, all contained in one weather-proof assembly with all gears running in oil. A hammer-blow device allows the motor to reach full speed before the full load is engaged.

Limitorque Air Motor Operated Valve Control





12-inch Crane 1500-Pound Steel Pressure-Seal Bonnet Gate Valve with Limitorque Electrically Operated Valve Control.

The ball bearing motor is totally enclosed. The handwheel, provided for manual operation, does not revolve during motor operation.

In closing the valve, the motor is stopped by a predetermined thrust exerted on the valve stem, acting on the limit switch, or limit valve. This also affords protection should any foreign matter obstruct the closing of the valve. In opening the valve, the motor is stopped by the mechanical limit switch, or limit valve, which stops the movement of the stem before the valve can back-seat. Limit switches and limit valves for both opening and closing are adjusted independent of each other.

Motor operators are available for unusual conditions and speeds of closing.

**Electric Motors:** Electric motor operators require a specially built high starting torque reversing motor. It is designed for intermittent duty, is capable of exerting its maximum power by the time the yoke sleeve in the operator completes one-eighth of a turn, and absorbs the shock of the built-in hammer-blow mechanism—all without danger of injury or overheating.

**Air or Gas Motors:** Air motors are of the rotary vane, or reciprocating piston reversible types. These are high speed, high starting torque motors, equipped with special air limit valves. Maximum air pressure is 125 pounds per square inch. Gas may be used instead of air to operate the motors, provided it is free of grit, or dirt, or chemicals, which may affect the motor.

Air motor units are of particular advantage in refineries, on oil and gas lines, and in various process industries, where sparks from electric motors and wires will ignite an explosive-laden atmosphere. They will operate even when totally submerged in water.

*Continued on next page*

# Electrical Equipment

Control of the electric power applied to motors is accomplished through reversing contactor panels set in operation by either push button stations or special electrical equipment.

All motor operators, panels, and control stations are especially built for this service, and conform to the standards established by the National Electrical Manufacturers' Association. Those standards are commonly known as "NEMA".

Careful consideration should be given to the electrical requirements when submitting inquiries, and placing orders, for motor operated valves. Unless otherwise specified, all motors will be furnished in NEMA III Weather-proof Enclosures—all panels and control stations in NEMA I General Purpose Enclosures.

# Standard Electrical Enclosures For Motors, Contactor Panels, and Control Stations

NEMA I—General Purpose Enclosure—serves as protection against dust and indirect splashing, but is not dust-tight or splash-proof.

NEMA II—Drip-proof Enclosure—meets the requirements of drip-proof or drip-tight apparatus.

NEMA III—Weather Resisting Enclosure—suitable for outdoor installation. It meets the requirements for splash-proof, weather-proof, sleet-proof, and moisture-resisting apparatus.

NEMA IV—Water-tight Enclosure. This is a cast or fabricated steel case and gasketed. It is water-tight and dust-tight, and meets the requirements for water-tight apparatus but is not submersible.

NEMA V—Dust-tight Enclosure—suitable for use in cement mills, and other locations, where dust must be excluded.

NEMA VI—Submersible Enclosure—meets the specifications for submersible apparatus.

NEMA VII—This case is designed for hazardous locations and is generally accepted as explosion-proof.

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# Reversing Contactor Panels

A reversing contactor panel is required for each electric motor operator unit.

Contactor panels have been developed and designed especially for valve operation. They consist of two mechanically interlocked three-pole contactors. Panels are furnished wired, provided with terminals, and mounted in an enclosure.

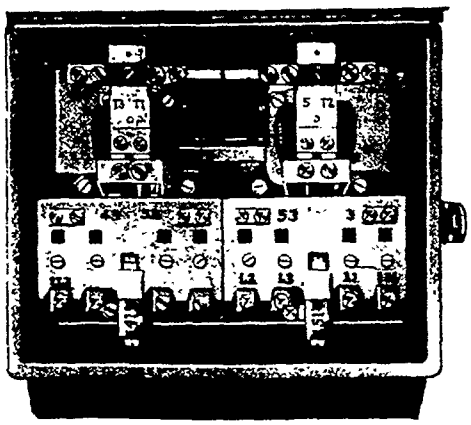
The arc quenchers used on these panels speedily extinguish the arc and provide for long contact life.

A mechanical interlock prevents damage when two opposite buttons are pushed at one time.

Any number of push button stations may be used with each reversing contactor panel.

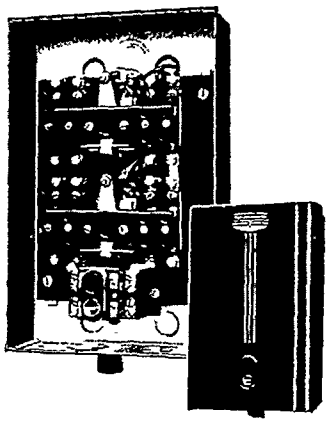
Single line break contactor panels are available. It is recommended, however, that double line break contactor panels be used for valve operation to prevent accidental operation of the valve in case of a ground or short circuit in the wiring.

***Continued on next page***

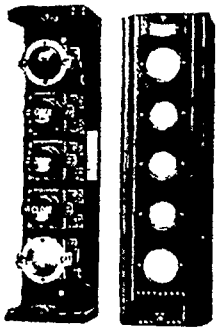


Limitorque Contactor Panels are regularly made in three sizes: No. 0, No. 1, and No. 2

Cutler-Hammer Contactor Panels are regularly made in two sizes and types: Size No. 1, Type "AAA"; Size No. 2, Type "CCC"



# Push Button Control Stations



Any of the following push button stations can be used to control electric motor operated valves. Unless otherwise specified, all stations will be furnished with three buttons (open-stop-close), and two lights (red and green). Provision can also be made for the use of additional automatic devices, as desired.

← Type HD-3
Cutler-Hammer
Push Button Control Station
in NEMA I Enclosure

Type AL →
Limitorque
Push Button Control Station
in NEMA V Enclosure

### Types of Control Stations Available

| Manufacturer | Type of Control Station: One Button | Two Button | Three Button | Drum Type | Lights | Enclosures Furnished | Mounting |
|---|---|---|---|---|---|---|---|
| Cutler-Hammer | KA and KB | | | — | 2 | NEMA IV | Surface |
| | HD-1 | HD-2 | HD-3 | — | 2 | NEMA I, IV, or VII | |
| | FHD-1 | FHD-2 | FHD-3 | DSLF | 2 | NEMA I | Flush |
| | — | — | — | DSL | 2 | NEMA I | Surface |
| | — | — | — | DS | None | NEMA I | |
| Limitorque Philadelphia Gear Works | — | — | AS | — | 2 | NEMA I | Surface or flush, as ordered |
| | ALEW | — | ALW | — | 2 | NEMA IV | |
| | ALEC | — | AL | — | 2 | NEMA V | |
| | — | — | ALEX | — | 2 | NEMA VII | |
| | W | — | — | — | 2 | Pistol Grip Switch | |
| | — | — | ALW-3 | — | 3 | NEMA IV | |
| | — | — | AL-3 | — | 3 | NEMA V | |

**Drum Stations DS and DL** have three positions; DSLF has two positions and a stop button.

**Enclosures**
NEMA I is sheet steel
NEMA IV is cast aluminum.
NEMA V is cast aluminum.
NEMA VII is cast steel

**Break-Glass Doors; Locks**
Cutler-Hammer Stations KA and KB have a break-glass door. KA has a Yale lock; KB will take a padlock.

Limitorque Stations, with the exception of types AS, ALEX, and W, have a break-glass door and a Yale lock.

# Step-Down Transformers and Fusible Plugs

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When push button stations and other electrical control apparatus, such as pressure and float switches, are to operate at a lower AC current voltage than the main motor, it is necessary to install a step-down transformer in the contactor panel. This requires a special over-size case.

Fusible plugs or disconnect switches can also be installed.

# Accessories

**Position indicators:** It is frequently desirable to have an indicator showing the exact position of the disc at all times, especially on globe valves, which are used for throttling purposes. Motor operators are furnished with protectors for the valve stem extension above the motor unit, to prevent mechanical damage to the stem and the accumulation of dust and dirt which might be carried into the yoke sleeve or yoke bushing by the stem. The valve stem, therefore, cannot act as an indicator.

All valve motor operators can be equipped with position indicators, of either the integral or remote type. The integral type is placed on the operator case, with a pointer indicating the disc position. The remote type is connected to a transmitter attached to the integral type indicator. Remote indicators may be in multiple.

A rod position indicator attached to the top of the stem of the valve, operating through a hole in the cap of the stem protector, is frequently furnished.

**Floor stands:** Motor operators may be mounted on floor stands for operating valves below a floor, when it is impractical to mount the operator directly on the valve. The floor stands may be of the plain type with the contactor panel and push button station mounted elsewhere, or of the combined type having the panel and station mounted on the side of the floor stand.

When a floor stand is used and the distance from the valve to the floor is within practical limits, a one-piece stem for the valve will be provided, extending through the floor stand. If the distance is too great for a one-piece stem, or the valve itself is in a line, which will impart movement to the valve through expansion or contraction, universal joints and spline couplings must be used in the stem.

Placing the floor stand at a location other than directly above the valve is not practical, due to the power absorbed by the required bevel gears, and the lost motion involved.

*Continued on next page*

# Recommendations

**Rising or non-rising stem valves:** The use of non-rising stem valves with motor operators is not generally recommended. The stems in such valves rotate with considerable speed and without interruption, and all of the wear takes place between the stem and the threaded bushing in the disc. Sediment or scale in the line greatly accelerates this wear, and the life of the valve is materially shortened.

In a rising stem valve, the wear is between the stem and the yoke sleeve or yoke bushing, which (being enclosed in the motor operator housing) is protected from all foreign matter. However, when clearance becomes the determining factor, non-rising stem valves can be furnished.

**Electrical insulation:** The insulation of the electric motor is important. For power plant operation, Class "B" Insulation should always be used, whereas for large water valves, or valves in a low temperature situation, Class "A" Insulation may be used.

Class "A" Insulation consists of cotton, silk, paper or other similar organic material immersed in oil or enamel as applied to conductors.

Class "B" Insulation consists of inorganic materials such as mica, or asbestos, in built-up form with binding substances.

**Electric current:** When alternating current motors are specified, 3 phase motors are regularly furnished. Single phase motors can be supplied for small valves only, requiring not over four-tenths horse power motors.

**Closing speeds:** Unless otherwise specified, the closing speed of the disc on gate valves will be figured on the basis of approximately 12 inches per minute, and on globe valves, approximately 6 inches per minute. Motor units are available for closing valves at higher speeds, and if required, all details of the installation should be provided.

# Information Required on Inquiries and Orders

1. Quantity, size, and end connections of valves (flanged, screwed, or welding ends).
2. Catalog number of regular valve preferred.
3. Rising or non-rising stem. See "Recommendations" above.
4. With or without by-pass. If by-pass is wanted, state its location in relation to the valve.
5. Service—steam, water, oil, air, gas, etc.
6. Working pressure, maximum differential pressure to open against, and operating temperature.
7. Valves used for: main steam, equalizing, boiler feed, circulating water, etc.
8. Information on any special conditions, such as: whether valve must close against full flow, open against full pressure, or if coking is present.
9. Maximum velocity through valve, if obtainable.
10. Position of valve run—horizontal or vertical.
11. On valves with horizontal run, give position of valve stem: vertical up, vertical down, horizontal, or other position.
12. Position of motor operator handwheel: parallel with or across the run of the valve.
13. Approximate maximum temperature at point where valve yoke will be located.
14. Desired closing speed of disc, in inches per minute, or all conditions if high speed closing is required.

**When Electric Motor Operator is Wanted:**

15. Electrical characteristics—voltage, type of current (AC or DC) and phase and cycle if AC. See "Recommendations" above.
16. State whether open-stop-close, close-only, or open-only stations are wanted; type of enclosure, and whether lock-up or non-lock-up; number of stations per valve. See page 128.

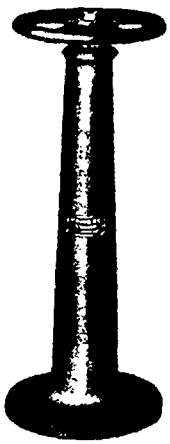
**When Air or Gas Motor Operator is Wanted:**

17. Available air or gas pressure for operating motor. (The minimum requirement is 70 pounds and the maximum 125 pounds. The normal working pressure of the motor is 100 p.s.i. Working pressures above this are not recommended due to increased vane friction at the higher speed.)

Type "S" Air Operated Limitorque Valve Controls on 4-inch Crane Gate Valves in the fire-water pump house of a refinery.

# Floor Stands

Without Indicator



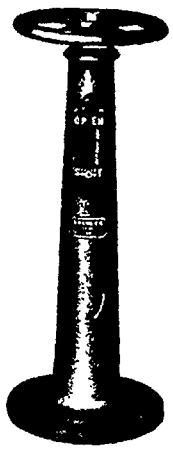
When equipped with the proper extension stem, these Floor Stands are suitable for operating either rising or non-rising stem valves. The list prices shown below are for the Floor Stand with wheel and wheel stem coupling, and, in addition, on the Floor Stand with Indicator, the complete indicator parts. They do not include extension stems, valve stem couplings, or yoke sleeve couplings.

Extension stems are illustrated on the opposite page. Prices are on application.

The 20-inch high Floor Stand is for valves with 8-inch and smaller diameter handwheels; the 32-inch for valves with larger diameter handwheels.

Regular Floor Stands without indicator are furnished for use with stem 2⅞-inch diameter or less. Regular Floor Stands with indicator are furnished for use with stems 2⅛-inch diameter or less.

With Indicator



**List Prices**

Including wheel and wheel stem coupling only.

| Height of Floor Stand | | Inches | 20 | 32 |
|---|---|---|---|---|
| Without Indicator | Painted column, japanned wheel | Each | 75.00 | 100.00 |
| | Finished column, japanned wheel | Each | 145.00 | 180.00 |
| | Finished column; rim and hub of wheel finished, spokes japanned | Each | 205.00 | 250.00 |
| With Indicator | Painted column, japanned wheel | Each | 115.00 | 140.00 |
| | Finished column, japanned wheel | Each | 185.00 | 220.00 |
| | Finished column; rim and hub of wheel finished, spokes japanned | Each | 245.00 | 290.00 |

# Directions for Ordering

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## Floor Stand Only

**For Crane Valves, specify:**

1. Style (with or without indicator) and finish of Floor Stand, and height
2. Size and catalog number of valve, and whether valve opens by turning to the right or left
3. Date valve was purchased, and complete markings.

**For other than Crane Valves, specify:**

4. Style (with or without indicator) and finish of Floor Stand
5. Size, style, and catalog number of valve
6. Manufacturer's name
7. Diameter of handwheel on valve
8. Number of turns to open
9. Dimension from center-line of valve to top of present handwheel—both open and closed positions, when wanted for globe and angle valves.
10. Whether valve opens by turning to the right or the left

## Floor Stand with Extension Stem

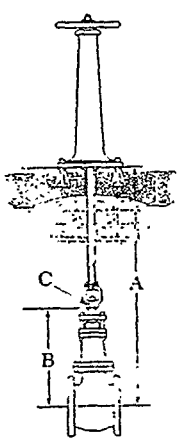
**For Crane Valves, specify:**

11. Information requested when ordering Floor Stand only (1 to 3, above)
12. Dimension A, center of valve port to floor level
13. Details, description, and proximity of structural members or walls available for support of long extension stems

**For other than Crane Valves, specify:**

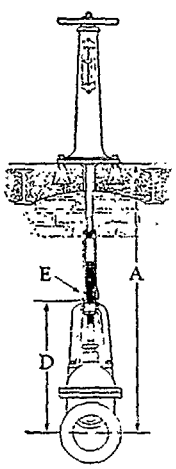
14. Information requested in above items 4 to 10, inclusive, and 12 and 13
15. If non-rising stem gate valve, or globe or angle valve, include:
    (a) Dimension B, center of valve to bottom of square on stem
    (b) Dimension C, dimensions of square on stem—in detail
16. If outside screw and yoke gate valve include:
    (a) Dimension D, center of valve to bottom of hub on handwheel
    (b) Dimension E, detail dimensions of the part of the yoke sleeve on which the handwheel fits

***Floor Stands with Extension Stems are priced on application.***




Non-Rising Stem Gate Valve

Unless otherwise ordered, extension stems are made of Extra Strong Pipe.

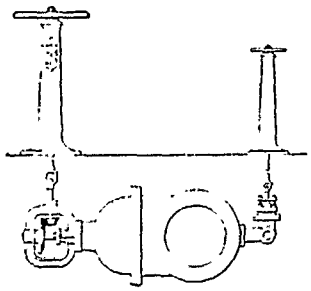



Outside Screw and Yoke Gate Valve

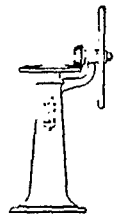
Unusually long extension stems must be properly supported.

# Floor Stands

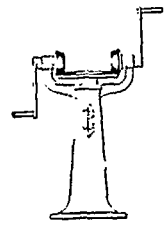
## Typical Application and Special Designs



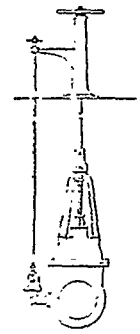
**Application E**
Floor Stands Applied to Gate Valve with By-Pass in Horizontal Position



**Application F**
Floor Stand with Single Bevel Gearing and Handwheel



**Application G**
Floor Stand with Double Bevel Gearing and Crank Handles



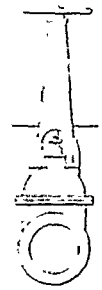
**Application K**
Floor Stand with Arm for Operating By-Pass

**Application L**
Bell Bottom Floor Stand Used on Non-Rising Stem Gate Valve Projecting Above Floor Line

The Floor Stands shown on the opposite page can be used to operate globe or angle valves or rising or non-rising stem gate valves, either with or without gearing. These meet the requirements of ordinary installations.

In addition, Floor Stands of special designs and for special installations, such as illustrated on this page, can be made to order. Prices on the special designs, equipped with gears, ball bearings, cranks, motors, arms, or with bell or wide bottom, are furnished on application.

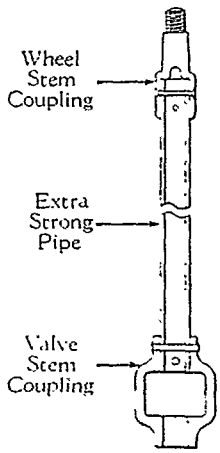
Inquiries and orders should indicate clearly what is wanted and be accompanied with a sketch including all known dimensions.



**Application J**
Wide Bottom Floor Stand Used on Rising Stem Gate Valve Projecting Above Floor Line

12

# Extension Stems



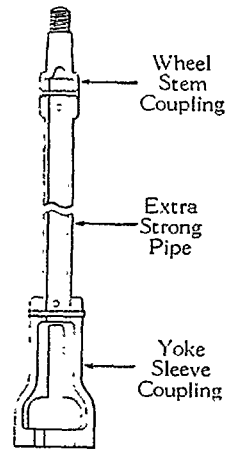

Extension Stem For Non-Rising Stem Gate Valves, Globe or Angle Valves

Extension stems are frequently required for valves that are to be operated from a distance. Ordinarily, a Floor Stand is used to support the stem and handwheel, but in many installations the extension stem only is used.

Extension stems for non-rising stem gate valves and for all globe and angle valves are furnished with a wheel stem coupling suitable for a square hole handwheel and a valve stem coupling to fit the square on the valve stem. Those for outside screw and yoke gate valves have the same wheel stem coupling as for non-rising stem gate valves and globe and angle valves, but have a hexagon hole yoke sleeve coupling, designed to absorb the rise of the valve stem, thus effecting non-rising operation of the extension stem.

Wheels are not furnished with extension stems unless ordered.

Unless otherwise ordered, extension stems are made of Extra Strong Pipe.




Extension Stem For Rising Stem Outside Screw and Yoke Gate Valves

Inquiries and orders should specify the length of the extension stem measured from the center of the valve port to the bottom of the square on the wheel stem coupling. For use on Crane valves, include the size and catalog number of the valve, the year of purchase and the complete valve markings. For use on valves not of Crane manufacture, include the information requested in lines 5 to 7, 9, 15 and 16 on page 130.

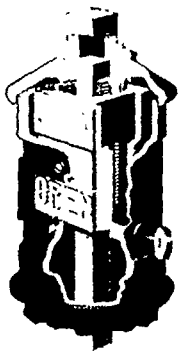
Extension stems that are long, must be rigidly and properly guided with supporting brackets. When requesting prices, furnish complete information.

*Prices on application*

# Indicator Posts

## Standard Pattern

No. 520
Applied to
No. 462
Gate Valve

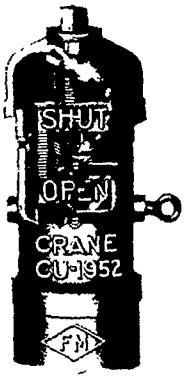



Enlarged
Sectional View
of Head
No. 520 Post

*When ordering an indicator post for a Crane valve, specify the catalog number of the post, the size and catalog number of the valve with which it will be used, and the depth of the trench (distance from ground level to bottom of pipe line).*

*When ordering indicator posts for valves other than Crane, refer to the paragraph below on "Special indicator posts."*

## Underwriters' Pattern




Enlarged
Sectional View
of Head
No. 510 Post

No. 510
Applied to
No. 462½
Gate Valve

### List Prices, Each, and Dimensions

| Depth of trench | | Feet | 2 to 6 |
|---|---|---|---|
| No. 510, with wrench | | | 168.00 |
| No. 520, with wrench | | | 138.00 |
| Extra for each 6" over 6-foot trench for No. 510 | | | 8.40 |
| Extra for each 6" over 6-foot trench for No. 520 | | | 7.00 |
| Distance from ground level to top of post | No. 510 | Inches | 38 |
| | No. 520 | Inches | 33¼ |

12

**Service recommendations:** Crane Indicator Posts provide an ideal means for operating iron body non-rising stem gate valves buried underground. They are used principally in factory and mill yards, on valves for fire protection service.

The Standard Pattern, recommended when the Underwriters' Pattern is not required, is suitable for valves 2 to 14-inch inclusive. It is generally used with the No. 462 Gate Valves shown on page 79.

The Underwriters' Pattern, approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories, is used with No. 462½ Underwriters' Pattern Gate Valves shown on page 80. The post is marked "CU" and "FM".

**Construction:** Crane Indicator Posts are sturdily constructed of cast iron. Each post is furnished with an angle wrench which can be locked or sealed at the side of the post when not in use. The operating nut is 1¼ inches square.

The word "OPEN" or "SHUT", in large, easily read letters, appears behind the indicator glass when the valve is open or closed, respectively. The lower plate, marked "OPEN", is adjustable, and its position is changed to suit the size of the valve. The indicator opening is fitted with a heavy plate glass ½-inch thick; small openings under the cap ventilate the entire post and prevent accumulation of moisture on the glass in cold weather.

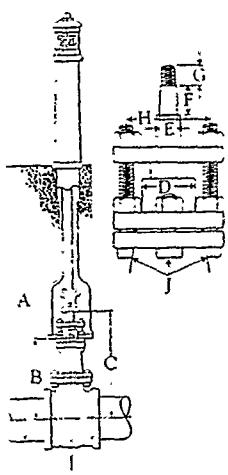
**Attaching post to valve:** These posts have the standard N.F.P.A. (National Fire Protection Association) flange for attachment to the valve; the operating rod has a socket for the valve stem.

When No. 462 Gate Valves are ordered for use with an indicator post, they are furnished with an indicator post flange bolted on the bonnet at no extra charge. When the No. 520 Indicator Post is required for valves already installed and not equipped with a flange, a separate adaptor plate for the valve is furnished with the post at no extra charge.

No. 462½ Gate Valves used with the No. 510 Indicator Post are furnished regularly with an indicator post flange cast integral with the bonnet.

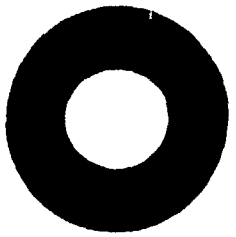
**Special indicator posts:** Indicator posts for non-rising stem gate valves other than Crane can be made to order at a special price. When ordering, specify the name of the valve manufacturer, the valve size, whether it opens by turning to the right or left, the number of turns to open, and the following dimensions:

A — Depth of trench
B — Center of pipe to top of stuffing box flange
C — Center of pipe to bottom of valve stem square
D — Diameter of stuffing box
E — Size of stem square
F — Height of stem square
G — Length of stem thread
H — Stuffing box bolt circle
J — Number and diameter of stuffing box studs and/or bolts.

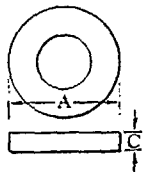


# Composition Discs

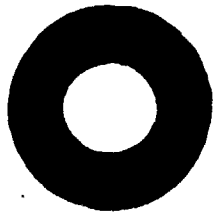
No. 1 Cranite Disc
⅛ to 3-inch



No. 1 Cranite Disc
3½ to 6-inch
No. 6 Composition Disc
⅛ to 6-inch



No. 4 Cranite Disc
⅛ to 3-inch



No. 10 and No. 12
Composition Discs
⅛ to 2-inch

| Size | List Prices per 100 Pieces | | | | | Approximate Dimensions in Inches | | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. 1 Cranite Discs | No. 4 Cranite Discs | No. 6 Discs | No. 10 Discs | No. 12 Discs | No. 1, No. 4, No. 6 | | No. 10 or No. 12 | |
| Inches | | | | | | A | C | A | C |
| ⅛ | 17.50 | 50.00 | 17.50 | 7.00 | 7.00 | 21/32 | 7/32 | ½ | ⅛ |
| ¼ | 17.50 | 50.00 | 17.50 | 7.00 | 7.00 | 21/32 | 7/32 | ½ | ⅛ |
| ⅜ | 17.70 | 57.00 | 17.70 | 8.00 | 8.00 | ¾ | 7/32 | 19/32 | ⅛ |
| ½ | 18.00 | 57.00 | 18.00 | 8.00 | 8.00 | 13/16 | ¼ | 21/32 | 3/16 |
| ¾ | 22.00 | 65.00 | 22.00 | 10.50 | 10.50 | 11/16 | ¼ | 29/32 | 7/32 |
| 1 | 23.00 | 82.00 | 23.00 | 13.50 | 13.50 | 1⅜ | ¼ | 1¼ | ¼ |
| 1¼ | 31.50 | 119.00 | 31.50 | 19.00 | 19.00 | 1⅝ | 11/32 | 1½ | ¼ |
| 1½ | 39.50 | 165.00 | 39.50 | 24.50 | 24.50 | 2 | 11/32 | 1 13/16 | 9/32 |
| 2 | 56.50 | 254.00 | 56.50 | 38.00 | 38.00 | 2 9/16 | 11/32 | 2 9/32 | 5/16 |
| 2½ | 74.00 | 334.00 | 74.00 | | | 3 3/16 | 15/32 | | |
| 3 | 179.00 | 471.00 | 179.00 | | | 3 15/16 | ½ | | |
| 3½ | 236.00 | | 236.00 | | | 4⅜ | 9/16 | | |
| 4 | 243.00 | | 243.00 | | | 4⅞ | 19/32 | | |
| 5 | 326.00 | | 326.00 | | | 6 1/16 | 19/32 | | |
| 6 | 370.00 | | 370.00 | | | 7 1/16 | 19/32 | | |

Crane Composition Discs are made from high quality materials—compounded, cured, and tested for the recommended services. All are molded and vulcanized. Constant study, research, and control assure uniformity in composition and serviceability.

**No. 1 Cranite Discs:** No. 1 Cranite Discs are made of a specially formulated composition consisting of a synthetic base, with asbestos and other ingredients. Sizes ⅛ to 3-inch have serrated faces on both sides; one side is marked "No. 1 Cranite", and includes the size marking. Sizes 3½-inch and larger are plain on both sides, without markings.

For 150 pounds steam, 366° F. maximum
*150 pounds hot water, 366° F. maximum
*300 pounds hot water, 300° F. maximum

**No. 4 Cranite Discs:** No. 4 Cranite Discs are laminated, and consist of a synthetic base with spirally wound long fibre asbestos and other ingredients. They are suitably cured to provide a hard disc for high temperature, yet they seat with a minimum of effort. All sizes have serrated faces on both sides; one side is marked "No. 4 Cranite", and includes the size.

For 300 pounds steam, 450° F. maximum
*600 pounds hot water, 420° F. maximum

*The No. 1 and No. 4 Discs are suitable for hot water under 200° F. only when used in globe and angle valves; however, when such valves are to be operated frequently or must seat easily, and the temperature does not exceed 200° F., the No. 6 Discs are recommended.

**No. 5 Cranoil Discs:** Cranoil Discs (not illustrated above), are compounded from phenol formaldehyde resinoid. They are cemented into the disc holders of the valves, and have specially machined faces to fit specially machined seats. They are not interchangeable with other Crane Discs. See page 31.

For oil, gasoline, air, or gas, 250° F. maximum

**No. 6 Discs:** No. 6 Discs are made of a specially formulated composition consisting of a synthetic base, with other ingredients. They are soft enough to make a tight seat on air or gas, yet sufficiently stiff and resistant to withstand hot water, and the wear and tear of repeated operation.

All sizes are plain on both sides, without markings.

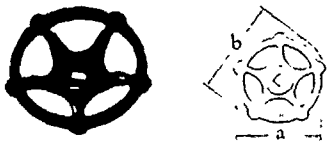
For 400 pounds hot water, 200° F. maximum
600 pounds water, air, gas, oil, or gasoline, 150° F. maximum.
(Also suitable for propane and butane when used in Underwriters' approved valves.)

**Nos. 10 and 12 Discs:** Nos. 10 and 12 Discs are not interchangeable with Nos. 1, 4, and 6 Discs; they are slightly smaller in size. Made from homogeneous compounds with synthetic bases, they are highly suitable for their respective recommended services.

All sizes are plain on both sides, without markings.

No. 10...For 100 pounds steam, 338° F. maximum
No. 12...For 150 pounds water, air, gas, oil, or gasoline, 200° F. maximum, and for domestic gas service.

# Wheels for Valves



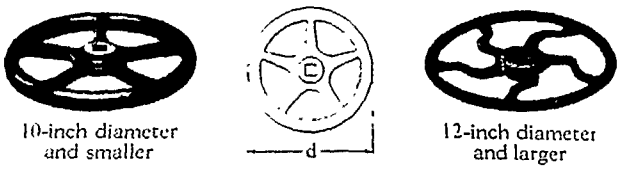

**Style A Wheels**, of a dished design with oval rim and either a square or threaded hole, are made of malleable iron. Orders must specify "square" or "threaded" hole.

Square hole wheels are used on the small size Steel Globe and Angle Valves shown on pages 237 to 239, 386, and 387.

Threaded hole wheels are used on the O.S. & Y. Steel Gate Valves shown on pages 223, 225, and 387, and on 2-inch Diaphragm Valves.

**Style B Wheels**, of malleable iron and similar to the Style A above, are made with a threaded hole only. They are used on Diaphragm Valves 1½-inch and smaller.

**Style F Wheels**, non-heat, round pattern with a square hole, are die cast in diameters 4 1/16-inch and smaller and malleable iron in the larger diameters. They are widely used on smaller size Brass, Bronze, Iron, and Steel Globe, Angle, and Gate Valves (but not on O.S. & Y. Gate Valves).




10-inch diameter and smaller — 12-inch diameter and larger

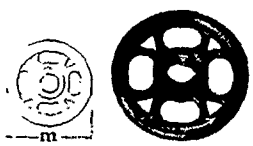
**Style D Wheels** have an oval rim, square hole, and are malleable iron. They are used on the larger size Diaphragm Valves, Brass, Bronze, Iron, and Steel Globe, Angle, and Gate Valves (but not on O.S. & Y. Gate Valves), they are also used on No. 453 Hose Gate Valves.

10-inch diameter and smaller — 12-inch diameter and larger

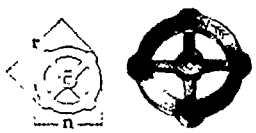
**Style E Wheels**, made of malleable iron and similar to the Style D above, have a hexagon hole. They are used on O.S. & Y. Iron and Steel Gate Valves. 6 and 7-inch diameter wheels are also available with a threaded hole for use with the Steel Gate Valves shown on pages 223, 225, and 387.

**Style L Wheels**, of a black, moulded composition material with a square socket, are used on Brass and Bronze Radiator Valves and on special polished valves.

**Style M Wheels** are a round pattern design. They have a round rim, a threaded hole, and are made of malleable iron. These wheels are used only on the No. 459 Bronze Gate Valves shown on page 19.




**Style N Wheels** are the "Navy" Four-Ball Pattern. They have a square hole, are made of polished brass, and are used on special polished valves.




## Sizes (Diameters) in Inches, and List Prices

**Style A**

| Size a | Size b | Price, Each Sq. Hole | Price, Each Thd. Hole |
|---|---|---|---|
| 2½ | 2 11/16 | .20 | .40 |
| *3 | 3¼ | .30 | .46 |
| 3½ | 3⅞ | .38 | .68 |
| 4 | 4 7/16 | .56 | .95 |
| 5 | 5½ | 1.05 | 1.60 |

**Style B**

| Size a | Size b | Price, Each Thd. Hole |
|---|---|---|
| 2 | 2 3/16 | .30 |
| 2¼ | 2 7/16 | .35 |
| 2½ | 2 11/16 | .40 |
| 3 | 3¼ | .46 |
| 4 | 4 7/16 | .95 |

*Prices of wheels for AAR Valves are shown on page 40.*

**Style D**

| Size d | Price Each |
|---|---|
| 3½ | .45 |
| 4½ | .75 |
| 5½ | 1.35 |
| 6 | 1.60 |
| 7 | 2.00 |
| 8 | 2.50 |
| 9 | 3.15 |
| *10 | 3.35 |
| 12 | 4.40 |
| 14 | 6.30 |
| 16 | 12.75 |
| 18 | 14.00 |
| 20 | 19.00 |
| 22 | 23.00 |
| 24 | 39.00 |
| 27 | 42.00 |
| 30 | 58.00 |
| 36 | 160.00 |
| 42 | 200.00 |

**Style E**

| Size e | Price, Each Hex. Hole | Price, Each Thd. Hole |
|---|---|---|
| 6 | 1.60 | 1.85 |
| 7 | 2.00 | 2.50 |
| 8 | 2.50 | |
| 9 | 3.15 | |
| *10 | 3.35 | |
| 12 | 4.40 | |
| 14 | 6.30 | |
| 16 | 12.75 | |
| 18 | 14.00 | |
| 20 | 19.00 | |
| 22 | 23.00 | |
| 24 | 39.00 | |
| 27 | 42.00 | |
| 30 | 58.00 | |
| 36 | 160.00 | |
| *42 | 200.00 | |

**Style F**

| Size f | Price Each |
|---|---|
| 1½ | .13 |
| 1¾ | .13 |
| 2 1/16 | .16 |
| 2 9/16 | .20 |
| 2¾ | .24 |
| 3 1/16 | .30 |
| 3⅝ | .36 |
| 4 1/16 | .44 |
| 4¾ | .56 |
| 5⅜ | .75 |

**Style L**

| Size h | Price Each |
|---|---|
| 1⅝ | .20 |
| 2 | .22 |
| 2¼ | .24 |
| 2½ | .28 |
| 2¾ | .32 |
| 3 | .40 |

**Style M**

| Size m | Price Each |
|---|---|
| 3 5/16 | .80 |
| 3⅝ | 1.00 |
| 3⅞ | 1.20 |
| 4⅜ | 1.60 |
| 4 13/16 | 1.90 |
| 5¾ | 2.20 |
| 6 11/16 | 4.30 |

**Style N**

| Size n | Size r | Price Each |
|---|---|---|
| 1½ | 1¾ | Prices on application |
| 1¾ | 2 | |
| 2 | 2⅜ | |
| *2½ | 3 | |
| 3 | 3½ | |
| 3½ | 4⅛ | |
| 4 | 4⅝ | |
| 5 | 5⅝ | |
| 6 | 6⅝ | |

**Ordering wheels or handles:** Specify the size and catalog number of the valve, or the size and style of the wheel or handle.

Valve dimension tables in the catalog include the wheel or handle size. The style can be determined from valve illustrations and the size, or from data shown on this and page 135.

*The asterisk indicates wheels made with two sizes of squares or hexagons; for these sizes, always include the size and catalog number of the valve on which the wheel will be used.

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# Handles for Valves

Style J Tee Handles are made of cast iron. They are used only on No. 50 Brass Hose Valves.

Style K Lever Handles are made of malleable iron. They are used on the smaller size Hydraulic Bronze and Steel Globe and Angle Valves.

*Ordering.....page 134*
*Tee Wrenches.....page 137*
*Keys for Lock Shields.....page 137*

## Sizes, in Inches, and List Prices

| | Size j | Price Each |
|---|---|---|
| Style J | 5⅛ | .45 |
| | 5¾ | .75 |
| | 6½ | .85 |
| | 8¼ | 1.00 |

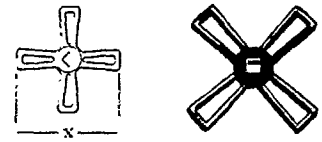
| | Size k | Price Each |
|---|---|---|
| Style K | 3⅛ | .32 |
| | 3 5/16 | .38 |
| | 3½ | .40 |
| | 3⅞ | .42 |
| | 4¼ | .46 |
| | 4⅝ | .50 |
| | 5 | .60 |
| | 5¾ | .70 |

| | Size s | Price Each |
|---|---|---|
| Style S | †2 9/16 | .15 |
| | 3 9/16 | .20 |
| | 4⅛ | .38 |
| | †4½ | .43 |
| | 4¾ | .46 |
| | 6 | .62 |

| | Size x | Price Each |
|---|---|---|
| Style X | †3 | .40 |
| | †3¾ | .50 |
| | †4¾ | .62 |
| | 6 | 1.00 |
| | 7 | 1.10 |

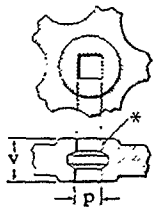
†Two sizes of squares; specify size wanted.

Style S Tee Handles are made of malleable iron. They are used on Bar Stock Valves and on some Corrosion-Resistant Globe Valves, Lip-Seal Bonnet Valves, and Ammonia Valves.




Style X Cross Handles are made of malleable iron. They are used on some Corrosion-Resistant Valves.

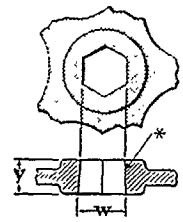
# Size of Hole in Wheels and Handles




Square Hole Wheel or Handle

The tables below show the size of hole in square hole and hexagon hole wheels and handles. Wheels and handles with the same size and type of hole, and the same hub length, are interchangeable.

***Caution:*** When substitution of wheels and handles involves the use of larger sizes than those with which the valves are regularly equipped, consideration must be given to the effect of increased power which will be obtained; recommendations furnished on request.




Hexagon Hole Wheel or Handle

*¾" total taper per foot

## Dimensions, in Inches

| Square Hole p | Square Hole v | Style A Size a | Style F Size f | Style N Size n | Style J Size j | Style K Size k | Style S Size s | Style X Size x | Chain Wheel Pitch Dia. |
|---|---|---|---|---|---|---|---|---|---|
| .20 | .30 | | 1½ | 1½ | | | | | |
| .24 | .35 | 2½ | 1¾ | 1¾ | | | | 3 | |
| .24 | .37 | | | | | | 2 9/16 | | |
| .29 | .35 | | 2 1/16 | 2 | | 3⅛ | | 3 | |
| .29 | .37 | | | | | | 2 9/16 | | |
| .29 | .44 | 3 | | | | | | | |
| .32 | .40 | | 2 9/16 | 2½ | | 3 5/16 | | 3¾ | |
| .32 | .44 | | | | | | 3 9/16 | | |
| .35 | .44 | | 2¾ | 2½ | | 3½ | 4½ | 3¾ | 2⅜ |
| .40 | .44 | 3 | 3 1/16 | 3 | 5⅛ | 3⅞ | 4⅛, 4½ | 4¾ | 2⅜ |
| .40 | .56 | 3½ | | | | | 4¾ | | 3 |
| .42 | .44 | | 3⅝ | 3½ | | 4¼ | | 4¾ | 3 |
| .42 | .81 | | | | 5¾ | | | | |
| .45 | .56 | | 4 1/16 | [illegible] | | 4⅝ | 6 | 6 | 3 |
| .45 | .69 | | | | 6½ | | | | |
| .53 | .62 | 4, 5 | 4¾, 5⅜ | 5 | | 5 | | 7 | 4 |
| .56 | .75 | | | | 8¼ | | | | |
| .56 | .87 | | | 6 | | 5¾ | | | 5 |

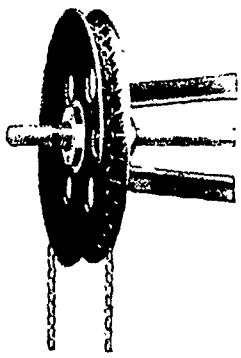
| Square Hole p | Square Hole v | Style D Size d | Chain Wheel | Square Hole p | Square Hole v | Style D Size d | Chain Wheel |
|---|---|---|---|---|---|---|---|
| .35 | .44 | 3½ | 2⅜ | 1.00 | 1.62 | 14 | 14 |
| .37 | .62 | 4½ | 4 | 1.13 | 1.75 | 16 | 14 |
| .44 | 1.00 | 5½ | 4 | 1.25 | 1.87 | 18 | 18 |
| .56 | .87 | 6 | 5 | 1.31 | 2.12 | 20 | 18 |
| .63 | 1.00 | 7 | 5 | 1.44 | 2.37 | 22 | 18 |
| .69 | 1.06 | 8 | 7½ | 1.50 | 2.44 | 24 | 24 |
| .75 | 1.19 | 9 | 7½ | 1.75 | 2.50 | 27 | 24 |
| .81 | 1.25 | 10 | 10 | 1.87 | 2.75 | 30 | 30 |
| .87 | 1.37 | 10 | 10 | 2.00 | 3.25 | 36 | 30 |
| .94 | 1.50 | 12 | 10 | 2.50 | 3.50 | 42 | |

| Hexagon Hole w | Hexagon Hole y | Style E Size e | Chain Wheel | Hexagon Hole w | Hexagon Hole y | Style E Size e | Chain Wheel |
|---|---|---|---|---|---|---|---|
| .99 | .69 | 6 | | 2.38 | 1.31 | 18 | 18 |
| .99 | .69 | 7 | 7½ | 2.75 | 1.31 | 20 | 18 |
| 1.16 | .75 | 8 | 7½ | 3.27 | 1.50 | 22 | 18 |
| 1.35 | .87 | 9 | 7½ | 3.46 | 1.62 | 24 | 24 |
| 1.54 | .87 | 10 | 10 | 3.53 | 1.69 | 27 | 24 |
| 1.67 | .87 | 10 | 10 | 4.03 | 1.75 | 30 | 30 |
| 1.86 | 1.00 | 12 | 10 | 4.56 | 2.19 | 36 | 30 |
| 2.05 | 1.06 | 14 | 14 | 5.16 | 2.75 | 42 | |
| 2.31 | 1.19 | 16 | 14 | 5.75 | 2.75 | 42 | |

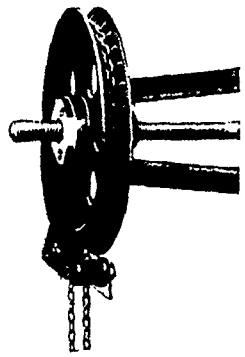
*Chain Wheels....page 136*

# Chain Wheels

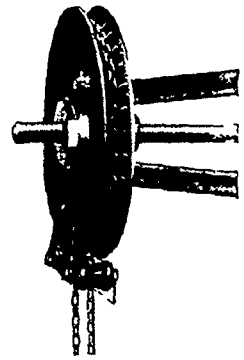
## For Brass, Iron, and Steel Valves



Chain Wheel
With Chain



Chain Wheel
With Guide and Chain



Hammer Blow Chain Wheel
With Guide and Chain
(Prices on Application)

Illustrations show Chain Wheels applied to Rising Stem Gate Valves. Applications on Non-Rising Stem Gate Valves and on Globe and Angle Valves, while not illustrated, are similar.

| Pitch Diameter of Chain Wheel Inches | List Prices, Each For use with Rising or Non-Rising Stem Valves With Square or Hexagon Hole Wheel* | | Chain Wheels are applicable to valves having the following style and size of Wheel or Handle with Square or Hexagon hole only | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Chain Wheel Only | Chain Wheel and Guide | Style A Wheel *Size Inches | Style D Wheel Size Inches | Style E Wheel *Size Inches | Style F Wheel Size Inches | Style K Handle Size Inches | Style S Handle Size Inches |
| 2⅜ | 3.75 | 17.50 | 3 | 3½ | | 2¾, 3 1/16 | 3½, 3⅞ | |
| 3 | 4.00 | 17.75 | 3½ | | | 3⅝, 4 1/16 | 4¼, 4⅝ | 4¾, 6 |
| 4 | 4.25 | 18.00 | 4. 5 | 4½, 5½ | | 4¾, 5⅜ | 5 | |
| 5 | 4.75 | 19.50 | | 6, 7 | | | 5¾ | |
| 7½ | 8.50 | 23.50 | | 8, 9 | 7, 8, 9 | | | |
| 10 | 12.50 | 28.50 | | 10, 12 | 10, 12 | | | |
| 14 | 18.00 | 35.00 | | 14, 16 | 14, 16 | | | |
| 18 | 26.00 | 44.00 | | 18, 20, 22 | 18, 20, 22 | | | |
| 24 | 45.00 | 65.00 | | 24, 27 | 24, 27 | | | |
| 30 | 95.00 | 125.00 | | 30, 36 | 30, 36 | | | |

List price of Chain for Chain Wheels .45 per foot || List price for connecting ends of Chain .65 per Chain

***Chain Wheels without guides will be furnished, unless ordered "With Guide".***
****Chain wheels for valves with threaded hole wheels are made to order; prices on application.***

For convenience in operating valves located above a normal reach from floor levels, Crane Chain Wheels are ideal. They are made from high quality cast iron, of unusually rugged and serviceable construction, and are designed to provide a positive grip on the chain under the most severe operation.

Through a new improved hub design, these chain wheels are easily attached and locked to valves in service; an instruction tag is supplied with each wheel.

**Guides:** Guides for Crane Chain Wheels, for sizes of 7½-inch pitch diameter and larger, are regularly equipped with rollers, as illustrated; Guides for smaller wheels have plain loops. Crane Guides hold the chain in close contact with a large portion of the circumference of the wheel, preventing slipping or jumping of the chain.

**Hammer Blow Chain Wheels:** When Chain Wheels are desired for operating large size or high pressure valves, additional power is usually necessary for the first effort in unseating the disc, and in the final movement, to effect tight seating. For conditions such as these, the Crane Hammer Blow Chain Wheel is recommended. Its design embodies a "lost motion", wherein the wheel turns freely through a large angle, building up momentum until the heavy operating lugs engage. The resulting "hammer blow" acts upon the valve stem, facilitating opening and closing of the valve. The Hammer Blow Chain Wheels are available in 7½-inch pitch diameter and larger; prices are furnished on application.

**Ordering:** When ordering a Chain Wheel separately, specify the pitch diameter of the Chain Wheel and the size and catalog number of the valve for which it is intended. Also indicate if a Chain Guide is desired.

When ordering a Chain for a Chain Wheel separately, specify the pitch diameter of the Chain Wheel for which the Chain is intended.

When valves are ordered with a Chain Wheel or with a Chain Wheel and Guide, the equipment will be mounted on the valve at no extra charge; no allowance will be made for the regular valve wheel or handle.

*For size of hole in Chain Wheels, Wheels, or Handles, see page 135.*

# Babbitt Adjustable Sprocket Rim

## With Chain Guide

| Size No. | Diameters, in Inches: Sprocket Wheels | Valve Wheels Rim Will Fit |
|---|---|---|
| 0 | 4 | 2 to 4 |
| 1 | 5⅞ | 4⅛ to 5⅞ |
| 1½ | 7½ | 6 to 7½ |
| 2 | 9 | 7¾ to 9 |
| 2½ | 12½ | 9¼ to 12½ |
| 3 | 15½ | 12¾ to 15½ |
| 3½ | 19 | 15¾ to 19 |
| 4 | 22 | 19¼ to 22 |
| 4½ | 26 | 22¼ to 26 |
| 5 | 30 | 26¼ to 30 |

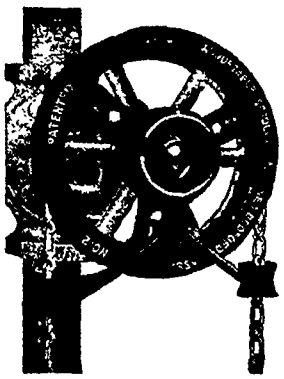
The Babbitt Rims may be easily attached to the wheels of valves in service. They do not in any way interfere with rising stems. Available in a wide range of sizes, each size can be adjusted to fit certain minimum and maximum diameters of valve wheels, as shown in the table at the left.

The new split guard ring of spring steel avoids the use of cotter pins.

The chain is rustproof.

When ordering, specify the number of feet of chain required, and indicate if the valve has a rising stem.

***Prices on application.***



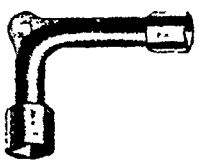
# Keys for Lock Shield

**Keys Used With Lock Shield Valves**

| Size of Valve Inches | Catalog Nos. of Valves: No. 67 G | No. 438 | No. 440 | No. 1240 No. 1241 | No. 4270 |
|---|---|---|---|---|---|
| ¼ | | | | 197 | |
| ⅜ | | | | | 197 |
| ½ | 198 | 197 | 198 | | 198 |
| ¾ | | 198 | | | |
| 1 | 198 or 199 | | | 198 | 198 or 199 |
| 1¼ | | 198 or 199 | 199 | | |
| 1½ | 199 | | | | |
| 2 | | 199 | | | |

**List Prices and Size of Square Hole**

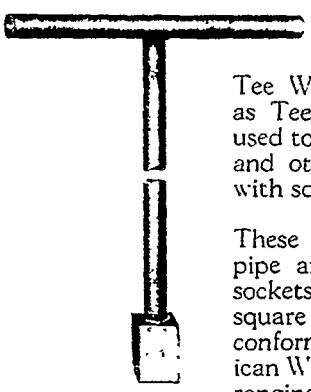
| Key Nos. | List Prices Each | Size of Square Hole Inches |
|---|---|---|
| No. 197 | 1.00 | .26 and .20 |
| No. 198 | 1.20 | .43 and .32 |
| No. 199 | 1.60 | .49 and .43 |



L-Shape Key
Malleable Iron
Cadmium Plated
Nos. 197, 198, and 199



# Tee Wrenches



Tee Wrench For Valves With Square Operating Nut

Tee Wrenches, frequently referred to as Tee-Handle Socket Wrenches, are used to operate all types of gate valves and other equipment regularly fitted with square operating nuts.

These welded wrenches, made of steel pipe and tubing, are furnished with sockets for either 2-inch or 3-inch square operating nuts. The nut sizes conform to the dimensions of the American Water Works Association. Lengths ranging from five to nine feet are regular; other lengths are made to order.

***Prices and dimensions on application.***

# Seat Ring Wrenches

**Typical Illustrations**

Illustrated here are wrenches for AAR Bronze Globe and Angle Valves.

*Left* . . . . for valves with ball disc.

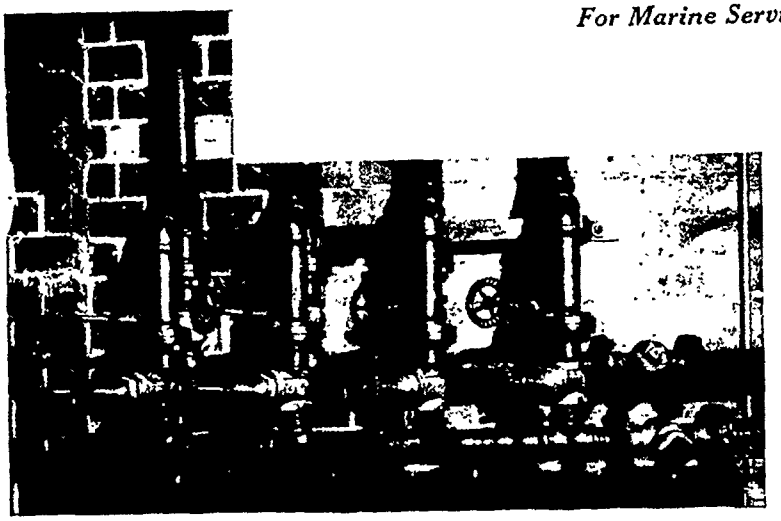
*Right* . . . for valves with plug disc.

A typical seat ring is shown under each wrench.

Wrenches for removing and inserting flat, bevel, and plug type body seat rings in Crane Brass, Bronze, and small Iron Body Globe and Angle Valves are available. They are made of steel, ruggedly constructed, and correctly designed. Prices on application.

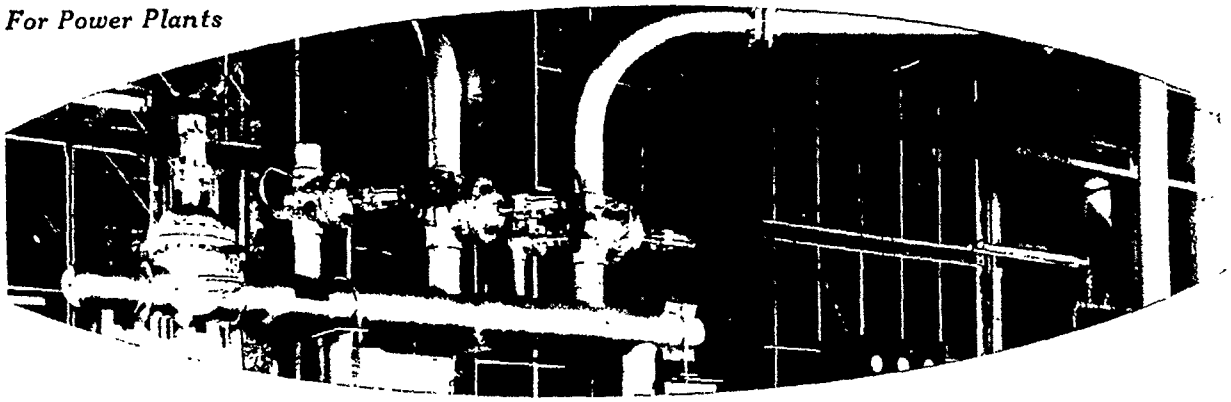
## *Approved by Every Industry — Crane Valves and Fittings*

*For General Use*

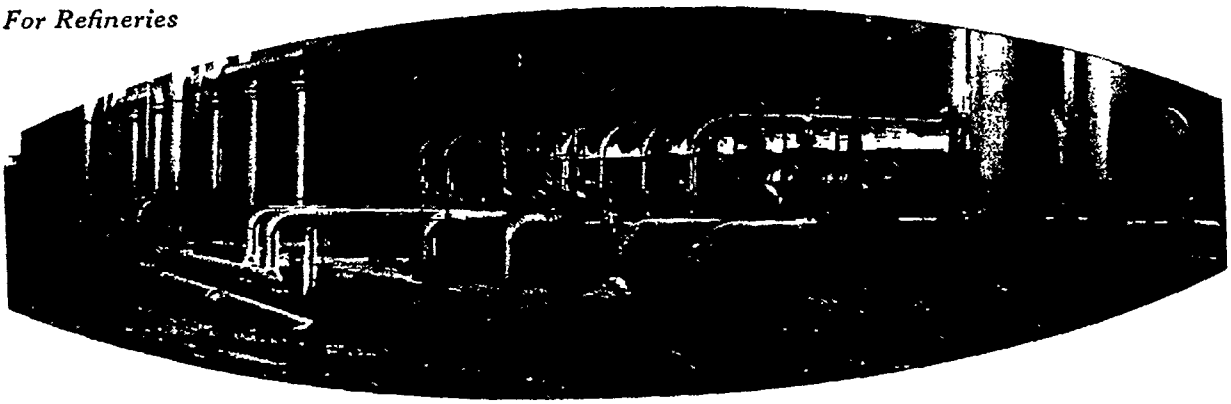


*For Marine Service*

*For Power Plants*



*For Refineries*



Malleable Iron
Screwed Fittings

# Malleable Iron Screwed Fittings

**150-Pound Banded Fittings**
List Prices and Description.....pages 140 and 141
Dimensions and List of Reducing Sizes....pages 142 and 143

**Plain Pattern Fittings**
List Prices and Description.....page 141
Dimensions and List of Reducing Sizes.....page 142

**Air-Tested 150-Pound Fittings**.....page 144
**Circulating Boiler Fittings**.....page 145

**300-Pound Fittings**.....pages 146 and 147
**Heavy Fittings**.....pages 146 and 147
**AAR Fittings**.....page 148

The Crane line of Malleable Iron Fittings includes fittings for steam working pressures up to 300 pounds and for water, oil, or gas working pressures up to 2000 pounds, depending upon size. The user is afforded a wide variety of types and an unusually liberal assortment of straight and reducing sizes.

Crane Malleable Iron is characterized by pressure tightness, stiffness, and toughness, the latter property being especially valuable in pipe fittings. It has a tensile strength of from 40,000 to 50,000 pounds per square inch. Uniformity and superior quality are assured through the application of improved methods in furnace practice, casting, and annealing.



Although differing in their weight and proportions, the various lines are alike in that no detail of manufacture is overlooked to provide fittings of exceptionally high quality. Except for Plain Pattern Fittings, the pipe ends are reinforced with bands. Tough, close-grained iron, threads accurately cut to gauge and in true alignment, openings chamfered to permit easy entrance of the pipe,—these and other features contribute to making Crane fittings uniformly satisfactory.

* * * * * * * * *

The list above does not include all the Malleable Iron Fittings manufactured by Crane. For greater convenience, the following fittings are shown in other sections of this catalog:

Plugs.....page 166
Bushings.....page 167
Single Strap and Double Strap Clamps.....page 171
Screwed Unions and Union Fittings.....pages 174 to 180
Flange Unions.....page 181
Railing Fittings.....pages 190 and 191
Floor Flanges.....page 203

*How to read reducing fittings....page 577*

# 150-Pound Malleable Iron Fittings

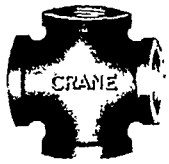
90° Elbow

45° Elbow

WORKING PRESSURES, BANDED FITTINGS
150 pounds saturated steam
300 pounds cold water, oil, or gas, non-shock

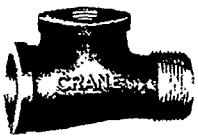
***Prices of Reducing Fittings and Reducers*** apply only to the sizes listed on pages 142 and 143; the price is determined by the size of the largest opening.

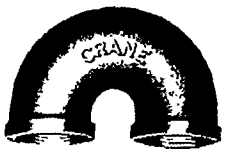
Tee


Cross

90° Street Elbow

45° Street Elbow


Service Tee


Return Bend

45° Y-Bend

Cap

Coupling Right Hand

Coupling Right & Left

Reducer

## List Prices, Each—Banded Fittings

| Size | 90° Elbows | | | | 45° Elbows | | Tees | | | | Crosses | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Straight | | Reducing | | | | Straight | | Reducing | | | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | .16 | .21 | | | .19 | .25 | .22 | .28 | | | .43 | .56 |
| 1/4 | .16 | .21 | .19 | .25 | .19 | .25 | .22 | .28 | .24 | .31 | .43 | .56 |
| 3/8 | .16 | .21 | .19 | .25 | .19 | .25 | .22 | .28 | .24 | .31 | .43 | .56 |
| 1/2 | .20 | .26 | .22 | .29 | .21 | .28 | .28 | .36 | .31 | .40 | .53 | .71 |
| 3/4 | .25 | .33 | .27 | .37 | .29 | .40 | .37 | .48 | .41 | .53 | .65 | .85 |
| 1 | .32 | .42 | .35 | .45 | .35 | .46 | .47 | .64 | .53 | .70 | .80 | 1.05 |
| 1 1/4 | .50 | .66 | .57 | .76 | .60 | .80 | .78 | 1.00 | .85 | 1.10 | 1.10 | 1.45 |
| 1 1/2 | .68 | .88 | .72 | .97 | .75 | .95 | .96 | 1.25 | 1.00 | 1.35 | 1.40 | 1.80 |
| 2 | .97 | 1.25 | 1.05 | 1.35 | 1.05 | 1.35 | 1.40 | 1.80 | 1.55 | 1.95 | 2.30 | 3.00 |
| 2 1/2 | 1.85 | 2.40 | 2.00 | 2.60 | 2.05 | 2.65 | 2.45 | 3.20 | 2.70 | 3.50 | 3.70 | 4.80 |
| 3 | 2.95 | 3.85 | 3.25 | 4.25 | 3.30 | 4.30 | 3.30 | 4.15 | 3.60 | 4.75 | 5.50 | 7.10 |
| 3 1/2 | 3.65 | 4.75 | | | 4.00 | 5.00 | 5.60 | 7.30 | | | 8.50 | 11.25 |
| 4 | 5.00 | 6.50 | 5.50 | 7.20 | 5.30 | 6.65 | 6.60 | 8.60 | 7.30 | 9.50 | 10.00 | 13.00 |
| 5 | 11.50 | 15.00 | | | 13.00 | 17.00 | 13.00 | 17.00 | | | 21.00 | 26.50 |
| 6 | 14.50 | 19.00 | | | 16.00 | 21.00 | 18.50 | 24.00 | 20.00 | 26.00 | 29.00 | 39.00 |

| Size | 90° Street Elbows | | | | 45° Street Elbows | | Service Tees | | | | 45° Y-Bends | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Straight | | Reducing | | | | Straight | | Reducing | | | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | .22 | .29 | | | .24 | .31 | | | | | | |
| 1/4 | .22 | .29 | | | .24 | .31 | .28 | .36 | | | | |
| 3/8 | .22 | .29 | | | .24 | .31 | .28 | .36 | | | .33 | .43 |
| 1/2 | .26 | .34 | .28 | .37 | .28 | .35 | .36 | .47 | | | .39 | .51 |
| 3/4 | .37 | .48 | .41 | .53 | .41 | .51 | .44 | .59 | | | .50 | .65 |
| 1 | .43 | .54 | .46 | .62 | .48 | .64 | .59 | .79 | .67 | .90 | .72 | .94 |
| 1 1/4 | .65 | .84 | .68 | .91 | .72 | .96 | .93 | 1.20 | 1.00 | 1.35 | 1.20 | 1.55 |
| 1 1/2 | .80 | 1.05 | .86 | 1.10 | .90 | 1.15 | 1.25 | 1.60 | 1.35 | 1.75 | 1.65 | 2.15 |
| 2 | 1.20 | 1.55 | 1.35 | 1.75 | 1.35 | 1.75 | 1.85 | 2.40 | 1.95 | 2.65 | 2.30 | 3.00 |
| 2 1/2 | 2.10 | 2.75 | | | | | | | | | 4.45 | 6.00 |
| 3 | 3.25 | 4.25 | | | | | | | | | 7.50 | 9.50 |
| 4 | 5.30 | 7.00 | | | | | | | | | 13.00 | 16.25 |

| Size | Return Bends | | | | | | Caps | | Couplings | | | | Reducers | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Close Pattern | | Medium Pattern | | Open Pattern | | | | Right Hand | | R. & L. | | | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | | | | | | | | | .17 | .22 | | | | |
| 1/4 | | | | | | | .11 | .15 | .17 | .22 | | | .17 | .22 |
| 3/8 | | | | | | | .11 | .15 | .17 | .22 | | | .17 | .22 |
| 1/2 | .47 | .60 | .50 | .65 | .53 | .69 | .14 | .18 | .19 | .24 | .20 | .27 | .19 | .24 |
| 3/4 | .56 | .73 | .60 | .78 | .65 | .85 | .19 | .25 | .22 | .29 | .25 | .34 | .22 | .29 |
| 1 | .68 | .88 | .73 | .95 | .80 | 1.05 | .23 | .30 | .34 | .44 | .37 | .48 | .34 | .44 |
| 1 1/4 | 1.00 | 1.30 | 1.10 | 1.45 | 1.30 | 1.70 | .30 | .40 | .44 | .58 | .50 | .67 | .44 | .58 |
| 1 1/2 | 1.40 | 1.80 | 1.55 | 2.00 | 1.80 | 2.35 | .41 | .53 | .55 | .70 | .64 | .80 | .55 | .70 |
| 2 | 2.50 | 3.15 | 2.60 | 3.40 | 2.85 | 3.70 | .53 | .66 | .80 | 1.00 | .85 | 1.15 | .80 | 1.00 |
| 2 1/2 | | | | | 5.50 | 6.90 | .94 | 1.20 | 1.45 | 1.85 | | | 1.45 | 1.85 |
| 3 | | | | | 8.30 | 10.80 | 1.30 | 1.75 | 2.00 | 2.50 | | | 2.00 | 2.50 |
| 3 1/2 | | | | | | | 2.00 | 2.70 | | | | | 3.65 | 4.75 |
| 4 | | | | | 16.00 | 20.00 | 2.35 | 3.05 | 4.00 | 5.30 | | | 4.00 | 5.30 |
| 5 | | | | | | | 4.20 | 5.50 | | | | | 7.50 | 10.00 |
| 6 | | | | | | | 8.00 | 10.50 | | | | | 10.00 | 13.00 |

*Dimensions and list of reducing sizes . . pages 142 and 143* *Air-tested fittings . . . . page 144*

# 150-Pound Malleable Iron Fittings

The Crane line of 150-Pound Malleable Iron Fittings, described and illustrated on pages 140 to 144, includes a wide variety of types and a large assortment of straight and reducing sizes. It affords the user an excellent selection, sufficient for every normal piping installation within its pressure and size range.

**Banded Fittings:** Banded fittings, so called because of the generous band which reinforces each female opening, are well proportioned and of good weight. Their strength is very high, providing a liberal factor of safety over the recommended working pressure. All openings are accurately threaded to gauge, are in true alignment, and are chamfered slightly, to permit easy entrance of the pipe.

**Plain Fittings:** Plain fittings are similar in quality to the Banded but do not have the strength producing reinforcing bands. They, too, have accurately cut threads with each opening in true alignment.

**Male end fittings:** A street elbow or a service tee, with the male thread on one end, eliminates one threaded joint when making up pipe lines. Their use, therefore, saves time and materials.

**Air-tested fittings:** Crane Air-Tested 150-Pound Malleable Iron Fittings are suitable for air brake and other compressed air lines; see page 144.

**Reducing fittings:** Reducing fittings are made in proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

Prices of reducing fittings and reducers are determined by the size of the largest opening and apply only to regularly listed sizes. All other sizes are special; prices on application. For list of sizes of Banded and Plain Reducers, see page 142; for list of sizes of Banded Reducing Elbows and Tees, see page 143.

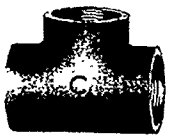
**Dimensions:** The dimensions of straight and reducing fittings are shown on pages 142 and 143. Plain fittings have the same center to end dimensions as the corresponding size banded fittings.

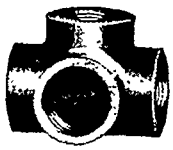
## Plain Pattern Fittings

90° Elbow

Side Outlet Elbow

Plain Pattern Fittings are satisfactory for low pressure gas and water lines, for plumbing in homes, or for railings.


Tee


Four-Way Tee

Coupling

Reducer

Locknut

Waste Nut

Cap

Extension Piece

Drop Elbow

13

### List Prices, Each—Plain Fittings

| Size | 90° Elbows | | Side Outlet Elbows | | Tees | | Four-Way Tees | | Couplings Right Hand | | Reducers | | Locknuts Hexagonal | | Waste Nuts | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | .16 | .21 | | | .22 | .28 | | | .17 | .22 | | | .07 | .09 | .15 | .19 |
| 1/4 | .16 | .21 | .35 | .47 | .22 | .28 | .40 | .52 | .17 | .22 | .17 | .22 | .07 | .09 | .15 | .19 |
| 3/8 | .16 | .21 | .35 | .47 | .22 | .28 | .40 | .52 | .17 | .22 | .17 | .22 | .07 | .09 | .15 | .19 |
| 1/2 | .20 | .26 | .40 | .52 | .28 | .36 | .48 | .64 | .19 | .24 | .19 | .24 | .09 | .11 | .17 | .22 |
| 3/4 | .25 | .33 | .45 | .58 | .37 | .48 | .62 | .80 | .22 | .29 | .22 | .29 | .11 | .14 | .19 | .25 |
| 1 | .32 | .42 | .66 | .88 | .47 | .64 | .80 | 1.05 | .34 | .44 | .34 | .44 | .14 | .18 | .22 | .29 |
| 1 1/4 | .50 | .66 | .90 | 1.15 | .78 | 1.00 | 1.10 | 1.45 | .44 | .58 | .44 | .58 | .18 | .23 | .28 | .36 |
| 1 1/2 | .68 | .88 | 1.15 | 1.50 | .96 | 1.25 | 1.50 | 1.95 | .55 | .70 | .55 | .70 | .25 | .32 | .37 | .48 |
| 2 | .97 | 1.25 | 1.60 | 2.10 | 1.40 | 1.80 | 2.30 | 3.00 | .80 | 1.00 | | | .42 | .55 | .70 | .88 |

| Size | Caps | | Extension Pieces | | Drop Elbows Female | |
|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | .11* | .15* | | | | |
| 1/4 | .11* | .15* | | | .28 | .37 |
| 3/8 | .11* | .15* | .28 | .36 | .28 | .37 |
| 1/2 | .14 | .18 | .31 | .40 | .32 | .42 |
| 3/4 | .19 | .25 | .40 | .52 | | |
| 1 | .23 | .30 | .50 | .65 | | |

*Caps in sizes 1/8, 1/4, and 3/8-inch are steel.

Plain Fittings are made to the same exacting standards as the Banded, having accurately cut threads with each opening in true alignment; the center to end dimensions are the same. The ends, however, are not reinforced with a band; and the fittings, therefore, are only suitable on non-pressure services such as railings, racks, etc., and for low pressure gas and water lines.

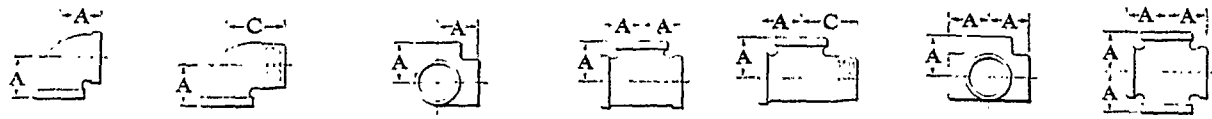
The prices of Reducers apply only to the sizes shown on page 142; the price is determined by the larger opening.

*Dimensions (same as Banded) . . . . page 142*

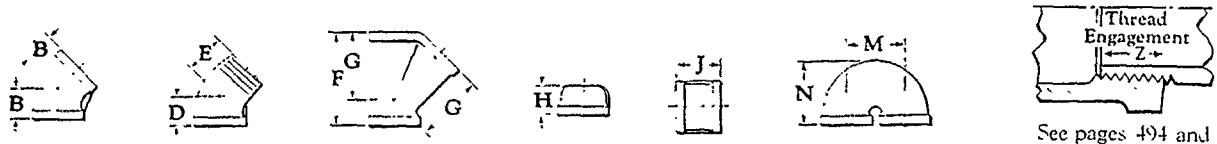
*List of sizes of Reducers . . . . page 142*

# 150-Pound Malleable Iron Fittings

## Dimensions of Straight Sizes, in Inches
### Banded and Plain Pattern




90° Elbow | 90° Street Elbow | Side Outlet Elbow | Tee | Service Tee | Four-Way Tee | Cross




45° Elbow | 45° Street Elbow | 45° Y-Bend | Cap | Coupling | *Return Bend

See pages 494 and 495 for explanation.

***These dimensions apply to both Banded and Plain Fittings; their center to end dimensions are alike.***

*Close Pattern Return Bends can not be used to make up parallel coils. The center to center dimension is so close that the bands of adjacent bends will not clear each other.

| Size | A | B | C | D | E | F | G | H | J | Return Bends Close M | Close N | Medium M | Medium N | Open M | Open N | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 11/16 | 1/2 | 1 | 11/16 | 13/16 | | | 9/16 | 15/16 | | | | | | | 1/4 |
| 1/4 | 13/16 | 3/4 | 13/16 | 5/8 | 15/16 | | | 5/8 | 11/16 | | | | | | | 3/8 |
| 3/8 | 15/16 | 13/16 | 17/16 | 11/16 | 11/16 | 2 1/8 | 1 7/16 | 3/4 | 13/16 | | | | | | | 3/8 |
| 1/2 | 1 1/8 | 7/8 | 1 5/8 | 13/16 | 13/16 | 2 7/16 | 1 11/16 | 7/8 | 1 5/16 | 1 | 1 3/4 | 1 1/4 | 1 5/8 | 1 1/2 | 1 7/8 | 1/2 |
| 3/4 | 1 5/16 | 1 | 1 7/8 | 15/16 | 1 5/16 | 2 7/8 | 2 | 1 1/16 | 1 1/2 | 1 1/4 | 2 3/16 | 1 1/2 | 1 15/16 | 2 | 2 1/4 | 9/16 |
| 1 | 1 1/2 | 1 1/8 | 2 1/8 | 1 1/16 | 1 1/2 | 3 3/8 | 2 7/16 | 1 3/16 | 1 11/16 | 1 1/2 | 2 1/2 | 1 7/8 | 2 1/4 | 2 1/2 | 2 5/8 | 11/16 |
| 1 1/4 | 1 3/4 | 1 5/16 | 2 7/16 | 1 1/4 | 1 11/16 | 4 1/16 | 2 15/16 | 1 1/4 | 1 15/16 | 1 3/4 | 2 13/16 | 2 1/4 | 2 13/16 | 3 | 3 3/16 | 11/16 |
| 1 1/2 | 1 15/16 | 1 7/16 | 2 11/16 | 1 3/8 | 1 7/8 | 4 1/2 | 3 5/16 | 1 5/16 | 2 1/8 | 2 3/16 | 3 3/16 | 2 1/2 | 3 3/16 | 3 1/2 | 3 5/8 | 11/16 |
| 2 | 2 1/4 | 1 11/16 | 3 1/4 | 1 11/16 | 2 1/4 | 5 7/16 | 4 | 1 7/16 | 2 1/2 | 2 5/8 | 3 7/8 | 3 | 3 7/8 | 4 | 4 3/8 | 3/4 |
| 2 1/2 | 2 11/16 | 1 15/16 | 3 13/16 | | | 6 1/4 | 4 11/16 | 1 13/16 | 2 7/8 | | | | | 4 1/2 | 4 15/16 | 15/16 |
| 3 | 3 1/8 | 2 3/16 | 4 1/2 | | | 7 1/4 | 5 9/16 | 1 15/16 | 3 3/16 | | | | | 5 | 5 9/16 | 1 |
| 3 1/2 | 3 7/16 | 2 3/8 | | | | | | 1 15/16 | | | | | | | | 1 1/16 |
| 4 | 3 3/4 | 2 5/8 | 5 11/16 | | | 8 7/8 | 6 15/16 | 2 1/16 | 3 11/16 | | | | | 6 | 6 11/16 | 1 1/8 |
| 5 | 4 1/2 | 3 1/16 | | | | | | 2 5/16 | | | | | | | | 1 1/4 |
| 6 | 5 1/8 | 3 7/16 | | | | | | 2 9/16 | | | | | | | | 1 5/16 |

13

## List of Sizes of Reducers and Dimensions, in Inches
### Banded and Plain Pattern

**Banded Reducers**

| Size | A | Size | A | Size | A |
|---|---|---|---|---|---|
| 1/4 × 1/8 | 1 | 1 1/2 × 1 1/4 | 2 5/16 | 3 × 2 1/2 | 3 11/16 |
| 3/8 × 1/4 | 1 1/8 | × 1 | 2 5/16 | × 2 | 3 11/16 |
| × 1/8 | 1 1/8 | × 3/4 | 2 5/16 | × 1 1/2 | 3 11/16 |
| 1/2 × 3/8 | 1 1/4 | × 1/2 | 2 5/16 | × 1 1/4 | 3 11/16 |
| × 1/4 | 1 1/4 | 2 × 1 1/2 | 2 13/16 | × 1 | 3 11/16 |
| × 1/8 | 1 1/4 | × 1 1/4 | 2 13/16 | 3 1/2 × 3 | 4 |
| 3/4 × 1/2 | 1 7/16 | × 1 | 2 13/16 | × 2 1/2 | 4 |
| × 3/8 | 1 7/16 | × 3/4 | 2 13/16 | × 2 | 4 |
| × 1/4 | 1 7/16 | × 1/2 | 2 13/16 | 4 × 3 1/2 | 4 3/8 |
| 1 × 3/4 | 1 11/16 | 2 1/2 × 2 | 3 1/4 | × 3 | 4 3/8 |
| × 1/2 | 1 11/16 | × 1 1/2 | 3 1/4 | × 2 1/2 | 4 3/8 |
| × 3/8 | 1 11/16 | × 1 1/4 | 3 1/4 | × 2 | 4 3/8 |
| × 1/4 | 1 11/16 | × 1 | 3 1/4 | × 1 1/2 | 4 3/8 |
| 1 1/4 × 1 | 2 1/16 | | | 5 × 4 | 5 1/8 |
| × 3/4 | 2 1/16 | | | 6 × 4 | 4 3/8 |
| × 1/2 | 2 1/16 | | | | |

Banded Reducer | Plain Reducer

The prices of Banded and Plain Pattern Reducers (pages 140 and 141) apply only to the sizes listed on this page; the size of the larger opening determines the price.

The engagement normally required between male and female pipe threads to make a tight joint is shown at the top of the page (dimension "Z"); this dimension applies to all 150-Pound Malleable Iron Fittings.

**Plain Reducers**

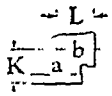
| Size | B |
|---|---|
| 1/4 × 1/8 | 1 |
| 3/8 × 1/4 | 1 1/8 |
| × 1/8 | 1 1/8 |
| 1/2 × 3/8 | 1 1/4 |
| × 1/4 | 1 1/4 |
| × 1/8 | 1 1/4 |
| 3/4 × 1/2 | 1 7/16 |
| × 3/8 | 1 7/16 |
| × 1/4 | 1 7/16 |
| 1 × 3/4 | 1 11/16 |
| × 1/2 | 1 11/16 |
| × 3/8 | 1 11/16 |
| × 1/4 | 1 11/16 |
| 1 1/4 × 1 | 2 1/16 |
| 1 1/2 × 1 1/4 | 2 5/16 |

*Prices of Banded Fittings....page 140*

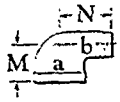
*Prices of Plain Pattern Fittings....page 141*

# 150-Pound Malleable Iron Fittings

## List of Sizes of Banded Reducing Fittings and Dimensions, in Inches




90° Elbow

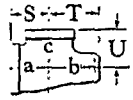



90° Street Elbow

The prices of banded reducing fittings (page 140) apply only to the sizes shown below; the size of the largest opening determines the price.

When specifying, always name the size of openings in the sequence of the lower case letters shown on the accompanying illustrations.

Tee




Service Tee

### 90° Elbows

| Size a | b | K | L |
|---|---|---|---|
| 1/4 | × 1/8 | 3/4 | 3/4 |
| 3/8 | × 1/4 | 7/8 | 7/8 |
| | × 1/8 | 13/16 | 7/8 |
| 1/2 | × 3/8 | 11/16 | 11/16 |
| | × 1/4 | 1 | 11/16 |
| 3/4 | × 1/2 | 13/16 | 1 1/4 |
| | × 3/8 | 1 1/8 | 1 1/8 |
| | × 1/4 | 1 1/8 | 1 1/8 |
| 1 | × 3/4 | 15/16 | 1 3/8 |
| | × 1/2 | 1 1/4 | 15/16 |
| | × 3/8 | 1 1/4 | 15/16 |
| 1 1/4 | × 1 | 19/16 | 1 5/8 |
| | × 3/4 | 17/16 | 1 5/8 |
| | × 1/2 | 17/16 | 1 5/8 |
| 1 1/2 | × 1 1/4 | 1 13/16 | 1 13/16 |
| | × 1 | 1 13/16 | 1 7/8 |
| | × 3/4 | 1 11/16 | 1 13/16 |
| 2 | × 1 1/2 | 2 | 2 1/8 |
| | × 1 1/4 | 1 15/16 | 2 1/16 |
| | × 1 | 1 15/16 | 2 1/16 |
| | × 3/4 | 1 5/8 | 2 |
| 2 1/2 | × 2 | 2 3/8 | 2 5/8 |
| | × 1 1/2 | 2 3/8 | 2 5/8 |
| 3 | × 2 1/2 | 2 13/16 | 3 |
| | × 2 | 2 1/2 | 2 7/8 |
| 4 | × 3 | 3 5/16 | 3 5/8 |

### 90° Street Elbows

| Size a | b | M | N |
|---|---|---|---|
| 1/2 | × 3/8 | 1 1/16 | 19/16 |
| 3/4 | × 1/2 | 1 3/16 | 1 3/4 |
| 1 | × 3/4 | 1 3/8 | 2 |
| 1 1/4 | × 1 | 19/16 | 2 5/16 |
| | × 3/4 | 19/16 | 2 1/4 |
| 1 1/2 | × 1 1/4 | 1 13/16 | 2 5/8 |
| | × 1 | 1 5/8 | 2 7/16 |
| | × 3/4 | 1 1/2 | 2 3/8 |
| 2 | × 1 1/2 | 2 1/16 | 3 |

### Tees

| Size a | b | c | P | Q | R |
|---|---|---|---|---|---|
| 1/4 | × 1/4 | × 1/8 | 3/4 | 3/4 | 3/4 |
| 1/8 | × 1/8 | × 1/4 | 3/4 | 3/4 | 3/4 |
| 3/8 | × 3/8 | × 1/4 | 7/8 | 7/8 | 7/8 |
| 3/8 | × 1/4 | × 3/8 | 15/16 | 7/8 | 15/16 |
| | | × 1/4 | 7/8 | 13/16 | 7/8 |
| 1/4 | × 1/4 | × 3/8 | 7/8 | 7/8 | 7/8 |
| 1/2 | × 1/2 | × 3/8 | 11/16 | 11/16 | 11/16 |
| | | × 1/4 | 1 | 1 | 11/16 |
| 1/2 | × 3/8 | × 1/2 | 1 1/8 | 11/16 | 1 1/8 |
| | | × 3/8 | 11/16 | 15/16 | 11/16 |
| 1/2 | × 1/4 | × 1/2 | 1 1/8 | 11/16 | 1 1/8 |
| 3/8 | × 3/8 | × 1/2 | 11/16 | 11/16 | 11/16 |
| 3/4 | × 3/4 | × 1/2 | 1 3/16 | 1 3/16 | 1 1/4 |
| | | × 3/8 | 1 1/8 | 1 1/8 | 1 3/16 |
| | | × 1/4 | 11/16 | 11/16 | 1 3/16 |
| 3/4 | × 1/2 | × 3/4 | 15/16 | 1 1/4 | 15/16 |
| | | × 1/2 | 1 3/16 | 1 1/8 | 1 1/4 |
| 3/4 | × 3/8 | × 3/4 | 15/16 | 1 3/16 | 15/16 |
| | | × 3/8 | 1 1/8 | 11/16 | 1 3/16 |
| 3/4 | × 1/4 | × 3/4 | 1 3/16 | 11/16 | 1 3/16 |
| 1/2 | × 1/2 | × 3/4 | 1 1/4 | 1 1/4 | 1 3/16 |
| 1 | × 1 | × 3/4 | 15/16 | 15/16 | 1 3/8 |
| | | × 1/2 | 1 1/4 | 1 1/4 | 15/16 |
| | | × 3/8 | 1 3/16 | 1 3/16 | 15/16 |
| | | × 1/4 | 1 3/16 | 1 3/16 | 15/16 |
| 1 | × 3/4 | × 1 | 17/16 | 1 3/8 | 17/16 |
| | | × 3/4 | 15/16 | 15/16 | 1 3/8 |
| | | × 1/2 | 1 1/4 | 1 3/16 | 15/16 |
| 1 | × 1/2 | × 1 | 17/16 | 15/16 | 17/16 |
| | | × 3/4 | 15/16 | 1 1/4 | 1 3/8 |
| | | × 1/2 | 1 1/4 | 1 1/8 | 15/16 |
| 3/4 | × 3/4 | × 1 | 1 3/8 | 1 3/8 | 15/16 |
| 1/2 | × 1/2 | × 1 | 1 3/8 | 1 3/8 | 15/16 |
| 1 1/4 | × 1 1/4 | × 1 | 19/16 | 19/16 | 1 5/8 |
| | | × 3/4 | 17/16 | 17/16 | 19/16 |
| | | × 1/2 | 15/16 | 15/16 | 1 1/2 |
| | | × 3/8 | 1 1/4 | 1 1/4 | 1 1/2 |
| 1 1/4 | × 1 | × 1 1/4 | 1 3/4 | 1 5/8 | 1 3/4 |
| | | × 1 | 19/16 | 17/16 | 1 5/8 |
| | | × 3/4 | 17/16 | 15/16 | 19/16 |
| | | × 1/2 | 17/16 | 15/16 | 19/16 |
| 1 1/4 | × 3/4 | × 1 1/4 | 1 11/16 | 19/16 | 1 11/16 |
| | | × 1 | 19/16 | 1 3/8 | 1 5/8 |
| 1 1/4 | × 3/4 | × 3/4 | 17/16 | 15/16 | 19/16 |
| 1 1/4 | × 1/2 | × 1 1/4 | 1 11/16 | 19/16 | 1 11/16 |
| | | × 1 | 19/16 | 1 3/8 | 1 5/8 |
| 1 1/2 | × 1 1/2 | × 1 1/4 | 1 13/16 | 1 13/16 | 1 13/16 |
| | | × 1 | 1 5/8 | 1 5/8 | 1 3/4 |
| | | × 3/4 | 1 1/2 | 1 1/2 | 1 11/16 |
| | | × 1/2 | 1 3/8 | 1 3/8 | 1 5/8 |
| 1 1/2 | × 1 1/4 | × 1 1/2 | 1 15/16 | 1 13/16 | 1 15/16 |
| | | × 1 1/4 | 1 3/4 | 1 11/16 | 1 13/16 |
| | | × 1 | 1 5/8 | 19/16 | 1 3/4 |
| | | × 3/4 | 1 5/8 | 19/16 | 1 3/4 |
| | | × 1/2 | 1 5/8 | 19/16 | 1 3/4 |
| 1 1/2 | × 1 | × 1 1/2 | 1 7/8 | 1 3/4 | 1 7/8 |
| | | × 1 1/4 | 1 3/4 | 1 11/16 | 1 13/16 |
| | | × 1 | 1 5/8 | 17/16 | 1 3/4 |
| 1 1/2 | × 3/4 | × 1 1/2 | 1 7/8 | 1 11/16 | 1 7/8 |
| | × 1/2 | × 1 1/2 | 1 7/8 | 1 11/16 | 1 7/8 |
| 1 1/4 | × 1 1/4 | × 1 1/2 | 1 13/16 | 1 13/16 | 1 3/4 |
| 1 | × 1 | × 1 1/2 | 1 3/4 | 1 3/4 | 1 5/8 |
| 2 | × 2 | × 1 1/2 | 2 | 2 | 2 1/8 |
| | | × 1 1/4 | 1 15/16 | 1 15/16 | 2 1/16 |
| | | × 1 | 1 3/4 | 1 3/4 | 2 |
| | | × 3/4 | 1 5/8 | 1 5/8 | 1 15/16 |
| | | × 1/2 | 1 1/2 | 1 1/2 | 1 7/8 |
| 2 | × 1 1/2 | × 2 | 2 1/4 | 2 1/8 | 2 1/4 |
| | | × 1 1/2 | 2 | 1 15/16 | 2 1/8 |
| | | × 1 1/4 | 1 15/16 | 1 3/4 | 2 1/16 |
| | | × 1 | 1 15/16 | 1 3/4 | 2 1/16 |
| 2 | × 1 1/4 | × 2 | 2 1/4 | 2 1/16 | 2 1/4 |
| | | × 1 1/2 | 2 | 1 15/16 | 2 1/8 |
| | | × 1 1/4 | 1 15/16 | 1 3/4 | 2 1/16 |
| 2 | × 1 | × 2 | 2 1/4 | 2 1/16 | 2 1/4 |
| | × 3/4 | × 2 | 2 1/4 | 1 15/16 | 2 1/4 |
| | × 1/2 | × 2 | 2 1/4 | 1 15/16 | 2 1/4 |
| 1 1/2 | × 1 1/2 | × 2 | 2 1/8 | 2 1/8 | 2 |
| 1 1/4 | × 1 1/4 | × 2 | 2 1/8 | 2 1/8 | 2 |
| 1 | × 1 | × 2 | 2 1/8 | 2 1/8 | 2 |
| 2 1/2 | × 2 1/2 | × 2 | 2 7/16 | 2 7/16 | 2 1/2 |
| | | × 1 1/2 | 2 3/16 | 2 3/16 | 2 1/2 |
| | | × 1 1/4 | 2 1/16 | 2 1/16 | 2 7/16 |
| | | × 1 | 1 7/8 | 1 7/8 | 2 3/8 |
| 2 1/2 | × 2 1/2 | × 3/4 | 1 13/16 | 1 13/16 | 2 3/16 |
| 2 1/2 | × 2 | × 2 1/2 | 2 11/16 | 2 9/16 | 2 11/16 |
| | | × 2 | 2 1/2 | 2 1/4 | 2 9/16 |
| 2 1/2 | × 1 1/2 | × 2 1/2 | 2 11/16 | 2 7/16 | 2 11/16 |
| | | × 2 | 2 1/2 | 2 1/8 | 2 9/16 |
| 2 | × 2 | × 2 1/2 | 2 1/2 | 2 1/2 | 2 7/16 |
| 3 | × 3 | × 2 1/2 | 2 13/16 | 2 13/16 | 3 1/16 |
| | | × 2 | 2 9/16 | 2 9/16 | 2 15/16 |
| | | × 1 1/2 | 2 5/16 | 2 5/16 | 2 3/4 |
| | | × 1 1/4 | 2 1/4 | 2 1/4 | 2 3/4 |
| | | × 1 | 2 1/16 | 2 1/16 | 2 5/8 |
| | | × 3/4 | 1 15/16 | 1 15/16 | 2 9/16 |
| 3 | × 2 1/2 | × 2 1/2 | 2 3/4 | 2 11/16 | 3 |
| | | × 2 | 2 9/16 | 2 1/2 | 2 15/16 |
| 3 | × 2 | × 3 | 3 1/8 | 2 15/16 | 3 1/8 |
| | | × 2 | 2 9/16 | 2 1/4 | 2 15/16 |
| 2 1/2 | × 2 1/2 | × 3 | 3 | 3 | 2 13/16 |
| 4 | × 4 | × 3 | 3 3/8 | 3 3/8 | 3 3/4 |
| | | × 2 1/2 | 2 15/16 | 2 15/16 | 3 5/8 |
| | | × 2 | 2 7/8 | 2 7/8 | 3 5/8 |
| | | × 1 1/2 | 2 7/8 | 2 7/8 | 3 5/8 |
| 4 | × 3 | × 4 | 3 3/4 | 3 11/16 | 3 3/4 |
| 3 | × 3 | × 4 | 3 11/16 | 3 11/16 | 3 1/4 |
| 6 | × 6 | × 4 | 4 1/8 | 4 1/8 | 4 15/16 |
| | | × 3 | 3 5/8 | 3 5/8 | 4 7/8 |
| | | × 2 | 3 1/16 | 3 1/16 | 4 11/16 |

### Service Tees

| Size a | b | c | S | T | U |
|---|---|---|---|---|---|
| 1 | × 1 | × 3/4 | 1 3/8 | 1 15/16 | 1 3/8 |
| 1 1/4 | × 1 | × 1 1/4 | 1 3/4 | 2 5/16 | 1 3/4 |
| | | × 1 | 1 3/4 | 2 5/16 | 1 3/4 |
| 1 1/4 | × 3/4 | × 1 1/4 | 1 3/4 | 2 3/16 | 1 3/4 |
| 1 | × 1 | × 1 1/4 | 1 5/8 | 2 3/8 | 1 9/16 |
| 1 1/2 | × 1 1/4 | × 1 1/2 | 1 15/16 | 2 5/8 | 1 15/16 |
| | × 1 | × 1 1/2 | 1 15/16 | 2 7/16 | 1 15/16 |
| 2 | × 2 | × 1 | 1 3/4 | 2 9/16 | 2 |
| | | × 1 1/2 | 2 1/4 | 3 | 2 1/4 |

*List prices....page 140*

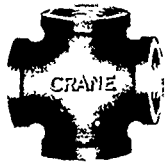
*Normal thread engagement....page 142*

# 150-Pound Malleable Iron Fittings

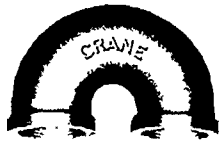
## Air-Tested

90° Elbow

Tee



Cross



Return Bend

***For air brake and other compressed air service***

45° Elbow

Any of the 150-Pound Malleable Iron Fittings illustrated and priced on page 142 can be furnished air tested when so ordered.

The list prices of Air-Tested Fittings are the same as for untested, but the Air-Tested are sold at an advance in price. See the Crane Discount Sheet for prices.

Air-Tested Fittings are admirably suited for air brake and other compressed air lines. They are given an air-under-water test.

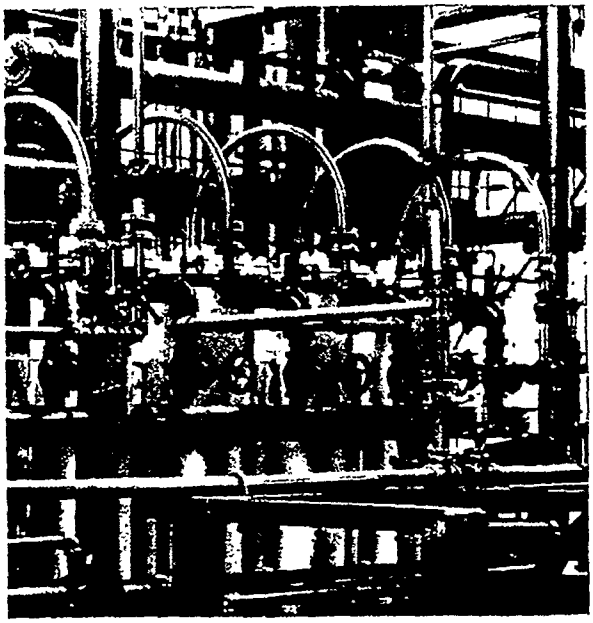
Banded 90° Elbows, 90° Street Elbows, and Tees, Black and Galvanized, sizes ¼ to 2-inch, are carried in stock air tested; other types and sizes are furnished to order on short notice.

Coupling

90° Street Elbow

Reducer

13


An unusual assortment of Crane Valves and Fittings

Gauging the threads of Screwed Fittings. This inspection is but one phase of the system that guards Crane Quality and assures the user satisfactory service.

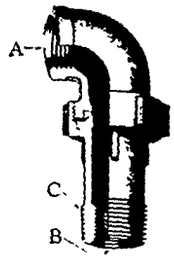
# Circulating Boiler Fittings

## Malleable Iron—Galvanized

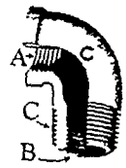
### Ground Joint

WORKING PRESSURE
150 pounds water, 200° F.

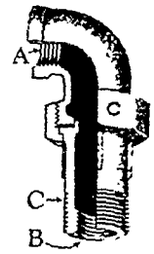
### Gasket Type



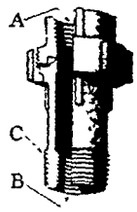

No. 586½
Elbow
Brass to Iron Seat
Ground Joint Union




No. 587
Elbow



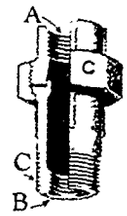

No. 586
Elbow
Gasket Type Union
(With Rubber Gasket)




No. 589½
Coupling
Brass to Iron Seat
Ground Joint Union

No. 588
Coupling

***When ordering Circulating Boiler Fittings, be sure to specify the correct size; refer to illustrations.***




No. 589
Coupling
Gasket Type Union
(With Rubber Gasket)

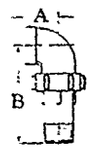
**List Prices, Each, Galvanized**

| Size Inches A B C | Ground Joint Type Union | | Gasket Type Union | | Without Union | |
|---|---|---|---|---|---|---|
| | No. 586½ Elbow | No. 589½ Coupling | No. 586 Elbow | No. 589 Coupling | No. 587 Elbow | No. 588 Coupling |
| ½×½×1 | 1.55 | 1.35 | 1.55 | 1.35 | .85 | .75 |
| ¾×½×1 | 1.70 | 1.50 | 1.70 | 1.50 | .85 | .75 |
| ¾×¾×1 | 1.70 | 1.50 | 1.70 | 1.50 | .85 | .75 |

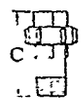
Circulating Boiler Fittings are especially designed for tanks or receivers that utilize an internal pipe.

The connection for cold water into a range boiler or hot water tank is a common example. The internal pipe is screwed into the female opening at the male end of the fitting, and the male end is then screwed into the tank. The cold water supply is then connected to the female opening of the fitting on the outside of the tank.

The fittings with a ground joint union are exceptionally strong, rugged, and durable. The rings, thread-pieces, and elbows are interchangeable with the corresponding parts of the 150-Pound Malleable Iron Unions shown on page 175.

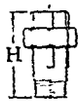



No. 586½

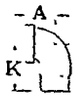



No. 589½

No. 586




No. 589




No. 587

No. 588

**Dimensions, in Inches**

| Size A B C | A | B | C | H | K | L |
|---|---|---|---|---|---|---|
| ½×½×1 | 1⅛ | 3 13/16 | 3⅜ | 3⅜ | 1 13/16 | 1 13/16 |
| ¾×½×1 | 1 5/16 | 3 15/16 | 3⅜ | 3 7/16 | 2 | 1 13/16 |
| ¾×¾×1 | 1 5/16 | 3 15/16 | 3⅜ | 3 7/16 | 2 | 1 13/16 |

***For extra gaskets for the No. 586 Elbow and No. 589 Coupling, see page 476.***

# 300-Pound Malleable Iron Fittings

No. 260 E
90° Elbow

No. 262 E
45° Elbow

No. 268 E
90° Street Elbow

No. 262½ E
45° Street Elbow

WORKING PRESSURES
300 pounds steam or oil, 550° F.

Cold Water, Oil, or Gas, Non-Shock
¼ to 1-inch — *2000 pounds
1¼ to 2-inch — *1500 pounds
2½ to 4-inch — *1000 pounds
5 and 6-inch — 800 pounds

Sizes 3-inch and smaller are tested with 300 pounds air-under-water and are suitable for 300 pounds ammonia.

Heavy Malleable

Fittings 3½-inch and larger were formerly known as "Heavy Malleable Iron," and are marked "Heavy" as illustrated above.

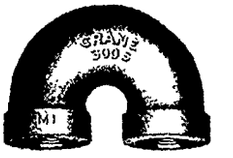
No. 264 E
Tee

No. 266 E
Cross

No. 267 E
Reducer

No. 278 E
Cap

No. 279 E
Coupling



No. 272 E
Return Bend

## List Prices, Black, Each

| Size | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 260 E, 90° Elbows | Straight | .47 | .47 | .72 | .82 | 1.05 | 1.40 | 1.80 | 2.50 | 3.85 | 5.50 | 9.60 | 11.00 | 21.00 | 27.50 |
| | Reducing | | .53 | .83 | .95 | 1.20 | 1.60 | 2.05 | 2.90 | 4.50 | 6.30 | | | | |
| No. 262 E, 45° Elbows | | .66 | .66 | .88 | 1.00 | 1.10 | 1.55 | 2.00 | 3.00 | 4.50 | 6.20 | 10.50 | 12.00 | 22.00 | 30.00 |
| No. 262½ E, 45° Street Elbows | | | | 1.00 | 1.10 | 1.30 | 1.75 | 2.30 | 3.50 | | | | | | |
| No. 264 E, Tees | Straight | .68 | .68 | .96 | 1.05 | 1.30 | 1.70 | 2.10 | 3.10 | 5.00 | 8.80 | 13.80 | 15.00 | 29.00 | 41.00 |
| | Reducing | | .78 | 1.10 | 1.20 | 1.50 | 1.95 | 2.40 | 3.55 | 5.75 | 10.50 | | 17.00 | | |
| No. 266 E, Crosses | | 1.75 | 1.75 | 2.10 | 2.25 | 2.55 | 3.20 | 4.20 | 6.00 | 10.00 | 15.50 | 22.00 | 26.00 | | |
| No. 267 E, Reducers | | | .52 | .64 | .78 | .94 | 1.05 | 1.45 | 2.10 | 3.35 | 5.10 | | 10.50 | | |
| No. 268 E, 90° Street Elbows | | .59 | .59 | .90 | 1.05 | 1.25 | 1.65 | 2.10 | 3.30 | 5.60 | 7.20 | | | | |
| No. 278 E, Caps | | .40 | .40 | .46 | .55 | .70 | .83 | 1.15 | 1.60 | 2.40 | 3.30 | | | | |
| No. 279 E, Couplings | | .40 | .40 | .46 | .55 | .70 | .83 | 1.15 | 1.60 | 2.40 | 3.30 | | | | |
| Pipe Size | Inches | 1 | 1 | 1 | 1¼ | 1¼ | 1¼ | 1½ | 1½ | 1½ | 2 | 2 | 2 | | |
| Center to Center | Inches | 1¾ | 2½ | 3 | 2¼ | 2½ | 3 | 3 | 3½ | 6 | 4 | 6 | 8 | | |
| No. 272 E, Return Bends | | 2.00 | 2.50 | 3.00 | 3.35 | 3.85 | 4.30 | 4.80 | 5.40 | 6.40 | 7.00 | 8.30 | 10.50 | | |

Galvanized fittings are made to order; add 50% to list prices of black fittings shown above.

**Service recommendations.** These fittings are especially suitable for severe service. With ends reinforced with a heavy band, they are exceptionally tough, strong, and rugged, and are far superior to so-called heavy malleable iron fittings made from standard cast iron patterns. Their threads are long and are accurately cut to gauge. Sizes 3½-inch and larger were formerly listed as "Heavy Malleable Iron Fittings" and are marked "Heavy".

**Ammonia service:** Sizes 3-inch and smaller are suitable for 300 pounds ammonia service. They are air tested and each female opening has a machined chamfer to permit soldering when desired.

**Reducing fittings:** The prices of reducing fittings and of reducers apply to regularly listed sizes only, as shown on the opposite page; the size of the largest opening determines the price. All other sizes are special; prices on application.

***Working pressures:** The working pressures given above for cold service do not apply to Street Elbows; these are recommended for 600 pounds cold water, oil, or gas, non-shock.

**Larger sizes:** For sizes larger than those listed, 1000-Pound W.O.G. Cast Steel Fittings are recommended; see page 202 for complete description.

Cast Iron
Screwed Fittings;
Sprinkler Fittings

# AAR Malleable Iron Fittings

No. 260 E
90° Elbow

No. 262 E
45° Elbow

No. 262½ E
45° Street Elbow

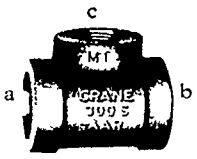
No. 268 E
90° Street Elbow

WORKING PRESSURE
300 pounds steam
TEST PRESSURE
300 pounds air-under-water

No. 267 E
Reducer

No. 278 E
Cap

No. 279 E
Coupling



No. 264 E, Tee

No. 266 E, Cross

Galvanized fittings: Galvanized fittings are made to order only. Prices are 50% higher than the list prices shown below for black fittings.

## List Prices, Black, Each

| Size | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 260 E, 90° Elbows | Straight | .47 | .47 | .72 | .82 | 1.05 | 1.40 | 1.80 | 2.50 | 3.85 | 5.50 |
| | Reducing | | | .83 | .95 | 1.20 | 1.60 | 2.05 | 2.90 | 4.50 | 6.30 |
| No. 262 E, 45° Elbows | | .66 | .66 | .88 | 1.00 | 1.10 | 1.55 | 2.00 | 3.00 | 4.50 | 6.20 |
| No. 262½ E, 45° Street Elbows | | | | 1.00 | 1.10 | 1.30 | 1.75 | 2.30 | 3.50 | | |
| No. 264 E, Tees | Straight | .68 | .68 | .96 | 1.05 | 1.30 | 1.70 | 2.10 | 3.10 | 5.00 | 8.80 |
| | Reducing | | | 1.10 | 1.20 | 1.50 | 1.95 | 2.40 | 3.55 | 5.75 | 10.50 |
| No. 266 E, Crosses | | 1.75 | 1.75 | 2.10 | 2.25 | 2.55 | 3.20 | 4.20 | 6.00 | 10.00 | 15.50 |
| No. 267 E, Reducers | | | .52 | .64 | .78 | .94 | 1.05 | 1.45 | 2.10 | 3.35 | 5.10 |
| No. 268 E, 90° Street Elbows | | | | .90 | 1.05 | 1.25 | 1.65 | 2.10 | 3.30 | 5.60 | 7.20 |
| No. 278 E, Caps | | .40 | .40 | .46 | .55 | .70 | .83 | 1.15 | 1.60 | 2.40 | 3.30 |
| No. 279 E, Couplings | | .40 | .40 | .46 | .55 | .70 | .83 | 1.15 | 1.60 | 2.40 | 3.30 |

**Association of American Railroads:** These fittings conform to the specifications and the recommended practice of the Association of American Railroads (AAR) for 300-Pound screwed pipe fittings. They are exactly the same as the fittings shown on pages 146 and 147, the types and sizes listed here being marked "AAR" because they are included in the AAR Specifications.

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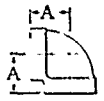
**Rugged construction:** These fittings are exceptionally strong, tough, and rugged. They are especially suitable for severe service and will withstand rough usage, piping strains, and vibration.

### Reducing Fittings Carried in Stock

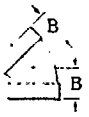
| No. 260 E 90° Elbows | No. 264 E, Tees a | b | c | a | b | c | a | b | c | No. 267 E Reducers | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ½ × ⅜ | ½ | ½ | ⅜ | 1¼ | 1¼ | 1 | 2 | 2 | 1½ | ⅜ × ¼ | 1½ × ¾ |
| ¾ × ½ | | ⅜ | ½ | | | ¾ | | | 1¼ | ½ × ⅜ | × ½ |
| 1 × ¾ | ¾ | ¾ | ½ | | | ½ | | | 1 | ¾ × ½ | 2 × 1½ |
| 1¼ × 1 | | ½ | ¾ | 1¼ | 1 | 1¼ | | | ¾ | 1 × ¾ | × 1¼ |
| 1½ × 1¼ | 1 | 1 | ¾ | 1½ | 1½ | 1¼ | | | ½ | × ½ | × 1 |
| 2 × 1½ | | | ½ | | | 1 | 2 | 1½ | 2 | 1¼ × 1 | × ½ |
| 2½ × 2 | | | ⅜ | | | ¾ | 2½ | 2½ | 2 | × ¾ | 2½ × 2 |
| 3 × 2½ | 1 | ¾ | 1 | 1½ | 1¼ | 1½ | | | 1½ | × ½ | 3 × 2½ |
| | | | | | | | 2½ | 2 | 2½ | 1½ × 1¼ | × 2 |
| | | | | | | | 3 | 3 | 2½ | × 1 | × 1½ |
| | | | | | | | | | 2 | | |
| | | | | | | | 3 | 2½ | 3 | | |

**Reducing sizes:** AAR Reducing 90° Elbows, Reducing Tees, and Reducers are carried in stock in the sizes shown in the table above. Prices of reducing fittings are determined by the size of the largest opening, and apply only to the sizes carried in stock.

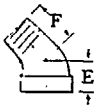
## Dimensions, in Inches



No. 260 E
90° Elbow



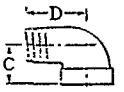
No. 262 E
45° Elbow



No. 262½ E
45° Street Elbow

Dimensions of straight sizes and of Reducers are shown in the table below.

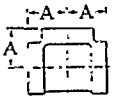
For dimensions of reducing sizes, see page 147.



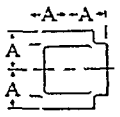
No. 268 E
90° Street Elbow

No. 267 E
Reducer

No. 278 E
Cap



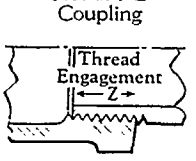
No. 264 E, Tee



No. 266 E, Cross

| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 15/16 | 11/16 | 1¼ | 17/16 | 1⅝ | 1 15/16 | 2⅛ | 2½ | 2 15/16 | 3⅜ |
| B | 13/16 | ⅞ | 1 | 1⅛ | 15/16 | 1½ | 1 11/16 | 2 | 2¼ | 2½ |
| C | | | 1¼ | 17/16 | 1⅝ | 1 15/16 | 2⅛ | 2½ | 2 15/16 | 3⅜ |
| D | | | 2 | 2 3/16 | 2 9/16 | 2⅞ | 3⅛ | 3 11/16 | 4½ | 5⅛ |
| E | | | 1 | 1⅛ | 1 5/16 | 1½ | 1 11/16 | 2 | | |
| F | | | 1⅜ | 1 9/16 | 1 13/16 | 2⅛ | 2 5/16 | 2 11/16 | | |
| J | | 1 7/16 | 1 11/16 | 1¾ | 2 | 2⅜ | 2 11/16 | 3 3/16 | 3 11/16 | 4 1/16 |
| K | 25/32 | ⅞ | 1 1/16 | 1¼ | 1⅜ | 1½ | 1 11/16 | 1 13/16 | 2⅛ | 2¼ |
| L | 1⅜ | 1⅝ | 1⅞ | 2⅛ | 2⅜ | 2⅞ | 2⅞ | 3⅝ | 4⅛ | 4⅛ |
| Z | ⅜ | ⅜ | ½ | 9/16 | 11/16 | 11/16 | 11/16 | ¾ | 15/16 | 1 |

No. 279 E
Coupling



See page 494 for explanation.

*AAR Valves.. pages 38 to 40* *AAR Unions . pages 178 to 180*

# Cast Iron Screwed Fittings
## Sprinkler Fittings

125-Pound Fittings
List Prices and Description.....pages 150 and 151
Dimensions and List of Reducing Sizes.....pages 151 to 155

Sprinkler Type Fittings.....page 156

250-Pound Short Pattern Fittings.....page 157

The Crane line of Cast Iron Screwed Fittings includes fittings for steam working pressures up to 250 pounds and for water, oil, or gas working pressures up to 400 pounds. In addition, it includes Drainage Fittings; see pages 159 to 164.

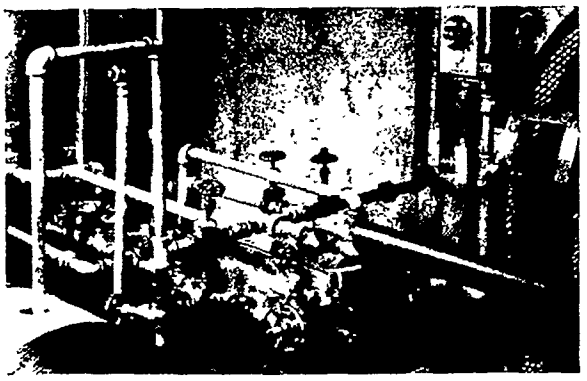
The list above does not include all the Cast Iron Screwed Fittings manufactured by Crane. For greater convenience, the following fittings are shown in other sections of this catalog:

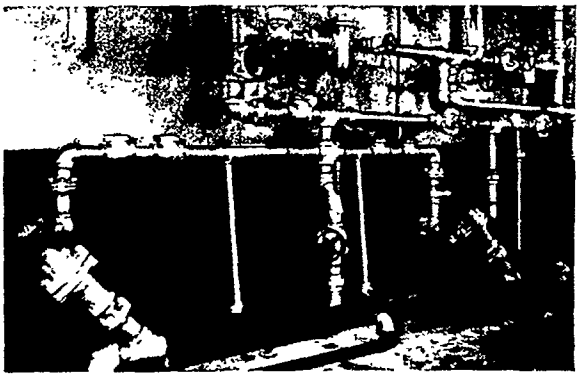
Plugs.....page 166
Bushings.....page 167
Flange Unions.....page 181
Floor Flanges.....page 203
Companion Flanges.....pages 202 to 204

*Drainage Fittings.....pages 159 to 164*
*Steel Pipe Couplings.....page 170*
*Wrought Steel Nipples.....pages 168 and 169*
*Unions and Union Fittings.....pages 173 to 182*

*Malleable Iron Screwed Fittings..pages 139 to 148*
*Steel Screwed Fittings.....pages 257 to 2[illegible]*
*How to read reducing fittings.....page [illegible]7*







Typical of many Crane valve and fitting installations.
In an industrial plant, on solvent recovery. In a power plant, on boiler piping.

# 125-Pound Cast Iron Fittings

WORKING PRESSURES
125 pounds saturated steam
175 pounds cold water, oil, or gas, non-shock

90° Elbow

45° Elbow

Tee

## List Prices, Each

| Size | 90° Elbows | | | | | | | | | | 45° Elbows | | Tees | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Straight | | | | | | *Reducing | | | | | | Straight | | *Reducing | |
| | Right Hand | | Right & Left | | Pitched | | Right Hand | | Pitched | | | | | | | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/4 | .19 | .38 | | | | | | | | | .21 | .42 | .24 | .48 | | |
| 3/8 | .19 | .38 | | | | | | | | | .21 | .42 | .24 | .48 | | |
| 1/2 | .22 | .44 | | | .23 | .46 | .24 | .48 | | | .24 | .48 | .31 | .62 | .34 | .68 |
| 3/4 | .28 | .56 | .31 | .62 | .31 | .62 | .31 | .62 | .35 | .70 | .31 | .62 | .39 | .78 | .43 | .86 |
| 1 | .34 | .68 | .38 | .76 | .36 | .72 | .38 | .76 | .43 | .86 | .38 | .76 | .44 | .88 | .51 | 1.02 |
| 1 1/4 | .44 | .88 | .48 | .96 | .48 | .96 | .48 | .96 | .53 | 1.06 | .48 | .96 | .66 | 1.32 | .72 | 1.44 |
| 1 1/2 | .60 | 1.20 | .66 | 1.32 | .68 | 1.36 | .69 | 1.38 | .76 | 1.52 | .68 | 1.36 | .82 | 1.64 | .94 | 1.88 |
| 2 | .90 | 1.80 | .98 | 1.96 | 1.00 | 2.00 | .98 | 1.96 | 1.10 | 2.20 | .96 | 1.92 | 1.20 | 2.40 | 1.30 | 2.60 |
| 2 1/2 | 1.45 | 2.90 | | | | | 1.55 | 3.10 | | | 1.55 | 3.10 | 1.85 | 3.70 | 2.05 | 4.10 |
| 3 | 2.20 | 4.40 | | | | | 2.50 | 5.00 | | | 2.40 | 4.80 | 2.80 | 5.60 | 3.10 | 6.20 |
| 3 1/2 | 3.10 | 6.20 | | | | | 3.30 | 6.60 | | | 3.30 | 6.60 | 4.35 | 8.70 | 4.80 | 9.60 |
| 4 | 4.00 | 8.00 | | | | | 4.30 | 8.60 | | | 4.50 | 9.00 | 5.40 | 10.80 | 6.20 | 12.40 |
| 5 | 6.85 | 13.70 | | | | | 7.50 | 15.00 | | | 7.50 | 15.00 | 9.40 | 18.80 | 10.50 | 21.00 |
| 6 | 9.00 | 18.00 | | | | | 10.30 | 20.60 | | | 10.00 | 20.00 | 12.00 | 24.00 | 14.00 | 28.00 |
| 8 | 18.50 | 37.00 | | | | | 20.00 | 40.00 | | | 20.00 | 40.00 | 25.00 | 50.00 | 27.00 | 54.00 |

**Wide assortment:** The Crane line of 125-Pound Cast Iron Fittings is illustrated on pages 150 to 156. It consists of a liberal variety of types of fittings, made in a large range of straight and reducing sizes. The line meets the requirements of nearly every piping installation using this class of material.

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Special attention is called to the long list of reducing sizes of elbows, tees, crosses, and reducers. Many of these are used chiefly in sprinkler service; combined with straight sizes and with the combination screwed and flanged fittings shown on page 156, they fill the need for the large assortment of items normally used in fire protection piping.

125-Pound Cast Iron Fittings can be distinguished from 150-Pound Malleable Iron Fittings by the wide joining bands at the ends of the fitting in place of the narrower bands with open crotch used on the latter. Cast iron screwed fittings can be removed, if necessary, from a pipe line that is being dismantled by splitting or breaking the fitting with a hammer; fittings of materials more ductile, like malleable iron or brass, cannot be so broken.

**Rugged construction:** Crane 125-Pound Cast Iron Fittings are sturdy, rugged, and well proportioned. They have heavy metal sections and are amply reinforced at points subjected to greatest stress, assuring a high factor of safety over the recommended working pressures. Reducing fittings are made in proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

**Threading:** All openings are carefully and accurately threaded to gauge and are in true alignment. To permit easy entrance of the pipe, when starting a joint, each opening is slightly chamfered. Fittings are tapped right hand except where otherwise indicated.

**Sprinkler service; Underwriters' approved:** All of the fittings shown on pages 150 to 156 have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

***Pricing reducing fittings:** The prices of reducing fittings and of reducers apply only to the regularly listed sizes shown on pages 152 to 155. Any other size is special; prices will be furnished upon receipt of inquiry specifying quantity, size, and type.

The price of a reducing fitting or of a reducer is determined by the size of its largest opening.

**Right & Left Elbows:** Right & Left 90° Elbows have ribs cast on the end with the left hand thread or have the letter "L" cast on the band on that end.

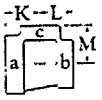
**Pitched Elbows:** Pitched 90° Elbows are pitched 1/4-inch per foot and have the letter "P" on the band at the pitched end.

**Dimensions:** The dimensions of both straight and reducing sizes are shown on pages 152 to 155.

*Iron Plugs and Bushings... pages 166 and 167*
*Cast Iron Flanged Fittings and Flanges....pages 195 to 204*
*Cast Iron Flange Unions....page 181*

# 125-Pound Cast Iron Fittings

## List of Sizes of Reducing Tees and Dimensions, in Inches




Reducing Tee

The prices of Reducing Tees on page 150 apply only to the sizes listed here and on the following page; the size of the largest opening determines the price.

When ordering, always name the size of openings in the sequence of the lower case letters shown on the illustration above.

| Size a | b | c | K | L | M |
|---|---|---|---|---|---|
| 1/2 | ×1/2 | ×3/8 | 11/16 | 11/16 | 11/16 |
| | | ×1/4 | 11/16 | 11/16 | 11/16 |
| 3/4 | ×3/4 | ×1/2 | 13/16 | 13/16 | 1 1/4 |
| | | ×3/8 | 1 1/8 | 1 1/8 | 13/16 |
| | | ×1/4 | 1 1/8 | 1 1/8 | 13/16 |
| 3/4 | ×1/2 | ×3/4 | 15/16 | 1 1/4 | 15/16 |
| | | ×1/2 | 13/16 | 1 1/8 | 1 1/4 |
| 1/2 | ×1/2 | ×3/4 | 1 1/4 | 1 1/4 | 13/16 |
| 1 | ×1 | ×3/4 | 15/16 | 15/16 | 1 3/8 |
| | | ×1/2 | 1 1/4 | 1 1/4 | 15/16 |
| | | ×1/4 | 1 1/4 | 1 1/4 | 1 3/8 |
| 1 | ×3/4 | ×1 | 17/16 | 1 3/8 | 17/16 |
| | | ×3/4 | 15/16 | 15/16 | 1 3/8 |
| | | ×1/2 | 1 1/4 | 13/16 | 15/16 |
| 1 | ×1/2 | ×1 | 17/16 | 15/16 | 17/16 |
| | | ×3/4 | 15/16 | 1 1/4 | 1 3/8 |
| | | ×1/2 | 1 1/4 | 13/16 | 15/16 |
| 1 | ×1/4 | ×1 | 1 1/2 | 1 3/8 | 1 1/2 |
| 3/4 | ×3/4 | ×1 | 1 3/8 | 1 3/8 | 15/16 |
| 1 1/4 | ×1 1/4 | ×1 | 19/16 | 19/16 | 1 5/8 |
| | | ×3/4 | 17/16 | 17/16 | 19/16 |
| | | ×1/2 | 15/16 | 15/16 | 1 1/2 |
| 1 1/4 | ×1 | ×1 1/4 | 1 3/4 | 1 5/8 | 1 3/4 |
| | | ×1 | 19/16 | 17/16 | 1 5/8 |
| | | ×3/4 | 17/16 | 15/16 | 19/16 |
| | | ×1/2 | 15/16 | 1 1/4 | 1 1/2 |
| 1 1/2 | ×1 1/2 | ×1 1/4 | 1 13/16 | 1 13/16 | 1 13/16 |
| | | ×1 | 1 5/8 | 1 5/8 | 1 3/4 |
| | | ×3/4 | 1 1/2 | 1 1/2 | 1 11/16 |
| | | ×1/2 | 1 3/8 | 1 3/8 | 1 5/8 |
| 1 1/2 | ×1 1/4 | ×1 1/2 | 1 15/16 | 1 13/16 | 1 15/16 |
| | | ×1 1/4 | 1 13/16 | 1 3/4 | 1 13/16 |
| | | ×1 | 1 5/8 | 1 9/16 | 1 3/4 |
| | | ×3/4 | 1 1/2 | 1 7/16 | 1 11/16 |
| | | ×1/2 | 1 3/8 | 1 5/16 | 1 5/8 |
| 1 1/2 | ×1 | ×1 1/2 | 1 15/16 | 1 3/4 | 1 15/16 |
| | | ×1 1/4 | 1 13/16 | 1 5/8 | 1 13/16 |
| | | ×1 | 1 5/8 | 1 7/16 | 1 3/4 |
| | | ×1/2 | 1 7/16 | 1 5/16 | 1 11/16 |
| 1 1/2 | ×3/4 | ×1 1/2 | 1 15/16 | 1 11/16 | 1 15/16 |
| | ×1/2 | ×1 1/2 | 1 15/16 | 1 5/8 | 1 15/16 |
| | ×1/2 | ×1 1/4 | 1 13/16 | 1 9/16 | 1 13/16 |
| 1 1/4 | ×1 1/4 | ×1 1/2 | 1 13/16 | 1 13/16 | 1 13/16 |
| | ×1 | ×1 1/2 | 1 13/16 | 1 3/4 | 1 13/16 |
| 1 | ×1 | ×1 1/2 | 1 3/4 | 1 3/4 | 1 5/8 |
| 2 | ×2 | ×1 1/2 | 2 | 2 | 2 1/8 |
| | | ×1 1/4 | 1 15/16 | 1 15/16 | 2 1/16 |
| | | ×1 | 1 3/4 | 1 3/4 | 2 |
| | | ×3/4 | 1 5/8 | 1 5/8 | 1 15/16 |
| | | ×1/2 | 1 1/2 | 1 1/2 | 1 7/8 |
| 2 | ×1 1/2 | ×2 | 2 1/4 | 2 1/8 | 2 1/4 |
| | | ×1 1/2 | 2 | 1 15/16 | 2 1/8 |
| | | ×1 1/4 | 1 15/16 | 1 13/16 | 2 1/16 |
| | | ×1 | 1 3/4 | 1 5/8 | 2 |
| | | ×3/4 | 1 5/8 | 1 1/2 | 1 15/16 |
| | | ×1/2 | 1 1/2 | 1 3/8 | 1 7/8 |
| 2 | ×1 1/4 | ×2 | 2 1/4 | 2 1/16 | 2 1/4 |
| | | ×1 1/2 | 2 | 1 13/16 | 2 1/8 |
| | | ×1 1/4 | 1 15/16 | 1 3/4 | 2 1/16 |
| | | ×1 | 1 3/4 | 1 9/16 | 2 |
| 2 | ×1 | ×2 | 2 1/4 | 2 | 2 1/4 |
| | | ×1 1/2 | 2 | 1 13/16 | 2 1/8 |
| | | ×1 1/4 | 1 7/8 | 1 3/4 | 2 1/16 |
| 2 | ×3/4 | ×2 | 2 1/4 | 1 15/16 | 2 1/4 |
| | ×1/2 | ×2 | 2 1/4 | 1 15/16 | 2 1/4 |
| | ×1/2 | ×1 1/2 | 2 | 1 13/16 | 2 1/8 |
| 1 1/2 | ×1 1/2 | ×2 | 2 1/8 | 2 1/8 | 2 |
| | ×1 1/4 | ×2 | 2 1/8 | 2 1/16 | 2 |
| | ×1 | ×2 | 2 1/8 | 2 | 2 |
| 1 1/4 | ×1 1/4 | ×2 | 2 1/16 | 2 1/16 | 1 15/16 |
| | ×1 | ×2 | 2 1/16 | 2 | 1 7/8 |
| 2 1/2 | ×2 1/2 | ×2 | 2 1/2 | 2 1/2 | 2 9/16 |
| | | ×1 1/2 | 2 1/4 | 2 1/4 | 2 7/16 |
| | | ×1 1/4 | 2 1/8 | 2 1/8 | 2 3/8 |
| | | ×1 | 1 15/16 | 1 15/16 | 2 5/16 |
| | | ×3/4 | 1 13/16 | 1 13/16 | 2 1/4 |
| | | ×1/2 | 1 13/16 | 1 13/16 | 2 1/4 |
| 2 1/2 | ×2 | ×2 1/2 | 2 11/16 | 2 9/16 | 2 11/16 |
| | | ×2 | 2 1/2 | 2 1/4 | 2 9/16 |
| | | ×1 1/2 | 2 1/4 | 2 | 2 7/16 |
| | | ×1 1/4 | 2 1/8 | 1 15/16 | 2 3/8 |
| | | ×1 | 1 15/16 | 1 3/4 | 2 5/16 |
| 2 1/2 | ×2 | ×3/4 | 1 13/16 | 1 5/8 | 2 1/4 |
| | | ×1/2 | 1 3/4 | 1 1/2 | 2 3/16 |
| 2 1/2 | ×1 1/2 | ×2 1/2 | 2 11/16 | 2 7/16 | 2 11/16 |
| | | ×2 | 2 1/2 | 2 1/8 | 2 9/16 |
| | | ×1 1/2 | 2 1/4 | 2 | 2 7/16 |
| 2 1/2 | ×1 1/4 | ×2 1/2 | 2 11/16 | 2 7/16 | 2 11/16 |
| | | ×2 | 2 7/16 | 2 1/8 | 2 9/16 |
| | | ×1 1/2 | 2 3/16 | 1 15/16 | 2 7/16 |
| 2 1/2 | ×1 | ×2 1/2 | 2 11/16 | 2 5/16 | 2 11/16 |
| | | ×2 | 2 7/16 | 2 1/8 | 2 9/16 |
| 2 1/2 | ×3/4 | ×2 1/2 | 2 11/16 | 2 5/16 | 2 11/16 |
| | ×1/2 | ×2 1/2 | 2 11/16 | 2 5/16 | 2 11/16 |
| | ×1/2 | ×2 | 2 7/16 | 2 1/8 | 2 9/16 |
| 2 | ×2 | ×2 1/2 | 2 9/16 | 2 9/16 | 2 1/2 |
| | | ×1 1/2 | 2 9/16 | 2 7/16 | 2 1/2 |
| | | ×1 1/4 | 2 9/16 | 2 3/8 | 2 7/16 |
| | | ×1 | 2 9/16 | 2 3/8 | 2 7/16 |
| 1 1/2 | ×1 1/2 | ×2 1/2 | 2 7/16 | 2 7/16 | 2 1/4 |
| 3 | ×3 | ×2 1/2 | 2 3/4 | 2 3/4 | 3 |
| | | ×2 | 2 9/16 | 2 9/16 | 2 15/16 |
| | | ×1 1/2 | 2 5/16 | 2 5/16 | 2 3/4 |
| | | ×1 1/4 | 2 3/16 | 2 3/16 | 2 11/16 |
| | | ×1 | 2 | 2 | 2 5/8 |
| | | ×3/4 | 1 15/16 | 1 15/16 | 2 9/16 |
| | | ×1/2 | 1 15/16 | 1 15/16 | 2 9/16 |
| 3 | ×2 1/2 | ×3 | 3 1/8 | 3 | 3 1/8 |
| | | ×2 1/2 | 2 3/4 | 2 11/16 | 3 |
| | | ×2 | 2 9/16 | 2 1/2 | 2 15/16 |
| | | ×1 1/2 | 2 5/16 | 2 1/4 | 2 3/4 |
| | | ×1 1/4 | 2 3/16 | 2 1/8 | 2 11/16 |
| | | ×1 | 2 | 1 15/16 | 2 5/8 |
| | | ×1/2 | 2 1/16 | 1 15/16 | 2 11/16 |
| 3 | ×2 | ×3 | 3 1/8 | 2 15/16 | 3 1/8 |
| | | ×2 1/2 | 2 3/4 | 2 9/16 | 3 |
| | | ×2 | 2 9/16 | 2 1/4 | 2 15/16 |
| | | ×1 1/2 | 2 5/16 | 2 | 2 3/4 |
| 3 | ×1 1/2 | ×3 | 3 1/8 | 2 3/4 | 3 1/8 |
| | | ×2 1/2 | 2 13/16 | 2 9/16 | 3 1/16 |
| 3 | ×1 1/4 | ×3 | 3 1/8 | 2 3/4 | 3 1/8 |
| | | ×2 1/2 | 2 13/16 | 2 9/16 | 3 1/16 |
| 3 | ×1 | ×3 | 3 1/8 | 2 5/8 | 3 1/8 |
| | | ×2 1/2 | 2 13/16 | 2 9/16 | 3 1/16 |
| 3 | ×3/4 | ×3 | 3 1/8 | 2 5/8 | 3 1/8 |
| 2 1/2 | ×2 1/2 | ×3 | 3 | 3 | 2 3/4 |
| | ×2 | ×3 | 3 1/16 | 2 15/16 | 2 13/16 |
| | ×1 1/2 | ×3 | 3 1/16 | 2 15/16 | 2 13/16 |
| | ×1 1/4 | ×3 | 3 1/16 | 2 15/16 | 2 13/16 |
| | ×1 | ×3 | 3 1/16 | 2 15/16 | 2 13/16 |
| 2 | ×2 | ×3 | 2 15/16 | 2 15/16 | 2 9/16 |
| 3 1/2 | ×3 1/2 | ×3 | 3 3/16 | 3 3/16 | 3 3/8 |
| | | ×2 1/2 | 2 7/8 | 2 7/8 | 3 5/16 |
| | | ×2 | 2 5/8 | 2 5/8 | 3 3/16 |
| | | ×1 1/2 | 2 7/16 | 2 7/16 | 3 1/16 |
| | | ×1 1/4 | 2 5/16 | 2 5/16 | 3 |
| | | ×1 | 2 1/8 | 2 1/8 | 2 15/16 |
| 3 1/2 | ×3 | ×3 1/2 | 3 7/16 | 3 7/16 | 3 7/16 |
| | | ×3 | 3 3/16 | 3 1/8 | 3 3/8 |
| | | ×2 1/2 | 2 7/8 | 2 13/16 | 3 5/16 |
| | | ×2 | 2 5/8 | 2 9/16 | 3 3/16 |
| | | ×1 1/2 | 2 3/8 | 2 5/16 | 3 1/16 |

*Continued on next page.*

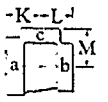
# 125-Pound Cast Iron Fittings

*Continued from preceding page.*

| Size a | b | c | K | L | M |
|---|---|---|---|---|---|
| 3½ | 3 | 1¼ | 2¼ | 2 3/16 | 3 |
| | | 1 | 2⅛ | 2 1/16 | 2 15/16 |
| 3½ | 2½ | 3½ | 3 7/16 | 3 5/16 | 3 7/16 |
| | | 3 | 3 3/16 | 3⅛ | 3⅜ |
| | | 2½ | 2⅞ | 2 13/16 | 3 5/16 |
| | | 2 | 2⅝ | 2 9/16 | 3 3/16 |
| 3½ | 2 | 3½ | 3 7/16 | 3 5/16 | 3 7/16 |
| | | 3 | 3 3/16 | 3⅛ | 3⅜ |
| 3½ | 1½ | 3½ | 3 7/16 | 3 5/16 | 3 7/16 |
| | | 3 | 3 3/16 | 3⅛ | 3⅜ |
| 3½ | 1¼ | 3½ | 3 7/16 | 3 5/16 | 3 7/16 |
| | | 3 | 3 3/16 | 3⅛ | 3⅜ |
| 3½ | 1 | 3½ | 3 7/16 | 3 5/16 | 3 7/16 |
| 3 | 3 | 3½ | 3⅜ | 3⅜ | 3 3/16 |
| | 2½ | 3½ | 3⅜ | 3⅜ | 3 3/16 |
| | 2 | 3½ | 3⅜ | 3⅜ | 3 3/16 |
| | 1½ | 3½ | 3⅜ | 3⅜ | 3 3/16 |
| 2½ | 2½ | 3½ | 3 5/16 | 3 5/16 | 2⅞ |
| 4 | 4 | 3½ | 3½ | 3½ | 3 11/16 |
| | | 3 | 3¼ | 3¼ | 3 11/16 |
| | | 2½ | 2 15/16 | 2 15/16 | 3⅝ |
| | | 2 | 2¾ | 2¾ | 3½ |
| | | 1½ | 2½ | 2½ | 3⅜ |
| | | 1¼ | 2⅜ | 2⅜ | 3¼ |
| | | 1 | 2 3/16 | 2 3/16 | 3 3/16 |
| | | ¾ | 2 3/16 | 2 3/16 | 3 3/16 |
| 4 | 3½ | 4 | 3¾ | 3¾ | 3¾ |
| | | 3½ | 3½ | 3 7/16 | 3 11/16 |
| | | 3 | 3¼ | 3¼ | 3⅝ |
| | | 2½ | 2 15/16 | 2⅞ | 3 9/16 |
| | | 2 | 2 11/16 | 2⅝ | 3½ |
| | | 1½ | 2 7/16 | 2⅜ | 3 5/16 |
| | | 1¼ | 2 5/16 | 2¼ | 3 5/16 |
| | | 1 | 2 5/16 | 2¼ | 3 5/16 |
| 4 | 3 | 4 | 3¾ | 3 11/16 | 3¾ |
| | | 3½ | 3½ | 3 7/16 | 3 11/16 |
| | | 3 | 3¼ | 3 1/16 | 3 11/16 |
| | | 2½ | 2 15/16 | 2⅞ | 3⅝ |
| | | 2 | 2¾ | 2 9/16 | 3½ |
| 4 | 2½ | 4 | 3¾ | 3⅝ | 3¾ |
| | | 3½ | 3½ | 3 7/16 | 3 11/16 |
| | | 3 | 3¼ | 3⅛ | 3⅝ |
| | | 2½ | 2 15/16 | 2 13/16 | 3 9/16 |
| 4 | 2 | 4 | 3¾ | 3½ | 3¾ |
| | | 3½ | 3¾ | 3½ | 3¾ |
| | | 3 | 3¼ | 2 15/16 | 3 11/16 |
| | | 2 | 2¾ | 2 9/16 | 3½ |
| 4 | 1½ | 4 | 3¾ | 3⅜ | 3¾ |
| | 1¼ | 4 | 3¾ | 3¼ | 3¾ |
| | 1 | 4 | 3¾ | 3¼ | 3¾ |
| 3½ | 3½ | 4 | 3 11/16 | 3 11/16 | 3½ |
| | 3 | 4 | 3 11/16 | 3 11/16 | 3½ |
| | 2½ | 4 | 3 11/16 | 3 11/16 | 3½ |
| | 2 | 4 | 3 11/16 | 3 11/16 | 3½ |
| 3 | 3 | 4 | 3 11/16 | 3 11/16 | 3¼ |
| | 2½ | 4 | 3⅝ | 3⅝ | 3¼ |
| 2½ | 2½ | 4 | 3⅝ | 3⅝ | 2 15/16 |
| 2 | 2 | 4 | 3⅝ | 3⅝ | 2 15/16 |
| 5 | 5 | 4 | 3 15/16 | 3 15/16 | 4 5/16 |
| | | 3½ | 4 | 4 | 4⅜ |
| | | 3 | 3 7/16 | 3 7/16 | 4¼ |
| | | 2½ | 3⅛ | 3⅛ | 4 3/16 |
| | | 2 | 2⅞ | 2⅞ | 4 1/16 |
| | | 1½ | 2½ | 2½ | 3⅞ |
| | | 1¼ | 2½ | 2½ | 3⅞ |
| | | 1 | 2½ | 2½ | 3⅞ |
| 5 | 4 | 5 | 4½ | 4 5/16 | 4½ |
| | | 4 | 3 15/16 | 3¾ | 4 5/16 |
| | | 3½ | 3¾ | 3½ | 4 5/16 |
| | | 3 | 3 7/16 | 3¼ | 4¼ |
| | | 2½ | 3⅛ | 2 15/16 | 4 3/16 |
| | | 2 | 2⅞ | 2¾ | 4 1/16 |
| | | 1½ | 2 11/16 | 2 7/16 | 4 |
| | | 1¼ | 2 11/16 | 2 7/16 | 4 |
| 5 | 3½ | 5 | 4½ | 4⅜ | 4½ |
| | | 4 | 4 | 3¾ | 4⅜ |
| | | 3½ | 3¾ | 3½ | 4 5/16 |
| | | 3 | 3½ | 3½ | 4 5/16 |
| 5 | 3 | 5 | 4½ | 4 5/16 | 4½ |
| | | 4 | 4 | 3¾ | 4⅜ |
| | | 3½ | 3¾ | 3½ | 4 5/16 |
| 5 | 2½ | 5 | 4½ | 4¼ | 4½ |
| | | 4 | 4 | 3¾ | 4⅜ |
| 5 | 2 | 5 | 4½ | 4 1/16 | 4½ |
| | 1½ | 5 | 4½ | 4¼ | 4½ |
| | 1¼ | 5 | 4½ | 4¼ | 4½ |
| 4 | 4 | 5 | 4 5/16 | 4 5/16 | 3 15/16 |
| | 3½ | 5 | 4⅜ | 4 5/16 | 4 |
| | 3 | 5 | 4⅜ | 4 5/16 | 4 |
| | 2½ | 5 | 4⅜ | 4 5/16 | 4 |
| 3½ | 3½ | 5 | 4 5/16 | 4 5/16 | 3¾ |
| | 3 | 5 | 4 5/16 | 4 5/16 | 3¾ |
| 3 | 3 | 5 | 4 5/16 | 4 5/16 | 3¾ |
| 6 | 6 | 5 | 4⅝ | 4⅝ | 5 1/16 |
| | | 4 | 4⅛ | 4⅛ | 4 15/16 |
| | | 3½ | 4⅛ | 4⅛ | 4 15/16 |
| | | 3 | 3⅝ | 3⅝ | 4⅞ |
| | | 2½ | 3 5/16 | 3 5/16 | 4 13/16 |
| | | 2 | 3 1/16 | 3 1/16 | 4 11/16 |
| | | 1½ | 2⅞ | 2⅞ | 4 9/16 |
| | | 1¼ | 2⅞ | 2⅞ | 4 9/16 |
| | | 1 | 2 9/16 | 2 9/16 | 4⅜ |
| 6 | 5 | 6 | 5⅛ | 5⅛ | 5⅛ |
| | | 5 | 4⅝ | 4 7/16 | 5 1/16 |
| | | 4 | 4⅛ | 3 15/16 | 4 15/16 |
| | | 3½ | 4 1/16 | 4 | 4 15/16 |
| | | 3 | 3⅝ | 3⅝ | 4⅞ |
| | | 2½ | 3 5/16 | 3⅛ | 4⅝ |
| | | 2 | 3 1/16 | 2⅞ | 4 11/16 |
| | | 1½ | 2¾ | 2¾ | 4½ |
| | | 1¼ | 2⅝ | 2⅝ | 4 7/16 |
| 6 | 4 | 6 | 5⅛ | 4 15/16 | 5⅛ |
| | | 5 | 4⅝ | 4 7/16 | 5 1/16 |
| | | 4 | 4⅛ | 3¾ | 4 15/16 |
| | | 3 | 3 9/16 | 3 9/16 | 4 13/16 |
| 6 | 3½ | 6 | 5⅛ | 4 15/16 | 5⅛ |
| | | 5 | 4⅝ | 4½ | 5 |
| 6 | 3 | 6 | 5⅛ | 4⅞ | 5⅛ |
| | | 5 | 4⅝ | 4½ | 5 |
| | | 4 | 4 1/16 | 4 | 4 15/16 |
| | | 3 | 3 9/16 | 3 9/16 | 4 13/16 |
| 6 | 2½ | 6 | 5⅛ | 4⅞ | 5⅛ |

## List of Sizes of Reducing Tees and Dimensions, in Inches

*Continued from preceding page*




Reducing Tee

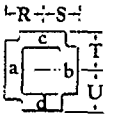
The prices of Reducing Tees on page 152 apply only to the sizes listed here and on the preceding page; the size of the largest opening determines the price.

When ordering, always name the size of openings in the sequence of the lower case letters shown on the illustration above.

| Size a | b | c | K | L | M |
|---|---|---|---|---|---|
| 6 | 2 | 6 | 5⅛ | 4 11/16 | 5⅛ |
| | 1½ | 6 | 5⅛ | 4 13/16 | 5⅛ |
| | 1¼ | 6 | 5⅛ | 4 13/16 | 5⅛ |
| 5 | 5 | 6 | 5 1/16 | 5 1/16 | 4⅝ |
| | 4 | 6 | 5 | 5 | 4⅝ |
| | 3½ | 6 | 5 | 4⅞ | 4⅝ |
| | 3 | 6 | 5 | 4⅞ | 4⅝ |
| 4 | 4 | 6 | 4 15/16 | 4 15/16 | 4⅛ |
| | 3½ | 6 | 4 15/16 | 4 15/16 | 4 1/16 |
| 8 | 8 | 6 | 5½ | 5½ | 6 5/16 |
| | | 5 | 4 15/16 | 4 15/16 | 6 3/16 |
| | | 4 | 4 7/16 | 4 7/16 | 6⅛ |
| | | 3½ | 4½ | 4½ | 6⅛ |
| | | 3 | 3 15/16 | 3 15/16 | 6 |
| | | 2½ | 3⅝ | 3⅝ | 5 15/16 |
| | | 2 | 3⅜ | 3⅜ | 5 13/16 |
| 8 | 6 | 8 | 6 9/16 | 6 9/16 | 6 9/16 |
| | | 6 | 5 9/16 | 5 9/16 | 6⅜ |
| | | 5 | 5 9/16 | 5 9/16 | 6⅜ |
| | | 4 | 4½ | 4½ | 6⅛ |
| 8 | 5 | 5 | 5 9/16 | 5 9/16 | 6⅜ |
| | 4 | 8 | 6 9/16 | 6 9/16 | 6 9/16 |
| | 2 | 8 | 6 9/16 | 6 9/16 | 6 9/16 |
| 6 | 6 | 8 | 6 5/16 | 6 5/16 | 5½ |
| | 5 | 8 | 6⅜ | 6⅜ | 5 9/16 |
| 5 | 5 | 8 | 6⅜ | 6⅜ | 5 9/16 |

# 125-Pound Cast Iron Fittings

## List of Sizes of Reducing Crosses and Dimensions, in Inches




Reducing Cross

The prices of Reducing Crosses on page 151 apply only to the sizes listed here; the size of the largest opening determines the price.

When ordering, always name the size of openings in the sequence of the lower case letters shown on the illustration above. For example, if "a" size is 2½", "b" is 2", and "c" and "d" are 1", the size is written: 2½ x 2 x 1 x 1".

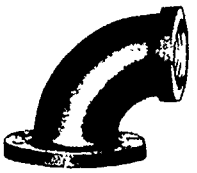
| Size a | b | c | d | R | S | T | U |
|---|---|---|---|---|---|---|---|
| 1½ | ×1½ | ×1 | ×1 | 1⅝ | 1⅝ | 1 13/16 | 1 13/16 |
| | ×1¼ | ×1 | ×1 | 1⅝ | 1⅝ | 1 13/16 | 1 13/16 |
| 2 | ×2 | ×1 | ×1 | 1¾ | 1¾ | 2 | 2 |
| | ×1½ | ×1¼ | ×1¼ | 1⅞ | 1⅞ | 2 1/16 | 2 1/16 |
| | ×1½ | ×1 | ×1 | 1¾ | 1¾ | 2 | 2 |
| 2½ | ×2½ | ×2 | ×2 | 2 7/16 | 2 7/16 | 2 9/16 | 2 9/16 |
| | | ×1½ | ×1½ | 2 3/16 | 2 3/16 | 2 7/16 | 2 7/16 |
| | | ×1½ | ×1¼ | 2 3/16 | 2 3/16 | 2 7/16 | 2 7/16 |
| | | ×1¼ | ×1¼ | 2⅛ | 2⅛ | 2⅜ | 2⅜ |
| | | ×1¼ | ×1 | 2 1/16 | 2 1/16 | 2⅜ | 2⅜ |
| | | ×1 | ×1 | 1 15/16 | 1 15/16 | 2 5/16 | 2 5/16 |
| 2½ | ×2 | ×2 | ×2 | 2 7/16 | 2 7/16 | 2 9/16 | 2 9/16 |
| | | ×1½ | ×1½ | 2 3/16 | 2 3/16 | 2 7/16 | 2 7/16 |
| | | ×1¼ | ×1¼ | 2 1/16 | 2 1/16 | 2⅜ | 2⅜ |
| | | ×1¼ | ×1 | 2 1/16 | 2 1/16 | 2⅜ | 2⅜ |
| | | ×1 | ×1 | 1 15/16 | 1 15/16 | 2 5/16 | 2 5/16 |
| 2½ | ×1½ | ×1½ | ×1 | 2 3/16 | 2 3/16 | 2 7/16 | 2 7/16 |
| | | ×1¼ | ×1¼ | 2 1/16 | 2 1/16 | 2⅜ | 2⅜ |
| 3 | ×3 | ×2½ | ×2½ | 2 13/16 | 2 13/16 | 3 1/16 | 3 1/16 |
| | | ×2 | ×2 | 2 9/16 | 2 9/16 | 2 15/16 | 2 15/16 |
| | | ×2 | ×1½ | 2 9/16 | 2 9/16 | 2 15/16 | 2 15/16 |
| | | ×1½ | ×1½ | 2 5/16 | 2 5/16 | 2 13/16 | 2 13/16 |
| | | ×1½ | ×1¼ | 2 5/16 | 2 5/16 | 2 13/16 | 2 13/16 |
| | | ×1¼ | ×1¼ | 2 3/16 | 2 3/16 | 2¾ | 2¾ |
| | | ×1¼ | ×1 | 2 3/16 | 2 3/16 | 2¾ | 2¾ |
| | | ×1 | ×1 | 2 1/16 | 2 1/16 | 2 11/16 | 2 11/16 |
| 3 | ×2½ | ×2½ | ×2 | 2 13/16 | 2 13/16 | 3 1/16 | 3 1/16 |
| | | ×2 | ×2 | 2 9/16 | 2 9/16 | 2 15/16 | 2 15/16 |
| | | ×2 | ×1½ | 2 9/16 | 2 9/16 | 2 15/16 | 2 15/16 |
| | | ×2 | ×1¼ | 2 9/16 | 2 9/16 | 2 15/16 | 2 15/16 |
| | | ×1½ | ×1½ | 2 5/16 | 2 5/16 | 2 13/16 | 2 13/16 |
| | | ×1¼ | ×1¼ | 2 3/16 | 2 3/16 | 2¾ | 2¾ |
| | | ×1¼ | ×1 | 2 3/16 | 2 3/16 | 2¾ | 2¾ |
| | | ×1 | ×1 | 2 1/16 | 2 1/16 | 2 11/16 | 2 11/16 |
| 3½ | ×3½ | ×3 | ×3 | 3 3/16 | 3 3/16 | 3⅜ | 3⅜ |
| | | ×2½ | ×2½ | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×2 | ×2 | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×2 | ×1½ | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×2 | ×1¼ | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×1½ | ×1½ | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| | | ×1½ | ×1¼ | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| | | ×1½ | ×1 | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| | | ×1¼ | ×1¼ | 2¼ | 2¼ | 3 | 3 |
| | | ×1 | ×1 | 2¼ | 2¼ | 3 | 3 |
| 3½ | ×3 | ×2½ | ×2½ | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×2½ | ×2 | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×2 | ×2 | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×2 | ×1½ | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×2 | ×1¼ | 2⅝ | 2⅝ | 3 3/16 | 3 3/16 |
| | | ×1½ | ×1½ | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| | | ×1½ | ×1¼ | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| | | ×1½ | ×1 | 2⅜ | 2⅜ | 3 1/16 | 3 1/16 |
| 3½ | ×3½ | ×3½ | ×3½ | 3¾ | 3¾ | 3¾ | 3¾ |
| | | ×3 | ×3 | 3¼ | 3¼ | 3⅝ | 3⅝ |
| | | ×2½ | ×2½ | 2 15/16 | 2 15/16 | 3 9/16 | 3 9/16 |
| | | ×2½ | ×2 | 2 15/16 | 2 15/16 | 3 9/16 | 3 9/16 |
| | | ×2 | ×2 | 2 11/16 | 2 11/16 | 3½ | 3½ |
| | | ×2 | ×1½ | 2 11/16 | 2 11/16 | 3½ | 3½ |
| | | ×1½ | ×1½ | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×1¼ | ×1¼ | 2 5/16 | 2 5/16 | 3 5/16 | 3 5/16 |
| | | ×1 | ×1 | 2 5/16 | 2 5/16 | 3 5/16 | 3 5/16 |
| 4 | ×3½ | ×2½ | ×2½ | 2 15/16 | 2 15/16 | 3 9/16 | 3 9/16 |
| | | ×2½ | ×1 | 2 15/16 | 2 15/16 | 3 9/16 | 3 9/16 |
| | | ×2 | ×2 | 2 11/16 | 2 11/16 | 3½ | 3½ |
| | | ×2 | ×1½ | 2 11/16 | 2 11/16 | 3½ | 3½ |
| | | ×1½ | ×1½ | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×1½ | ×1 | 2⅞ | 2⅞ | 3 5/16 | 3 5/16 |
| | | ×1¼ | ×1¼ | 2 5/16 | 2 5/16 | 3 5/16 | 3 5/16 |
| | | ×1¼ | ×1 | 2 5/16 | 2 5/16 | 3 5/16 | 3 5/16 |
| 4 | ×3 | ×2½ | ×2 | 2 15/16 | 2 15/16 | 3 9/16 | 3 9/16 |
| 5 | ×5 | ×4 | ×4 | 4 | 4 | 4⅜ | 4⅜ |
| | | ×3½ | ×3½ | 4 | 4 | 4⅜ | 4⅜ |
| | | ×3 | ×3 | 3½ | 3½ | 4 5/16 | 4 5/16 |
| | | ×2½ | ×2½ | 3 3/16 | 3 3/16 | 4¼ | 4¼ |
| | | ×2½ | ×2 | 3 3/16 | 3 3/16 | 4¼ | 4¼ |
| | | ×2 | ×2 | 2 15/16 | 2 15/16 | 4⅛ | 4⅛ |
| | | ×2 | ×1½ | 2 15/16 | 2 15/16 | 4⅛ | 4⅛ |
| | | ×1½ | ×1½ | 2 11/16 | 2 11/16 | 4 | 4 |
| | | ×1½ | ×1¼ | 2 11/16 | 2 11/16 | 4 | 4 |
| | | ×1¼ | ×1¼ | 2 9/16 | 2 9/16 | 3 15/16 | 3 15/16 |
| 5 | ×4 | ×3 | ×3 | 3½ | 3½ | 4 5/16 | 4 5/16 |
| | | ×2½ | ×2½ | 3 3/16 | 3 3/16 | 4¼ | 4¼ |
| | | ×2½ | ×2 | 3 3/16 | 3 3/16 | 4¼ | 4¼ |
| | | ×2 | ×2 | 2 15/16 | 2 15/16 | 4⅛ | 4⅛ |
| | | ×1½ | ×1½ | 2 11/16 | 2 11/16 | 4 | 4 |
| 6 | ×6 | ×5 | ×5 | 4⅜ | 4⅝ | 5 | 5 |
| | | ×4 | ×4 | 4 1/16 | 4 1/16 | 4 15/16 | 4 15/16 |
| | | ×3½ | ×3½ | 4 1/16 | 4 1/16 | 4 15/16 | 4 15/16 |
| | | ×3 | ×3 | 3 9/16 | 3 9/16 | 4 13/16 | 4 13/16 |
| | | ×2½ | ×2½ | 3¼ | 3¼ | 4¾ | 4¾ |
| | | ×2½ | ×2 | 3¼ | 3¼ | 4¾ | 4¾ |
| | | ×2 | ×2 | 3 | 3 | 4⅝ | 4⅝ |
| | | ×1½ | ×1½ | 2¾ | 2¾ | 4½ | 4½ |
| | | ×1¼ | ×1¼ | 2⅝ | 2⅝ | 4 7/16 | 4 7/16 |
| 6 | ×5 | ×3 | ×3 | 3 9/16 | 3 9/16 | 4 13/16 | 4 13/16 |
| | | ×2 | ×2 | 3 | 3 | 4⅝ | 4⅝ |
| | | ×1½ | ×1½ | 2¾ | 2¾ | 4½ | 4½ |
| 8 | ×8 | ×6 | ×6 | 5 9/16 | 5 9/16 | 6⅜ | 6⅜ |
| | | ×5 | ×5 | 5 9/16 | 5 9/16 | 6⅜ | 6⅜ |
| | | ×4 | ×4 | 4½ | 4½ | 6⅛ | 6⅛ |
| 8 | ×6 | ×4 | ×4 | 4½ | 4½ | 6⅛ | 6⅛ |

*List prices....pages 150 and 151*
*Description...pages 150 and 151*
*Thread engagement....page 152*
*Iron Plugs..... page 166*
*Iron Bushings ... .. page 167*

# 125-Pound Cast Iron Fittings

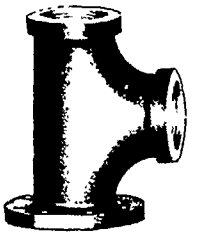
## Sprinkler Type

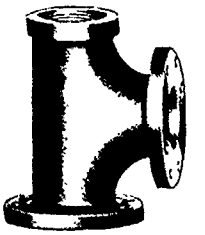
WORKING PRESSURES
125 pounds saturated steam
175 pounds water


90° Long Turn Elbow Flanged and Screwed

90° Short Turn Elbow Flanged and Screwed

45° Short Turn Elbow Flanged and Screwed


Long Turn Tee Flanged, Screwed, Screwed


Long Turn Tee Flanged, Screwed, Flanged

### List Prices, Each

| Size | | Inches | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Elbows | 90° Long Turn, Flanged and Screwed | Black | | 10.00 | | 14.00 | 18.00 | 25.00 | |
| | | Galv. | | 20.00 | | 28.00 | 36.00 | 50.00 | |
| | 90° Short Turn, Flanged and Screwed | Black | 5.50 | 6.50 | 8.50 | 9.50 | 12.00 | 15.00 | 30.00 |
| | | Galv. | 11.00 | 13.00 | 17.00 | 19.00 | 24.00 | 30.00 | 60.00 |
| | 45° Short Turn, Flanged and Screwed | Black | 6.00 | 7.00 | 9.00 | 10.00 | 13.00 | 18.00 | 35.00 |
| | | Galv. | 12.00 | 14.00 | 18.00 | 20.00 | 26.00 | 36.00 | 70.00 |
| Long Turn Tees | Flanged, Screwed, Screwed | Black | | 14.00 | | 20.00 | 26.00 | 34.00 | |
| | | Galv. | | 28.00 | | 40.00 | 52.00 | 68.00 | |
| | Flanged, Screwed, Flanged | Black | | 19.00 | | 25.00 | 31.00 | 41.00 | |
| | | Galv. | | 38.00 | | 50.00 | 62.00 | 82.00 | |

**Sprinkler fittings:** These cast iron fittings have one opening threaded and one opening flanged, except for the tees which are made with one end of the run flanged and the other end threaded, but with the outlet either threaded or flanged. When ordering tees, be sure to specify the type wanted.

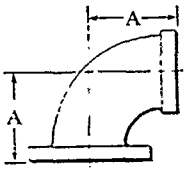
The fittings are primarily used in sprinkler piping, but they are equally well suited for other services where combination screwed and flanged iron fittings for 125 pounds steam or for 175 pounds water are needed.

**Flanged ends:** On flanged ends, the dimensions and drilling of the flange conforms to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flange is plain faced, with a smooth finish, and is regularly furnished faced and drilled.

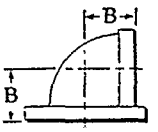
**Underwriters' approved:** These fittings have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Other sprinkler items:** The Crane line includes a wide variety of items suitable for sprinkler piping. Cast Iron Screwed Fittings are shown in this section, pages 149 to 157; Cast Iron Flanged Fittings and Flanges are shown on pages 195 to 204; for other Underwriters' items, see the alphabetical index.

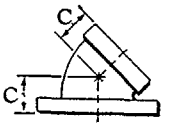
14



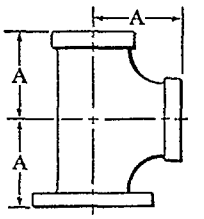
90° Long Turn Elbow



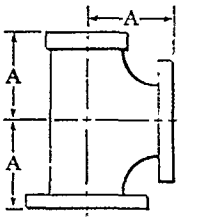
90° Short Turn Elbow



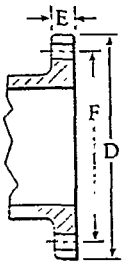
45° Short Turn Elbow



Long Turn Tee



Long Turn Tee




### Dimensions, in Inches

| Size | Inches | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|
| A | | | 5 | | 6½ | 7½ | 9 | |
| B | | 2 11/16 | 3⅛ | 3 7/16 | 3¾ | 4½ | 5⅛ | 6 9/16 |
| C | | 1 15/16 | 2 3/16 | 2⅜ | 2⅝ | 3 1/16 | 3 7/16 | 4 1/16 |
| D | | 7 | 7½ | 8½ | 9 | 10 | 11 | 13½ |
| E | | 11/16 | ¾ | 13/16 | 15/16 | 15/16 | 1 | 1⅛ |
| F | | 5½ | 6 | 7 | 7½ | 8½ | 9½ | 11¾ |
| No. of bolts | | 4 | 4 | 8 | 8 | 8 | 8 | 8 |
| Dia. of bolts | | ⅝ | ⅝ | ⅝ | ⅝ | ¾ | ¾ | ¾ |

# 250-Pound Cast Iron Fittings

## Short Pattern

WORKING PRESSURES
250 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock

90° Elbow
No. 182 E

45° Elbow
No. 186 E

Tee
No. 188 E, Straight
No. 190 E, Reducing

### List Prices, Black, Each

| Size Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 182 E, 90° Elbows | .47 | .47 | .53 | .63 | .76 | 1.10 | 1.40 | 1.95 | 3.00 | 4.40 | 7.30 | 8.80 | 13.00 | 17.50 | 35.00 |
| No. 186 E, 45° Elbows | | | .62 | .72 | .85 | 1.20 | 1.55 | 2.20 | 3.50 | 5.00 | 8.00 | 10.00 | 14.50 | 20.00 | 40.00 |
| No. 188 E, Tees, Straight | .76 | .76 | .82 | .90 | 1.10 | 1.50 | 1.95 | 2.60 | 4.25 | 6.40 | 10.00 | 12.00 | 20.00 | 25.00 | 50.00 |
| No. 190 E, Tees, Reducing | | | | 1.10 | 1.30 | 1.75 | 2.20 | 3.00 | | | | | | | |

Galvanized fittings are made to order: add 100% to list prices of black fittings shown above.

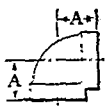
**Rugged construction:** Crane 250-Pound Cast Iron Fittings are of the Short Pattern. They are unusually rugged and have a high factor of safety above the recommended working pressure.

**Threading:** The thread lengths are longer than those found in standard weight fittings, and the threads are accurately cut to gauge. All openings are in true alignment and are slightly chamfered to assure easy entrance of the pipe.

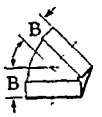
**Sprinkler service; Underwriters' approved:** Crane 250-Pound Cast Iron Fittings have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Reducing tees:** The prices of reducing tees apply to regularly listed sizes only, as shown in the dimension table below. The size of the largest opening determines the price. All other sizes are special; prices on application.

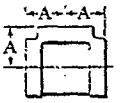
## Dimensions, in Inches



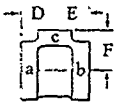

No. 182 E
90° Elbow




No. 186 E
45° Elbow

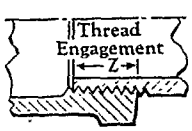



No. 188 E
Tee, Straight




No. 190 E
Tee, Reducing

| Size | A | B | Z |
|---|---|---|---|
| 1/4 | 1 1/4 | | 3/8 |
| 3/8 | 1 3/8 | | 3/8 |
| 1/2 | 1 1/4 | 1 | 1/2 |
| 3/4 | 1 7/16 | 1 1/8 | 9/16 |
| 1 | 1 5/8 | 1 5/16 | 11/16 |
| 1 1/4 | 2 | 1 1/2 | 11/16 |
| 1 1/2 | 2 1/8 | 1 11/16 | 11/16 |
| 2 | 2 1/2 | 2 | 3/4 |
| 2 1/2 | 2 15/16 | 2 1/4 | 15/16 |
| 3 | 3 3/8 | 2 1/2 | 1 |
| 3 1/2 | 3 3/4 | 2 9/16 | 1 1/16 |
| 4 | 4 1/8 | 2 13/16 | 1 1/8 |
| 5 | 4 7/8 | 3 3/16 | 1 1/4 |
| 6 | 5 5/8 | 3 11/16 | 1 5/16 |
| 8 | 7 | 4 5/8 | 1 7/16 |

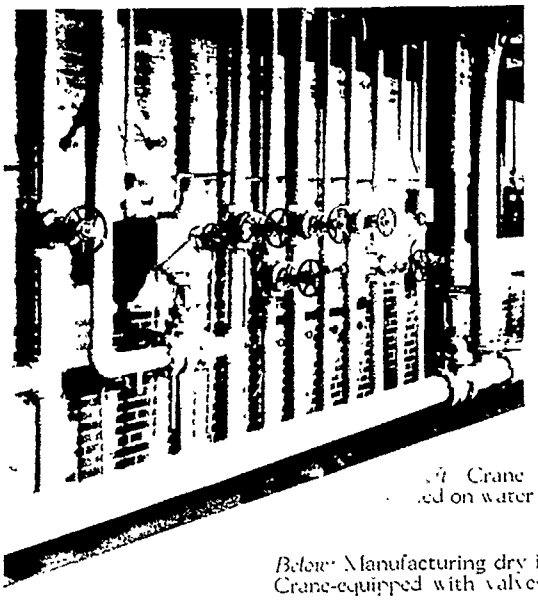



Dimension "Z", shown in the table at the left, applies to all 250-Pound Cast Iron Fittings. It is the engagement normally required between male and female pipe threads to make a tight joint; see pages 404 and 405 for explanation.

| Size a | b | c | D | E | F |
|---|---|---|---|---|---|
| 3/4 | 3/4 | 1/2 | 1 5/16 | 1 5/16 | 1 3/8 |
| 1 | 1 | 3/4 | 1 1/2 | 1 1/2 | 1 9/16 |
| | | 1/2 | 1 1/2 | 1 1/2 | 1 9/16 |
| 1 1/4 | 1 1/4 | 1 | 1 3/4 | 1 3/4 | 1 13/16 |
| | | 3/4 | 1 3/4 | 1 3/4 | 1 15/16 |
| 1 1/2 | 1 1/2 | 1 1/4 | 2 | 2 | 2 1/16 |
| | | 1 | 2 | 2 | 2 1/16 |
| | | 3/4 | 1 7/8 | 1 7/8 | 2 |
| 2 | 2 | 1 1/2 | 2 1/4 | 2 1/4 | 2 3/8 |
| | | 1 1/4 | 2 1/4 | 2 1/4 | 2 3/8 |
| | | 1 | 2 | 2 | 2 3/16 |
| | | 3/4 | 2 | 2 | 2 3/16 |

When specifying reducing tees, always name the size of openings in the sequence of the lower case letters, as shown above.

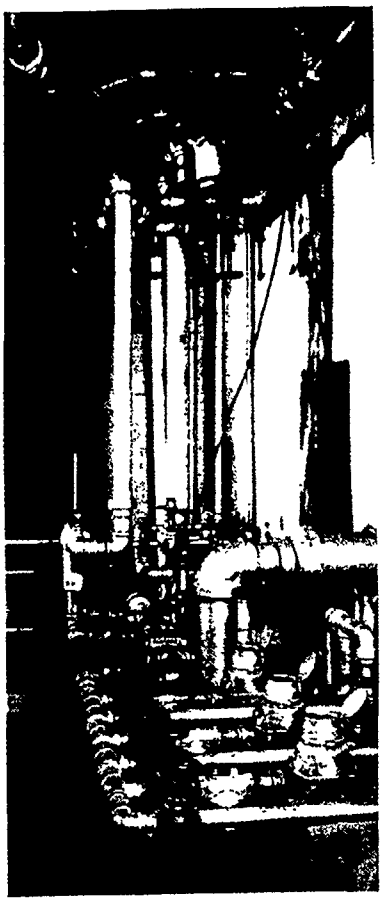
14



*One Source*

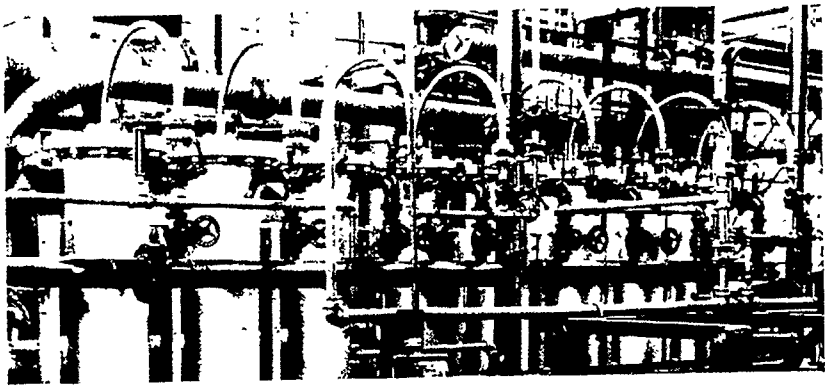
# CRANE

*For Valves*
*For Fittings*
*For Pipe*



Small Crane valves and fittings satisfy many users. Illustrated above is a typical installation in a sewage disposal plant.

*Below:* Manufacturing dry ice and carbon dioxide gas. Crane-equipped with valves, fittings, and pipe bends.



14

For dependable service, long usage, and economical operation.

Crane products installed in the burner of a steel mill furnace.

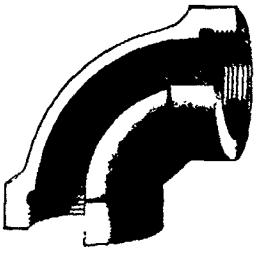
# Cast Iron Drainage Fittings

Elbows.....pages 100 and 161
Tees.....page 161
90° Y-Branches.....page 102
45° Y-Branches.....page 103

Couplings.....page 161
Increasers.....page 101
Roof Connections.....page 101
Tucker Connections.....page 101
Traps.....page 103

Crane-Hulbert Drainage Fittings.....page 164

*Other Cast Iron Screwed Fittings....pages 149 to 157*



**Unobstructed flow:** The inside diameter of Crane Cast Iron Drainage Fittings is approximately the same as the inside diameter of wrought pipe. When a joint is made, the end of the pipe practically meets the shoulder at the back of the thread chamber, forming a smooth passageway to prevent catching or clogging of foreign matter. Each opening is chamfered to permit easy entrance of the pipe.

**Pitched openings:** Fittings having openings at right angles have the threads tapped pitched so that the horizontal line will pitch ¼ inch per foot, assuring positive drainage; wherever practicable, the face of the pitched opening is tilted ¼ inch per foot. All fittings having pitched threads are so indicated on the following pages.

**Materials:** Except for the 2-inch No. 1048 Tucker Connection which is malleable iron, all Crane Drainage Fittings are made of high grade cast iron.

Malleable Iron Drainage Fittings, made from the patterns used for cast iron, can be furnished on special order: prices on application.

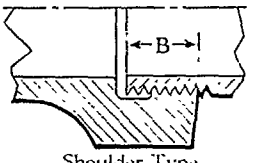
Brass Drainage Fittings also can be furnished on special order; prices on application.

**Coatings:** These fittings are regularly listed black (being coated with black japan) and galvanized. Uncoated or plain fittings, for communities requiring fittings that are not coated, can also be furnished when so specified, at the same price as black fittings.

**Vacuum cleaning:** Crane Drainage Fittings are well suited for vacuum cleaning installations. Regular pitched fittings are furnished unless orders specify "unpitched". Unpitched drainage fittings are special at all times; prices on application.

**American Standard:** Crane Cast Iron Drainage Fittings comply with the American Standard for Cast Iron Screwed Drainage Fittings, B10.12-1942.

**Thread engagement:** The normal engagement between Crane shoulder type Drainage Fittings and American Standard Taper Male Pipe Threads is shown in the table below. The fittings have American Standard Taper Female Threads, and variations in tapping are limited to one turn small and no turn large from the standard size as determined by the working gauge. The male thread on the pipe should not be threaded small to gauge and not more than one turn large.




Shoulder Type Drainage Fitting Threads

Thread Engagement, in Inches

| Size | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| B | ⅝ | ⅝ | ⅝ | ⅞ | 15/16 | 1 1/16 | 1 3/16 | 1¼ | 1⅜ | 1 9/16 |

15

# Cast Iron Drainage Fittings

*No. 1000
90° Elbow

No. 1002
60° Elbow

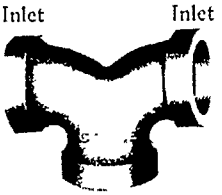
No. 1003
45° Elbow

No. 1005
22½° Elbow

No. 1006
11¼° Elbow

*No. 1008
90° Elbow
2-inch Side
Outlet

*No. 1009
90° Elbow
2-inch Heel
Outlet




*No. 1010
Three-Way Elbow

No. 1057
90° Street Elbow

No. 1058
45° Street Elbow

## List Prices, Each

| Size | No. 1000 90° Elbows Straight Black | Straight Galv. | †Reducing Black | †Reducing Galv. | No. 1002 60° Elbows Black | Galv. | No. 1003 45° Elbows Black | Galv. | No. 1005 22½ Elbows Black | Galv. | No. 1006 11¼° Elbows Black | Galv. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | | | | | | | | | | | | |
| 1¼ | .61 | .79 | | | .70 | .90 | .61 | .79 | .70 | .90 | .70 | .90 |
| 1½ | .72 | .95 | .80 | 1.05 | .80 | 1.05 | .72 | .95 | .80 | 1.05 | .80 | 1.05 |
| 2 | 1.05 | 1.35 | 1.20 | 1.55 | 1.20 | 1.60 | 1.05 | 1.35 | 1.20 | 1.60 | 1.20 | 1.60 |
| 2½ | 2.10 | 2.75 | | | 2.30 | 3.00 | 2.10 | 2.75 | 2.30 | 3.00 | 2.30 | 3.00 |
| 3 | 3.00 | 3.90 | | | 3.50 | 4.60 | 3.00 | 3.90 | 3.50 | 4.60 | 3.50 | 4.60 |
| 4 | 5.00 | 6.50 | 5.40 | 7.00 | 5.60 | 7.25 | 5.00 | 6.50 | 5.60 | 7.25 | 5.60 | 7.25 |
| 5 | 9.00 | 12.00 | | | 10.00 | 13.00 | 8.50 | 11.00 | | | | |
| 6 | 12.00 | 16.00 | | | 14.00 | 18.00 | 11.30 | 14.70 | | | | |
| 8 | 33.50 | 43.50 | | | | | 30.00 | 39.00 | | | | |
| 10 | 53.00 | 69.00 | | | | | 50.00 | 65.00 | | | | |

| Size | No. 1008 90° Elbows with 2-inch Side Outlet Black | Galv. | No. 1009 90° Elbows with 2-inch Heel Outlet Black | Galv. | No. 1010 Three-Way Elbows Straight Black | Galv. | †Reducing Black | Galv. | No. 1057 90° Street Elbows Black | Galv. | No. 1058 45° Street Elbows Black | Galv. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | | | | | | | | | | | | |
| 1¼ | | | | | 1.65 | 2.15 | | | .75 | .98 | .75 | .98 |
| 1½ | | | | | 1.80 | 2.35 | 1.95 | 2.55 | .86 | 1.15 | .86 | 1.15 |
| 2 | | | | | 2.30 | 3.00 | 2.50 | 3.25 | 1.45 | 1.90 | 1.45 | 1.90 |
| 4 | 7.50 | 9.75 | 7.50 | 9.75 | | | | | | | | |

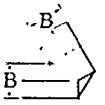
*Inlets are pitched ¼-inch per foot.

†Prices of Reducing 90° Elbows and Reducing Three-Way Elbows apply only to the sizes shown in the table at the lower right; the size of the largest opening determines the price. When specifying, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations below.

15

## Dimensions, in Inches

No. 1000

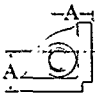



No. 1002

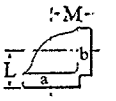
No. 1003

No. 1005

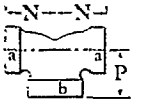
No. 1006




No. 1008



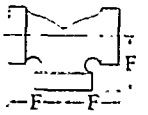

No. 1000
Reducing



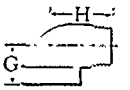

No. 1010
Reducing

| Size | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| 1¼ | 1¾ | 1 9/16 | 1 5/16 | 1⅛ | 1 1/16 | 2¼ | 1⅝ | 2⅝ | 1 3/16 | 1⅞ |
| 1½ | 1 15/16 | 1¾ | 1 7/16 | 1¼ | 1¼ | 2½ | 1 13/16 | 2 15/16 | 1¼ | 2 |
| 2 | 2¼ | 2 1/16 | 1 11/16 | 1 7/16 | 1⅜ | 3 1/16 | 2⅛ | 3 5/16 | 1¾ | 2 7/16 |
| 2½ | 2 11/16 | 2½ | 2 1/16 | 1¾ | 1⅝ | | | | | |
| 3 | 3 1/16 | 2⅞ | 2 3/16 | 2 | 1 13/16 | | | | | |
| 4 | 3 13/16 | 3⅜ | 2⅝ | 2 5/16 | 2 | | | | | |
| 5 | 4½ | 3⅞ | 3 1/16 | | | | | | | |
| 6 | 5⅛ | 4¼ | 3 7/16 | | | | | | | |
| 8 | 6½ | | 4 3/16 | | | | | | | |
| 10 | 8 1/16 | | 5 3/16 | | | | | | | |

No. 1009




No. 1010




No. 1057

No. 1058

| No. 1000, Reducing Size a | b | L | M |
|---|---|---|---|
| 1½ | 1¼ | 1 13/16 | 1⅞ |
| 2 | 1½ | 2⅛ | 2 5/16 |
| 4 | 3 | 3⅜ | 3¾ |

| No. 1010, Reducing Size a | b | N | P |
|---|---|---|---|
| 1¼ | 1½ | 2½ | 2⅜ |
| 1½ | 2 | 2 15/16 | 2 11/16 |

*Description....page 159*

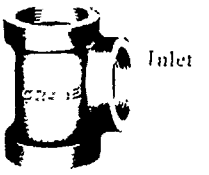
*Normal thread engagement....page 494*

# Cast Iron Drainage Fittings

*No. 1001
90° Elbow
Long Turn

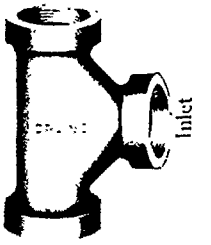
*No. 1001½
90° Elbow
Extra Long Turn

No. 1004
45° Elbow
Long Turn




No. 1017, Tee

*Inlets are pitched ¼-inch per foot.



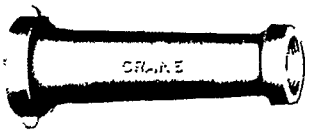

*No. 1018, Basin Tee

## List Prices, Each

| Size | No. 1001 90° Elbows Long Turn | | No. 1001½ 90° Elbows Extra Long Turn | | No. 1004 45° Elbows Long Turn | | No. 1017, Tees Straight | | No. 1017, Tees †Reducing | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1¼ | .75 | .98 | 1.10 | 1.40 | .75 | .98 | .85 | 1.10 | | |
| 1½ | .90 | 1.15 | 1.30 | 1.70 | .90 | 1.15 | 1.10 | 1.45 | 1.20 | 1.55 |
| 2 | 1.35 | 1.80 | 1.85 | 2.40 | 1.35 | 1.80 | 1.85 | 2.40 | 2.05 | 2.65 |
| 2½ | 2.70 | 3.50 | 3.65 | 4.75 | 2.70 | 3.50 | 3.50 | 4.55 | 3.85 | 5.00 |
| 3 | 3.60 | 4.70 | 5.00 | 6.50 | 3.60 | 4.70 | 4.60 | 6.00 | 5.00 | 6.50 |
| 4 | 6.40 | 8.30 | 8.50 | 11.00 | 6.40 | 8.30 | 7.70 | 10.00 | 8.50 | 11.00 |
| 5 | 12.00 | 15.50 | | | 12.00 | 15.50 | | | | |
| 6 | 16.50 | 21.50 | | | 16.50 | 21.50 | | | | |

| Size | No. 1018 Basin Tees | | No. 1033 †Increasers | | No. 1034 Roof Connections | | No. 1048 Tucker Connections | | No. 1070 Couplings | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1¼ | 1.20 | 1.60 | | | | | 1.45 | 1.90 | .95 | 1.25 |
| 1½ | 1.65 | 2.15 | | | 1.40 | 1.80 | 1.60 | 2.10 | 1.10 | 1.45 |
| 2 | 2.50 | 3.25 | 2.65 | 3.45 | 1.65 | 2.15 | 1.95 | 2.55 | 1.40 | 1.80 |
| 2½ | | | | | | | | | 1.90 | 2.45 |
| 3 | | | 4.15 | 5.40 | 2.10 | 2.75 | 3.50 | 4.55 | 2.90 | 3.80 |
| 4 | | | 5.85 | 7.60 | 3.05 | 4.00 | 7.25 | 9.50 | 4.15 | 5.40 |
| 5 | | | 9.20 | 12.00 | | | 11.50 | 15.00 | 7.00 | 9.10 |
| 6 | | | 11.00 | 14.50 | | | 14.00 | 18.20 | 9.30 | 12.00 |
| 8 | | | | | | | | | 19.00 | 24.70 |

†Prices of Reducing Tees and Increasers apply only to the sizes shown at the lower right; the size of the largest opening determines the price. When specifying reducing tees, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustration below.



No. 1033, Increaser

No. 1034
Roof Connection
(Straight threads)

No. 1070
Coupling

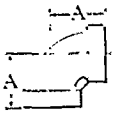
Roof Connections, used on steel or wrought iron vent pipes at the point they pass through a roof, form a counter-flashing at the top edge of the roof flashing around the pipe.

No. 1048
Tucker
Connection

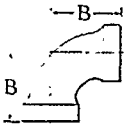
Tucker Connections in sizes 4 to 6-inch have a loose ring (not illustrated). The 2-inch size is malleable iron, it will fit within a 4-inch wall.

15

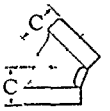
## Dimensions, in Inches



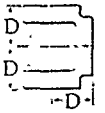

No. 1001



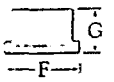

No. 1001½



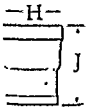

No. 1004



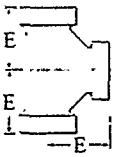

No. 1017




No. 1034



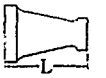

No. 1048



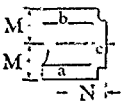

No. 1018

No. 1070

| Size | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| 1¼ | 2¼ | 3 | 1¾ | 1¾ | 2 5/16 | | | 3¼ | 3¾ | 3 |
| 1½ | 2½ | 3½ | 1⅞ | 1 15/16 | 2 11/16 | 2⅞ | 3 | 3½ | 4 | 3⅜ |
| 2 | 3 1/16 | 4 | 2¼ | 2 5/16 | 3½ | 3 13/16 | 2½ | 3⅜ | 4½ | 3¾ |
| 2½ | 3 11/16 | 4½ | 2½ | 2 11/16 | | | | | | 4 |
| 3 | 4¼ | 5¼ | 2 15/16 | 3 1/16 | | 4 15/16 | 3 | 5 5/16 | 4¾ | 4¼ |
| 4 | 5 3/16 | 6¼ | 3½ | 3 13/16 | | 6 | 3 | 6⅝ | 7 | 4½ |
| 5 | 6⅛ | | 4⅛ | | | | | 7 13/16 | 7 | 5¾ |
| 6 | 7⅛ | | 4⅞ | | | | | 9 | 7 | 5 |
| 8 | | | | | | | | | | 5⅝ |




No. 1033




No. 1017
Reducing

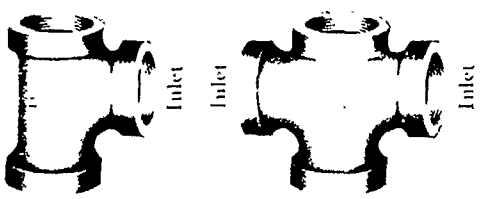
| No. 1033 Increasers Size | L |
|---|---|
| 2×1½ | 9 |
| 3×2 | 9 |
| 4×3 | 9 |
| ×2 | 9 |
| 5×4 | 9 |
| 6×5 | 9 |
| ×4 | 9 |

| No. 1017 Reducing Tee Size a | b | c | M | N |
|---|---|---|---|---|
| 1½ | 1½ | 1¼ | 1 15/16 | 1 15/16 |
| 2 | ×2 | ×1½ | 2 1/32 | 2 3/16 |
| | | ×1¼ | 2 1/32 | 2 3/16 |
| 2½ | ×2½ | ×2 | 2 13/32 | 2⅝ |
| 3 | ×3 | ×2 | 2 17/32 | 2⅞ |
| | | ×1½ | 2 17/32 | 2⅞ |
| 4 | ×4 | ×3 | 3½ | 3¾ |
| | | ×2 | 2¾ | 3 7/16 |

*Description . . . page 159*

*Thread engagement . . . page 494*

# Cast Iron Drainage Fittings

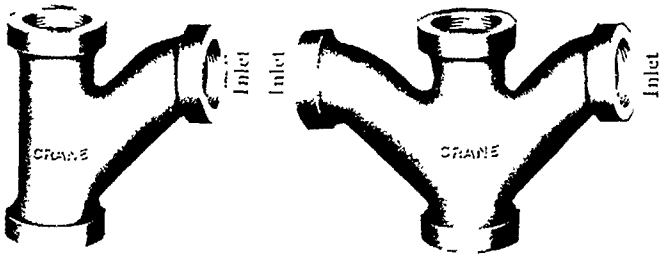



Tee Pattern

No. 1020
90° Y-Branch

No. 1024
90° Double Y-Branch

All inlets on Y-Branches are pitched 1/4-inch per foot.




Long Turn, Tee Pattern

No. 1022
90° Y-Branch

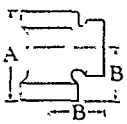
No. 1026
90° Double Y-Branch

## List Prices, Each

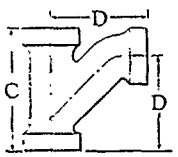
| Size | 90° Y-Branches | | | | | | | | 90° Double Y-Branches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. 1020 Tee Pattern | | | | No. 1022 Long Turn, Tee Pattern | | | | No. 1024 Tee Pattern | | | | No. 1026 Long Turn, Tee Pattern | | | |
| | Straight | | *Reducing | | Straight | | *Reducing | | Straight | | *Reducing | | Straight | | *Reducing | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1¼ | .85 | 1.10 | | | 1.45 | 1.90 | | | 1.55 | 2.00 | | | 2.30 | 3.00 | | |
| 1½ | 1.10 | 1.45 | 1.20 | 1.55 | 1.75 | 2.30 | 2.00 | 2.60 | 1.85 | 2.40 | 2.05 | 2.65 | 2.75 | 3.50 | 3.00 | 3.90 |
| 2 | 1.85 | 2.40 | 2.05 | 2.65 | 3.10 | 4.00 | 3.30 | 4.30 | 2.75 | 3.55 | 3.00 | 3.90 | 4.50 | 5.80 | 5.00 | 6.50 |
| 2½ | 3.50 | 4.55 | 3.85 | 5.00 | 5.60 | 6.90 | 6.10 | 8.00 | | | | | | | | |
| 3 | 4.60 | 6.00 | 5.00 | 6.50 | 8.30 | 10.80 | 9.00 | 11.70 | 7.50 | 9.75 | 8.50 | 11.00 | 12.00 | 15.50 | 13.00 | 17.00 |
| 4 | 7.70 | 10.00 | 8.50 | 11.00 | 14.00 | 18.00 | 16.00 | 21.00 | 14.00 | 18.00 | 15.50 | 20.00 | 21.50 | 28.00 | | |
| 5 | 13.00 | 16.90 | 14.50 | 20.00 | | | | | | | | | | | | |
| 6 | 20.00 | 26.00 | 21.00 | 27.50 | | | | | | | | | | | | |

*The prices of Reducing 90° Y-Branches apply only to the sizes shown at the lower right; the size of the largest opening determines the price. When specifying, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations below.

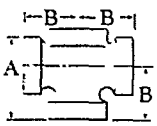
## Dimensions, in Inches



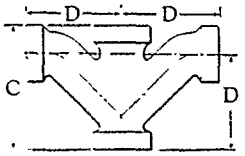

No. 1020




No. 1022



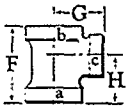

No. 1024



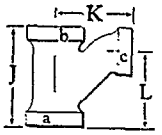

No. 1026

| Size | A | B | C | D |
|---|---|---|---|---|
| 1¼ | 3¾ | 2¼ | 4¾ | 3⅝ |
| 1½ | 4¼ | 2½ | 5⅜ | 4⅛ |
| 2 | 5 3/16 | 3 1/16 | 7 | 5¼ |
| 2½ | 6 5/16 | 3 11/16 | 8¼ | 6¼ |
| 3 | 7¼ | 4¼ | 9⅞ | 7½ |
| 4 | 8¾ | 5 3/16 | 13 | 9⅞ |
| 5 | 10 5/16 | 6⅛ | | |
| 6 | 11 15/16 | 7⅛ | | |

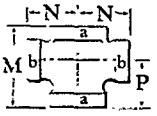
*Description. page 159*



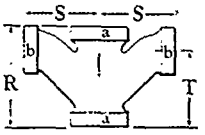

No. 1020, Reducing




No. 1022, Reducing




No. 1024, Reducing




No. 1026, Reducing

### Reducing 90° Y-Branches

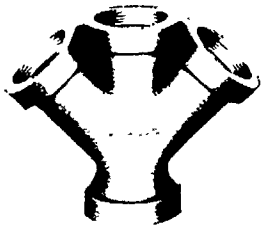
| Size a | b | c | No. 1020 F | G | H | No. 1022 J | K | L |
|---|---|---|---|---|---|---|---|---|
| 1½ | ×1½ | ×1¼ | 3⅞ | 2½ | 2⅜ | 5⅛ | 3⅞ | 3 15/16 |
| | ×1¼ | ×1¼ | 3⅞ | 2½ | 2⅜ | — | — | — |
| 2 | ×2 | ×1½ | 4⅝ | 2 15/16 | 2 11/16 | 5¾ | 4⅜ | 4 7/16 |
| | | ×1¼ | 4⅜ | 2 13/16 | 2 11/16 | 5¾ | 4⅜ | 4 7/16 |
| 2 | ×1½ | ×2 | 4 13/16 | 3 1/16 | 3 1/16 | 6⅜ | 5 7/16 | 5 7/16 |
| | | ×1½ | 4⅝ | 2 15/16 | 2 11/16 | — | — | — |
| 2½ | ×2½ | ×2 | 5½ | 3 5/16 | 3¼ | 7⅜ | 5¾ | 5¾ |
| 3 | ×3 | ×2½ | — | — | — | 9⅞ | 7½ | 7½ |
| | | ×2 | 5 11/16 | 3⅝ | 3 5/16 | 7 9/16 | 6 1/16 | 5 15/16 |
| | | ×1½ | 5 1/16 | 3 5/16 | 2 15/16 | 5 15/16 | 5 | 4⅝ |
| | | ×1¼ | 5 1/16 | 3 5/16 | 2 15/16 | — | — | — |
| 4 | ×4 | ×3 | 7⅜ | 4¾ | 4 5/16 | 10 | 8 1/16 | 7⅝ |
| | | ×2 | 5 13/16 | 4 1/16 | 3⅜ | 7 11/16 | 6⅝ | 6 1/16 |
| | | ×1½ | 5¼ | 3 13/16 | 3 | 6 1/16 | 5 7/16 | 4¾ |
| 5 | ×5 | ×4 | 9⅛ | 5 11/16 | 5⅜ | — | — | — |
| 6 | ×6 | ×5 | 10 9/16 | 6⅝ | 6¼ | — | — | — |
| | | ×4 | 9¼ | 6 3/16 | 5 7/16 | — | — | — |

| Size a | b | No. 1024 M | N | P | No. 1026 R | S | T |
|---|---|---|---|---|---|---|---|
| 1½ | ×1¼ | 3⅞ | 2½ | 2⅜ | 5⅛ | 3⅞ | 3 15/16 |
| 2 | ×1½ | 4⅝ | 2 15/16 | 2 11/16 | 5¾ | 4⅜ | 4 7/16 |
| | ×1¼ | 4⅝ | 2 15/16 | 2 11/16 | 5¾ | 4⅜ | 4 7/16 |
| 3 | ×2 | 5 11/16 | 3⅝ | 3 5/16 | 7 9/16 | 6 1/16 | 5 15/16 |
| | ×1½ | 5¼ | 3 7/16 | 3 | — | — | — |
| 4 | ×2 | 5 13/16 | 4 1/16 | 3⅜ | — | — | — |
| | ×1½ | 5¼ | 3 13/16 | 3 | — | — | — |

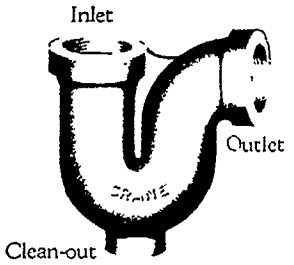
*Normal thread engagement....page 494*

# Cast Iron Drainage Fittings

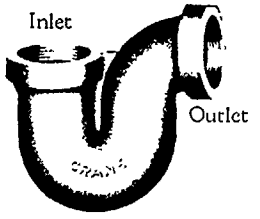
No. 1028
45° Y-Branch



No. 1030
45° Double Y-Branch




No. 1059
P Trap

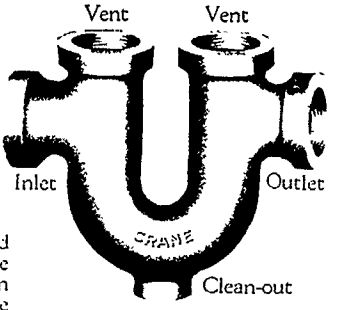



No. 1059½
Bath P Trap

## List Prices, Each

| Size | No. 1028 45° Y-Branches | | | | No. 1030 45° Double Y-Branches | | | |
|---|---|---|---|---|---|---|---|---|
| | Straight | | *Reducing | | Straight | | *Reducing | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1¼ | 1.05 | 1.40 | | | 2.20 | 2.90 | | |
| 1½ | 1.50 | 2.00 | 1.65 | 2.15 | 2.80 | 3.65 | | |
| 2 | 2.50 | 3.25 | 2.75 | 3.55 | 3.90 | 5.00 | 4.30 | 5.60 |
| 2½ | 4.45 | 5.75 | 4.70 | 6.15 | 6.50 | 8.50 | | |
| 3 | 5.85 | 7.60 | 6.60 | 8.60 | 9.80 | 12.70 | 10.80 | 14.00 |
| 4 | 11.00 | 14.50 | 12.00 | 15.60 | 18.00 | 23.50 | | |
| 5 | 16.50 | 21.50 | 18.50 | 24.00 | | | | |
| 6 | 26.50 | 34.50 | 29.00 | 36.00 | | | | |
| 8 | 64.00 | 83.00 | 70.00 | 91.00 | | | | |
| 10 | 97.00 | 126.00 | | | | | | |

| Size | No. 1038 Running Traps | | No. 1059 P Traps | | No. 1059½ Bath P Traps | |
|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. |
| 1¼ | 4.40 | 5.75 | 1.80 | 2.35 | | |
| 1½ | 4.75 | 6.20 | 2.00 | 2.60 | 2.00 | 2.60 |
| 2 | 7.00 | 9.10 | 3.50 | 4.55 | 3.00 | 3.90 |
| 3 | 14.00 | 18.00 | 7.00 | 9.10 | | |
| 4 | 28.00 | 36.50 | 17.50 | 23.00 | | |



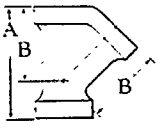

No. 1038
Running Trap

The outlet on P and Bath P Traps and the inlet and outlet on Running Traps are pitched ¼-inch per foot.

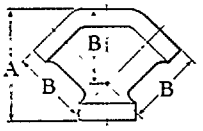
*The prices of Reducing 45° Y-Branches apply only to the sizes shown at the lower right; the size of the largest opening determines the price. When specifying, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations below.

*Description....page 159*
*Normal thread engagement....page 494*

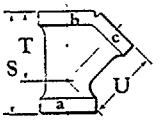
## Dimensions, in Inches



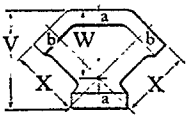

No. 1028




No. 1030

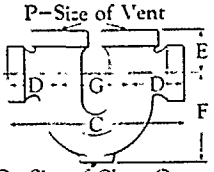



No. 1028, Reducing

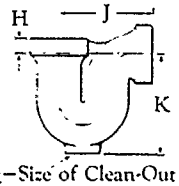



No. 1030, Reducing

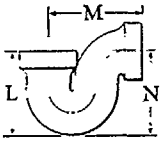
| Size | A | B |
|---|---|---|
| 1¼ | 5 | 3¼ |
| 1½ | 5½ | 3⅝ |
| 2 | 6½ | 4⅜ |
| 2½ | 7⅞ | 5⅜ |
| 3 | 9 | 6 3/16 |
| 4 | 10⅞ | 7 11/16 |
| 5 | 12 15/16 | 9 3/16 |
| 6 | 14¾ | 10¾ |
| 8 | 18 13/16 | 13 9/16 |
| 10 | 23 | 16½ |




No. 1038




No. 1059




No. 1059½

| Size | C | D | E | F | G | H | J | K | L | M | N | P | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1¼ | 7⅝ | 2¼ | 2 | 4½ | 3⅛ | ¾ | 3 15/16 | 4½ | | | | 1¼ | ¾ |
| 1½ | 8⅜ | 2½ | 2¼ | 4 15/16 | 3⅜ | ⅞ | 4⅜ | 5 | 4⅜ | 4½ | 4⅝ | 1½ | 1 |
| 2 | 10⅛ | 3 1/16 | 2 9/16 | 5 11/16 | 4 | ⅞ | 5 5/16 | 5 11/16 | 5⅜ | 5 5/16 | 5⅜ | 2 | 1 |
| 3 | 13¾ | 4 3/16 | 3½ | 7¾ | 5⅜ | 1 3/16 | 7⅛ | 7¾ | | | | 3 | 1¼ |
| 4 | 17¼ | 5⅛ | 4 3/16 | 9⅜ | 7 | 1½ | 9¼ | 9 3/16 | | | | 4 | 2 |

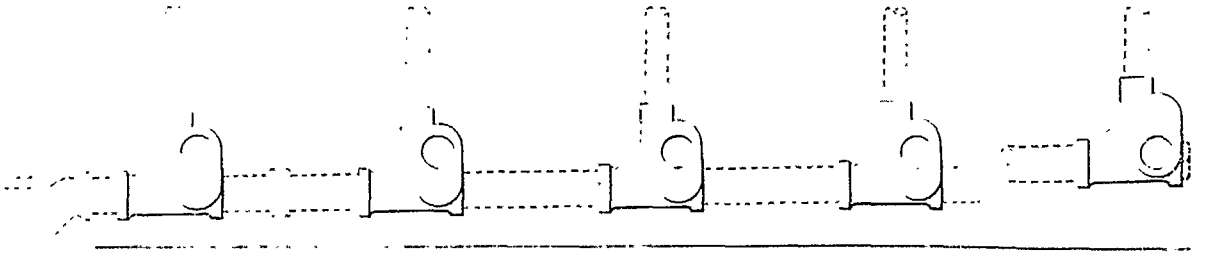
### Reducing 45° Y-Branches

| Size | | | No. 1028 | | |
|---|---|---|---|---|---|
| | b | c | S | T | U |
| 1½×1½×1¼ | | | 5¼ | 3½ | 3 7/16 |
| 2 | ×2 | ×1½ | 5⅞ | 4 1/16 | 4⅛ |
| | | ×1¼ | 5⅞ | 4 1/16 | 4⅛ |
| 2 | ×1½ | ×1½ | 5 7/16 | 3⅝ | 3⅝ |
| 2½×2½×2 | | | 7 1/16 | 4 15/16 | 5⅛ |
| | | ×1½ | 6 7/16 | 4 9/16 | 4⅝ |
| 3 | ×3 | ×2½ | 8 | 5 11/16 | 5 13/16 |
| | | ×2 | 7⅜ | 5 5/16 | 5⅜ |
| | | ×1½ | 6⅝ | 4 15/16 | 5 1/16 |
| 4 | ×4 | ×3 | 9¼ | 6⅞ | 7 3/16 |
| | | ×2 | 7 11/16 | 6 | 6 5/16 |
| | | ×1½ | 7 3/16 | 5¾ | 6 1/16 |
| 5 | ×5 | ×4 | 11⅜ | 8 7/16 | 8½ |
| 6 | ×6 | ×5 | 13 | 9 13/16 | 10 |
| | | ×4 | 11⅞ | 9 1/16 | 9⅜ |
| 8 | ×8 | ×6 | 14 15/16 | 11⅞ | 12⅜ |
| | | ×4 | 11 7/16 | 10 7/16 | 11 |

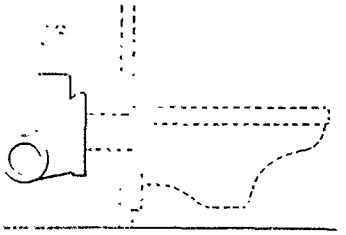
| Size | | No. 1030 | | |
|---|---|---|---|---|
| a | b | V | W | X |
| 2 | ×1½ | 5⅞ | 4 1/16 | 4⅛ |
| 3 | ×2 | 7⅜ | 5 5/16 | 5⅜ |

# Crane-Hulbert Drainage Fittings

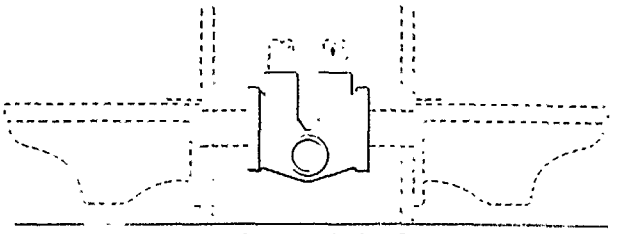
## For Wall Closets



Typical Installation of Crane-Hulbert Fittings
Side View



Single Battery of Wall Closets
End View



Double Battery of Wall Closets
End View

### *Designed to Simplify Wall Closet Installation*

Crane-Hulbert Drainage Fittings are especially designed to facilitate the installation of single or double batteries of wall closets. Their compact construction, economy of installation, and simplification of waste and vent piping are a combination of features that fulfill a specific need with efficiency and thoroughness.

### *Permits Drain Line Above the Floor*

The primary function of the fittings is to permit installation of a lateral drain line above the floor, accurately pitched according to proper plumbing practice, with the closets of the battery set at a uniform height from the floor. To accomplish such an arrangement, Crane-Hulbert Fittings have inlet openings located at progressive distances above the center of the drain line.

### *Used with Two Types of Wall Closets*

The fittings are used with wall closets of two types: the blow-out or the siphon jet. When the blow-out type is used, twelve closets in a single battery or twenty-four closets in a double battery may be installed. When the siphon jet type is used, six closets in a single battery or twelve closets in a double battery may be installed. In either case, a high sanitary standard is maintained. Drainage is rapid and thorough. The unobstructed space beneath the closet bowl is easily cleaned.

### *Low Cost—Easy Installation*

With Crane-Hulbert Fittings, expensive construction costs are minimized. Their use eliminates the need to raise floors or to provide grooves in ceilings to accommodate the piping essential to the installation of floor type closets. Each fitting combines into a single casting the advantages of a drainage elbow, nipple, and Y-branch, thus eliminating two fittings and two screwed joints on every closet installed.

### *A Complete Line*

The complete line includes long turn fittings with screwed ends or with hub and spigot ends in a wide assortment of types and sizes. The fittings are furnished black or galvanized. In addition to the long turn design illustrated on this page, Short Turn Crane-Hulbert Drainage Fittings are available. Short Turn Fittings are furnished single pattern with screwed ends only. They are used to advantage where space is limited, especially near the stack.

### *Supporting Fittings Also Available*

Supporting fittings for wall closets are also available. Two type are furnished: the supporting flange type for use with iron pipe connections, and the supporting chair type for use with either iron or lead pipe connections. The chair type has a base which is built into the floor; the flange type has leveling bolts instead of a base. Complete information will be furnished on request.

***Complete information, prices, and dimensions will be furnished on application.***

Iron Plugs &
Bushings; Steel Nipples;
Couplings; Clamps

# Iron Plugs and Bushings; Steel Nipples; Couplings; Clamps

Plugs and Bushings
Iron.....pages 166 and 167

Nipples
Wrought Steel.....pages 168 and 169

Pipe Couplings
Steel.....page 170

Couplings
Dresser.....page 172
Rolagrip.....page 172
Gruvagrip.....page 172

Clamps
Single Strap and Double Strap.....page 171
Band-It.....page 171
Dresser.....page 172

The fittings mentioned above have been grouped together in this section of the catalog because they are used generally with Malleable Iron and Cast Iron Screwed Fittings.



For greater convenience, the following fittings are shown with related products in other sections of this catalog:

Hydrant Clamps.....page 67
Wood Rod Couplings.....page 67
Street Washer Keys.....page 67
Hydrant Handles.....page 67

Brass Couplings.....pages 184 and 186
Brass Locknuts.....page 184
Brass Plugs and Bushings.....page 185
Brass Nipples.....page 186

Steel Plugs and Bushings.....page 260
Malleable Iron Couplings.....pages 140, 144 and 146
AAR Malleable Iron Couplings.....page 148
Forged Steel Couplings.....pages 258 and 259

# Iron Plugs

Cored Solid
Square Head Plugs

Cored Solid
Bar Plugs

Countersunk Plug
*1/4 and 3/8-inch sizes have a hexagon hole.*

List Prices, Each

| Size | Square Head Plugs Right Hand | | | | Bar Plugs Right Hand | | | | Countersunk Plugs Right Hand | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cored | | Solid | | Cored | | Solid | | | |
| Inches | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | | | .07 | .12 | | | | | | |
| 1/4 | | | .07 | .12 | | | | | .13 | .22 |
| 3/8 | | | .07 | .12 | | | | | .13 | .22 |
| 1/2 | | | .07 | .12 | | | | | .13 | .22 |
| 3/4 | .09 | .15 | .18 | .30 | | | | | .18 | .30 |
| 1 | .10 | .17 | .20 | .34 | | | | | .20 | .34 |
| 1 1/4 | .14 | .24 | .22 | .37 | | | | | .22 | .37 |
| 1 1/2 | .19 | .32 | .29 | .49 | | | | | .29 | .49 |
| 2 | .27 | .46 | .40 | .68 | | | | | .40 | .68 |
| 2 1/2 | .46 | .78 | .58 | .98 | | | | | .58 | .98 |
| 3 | .65 | 1.10 | .94 | 1.60 | | | | | .94 | 1.60 |
| 3 1/2 | 1.00 | 1.70 | 1.45 | 2.45 | | | | | 1.65 | 2.80 |
| 4 | | | | | 1.15 | 1.95 | 1.75 | 3.00 | 2.80 | 4.75 |
| 5 | | | | | 1.95 | 3.30 | 2.90 | 4.90 | | |
| 6 | | | | | 2.30 | 3.90 | 3.50 | 6.00 | | |
| 8 | | | | | 4.40 | 7.50 | 6.00 | 10.00 | | |

**Service suggestions:** Cored and Countersunk Plugs are generally used with:

125-Pound Cast Iron Fittings
150-Pound Malleable Iron Fittings

Solid Plugs are generally used with:

250-Pound Cast Iron Fittings
300-Pound Malleable Iron Fittings

Solid Plugs sizes 3/8-inch and smaller are recommended for the same pressures and temperatures as the No. 309 Steel Plugs shown on page 260.

**American Standard:** These plugs conform to the American Standard for Ferrous Plugs with Pipe Threads (B16.14-1949).

Materials

| Style | | Steel | Malleable Iron | Cast Iron |
|---|---|---|---|---|
| Square Head | Cored | | | All sizes |
| | Solid | 1/8 to 1/2" | | 3/4" and larger |
| Bar | Cored | | | All sizes |
| | Solid | | | All sizes |
| Countersunk | | 1/4 to 1/2" | 3/4 to 1 1/4" | 1 1/2" and larger |

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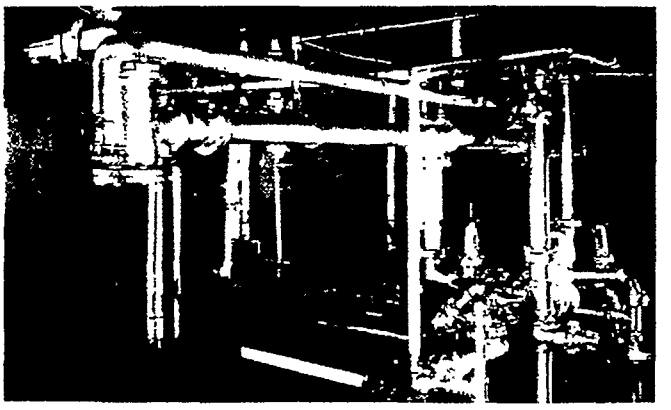


Diversified and complete, the Crane line fulfills the requirements of specialized or general piping installations.

# Iron Bushings

Outside Hexagon

Inside Hexagon

Face

*Face Bushings in sizes 3/4-inch and smaller do not have lugs (not illustrated).*

Eccentric

List Prices, Each

| Size | Hexagon Bushings | | Face Bushings | | Eccentric Bushings | |
|---|---|---|---|---|---|---|
| Inches | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/4 | .12 | .18 | .18 | .27 | | |
| 3/8 | .12 | .18 | .18 | .27 | | |
| 1/2 | .13 | .20 | .20 | .30 | | |
| 3/4 | .15 | .22 | .24 | .36 | | |
| 1 | .17 | .26 | .28 | .42 | | |
| 1 1/4 | .21 | .32 | .36 | .54 | .60 | .90 |
| 1 1/2 | .25 | .38 | .45 | .69 | .66 | 1.00 |
| 2 | .30 | .45 | .61 | .92 | .90 | 1.35 |
| 2 1/2 | .42 | .63 | .80 | 1.20 | 1.50 | 2.25 |
| 3 | .57 | .85 | 1.05 | 1.60 | 2.10 | 3.15 |
| 3 1/2 | .90 | 1.35 | 1.75 | 2.65 | 2.80 | 4.25 |
| 4 | 1.15 | 1.75 | 2.10 | 3.15 | 3.70 | 5.50 |
| 5 | 2.00 | 3.00 | 3.20 | 4.80 | 5.00 | 7.50 |
| 6 | 2.40 | 3.60 | 4.80 | 7.20 | 6.60 | 10.00 |
| 8 | 4.50 | 6.70 | 13.00 | 19.50 | | |

List prices shown at the left apply only to stock items. A tabulation of the sizes carried in stock and the materials from which they are made—cast iron, malleable iron, or steel—is shown in the table below. Other sizes or materials are special; prices are furnished on application.

Bushings Carried in Stock

| Hexagon | | | Face | | | Eccentric | |
|---|---|---|---|---|---|---|---|
| 1/4 ×1/8 s | 2 ×1 1/2 m | 4×3 1/2 | 1/4 ×1/8 s | 2 1/2×2 m | | 1 1/4×3/4 | 3 1/2×2 1/2 |
| 3/8 ×1/4 s | ×1 1/4 | ×3 | 3/8 ×1/4 s | ×1 1/2 m | | ×1/2 | ×2 |
| ×1/8 s | ×1 | ×2 1/2 | ×1/8 s | ×1 1/4 m | | 1 1/2×3/4 | ×1 1/2 |
| 1/2 ×3/8 m | ×3/4 | ×2 | 1/2 ×3/8 s | 3 ×2 1/2 m | | ×1/2 | ×1 1/4 |
| ×1/4 m | ×1/2 | ×1 1/2 | ×1/4 s | ×2 m | | 2 ×1 1/4 | 4 ×3 |
| ×1/8 m | ×3/8 | ×1 1/4 | ×1/8 s | ×1 1/2 m | | ×1 | ×2 1/2 |
| 3/4 ×1/2 m | ×1/4 | ×1 | 3/4 ×1/2 s | ×1 1/4 m | | ×3/4 | ×2 |
| ×3/8 m | 2 1/2×2 m | 5×4 | ×3/8 s | 3 1/2×3 m | | ×1/2 | ×1 1/2 |
| ×1/4 | ×1 1/2 | ×3 1/2 | ×1/4 s | ×2 1/2 m | | 2 1/2×1 1/2 | ×1 1/4 |
| ×1/8 | ×1 1/4 | ×3 | 1 ×3/4 m | ×2 m | | ×1 1/4 | ×1 |
| 1 ×3/4 m | ×1 | ×2 1/2 | ×1/2 m | 4 ×3 1/2 m | | ×1 | 5 ×4 |
| ×1/2 | ×3/4 | ×2 | ×3/8 m | ×3 m | | ×3/4 | ×3 1/2 |
| ×3/8 | ×1/2 | 6×5 | ×1/4 m | ×2 1/2 m | | ×1/2 | ×3 |
| ×1/4 | 3 ×2 1/2 | ×4 | 1 1/4×1 m | ×2 | | 3 ×2 | ×2 1/2 |
| ×1/8 | ×2 | ×3 1/2 | ×3/4 m | 5 ×4 m | | ×1 1/2 | ×2 |
| 1 1/4×1 m | ×1 1/2 | ×3 | ×1/2 m | ×3 | | ×1 1/4 | 6 ×4 |
| ×3/4 | ×1 1/4 | ×2 1/2 | 1 1/2×1 1/4 m | 6 ×5 m | | ×1 | ×3 |
| ×1/2 | ×1 | ×2 | ×1 m | ×4 | | ×3/4 | ×2 1/2 |
| ×3/8 | ×3/4 | 8×6 | ×3/4 m | ×3 | | | ×2 |
| ×1/4 | ×1/2 | ×5 | ×1/2 m | 8 ×6 m | | | |
| 1 1/2×1 1/4 m | 3 1/2×3 | ×4 | 2 ×1 1/2 m | | | | |
| ×1 | ×2 1/2 | ×3 1/2 | ×1 1/4 m | | | | |
| ×3/4 | ×2 | ×3 | ×1 m | | | | |
| ×1/2 | ×1 1/2 | | ×3/4 m | | | | |
| ×3/8 | ×1 1/4 | | ×1/2 m | | | | |
| ×1/4 | ×1 | | | | | | |

Notes

m—Letter "m" indicates sizes made of malleable iron.

s—Letter "s" indicates sizes made of steel.

Sizes not indicated with either "m" or "s" are made of cast iron.

Hexagon bushing sizes set in light face type have an inside hexagon. Other sizes (set in bold face type) are made with an outside hexagon.

# Wrought Steel Nipples

Close Nipple

Long Nipple

## Standard Black Right Hand Nipples

| Pipe Size | Length Inches | List Prices, Each | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Length | | | | | | | | | | | | | | | |
| Inches | Close | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ⅛ | ¾ | .19 | .19 | .20 | .21 | .22 | .23 | .25 | .27 | .29 | .31 | .33 | .38 | .42 | .46 | .50 | .53 | .57 |
| ¼ | ⅞ | .18 | .19 | .20 | .21 | .22 | .23 | .25 | .27 | .29 | .31 | .33 | .38 | .42 | .46 | .50 | .53 | .57 |
| ⅜ | 1 | .18 | .19 | .20 | .21 | .22 | .23 | .25 | .27 | .29 | .31 | .33 | .38 | .42 | .46 | .50 | .53 | .57 |
| ½ | 1⅛ | .19 | .20 | .22 | .23 | .25 | .27 | .29 | .31 | .33 | .35 | .37 | .43 | .47 | .51 | .56 | .60 | .65 |
| ¾ | 1⅜ | .24 | | .26 | .27 | .29 | .31 | .33 | .36 | .39 | .42 | .45 | .52 | .58 | .63 | .69 | .74 | .80 |
| 1 | 1½ | .35 | | .38 | .41 | .43 | .46 | .49 | .52 | .56 | .59 | .62 | .70 | .78 | .85 | .93 | 1.01 | 1.09 |
| 1¼ | 1⅝ | .44 | | .48 | .50 | .53 | .57 | .61 | .65 | .70 | .74 | .78 | .89 | .99 | 1.09 | 1.19 | 1.29 | 1.39 |
| 1½ | 1¾ | .53 | | .56 | .61 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.07 | 1.19 | 1.31 | 1.43 | 1.55 | 1.67 |
| 2 | 2 | .68 | | | .75 | .82 | .88 | .95 | 1.02 | 1.09 | 1.16 | 1.23 | 1.38 | 1.54 | 1.70 | 1.86 | 2.02 | 2.18 |
| 2½ | 2½ | 1.36 | | | | 1.48 | 1.60 | 1.72 | 1.82 | 1.94 | 2.06 | 2.18 | 2.45 | 2.72 | 2.99 | 3.26 | 3.53 | 3.80 |
| 3 | 2⅝ | 1.72 | | | | 1.84 | 1.98 | 2.12 | 2.24 | 2.39 | 2.54 | 2.69 | 3.04 | 3.39 | 3.74 | 4.09 | 4.44 | 4.79 |
| 3½ | 2¾ | 2.46 | | | | | | 2.94 | 3.10 | 3.37 | 3.63 | 3.89 | 4.37 | 4.85 | 5.33 | 5.81 | 6.29 | 6.77 |
| 4 | 2⅞ | 2.80 | | | | | | 3.36 | 3.55 | 3.85 | 4.15 | 4.45 | 4.99 | 5.54 | 6.09 | 6.64 | 7.19 | 7.74 |
| 5 | 3 | 4.88 | | | | | | | 6.05 | 6.44 | 6.83 | 7.22 | 7.97 | 8.72 | 9.47 | 10.22 | 10.97 | 11.72 |
| 6 | 3⅛ | 6.57 | | | | | | | 8.10 | 8.61 | 9.11 | 9.63 | 10.59 | 11.55 | 12.51 | 13.47 | 14.43 | 15.39 |
| 8 | 3½ | 14.88 | | | | | | | | 16.60 | 17.18 | 17.76 | 18.92 | 20.08 | 21.24 | 22.40 | 23.56 | 24.72 |
| 10 | 3⅞ | 20.35 | | | | | | | | 21.89 | | 23.47 | 25.05 | 26.63 | 28.21 | 29.79 | 31.37 | 32.95 |
| 12 | 4½ | 27.00 | | | | | | | | | | 30.44 | | 35.04 | 37.34 | 39.64 | 41.94 | 44.24 |

## Extra Strong Black Right Hand Nipples

| Pipe Size | Length Inches | List Prices, Each | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Length | | | | | | | | | | | | | | | |
| Inches | Close | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ⅛ | ¾ | .39 | .40 | .43 | .46 | .49 | .52 | .55 | .58 | .62 | .66 | .70 | .80 | .89 | .97 | 1.05 | 1.13 | 1.21 |
| ¼ | ⅞ | .28 | .28 | .30 | .32 | .34 | .36 | .38 | .40 | .43 | .46 | .49 | .56 | .61 | .67 | .72 | .78 | .84 |
| ⅜ | 1 | .28 | .28 | .30 | .32 | .34 | .36 | .38 | .40 | .43 | .46 | .49 | .56 | .61 | .67 | .72 | .78 | .84 |
| ½ | 1⅛ | .28 | .30 | .32 | .34 | .37 | .40 | .43 | .47 | .50 | .53 | .56 | .65 | .71 | .77 | .83 | .89 | .96 |
| ¾ | 1⅜ | .36 | | .39 | .41 | .44 | .47 | .50 | .54 | .58 | .62 | .66 | .76 | .84 | .92 | 1.00 | 1.08 | 1.17 |
| 1 | 1½ | .53 | | .57 | .61 | .64 | .68 | .72 | .77 | .81 | .86 | .91 | 1.03 | 1.14 | 1.25 | 1.36 | 1.48 | 1.60 |
| 1¼ | 1⅝ | .66 | | .70 | .75 | .80 | .85 | .91 | .97 | 1.03 | 1.09 | 1.15 | 1.32 | 1.47 | 1.61 | 1.76 | 1.90 | 2.04 |
| 1½ | 1¾ | .79 | | .84 | .91 | .97 | 1.04 | 1.11 | 1.18 | 1.26 | 1.33 | 1.41 | 1.58 | 1.76 | 1.93 | 2.11 | 2.29 | 2.47 |
| 2 | 2 | 1.03 | | | 1.13 | 1.23 | 1.32 | 1.42 | 1.53 | 1.63 | 1.74 | 1.84 | 2.07 | 2.30 | 2.54 | 2.78 | 3.02 | 3.26 |
| 2½ | 2½ | 2.02 | | | | 2.19 | 2.37 | 2.55 | 2.69 | 2.87 | 3.04 | 3.22 | 3.61 | 4.00 | 4.40 | 4.80 | 5.20 | 5.60 |
| 3 | 2⅝ | 2.58 | | | | 2.74 | 2.95 | 3.16 | 3.34 | 3.56 | 3.78 | 4.00 | 4.52 | 5.04 | 5.56 | 6.08 | 6.60 | 7.12 |
| 3½ | 2¾ | 3.65 | | | | | | 4.36 | 4.59 | 4.99 | 5.37 | 5.79 | 6.49 | 7.19 | 7.89 | 8.59 | 9.29 | 9.99 |
| 4 | 2⅞ | 4.17 | | | | | | 5.00 | 5.28 | 5.72 | 6.17 | 6.61 | 7.41 | 8.23 | 9.04 | 9.85 | 10.67 | 11.48 |
| 5 | 3 | 7.31 | | | | | | | 9.06 | 9.65 | 10.23 | 10.82 | 11.94 | 13.06 | 14.18 | 15.37 | 16.43 | 17.54 |
| 6 | 3⅛ | 9.98 | | | | | | | 12.34 | 13.12 | 13.89 | 14.69 | 16.17 | 17.65 | 19.13 | 20.61 | 22.10 | 23.58 |

*For description and footnotes, see the opposite page.*

*Genuine Wrought Iron Nipples — prices on application.*

# Wrought Steel Nipples

Close Nipple

Long Nipple

## Standard Galvanized Right Hand Nipples

| Pipe Size | Length Inches | List Prices, Each | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Close | Length | | | | | | | | | | | | | | | |
| Inches | Close | | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ⅛ | ¾ | .23 | .23 | .25 | .27 | .29 | .31 | .33 | .35 | .38 | .41 | .44 | .52 | .57 | .62 | .67 | .72 | .77 |
| ¼ | ⅞ | .22 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .36 | .38 | .41 | .49 | .53 | .57 | .62 | .66 | .71 |
| ⅜ | 1 | .22 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .36 | .38 | .41 | .49 | .53 | .57 | .62 | .66 | .71 |
| ½ | 1⅛ | .22 | .24 | .26 | .28 | .30 | .33 | .35 | .37 | .40 | .43 | .45 | .53 | .58 | .63 | .69 | .74 | .80 |
| ¾ | 1⅜ | .28 | | .31 | .33 | .35 | .38 | .41 | .44 | .48 | .51 | .55 | .64 | .71 | .77 | .85 | .92 | .99 |
| 1 | 1½ | .42 | | .45 | .49 | .52 | .56 | .60 | .64 | .68 | .72 | .76 | .86 | .96 | 1.05 | 1.15 | 1.25 | 1.35 |
| 1¼ | 1⅝ | .53 | | .57 | .61 | .64 | .69 | .75 | .80 | .86 | .91 | .97 | 1.10 | 1.23 | 1.35 | 1.48 | 1.60 | 1.73 |
| 1½ | 1¾ | .63 | | .68 | .74 | .79 | .85 | .91 | .98 | 1.05 | 1.11 | 1.17 | 1.32 | 1.47 | 1.62 | 1.77 | 1.92 | 2.07 |
| 2 | 2 | .82 | | | .91 | .99 | 1.07 | 1.16 | 1.25 | 1.34 | 1.43 | 1.52 | 1.71 | 1.91 | 2.11 | 2.31 | 2.52 | 2.72 |
| 2½ | 2½ | 1.69 | | | | 1.84 | 1.99 | 2.15 | 2.28 | 2.43 | 2.59 | 2.74 | 3.09 | 3.43 | 3.78 | 4.12 | 4.47 | 4.81 |
| 3 | 2⅝ | 2.14 | | | | 2.29 | 2.47 | 2.65 | 2.82 | 3.01 | 3.20 | 3.39 | 3.84 | 4.28 | 4.73 | 5.18 | 5.62 | 6.07 |
| 3½ | 2¾ | 3.04 | | | | | | 3.66 | 3.86 | 4.20 | 4.53 | 4.85 | 5.46 | 6.07 | 6.68 | 7.29 | 7.90 | 8.51 |
| 4 | 2⅞ | 3.47 | | | | | | 4.19 | 4.43 | 4.81 | 5.19 | 5.57 | 6.25 | 6.95 | 7.65 | 8.35 | 9.05 | 9.75 |
| 5 | 3 | 6.01 | | | | | | | 7.49 | 7.99 | 8.48 | 8.98 | 9.92 | 10.88 | 11.83 | 12.83 | 13.73 | 14.68 |
| 6 | 3⅛ | 8.09 | | | | | | | 10.02 | 10.67 | 11.30 | 11.96 | 13.18 | 14.39 | 15.61 | 16.83 | 18.05 | 19.27 |

Crane Nipples, shown on this and the opposite page, are of unusually high quality and have accurately cut threads. They are made of new, full weight, mill tested pipe.

**Standard Butt Nipples, Right Hand:** Standard Black Butt Nipples ⅛ to 12-inch and Standard Galvanized Butt Nipples ⅛ to 6-inch can be furnished at an advance in price over corresponding Close Nipples; see the Crane Discount Sheet.

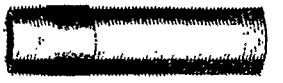
**Standard Right and Left Nipples, Black:** Standard Right and Left Nipples, Black only, 4 inches long only, in ⅜ to 2-inch pipe sizes, can be furnished at an advance in price over the corresponding Standard Black Right Hand Nipples; see the Crane Discount Sheet.

**Extra Strong Galvanized Right Hand Nipples:** Extra Strong Galvanized Right Hand Nipples in ⅛ to 6-inch pipe sizes can be furnished at an advance in price over Extra Strong Black Right Hand Nipples; see the Crane Discount Sheet.

**Seamless Steel Nipples:** Seamless Steel Black Right Hand Nipples can be furnished as follows: (1) Standard in 2 to 12-inch pipe sizes; they use the same list prices as corresponding Standard Wrought Steel Nipples but are sold at an advance in price. (2) Extra Strong in 2 to 6-inch pipe sizes; they use the same list prices as corresponding Extra Strong Wrought Steel Nipples but are sold at an advance in price. (3) Double Extra Strong in 2 to 6-inch pipe sizes; these are sold at an advance in price over corresponding Extra Strong Seamless Steel Nipples. See the Crane Discount Sheet.

**Seamless Steel Pressure Tube Nipples:** Seamless Steel Pressure Tube Nipples (I.P.S.), Right Hand Black only, can be furnished as follows: Standard in ⅛ to 1½-inch sizes, Extra Strong in ⅛ to 1½-inch sizes, and Double Extra Strong in ½ to 1½-inch sizes. See the Crane Discount Sheet for prices.

## Standard Tank Nipples



Tank Nipple

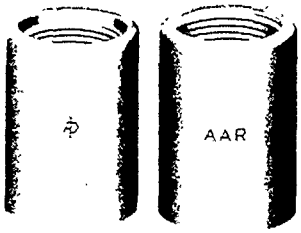
Tank Nipples have a Standard Taper Pipe Thread on one end. The other end has a Standard Taper Pipe Thread running into an American Standard Locknut Thread for a total thread length of 4 inches.

| Pipe Size | Length | List Prices Each | |
|---|---|---|---|
| Inches | Inches | Black | Galv. |
| ¼ | 6 | .83 | .96 |
| ⅜ | 6 | .83 | .96 |
| ½ | 6 | .89 | 1.02 |
| ¾ | 6 | 1.10 | 1.27 |
| 1 | 6 | 1.35 | 1.55 |
| 1¼ | 6 | 1.75 | 2.01 |
| 1½ | 6 | 2.05 | 2.35 |
| 2 | 6 | 2.63 | 3.03 |
| 2½ | 6 | 4.50 | 5.18 |
| 3 | 6 | 5.35 | 6.16 |

# Steel Pipe Couplings

Standard Right Hand — Standard Right and Left

Extra Heavy
Right Hand—Recessed
Right Hand—Not Recessed
Right and Left—Not Recessed




API Line Pipe Right Hand Recessed — AAR 300-Pound Right Hand Not Recessed

Half Coupling
Standard or Extra Heavy
Not Recessed

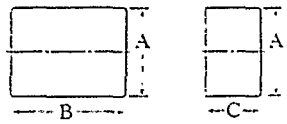
## List Prices, per 100 Pieces

Asterisk indicates straight tapped couplings; all others are taper tapped.

| Type | Size | Standard Couplings | | Extra Heavy Couplings "Not Recessed" R.H. Couplings furnished only when specified. | | | | API Line Pipe Couplings | | AAR Couplings | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Not Recessed | | Recessed | | Recessed | | Not Recessed | |
| | In. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| Right Hand | 1/8 | * 3.30 | * 5.10 | †14.10 | †17.25 | †14.10 | †17.25 | On request | | — | — |
| | 1/4 | * 4.90 | * 6.50 | †19.90 | †21.70 | †19.90 | †21.70 | 19.90 | 21.70 | 19.90 | 21.70 |
| | 3/8 | * 5.30 | * 6.70 | †21.20 | †23.00 | †21.20 | †23.00 | 21.20 | 23.00 | 21.20 | 23.00 |
| | 1/2 | * 7.60 | * 8.90 | †28.00 | †33.80 | †28.00 | †33.80 | 28.00 | 33.80 | 28.00 | 33.80 |
| | 3/4 | *10.80 | *13.30 | †34.50 | †40.00 | †34.50 | †40.00 | 34.50 | 40.00 | 34.50 | 40.00 |
| | 1 | *15.60 | *18.60 | †51.80 | †57.30 | †51.80 | †57.30 | 51.80 | 57.30 | 51.80 | 57.30 |
| | 1 1/4 | *19.00 | *23.20 | †54.00 | †61.80 | †54.00 | †61.80 | 54.00 | 61.80 | 54.00 | 61.80 |
| | 1 1/2 | *25.40 | *30.30 | †58.20 | †67.00 | †58.20 | †67.00 | 58.20 | 67.00 | 58.20 | 67.00 |
| | 2 | *38.30 | *47.40 | 98.80 | 122.00 | 98.80 | 122.00 | 98.80 | 122.00 | 98.80 | 122.00 |
| | 2 1/2 | 71.40 | 86.90 | 162.00 | 192.00 | 162.00 | 192.00 | 162.00 | 192.00 | 162.00 | 192.00 |
| | 3 | 105.00 | 127.80 | 192.60 | 224.00 | 192.60 | 224.00 | 192.60 | 224.00 | 192.60 | 224.00 |
| | 3 1/2 | 155.00 | 191.40 | 256.50 | 303.60 | 256.50 | 303.60 | 256.50 | 303.60 | — | — |
| | 4 | 193.00 | 226.00 | 291.00 | 339.60 | 291.00 | 339.60 | 291.00 | 339.60 | — | — |
| | 5 | On request | | On request | | On request | | On request | | — | — |
| | 6 | | | | | | | | | — | — |
| | 8 | — | — | — | — | | | | | — | — |
| | 10 | — | — | — | — | | | | | — | — |
| | 12 | — | — | — | — | | | | | — | — |
| Right and Left | 1/4 | 10.30 | 11.90 | On request | | | | | | | |
| | 3/8 | 10.80 | 12.60 | | | | | | | | |
| | 1/2 | 15.50 | 18.30 | 27.50 | 35.00 | | | | | | |
| | 3/4 | 19.20 | 21.70 | 40.00 | 48.60 | | | | | | |
| | 1 | 26.20 | 29.30 | 58.00 | 70.00 | | | | | | |
| | 1 1/4 | 30.00 | 34.20 | 63.00 | 77.00 | | | | | | |
| | 1 1/2 | 35.60 | 40.60 | 70.50 | 83.40 | | | | | | |
| | 2 | 60.00 | 69.00 | 109.00 | 132.00 | | | | | | |
| | 2 1/2 | On request | | On request | | | | | | | |
| | 3 | | | | | | | | | | |
| Half, Right Hand | 1/8 | * 2.60 | * 4.10 | On request | | | | | | | |
| | 1/4 | * 3.90 | * 5.20 | 15.90 | 17.40 | | | | | | |
| | 3/8 | * 4.30 | * 5.40 | 17.00 | 18.40 | | | | | | |
| | 1/2 | * 6.10 | * 7.10 | 22.30 | 27.00 | | | | | | |
| | 3/4 | * 8.70 | *10.70 | 27.60 | 32.10 | | | | | | |
| | 1 | *12.50 | *14.90 | 41.50 | 45.80 | | | | | | |
| | 1 1/4 | *15.30 | *18.60 | 43.30 | 49.50 | | | | | | |
| | 1 1/2 | *20.30 | *24.30 | 46.60 | 53.50 | | | | | | |
| | 2 | *30.60 | *38.00 | 79.00 | 97.70 | | | | | | |
| | 2 1/2 | 57.10 | 69.50 | 129.60 | 153.60 | | | | | | |
| | 3 | 84.00 | 102.20 | 154.00 | 179.30 | | | | | | |
| | 3 1/2 | 124.00 | 153.00 | 205.20 | 243.00 | | | | | | |
| | 4 | 154.30 | 180.70 | 232.80 | 271.70 | | | | | | |
| | 5 | On request | | On request | | | | | | | |
| | 6 | | | | | | | | | | |

*These sizes (regularly straight tapped) are available taper tapped; prices on request.
†These sizes (regularly taper tapped) are available straight tapped; prices on request.

## Dimensions, in Inches




Coupling — Half Coupling

| Type | Size | A | B | C |
|---|---|---|---|---|
| Standard | 1/8 | .563 | 13/16 | 11/32 |
| | 1/4 | .719 | 13/16 | 17/32 |
| | 3/8 | .875 | 13/16 | 17/32 |
| | 1/2 | 1.063 | 19/16 | 23/32 |
| | 3/4 | 1.313 | 1 5/8 | 3/4 |
| | 1 | 1.576 | 2 | 15/16 |
| | 1 1/4 | 1.900 | 2 1/16 | 31/32 |
| | 1 1/2 | 2.200 | 2 1/16 | 31/32 |
| | 2 | 2.750 | 2 1/8 | 1 |
| | 2 1/2 | 3.250 | 3 1/8 | 1 1/2 |
| | 3 | 4.000 | 3 1/4 | 1 9/16 |
| | 3 1/2 | 4.625 | 3 3/8 | 1 5/8 |
| | 4 | 5.000 | 3 1/2 | 1 11/16 |
| | 5 | 6.296 | 3 3/4 | 1 3/4 |
| | 6 | 7.390 | 4 | 1 7/8 |
| Extra Heavy, API Line Pipe, or AAR | 1/8 | .563 | 1 1/16 | 15/32 |
| | 1/4 | .719 | 1 5/8 | 3/4 |
| | 3/8 | .875 | 1 5/8 | 3/4 |
| | 1/2 | 1.063 | 2 1/8 | 1 |
| | 3/4 | 1.313 | 2 1/8 | 1 |
| | 1 | 1.576‡ | 2 5/8 | 1 1/4 |
| | 1 1/4 | 2.054 | 2 3/4 | 1 5/16 |
| | 1 1/2 | 2.200 | 2 3/4 | 1 5/16 |
| | 2 | 2.875 | 2 7/8 | 1 3/8 |
| | 2 1/2 | 3.375 | 4 1/8 | 2 |
| | 3 | 4.000 | 4 1/4 | 2 1/16 |
| | 3 1/2 | 4.625 | 4 3/8 | 2 1/8 |
| | 4 | 5.200 | 4 1/2 | 2 3/16 |
| | 5 | 6.296 | 4 5/8 | 2 3/16 |
| | 6 | 7.390 | 4 7/8 | 2 5/16 |
| | 8 | 9.625 | 5 1/4 | — |
| | 10 | 11.750 | 5 3/4 | — |
| | 12 | 14.000 | 6 1/8 | — |

‡For "Not Recessed" Extra Heavy and AAR Couplings in the 1-inch size, Dimension "A" is 1.600".

These strong, rugged couplings are inspected during all stages of manufacture to insure high quality. Threads are accurately cut to gauge. The special bevel or recess at the ends protects the first threads and assures easy starting and true alignment. Right and Left Couplings are knurled on the end having the left hand thread.

**Standards:** Standard and Extra Heavy Couplings conform to dimensions listed in the American Iron and Steel Institute Steel Products Manual, Section 18, dated December, 1951. API Couplings conform to American Petroleum Institute's Standard No. 5-L, 12th Edition, dated March, 1951; they bear the API monogram. AAR Couplings conform to specifications of the Association of American Railroads Manual of Standard and Recommended Practice, 1951 Revision.

**Other couplings:** Drive Pipe, Water Well Casing, Well Driller, and other types of Couplings are also available; prices on request.

*Malleable Iron Couplings....pages 140 to 148* *Forged Steel Couplings....pages 258 and 259*

# Single Strap and Double Strap Clamps

## Malleable Iron with Wrought Steel Straps

### Sizes and List Prices

| Type and Catalog No. | | Clamp Will Fit: Wrought Pipe Size Inches | Clamp Will Fit: O.D. Casing Size Inches | Clamp Will Fit: Cast Iron Pipe Size Inches | Clamp Will Fit: O.D. of Circle Inches | Size of Pipe Tapping in Clamp Inches | List Prices Black Each |
|---|---|---|---|---|---|---|---|
| Single Strap Clamps | No. 0 | 1½ | | | 1⅞ | ½ or ¾ | 2.30 |
| | No. 1 | 2 | 2½ | | 2⅜ | ½ to 1 | 2.60 |
| | No. 2 | 2½ | 2¾ & 3 | 2 | 2⅞ | ½ to 1¼ | 2.90 |
| | No. 3 | 3 | 3½ | | 3½ | ½ to 1 | 3.25 |
| | No. 4 | 3 | 3½ | | 3½ | 1¼ to 2 | 3.25 |
| | No. 5 | 3½ | 4 | 3 | 4 | ½ to 1 | 3.75 |
| | No. 6 | 3½ | 4 | 3 | 4 | 1¼ to 2 | 3.75 |
| | No. 7 | 4 | 4½ | | 4½ | ½ to 1½ | 4.25 |
| | No. 8 | 4 | 4½ | | 4½ | 2 | 4.25 |
| | No. 13 | 5 | 5½ | | 5 9/16 | ¾ to 1½ | 4.75 |
| | No. 14 | 5 | 5½ | | 5 9/16 | 2 | 4.75 |
| | No. 19 | 6 | 6⅝ | | 6⅝ | ¾ to 1½ | 5.25 |
| | No. 20 | 6 | 6⅝ | | 6⅝ | 2 | 5.25 |
| Double Strap Clamps | No. 41 | 2 | 2½ | | 2⅜ | ½ to 1½ | 5.25 |
| | No. 42 | 2½ | 2¾ & 3 | 2 | 2⅞ | ¾ to 1½ | 5.85 |
| | No. 43 | 3 | 3½ | | 3½ | ¾ to 2 | 6.50 |
| | No. 44 | 3½ | 4 | 3 | 4 | ¾ to 2 | 7.50 |
| | No. 45 | 4 | 4½ | | 4½ | ¾ to 2 | 8.50 |
| | No. 47 | 5 | 5½ | | 5 9/16 | ¾ to 2 | 9.50 |
| | No. 49 | 6 | 6⅝ | | 6⅝ | ¾ to 2 | 10.50 |
| | No. 50 | 6 | 6⅝ | | 6⅝ | 2½, 3, 4 | 13.00 |

***Galvanized Single Strap or Double Strap Clamps are made to order at an advance of 50 per cent over the prices of Black Clamps.***

Single Strap Clamp

Showing Application of Single Strap Clamp

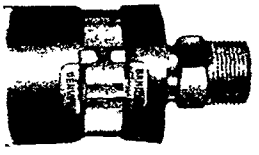
Double Strap Clamp

**Ordering:** When ordering Single Strap or Double Strap Clamps, specify the catalog number of the Clamp and the size of the pipe tapping

# Band-It Pipe and Hose Clamps

***Use Band-It as a pipe repair clamp***

Band-It is used effectively with all types of pressure and suction hose. The clamps will even hold old, oil-soaked hose.



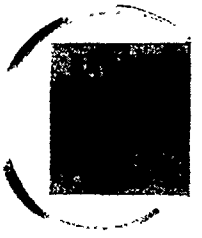
***Use Band-It as a pipe hose clamp***

Repair leaks or splits in any size pipe or tank. Place packing over leak and under band; no need to disconnect the pipe or tank.

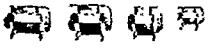
Any permanent or emergency clamping job from ½-inch to thirty feet in diameter is easy to handle with Band-It Clamping Bands. Economical, portable, and easy to use. Band-It stops leaks, and repairs, conserves, and extends the life of hose, steel pipe, tanks, electrical cables, wooden beams, etc.

**Bands:** Clamping bands, formed from one continuous roll of stainless steel band, are furnished in widths of ⅜, ½, ⅝, and ¾-inch.

**Buckles:** Buckles, made of stainless steel, are furnished one hundred to the package in widths of ⅜, ½, ⅝, and ¾-inch.



Clamping Band

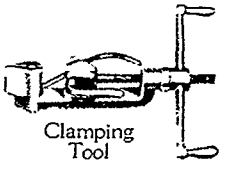


Clamping Band Buckles

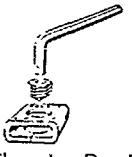
**Scru-Lokt Buckles:** Scru-Lokt Buckles are recommended for use in close quarters. They are available in a ½-inch width for use with ⅜ or ½-inch bands, and in a ¾-inch width for use with ⅝ or ¾-inch bands. Packaged one hundred to the box.

**Clamping Tool:** Clamping tools effectively clamp bands of all widths. A ball-bearing action provides easy operation.

***Prices on application***



Clamping Tool

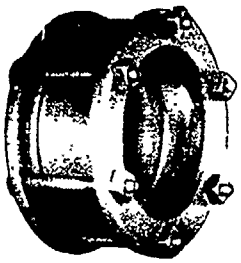


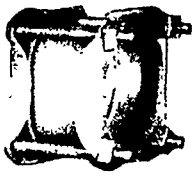
Clamping Band Scru-Lokt Buckle

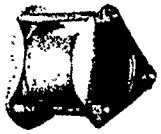
# Dresser Couplings and Clamps

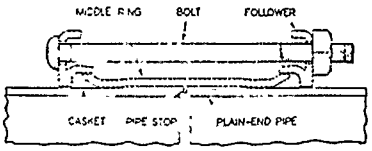
## Regular Steel Couplings

Style 38










These couplings make tight connections on steel, cast iron, and other lines. Parts consist of two resilient gaskets, a steel middle ring, and two steel follower rings, which fit over plain-end pipe and are bolted together. Resulting joints absorb expansion, contraction, vibration, and deflection.

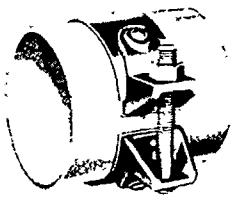
The couplings can be used over and over again simply by replacing the gaskets and bolts. Gaskets for gas, water, oil, air, and other services, as well as asbestos gaskets for temperatures over 215° F., are available; specify service on order. Data on larger sizes, up to 24-inch, furnished on request.

Dimensions, in Inches

| Pipe Size | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 | 6 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outside diameter | .675 | .840 | 1.050 | 1.315 | 1.660 | 1.900 | 2.375 | 2.875 | 3.500 | 4.000 | 4.500 | 5.000 | 5.563 | 5.563 | 6.625 | 6.625 |
| Number of bolts | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 |
| Bolt diameter | 3/8 | 3/8 | 1/2 | 1/2 | 1/2 | 1/2 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 | 5/8 |
| Length of bolt | 5 | 5 | 6 3/4 | 6 3/4 | 6 3/4 | 6 3/4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | 10 |

## Band Clamps

Style 77 B



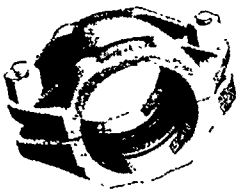
Use these clamps to repair small holes and leaks appearing in straight runs of steel pipe. The one-piece steel band is sprung over the pipe and bolted together. Cone gaskets or sheet rubber are supplied, if specified; use asbestos gaskets for temperatures over 215° F. Available in widths of 2, 4, and 6 inches for pipe sizes up to 5-inch, and in widths of 3 and 6 inches for larger pipe sizes.

## *No-Thread* Fittings

Regular Coupling

These compression fittings are designed to simplify the joining of plain-end pipe in sizes up to 2-inch. No threading is necessary. Regular and long couplings, elbows, tees, threaded branch tees, caps, etc. are available.

# Rolagrip and Gruvagrip Couplings



Rolagrip Coupling
For Plain End Pipe

Gruvagrip Coupling
For Grooved End Pipe

Rolagrip and Gruvagrip are sturdy, easy-to-use couplings designed for quick joining of pipe ends. They are widely used on air, water, brine, natural gas, crude oil, gasoline (including aromatics), butane, propane, naphtha, and other services. They are particularly useful on lines subject to vibration or misalignment.

The couplings consist of two housing halves, a specially compounded gasket, and bolts. The gasket is slipped over the pipe ends; the housing halves are placed around the gasket and bolted together to form a tight, leak-proof connection. No threading, welding, or flanging is necessary. Rolagrip features steel rollers that grip both pipe and coupling; Gruvagrip fits into grooves in the pipe. Both can be used again and again.

**Gruvagrip fittings** (not illustrated) include elbows, tees, crosses, laterals, nipples, caps, and reducers. Used with Gruvagrip couplings or grooved end pipe, they are quickly installed into tight leak-proof connections. Sizes 3/4 to 6-inch (1000 psi) and 8 to 12-inch (800 psi) are available.

Sizes and Ratings

| Pipe Sizes | Working Pressures, psi, 200° F. Max. Temp. | | |
|---|---|---|---|
| | *Rolagrip | | Gruvagrip |
| Inches | Regular | Super | |
| 1 1/2 | 1000 | — | 1000 |
| 2 | 1000 | — | 1000 |
| 2 1/2 | 1000 | — | 1000 |
| 3 | 1000 | 2000 | 1000 |
| 3 1/2 | 1000 | — | 1000 |
| 4 | 1000 | 2000 | 1000 |
| 5 | 1000 | — | 1000 |
| 6 | 800 | — | 1000 |
| 8 | 800 | — | 800 |
| 10 | 800 | — | 800 |
| 12 | 600 | — | 800 |

*Rolagrip couplings for copper tubing:
4 and 5-inch OD. . . . . 1000 psi
6-in. OD. . 500 psi 7-in. OD. . 800 psi

*Prices on application*

16

# Iron Unions, Union Fittings, & Flange Unions

# Iron
# Unions, Union Fittings, and Flange Unions

(Including AAR Forged Steel Unions)

**Malleable Iron Unions**
- 150-Pound, Gasket Type....page 174
- 150-Pound, Ground Joint....page 175
- 300-Pound....page 177
- Railroad....page 176
- AAR....page 178
- AAR, with Steel Male Tail-Piece....page 180

**AAR Forged Steel Unions**....page 180

**Malleable Iron Union Fittings**
- 150-Pound, Gasket Type....page 174
- 150-Pound, Ground Joint....page 175
- Railroad....page 176
- AAR....page 179
- AAR, with Steel Male Tail-piece....page 180

**Flange Unions**
- Cast Iron, Gasket Type....page 181
- Malleable Iron, Ground Joint....page 181
- Tongue and Groove....page 182

***Saving Materials and Labor with Unions and Union Fittings....pages 174 and 264***

Crane manufactures an unusually diversified line of unions and union fittings. Whether it be an inexpensive ground joint malleable iron union for a domestic water line, a massive steel union for a central power station—a union for any service—it can be purchased from Crane.

The line includes brass, malleable iron, 18-8 Mo, and forged steel unions, brass and malleable iron union fittings, and cast iron, malleable iron, and forged steel flange unions.

Crane Unions are exceptionally strong, tough, and durable. Each part is liberally proportioned and amply reinforced at points subjected to greatest stress. Special attention has been given to the interchangeability of parts.



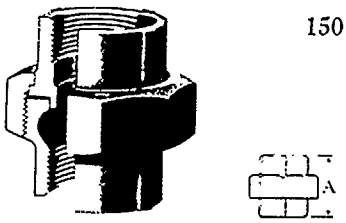
* * * * * * * * *

For greater convenience, several lines of unions and union fittings are included with allied material in other sections of this catalog. See the pages referred to below:

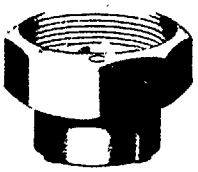
Brass Unions and Union Elbows....page 187
Brass Solder-Joint Unions....page 423
Circulating Boiler Fittings....page 145
Forged Steel Unions....pages 263 and 264
Forged Steel Flange Unions....page 265
Forged Steel Combination Elbows....page 266
18-8 Mo Unions....page 383

# Malleable Iron—Gasket Type
# 150-Pound Unions and Union Elbow

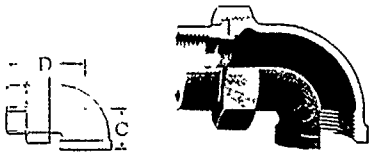
WORKING PRESSURES
150 pounds saturated steam — 300 pounds cold water




No. 1219, Union
Female



No. 1218, Two-Third Union
Female




No. 1290, 90° Elbow
Female Union

## List Prices and Dimensions

| Size | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Price, Each | No. 1219, Unions Female | Black | .85 | .85 | .90 | 1.00 | 1.30 | 1.80 | 2.20 | 2.75 | 5.60 | 9.25 |
| | | Galv. | 1.10 | 1.10 | 1.20 | 1.30 | 1.70 | 2.35 | 2.85 | 3.55 | 7.30 | 12.00 |
| | No. 1218, Two-Third Unions Female | Black | .50 | .50 | .54 | .60 | .78 | 1.08 | 1.32 | 1.65 | 3.35 | 5.60 |
| | | Galv. | .65 | .65 | .70 | .78 | 1.00 | 1.40 | 1.70 | 2.15 | 4.40 | 7.25 |
| | No. 1290, 90° Elbows With Female Union | Black | 1.10 | 1.10 | 1.30 | 1.55 | 1.90 | 2.70 | 3.50 | 4.80 | 9.75 | 14.50 |
| | | Galv. | 1.35 | 1.35 | 1.60 | 1.95 | 2.40 | 3.40 | 4.35 | 6.00 | 12.00 | 18.00 |
| Dimensions, in Inches | A | | 1 5/8 | 1 3/4 | 1 7/8 | 2 1/8 | 2 3/8 | 2 5/8 | 2 15/16 | 3 1/4 | 3 9/16 | 3 15/16 |
| | C | | 13/16 | 15/16 | 1 1/8 | 1 5/16 | 1 7/16 | 1 3/4 | 1 15/16 | 2 1/4 | 2 11/16 | 3 1/8 |
| | D | | 1 13/16 | 2 1/16 | 2 5/16 | 2 5/8 | 3 | 3 7/16 | 3 13/16 | 4 3/8 | 4 7/8 | 5 5/8 |

**Gaskets:** The No. 1219 Unions and the No. 1290 90° Elbows are equipped with a rubber gasket. For extra gaskets, see page 476.

**Sturdy construction:** These are well proportioned and sturdily constructed unions and union elbows. A long lip on the inside edge of the gasket seating area on the tail-piece serves to retain the gasket after the union is assembled.

**Two-Third Union:** The No. 1218 Two-Third Union consists of a union ring and a tail-piece (the gasket is not furnished).

This type of union is principally used by equipment manufacturers, the equivalent of the thread-piece being made as an integral part of the equipment, and the Two-Third Union being used to complete the union connection.

*Thread engagement....page 494*

## *Crane Unions and Union Fittings Save Material and Labor*

Figure A

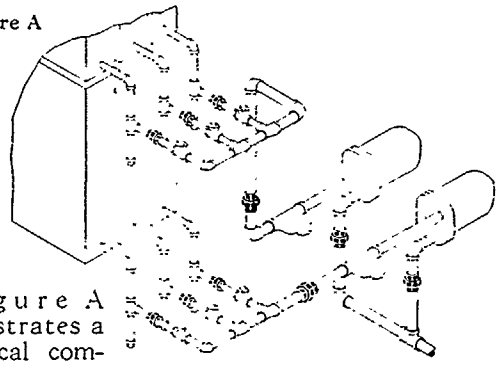


Figure A illustrates a typical complicated arrangement of piping on the return side of double tiered blast heaters. The return from the stacks in each tier are drained individually by a trap, and the condensation is accumulated by a single return header. The illustration shows the most common method of providing union joints on such an installation; only female unions are used.

Figure B shows an improved and economical arrangement made by using male and female unions and union fittings in place of ordinary pipe fittings and female unions. The connections are more compact, and the piping has been simplified. Easy access to traps and all parts of the lines is maintained. 18 nipples, 36 pipe threads, 9 fittings, and 27 joints have been eliminated.

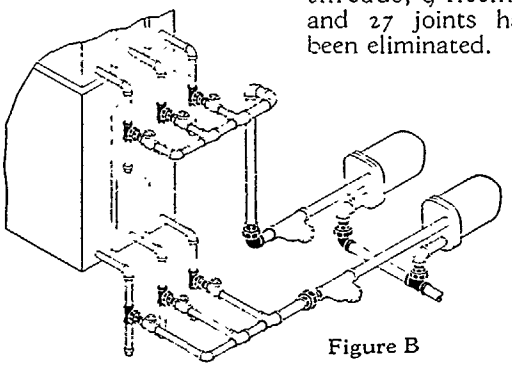
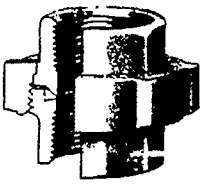
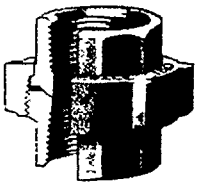


Figure B

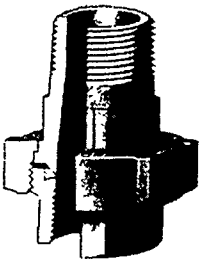
# Malleable Iron—Ground Joint
# 150-Pound Unions and Union Fittings



No. 1280, Union
Female
Brass to Iron Seat



No. 1280½, Union
Female
All-Iron Seat

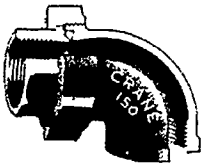


No. 1281, Union
Male and Female
Brass to Iron Seat

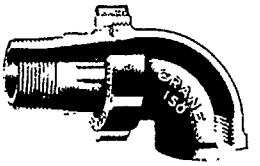
WORKING PRESSURES
150 pounds saturated steam
300 pounds cold water, air, oil, gas, or gasoline, non-shock

FEATURES
Brass to Iron Seat
(Underwriters' Approved)
or
All-iron Seat
Ground Joint—Air Tested

SERVICE RECOMMENDATIONS
These rugged unions and union fittings are ideal for domestic service and for a wide variety of industrial applications on steam, hot water, cold water, oil, air, gas, and gasoline lines.

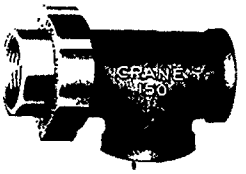


No. 1282, 90° Elbow
Female Union

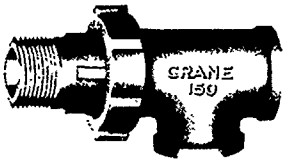


No. 1283, 90° Elbow
Male Union

Brass to Iron Seat



No. 1284, Tee
Female Union on Run



No. 1285, Tee
Male Union on Run

Brass to Iron Seat

## List Prices, Each

| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unions | No. 1280, Female | Black | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 |
| | | Galv. | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 |
| | No. 1280½, Female | Black | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 |
| | | Galv. | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 |
| | No. 1281, Male and Female | Black | 1.25 | 1.25 | 1.45 | 1.95 | 2.45 | 3.40 | 4.05 | 5.40 | 9.70 | 15.25 |
| | | Galv. | 1.50 | 1.50 | 1.75 | 2.35 | 2.95 | 4.10 | 4.85 | 6.50 | 11.50 | 18.25 |
| 90° Elbows | No. 1282, with Female Union | Black | 1.45 | 1.45 | 1.70 | 2.05 | 2.50 | 3.50 | 4.60 | 6.30 | | |
| | | Galv. | 1.80 | 1.80 | 2.10 | 2.55 | 3.15 | 4.35 | 5.75 | 8.00 | | |
| | No. 1283, with Male Union | Black | 1.60 | 1.60 | 2.00 | 2.70 | 3.25 | 4.55 | 5.80 | 8.10 | | |
| | | Galv. | 2.00 | 2.00 | 2.50 | 3.40 | 4.10 | 5.75 | 7.25 | 10.00 | | |
| Tees | No. 1284, with Female Union | Black | 1.90 | 1.90 | 2.20 | 2.60 | 3.00 | 4.10 | 5.20 | 7.00 | | |
| | | Galv. | 2.40 | 2.40 | 2.75 | 3.25 | 3.75 | 5.10 | 6.50 | 8.75 | | |
| | No. 1285, with Male Union | Black | 2.05 | 2.05 | 2.50 | 3.25 | 3.75 | 5.15 | 6.40 | 8.80 | | |
| | | Galv. | 2.55 | 2.55 | 3.10 | 4.05 | 4.70 | 6.50 | 8.00 | 11.00 | | |

These unions and union fittings, designed to combine liberal strength with light weight and minimum over-all dimensions, have a high safety factor. Female tail-pieces and thread-pieces have octagon ends. Union rings and male tail-pieces are circular in shape and have generous size lugs to provide a good wrench grip.

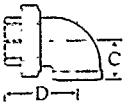
**Ground joint:** The ground joint seat holds pressure easily; no gasket is required. It can be taken apart and reassembled repeatedly without affecting the strength or tightness of the joint.

**Seats:** All of the union fittings and the No. 1282 and No. 1281 Unions have a non-corrosive brass to iron seat. The brass ring is forced in under high pressure and will not loosen in service.

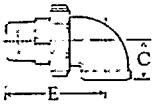
The No. 1280½ Unions have an all-iron seat suitable for services that are corrosive to brass but where all-iron construction is satisfactory; the seat is integral with the thread-piece. For identification of all-iron, the union ring is painted green.

**Underwriters' Specifications:** Crane 150-Pound Malleable Iron Unions and Union Fittings with Brass to Iron Seat have been approved by the Underwriters' Laboratories, Inc., for use on hazardous liquids. They are marked "CU."

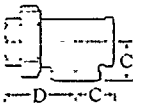




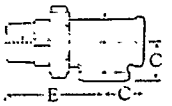

No. 1282




No. 1283




No. 1284




No. 1285

No. 1280 or
No. 1280½

No. 1281

*For thread engagement, see page 494.*

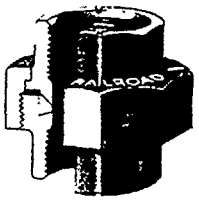
## Dimensions, in Inches

| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 3/8 | 1½ | 1 11/16 | 1⅞ | 2¼ | 2 5/16 | 2⅜ | 2 9/16 | 3¼ | 3 9/16 |
| B | 2 3/16 | 2⅜ | 2⅝ | 3 | 3 5/16 | 3⅝ | 3 15/16 | 4¼ | 4 15/16 | 5⅝ |
| C | 13/16 | 15/16 | 1⅛ | 1 5/16 | 1½ | 1¾ | 1 15/16 | 2¼ | | |
| D | 1 11/16 | 1⅞ | 2⅛ | 2 7/16 | 2⅞ | 3 3/16 | 3⅜ | 3⅞ | | |
| E | 2 7/16 | 2⅞ | 3 | 3 9/16 | 3 15/16 | 4 7/16 | 4⅞ | 5½ | | |

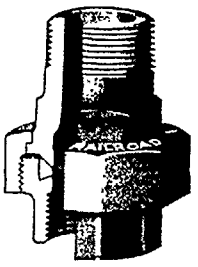
# Malleable Iron
# Railroad Unions and Union Elbows

## Unions

WORKING PRESSURES
250 pounds saturated steam
500 pounds cold water, air, oil, gas, or gasoline, non-shock



No. 519
Union
Female



No. 519½
Union
Male and Female

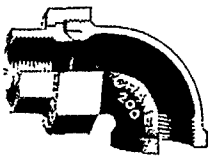
FEATURES
Brass to Iron Seat
Ground Joint
Air Tested

SERVICE RECOMMENDATIONS

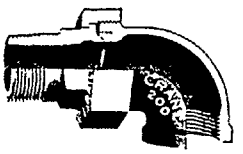
Crane Railroad Unions and Union Elbows are recommended for exacting service on pipe lines carrying steam, water, oil, air, gas, gasoline, or other fluids. They are especially suitable for railroad work and are used on general locomotive, car, shop, and yard service. They are furnished with female or with male and female ends.

## Union Elbows

WORKING PRESSURES
200 pounds saturated steam
400 pounds cold water, air, oil, gas, or gasoline, non-shock



No. 590
90° Elbow
Female Union



No. 592
90° Elbow
Male Union

### List Prices, Each

| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unions | No. 519, Female | Black | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 |
| | | Galv. | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 |
| | No. 519½, Male and Female | Black | 1.25 | 1.25 | 1.45 | 1.95 | 2.45 | 3.40 | 4.05 | 5.40 | 9.70 | 15.25 |
| | | Galv. | 1.50 | 1.50 | 1.75 | 2.35 | 2.95 | 4.10 | 4.85 | 6.50 | 11.50 | 18.25 |
| 90° Elbows | No. 590, with Female Union | Black | 1.45 | 1.45 | 1.70 | 2.05 | 2.50 | 3.50 | 4.60 | 6.30 | | |
| | | Galv. | 1.80 | 1.80 | 2.10 | 2.55 | 3.15 | 4.35 | 5.75 | 8.00 | | |
| | No. 592, with Male Union | Black | 1.60 | 1.60 | 2.00 | 2.70 | 3.25 | 4.55 | 5.80 | 8.10 | | |
| | | Galv. | 2.00 | 2.00 | 2.50 | 3.40 | 4.10 | 5.75 | 7.25 | 10.00 | | |

**Dependable construction:** All parts are heavy and ruggedly constructed and will withstand strains resulting from making up joints, expansion and contraction, vibration, etc.

**Brass to iron seat, ground joint:** No gasket is necessary. The brass to iron ground joint is non-corrosive and makes a tight seat very easily. It can be taken apart and reassembled repeatedly without affecting its strength or tightness. The brass seat ring is forced in under high pressure, and it will not loosen in service.

**Test:** Each union and union fitting is given an air-under-water test.

**Interchangeability:** The tail-pieces and union rings of the unions are interchangeable, size for size, with the corresponding parts of the 90° elbows.

**Underwriters' Specifications:** All of the Railroad Unions and Railroad Union Elbows shown on this page have been approved by the Underwriters' Laboratories, Inc., for use on hazardous liquids. They are marked "CU".

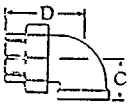
No. 519

No. 519½

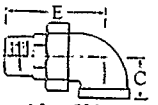
### Dimensions, in Inches

| Size | | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unions | A | 1⅝ | 1¾ | 1⅞ | 2⅛ | 2⅜ | 2⅝ | 2 15/16 | 3¼ | 3⅞ | 4½ |
| | B | 2¼ | 2 7/16 | 2 11/16 | 3 1/16 | 3 5/16 | 3 11/16 | 4 | 4 5/16 | 4⅞ | 5⅝ |
| 90° Elbows | C | 13/16 | 15/16 | 1⅛ | 1 5/16 | 1 7/16 | 1¾ | 1 15/16 | 2¼ | | |
| | D | 1 13/16 | 2 1/16 | 2 5/16 | 2⅝ | 3 | 3 7/16 | 3 13/16 | 4⅜ | | |
| | E | 2 7/16 | 2¾ | 3 1/16 | 3½ | 3 15/16 | 4 7/16 | 4¾ | 5⅜ | | |

*Thread engagement . page 494*




No. 590




No. 592

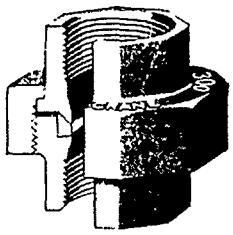
# 300-Pound Malleable Iron Unions

WORKING PRESSURES
No. 198 E — 300 pounds steam, 550° F.
No. 198½ E — 300 pounds steam, 550° F.
No. 197 E — 300 pounds saturated steam

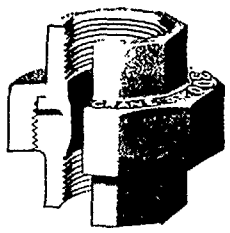
All types—600 pounds cold water, air, oil, or gas, non-shock

***Tested 150 pounds air-under-water***

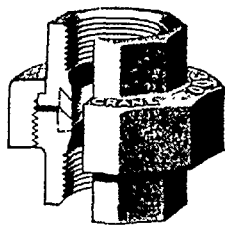
FEATURES
Brass to Iron, All-Iron, or Brass to Brass Seat
Ground Joint *Octagon Ends



No. 198 E
Female Union
**Brass to Iron Seat**



No. 198½ E
Female Union
**All-Iron Seat**



No. 197 E
Female Union
**Brass to Brass Seat**

*No. 198 E Unions have round ends on the ½-inch size and decagon ends on the 4-inch size.

**List Prices, Each**

| Size | | Inches | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brass to Iron Seat | No. 198 E | Black | 1.10 | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 | 23.50 |
| | | Galv. | 1.30 | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 | 28.00 |
| All-Iron Seat | No. 198½ E | Black | | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 | |
| | | Galv. | | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 | |
| Brass to Brass Seat | No. 197 E | Black | | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 | |
| | | Galv. | | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 | |

**Service recommendations:** Crane 300-Pound Malleable Iron Unions are recommended where long life and dependability are desired on lines conveying steam, water, oil, air, gas, or similar fluids. Their sturdy construction makes them especially suitable for severe services.

**Unusually rugged:** All parts are massive and rugged. The malleable iron from which they are made has high tensile strength and is characterized by pressure tightness, stiffness, and toughness.

**Choice of seat construction:** The unions are made with three types of seat construction:

Brass to Iron Seat—No. 198 E
All-Iron Seat—No. 198½ E
Brass to Brass Seat—No. 197 E

**Brass seat unions:** Brass seat unions have durable, non-corrosive seating surfaces. The large brass rings are forced into the retaining grooves under high pressure; they will not loosen in service.

**All-iron unions:** All-iron unions have seating surfaces integral with the end-pieces. They are suitable for steam, oil, air, or gas lines where a non-corrosive seat is not desired, and for acid lines where all-iron material is satisfactory.

**Ground joint:** All of these unions have a ground joint seat that holds pressure easily; no gasket is needed. The unions can be taken apart and reassembled repeatedly without affecting their strength or tightness.

**Interchangeability:** The corresponding parts of these unions are interchangeable, size for size.

**Identification of seat:**

Brass to iron seat black unions are all black.
All-iron black unions have the union ring enameled green.
Brass to brass seat black unions have the union ring enameled maroon.
Galvanized unions are all-galvanized, with no other distinguishing color on the union ring.



**Dimensions, in Inches**

| Size | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1½ | 1⅝ | 1 13/16 | 1 15/16 | 2¼ | 2 7/16 | 2 13/16 | 3 | 3⅜ | 4 | 4 5/16 | 5 |

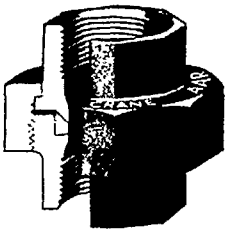
*Thread engagement....page 494*

# AAR Malleable Iron Unions

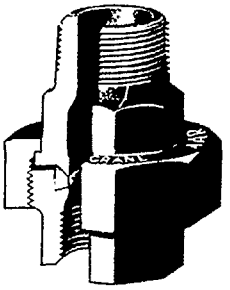
WORKING PRESSURES
300 pounds steam, 550° F.
600 pounds cold water, air, oil, gas, or gasoline, non-shock

***Tested 150 pounds air-under-water***

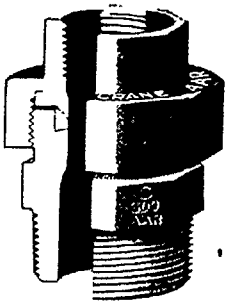
FEATURES
Brass to Iron Seat — Ground Joint
Octagon Ends



No. 819 E
Union
Female



No. 819½ E
Union
Male and Female



No. 817 E
Reducing Air Pump Union
(Male end is larger)

For straight size Air Pump Unions, use either the No. 819½ E shown at the left or the No. 919½ E shown on page 180.

***For FORGED STEEL AAR Unions, see page 180.***

## List Prices, Unions

| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 819 E, Female | Black | Each | 1.10 | 1.10 | 1.15 | 1.30 | 1.70 | 2.35 | 2.85 | 3.60 | 7.35 | 12.00 |
| | Galv. | Each | 1.30 | 1.30 | 1.40 | 1.55 | 2.05 | 2.85 | 3.45 | 4.30 | 8.80 | 14.50 |
| No. 819½ E, Male and Female | Black | Each | 1.25 | 1.25 | 1.45 | 1.95 | 2.45 | 3.40 | 4.05 | 5.40 | 9.70 | 15.25 |
| | Galv. | Each | 1.50 | 1.50 | 1.75 | 2.35 | 2.95 | 4.10 | 4.85 | 6.50 | 11.50 | 18.25 |

## List Prices, Air Pump Unions

| Size | Inches | 1¼ x 1 | 1½ x 1¼ | 2 x 1 | 2 x 1¼ | 2 x 1½ |
|---|---|---|---|---|---|---|
| No. 817 E, Reducing, Black | Each | 3.75 | 4.50 | 6.00 | 6.00 | 6.00 |

**Service recommendations:** Crane AAR Unions and Union Fittings are ideal for service where long life and dependability are desired.

They are especially suited for railroad work because they easily withstand abuse, piping strains, vibration, expansion, and contraction.

**Unusually rugged:** All parts are of massive, sturdy construction. The malleable iron from which they are made is exceptionally strong and tough.

**Brass to iron seat, ground joint:** The brass to iron ground joint seat is non-corrosive and holds pressure easily; no gasket is needed. The brass seat ring is forced in under high pressure and will not loosen in service. The unions can be taken apart and reassembled repeatedly without affecting their strength or tightness.

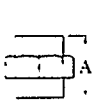
**Underwriters' Specifications:** Crane AAR Unions (except No. 817 E) and Union Fittings have been approved by the Underwriters' Laboratories, Inc., for use on hazardous liquids.

**Association of American Railroads:** The unions shown on this page and the union fittings shown on the following page conform to the specifications and recommended practice of the Association of American Railroads (AAR) for 300-pound unions and union fittings. When subjected to tensile tests, their breaking strengths exceed those required by the specifications.

**Interchangeability:** The tail-pieces and the union rings on all of the AAR Unions and Union Fittings shown on this and the following two pages are interchangeable, size for size.

17

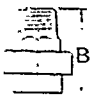
## Dimensions, in Inches



No. 819 E

| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| A—No. 819 E | 1⅝ | 1 13/16 | 1 15/16 | 2¼ | 2 7/16 | 2 13/16 | 3 | 3⅜ | 4 | 4 5/16 |
| B—No. 819½ E | 2¼ | 2½ | 2 11/16 | 3⅛ | 3⅜ | 3¾ | 3 15/16 | 4 5/16 | 5 1/16 | 5½ |

| Size | 1¼ x 1 | 1½ x 1¼ | 2 x 1 | 2 x 1¼ | 2 x 1½ |
|---|---|---|---|---|---|
| B—No. 817 E | 3½ | 3 13/16 | 3¾ | 4 | 4⅛ |



No. 819½ E
or No. 817 E

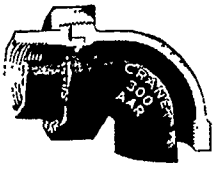
*AAR Unions and Union Fittings with STEEL male tail-piece . page 180*
*AAR Malleable Iron Screwed Fittings....page 148*
*AAR Brass Valves....pages 38 to 40*

# AAR Malleable Iron Union Fittings

WORKING PRESSURES
300 pounds steam, 550° F.
600 pounds cold water, air, oil, gas, or gasoline, non-shock

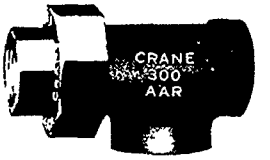
***Tested 150 pounds air-under-water***

FEATURES
Brass to Iron Seat — Ground Joint
Octagon Ends

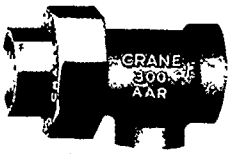



No. 890 E
90° Elbow
Female Union

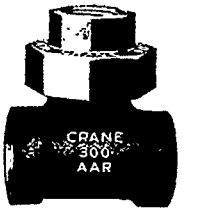
No. 891½ E
45° Elbow
Female Union



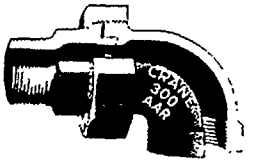

No. 894 E
Tee
Female Union on Run




No. 895 E
Reducing Tee
Female Union on Run

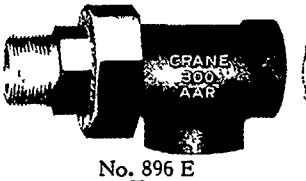



No. 898 E
Tee
Female Union
on Outlet

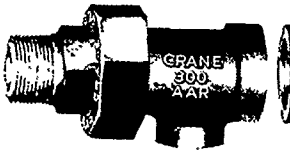



No. 892 E
90° Elbow
Male Union

No. 893 E
45° Elbow
Male Union




No. 896 E
Tee
Male Union on Run




No. 897 E
Reducing Tee
Male Union on Run

No. 898½ E
Tee
Male Union
on Outlet

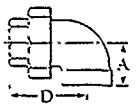
## List Prices, Each, Black

| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90° Elbows | No. 890 E, Female Union | | 1.45 | 1.45 | 1.70 | 2.05 | 2.50 | 3.50 | 4.60 | 6.30 | 12.60 | 18.75 |
| | No. 892 E, Male Union | | 1.60 | 1.60 | 2.00 | 2.70 | 3.25 | 4.55 | 5.80 | 8.10 | 15.00 | 22.00 |
| 45° Elbows | No. 891½ E, Female Union | | 1.45 | 1.45 | 1.70 | 2.05 | 2.50 | 3.50 | 4.60 | 6.30 | 12.60 | |
| | No. 893 E, Male Union | | 1.60 | 1.60 | 2.00 | 2.70 | 3.25 | 4.55 | 5.80 | 8.10 | 15.00 | |
| Tees | No. 894 E, Female Union on Run | | 1.90 | 1.90 | 2.20 | 2.60 | 3.00 | 4.10 | 5.20 | 7.00 | 15.75 | 22.00 |
| | No. 896 E, Male Union on Run | | 2.05 | 2.05 | 2.50 | 3.25 | 3.75 | 5.15 | 6.40 | 8.80 | 18.00 | 25.00 |
| | No. 898 E, Female Union on Outlet | | 2.10 | 2.10 | 2.30 | 2.70 | 3.15 | 4.25 | 5.50 | 7.50 | 16.50 | |
| | No. 898½ E, Male Union on Outlet | | 2.25 | 2.25 | 2.60 | 3.35 | 3.90 | 5.30 | 6.70 | 9.30 | 19.00 | |

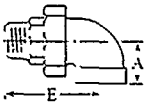
| Size | | Inches | 1 x 1 x ⅜ | 1 x 1 x ½ | 1 x 1 x ¾ |
|---|---|---|---|---|---|
| Reducing Tees | No. 895 E, Female Union on Run | | 3.15 | 3.15 | 3.15 |
| | No. 897 E, Male Union on Run | | 3.90 | 3.90 | 3.90 |

Galvanized AAR Union Fittings can be made to order; prices are furnished on application.

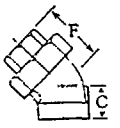
## Dimensions, in Inches



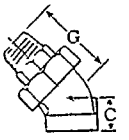

No. 890 E



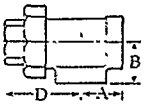

No. 892 E



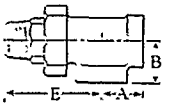

No. 891½ E



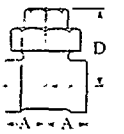

No. 893 E



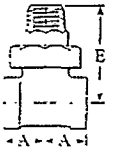

No. 894 E or 895 E




No. 896 E or 897 E




No. 898 E




No. 898½ E

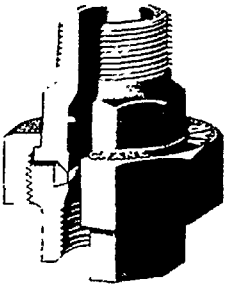
| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 1x1x⅜ | 1x1x½ | 1x1x¾ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 15/16 | 1 1/16 | 1¼ | 1 7/16 | 1⅝ | 1 15/16 | 2⅛ | 2½ | 2 15/16 | 3⅜ | 1 5/16 | 1 7/16 | 1½ |
| B | 15/16 | 1 1/16 | 1¼ | 1 7/16 | 1⅝ | 1 15/16 | 2⅛ | 2½ | 2 15/16 | 3⅜ | 1 7/16 | 1½ | 1 9/16 |
| C | 13/16 | ⅞ | 1 | 1⅛ | 1 5/16 | 1½ | 1 11/16 | 2 | 2¼ | | | | |
| D | 2 | 2¼ | 2 7/16 | 2⅞ | 3 3/16 | 3 11/16 | 3 15/16 | 4½ | 5 7/16 | 5 15/16 | 2¾ | 2⅞ | 3 |
| E | 2 9/16 | 2⅞ | 3 3/16 | 3¾ | 4 1/16 | 4⅝ | 4⅞ | 5⅜ | 6 7/16 | 7 3/16 | 3 11/16 | 3 13/16 | 3 15/16 |
| F | 1⅝ | 1¾ | 1 15/16 | 2 3/16 | 2½ | 2⅞ | 3 3/16 | 3 11/16 | 4 3/16 | | | | |
| G | 2 3/16 | 2 7/16 | 2 11/16 | 3 1/16 | 3 7/16 | 3 13/16 | 4⅛ | 4 9/16 | 5 3/16 | | | | |

*Description . . . page 178*

*Thread engagement . . . . page 494*

# AAR Malleable Iron Unions and Union Fittings

## With Steel Male Tail-Piece



No. 919½ E
Union

WORKING PRESSURES
300 pounds steam 550° F.
600 pounds cold water, air, oil, or gas, non-shock

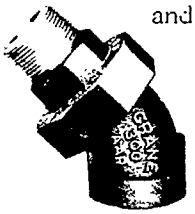
***Tested 150 pounds air-under-water***

***Brass to Steel Seat  Ground Joint  Octagon Ends***

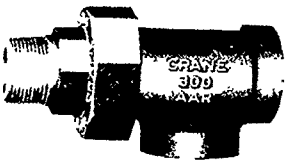
These unions and union fittings are the same as those shown on the preceding two pages except that they have a forged steel tail-piece on sizes 2-inch and smaller and a cast steel tail-piece on larger sizes. They are especially suited for severe services where the strength and toughness of steel is needed in the male end.

All parts are interchangeable, size for size, with the corresponding parts of Malleable Iron AAR Unions and Union Fittings (pages 178 and 179). Galvanized unions and union fittings are made to order; prices on application.

No. 992 E
90° Elbow



No. 993 E
45° Elbow



No. 996 E
Tee
Union on Run

No. 997 E
Reducing Tee
Union on Run

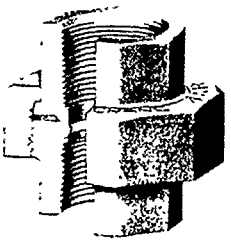
No. 998½ E
Tee
Union on Outlet

### List Prices, Black, Each

| Size Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 919½ E. Unions | 2.20 | 2.20 | 2.50 | 3.50 | 4.25 | 6.00 | 7.00 | 9.50 | 17.00 | 26.50 |
| No. 992 E. 90° Elbows | 2.55 | 2.55 | 3.00 | 4.25 | 5.00 | 7.25 | 8.75 | 12.25 | 22.50 | 33.50 |
| No. 993 E. 45° Elbows | 2.55 | 2.55 | 3.00 | 4.25 | 5.00 | 7.25 | 8.75 | 12.25 | 22.50 | |
| No. 996 E. Tees | 3.00 | 3.00 | 3.55 | 4.80 | 5.50 | 7.75 | 9.50 | 13.00 | 25.50 | 36.50 |
| No. 998½ E. Tees | 3.20 | 3.20 | 3.65 | 5.00 | 5.70 | 8.00 | 9.75 | 13.50 | 26.50 | |

| Size Inches | No. 997 E Reducing Tees |
|---|---|
| 1 x 1 x ⅜ | 5.70 |
| 1 x 1 x ½ | |
| 1 x 1 x ¾ | |

# AAR Forged Steel Ground Joint Unions



No. 950 H
Union
Female

WORKING PRESSURE
300 pounds steam

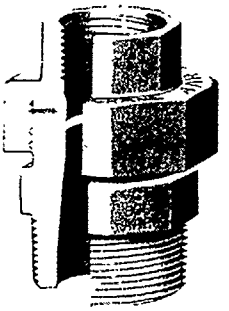
***Tested 150 pounds air-under-water***

***Brass to Steel Seat  Ground Joint  Octagon Ends***

These are light weight, rugged Forged Steel AAR Unions, ideal for locomotive and other railroad services subject to vibration, expansion, and contraction.

The brass to steel ground joint seat is non-corrosive and holds pressure easily; no gasket is required. Corresponding parts interchange with those of unions shown on page 178 and above.

***These unions conform to the AAR specifications for 300-pound unions. The union ring is marked "Crane-AAR-300".***



No. 953½ H
Reducing Air Pump Union
(Male end is larger)

### List Prices, Black

| Size | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 950 H. Female Unions | Each | 2.25 | 2.50 | 3.00 | 3.50 | 4.25 | 5.50 | 6.80 | 8.50 | 17.00 | 26.00 |

| Size | Inches | 1¼ x 1 | 1½ x 1¼ | 2 x 1 | 2 x 1¼ | 2 x 1½ |
|---|---|---|---|---|---|---|
| No. 953½ H. Reducing Air Pump Unions | Each | 8.50 | 11.50 | 14.75 | 14.75 | 14.75 |

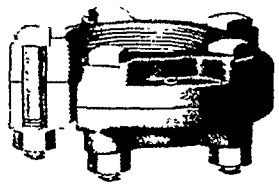
*Dimensions are the same as AAR Malleable Iron Unions and Union Fittings . . . see pages 178 and 179*

# Cast Iron Gasket Type Flange Unions

## 125-Pound

WORKING PRESSURES
125 pounds saturated steam
175 pounds cold water
or gas, non-shock

Galvanized unions have galvanized bolts.



125-Pound
Faced, Plain Face

### List Prices and Dimensions

| Size | | Inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125-Pound | Black | Each | 1.10 | 1.30 | 1.50 | 1.75 | 2.10 | 2.70 | 3.40 | 4.10 | 5.00 | 6.00 | 7.00 | 8.50 | 15.00 |
| | Galvanized | Each | 2.20 | 2.60 | 3.00 | 3.50 | 4.20 | 5.40 | 6.80 | 8.20 | 10.00 | 12.00 | 14.00 | 17.00 | 30.00 |
| | End to end | Inches | 13/16 | 15/16 | 1 7/16 | 1 9/16 | 1 11/16 | 1 13/16 | 2 5/16 | 2 7/16 | 2 9/16 | 2 11/16 | 2 15/16 | 3 1/16 | 3 9/16 |
| | Dia. of flanges | Inches | 2 3/4 | 3 3/8 | 3 5/8 | 4 1/8 | 4 1/2 | 5 1/8 | 5 7/8 | 6 5/8 | 7 1/4 | 7 3/4 | 9 1/8 | 10 3/8 | 12 3/4 |
| | No. and dia. of bolts | | 3-3/8 | 3-7/16 | 3-7/16 | 4-7/16 | 4-1/2 | 4-1/2 | 4-5/8 | 4-5/8 | 4-5/8 | 5-5/8 | 5-5/8 | 6-5/8 | 8-5/8 |

These 125-Pound Cast Iron Flange Unions are equipped with a cloth inserted rubber gasket. The unions are sturdy and compact and are suitable for steam, water, or gas service.

When unions larger than those listed above are required, two No. 553, 125-Pound Cast Iron Companion Flanges (shown on page 202) may be bolted together.

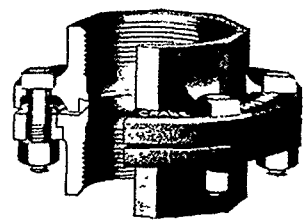
*Extra gaskets....page 476*

# Malleable Iron Ground Joint Flange Unions

## Three-Part

WORKING PRESSURES
600 pounds cold water, oil, or gas, non-shock
Sizes 4-inch and smaller—300 pounds saturated steam
Sizes 5-inch and larger —200 pounds saturated steam

***Brass to Iron Seat Ground Joint***
***Loose ring makes it easy to line up bolt holes.***



No. 775
Flange Union

### List Prices and Dimensions

| Size | Inches | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 775, Black | Each | 5.50 | 6.20 | 7.20 | 9.00 | 11.50 | 15.00 | 20.00 | 23.00 | 40.00 | 64.00 | 94.00 | 185.00 |
| End to end | Inches | 1 1/2 | 3 | 3 1/8 | 3 11/16 | 4 1/8 | 4 1/2 | 4 11/16 | 5 | 5 3/8 | 5 7/8 | 6 7/8 | 8 3/16 |
| Diameter of flanges | Inches | 3 3/4 | 4 1/8 | 4 5/8 | 5 1/4 | 6 3/16 | 7 3/16 | 7 3/4 | 8 3/8 | 9 3/4 | 11 | 14 1/8 | 16 7/8 |
| No. and dia. of bolts | | 4-7/16 | 4-7/16 | 4-1/2 | 5-1/2 | 5-9/16 | 5-5/8 | 5-5/8 | 6-5/8 | 6-5/8 | 8-3/4 | 10-7/8 | 12-1 |

**Advantages of the three-part construction:** The No. 775 Union has three major parts: flange-piece, tail-piece, and loose ring. The ring combined with the ball type seat assures tightness even when the pipe line is slightly out of alignment. Being loose, the ring can be conveniently swiveled to any desired position to line up the bolt holes.

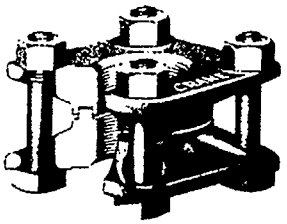
**Brass to iron seat, ground joint:** The brass to iron seat is non-corrosive, and the ground joint eliminates the need for a gasket. The brass seat ring is forced into the tail-piece under high pressure and will not loosen in service. The union can be taken apart and reassembled repeatedly without injuring its strength or seating qualities.

**Identification:** The loose ring is painted yellow so that the union can be easily identified.

**Test:** Each union is given a hydrostatic test.

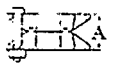
# Tongue and Groove Flange Unions

WORKING PRESSURES
300 pounds steam or oil (500° F.)—300 pounds ammonia
*1000 pounds cold water, oil, or gas, non-shock

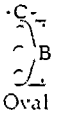


No. 1589
With Cranite or Lead Gasket

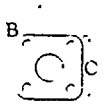
*The No. 1589 Union in the 4-inch size is rated for only 600 pounds cold water, oil, or gas, non-shock.



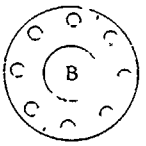

"A" is end to end of threads.




Oval




Square




Round

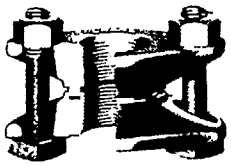
## List Prices and Dimensions

| Size | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1589 | Each | 2.75 | 3.00 | 3.35 | 3.75 | 4.75 | 5.80 | 6.90 | 8.20 | 12.50 | 19.50 | 27.00 |
| Style of flanges | | Oval | | | | | Square | | | | Round | |
| A | Inches | 15/16 | 1 1/2 | 1 11/16 | 1 13/16 | 2 | 2 1/8 | 2 3/16 | 2 1/4 | 2 13/16 | 3 | 3 3/8 |
| B | Inches | 3 5/8 | 3 13/16 | 4 | 4 3/4 | 4 1/2 | 5 | 6 | 6 1/2 | 7 1/2 | 8 1/4 | 10 |
| C | Inches | 1 5/8 | 1 3/4 | 2 | 2 1/4 | 3 9/16 | 3 15/16 | 4 11/16 | 5 1/16 | 5 15/16 | | |
| No. of bolts | | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 8 | 8 |
| Dia. of bolts | | 1/2 | 1/2 | 1/2 | 5/8 | 1/2 | 1/2 | 5/8 | 5/8 | 3/4 | 3/4 | 3/4 |

No. 1589 Unions in sizes 3-inch and smaller are forged steel; the 4-inch size is malleable iron.

The unions are rugged and serviceable. They are made by bolting together a No. 1547 Tongue Flange and a No. 1545 Groove Flange (see the illustrations shown on page 415).

No. 1589 Unions are regularly furnished with a Cranite gasket; when so specified, they will be furnished with a lead gasket at no extra charge.



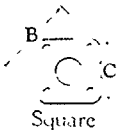
No. 1591½
With Cranite or Lead Gasket

## List Prices and Dimensions

| Size | Inches | 1 | 1 1/4 | 2 |
|---|---|---|---|---|
| No. 1591 1/2 | Each | 4.25 | 4.75 | 8.20 |
| Style of flanges | | Oval | | Square |
| A | Inches | 2 | 2 1/8 | 2 11/16 |
| B | Inches | 4 3/4 | 5 1/4 | 5 13/16 |
| C | Inches | 2 5/8 | 3 | 4 1/2 |
| No. and dia. of bolts | | 2-5/8 | 2-5/8 | 4-5/8 |

"A" is end to end of threads.

Oval




Square

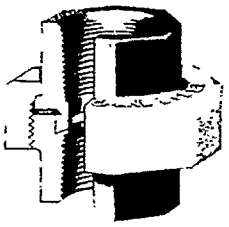
No. 1591½, unusually compact forged steel unions, are made by bolting together a No. 1582½ Tongue Flange and a No. 1583½ Groove Flange (see page 415). The unions are ideal for making up pipe coils with close centers and for other services requiring a good joint in limited space. They are regularly furnished with a Cranite gasket; if specified, they will be furnished with a lead gasket at no extra charge.

*Extra gaskets....page 416*

## *Crane Forged Steel Unions and Combination Elbows For High Pressure—High Temperature Service*

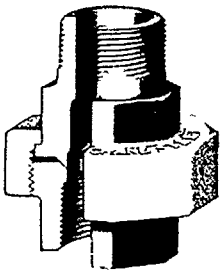
*See pages 263 to 266.*

17



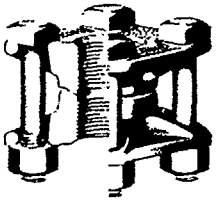
Forged Steel
Ground Joint
Female Unions
Brass to Steel Seat

*See page 263*



Forged Steel
Ground Joint
Male and Female Unions
Steel to Steel Seat

*See page 263*



Forged Steel
Ground Joint
Flange Unions
Steel to Steel or
Brass to Steel Seat

*See page 265*

Forged Steel
Combination Elbows
Complete with Flange,
Bolts, and Cranite
or Lead Gasket

*See page 266*

# Brass Fittings, Nipples, Unions, & Flanges

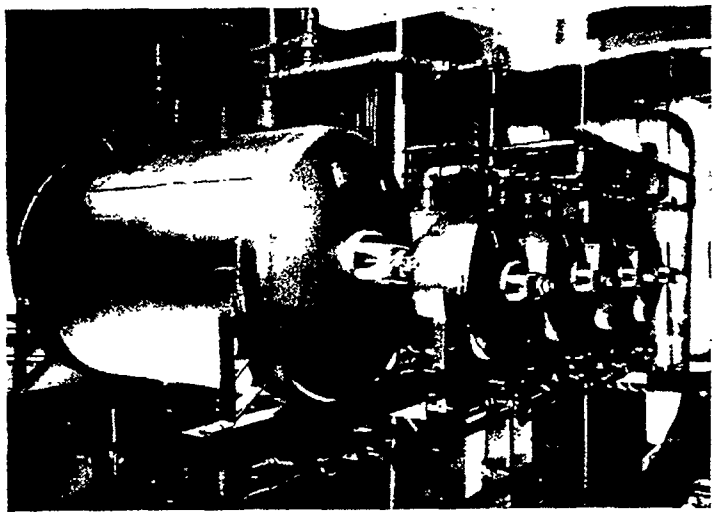
# Brass
# Fittings, Nipples, Unions, and Flanges


Screwed Fittings
- 125-Pound.....pages 184 and 185
- 250-Pound.....page 186

Flanges
- 150-Pound Companion Flanges.....page 186
- 300-Pound Companion Flanges.....page 188
- Floor Flanges.....page 184

Unions
- 125-Pound.....page 187
- 200-Pound, Government Pattern.....page 187
- 300-Pound.....page 187

Union Elbows.....page 187
Plugs and Bushings.....page 185
Nipples.....page 186

An installation of Crane brass screwed and solder-joint fittings, unions, and valves in a large commercial building. Office buildings, schools, and hospitals are among the commercial users who choose Crane equipment for dependable control of service lines.


*How to read reducing fittings*.....*page 577*
*Brass Solder-Joint Fittings*.....*pages 422 to 425*
*Brass Fittings for Marine Service*.....*page 399*

# 125-Pound Brass Fittings

90° Elbow

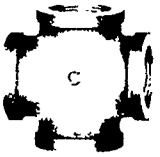
90° Street Elbow

WORKING PRESSURES
125 pounds
saturated steam
175 pounds
cold water, oil or gas, non-shock
***Air Tested***

45° Elbow

45° Street Elbow

Tee


Cross

Cap

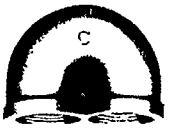
Right Hand

Right & Left
Couplings

Reducer

Locknut

45° Y-Bend


Return Bend

Round
Floor Flange
Right Hand

## List Prices, Rough, Each

| Size | | | Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elbows | Straight | 90° | | .32 | .32 | .32 | .48 | .65 | 1.00 | 1.60 | 2.00 | 3.25 | 6.20 | 9.50 | 22.00 |
| | | 45° | | .35 | .35 | .35 | .44 | .65 | 1.10 | 1.76 | 2.20 | 3.58 | 6.80 | 10.50 | 24.00 |
| | | 90° Street | | .48 | .48 | .48 | .60 | .85 | 1.40 | 2.15 | 2.80 | 4.75 | | | |
| | | 45° Street | | .48 | .48 | .48 | .60 | .85 | 1.40 | 2.15 | 2.80 | 4.75 | | | |
| | Reducing, 90° | | | | .48 | .48 | .52 | .71 | 1.25 | 1.90 | 2.40 | 4.25 | 7.50 | 11.50 | 26.00 |
| Tees | Straight | | | .44 | .44 | .44 | .56 | .80 | 1.42 | 2.00 | 2.75 | 4.50 | 8.50 | 13.00 | 30.00 |
| | Reducing | 1 opening | | | .53 | .53 | .67 | .96 | 1.70 | 2.40 | 3.30 | 5.40 | 10.00 | 15.50 | 36.00 |
| | | 2 openings | | | | .57 | .73 | 1.05 | 1.85 | 2.60 | 3.50 | 5.85 | 11.00 | | |
| Crosses | | | | .72 | .72 | .72 | .90 | 1.30 | 2.00 | 3.00 | 4.00 | 8.00 | 15.00 | 22.00 | 45.00 |
| Caps* | | | | .24 | .24 | .24 | .32 | .42 | .66 | 1.00 | 1.35 | 2.30 | 4.25 | 6.50 | 12.50 |
| Couplings | Right Hand* | | | .32 | .32 | .32 | .40 | .53 | .80 | 1.25 | 1.70 | 2.80 | 4.50 | 6.25 | 11.50 |
| | Right & Left* | | | | | .85 | 1.00 | 1.18 | 1.70 | 2.40 | 2.80 | 4.00 | 6.50 | 8.50 | |
| Reducers | Reducing 1 or 2 sizes | | | | .34 | .34 | .43 | .63 | 1.05 | 1.70 | 2.15 | 3.20 | 5.50 | 7.00 | 15.00 |
| | Reducing 3 sizes | | | | | | | .70 | | | 2.35 | 3.50 | | | |
| Locknuts* | | | | .15 | .15 | .15 | .25 | .30 | .45 | .68 | .88 | 1.40 | 2.50 | 4.00 | 8.00 |
| 45° Y-Bends | | | | | | 1.00 | 1.15 | 1.50 | 2.60 | 4.30 | 6.00 | 10.00 | | | |
| Return Bends | Close | Center to center, Inches | | | | | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 3/16 | 2 5/8 | | | |
| | | Right Hand | | | | | .95 | 1.35 | 1.90 | 3.20 | 5.00 | 7.75 | | | |
| | Open | Center to center, Inches | | | | | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | | | |
| | | Right Hand | | | | | 1.25 | 1.80 | 2.50 | 3.60 | 5.75 | 8.00 | | | |
| Floor Flanges | Diameter | | Inches | | 2 1/2 | 2 1/2 | 3 | 3 | 4 | 5 | 5 | 5 | | | |
| | Right Hand | | | | 1.75 | .75 | .88 | 1.20 | 1.88 | 2.15 | 3.00 | 4.00 | | | |

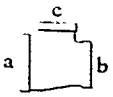
*Caps 3/8-inch and smaller, Couplings 1/2-inch and smaller, and Locknuts in the 1/8-inch size are made from bar stock.

The largest opening on reducing fittings determines the list price; for example, a

1 x 3/4 x 1" Tee (reducing 1 opening) is $1.70 list.

1 x 1/2 x 3/4" or 3/4 x 3/4 x 1" Tee (reducing 2 openings) is $1.85 list, etc.

Reducing tees: When specifying reducing tees, always name the size of openings in the sequence of the lower case letters shown on the illustration at the right.




***Dimensions.....page 185***
***Brass Nipples..page 186***
***Brass Unions....page 187***

Reducing Fittings Carried Stock
***List prices apply only to these sizes.***

### Reducing 90° Elbows

| | | |
|---|---|---|
| 1/4×1/8 | 1 ×3/4 | 2 ×1 1/2 |
| 3/8×1/4 | ×1/2 | ×1 1/4 |
| ×1/8 | 1 1/4×1 | 2 1/2×2 |
| 1/2×3/8 | ×3/4 | 3 ×2 1/2 |
| ×1/4 | 1 1/2×1 1/4 | ×2 |
| 3/4×1/2 | ×1 | 4 ×3 |

### Reducers

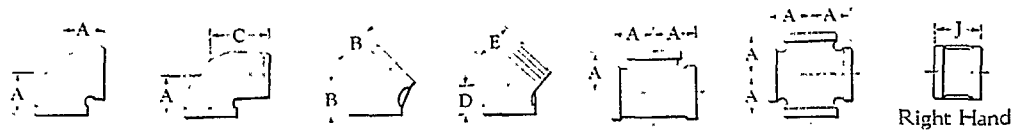
| | | |
|---|---|---|
| 1/4×1/8 | 1 ×3/4 | 2 ×1 1/2 |
| 3/8×1/4 | ×1/2 | ×1 1/4 |
| ×1/8 | 1 1/4×1 | ×1 |
| 1/2×3/8 | ×3/4 | 2 1/2×2 |
| ×1/4 | 1 1/2×1 1/4 | 3 ×2 1/2 |
| 3/4×1/2 | ×1 | ×2 |
| ×3/8 | ×3/4 | 4 ×3 |
| ×1/4 | | |

### Reducing Tees

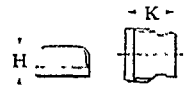
| a | b | c | a | b | c | a | b | c | a | b | c |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4×1/4×1/8 | 1 | ×1 | ×3/4 | | | 1 1/4×3/4 | ×1 1/4 | 2 | ×2 | ×1 1/2 |
| | | | ×1/2 | | | 1 1/4×1/2 | ×1 1/4 | | | ×1 1/4 |
| 3/8×3/8×1/4 | | | ×3/8 | | | 1 | ×1 | ×1 1/4 | | ×1 |
| 3/8×1/4×3/8 | 1 | ×3/4 | ×1 | | | | | | | ×3/4 |
| ×1/4 | | | ×3/4 | | | | | | | ×1/2 |
| | | | ×1/2 | | | 1 1/2×1 1/2×1 1/4 | | 2 | ×1 1/2×2 | |
| | | | | | | | ×1 | | | ×1 1/2 |
| 1/2×1/2×3/8 | 1 | ×1/2 | ×1 | | | | ×3/4 | | 1 1/2×1 1/2×2 | |
| ×1/4 | | | ×3/4 | | | | ×1/2 | | | |
| 1/2×3/8×1/2 | | | ×1/2 | | | 1 1/2×1 1/4×1 1/2 | | | 2 1/2×2 1/2×2 | |
| ×3/8 | 3/4 | ×3/4 | ×1 | | | | ×1 1/4 | | 2 1/2×2 | ×2 |
| 3/8×3/8×1/2 | | | | | | | ×1 | | 2 | ×2 | ×2 1/2 |
| | 1 1/4×1 1/4×1 | | | | | 1 1/2×1 | ×1 1/2 | | | | |
| 3/4×3/4×1/2 | | | ×3/4 | | | | ×1 1/4 | | 3 | ×3 | ×2 1/2 |
| ×3/8 | | | ×1/2 | | | | ×1 | | | | ×2 |
| 3/4×1/2×3/4 | 1 1/4×1 | | ×1 1/4 | | | 1 1/2×3/4 | ×1 1/2 | | | | |
| ×1/2 | | | ×1 | | | 1 1/4×1 1/4×1 1/2 | | | 4 | ×4 | ×3 |
| 1/2×1/2×3/4 | | | ×3/4 | | | 1 | ×1 | ×1 1/2 | | | ×2 |

# Dimensions of 125-Pound Brass Fittings

*Dimensions are given in inches. For list prices see the preceding page.*




90° Elbow | 90° Street Ell | 45° Elbow | 45° Street Ell | Tee | Cross | Right Hand Coupling

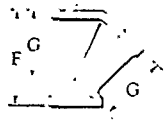



Cap | *Reducer

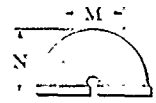
*K is for reducers with either one or two size reductions.

| Size | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 9/16 | 11/16 | 13/16 | 1 | 1 3/16 | 1 7/16 | 1 11/16 | 1 7/8 | 2 3/16 | 2 11/16 | 3 1/8 | 3 3/4 |
| B | 1/2 | 9/16 | 5/8 | 13/16 | 7/8 | 1 1/16 | 1 1/4 | 1 5/16 | 1 1/2 | 1 15/16 | 2 3/16 | 2 5/8 |
| C | 15/16 | 1 1/8 | 1 1/4 | 1 1/2 | 1 11/16 | 2 | 2 1/4 | 2 7/16 | 2 7/8 | | | |
| D | 7/16 | 5/8 | 11/16 | 13/16 | 15/16 | 1 1/16 | 1 1/4 | 1 3/8 | 1 11/16 | | | |
| E | 13/16 | 15/16 | 1 1/16 | 1 3/16 | 1 5/16 | 1 1/2 | 1 11/16 | 1 7/8 | 2 1/4 | | | |
| F | | | 1 13/16 | 2 3/16 | 2 5/8 | 3 3/16 | 3 7/8 | 4 1/4 | 5 | | | |
| G | | | 1 5/16 | 1 5/8 | 1 15/16 | 2 3/8 | 2 7/8 | 3 1/8 | 3 3/4 | | | |
| H | 1/2 | 9/16 | 5/8 | 3/4 | 7/8 | 1 | 1 1/8 | 1 3/16 | 1 5/16 | 1 11/16 | 1 3/4 | 2 |
| J | 7/8 | 1 5/16 | 1 11/16 | 1 5/16 | 1 7/16 | 1 11/16 | 1 7/8 | 1 15/16 | 2 3/16 | 2 7/8 | 3 3/16 | 3 11/16 |
| K* | | 1 5/16 | 1 11/16 | 1 1/8 | 1 3/8 | 1 9/16 | 1 11/16 | 1 7/8 | 2 1/16 | 3 1/4 | 3 11/16 | 4 3/8 |
| Return Bends, Close, M | | | | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 3/16 | 2 5/8 | | | |
| Return Bends, Close, N | | | | 1 7/16 | 1 3/4 | 2 1/16 | 2 1/2 | 2 7/8 | 3 3/8 | | | |
| Return Bends, Open, M | | | | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | | | |
| Return Bends, Open, N | | | | 1 11/16 | 2 1/8 | 2 9/16 | 3 1/16 | 3 1/2 | 4 | | | |
| Floor Flange, Flange diameter | | 2 1/2 | 2 1/2 | 3 | 3 | 4 | 5 | 5 | 5 | | | |
| Floor Flange, Flange thickness | | 5/32 | 3/16 | 7/32 | 3/16 | 1/4 | 1/4 | 9/32 | 9/32 | | | |
| Floor Flange, Hub thickness | | 1/2 | 9/16 | 5/8 | 11/16 | 25/32 | 7/8 | 15/16 | 1 1/32 | | | |
| Floor Flange, Bolt circle dia. | | 1 13/16 | 1 13/16 | 2 1/4 | 2 5/16 | 3 1/8 | 3 13/16 | 3 15/16 | 3 7/8 | | | |
| Floor Flange, No. & dia. holes | | 3-7/32 | 3-7/32 | 4-1/4 | 4-1/4 | 4-1/4 | 5-1/4 | 5-9/32 | 5-9/32 | | | |
| Z | 1/4 | 3/8 | 3/8 | 1/2 | 9/16 | 11/16 | 11/16 | 11/16 | 3/4 | 15/16 | 1 | 1 1/8 |

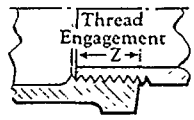
The dimensions shown cover most currently used straight size ings and Reducers. Dimensions of reducing sizes and other types of fittings furnished on application.




45° Y-Bend




Return Bend




For explanation, see page 494.

# Brass Plugs and Bushings

Cored Plug Square Head | Solid Plug Square Head | Countersunk Plug | Bushing Outside Hexagon | Bushing Inside Hexagon | Face Bushing

## List Prices, Rough

| Size | | | Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plugs | Square Head | Cored | Each | | | | .33 | .38 | .50 | .75 | .95 | 1.50 | 2.50 | 4.00 | 7.50 |
| Plugs | Square Head | Solid | Each | .21 | .21 | .21 | .33 | .40 | .60 | .90 | 1.25 | 2.10 | 3.70 | 6.00 | 14.50 |
| Plugs | Countersunk | | Each | | | | .33 | .40 | .60 | .90 | 1.25 | 2.10 | 3.70 | 6.00 | 14.50 |
| Bushings | Hexagon | Reducing 1 or 2 sizes | Each | .20 | .20 | .25 | .35 | .53 | .90 | 1.15 | 1.70 | 3.40 | 5.00 | 11.00 | |
| Bushings | Hexagon | Reducing 3 to 5 sizes | Each | | | .30 | .42 | .64 | 1.08 | 1.40 | 2.05 | 4.10 | 6.00 | 13.00 | |
| Bushings | Face | | Each | .42 | .42 | .48 | .66 | .99 | 1.32 | 1.65 | 2.10 | | | | |

**Plugs:** Generally, Cored and Countersunk Plugs are used with 125-Pound Brass Fittings (page 184), and Solid Plugs with 250-Pound Brass Fittings (page 186). Solid Plugs 3/8-inch and smaller are made from bar stock.

**Hexagon Bushings:** Hexagon Bushings have an outside or inside hexagon, as illustrated above, depending on the size of the bushing; see the table at the right. The 1/4 x 1/8-inch size is made from bar stock.

**Face Bushings:** Face Bushings in sizes 1/2-inch and smaller and in the 1 1/4-inch size do not have the two small lugs shown in the illustration above. Sizes 1/2-inch and smaller are made from bar stock.

*250-Pound Brass Fittings..page 186* *Brass Unions..page 187*

### Bushings Carried in Stock

*List prices apply only to these sizes.*

| Hexagon Bushings | | | Face Bushings |
|---|---|---|---|
| 1/4 x 1/8 | 1 1/4 x 1 | 2 1/2 x 2 | 1/4 x 1/8 |
| 3/8 x 1/4 | x 3/4 | x 1 1/2 † | 3/8 x 1/4 |
| x 1/8 | x 1/2 | x 1 1/4 † | 1/2 x 3/8 |
| 1/2 x 3/8 | x 3/8 | x 1 † | x 1/4 |
| x 1/4 | 1 1/2 x 1 1/4 | 3 x 2 1/2 | |
| x 1/8 | x 1 | x 2 † | 3/4 x 1/2 |
| 3/4 x 1/2 | x 3/4 | x 1 1/2 † | 1 x 3/4 |
| x 3/8 | x 1/2 | x 1 1/4 † | x 1/2 |
| x 1/4 | 2 x 1 1/2 | | |
| 1 x 3/4 | x 1 1/4 | 4 x 3 | 1 1/4 x 1 |
| x 1/2 | x 1 | x 2 1/2 † | 1 1/2 x 1 1/4 |
| x 3/8 | x 3/4 | x 2 † | 2 x 1 1/2 |
| x 1/4 | x 1/2 | x 1 1/2 † | x 1 1/4 |

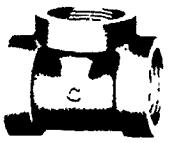
†Indicates Bushings made with inside hexagon.

18

# 250-Pound Brass Fittings

90° Elbow

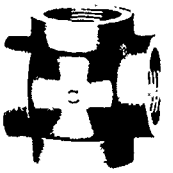
45° Elbow



Tee

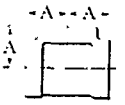
WORKING PRESSURES
250 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock
*Air Tested*

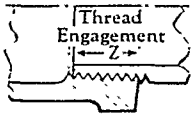
Dimensions of 90° Elbows and Tees apply only to straight sizes; dimensions of reducing sizes will be furnished on request.



Cross

Coupling






See page 494 for explanation

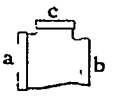
## List Prices, Rough, Each, and Dimensions

| Size | | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elbows | 90° | Straight | | .56 | .56 | .85 | 1.15 | 2.00 | 3.00 | 4.50 | 7.50 | 12.00 | 20.00 | 37.00 |
| | | Reducing | | | | 1.10 | 1.30 | 2.40 | 3.60 | 5.40 | 9.00 | 14.40 | 24.00 | 44.50 |
| | 45° | | | .62 | .62 | .88 | 1.20 | 2.10 | 3.15 | 4.75 | 7.75 | 12.50 | 21.00 | 39.00 |
| Tees | Straight | | | .90 | .90 | 1.20 | 1.65 | 2.60 | 4.20 | 6.00 | 10.00 | 15.00 | 24.00 | 41.00 |
| | Reducing | 1 opening | | | | 1.30 | 1.80 | 2.85 | 4.60 | 6.60 | 11.00 | 16.50 | 25.50 | 45.00 |
| | | 2 openings | | | | | 1.90 | 3.00 | 4.80 | 6.90 | | | | |
| Crosses | | | | 1.30 | 1.30 | 2.00 | 2.50 | 4.00 | 5.50 | 8.50 | 14.00 | 22.00 | 30.00 | 45.00 |
| Couplings, Right Hand | | | | .70 | .70 | 1.00 | 1.25 | 1.90 | 2.70 | 4.00 | 5.50 | 9.00 | 13.00 | 20.00 |
| Dimensions, in Inches | A | 90° Elbows | | 13/16 | 15/16 | 1 1/8 | 1 5/16 | 1 1/2 | 1 3/4 | 1 15/16 | 2 1/4 | 2 11/16 | 3 1/8 | 3 3/4 |
| | | Tees | | 13/16 | 15/16 | 1 1/8 | 1 5/16 | 1 1/2 | 1 3/4 | 1 15/16 | 2 1/4 | 2 13/16 | 3 1/4 | 4 |
| | | Crosses | | 3/4 | 15/16 | 1 1/16 | 1 5/16 | 1 1/2 | 1 13/16 | 2 | 2 3/8 | 2 7/8 | 3 3/8 | 4 1/16 |
| | B | | | 3/4 | 13/16 | 7/8 | 1 | 1 1/8 | 1 5/16 | 1 7/16 | 1 11/16 | 1 3/4 | 2 1/8 | 2 7/16 |
| | F | | | 1 3/8 | 1 1/2 | 1 7/16 | 1 5/8 | 1 13/16 | 2 1/8 | 2 3/8 | 2 11/16 | 3 1/16 | 3 1/4 | 4 |
| | Z | | | 3/8 | 3/8 | 1/2 | 9/16 | 11/16 | 11/16 | 11/16 | 3/4 | 15/16 | 1 | 1 1/8 |

***List prices of reducing 90° elbows and tees apply only to sizes carried in stock.***

The largest opening on reducing fittings determines the price; for example, a 1 x 3/4 x 1" Tee (reducing 1 opening) is $2.85 list, a 1 x 3/4 x 3/4" or 3/4 x 3/4 x 1" Tee (reducing 2 openings) is $3.00 list, etc.

**Reducing tees:** When specifying reducing tees always name the size of openings in the sequence of the lower case letters as illustrated at the right.



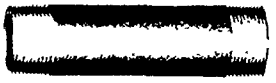

Reducing Tee

### Reducing Fittings Carried in Stock

| Reducing 90° Elbows | | | Reducing Tees a | b | c | a | b | c | a | b | c | a | b | c |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/2 × 3/8 | 1 1/2 × 1 1/4 | | 1/2 × 1/2 × 3/8 | | | 1 × 3/4 | | × 1 | 1 1/4 × 3/4 | | × 1 1/4 | 1 1/2 × 1 | | × 1 1/2 | 3 × 3 | | × 2 |
| 3/4 × 1/2 | | × 1 | 3/4 × 3/4 × 1/2 | | | | | × 3/4 | 1 × 1 | | × 1 1/4 | 1 1/4 × 1 1/4 × 1 1/2 | | | 3 × 2 1/2 | | × 3 |
| 1 × 3/4 | 2 | × 1 1/2 | | | × 3/8 | 3/4 × 3/4 | | × 1 | | | | | | | 3 × 2 | | × 3 |
| × 1/2 | | × 1 1/4 | 3/4 × 1/2 × 3/4 | | | 1 1/4 × 1 1/4 × 1 | | | 1 1/2 × 1 1/2 × 1 1/4 | | | 2 × 2 | | × 1 1/2 | 4 × 4 | | × 3 |
| 1 1/4 × 1 | 2 1/2 × 2 | | | | × 1/2 | | | × 3/4 | | | × 1 | | | × 1 1/4 | | | × 2 |
| × 3/4 | 3 | × 2 1/2 | 1/2 × 1/2 × 3/4 | | | | | × 1/2 | | | × 3/4 | | | × 1 | 4 × 3 | | × 4 |
| | | × 2 | 1 × 1 | | × 3/4 | 1 1/4 × 1 | | × 1 1/4 | 1 1/2 × 1 1/4 × 1 1/4 | | | | | × 3/4 | | | |
| | 4 | × 3 | | | × 1/2 | | | × 1 | | | × 1 | 2 1/2 × 2 1/2 × 2 | | × 1/2 | | | |

# Red Brass Nipples

Close Nipple



Long Nipple

These are high quality Brass Nipples, made from new pipe, having clean, sharp threads accurately cut to gauge.

***Brass Locknuts...page 184***
***Brass Plugs.....page 185***
***Brass Bushings...page 185***
***Brass Unions.... page 187***

## List Prices

| Pipe Size Inches | Length Inches Close | List Prices, Each: Close | Length, Inches 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 3/4 | .10 | .12 | .15 | .17 | .18 | .20 | .22 | .24 | .26 | .28 | .30 |
| 1/4 | 7/8 | .14 | .18 | .21 | .24 | .27 | .30 | .33 | .37 | .40 | .43 | .46 |
| 3/8 | 1 | .16 | .20 | .24 | .28 | .32 | .36 | .40 | .44 | .48 | .52 | .60 |
| 1/2 | 1 1/8 | .23 | .25 | .31 | .37 | .42 | .47 | .53 | .59 | .65 | .71 | .77 |
| 3/4 | 1 3/8 | .32 | | .38 | .46 | .54 | .62 | .70 | .78 | .85 | .93 | 1.00 |
| 1 | 1 1/2 | .44 | | .53 | .63 | .74 | .84 | .94 | 1.05 | 1.16 | 1.27 | 1.40 |
| 1 1/4 | 1 5/8 | .69 | | .92 | .92 | 1.07 | 1.23 | 1.38 | 1.53 | 1.68 | 1.84 | 2.00 |
| 1 1/2 | 1 3/4 | .83 | | 1.06 | 1.06 | 1.24 | 1.43 | 1.61 | 1.78 | 1.96 | 2.15 | 2.30 |
| 2 | 2 | 1.15 | | | 1.40 | 1.65 | 1.89 | 2.13 | 2.37 | 2.61 | 2.85 | 3.10 |
| 2 1/2 | 2 1/2 | 2.64 | | | | 3.10 | 3.56 | 4.02 | 4.48 | 4.94 | 5.40 | 5.86 |
| 3 | 2 5/8 | 3.85 | | | | 4.47 | 5.06 | 5.70 | 6.26 | 6.90 | 7.53 | 8.16 |
| 4 | 2 7/8 | 7.25 | | | | | | 9.40 | 10.50 | 11.50 | 12.60 | 13.80 |
| 5 | 3 | 13.25 | | | | | | 16.50 | 16.50 | 18.00 | 19.50 | 21.00 |
| 6 | 3 1/8 | 18.00 | | | | | | 22.00 | 22.00 | 24.00 | 26.00 | 28.00 |

# Brass Ground Joint Unions

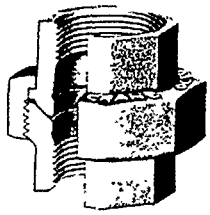
## 125-Pound

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas, non-shock

125-Pound
Octagon ends on sizes ⅛ to 2-inch; round ends on other sizes.

## Government Pattern

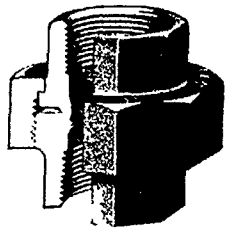
WORKING PRESSURES
200 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock
*Air Tested*



No. 523½
Octagon Ends

## 300-Pound

WORKING PRESSURES
300 pounds steam, 550° F.
600 pounds cold water, oil, or gas, non-shock
*Air Tested*



No. 696 E
Octagon Ends

***These unions have a ground joint; no gasket is required.***

### List Prices and Dimensions

| Size | | Inches | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125-Pound | Rough | Each | 1.02 | 1.02 | 1.02 | 1.23 | 1.70 | 2.25 | 3.30 | 3.90 | 6.00 | 11.00 | 17.00 |
| | End to End | Inches | 1 11/32 | 1 19/32 | 1⅝ | 1¾ | 2 1/16 | 2 13/32 | 2⅜ | 2 15/32 | 2 15/16 | 3 13/16 | 3 13/16 |
| Government Pattern | No. 523½, Rough | Each | 1.25 | 1.25 | 1.25 | 1.60 | 2.25 | 3.00 | 4.20 | 5.40 | 8.50 | 13.70 | 23.40 |
| | End to end | Inches | 1 7/16 | 1 9/16 | 1¾ | 1 15/16 | 2⅛ | 2 7/16 | 2 11/16 | 2¾ | 3 3/16 | 3 9/16 | 3¾ |
| 300-Pound | No. 696 E, Rough | Each | | 2.75 | 2.75 | 3.15 | 4.40 | 6.00 | 8.50 | 10.50 | 15.50 | | |
| | End to end | Inches | | 1⅝ | 1 13/16 | 1 15/16 | 2¼ | 2 7/16 | 2 13/16 | 3 | 3⅜ | | |

The No. 523½ Government Pattern Unions when cast in the required composition, comply with U. S. Navy Department Specifications.

The No. 696 E 300-Pound Unions are made of Crane Special Bronze, a hard, leaded tin bronze.

**Ground joint:** All of these unions have a ground joint seat that holds pressure easily; no gasket is required.

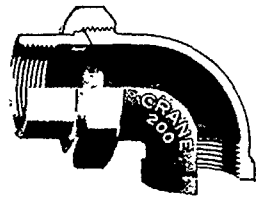
The unions can be taken apart and reassembled repeatedly without affecting their strength or tightness.

# Brass Ground Joint Union Elbows

WORKING PRESSURES
200 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock

*Air tested* *Ground joint* *No gasket required*

No. 524½ Union Elbows have a semi-finished tail-piece; the elbow portion is rough. On sizes 1-inch and larger, the tail-piece has inside lugs, as illustrated; on smaller sizes, the tail-piece is made without lugs. The elbows have a ground joint seat that holds pressure easily; no gasket is required.




No. 524½
90° Union Elbow

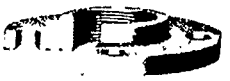
18

### List Prices and Dimensions

| Size | | Inches | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 524½ | Price | Each | 2.15 | 2.15 | 2.15 | 2.90 | 3.90 | 5.70 | 8.00 | 10.00 | 15.00 |
| | Center to end | Inches | 9/16 | 13/16 | 15/16 | 1⅛ | 1 5/16 | 1 7/16 | 1¾ | 1 15/16 | 2¼ |
| | Center to union end | Inches | 1½ | 1¾ | 1 15/16 | 2 3/16 | 2⅝ | 3 | 3 7/16 | 3¾ | 4¼ |

# 150 and 300-Pound Brass Flanges

Working Pressures
No. 2104
150 pounds saturated steam
225 pounds cold water, oil, or gas, non-shock



Companion Flange
No. 2104, 150-Pound
No. 2109, 300-Pound

Working Pressures
No. 2109
300 pounds steam
500 pounds cold water, oil, or gas, non-shock

## List Prices and Dimensions

| Size | | Inches | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150-Pound F. & D. | No. 2104, Screwed Flange | Each | 7.00 | 8.00 | 10.00 | 13.50 | 17.00 | 21.00 | 30.00 | 36.00 | 44.00 |
| | Diameter | Inches | 4¼ | 4⅝ | 5 | 6 | 7 | 7½ | 9 | 10 | 11 |
| | Thickness | Inches | ⅜ | 13/32 | 7/16 | ½ | 9/16 | ⅝ | 11/16 | ¾ | 13/16 |
| 300-Pound F. & D. | No. 2109, Screwed Flange | Each | 8.75 | 10.00 | 12.50 | 16.50 | 21.00 | 26.00 | | | |
| | Diameter | Inches | 4⅞ | 5¼ | 6⅛ | 6½ | 7½ | 8¼ | | | |
| | Thickness | Inches | 19/32 | ⅝ | 11/16 | ¾ | 13/16 | 29/32 | | | |

**150-Pound:** The No. 2104 Companion Flange is made of red brass. Dimensions conform to the MSS 150-Pound SP Bronze Flange and Flanged Fitting Standard (No. SP-2-1040).

All sizes interchange with American Standard Cast Iron Flanges, Class 125, differing only in thickness and in facing.

**300-Pound:** The No. 2109 Companion Flange is made of a high grade steam metal. Dimensions conform to the MSS 300-Pound SP Bronze Flange and Flange Fitting Standard (No. SP-2-1040).

All sizes interchange with American Standard Cast Iron Flanges, Class 250, differing only in thickness and in facing.

**Facing:** The flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Full face gaskets should be used.

**Drilling:** These flanges are furnished faced and drilled (F. & D.) unless ordered faced only.

Prices include facing and drilling to the MSS Standard. No deduction is made when flanges are ordered faced only.

**Bolting to iron or steel material:** When brass flanges are bolted to iron or steel material which normally has a raised face, the raised face should be removed to provide a full face bearing for the gasket.

Brass flanged material should not be bolted to Cranelap Flanged Pipe Joints.

*Templates for drilling . . . page 458*

At the Crane Chicago Works
Inspecting and checking the alignment of Crane Screwed Fittings.

# Railing Fittings

**Railing Fittings**
Ball Pattern, Malleable Iron.....page 190
Adjustable, Malleable Iron.....page 191
Nu-Rail Slip-on, Aluminum.....page 193

**Railing Threads**
Dimensions and Normal Engagement.....page 192

**Rivets**
For Railing Fittings.....page 192

***Brass Floor Flanges*.....*page 184***
***Iron Floor Flanges*.....*page 203***

2-inch Galvanized Double Pipe Railing — total length of railing 6000 feet
Fabricated in a Crane Branch House Shop

Crane Shops can furnish Pipe Railings of all descriptions and for a large variety of services. They can be manufactured from any kind of commercial pipe, using any of the regular railing fittings listed or special types when exceptional conditions prevail.

Pipe Railings can be supplied with the fittings and pipe loose, all completely cut to length and prepared ready for field assembly. Small sizes of railings and sections of large railings can be assembled in Crane Shops and delivered to the field site for final assembly by the user.

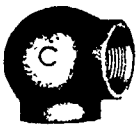
Beyond the scope of the regular Railing Fittings, Crane can provide special fittings for screwed, slip, or slip and pinned joints to fill every requirement. For long railings, the posts can be assembled separately, using threaded joints, and the horizontal runs of the fittings reamed and drilled for slip and pin connections; random runs of pipe can then be economically utilized to complete the railing in the field.

When so desired, special Pipe Railings requiring bent sections or welded construction can be fabricated in Crane Shops.

Orders and inquiries for price or information on Pipe Railings should be accompanied by a sketch showing dimensions. In the case of stair railings, the angle should be specified.

Inquiries or orders should also specify the kind and finish of the pipe, the type or figure number of the fittings, details regarding the openings, and whether or not partially or completely assembled.

# Malleable Iron Ball Pattern Railing Fittings



90° Elbow
No. 1, Right Hand

Square Floor Flange
No. 7, Right Hand

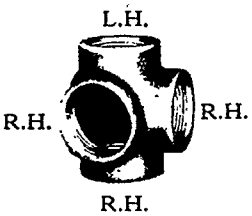
*Brass Round Floor Flanges....page 184*
*Iron Round Floor Flanges....page 203*

Male Ball Ornament
No. 8, Left Hand
No. 8½, Right Hand

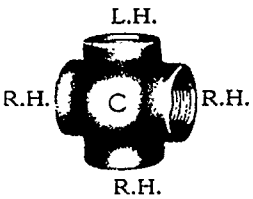
Female Ball Ornament
No. 13, Right Hand

90° Side Outlet Elbow
No. 2, Right Hand

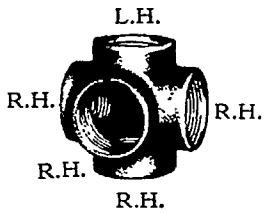
Tee
No. 3, Tapped as shown
No. 3½, Right Hand




Side Outlet Tee
No. 4, Tapped as shown
No. 4½, Right Hand




Cross
No. 5, Tapped as shown
No. 5½, Right Hand



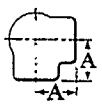

Side Outlet Cross
No. 6, Right Hand
No. 6½, Tapped as shown

## List Prices, Each

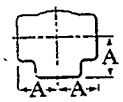
| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| 90° Elbows | No. 1 | Black | .43 | .52 | .64 | .92 | 1.20 | 1.65 |
| | | Galv. | .56 | .68 | .83 | 1.20 | 1.55 | 2.15 |
| 90° Side Outlet Elbows | No. 2 | Black | .57 | .72 | .84 | 1.20 | 1.60 | 2.20 |
| | | Galv. | .74 | .94 | 1.10 | 1.55 | 2.10 | 2.85 |
| Tees | No. 3 or 3½ | Black | .47 | .57 | .70 | 1.00 | 1.30 | 1.80 |
| | | Galv. | .61 | .74 | .91 | 1.25 | 1.70 | 2.25 |
| Side Outlet Tees | No. 4 or 4½ | Black | .69 | .82 | 1.10 | 1.45 | 1.95 | 2.60 |
| | | Galv. | .90 | 1.05 | 1.45 | 1.90 | 2.55 | 3.40 |
| Crosses | No. 5 or 5½ | Black | .60 | .74 | .95 | 1.30 | 1.75 | 2.35 |
| | | Galv. | .78 | .96 | 1.20 | 1.65 | 2.25 | 2.95 |
| Side Outlet Crosses | No. 6 or 6½ | Black | .80 | .93 | 1.20 | 1.65 | 2.20 | 2.95 |
| | | Galv. | 1.05 | 1.20 | 1.55 | 2.15 | 2.85 | 3.85 |
| Square Floor Flanges | No. 7 | Black | .37 | .48 | .55 | .92 | 1.35 | 2.35 |
| | | Galv. | .48 | .62 | .72 | 1.20 | 1.75 | 3.15 |
| Male Ball Ornaments | No. 8 or 8½ | Black | .67 | .80 | .95 | 1.15 | 1.40 | 1.75 |
| | | Galv. | .87 | .99 | 1.25 | 1.50 | 1.80 | 2.35 |
| Female Ball Ornaments | No. 13 | Black | .67 | .80 | .95 | 1.15 | 1.40 | 1.75 |
| | | Galv. | .87 | .99 | 1.25 | 1.50 | 1.80 | 2.35 |

**Reamed fittings:** Fittings with one or more openings reamed for slip joint, or with one or more openings reamed for slip joint and drilled for rivets, can be made to order at an advance over regular list prices. See the Crane Discount Sheet for prices. Orders should be accompanied by a sketch.

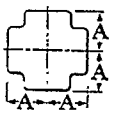
## Dimensions, in Inches



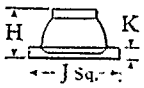

No. 1



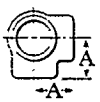

No. 3 or 3½



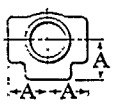

No. 5 or 5½



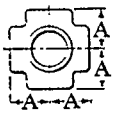

No. 7—Side View



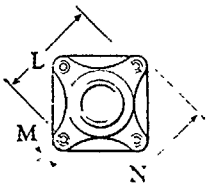

No. 2




No. 4 or 4½




No. 6 or 6½




No. 7—Top View

| Size | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| A | 1⅛ | 1 5/16 | 1½ | 1¾ | 1 15/16 | 2¼ |
| E | 2 | 2½ | 2 11/16 | 3⅜ | 3¾ | 4 11/16 |
| F | 2½ | 3 1/16 | 3 7/16 | 4 3/16 | 4 11/16 | 5 9/16 |
| G | 1½ | 1⅞ | 2 1/16 | 2½ | 2 13/16 | 3 7/16 |
| H | 1 3/16 | 1½ | 1¾ | 2 3/16 | 2½ | 2 15/16 |
| J | 2⅛ | 2½ | 3 5/16 | 4 3/16 | 4¾ | 5¾ |
| K | ¼ | 5/16 | 5/16 | 11/32 | ⅜ | 7/16 |
| L | 2⅛ | 2 15/32 | 3½ | 4⅝ | 5⅜ | 6¾ |
| M | ¼ | ¼ | 9/32 | 5/16 | 5/16 | 11/32 |
| N | 2¾ | 3¼ | 4⅜ | 5½ | 6⅜ | 7⅝ |

*Dimension "A" applies to the center to side outlet also.

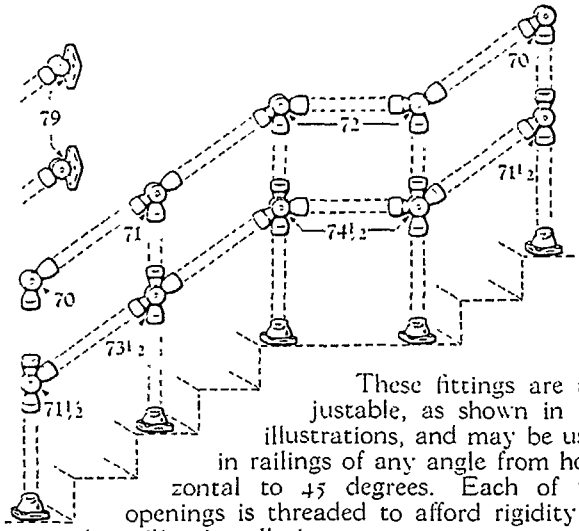
No. 8 or 8½

No. 13

***For threading, thread engagement, and rivet data, see page 192.***

# Malleable Iron Adjustable Railing Fittings

## Ball Type



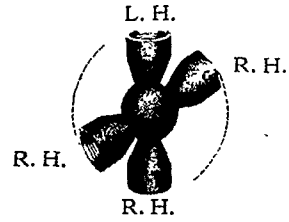

These fittings are adjustable, as shown in the illustrations, and may be used in railings of any angle from horizontal to 45 degrees. Each of the openings is threaded to afford rigidity to the railing installation.

Elbow
No. 70, Right Hand Female

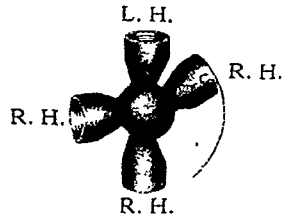
Elbow
No. 70½, Right Hand Male and Female

Tee
No. 71, Right Hand
No. 71½, Tapped as shown

Stair Landing Tee
No. 72, Right Hand




Cross
No. 73, Right Hand
No. 73½, Tapped as shown




Stair Landing Cross
No. 74, Right Hand
No. 74½, Tapped as shown

Flange
No. 79, Right Hand

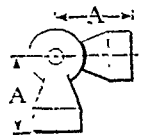
No. 70½ Male and Female Elbows may be used in combination with the Ball Pattern Railing Fittings shown on page 190. Such combinations provide for corner fittings and enable erecting railings at angles steeper than 45 degrees.

**Galvanized fittings:** Galvanized fittings are made to order; for list prices, add 50% to the prices of the black fittings shown below.

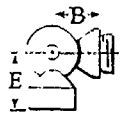
### List Prices, Black

| Size | | Inches | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| Elbows | No. 70 | Each | 2.70 | 2.90 | 3.70 | 5.75 |
| | No. 70½ | Each | 3.00 | 3.30 | 4.10 | 6.30 |
| Tees | No. 71 | Each | 3.50 | 4.15 | 4.60 | 8.00 |
| | No. 71½ | Each | 3.50 | 4.15 | 4.60 | 8.00 |
| | No. 72 | Each | 3.50 | 4.15 | 4.60 | 8.00 |
| Crosses | No. 73 | Each | 4.20 | 5.10 | 6.00 | 10.00 |
| | No. 73½ | Each | 4.20 | 5.10 | 6.00 | 10.00 |
| | No. 74 | Each | 4.20 | 5.10 | 6.00 | 10.00 |
| | No. 74½ | Each | 4.20 | 5.10 | 6.00 | 10.00 |
| Flanges | No. 79 | Each | 3.45 | 4.10 | 4.75 | 8.50 |

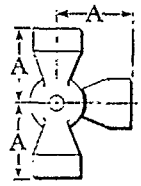
### Dimensions, in Inches



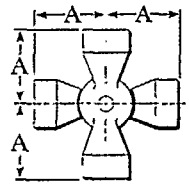

Elbow
Female



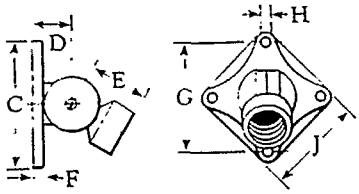

Elbow
Male and Female




Tees




Crosses




Flange

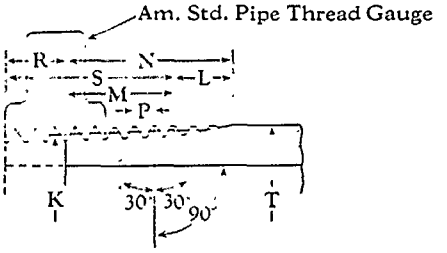
| Size | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|
| A | 2¾ | 3¼ | 3¾ | 4¼ |
| B | 1 11/16 | 2⅛ | 2⅜ | 2 15/16 |
| C | 4⅜ | 5 9/16 | 6⅜ | 7¾ |
| D | 1 11/16 | 1 11/16 | 1⅞ | 2¼ |
| E | 2 3/16 | 2½ | 2 13/16 | 3¼ |
| F | 5/16 | ⅜ | ⅜ | 7/16 |
| G | 3¾ | 4 13/16 | 5 9/16 | 6¾ |
| H | 9/32 | 5/16 | 5/16 | 11/32 |
| J | 3 5/16 | 4 3/16 | 4¾ | 5¾ |

*For thread engagement, see page 192.*

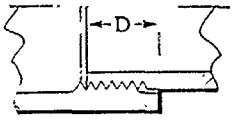
# Crane Railing Pipe Threads

Threading Tolerance:
Nothing Large
One turn Small

Dotted lines show the amount that an American Standard Pipe Thread is shortened at the end.




Total Taper ¾-inch per Foot




Crane Railing Fitting Thread Assembly
The recess in the fitting provides a covering for the last scratch or imperfect thread on the Railing Pipe, making a neat appearing joint.

Dimensions, in Inches

| Size of Pipe | T O.D. of Pipe | Number of Threads Per Inch | K Pitch Dia. at End of Male Thread | S Effective Length Am. Std. Pipe Thread | M Effective Length Am.Std. Railing Pipe Thread | N Total Length of Male Thread Max.) | R Amount Am. Std. Pipe Thread is Shortened at the End Thds. | R Inches | P Pitch of Thread | L Imperfect Threads due to Lead of Die (Max.) Thds. | L Inches | D Length of Pipe Entering Recessed Railing Fitting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ½ | .840 | 14 | .77182 | .5337 | .3194 | .4980 | 3 | .2143 | .07143 | 2½ | .1786 | ½ |
| ¾ | 1.050 | 14 | .98107 | .5457 | .3314 | .5100 | 3 | .2143 | .07143 | 2½ | .1786 | ½ |
| 1 | 1.315 | 11½ | 1.22993 | .6828 | .4219 | .6393 | 3 | .2609 | .08696 | 2½ | .2174 | ⅝ |
| 1¼ | 1.660 | 11½ | 1.57343 | .7068 | .4459 | .7068 | 3 | .2609 | .08696 | 3 | .2609 | 11/16 |
| 1½ | 1.900 | 11½ | 1.81239 | .7235 | .4626 | .7235 | 3 | .2609 | .08696 | 3 | .2609 | ¾ |
| 2 | 2.375 | 11½ | 2.28532 | .7565 | .4956 | .7565 | 3 | .2609 | .08696 | 3 | .2609 | ¾ |

### Cutting Railing Pipe Threads

The above Railing Pipe Threads are the same as the American Standard Taper Pipe Threads except they are shortened at the small end by three threads as shown in Column "R". Regular solid or adjustable dies may be used, making allowance for the three threads that this thread is shortened. The dies, therefore, should only be run on far enough to provide the specified "R" dimension.

The total thread length "N" is maximum and if necessary may be shorter provided the length of imperfect threads "L" caused by the lead of the die is reduced the same amount.

*Crane Thread Lubricants....page 464*

# Rivet Data

## For Malleable Iron Ball Pattern Railing Fittings

The Malleable Iron Ball Pattern Railing Fittings illustrated on page 192 can be especially prepared for rivets, when so ordered; prices on application.

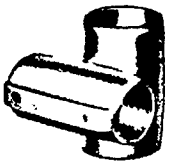
When supplied for riveted joints, the diameter of the rivet hole and its location in relation to the end of the fitting will conform to the data shown in the table at the right. Any other drilling for rivets is considered special, and orders must be accompanied by complete details or a sketch; prices will be furnished on application.

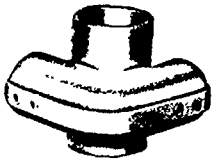
For satisfactory results, users are urged to abide by these standard diameters and lengths of rivets.

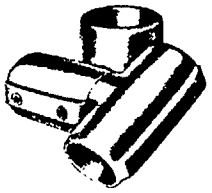
Dimensions, in Inches

| Nominal Pipe Size of Fitting | Drilling of Rivet Holes for all Malleable Iron Railing Fittings: Diameter of Hole | Center of Hole to End of Fitting | Diameter of Rivet | Length of Rivet Measured from under Head |
|---|---|---|---|---|
| ½ | 3/16 | 5/16 | 3/16 | 1¼ |
| ¾ | 3/16 | 5/16 | 3/16 | 1½ |
| 1 | ¼ | ⅜ | ¼ | 1¾ |
| 1¼ | ¼ | ⅜ | ¼ | 2¼ |
| 1½ | ¼ | ⅜ | ¼ | 2½ |
| 2 | 5/16 | ⅜ | 5/16 | 3 |

# Nu-Rail Slip-On Fittings


No. 10
Cross


No. 20
Corner


No. 30
Adjustable Cross

No. 30-A
Modified Cross

No. 30-B
Swivel

### *Low Cost Installations with Nu-Rail*

Specially designed Nu-Rail Fittings effect a quick, easy, and economical method of pipe fitting. Attractive, modern appearance combined with engineering simplicity make them ideal for a host of applications. They are widely used in the construction of railings, storage bins and racks, truck racks, pipe enclosures, scaffolds, display stands, turnstiles, grandstand structures, etc.

No. 30-C
Adjustable Swivel

No. 40
Floor Flange

**Designed for easy usage:** Nu-Rail Fittings are extremely easy to use. They are equipped with knurled point, hardened steel set screws. Simply slip the pipe through the fitting and tighten the screws to lock the pipe in a firm, permanent grip. The screws are free of vibration.

The fittings feature an offset design which permits the pipe to cross and continue through the fitting. No threading or welding is necessary, and because the pipe slips through the fitting, cutting is reduced to a minimum. The result is easier installation and a substantial saving in labor cost.

No. 50
Wall Flange

No. 60
Plug

**Sturdy, corrosion-resistant materials:** The fittings are made of virgin aluminum and magnesium alloy having a tensile strength of 35,000 to 45,000 pounds per square inch and an elongation of 11 to 15 per cent. They will safely carry full capacity loads and their use is limited only by the maximum strength of the pipe used.

**Snug pipe fit:** Allowing for a reasonable variation in pipe size, Nu-Rail Fittings are gauged to fit standard iron pipe sizes of aluminum, brass, or iron with sufficient clearance to permit the fittings to slip easily on the pipe.

**A wide choice:** As shown in the small table at the upper right, Nu-Rail Fittings are available in a wide range of both straight and reducing sizes.

The complete line includes basic cross, corner, and swivel fittings, which, with the use of the No. 60 Plugs, can be used individually or in combination to make any conceivable type of fitting. Refer to the large table at the right.

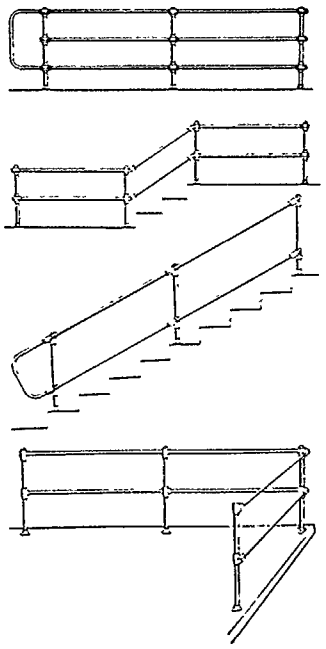
Completing the line and simplifying installation problems are a No. 40 Floor Flange and a No. 50 Wall Flange.

***Prices and additional data will be furnished on application.***

Available Sizes, Inches

| Catalog No. | Straight Sizes | Reducing Sizes |
|---|---|---|
| No. 10 | ¾, 1, 1¼, 1½, or 2 | 1 ×¾<br>1¼×1<br>1½×1¼<br>or<br>2 ×1½ |
| No. 20 | | |
| No. 30 | | |
| No. 30-A | | |
| No. 30-B | ¾, 1, 1¼, 1½, or 2 | — |
| No. 30-C | | — |
| No. 40 | | — |
| No. 50 | | — |
| No. 60 | | — |

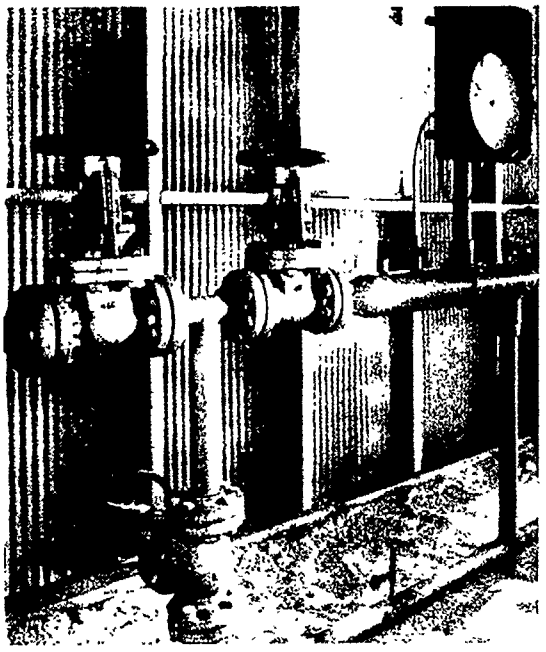
### *Typical Applications*



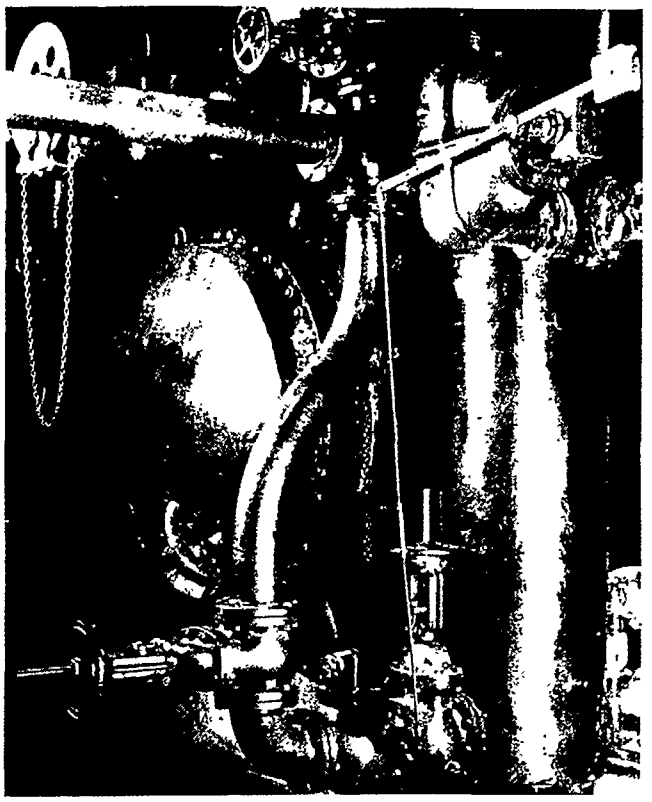
Varied Applications of Basic Fittings

| Type of Fitting Wanted | | Use Fittings Listed Below |
|---|---|---|
| Non-Adjustable | Elbow<br>Tee<br>Cross | No. 10 |
| | S.O. Elbow<br>S.O. Tee | No. 20 |
| Adjustable | Elbow<br>Tee<br>Cross<br>S.O. Elbow<br>S.O. Tee<br>S.O. Cross | No. 30 |
| Double Adjustable | Elbow<br>Tee<br>Cross | No. 10 with two No. 30-B |
| Adjustable Stair Landing | Tee<br>Cross<br>S.O. Tee<br>S.O. Cross<br>Double S.O. Tee<br>Double S.O. Cross | No. 30-A with No. 30-C |

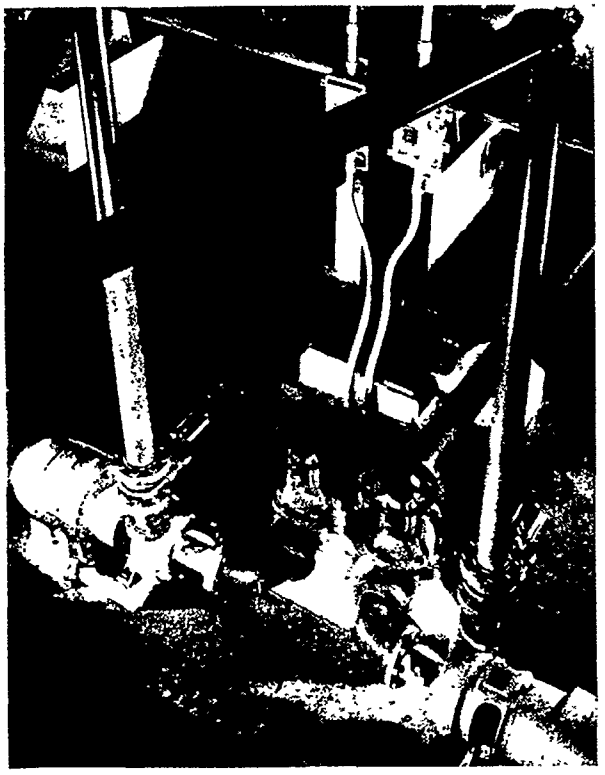
## *The Best in Piping Equipment Always — From Crane*



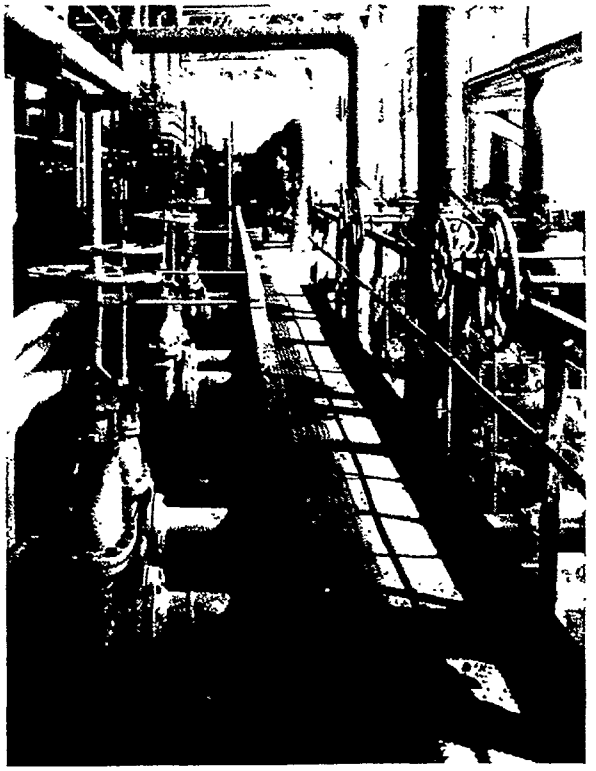
*A refractory plant utilizes Crane products.*



*An emergency drain line in a power plant—Crane-equipped.*



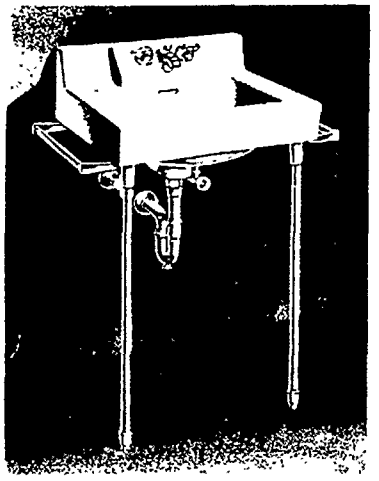
*Crane cast iron valves and fittings installed in the mash transfer lines of a distillery.*



*Crane products in a natural gas installation; extension stems on valves facilitate operation.*

# BEVERLY VITREOUS CHINA LAVATORIES

With Whitney *Dial-ese* Trim



1-120-E, On Metal Legs

### 1-120-E, On Metal Legs
Size: 20x18"

Lavatory: **Beverly** vitreous china lavatory with beveled panel back, rectangular basin with splash lip and soap depression.

Supports: 8-710 **Crestmont** round metal legs, concealed hangers and wall screws.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting (with coupling nuts, less ¼" tailpieces).

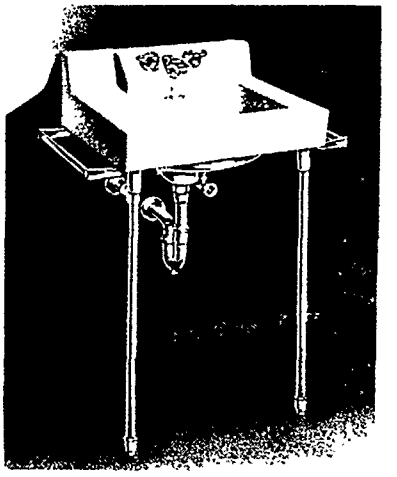
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

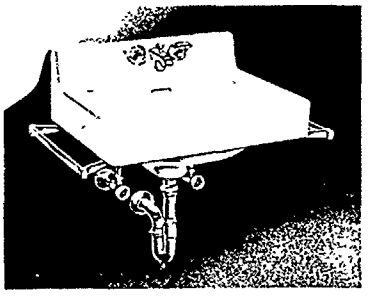
*Note: Lavatory trap is not included.*

### 1-120-F, On Metal Legs

Same, except with 8-133 **Whitney** supply fitting with chain and stopper, and 8-350 1¼" P.O. plug.



1-120-F, On Metal Legs



### 1-120-E, Wall Hung—Size: 20x18"

Lavatory: **Beverly** vitreous china lavatory with beveled panel back, rectangular basin with splash lip and soap depression.

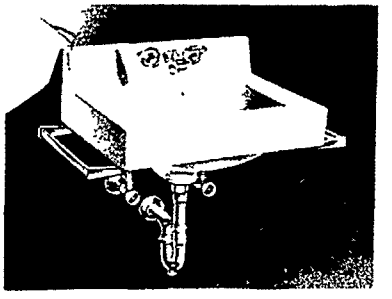
Supports: Concealed hangers and wall screws.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting (with coupling nuts, less ¼" tailpieces).

Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



### 1-120-F, Wall-Hung—Size: 20x18"

Lavatory: **Beverly** vitreous china lavatory with beveled panel back, rectangular basin with splash lip and soap depression.

Supports: Concealed hangers and wall screws.

"F" Trim: 8-133 **Whitney** *Dial-ese* supply fitting with chain and stopper (with coupling nuts, less ¼" tailpieces); 8-350 1¼" P.O. plug.

Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

*All exposed metal trim is chromium plated.*

*For other supply pipes and traps, refer to Section 8.*

**Overall Dimensions**

| | |
|---|---|
| Size | 20x18" |
| Basin | 14½x11" |
| Height of back | 3⅜" |
| Height, floor to top of rim | 31" |

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

**PRICES COMPLETE, less traps**

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. wt. Pounds |
|---|---|---|---|---|
| **1-120-E, On Metal Legs** | 20x18 | **$101.90** | **$119.40** | 60 |
| **1-120-F, On Metal Legs** | 20x18 | **98.00** | **115.50** | 60 |
| **1-120-E, Wall Hung** | 20x18 | **85.30** | **102.80** | 55 |
| **1-120-F, Wall Hung** | 20x18 | **81.40** | **98.90** | 55 |

| | |
|---|---|
| **8-304** supplies | Per Pair **$9.40** |
| **8-324** ¼" male tailpieces | Per Pair **.48** |
| **8-697 Crestmont** towel bars | Per Pair **11.60** |
| **8-710 Crestmont** legs | Per Pair **16.60** |
| For aerator on spout | Add **$2.10** |

*Prices are subject to change without notice.*

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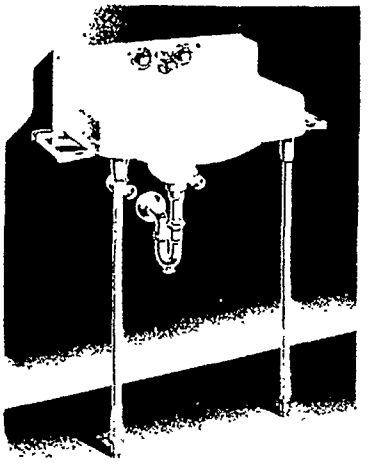
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# OXFORD VITREOUS CHINA LAVATORIES

With Whitney *Dial-ese* Trim



1-125-E, On Metal Legs

**1-125-E, On Metal Legs**
**Sizes: 19x17" and 20x14"**
**1-130-E, On Metal Legs Size: 26x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

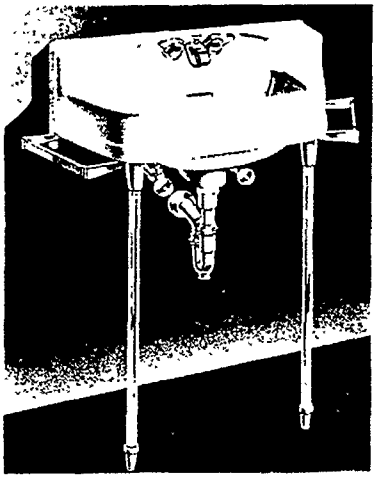
Supports: 8-710 **Crestmont** round metal legs, concealed hangers and wall screws.

"E" Trim: 8-130 **Whitney *Dial-ese*** supply and direct lift waste fitting (with coupling nuts, less ¼" tailpieces).

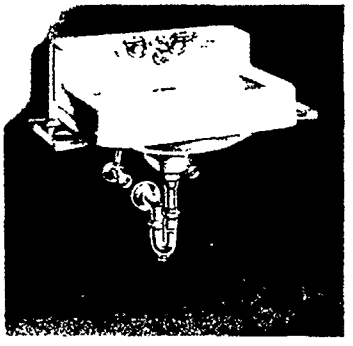
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***



1-130-E, On Metal Legs



1-125-E, Wall Hung

**1-125-E, Wall Hung—Sizes: 19x17" and 20x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

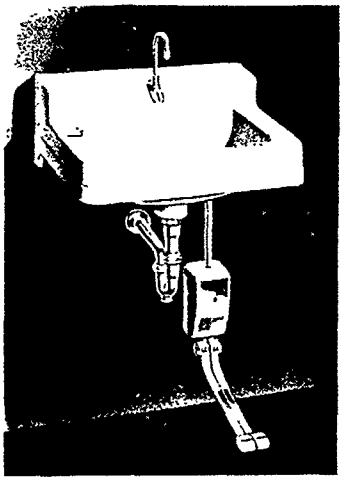
Supports: Concealed hangers and wall screws.

"E" Trim: 8-130 **Whitney *Dial-ese*** supply and direct lift waste fitting (with coupling nuts, less ¼" tailpieces).

Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***



1-145, Wall Hung

**1-145, Wall Hung—Sizes: 19x17" and 20x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back; rectangular basin with splash lip and soap depression.

Supports: Concealed hangers and wall screws.

Trim: 8H-504 wall mounted self-closing mixing valve with integral stops and polished aluminum hinged pedals; gooseneck spout with **Spring-Flo** aerator and supply with volume control to spout.

Waste: 8-353 1¼" P.O. plug with perforated open strainer.

***Note: Lavatory trap is not included.***

Whitney supply fitting with chain and stopper (F Trim) can also be furnished on 1-125 or 1-130 Oxford lavatories. When so desired merely change Suffix Designation and use Trim Description below.

*F Trim*
8-133 Whitney *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Size.... | 19x17" | Basin.... | 14x11" |
| | 20x14" | | 15x9" |
| | 26x14" | | 17¼x9" |
| Height of shelf back..... | | | 33/8" |
| Height, floor to top of rim. .... | | | 31" |

All exposed metal trim is chromium plated.

*For other supply pipes and traps, refer to Section 8.*

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

**PRICES COMPLETE, less traps**

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **1-125-E, On Metal Legs** | 19x17 | **$99.40** | **$105.90** | 60 |
| | 20x14 | **105.20** | **124.50** | 70 |
| **1-125-F, On Metal Legs** | 19x17 | **95.50** | **102.00** | 60 |
| | 20x14 | **101.30** | **120.60** | 70 |
| **1-125-E Wall Hung** | 19x17 | **82.80** | **89.30** | 55 |
| | 20x14 | **88.60** | **107.90** | 65 |
| **1-125-F, Wall Hung** | 19x17 | **78.90** | **85.40** | 55 |
| | 20x14 | **84.70** | **104.00** | 65 |
| **1-130-E, On Metal Legs** | 26x14 | **124.60** | **153.40** | 80 |
| **1-130-F, On Metal Legs** | 26x14 | **120.70** | **149.50** | 80 |
| **1-145, Wall Hung** | 19x17 | **134.10** | **140.60** | 75 |
| | 20x14 | **139.90** | **159.20** | 85 |

| | |
|---|---|
| **8-304** flexible supplies | Per Pair **$9.40** |
| **8-324** ¼" male tailpieces | Per Pair **.48** |
| **8-697 Crestmont** towel bars | Per Pair **11.60** |
| **8-710 Crestmont** legs | Per Pair **16.60** |
| For aerator on spout | Add **$2.10** |

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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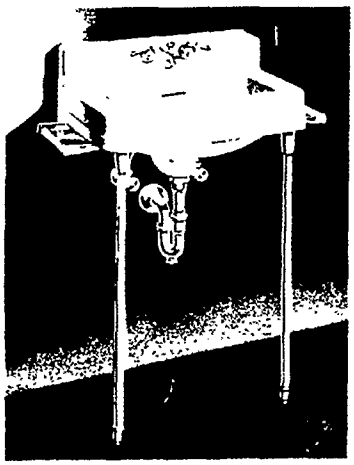
# OXFORD VITREOUS CHINA LAVATORIES

With Repcal Trim



1-125-ERS, On Metal Legs

**1-125-ERS, On Metal Legs**
**Sizes: 19x17" and 20x14"**

**1-130-ERS, On Metal Legs—Size: 26x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

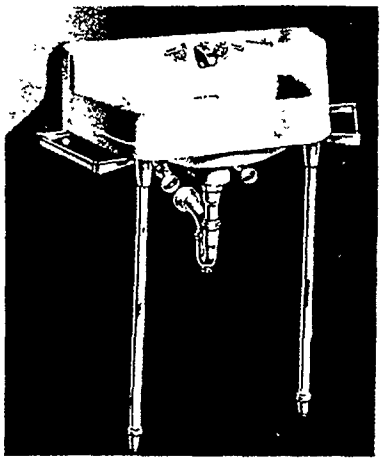
Supports: 8-710 **Crestmont** round metal legs, concealed hangers and wall screws.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

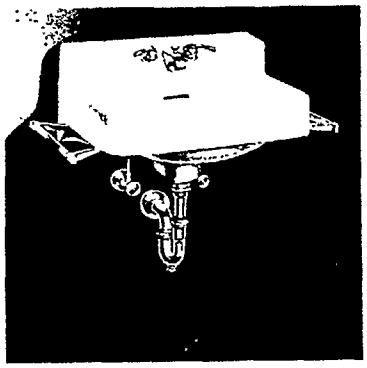
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-130-ERS, On Metal Legs



1-125-ERS, Wall Hung

**1-125-ERS, Wall Hung—Sizes: 19x17" and 20x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

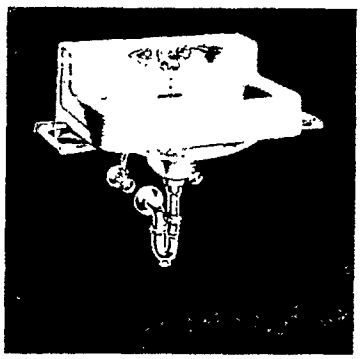
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**1-125-FRS, Wall Hung—Sizes: 19x17" and 20x14"**

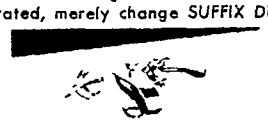
Same, except with 8-135 **Repcal** supply fitting with renewable seats, chain, stopper and 8-350 1¼" P. O. plug.



1-125-FRS, Wall Hung

### ALTERNATE REPCAL TRIM FOR OXFORD LAVATORIES

When ordering an Oxford lavatory with Repcal trim other than illustrated, merely change SUFFIX DESIGNATION and TRIM DESCRIPTION.



**ERS Trim**
8-132 **Repcal** supply and direct lift waste fitting with renewable seats.

**ER Trim**
8-131 **Repcal** supply and direct lift waste fitting with integral seats.

**FRS Trim**
8-135 **Repcal** supply fitting with renewable seats, chain and stopper; 8-350 1¼" P.O. plug.

**FR Trim**
8-134 **Repcal** supply fitting with integral seats, chain and stopper; 8-350 1¼" P.O. plug.

The above fittings are regularly furnished with 45° elbows, coupling nuts, friction rings and washers for slip joint connection. When required for use with iron pipe supplies, specify the No. 20-19 ¼" male tailpieces.

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Size | 19x17" | Basin | 14x11" |
| | 20x14" | | 15x9" |
| | 26x14" | | 17¼x9" |

Height of shelf back ..... 33⅜"
Height, floor to top of rim ..... 31"

**PRICES COMPLETE, less traps**

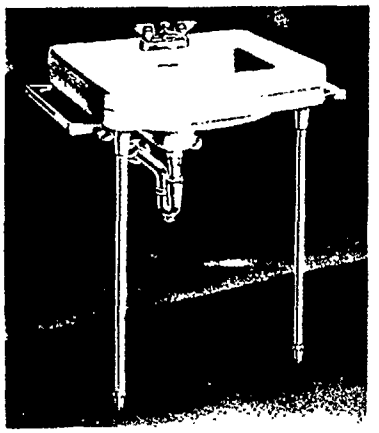
| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **1-125-ER, On Metal Legs** | 19x17 | $91.10 | $97.60 | 60 |
| | 20x14 | 96.90 | 116.20 | 70 |
| **1-125-ERS, On Metal Legs** | 19x17 | 91.80 | 98.30 | 60 |
| | 20x14 | 97.60 | 116.90 | 70 |
| **1-125-FR, On Metal Legs** | 19x17 | 88.80 | 95.30 | 60 |
| | 20x14 | 94.60 | 113.90 | 70 |
| **1-125-FRS, On Metal Legs** | 19x17 | 89.60 | 96.10 | 60 |
| | 20x14 | 95.40 | 114.70 | 70 |
| **1-125-ER, Wall Hung** | 19x17 | 74.50 | 81.00 | 55 |
| | 20x14 | 80.30 | 99.60 | 65 |
| **1-125-ERS, Wall Hung** | 19x17 | 75.20 | 81.70 | 55 |
| | 20x14 | 81.00 | 100.30 | 65 |
| **1-125-FR, Wall Hung** | 19x17 | 72.20 | 78.70 | 55 |
| | 20x14 | 78.00 | 97.30 | 65 |
| **1-125-FRS, Wall Hung** | 19x17 | 73.00 | 79.50 | 55 |
| | 20x14 | 78.80 | 98.10 | 65 |
| **1-130-ER, On Metal Legs** | 26x14 | 116.30 | 145.10 | 80 |
| **1-130-ERS, On Metal Legs** | 26x14 | 117.00 | 145.80 | 80 |
| **1-130-FR, On Metal Legs** | 26x14 | 114.00 | 142.80 | 80 |
| **1-130-FRS, On Metal Legs** | 26x14 | 114.70 | 143.60 | 80 |

| | |
|---|---|
| **8-304** flexible supplies, | Per Pair **$9.40** |
| **8-697 Crestmont** towel bars | Per Pair **11.60** |
| **8-710 Crestmont** legs | Per Pair **16.60** |
| **20-19** ¼" male tailpieces | Per Pair **.38** |
| For aerator on spout | Add **1.60** |

All exposed metal trim is chromium plated.

# NORWICH VITREOUS CHINA LAVATORIES

On Metal Legs or On Porcelain Enameled Brackets



1-150-V, On Metal Legs

1-150-V, On Metal Legs
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

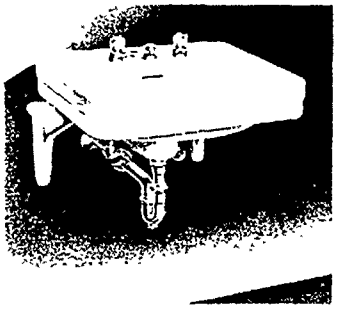
Supports: 8-710 Crestmont round metal legs; 8-765 wall brackets.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply with indirect lift waste fitting.

Towel Bars: 8-697 Crestmont towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-150-R, On Enameled Brackets
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

Supports: 8-763 white enameled cast iron brackets.

"R" Trim: 8-31 Vantage *Dial-ese* faucets (with coupling nuts, less 1/4" tailpieces); 8-41 Lever Action Securo waste.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

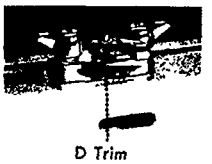
Overall Dimensions

| Size | Basin |
|---|---|
| 20x18" | 14x11" |
| 24x21" | 16x11" |
| Floor to rim 31" | |

ALTERNATE TRIM FOR NORWICH LAVATORIES

For Norwich lavatories with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

V Trim
8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.
8-562-A, Same except with aerator.



D Trim
8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1 1/4" P.O. plug.
8-569-A, Same except with aerator.

L Trim
8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.
8-5, same except with lever handles.

P Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1 1/4" P.O. plug.

R Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste.

S Trim
8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.
8-575-A, Same except with aerator.

M Trim

M Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P," "R" and "M" trimmings
8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

All exposed metal trim is chromium plated.

PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-150, Norwich Ware Only | 20x18 | $33.70 | $50.50 | 55 |
| | 24x21 | 49.60 | 74.30 | 72 |
| 1-150-D, On Metal Legs | 20x18 | 96.60 | 113.40 | 75 |
| | 24x21 | 112.50 | 137.20 | 95 |
| 1-150-L, On Metal Legs | 24x21 | 146.80 | 171.60 | 100 |
| 1-150-M, On Metal Legs | 20x18 | 100.42 | 117.22 | 75 |
| | 24x21 | 116.32 | 141.02 | 95 |
| 1-150-P, On Metal Legs | 20x18 | 96.18 | 112.98 | 75 |
| | 24x21 | 112.08 | 136.78 | 95 |
| 1-150-R, On Metal Legs | 20x18 | 110.92 | 127.72 | 75 |
| | 24x21 | 126.82 | 151.52 | 95 |
| 1-150-S, On Metal Legs | 20x18 | 107.90 | 124.70 | 75 |
| | 24x21 | 123.80 | 148.50 | 95 |
| 1-150-V, On Metal Legs | 20x18 | 101.30 | 118.10 | 75 |
| | 24x21 | 117.20 | 141.90 | 95 |
| 1-150-D, On Brackets | 20x18 | 79.20 | — | 90 |
| | 24x21 | 95.10 | — | 110 |
| 1-150-L, On Brackets | 24x21 | 129.40 | — | 115 |
| 1-150-M, On Brackets | 20x18 | 83.02 | — | 90 |
| | 24x21 | 98.92 | — | 110 |
| 1-150-P, On Brackets | 20x18 | 78.78 | — | 90 |
| | 24x21 | 94.68 | — | 110 |
| 1-150-R, On Brackets | 20x18 | 93.52 | — | 90 |
| | 24x21 | 109.42 | — | 110 |
| 1-150-S, On Brackets | 20x18 | 90.50 | — | 90 |
| | 24x21 | 106.40 | — | 110 |
| 1-150-V, On Brackets | 20x18 | 83.90 | — | 90 |
| | 24x21 | 99.80 | — | 110 |

| | | |
|---|---|---|
| 8-31 or 8-39 Vantage faucets | Per Pair | $14.12 |
| 8-36 Victor Magiclose faucets | Per Pair | 18.48 |
| 8-304 flexible supplies | Per Pair | 9.40 |
| 8-324 1/4" male tailpieces | Per Pair | .48 |
| 8-697 Crestmont towel bars | Per Pair | 11.60 |
| 8-710 Crestmont legs | Per Pair | 16.60 |
| For aerators (D, S and V trim only) | Add | 2.10 |

*Prices are subject to change without notice.*



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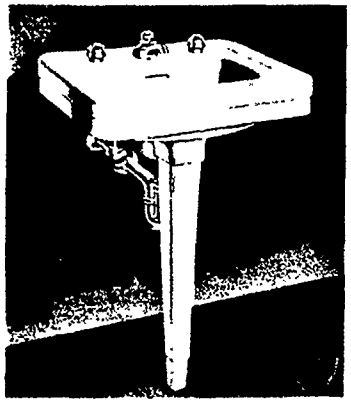
# NORWICH VITREOUS CHINA LAVATORIES

On China Leg



1-170-L, On China Leg

1-170-L, On China Leg—Size: 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip, and soap depression.

Supports: Vitreous china leg; 8-765 aluminum wall brackets.

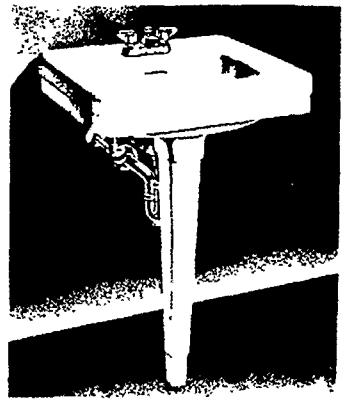
"L" Trim: 8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with coupling nuts, less ¼" tailpieces. (Specify 8-5 for Temple trim with hooded lever handles.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

1-170-V, On China Leg—Sizes: 20x18" and 24x21"

Same, except with 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.



1-170-V, On China Leg

## ALTERNATE TRIM FOR NORWICH LAVATORIES ON CHINA LEG

When ordering a Norwich lavatory with trim other than illustrated merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

**K Trim**

8-11 Temple *Dial-ese* supply and Lever Action Securo waste fitting with integral push button ice water valve and three rib handles.

8-6, same except with lever handles.

**D Trim**

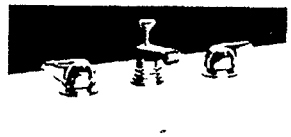
8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

8-569-A, Same except with aerator.

**V Trim**

8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

8-562-A, Same except with aerator.



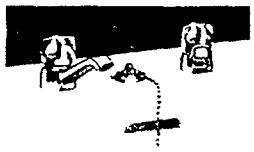
**S Trim**

8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.

8-575-A, Same except with aerator.

**Overall Dimensions**

Size...20x18" Basin...14x11"
24x21" 16x11"
Height, floor to top of rim...31"

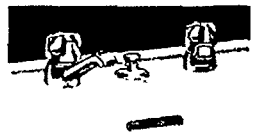


**P Trim**

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

**R Trim**

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste fitting.



**M Trim**

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P", "R" and "M" trimmings

8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

## Norwich Lavatories on China Leg—PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-170 Ware Only | 20x18 | $50.60 | $73.20 | 75 |
| | 24x21 | 66.50 | 97.00 | 93 |
| 1-170-D | 20x18 | 79.70 | 102.30 | 85 |
| | 24x21 | 95.60 | 126.10 | 105 |
| 1-170-K | 24x21 | 148.30 | 178.80 | 110 |
| 1-170-L | 24x21 | 130.00 | 160.50 | 110 |
| 1-170-M | 20x18 | 83.52 | 106.12 | 85 |
| | 24x21 | 99.42 | 129.92 | 105 |

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-170-P | 20x18 | $79.28 | $101.88 | 85 |
| | 24x21 | 95.18 | 125.68 | 105 |
| 1-170-R | 24x21 | 109.92 | 140.42 | 110 |
| 1-170-S | 20x18 | 91.00 | 113.60 | 85 |
| | 24x21 | 106.90 | 137.40 | 105 |
| 1-170-V | 20x18 | 84.40 | 107.00 | 85 |
| | 24x21 | 100.30 | 130.80 | 105 |

Norwich lavatories can be furnished with china leg to set lavatories 24" or 27" high, rim to floor, when so specified.

*For other supply pipes and traps, refer to Section 8.*
*All exposed metal trim is chromium plated.*

| | | |
|---|---|---|
| 8-31 or 8-39 Vantage faucets | Per Pair | $14.12 |
| 8-36 Victor Magiclose faucets | Per Pair | 18.48 |
| 8-304 flexible supplies | Per Pair | 9.40 |
| 8-324 ¼" male tailpieces | Per Pair | .48 |
| For aerators (D, S and V trim only) | Add | 2.10 |

*Prices are subject to change without notice.*

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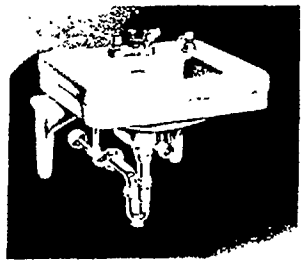
# NORWICH VITREOUS CHINA LAVATORIES

With Integral Liquid Soap Chamber



1-200-V, On Enameled Brackets
Size: 20x18"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and integral liquid soap chamber.

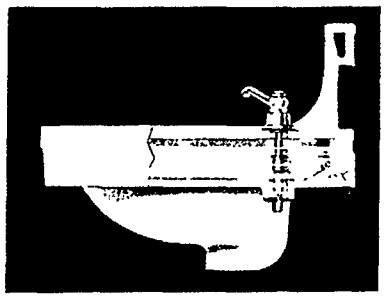
Supports: 8-763 white enameled cast iron brackets.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect waste fitting; self-closing push button liquid soap valve.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

Sectional View of Liquid Soap Chamber



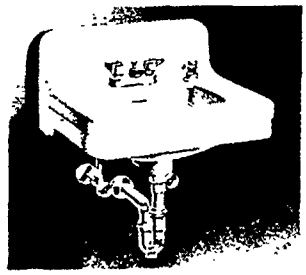
FEATURES

Large capacity, holds 10 pints—requires less frequent filling.

Chamber is easily refilled by removing cap from top of valve, through which the liquid is poured.

Where low temperatures warrant draining the water system, the liquid soap must also be drained from the chamber.

Overall Dimensions
Size...20x18" Basin...14x11"



1-210-V, Wall Hung
Size: 20x18"

Lavatory: Norwich vitreous china lavatory with 6" high back, rectangular basin, splash lip and integral liquid soap chamber.

Supports: Concealed hangers and wall screws.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting; self-closing push button liquid soap valve.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

## ALTERNATE TRIM FOR NORWICH LAVATORIES WITH INTEGRAL SOAP CHAMBER

When ordering a Norwich lavatory with trim other than illustrated merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

P Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

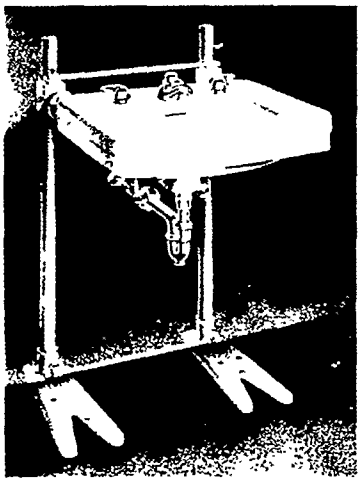
R Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste fitting.

S Trim
8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.
8-575-A, Same except with aerator.

M Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P", "R" and "M" trimmings
8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

## NORWICH LAVATORIES ON CHAIR CARRIER



1-190-L, On Chair Carrier

1-190-L, On Chair Carrier
Size: 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

Supports: 8-783 built-in chair carrier with concealed brackets.

"L" Trim: 8-5 Temple *Dial-ese* supply and Lever Action Securo waste fitting with lever handles and coupling nuts, less ¼" tailpieces. (Specify 8-10 for Temple trim with hooded three rib handles).

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

Norwich lavatories on chair carrier are available with the following alternate trim:

1-190-P Sizes: 20x18" and 24x21"
1-190-S Sizes: 20x18" and 24x21"

PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-190 | 20x18 | $39.00 | $55.80 | 55 |
| Ware Only | 24x21 | 54.90 | 79.60 | 72 |
| On Chair Carrier | | | | |
| 1-190-L | 24x21 | $168.40 | $193.10 | 145 |
| 1-190-P | 20x18 | 117.68 | 134.48 | 115 |
| | 24x21 | 133.58 | 158.28 | 135 |
| 1-190-S | 20x18 | 129.40 | 146.20 | 115 |
| | 24x21 | 145.30 | 170.00 | 135 |
| On Enameled Brackets | | | | |
| 1-200-M | 20x18 | $120.62 | - | 60 |
| 1-200-P | 20x18 | 116.38 | — | 60 |
| 1-200-R | 20x18 | 131.02 | — | 62 |
| 1-200-S | 20x18 | 128.10 | — | 62 |
| 1-200-V | 20x18 | 121.50 | — | 60 |
| Wall Hung | | | | |
| 1-210-M | 20x18 | $108.72 | — | 61 |
| 1-210-P | 20x18 | 104.48 | — | 61 |
| 1-210-R | 20x18 | 119.12 | — | 63 |
| 1-210-S | 20x18 | 116.20 | — | 63 |
| 1-210-V | 20x18 | 109.60 | — | 61 |

| | | |
|---|---|---|
| 8-31 or 8-39 Vantage faucets | Per Pair | $14.12 |
| 8-36 Victor Magiclose faucets | Per Pair | 18.48 |
| 8-304 flexible supplies | Per Pair | 9.40 |
| 8-324 ¼" male tailpieces | Per Pair | .48 |
| 8-783 chair carrier | Each | 50.00 |
| For aerators (For V and S trim only) | Add | 2.10 |

Temple trim with three-rib or lever handles, same price.

*Prices are subject to change without notice.*



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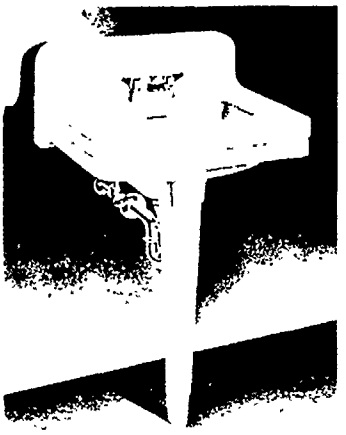
# NORWICH VITREOUS CHINA LAVATORIES

With 6" High Back—Wall Hung or On China Leg



1-220-V, On China Leg

1-220 Norwich lavatories can be furnished with china leg to set lavatories 24" or 27" high, rim to floor.

### 1-220-V, On China Leg—Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with back, rectangular basin with splash lip and soap depression.

Supports: Vitreous china leg; concealed hangers and wall screws.

"V" Trim 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-240-V, Wall Hung—Sizes: 18x15", 20x18" and 24x21"

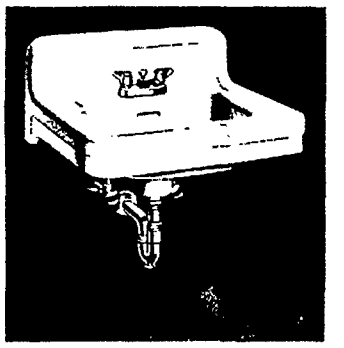
Lavatory: Norwich vitreous china lavatory with back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-240-V, Wall Hung

Overall Dimensions

| | | | |
|---|---|---|---|
| Size... | 18x15" | Basin... | 14x9" |
| | 20x18" | | 14x11" |
| | 24x21" | | 16x11" |

Floor to top of rim..... 31"

## ALTERNATE TRIM FOR NORWICH LAVATORIES

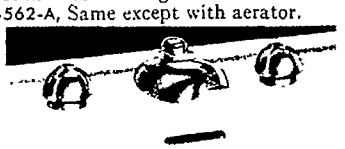
For Norwich lavatories with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

V Trim

8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.
8-562-A, Same except with aerator.

D Trim

8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug. 8-569-A, Same except with aerator.



L Trim

8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.

8-5, same except with lever handles.

P Trim

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

R Trim

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste fitting.

S Trim

8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.
8-575-A, Same except with aerator.

M Trim

M Trim

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P", "R" and "M" trimmings

8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

All exposed metal trim is chromium plated. *For other supply pipes and traps, refer to Section 8.*

## PRICES COMPLETE, less traps

### Norwich On China Leg

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-220 Ware Only | 20x18 | $43.30 | $65.00 | 80 |
| | 24x21 | 68.80 | 103.10 | 100 |
| 1-220-D | 20x18 | 72.40 | 94.10 | 90 |
| | 24x21 | 97.90 | 132.20 | 100 |
| 1-220-L | 24x21 | 132.30 | 166.60 | 115 |
| 1-220-M | 20x18 | 76.22 | 97.92 | 90 |
| | 24x21 | 101.72 | 136.02 | 110 |
| 1-220-P | 20x18 | 71.98 | 93.68 | 90 |
| | 24x21 | 97.48 | 131.78 | 110 |
| 1-220-R | 20x18 | 92.32 | 116.82 | 90 |
| | 24x21 | 112.12 | 146.52 | 110 |
| 1-220-S | 20x18 | 83.70 | 105.40 | 90 |
| | 24x21 | 109.20 | 143.50 | 110 |
| 1-220-V | 20x18 | 77.10 | 98.80 | 90 |
| | 24x21 | 102.60 | 136.90 | 110 |

### Norwich Wall Hung

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-240 Ware Only | 18x15 | $31.50 | $47.30 | 40 |
| | 20x18 | 31.60 | 47.40 | 48 |
| | 24x21 | 57.10 | 85.70 | 92 |
| 1-240-D | 18x15 | 60.60 | 76.40 | 50 |
| | 20x18 | 60.70 | 76.50 | 60 |
| | 24x21 | 86.20 | 114.80 | 100 |
| 1-240-L | 24x21 | 120.60 | 149.20 | 105 |
| 1-240-M | 18x15 | 64.42 | 80.22 | 50 |
| | 20x18 | 64.52 | 80.32 | 60 |
| | 24x21 | 90.02 | 118.62 | 100 |
| 1-240-P | 18x15 | 60.18 | 75.98 | 50 |
| | 20x18 | 60.28 | 76.08 | 60 |
| | 24x21 | 85.78 | 114.38 | 100 |
| 1-240-R | 20x18 | 80.72 | 99.42 | 60 |
| | 24x21 | 100.52 | 129.12 | 100 |
| 1-240-S | 18x15 | 71.90 | 87.70 | 50 |
| | 20x18 | 72.00 | 87.80 | 60 |
| | 24x21 | 97.50 | 126.10 | 100 |
| 1-240-V | 18x15 | 65.30 | 81.10 | 50 |
| | 20x18 | 65.40 | 81.20 | 60 |
| | 24x21 | 90.90 | 119.50 | 100 |

| | | |
|---|---|---|
| 8-31 or 8-39 Vantage faucets | Per Pair | $14.12 |
| 8-36 Victor Magiclose faucets | Per Pair | 18.48 |
| 8-304 flexible supplies | Per Pair | 9.40 |
| 8-324 ¼" male tailpieces | Per Pair | .48 |
| For aerators (D, S and V trim) | Add | 2.10 |

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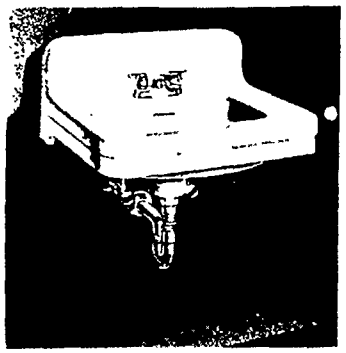
## NORWICH LAVATORIES
With Neu-Spray *Dial-ese* Trim



8-572
Neu-Spray Fitting

View of Spray Face

1-240-V, Wall Hung, with Neu-Spray Trim
Sizes: 18x15", 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with 6" high back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

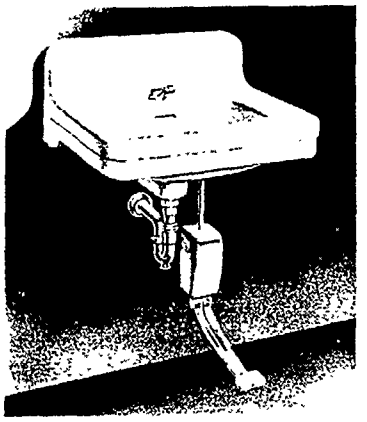
Trim: 8-572 Neu-Spray *Dial-ese* supply fitting with raised spout and 1¾" diameter perforated spray face (with coupling nuts, less ¼" tailpieces).

Waste: 8-353 1¼" P.O. plug with perforated open strainer.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

## NORWICH LAVATORIES
With Pedal Operated Supply Valve



1-243, Wall Hung

1-243, Wall Hung
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with 6" high back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

Trim: 8H-500 wall mounted self-closing mixing valve with integral stops and polished aluminum hinged pedals; raised spout and supply to spout with volume control.

Waste: 8-353 1¼" P.O. plug with perforated open strainer.

*Note: Lavatory trap is not included.*

PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **Norwich, Ware Only** | 18x15" | **$31.50** | **$47.30** | 40 |
| | 20x18" | **31.60** | **47.40** | 48 |
| | 24x21" | **57.10** | **85.70** | 92 |
| **1-240-V, with Neu-Spray Trim** | 18x15" | **74.00** | **89.80** | 50 |
| | 20x18" | **74.10** | **89.90** | 60 |
| | 24x21" | **99.60** | **128.20** | 100 |
| **1-243, Wall Hung** | 20x18" | **139.30** | **155.10** | 65 |
| | 24x21" | **164.80** | **193.40** | 105 |

**8-304** supplies Per Pair **$9.40**
**8-324** ¼" male tailpieces Per Pair **.48**



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# COUNTESS LAVATORY ENSEMBLES

## SALES FEATURES

### Cabinet

One-piece wood construction—exterior surfaces are faced with colorful laminated plastics; interior of cabinet, edges, toe base and knee space back panel are painted in harmonizing colors.

Two storage compartments, one stationary shelf and one medicine drawer with check stop, easily removed for cleaning.

Doors have semi-concealed hinges, chromium plated knobs and roller type spring latches.

Available in 3 color patterns—Planked Maple (Parkwood), Walnut (Parkwood) and Gray Limba (Parkwood).

Shipped assembled in one carton.

All exposed metal trim is chromium plated

### Countertop

Wood core—exposed surfaces and edges faced with laminated plastic, no metal trim.

Back coved into counter, rounded front corners.

Available in 3 color patterns—Brown Marble (Formica), Charcoal Medley (Textolite) and Blue Skylark (Formica).

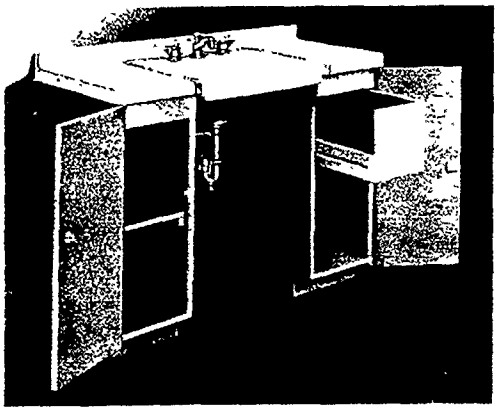
Hudee lavatory frame is included.

Countertop is packed in separate carton.

### Lavatories

Available with 2 types of trim—1-284-S Countess with 8-575-A Embassy trim or 1-284-V Countess with 8-562-A Neu-Rainier trim.

Countess lavatories are furnished in white or any of the seven regular Crane colors.



### 1-260-S COUNTESS LAVATORY ENSEMBLE (*Open View*)

Countertop: Type 1-C-5 1½" thick, laminated plastic faced countertop with 2" high back, square front rim with rounded corners and finished ends; **Hudee** lavatory frame. (Specify color.)

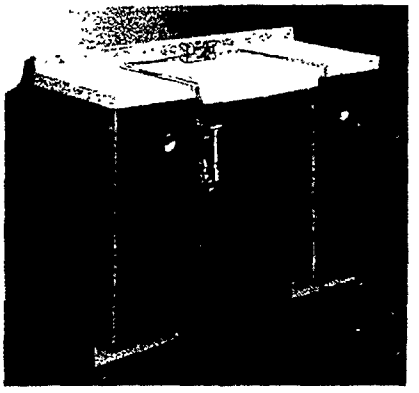
Cabinet: Laminated plastic faced wood cabinet with two end compartments and full length flush back, utility shelf, medicine drawer and chromium knobs. (Specify color.)

Lavatory: 1-284-S **Countess** vitreous china lavatory with modified rectangular basin, splash lip, twin front overflow and two soap depressions. (Specify if white or Crane color.)

"S" Trim: 8-575-A **Embassy** *Dial-ese* supply and indirect lift waste with aerator. (Specify 8-575 if less aerator.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



### 1-260-V COUNTESS LAVATORY ENSEMBLE

Countertop: Type 1-C-5 1½" thick, laminated plastic faced countertop with 2" high back, square front rim with rounded corners and finished ends; **Hudee** lavatory frame. (Specify color.)

Cabinet: Laminated plastic faced wood cabinet with two end compartments and full length flush back, utility shelf, medicine drawer and chromium knobs. (Specify color.)

Lavatory: 1-284-V **Countess** vitreous china lavatory with modified rectangular basin, splash lip, twin front overflow and two soap depressions. (Specify if white or Crane color.)

"V" Trim: 8-562-A **Neu-Rainier** *Dail-ese* supply and indirect lift waste with aerator. (Specify 8-562 if less aerator.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### COLOR SELECTION

In selecting color combinations for **Countess** lavatory ensembles it is essential first to determine the color of the lavatory, then the color pattern for the countertop and next the color pattern for the cabinet. The color chart below is arranged accordingly. When ordering be sure to specify lavatory, countertop and cabinet colors desired.

| Lavatory | Countertop | Cabinet |
|---|---|---|
| White or Sky Blue | Blue Skylark | Walnut, Gray Limba or Planked Maple |
| Shell Pink | Charcoal Medley | Gray Limba |
| Citrus Yellow or Sun Tan | Brown Marble | Walnut, Gray Limba or Planked Maple |
| Pale Jade or Persian Red | Brown Marble | Walnut or Planked Maple |
| French Grey | Charcoal Medley | Gray Limba, Planked Maple or Walnut |

**Overall Dimensions**

Top Size.....42x18½"
Rim to Floor.....31"
Lavatory Size.....20x17"
Basin Size.....†15½x11¼"
†Width at back is 14"

### ENSEMBLE PRICES COMPLETE, less trap

| Catalog Number | Price, Each: With White Lavatory | Price, Each: With Colored Lavatory | Shipping Weight, Pounds: Lavatory and Trim | Shipping Weight, Pounds: Countertop Only | Shipping Weight, Pounds: Cabinet Only |
|---|---|---|---|---|---|
| 1-260-S | $308.20 | $325.60 | 56 | 15 | 85 |
| 1-260-V | 301.60 | 319.00 | 55 | 15 | 85 |

If less aerator.....Deduct $2.10
If less 8-304 supplies.....Per Pair, Deduct 9.40
For 8-324 ¼" male tailpieces.....Per Pair, Add .48

*For other supply pipes and traps, refer to Section 8.*

*Prices are subject to change without notice.*

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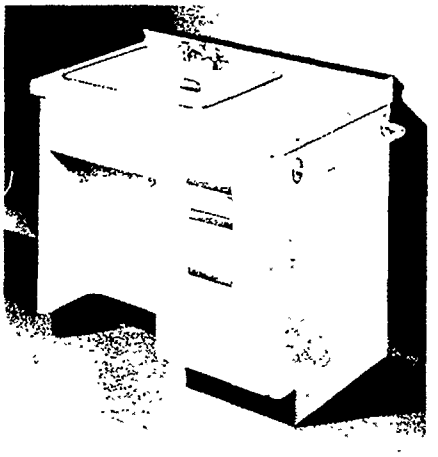
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# LAVANETTE AND VANETTE

*For Bath or Powder Room — A Lavatory, Vanity and Powder Bar — All in One*

Cabinet is baked enamel finish, all-steel with two drawers and one cupboard compartment. Enclosed recess provides ample knee space and conceals plumbing. Drawers are one-piece with curved corners—top drawer has lift out tray for toilet accessories. Middle drawer has tiltproof slanting shelves for convenient storage of medical supplies. It is fitted with a lock. Cupboard compartment provides a spacious area for bath towel storage—a lift out receptacle for convenient disposal of used tissues, etc., is attached to door. Top is one-piece, stain-resisting **Formica** with integral back—available in white or a choice of attractive colors, as shown in the table below.



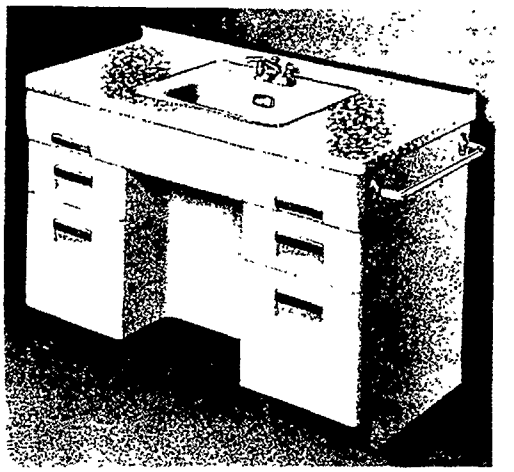
## No. 3500 LAVANETTE

Cabinet with Top: All-steel baked enamel finish cabinet with one-piece single surface stain-resisting **Formica** top.
Lavatory: 21x17" **Vanity** acid-resisting porcelain enameled formed metal lavatory with soap depression.
Frame: One-piece stainless steel frame.
Trim: B-419-SF **Repcal** supply and pop-up waste fitting with aerator.
Towel Bars: Clear **Lucite** towel bars with metal brackets.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Length | 36" | Width | 23 3/8" |
| Height, floor to rim | 31 3/8" | Height of back | 2 1/8" |



## No. 5748 VANETTE

Cabinet with Top: All-steel baked enamel finish cabinet with one-piece double surface stain-resisting **Formica** top.
Lavatory: 21x17" **Vanity** acid-resisting porcelain enameled formed metal lavatory with soap depression.
Frame: One-piece stainless steel frame.
Trim: B-419-SF **Repcal** supply and pop-up waste fitting with aerator.
Towel Bars: Clear **Lucite** towel bars with metal brackets.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Length | 48" | Width | 23 3/8" |
| Height, floor to rim | 31 3/8" | Height of back | 2 1/8" |

## TRANSPORTATION CHARGES ON LAVANETTE AND VANETTE COMBINATIONS

NOTE: Lavanette and Vanette combinations shown below are F.O.B. nearest distribution point. *All actual transportation costs from distribution point to delivery point will be added to the prices shown.* Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.

### CABINET DISTRIBUTION POINTS BY ZONES

| ZONE 1 | ZONE 1 | ZONE 1 | ZONE 1 | ZONE 2 |
|---|---|---|---|---|
| Atlanta, Ga. | Charlotte, N. C. | Denver, Colo. | Philadelphia, Pa. | Los Angeles, Cal. |
| Bayonne, N. J. | Chicago, Ill. | Des Moines, Ia. | Pittsburgh, Pa. | San Francisco, Cal. |
| Brighton, Mass. | Cincinnati, O. | Maumee, O. | St. Louis, Mo. | Seattle, Wash. |
| Buffalo, N. Y. | Dallas, Tex. | New Orleans, La. | | |

### PRICES COMPLETE, less trap

| LAVANETTE | | | | Lavatory Bowl and Cabinet Color | Formica Top Color | VANETTE | | | |
|---|---|---|---|---|---|---|---|---|---|
| Catalog Numbers | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds | | | Catalog Number | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
| 3500-1 or *3500-1DL | $251.94 | $266.88 | 145 | White | Gray | 5748-1 | $326.78 | $347.20 | 191 |
| 3500-2 or *3500-2DL | | | | Blue | Blue | 5748-2 | | | |
| 3500-3 or *3500-3DL | | | | Green | Gray | 5748-3 | | | |
| 3500-4 or *3500-4DL | | | | Tan | Red | 5748-4 | | | |
| 3500-5 or *3500-5DL | | | | Pink | Gray | 5748-5 | | | |
| 3500-6 or *3500-6DL | | | | Blue | Coral Skylark | 5748-6 | | | |
| 3500-7 or *3500-7DL | | | | Blue | Pink Frost | 5748-7 | | | |
| 3500-8 or *3500-8DL | | | | Coral | Pink Frost | 5748-8 | | | |

*If less 8-304 flexible supplies.. . . Per Pair, Deduct $9.40* For 20-19 1/4" male tailpieces..... ... Per Pair, Add $.38

*Units with suffix "DL" have drawers on left side and basin on right side instead of as illustrated.



*Prices are subject to change without notice.*

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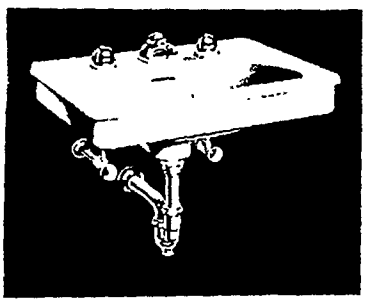
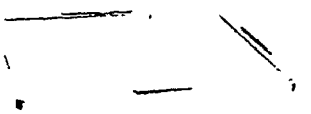
# VITREOUS CHINA LAVATORIES

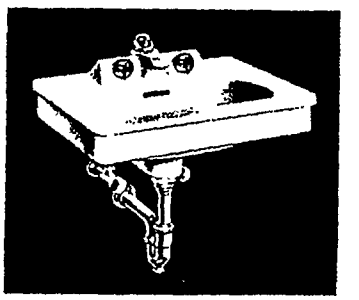
For Counter Top Installations



Hudee "B" Aluminum Frame
For China Lavatories



Made of aluminum—it forms a permanent support and water tight seal for Crane china built-in counter-top lavatories.



### 1-270-L ELAYNE Size: 27x20"

Lavatory: **Elayne** vitreous china lavatory with semi-oval basin and splash lip, for counter top installation.

"L" Trim: 8-10 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting with coupling nuts, less ¼" tailpieces. (Specify 8-5 for **Temple** trim with hooded lever handles.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-270-K ELAYNE Size: 27x20"

Same as 1-270-L except with 8-11 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting with integral push-button ice water valve. (Specify 8-6 for **Temple** trim with hooded lever handles.)

### 1-275-J MARCIA Size: 24x21"

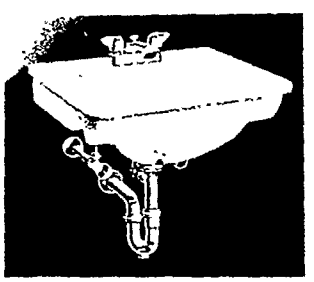
Lavatory: **Marcia** vitreous china lavatory with integral spout, raised beveled panel, semi-oval basin and splash lip, for counter top installation.

"J" Trim: 8-9 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting with coupling nuts, less ¼" tailpieces. (Specify 8-4 for **Temple** trim with hooded lever handles.)

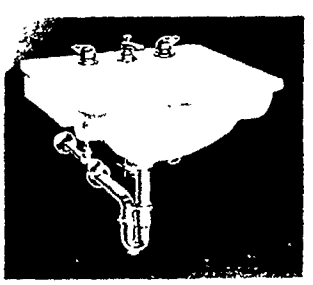
Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

## WESTLAND LAVATORIES For Counter Top Installations



1-282-V



1-282-S

### 1-282-V Size: 20x19"

Lavatory: **Westland** vitreous china lavatory with rectangular basin, splash lip, twin front overflow and two soap depressions.

"V" Trim: 8-562 **Neu-Rainier** *Dial-ese* supply and indirect lift waste fitting with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-282-S Size: 20x19"

Lavatory: **Westland** vitreous china lavatory with rectangular basin, splash lip, twin front overflow and two soap depressions.

"S" Trim: 8-575 **Embassy** *Dial-ese* supply and indirect lift waste with coupling nuts, less ¼" tailpieces.

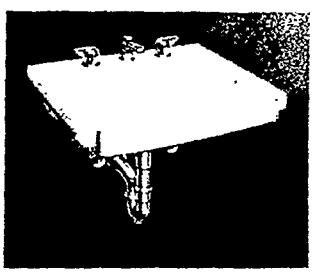
Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-282-L Size: 20x19" (not illustrated)

Same as 1-282-S except with 8-10 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting ("L" Trim).

## COUNTESS LAVATORIES



### 1-284-S Size: 20x17"

Lavatory: **Countess** vitreous china lavatory with modified rectangular basin, splash lip, twin front overflow and two soap depressions, for countertop installations.

"S" Trim: 8-575 **Embassy** *Dial-ese* supply and indirect lift waste (with coupling nuts, less ¼" tailpieces).

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included*

### 1-284-V Size: 20x17"

Same as 1-284-S except with 8-562 **Neu-Rainier** *Dial-ese* supply and indirect lift waste fitting ("V" trim).

**Overall Dimensions**

| Name | Size | Basin |
|---|---|---|
| Countess | 20x17" | †15½x11¼" |
| Elayne | 27x20" | 21x11" |
| Marcia | 24x21" | 17x10½" |
| Westland | 20x19" | 16x11" |

†Width at back is 14".

## PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-270-K | 27x20 | $158.00 | $193.70 | 88 |
| 1-270-L | 27x20 | 138.50 | 174.20 | 90 |
| 1-275-J | 24x21 | 126.40 | 163.30 | 100 |
| 1-282 Ware Only | 20x19 | 32.00 | 48.10 | 50 |
| 1-282-L | 20x19 | 97.40 | 113.40 | 65 |
| 1-282-S | 20x19 | 72.40 | 88.50 | 60 |
| 1-282-V | 20x19 | 65.80 | 81.90 | 60 |
| 1-284 Ware Only | 20x17 | $34.80 | $52.20 | 47 |
| 1-284-S | 20x17 | 75.20 | 92.60 | 57 |
| 1-284-V | 20x17 | 68.60 | 86.00 | 57 |

**8-10 Temple** trim brush finish C.P. **Add $11.40**
**8-304** flexible supplies ..... **Per pr. 9.40**
**8-324** ¼" male tailpieces..... **Per pr. .48**
For aerators **S** and **V** trim only.... **Each Add 2.10**

**Aluminum Lavatory Frames**

| Name | Number or Size | Price |
|---|---|---|
| Countess | *No. CRC-550 | $8.60 |
| Countess | **No. CRC-549 | 5.80 |
| Elayne | Type "B" 27x20" | 10.20 |
| Marcia | Type "B" 24x21" | 10.00 |
| Westland | Type "B" 20x19" | 9.80 |

*One-piece, 3-sided.
**Two end pieces only.
For frame individually packaged..... **Add Each $.50**

*Prices are subject to change without notice.*

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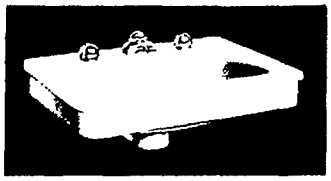
*May 4, 1955*
*Superseding September 16, 1954*

# CRANE FORMED PLASTIC LAVATORY COUNTERTOPS WITH BUILT-IN LAVATORIES AND MODULAR CABINETS

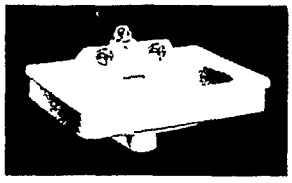
This and the following pages covers a listing of the new line of Crane quality-made bathroom ensembles, each consisting of Formed Plastic Countertops with built-in Vitreous China Lavatories and **Regal** Modular Cabinets. A complete description of the styles of countertops, lavatories and cabinets is shown. Various arrangements, to fit specific space areas are possible—cabinets with supplementary accessory parts and countertops can be combined to form Flat Wall, L-Shaped or U-Shaped installations.

## Crane Vitreous China Lavatories for Building into Countertops

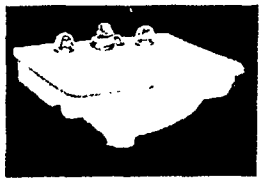
1-80 Criterion
Sizes: $30\frac{1}{4}$x22" and $21\frac{1}{2}$x$17\frac{3}{4}$"



1-270-L Elayne
Size: 27x20"



1-275-J Marcia
Size: 24x21"



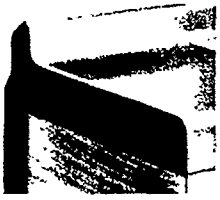
1-282-L Westland
Size: 20x19"

Crane lavatories are available in white or the following regular colors:

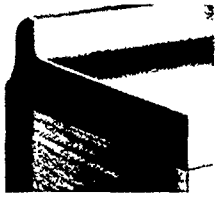
| | | | |
|---|---|---|---|
| Sun Tan | Persian Red | | Shell Pink |
| Pale Jade | Citrus Yellow | French Grey | Sky Blue |

## Formed Plastic Countertops

Countertops are made from special **Formica** forming stock materials to make possible the smooth coves, rounded splashbacks and rounded front aprons. The **Formica** covering is bonded to a wood core under heat and pressure. Countertops are made in three styles, to suit the design and installation requirements of the lavatories. Except for the mounting ring, used in installing the **Elayne, Marcia** and **Westland** lavatories, there is no visible metal trim, as the backsplash is coved into the countertop. Aprons at front and sides are 4" high, backsplash is $3\frac{1}{2}$" high. Countertops are available in the various **Formica** color patterns shown below.



**Style No. 1**
With coved and rounded back and rounded apron



**Style No. 2**
With coved and square back and square apron

**Style No. 3**
Without back and with square apron

Formica Color Patterns

| | | | |
|---|---|---|---|
| 20C1 | Tan Linen | 2M1 | Gray Moonglo |
| 1C41 | Blue Linen | 36M30 | Red Moonglo |
| 36C30 | Red Linen | 50M52 | Green Moonglo |
| 2C1 | Gray Linen | 25M11 | Yellow Moonglo |
| 66C11 | Yellow Linen | 81L30 | Terra Cotta Skylark |
| 2D1 | Gray Pearl | 82L11 | Yellow Skylark |
| 34D31 | Red Pearl | 87L19 | Dark Green Skylark |
| 5D11 | Yellow Pearl | 86L18 | Gray Skylark |

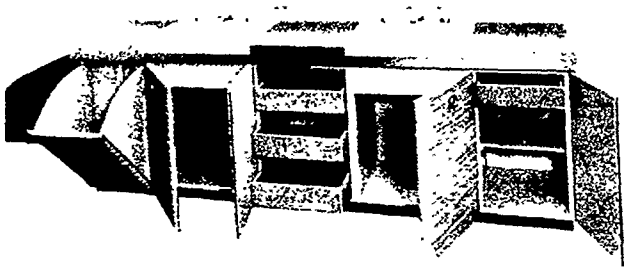
1014 Black (plain)

## Regal Modular Bathroom Cabinets

**Regal** cabinets are quality constructed from a good grade of plywood. Exposed fronts have a wood grain pattern laminated plastic sheet, bonded to the wood under heat and pressure, and reinforced with metal trim at points subject to wear. Exposed edges and interior surfaces are painted a light blue-gray color. The large diameter chromium plated knobs are also ornamental. Doors have sturdy piano hinges and roller spring catches. Drawers have all-wood, trouble free slides and, like the shelves, are made of hardwood and varnished to provide a bright and sanitary interior. Toe base, at front and sides, is painted black.

Cabinet units are completely assembled and individually packaged in cartons when shipped from the factory. Each unit, together with accessory parts and countertops, is fitted together on the job. Wood screws are furnished, and as they are inserted from within the cabinets, they are concealed from view.

As the fronts of all cabinets are finished with colored plastic facing and the sides and backs are unfinished, when being installed with the sides exposed to view, $\frac{3}{4}$" thick separate colored plastic faced side panels are used to provide a finished appearance. They are attached with wood screws from within. There are four types of cabinets, as shown in the illustration at the left. These are Hamper, Lavatory, Three-Drawer and Utility. They are made in a number of sizes so as to provide unlimited ensemble arrangements.



Hamper Cabinet | Lavatory Cabinet | Drawer Cabinet | Lavatory Cabinet | Utility Cabinet

Wood grain finishes for cabinets and panels are available as follows:

| | |
|---|---|
| No. 2024 Grey Heather | No. 4004 Grey Oak (light) |
| No. 2026 Green Heather | No. 4006 Prima Vera (blond) |
| No. 2027 Blue Heather | No. 4007 Walnut (dark) |
| No. 2028 Rose Heather | No. 44311 Tan Heather |
| No. 2029 Yellow Heather | |



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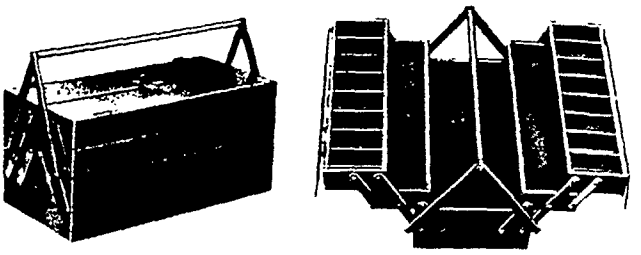
## Duplex Plumbers' Tool Boxes

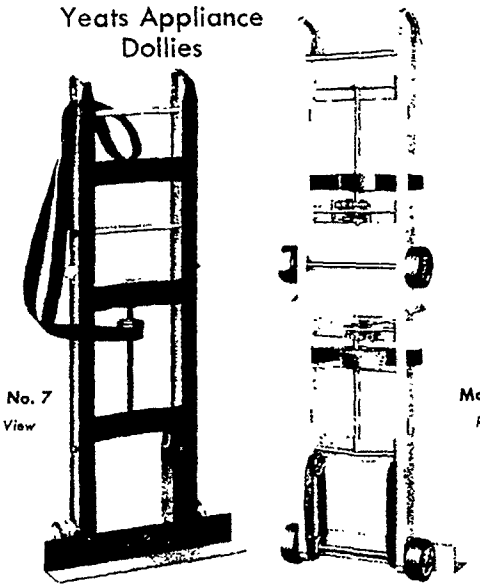


The sixteen compartments in the upper trays provide ample space for accessories; the three large compartments are for large tools, fittings, parts, etc. The box may be opened completely or either side individually, by a slight pressure on the handle. Lifting the handle closes the box. Constructed of heavy gauge steel finished with long wearing, light grey Hammertex enamel, baked on.

PRICES COMPLETE *F.O.B. Sherman, N. Y.

| Number | Length Inches | Width Inches | Height Inches | *Price Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| **214** | 14 | 8 | 7¾ | **$13.08** | 12 |
| **216** | 16 | 8 | 7¾ | **15.92** | 16 |
| **219** | 19 | 8 | 7¾ | **16.64** | 17 |
| **221** | 21 | 8 | 7¾ | **17.36** | 18 |

## Yeats Appliance Dollies



**Model No. 7**
*Front View*

**Model No. 9**
*Rear View*

These dollies are ideal for handling heavy items, such as water heaters, ranges, residential boilers, tanks, sinks, etc. They have a strong aluminum alloy frame with a 4x24" steel lip. The entire front surface is padded with felt. The 5x2" rubber tired wheels are equipped with roller bearings. Cross members are curved. The 14-foot heavy web strap assures positive grip and is tightened by a ratchet device. The caterpillar "step glide" permits the dolly to move over polished steps without marring or scratching. Available in three sizes.

*All Prices are F.O.B. Milwaukee, Wis. or Fullerton, Calif.

**Model No. 5** 47" high (Shpg. wt. 32 lbs.).....Price, Each **$109.00***
**Model No. 7** 59" high (Shpg. wt. 36 lbs.). .....Price, Each **115.00***
**Model No. 9** 71" high (Shpg. wt. 50 lbs.).....Price, Each **149.00***
Extra Strap (15 foot with ring buckle).....Price, Each **6.50***
Rubber Tired Swivel Casters with Bracket.....Price Per Set **9.00***
Lip Extension Board with Hook (10x24").....Price, Each **6.50***

## Williams' Flange-Jacks

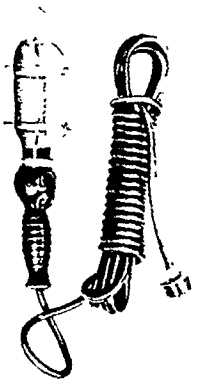
For fast, safe, easy gasket replacement. Flange-Jacks, sold and used only in pairs, exert tremendous pressure; flanges are parted easily, quickly, and evenly without damage to flange faces when gasket is being replaced. No shock, no danger of flying wedges, no sparks from hammer blows.

No. 20 Flange-Jacks are for 2 to 20" 125-Lb. and 1 to 12" 250-Lb. Cast Iron Joints; No. 30 are for 16 to 48" 125-Lb. and 12 to 30" 250-Lb. Cast Iron Joints. Complete technical data furnished on request.

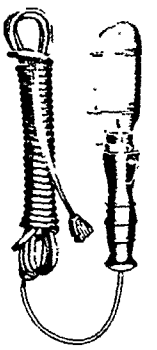
**No. 20,** Pair, weight 13 lbs..... **$42.58**
**No. 30,** Pair, weight 45 lbs..... **85.18**

## Standard Portable Cord Trouble Lights

*All Cords, Sockets, Switches, and Plugs Approved by Underwriters' Laboratories.*



No. SD
Super Duty



No. 103
Master

**No. SD, Super Duty:** A sturdy and serviceable trouble light with a cadmium plated, easy-open lamp guard and full non-glare reflector; all-rubber pistol-grip shockproof handle with push-thru safety switch and convenient side outlet; 18 2 S rubber covered, jute filled, extra flexible wire, with a heavy duty spring action plug and cord grip clamp.

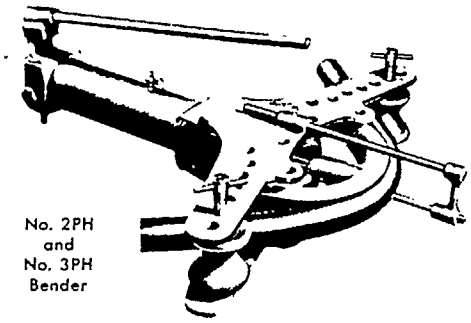
**No. SD-25A,** cord length 25 ft.....Price, Each **$8.50**
**No. SD-50A,** cord length 50 ft.....Price, Each **13.30**

**No. 103, Master:** Similar to the Super Duty above, but lighter in construction. It has the cadmium plated easy-open lamp guard and full non-glare reflector; heavy duty shock-proof handle with push-thru safety switch; and 18 2 SJ rubber covered, jute filled, extra flexible wire, and molded machine type plug.

**No. 103-25C,** cord length 25 ft.....Price, Each **$5.60**
**No. 103-50C,** cord length 50 ft.....Price, Each **8.70**

*Prices are subject to change without notice.*

Printed in U.S.A. LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.



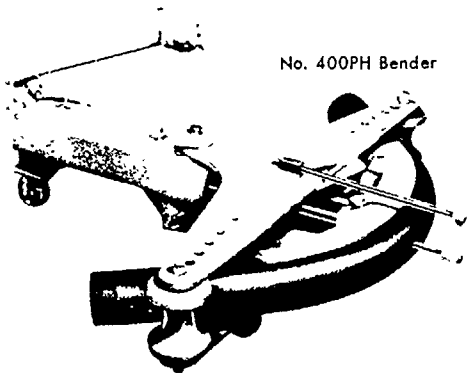
No. 2PH and No. 3PH Bender

## TAL PORTABLE PIPE AND TUBE BENDERS

Tal Hydraulic and Mechanical Benders are well suited for plumbing and heating work. The tight fit of the pipe in the bending Formers coupled with the unique design of the machines results in smooth bends, free from kinks or wrinkles, with no filling or heating. Bending is done in one setting without moving the pipe; benders can be quickly assembled or changed from one pipe size to another. Ruggedly constructed, efficient, and simple to operate.

### 90° Prestal Pipe Benders

The Nos. 2PH, 3PH, and 400PH Benders are operated by means of a hydraulic pump. They are similar in design and construction, differing principally in the size of bending Formers which can be used with them (the No. 400PH has a heavier pump and is mounted on casters). The No. 2PH uses Formers for Standard pipe up to the 2" size; the No. 3PH, up to 3" size; and the No. 400PH, up to 4". Bending Formers are regularly furnished in sets, as follows:



No. 400PH Bender

| | Shpg. Wt. | *Each |
|---|---|---|
| **No. 2PH,** 2" Bender with 7 Formers, Sets Nos. 0 and 1 (3/8" to 2") | 128# | **$441.60** |
| **No. 3PH,** 3" Bender with 9 Formers, Sets Nos. 0, 1 and 3 (3/8" to 3") | 191# | **588.00** |
| **No. 400PH,** 4" Bender without Formers (order formers from chart below) | 427# | **976.00** |

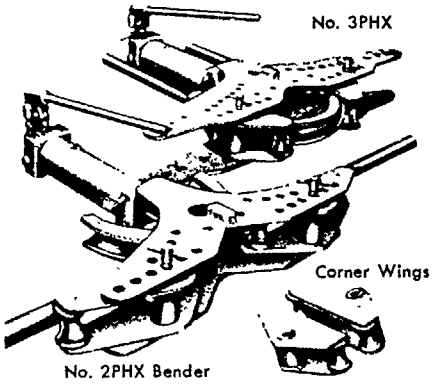
90° Bending Formers—*Prices, Per Set

| Formers | Set No. 0 | | | Set No. 1 | | | | Set No. 3 | | Set No. 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe Sizes | 3/8" | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" | 2 1/2" | 3" | 3 1/2" | 4" |
| †Radii | 1 3/8" | 1 3/4" | 2 3/8" | 3 3/8" | 4 3/8" | 5 1/2" | 7 3/4" | 10" | 12" | 18" | 23" |
| *Per Set | **$30.70** | | | **$106.00** | | | | **$138.00** | | **$299.20** | |

†Minimum radii obtained with Tal Benders; any longer radius bend can be made with the same Bending Formers.

Formers for pipe 2 1/2" and larger can be used for rigid conduit; Long Radius Formers for conduit 2" and smaller also available. Details on other Bender and Former combinations, including a combined 2 and 3" Bender, furnished on request.
The above Benders can also be furnished for 5", 6" or 8" pipe.

## 180° Prestal Pipe Bender with 90° Formers



No. 3PHX

Corner Wings

No. 2PHX Bender

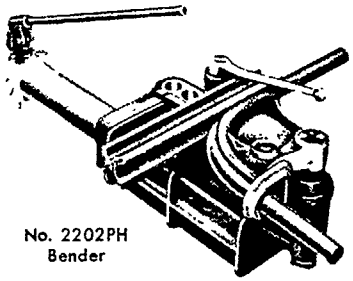
Nos. 2PHX and 3PHX benders make 180° return bends, 90° or other various degree bends with one forward movement of the ram and one pipe and corner setting. Each Bender has a hydraulic ram unit, special 180° frame with two corner wings and standard 90° Formers. 180° Formers are purchased as required, see table below for standard sizes and prices. When ordering, specify the pipe size and center to center dimension.

| No. | Size | 90° Formers | Set No. | Sizes | Shpg. Wt. | *Each |
|---|---|---|---|---|---|---|
| **2PHX** | 2" | 7 | 0 & 1 | 3/8" to 2" | 160# | **$572.30** |
| **3PHX** | 3" | 9 | 0, 1 & 3 | 3/8" to 3" | 230# | **724.00** |

Note: Bender in 4 inch size also available.

| Pipe Size | 180° Bending Formers—*Prices, Each | | | | |
|---|---|---|---|---|---|
| | 6" centers | 9" centers | 12" centers | 15" centers | 18" centers |
| 3/4" | **$24.00** | **$35.00** | **$41.00** | **$52.80** | **$64.00** |
| 1" | — | **39.50** | **43.00** | **56.00** | **68.00** |
| 1 1/4" | — | — | **55.00** | **62.00** | **72.00** |
| 1 1/2" | — | — | **57.00** | — | — |

## Hydraulic Copper Tube Bender



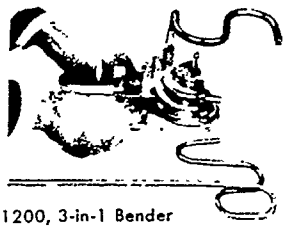
No. 2202PH Bender

This Portable Hydraulic Tube Bender makes simple, fast, accurate offsets or 90° bends in types K or L hard or soft copper water tube. It is sold either as a complete Tube Bender with proper Tube Formers or as a Tube Attachment with Tube Formers for use with the No. 2PH or No. 3PH Pipe Benders. Combinations other than those listed below, individual Formers with bars and grips, as well as Formers for thin wall conduit are available; information furnished on request.

| | Shpg. Wt. | *Price Each |
|---|---|---|
| **No. 2202PH** Complete Copper Tube Bender with 4 Formers for 1" (5 3/4" radius), 1 1/4" (7 1/4" radius), 1 1/2" (8 1/4" radius), and 2" (10" radius) tube | 205# | **$694 00** |
| **No. 2203PH** same as above but with one additional Former for 3" (15" radius) tube (soft copper only) | 282# | **993.50** |
| **No. 2230PH** Copper Tube Attachment for 2" or 3" Pipe Bender, with 4 Formers for 1", 1 1/4", 1 1/2", and 2" tube | 170# | **505.60** |
| **No. 2231PH** Copper Tube Attachment for 2" or 3" Pipe Bender, with 5 Formers for 1", 1 1/4", 1 1/2", 2", and 3" tube (for soft copper tubing only) | 247# | **805.10** |

## "Three-In-One" Tube Bender

The No. 1200, 3-in-1 Bender is a multi-purpose hand tool for all small tube bending. It is simple to operate, light in weight, and easy to carry. There are no loose parts—no fastening is necessary. Will bend copper, K and L, Bundy, aluminum and other thin wall tube, in sizes 3/8" O.D., 1/2" O.D. and 5/8" O.D. This Bender is well suited for radiant heat jobs. Makes any bend up to 180° quickly and easily in one operation.



No. 1200, 3-in-1 Bender

| Tube Sizes | O.D. of Tubing | Radius |
|---|---|---|
| 1/4" | 3/8" | 1" |
| 3/8" | 1/2" | 1 1/2" |
| 1/2" | 5/8" | 2" |

**No. 1200,** 3-in-1 Bender
Price, Each **$76.00***
Shpg. Wt. 6 pounds

*All prices are F.O.B. Milwaukee, Wisc.

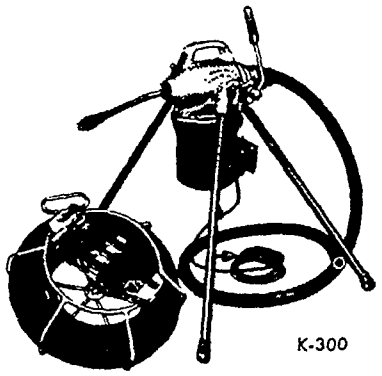
*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

## Kollmann Sewer and Drain Cleaning Machine



K-300

This light weight well-balanced machine, which incorporates many features of the heavy duty units, weighs only 40 pounds. It is especially designed for use in sink drains. The 1/8 H.P. motor drives up to 100 feet of sectional cable through any installation of traps and elbows as small as 1¼" size. Will also clear down-spouts, cellar drains and underground or overhead industrial supply lines up to 3" size.

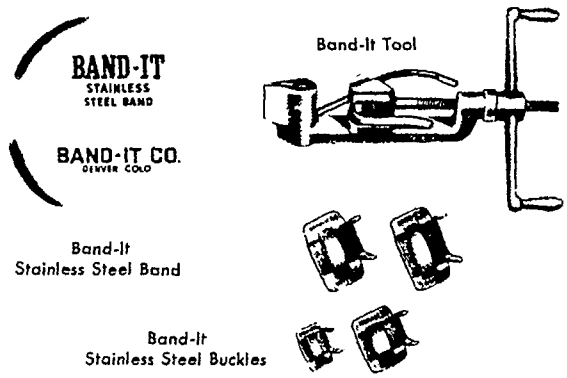
The unit is fully enclosed to assure clean, fast and safe operation. Sectional, spring steel cables have quick-change, pin-locking couplings. The guide hose eliminates danger of cable whipping.

**Standard Equipment Includes:** 1/8 H.P. 110 volt, 60 cycle motor; 1 6' guide hose; 4 7½' lengths ⅝" cable; 1 ball-type auger; 1 grease cutter; 1 straight auger (cable and augers assembled to welded steel carrier with tool plate) and convenient carrying handles.

*All prices are F.O.B. Erie, Pa.

| Number | Description | *Price Each | Shpg. Wt. |
|---|---|---|---|
| K-300 | Machine Complete | $350.00 | 40 lbs. |
| | **Replacement Parts** | | |
| 58C | Cable Carrier (less cable & tools) | $13.00 | 7½ |
| 314 | Guide Hose, 6' length | 20.00 | 1 |
| 340 | Ball Auger | 3.50 | ½ |
| 341 | Straight Auger | 3.50 | ½ |
| 342 | Grease Cutter | 4.00 | ½ |
| 344 | Section Cable, 7½' length | 7.50 | 5 |

## Band-It Clamps

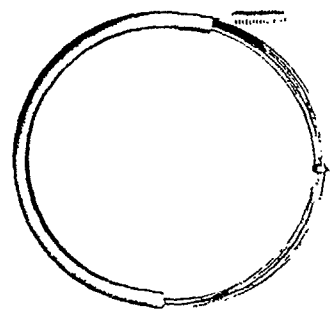



With Band-It Clamps, for a few cents and in a few seconds, you can handle any permanent or emergency clamping job from ½-inch to 30 feet in diameter. 100' rolls of stainless steel bands and buckles in ⅜, ½, ⅝, and ¾" widths handle every job, with the one Band-It Tool. Band-Its stop leaks; repair, conserve, and extend the usefulness of hose, steel pipe, and tanks; can be used for an endless number of clamping or banding jobs both in the field and in the shop. Economical, easy to apply, and readily portable.

Band-It Tool, with ball bearing (Wt. 4 7/16 lbs.), Price, Each . . . $24.00

| Width Bands or Buckles | Band-It Bands | | | Band-It Buckles | | |
|---|---|---|---|---|---|---|
| | Weight Per Roll | Per Roll 100 feet | Per Foot | Weight Per Box | Per Box 100 pcs. | Buckles Each |
| ⅜" | 3½ lbs. | $12.00 | $.18 | 13/16 lbs. | $12.00 | $.18 |
| ½" | 5 5/16 lbs. | 16.00 | .24 | 2 1/16 lbs. | 16.00 | .24 |
| ⅝" | 6¾ lbs. | 20.00 | .30 | 2⅝ lbs. | 20.00 | .30 |
| ¾" | 8 7/16 lbs. | 24.00 | .36 | 3 3/16 lbs. | 24.00 | .36 |

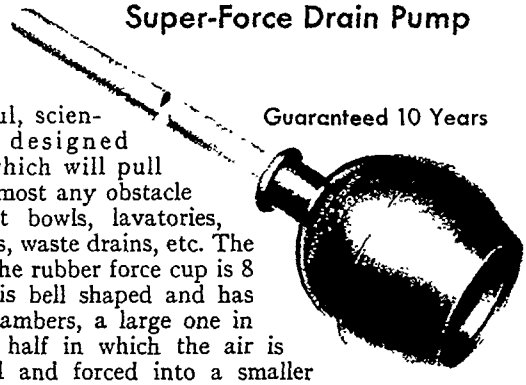
## Marco Hootnany



Round wire coiled inside a half circle brass tube. Has integral spring head on end of wire.

No. 1, 25'.....Each $ 6.40
No. 2, 50'.....Each 9.00
No. 3, 75'.....Each 14.30
No. 4, 100'.....Each 27.00

## Super-Force Drain Pump

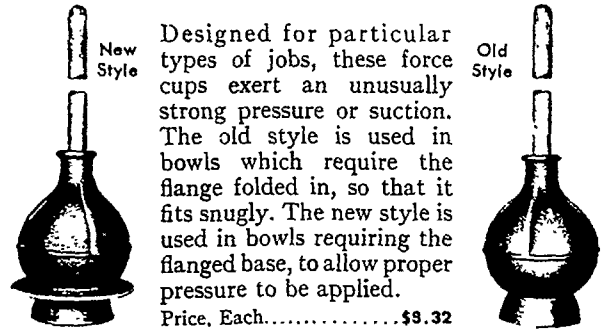


Guaranteed 10 Years

A powerful, scientifically designed plunger which will pull or push almost any obstacle from toilet bowls, lavatories, sinks, traps, waste drains, etc. The length of the rubber force cup is 8 inches; it is bell shaped and has two air chambers, a large one in the upper half in which the air is compressed and forced into a smaller space below. The pressure and vacuum created is sufficient to do many jobs far beyond the ability of the ordinary plunger. A non-slip feature is provided by a lower collar design on the cup.

Price, Each, with 24-inch handle.....$9.90

## National Force Cups




Designed for particular types of jobs, these force cups exert an unusually strong pressure or suction. The old style is used in bowls which require the flange folded in, so that it fits snugly. The new style is used in bowls requiring the flanged base, to allow proper pressure to be applied.

Price, Each.....$8.32

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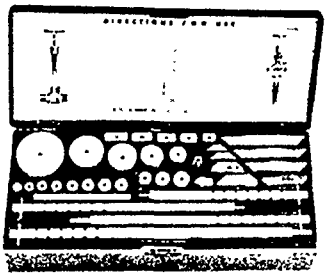
## Skinner Valve and Bibb Reseater



Valve and Bibb Reseater

Reseating a bibb

Reseating a valve

Two tools for the price of one. Quickly and accurately reseats flat and 45° taper seat globe and angle valves, ¼" to ¾" bibbs, faucets, cocks, and small fixtures. All cutters are guaranteed for life. Any cutter becoming dull will be resharpened or replaced free of charge.

Cutters can be furnished for valves with other than standard flat or 45° seats. Specify make and figure number.

Packed in a styrene plastic case, complete with operating instructions.

Price, each, for ¼" to 2" valves..... **$95.50**
Price, each, for ¼" to 3" valves..... **125.00**

## Chicago Specialty Reseating Tools

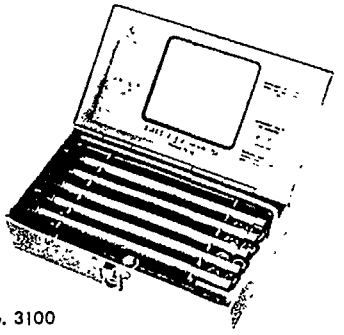
**No. 3100 Reseating Set**

Set contains 4 taps, 1 reamer, 2 insert keys, 8 seats, 1 4-in-1 guide, and 1 T-handle wrench. Packed in a metal lock-tight box.

Price, Each..... **$23.02**

**Extra Seats:** No. 1 ⅜"; No. 2, 7/16" No. 3, ½"; No. 4, 9/16".

Price, Each..... **$ .20**



No. 3100

No. 3113

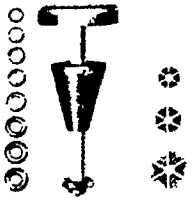
**No. 3113 Bibb Dresser:** Solid brass 4-in-1 cone furnished with 4 cutters, ½", ⅝", ¾", ⅞". Milled edge assures smooth seat.

Price, Each..... **$3.06**

**No. 3119 Bibb and Valve Seat Dresser:** Specially designed steel cutters provide shoulder similar to that on new faucet or valve.

Price, Each, with 4 cutters..... **$10.14**

No. 3119



Bibb Seat Dresser

## Skinner Bibb Seat Dresser and Self-Aligning Bibb Reseater

Self-Aligning Bibb Reseater

(At left) Bibb Seat Dresser is used for reseating common compression bibbs. Ground hardened-steel cutters, non-chatter cone, and chromium plated finish.

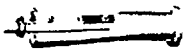
Price, each, complete with eight alignment guides, and four cutters, ⅜", ½", ⅝" and ¾"..... **$5.90**

(At right) Self-Aligning Bibb Reseater is used for reseating flat seat bibbs. A guide pilot screwed on below the cutter sets into the seat opening and holds the cutter to an absolute center while the taper chuck is being attached. The fine hardened threads on the taper chuck engage any surface and hold with a wedge grip.

Price, each, complete with five Skinner cutters of hardened steel, guaranteed to stay sharp, and twelve pilots to fit all makes of flat seat bibbs, ¼" to ¾"..... **$19.70**

## Perfecto Washer Trimmer

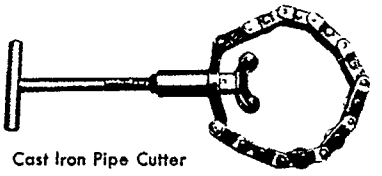
**Takes Washers from ⅝" to No. 00**



A tool designed to cut bibb washers to proper size, thereby assuring a perfect fitting washer. Made of aluminum alloy; precision made. Cutting blade made of tempered Swedish steel. A simple tool to operate.

Price, Each..... **$7.90**

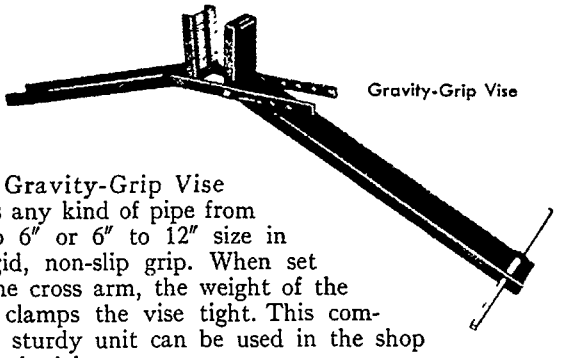
## Springload Pipe Cutter and Pipe Vise



Cast Iron Pipe Cutter

Particularly designed for cutting cast iron pipe, water pipe, Duriron pipe, and cement sewer tile. This light weight, heavy duty, precision-built tool makes a clean cut in much less time than required by other methods. Use with or without a vise. Each size contains seven cutter wheels in the chain and two in the cutter head. Forged, alloyed steel wheels are interchangeable and replaceable; specify whether wheels are for use on sand cast, centrifugal cast, or clay pipe. Additional wheels can be ordered in all three types.

**No. 6,** for 2" to 6" pipe (shpg. wt. 12 lbs.)..... †Price, Each **$ 85.00**
**No. 12,** for 4" to 12" pipe (shpg. wt. 20 lbs.)..... †Price, Each **169.50**



Gravity-Grip Vise

The Gravity-Grip Vise holds any kind of pipe from 2" to 6" or 6" to 12" size in a rigid, non-slip grip. When set on the cross arm, the weight of the pipe clamps the vise tight. This compact, sturdy unit can be used in the shop or on the job.

**No. V-6,** for 2" to 6" pipe (shpg. wt. 21 lbs.)..... †Price, Each **$49.50**
**No. V-12,** for 6" to 12" pipe (shpg. wt. 45 lbs.)..... †Price, Each **89.50**

†All prices are F.O.B. Seattle, Washington.



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Printed in U.S.A.

# CRANE DEALER PRICE SERVICE

May 10, 1955

TO THE DEALER

Enclosed are new and replacement pages for your **PRICE SERVICE CATALOG.** These bring most pages of the catalog up-to-date with pricing data previously supplied to you. Important product changes are as follows:

Section 1 - Lavatory "C" trim and "W" trim with direct lift waste are replaced by "V" trim and "M" trim respectively with indirect lift waste.
Section 2 - Criterion baths have been increased from 28¾" wide, at end, to 30".
Section 3 - 3-558 Sahara tank with one piece insulating liner replaces 3-557.
Section 5 - Crane kitchen cabinets are now available in four colors as listed on page 5-3.
Section 6 - Corridor fountain and cuspidor combination replaces Clearstream fountain and Gymnasium cuspidor. Enameled Bradley washfountains now available in five colors.
Section 8 - All rim guards currently available for service sinks are now shown on page 8-16.
Section 9 - Coyne and Delany No. 50 backflow preventer has replaced former Vigilant vacuum breaker.
Section 15 - New model Lau ventilating fans are shown on page 15-27.
Section 19 - Crane iron body foot valves are included on page 19-15.

**For Section 1**

| | | |
|---|---|---|
| Pages | 1-3 and | 1-4 |
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| | 1-7 | 1-8 |
| | 1-9 | 1-10 |
| | 1-11 | 1-12 |
| | 1-13 | 1-14 |
| | 1-14a | 1-14b |
| | 1-15 | 1-16 |
| | 1-19 | 1-20 |
| | 1-21 | 1-22 |
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**For Section 2**

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**For Section 3**

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| | 3-9 | 3-10 |
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| | 3-19 | 3-20 |
| | 3-21 | 3-22 |

**For Section 5**

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**For Section 6**

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| | 6-12a | 6-12b |
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**For Section 7**

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**For Section 8**

| | | |
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**For Section 8 Cont.**

| | | |
|---|---|---|
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**For Section 9**

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| | 9-11 | 9-12 |
| | 9-13 | 9-14 |
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**For Section 15**

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|---|---|---|
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**For Section 19**

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|---|---|---|
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| | 19-13 | 19-14 |
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| | 19-17 | 19-18 |
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| | 19-21 | Blank |

**For Section 20**

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| | 20-19 | 20-20 |

**For Section 21**

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| Pages | 21-5 and | 21-6 |
| | 21-7 | 21-8 |

If any of the above pages are not received, make notations, sign and return this notice to your Crane Branch or Crane Wholesaler. If all pages are received, a return notice is not necessary.

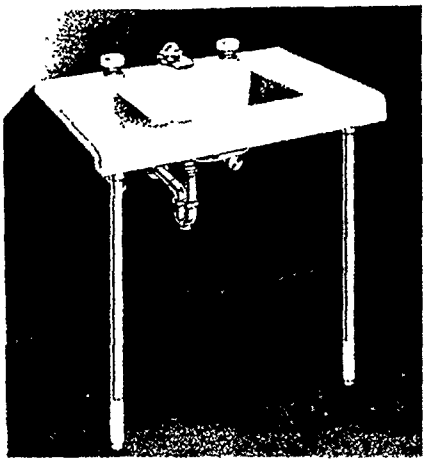
C R A N E C O.

Name_____ City_____

Address_____ State_____

# CRITERION VITREOUS CHINA LAVATORIES

On Metal Legs—For Tiling Into Countertops



1-80, On Metal Legs

### 1-80, On Metal Legs
Sizes: 21½x17¾" and 30¼x22"

Lavatory: Criterion vitreous china lavatory with rectangular basin, splash lip and front overflow.

Supports: 8-702 Criterion brush finish chromium plated round metal legs with clear Lucite base; 8-765 wall brackets.

Trim: 8-1 Criterion *Dial-ese* brush finish chromium plated supply and Lever Action Securo waste fitting with clear Lucite handles (with coupling nuts, less ¼" tailpieces).

Supplies: 8-304 ⅜" brush finish chromium plated angle supplies with stops and flexible risers.

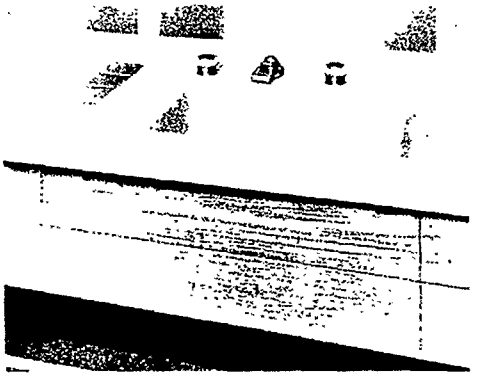
*Note: Lavatory trap is not included.*

8-1 Criterion Trim

The new Criterion design supply and waste trim features the quick-draining Lever Action Securo Waste, easy operating *Dial-ese* controls, and a modern design spout. Handles have a metal base and cap with a fluted ring of crystal-clear Lucite.

8-702 Leg

Criterion legs are a matching design to the lavatory trim. The shaft is round tubing with crystal-clear Lucite base section. adjustable top capitol and floor pad with dowel pin.



### 1-80, For Tiling In
Sizes: 21½x17¾" and 30¼x22"

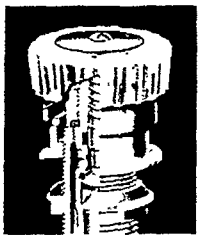
Lavatory: Criterion vitreous china lavatory with rectangular basin, splash lip and front overflow.

Trim: 8-1 Criterion *Dial-ese* brush finish chromium plated supply and Lever Action Securo waste fitting with clear Lucite handles (with coupling nuts, less ¼" tailpieces).

Supplies: 8-304 ⅜" chromium plated angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### Features of *Dial-ese* Controls



Section through valve

- Finger tip operation.
- As easy to turn as the dial on your radio.
- Stem threads are lubricated—lubrication cannot wash out.
- Stem packing is below threads—prevents liming or corrosion.
- Water pressure below seat aids in closing.
- Same *Dial-ese* unit fits all Crane trim, insuring complete interchangeability.

*Dial-ese* unit

### PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price Each White | Price Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-80, On Metal Legs | 21½x17¾ | $199.68 | $236.48 | 80 |
| | 30¼x22 | 237.98 | 293.78 | 110 |
| 1-80, For Tiling In | 21½x17¾ | 161.20 | 198.00 | 75 |
| | 30¼x22 | 199.50 | 255.30 | 105 |

| | | |
|---|---|---|
| 8-691 Temple towel bars (brush finish) | Per Pair | $22.30 |
| 8-702 Criterion legs (brush finish) | Per Pair | 31.00 |
| 8-710 Crestmont round legs (brush finish) | Per Pair | 19.30 |
| 8-324 ¼" male tailpieces | Per Pair | .48 |
| 8-1 Criterion trim (polished chr. pl.) | No extra charge | |

*For Criterion Baths, refer to Section 2.*
*For Criterion Closets, refer to Section 3.*
*For traps, refer to Section 8.*

### Overall Dimensions

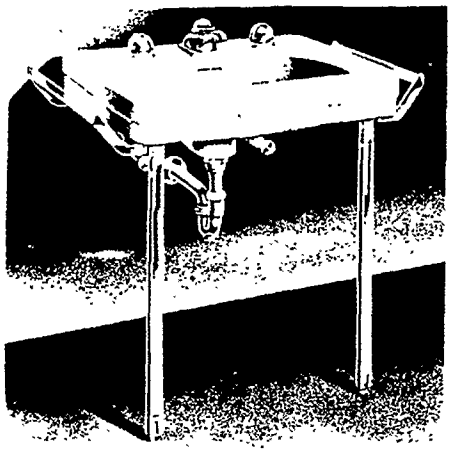
Size 30¼x22" Basin . . 16¼x12½" Apron height . . 2¾"
Size 21½x17¾" Basin . . 14 x 9½" Apron height . 2¾"
Height, floor to top of rim 31

*Prices are subject to change without notice.*

Printed in U.S.A. LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# DIANA VITREOUS CHINA LAVATORIES

On Metal Legs—On China Leg—On Chair Carrier



1-100-L, On Metal Legs
Sizes: 24x20", 27x21" and 33x22"

Lavatory: Diana vitreous china lavatory with semi-oval basin and splash lip.

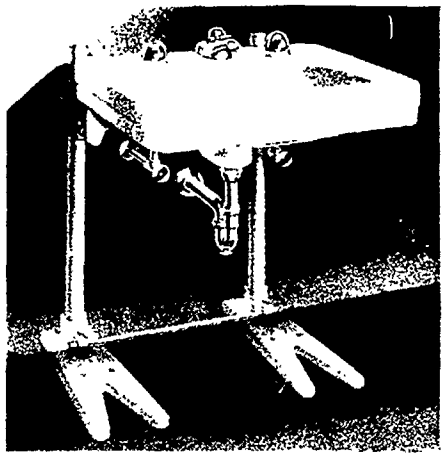
Supports: 8-700 Temple square metal legs; 8-765 wall brackets.

"L" Trim: 8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles with coupling nuts, less ¼" tailpieces. (Specify 8-5 if with hooded lever handles.)

Towel Bars: 8-691 Temple Towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-100-L, On Chair Carrier
Sizes: 24x20", 27x21" and 33x22"

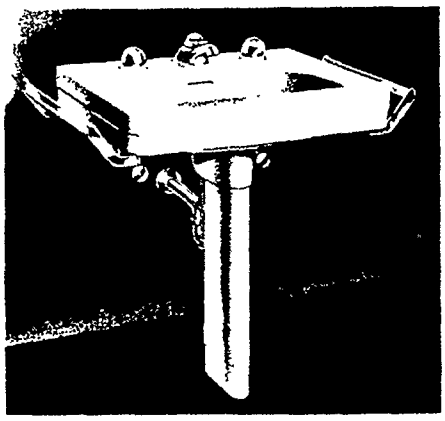
Lavatory: Diana vitreous china lavatory with semi-oval basin and splash lip.

Supports: 8-782 built-in chair carrier with exposed painted enamel, cast iron brackets.

"L" Trim: 8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles with coupling nuts, less ¼" tailpieces. (Specify 8-5 if with hooded lever handles.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-103-L, On China Leg

1-103-L, On China Leg—Sizes: 24x20" and 27x21"

Lavatory: Diana vitreous china lavatory with semi-oval basin and splash lip.

Supports: Vitreous china pedestal leg and 8-765 wall brackets.

"L" Trim: 8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles with coupling nuts, less ¼" tailpieces. (Specify 8-5 if with hooded lever handles.)

Towel Bars: 8-691 Temple towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**Diana lavatories can also be furnished with "K" Trim having push-button ice water valve. When so desired merely change SUFFIX DESIGN TION and use TRIM DESCRIPTION given below.**

K Trim

8-11 Temple *Dial-ese* supply and Lever Action Securo waste fitting with integral push-button ice water valve and three rib handles with coupling nuts, less ¼" tailpieces. (Specify 8-6 if with hooded lever handles.)

*Temple trim with three rib or lever handles, same price.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Size | 24x20" | Basin | 18x11" |
| | 27x21" | | 21x12" |
| | 33x22" | | 23x13" |
| Height, floor to top of rim | | | 31" |

*For Chair or Wall Carriers or lavatory traps, refer to Section 8.*

All exposed metal trim is chromium plated.

PRICES COMPLETE, less traps

| Number | Size | White | Color | Shpg. Wt. | Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|---|---|---|---|---|
| 1-100-K On Metal Legs | 24x20" | $192.40 | $221.90 | 100 lbs. | 1-100-K On Chair Carrier | 24x20" | $197.60 | $227.10 | 150 lbs. |
| | 27x21" | 209.00 | 246.80 | 120 lbs. | | 27x21" | 214.20 | 252.00 | 170 lbs. |
| | 33x22" | 242.60 | 297.20 | 140 lbs. | | 33x22" | 247.80 | 302.40 | 190 lbs. |
| 1-100-L On Metal Legs | 24x20" | 172.90 | 202.40 | 105 lbs. | 1-100-L On Chair Carrier | 24x20" | 178.10 | 207.60 | 155 lbs. |
| | 27x21" | 189.50 | 227.30 | 125 lbs. | | 27x21" | 194.70 | 232.50 | 175 lbs. |
| | 33x22" | 223.10 | 277.70 | 145 lbs. | | 33x22" | 228.30 | 282.90 | 195 lbs. |
| 1-103-K On China Leg | 24x20" | 184.30 | 221.00 | 120 lbs. | 1-103-L On China Leg | 24x20" | 164.90 | 201.50 | 125 lbs. |
| | 27x21" | 200.90 | 245.90 | 140 lbs. | | 27x21" | 181.50 | 226.40 | 145 lbs. |

| | | | | | |
|---|---|---|---|---|---|
| 8-304 supplies | Per Pair | $9.40 | 8-691 Temple towel bars | Per Pair | $18.90 |
| 8-324 ¼" male tailpieces | Per Pair | .48 | 8-700 Temple legs | Per Pair | 22.30 |
| 8-10 Temple Brush finish C.P. | Add | 11.40 | 8-782 Chair Carrier | | 52.00 |



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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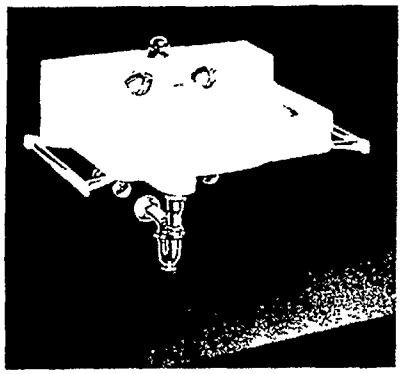
# DREXEL VITREOUS CHINA LAVATORIES



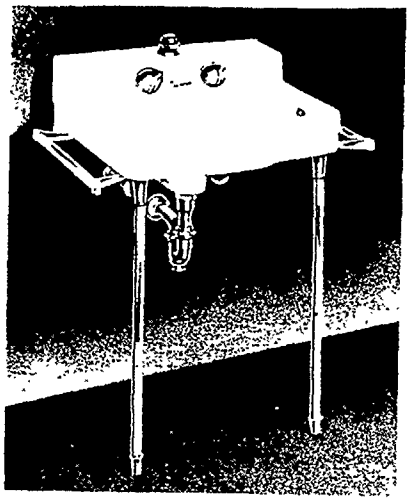
1-110-J, Wall Hung — Size: 22x18"

Lavatory: Drexel vitreous china lavatory with integral spout, beveled panel shelf back, semi-oval basin with splash lip and soap depression.
Supports: Concealed hangers and wall screws.
"J" Trim: 8-9 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.
Towel Bars: 8-697 Crestmont towel bars.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

Overall Dimensions

Size...22x18" Basin...17x10½"
27x21" 21x12"
Height, floor to top of rim.....31"

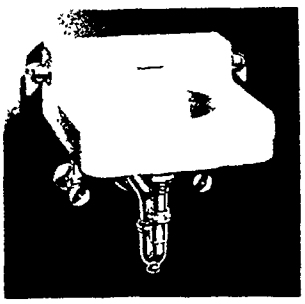


1-110-J, On Metal Legs
Sizes: 22x18" and 27x21"

Lavatory: Drexel vitreous china lavatory with integral spout, beveled panel shelf back, semi-oval basin with splash lip and soap depression.
Supports: 8-711 Crestmont hexagon metal legs, concealed hangers and wall screws.
"J" Trim: 8-9 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.
Towel Bars: 8-697 Crestmont towel bars.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

# DREXEL VITREOUS CHINA DENTAL LAVATORY



1-119, Wall Hung

Overall Dimensions

Size.....14x14"
Basin diameter.....8½"

1-119, Wall Hung—Size: 14x14"

Lavatory: Drexel vitreous china flushing rim dental lavatory with shelf back, round basin, integral outlet strainer and two tumbler recesses in shelf top.
Supports: Concealed hangers and wall screws.
Trim: 8-160 *Dial-ese* supply and flushing rim fitting with concealed metal spout and backflow preventer (with coupling nuts, less ¼" tailpieces).
Waste: 8-352 waste fitting with 1¼" O.D. tailpiece.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-110-J, On Legs | 22x18 | $132.20 | $159.30 | 100 |
| | 27x21 | 157.30 | 197.00 | 120 |
| 1-110-J, Wall Hung | 22x18 | 115.60 | 142.70 | 90 |
| 1-119, Wall Hung | 14x14 | 108.50 | 129.70 | 60 |

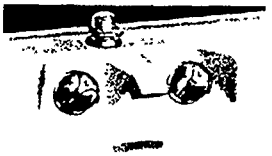
| | | |
|---|---|---|
| 8-304 supplies | Per Pair | $9.40 |
| 8-324 ¼" male tailpieces | Per Pair | .48 |
| 8-697 Crestmont towel bars | Per Pair | 11.60 |
| 8-711 Crestmont legs | Per Pair | 16.60 |

*For lavatory traps, refer to Section 8.*
*For Drexel Baths, refer to Section 2.*
*For Drexel Closets, refer to Section 3.*

All exposed metal trim is chromium plated.

# TRIM FOR CRANE LAVATORIES

## Suffix Designations and Trim Descriptions



**J Trim**

8-9 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.

8-4, same except with lever handles.

**K Trim**

8-11 Temple *Dial-ese* supply and Lever Action Securo waste fitting with integral push button ice water valve and three rib handles.

8-6, same except with lever handles.

**L Trim**

8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.

8-5, same except with lever handles.

**E Trim**

8-130 Whitney *Dial-ese* supply and direct lift waste fitting.

8-130-A, Same except with aerator.

**ER Trim**

8-131 Repcal supply and direct lift waste fitting with integral seats.

8-131-A, Same except with aerator.

**ERS Trim**

8-132 Repcal supply and direct lift waste fitting with renewable seats.

8-132-A, Same except with aerator.

**F Trim**

8-133 Whitney *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

8-133-A, Same except with aerator.

**FR Trim**

8-134 Repcal supply fitting with integral seats, chain and stopper; 8-350 1¼" P.O. plug.

8-134-A, Same except with aerator.

**FRS Trim**

8-135 Repcal supply fitting with renewable seats, chain and stopper; 8-350 1¼" P.O. plug.

8-135-A, Same except with aerator.

**D Trim**

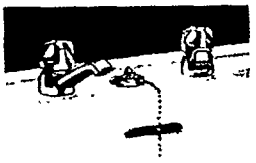
8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

8-569-A, Same except with aerator.

**V Trim**

8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

8-562-A, Same except with aerator.



**P Trim**

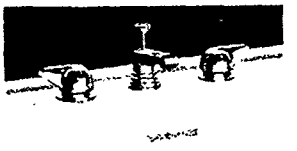
*For Vitreous China Lavatories*

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

**P Trim**

*For Porcelain Enameled Lavatories*

*8-31 Vantage *Dial-ese* faucets with four-arm handles; chainstay through back with chain and stopper; 8-350 1¼" P.O. plug.



**S Trim**

8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.

8-575-A, Same except with aerator.

**R Trim**

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste fitting.

**M Trim**

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P," "R" and "M" trimmings

8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

### Interchangeable Trimmings

D and V trim use the same ware openings on china or enameled lavatories.

M, P and S trim use the same ware openings on china lavatories only.

M and S trim use same ware openings on enameled lavatories.

E, ER, ERS, F, FR, and FRS trim for 45° panel use the same ware openings on china or enameled lavatories.



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LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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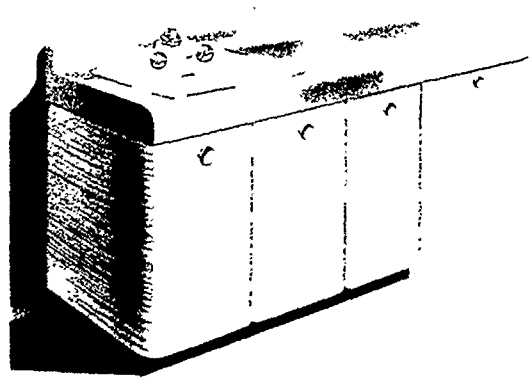
## BATHROOM COUNTERTOP AND CABINET ENSEMBLES

*With Vitreous China Lavatories, Formed Plastic Countertops and Modular Cabinets*

**Marcia** and **Westland** lavatories can be installed in any of the following three styles of countertops:

**Style No. 1**, with coved and rounded top back and rounded front apron.
**Style No. 2**, with coved and square top back and square front apron.
**Style No. 3**, without back and with square front apron.

The lavatory is firmly secured to the countertop with a satin finish stainless steel mounting ring that is neatly joined and soldered at the rear. A compressed lead foil gasket and caulking compound provide an excellent sealed joint between lavatory and countertop.



**1-268 Marcia—Size: 77½x25″**

Countertop: Type 1-M-1 **Formica** countertop with 3½″ high, coved and rounded top back, rounded front apron and finished ends; stainless steel mounting ring; 1-275-J 24x21″ **Marcia** vitreous china built-in lavatory with 8-9 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting.

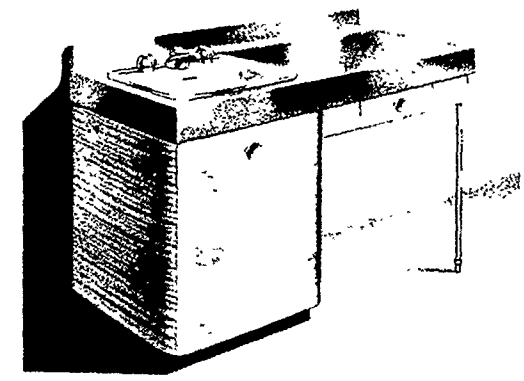
Supplies: 8-304 3/8″ angle supplies with stops and flexible risers.

Cabinets: **Regal** Modular laminated plastic faced wood cabinets consisting of 30″ Lavatory cabinet, 15″ Drawer cabinet, 18–30″ Vanity drawer, 4¼″ side panel, 19½″ side panel and 23¾″ side panel.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

Top Size 77½x25″ Lavatory Size... 24x21″ Floor to Rim... 31″



**1-269 Westland—Size: 53½x25″**

Countertop: Type 1-W-2 **Formica** countertop with 3½″ high, coved and square top back, square front apron and finished ends; stainless steel mounting ring; 1-281-L 20x19″ **Westland** vitreous china built-in lavatory with 8-10 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting. (Specify 8-5 for **Temple** trim with hooded lever handles.)

Supplies: 8-304 3/8″ angle supplies with stops and flexible risers.

Cabinets: **Regal** Modular laminated plastic faced wood cabinets consisting of 21″ Lavatory cabinet, 18–30″ Vanity drawer, 4¼″ side panel, 19½″ side panel and 23¾″ side panel.

Leg: 8-710 **Crestmont** round metal leg.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

Top Size....53½x25″ Lavatory Size.. .20x19″ Floor to Rim 31″

### BATHROOM ENSEMBLE PRICES COMPLETE (less traps)

*Countertops are F.O.B. Chicago, Illinois; Cabinets are F.O.B. Brooklyn, New York

| Catalog Number | Overall Size Inches | Lavatory Size, Inches | *Price Complete: With White Lavatory | *Price Complete: With Colored Lavatory | Shipping Weight, Pounds: Complete Ensemble | Shipping Weight, Pounds: Countertop and Lavatory | Shipping Weight, Pounds: Cabinets Only |
|---|---|---|---|---|---|---|---|
| **1-265** | 59½x22 | 21½x17¾ | **$618.06** | **$654.86** | 310 | 160 | 150 |
| **1-265** | 59½x25 | 30¼x22 | **656.36** | **712.16** | 340 | 190 | 150 |
| **1-266** | 92½x22 | 21½x17¾ | **1038.92** | **1112.52** | 525 | 285 | 240 |
| **1-266** | 92½x25 | 30¼x22 | **1115.52** | **1227.12** | 585 | 345 | 240 |
| **1-267** | 62½x25 | 27x20 | **516.40** | **552.10** | 265 | 140 | 125 |
| **1-268** | 77½x25 | 24x21 | **586.72** | **623.62** | 335 | 200 | 135 |
| **1-269** | 53½x25 | 20x19 | **372.98** | **388.98** | 220 | 140 | 80 |

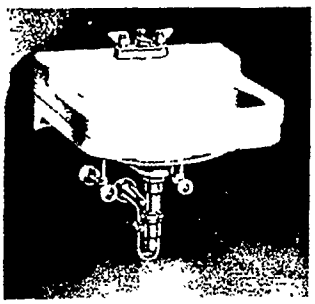
Note: When ordering, it is necessary to indicate the selected colors applying to lavatory, countertop and cabinets.

*For individual cabinets and accessories, refer to Page 1-17.*

*For other supply pipes and traps, refer to Section 8.*

Exposed metal trim is chromium plated.

# YORKSHIRE VITREOUS CHINA LAVATORIES



1-300-V, Wall Hung

1-300-V, Wall Hung
Sizes: 18x15", 20x18" and 24x20"

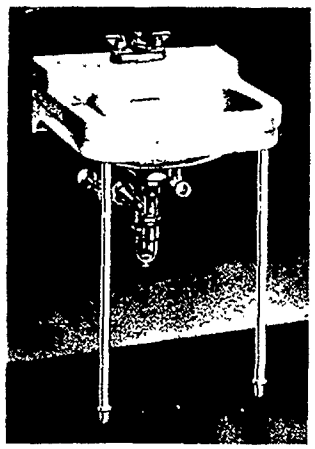
Lavatory: Yorkshire vitreous china lavatory with shelf back, splash lip and soap depressions.

Supports: Concealed hangers and wall screws.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-300-V, On Metal Legs
Sizes: 20x18" and 24x20"

Lavatory: Yorkshire vitreous china lavatory with shelf back, splash lip and soap depression.

Supports: 8-710 Crestmont round metal legs; concealed hangers and wall screws.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Size... | 18x15" | Basin..... | 14x9" |
| | 20x18" | | 15½x11⅜" |
| | 24x20" | | 18x12⅜" |

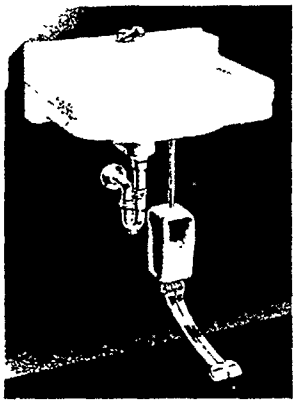
Height, floor to top of rim.....31"

ALTERNATE TRIM FOR YORKSHIRE LAVATORIES

When ordering a Yorkshire lavatory with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

**D Trim**
8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper;
8-350 1¼" P.O. plug.
8-569-A, Same except with aerator.

**V Trim**
8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.
8-562-A, Same except with aerator.



1-307, Wall Hung

## YORKSHIRE CHINA LAVATORIES
### With Pedal Operated Supply Valve

1-307, Wall Hung—Sizes: 20x18" and 24x20"

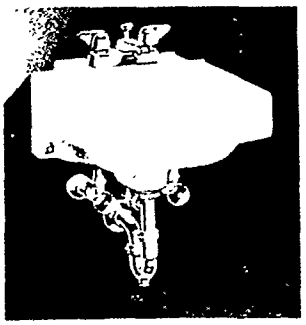
Lavatory: Yorkshire vitreous china lavatory with shelf back, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

Trim: 8H-500 wall mounted self-closing mixing valve with integral stops and polished aluminum hinged pedals; raised spout and supply to spout with volume control.

Waste: 8-353 1¼" P. O. plug with perforated open strainer.

*Note: Lavatory trap is not included.*



1-311-V, Wall Hung

## PETITE VITREOUS CHINA LAVATORY
1-311-V—Size: 14x14"

Lavatory: Petite vitreous china lavatory with rectangular basin, splash lip and ¾" high ledge back.

Supports: Concealed hanger and wall screws.

"V" Trim: 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included*

Overall Dimensions
Size.....14x14"
Basin.....10⅜x8¼"

All exposed metal trim is chromium plated.

*For other supply pipes and traps, refer to Section 8*

PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| Yorkshire, Ware Only | 18x15 | $25.20 | $29.00 | 34 |
| | 20x18 | 31.60 | 47.40 | 42 |
| | 24x20 | 58.70 | 88.10 | 74 |
| **Yorkshire On Metal Legs** | | | | |
| 1-300-D | 20x18 | 77.30 | 93.10 | 60 |
| | 24x20 | 104.40 | 133.80 | 90 |
| 1-300-V | 20x18 | 82.00 | 97.80 | 60 |
| | 24x20 | 109.10 | 138.50 | 90 |
| **Yorkshire Wall Hung** | | | | |
| 1-300-D | 18x15 | $54.30 | $58.10 | 45 |
| | 20x18 | 60.70 | 76.50 | 55 |
| | 24x20 | 87.80 | 117.20 | 85 |
| 1-300-V | 18x15 | 59.00 | 62.80 | 45 |
| | 20x18 | 65.40 | 81.20 | 55 |
| | 24x20 | 92.50 | 121.90 | 85 |
| 1-307 | 20x18 | 139.30 | 155.10 | 60 |
| | 24x20 | 166.40 | 195.80 | 90 |
| 1-311-V | 14x14 | 64.30 | 79.50 | 60 |

| | |
|---|---|
| 8-304 flexible supplies | Per Pair $9.40 |
| 8-324 ¼" male tailpieces | Per Pair .48 |
| 8-710 Crestmont legs | Per Pair 16.60 |
| For aerators (D and V trim only) | Add 2.10 |

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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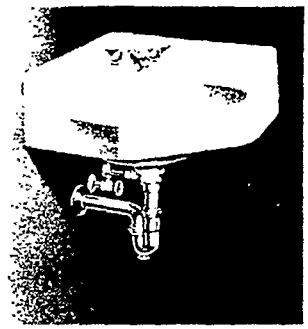
## CORNATE VITREOUS CHINA CORNER LAVATORIES

With 3¼" High Back



1-370-F, Wall Hung—Size: 17x17"

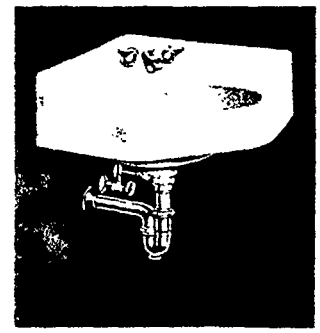
Lavatory: Cornate vitreous china corner lavatory with 3¼" high back, beveled panel, splash lip and soap depression.

Supports: Concealed hangers and wall bracket.

"F" Trim: 8-133 Whitney *Dial-ese* supply fitting with chain and stopper, with coupling nuts, less ¼" tailpieces; 8-350 1¼" P.O. plug.

Supplies: 8-304 ⅜" supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-370-E, Wall Hung—Size: 17x17"

Lavatory: Cornate vitreous china corner lavatory with 3¼" high back, beveled panel, splash lip and soap depression.

Supports: Concealed hangers and wall bracket.

"E" Trim: 8-130 Whitney *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

*Overall Dimensions* Size....17x17" Basin. 15½x10"

## ORAL HYGIENE VITREOUS CHINA DENTAL LAVATORY

1-398, Wall Hung—Size: 9¼x9"

Lavatory: Oral Hygiene vitreous china dental lavatory with 3¼" high beveled panel back and integral flushing rim.

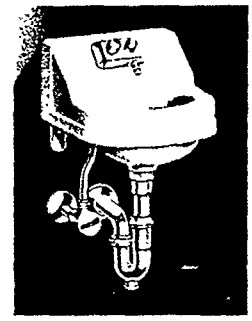
Supports: Concealed hanger and wall brackets.

Trim: Push button self-closing cold water supply and flushing rim fitting with back flow preventer.

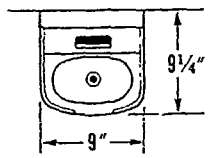
Waste: Perforated open strainer with 1¼" O.D. tailpiece.

Supply: 8-304 ⅜" angle supply with stop and flexible riser.

*Note: Lavatory trap is not included.*



1-398, Wall Hung




Overall Dimensions
Size 9¼x9"
Basin 6¾x4⅛"

PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **1-370-E, Wall Hung** | 17x17 | **$90.70** | **$116.80** | 55 |
| **1-370-F, Wall Hung** | 17x17 | **86.90** | **113.10** | 55 |
| **1-398, Wall Hung** | 9¼x9 | **75.68** | **85.88** | 30 |

***8-304** flexible supplies Per Pair **$9.40**
*One supply pipe only (for cold water line) is included in price of 1-398 lavatory.
**8-324** ¼" male tailpieces Per Pair **.48**
For aerator (E and F trim only) Add **2.10**

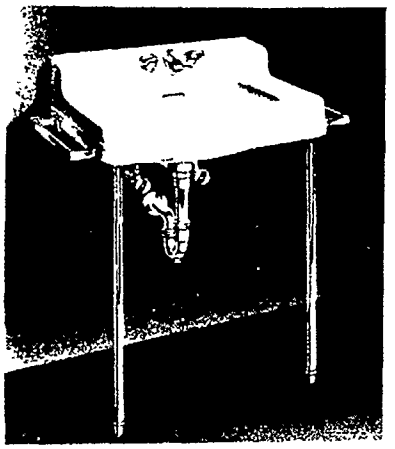
*For other supply pipes and traps, refer to Section 8.*

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# NEUDAY PORCELAIN ENAMELED CAST IRON LAVATORIES

With Whitney *Dial-ese* Trim



1-455-E, On Metal Legs—24x18"
Soap depression is on rim.

### 1-455-E, On Metal Legs
Sizes: 19x17" and 24x18"

Lavatory: Neuday porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

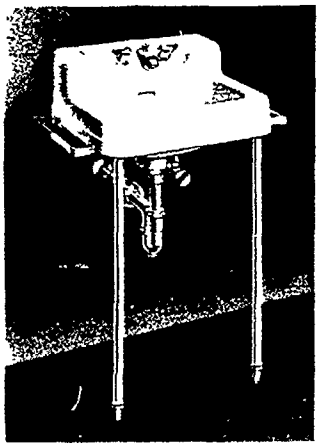
Supports: 8-714 Crestmont round metal legs and concealed wall hanger.

"E" Trim: 8-130 Whitney *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

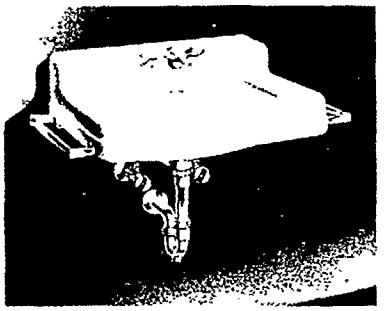
Towel Bars: 8-698 Crestmont clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-455-E, On Metal Legs—19x17"
Soap depression is on shelf.



1-455-E, Wall Hung—24x18"

### 1-455-E, Wall Hung
Sizes: 19x17" and 24x18"

Lavatory: Neuday porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Support: Concealed wall hanger.

"E" Trim: 8-130 Whitney *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Towel Bars: 8-698 Crestmont clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

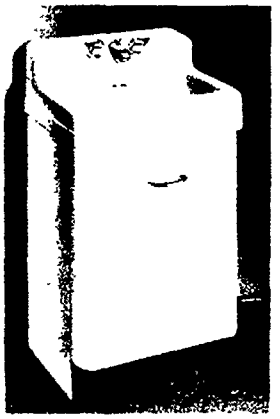
*Note: Lavatory trap is not included.*

Whitney supply fitting with chain and stopper (F Trim) can also be furnished on Neuday lavatories. When so desired merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

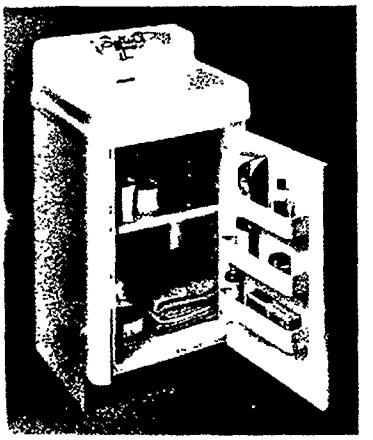
F Trim
8-133 Whitney *Dial-ese* supply fitting with chain and stopper;
8-350 1¼" P. O. plug.

**Overall Dimensions**

Size....19x17" Basin...15½x10½"
24x18" 16x11"
Height, floor to top of rim.....31"
Height of shelf back.....3¼"



1-455-E, On Steel Cabinet
19x17" size only



*Open View of Cabinet*

Lavatory: Neuday porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Support: Concealed wall hanger.

"E" Trim: 8-130 Whitney *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

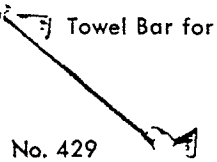
Cabinet: Neuday white baked enamel steel cabinet with single inside shelf, three shelf compartments on inside of door, and black enameled toe base; door is hinged on right hand side.

*Note: Lavatory trap is not included.*

*When ordering, specify if regular or acid-resisting enamel is required.*

All exposed metal trim is chromium plated.

### Towel Bar for Neuday Lavatory Cabinet



No. 429

Round tubing towel bar with metal brackets for attaching to sides of Neuday lavatory cabinet.

**PRICES COMPLETE, less traps**

| Catalog Number | Size Inches | White Regular | White A.R. | Color A.R. | Shpg.Wt. Pounds |
|---|---|---|---|---|---|
| **1-455-E, On Metal Legs** | 19x17 | $94.40 | $98.20 | $101.90 | 95 |
| | 24x18 | 103.00 | 107.90 | 112.70 | 115 |
| **1-455-F, On Metal Legs** | 19x17 | 93.00 | 96.80 | 100.50 | 95 |
| | 24x18 | 101.60 | 106.50 | 111.30 | 115 |
| **1-455-E, Wall Hung** | 19x17 | 77.80 | 81.60 | 85.30 | 90 |
| | 24x18 | 86.40 | 91.30 | 96.10 | 110 |
| **1-455-F, Wall Hung** | 19x17 | 76.40 | 80.20 | 83.90 | 90 |
| | 24x18 | 85.00 | 89.90 | 94.70 | 110 |
| **1-455-E, On Cabinet** | 19x17 | 124.96 | 128.76 | 132.46* | 130 |

*Price is for colored lavatory with white cabinet.

| | | |
|---|---|---|
| **8-304** flexible supplies | Per Pair | **$9.40** |
| **8-324** ¼" male tailpieces | Per Pair | **.48** |
| **8-698 Crestmont** towel bars | Per Pair | **11.60** |
| **8-714 Crestmont** legs | Per Pair | **16.60** |
| **429** Cabinet towel bars | Per Pair | **10.00** |
| For aerator on spout | Add | **2.10** |

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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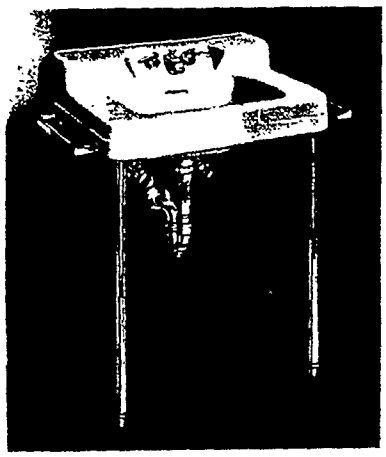
# NEUDAY PORCELAIN ENAMELED CAST IRON LAVATORIES

With Repcal Trim



1-455-ERS, On Metal Legs
24x18" size
Soap depression is on rim.

### 1-455-ERS, On Metal Legs
Sizes: 19x17" and 24x18"

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Supports: 8-714 **Crestmont** round metal legs and concealed wall hanger.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

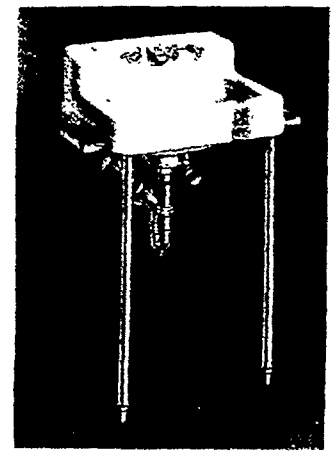
Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

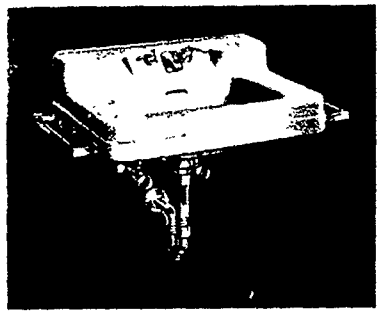
*Note: Lavatory trap is not included.*

**Overall Dimensions**

Size...19x17" Basin...15½x10½"
24x18" 16x11"
Height, floor to top of rim..... 31"
Height of shelf back.....3¼"



1-455-ERS, On Metal Legs
19x17" size
Soap depression is on shelf.



1-455-ERS, Wall Hung
24x18" size
Soap depression is on rim.

### 1-455-ERS, Wall Hung
Sizes: 19x17" and 24x18"

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

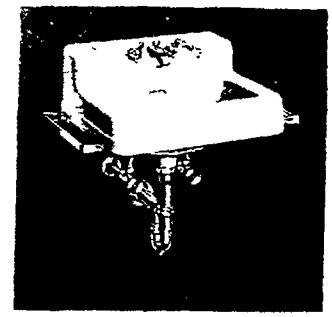
Support: Concealed wall hanger.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-455-ERS, Wall Hung
19x17" size
Soap depression is on shelf.

All exposed metal trim is chromium plated.

*When ordering, specify if regular or acid-resisting enamel is required.*

## ALTERNATE REPCAL TRIM FOR NEUDAY LAVATORIES

When ordering a Neuday lavatory with Repcal trim other than illustrated, merely change SUFFIX DESIGNATION and TRIM DESCRIPTION.

ERS Trim
8-132 **Repcal** supply and direct lift waste fitting with renewable seats.

ER Trim
8-131 **Repcal** supply and direct lift waste fitting with integral seats.

FRS Trim
8-135 **Repcal** supply fitting with renewable seats, chain and stopper; 8-350 1¼" P.O. plug.

FR Trim
8-134 **Repcal** supply fitting with integral seats, chain and stopper; 8-350 1¼" P.O. plug.

The above fittings are regularly furnished with 45° elbows, coupling nuts, friction rings and washers for slip joint connection. When required for use with iron pipe supplies, specify the No. 20-19 ¼" male tailpieces.

### PRICES COMPLETE, less traps

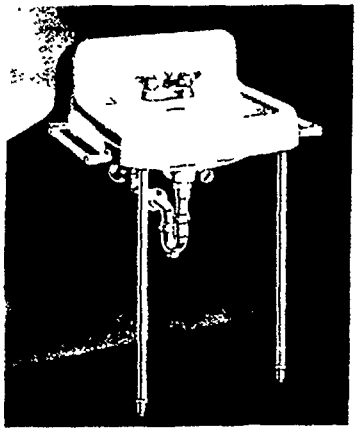
| Catalog Number | Size Inches | White Regular | White A. R. | Color A. R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| **1-455-ER, On Metal Legs** | 19x17 | $87.80 | $91.60 | $95.30 | 95 |
| | 24x18 | 96.40 | 101.30 | 106.10 | 115 |
| **1-455-ERS, On Metal Legs** | 19x17 | 88.50 | 92.30 | 96.00 | 95 |
| | 24x18 | 97.10 | 102.00 | 106.80 | 115 |
| **1-455-FR, On Metal Legs** | 19x17 | 86.30 | 90.10 | 93.80 | 95 |
| | 24x18 | 94.90 | 99.80 | 104.60 | 115 |
| **1-455-FRS, On Metal Legs** | 19x17 | 87.00 | 90.80 | 94.60 | 95 |
| | 24x18 | 95.70 | 100.60 | 105.30 | 115 |
| **1-455-ER, Wall Hung** | 19x17 | 71.20 | 75.00 | 78.70 | 90 |
| | 24x18 | 79.80 | 84.70 | 89.50 | 110 |
| **1-455-ERS, Wall Hung** | 19x17 | 71.90 | 75.70 | 79.40 | 90 |
| | 24x18 | 80.50 | 85.40 | 90.20 | 110 |
| **1-455-FR, Wall Hung** | 19x17 | 69.70 | 73.50 | 77.20 | 90 |
| | 24x18 | 78.30 | 83.20 | 88.00 | 110 |
| **1-455-FRS, Wall Hung** | 19x17 | 70.40 | 74.20 | 78.00 | 90 |
| | 24x18 | 79.10 | 84.00 | 88.70 | 110 |

| | | |
|---|---|---|
| **8-304** flexible supplies | Per Pair | **$9.40** |
| **8-698 Crestmont** towel bars | Per Pair | **11.60** |
| **8-714 Crestmont** legs | Per Pair | **16.60** |
| **20-19** ¼" male tailpieces | Per Pair | **.38** |
| For aerator on spout | Add | **1.60** |

*For other supply pipes and traps, refer to Section 8*

# RHODILE AND CAROLINA PORCELAIN ENAMELED CAST IRON LAVATORIES

With 6" High Back



1-495-V, On Metal Legs
Size: 20x18"

Lavatory: **Rhodile** porcelain enameled cast iron lavatory with back, rectangular basin and soap depression.

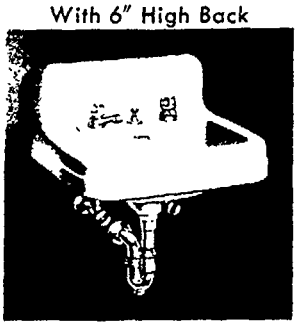
Supports: 8-714 **Crestmont** round metal legs and concealed wall hanger.

"V" Trim 8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***



1-495-M, Wall Hung
Size: 20x18"

Lavatory: **Rhodile** porcelain enameled cast iron lavatory with back, rectangular basin and soap depression.

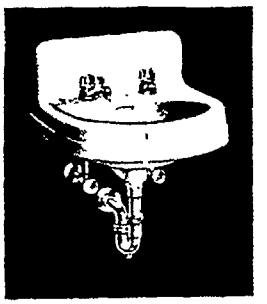
Support: Concealed wall hanger.

"M" Trim: 8-31 **Vantage** *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

**Overall Dimensions**
Size...20x18" Basin...15½x10"
Height, floor to top of rim.....31"



1-531-P, Wall Hung
Size: 19x17"

Lavatory: **Carolina** porcelain enameled cast iron lavatory with back, oval basin and soap depression.

Support: Concealed wall hanger.

"P" Trim: 8-31 **Vantage** *Dial-ese* faucets with coupling nuts, less 1¼" tailpieces; 8-350 1¼" P.O. plug; and chainstay with chain and rubber stopper.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

**Overall Dimensions**
Size...19x17" Basin...15¼x9¾"
Height, floor to top of rim.....31"

## PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | White Regular | White A. R. | Color A. R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| Rhodile, Ware Only | 20x18 | $34.50 | $38.80 | $43.10 | 82 |
| **On Metal Legs** | | | | | |
| 1-495-D | 20x18 | 91.80 | 96.10 | 100.40 | 100 |
| 1-495-M | 20x18 | 95.62 | 99.92 | 104.22 | 95 |
| 1-495-P | 20x18 | 90.62 | 94.92 | 99.22 | 100 |
| 1-495-S | 20x18 | 103.10 | 107.40 | 111.70 | 100 |
| 1-495-V | 20x18 | 96.50 | 100.80 | 105.10 | 95 |
| **Wall Hung** | | | | | |
| 1-495-D | 20x18 | 63.60 | 67.90 | 72.20 | 93 |
| 1-495-M | 20x18 | 67.42 | 71.72 | 76.02 | 93 |
| 1-495-P | 20x18 | 62.42 | 66.72 | 71.02 | 93 |
| 1-495-S | 20x18 | 74.90 | 79.20 | 83.50 | 93 |
| 1-495-V | 20x18 | 68.30 | 72.60 | 76.90 | 88 |
| Carolina Ware Only | 19x17 | 31.30 | 35.20 | 39.10 | 65 |
| 1-531-D | 19x17 | 60.40 | 64.30 | 68.20 | 83 |
| 1-531-M | 19x17 | 64.22 | 68.12 | 72.02 | 78 |
| 1-531-P | 19x17 | 59.22 | 63.12 | 67.02 | 83 |
| 1-531-S | 19x17 | 71.70 | 75.60 | 79.50 | 83 |
| 1-531-V | 19x17 | 65.10 | 69.00 | 72.90 | 78 |

| | | |
|---|---|---|
| **8-31** or **8-39 Vantage** faucets | Per Pair | $14.12 |
| **8-36 Victor Magiclose** faucets | Per Pair | 18.48 |
| **8-304** flexible supplies | Per Pair | 9.40 |
| **8-324** ¼" male tailpieces | Per Pair | .48 |
| **8-698 Crestmont** towel bars | Per Pair | 11.60 |
| **8-714 Crestmont** legs | Per Pair | 16.60 |
| For aerators (D, S and V trim only) | Add | 2.10 |

All exposed metal trim is chromium plated.

*When ordering, specify if regular or acid-resisting enamel is required.*

### ALTERNATE TRIM FOR RHODILE AND CAROLINA LAVATORIES

When ordering a Rhodile or Carolina lavatory with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

V Trim

8-562 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.
8-562-A, Same except with aerator.

D Trim

8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.
8-569-A, Same except with aerator.

S Trim

8-575 Embassy *Dial-ese* supply and indirect lift waste fitting.
8-575-A, Same except with aerator.

P Trim

*8-31 Vantage *Dial-ese* faucets with four-arm handles; chainstay through back with chain and stopper; 8-350 1¼" P.O. plug.

M Trim

*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-49 indirect lift waste fitting.

*Alternate faucets for "P" and "M" trimmings
8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.



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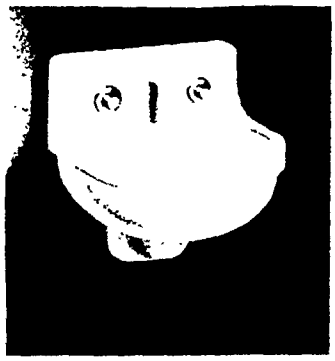
# PARVUS VITREOUS CHINA PRISON LAVATORIES

With 5" High Back—Flat Wall or Corner Types



1-600

### 1-600, Flat Wall Type
Size: 14x13"

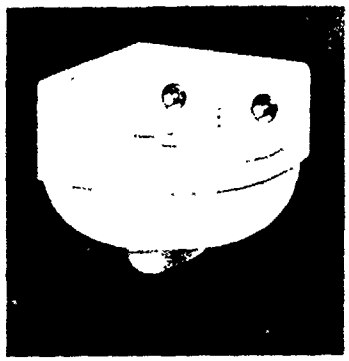
Lavatory: Parvus vitreous china prison lavatory with 5" high back, integral supply channel to spout and drinking nozzle; integral slow draining strainer and integral soap dish; $1\frac{1}{4}$" male outlet connection.

Trim: No. 15699A vandal proof push button hot and cold water supply valves for partitions up to 1" thick.

### 1-601, Flat Wall Type
Size: 14x13"

Same as 1-600 except with No. 15699 vandal proof push button cold water supply valve only for partitions up to 1" thick.

1-601



1-602

### 1-602, Corner Type
Size: 14x14"

Lavatory: Parvus vitreous china corner prison lavatory with 5" high back, integral supply channel to spout and drinking nozzle; integral slow draining strainer and integral soap dish; $1\frac{1}{4}$" male outlet connection.

Trim: No. 15699A vandal proof push button hot and cold water supply valves for partitions up to 1" thick.

### 1-603, Corner Type (not illustrated)
Size: 14x14"

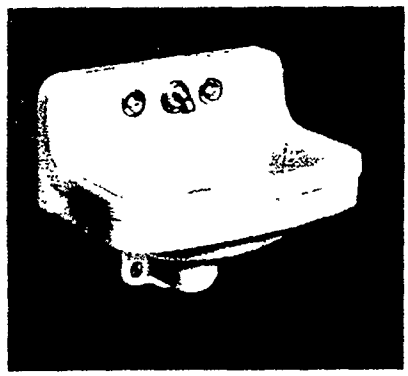
Same as 1-602 except with No. 15699 vandal proof push button cold water supply valve only for partitions up to 1" thick.

*PARVUS lavatories can also be furnished with vandal proof metal spout and drinking nozzle.*

No. 15699 vandal proof push button supply valve for prison lavatories having integral channel to spout and drinking nozzle, for partitions up to 1" thick. Long shank valves can be furnished for partitions of greater thickness.

# FOLSOM VITREOUS CHINA PRISON LAVATORIES

With 6" High Back—Flat Wall Type



1-610

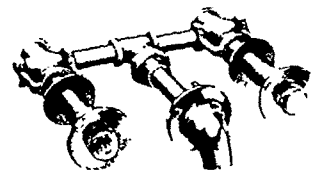
### 1-610, Flat Wall Type
Size: 20x15"

Lavatory: Folsom vitreous china prison lavatory with 6" high back, integral slow draining strainer and $1\frac{1}{4}$" male outlet connection; and supporting bolts.

Trim: No. 15686 vandal proof push button combination hot and cold water supply fitting with metal spout for partitions up to 1" thick.

### 1-611, Flat Wall Type (not illustrated)
Size: 20x15"

Same as 1-610 except with No. 15686A vandal proof push button cold water supply valve only and metal spout for partitions up to 1" thick.



No. 15686 vandal proof push button combination hot and cold water supply fitting with metal spout for partitions up to 1" thick. Long shank valves and nipple to spout with union connection can be furnished for partitions of greater thickness.

**IMPORTANT**

*PARVUS and FOLSOM lavatories do not have an integral trap. Provision must be made for installation of trap behind wall.*

*Wall thickness must be specified when ordering the PARVUS and FOLSOM lavatories. Supply trim is regularly furnished for walls up to 1" thick. Prices of trim for walls of greater thickness is on application.*

All exposed metal trim is chromium plated.

*Above lavatories can be furnished with $1\frac{1}{2}$" male outlet connection when specified, at no extra cost.*

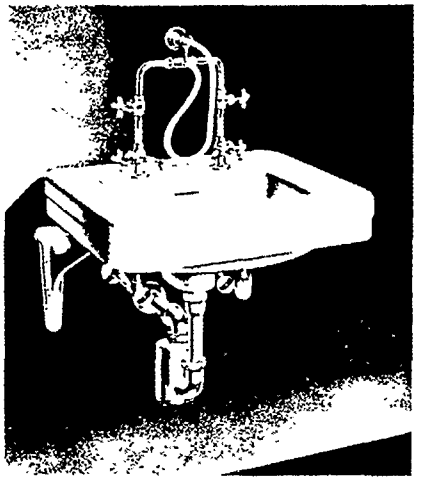
Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

PRICES COMPLETE

| Number | Size | White | Shpg. Wt |
|---|---|---|---|
| **1-600 or 1-601 Ware Only** | 14x13" | **$47.90** | 50 lbs. |
| **1-600** | 14x13" | **71.52** | 55 |
| **1-601** | 14x13" | **60.00** | 53 |
| **1-602 or 1-603 Ware Only** | 14x14" | **57.10** | 55 |
| **1-602** | 14x14" | **79.72** | 60 |
| **1-603** | 14x14" | **69.20** | 58 |
| **1-610 or 1-611 Ware Only** | 20x15" | **55.90** | 62 |
| **1-610** | 20x15" | **87.56** | 70 |
| **1-611** | 20x15" | **79.88** | 65 |

*Supply pipes and traps are not included in the above prices.*

# NORWICH VITREOUS CHINA BARBER LAVATORY



1-640, On Wall Brackets
Size: 24x21"

Lavatory: Norwich vitreous china barber lavatory with rectangular basin, splash lip and soap depression.

Support: 8-763 white enameled cast iron brackets.

Trim: 8-246 lavatory supply and shampoo fitting with by-pass pattern faucets, control valves, 2½" spray with rubber hose and hook.

Waste: 8-353 1½" P.O. plug with perforated open strainer.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

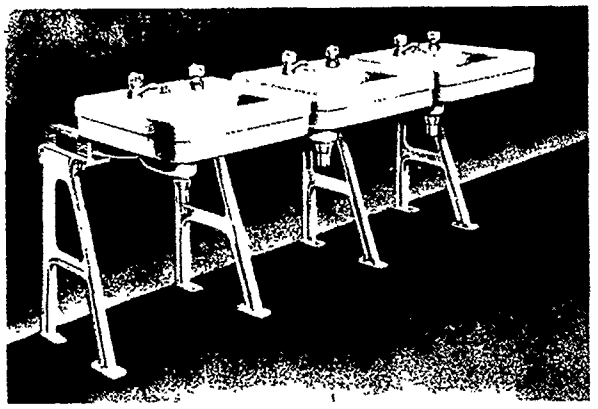
Trap: H-21½ Josam 1½" cast brass hair intercepting "P" trap with screwed watertight cover and removable perforated cylindrical screen; waste pipe to wall with escutcheon.

PRICES COMPLETE

| Number | Size | White | Color | Shpg.Wt. |
|---|---|---|---|---|
| 1-640 | 24x21" | $203.56 | $228.26 | 95 lbs. |

If less 8-304 Supplies, deduct Per Pair $9.40

# NORWICH VITREOUS CHINA LAVATORIES IN BATTERIES



1-150-P, On Single Battery Frame
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

Support: Painted cast iron single battery supporting frame.

"P" Trim: 8-36 Victor *Magiclose* self-closing faucets with coupling nuts, less ¼" tailpieces; 8-655 chainstay with chain and stopper; 8-350 1¼" P. O. plug.

*Note: Supply pipes and traps are not included.*

PRICES, less supply pipes and traps

SINGLE BATTERIES WITH SUPPORTING FRAME

| Catalog Number | Size Inches | Number in Battery | Prices, Complete | Prices, Less Trim | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 1-150-P | 20x18 | 2 | $179.58 | $132.30 | 150 |
| | | 3 | 264.12 | 193.20 | 250 |
| | | 4 | 348.66 | 254.10 | 350 |
| 1-150-P | 24x21 | 2 | 217.38 | 170.10 | 175 |
| | | 3 | 320.82 | 249.90 | 300 |
| | | 4 | 424.26 | 329.70 | 425 |

8-324 ¼" male tailpieces Per Pair $.48

Dimensions

Size.....20x18" Basin.....14x11"
24x21" 16x11"
Height, floor to top of rim.....31"

All exposed metal trim is chromium plated.

Norwich lavatories, in single batteries, can be furnished in one, two or as many sections as specified—prices are on application.

*For supply pipes and traps, refer to Section 8.*



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# NEUVOGUE PORCELAIN ENAMELED CAST IRON RECEPTOR BATHS

With Integral Corner Seat

With Criterion Deviator Trim
2-50-LC, Left Hand Outlet 2-50-RC, Right Hand Outlet
Size: 4'0"

Bath: **Neuvogue** acid-resisting porcelain enameled cast iron recess receptor bath with integral corner seat.

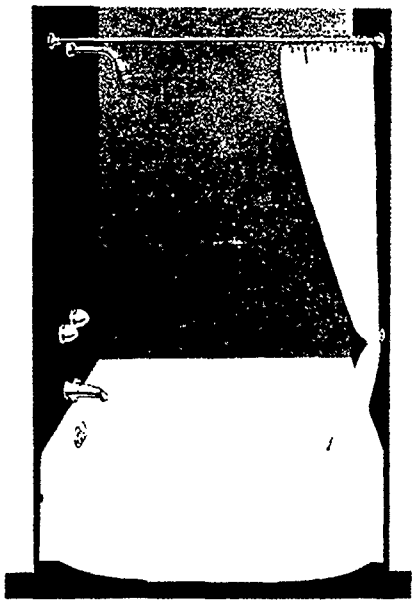
"C" Trim: 2-310 **Criterion** ***Dial-ese*** Deviator overrim supply and shower fitting with clear Lucite handles, 4" diameter ball joint head, and ½" female union inlets.

Waste: 9-66 **Criterion Accesso** 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*
All exposed metal trim is brush finish chromium plated.



With Temple Deviator Trim
2-50-LD, Left Hand Outlet 2-50-RD, Right Hand Outlet
Size: 4'0"

Bath: **Neuvogue** acid-resisting porcelain enameled cast iron recess receptor bath with integral corner seat.

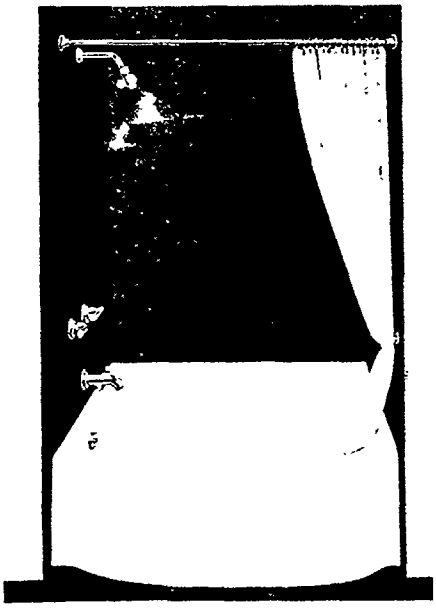
"D" Trim: 2-322 **Temple** ***Dial-ese*** Deviator overrim supply and shower fitting with **Temple** ball joint head, three-rib handles, and ½" female union inlets. (Specify 2-324 for **Temple** trim with hooded lever handles.)

Waste: 9-60 **Temple Accesso** 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*
All exposed metal trim is polished finish chromium plated.



2-50-LE

With Regal Deviator Trim
2-50-LE, Left Hand Outlet 2-50-RE, Right Hand Outlet
Size: 4'0"

Bath: **Neuvogue** acid-resisting porcelain enameled cast iron recess receptor bath with integral corner seat.

"E" Trim: 2-305 **Regal** ***Dial-ese*** Deviator overrim supply and shower fitting with **Rainbeau** ball joint head, and ½" female union inlets.

Waste: 9-55 **Crestmont** 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*
*All exposed metal trim is polished finish chromium plated.*

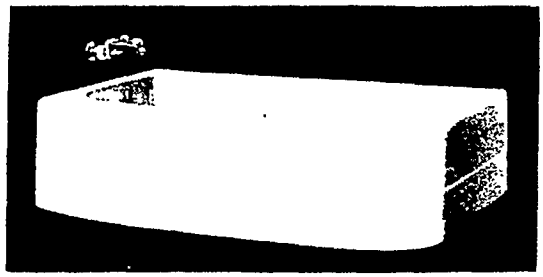
*Overall Dimensions*
Length.....48"
Height.....16"
Width, at center.....46"
Width, at ends.....41"
Rims tile in 1"

PRICES COMPLETE, less curtains

| Catalog Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|
| **2-50 Neuvogue, Bath Only** | 4'0" | **$294.10** | **$326.80** | 445 lbs. |
| **2-50-LC or 2-50-RC** | 4'0" | **461.52** | **494.22** | 475 lbs. |
| **2-50-LD or 2-50-RD** | 4'0" | **388.66** | **421.36** | 470 lbs. |
| **2-50-LE or 2-50-RE** | 4'0" | **354.76** | **387.46** | 465 lbs. |

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*
Temple trim with three-rib or hooded lever handles, same price.

# CRITERION PORCELAIN ENAMELED CAST IRON CORNER BATHS



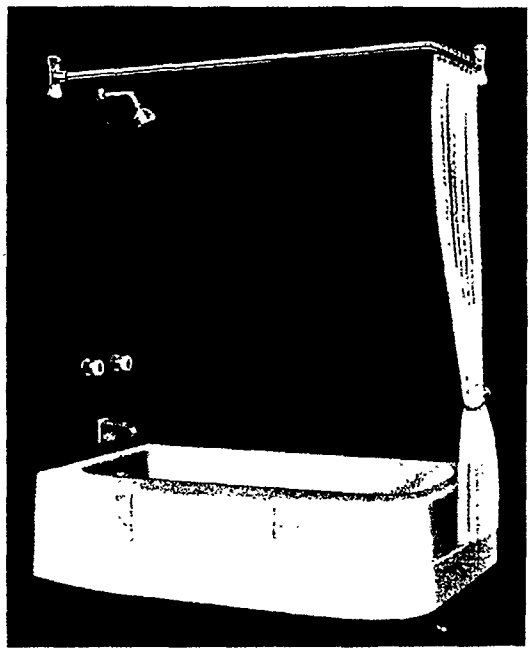
With Criterion Overrim Trim
2-60-LJ, Left Hand Corner 2-60-RJ, Right Hand Corner
Size: 5'0"

Bath: Criterion porcelain enameled cast iron corner bath.

"J" Trim: 9-15 Criterion *Dial-ese* overrim supply fitting with clear Lucite handles; ½" female union inlets.

Waste: 9-66 Criterion Accesso 1½" pop-up waste and overflow.

All exposed metal trim is brush finish chromium plated.



With Criterion Deviator Trim
2-60-LC, Left Hand Corner 2-60-RC, Right Hand Corner
Size: 5'0"

Bath: Criterion porcelain enameled cast iron corner bath.

"C" Trim: 2-310 Criterion *Dial-ese* Deviator overrim supply and shower fitting with clear Lucite handles, 4" diameter ball joint head, and ½" female union inlets.

Waste: 9-66 Criterion Accesso 1½" pop-up waste and overflow.

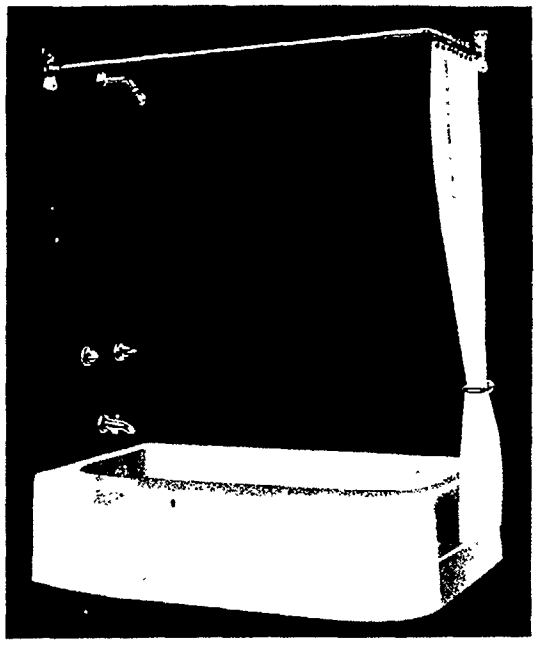
Rod: 4-113 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

All exposed metal trim is brush finish chromium plated.

Overall Dimensions
Length....61" Width, at center..32½"
Height....16" Width, at end. ..30"
Rims at back and end tile in 1"



With Regal Deviator Trim
2-60-LE, Left Hand Corner 2-60-RE, Right Hand Corner
Size: 5'0"

Bath: Criterion porcelain enameled cast iron corner bath.

"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head, and ½" female union inlets.

Waste: 9-55 Crestmont 1½" pop-up waste and overflow.

Rod: 4-113 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

All exposed metal trim is polished chromium plated.

With Regal Overrim Trim
2-60-LL, Left Hand Corner 2-60-RL, Right Hand Corner

Same as above except with 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets, less shower, curtain rod and hold back hook.

PRICES COMPLETE, less curtains

| Catalog Number | Size Ft. | White Regular | White A.R. | Color A.R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 2-60 Criterion Bath Only | 5 | $167.40 | $188.30 | $209.30 | 430 |
| 2-60-LC or 2-60-RC | 5 | 347.50 | 368.40 | 389.40 | 460 |
| 2-60-LE or 2-60-RE | 5 | 235.42 | 256.32 | 277.32 | 455 |
| 2-60-LJ or 2-60-RJ | 5 | 288.70 | 309.60 | 330.60 | 450 |
| 2-60-LL or 2-60-RL | 5 | 209.10 | 230.00 | 251.00 | 445 |

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*

*When ordering, specify if regular or acid-resisting enamel is required.*



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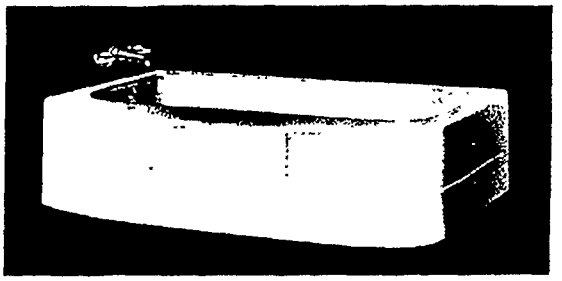
# CRITERION PORCELAIN ENAMELED CAST IRON BATHS



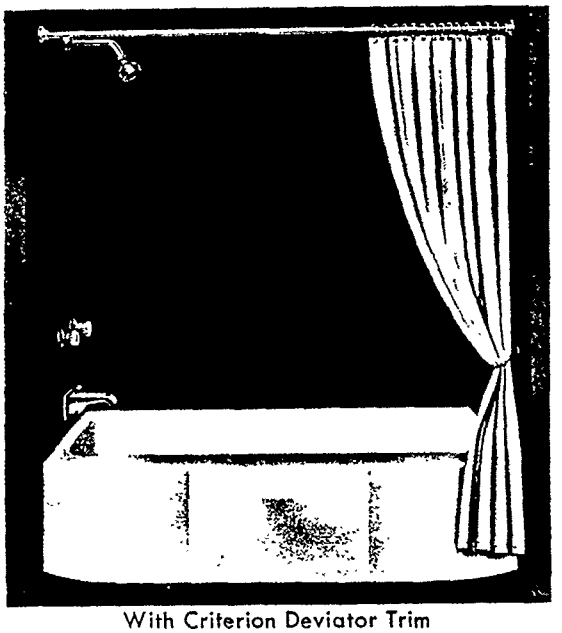
With Temple Overrim Trim
2-60-LK, Left Hand Corner 2-60-RK, Right Hand Corner
Size: 5′0″

Bath: Criterion porcelain enameled cast iron corner bath.

"K" Trim: 9-22 Temple *Dial-ese* overrim supply fitting with hooded lever handles and ½″ female union inlets. (Specify 9-20 for Temple trim with three-rib handles.)

Waste: 9-60 Temple Accesso 1½″ pop-up waste and overflow.

*All exposed metal trim is polished chromium plated.*



With Criterion Deviator Trim
2-80-LC, Left Hand Outlet 2-80-RC, Right Hand Outlet
Sizes: 5′0″ and 5′6″

Bath: Criterion porcelain enameled cast iron recess bath.

"C" Trim: 2-310 Criterion *Dial-ese* Deviator overrim supply and shower fitting with clear Lucite handles, 4″ diameter ball joint head, and ½″ female union inlets.

Waste: 9-66 Criterion Accesso 1½″ pop-up waste and overflow.

Rod: 4-103 1″ O.D. curtain rod with flanges.

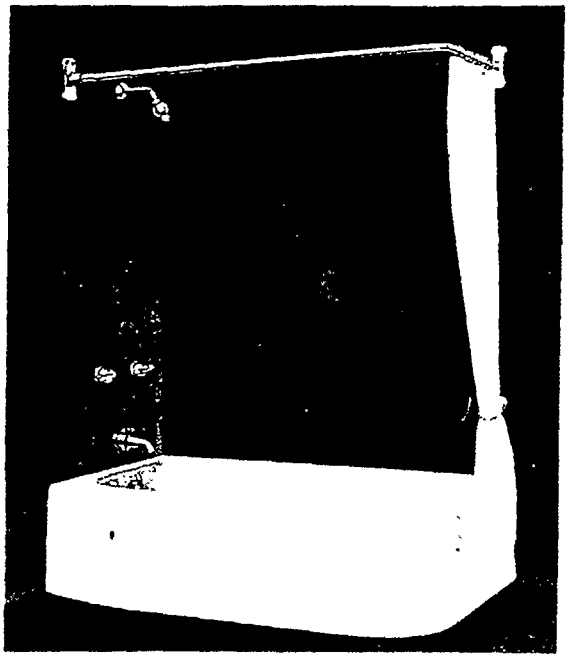
Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

*All exposed metal trim is brush finish chromium plated.*

With Criterion Overrim Trim
2-80-LJ, Left Hand Outlet 2-80-RJ, Right Hand Outlet

Same as above except with 9-15 Criterion *Dial-ese* overrim supply fitting, less shower, curtain rod and hold back.



With Temple Deviator Trim
2-60-LD, Left Hand Corner 2-60-RD, Right Hand Corner
Size: 5′0″

Bath: Criterion porcelain enameled cast iron corner bath.

"D" Trim: 2-324 Temple *Dial-ese* Deviator overrim supply and shower fitting with Temple ball joint head, hooded lever handles, and ½″ female union inlets. (Specify 2-322 for Temple trim with three-rib handles.)

Waste: 9-60 Temple Accesso 1½″ pop-up waste and overflow.

Rod: 4-113 1″ O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

*All exposed metal trim is polished chromium plated.*

Temple Trim with three rib or hooded lever handles, same price.

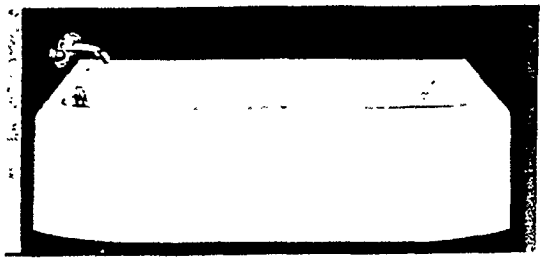
| Dimensions | Corner | Recess |
|---|---|---|
| Length | 61″ | 60″ or 66″ |
| Height | 16″ | 16″ |
| Width, at center | 32½″ | 32½″ |
| Width, at ends | 30″ | 30″ |
| Rims tile in | 1″ | 1″ |

PRICES COMPLETE, less curtains

| Catalog Number | Size Ft. | White Regular | White A.R. | Color A.R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 2-60 Criterion Corner Bath Only | 5 | $167.40 | $188.30 | $209.30 | 430 |
| 2-60-LD or 2-60-RD | 5 | 269.32 | 290.22 | 311.22 | 455 |
| 2-60-LK or 2-60-RK | 5 | 236.40 | 257.30 | 278.30 | 450 |
| 2-80 Criterion Recess Bath Only | 5 | 151.10 | 170.00 | 188.90 | 370 |
| | 5½ | 171.20 | 192.60 | 214.00 | 430 |
| 2-80-LC or 2-80-RC | 5 | 318.52 | 337.42 | 356.32 | 400 |
| | 5½ | 339.50 | 360.90 | 382.30 | 460 |
| 2-80-LJ or 2-80-RJ | 5 | 272.40 | 291.30 | 310.20 | 390 |
| | 5½ | 292.50 | 313.90 | 335.30 | 450 |

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*

# CRITERION PORCELAIN ENAMELED CAST IRON RECESS BATHS



With Temple Overrim Trim

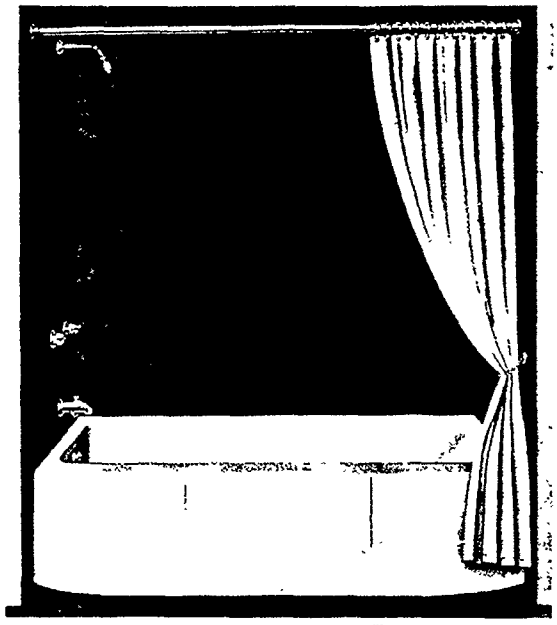
2-80-LK, Left Hand Outlet 2-80-RK, Right Hand Outlet

Sizes 5'0" and 5'6"

Bath: Criterion porcelain enameled cast iron recess bath.

"K" Trim: 9-20 Temple *Dial-ese* overrim supply fitting with three-rib handles and ½" female union inlets. (Specify 9-22 for Temple trim with hooded lever handles.)

Waste: 9-60 Temple Accesso 1½" pop-up waste and overflow.



With Regal Deviator Trim

2-80-LE, Left Hand Outlet 2-80-RE, Right Hand Outlet

Sizes: 5'0" and 5'6"

Bath: Criterion porcelain enameled cast iron recess bath.

"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head, and ½" female union inlets.

Waste: 9-55 Crestmont 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

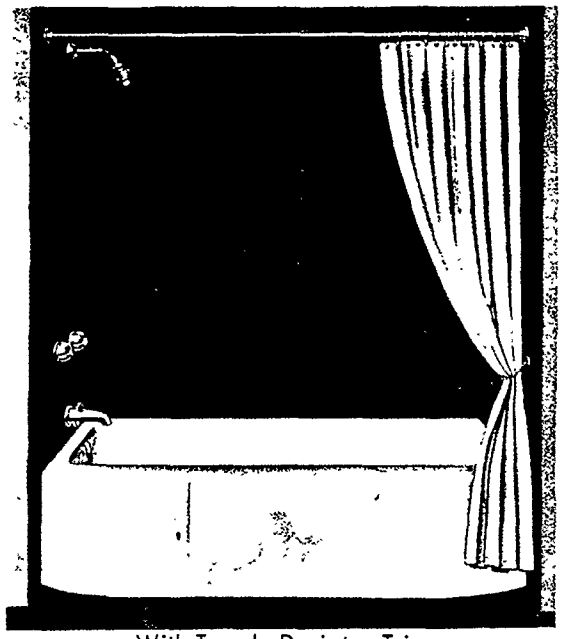
Hold Back: 4-141 hold back hook with chain and ring.

*Note. Shower curtain and snap hooks are not included.*

With Regal Overrim Trim

2-80-LL, Left Hand Outlet 2-80-RL, Right Hand Outlet

Same as above except with 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets, less shower, curtain rod and hold back hook.



With Temple Deviator Trim

2-80-LD, Left Hand Outlet 2-80-RD, Right Hand Outlet

Sizes: 5'0" and 5'6"

Bath: Criterion porcelain enameled cast iron recess bath.

"D" Trim: 2-322 Temple *Dial-ese* Deviator overrim supply and shower fitting with Temple ball joint head, three-rib handles, and ½" female union inlets. (Specify 2-324 for Temple trim with hooded lever handles.)

Waste: 9-60 Temple Accesso 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

Overall Dimensions

Length. . . . . 60" or 66" Width, at center... 32½"

Height. . . . . 16" Width, at ends... 30"

Rims tile in 1"

PRICES COMPLETE, less curtains

| Catalog Number | Size Ft. | White Regular | White A.R. | Color A.R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 2-80 Criterion Bath Only | 5 | $151.10 | $170.00 | $188.90 | 370 |
| | 5½ | 171.20 | 192.60 | 214.00 | 430 |
| 2-80-LD or 2-80-RD | 5 | 245.66 | 264.56 | 283.46 | 395 |
| | 5½ | 266.06 | 287.46 | 308.86 | 455 |
| 2-80-LE or 2-80-RE | 5 | 211.76 | 230.66 | 249.56 | 390 |
| | 5½ | 232.16 | 253.56 | 274.96 | 450 |
| 2-80-LK or 2-80-RK | 5 | 220.10 | 239.00 | 257.90 | 390 |
| | 5½ | 240.20 | 261.60 | 283.00 | 450 |
| 2-80-LL or 2-80-RL | 5 | 192.80 | 211.70 | 230.60 | 385 |
| | 5½ | 212.90 | 234.30 | 255.70 | 445 |

*When ordering, specify if regular or acid resisting enamel is required.*

*Temple Trim with three rib or hooded lever handles, same prices.*

All exposed metal trim is chromium plated.

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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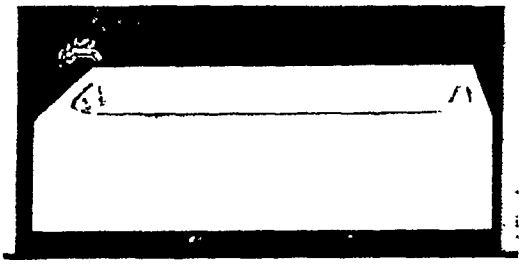
## NEUDAY PORCELAIN ENAMELED CAST IRON RECESS BATHS



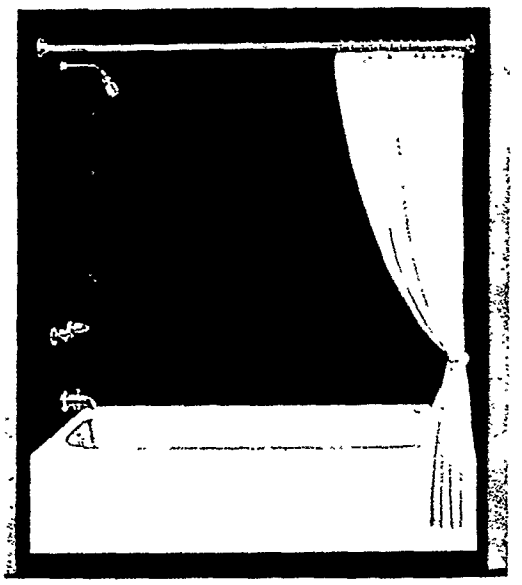
With Regal Overrim Trim
2-90-LL, Left Hand Outlet 2-90-RL, Right Hand Outlet
*Sizes: 4'6" and 5'0"

Bath: Neuday porcelain enameled cast iron recess bath.

"L" Trim: 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets.

Waste: 9-51 Crestmont 1½" connected waste and overflow with chain and stopper.

*4'6" size does not have slope at head end.



With Regal Deviator Trim
2-90-LE, Left Hand Outlet 2-90-RE, Right Hand Outlet
*Sizes: 4'6" and 5'0"

Bath: Neuday porcelain enameled cast iron recess bath.

"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head, and ½" female union inlets.

Waste: 9-56 Crestmont 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

**4'6" size does not have slope at head end.*

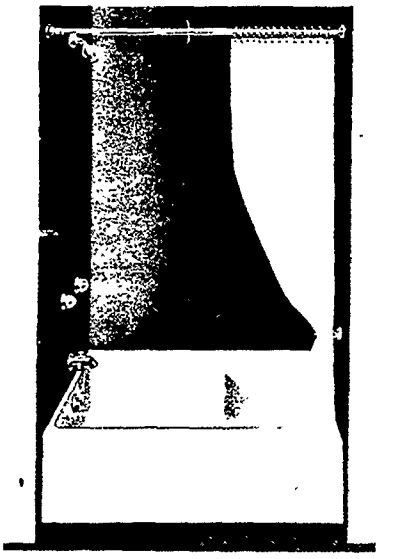
*When ordering, specify if regular or acid resisting enamel is required.*

*Overall Dimensions*
Length.....54" or 60" Width.....30½"
Height.. .....14" Rims tile in..... 1"

All exposed metal trim is chromium plated.

## LAHOMA DURACLAY RECEPTOR BATH

With Integral Seat—Earthenware, Vitreous Glazed



With Temple Deviator Trim
2-130-LD, Left Hand Outlet 2-130-RD, Right Hand Outlet
Size 42x31"

Bath: Lahoma Duraclay, earthenware vitreous glazed, recess receptor bath with integral corner seat.

"D" Trim: 2-326 Temple *Dial-ese* Deviator overrim supply and shower fitting with 3½" long spout, Temple ball joint head, three-rib handles and ½" female union inlets. (Specify 2-328 for Temple trim with hooded lever handles.

Waste: 9-58 Crestmont 1½" pop-up waste and overflow.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

With Regal Deviator Trim
2-130-LE, Left Hand Outlet 2-130-RE, Right Hand Outlet

Same as above except with 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball-joint head, and ½" female union inlets.

*Overall Dimensions*
Length..42" Width .....31"
Height..12" Rims tile in.. 1"

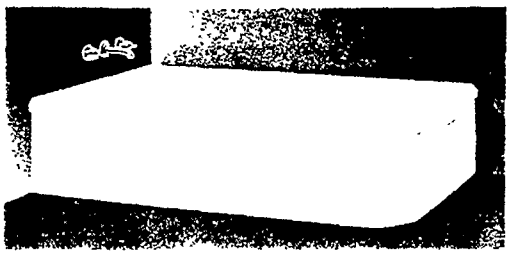
Temple trim with three-rib or hooded lever handles, same price.

PRICES COMPLETE, less curtains

| Catalog Number | Size Ft. | White Regular | White A.R. | Color A.R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 2-90 Neuday Bath Only | 4½ | $139.90 | $157.40 | $174.90 | 325 |
| | 5 | 125.00 | 132.50 | 140.70 | 350 |
| 2-90-LE or 2-90-RE | 4½ | 200.56 | 218.06 | 235.56 | 345 |
| | 5 | 185.96 | 193.46 | 201.66 | 370 |
| 2-90-LL or 2-90-RL | 4½ | 176.50 | 194.00 | 211.50 | 340 |
| | 5 | 161.60 | 169.10 | 177.30 | 365 |
| 2-130 Lahoma Bath Only | 3½ | — | 164.40 | 246.60 | 270 |
| 2-130-LD or 2-130-RD | 3½ | — | 248.36 | 330.56 | 295 |
| 2-130-LE or 2-130-RE | 3½ | — | 224.46 | 306.66 | 290 |

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*

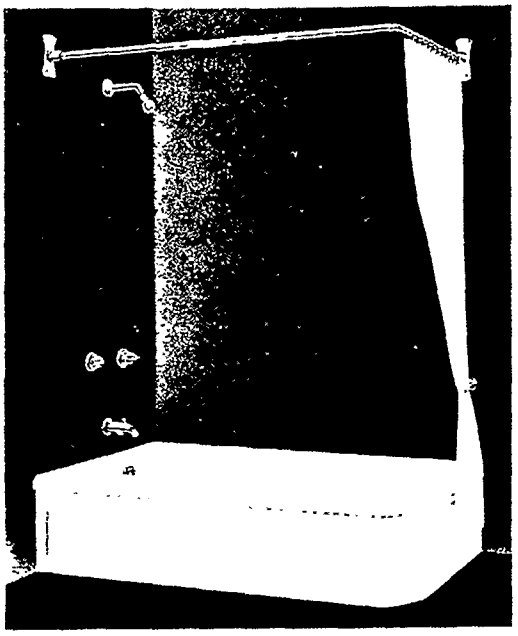
# ALLIANCEWARE PORCELAIN ENAMELED FORMED METAL BATHS



With Regal Overrim Trim

2-155-LL, Left Hand Corner 2-155-RL, Right Hand Corner
Size 5'0"

Bath: Albecor acid-resisting porcelain enameled 14-gauge formed metal corner bath.
"L" Trim: 9-35 Regal *Dial-ese* overrim supply fitting with 1½" female union inlets.
Waste: 9-51 Crestmont 1½" connected waste and overflow with chain and stopper.



With Regal Deviator Trim

2-155-LE, Left Hand Corner 2-155-RE, Right Hand Corner
Size 5'0"

Bath: Albecor acid-resisting porcelain enameled 14-gauge formed metal corner bath.
"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head and ½" female union inlets.
Waste: 9-56 Crestmont 1½" pop-up waste and overflow.
Rod: 4-113 1" O.D. curtain rod with flanges.
Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

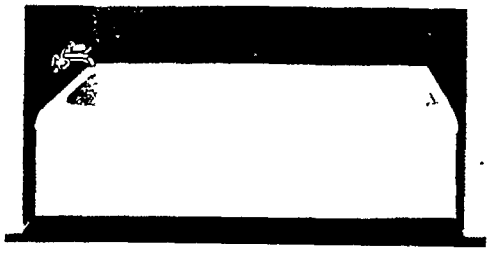
*Overall Dimensions*

| | | | |
|---|---|---|---|
| Length | 60" | Width | 31⅛" |
| Height | 15" | Rims tile in | 1" |

Formed metal baths are available in the following Crane colors:
Pale Jade, French Gray, Sky Blue, Shell Pink, Sun Tan

*For curtain rods and curtains, refer to Section 4; for other bath trim, refer to Section 9.*

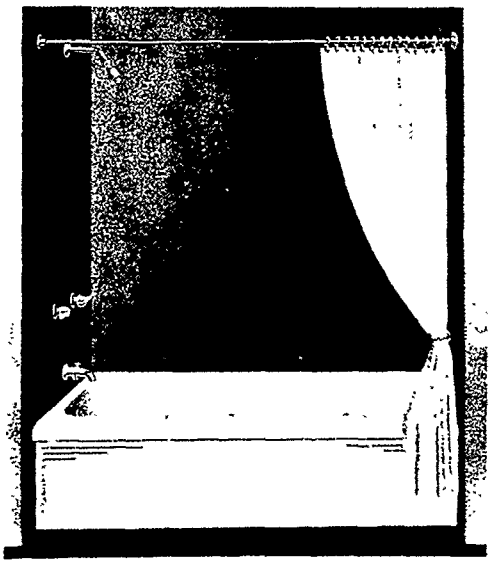
All exposed metal trim is chromium plated.



With Regal Overrim Trim

2-160-LL, Left Hand Outlet 2-160-RL, Right Hand Outlet
Size: 5'0"

Bath: Champion acid-resisting porcelain enameled 14-gauge formed metal recess bath.
"L" Trim: 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets.
Waste: 9-51 Crestmont 1½" connected waste and overflow with chain and stopper.



With Regal Deviator Trim

2-160-LE, Left Hand Outlet 2-160-RE, Right Hand Outlet
Size: 5'0"

Bath: Champion acid-resisting porcelain enameled 14-gauge formed metal recess bath.
"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head and ½" female union inlets.
Waste: 9-56 Crestmont 1½" pop-up waste and overflow.
Rod: 4-103 1" O.D. curtain rod with flanges.
Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

PRICES COMPLETE, less curtains

| Catalog Number | Size | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 2-155 Albecor, Bath Only | 5'0" | $130.40 | $143.40 | 145 |
| 2-155-LE or 2-155-RE | 5'0" | 198.42 | 211.42 | 165 |
| 2-155-LL or 2-155-RL | 5'0" | 167.00 | 180.00 | 160 |
| 2-160 Champion, Bath Only | 5'0" | 99.10 | 109.00 | 135 |
| 2-160-LE or 2-160-RE | 5'0" | 159.76 | 169.66 | 155 |
| 2-160-LL or 2-160-RL | 5'0" | 135.70 | 145.60 | 140 |

*Prices are subject to change without notice.*



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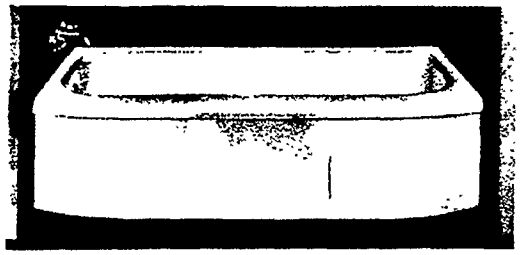
# ALLIANCEWARE PORCELAIN ENAMELED FORMED METAL BATHS

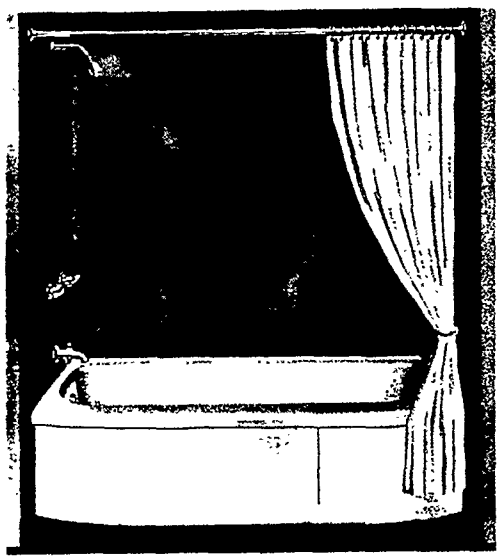


With Regal Overrim Trim
2-180-LL, Left Hand Outlet 2-180-RL, Right Hand Outlet
Size: 5'0"

Bath: Ohio acid-resisting porcelain enameled 12-gauge formed metal recess bath.

"L" Trim: 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets.

Waste: 9-59 Crestmont 1½" pop-up waste and overflow.



With Regal Deviator Trim
2-180-LE, Left Hand Outlet 2-180-RE, Right Hand Outlet
Size: 5'0"

Bath: Ohio acid-resisting porcelain enameled 12-gauge formed metal recess bath.

"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head, and ½" female union inlets.

Waste: 9-59 Crestmont 1½" pop-up waste and overflow.

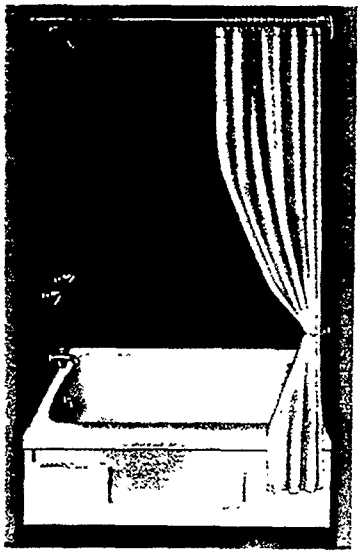
Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

Overall Dimensions—Ohio
Length.....60" Width, at ends ...30⅝"
Height...15½" Width, at center...32½"
Rims tile in 1"

Formed metal baths are available in the following Crane colors:
Pale Jade French Gray Sky Blue
Shell Pink Sun Tan



With Regal Deviator Trim
2-185-LE, Left Hand Outlet 2-185-RE, Right Hand Outlet
Size: 42x30⅝"

Bath: Junior acid-resisting porcelain enameled 14-gauge formed metal recess bath.

"E" Trim: 2-305 Regal *Dial-ese* Deviator overrim supply and shower fitting with Rainbeau ball joint head, and ½" female union inlets.

Waste: B501-B42S Repcal 1½" trip-lever bath waste.

Rod: 4-103 1" O.D. curtain rod with flanges.

Hold Back: 4-141 hold back hook with chain and ring.

*Note: Shower curtain and snap hooks are not included.*

With Regal Overrim Trim (not illustrated)
2-185-LL, Left Hand Outlet 2-185-RL, Right Hand Outlet
Size: 42x30⅝"

Bath: Junior acid-resisting porcelain enameled 14-gauge formed metal recess bath.

"L" Trim: 9-35 Regal *Dial-ese* overrim supply fitting with ½" female union inlets.

Waste: B501-B42S Repcal 1½" trip-lever bath waste.

Overall Dimensions—Junior
Length...42" Width.....30⅝"
Height...12" Rims tile in.....1"

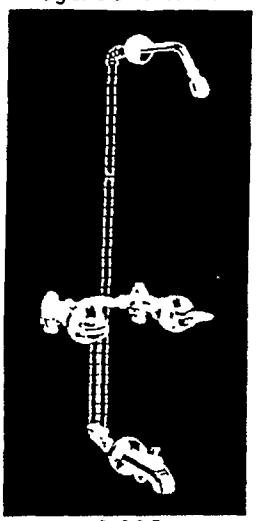
PRICES COMPLETE, less curtains

| Catalog Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|
| 2-180 Ohio, Bath Only | 5'0" | $116.50 | $128.20 | 170 lbs. |
| 2-180-LE or 2-180-RE | 5'0" | 177.16 | 188.86 | 190 lbs. |
| 2-180-LL or 2-180-RL | 5'0" | 158.20 | 169.90 | 185 lbs. |
| 2-185 Junior, Bath Only | 42x30⅝" | 92.50 | 101.70 | 101 lbs. |
| 2-185-LE or 2-185-RE | 42x30⅝" | 148.48 | 157.68 | 121 lbs. |
| 2-185-LL or 2-185-RL | 42x30⅝" | 130.12 | 139.32 | 116 lbs. |

All exposed metal trim is chromium plated.

*For curtain rods and curtains, refer to Section 4.*
*For other bath trim, refer to Section 9.*

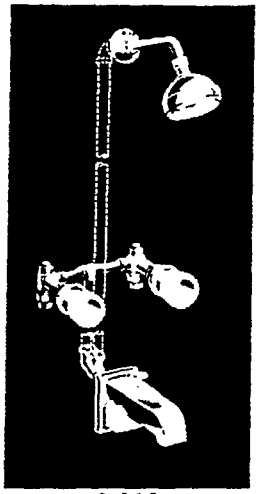
Regal Deviator Trim



2-305

Regal concealed bath and shower fitting with Deviator spout, ½" female union inlet valves on 8" centers with *Dial-ese* controls, Rainbeau ball joint shower head, bent arm and escutcheon.

Criterion Deviator Trim

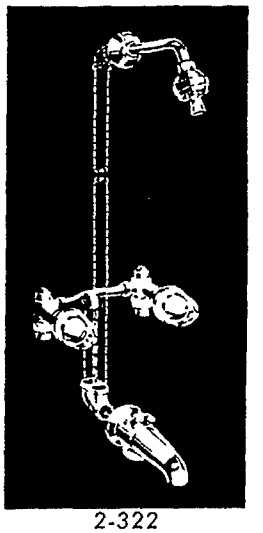


2-310

Criterion concealed bath and shower fitting with Deviator spout, ½" female union inlet valves in 8" centers with *Dial-ese* controls and clear Lucite handles, 4" diameter ball joint head, bent arm and escutcheon.

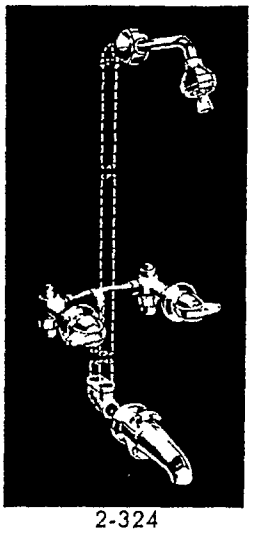
All exposed metal parts are brush finish chromium plated.

Temple Deviator Trim



2-322

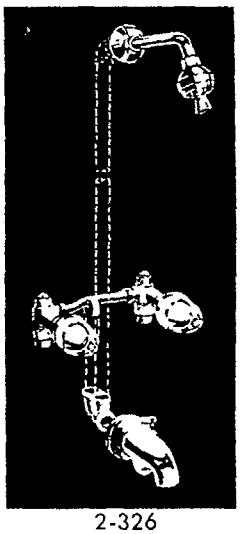
Temple concealed bath and shower fitting with Deviator spout, ½" female union inlet valves on 8" centers with *Dial-ese* controls and three-rib handles, Temple ball joint shower head, bent arm and escutcheon.



2-324

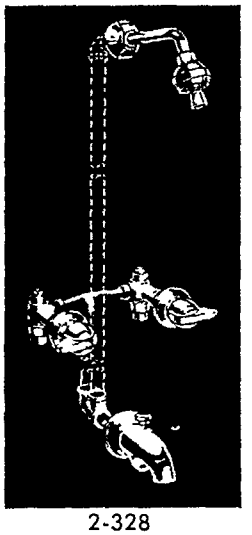
Temple concealed bath and shower fitting with Deviator spout, ½" female union inlet valves on 8" centers with *Dial-ese* controls and hooded lever handles, Temple ball joint shower head, bent arm and escutcheon.

Temple Deviator Trim for Lahoma Baths



2-326

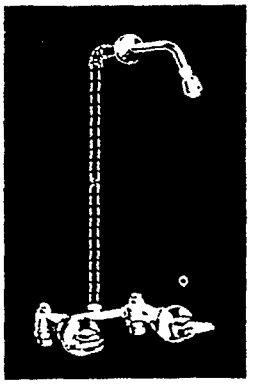
Temple concealed bath and shower fitting with 3½" long Deviator spout, ½" female union inlet valves on 8" centers with *Dial-ese* controls and three-rib handles, Temple ball joint shower head, bent arm and escutcheon.



2-328

Temple concealed bath and shower fitting with 3½" long Deviator spout, ½" female union inlet valves on 8" centers with *Dial-ese* controls and hooded lever handles, Temple ball joint shower head, bent arm and escutcheon.

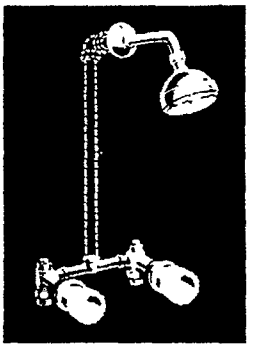
Regal Two-Valve Shower



2-355

Regal concealed two-valve shower, ½" female union inlet valves on 8" centers with *Dial-ese* controls, Rainbeau ball joint shower head, bent arm and escutcheon.

Criterion Two-Valve Shower



2-360

Criterion concealed two-valve shower, ½" female union inlet valves on 8" centers with *Dial-ese* controls and clear Lucite handles, 4" diameter ball joint head, bent arm and escutcheon.

All exposed metal parts are brush finish chromium plated.

PRICE, EACH

| Catalog Number | Price, Each | Shpg. Wt. Pounds | Catalog Number | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 2-305 | $36.80 | 8½ | 2-326 | $60.70 | 12 |
| 2-310 | 107.00 | 12 | 2-328 | 60.70 | 12 |
| 2-322 | 60.70 | 12 | 2-355 | 28.90 | 7 |
| 2-324 | 60.70 | 11 | 2-360 | 75.80 | 10 |

Unless otherwise specified, exposed metal trim is chromium plated.

For shower heads and shower valves, refer to Section 9



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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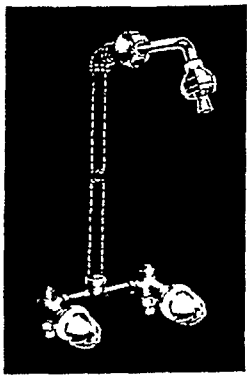
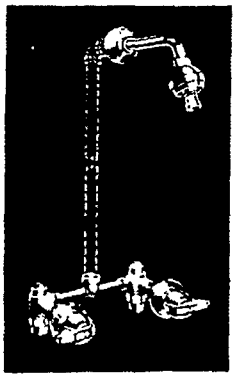
## Temple Two-Valve Showers



2-372

**Temple** concealed two-valve shower, ½" female union inlet valves on 8" centers with *Dial-ese* controls and three-rib handles. **Temple** ball joint shower head, bent arm and escutcheon.



2-374

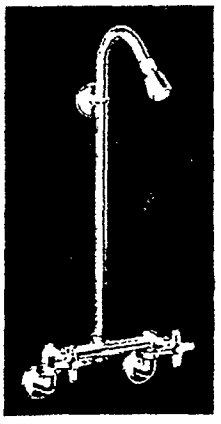
**Temple** concealed two-valve shower, ½" female union inlet valves on 8" centers with *Dial-ese* controls and hooded lever handles, **Temple** ball joint shower head, bent arm and escutcheon.

## Y.M.C.A. Two-Valve Shower

2-382

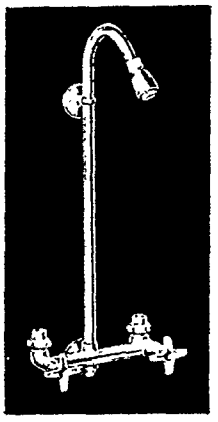
Y.M.C.A. concealed two-valve vandal-proof shower with ½" straight pattern extended shank valves for 5" thick walls, ½" female I.P. inlets and four-arm indexed handles. **Refreshor** shower head with integral volume regulator with screw driver slot and ½" female flanged 60° cast brass elbow.

## Exposed Two-Valve Showers



2-470

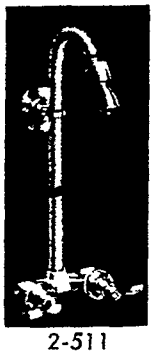
Exposed two valve shower with ½" female union elbow supplies on 8" centers, *Dial-ese* controls with metal cross handles, **Rainbeau** ball joint shower head, gooseneck riser with wall support.



2-471

Exposed two-valve shower with ½" female union inlets on 8" centers for supplies from ceiling, *Dial-ese* controls with metal cross handles, **Rainbeau** ball joint, shower head, gooseneck riser with wall support, and drain plug.

*Note: Yoke and trimmings are reversible for supplies from floor.*



2-511

Exposed two-valve factory shower, rough chromium plated valve body with compression trimmings and lever handles on 3⅜" centers, ½" female end inlets for supplies from floor or ceiling, **Economy** ball joint shower head and galvanized gooseneck riser with wall support.

*End to end of supply inlets, 4½".*

2-512

**Repcal** rough nickel plated exposed two-valve shower with ½" female union inlets on 8" centers for supplies from ceiling, four-arm handles, **Presto** automatically self-cleaning shower head and galvanized gooseneck riser with wall support.

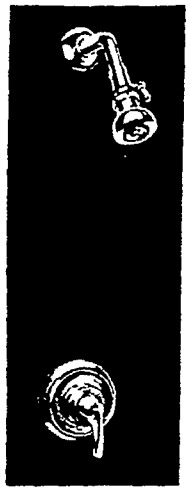
*For shower heads refer to Section 9.*

PRICE, EACH

| Catalog Number | Price, Each | Shpg. Wt. Pounds |
|---|---|---|
| 2-372 | $50.90 | 9 |
| 2-374 | 50.90 | 9 |
| 2-382 | 52.50 | 11¼ |
| 2-470 | 43.40 | 8 |
| 2-471 | 42.30 | 8 |
| 2-511 | 15.10 | 7½ |
| 2-512 | 21.10 | 6 |

**Unless otherwise specified, all exposed metal trim is chromium plated.**

## SYMMONS SAFETYMIX SHOWERS

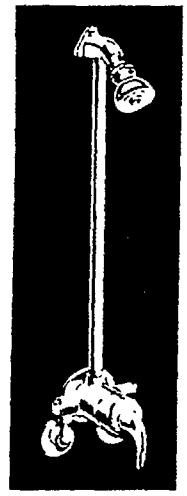


No. 1500

Concealed shower with ½" Safetymix pressure actuated non-scalding valve, shower arm with wall flange and Senior ball joint shower head with external volume control.

No. 1500-10

Same, except with concealed screw driver stops.

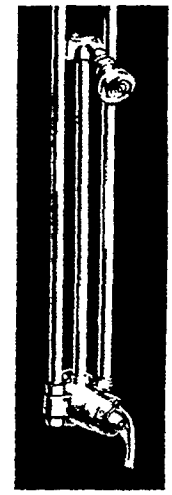


No. C-2510

Exposed shower with ½" Safetymix pressure actuated non-scalding valve with wall flange, radial union elbows, flanged street elbows, 20" riser with head bracket fitting and Senior ball joint shower head with internal volume control.

No. 2510

Same, except less flanged street elbows.



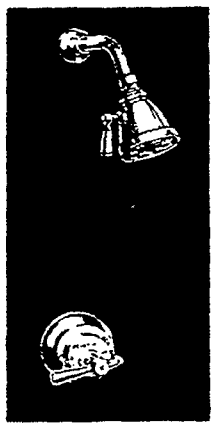
No. E-3510

Exposed shower with ½" Safetymix pressure actuated non-scalding valve with wall flange, integral union stops, 32" supply risers, 20" riser to head with head bracket fitting and Senior ball joint shower head with internal volume control.

No. 3510

Same, except less 32" supply risers.

## SENTINEL BALANCED PRESSURE SHOWERS

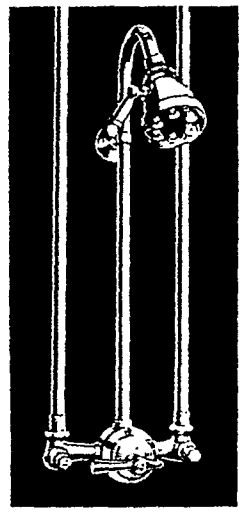


S-1700

Speakman ½" concealed Sentinel balanced pressure shower with metal lever handle, dial and wall plates, bent shower arm, wall flange, ball joint with concealed volume control and Anystream self-cleaning shower head.

S-1705

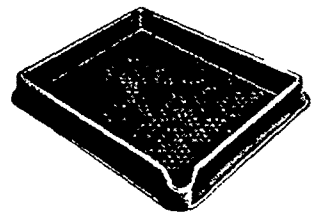
Same, but with screwdriver Hi-Seat controlling valves with metal escutcheons.



S-1720

Speakman ½" exposed Sentinel balanced pressure shower with wall supporting flange and metal lever handle and dial plate, screwdriver corner controlling valves with renewable seats, 36" supplies to ceiling, gooseneck riser with supporting flange, ball joint with concealed volume control and Anystream self-cleaning shower head.

## U. S. RUBBER FOOT BATH TRAY



For use in pools and shower rooms for the prevention of athlete's foot. Will not deteriorate from the use of antiseptic solutions. Corrugated surface prevents slipping. Has spout for easy draining.

| | Sizes | |
|---|---|---|
| P-3855 | 23x23" | 3¼" deep |
| P-3756 | 25½x30½" | 3½" deep |

| Catalog Number | Price, Each | Shpg. Wt. Pounds |
|---|---|---|
| 1500 | $66.44 | 5½ |
| 1500-10 | 80.28 | 6¾ |
| C-2510 | 91.10 | 8¾ |
| 2510 | 84.44 | 8¼ |
| E-3510 | 107.92 | 13¼ |
| 3510 | 89.16 | 8½ |
| S-1700 | 73.50 | 13 |
| S-1705 | 95.14 | 19 |
| S-1720 | 113.40 | 21 |
| P-3855 | 30.94 | 16 |
| P-3756 | 44.00 | 19 |

Exposed metal trim is chromium plated.



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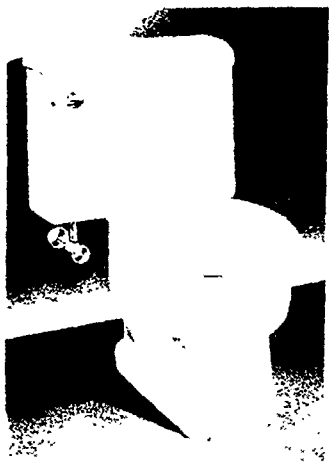
# CRITERION CORRECT POSTURE VITREOUS CHINA CLOSETS

The smart design and distinctive appearance of **Criterion** close-coupled, correct posture closet combinations with a quiet, whirlpool siphon action combine to create attractive units with many desirable features. Foremost among these features is the scientifically designed rim and seat with dip in center, recommended by medical authorities as an aid to natural, healthful posture.

**Criterion** closets are available with a specially designed saddle type seat with flat top overlapping cover, which when lowered completely encases seat and rim, or with a saddle type seat and cover both curved to match the contour of the bowl rims.

A large water surface that reduces fouling space, a deep water seal that prevents the escape of sewer gas, a large trapway to reduce the possibility of stoppage, and the easy to clean vitreous china surfaces are other desirable features.



3-102

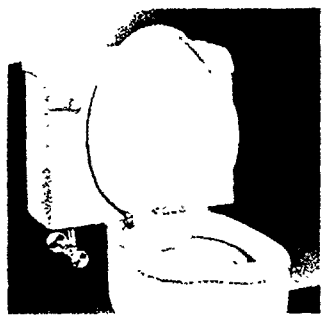
## 3-102 CRITERION
*With Saddle Seat and Flat Top Cover*

Bowl: **Criterion** siphon jet, whirlpool action, elongated rim hygienic correct posture bowl with self-draining jet; china bolt caps.

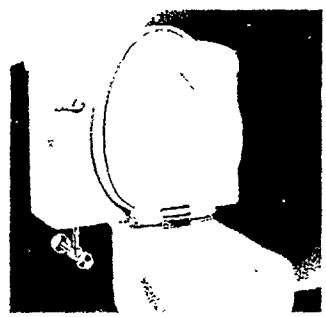
Tank: **Criterion** vitreous china tank and cover with trimmings.

Supply: 9-631 3/8" angle supply pipe with stop.

Seat: Church **Moltex** correct posture seat with flat top telescopic cover.



Cover has been raised to show the contour of rim and seat.



Both seat and cover have been raised showing how seat nests within the cover.

3-103

## 3-103 CRITERION
*With Saddle Seat and Cover*

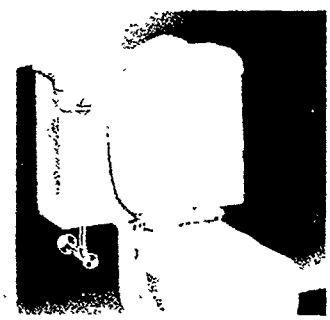
Bowl: **Criterion** siphon jet, whirlpool action, elongated rim hygienic correct posture bowl with self-draining jet; china bolt caps.

Tank: **Criterion** vitreous china tank and cover with trimmings.

Supply: 9-631 3/8" angle supply pipe with stop.

Seat: Church **Moltex** correct posture seat with cover.

Cover has been raised to show the contour of rim and seat.



Both seat and cover have been raised to show how the seat partially nests within the cover.

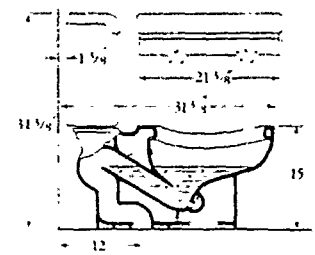
All exposed metal trim is brush finish chromium plated.

Criterion closets can also be furnished with exposed metal parts polished chromium plated when so specified.

*For Criterion baths, refer to Section 2.*

*For Criterion lavatories, refer to Section 1.*

Overall Dimensions 3-102 and 3-103




### PRICES

| Catalog Number | White with White Seat | Colored with Plain Color Seat | Shpg. Wt. Pounds |
|---|---|---|---|
| **3-102** | **$206.44** | **$302.72** | 170 |
| **3-103** | **191.86** | **275.72** | 170 |

If less **9-631** angle supply pipe — **Deduct $10.22**
For anti-siphon float valve — **Add 2.20**



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# DREXEL VITREOUS CHINA CLOSETS

### 3-126 DREXEL

Bowl: Drexel siphon jet, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: Drexel vitreous china tank and cover with trimmings.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-934-W 1¼" extended back closed front white sheet covered seat with cover.

### 3-127 DREXEL

Same as above except with elongated rim bowl and 3-935-W 1¼" white sheet covered seat with cover.

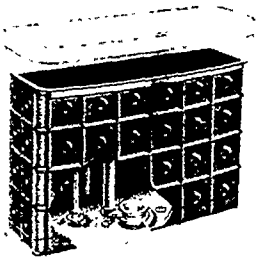
### 3-128 DREXEL
*With Sahara Rubber Lined Insulated Tank*

Bowl: Drexel siphon jet, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: 3-558 Sahara vitreous china tank and cover with trimmings and insulating liner.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-934-W 1¼" extended back closed front white sheet covered seat with cover.

### 3-129 DREXEL

Same, except elongated rim bowl and 3-935-W 1¼" white sheet covered seat with cover.

### 3-558 SAHARA TANK



*With Rubber Insulating Liner*

The insulating liner consists of 5/16" thick rubber composition securely cemented to the inside surfaces of the tank. It serves a two-fold purpose: (1) eliminates outside dripping of the tank resulting from condensation during periods of high humidity and (2) it will temporarily prevent leakage of water on the floor if the closet tank is accidentally cracked.

The Sahara tanks used with the 3-128 and 3-129 closets described on this page are shipped with insulating liner assembled to the tank interior.

These tanks are regularly furnished with 9-500 Hy-Lo float valves. 9-501 Hy-Lo Vacuum Breaker float valves can be furnished at an additional charge.

3-126 DREXEL with Teleseat

### 3-126 DREXEL with Teleseat

Bowl: Drexel siphon jet, whirlpool action, regular rim bowl sith self-draining jet; china bolt caps.
Tank: Drexel tank and cover with trimmings.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: No. 600 Teleseat with flat top telescopic cover.

### 3-127 DREXEL with Teleseat

Same as above except elongated rim bowl and Sperzel No. 600-E Teleseat with flat telescopic cover.

### 3-128 DREXEL with Teleseat
*and Sahara Rubber Lined Insulated Tank*

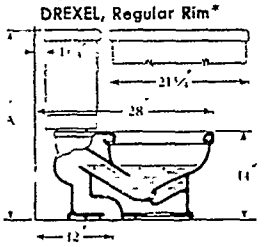
Bowl: Drexel siphon jet, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: 3-558 Sahara vitreous china tank and cover with trimmings and rubber insulating liner.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: No. 600 Teleseat with flat top telescopic cover.

### 3-129 DREXEL with Teleseat
*and Sahara Rubber Lined Insulated Tank*

Same as above except elongated rim bowl and Sperzel No. 600-E Teleseat with flat telescopic cover.

3-128 DREXEL with Teleseat

**Overall Dimensions**
**DREXEL, Regular Rim***




"A" Dimensions
3-126 and 3-127 29⅞"
3-128 and 3-129 30¾"

*Drexel elongated rim bowls are 2" longer, wall to front.

### PRICES

| Catalog Number | White Complete: With Plain White Seat | White Complete: Less Seat | Color Complete: Plain Seat | Color Complete: Pearl Seat | Color Complete: Less Seat | Shipping Weight Pounds |
|---|---|---|---|---|---|---|
| 3-126 | $118.22 | $92.08 | $150.94 | $158.14 | $123.48 | 135 |
| 3-127 | 130.84 | 99.78 | 167.52 | 175.12 | 134.98 | 145 |
| 3-128 | 138.82 | 112.68 | 171.64 | 178.84 | 144.18 | 145 |
| 3-129 | 151.54 | 120.48 | 188.22 | 195.82 | 155.68 | 155 |
| DREXEL with Teleseat | | | | | | |
| 3-126 | $124.08 | $92.08 | $158.14 | — | $123.48 | 135 |
| 3-127 | 134.44 | 99.78 | 172.32 | — | 134.98 | 145 |
| 3-128 | 144.68 | 112.68 | 178.84 | — | 144.18 | 145 |
| 3-129 | 155.14 | 120.48 | 193.02 | — | 155.68 | 155 |

*If with 9-630 angle supply, less stop* **Deduct $2.32**
*For anti-siphon float valve* **Add 2.20**

*Colored Seats are available in the following regular Crane colors:*

| | |
|---|---|
| *Citrus Yellow* | *Persian Red* |
| French Gray | Shell Pink |
| Pale Jade | Sky Blue |
| Sun Tan | |

*For other closet seats, refer to Pages 3-19 to 3-22.*

All exposed metal trim is chromium plated.

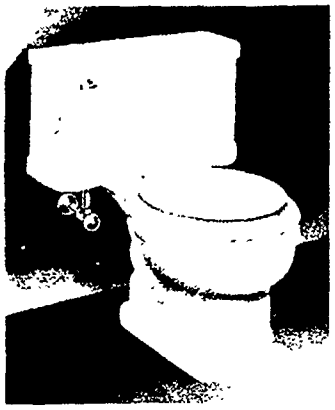
*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

*May 4, 1955*
*Superseding September 16, 1954*

# OXFORD AND NEU-SANIX CLOSE-COUPLED CLOSETS



3-140

### 3-140 OXFORD

Bowl: Oxford reverse trap, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.

Tank: Oxford vitreous china tank and cover with trimmings.

Supply: 9-631 3/8" angle supply pipe with stop.

Seat: CL-50 CRANE-LINE extended back solid Olsonite closed front seat with cover.

### 3-142 OXFORD

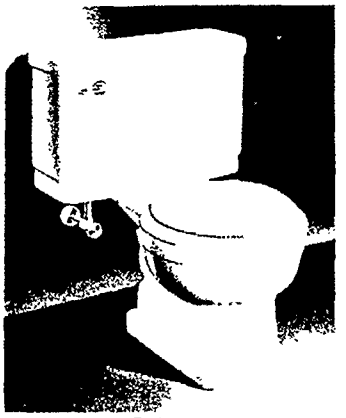
*With Sahara Rubber Lined Insulated Tank*

Bowl: Oxford reverse trap, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.

Tank: 3-558 Sahara vitreous china tank and cover with trimmings and rubber insulating liner.

Supply: 9-631 3/8" angle supply pipe with stop.

Seat: CL-50 CRANE-LINE extended back white solid Olsonite closed front seat with cover.



3-142

All exposed metal trim is chromium plated.

*For data on Sahara Tanks, see Page 3-3.*

3-150

### 3-150 NEU-SANIX

Bowl: Neu-Sanix washdown whirlpool action, regular rim bowl with jet; china bolt caps.

Tank: Oxford vitreous china tank and cover with trimmings.

Supply: 9-631 3/8" angle supply pipe with stop.

Seat: 3-912-W 1¼" sprayed white square back seat with cover.

### 3-152 NEU-SANIX

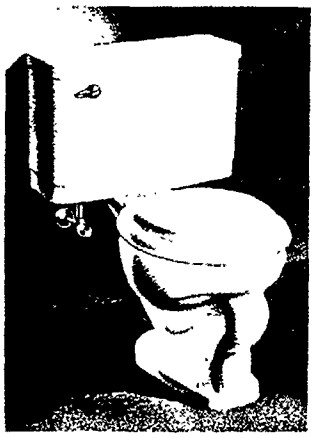
*With Sahara Insulated China Tank*

Bowl: Neu-Sanix washdown whirlpool action, regular rim bowl with jet; china bolt caps.

Tank: 3-558 Sahara vitreous china tank and cover with trimmings and rubber insulating liner.

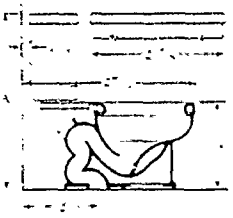
Supply: 9-631 3/8" angle supply pipe with stop.

Seat: 3-912-W 1¼" sprayed white square back seat with cover.



3-152

Overall Dimensions
OXFORD, Regular Rim



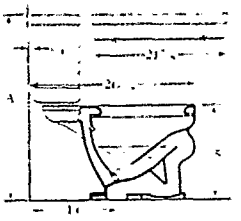
"A" Dimensions
3-140 28½" 3-142 31"

PRICES

| Catalog Number | White Complete: With Plain White Seat | White Complete: Less Seat | Color Complete: Plain Seat | Color Complete: Pearl Seat | Color Complete: Less Seat | Shipping Weight Pounds |
|---|---|---|---|---|---|---|
| *3-140 | $88.38 | $68.38 | $106.38 | $107.98 | $83.98 | 115 |
| 3-142 | 122.58 | 102.58 | 148.08 | 149.68 | 125.68 | 125 |
| *3-150 | 71.38 | 62.18 | 86.14 | — | 76.28 | 115 |
| 3-152 | 103.38 | 94.18 | 124.94 | — | 115.08 | 125 |

| | | |
|---|---|---|
| If with 9-630 angle supply, less stop | Deduct | $2.32 |
| For anti-siphon float valve | Add | 2.20 |
| *For Hy-Lo float valve | Add | 1.90 |

Overall Dimensions
NEU-SANIX, Regular Rim



"A" Dimensions
3-150 29" 3-152 31⅞"

*For other closet seats, refer to Pages 3-19 to 3-22.*

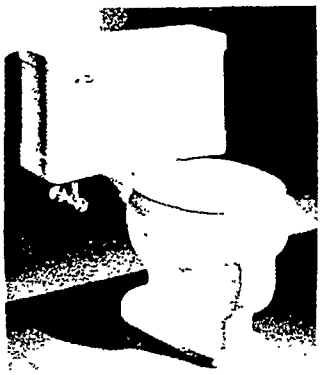


*Prices are subject to change without notice*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# NEUDAY CLOSE-COUPLED CLOSETS



3-160

### 3-160 NEUDAY

Bowl: **Neuday** washdown whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: **Oxford** vitreous china tank and cover with trimmings.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-912-W 1¼" sprayed white square back seat with cover.

### 3-162 NEUDAY
*With Sahara Insulated China Tank*

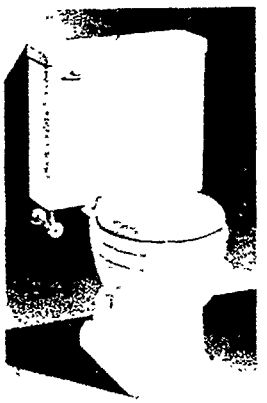
Bowl: **Neuday** washdown whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: 3-558 **Sahara** vitreous china tank and cover with trimmings and rubber insulating liner.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-912-W 1¼" sprayed white square back seat with cover.

3-162

All exposed metal trim is chromium plated.

*For data on Sahara Tanks, see Page 3-3.*

# CLOSET AND TANK COMBINATIONS



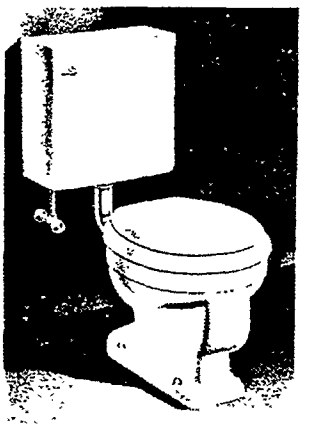
3-167

### 3-167 PETITE

Bowl: **Petite** reverse trap, whirlpool action, regular rim bowl with self-draining jet; china bolt caps.
Tank: **Petite** vitreous china 6-gallon tank with trimmings and bolt-on cover.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: **Bemis** T-50 sprayed white square back seat and cover.

### 3-180 NEU-ERA

Bowl: **Neu-Era** washdown whirlpool action, regular rim bowl with self-draining jet.
Tank: 3-560 **Neu-Era** vitreous china 6-gallon tank with trimmings and elbow flush connection.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-912-W 1¼" sprayed white square back seat with cover.

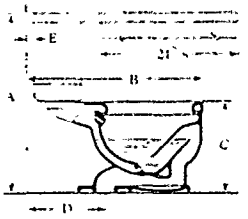


3-180

## PRICES

| Catalog Number | White Complete With Seat | White Complete Less Seat | Colored Complete With Plain Color Seat | Colored Complete Less Seat | Shpg. Weight Pounds |
|---|---|---|---|---|---|
| *3-160 | $71.38 | $62.18 | $86.14 | $76.28 | 105 |
| 3-162 | 103.38 | 94.18 | 124.94 | 115.08 | 115 |
| *3-167 | 73.78 | 64.98 | 89.02 | 79.68 | 100 |
| *3-180 | 75.88 | 66.68 | 101.24 | 91.38 | 110 |

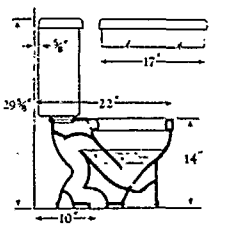
| | | | |
|---|---|---|---|
| **Neu-Era** bowl only, | White $24.80; | Color | $37.20 |
| If with **9-630** angle supply, less stop | | Deduct | 2.32 |
| For anti-siphon float valve | | Add | 2.20 |
| *For Hy-Lo float valve | | Add | 1.90 |



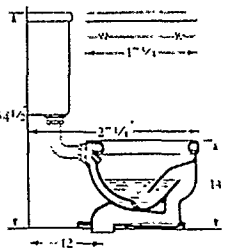
Neuday

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 3-160 | 28⅛" | 27¼" | 14" | 12" | 1" |
| 3-162 | 31" | 27¼" | 14" | 12" | 1" |

*For other closet seats, refer to pages 3-19 and 3-22.*
*For other supply pipes, refer to Section 9.*



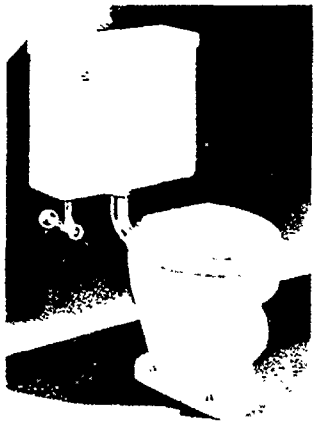
3-167 Petite



3-180 Neu-Era

## CLOSET AND TANK COMBINATIONS

### 3-200 SAXONET



3-200

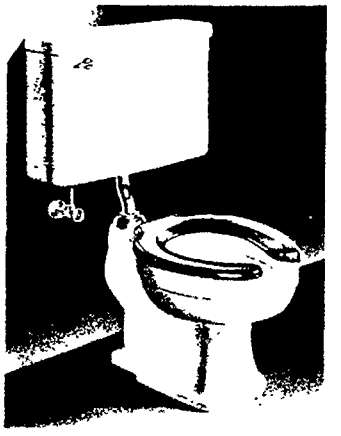
Bowl: Saxonet washdown whirlpool action, regular rim bowl with jet.
Tank: 3-560 Neu-Era vitreous china 6-gallon tank with trimmings and elbow flush connection.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: 3-912-W 1¼" sprayed white square back seat with cover.

### 3-208 SANTON JR.

Bowl: Santon Jr. siphon jet elongated rim, 2" top spud bowl; china bolt caps.
Tank: 3-570 Ipswich vitreous china 8-gallon tank with trimmings and offset flush connection.
Supply: 9-631 3/8" angle supply pipe with stop.
Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

### 3-207 SANTON

Same, except with 15" high Santon bowl.



3-208

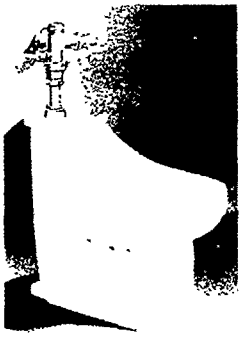
All exposed metal trim is chromium plated.

| Catalog Number | White Complete With Seat | White Complete Less Seat | White Bowl Only | Colored Complete With Plain Color Seat | Colored Complete Less Seat | Color Bowl Only | Shpg. Weight Pounds |
|---|---|---|---|---|---|---|---|
| *3-200 | $75.88 | $66.68 | $24.80 | $101.24 | $91.38 | $37.20 | 110 |
| *3-207 | 110.04 | 90.98 | 44.80 | — | 127.28 | 67.30 | 160 |
| *3-208 | 112.54 | 93.48 | 47.30 | — | 130.88 | 70.90 | 160 |

| | | |
|---|---|---|
| If with 9-630 angle supply, less stop | Deduct | $2.32 |
| For anti-siphon float valve | Add | 2.20 |
| *For Hy-Lo float valve | Add | 1.90 |

## HY-SAN HYGIENIC RIM STRADDLE TYPE BOWL

*For Public Toilet Rooms*

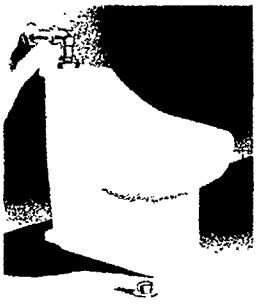


3-282-T

Bowl: Hy-San blowout hygienic rim straddle type 1½" top inlet, floor outlet bowl; china bolt caps.
Valve: 9-405-W Triumph flush valve with backflow preventer, 1" angle lockshield stop and flush connection.

### 3-285-T

Same, except wall hung, wall outlet bowl and 3-982 supporting flange unit for walls up to 1¼" thick.



3-283-T

Bowl: Hy-San blowout hygienic rim straddle type 1½" top inlet, floor outlet bowl; china bolt caps.
Valve: 9-451-W Triumph concealed flush valve with push button operating means in the floor, backflow preventer, 1" straight lockshield stop and flush connection. (For wall up to 6" thick—specify wall thickness.)

Height front rim to floor 14¾"

3-286-T

Bowl: Hy-San blowout hygienic rim straddle type 1½" back inlet, wall bowl.
Valve: 9-433-W Triumph concealed flush valve with oscillating handle, backflow preventer, 1" straight lockshield stop and flush connection. (For walls up to 6" thick—specify wall thickness.)
Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" thick walls.

3-288-T

### 3-288-T

Bowl: Hy-San blowout hygienic rim straddle type 1½" back inlet, wall bowl.
Valve: 9-454-W Triumph concealed flush valve with push button operating means in the floor, backflow preventer, 1" straight lockshield stop and flush connection. (For walls up to 6" thick—specify wall thickness.)
Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" thick walls.

Hy-San bowls are also available with Sloan flush valves.

*NOTE: Crane Supporting Flange Units and Crane Chair Carriers are made for partitions up to 1¼" thick; partitions thicker than 1¼" must be recessed to accommodate these supports.*

| Catalog Number | Prices, Complete White | Prices, Complete Color | Bowl Only White | Bowl Only Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 3-282-T | $134.86 | $183.96 | $97.50 | $146.30 | 90 |
| 3-283-T | 185.40 | 234.50 | 97.50 | 146.30 | 90 |
| 3-285-T | 178.56 | 232.86 | 108.60 | 162.90 | 120 |
| 3-286-T | 181.10 | 235.40 | 108.60 | 162.90 | 120 |
| 3-288-T | 220.56 | 274.86 | 108.60 | 162.90 | 125 |



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# VITREOUS CHINA CLOSETS WITH SLOAN FLUSH VALVES

### 3-300-C SANTON

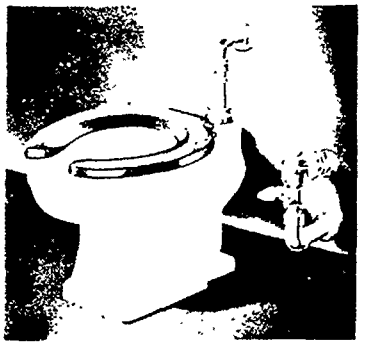
Bowl: **Santon** siphon jet elongated rim 1½" top spud bowl; china bolt caps.

Valve: No. 110 F YV **Crown** flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: **Church** No. [illegible]0 **Sani-Black** hard rubber open front seat with check hinge.

### 3-301-C SANTON

Same, except regular rim Santon bowl with **Church** No. 5700 **Sani-Black** open front seat.

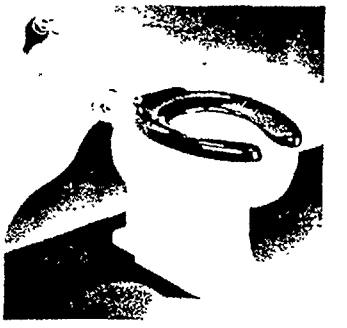


### 3-306-R SANTON

Bowl: **Santon** siphon jet elongated rim 1½" top spud bowl; china bolt caps.

Valve: No. 310 **Royal** foot pedal flush valve with vacuum breaker, 1" screw-driver stop and exposed flush connections.

Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.



### 3-310-C SANTON

Bowl: **Santon** siphon jet elongated rim 1½" back spud bowl; china bolt caps.

Valve: No. 140 YV **Crown** concealed flush valve with vacuum breaker, 1" wheel handle stop and flush connection. (For walls up to 6" thick specify wall thickness.)

Seat: **Church** No. 9500 black or white **Moltex** open front seat with check hinge.

All exposed metal trim is chromium plated.

### 3-320-R WHIRLTON

Bowl: **Whirlton** siphon jet whirlpool action elongated rim 1½" top spud bowl; china bolt caps.

Valve: No. 110 F Q YG YV **Royal** flush valve with vacuum breaker, 1" screw-driver stop, seat bumper and flush connection.

Seat: 3-935-W 1½" extended back white sheet covered seat with cover.

### 3-340-C SPEEDWAY

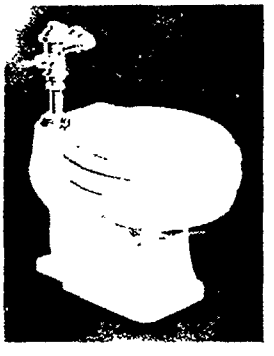
Bowl: **Speedway** blow-out elongated rim 1½" top spud bowl; china bolt caps.

Valve: No. 110 F YV **Crown** flush valve with vacuum breaker, 1" screw-dr ver stop and flush connection.

Seat: **Sperzel** No. 50-E black solid plastic open front seat with self-sustaining hinge.

### 3-341-C SPEEDWAY

Same, except regular rim Speedway bowl with **Sperzel** No. 50 black solid plastic open front seat with self-sustaining hinge.



3-320-R

3-340-C

**Overall Dimensions, Inches**

| Catalog Number | Roughs In | Rim to Floor | Projection Wall to Lip |
|---|---|---|---|
| **3-300-C** | 12 | 15 | 27½ |
| **3-301-C** | 12 | 15 | 25½ |
| **3-306-R** | 12 | 15 | 27½ |
| **3-310-C** | 14 | 15 | 29½ |
| **3-320-R** | 12 | 15 | 27½ |
| **3-340-C** | 9 | 14¾ | 26¼ |
| **3-341-C** | 9 | 14¾ | 24¼ |

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

**PRICES**

| Catalog Number | White: Complete | White: Complete Less Seat | White: Bowl Only | Colored: Complete with Plain Color Seat | Colored: Less Seat | Colored: Bowl Only | Shipping Weight Pounds |
|---|---|---|---|---|---|---|---|
| **3-300-C** | $101.22 | $82.16 | $44.80 | — | $104.96 | $67.30 | 75 |
| **3-301-C** | 94.62 | 75.56 | 38.20 | — | 94.96 | 57.30 | 75 |
| **3-306-R** | 116.02 | 96.96 | 44.80 | — | 119.76 | 67.30 | 85 |
| **3-310-C** | 116.16 | 93.50 | 52.40 | — | 120.00 | 78.60 | 75 |
| **3-320-R** | 132.02 | 96.96 | 53.60 | $161.56 | 123.96 | 80.30 | 75 |
| **3-340-C** | 94.26 | 81.36 | 44.00 | — | 103.66 | 66.00 | 70 |
| **3-341-C** | 87.16 | 74.76 | 37.40 | — | 93.76 | 56.10 | 70 |

*For other closet seats, refer to Pages 3-19 to 3-22.*

*For Flush Valves, refer to Section 9.*

All exposed metal trim is chromium plated.

# VITREOUS CHINA CLOSETS WITH SLOAN FLUSH VALVES

3-360-R

### 3-360-R PURTON

Bowl: **Purton** siphon jet 3" trapway, elongated rim. 1½" top spud bowl; china bolt caps.

Valve: No. 115 YV **Royal** flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

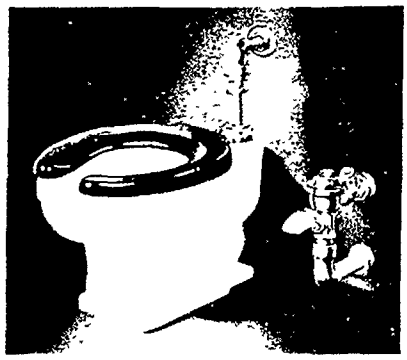
Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.

### 3-363-R PURTON

Bowl: **Purton** siphon jet, 3" trapway, elongated rim. 1½" top spud bowl; china bolt caps.

Valve: No. 310 **Royal** foot pedal flush valve with vacuum breaker, 1" screw-driver stop and exposed flush connections.

Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.



3-363-R

All exposed metal trim is chromium plated.

### 3-380-C BABY

Bowl: **Baby** siphon jet regular rim 1½" top spud bowl; china bolt caps.

Valve: No. 110 F YO YV **Crown** flush valve with vacuum breaker, 1" screw-driver stop, seat bumper and flush connection.

Seat: **Church** No. 1580 white solid plastic open front seat.

### 3-400-C TROY

Bowl: **Troy** reverse trap elongated rim 1½" back spud bowl with self draining jet; china bolt caps.

Valve: No. 120 F YV **Crown** flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.

### 3-401-C TROY

Same, except regular rim **Troy** bowl with **Church** No. 5700 seat.

### 3-420-C SAXONET

Bowl: **Saxonet** washdown whirlpool action regular rim 1½" back spud bowl with jet; china bolt caps.

Valve: No. 120 F YO YV **Crown** flush valve with vacuum breaker, 1" screw-driver stop, seat bumper and flush connection.

Seat: 3-904-W 1¼" sprayed white square back open front seat.

### PRICES AND DIMENSIONS

| Catalog Number | White | | | Colored | | Shipping Weight Pounds | Overall Dimensions, Inches | | |
|---|---|---|---|---|---|---|---|---|---|
| | Complete | less Seat | Bowl Only | less Seat | Bowl Only | | Roughs In | Rim to Floor | Projection Wall to Lip |
| 3-360-R | $119.16 | $100.10 | $57.80 | $129.20 | $86.60 | 90 | 11 | 14 | 28¼ |
| 3-363-R | 129.02 | 109.96 | 57.80 | 139.06 | 86.60 | 90 | 11 | 14 | 28¼ |
| 3-380-C | 100.62 | 83.96 | 45.80 | 107.16 | 68.70 | 70 | 9½ | 10 | 23¾ |
| 3-400-C | 95.06 | 76.00 | 36.50 | 94.50 | 54.70 | 60 | 12 | 14 | 27½ |
| 3-401-C | 88.46 | 69.40 | 29.90 | 84.70 | 44.90 | 60 | 12 | 14 | 25½ |
| 3-420-C | 74.62 | 65.40 | 24.80 | 78.40 | 37.20 | 50 | 12 | 15 | 24½ |

*For other closet seats, refer to Pages 3-19 to 3-22.*

*For Flush Valves, refer to Section 9.*

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.



*Prices are subject to change without notice*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# VITREOUS CHINA CLOSETS WITH SLOAN FLUSH VALVES

3-430-C

### 3-430-C KING COTTON

Bowl: King Cotton extra heavy washout, large trapway, regular rim, 1½" back spud bowl; china bolt caps.

Valve: No. 120 F YV Crown flush valve with vacuum breaker, 1" screwdriver stop and flush connection.

Seat: Church No. 5700 Sani-Black hard rubber open front seat with check hinge.

### 3-432-C KING COTTON

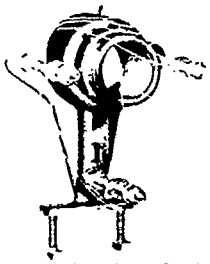
Bowl: King Cotton extra heavy washout, large trapway, regular rim, integral seat, 1½" back spud bowl.

Valve: No. 154 YV Crown concealed push button flush valve with vacuum breaker, 1" wheel handle stop and flush connection. (For walls up to 6" thick—specify wall thickness.)

*For Sectional View and Features of King Cotton bowls, refer to Page 3-23.*

3-432-C

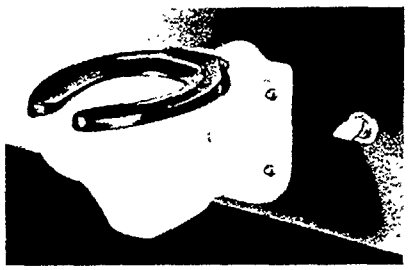
# VITREOUS CHINA WALL HUNG CLOSETS WITH SLOAN FLUSH VALVES



Rapidway Bowl with Crane Supporting Flange Unit

The importance of good sanitary conditions in public toilet rooms has provided an increasing demand for wall type closets. The floor beneath the bowl is free from obstructions, and is therefore easier to keep clean. This desirable feature, together with excellence in design and utility, are presented in the Walton, Rapidway and Lowall wall closets.

When supported on a Crane concealed Chair Carrier or a Supporting Flange Unit, the wall closet makes a very sturdy assembly.



### 3-456-R WALTON

Bowl: Walton siphon jet elongated rim, 1½" back spud wall bowl.

Valve: No. 313 Royal concealed flush valve with foot pedal, vacuum breaker, 1" wheel handle stop and 1¼" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-980 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" thick walls.

NOTE: Crane Supporting Flange Units and Crane Chair Carriers are made for partitions up to 1¼" thick; partitions thicker than 1¼" must be recessed to accommodate these supports.

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

### 3-450-R WALTON

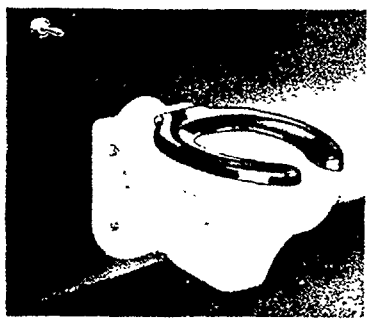
Bowl: Walton siphon jet elongated rim, 1½" top spud wall bowl.

Valve: No. 112 YV Royal flush valve with vacuum breaker, 1" screwdriver stop and flush connection.

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-980 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" thick walls.

All exposed metal trim is chromium plated.



### 3-452-R WALTON

Bowl: Walton siphon jet elongated rim, 1½" back spud wall bowl.

Valve: No. 143 YV Royal concealed flush valve with vacuum breaker, 1" wheel handle stop and flush connection. (For walls up to 6" thick—specify wall thickness.)

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

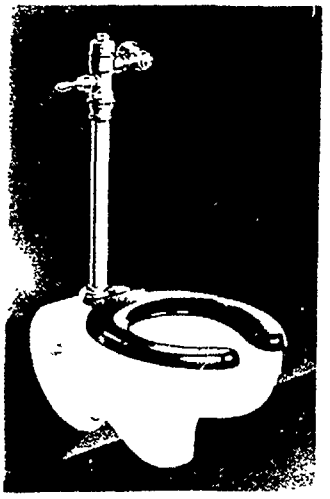
Support: 3-980 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" thick walls.

## PRICES AND DIMENSIONS

| Catalog Number | White | | | Dimensions, Inches | | | Shipping Weight, Pounds |
|---|---|---|---|---|---|---|---|
| | Complete | Less Seat | Bowl Only | Roughs In | Rim to Floor | Projection, Wall to Lip | |
| 3-430-C | $104.66 | $85.60 | $46.10 | 8 | 14⅜ | 25⅜ | 75 |
| 3-432-C | 93.50 | 93.50 | 53.10 | 5½ | 14⅜ | 22⅞ | 75 |
| 3-450-R | 160.80 | 141.74 | 65.50 | 5½ | 15⅜ | 25¾ | 110 |
| 3-452-R | 163.20 | 144.14 | 65.50 | 5½ | 15⅜ | 25¾ | 115 |
| 3-456-R | 173.32 | 154.26 | 65.50 | 5½ | 15⅜ | 25¾ | 115 |

*For other closet seats, refer to Pages 3-19 to 3-21.*
*For flush valves, refer to Section 9.*
*For wall closet Supporting Flange Units and Chair Carriers, refer to Pages 3-16 to 3-18.*
*For Crane-Hulbert Drainage Fittings, refer to Pages 21-6 and 21-7.*

# VITREOUS CHINA CLOSETS WITH SLOAN FLUSH VALVES



3-460-C

### 3-460-C RAPIDWAY

Bowl: Rapidway blow-out elongated rim, $1\frac{1}{2}$" top spud wall bowl.

Valve: No. 115 YV Crown flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for $1\frac{1}{4}$" thick walls.

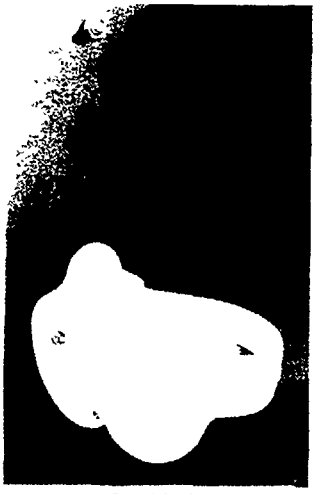
### 3-462-C RAPIDWAY

Bowl: Rapidway blow-out elongated rim, integral seat, $1\frac{1}{2}$" back spud wall bowl.

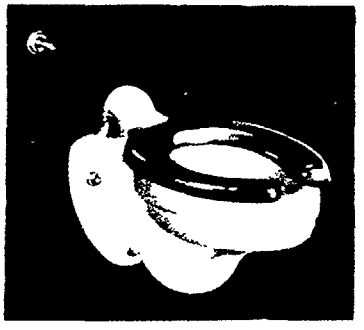
Valve: No. 150 YV Crown concealed push button flush valve with vacuum breaker, 1" wheel handle stop and 1" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for $1\frac{1}{4}$" thick walls.

Rapidway and Lowall bowls require a minimum of 15 lbs. pressure at the valve for satisfactory operation.



3-462-C



### 3-464-C RAPIDWAY

Bowl: Rapidway blow-out elongated rim, $1\frac{1}{2}$" back spud wall bowl.

Valve: No. 144 YV Crown concealed flush valve with vacuum breaker, 1" wheel handle stop and flush connection. (For walls up to 6" thick—specify wall thickness.)

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for $1\frac{1}{4}$" thick walls.

### 3-466-R RAPIDWAY (not illustrated)

Same except with No. 313 Royal concealed flush valve with foot pedal, vacuum breaker, 1" wheel handle stop and $1\frac{1}{4}$" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

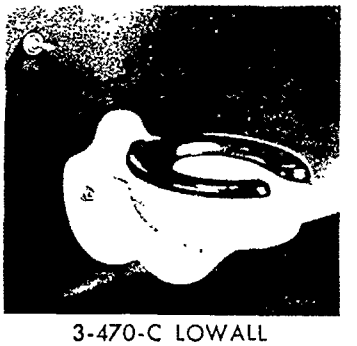
### 3-468-C LOWALL

Bowl: Lowall blow-out elongated rim, $1\frac{1}{2}$" top spud wall bowl with twin self-draining jets.

Valve: No. 112 YV Crown flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for $1\frac{1}{4}$" thick walls.



### 3-470-C LOWALL

Bowl: Lowall blow-out elongated rim, $1\frac{1}{2}$" back spud wall bowl with twin self draining jets.

Valve: No. 144 YV Crown concealed flush valve with vacuum breaker, 1" wheel handle stop and flush connection. (For walls up to 6" thick—specify wall thickness.)

Seat: Church No. 2500 Sani-Black hard rubber open front seat with check hinge.

Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for $1\frac{1}{4}$" thick walls.

NOTE: Crane Supporting Flange Units and Crane Chair Carriers are made for partitions up to $1\frac{1}{4}$" thick; partitions thicker than $1\frac{1}{4}$" must be recessed to accommodate these supports.

All exposed metal trim is chromium plated.

### PRICES AND DIMENSIONS

| Catalog Number | White: Complete | White: Less Seat | White: Bowl Only | Dimensions, Inches: Roughs In | Dimensions, Inches: Rim to Floor | Dimensions, Inches: Projection, Wall to Lip | Shipping Weight, Pounds |
|---|---|---|---|---|---|---|---|
| 3-460-C | $152.20 | $133.14 | $60.90 | $12\frac{1}{4}$ | $15\frac{1}{2}$ | $24\frac{1}{2}$ | 100 |
| 3-462-C | 135.44 | 135.44 | 68.00 | $12\frac{1}{4}$ | $15\frac{1}{2}$ | 22 | 105 |
| 3-464-C | 152.32 | 133.26 | 60.90 | $12\frac{1}{4}$ | $15\frac{1}{2}$ | 22 | 105 |
| 3-466-R | 165.12 | 146.06 | 60.90 | $12\frac{1}{4}$ | $15\frac{1}{2}$ | 22 | 110 |
| 3-468-C | 149.92 | 130.86 | 60.90 | $10\frac{3}{4}$ | 14 | $24\frac{1}{2}$ | 105 |
| 3-470-C | 152.32 | 133.26 | 60.90 | $10\frac{3}{4}$ | 14 | $24\frac{1}{2}$ | 110 |

*For other closet seats, refer to Pages 3-19 to 3-22.*
*For flush valves, refer to Section 9.*
*For wall closet Supporting Flange Units and Chair Carriers, refer to Pages 3-16 to 3-18.*
*For Crane-Hulbert Drainage Fittings, refer to Pages 21-6 and 21-7.*



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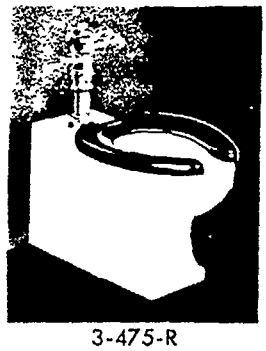
Printed in U.S.A.

# VITREOUS CHINA CLOSETS WITH SLOAN FLUSH VALVES



3-475-R

### 3-475-R SANWALTON

Bowl: **Sanwalton** siphon jet, angle flange, elongated rim, 1½" top inlet wall outlet bowl; china bolt caps.

Valve: No. 110 F YV **Royal** flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.

### 3-476-R SANWALTON

Bowl: **Sanwalton** siphon jet, angle flange, elongated rim, integral seat, 1½" back inlet wall outlet bowl.

Valve: No. 150 YV **Royal** concealed push button flush valve with vacuum breaker, 1" wheel handle stop and 1" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

3-476-R

3-477-R

### 3-477-R SANWALTON

Bowl: **Sanwalton** siphon jet, angle flange, elongated rim, integral seat, 1½" back inlet floor outlet bowl.

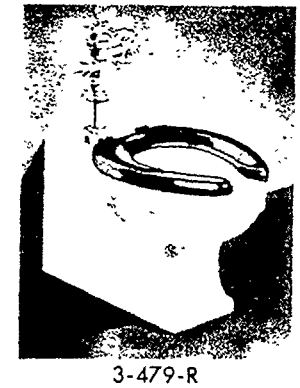
Valve: No. 150 YV **Royal** concealed push button flush valve with vacuum breaker, 1" wheel handle stop and 1" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

### 3-479-R SANWALTON

Bowl: **Sanwalton** siphon jet, angle flange, elongated rim, 1½" top inlet floor outlet bowl; china bolt caps.

Valve: No. 110 F YV **Royal** flush valve with vacuum breaker, 1" screw-driver stop and flush connection.

Seat: **Church** No. 2500 **Sani-Black** hard rubber open front seat with check hinge.



3-479-R

3-487-C

### 3-487-C ANGLETON

Bowl: **Angleton** blow-out, angle flange, regular rim, integral seat, 1½" back inlet wall outlet bowl.

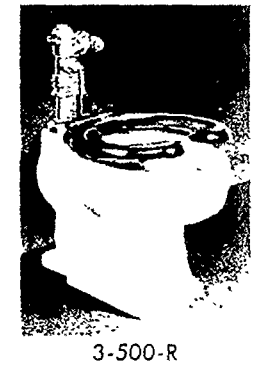
Valve: No. 150 YV **Crown** concealed push button flush valve with vacuum breaker, 1" wheel handle stop and 1" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

**Angleton closets require a minimum of 15 pounds pressure at the valve for satisfactory operation.**

### 3-500-R SANTON

Bowl: **Santon** siphon jet, elongated rim, 1½" top spud bowl; china bolt caps.

Valve and Seat: No. 161 YS YV **Royal** seat-operated flush valve with vacuum breaker, 1" screw-driver stop, flush connection and **Sani-Black** hard rubber open front and back seat.



3-500-R

## PRICES AND DIMENSIONS

| Catalog Number | White: Complete | White: Less Seat | White: Bowl Only | Colored: Bowl Only | Dimensions, Inches: Roughs In | Dimensions, Inches: Rim to Floor | Dimensions, Inches: Projection, Wall to Lip | Shipping Weight Pounds |
|---|---|---|---|---|---|---|---|---|
| 3-475-R | $134.20 | $115.14 | $74.80 | — | 4½ | 14½ | 26 | 100 |
| 3-476-R | 119.10 | 119.10 | 81.90 | — | 4½ | 14½ | 26 | 100 |
| 3-477-R | 123.30 | 123.30 | 86.10 | — | 9 | 14½ | 26 | 100 |
| 3-479-R | 137.10 | 118.04 | 77.70 | — | 9 | 14½ | 26 | 100 |
| 3-487-C | 103.84 | 103.84 | 69.30 | — | 11 | 14½ | 22 | 85 |
| 3-500-R | 132.30 | — | 44.80 | $67.30 | 12 | 15 | 27½ | 80 |

*For other closet seats, refer to Pages 3-19 to 3-22.*
*For flush valves, refer to Section 9.*

All exposed metal trim is chromium plated.

Note: Materials listed above will be furnished as described, contingent upon our ability to secure parts.

# VITREOUS CHINA SEAT-ACTION PRESSURE TANK CLOSETS

### 3-525 SANTON

Bowl: **Santon** siphon jet, elongated rim, 1½" top spud bowl.

Trim: No. 132-ST **Modern-Kelly** seat-action pressure tank valve with ½" supply, open front composition seat for elongated rim bowl, 8x24" galvanized steel concealed tank with pipe and connections for walls up to 6" thick—specify wall thickness.

### 3-526 SANTON (not illustrated)

Same as 3-525 except with No. 131-ST **Modern-Kelly** trim with exposed tank and connections.

**Santon closets require a minimum operating pressure of 35 pounds at the valve**

### 3-532 SAXONET

Bowl: **Saxonet** washdown whirlpool action regular rim 1½" back spud bowl with jet.

Trim: No. 131-SB **Modern-Kelly** seat-action pressure tank valve with ½" supply, open front composition seat for regular rim bowl, 8x24" galvanized steel exposed tank with 1¼"x 30" galvanized flush pipe and connections.

### 3-533 SAXONET (not illustrated)

Same as 3-532 except with No. 132-SB **Modern-Kelly** trim with concealed tank and connections for walls up to 6" thick -specify wall thickness.

**Saxonet closets require a minimum operating pressure of 20 pounds at the valve.**

### 3-535 RAPIDWAY

Bowl: **Rapidway** blow-out elongated rim, 1½" top spud wall bowl.

Trim: No. 133-S **Modern-Kelly** seat-action pressure tank valve with ½" supply, open front composition seat for elongated rim bowl, 8x24" galvanized steel concealed tank with pipe and connections for walls up to 6" thick—specify wall thickness.

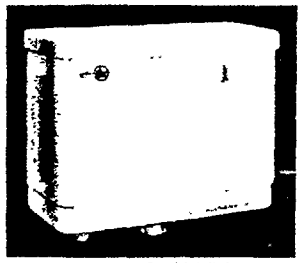
Support: 3-982 supporting flange unit with 4" I.P.S. brass outlet connection for 1¼" walls.

**Rapidway closets require a minimum operating pressure of 35 pounds at the valve.**

## PRICES AND DIMENSIONS OF PRESSURE TANK CLOSETS

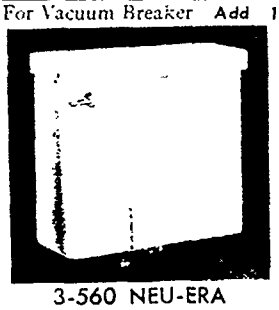
| Catalog Number | Price Each | Shpg. Wt. Pounds | Overall Height including Tank | Projection Wall to Lip | Bowl Roughs in | Bowl Height Floor to Rim |
|---|---|---|---|---|---|---|
| **3-525** | **$148.80** | 110 | — | 27½ | 12 | 15 |
| **3-526** | **145.80** | 105 | 78½ | 27 | 11½ | 15 |
| **3-532** | **127.80** | 85 | 78½ | 25¼ | 12¾ | 15 |
| **3-533** | **130.80** | 90 | — | 25¼ | 12¾ | 15 |
| **3-535** | **201.80** | 135 | — | 24½ | 12¼ | 15½ |

For Vacuum Breaker **Add 14.00** For Chr. Pl. flush pipe **Add 10.00**



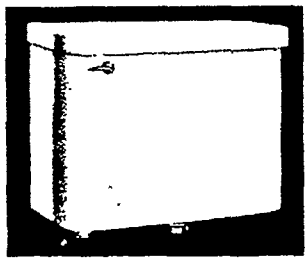
### 3-558 SAHARA
With Insulating Liner

**Sahara** vitreous china bottom supply close-coupled tank with rubber insulating liner, metal operating lever, flush valve, **CRANE-LINE Hy-Lo** float valve, bolts and washers for attaching to Drexel, Oxford, Neuday or Neu-Sanix closet bowls.



### 3-560 NEU-ERA

**Neu-Era** 6-gallon vitreous china bottom supply tank with metal operating lever, flush valve, float valve and elbow flush connection.



### 3-570 IPSWICH

**Ipswich** 8-gallon vitreous china bottom supply tank with metal operating lever, flush valve, float valve and offset flush connection.

### TANK COVER LOCKING DEVICE

Locking cover device provides vandal-proof feature, for use on Drexel, Ipswich, Neu-Era and Oxford tanks.

Add to tank price **$5.60**

## CLOSET TANK PRICES AND DIMENSIONS

| Catalog Number | Price Complete White | Price Complete Color | Shpg. Wt. Pounds | Overall Dimensions, Inches Width | Depth | Height |
|---|---|---|---|---|---|---|
| **3-558** | **$64.40** | **$80.40** | 85 | 21¾ | 7⅞ | 16½ |
| ***3-560** | **35.90** | **48.20** | 55 | 17¾ | 7⅜ | 16½ |
| ***3-570** | **39.90** | **53.40** | 75 | 22 | 8½ | 16½ |

For Anti-Siphon float valve, **Add $2.20** *For Hy-Lo float valve, **Add $1.90**

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# CRANE VITREOUS CHINA CLOSET BOWLS

## Siphon Jet

Santon

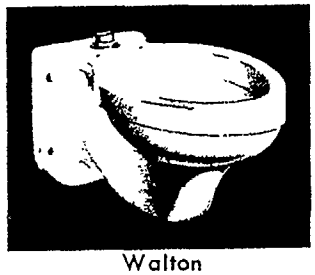
Saneto

Whirlton

Purton

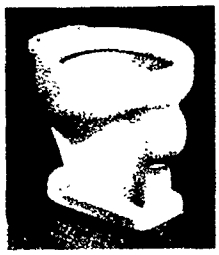
Santon Jr.

Baby


Walton

Sanwalton

## Washdown


Saxonet

Neudec

King Cotton
(Washout)

## DESCRIPTIONS, DIMENSIONS AND PRICES
## SIPHON JET

| Name of Bowl | Outlet F-Floor W-Wall | Style of Rim | Inlet | | Dimensions, Inches | | | Shipping Weight, Pounds | Price, Each | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Size, Inches | Type | Rim to Floor | Roughing-in Tank | Roughing-in Valve | | White | Color |
| Santon | F | Elongated | 1½ or 2 | Top | 15 | 14 | 12 | 60 | $44.80 | $67.30 |
| Santon | F | Regular | 1½ or 2 | Top | 15 | 14 | 12 | 58 | 38.20 | 57.30 |
| Santon | F | Elongated | 1½ or 2 | Back | 15 | — | 14 | 60 | 52.40 | 78.60 |
| Santon Jr. | F | Elongated | 1½ | Top | 13 | 14 | 12 | 70 | 47.30 | 70.90 |
| Santon Jr. | F | Regular | 1½ | Top | 13 | 14 | 12 | 65 | 41.00 | 61.40 |
| Saneto | F | Elongated | 1½ or 2 | Top | 15 | 12 | 10 | 60 | 44.80 | 67.30 |
| Saneto | F | Regular | 1½ or 2 | Top | 15 | 12 | 10 | 58 | 38.20 | 57.30 |
| Whirlton | F | Elongated | 1½ | Top | 15 | — | 12 | 60 | 53.60 | 80.30 |
| Purton | F | Elongated | 1½ | Top | 14 | — | 11 | 75 | 57.80 | 86.60 |
| Baby | F | Regular | 1½ | Top | 10 | 12 | 9½ | 54 | 45.80 | 68.70 |
| Walton | W | Elongated | 1½ | Top | 15½ | — | 5½ | 70 | 65.50 | — |
| Walton | W | Elongated | 1½ | Back | 15½ | — | 5½ | 71 | 65.50 | — |
| Sanwalton | F | Elongated | 1½ | Top | 14½ | — | 9 | 85 | 77.70 | — |
| Sanwalton | W | Elongated | 1½ | Top | 14½ | — | 4½ | 85 | 74.80 | — |
| Sanwalton | W | Elongated, Integral Seat | 1½ | Back | 14½ | — | 4½ | 85 | 81.90 | — |
| Sanwalton | F | Elongated, Integral Seat | 1½ | Back | 14½ | — | 9 | 85 | 86.10 | — |
| **WASHDOWN** | | | | | | | | | | |
| Saxonet | F | Regular | 1½ or 2 | Back | 15 | 14 | 12 | 40 | 24.80 | 37.20 |
| Saxonet | F | Regular, Integral Seat | 1½ | Back | 15 | — | 12 | 40 | 28.40 | — |
| Neudec | F | Regular | 2 | Back | 14 | 10 | — | 41 | 30.70 | 46.00 |
| King Cotton | F | Regular | 1½ or 2 | Back | 14½ | 11 | 8 | 60 | 46.10 | — |
| King Cotton | F | Regular, Integral Seat | 1½ or 2 | Back | 14½ | 11 | 5½ | 63 | 53.10 | — |

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

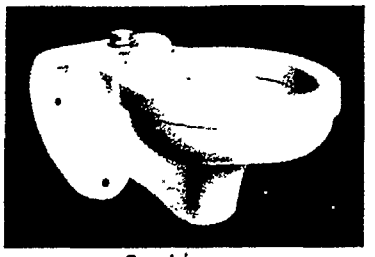
Printed in U.S.A.

*May 4, 1955*
*Superseding August 17, 1953*

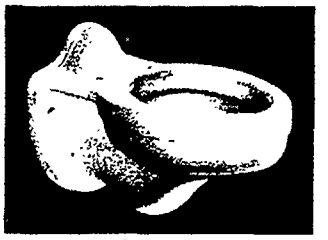
# CRANE VITREOUS CHINA CLOSET BOWLS

## Blow-Out

Speedway



Rapidway



Lowall

Angleton

Reverse Trap

Troy

### DESCRIPTIONS, DIMENSIONS AND PRICES

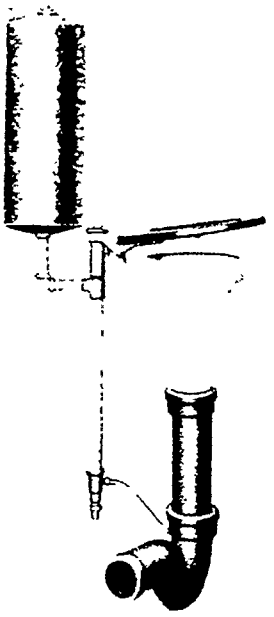
#### BLOW-OUT

| Name of Bowl | Outlet F-Floor W-Wall | Style of Rim | Inlet Size, Inches | Inlet Type | Dimensions, Inches Rim to Floor | Dimensions, Inches Roughing-in with Valve | Shipping Weight, Pounds | Price, Each White | Price, Each Color |
|---|---|---|---|---|---|---|---|---|---|
| **Speedway** | F | Elongated | 1½ | Top | 15 | 9 | 58 | $44.00 | $66.00 |
| **Speedway** | F | Regular | 1½ | Top | 15 | 9 | 56 | 37.40 | 56.10 |
| **Rapidway** | W | Elongated | 1½ | Top | 15½ | 12¼ | 64 | 60.90 | — |
| **Rapidway** | W | Elongated | 1½ | Back | 15½ | 12¼ | 68 | 60.90 | — |
| **Rapidway** | W | Elongated, Integral Seat | 1½ | Back | 15½ | 12¼ | 71 | 68.00 | — |
| **Lowall** | W | Elongated | 1½ | Top | 14 | 10¾ | 68 | 60.90 | — |
| **Lowall** | W | Elongated | 1½ | Back | 14 | 10¾ | 68 | 60.90 | — |
| **Angleton** | W | Regular, Integral Seat | 1½ | Back | 14½ | 11 | 75 | 69.30 | — |

#### REVERSE TRAP

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Troy** | F | Elongated | 1½ or 2 | Back | 14 | 12 | 47 | 36.50 | 54.70 |
| **Troy** | F | Regular | 1½ or 2 | Back | 14 | 12 | 46 | 29.90 | 44.90 |

## FROST-PROOF CLOSET



No. 100

Modern-Kelly frost-proof closets are designed for installations subjected to freezing temperatures. When the closet is in use (seat down) the valve is opened, permitting water to fill the tank. When the seat is released, the valve closes, and the closet flushes. All remaining water in the tank and valve drains out through a drain opening in the side of the valve. The hopper is cast iron, white porcelain enameled inside and on rim, and painted white outside.

### MODERN-KELLY No. 100

*With Galvanized Pressure Tank*

Hopper: Round cast iron roll rim hopper, white porcelain enameled inside and on rim, painted white outside.

Seat: Oak finish wood seat with galvanized malleable seat ring and hinge.

Tank: 8 x 24″ galvanized steel pressure tank with piping to valve.

Trim: Bronze seat-operated valve with leather packing, removable seat, 12″ copper drain tube, and offset flush connection, for 24″ bury. (Also furnished for 36″, 48″ or 60″ bury as specified).

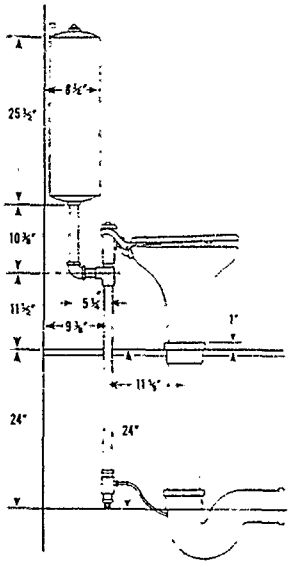
**Note: Trap and soil pipe are not included.**

**When Ordering:** Specify depth of bury. Valve must be installed below frost line.

PRICES COMPLETE
*F.O.B. Chicago, Illinois

| Catalog Number | Depth Bury, Inches | *Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| 100 | 24 | **$93.00** | 90 |
| | 36 | **95.50** | 92 |
| | 48 | **98.00** | 94 |
| | 60 | **100.50** | 96 |

For anti-back siphonage device, **Add $16.00**




No. 100 Roughing-in
May be roughed-in 6″ closer by installing tank behind wall.



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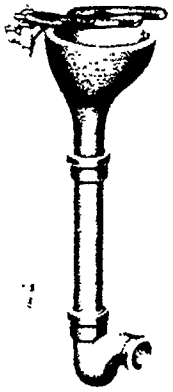
Printed in U.S.A.

# FROST-PROOF CLOSETS

Frost-proof closets are designed for installation in a garage, yard, camp, factory, basement or other unheated places. The valve is installed below the frost line and will not freeze in even the coldest weather. A pit is not required.

Closets with tanks use only four gallons of water for each flush. Depressing the seat allows the tank to fill. Only enough water to compress the air enters the tank, after which no more water is used until the seat is again operated. Releasing the seat allows a strong and cleansing flush direct from tank to hopper. Water remaining in valve casing then passes down through the waste valve (below the frost line) into a sewer or gravel box, leaving entire fixture empty.



H-1

## HAAS H-1

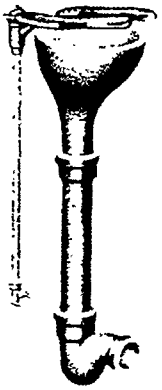
*With Galvanized Pressure Tank*

Hopper: Acid-resisting, porcelain enameled inside, painted black outside, elongated rim cast iron hopper with integral flushing rim and spud end to caulk into soil pipe.

Seat: Hardwood open front and back seat with reinforced hinge.

Tank: 8 x 24" galvanized steel pressure tank.

Trim: Supply and flush valve assembled with 4' rod and casing to be installed 3' below ground; copper waste connection.



H-2

## HAAS H-2

*Flushes continuously while in use and drains completely when seat is released.*

Hopper: Acid-resisting, porcelain enameled inside, painted black outside, elongated rim cast iron hopper with integral flushing rim and spud end to caulk into soil pipe.

Seat: Hardwood open front and back seat with reinforced hinge.

Trim: Supply and flush valve assembled with 4' rod and casing to be installed 3' below ground; copper waste connection.

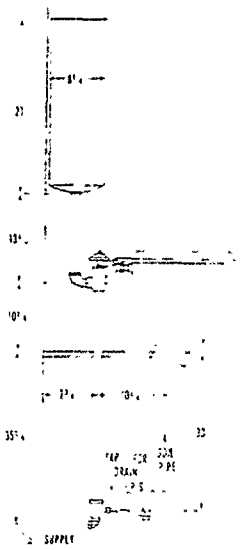
*Valves are furnished in any specified length up to 5 feet at same price.*

*Trap and soil pipe are not included.*

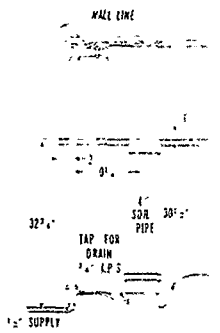
PRICES COMPLETE
*F.O.B. Dayton, Ohio

| Catalog Number | *Price, Each | Shpg. Wt. Pounds |
|---|---|---|
| H-1 | $95.20 | 80 |
| H-2 | 79.60 | 55 |

| | | |
|---|---|---|
| For valve over 5 feet, | Add per foot | $2.50 |
| For enameled all over hopper, | Add | 12.00 |
| For self-raising seat, | Add | 8.00 |
| For vacuum breaker, | Add | 13.00 |



H-1 Roughing-in
May be roughed-in 5½" closer by installing tank behind wall




H-2 Roughing-in

No. 4

## VOGEL No. 4

*Vitreous China Hopper—Painted White Tank*

Hopper: Vitreous china flushing rim hopper with top inlet.

Seat: Reinforced hardwood closed front seat.

Tank: Painted white enamel round pressure tank.

Trim: Union elbow flush connection, waste connection, supply and flush valves assembled with 3'2" of galvanized iron valve rod and casing.

## VOGEL No. 15

Same, except with vacuum breaker and ball check waste.

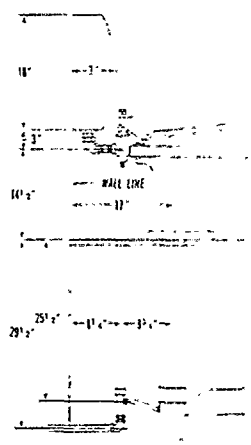
*Valves are furnished in any specified length up to 4 feet at same price.*

*Trap and soil pipe are not included.*

PRICES COMPLETE
†F.O.B. Wilmington, Delaware

| Catalog Number | †Price, Each | Shpg. Wt. Pounds |
|---|---|---|
| 4 | $105.40 | 65 |
| 15 | 112.20 | 68 |

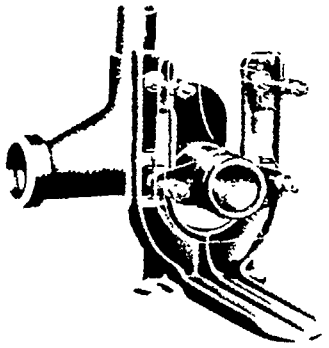
For valve over 4 feet, **Add per foot** $2.56




No. 4 Roughing-in

# CRANE WALL CLOSET SUPPORTING FLANGE UNITS AND CHAIRS

For use with Screwed Drainage Fittings or with Hub and Spigot Soil Pipe



WALTON bowl with Crane concealed Supporting Chair and Crane-Hulbert drainage fitting.

NOTE: Crane Supporting Flange Units and Crane Supporting Chairs are made for partitions up to 1¼" thick—partitions thicker than 1¼" must be recessed to accommodate these supports.

## FEATURES AND ADVANTAGES

When the drainage piping is securely anchored, both vertically and horizontally, the Supporting Flange Unit acts as a fulcrum carrying the weight of the closet and the applied load. When Supporting Chairs are used, the large, flat foot, buried into the floor, carries the entire weight of the closet, independent of walls or drainage line connections.

A space of 1/16" between closet and wall is a clear indication that no part of the load is carried by the wall. This also allows for slight unevenness in wall finish without altering stud settings.

Outlet connection allows for ample adjustment over recommended roughing-in so that a water tight seal can be made between gasket and outlet connection.

Three or four point suspension permits quick and easy assembly of closet to supporting flange unit or chair.

A standard 4" nipple, furnished by the dealer, is used between closet support and drainage fitting. It is the only part varying with wall thickness.

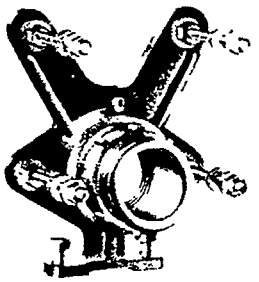
Closet Supporting Chairs may also be installed with lead pipe. For such installations the lead connection is brought through the wall and peened over the outlet connection, eliminating the usual solder or wiped joint.

Closet bowl can be removed readily by taking off the exposed cap nuts.

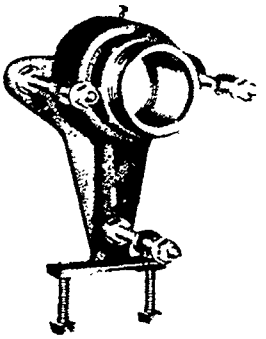
## WALL CLOSET SUPPORTING FLANGE UNITS

For 4" Iron Pipe

Cast iron closet Supporting Flange Unit with adjustable outlet connection for 4" iron pipe, with asbestos gasket, studs, nuts and washers.



3-980
For Siphon Jet Bowls



3-982
For Blow-Out Bowls

Crane Supporting Flange Units are designed to be installed 4½" from the face of the finished wall to the back edge of the flange, regardless of the thickness of the partition.

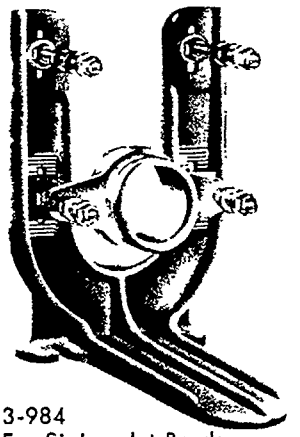
All exposed metal parts are chromium plated.

*For Crane-Hulbert Drainage Fittings, refer to Section 21.*

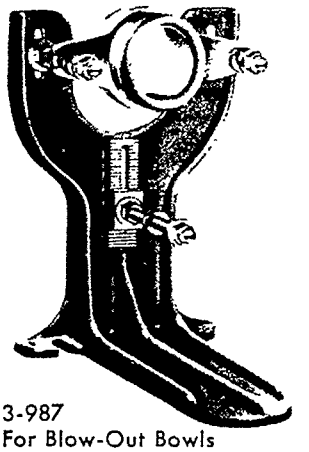
## WALL CLOSET SUPPORTING CHAIRS

For 4" Lead or Iron Pipe

Cast iron closet Supporting Chair with adjustable outlet connection for 4" pipe, with asbestos gasket, studs, nuts and washers.



3-984
For Siphon Jet Bowls



3-987
For Blow-Out Bowls

Crane Supporting Chairs must be installed 4½" from the face of the finished wall to the back of the chair, regardless of the thickness of the partition, and 2½" below the finished floor for Rapidway bowls or 4" below the finished floor for Lowall bowls.

PRICES COMPLETE—*For partitions up to 1¼" thick

*Partitions of greater thickness must be recessed to accommodate these supports.

| Catalog Number | For use with Crane Wall Hung Bowls | Type of Outlet Connection | Pr. Each | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 3-980 | Walton | Brass, for 4" iron pipe | $36.50 | 28 |
| 3-981 | Walton | Galv., for 4" iron pipe | 33.30 | 28 |
| 3-982 | Rapidway and Lowall | Brass, for 4" iron pipe | 32.90 | 23 |
| 3-983 | Rapidway and Lowall | Galv., for 4" iron pipe | 29.60 | 23 |
| 3-984 | Walton | Brass, for 4" lead pipe | 37.70 | 45 |
| 3-985 | Walton | Brass, for 4" iron pipe | 44.90 | 50 |
| 3-986 | Walton | Galv., for 4" iron pipe | 42.10 | 50 |
| 3-987 | Rapidway and Lowall | Brass, for 4" lead pipe | 35.70 | 42 |
| 3-988 | Rapidway and Lowall | Brass, for 4" iron pipe | 42.70 | 47 |
| 3-989 | Rapidway and Lowall | Galv., for 4" iron pipe | 40.50 | 47 |



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## SOLID OLSONITE CLOSET SEATS

*Extended Back—Olsonite Covered Hinges*

Black, White, Marbleized Black and White and all Crane Colors, Plain or Pearlescent

CL-50 Regular Rim
CL-54 Elongated Rim

CL-52 Regular Rim
CL-56 Elongated Rim

The above seats are stamped CRANE-LINE.

No. 51 Regular Rim
No. 55 Elongated Rim

No. 53 Regular Rim
No. 57 Elongated Rim

Colored seats are available in regular Crane colors as follows:

| | | | |
|---|---|---|---|
| Sun Tan | Persian Red | Pale Jade | India Ivory |
| French Gray | Citrus Yellow | Sky Blue | Shell Pink |

## COMMERCIAL THICKNESS SEATS

*Black or White*

No. 5 Regular Rim
No. 10 Elongated Rim

No. 5 and No. 10 seats can be furnished with self-sustaining hinge at no extra cost.

For bar type or surface check. Add per seat $.66

For concealed check hinge. Add per seat $.66

### PRICES—SOLID OLSONITE SEATS

| Catalog Number | Plain White | Plain White | All CRANE Colors Plain | All CRANE Colors Pearl |
|---|---|---|---|---|
| 5 | $15.20 | $12.40 | — | — |
| 10 | 15.74 | 12.94 | — | — |
| CL-50 | 20.00 | 18.54 | $22.40 | $24.00 |
| 51 | 15.20 | 12.40 | 16.80 | 18.26 |
| CL-52 | 20.00 | 18.54 | 22.40 | 24.00 |
| 53 | 15.20 | 12.40 | 18.60 | 18.26 |
| CL-54 | 24.66 | 24.66 | 27.20 | 30.66 |
| 55 | 15.74 | 15.74 | 17.74 | 19.06 |
| CL-56 | 24.66 | 24.66 | 27.20 | 30.66 |
| 57 | 15.74 | 12.94 | 17.74 | 19.06 |

Prices on No. 51, and No. 55 cover black or white seats with lug check (not illustrated). For seats less lug check as illustrated, add $1.06 per seat.

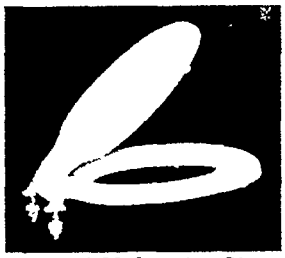
## CHURCH MOLTEX CLOSET SEATS

*Hardwood Core—Extended Back—Concealed Hinges*

A heavy Moltex covering, 3/32" thick, is moulded over a hardwood core and is reinforced with a steel and brass plate embedded across the back and moulded integrally entirely within the seat.

Black or White

No. 1270 Regular Rim
No. 1070 Elongated Rim



No. 1250 Regular Rim
No. 1050 Elongated Rim

*With Check Hinges*

No. 9700 Regular Rim
No. 9500 Elongated Rim

## CHURCH MOLTEX CLOSET SEATS

*With Moulded Core*

*Square Back White Only*

No. 900 Regular Rim

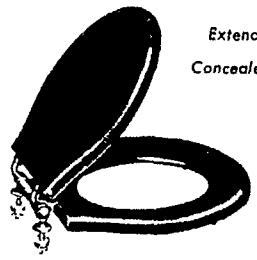
*Extended Back Black or White*

No. 940 Regular Rim

## CHURCH' SANI-BLACK HARD RUBBER SEATS

*Extended Back*

*Concealed Hinges*



No. 2200 Regular Rim
No. 3000 Elongated Rim

No. 5600 Regular Rim
No. 2600 Elongated Rim

No. 2300 Regular Rim
No. 3100 Elongated Rim

No. 5700 Regular Rim
No. 2500 Elongated Rim

Sani-Black seats without covers have concealed check hinges.

## CHURCH COREX CLOSET SEATS

*Moulded Core—Extended Back—White or Black*

Corex seats have thick moulded surface over a core of hardwood fibrous chips and resins, compressed under pressure. A heavy brass insert across the back is embedded into the moulded core.

No. 395 Elongated Rim, without check hinge
No. 395-C Elongated Rim, with check hinge
No. 397 Regular Rim, without check hinge
No. 397-C Regular Rim. with check hinge

### PRICES—CHURCH MOULDED SEATS

| Catalog Number | Price, Each White | Price, Each Black | Catalog Number | White or Black | Catalog Number | Black Each |
|---|---|---|---|---|---|---|
| *395 | $15.74 | $13.86 | 1050 | $39.74 | 2200 | $34.00 |
| 395-C | 16.40 | 14.66 | 1070 | 39.74 | 2300 | 19.06 |
| *397 | 15.20 | 13.34 | 1250 | 39.74 | 2500 | 19.06 |
| 397-C | 15.86 | 14.00 | 1270 | 39.74 | 2600 | 34.00 |
| 900 | 20.00 | 18.54 | 9500 | 22.66 | 3000 | 34.00 |
| 940 | 25.34 | 22.66 | 9700 | 22.66 | 3100 | 19.06 |
| | | | | | 5600 | 34.00 |
| | | | | | 5700 | 19.06 |

*Available with self-sustaining hinge, same price.

For other seats see Pages 3-20 to 3-22

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## MOULDED CLOSET SEATS with Self-Raising Hinges

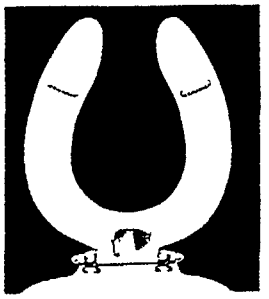
SPERZEL
*Black or White*

No. 60 Regular
No. 60E Elongated

SPERZEL
*Pad Type*
*Black or White*

LP20 Regular
LP20E Elongated

OLSONITE
*Black or White*

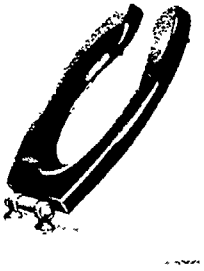


No. 1550 Regular
No. 1650 Elongated

CHURCH MOLTEX
*Black or White*

No. 8100 Regular
No. 8200 Elongated

CHURCH SANI-BLACK
*Black Only*

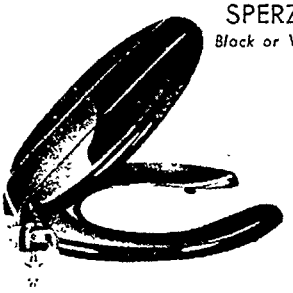


No. 6700 Regular
No. 6500 Elongated

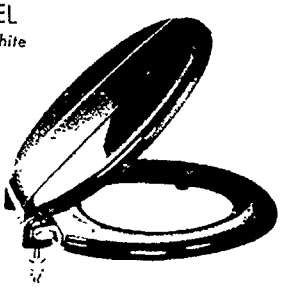
## MOULDED CLOSET SEATS with Self-Sustaining Hinges

Self-Sustaining Hinges hold both seat and cover in any position

SPERZEL
*Black or White*

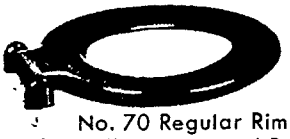


No. 55 Regular Rim
No. 55E Elongated Rim



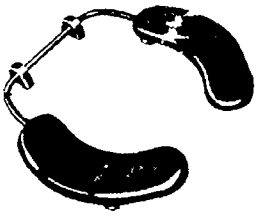
No. 75 Regular Rim
No. 75E Elongated Rim

No. 50 Regular Rim
No. 50E Elongated Rim



No. 70 Regular Rim
No. 70E Elongated Rim

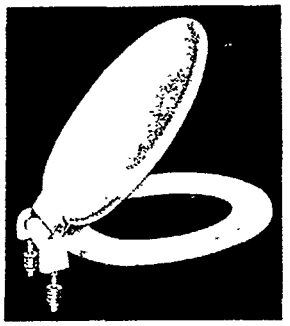
Pad Type



LP40 Regular Rim
LP40E Elongated Rim

With Stainless Steel Hinge Pin

No. 150 Regular Rim
No. 150E Elongated Rim



No. 100 Regular Rim
No. 100E Elongated Rim

No. 100 and No. 100E seats can be furnished in the following regular Crane colors: Citrus Yellow, French Gray, Pale Jade, Persian Red, Shell Pink, Sky Blue, Sun Tan

Prices Each
**No. 100 $22.40** **No. 100E $27.20**
For Black and White prices see table.

CHURCH MOLTEX
*Black or White*

No. 8700 Regular Rim
No. 8500 Elongated Rim

No. 8800 Regular Rim
No. 8600 Elongated Rim

CHURCH SANI-BLACK
*Black Only*

No. 6000 Regular Rim
No. 6100 Elongated Rim

OLSONITE
*White or Black*

No. 1750 Regular Rim
No. 1850 Elongated Rim

PRICES

| Number | White | Black | Number | White | Black |
|---|---|---|---|---|---|
| LP20 | $29.30 | $26.40 | *150 | $21.90 | $18.70 |
| LP20E | 29.60 | 26.70 | *150E | 22.10 | 18.90 |
| LP40 | 25.20 | 22.40 | 1550 | 33.46 | 30.14 |
| LP40E | 25.50 | 22.70 | 1650 | 33.46 | 30.14 |
| *50 | 15.20 | 12.40 | 1750 | 32.66 | 28.66 |
| *50E | 15.70 | 12.90 | 1850 | 32.66 | 28.66 |
| 55 | 36.80 | 33.20 | 6000 | — | 28.66 |
| 55E | 37.20 | 33.90 | 6100 | — | 28.66 |
| 60 | 29.30 | 26.40 | 6500 | — | 30.14 |
| 60E | 29.60 | 26.70 | 6700 | — | 30.14 |
| 70 | 15.20 | 12.40 | 8100 | 33.46 | 33.46 |
| 70E | 18.50 | 15.70 | 8200 | 33.46 | 33.46 |
| 75 | 36.80 | 33.20 | 8500 | 32.66 | 32.66 |
| 75E | 37.20 | 33.90 | 8600 | 57.06 | 57.06 |
| 100 | 20.00 | 18.50 | 8700 | 32.66 | 32.66 |
| 100E | 24.70 | 24.70 | 8800 | 57.06 | 57.06 |

*Available with concealed check hinge. Add per seat $.50

*Prices are subject to change without notice*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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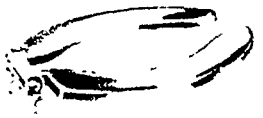
# MOULDED CLOSET SEATS—OPEN FRONT AND OPEN BACK

## OLSONITE

*With Check Hinges*
*White or Black*



No. 1050 Elongated Rim

**Price Each**
White or Black **$25.86**

## CHURCH MOLTEX

*With Check Hinges*
*Black or White*

No. 9100 Regular Rim
No. 9900 Elongated Rim

**Price Each**
White or Black **$25.86**

## CHURCH SANI-BLACK

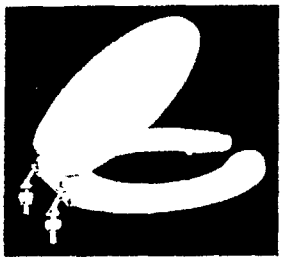
*With Check Hinges*
*Black Only*

No. 5100 Regular Rim
No. 5900 Elongated Rim

**Price Each**
Black only **$25.86**

# 1¼" WOOD CLOSET SEATS—SQUARE BACK

Sprayed White or Color-Chromium Plated Bar Hinges



Open Front with Cover
3-900 Regular Rim
3-901 Elongated Rim

Open Front less Cover
3-904 Regular Rim
3-905 Elongated Rim

Closed Front with Cover
3-912 Regular Rim
3-913 Elongated Rim

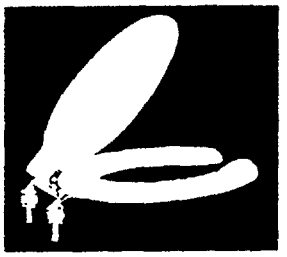
Closed Front less Cover
3-916 Regular Rim
3-917 Elongated Rim

PRICE EACH

| | OPEN FRONT WITH COVER | | | | OPEN FRONT LESS COVER | | | | CLOSED FRONT WITH COVER | | | | CLOSED FRONT LESS COVER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | |
| | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price |
| White | 3-900-W | **$9.60** | 3-901-W | **$13.86** | 3-904-W | **$9.22** | 3-905-W | **$13.20** | 3-912-W | **$9.20** | 3-913-W | **$13.46** | 3-916-W | **$8.02** | 3-917-W | **$12.80** |
| Color | 3-900-C | **10.26** | 3-901-C | **14.54** | 3-904-C | **9.90** | 3-905-C | **13.86** | 3-912-C | **9.86** | 3-913-C | **14.14** | 3-916-C | **8.70** | 3-917-C | **13.46** |

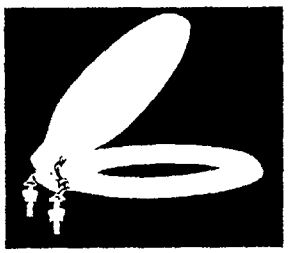
# 1¼" WOOD CLOSET SEATS—EXTENDED BACK

Sprayed White or Color—Chromium Plated Concealed Hinges



Open Front with Cover
3-902 Regular Rim
3-903 Elongated Rim

Open Front less Cover
3-906 Regular Rim
3-907 Elongated Rim



Closed Front with Cover
3-914 Regular Rim
3-915 Elongated Rim

Closed Front less Cover
3-918 Regular Rim
3-919 Elongated Rim

PRICE EACH

| | OPEN FRONT WITH COVER | | | | OPEN FRONT LESS COVER | | | | CLOSED FRONT WITH COVER | | | | CLOSED FRONT LESS COVER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | |
| | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price |
| White | 3-902-W | **$13.06** | 3-903-W | **$16.00** | 3-906-W | **$10.26** | 3-907-W | **$12.80** | 3-914-W | **$12.66** | 3-915-W | **$15.60** | 3-918-W | **$9.20** | 3-919-W | **$11.74** |
| Color | 3-902-C | **13.74** | 3-903-C | **16.66** | 3-906-C | **10.80** | 3-907-C | **13.34** | 3-914-C | **13.34** | 3-915-C | **16.26** | 3-918-C | **9.74** | 3-919-C | **12.26** |

IMPORTANT—When ordering closet seats specify catalog number and if white or color—for colored seats, also specify name of Crane color.

*Colored Seats are available in the following regular Crane colors:*
Citrus Yellow, Persian Red, Sky Blue, French Gray, Pale Jade, Shell Pink, Sun Tan

*Prices are subject to change without notice.*

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LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## 1¼" SHEET COVERED CLOSET SEATS—SQUARE BACK

Plain White or Color—Pearl White or Color—Chromium Plated Bar Hinges

Open Front with Cover
3-920 Regular Rim
3-921 Elongated Rim

Open Front, less Cover
3-924 Regular Rim
3-925 Elongated Rim

Closed Front with Cover
3-932 Regular Rim
3-933 Elongated Rim

Closed Front, less Cover
3-936 Regular Rim
3-937 Elongated Rim

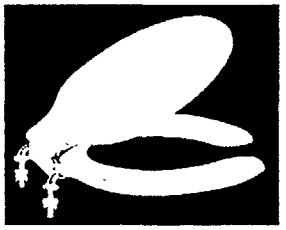
PRICE EACH

| | OPEN FRONT WITH COVER | | | | OPEN FRONT LESS COVER | | | | CLOSED FRONT WITH COVER | | | | CLOSED FRONT LESS COVER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | |
| | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price |
| White, Plain | 3-920-W | $21.86 | 3-921-W | $24.66 | 3-924-W | $12.66 | 3-925-W | $14.96 | 3-932-W | $20.94 | 3-933-W | $24.66 | 3-936-W | $12.06 | 3-937-W | $14.34 |
| Black, Plain | 3-920-B | 23.86 | 3-921-B | 27.20 | 3-924-B | 14.00 | 3-925-B | 16.26 | 3-932-B | 23.20 | 3-933-B | 27.20 | 3-936-B | 13.38 | 3-937-B | 15.68 |
| Color, Plain | 3-920-C | 23.86 | 3-921-C | 27.20 | 3-924-C | 14.00 | 3-925-C | 16.26 | 3-932-C | 23.20 | 3-933-C | 27.20 | 3-936-C | 13.38 | 3-937-C | 15.68 |
| Color, Pearl | 3-920-P | 26.80 | 3-921-P | 30.66 | 3-924-P | 14.18 | 3-925-P | 18.96 | 3-932-P | 25.60 | 3-933-P | 30.66 | 3-936-P | 13.60 | 3-937-P | 15.68 |

Note: Color Pearl prices also apply to seats in White Pearl and Black Pearl finish.

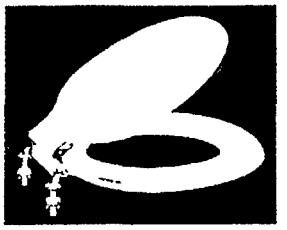
## 1¼" or 1½" SHEET COVERED CLOSET SEATS—EXTENDED BACK

Plain White or Color—Pearl White or Color—Chromium Plated Concealed Hinges



Open Front with Cover
3-922 Regular Rim
3-923 Elongated Rim

Open Front, less Cover
3-926 Regular Rim
3-927 Elongated Rim



Closed Front with Cover
3-934 Regular Rim
3-935 Elongated Rim

Closed Front, less Cover
3-938 Regular Rim
3-939 Elongated Rim

PRICE EACH

| | | OPEN FRONT WITH COVER | | | | OPEN FRONT LESS COVER | | | | CLOSED FRONT WITH COVER | | | | CLOSED FRONT LESS COVER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | | Regular Rim | | Elongated Rim | |
| | | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price | Number | Price |
| 1¼" | White, Plain | 3-922-W | $28.80 | 3-923-W | $33.34 | 3-926-W | $16.40 | 3-927-W | $19.06 | 3-934-W | $26.14 | 3-935-W | $31.06 | 3-938-W | $15.74 | 3-939-W | $18.40 |
| | Black, Plain | 3-922-B | 30.26 | 3-923-B | 34.66 | 3-926-B | 17.74 | 3-927-B | 20.40 | 3-934-B | 27.46 | 3-935-B | 32.54 | 3-938-B | 17.06 | 3-939-B | 19.74 |
| | Color, Plain | 3-922-C | 30.26 | 3-923-C | 34.66 | 3-926-C | 17.74 | 3-927-C | 20.40 | 3-934-C | 27.46 | 3-935-C | 32.54 | 3-938-C | 17.06 | 3-939-C | 19.74 |
| | Color, Pearl | 3-922-P | 37.74 | 3-923-P | 42.54 | 3-926-P | 18.00 | 3-927-P | 23.06 | 3-934-P | 34.66 | 3-935-P | 40.14 | 3-938-P | 17.34 | 3-939-P | 22.40 |
| 1½" | White, Plain | 3-922-W | 31.86 | 3-923-W | 37.34 | — | — | — | — | 3-934-W | 30.14 | 3-935-W | 35.06 | — | — | — | — |
| | Black, Plain | 3-922-B | 34.00 | 3-923-B | 40.14 | — | — | — | — | 3-934-B | 31.46 | 3-935-B | 37.60 | — | — | — | — |
| | Color, Plain | 3-922-C | 34.00 | 3-923-C | 40.14 | — | — | — | — | 3-934-C | 31.46 | 3-935-C | 37.60 | — | — | — | — |
| | Color, Pearl | 3-922-P | 42.54 | 3-923-P | 48.14 | — | — | — | — | 3-934-P | 40.80 | 3-935-P | 45.86 | — | — | — | — |

Note: Color Pearl prices also apply to seats in White Pearl and Black Pearl finish.
*When ordering 3-922, 3-923, 3-934 or 3-935 seats specify if 1¼" or 1½" thick seats are desired.*

IMPORTANT—When ordering closet seats specify catalog number and if plain white, plain color, pearl white or pearl color: for colored seats also specify name of Crane color.

Colored Seats are available in the following regular Crane colors:
Citrus Yellow, Persian Red, Sky Blue, French Gray, Pale Jade, Shell Pink, Sun Tan



*Prices are subject to change without notice*
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.
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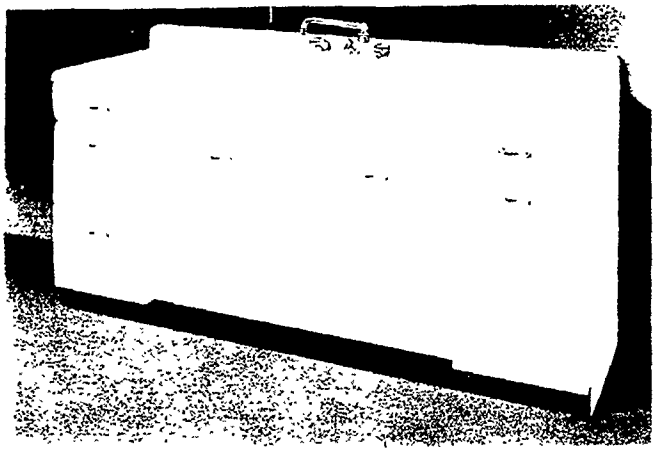
## KITCHEN QUEEN PORCELAIN ENAMELED CAST IRON CABINET SINK



### 5-40-S KITCHEN QUEEN

Sink: Kitchen Queen acid-resisting porcelain enameled cast iron two-compartment sink with back, depressed drainboards, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 Temple *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 7240 CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and traps are not included.*

| | Overall Dimensions | | |
|---|---|---|---|
| Sink..... | 72x25¼" | Each Basin.... 18x16x8" | Height of back 4" |
| Cabinet... | 72x24 5/16" | Height..34½" (sets sink 36" floor to top of rim) | |

No. 7240 Kitchen Queen cabinet is arranged to accommodate the following accessories, when specified.

| | |
|---|---|
| SB Utility Basket | CB Hardwood Cutting Board |
| CT Plastic Cutlery Tray | STR Sliding Towel Rack |

*Refer to Page 5-16 for illustrations and descriptions.*

### Alternate Supply Fittings for Beveled Panel Back Sinks

The Kitchen Queen, Kitchen Pride, Sunnyday and All-American sinks with beveled panel backs can be furnished with the following alternate Temple supply fittings with *Dial-ese* controls when specified:

8-62—Temple *Dial-ese* swinging s[illegible]t, two-valve supply fitting, less spray, with cover plate [illegible] Specify 8-62-A if with aerator.)

8-66—Temple *Dial-ese* swinging spout, three-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-66-A if with aerator.)

8-68—Temple *Dial-ese* swinging spout, three-valve supply fitting, less spray, with cover plate. (Specify 8-68-A if with aerator.)

To order Kitchen Queen sinks with alternate supply fittings as illustrated above, use the following catalog numbers:

5-40, with 8-62 or 8-62-A fitting.
5-40-T, with 8-68 or 8-68-A fitting.
5-40-TS, with 8-66 or 8-66-A fitting.

All exposed metal trim is chromium plated.

## TRANSPORTATION CHARGES ON WHITE UNDERSINK AND WHITE KITCHEN CABINETS

Note: Undersink cabinets and base and wall cabinets shown on this page and on the pages following are F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the cabinet prices shown. Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.

### CABINET DISTRIBUTION POINTS BY ZONES

| ZONE 1 | ZONE 1 | ZONE 1 | ZONE 1 | ZONE 2 |
|---|---|---|---|---|
| Atlanta, Ga. | Charlotte, N. C. | Denver, Colo. | Philadelphia, Pa. | Los Angeles, Cal. |
| Bayonne, N. J. | Chicago, Ill. | Des Moines, Ia. | Pittsburgh, Pa. | San Francisco, Cal. |
| Brighton, Mass. | Cincinnati, O. | Maumee, O. | St. Louis, Mo. | Seattle, Wash. |
| Buffalo, N. Y. | Dallas, Tex. | New Orleans, La. | | |

Note: All Crane undersink cabinets and kitchen cabinets are now available in the following four colors: Butter Yellow, Spring Green, Birch Tan and Blossom Pink. Contact your Crane Branch or Crane Wholesaler for prices.

### PRICES COMPLETE, less supplies and traps

*†Color Price includes colored sink and white cabinet.*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | Pounds |
| 5-40, with Cabinet | $415.42 | $438.12 | $440.74 | $463.44 | 520 |
| 5-40-S, with Cabinet | 422.42 | 445.12 | 447.74 | 470.44 | 522 |
| 5-40-T, with Cabinet | 424.72 | 447.42 | 450.04 | 472.74 | 522 |
| 5-40-TS, with Cabinet | 431.72 | 454.42 | 457.04 | 479.74 | 524 |
| No. 7240 Cabinet Only | 168.42 | — | 193.72 | — | 182 |

| | | |
|---|---|---|
| For aerator on spout..... | Add | $1.90 |
| For 8-324 ¼" male tailpieces.... ... | Per Pair, Add | .48 |
| For SB Utility Basket..... | Add | 3.52 |
| For CT Plastic Cutlery Tray..... | Add | 3.22 |
| For STR Sliding Towel Rack... ..... | Add | 12.00 |
| For CB Hardwood Cutting Board..... | Add | 5.02 |
| If less 8-361 wastes..... | Each, Deduct | 6.70 |

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal unit, refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*

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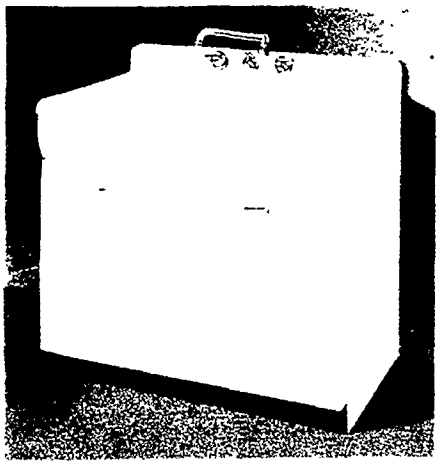
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## KITCHEN PRIDE AND SUNNYDAY PORCELAIN ENAMELED CAST IRON CABINET SINKS



5-44-S KITCHEN PRIDE

Sink: **Kitchen Pride** acid-resisting porcelain enameled cast iron two-compartment sink with back, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 **Temple** *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 3800 **CRANE** baked white enamel steel cabinet with sink clamps.

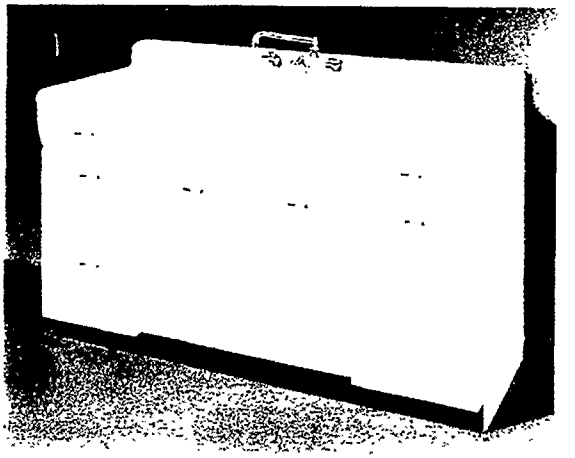
*Note: Sink supplies and traps are not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sink | 38x25¼" | Each basin ... 18x16x8" | Height of back 4" |
| Cabinet | 38x24 5/16" | Height .. 34½" (sets sink 36" floor to top of rim) | |

To order Kitchen Pride or Sunnyday sinks with alternate Temple supply fittings described on Page 5-3, use the catalog numbers shown below:

| Kitchen Pride | | Sunnyday |
|---|---|---|
| 5-44 | with 8-62 or 8-62-A fitting— | 5-50 |
| 5-44-T | with 8-68 or 8-68-A fitting— | 5-50-T |
| 5-44-TS | —with 8-66 or 8-66-A fitting— | 5-50-TS |



5-50-S SUNNYDAY

Sink: **Sunnyday** acid-resisting porcelain enameled cast iron single compartment sink with back, depressed drainboards, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 **Temple** *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

Overall Dimensions

| Sink Size | Basin Size | Back Height | Cabinet Size | Cabinet Height | Sink rim to floor |
|---|---|---|---|---|---|
| 54x25¼" | 20x18x8" | 4" | 54x24 5/16" | 34½" | 36" |
| 60x25¼" | 22x18x8" | 4" | 60x24 5/16" | 34½" | 36' |

Cabinets are arranged to accommodate the following accessories, when specified:

No. 3800 **Kitchen Pride** Cabinet—**SB** Utility Basket.
Nos. 5440 or 6040 **Sunnyday** Cabinet—**SB** Utility Basket, **STR** Sliding Towel Rack, **CB** Hardwood Cutting Board and **CT** Plastic Cutlery Tray.

*Refer to Page 5-16 for illustrations and descriptions.*

### TRANSPORTATION CHARGES ON SINK CABINETS

(*See Page 5-3 for details*)

PRICES COMPLETE, *less supplies and traps*

*†Color Price includes colored sinks and white cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 †Color | ZONE 2 White | ZONE 2 †Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| 5-44, with Cabinet | 38x25¼ | $214.98 | $226.58 | $223.88 | $235.48 | 305 |
| 5-44-S, with Cabinet | 38x25¼ | 221.98 | 233.58 | 230.88 | 242.48 | 306 |
| 5-44-T, with Cabinet | 38x25¼ | 224.28 | 235.88 | 233.18 | 244.78 | 307 |
| 5-44-TS, with Cabinet | 38x25¼ | 231.28 | 242.88 | 240.18 | 251.78 | 308 |
| No. 3800 Cabinet Only | 38x24 5/16 | 68.68 | — | 77.58 | — | 95 |
| 5-50, with Cabinet | 54x25¼ | 290.02 | 303.42 | 310.18 | 323.58 | 421 |
| 5-50-S, with Cabinet | 54x25¼ | 297.02 | 310.42 | 317.18 | 330.58 | 422 |
| 5-50-T, with Cabinet | 54x25¼ | 299.32 | 312.72 | 319.48 | 332.88 | 424 |
| 5-50-TS, with Cabinet | 54x25¼ | 306.32 | 319.72 | 326.48 | 339.88 | 425 |
| No. 5440 Cabinet Only | 54x24 5/16 | 132.62 | — | 152.78 | — | 163 |
| 5-50, with Cabinet | 60x25¼ | 301.58 | 315.68 | 322.24 | 336.34 | 442 |
| 5-50-S, with Cabinet | 60x25¼ | 308.58 | 322.68 | 329.24 | 343.34 | 443 |
| 5-50-T, with Cabinet | 60x25¼ | 310.88 | 324.98 | 331.54 | 345.64 | 444 |
| 5-50-TS, with Cabinet | 60x25¼ | 317.88 | 331.98 | 338.54 | 352.64 | 445 |
| No. 6040 Cabinet Only | 60x24 5/16 | 137.78 | — | 158.44 | — | 169 |

| | |
|---|---|
| For aerator on spout | Add $1.90 |
| For **8-324** ¼" male tailpieces | Per Pair, Add .48 |
| For **SB** Utility Basket | Add 3.52 |
| For **CT** Plastic Cutlery Tray | Add 3.22 |
| For **STR** Sliding Towel Rack | Add 12.00 |
| For **CB** Hardwood Cutting Board | Add 5.02 |
| If less **8-361** wastes | Each, Deduct 6.70 |

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*

All exposed metal trim is chromium plated.

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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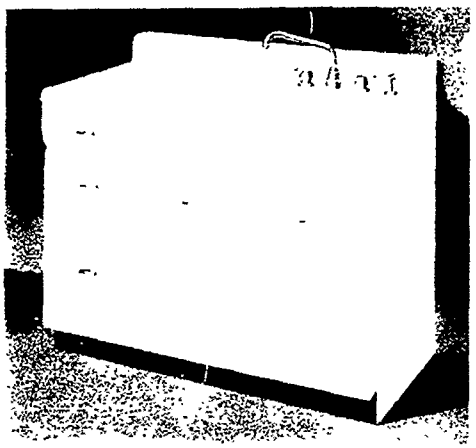
# HOMEMAKER PORCELAIN ENAMELED CAST IRON CABINET SINKS



HOMEMAKER
*5-81-S, with Left Hand Drainboard*
*5-82-S, with Right Hand Drainboard*

Sink: **Homemaker** acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboard, soap depression and concealed wall attachment plates.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and trap are not included.***

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Sink | 42x25¼" | Basin.....20x18x8" | Height of back.....4" |
| Cabinet | 42x24 5/16" | Height..34½" (sets sink 36" floor to top of rim) | |

No. 4240 **Homemaker** cabinets are arranged to accommodate the following accessories, when specified:

**SB** Utility Basket — **STR** Sliding Towel Rack
**CT** Plastic Cutlery Tray — **CB** Hardwood Cutting Board

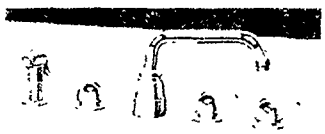
*Refer to Page 5-16 for illustrations and descriptions.*

### Alternate Supply Fittings for Deck Type Kitchen Sinks

The **Homemaker**, **Sunnycrest**, **Stewardess**, **AllianceWare** and all flat rim ledge type sinks can be furnished with the following alternate **Embassy** supply fittings with *Dial-ese* controls when specified:

8-84 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting, less spray. (Specify 8-84-A if with aerator.)

8-85 **Embassy** *Dial-ese* ledge type, swinging spout three-valve supply fitting, less spray. (Specify 8-85-A if with aerator.)



8-89 **Embassy** *Dial-ese* ledge type, swinging spout three-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-89-A if with aerator.)

To order **Homemaker** sinks with alternate supply fittings as illustrated above, use the following catalog numbers:

*With 8-84 or 8-84-A Embassy Fitting*
5-81, L. H. Drainboard — 5-82, R. H. Drainboard

*With 8-85 or 8-85-A Embassy Fitting*
5-81-T, L. H. Drainboard — 5-82-T, R. H. Drainboard

*With 8-89 or 8-89-A Embassy Fitting*
5-81-TS, L. H. Drainboard — 5-82-TS, R. H. Drainboard

All exposed metal trim is chrome plated.

## TRANSPORTATION CHARGES ON SINK CABINETS

(See Page 5-3 for details)

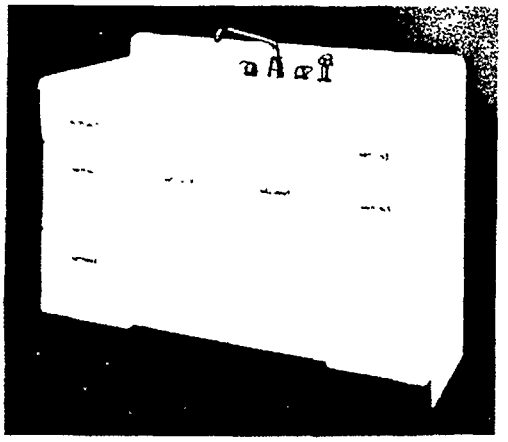
PRICES COMPLETE, less supplies and traps
*†Color Price includes colored sink and white cabinet*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| **5-81 or 5-82, with Cabinet** | $211.16 | $220.86 | $225.36 | $235.06 | 323 |
| **5-81-S or 5-82-S, with Cabinet** | 219.06 | 228.76 | 233.26 | 242.96 | 324 |
| **5-81-T or 5-82-T, with Cabinet** | 218.96 | 228.66 | 233.16 | 242.86 | 325 |
| **5-81-TS or 5-82-TS, with Cabinet** | 227.26 | 236.96 | 241.46 | 251.16 | 326 |
| **5-81 or 5-82, Sinks Only, less all trim** | 87.70 | 97.40 | 87.70 | 97.40 | 195 |
| **No. 4240-L or No. 4240-R Cabinet Only** | 97.56 | — | 111.76 | — | 120 |

For aerator on spout.....Add $1.80
For **8-324** ¼" tailpieces.....Per Pair, Add .48
For **SB** Utility Basket..... ..... Add 3.52
For **CT** Cutlery Tray..... ..... Add 3.22
For **STR** Towel Rack..... ..... Add 12.00
For **CB** Cutting Board..... .... Add 5.02
Is less **8-361** waste..... .Each, Deduct 6.70

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27*

## SUNNYCREST AND STEWARDESS PORCELAIN ENAMELED CAST IRON CABINET SINKS



### 5-100-S SUNNYCREST

Sink: Sunnycrest acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboards, two soap depressions and concealed wall attachment plates.

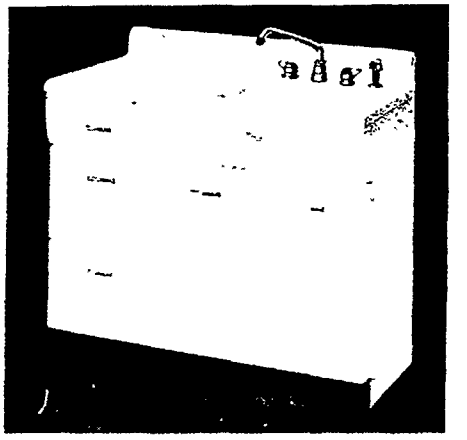
Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5422 (for 54" sink) or No. 6022 (for 60" sink) CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included*

| Sink Size | Basin Size | Overall Dimensions: Back Height | Cabinet Size | Cabinet Height | Sink rim to floor |
|---|---|---|---|---|---|
| 54x22½" | 20x15x8" | 4" | 54x21¾" | 34½" | 36" |
| 60x22½" | 22½x15x8" | 4" | 60x21¾" | 34½" | 36" |



### STEWARDESS

5-103-S, with Left Hand Drainboard
5-106-S, with Right Hand Drainboard

Sink: Stewardess acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboard, soap depression and concealed wall attachment plates.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4222-L (for left hand drainboard) No. 4222-R (for right hand drainboard) CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

Overall Dimensions

Sink.....42x22½" Basin.....20x15x8" Height of back. . .4"
Cabinet....42x21¾" Height..34½" (sets sink 36" floor to top of rim)

To order Sunnycrest or Stewardess sinks with alternate Embassy supply fittings described on Page 5–5, use the catalog numbers shown below.

With 8-84 or 8-84-A Embassy Fitting
5-100 Sunnycrest
5-103 Stewardess L. H. Drainboard
5-106 Stewardess R. H. Drainboard

With 8-85 or 8-85-A Embassy Fitting
5-100-T Sunnycrest
5-103-T Stewardess L. H. Drainboard
5-106-T Stewardess R. H. Drainboard

With 8-89 or 8-89-A Embassy Fitting
5-100-TS Sunnycrest
5-103-TS Stewardess L. H. Drainboard
5-106-TS Stewardess R. H. Drainboard

No. 5422 and No. 6022 Sunnycrest cabinets and No. 4222 Stewardess cabinets are arranged to accommodate the following accessories, when specified:

SB Utility Basket
CT Plastic Cutlery Tray
STR Sliding Towel Rack
CB Hardwood Cutting Board

Refer to Page 5–16 for illustrations and descriptions.

All exposed metal trim is chromium plated.

### TRANSPORTATION CHARGES ON SINK CABINETS

(See Page 5-3 for details)

PRICES COMPLETE, less supplies and traps

*†Color Price includes colored sink and white cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 †Color | ZONE 2 White | ZONE 2 †Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| **5-100, with Cabinet** | 54x22½ | $277.32 | $289.72 | $298.08 | $310.48 | 366 |
| **5-100-S, with Cabinet** | 54x22½ | 285.22 | 297.62 | 305.98 | 318.38 | 367 |
| **5-100-T, with Cabinet** | 54x22½ | 285.12 | 297.52 | 305.88 | 318.28 | 368 |
| **5-100-TS, with Cabinet** | 54x22½ | 293.42 | 305.82 | 314.18 | 326.58 | 369 |
| **5-100, Sink Only, less all trim** | 54x22½ | 111.30 | 123.70 | 111.30 | 123.70 | 230 |
| **No. 5422 Cabinet Only** | 54x21¾ | 140.12 | — | 160.88 | — | 128 |
| **5-100, with Cabinet** | 60x22½ | 290.56 | 303.86 | 311.98 | 325.28 | 383 |
| **5-100-S, with Cabinet** | 60x22½ | 298.46 | 311.76 | 319.88 | 333.18 | 384 |
| **5-100-T, with Cabinet** | 60x22½ | 298.36 | 311.66 | 319.78 | 333.08 | 385 |
| **5-100-TS, with Cabinet** | 60x22½ | 306.66 | 319.96 | 328.08 | 341.38 | 386 |
| **5-100, Sink Only, less all trim** | 60x22½ | 118.60 | 131.90 | 118.60 | 131.90 | 240 |
| **No. 6022 Cabinet Only** | 60x21¾ | 146.06 | — | 167.48 | — | 135 |
| **5-103 or 5-106, with Cabinet** | 42x22½ | 216.80 | 226.10 | 232.40 | 241.70 | 262 |
| **5-103-S or 5-106-S, with Cabinet** | 42x22½ | 224.70 | 234.00 | 240.30 | 249.60 | 263 |
| **5-103-T or 5-106-T, with Cabinet** | 42x22½ | 224.60 | 233.90 | 240.20 | 249.50 | 264 |
| **5-103-TS or 5-106-TS, with Cabinet** | 42x22½ | 232.90 | 242.20 | 248.50 | 257.80 | 265 |
| **5-103 or 5-106, Sink Only, less all trim** | 42x22½ | 83.00 | 92.30 | 83.00 | 92.30 | 160 |
| **No. 4222-L or No. 4222-R Cabinet Only** | 42x21¾ | 107.90 | — | 123.50 | — | 96 |

For aerator on spout... . . . . **Add $1.80**
For 8-324 ¼" tailpieces. . . **Per Pair, Add .48**
For SB Utility Basket ... .. . . . . **Add 3.52**
For CT Cutlery Tray... . **Add 3.22**
For STR Towel Rack . . . . **Add $12.00**
For CB Cutting Board..... . . . **Add 5.02**
If less 8-361 waste.. ..... **Each, Deduct 6.70**

*For sink traps and supply pipes, refer to Section 8. For waste disposal units, refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*



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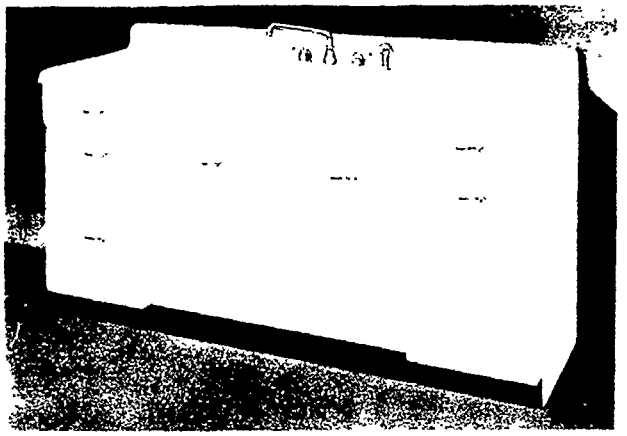
## ALLIANCEWARE PORCELAIN ENAMELED FORMED METAL CABINET SINKS



### 5-117-S ALLIANCEWARE

Sink: AllianceWare white acid-resisting porcelain enameled formed metal two-compartment ledge sink with back, depressed drainboards and two soap depressions.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 6640 CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

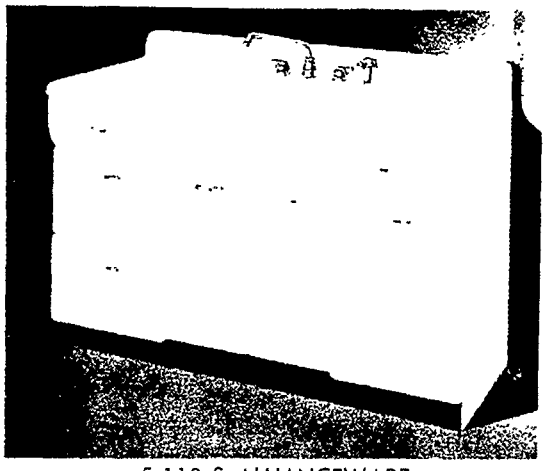
### 5-117 ALLIANCEWARE

Same, except with 8-84 Embassy supply fitting, less hose and spray, with 8-650 faucet hole cover. (Specify 8-84-A if with aerator.)

*Note: Sink supplies and traps are not included.*

**Overall Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Sink | 66x25" | Each basin | 15x17½x8" | Height of back | 4" |
| Cabinet | 66x24 5/16" | Height | 34½" (sets sink 36" floor to top of rim) | | |



### 5-118-S ALLIANCEWARE

Sink: AllianceWare white acid-resisting porcelain enameled formed metal single compartment ledge sink with back, depressed drainboards and soap depression.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

### 5-118 ALLIANCEWARE

Same, except with 8-84 Embassy supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

*Note: Sink supplies and traps are not included.*

**Overall Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Sink | 54x25" | Basin | 20x17½x7" | Height of back | 4" |
| Cabinet | 54x24 5/16" | Height | 34½" (sets sink 36" floor to top of rim | | |

No. 5440 and 6640 CRANE cabinets for AllianceWare sinks are arranged to accommodate the following accessories, when specified:

SB Utility Basket — STR Sliding Towel Rack
CT Plastic Cutlery Tray — CB Hardwood Cutting Board

*Refer to Page 5-16 for illustrations and descriptions.*

All exposed metal trim is chromium plated

### TRANSPORTATION CHARGES ON SINK CABINETS

(See Page 5-3 for details)

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|
| 5-117, with Cabinet | $270.34 | $291.70 | 286 |
| 5-117-S, with Cabinet | 277.66 | 299.02 | 286 |
| 5-117, Sink Only, less all trim | 94.00 | 94.00 | 101 |
| No. 6640 Cabinet Only | 143.16 | 164.52 | 176 |
| 5-118, with Cabinet | 217.42 | 237.58 | 257 |
| 5-118-S, with Cabinet | 225.32 | 245.48 | 257 |
| 5-118, Sink Only, less all trim | 58.90 | 58.90 | 80 |
| No. 5440 Cabinet Only | 132.62 | 152.78 | 163 |

| | |
|---|---|
| For aerator on spout | Add $1.80 |
| For 8-324 ¼" male tailpieces | Per Pair, Add .48 |
| For So Utility Basket | Add 3.52 |
| For CT Plastic Cutlery Tray | Add 3.22 |
| For STR Sliding Towel Rack | Add 12.00 |
| For CB Hardwood Cutting Board | Add 5.02 |
| If less 8-361 waste | Each, Deduct 6.70 |

*For sink traps, supply pipes and continuous wastes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*

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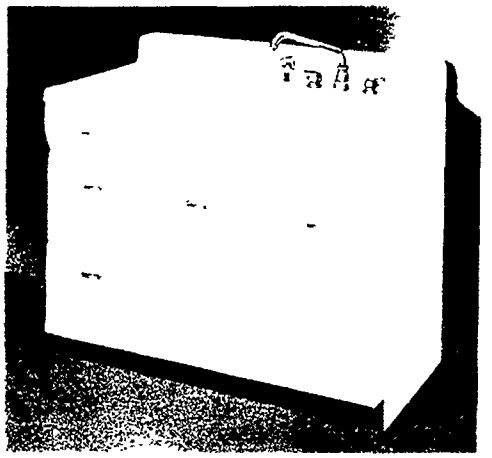
## ALLIANCEWARE FORMED METAL CABINET SINKS



5-121-S, with Left Hand Drainboard
5-122-S, with Right Hand Drainboard

Sink: AllianceWare white acid-resisting porcelain enameled formed metal, single compartment ledge sink with back, depressed drainboard and soap depression.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

5-121, with Left Hand Drainboard
5-122, with Right Hand Drainboard

Same, except with 8-84 Embassy supply fitting less hose and spray. (Specify 8-84-A if with aerator.)

*Refer to Page 5-16 for illustrations and descriptions.*

Overall Dimensions

| | | | | | |
|---|---|---|---|---|---|
| Sink | 42x25" | Basin | 20x17½x7" | Height of back | 4" |
| Cabinet | 42x24⅝" | Height | 34½" (sets sink 36" floor to top of rim) | | |

No. 4240 CRANE cabinet for AllianceWare sink is arranged to accommodate the following accessories, when specified:

SB Utility Basket — STR Sliding Towel Rack
CT Plastic Cutlery Tray — CB Hardwood Cutting Board

*Refer to Page 5-16 for illustrations and descriptions.*

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|
| 5-121 or 5-122, with Cabinet | $181.76 | $195.96 | 190 |
| 5-121-S or 5-122-S, with Cabinet | 189.66 | 203.86 | 190 |
| 5-121 or 5-122 Sink Only, less all trim | 58.30 | 58.30 | 63 |
| No. 4240-L or No. 4240-R Cabinet Only | 97.56 | 111.76 | 120 |

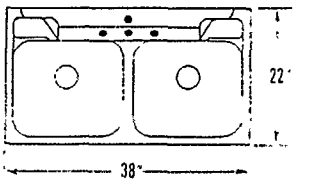
| | |
|---|---|
| For aerator on spout | Add $1.80 |
| For 8-324 $1\frac{1}{4}$" male tailpieces | Per Pair, Add .48 |
| For SB Utility Basket | Add 3.52 |
| For CT Plastic Cutlery Tray | Add 3.22 |
| For STR Sliding Towel Rack | Add 12.00 |
| For CB Hardwood Cutting Board | Add 5.02 |
| If less 8-361 waste | Deduct 6.70 |

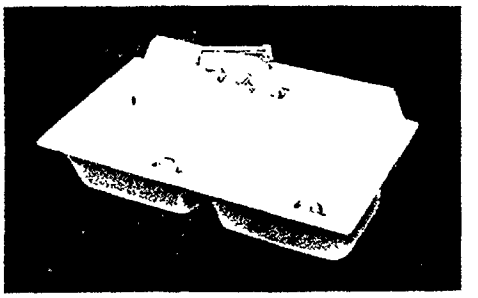
*For sink traps, supply pipes and continuous wastes, refer to Section 8.*

## ALL AMERICAN CAST IRON SINKS

*For Building into Fabricated Tops*

The overall size, large and deep twin basins, low height integral back, and wide flat rims of the All American are features that make it a most desirable style for building into fabricated sink tops. In addition, the beveled fixture panel is a feature found only in the most modern styles of CRANE sinks. The sink ends are offset to provide a more attractive and water tight installation. It is a practical design for use with Formica, Textolite, Micarta, linoleum or other covering materials for fabricated countertop installations.



5-124-S ALL AMERICAN

Sink: All American acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back, beveled fixture panel and two soap depressions, for counter top installation.

Trim: 8-60 Temple *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 Receptol basket strainers with stoppers and $1\frac{1}{2}$" tailpieces.

*Note: Sink supplies and traps are not included.*

Overall Dimensions

| | | | | | |
|---|---|---|---|---|---|
| Size | 38x22" | Each Basin | 17x15½x8" | Height of back | 4" |

All American sinks are available with alternate Temple supply fittings as described on Page 5-3. To order, specify catalog numbers as follows:

5-124 —with 8-62 or 8-62-A fitting.
5-124-T —with 8-68 or 8-68-A fitting.
5-124-TS—with 8-66 or 8-66-A fitting.

HUDEE stainless steel sink frames, for use with All American sinks, are illustrated on Page 5-21.

PRICES COMPLETE, less supplies and traps

| Catalog Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| 5-124 | $136.90 | $147.30 | 160 |
| 5-124-S | 143.90 | 154.30 | 161 |
| 5-124-T | 146.20 | 156.60 | 162 |
| 5-124-TS | 153.20 | 163.60 | 163 |

| | |
|---|---|
| For aerator on spout | Add $1.90 |
| For 8-324 $1\frac{1}{4}$" male tailpieces | Per Pair, Add .48 |
| If less 8-361 wastes | Each, Deduct 6.70 |

*For waste disposal units, refer to Pages 5-24 to 5-27.*



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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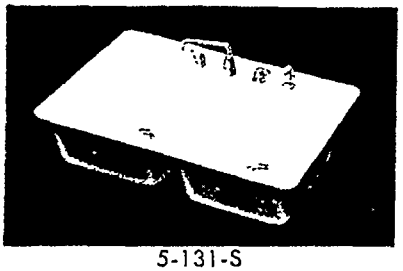
## CAST IRON FLAT RIM SINKS



5-131-S

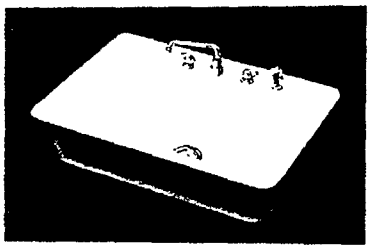
Sink: Acid-resisting porcelain enameled cast iron two-compartment flat rim sink with extended back ledge and two soap depressions.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

*Note: Sink supplies, traps and continuous wastes are not included.*

Overall Dimensions Size 32x21" Basin sizes. . . . 14½x15½x8"



5-136-S

Sink: Acid-resisting porcelain enameled cast iron flat rim sink with extended back ledge and *two soap depressions.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

*Note: Sink supplies and trap are not included.*

Overall Dimensions: Size. . . .24x21" Basin size. . . . . 21½x15½x8"
Size . . . . .30x21" Basin size. . . . . 27½x15½x8"
*24x21" size does not have soap depressions.

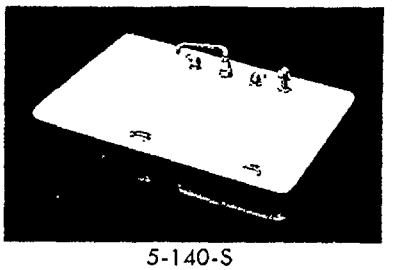
Cast iron flat rim sinks are available with alternate Embassy supply fittings as illustrated on Page 5-5; to order (specify catalog number as follows.:

| Two Basin | | Single Basin |
|---|---|---|
| 5-131 | —with 8-84 or 8-84-A fitting— | 5-136 |
| 5-131-T | —with 8-85 or 8-85-A fitting— | 5-136-T |
| 5-131-TS | —with 8-89 or 8-89-A fitting— | 5-136-TS |

PRICES COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 5-131 | 32x21 | $108.80 | $117.20 | 113 |
| 5-131-S | 32x21 | 116.70 | 125.10 | 114 |
| 5-131-T | 32x21 | 116.60 | 125.00 | 114 |
| 5-131-TS | 32x21 | 124.90 | 133.30 | 115 |
| 5-131, Ware Only | 32x21 | 76.20 | 84.60 | 105 |
| 5-136 | 24x21 | 71.30 | 76.30 | 81 |
| | 30x21 | 79.30 | 85.20 | 101 |
| 5-136-S | 24x21 | 79.20 | 84.20 | 82 |
| | 30x21 | 87.20 | 93.10 | 102 |
| 5-136-T | 24x21 | 79.10 | 84.10 | 82 |
| | 30x21 | 87.10 | 93.00 | 102 |
| 5-136-TS | 24x21 | 87.40 | 92.40 | 83 |
| | 30x21 | 95.40 | 101.30 | 103 |
| 5-136, Ware Only | 24x21 | 45.40 | 50.40 | 75 |
| | 30x21 | 53.40 | 59.30 | 95 |

## FORMED METAL FLAT RIM SINKS



5-140-S

Sink: AllianceWare white acid-resisting porcelain enameled formed metal two-compartment flat rim sink with extended back ledge.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

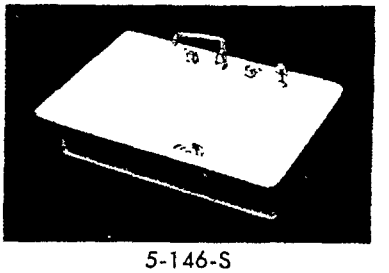
Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

*Note: Sink supplies, traps, and continuous wastes are not included.*

5-140

Same except with 8-84 Embassy supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

Overall Dimensions: Size . . .32x21" Basin Sizes 13½x14x8"



5-146-S

Sink: AllianceWare white acid-resisting porcelain enameled formed metal flat rim sink with extended back ledge.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

*Note: Sink supplies and trap are not included.*

5-146

Same except with 8-84 Embassy supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

Overall Dimensions: Size. . . . . 24x21" Basin Size 20½x14½x8"
Size. . . . 30x21" Basin Size. . . 26½x14½x8"

PRICE COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | Price, Each White | Shpg. Wt. Pounds |
|---|---|---|---|
| 5-140 | 32x21 | $78.00 | 47 |
| 5-140-S | 32x21 | 85.90 | 48 |
| 5-140, Ware Only | 32x21 | 45.40 | 39 |
| 5-146 | 24x21 | 49.40 | 37 |
| | 30x21 | 52.70 | 43 |
| 5-146-S | 24x21 | 57.30 | 38 |
| | 30x21 | 60.60 | 44 |
| 5-146, Ware Only | 24x21 | 23.50 | 29 |
| | 30x21 | 26.80 | 35 |

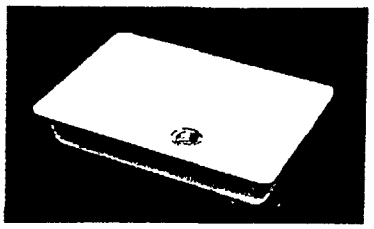
For aerator on spout. . . . . Add $1.80
For 8-324 ¼" male tailpieces. . . . . Per Pair, Add .48
If less 8-361 waste . . . . . Each, Deduct 6.70

*For sink traps and continuous wastes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*
*For HUDEE stainless steel sink frames, refer to Page 5-23.*

*Prices are subject to change without notice.*

Printed in U.S.A. LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## PORCELAIN ENAMELED CAST IRON



**5-150**

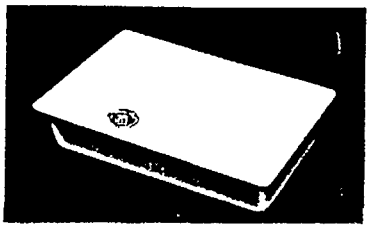
Sink: Acid-resisting porcelain enameled cast iron flat rim center outlet sink.

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sizes | 24x20" | Basin Sizes | 21½x17½x6" |
| | 30x20" | | 27½x17½x6" |



**5-155**

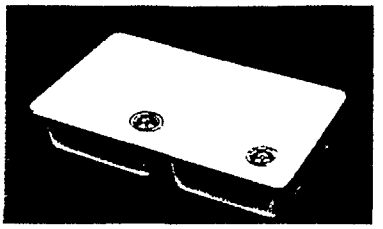
Sink: Acid-resisting porcelain enameled cast iron flat rim end outlet sink.

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sizes | 24x18" | Basin Sizes | 21½x15½x6" |
| | 24x20" | | 21½x17½x6" |
| | 30x18" | | 27½x15½x6" |
| | 30x20" | | 27½x17½x6" |



**5-160**

Sink: Acid-resisting porcelain enameled cast iron two-compartment flat rim sink with center outlets.

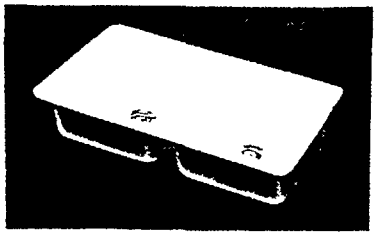
Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

*Note: Sink traps are not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sizes | 32x20" | Basin Sizes | 14x17½x8" |
| | 42x20" | | 19x17½x8" |

## PORCELAIN ENAMELED FORMED METAL



**5-165**

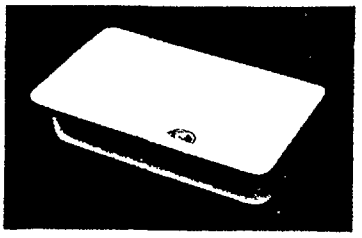
Sink: AllianceWare white acid-resisting porcelain enameled formed metal two-compartment flat rim sink with center outlets.

Wastes: Two 8-361 Receptol basket strainers with stoppers and 1½" tailpieces.

*Note: Sink traps are not included.*

Overall Dimensions

Size . . 32x18" Basin Sizes . 13 7/16x14x8"



**5-168**

Sink: AllianceWare white acid-resisting porcelain enameled formed metal center outlet sink.

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

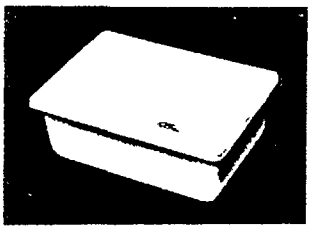
*Note: Sink trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sizes... | 24x18" | Basin Sizes... | 20⅞x14⅞x8" |
| | 30x18" | | 26⅞x14⅞x8" |

## DURACLAY

*Earthenware, Vitreous Glazed*



**5-180**

Sink: Duraclay, earthenware vitreous glazed, flat rim center outlet sink.

Waste: 8-361 Receptol basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

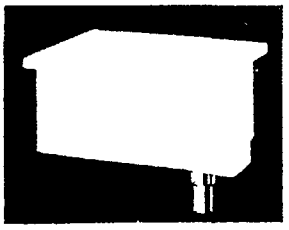
Overall Dimensions

| | | | |
|---|---|---|---|
| Sizes . | 20x18" | Basin Sizes | 16⅛x14x6½" |
| | 24x18" | | 21x15x8" |

HUDEE stainless steel sink frames are available for porcelain enameled cast iron and formed metal sinks—refer to Page 5-23 for details.

## VITREOUS CHINA

For Installation Under Countertops



**5-186**

Sink: Vitreous china end outlet flat rim sink with integral overflow. (Top of rim is unglazed, for installation under countertop.)

Waste: 8-353 P.O. plug with perforated open strainer and 1½" tailpiece.

*Note: Sink trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Sink Sizes. | 12x8" | Basin Sizes. | 9x5x5" |
| | 15x12" | | 12¼x9¼x6" |
| | 20x14" | | 17x11x8" |

All exposed metal trim is chromium plated.

### PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 5-150 | 24x20 | $35.60 | $38.70 | 57 |
| | 30x20 | 41.60 | 45.40 | 82 |
| 5-155 | 24x18 | 34.20 | 37.20 | 52 |
| | 24x20 | 35.60 | 38.70 | 57 |
| | 30x18 | 37.60 | 41.00 | 72 |
| | 30x20 | 40.50 | 44.20 | 80 |
| 5-160 | 32x20 | 71.40 | 77.80 | 120 |
| | 42x20 | 88.90 | 97.40 | 145 |
| 5-165 | 32x18 | 53.50 | — | 39 |
| 5-168 | 24x18 | 25.20 | — | 30 |
| | 30x18 | 29.90 | — | 34 |
| 5-180 | 20x18 | 39.00 | 55.20 | 62 |
| | 24x18 | 47.70 | 68.20 | 82 |
| 5-186 | 12x8 | 33.70 | — | 30 |
| | 15x12 | 42.10 | — | 36 |
| | 20x14 | 60.38 | — | 47 |

If less 8-361 waste . . . . . Each, Deduct $6.70

If less 8-353 waste . . . . . Each, Deduct 4.50

*For sink traps and continuous wastes, refer to Section 8.*

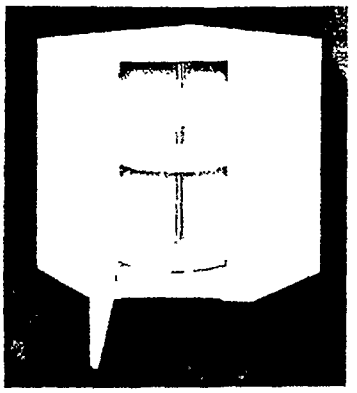
*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

## CRANE CORNER WALL CABINETS



No. R30CW, Open View

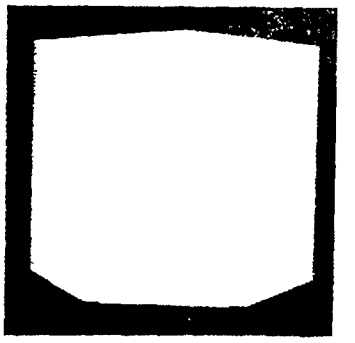
**No. R30CW, *With Revolving Shelves***
CRANE baked white enamel steel corner wall cabinet, 30⅛" high, with two adjustable, revolving shelves and concealed hangers; door hinged at left.

| Catalog Number | Width of backs | Depth at sides |
|---|---|---|
| R30CW | 25" | 13" |

Shelves have turned up edges with roll rims—they revolve on a ball bearing shaft.

**No. 30CW, *with Adjustable Shelves***
CRANE baked white enamel steel corner wall cabinet, 30⅛" high, with two adjustable shelves and concealed hangers; door hinged at left.

| Catalog Number | Width of backs | Depth at sides |
|---|---|---|
| 30CW | 25" | 13" |



No. 30CW

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

PRICE EACH

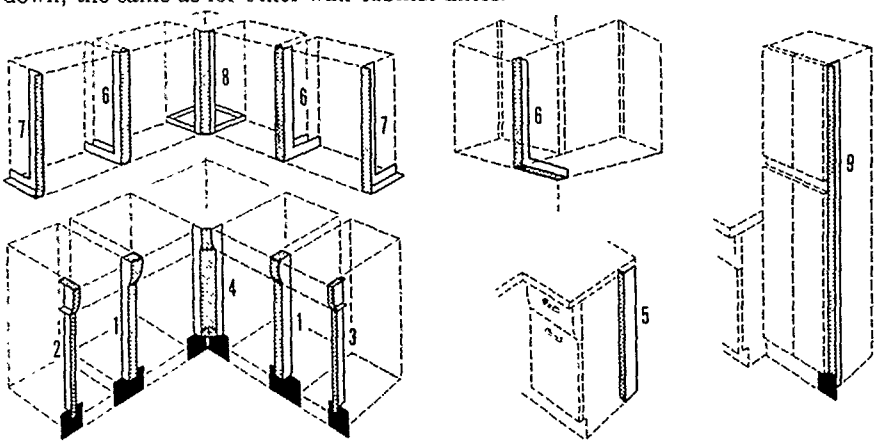
| Catalog Number | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| R30CW | 25x30⅛ | $87.76 | $95.92 | 70 |
| 30CW | 25x30⅛ | 58.12 | 66.46 | 73 |

## FILLER PIECES FOR CRANE KITCHEN CABINETS

Filler pieces are die formed with curved contours and rounded edges to match the contours of Crane cabinets. They are installed flush with the front of doors and drawers.

Base cabinet filler pieces have a white baked enamel vertical piece and black toe plate.

Vertical and horizontal pieces for wall cabinets have a white baked enamel finish. Corner filler pieces for wall cabinets are installed with the flat bottom piece face down, the same as for other wall cabinet fillers.

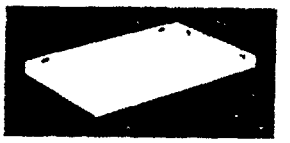



FILLERS—Sizes and Applications

| Symbol | Catalog Number | Type of Filler | Size, Inches Width | Size, Inches Height |
|---|---|---|---|---|
| FOR BASE CABINETS | | | | |
| 1 | IBF-1 | Inside | 1 | 34½ |
| 1 | IBF-2 | Inside | 2 | 34½ |
| 2 | SBF-L | Scribe | 3 | 34½ |
| 3 | SBF-R | Scribe | 3 | 34½ |
| 4 | CBF | Corner | 1 11/16x1 11/16 | 34½ |
| 5 | 7½RCB | Scribe | 7½ | 34½ |
| FOR WALL CABINETS | | | | |
| 6 | IWF-18-1 | Inside | 1 | 18⅛ |
| 6 | IWF-18-2 | Inside | 2 | 18⅛ |
| 6 | IWF-30-1 | Inside | 1 | 30⅛ |
| 6 | IWF-30-2 | Inside | 2 | 30⅛ |
| 7 | SWF-12 | Scribe | 3 | 12⅛ |
| 7 | SWF-18 | Scribe | 3 | 18⅛ |
| 7 | SWF-30 | Scribe | 3 | 30⅛ |
| 8 | CWF-18 | Corner | 14x14 | 18⅛ |
| 8 | CWF-30 | Corner | 14x14 | 30⅛ |
| FOR BROOM CABINETS | | | | |
| 9 | SF81 | Scribe | 3 | 81 |

## SNAP-IN BOTTOMS

Snap in bottoms have elongated holes to match the protruding buttons in the recessed bottoms of cabinets.



CRANE baked white enamel steel snap-in bottom.

| Catalog Number | Size, Inches | For Cabinets Numbered |
|---|---|---|
| B-15 | 15x13 | 1530-L or R; 5430W (2) |
| B-18 | 18x13 | 1830-L or R |
| B-21 | 21x13 | 2118; 2130 |
| B-24 | 24x13 | 2418; 2430; 24BCW; 5430W (1) |
| B-27 | 27x13 | 2730 |
| B-30 | 30x13 | 3018; 3030 |
| B-36 | 36x13 | 3612; 3615; 3618; 3630 |
| B-CW | 25x25 | 30CW; R30CW |

PRICE, EACH

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds | Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|
| B-15 | 15x13 | $5.62 | 3 | CBF | 1 11/16x1 11/16x34½ | $11.46 | 4 |
| B-18 | 18x13 | 5.76 | 3½ | 7½RCB | 7½x34½ | 7.76 | 3 |
| B-21 | 21x13 | 6.62 | 3½ | IWF-18-1 | 1x18⅛ | 8.20 | 1¾ |
| B-24 | 24x13 | 6.88 | 4 | IWF-18-2 | 2x18⅛ | 8.20 | 2 |
| B-27 | 27x13 | 7.62 | 4½ | IWF-30-1 | 1x30⅛ | 8.20 | 2½ |
| B-30 | 30x13 | 8.26 | 5 | IWF-30-2 | 2x30⅛ | 8.20 | 2¾ |
| B-36 | 36x13 | 8.50 | 7½ | SWF-12 | 3x12⅛ | 8.20 | 1 |
| B-CW | 25x25 | 11.26 | 8½ | SWF-18 | 3x18⅛ | 8.20 | 1½ |
| IBF-1 | 1x34½ | 8.20 | 2½ | SWF-30 | 3x30⅛ | 8.20 | 3 |
| IBF-2 | 2x34½ | 8.20 | 3 | CWF-18 | 14x14x18⅛ | 11.46 | 4½ |
| SBF-L | 3x34½ | 8.20 | 2½ | CWF-30 | 14x14x30⅛ | 11.46 | 5½ |
| SBF-R | 3x34½ | 8.20 | 2½ | SF-81 | 3x81 | 18.16 | 6½ |

*Prices are subject to change without notice.*

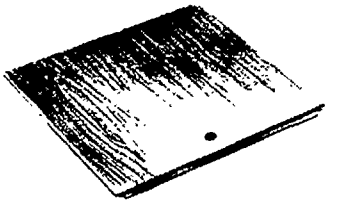
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# ACCESSORIES FOR CRANE KITCHEN CABINETS

**CT Cutlery Tray**
White plastic cutlery tray.

Can be used in drawers of 15" and 30" wide base cabinets.

Size, Inches.....11 5/8x12 5/8x1 5/16



**CB Cutting Board**
Hardwood cutting board.

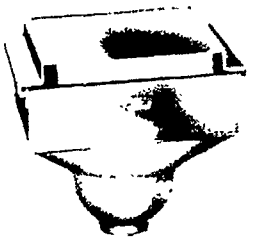
Can be used in drawers of 15" and 30" wide base cabinets.

Size, Inches.....11 3/4x11 3/4x 1/2

**BBC Bread Drawer Cover**
Sheet tin bread drawer sliding cover.

Can be used in drawers of 15" and 30" wide base cabinets.

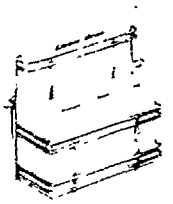
Size, Inches.....11 15/16x19 1/2



**SFB Flour Dispenser**
Sheet tin flour dispenser with crank handle sifter and screws.

Attaches to underside of shelf in wall cabinets; slides in and out of cabinet.

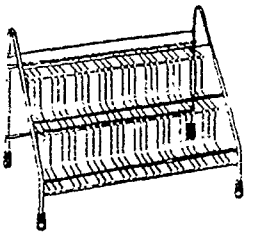
Size, Inches.....11x10 1/8x9 1/2



**RF Recipe Card Rack**
Bright zinc plated recipe card rack, with screws, 100 3x5" ruled cards with guides and two memo pads.

Attaches to inside of wall cabinet doors.

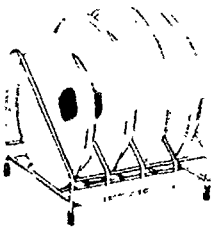
Size, Inches.....6 3/4x2 1/4x4 1/4



**WCR Step Shelf**
Bright zinc plated condiment step shelf, with rubber tipped feet.

Stored on shelf in wall cabinet.

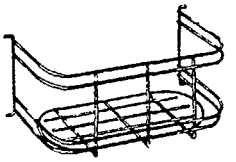
Size, Inches.....10 1/4x8 1/4x7 3/4



**LF Pan Rack**
Bright zinc plated cake pan and lid rack, with rubber tipped feet.

Stored on shelf in wall cabinet or base cabinet.

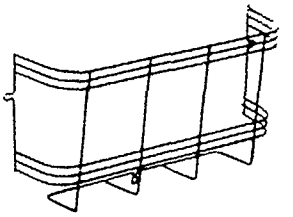
Size, Inches.....8 3/4x8 1/4x7 3/4



**SB Utility Basket**
Bright zinc plated utility basket, snap-in attachment prongs.

Attaches to inside of base cabinet doors.

Size, Inches.....8 1/8x3 3/8x3 7/8



**LR-12 Lid Rack**
Bright zinc plated lid rack, with screws.

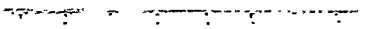
Attaches to inside of base cabinet doors.

LR-12 Size, Inches.....12 3/8x3x7
LR-16 Size, Inches.....16 1/4x3x7

**STR Sliding Towel Rack**
Cadmium plated sliding towel rack, with clip-on attachment prongs.

Attaches to inside partition of undersink cabinets.

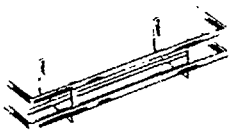
Size, Inches.....16x4 1/2x2



**CH-17 Cup Hook Rack**
Cadmium plated cup hook rack, with attachment adhesive.

Attaches to underside of shelf in wall cabinets.

CH-17 Length, Inches...17 No. of Hooks..6
CH-20 Length, Inches...20 No. of Hooks..6
CH-23 Length, Inches...23 No. of Hooks..8



**CR Condiment Rack**
Cadmium plated condiment rack, with screws.

Attaches to inside of door on wall cabinets.

Size, Inches.....9 1/2x3x2

## PRICE, EACH

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| BBC | 11 15/16x19 1/2 | $3.76 | 3/4 |
| CB | 11 3/4x11 3/4x1/2 | 5.02 | 1 3/8 |
| CH17 | 17 | 3.16 | 1/4 |
| CH20 | 20 | 3.38 | 1/3 |
| CH23 | 23 | 3.52 | 1/3 |
| CR | 9 1/2x3x2 | 3.52 | 3/4 |
| CT | 11 5/8x12 5/8x1 5/16 | 3.22 | 1 1/2 |
| LF | 8 3/4x8 1/4x7 3/4 | 5.40 | 2 1/4 |
| LR12 | 12 3/8x3x7 | 3.22 | 3/4 |
| LR16 | 16 1/4x3x7 | 3.38 | 3/4 |
| RF | 6 3/4x2 1/4x4 1/4 | 4.88 | 1 1/2 |
| SB | 8 1/8x3 3/8x3 7/8 | 3.52 | 1/2 |
| SFB | 11x10 1/8x9 1/2 | 12.38 | 1 1/4 |
| STR | 16x4 1/2x2 | 12.00 | 5 1/2 |
| WCR | 10 1/4x8 1/4x7 3/4 | 5.62 | 2 |

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price

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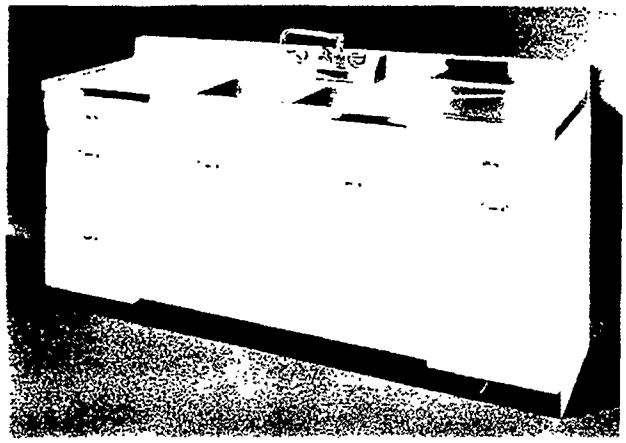
# LUSTERTONE STAINLESS STEEL CABINET SINKS



## 5-221-S KITCHEN QUEEN, Stainless Steel

Sink: **Kitchen Queen** Lustertone stainless steel two-compartment sink with back, drainboards, beveled fixture panel and concealed wall clips.

Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two LK-35 **Duo** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

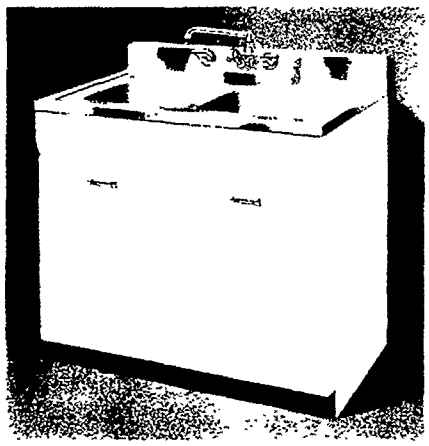
*Note: Sink traps are not included.*

## 5-221 KITCHEN QUEEN, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator.)

**Overall Dimensions**

Sink . . . . 72x25" Each Basin.. 16x13½x7½" Height of back . 4"
Cabinet.. 72x24 5/16" Height. .34½" (sets sink 36" floor to top of rim)



## 5-223-S KITCHEN PRIDE, Stainless Steel

Sink: **Kitchen Pride** Lustertone stainless steel two-compartment sink with back, beveled fixture panel and concealed wall clips.

Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two LK-35 **Duo** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 3800 **CRANE** baked white enamel steel cabinet with sink clamps.

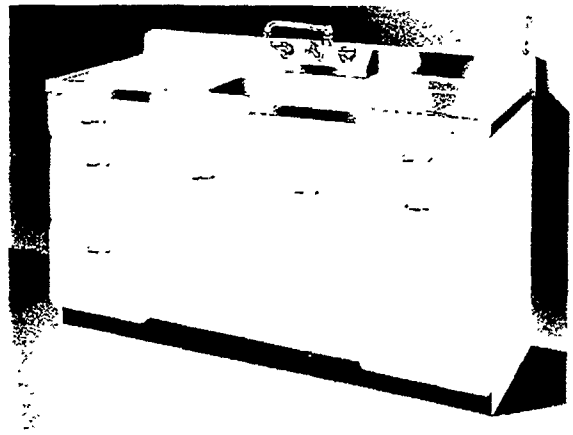
*Note: Sink traps are not included.*

## 5-223 KITCHEN PRIDE, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator.)

**Overall Dimensions**

Sink . . . . .38x25" Each Basin...16x13½x7½" Height of back. .4"
Cabinet...38x24 5/16" Height...34½" (sets sink 36" floor to top of rim)



## 5-225-S SUNNYDAY, Stainless Steel

Sink: **Sunnyday** Lustertone stainless steel single compartment sink with back, drainboards, beveled fixture panel and concealed wall clips.

Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Waste: LK-35 **Duo** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink trap is not included.*

## 5-225 SUNNYDAY, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator..

**Overall Dimensions**

| Sink | Basin | Back | Cabinet | Cabinet Height | Sink, floor to rim |
|---|---|---|---|---|---|
| 54x25" | 16x18x7½" | 4" | 54x24 5/16" | 34½" | 36" |
| 60x25" | 16x18x7½" | 4" | 60x24 5/16" | 34½" | 36" |

Cabinets are arranged to accommodate the following accessories, when specified:

Nos. 7240, 5440 or 6040—**SB** Utility Basket; **CT** Cutlery Tray; **CB** Hardwood Cutting Board and **STR** Sliding Towel Rack.

No. 3800—**SB** Utility Basket.

*Refer to Page 5-16 for illustrations and descriptions.*

## TRANSPORTATION CHARGES ON SINK CABINETS

(See Page 5-3 for details)

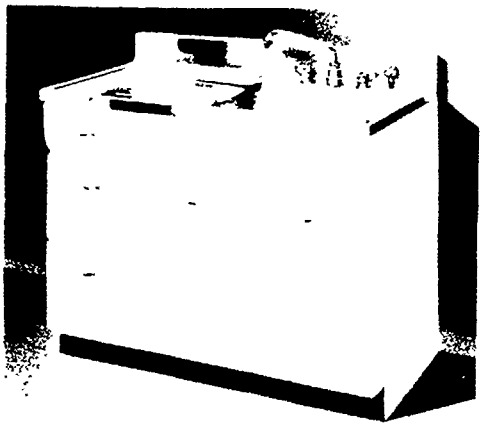
### PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **5-221, with Cabinet** | 72x25 | $546.62 | $571.94 | 300 |
| **5-221-S, with Cabinet** | 72x25 | 553.62 | 578.94 | 301 |
| **No. 7240 Cabinet Only** | 72x24 5/16 | 168.42 | 193.74 | 182 |
| **5-223, with Cabinet** | 38x25 | 488.64 | 497.54 | 148 |
| **5-223-S, with Cabinet** | 38x25 | 495.64 | 504.54 | 149 |
| **No. 3800 Cabinet Only** | 38x24 5/16 | 68.68 | 77.58 | 95 |
| **5-225, with Cabinet** | 54x25 | 433.30 | 453.46 | 241 |
| | 60x25 | 447.66 | 468.32 | 264 |
| **5-225-S, with Cabinet** | 54x25 | 440.30 | 460.46 | 242 |
| | 60x25 | 454.66 | 475.32 | 265 |
| **No. 5440 Cabinet Only** | 54x24 5/16 | 132.62 | 152.78 | 163 |
| **No. 6040 Cabinet Only** | 60x24 5/16 | 137.78 | 158.44 | 169 |

For aerator on spout.....**Add $1.90**
For **8-324** ¼" male tailpieces .....***Per Pair, Add*** **.48**
For **SB** Utility Basket.....**Add 3.52**
For **CT** Plastic Cutlery Tray.....**Add 3.22**
For **STR** Sliding Towel Rack.....**Add 12.00**
For **CB** Hardwood Cutting Board.....**Add 5.02**
If less **LK-35** strainers.....**Each, Deduct 4.88**

*For traps and supply pipes, refer to Section 8.*

# LUSTERTONE STAINLESS STEEL CABINET SINKS



5-229-S, with Left Hand Drainboard
5-230-S, with Right Hand Drainboard

Sink: Lustertone stainless steel single compartment ledge sink with back, drainboard and wall clips.

Trim: 8-88 Embassy *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 Duo basket strainer with 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

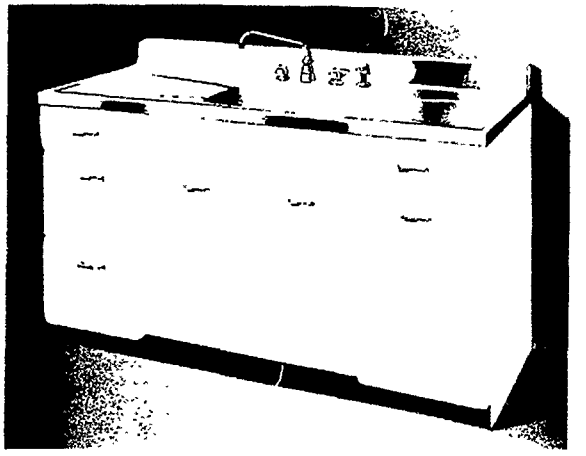
*Note: Sink trap is not included.*

5-229, with Left Hand Drainboard
5-230, with Right Hand Drainboard

Same, except with 8-84 Embassy supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

Overall Dimensions

| | | | | |
|---|---|---|---|---|
| Sink | 42x25" | Basin | 13½x16x7½" | Height of back...4" |
| Cabinet | 42x24 5/16" | Height...34½" (sets sink 36" floor to top of rim) | | |



5-231-S

Sink: Lustertone stainless steel single compartment ledge sink with back, drainboards and wall clips.

Trim: 8-88 Embassy *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 Duo basket strainer with 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink), No. 6040 (for 60" sink), No. 6640 (for 66" sink) or No. 7240 (for 72" sink) CRANE baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink trap is not included.*

5-231

Same, except with 8-84 Embassy supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

Overall Dimensions

| Sink Size | Basin Size | Sink Back | Cabinet Size | Cabinet Height |
|---|---|---|---|---|
| *54x25" | 18x16" or 20x18" | 4" | 54x24 5/16" | 34½" (sets sink rim 36" from floor) |
| *60x25" | 18x16" or 20x18" | 4" | 60x24 5/16" | |
| 66x25" | 18x16" | 4" | 66x24 5/16" | |
| *72x25" | 18x16" or 20x18" | 4" | 72x24 5/16" | |

Depth of basins 7½" *When ordering specify sink size and basin size.

Cabinets are arranged to accommodate the following accessories, when specified:
SB Utility Basket CB Hardwood Cutting Board CT Plastic Cutlery Tray STR Sliding Towel Rack

TRANSPORTATION CHARGES ON SINK CABINETS *(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Size, Inches | Basin Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 5-229 or 5-230, with Cabinet | 42x25 | 13½x16x7½ | $266.02 | $280.22 | 170 |
| 5-229-S or 5-230-S, with Cabinet | 42x25 | 13½x16x7½ | 273.92 | 288.12 | 171 |
| 5-231, with Cabinet | 54x25 | 18x16x7½ | 335.12 | 355.28 | 234 |
| | 54x25 | 20x18x7½ | 350.28 | 370.44 | 234 |
| | 60x25 | 18x16x7½ | 350.70 | 371.36 | 245 |
| | 60x25 | 20x18x7½ | 365.86 | 386.52 | 245 |
| | 66x25 | 18x16x7½ | 370.48 | 391.84 | 257 |
| | 72x25 | 18x16x7½ | 398.52 | 423.84 | 268 |
| | 72x25 | 20x18x7½ | 413.68 | 439.00 | 268 |
| 5-231-S, with Cabinet | 54x25 | 18x16x7½ | 343.02 | 363.18 | 235 |
| | 54x25 | 20x18x7½ | 358.18 | 378.34 | 235 |
| | 60x25 | 18x16x7½ | 358.60 | 379.26 | 246 |
| | 60x25 | 20x18x7½ | 373.76 | 394.42 | 246 |
| | 66x25 | 18x16x7½ | 378.38 | 399.74 | 258 |
| | 72x25 | 18x16x7½ | 406.42 | 431.74 | 269 |
| | 72x25 | 20x18x7½ | 421.58 | 446.90 | 269 |

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| No. 4240-L Cabinet Only | 42x24 5/16 | $97.56 | $111.76 | 120 |
| No. 4240-R Cabinet Only | 42x24 5/16 | 97.56 | 111.76 | 120 |
| No. 5440 Cabinet Only | 54x24 5/16 | 132.62 | 152.78 | 163 |
| No. 6040 Cabinet Only | 60x24 5/16 | 137.78 | 158.44 | 169 |
| No. 6640 Cabinet Only | 66x24 5/16 | 143.16 | 164.52 | 176 |
| No. 7240 Cabinet Only | 72x24 5/16 | 168.42 | 193.74 | 182 |

| | |
|---|---|
| For aerator on spout | Add $1.80 |
| For 8-324 1¼" male tailpieces | Per Pair, Add .48 |
| For SB Utility Basket | Add 3.52 |
| For CT Plastic Cutlery Tray | Add 3.22 |
| For STR Sliding Towel Rack | Add 12.00 |
| For CB Hardwood Cutting Board | Add 5.02 |
| If less LK-35 Strainers | Deduct 4.88 |
| If less 8-84 Embassy Trim (where described) | Deduct 19.20 |
| If less 8-88 Embassy Trim (where described) | Deduct 27.10 |

For sink traps and supplies, refer to Section 8.

For cabinet accessories, refer to Page 5-16.



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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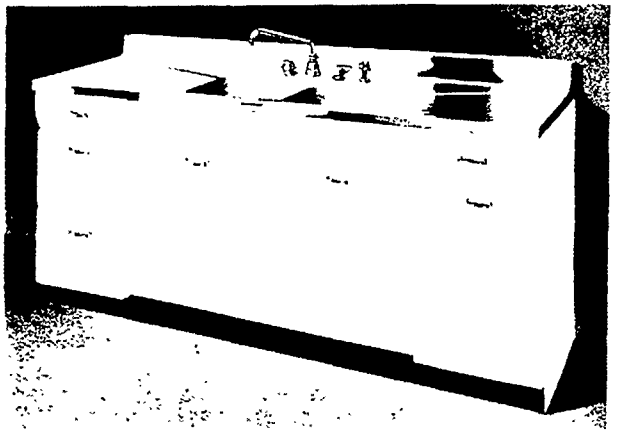
## LUSTERTONE STAINLESS STEEL CABINET SINKS



5-232-S

**5-232-S**

Sink: **Lustertone** stainless steel two-compartment ledge sink with back, drainboards and wall clips.
Trim: 8-88 **Embassy** *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpiece.
Cabinet: No. 6040 (for 60" sink), No. 6640 (for 66" sink) or No. 7240 (for 72" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink traps are not included.*

**5-232**

Same, except with 8-84 **Embassy** supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

*Overall Dimensions*

| Sink Size | Basin Sizes | Sink Back | Cabinet Size | Cabinet Height |
|---|---|---|---|---|
| 60x25" | 13½x16" | 4" | 60x24 5/16" | 34½" (sets |
| *66x25" | 13½x16" or 16x18" | 4" | 66x24 5/16" | sink rim 36" |
| *72x25" | 13½x16" or 16x18" | 4" | 72x24 5/16" | from floor |

Depth of basins....7½" *When ordering specify sink size and basin size.

### TRANSPORTATION CHARGES ON SINK CABINETS *(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Size, Inches | Basin Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 5-232, with Cabinet | 60x25 | 13½x16x7½ | $401.04 | $421.70 | 247 |
| | 66x25 | 13½x16x7½ | 415.64 | 437.00 | 259 |
| | 66x25 | 16x18x7½ | 453.52 | 474.88 | 259 |
| | 72x25 | 13½x16x7½ | 452.44 | 477.76 | 270 |
| | 72x25 | 16x18x7½ | 490.32 | 515.64 | 270 |
| 5-232-S, with Cabinet | 60x25 | 13½x16x7½ | 408.94 | 429.60 | 248 |
| | 66x25 | 13½x16x7½ | 423.54 | 444.90 | 260 |
| | 66x25 | 16x18x7½ | 461.42 | 482.78 | 260 |
| | 72x25 | 13½x16x7½ | 460.34 | 485.66 | 271 |
| | 72x25 | 16x18x7½ | 498.22 | 523.54 | 271 |

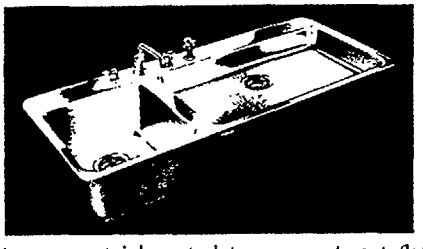
If less **8-84 Embassy** trim (where described)..... **Deduct $19.20**

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **No. 6040 Cabinet Only** | 60x24 5/16 | $137.78 | $158.44 | 169 |
| **No. 6640 Cabinet Only** | 66x24 5/16 | 143.16 | 164.52 | 176 |
| **No. 7240 Cabinet Only** | 72x24 5/16 | 168.42 | 193.74 | 182 |

For aerator on spout..... **Add $1.80**
For **8-324** ¼" male tailpieces..... **Per Pair, Add .48**
For **SB** Utility Basket..... **Add 3.52**
For **CT** Plastic Cutlery Tray..... **Add 3.22**
For **CB** Hardwood Cutting Board..... **Add 5.02**
For **STR** Sliding Towel Rack..... **Add 12.00**
If less **LK-35** Strainers..... **Each, Deduct 4.88**

If less **8-88 Embassy** trim (where described).. **Deduct $27.10**

## LUSTERTONE STAINLESS STEEL DEEP AND SIT-DOWN BOWL SINKS



**LS-3221-RS,**
**With Shallow Bowl at Right**

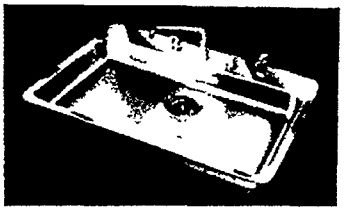
**LS-3221-LS,**
**With Shallow Bowl at Left**

Sink: **Lustertone** stainless steel two-compartment flat rim sink with extended back ledge, deep bowl and shallow "sit-down" bowl.
Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpieces.

*Note: Sink traps are not included.*

**LS-3221-R, with shallow bowl at right**
**LS-3221-L, with shallow bowl at left**

Same, except with 8-84 **Embassy** supply less spray. (Specify 8-84-A if with aerator.)



LS-1621-S

Sink: **Lustertone** stainless steel flat rim "sit-down" sink with extended back ledge.
Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

*Note: Sink trap is not included.*

**LS-1621**

Same, except with 8-84 **Embassy** supply less spray. (Specify 8-84-A if with aerator.)

PRICES COMPLETE, less supplies and traps

| Catalog Number | Overall Size, Inches | Deep Bowl, Inches | Shallow Bowl, Inches | Price, Each | Shpg. Weight Pounds | Add for Hudee Frame |
|---|---|---|---|---|---|---|
| LS-3221-R or L | 32x21 | 13½x16x7½ | 13½x16x3½ | $145.50 | 31 | $10.88 |
| LS-4021-R or L | 40x21 | 13½x16x7½ | 22x16x3½ | 156.22 | 33 | 20.92 |
| LS-4221-R or L | 42x21 | 18x16x7½ | 18x16x3½ | 154.80 | 35 | 12.16 |
| LS-4621-R or L | 46x21 | 13½x16x7½ | 28x16x3½ | 185.92 | 39 | 20.92 |
| LS-4821-R or L | 48x21 | 22x16x7½ | 22x16x3½ | 165.98 | 42 | 20.92 |
| LS-3221-RS or LS | 32x21 | 13½x16x7½ | 13½x16x3½ | 153.40 | 32 | 10.88 |
| LS-4021-RS or LS | 40x21 | 13½x16x7½ | 22x16x3½ | 164.12 | 34 | 20.92 |
| LS-4221-RS or LS | 42x21 | 18x16x7½ | 18x16x3½ | 162.70 | 36 | 12.16 |
| LS-4621-RS or LS | 46x21 | 13½x16x7½ | 28x16x3½ | 193.82 | 40 | 20.92 |
| LS-4821-RS or LS | 48x21 | 22x16x7½ | 22x16x3½ | 173.88 | 43 | 20.92 |

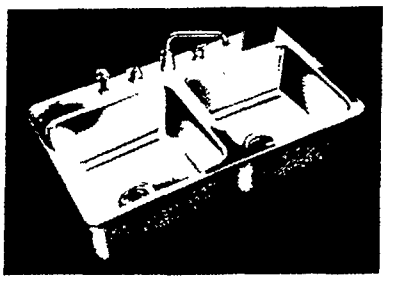
| Catalog Number | Overall Size, Inches | Bowl Size, Inches | Price, Each | Shpg. Weight Pounds | Add for Hudee Frame |
|---|---|---|---|---|---|
| LS-1621 | 16x21 | 13½x16x3½ | $85.12 | 19 | $10.36 |
| LS-2121 | 21x21 | 18x16x3½ | 90.00 | 21 | 10.58 |
| LS-2421 | 24x21 | 22x16x3½ | 95.86 | 22 | 10.12 |
| LS-3021 | 30x21 | 28x16x3½ | 125.56 | 23 | 10.58 |
| LS-1621-S | 16x21 | 13½x16x3½ | 93.02 | 20 | 10.36 |
| LS-2121-S | 21x21 | 18x16x3½ | 97.90 | 22 | 10.58 |
| LS-2421-S | 24x21 | 22x16x3½ | 103.76 | 23 | 10.12 |
| LS-3021-S | 30x21 | 28x16x3½ | 133.46 | 24 | 10.58 |

For aerator on spout. **Add $1.80** For **8-324** ¼" male tailpieces.. **Per Pair, Add $.48** If less **LK-35** strainer..... **Deduct, Each $4.88**

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## LUSTERTONE STAINLESS STEEL FLAT RIM SINKS



L-2817-S

Sink: **Lustertone** stainless steel two-compartment flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. Specify 8-88-A if with aerator.

Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpieces.

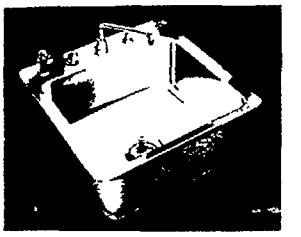
*Note: Sink traps are not included.*

L-2817

Same, except with 8-84 **Embassy** supply fitting less spray. (Specify 8-84-A if with aerator.)

Overall Dimensions

| Catalog Numbers | Size | Each Basin |
|---|---|---|
| L-2817 or L-2817-S | 28x17" | 12x12x7½" |
| L-3617 or L-3617-S | 36x17" | 16x11½x7½" |
| L-2821 or L-2821-S | 28x21" | 11½x16x7½" |
| L-3221 or L-3221-S | 32x21" | 13½x16x7½" |
| L-4221 or L-4221-S | 42x21" | 18x16x7½" |



L-1817-S

Sink: **Lustertone** stainless steel flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

*Note: Sink trap is not included.*

L-1817

Same, except with 8-84 **Embassy** supply fitting, less spray. (Specify 8-84-A if with aerator.)

Overall Dimensions

| Catalog Numbers | Size | Basin Size |
|---|---|---|
| L-1417 | 14x17" | 12x12" |
| L-1817 or L-1817-S | 18x17" | 16x11½" |
| L-1421 | 14x21" | 11½x16" |
| L-1621 | 16x21" | 13½x16' |
| L-2121 or L-2121-S | 21x21" | 18x16" |
| L-2421 or L-2421-S | 24x21" | 22x16" |
| L-3021 or L-3021-S | 30x21" | 28x16' |

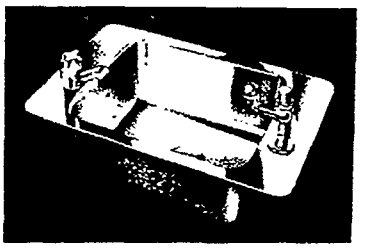
**Note:** L-1417, L-1421 and L-1621 are available only with 8-84 **Embassy** supply fitting less spray.

PRICES COMPLETE, *less supplies and traps*

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds | Add for Hudee Frame |
|---|---|---|---|---|
| L-2817 | 28x17 | $146.56 | 28 | $10.88 |
| L-3617 | 36x17 | 151.50 | 32 | 12.16 |
| L-2821 | 28x21 | 153.90 | 32 | 10.88 |
| L-3221 | 32x21 | 131.18 | 32 | 10.88 |
| L-4221 | 42x21 | 144.28 | 38 | 12.16 |
| L-2817-S | 28x17 | 154.46 | 29 | 10.88 |
| L-3617-S | 36x17 | 159.40 | 33 | 12.16 |
| L-2821-S | 28x21 | 161.80 | 33 | 10.88 |
| L-3221-S | 32x21 | 139.08 | 33 | 10.88 |
| L-4221-S | 42x21 | 152.18 | 39 | 12.16 |
| L-1417 | 14x17 | 82.88 | 21 | 10.36 |
| L-1817 | 18x17 | 85.36 | 22 | 10.36 |
| L-1421 | 14x21 | 86.56 | 23 | 10.36 |
| L-1621 | 16x21 | $79.58 | 20 | $10.36 |
| L-2121 | 21x21 | 84.00 | 23 | 10.58 |
| L-2421 | 24x21 | 89.32 | 24 | 10.12 |
| L-3021 | 30x21 | 116.32 | 26 | 10.88 |
| L-1817-S | 18x17 | 93.26 | 23 | 10.36 |
| L-2121-S | 21x21 | 91.90 | 24 | 10.58 |
| L-2421-S | 24x21 | 97.22 | 25 | 10.12 |
| L-3021-S | 30x21 | 124.22 | 27 | 10.88 |

For aerator on spout.....Add $1.80
For **8-324** ¼" male tailpieces.....Per Pair, Add .48
If less **LK-35** strainer.....Each, Deduct 4.88
If less **8-88 Embassy** trim (where described).....Deduct 27.10
If less **8-84 Embassy** trim (where described).....Deduct 19.20

## LUSTERTONE STAINLESS STEEL DRINKING FOUNTAIN AND SINK COMBINATIONS



Stainless steel, one-piece Hudee sink frames are regularly furnished with corner clips and fastening lugs for ⅝" to ¾" thick countertops; specify if lugs are required for ⅞" to 1" thick countertops.

DRK-2416

Fountain and Sink: **Lustertone** stainless steel flat rim drinking fountain and sink combination with wide ledge at right and left ends, each ledge drilled for single faucet.

Trim: 8-31 **Vantage** *Dial-ese* faucet; 748 **Naiad** push button self-closing, angle stream drinking fountain bubbler.

Waste: LK-35 **Duo** basket strainer with stopper and 1½" tailpiece.

*Note: Supplies and trap are not included.*

PRICES COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | | Basin Size, Inches | | | Shpg. Wt. Pounds | Price, Complete | Add for Hudee Frame |
|---|---|---|---|---|---|---|---|---|
| | Length | Width | Length | Width | Depth | | | |
| DRK-2416 | 24 | 16 | 16 | 13½ | 7½ | 21 | $116.34 | $10.12 |
| DRK-2421 | 24 | 21 | 16 | 18 | 7½ | 23 | 121.22 | 10.12 |
| DRK-2118 | 21½ | 18 | 13½ | 16 | 7½ | 20 | 116.34 | 10.58 |
| DRK-3018 | 30 | 18 | 22 | 16 | 7½ | 25 | 133.96 | 10.88 |

If less **8-31 Vantage** faucet **Deduct $7.06** If less **748** bubbler fitting **Deduct $25.80**

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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## CRANE FABRICATED SINK TOPS WITH FLAT RIM SINKS AND UNDERSINK CABINETS

All of the flat rim sinks described on preceding pages can be installed in a sink top assembly consisting of a wood core with **Formica** or similar laminated plastic coverings. In order to secure a satisfactory and lasting assembly for your customer, it is essential to have the **All-American** sink bowl assembled to the sink top at the factory. All other types of flat rim sinks are assembled to the sink top by the installing contractor.

5-250-S

Sink Top: **Formica** covered wood core fabricated sink top, $1\frac{1}{2}$" thick, with double drainboard and 5" high back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-124-S 38x22" **All American** acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back, beveled fixture panel and two soap depressions.

Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A, if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and $1\frac{1}{2}$" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

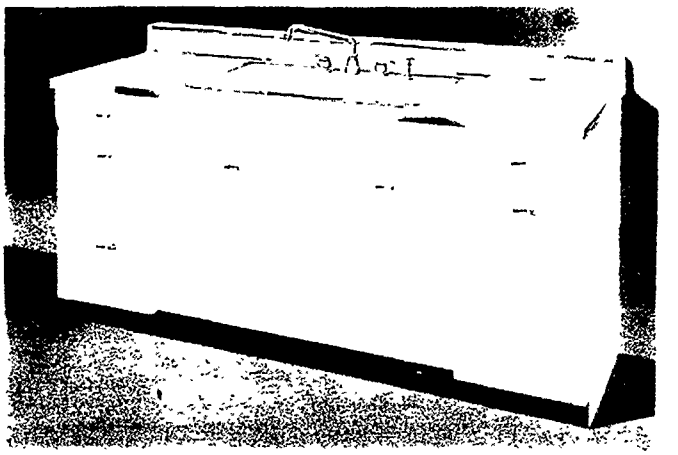
**Overall Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Sink Top | 72x25¼" | Sink Bowl | 38x22" | Each Basin | 17x15½x8" |
| Cabinet | 72x24 5/16" | Height | 34½" (sets sink 36" floor to top of rim) | | |

**ALTERNATE SINK TRIMMINGS**

| Unit No. | Trim Description |
|---|---|
| **5-250** | With 8-62 or 8-62-A **Temple** 2-valve supply, less spray |
| **5-250-T** | With 8-68 or 8-68-A **Temple** 3-valve supply, less spray |
| **5-250-TS** | With 8-66 or 8-66-A **Temple** 3-valve supply, with spray |

*Refer to Page 5-3 for illustrations.*



5-251-S

Sink Top: *Formica* covered wood core fabricated sink top, $1\frac{1}{2}$" thick, with double drainboard and 4" high back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-131-S 32x21" acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back ledge and two soap depressions.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and $1\frac{1}{2}$" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and traps are not included.*

**Overall Dimensions**

| | | | | | |
|---|---|---|---|---|---|
| Sink Top | 72x25¼" | Sink Bowl | 32x21" | Each Basin | 14¼x15½x8" |
| Cabinet | 72x24 5/16" | Height | 34½" (sets sink 36" floor to top of rim) | | |

**ALTERNATE SINK TRIMMINGS**

| Unit No. | Trim Description |
|---|---|
| **5-251** | 8-84 or 8-84-A **Embassy** 2-valve supply, less spray |
| **5-251-T** | 8-85 or 8-85-A **Embassy** 3-valve supply, less spray |
| **5-251-TS** | 8-89 or 8-89-A **Embassy** 3-valve supply, with spray |

*Refer to Page 5-5 for illustrations*

## TRANSPORTATION CHARGES ON SINK TOPS AND SINK CABINETS

SINK TOPS—F.O.B. factory at Rensselaer, Indiana. All actual transportation costs from factory to delivery point will be added to prices shown.

SINK CABINETS—F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the cabinet prices shown. Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.

### PRICES COMPLETE, less supplies and traps

*†Color Prices include Colored Sink and White Cabinet*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| **5-250, with Cabinet** | $426.14 | $436.54 | $451.46 | $461.86 | 416 |
| **5-250-S, with Cabinet** | 433.14 | 443.54 | 458.46 | 468.86 | 417 |
| **5-250-T, with Cabinet** | 435.44 | 445.84 | 460.76 | 471.16 | 417 |
| **5-250-TS, with Cabinet** | 442.44 | 452.84 | 467.76 | 478.16 | 418 |
| **No. 7240 Cabinet Only** | 168.42 | — | 193.74 | — | 182 |

Approx. Shipping Weights—5-250 Top Only, 75 lbs.
5-124 Bowl Only, 150 lbs.

For aerator on spout **(Temple Trim)** . . . . . **Add $1.90**
For **8-324** $\frac{1}{4}$" male tail pieces . . . . . **Per Pair, Add .48**

*For Cabinet Accessories, Refer to Page 5-16.*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| **5-251, with Cabinet** | $391.74 | $400.14 | $417.06 | $425.46 | 371 |
| **5-251-S, with Cabinet** | 399.64 | 408.04 | 424.96 | 433.36 | 372 |
| **5-251-T, with Cabinet** | 399.54 | 407.94 | 424.86 | 433.26 | 372 |
| **5-251-TS, with Cabinet** | 407.84 | 416.24 | 433.16 | 441.56 | 373 |
| **No. 7240 Cabinet Only** | 168.42 | — | 193.74 | — | 182 |

Approx. Shipping Weights—5-251 Top Only, 75 lbs.
5-131 Bowl Only, 105 lbs.

For aerator on spout **(Embassy Trim)** . . . . . **Add $1.80**
If less **8-361** wastes . . . . . **Each, Deduct 6.70**

*For Sink Traps and Wastes, Refer to Section 8.*

*Prices are subject to change without notice.*

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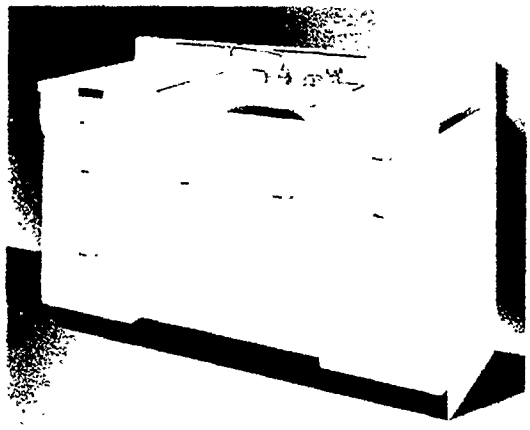
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

*May 4, 1955*
*Superseding February 28, 1955*

## CRANE FABRICATED SINK TOPS WITH FLAT RIM SINKS AND UNDERSINK CABINETS



### 5-252-S

Sink Top: Formica covered wood core fabricated sink top, $1\frac{1}{2}$" thick, with double drainboard and 4" high integral back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-146-S 24x21" AllianceWare white acid-resisting porcelain enameled formed metal flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and $1\frac{1}{2}$" tailpiece.

Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

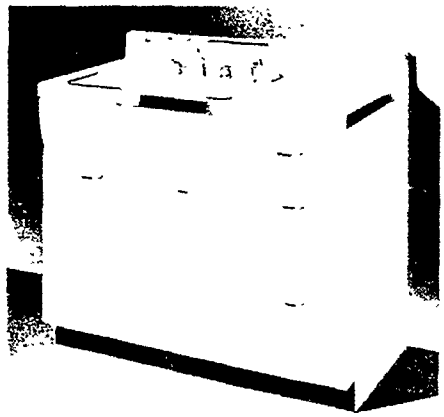
### 5-252

Same, except with 8-84 **Embassy** supply, less hose and spray. (Specify 8-84-A, if with aerator.)

**Overall Dimensions**

| Sink Top | Sink Bowl | Basin | Cabinet | *Cabinet Height |
|---|---|---|---|---|
| 60x25¼" | 24x21" | 20⅞x14⅞x8" | 60x24 5/16" | 34½" |
| 54x25¼" | 24x21" | 20⅞x14⅞x8" | 54x24 5/16" | 34½" |

*Sets sink 36", floor to top of rim.



### 5-253-S with Left Hand Drainboard
### 5-254-S with Right Hand Drainboard

Sink Top: Formica covered wood core fabricated sink top, $1\frac{1}{2}$" thick, with single drainboard and 4" high integral back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-136-S 24x21" acid-resisting porcelain enameled cast iron flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and $1\frac{1}{2}$" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

**Overall Dimensions**

Sink Top 42x25¼" Sink 24x21" Basin 21½x15½x8"
Cabinet 42x24 5/16" Height 34½" (sets sink 36" floor to top of rim)

**ALTERNATE SINK TRIMMINGS**

| Unit Number | Trim Description |
|---|---|
| **5-253 or 5-254** | 8-84 or 8-84-A **Embassy** 2-valve supply, less spray |
| **5-253-T or 5-254-T** | 8-85 or 8-85-A **Embassy** 3-valve supply, less spray |
| **5-253-TS or 5-254-TS** | 8-89 or 8-89-A **Embassy** 3-valve supply, with spray |

*Refer to Page 5-5 for illustrations*

### Color Selection

Formica, Micarta, Textolite or similar laminated plastic sink top coverings are furnished in a wide range of colors and patterns—refer to your local Crane Branch or Crane Wholesaler for color selections.

*All exposed metal trim is chromium plated.*

## TRANSPORTATION CHARGES ON SINK TOPS AND SINK CABINETS

*(See Page 5-21 for details)*

### PRICES COMPLETE, less supplies and traps

*†Color Prices include Colored Sink and White Cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 Color | ZONE 2 White | ZONE 2 Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| **5-252, with Cabinet** | 54x25¼ | $273.48 | — | $293.64 | — | 252 |
| | 60x25¼ | 285.94 | — | 306.60 | — | 269 |
| **5-252-S, with Cabinet** | 54x25¼ | 281.30 | — | 301.54 | — | 253 |
| | 60x25¼ | 293.84 | — | 314.50 | — | 270 |
| **No. 5440 Cabinet Only** | 54x24 5/16 | 132.62 | — | 152.78 | — | 163 |
| **No. 6040 Cabinet Only** | 60x24 5/16 | 137.78 | — | 158.44 | — | 169 |
| **5-253 or 5-254, with Cabinet** | 42x25¼ | 244.54 | $249.54 | 258.74 | $263.74 | 244 |
| **5-253-S or 5-254-S, with Cabinet** | 42x25¼ | 252.44 | 257.44 | 266.64 | 271.64 | 245 |
| **5-253-T or 5-254-T, with Cabinet** | 42x25¼ | 252.34 | 257.34 | 266.54 | 271.54 | 245 |
| **5-253-TS or 5-254-TS, with Cabinet** | 42x25¼ | 260.64 | 265.64 | 274.84 | 279.84 | 246 |
| **No. 4240 Cabinet Only** | 42x24 5/16 | 97.56 | — | 111.76 | — | 120 |

Approx. Shipping Weights—5-252 Top only, 54x25¼" 55 lbs; 60x25¼" 60 lbs.
5-253 or 5-254, Top Only 45 lbs.
5-146 Sink Only 30 lbs. 5-136 Sink Only 75 lbs.

For aerator on spout **Add $1.80** If less **8-361** waste **Deduct $6.70**
For **8-324** ¼" male tailpieces **Per Pair, Add .48**

*For sink traps and continuous wastes, Refer to Section 8.*

*For waste disposal units, Refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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# LAUNDRY TUBS AND APPLIANCES—WASH SINKS DRINKING FOUNTAINS

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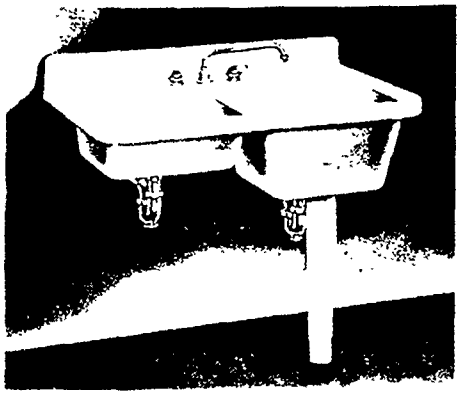
# ASHFORD PORCELAIN ENAMELED CAST IRON COMBINATION SINK AND LAUNDRY TUBS



6-51 On Single Leg, sink at left
6-50 On Single Leg, sink at right

Sink and Tub: Ashford acid-resisting porcelain enameled cast iron combination ledge sink and laundry tub with back and soap depression.

Supports: 8-730 painted white adjustable angle leg under tub compartment; concealed wall hangers.

Trim: 8-84 Embassy *Dial-ese* ledge type swinging spout supply fitting. Specify 8-84-A if with aerator.

Wastes: 8-361 Receptol basket strainer with stopper and 1½" tailpiece in sink; 8-355 waste plug with rubber stopper and 1½" tailpiece in tub.

*Note: Sink traps are not included.*

6-51 On Two Legs, sink at left
6-50 On Two Legs, sink at right
*(Not illustrated)*

Same as above except with additional leg under sink compartment.

*Overall Dimensions*

| | | | |
|---|---|---|---|
| Size | 42x25¼" | Sink size | 18x18x 8" deep |
| Height of Back | 4" | Tub size | 18x18x14" deep |
| Height with cabinet, floor to top of rim | | | 36" |
| Height with adjustable legs, floor to top of rim | | | 32" to 36" |

## ALTERNATE SUPPLY TRIM

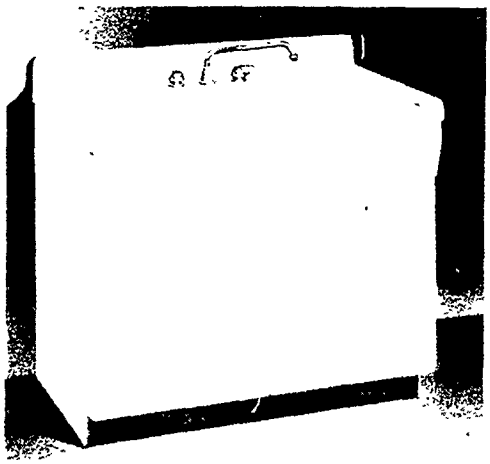
*Alternate supply trim is illustrated on Page 6-3. To order, add trim suffix letter to catalog number as shown in Price Table below.*

## SLIDING DRAINBOARD

6-72

6-72
Acid-resisting porcelain enameled steel sliding drainboard for Ashford combination sink and tub.
Overall size: 24"x24"

All exposed metal trim is chromium plated.
For sink traps, refer to Section 8.



6-51 On Steel Cabinet, sink at left
6-50 On Steel Cabinet, sink at right

Sink and Tub: Ashford acid-resisting porcelain enameled cast iron combination ledge sink and laundry tub with back and soap depression.

Trim: 8-84 Embassy *Dial-ese* ledge type swinging spout supply fitting. Specify 8-84-A if with aerator.

Wastes: 8-361 Receptol basket strainer with stopper and 1½" tailpiece in sink; 8-355 waste plug with rubber stopper and 1½" tailpiece in tub.

Cabinet: No. 4200ST baked white enamel steel cabinet.

*Note: Sink traps are not included*

## TRANSPORTATION CHARGES ON WHITE SINK CABINETS

NOTE: Undersink cabinet shown in combinations on this page and also on page 6-4 are F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the cabinet prices shown. Consult your local Crane branch or Crane Wholesaler for nearest distribution point.

CABINET DISTRIBUTION POINTS BY ZONES

| Zone 1 | Zone 1 | Zone 1 | |
|---|---|---|---|
| Atlanta, Ga. | Chicago, Ill. | Maumee, O. | |
| Bayonne, N. J. | Cincinnati, O. | New Orleans, La. | Zone 2 |
| Brighton, Mass. | Dallas, Texas | Philadelphia, Pa. | Los Angeles, Cal. |
| Buffalo, N.Y. | Denver, Colo. | Pittsburgh, Pa. | San Francisco, Cal. |
| Charlotte, N. C. | Des Moines, Ia. | St. Louis, Mo. | Seattle, Wash. |

NOTE: The No. 4200ST cabinet is also available in the four following colors: Butter Yellow, Spring Green, Birch Tan and Blossom Pink. Consult your local Crane branch or Crane Wholesaler for prices.

## PRICES COMPLETE, less traps

| Number and Description | Price, Each ZONE 1 White | Price, Each ZONE 1 †Color | Price, Each ZONE 2 White | Price, Each ZONE 2 †Color | Shpg. Weight Pounds |
|---|---|---|---|---|---|
| 6-50 or 6-51, On Cabinet | $208.64 | $221.04 | $217.54 | $229.94 | 340 |
| 6-50-S or 6-51-S, On Cabinet | 216.54 | 228.94 | 225.44 | 237.84 | 340 |
| 6-50-T or 6-51-T, On Cabinet | 216.44 | 228.84 | 225.34 | 237.74 | 340 |
| 6-50-TS or 6-51-TS, On Cabinet | 224.74 | 237.14 | 233.64 | 246.04 | 340 |
| No. 4200ST, Cabinet Only | 68.68 | — | 77.58 | — | |

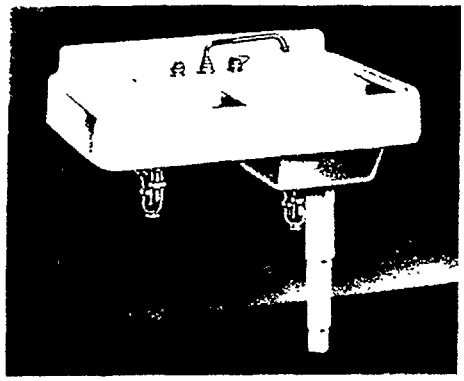
| Number and Description | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-50 or 6-51, On Leg | $146.06 | $163.96 | 260 |
| 6-50-S or 6-51-S, On Leg | 153.96 | 171.86 | 260 |
| 6-50-T or 6-51-T, On Leg | 153.86 | 171.76 | 260 |
| 6-50-TS or 6-51-TS, On Leg | 162.16 | 180.06 | 260 |
| 6-50 or 6-51, On Two Legs | 153.06 | 177.86 | 270 |
| 6-50-S or 6-51-S, On Two Legs | 160.96 | 185.76 | 270 |
| 6-50-T or 6-51-T, On Two Legs | 160.86 | 185.66 | 270 |
| 6-50-TS or 6-51-TS, On Two Legs | 169.16 | 193.96 | 270 |
| 6-50 or 6-51, Ware Only, No Legs | 111.72 | 124.12 | 230 |
| 6-72 Drainboard | 9.30 | — | 15 |

† Color price includes colored sink and tub with white cabinet.
For aerator on spout Add $1.80

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## BELMONT PORCELAIN ENAMELED CAST IRON COMBINATION SINK AND LAUNDRY TUBS



6-75 On Single Leg, sink at left
6-74 On Single Leg, sink at right

Sink and Tub: Belmont acid-resisting porcelain enameled cast iron combination ledge sink and laundry tub with back, 6" apron, and soap depression.

Supports: 8-730 painted white adjustable angle leg under tub compartment; concealed wall hangers.

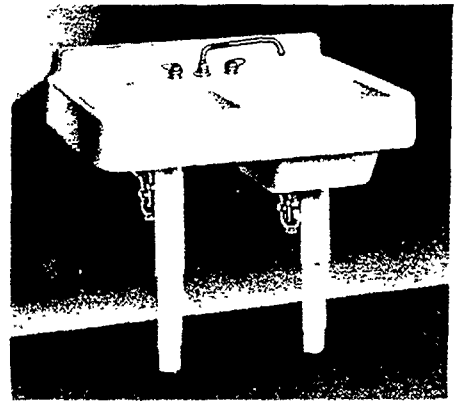
Trim: 8-84 Embassy *Dial-ese* ledge type, swinging spout supply fitting. Specify 8-84-A if with aerator).

Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

*Note: Sink traps are not included.*

**Belmont—Overall Dimensions**

| | | | |
|---|---|---|---|
| Size | 42x25¼" | Sink size | 18x18x 8" deep |
| Height of Back | 4" | Tub size | 18x18x14" deep |
| Height with adjustable legs, floor to top of rim | | | 32" to 36" |



6-75 On Two Legs, sink at left
6-74 On Two Legs, sink at right

Sink and Tub: Belmont acid-resisting porcelain enameled cast iron combination ledge sink and laundry tub with back, 6" apron, and soap depression.

Supports: Two 8-730 painted white adjustable angle legs, one under sink and one under tub compartment; concealed wall hangers.

Trim: 8-84 Embassy *Dial-ese* ledge type, swinging spout supply fitting. (Specify 8-84-A if with aerator).

Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

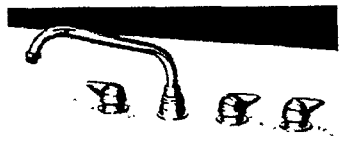
*Note: Sink traps are not included.*

REVERSIBLE DRAINBOARD

6-79
Acid-resisting, porcelain enameled steel, reversible drainboard for Belmont combination sink and tubs.
Overall size: 21½" x 7½"

### ALTERNATE SUPPLY TRIM FOR ASHFORD AND BELMONT SINK AND TUBS

**The Ashford and Belmont combination sink and tubs can be furnished with the following alternate Embassy supply fittings with Dial-ese controls when specified**

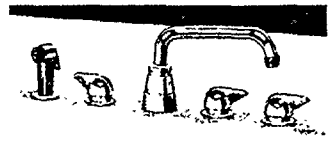


T TRIM

8-85—Three-valve supply fitting, less spray.
8-85-A—Same with aerator.

S TRIM

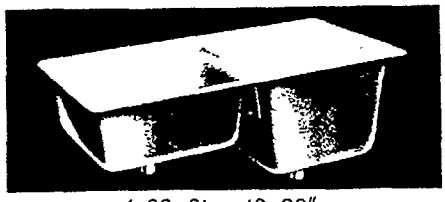
8-88—Two-valve supply fitting, with hose and spray.
8-88-A—Same with aerator.



TS TRIM

8-89—Three-valve supply fitting with hose and spray.
8-89-A—Same with aerator.

### FLAT RIM—REVERSIBLE



6-80, Size 42x20"

Sink and Tub: Acid-resisting porcelain enameled cast iron reversible flat rim combination sink and laundry tub.

Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

*Note: Sink traps are not included.*

**Overall Dimensions**

Sink size 18½x17¼x8" deep  Tub size 18½x17½x14" deep

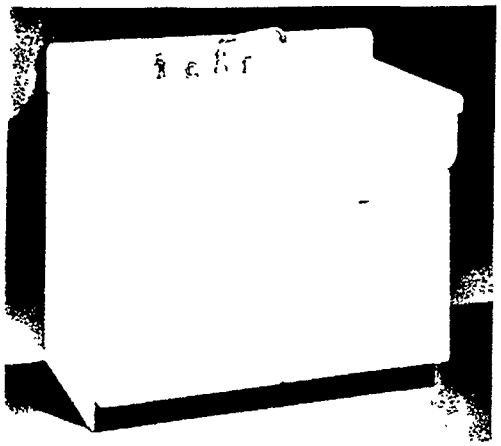
### PRICES COMPLETE, less traps

| Description and Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| **6-74 or 6-75 Ware Only, Less Legs** | $127.30 | $141.30 | 280 |
| **6-74 or 6-75, On Single Leg** | 161.64 | 181.14 | 310 |
| **6-74 or 6-75, On Two Legs** | 168.64 | 195.04 | 320 |
| **6-74-S or 6-75-S, On Single Leg** | 169.54 | 189.04 | 310 |
| **6-74-S or 6-75-S, On Two Legs** | 176.54 | 202.94 | 320 |
| **6-74-T or 6-75-T, On Single Leg** | 169.44 | 188.94 | 310 |
| **6-74-T or 6-75-T, On Two Legs** | 176.44 | 202.84 | 320 |
| **6-74-TS or 6-75-TS, On Single Leg** | 177.74 | 197.24 | 310 |
| **6-74-TS or 6-75-TS, On Two Legs** | 184.74 | 211.14 | 320 |
| **6-30, Reversible, Ware Only** | 80.60 | 89.60 | 175 |
| **6-80, Reversible, Complete** | 89.64 | 98.64 | 180 |
| **6-79 Drainboard** | 7.50 | — | 10 |

For aerator on spout..... **Add each $1.80**
For 8-324 ¼" male tailpieces.... **Add per pair .48**

**All exposed metal trim is chromium plated.** *For sink traps, refer to Section 8.*

# ALLIANCEWARE PORCELAIN ENAMELED FORMED METAL COMBINATION SINK AND LAUNDRY TUBS



6-69-S, On Steel Cabinet, sink at left
6-68-S, On Steel Cabinet, sink at right

Sink and Tub: AllianceWare white acid-resisting porcelain enameled formed metal combination ledge sink and laundry tub with back and soap depression; 6-78 white acid-resisting porcelain enameled removable sliding drainboard.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout supply fitting with automatic diverter valve, and thumb control spray with rubber hose. (Specify 8-88-A, if with aerator.

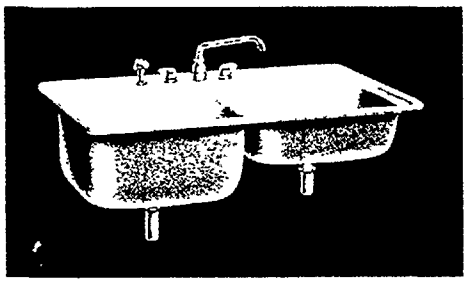
Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

Cabinet: No. 4200ST baked white enamel steel cabinet.

*Note: Sink traps are not included.*

### 6-68 or 6-69, On Steel Cabinet

Same, except with 8-84 Embassy supply fitting, without hose and spray. (Specify 8-84-A if with aerator.)



6-87-S, sink at left 6-86-S, sink at right

Sink and Tub: AllianceWare white acid-resisting porcelain enameled formed metal flat rim, combination sink and laundry tub with extended back ledge.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout supply fitting with automatic diverter valve and thumb control spray with rubber hose. Specify 8-88-A if with aerator.)

Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

*Note: Sink traps are not included.*

### 6-87, sink at left 6-86, sink at right

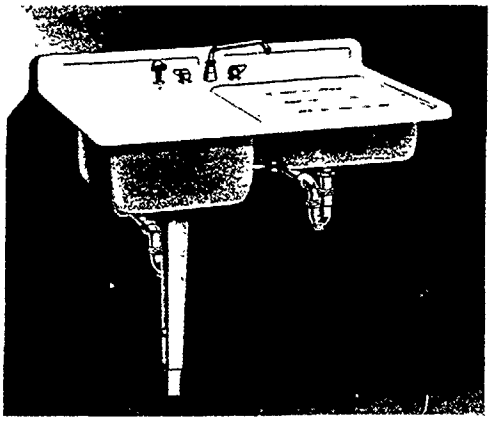
Same, except with 8-84 supply fitting, less spray. Specify 8-84-A, if with aerator.

Overall Dimensions

Size 42x21" Tub size $18\frac{3}{4}$x14x$11\frac{3}{4}$" deep
Sink size $18\frac{3}{4}$x14x7" deep

### 6-84, Reversible (not illustrated)

Same, except 42x18" size without extended back ledge and without supply fitting.



6-69-S, On Single Leg, sink at left
6-68-S, On Single Leg, sink at right

Sink and Tub: AllianceWare white acid-resisting porcelain enameled formed metal combination ledge sink and laundry tub with back and soap depression; 6-78 white acid-resisting porcelain enameled removable sliding drainboard.

Support: Painted black formed metal adjustable leg.

Trim: 8-88 Embassy *Dial-ese* ledge type, swinging spout supply fitting with automatic diverter valve, and thumb control spray with rubber hose. (Specify 8-88-A, if with aerator.)

Wastes: 8-361 Receptol basket strainer with stopper and $1\frac{1}{2}$" tailpiece in sink; 8-355 waste plug with rubber stopper and $1\frac{1}{2}$" tailpiece in tub.

*Note: Sink traps are not included.*

### 6-68 or 6-69, On Single Leg

Same, except with 8-84 Embassy supply fitting without hose and spray. (Specify 8-84-A, if with aerator.)

6-68 and 6-69 Overall Dimensions

| Size | Sink Size | Tub Size |
|---|---|---|
| 42x25" | $17\frac{1}{2}$x$16\frac{1}{4}$x8" deep | $17\frac{1}{2}$x$16\frac{1}{4}$x12" deep |
| †48x25" | $19\frac{1}{4}$x$16\frac{1}{4}$x8" deep | $19\frac{1}{4}$x$16\frac{1}{4}$x12" deep |

Height of back, 4"

†Note: 48x25" size made with tub at left only.

## TRANSPORTATION CHARGES ON SINK CABINETS

(See Page 6-2 for details)

PRICES COMPLETE, less traps

| Description and Catalog Number | Size, Inches | Price, each—White A.R. ZONE 1 | ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 6-68 or 6-69, On Cabinet | 42x25 | $187.52 | $196.42 | 186 |
| 6-68-S or 6-69-S, On Cabinet | 42x25 | 195.42 | 204.32 | 186 |
| No. 4200ST Cabinet | 42x25 | 68.68 | 77.58 | 100 |

| Description and Catalog Number | Size, Inches | Price, each White A. R. | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-68 or 6-69, On Leg | 42x25 | $125.84 | 95 |
| 6-68-S or 6-69-S, On Leg | 42x25 | 133.74 | 95 |
| 6-68, On Leg | 48x25 | 134.24 | 105 |
| 6-68-S, On Leg | 48x25 | 142.14 | 105 |
| 6-68 or 6-69, Ware Only, Less Leg | 42x25 | 81.00 | 78 |
| | 48x25 | 89.00 | 82 |
| 6-84, Reversible | 42x18 | 65.14 | 55 |
| 6-84, Ware Only | 42x18 | 56.10 | 50 |
| 6-86 or 6-87, Flat Rim | 42x21 | 89.44 | 63 |
| 6-86-S or 6-87-S, Flat Rim | 42x21 | 97.34 | 62 |
| 6-86 or 6-87, Ware Only | 42x21 | 61.20 | 53 |
| 6-78 Drainboard | For 42x18 | 9.40 | 7 |
| | For 42x21 | 9.40 | 7 |
| | For 42x25 | 9.60 | 8 |
| | For 48x25 | 10.00 | 10 |

For aerator on spout. Add each $1.80
For 8-324 $\frac{1}{4}$" male tailpieces. Add per pair .48



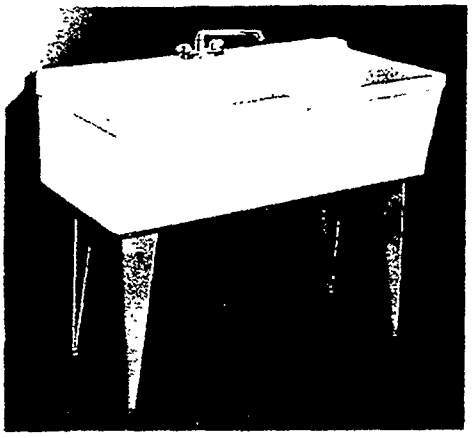
Prices are subject to change without notice

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# LAUNDRETTE DURACLAY LAUNDRY TUBS

Earthenware, Vitreous Glazed



6-112

## 6-112

Tub: Laundrette Duraclay, earthenware vitreous glazed, two-compartment laundry tub with integral washboard and ledge back with two soap depressions.

Support: 6-248 Herc-U-Lite black enameled steel support with leveling screws.

Trim: B36HRR Repcal supply fitting with renewable units and seats; 8" long swinging spout with hose end.

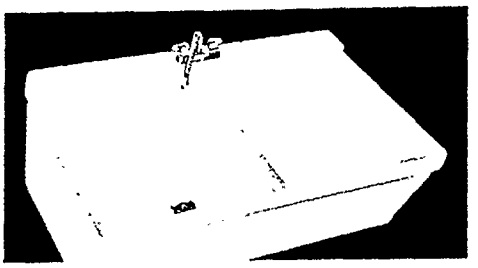
Waste: Rough brass twin Duo waste connection with rubber stoppers and 1½" O.D. tailpiece.

*Note: Trap is not included.*

**Overall Dimensions**

Sizes. 36x25x12" deep and 42x25x12" deep.
Rim to floor. . . . . 34"

An integral washboard is incorporated into the single tub and into the left hand compartment of the two-compartment tub.



Large compartments of the Laundrette allow ample room for efficient laundering. Flat ledge back provides wide shelf for laundering materials with two conveniently located integral soap depressions.

## 6-116

Tub: Laundrette Duraclay, earthenware vitreous glazed, single compartment laundry tub with integral washboard and ledge back with soap depression.

Support: 6-248 Herc-U-Lite black enameled steel support with leveling screws.

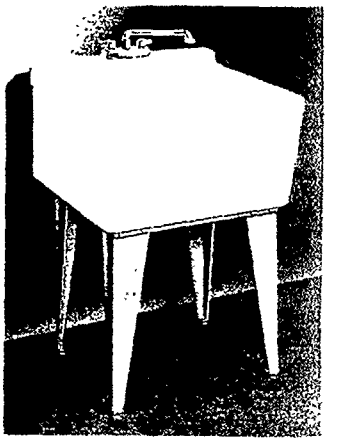
Trim: B36HRR Repcal supply fitting with renewable units and seats; 8" long swinging spout with hose end.

Waste: 8-355 brass waste plug with rubber stopper and 1½" O.D. tailpiece.

*Note: Trap is not included.*

**Overall Dimensions**

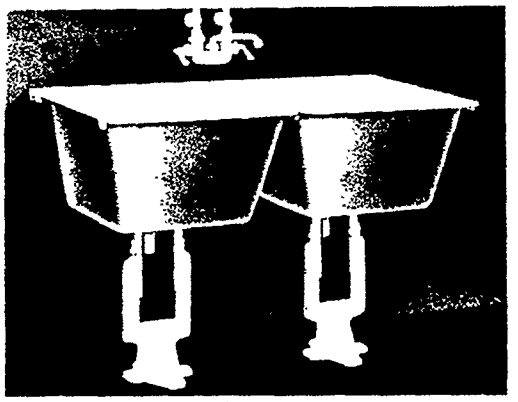
Size. . 22x25x12" deep  Rim to floor. . 34"



6-116

*Note: Myrastand support also available for Laundrette laundry tubs—see page 6-6.*

# PORCELAIN ENAMELED CAST IRON LAUNDRY TUBS



6-202

Tubs: Battery of two, porcelain enameled inside, ground coat outside, cast iron flat rim laundry tubs.

Supports: Painted white cast iron adjustable supporting stands; concealed hangers.

Trim: B34CR Repcal rough nickel plated laundry tub faucet with hose end swinging spout; ½" union inlets on 3¼" centers for supplies from ceiling.

Wastes: 8-355 brass waste plugs with rubber stoppers and 1½" tailpieces.

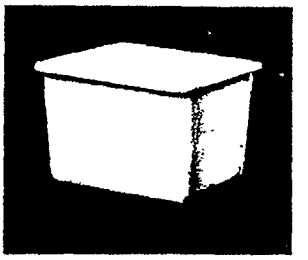
*Note: Traps and supply pipes are not included.*

**Overall Dimensions**

Sizes, each tub . . . . . 24x22x13¼" deep.  Height, adjustable from 30" to 33½".

*When ordering, specify if regular or acid-resisting enamel is required.*

# DURACLAY



6-130

Tub: Duraclay, earthenware vitreous glazed, center outlet flat rim laundry tub.

Waste: 8-355 brass waste plug with rubber stopper and 1½" tailpiece.

*Note: Trap is not included.*

Size . . . . . 20x18x12" deep

**PRICES COMPLETE, less traps**

| Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|
| 6-112 | 36x25" | $139.98 | $197.68 | 245 lbs |
| | 42x25" | 168.88 | 240.98 | 270 lbs |
| 6-116 | 22x25" | 87.72 | 118.12 | 160 lbs. |
| 6-130 | 20x18" | 44.34 | 65.34 | 75 lbs |
| 6-202 Battery of 2 | 24x22" | White Regular $125.70 | White A.R. $137.30 | 230 lbs. |

If less B36HRR supply fitting . . . Deduct $16.22
If less B34CR laundry faucet. . . . Deduct 9.82
For 20-19 ¼" male tailpieces. Add Per Pr. .38

Unless otherwise specified, all exposed metal trim is chromium plated.

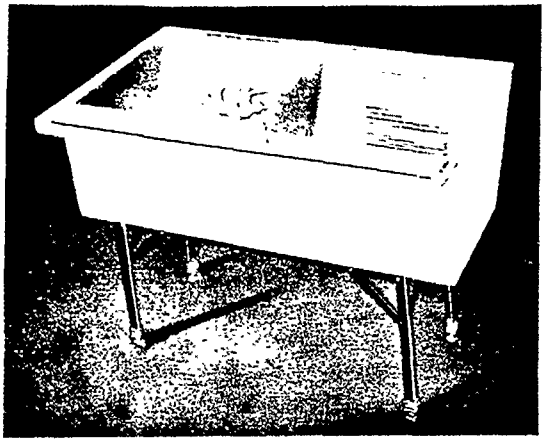
*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

*May 4, 1955*
*Superseding February 28, 1955*

# CEMENT COMPOSITION LAUNDRY TUBS



6-230

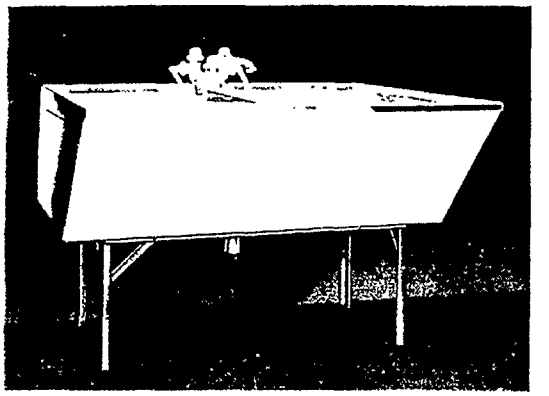
Tub: Shelfon one piece cement composition laundry tub with 6" wide integral shelf and self-draining soap depressions; raised metallic rim, built-in rustless metallic washboard and aluminum faucet anchor.

Support: Painted angle iron supporting frame with Lightning Levelers.

Trim: B34R Repcal Rgh. N.P. laundry tub faucet with swinging hose end spout; 1/2" union inlets on 3 1/4" centers, for supplies from ceiling. (3-part tub has two faucets.)

Waste: Cast-in waste connection with nickel plated brass strainers, rubber stoppers and 1 1/2" tailpiece.

| Overall Sizes: | Single | 2-part | 3-part | Tubs |
|---|---|---|---|---|
| | 25x28" | 48x28" | 72x28" | 16" deep |



6-240

Tub: Cast cement composition laundry tub with metallic rim.

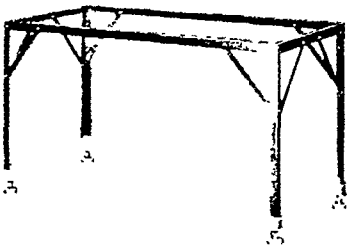
Support: Painted angle iron supporting frame.

Trim: B34R Repcal Rgh. N.P. laundry tub faucet with swinging hose end spout; 1/2" union inlets on 3 1/4" centers for supplies from ceiling. (3-part tub has two faucets.

Waste: Cast-in waste connection with nickel plated brass strainers, rubber stoppers and 1 1/2" tailpiece.

| Sizes: | Single | 2-part | 3-part |
|---|---|---|---|
| | 25x24" | 48x24" | 72x24" |
| All tubs | 27x24" | 54x24" | |
| 16" deep | 31x24" | 60x24" | |

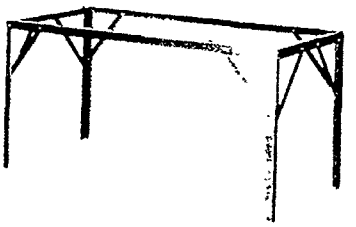
# LAUNDRY TUB SUPPORTING FRAMES



6-245

Dark green enameled angle iron supporting frame for cement composition laundry tubs, with cadmium plated Lightning Levelers.

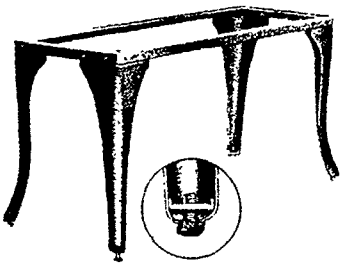
Lengths 24", 40" and 64"
Width 15" Height 18"



6-247

Dark green enameled angle iron supporting frame for cement composition laundry tubs.

Lengths 24",40",46",52" and 64"
Width 15" Height 18"



6-249

Myrastand aluminum finish formed steel supporting frame with leveling bolts for Laundrette Duraclay laundry tubs.

Lengths 18", 32" and 38"
Width 17 1/2" Height 21"

## LAUNDRY TUBS
### *PRICES COMPLETE, F.O.B., Chicago, Ill.

| Number | Type | Size | *Price | Shpg. Wt. |
|---|---|---|---|---|
| 6-230 | Single | 25x28" | $44.40 | 200 lbs. |
| | 2-part | 48x28" | 57.84 | 400 lbs. |
| | 3-part | 72x28" | 96.04 | 600 lbs. |
| 6-240 | Single | 25x24" | 36.00 | 175 lbs. |
| | Single | 27x24" | 37.52 | 200 lbs. |
| | Single | 31x24" | 39.04 | 225 lbs. |
| | 2-part | 48x24" | 46.62 | 325 lbs. |
| | 2-part | 54x24" | 52.52 | 350 lbs. |
| | 2-part | 60x24" | 57.76 | 375 lbs. |
| | 3-part | 72x24" | 78.44 | 500 lbs. |

If less B34R supply fitting . . Deduct each $9.92

*For local prices, contact your Crane Branch or Crane Wholesaler.*

## SUPPORTING FRAMES
### †PRICES COMPLETE, F.O.B. Shipping Point

| Number | Type of Tub | Size | †Price | Shpg. Wt. |
|---|---|---|---|---|
| 6-245 | Single | 24" | $8.54 | 14 lbs. |
| | 2-part | 40" | 8.54 | 15 lbs. |
| | 3-part | 64" | 12.80 | 23 lbs. |
| 6-247 | Single | 24" | 5.34 | 10 lbs. |
| | 2-part | 40" | 5.34 | 12 lbs. |
| | 2-part | 46" | 6.66 | 14 lbs. |
| | 2-part | 52" | 7.34 | 16 lbs. |
| | 3-part | 64" | 8.00 | 18 lbs. |
| 6-249 for Laundrette | 22" single | 18" | 8.40 | 14 lbs. |
| | 36" 2-part | 32" | 8.40 | 16 lbs. |
| | 42" 2-part | 38" | 8.40 | 18 lbs. |

†6-245 and 6-247 frames are F.O.B., Chicago, Ill.
6-249 frames are F.O.B. Philadelphia, Pa.



*Prices are subject to change without notice*

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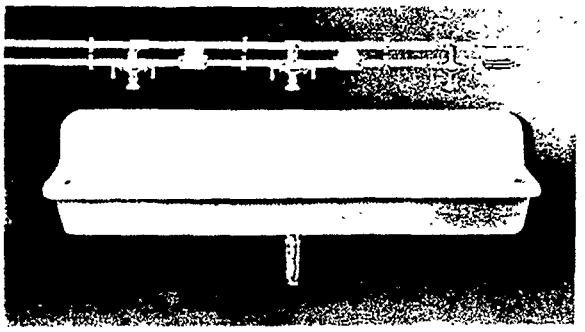
# PORCELAIN ENAMELED CAST IRON FACTORY WASH SINKS



6-300

Wash Sink: Porcelain enameled inside, ground coat outside, cast iron roll rim wash sink with 8" high back and center outlet.

Supports: Concealed hangers.

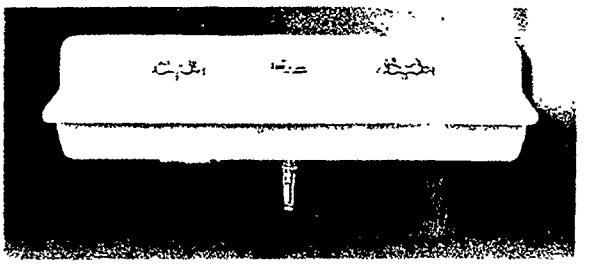
Trim: 8-241 Quaturn rough nickel plated wash sink faucets with flow reducers, 1¾" diameter removable-face spray nozzles, and ¾" I.P.S. male union supply connections on 3" vertical centers.
Rough nickel plated brass soap dishes.

Waste: 8-354 brass perforated open strainer with 1½" tailpiece.

*Note: Trap and piping illustrated are not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Length | 4' | 5' | 6' |
| Width | 18" | 18" | 18" |
| Depth, inside | 7" | 7" | 7" |
| Number of faucets | 2 | 3 | 3 |
| Number of soap dishes | 2 | 3 | 3 |



6-305

Wash Sinks: Porcelain enameled inside, ground coat outside, cast iron roll rim wash sink with 8" high back and center outlet; stainless steel soap dishes.

Supports: Concealed hangers.

Trim: 8-239 Quaturn rough nickel plated wash sink faucets with flow reducers, plain nozzles, and ½" I.P.S. female flanged union supply connections on 3⅜" centers.

Waste: 8-354 brass perforated open strainer with 1½" tailpiece.

*Note: Trap is not included.*

Overall Dimensions

| | | | |
|---|---|---|---|
| Length | 4' | 5' | 6' |
| Width | 18" | 18" | 18" |
| Depth, Inside | 7" | 7" | 7" |
| Number of faucets | 2 | 3 | 3 |
| Number of soap dishes | 1 | 2 | 2 |

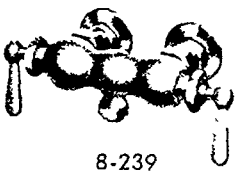
8-241

### 8-241 Quaturn Faucet

Quaturn rough nickel plated wash sink faucet with concealed flow reducers, indexed lever handles, 1¾" removable-face spray nozzle, and ¾" I.P.S. male tailpieces on 3" vertical centers.

### 8-239 Quaturn Faucet

Quaturn rough nickel plated wash sink faucet with concealed flow reducers, indexed lever handles, plain nozzle, and ½" I.P.S. female flanged union supply connections on 3⅜" centers.



8-239

PRICES COMPLETE, less traps

| Number | Size | Number of Faucets | Number of Soap Dishes | Regular Enamel | A.R. Enamel | Shpg.Wt. Pounds |
|---|---|---|---|---|---|---|
| 6-300 | 4' | 2 | 2 | $200.78 | $219.98 | 180 |
| | 5' | 3 | 3 | 245.16 | 267.16 | 215 |
| | 6' | 3 | 3 | 267.36 | 292.06 | 280 |
| 6-305 | 4' | 2 | 1 | 189.48 | 208.68 | 175 |
| | 5' | 3 | 2 | 229.46 | 251.46 | 210 |
| | 6' | 3 | 2 | 251.66 | 276.36 | 275 |
| 6-300 or 6-305 Wash Sink Only | 4' | — | — | 153.80 | 173.00 | 165 |
| | 5' | — | — | 175.80 | 197.80 | 195 |
| | 6' | — | — | 198.00 | 222.70 | 260 |
| 8-239 | ¾" | — | — | Rgh. N.P. 15.48 | | 3½ |
| 8-241 | ½" | — | — | Rgh. N.P. 16.12 | | 5 |

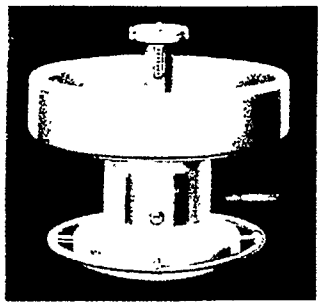
*When ordering, specify if regular or acid-resisting enamel is required.*

*For other wash sink faucets, refer to Section 8.*

*For sink traps, refer to Section 8.*

# BRADLEY WASHFOUNTAINS

Precast Marble or Stone Compositions—Stainless Steel or Enameled Iron.
Circular or Semi-Circular—Foot or Hand Controlled



Type AFA 36" Circular

## PRECAST STONE COMPOSITIONS

GRANITO—Limestone with sand-colored binder, machine ground and rubbed inside and outside.

INERGRAN—Limestone with sand-colored binder, machine ground and rubbed bowl interiors—bowl exteriors and pedestals rubbed only.

BRADSTONE—Limestone with sand-colored binder, rubbed surfaces, not ground.

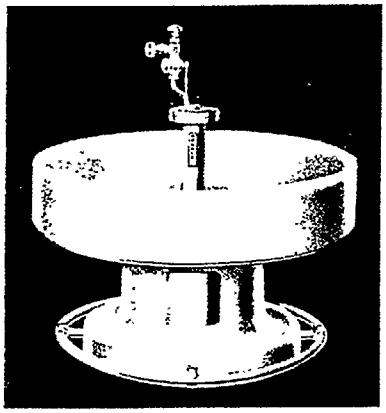
## PRECAST MARBLE COMPOSITIONS

MARMOGRAN—White marble aggregate with sand-colored binder, ground and rubbed.

SAGE GREEN MARMORITE—White marble aggregate in green binder, ground and rubbed.

VARI-COLORED MARMORITE—Marble of variegated colors with neutral binder, ground and rubbed.

BLACK AND WHITE MARMORITE—White marble aggregate with black binder, ground and rubbed.



Type BFA 54" Circular

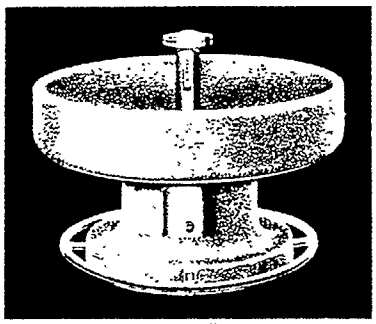
STAINLESS STEEL—Bowls are one-piece pressings of heavy gauge, 18-8 stainless steel. Pedestals are formed metal, bonderized, with acid-resisting baked enamel finish to match bowls. Scuff-ring bases are black enameled.

ENAMELED IRON—Bowls are one-piece pressings of deep-drawing steel with acid-resisting vitreous enamel finish. Pedestals are formed metal, bonderized, with acid-resisting baked enamel finish. Scuff-ring bases are black enameled.

### STANDARD EQUIPMENT

FOOT-CONTROLLED—Manually operated mixing valves, self-closing foot valves, and traps are standard equipment.

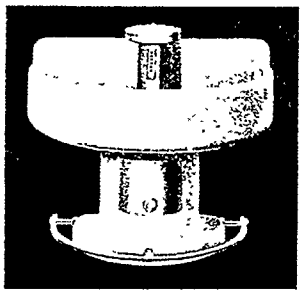
HAND-CONTROLLED—Manually operated mixing valves, operating valves and traps are standard equipment.



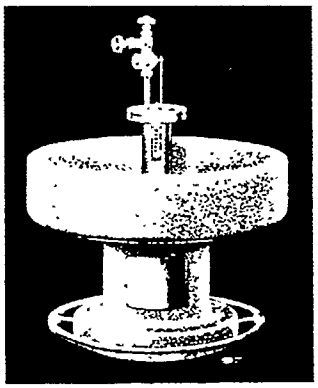
Type HFA 54" Circular

### MIXING VALVE

The mixing valve regulates temperature only, and in no way affects the volume of water, control of water delivery being accomplished by a separate valve.



Type CFA 36" Semi-Circular



Type OFA 36" Circular

### SPECIFICATIONS AND SIZES

| Foot Controlled | Hand Controlled | Characteristics | Design | Diameter, Inches | Number of users |
|---|---|---|---|---|---|
| AFA | AHA | Supplies and vent from below | Circular | 54<br>36 | 8 to 10<br>5 or 6 |
| BFA | BHA | Supplies from above, direct rising vent | Circular | 54<br>36 | 8 to 10<br>5 or 6 |
| *CFA | *CHA | Supplies and vent through wall or floor | Semi-circular | 54<br>36 | 5 to 6<br>3 |
| HFA | HHA | Supplies from below, direct rising vent | Circular | 54<br>36 | 8 to 10<br>5 or 6 |
| OFA | OHA | Supplies from above, vent from below | Circular | 54<br>36 | 8 to 10<br>5 or 6 |

*Types CFA and CHA are also obtainable for overhead supplies, overhead vent, or overhead supplies and vent, on special order.

**Overall Dimensions**

Height, floor to top of rim, all types . . . . . 28"
36" Semi-Circular, floor to top of back . . . . . 32"
54" Semi-Circular, floor to top of back . . . . . 35¼"
36" Semi-Circular, projection, wall to front . . . . . 22¾"
54" Semi-Circular, projection, wall to front . . . . . 32¼"

Foot controlled models are illustrated.

*For prices, refer to following page.*

*Prices are subject to change without notice*



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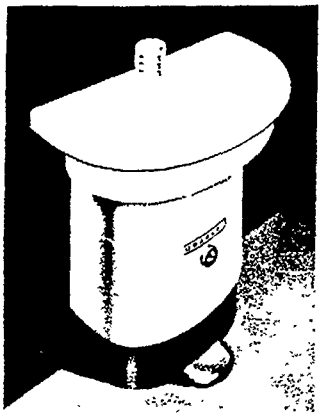
# BRADLEY DUO WASHFOUNTAINS

Enameled Iron or Stainless Steel



Duo Washfountain
*Enameled Iron*

Overall Dimensions

| | |
|---|---|
| Height | 31" |
| Width | 27¾" |
| Projection | 15⅞" |

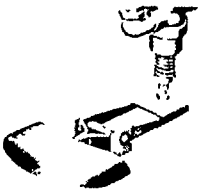
Duo Washfountains are designed for small washrooms in factories, stores, offices, schools, or wherever the number of users to be serviced does not require larger units. The Duo acts as a safeguard to health — each person washes in a continuous, ever-clean spray of running water. Foot-control operation eliminates possibility of skin infections as hands touch nothing but clear running water. Available with stainless steel or enameled iron bowls.

### ENAMELED IRON

Bowls are finished in acid-resisting vitreous enamel—pedestals are formed metal, bonderized, with baked enamel finish to match bowls. Scuff-bases are black enameled.

### STAINLESS STEEL

Bowls are 18-8 stainless steel—pedestals are formed metal, bonderized, with baked enamel finish to match bowls. Scuff-bases are black enameled.

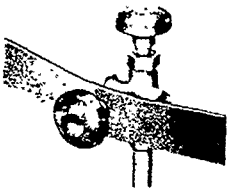


### FOOT CONTROL

Assures maximum water economy. A touch of the foot turns spray on, and removal turns it off.

### SPRAY HEAD

Discharges semi-annular spray of running water. Top is removable for cleaning. Chromium plated brass.



### MIXING VALVE

Regulates temperature only. Does not affect volume of water. Tempered water is obtained without opening operating valve to maximum pressure.

PRICES COMPLETE, F.O.B. Milwaukee, Wis.

| | | | | | |
|---|---|---|---|---|---|
| †Enameled Iron | $142.80 | Stainless Steel | $200.60 | Shpg. Wt. 56 lbs. | |

†For colors, see note at bottom of page.

### SOAP VALVES

Liquid and Powdered Soap Dispensers are made of glossy, black thermosetting plastic and are moulded in two halves for installation on fountains with overhead piping. Each section has two valves, powdered soap valves have side swing action, while liquid soap valves are push-up type.

*For Prices, see table below.*

### BRADEX FIXTURE CLEANER

A safe, effective and economical cleaning agent for washroom fixtures; especially recommended for washfountains. It contains no free acid, harsh abrasives or other destructive agents, thus can be used with safety—sprinkle lightly on surface to be cleaned, rub with a moist cloth and wash off with water.

*Available in cartons of 10, 25, 50 and 100 pounds.*

Circular Designs—*PRICES COMPLETE, F.O.B. Milwaukee, Wis., less soap dispensers

| FOOT CONTROLLED—Types AFA; BFA, HFA and OFA | | | | | HAND CONTROLLED—Types AHA, BHA, HHA and OHA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Material Compositions | *Price, Each 54" | *Price, Each 36" | Shpg. Wt. Pounds 54" | Shpg. Wt. Pounds 36" | Material Compositions | *Price, Each 54" | *Price, Each 36" | Shpg. Wt. Pounds 54" | Shpg. Wt. Pounds 36" |
| Granito | $424.16 | $297.50 | 1265 | 570 | Granito | $377.40 | $258.40 | 1250 | 560 |
| Inergran | 412.26 | 294.10 | 1265 | 570 | Inergran | 365.50 | 255.00 | 1250 | 560 |
| Bradstone | 403.76 | 290.70 | 1265 | 570 | Bradstone | 357.00 | 251.60 | 1250 | 560 |
| Marmogran | 445.40 | 309.40 | 1265 | 570 | Marmogran | 398.66 | 270.30 | 1250 | 560 |
| Marmorite, all colors | 461.56 | 319.60 | 1265 | 570 | Marmorite, all colors | 414.80 | 280.50 | 1250 | 560 |
| †Enameled | 454.76 | 308.56 | 270 | 195 | †Enameled | 408.00 | 269.46 | 240 | 175 |
| Stainless | 701.26 | 447.10 | 250 | 175 | Stainless | 654.50 | 408.00 | 220 | 155 |

Above prices include traps. If with soap dispensers for liquid or powdered soap, add each $44.20

Semi-Circular Designs—*PRICES COMPLETE, F.O.B. Milwaukee, Wis., less soap dispensers

| FOOT CONTROLLED—Type CFA | | | | | HAND CONTROLLED—Type CHA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Material Compositions | *Price, Each 54" | *Price, Each 36" | Shpg. Wt. Pounds 54" | Shpg. Wt. Pounds 36" | Material Compositions | *Price, Each 54" | *Price, Each 36" | Shpg. Wt. Pounds 54" | Shpg. Wt. Pounds 36" |
| Granito | $398.66 | $289.86 | 1010 | 475 | Granito | $360.40 | $255.86 | 1000 | 465 |
| Inergran | 382.50 | 286.45 | 1010 | 475 | Inergran | 344.26 | 252.46 | 1000 | 465 |
| Bradstone | 369.76 | 282.20 | 1010 | 475 | Bradstone | 331.50 | 248.20 | 1000 | 465 |
| Marmogran | 415.66 | 301.76 | 1010 | 475 | Marmogran | 377.40 | 267.76 | 1000 | 465 |
| Marmorite, all colors | 428.40 | 311.96 | 1010 | 475 | Marmorite, all colors | 390.16 | 277.96 | 1000 | 465 |
| †Enameled | 391.00 | 279.66 | 215 | 155 | †Enameled | 352.76 | 245.66 | 195 | 145 |
| Stainless | 636.66 | 428.40 | 205 | 155 | Stainless | 598.40 | 394.40 | 185 | 145 |

Above prices include traps. If with soap dispensers for liquid or powdered soap, add each $39.10

### Bradex Fixture Cleaner

Prices, per carton, F.O.B. Milwaukee, Wis.

| | |
|---|---|
| 10 pounds | $ 3.50 |
| 25 pounds | 8.20 |
| 50 pounds | 15.10 |
| 100 pounds | 27.20 |

†Note: Enameled washfountains are available in White and the following five colors:

Forest Green, Pastel Yellow, Sea Green, Sky Blue, Sun Tan.

Unless color is specified on order White will be furnished.

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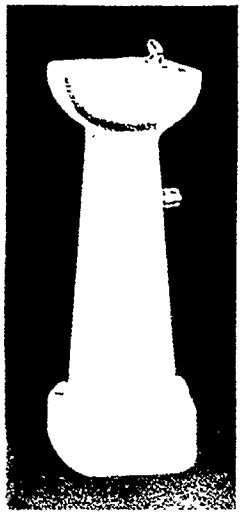
# VITREOUS CHINA DRINKING FOUNTAINS



6-504

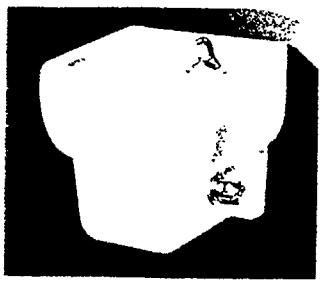
### 6-504 Corwith

Fountain: **Corwith** vitreous china pedestal drinking fountain with elevated bubbler base and integral strainer; floor screws with washers and cap nuts; china bolt caps.

Supply: 6-507 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, loose key stop; **Victor** self-closing valve with ***Magiclose*** control unit, and access cover plate.

Waste: 6-810 1" I.P.S. female outlet connection.

Overall Dimensions
Receptor ..12½x12½" Height .34"



6-514

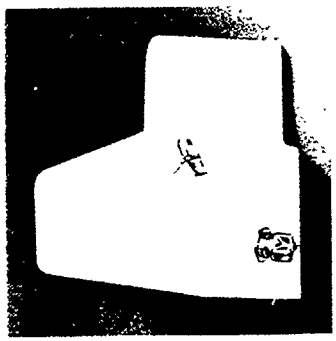
### 6-514 Clearstream

Fountain: **Clearstream** vitreous china wall drinking fountain with elevated bubbler base and integral strainer; wall screws with washers and cap nuts.

Supply: 6-518 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop, **Victor** self-closing valve with ***Magiclose*** control unit, and access cover plate.

Waste: 6-817 1¼" I.P.S. female galvanized "P" trap.

Overall Dimension
Width.....12" Height.....11⅝" Projection 13"



6-520

### 6-520 Waterfall

Fountain: **Waterfall** vitreous china wall drinking fountain with 7" high back, elevated bubbler base and integral strainer; concealed hanger and wall screw.

Supply: 6-529 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop, **Victor** self-closing valve with ***Magiclose*** control unit and access cover plate.

Waste: 6-817 1¼" I.P.S. female galvanized "P" trap.

Overall Dimensions
Width.....12" Height.....17⅛" Projection.....13"

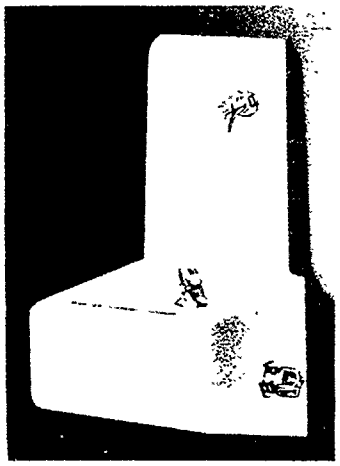
### 6-526 Waterfall

Fountain: **Waterfall** vitreous china wall drinking fountain with 15" high back, elevated bubbler base and integral strainer; concealed hanger and wall screw.

Supply: 6-529 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop, **Victor** self-closing valve with ***Magiclose*** control unit, and access cover plate.

Faucet: 6-760 push button ice water faucet.

Waste: 6-817 1¼" I.P.S. female galvanized "P" trap.

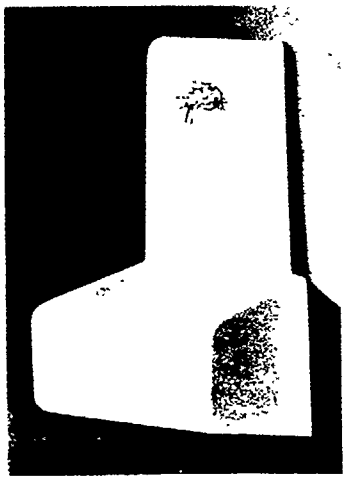


6-526

### 6-525 Waterfall

Same as 6-526 except less ice water faucet.

Overall Dimensions
Width ...12" Height.. .25⅛"
Projection. . . 13"



6-527

### 6-527 Waterfall

Fountain: **Waterfall** vitreous china wall drinking fountain with 15" high back and integral strainer; concealed hanger and wall screw.

Faucet: 6-760 push button ice water faucet.

Waste: 6-817 1¼" I.P.S. galvanized "P" trap.

Overall Dimensions
Width.....12" Height....25⅛" Projection....13"

All exposed metal trim is chromium plated.

### PRICES, COMPLETE

| Catalog Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-504 | $167.80 | $216.60 | 140 |
| 6-514 | 107.00 | 127.50 | 50 |
| 6-520 | 116.30 | 142.10 | 55 |
| 6-525 | 147.60 | 188.00 | 68 |
| 6-526 | 159.70 | 200.10 | 70 |
| 6-527 | 110.20 | 150.60 | 60 |

For fountain bubblers, refer to Page 6-16.
For ice water faucets, refer to Page 6-16.



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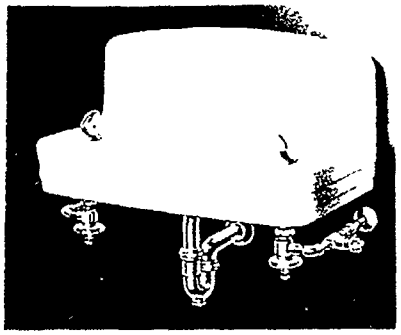
Printed in U.S.A.

# VITREOUS CHINA DRINKING FOUNTAINS



6-530

Overall Dimensions

Width 24" Height 12" Projection 13"

### 6-530 Erie

Fountain: **Erie** vitreous china wall drinking fountain with 8" high back, elevated bubbler bases and integral strainer; concealed hangers and apron screws.

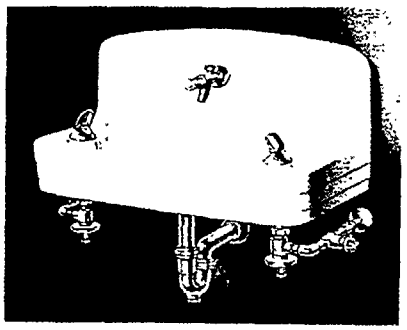
Supplies: Two 6-547 supply fittings, each with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop and **Victor** self-closing valve with *Magiclose* control unit.

Waste: 8-352 waste fitting with 1¼" O.D. tailpiece.

Trap: 8-401 1¼" bent tube adjustable "P" trap with cleanout.

### 6-531 Erie

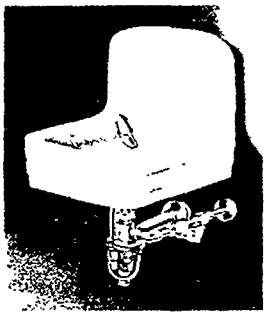
Same, except with 6-760 push button ice water faucet.



6-531

Overall Dimensions

Width 24" Height 12" Projection 13"



6-536 Erie

Fountain: **Erie** vitreous china wall drinking fountain with 8" high back, elevated bubbler base and integral strainer; concealed hanger and apron screws.

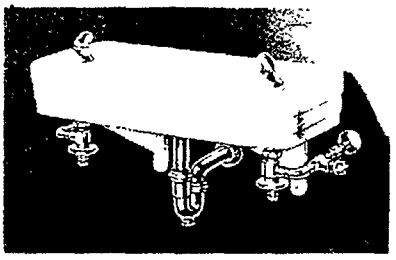
Supply: 6-547 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop and **Victor** self-closing valve with *Magiclose* control unit.

Waste: 8-352 waste fitting with 1¼" O.D. tailpiece.

Trap: 8-401 1¼" bent tube adjustable "P" trap with cleanout.

Overall Dimensions

Width.....12" Height.....12" Projection.....13"



6-542 Ontario

Fountain: **Ontario** vitreous china drinking fountain with elevated bubbler bases and integral strainer; porcelain enameled cast iron brackets with screws.

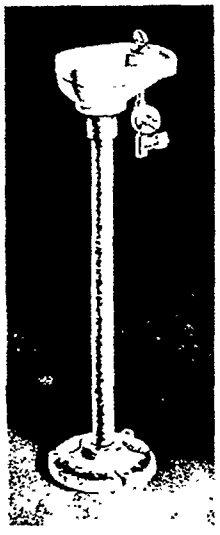
Supplies: Two 6-547 supply fittings, each with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop and **Victor** self-closing valve with *Magiclose* control unit.

Waste: 8-352 waste fitting with 1¼" O.D. tailpiece.

Trap: 8-401 1¼" bent tube adjustable "P" trap with cleanout.

Overall Dimensions

Width.....24" Apron height.....4"
Projection.....13", set 2" from wall.



6-551

### 6-551 Thurstend

Receptor: **Thurstend** vitreous china drinking fountain receptor with elevated bubbler base and integral strainer.

Supply: 6-728 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator; **Victor** self-closing valve with *Magiclose* control unit.

Waste: 6-820 galvanized waste connection with 1½" supporting pipe pedestal and cast iron base; 1" galvanized waste pipe to floor.

Overall Dimensions

Receptor.....10x7½" Height.....34"

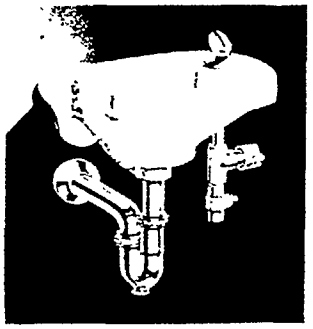
*Unless otherwise specified, all exposed metal trim is chromium plated.*

PRICES COMPLETE

| Catalog Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-530 | $193.00 | $226.40 | 80 |
| 6-531 | 205.10 | 238.50 | 80 |
| 6-536 | 103.60 | 120.90 | 50 |
| 6-542 | 200.50 | 230.50 | 60 |
| 6-551 | 84.40 | — | 40 |

*For fountain bubblers and ice water faucets, refer to Page 6-16.*

# DRINKING FOUNTAINS



6-555
Vitreous China

Overall Dimensions
Receptor 10x7½" Projection 12"

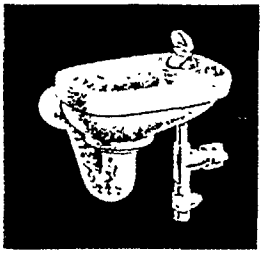
### 6-555 Thurstend, Vitreous China

Receptor: Thurstend vitreous china drinking fountain receptor with elevated bubbler base and integral strainer.

Supply: 6-727 supply fitting with Purflo angle stream bubbler with vandal-proof base, screw-driver regulating stop, and Victor self-closing valve with *Magiclose* control unit.

Waste: 6-815 galvanized combination wall bracket and outlet connection with 1¼" O.D. tailpiece.

Trap: 8-401 1¼" bent tube adjustable "P" trap with cleanout.



6-559
Galvanized Iron

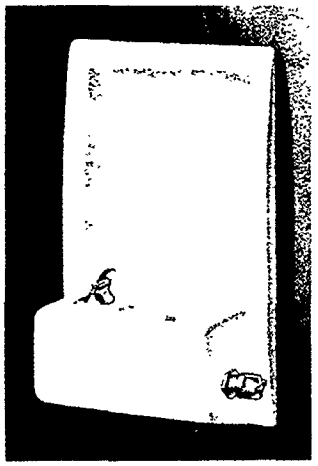
Overall Dimensions
Receptor 9x6"
Projection 11¼"

### 6-559 Thurstend, Galvanized Iron

Receptor: Thurstend galvanized iron drinking fountain receptor with elevated bubbler base and integral strainer.

Supply: 6-727 supply fitting with Purflo angle stream bubbler with vandal-proof base, screw-driver regulating stop, and Victor self-closing valve with *Magiclose* control unit.

Waste: 6-817 1¼" I.P.S. female galvanized "P" trap.



6-570

Overall Dimensions
Width. . 15"
Height 26½"
Projection 7¾"

### 6-570 Coolbrook

Fountain: Coolbrook vitreous china semi-recessed drinking fountain with elevated bubbler base, integral strainer and wall screws.

Supply: 6-572 supply fitting with Purflo angle stream bubbler with vandal-proof base, automatic stream regulator, screw-driver stop, Victor self-closing valve with *Magiclose* control unit, and access cover plate.

Waste: 6-813 waste fitting with 1¼" O.D. tailpiece.

*Note: Trap and cleanout are not included.*

### 6-575 Corridor

Fountain: Corridor vitreous china recess fountain with integral strainer, and wall screws.

Supply: 6-577 supply fitting with Purflo angle stream bubbler with vandal-proof base, automatic stream regulator, concealed screw-driver stop, Victor self-closing valve with *Magiclose* control unit, and access cover plate.

Waste: 6-813 waste fitting with 1¼" O.D. tailpiece.

*Note: Trap and cleanout are not included.*

6-575

Overall Dimensions
Width.. . . 16"
Height..... 30"
Recess depth. 10"

### PRICES COMPLETE

| Catalog Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-555 | $62.50 | — | 20 |
| 6-559 | 45.80 | — | 15 |
| 6-570 | 153.60 | $195.40 | 80 |
| 6-575 | 200.00 | 260.30 | 90 |

*For fountain bubblers, refer to Page 6-16.*



*Prices are subject to change without notice.*

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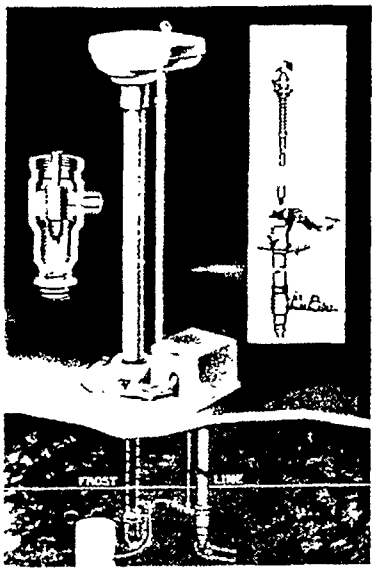



## THURSTEND FREEZE-PROOF DRINKING FOUNTAINS

No pit is required, easy to install. Should require no attention for many years, regardless of weather conditions. When pedal is at rest, valve is automatically shut off and water completely drains from fountain to below freezing depth. Leather shut-off ball may be quickly replaced by unscrewing pedal cap and lifting out the entire plunger unit, as illustrated.

*6-563 Thurstend*

Receptor: **Thurstend** vitreous china drinking fountain receptor with elevated bubbler base and integral strainer; Purflo angle stream bubbler with vandal proof base.

Supply: **Modern-Kelly** No. 10 self draining pedal action valve with back flow ball checks, air vent pipe with screened cap, and vandal proof cover, automatic stream regulator and 3/8" galvanized supply pipe with union.

Waste: 6-820 galvanized waste connection with 1 1/2" supporting pipe pedestal and cast iron base, 1" galvanized waste pipe to floor.

*When installing this fountain provide drainage by burying a length of drain tile, filled with gravel, below frost line, and connecting with drain tube.*

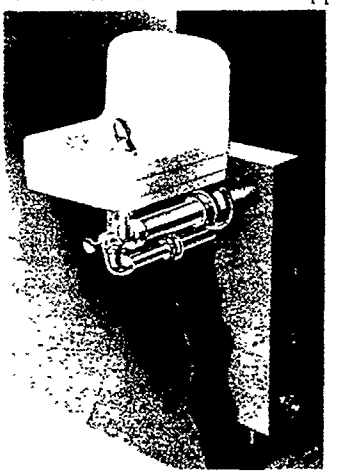
*Overall Dimensions*
Receptor . .10x7½" Height. . . . .34"
Standard Bury . .18", 36", 48", or 60"

PRICES COMPLETE

| Catalog Number | Size Bury | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-563 | 18" | $163.80 | 60 |
| | 36" | 169.06 | 65 |
| | 48" | 172.80 | 70 |
| | 60" | 176.56 | 75 |

## ERIE AND ONTARIO FREEZE-PROOF DRINKING FOUNTAINS

Erie and Ontario wall-hung, freeze-proof drinking fountains can be installed in school yards, refreshment stands, factories and many other points without danger of freezing. All surplus water from both the supply and waste lines drains back into the heated portion of the building, each time the fountain is used. The exposed supply line to the bubbler also drains completely after each operation.



6-590 Erie

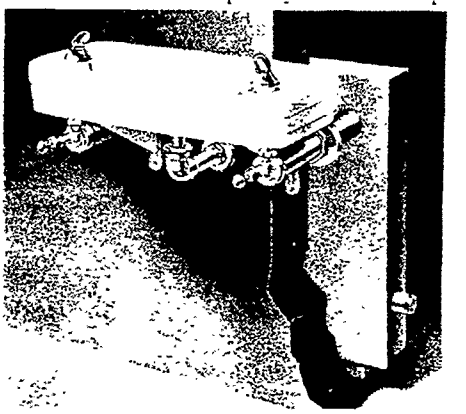
Fountain: Erie 12x13" vitreous china, freeze-proof, wall drinking fountain with 8" high back, elevated bubbler base with Purflo angle stream bubbler, integral strainer, waste fitting with 1¼" O.D. tailpiece, concealed hanger and apron screws.

Supply and Waste: No. 6-590 **Modern-Kelly** No. 14 push button, automatic freeze-proof valve and drain assembly with automatic stream regulator and 3/8" supply connection with stop for walls up to 12" thick. See below*

Waste Unit: 1¼" O.D. elbow connection with slip nut and escutcheon, waste connection and "P" trap assembled within cabinet.

Cabinet: 12x18x4" painted metal insulated cabinet with access panel and supporting screws.

*Note supply and waste connections may be furnished at either side of cabinet. Insulated cabinet should be installed within heated section of building. Specify whether cabinet is for exposed or recess installation.*



6-591 Ontario

Fountain: Ontario [illegible]" vitreous china, freeze-proof, wall drinking fountain with elevated bubbler bases and two Purflo angle stream bubblers, integral strainer, waste fitting with 1¼" O.D. tailpiece, and porcelain enameled brackets with screws.

Supply and Waste: 6-591 Two **Modern-Kelly** No. 15 push button, automatic freeze-proof valves and drain assemblies with automatic stream regulators and 3/8" supply connection with stop for walls up to 12" thick. See below*

Waste Unit: 1¼" O.D. elbow connection with slip nut and escutcheon, waste connection and "P" trap assembled within cabinet.

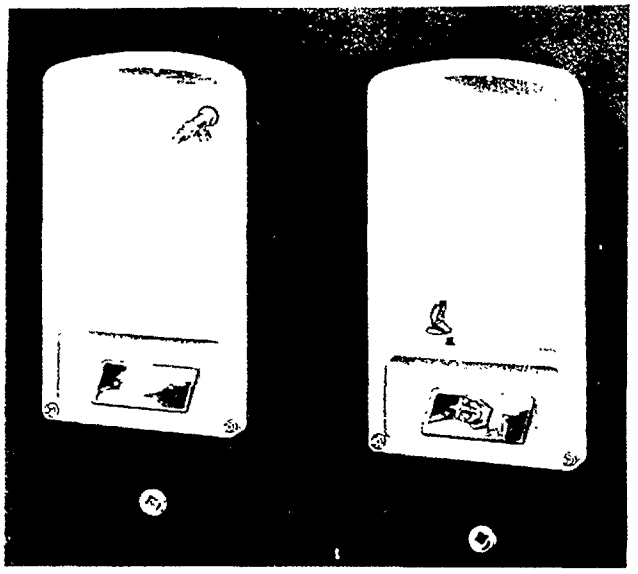
Cabinet: 24x18x4" painted metal insulated cabinet with access panel and supporting screws.

*Regularly furnished for 12" thick walls. Where measurement exceeds 12", specify wall thickness.

PRICES COMPLETE

| Catalog Number | Price, Each | | Shpg. Wt. Pounds |
|---|---|---|---|
| | White | Color | |
| 6-590 | $225.22 | $242.52 | 70 |
| 6-591 | 381.30 | 411.30 | 115 |

## CORRIDOR DRINKING FOUNTAIN AND CUSPIDOR COMBINATION



6-610

Fountain: **Corridor** vitreous china recess drinking fountain with elevated bubbler base, integral strainer and wall screws with washers and cap nuts.

Supply: 6-578 supply fitting with **Purflo** angle stream bubbler with vandal-proof base, automatic stream regulator, concealed screw-driver stop, **Victor** type by-pass pattern self-closing valve with ***Magiclose*** control unit; access cover plate.

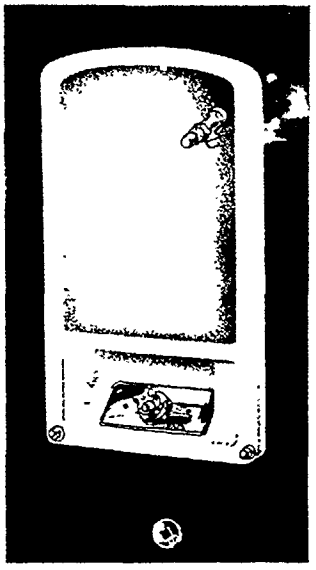
Waste: 6-813 waste fitting with 1¼" O.D. tailpiece.

Cuspidor: **Corridor** vitreous china recess cuspidor with integral strainer, wall screws with washers and cap nuts; access cover plate.

Supply: ⅜" I.P.S. fan flush spreader with integral stop.

Waste: 6-813 waste fitting with 1¼" O.D. tailpiece.

***Note: Concealed supply piping from drinking fountain to cuspidor and concealed traps with fittings for both fountain and cuspidor are not included.***



6-612

## CORRIDOR CUSPIDOR

6-612

Cuspidor: [illegible]idor vitreous china recess cuspidor with int[illegible] strainer and wall screws.

Supply: 6-613 supply fitting with **Victor** self-closing valve with ***Magiclose*** control unit, concealed screw-driver stop, access cover plate; ⅜" I.P.S. fan flush spreader with integral stop.

Waste: 6-813 waste fitting with 1¼" O.D. tailpiece.

***Note: Concealed piping from supply fitting to spreader and concealed trap with fittings for cuspidor are not included.***

**Exposed metal trim is chromium plated.**

| Overall Dimensions | Corridor Fountain | Corridor Cuspidor |
|---|---|---|
| Width | 16" | 16" |
| Height | 30" | 30" |
| Depth in wall | 9⅞" | 9⅞" |

### PRICES

| Catalog Number | Price, Each | | Shpg. Wt. Pounds |
|---|---|---|---|
| | White | Color | |
| 6-610 | $374.70 | $505.30 | 170 |
| 6-612 | 196.50 | 255.40 | 80 |

Prices do not include traps, cleanouts nor concealed piping.



*Prices are subject to change without notice.*

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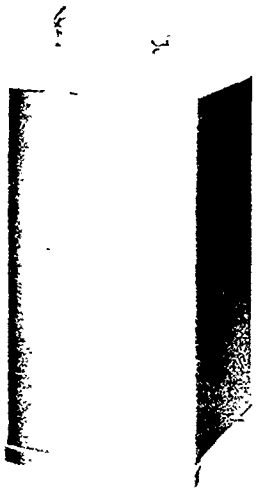
# HALSEY TAYLOR ELECTRIC DRINKING WATER COOLERS

*Hermetically Sealed Condensing Unit—Air Cooled*

Porcelain Enameled Top



CH10A, CH15A and HT30A
Hand Controlled

## FEATURES

**Cabinet**—Constructed of Bonderized steel, spot welded and finished in metallic gray.

**Fountain Receptor**—CH models have porcelain enameled cast iron receptors; SC Models have polished stainless steel receptors.

**Bubbler**—Chromium plated two-stream mound-building type.

**Automatic Stream Control**—Maintains a constant height drinking stream under varying water pressure; installed inside of cabinet.

**Storage Tank**—Everdur, tested for 140 pounds pressure.

**Insulation**—Full 2½" of approved granulated cork.

**Cooling Coil**—Copper tubing; patented direct flow.

**Precooler**—Non-clogging copper coil.

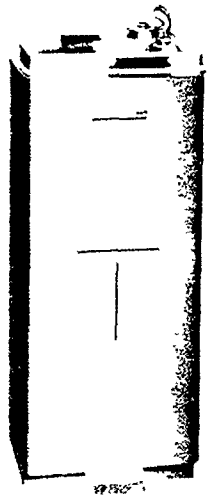
**Expansion Valve**—Automatic, special unloading type.

**Temperature Control**—Thermostatic, in direct contact with outlet water.

**Condensing Unit**—Hermetically sealed, internally spring mounted to eliminate vibration.

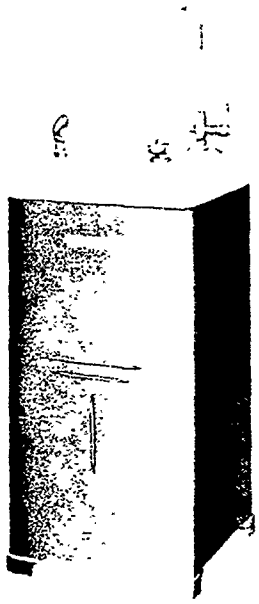
**Refrigerant**—Freon 12.

Stainless Steel Top



SC10A
Foot Operated

Porcelain Enameled Top



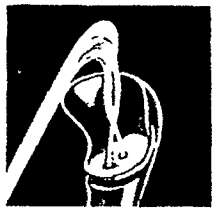
CH10A Hand Controlled
with Glass Filler
*(Glass Filler is extra)*

## HOURLY CAPACITIES

Gallons of 50° F. drinking water delivered per hour based on 60% spill through precooler.

| | Inlet Water Temperatures at | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 70° F. | | | | 80° F. | | | | 90° F. | | | | 100° F. | | | |
| **Room Temperature** | 70° | 80° | 90° | 100° | 70° | 80° | 90° | 100° | 70° | 80° | 90° | 100° | 70° | 80° | 90° | 100° |
| **CH10** | 18.0 | 16.5 | 14.5 | 13.2 | 12.3 | 11.3 | 10.0 | 9.1 | 9.5 | 8.5 | 7.6 | 7.0 | 7.7 | 6.9 | 6.5 | 5.8 |
| **CH15** | 26.2 | 24.2 | 23.2 | 21.2 | 17.8 | 16.5 | 15.8 | 14.5 | 14.4 | 13.3 | 12.5 | 11.5 | 11.9 | 11.2 | 10.6 | 9.5 |
| **HT30A** | 41.2 | 38.8 | 35.6 | 34.6 | 31.0 | 29.1 | 25.8 | 24.0 | 23.0 | 21.5 | 21.0 | 18.6 | 19.0 | 18.2 | 17.0 | 15.0 |
| **SC10A** | 18.0 | 16.5 | 14.5 | 13.2 | 12.3 | 11.3 | 10.0 | 9.1 | 9.5 | 8.5 | 7.6 | 7.0 | 7.7 | 6.9 | 6.5 | 5.8 |

Two-Stream Projector



The two stream, mound-building bubbler used on these fountains provides absolute sanitation and meets all health requirements. The automatic regulator control maintains the drinking stream at a uniform height.

No. 2382
Glass Filler

All water coolers can be fitted with No. 2382 chromium plated lever handle, self-closing type glass fillers at an extra charge.

Motors
A.C.
115 Volt
60 Cycle
Single Phase

*Overall Dimensions, Inches*

| Model Numbers | CH10A CH15A | HT30A | SC10A |
|---|---|---|---|
| Width | 18¾ | 22⅝ | 15¼ |
| Depth | 18¾ | 22⅝ | 15¼ |
| Height, to rim | 40 | 40¾ | 40 |
| Height, overall | 43¼ | 44 3/16 | 43¼ |
| Pedal Extension | — | — | 2⅜ |

## MODEL NUMBERS, DATA AND PRICES

*All Prices are F.O.B. Warren, Ohio

| Model Number Type of Control | | Tank Capacity | Motor | Type of | *Price | Shipping Weight, |
|---|---|---|---|---|---|---|
| **Hand** | **Foot** | Gallons | H.P. | Condenser | Each | Pounds |
| **CH10A** | — | 1¼ | ⅙ | Air Cooled | **$472.50** | 230 |
| **CH15A** | — | 3½ | ¼ | Air Cooled | **540.00** | 250 |
| **HT30A** | — | 10 | ½ | Air Cooled | **990.00** | 400 |
| — | **SC10A** | 1¼ | ⅙ | Air Cooled | **472.50** | 173 |

For No. 2382 self-closing glass filler **Add $22.50**
For foot pedal (available for all hand-operated coolers) **Add 21.76**
For White or Special Colors (include color sample with order) **Add 9.00**

*Prices are subject to change without notice.*

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## PURFLO BUBBLERS

6-731

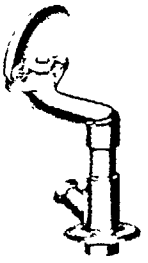
6-731

Purflo [illegible] stream bubbler [illegible] I.P.S. female inlet.

6-733

6-733

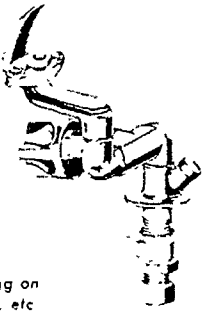
Purflo [illegible] bubbler [illegible] I.P.S. female flanged inlet connection.



6-735

6-735

Purflo angle stream bubbler [illegible] I.P.S. female flanged inlet connection with regulating screw.

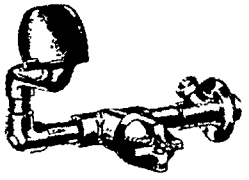


6-739

6-739

Purflo angle stream bubbler with Victor self-closing valve with *Magiclose* control unit, flanged inlet base with regulating screw and union ring, less tailpiece.

*Designed for installation through the hot water punching on lavatories, recommended for filling stations factories, etc*

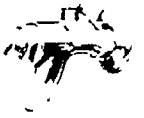


6-746

6-746

Purflo angle stream bubbler with Victor self-closing valve with *Magiclose* control unit, 3/8" I.P.S. female flanged inlet connection with regulating screw.

## ICE WATER FAUCETS



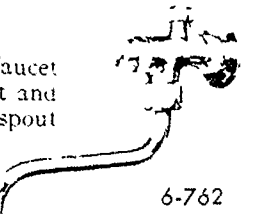
6-760

6-760

3/8" push button, self-closing ice water faucet with composition disc and concealed regulating screw; center of spout outlet to wall 2 1/2"

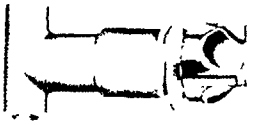
6-762

3/8" push button, self-closing ice water faucet with composition disc, swinging spout and concealed regulating screw; center of spout outlet to wall 7"



6-762

## DRINKING FOUNTAIN STOPS

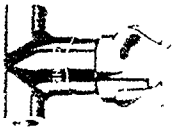


6-781

6-781

Victor 1/4" concealed self-closing stop with *Magiclose* control unit.

*Flange is adjustable for variations up to 3/4"*



6-782

6-782

Victor exposed self-closing stop with *Magiclose* control unit. Sizes: 3/8" and 1/2"

6-783

6-783

1/4" concealed lock-shield stop with composition disc, renewable seat and loose key.

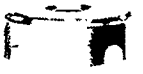
*Flange is adjustable for variations up to 3/4"*

6-784

6-784

3/8" exposed stop with screw driver slot.

## FOUNTAIN STRAINER



6-830

6-830

Metal drinking fountain strainer.

*For use on fountains having bubbler connection on center of waste outlet.*

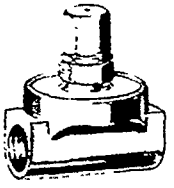
## AUTOMATIC STREAM REGULATORS

*For pressures up to 100 pounds*

Crane Automatic Stream Regulators provide uniform, balanced water supply despite fluctuating pressures. No water is wasted to maintain a constant height stream as all water entering the regulator passes on to the bubbler—no water is discharged into the waste line without first passing through the bubbler. Furnished rough brass for concealed installations and chromium plated brass for exposed installations.

*Regulator should be installed between bubbler and control stop.*

Unless otherwise specified all exposed metal trim is chromium plated.



6-800

3/8" exposed diaphragm type brass straight pattern Automatic Stream Regulator with integral regulating screw, female inlet and outlet.

6-801

1/4" concealed diaphragm type rough brass straight pattern Automatic Stream Regulator with integral regulating screw, female inlet and outlet.

### PRICES

| Catalog Number | Size Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| 6-731 | 3/8 | $11.04 | 3/4 |
| 6-733 | 3/8 | 14.04 | 1 |
| 6-735 | 3/8 | 17.68 | 1 1/4 |
| 6-739 | 1/4 | 32.00 | 3 1/4 |
| 6-746 | 3/8 | 33.06 | 2 1/2 |
| 6-760 | 3/8 | 12.10 | 1 |
| 6-762 | 3/8 | 16.20 | 1 1/4 |
| 6-781 | 1/4 | 13.86 | 2 |
| 6-782 | 3/8 | 9.44 | 1 |
| 6-782 | 1/2 | 9.44 | 1 1/4 |
| 6-783 | 1/4 | 10.62 | 2 |
| 6-784 | 3/8 | 4.42 | 1/2 |
| 6-800 | 3/8 | 14.04 | 3/4 |
| 6-801 | 1/4 | 10.94 | 3/4 |
| 6-830 | — | 3.90 | 1 1/2 |

*Prices are subject to change without notice.*

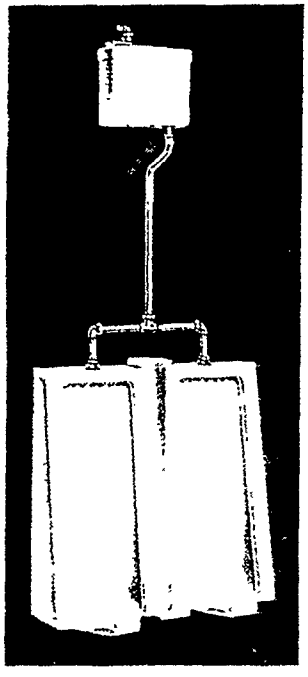


LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# SANITOR VITREOUS CHINA STALL URINALS

*With Integral Flushing Rim—18" Wide*



7-30

Sanitor stall urinals can be furnished in single units or in batteries of 2, 3, 4, 5 or 6 urinals with one tank

### 7-30

Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-36 vitreous china extended wing seam cover.

Tanks: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 Universal strainers.

### 7-31

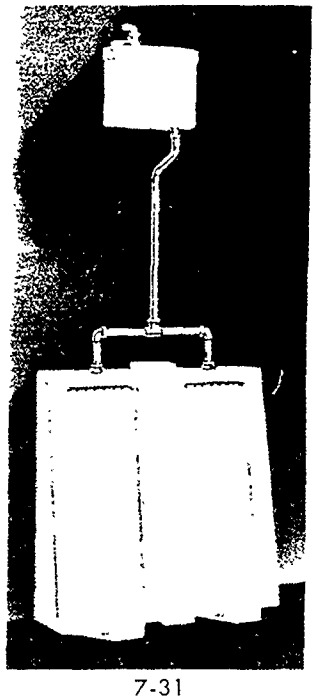
Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-35 vitreous china plain front seam cover.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 Universal strainers.



7-31

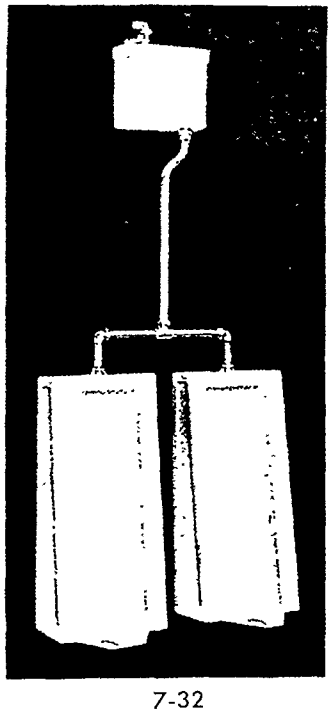
**Overall Dimensions**

| | | | |
|---|---|---|---|
| Width.... .. | 18" | Floor to top. | $38\frac{1}{4}$" |
| Wall to lip... | 16" | Set in floor... | $3\frac{3}{4}$" |

*For size of Bellemeade tanks and Alert valves used with urinals in batteries, refer to Pages 9-14 and 9-15*

*For other urinal trim see Page 9-14*

*For 7-35 and 7-36 vitreous china seam covers, see following page*



7-32

### 7-32

Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 Universal strainers.

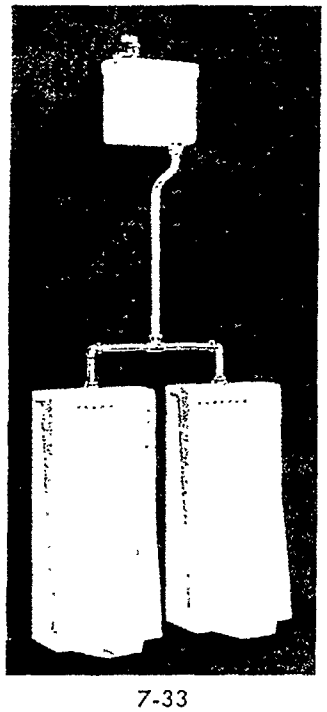
### 7-33

Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim and integral extended wing shields.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 Universal strainers.



7-33

## WHITE PRICES COMPLETE (Colored Ware—Prices on Request)

| Catalog Number | 18" Wide China Stalls | Prices, Each Unit Complete: Single Stall | Batteries of 2 | 3 | 4 | 5 | 6 | Shipping Weight, Pounds: Single Stall | Battery of 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-30 | With 7-36 $5\frac{1}{4}$" seam covers | — | $405.16 | $588.78 | $780.02 | $980.38 | $1168.34 | — | 405 | 610 | 815 | 1045 | 1245 |
| 7-30 | With 7-36 $7\frac{1}{4}$" seam covers | — | 418.06 | 614.10 | 818.52 | 1031.42 | 1232.16 | — | 410 | 620 | 840 | 1065 | 1270 |
| 7-31 | With 7-35 $5\frac{1}{4}$" seam covers | — | 398.56 | 575.58 | 760.22 | 953.98 | 1135.34 | - | 400 | 600 | 810 | 1025 | 1220 |
| 7-31 | With 7-35 $7\frac{1}{4}$" seam covers | — | 413.76 | 605.50 | 805.62 | 1014.22 | 1210.66 | - | 405 | 610 | 825 | 1045 | 1245 |
| 7-32 | Plain, without seam covers | $202.50 | 366.26 | 510.98 | 663.32 | 824.78 | 973.84 | 175 | 335 | 470 | 615 | 765 | 895 |
| 7-33 | With integral wing shields | 210.00 | 381.26 | 533.48 | 693.32 | 862.28 | 1018.84 | 185 | 355 | 500 | 655 | 815 | 955 |

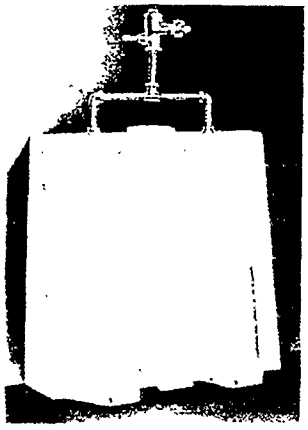
**Sanitor Stalls Only,** less trim **Plain Front** **$128.20** **With Integral Shields** **$135.70** **All exposed metal is chromium plated**

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# SANITOR VITREOUS CHINA STALL URINALS

*With Integral Flushing Rim—18" Wide*



7-34-C

### 7-34-C

Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-35 vitreous china plain front seam cover.

Valves: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Flush Pipe: 9-917 flush pipe assembly.

Strainers: 9-906 Universal strainers.

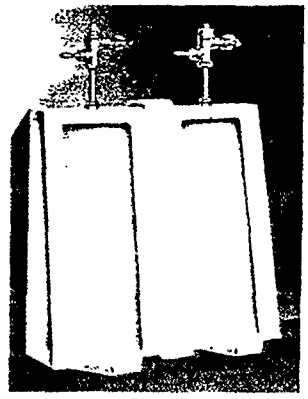
### 7-37-C

Urinals: Sanitor vitreous china slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-35 vitreous china plain front seam cover.

Valves: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Strainers: 9-906 Universal strainers.



7-37-C

7-38-C

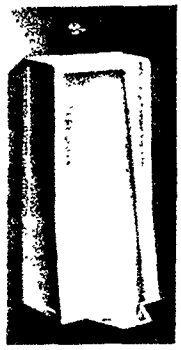
Urinal: Sanitor vitreous china slope front, top inlet stall urinal with integral flushing rim and integral extended wing shields.

Valve: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Strainer: 9-906 Universal strainer.

### 7-40-C

Same, except stall urinal without extended wing shields.



7-39-C

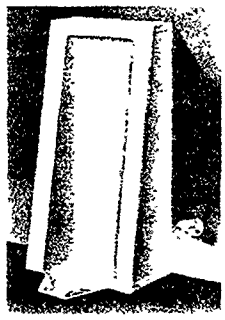
Urinal: Sanitor vitreous china slope front, back inlet stall urinal with integral flushing rim and integral extended wing shields.

Valve: No. 194 Crown concealed flush valve with oscillating handle, ¾" wheel handle straight stop and flush connection. (For walls up to 6" thick —specify wall thickness).

Strainer: 9-906 Universal strainer.

### 7-43-C

Same, except stall urinal without extended wing shields.



7-44-R

Urinal: Sanitor vitreous china slope front back inlet stall urinal with integral flushing rim.

Valve: No. 333 Royal concealed flush valve with foot pedal, ¾" wheel handle angle stop and 1" female I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness).

Strainer: 9-906 Universal strainer.

**Overall Dimensions**

Width.....18" Floor to top...38¼"
Wall to lip...16" Set in floor ... 3¾"

## CHINA SEAM COVERS

7-35
Plain Front

7-36
Extended Wing

### PRICE EACH

| Number | Width | White | Color |
|---|---|---|---|
| 7-35 | 5¼" | $32.30 | $48.50 |
| | 7¼" | 46.70 | 70.10 |
| 7-36 | 5¼" | 38.90 | 58.30 |
| | 7¼" | 51.00 | 76.50 |

### PRICES COMPLETE

| Catalog Number | 18" Wide China Stalls | Prices, Each Unit Complete | | | | | | Shpg. Wt., Lbs. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Single Stall | | Battery of 2 | | Battery of 3 | | Single Stall | Battery of 2 | Battery of 3 |
| | | White | Color | White | Color | White | Color | | | |
| 7-34C | With 7-35 5¼" seam covers | — | — | $358.40 | $503.00 | $534.24 | $759.24 | — | 360 | 570 |
| 7-34C | With 7-35 7¼" seam covers | — | — | 373.08 | 524.88 | 563.54 | 802.94 | — | 370 | 590 |
| 7-37C | With 7-35 5¼" seam covers | — | — | 371.66 | 516.26 | 573.64 | 798.64 | — | 360 | 570 |
| 7-37C | With 7-35 7¼" seam covers | — | — | 386.06 | 537.86 | 602.44 | 841.84 | — | 370 | 590 |
| 7-38C | With integral wing shields | $177.18 | $244.98 | 354.36 | 489.96 | 531.54 | 734.94 | 160 | 320 | 480 |
| 7-39C | With integral wing shields | 177.98 | 245.78 | 355.96 | 491.56 | 533.94 | 737.34 | 160 | 320 | 480 |
| 7-40C | Plain front | 169.68 | 233.88 | 339.36 | 467.76 | 509.04 | 701.64 | 150 | 300 | 450 |
| 7-43C | Plain front | 170.48 | 234.68 | 340.96 | 469.36 | 511.44 | 704.04 | 150 | 300 | 450 |
| 7-44R | Plain front | 176.20 | 240.40 | 352.40 | 480.80 | 528.60 | 721.20 | 150 | 300 | 450 |

| Sanitor Stalls Only, less trim | White | Color |
|---|---|---|
| Plain Front | $128.20 | $192.40 |
| With Integral Shields | 135.70 | 203.50 |

**All exposed metal trim is chromium plated.**
*For urinal trim, refer to Section 9*

If flush valves are required with vacuum breakers to meet local code requirements,
ADD per valve: Exposed.....$4.54 Concealed.....$3.86

*Prices are subject to change without notice*

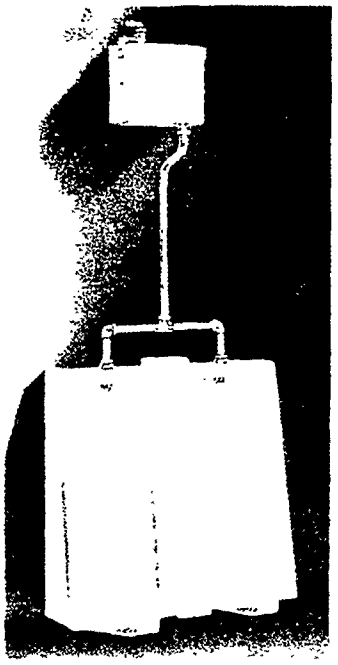


LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# SANITOR DURACLAY STALL URINALS

*Earthenware Vitreous Glazed—With Metal Spreaders—18" and 21" Wide*



7-45

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front top inlet stall urinals.

Seam Cover: 7-55 Duraclay, earthenware vitreous glazed, plain front seam cover.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

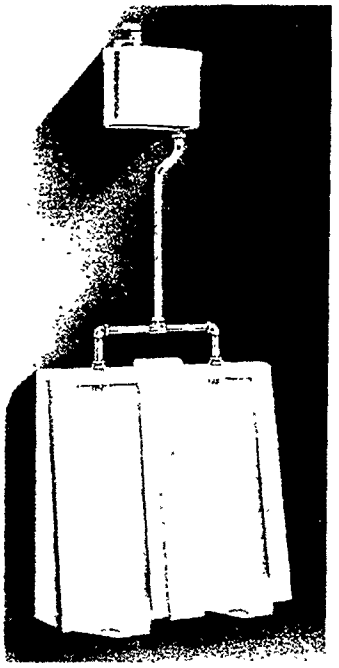
Flush Pipe: 9-915 flush pipe assembly.

Spreaders: 9-900 top inlet spreaders.

Strainers: 9-906 Universal strainers.

7-47 (Not illustrated)

Same as 7-45 except without seam covers.



7-46

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front top inlet stall urinals.

Seam Cover: 7-56 Duraclay, earthenware vitreous glazed, extended wing seam cover.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

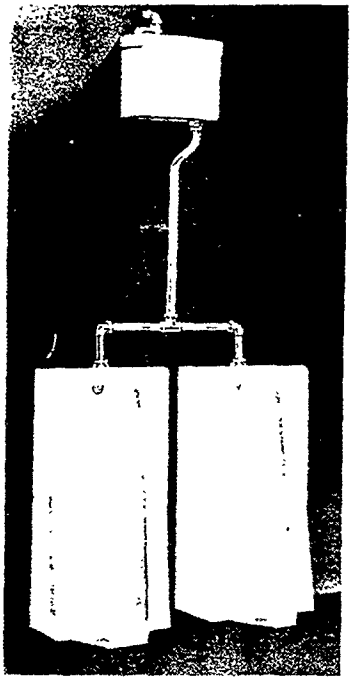
Flush Pipe: 9-915 flush pipe assembly.

Spreaders: 9-900 top inlet spreaders.

Strainers: 9-906 Universal strainers.

Sanitor stall urinals can be furnished in single units or in batteries of 2, 3, 4, 5, or 6 with one tank.

*All exposed metal trim is chromium plated.*



7-48

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front top inlet stall urinals with integral extended wing shields.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Spreaders: 9-900 top inlet spreaders.

Strainers: 9-906 Universal strainers.

**Overall Dimensions**

*Widths..18" and 21" Floor to top..38¼"
Wall to lip.....16" Set in floor... 3¾"
*7-48 Sanitor stalls with integral extended wing shields are made 18" wide only.

## WHITE PRICES COMPLETE (Colored Ware—Prices on Request)

| Catalog Number | 18" and 21" Wide Duraclay Stalls | Width, Inches | Prices, Each Unit Complete: Single Stall | Battery of 2 | Battery of 3 | Battery of 4 | Battery of 5 | Battery of 6 | Shipping Weight, Pounds: Single Stall | Battery of 2 | Battery of 3 | Battery of 4 | Battery of 5 | Battery of 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-45 | With 7-55 5¼" seam covers | 18 | — | $396.96 | $573.18 | $757.02 | $949.98 | $1130.54 | — | 440 | 660 | 890 | 1130 | 1350 |
| | | 21 | — | 448.76 | 650.80 | 861.24 | 1080.12 | 1286.88 | — | 480 | 720 | 970 | 1230 | 1470 |
| 7-45 | With 7-55 7¼" seam covers | 18 | — | 412.16 | 603.10 | 802.42 | 1010.22 | 1205.86 | — | 450 | 680 | 920 | 1170 | 1400 |
| | | 21 | — | 463.96 | 680.72 | 906.64 | 1140.36 | 1362.20 | — | 490 | 740 | 1000 | 1270 | 1520 |
| 7-46 | With 7-56 5¼" seam covers | 18 | — | 403.56 | 586.38 | 776.82 | 976.38 | 1163.54 | — | 445 | 670 | 905 | 1150 | 1375 |
| | | 21 | — | 455.36 | 664.00 | 881.04 | 1106.52 | 1319.88 | — | 485 | 730 | 985 | 1250 | 1495 |
| 7-46 | With 7-56 7¼" seam covers | 18 | — | 416.46 | 611.70 | 815.32 | 1027.42 | 1227.36 | — | 455 | 690 | 935 | 1190 | 1425 |
| | | 21 | — | 468.26 | 689.32 | 919.54 | 1157.56 | 1383.70 | — | 495 | 750 | 1015 | 1290 | 1545 |
| 7-47 | Plain, no seam covers | 18 | $201.70 | 364.66 | 508.58 | 660.12 | 820.78 | 969.04 | 200 | 365 | 510 | 665 | 830 | 975 |
| | | 21 | 227.20 | 416.46 | 586.20 | 764.34 | 950.92 | 1125.38 | 220 | 395 | 560 | 715 | 890 | 1045 |
| 7-48 | With integral wing shields | 18 | 207.40 | 376.06 | 525.68 | 682.92 | 849.28 | 1003.24 | 210 | 490 | 550 | 730 | 905 | 1070 |

| Sanitor Stalls Only, less trim | | |
|---|---|---|
| Plain Front | 18 | $120.30 |
| | 21 | 145.80 |
| With Integral Shields | 18 | 126.00 |

*For Duraclay Seam Covers, refer to Page 7-6.*

*For size of Bellemeade tanks and Alert valves used with urinals in batteries, refer to Pages 9-14 and 9-15.*

*For other urinal trim see Page 9-14.*

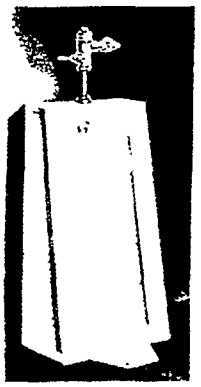
*Prices are subject to change without notice.*

Printed in U.S.A.

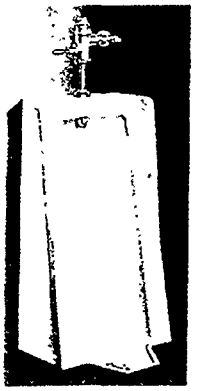
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# SANITOR DURACLAY STALL URINALS

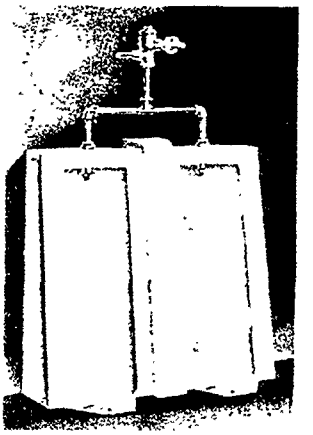
*Earthenware Vitreous Glazed—With Metal Spreaders—18" and 21" Wide*



7-50-C



7-52-C



7-53-C

### 7-50-C

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front top inlet stall urinal.

Valve: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Spreader: 9-900 top inlet spreader.

Strainer: 9-906 Universal Strainer.

### 7-52-C

Same as 7-50 except stall has integral extended wing shields.

### 7-53-C

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front top inlet stall urinals.

Seam Cover: 7-55 Duraclay earthenware vitreous glazed, plain front seam cover.

Valve: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Flush Pipe: 9-917 flush pipe assembly.

Spreaders: 9-900 top inlet spreaders.

Strainers: 9-906 Universal strainers.

**Furnished in batteries of 2 or 3 urinals with one flush valve.**

7-57-C

### 7-57-C

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front back inlet stall urinal with integral extended wing shields.

Valve: No. 194 Crown concealed flush valve with oscillating handle, ¾" wheel handle straight stop and flush connection. (For walls up to 6" thick —specify wall thickness.)

Spreader: 9-903 back inlet spreader.

Strainer: 9-906 Universal strainer.

### 7-61-C (Not Illustrated)

Same as 7-57-C except stall is without integral extended wing shields.

7-62-R

### 7-62-R

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front back inlet stall urinal.

Valve: No. 333 Royal concealed flush valve with foot pedal, ¾" wheel handle angle stop and 1" female I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

Spreader: 9-903 back inlet spreader.

Strainer: 9-906 Universal strainer.

## DURACLAY SEAM COVERS

7-55
Plain Front

7-56
Extended Wing

### PRICES EACH

| Number | Width | White | Color |
|---|---|---|---|
| 7-55 | 5¼" | $32.30 | $48.50 |
| | 7¼" | 46.70 | 70.10 |
| 7-56 | 5¼" | 38.90 | 58.30 |
| | 7¼" | 51.00 | 76.50 |

## PRICES COMPLETE

| Catalog Number | Width Inches | Prices, Each Unit Complete | | | | | | Shipping Weight, Pounds | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Single Stall | | Battery of 2 | | Battery of 3 | | Single Stall | Battery of 2 | Battery of 3 |
| | | White | Color | White | Color | White | Color | | | |
| 7-50C | 18 | $168.88 | $229.08 | $337.76 | $458.16 | $506.64 | $687.24 | 175 | 350 | 525 |
| 7-50C | 21 | 194.38 | 267.38 | 388.76 | 534.76 | 583.14 | 802.14 | 185 | 370 | 555 |
| 7-52C | 18 | 174.58 | 237.58 | 349.16 | 475.16 | 523.74 | 712.74 | 180 | 360 | 540 |
| †7-53C | 18 | — | — | 356.80 | 493.40 | 531.84 | 744.84 | — | 410 | 645 |
| †7-53-C | 21 | — | — | 408.36 | 570.56 | 609.34 | 860.74 | — | 430 | 675 |
| 7-57-C | 18 | 175.82 | 238.82 | 351.64 | 477.64 | 527.46 | 716.46 | 180 | 360 | 540 |
| 7-61-C | 18 | 170.12 | 230.32 | 340.24 | 460.64 | 510.36 | 690.96 | 175 | 350 | 525 |
| 7-61-C | 21 | 195.62 | 268.62 | 391.24 | 537.24 | 586.86 | 805.86 | 185 | 370 | 555 |
| 7-62-R | 18 | 175.84 | 236.04 | 351.68 | 472.08 | 527.52 | 708.12 | 175 | 350 | 525 |
| 7-62-R | 21 | 201.34 | 274.34 | 402.68 | 548.68 | 604.02 | 823.02 | 185 | 370 | 555 |

| Sanitor Stalls Only, less trim | | White | Color |
|---|---|---|---|
| Plain Front | 18" | $120.30 | $180.50 |
| | 21" | 145.80 | 218.80 |
| With Integral Shields | 18" | 126.00 | 189.00 |

If flush valves are required with vacuum breakers to meet local code requirements.
ADD per valve: Exposed $4.54
Concealed. $3.86

†Prices include 7-55 5¼" wide plain front seam covers.

**Overall Dimensions**

*Widths. 18" and 21" Floor to top....38¼"
Wall to lip ... 16" Set in floor. . 3¾"

*7-52-C and 7-57-C Sanitor stalls with integral extended wing shields are made 18" wide only.

*For urinal trim, refer to Section 9.*

*Prices are subject to change without notice.*



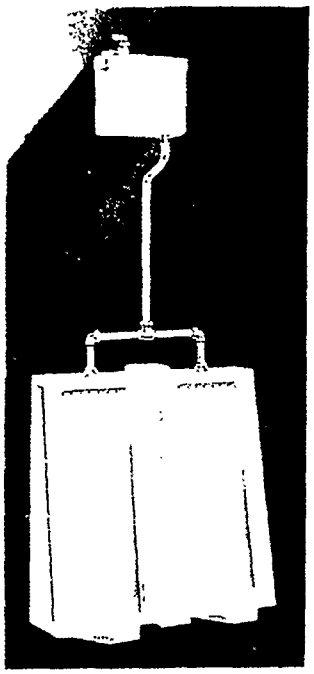
May 4, 1955
*Superseding September 28, 1953*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# SANITOR DURACLAY STALL URINALS

*Earthenware Vitreous Glazed—With Integral Flushing Rim—18" Wide*



7-65

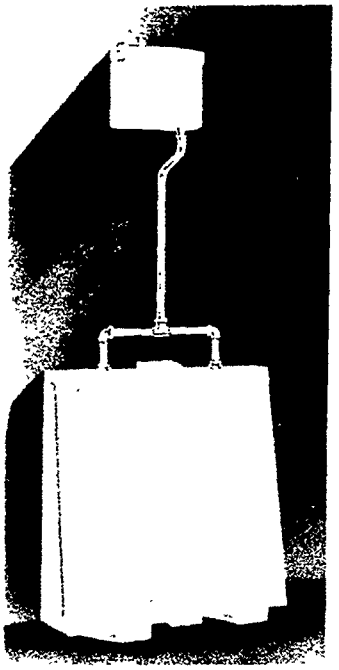
Urinals: **Sanitor** Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-56 Duraclay, earthenware vitreous glazed, extended wing seam cover.

Tank: 7-170 **Bellemeade** vitreous china tank with **Alert** automatic siphon valve and **Marvel** float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 **Universal** strainers.



7-66

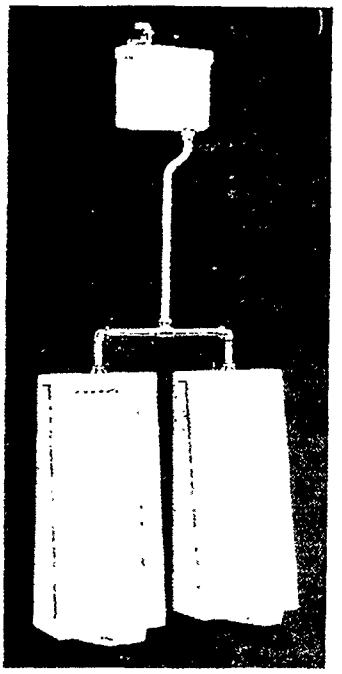
Urinals: **Sanitor** Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-55 Duraclay, earthenware vitreous glazed, plain front seam cover.

Tank: 7-170 **Bellemeade** vitreous china tank with **Alert** automatic siphon valve and **Marvel** float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 **Universal** strainers.



7-67

Urinals: **Sanitor** Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinals with integral flushing rim.

Tank: 7-170 **Bellemeade** vitreous china tank with **Alert** automatic siphon valve and **Marvel** float valve.

Flush Pipe: 9-915 flush pipe assembly.

Strainers: 9-906 **Universal** Strainers.

***Sanitor stall urinals can be furnished in single units or in batteries of 2, 3, 4, 5 or 6 urinals with one tank.***

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Width..... | 18" | Floor to top..... | 38¼" |
| Wall to lip. | 16" | Set in floor..... | 3¾" |

## WHITE PRICES COMPLETE (Colored Ware—Prices on Request)

| Catalog Number | 18" Wide Duraclay Stalls | Prices, Each Unit Complete | | | | | | Shipping Weight, Pounds | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Single Stall | Batteries of 2 | 3 | 4 | 5 | 6 | Single Stall | Batteries of 2 | 3 | 4 | 5 | 6 |
| 7-65 | With 7-56 5¼" seam covers | — | $405.16 | $588.78 | $780.02 | $980.38 | $1168.34 | — | 445 | 670 | 910 | 1150 | [illegible] |
| 7-65 | With 7-56 7¼" seam covers | — | 418.06 | 614.10 | 818.52 | 1031.42 | 1232.16 | — | 450 | 685 | 930 | 1180 | 1405 |
| 7-66 | With 7-55 5¼" seam covers | — | 398.56 | 575.58 | 760.22 | 953.98 | 1135.34 | — | 440 | 660 | 890 | 1130 | 1345 |
| 7-66 | With 7-55 7¼" seam covers | — | 413.76 | 605.50 | 805.62 | 1014.22 | 1210.66 | — | 445 | 675 | 915 | 1160 | 1380 |
| 7-67 | Plain, without seam covers | $202.50 | 366.26 | 510.98 | 663.32 | 824.78 | 973.84 | 190 | 365 | 515 | 675 | 840 | 985 |
| **Sanitor Stalls Only**, less trim | | 128.20 | | | | | | | | | | | |

*For Duraclay seam covers, refer to Page 7-6.*

*For size of Bellemeade tanks and Alert valves used with urinals in batteries, refer to Pages 9-14 and 9-15.*

**All exposed metal trim is chromium plated.**

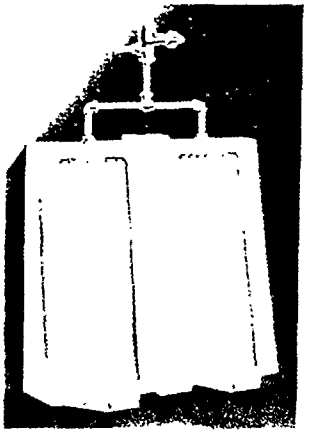
*For other urinal trim see Page 9-14.*

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# SANITOR DURACLAY STALL URINALS

*Earthenware Vitreous Glazed—With Integral Flushing Rim—18" Wide*



7-70-C

### 7-70-C

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinals with integral flushing rim.

Seam Cover: 7-55 Duraclay, earthenware vitreous glazed, plain front seam cover.

Valve: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Flush Pipe: 9-917 flush pipe assembly.

Strainers: 9-906 Universal strainers.

**Sanitor stall urinals can be furnished in batteries of 2 or 3 urinals with one flush valve.**

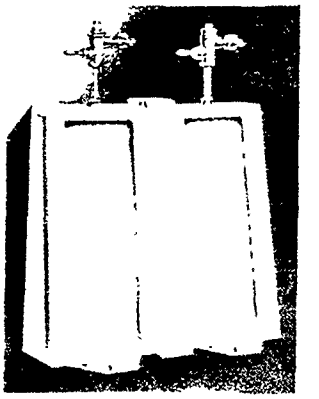
### 7-71-C

Urinals: Sanitor Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinals with integral flushing rim.

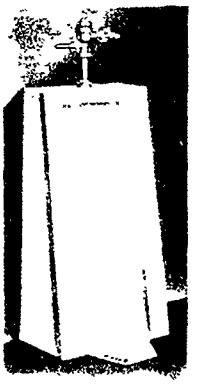
Seam Cover: 7-55 Duraclay, earthenware vitreous glazed, plain front seam cover.

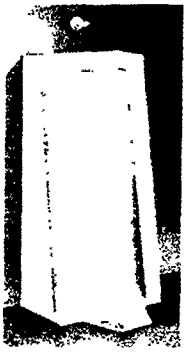
Valves: No. 185 Crown flush valves with ¾" screw-driver angle stop and flush connection.

Strainers: 9-906 Universal strainers.



7-71-C





### 7-74-C

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front, top inlet stall urinal with integral flushing rim.

Valve: No. 185 Crown flush valve with ¾" screw-driver angle stop and flush connection.

Strainer: 9-906 Universal strainer.

### 7-75-C

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front, back inlet stall urinal with integral flushing rim.

Valve: No. 194 Crown concealed flush valve with oscillating handle, ¾" wheel handle straight stop and flush connection. (For walls up to 6" thick—specify wall thickness).

Strainer: 9-906 Universal strainer.

### 7-76-R

Urinal: Sanitor Duraclay, earthenware vitreous glazed, slope front, back inlet stall urinal with integral flushing rim.

Valve: No. 333 Royal concealed flush valve with foot pedal, ¾" wheel handle angle stop and 1" female I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness).

Strainer: 9-906 Universal strainer.

## PRICES COMPLETE

| Catalog Number | 18" Wide Duraclay Stalls | Prices, Each Unit Complete: Single Stall White | Single Stall Color | Battery of 2 White | Battery of 2 Color | Battery of 3 White | Battery of 3 Color | Shipping Weight, Lbs.: Single Stall | Battery of 2 | Battery of 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| 7-70-C | With 7-55 5¼" seam covers | — | — | $358.40 | $503.00 | $534.24 | $759.24 | — | 400 | 635 |
| 7-70-C | With 7-55 7¼" seam covers | — | — | 373.08 | 524.88 | 563.54 | 802.94 | — | 410 | 655 |
| 7-71-C | With 7-55 5¼" seam covers | — | — | 371.66 | 516.26 | 573.64 | 798.64 | — | 395 | 630 |
| 7-71-C | With 7-55 7¼" seam covers | — | — | 386.06 | 537.86 | 602.44 | 841.84 | — | 405 | 650 |
| 7-74-C | Plain front | $169.68 | $233.88 | 339.36 | 467.76 | 509.04 | 701.64 | 160 | 320 | 480 |
| 7-75-C | Plain front | 170.48 | 234.68 | 340.96 | 469.36 | 511.44 | 704.04 | 160 | 320 | 480 |
| 7-76-R | Plain front | 176.20 | 240.40 | 352.40 | 480.80 | 528.60 | 721.20 | 165 | 330 | 495 |
| Sanitor Stalls Only, less trim | | 128.20 | 192.40 | | | | | | | |

If flush valves are required with vacuum breakers to meet local code requirements.
**ADD** per valve: Exposed **$4.54** Concealed **$3.86**

| Overall Dimensions | | | |
|---|---|---|---|
| Width | 18" | Floor to top | 38¼" |
| Wall to lip | 16" | Set in floor | 3¾" |

*For Duraclay seam covers, refer to Page 7-6.*

For urinal trim, refer to Section 9.

All exposed metal trim is chromium plated.

*Prices are subject to change without notice.*



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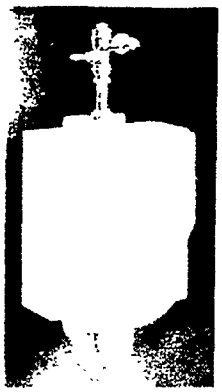
Printed in U.S.A.

## NEU-RIO VITREOUS CHINA BLOW-OUT URINALS

*With Integral Flushing Rim—Integral Trap—18" Wide*



7-80-C

### 7-80-C

Urinal: Neu-Rio vitreous china blow-out urinal with integral extended shields, flushing rim and trap with cleanout, 1¼" top inlet, 2" back outlet connection and supporting bolts.

Valve: No. 180 YV Crown flush valve with vacuum breaker, 1" screw-driver angle stop and flush connection.

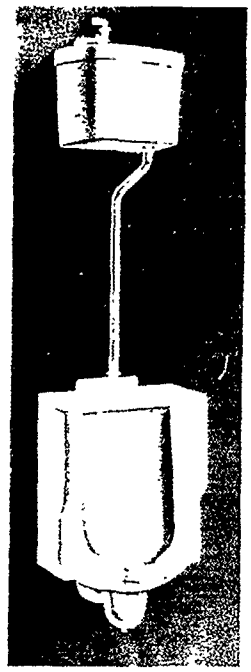
### 7-81

Urinal: Neu-Rio vitreous china blow-out urinal with integral extended shields, flushing rim and trap with cleanout, 1¼" top inlet, 2" back outlet connection and supporting bolts.

Tank: 7-170 Bellemeade No. 4 vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 No. 13 flush pipe assembly.

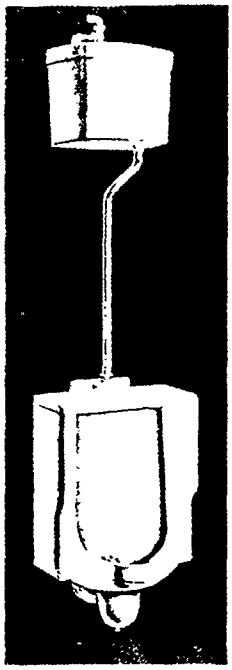
Neu-Rio urinals are also available with back inlet.



7-81

## CORRECTO VITREOUS CHINA WASHOUT URINALS

*Integral Flushing Rim—Integral Trap—Integral Strainer—18" Wide*



7-85

### 7-85

Urinal: Correcto vitreous china washout urinal with integral extended shields, flushing rim, strainer and trap with cleanout, ¾" top inlet, 2" back outlet and supporting bolts.

Tank: 7-170 Bellemeade No. 1 vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 No. 1 flush pipe assembly.

Correcto urinals may be arranged in batteries for flushing with one tank.

### 7-87-C

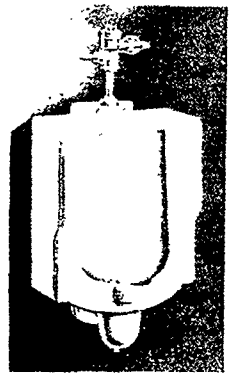
Urinal: Correcto vitreous china washout urinal with integral extended shields, flushing rim, strainer and trap with cleanout, ¾" top inlet, 2" back outlet and supporting bolts.

Valve: No. 186 Crown flush valve with ¾" screw-driver angle stop and flush connection.

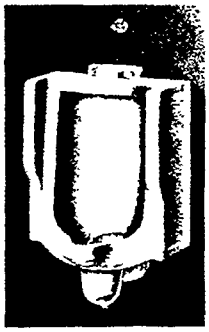
### 7-88-C

Urinal: Correcto vitreous china washout urinal with integral extended shields, flushing rim, strainer and trap with cleanout, ¾" back inlet, 2" back outlet and supporting bolts.

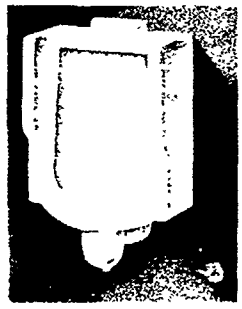
Valve: No. 195 Crown concealed flush valve with oscillating handle, ¾" wheel handle straight stop and flush connection. (For walls up to 6" thick—specify wall thickness.)



7-87-C



7-88-C



7-89-R

### 7-89-R

Urinal: Correcto vitreous china washout urinal with integral extended shields, flushing rim, strainer and trap with cleanout, ¾" back inlet, 2" back outlet and supporting bolts.

Valve: No. 323 Royal concealed flush valve with foot pedal, ¾" wheel handle angle stop and 1" I.P.S. union outlet. (For walls up to 6" thick—specify wall thickness.)

### PRICES COMPLETE

| Catalog Number | Prices, complete White | Prices, complete Color | Shipping Pounds |
|---|---|---|---|
| 7-80-C | $166.36 | $230.96 | 105 |
| 7-81 | 219.90 | — | 160 |
| Neu-Rio Urinal Only | 129.30 | 193.90 | 95 |
| 7-85 | 176.06 | — | 160 |
| 7-87-C | 143.24 | 198.54 | 105 |
| 7-88-C | 144.04 | 199.34 | 105 |
| 7-89-R | 149.76 | 205.06 | 105 |
| Correcto Urinal Only | 110.70 | 166.00 | 95 |

If Correcto urinals are required with vacuum breakers to meet local codes, ADD per valve:
Crown, concealed . . $3.86 exposed. $4.54
Royal, concealed . . 3.86

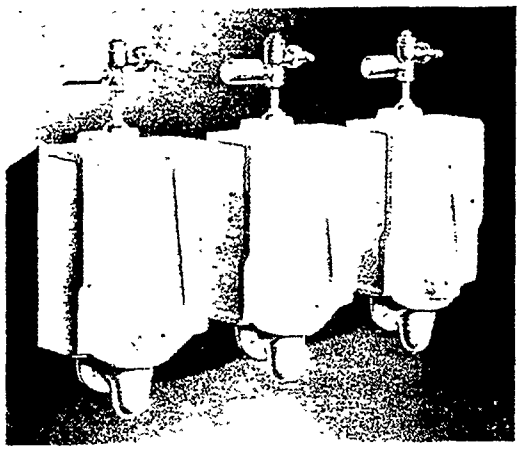
Overall Dimensions
Width . . 18" Height . . . . . 32½"
Projection, wall to lip . . . . . 13"

*For urinal trim, refer to Section 9.*
*For chair carriers, refer to Page 7-13.*

All exposed metal trim is chromium plated.

# CORRECTO VITREOUS CHINA URINALS

*Integral Flushing Rim—Integral Trap—Integral Strainer—18" Wide*
*With Electrically Operated Flush Valve*



7-90-C Group of Three Urinals

7-90-C

Urinal: Correcto vitreous china washout urinal with integral extended shields, flushing rim, strainer and trap with cleanout, 3/4" top inlet, 2" back outlet and supporting bolts.

Valve: No. 186 EM Crown flush valve with electric motor for automatic flushing, 3/4" screw-driver angle stop, flush connection and *timing device.

*Specify Day-Night Timer with 24-hour clock for day and night flushing operation or Five Minute Timer for use with toggle switch in standard switch box.

Overall Dimensions

Width 18" Height 32 1/2" Projection, wall to lip 13"

PRICE COMPLETE, EACH URINAL

| Catalog No. and Timer Description | Wall | Floor | Shipping Wt. |
|---|---|---|---|
| 7-90-C with Day-Night Timer | $342.56 | $397.86 | 145 lbs. |
| 7-90-C with Five-Minute Timer | 217.90 | 273.20 | 135 lbs. |

## Electrically Operated Urinal Flush Valves

The *Sloan Automatic Flushing Systems* are designed principally for the automatic operation of Sloan urinal flush valves, and are adaptable to old as well as new installations.

With automatic flushing in public or semi-public toilet rooms, neglect to flush urinals is entirely eliminated—more hygienic conditions assured and better housekeeping of the toilet room encouraged on the part of building tenants, company employees, customers and the public.

In special installations such as sanitariums, hospitals, institutions and prisons, the responsibility of the individual to operate the flush valve is entirely eliminated with automatic flushing.

### EFFICIENCY

Operated on a 24-hour cycle, the flushing system can be set for any variation of day and night flushing. In office toilet rooms, for example, each flush valve can be operated from 8 A.M. at intervals of once every five minutes (throughout the day); and from 5 P.M. at intervals of once each hour (throughout the night).

Once these time intervals have been selected on the clock-dial, the system is completely automatic and will operate indefinitely without further attention.

### ECONOMY

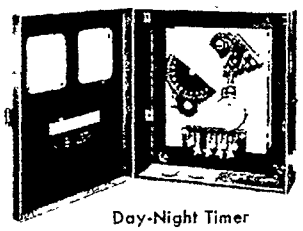
Unlike other types of automatic equipment, the Sloan System flushes but once each hour during the night when the toilet rooms are not in use. Thus, eleven flushes per hour, or 132 flushes through a twelve-hour night, are saved. Assuming two gallons of water are required per flush, approximately 100,000 gallons of water are saved per year per valve— or enough to pay for the system in a short period of time.

### SIMPLICITY

The system is comprised of but two principal additions to the standard Sloan flush valve installation. They are (1) the Sloan Timer, which controls the time interval between flushes and 2) the Sloan Flush Valve Motor-Operator which replaces the handle assembly to flush the valve. These two elements, plus the standard wiring necessary to make the electrical circuit, complete the entire installation. Timer and Motor-Operator are arranged for 110-V. 60-cycle, A.C., as standard equipment.

### OUTSTANDING FEATURES

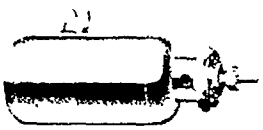
1. Fully automatic operation.
2. Adaptable to any Sloan flush valve.
3. Existing Sloan flush valve installations easily converted to automatic equipment.
4. Saves tremendous quantities of water.
5. Adjustable for various flushing intervals.
6. Operates flush valves in sequence.
7. Accurate electric clock timing.
8. Continuous automatic operation through day and night cycles.
9. Motor operator built for long life—no oiling nor servicing required.



Day-Night Timer

The Day-Night Timer operates flush valves in sequence at five minute intervals through the day and at one hour intervals through the night. A twenty-four hour clock dial permits this selection to coincide with the traffic in the toilet room.

The Five-Minute Timer operates valves at five minute intervals only. It may be located on the wall of the toilet room in much the same manner as an electric light switch. In fact, it has its own toggle switch with which to disconnect the motor operator at the flush valve. This toggle switch can also be connected in parallel with the toilet room lights, if desired. With this arrangement, the automatic flushing system will operate only when lights are lit and the toilet room is ready for use.



Motor Operator

The Motor Operator replaces the regular flush valve handle assembly and flushes the valve the same way as in manual operation. Provision is made to test valve manually without removing motor operator.



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Printed in U.S.A.

## SANURO VITREOUS CHINA SIPHON JET PEDESTAL URINALS

Sanuro urinals are recommended for public and semi-public toilet rooms. They are desirable fixtures for Railroad Stations, Bus Depots, Hotels, Theatres, Office Buildings and Industrial Plants.

The large, open passage through the trapway, together with a strong jet-impelled cataract action assures a positive, quick, efficient and quiet flush sufficient to clear fixture of cigar stubs and other similar discarded refuse. The outlet takes a regular closet floor flange. Sanuro urinals operate efficiently with either high tank or flush valve.

### 7-92

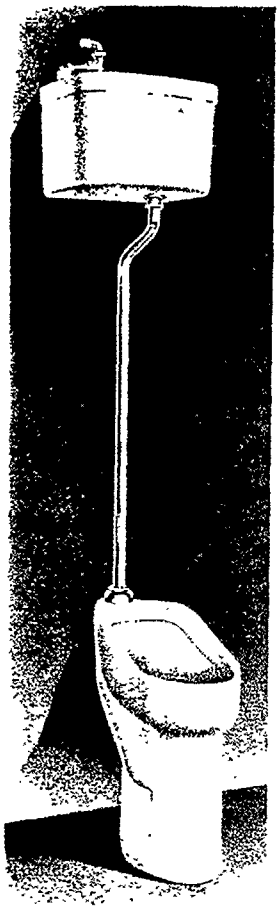
Urinal: Sanuro vitreous china siphon jet pedestal urinal with 1¼" top inlet; china bolt caps.

Tank: 7-170 Bellemeade No. 3 vitreous china tank with Alert automatic siphon valve and Marvel float valve.

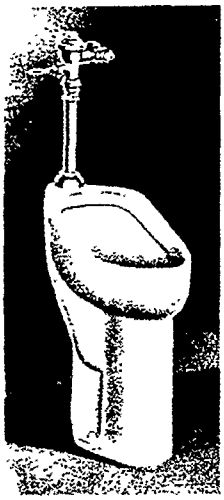
Flush Pipe: 9-915 No. 15 flush pipe assembly.

**Overall Dimensions**

Floor to lip, 20¼" Lip to back (urinal only)..19¼"
Projection, top supply with tank or exposed valve, (set 2" from wall)..... 21¼"
Projection, back supply with concealed valve, (set 3" from wall).....22¼"



7-92



7-96-R

### 7-96-R

Urinal: Sanuro vitreous china siphon jet pedestal urinal with 1¼" top inlet; china bolt caps.

Valve: No. 181 U YV Royal flush valve with vacuum breaker, 1" screw-driver angle stop and flush connection.

### 7-98-R

Urinal: Sanuro vitreous china siphon jet pedestal urinal with 1¼" back inlet; china bolt caps.

Valve: No. 191 U YV Royal concealed flush valve with oscillating handle, vacuum breaker, 1" wheel handle straight stop and flush connection. (For walls up to 6" thick—specify wall thickness.)

7-98-R

## EXPEDIO VITREOUS CHINA BLOW-OUT URINAL

7-104-C

**Overall Dimensions**

Width..... 14"
Height..... 17⅜"
Projection, wall to lip.... 21"

*For urinal trim, size of tanks and flush pipe assemblies, refer to Section 9.*

### 7-104-C

Urinal: Expedio vitreous china blow-out urinal with 1½" top inlet, 2" outlet connection and supporting bolts.

Valve: No. 180 T YV Crown flush valve, with vacuum breaker, 1" screw-driver angle stop and flush connection.

### 7-103-C

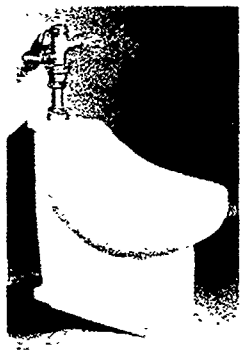
Same, except with 1¼" back inlet and No. 190 U YV Crown concealed valve with vacuum breaker. (For walls up to 6" thick-specify wall thickness.)

**PRICES COMPLETE**

| Catalog Number | Price, Each Unit | | Shpg. Wt. Pounds |
|---|---|---|---|
| | White | Color | |
| 7-92 | $173.84 | — | 135 |
| 7-96-R | 131.04 | $176.44 | 80 |
| 7-98-R | 132.64 | 178.04 | 80 |
| Sanuro Urinal Only | 90.20 | 135.30 | 70 |
| 7-103-C | 123.30 | — | 75 |
| 7-104-C | 123.16 | — | 75 |
| Expedio Urinal Only | 86.10 | — | 65 |

*All exposed metal trim is chromium plated.*

## HY-SAN HYGIENIC RIM STRADDLE TYPE BOWL



3-282-T HY-SAN

The Hy-San is designed for public toilet rooms. The shape and design assure correct posture. When in use there is no physical contact with the bowl, eliminating the possible communication of disease germs. Available with hand or foot operated flushing valves.

*For complete details and prices, refer to Page 3-6.*

# MANHATTAN VITREOUS CHINA SIPHON JET URINALS

7-105-C

### 7-105-C

Urinal: **Manhattan** vitreous china siphon jet urinal with integral trap, $1\frac{1}{4}$" top inlet, 2" back outlet connection and supporting bolts.

Valve: No. 180 YV **Crown** flush valve with vacuum breaker, 1" screw-driver angle stop and flush connection.

### 7-106-C

Urinal: **Manhattan** vitreous china siphon jet urinal with integral trap, $1\frac{1}{4}$" top inlet, 2" bottom outlet and supporting bolts.

Valve: No. 180 YV **Crown** flush valve with vacuum breaker, 1" screw-driver angle stop and flush connection.

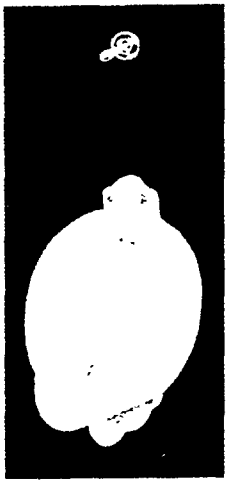
Waste: 2" O.D. x 17" straight waste to floor with escutcheon.

**Overall dimensions**

| | | | |
|---|---|---|---|
| Width | $14\frac{1}{4}$" | Projection, wall to lip | $13\frac{1}{4}$ |
| Height, back outlet | $22\frac{3}{4}$", bottom outlet | | $22\frac{1}{4}$" |

7-106-C

# VITREOUS CHINA WASHOUT URINALS



7-110-C

### 7-110-C

Urinal: **Santo** vitreous china washout urinal with integral strainer and trap, $\frac{3}{4}$" back inlet, 2" back outlet connection and supporting bolts.

Valve: No. 195 **Crown** concealed flush valve with oscillating handle, $\frac{3}{4}$" wheel handle straight stop and flush connection. (For walls up to 6" thick specify wall thickness.)

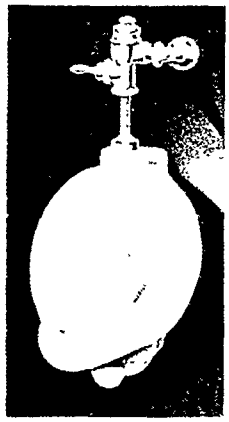
### 7-111-C

Urinal: **Santo** vitreous china washout urinal with integral strainer and trap, $\frac{3}{4}$" top inlet, 2" back outlet connection and supporting bolts.

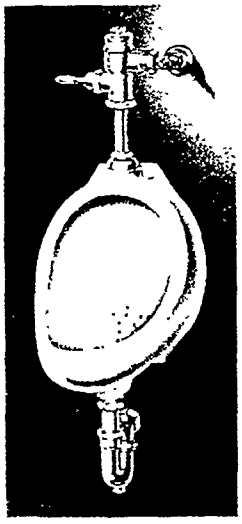
Valve: No. 186 **Crown** flush valve with $\frac{3}{4}$" screw-driver angle stop and flush connection.

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Width | $14\frac{1}{4}$" | Projection, wall to lip | 14" |
| Height, back inlet | $22\frac{3}{4}$", top inlet | | $20\frac{1}{2}$" |



7-111-C



7-116-C

### 7-116-C

Urinal: **Bedfordshire** vitreous china washout urinal with integral strainer, $\frac{3}{4}$" top inlet and $1\frac{1}{2}$" bottom outlet with tailpiece.

Valve: No. 186 **Crown** flush valve with $\frac{3}{4}$" screw-driver angle stop and flush connection.

Trap: 8-421 $1\frac{1}{2}$" bent tube adjustable "P" trap with female I.P. outlet

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Width | 13" | Height | 18" |
| Projection, wall to lip | | | 13" |

### 7-118-C

Urinal: **Servitor** vitreous china washout urinal with integral strainer and supporting bolts; $\frac{3}{4}$" top inlet and $1\frac{1}{2}$" bottom outlet with tailpiece.

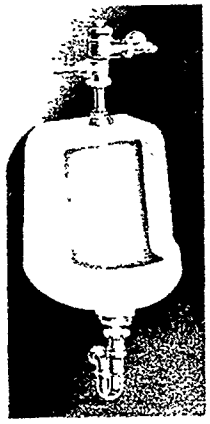
Valve: No. 186 **Crown** flush valve with $\frac{3}{4}$" screw-driver angle stop and flush connection.

Trap: 8-421 $1\frac{1}{2}$" bent tube adjustable "P" trap with female I.P. outlet.

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Width | 12" | Height | $17\frac{3}{4}$" |
| Projection, wall to lip | | | 11" |

Exposed metal trim is chromium plated.



7-118-C

### PRICES COMPLETE

| Catalog Number | Price Each | Shpg. wt. Pounds |
|---|---|---|
| **7-105-C** | **$94.02** | 65 |
| **7-106-C** | **104.22** | 65 |
| **7-105 Urinal Only** | **56.70** | 55 |
| **7-106 Urinal Only** | **56.70** | 55 |
| ***7-110-C** | **87.34** | 65 |
| ***7-111-C** | **84.24** | 65 |
| **7-110 Urinal Only** | **54.00** | 55 |
| **7-111 Urinal Only** | **51.70** | 55 |
| ***7-116-C** | **71.20** | 55 |
| **7-116 Urinal Only** | **32.70** | 45 |
| ***7-118-C** | **80.70** | 55 |
| **7-118 Urinal Only** | **42.20** | 45 |

*If flush valves are required with vacuum breakers to meet local code requirements, **ADD** per valve

Exposed **$4.54** Concealed **$3.86**

*For urinal trim, refer to Section 9*



*Prices are subject to change without notice.*

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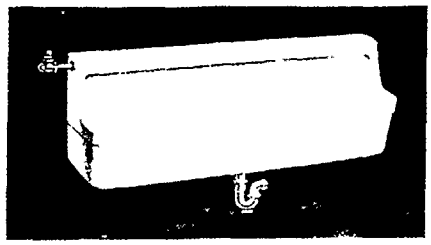
## DURACLAY TROUGH URINALS

*Earthenware Vitreous Glazed*



7-124

Urinal: Duraclay, earthenware vitreous glazed, trough urinal with supporting bolts and brackets, polished brass beehive strainer, concealed brass perforated flush pipe and 3/8" lockshield straight stop.

Trap: 8-421 1 1/2" bent tube adjustable "P" trap with female I.P. outlet.

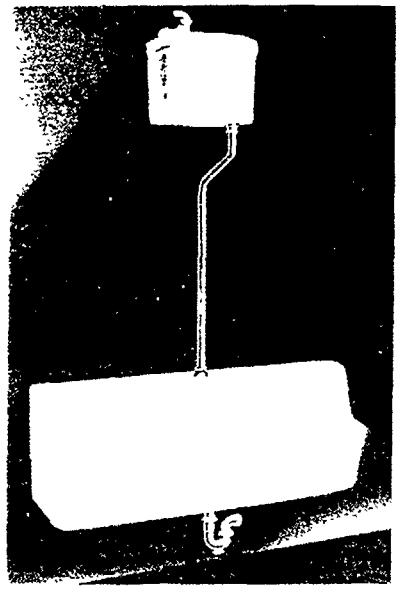
7-125

Urinal: Duraclay, earthenware vitreous glazed, trough urinal with supporting bolts and brackets, polished brass beehive strainer and concealed brass perforated flush pipe.

Tank: 7-170 Bellemeade vitreous china tank with Alert automatic siphon valve and Marvel float valve.

Flush Pipe: 9-915 flush pipe assembly.

Trap: 8-421 1 1/2" bent tube adjustable "P" trap with female I.P. outlet.



7-125

**Overall Dimensions**

Lengths.. ..24" 36" 48" 60"
Width.. 12" Depth inside..7"
Height of back....8"

**Exposed metal trim is chromium plated.**

*For size of Bellemeade tanks and Alert valves for trough urinals, see page 9-15.*

## BELLEMEADE VITREOUS CHINA TANKS

7-170 Bellemeade vitreous china end outlet urinal tank with Alert automatic siphon valve and Marvel float valve with 3/8" I.P.S. male union elbow supply connection.

7-171 Bellemeade-Sahara tank with rubber insulating liner—for use only where regular No. 3 tank is specified.

*Refer to your Crane branch for prices.*

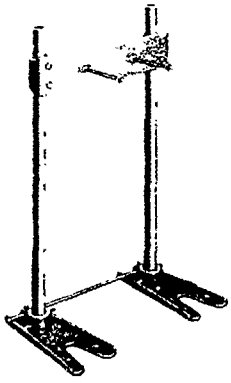
| Tank No. | Capacity, Gallons | Size of Alert Valve, Inches |
|---|---|---|
| 1 | 2 | 3/4 |
| 3 | 4 | 3/4, 1 or 1 1/4 |
| 4 | 6 | 1 1/4 or 1 1/2 |
| 5 | 8 | 1 1/4 or 1 1/2 |

**Overall Dimensions—Inches**

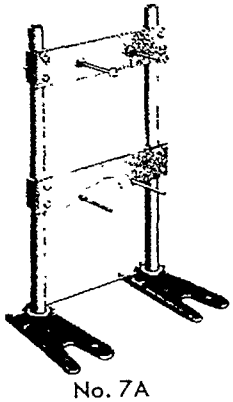
| Tank No. | Length | Width | *Depth |
|---|---|---|---|
| 1 | 13 3/8 | 5 | 12 1/2 |
| 3 | 15 3/8 | 8 | 12 1/2 |
| 4 | 17 3/8 | 9 1/2 | 12 1/2 |
| 5 | 19 3/8 | 10 1/2 | 12 1/2 |

*All tanks are 12" deep inside.

## CHAIR CARRIERS FOR CRANE URINALS



No. 7



No. 7A

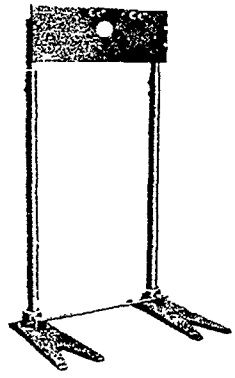
**Jay R. Smith No. 7**
**J. A. Zurn Z-1221-1**

Chair Carriers for Correcto or Neu-Rio urinals have a top steel plate with supporting bolts and are secured to heavy cast iron adjustable pipe sleeves. Each carrier is furnished with coated cast iron cantilever foot supports, adjustable sleeves, steel tubular uprights and alignment trusses, steel plates with adjustable holes, bolts, nuts and chromium plated cap nuts and washers. The top supporting plate is furnished with cut out for back inlet urinals.

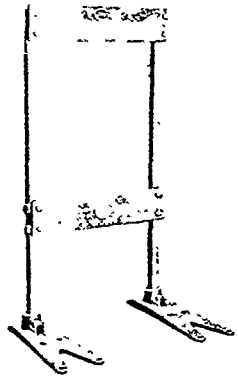
**Jay R. Smith No. 7A**
**J. A. Zurn Z-1222-1**

Same as No. 7 and Z-1221-1 except with bottom plate and thrust bolts to absorb the horizontal thrust of the fixture.

**Chair carriers are also available for other Crane urinals—for data refer to your local Crane Branch or Crane Wholesaler.**



Z-1221-1



Z-1222-1

### WHITE PRICES COMPLETE

| Catalog Number | Length Inches | Price, Each | Shpg. wt. Pounds |
|---|---|---|---|
| 7-124 | 24 | $96.66 | 107 |
| | 36 | 113.46 | 132 |
| | 48 | 142.86 | 167 |
| | 60 | 191.96 | 227 |
| 7-125 | 24 | 159.24 | 140 |
| | 36 | 182.64 | 180 |
| | 48 | 212.40 | 215 |
| | 60 | 265.60 | 275 |

| Catalog Number | Alert Valve Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| 7-170#1 | 3/4 | 54.40 | 40 |
| 7-170#3 | 3/4 | 61.00 | 55 |
| | 1 | 64.30 | 55 |
| | 1 1/4 | 66.60 | 55 |
| 7-170#4 | 1 1/4 | 70.70 | 65 |
| | 1 1/2 | 75.10 | 65 |
| 7-170#5 | 1 1/4 | 74.70 | 75 |
| | 1 1/2 | 79.10 | 75 |

**Bellemeade Tanks Only, less trim**

| | | | |
|---|---|---|---|
| 7-170#1 | $25.80 | 7-170#4 | $36.50 |
| 7-170#3 | 32.40 | 7-170#5 | 40.50 |

When ordering Bellemeade tanks specify catalog number and size of Alert valve.

### CHAIR CARRIER PRICES COMPLETE

| Catalog Number | Prices, Each: For top or back inlet Correcto or Neu-Rio Urinals | Shipping Weight Pounds |
|---|---|---|
| 7 | $40.00 | 50 |
| 7A | 50.00 | 60 |
| Z-1221-1 | 40.00 | 53 |
| Z-1222-1 | 50.00 | 58 |

Note: When ordering specify name and catalog number of urinal and if with top or back inlet.

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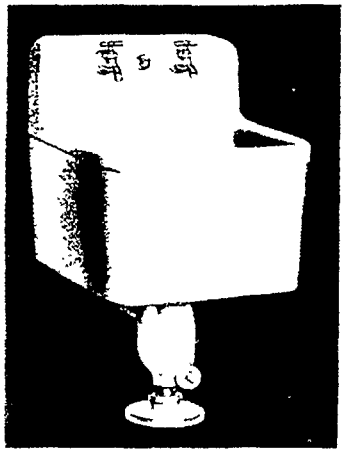
*May 4, 1955*
*Superseding September 16, 1954*

# DURACLAY SERVICE SINKS

*Earthenware Vitreous Glazed—8" High Back*



7-500

### 7-500

Sink: Duraclay, earthenware vitreous glazed, service sink with 8" high back and supporting screw.

Supply: Two 8-212 ½" solid female flange faucets with "T" handle.

Trap: 7-620 3" porcelain enameled inside, cast iron adjustable "P" trap standard with metal strainer and rough brass cleanout plug.

### 7-505

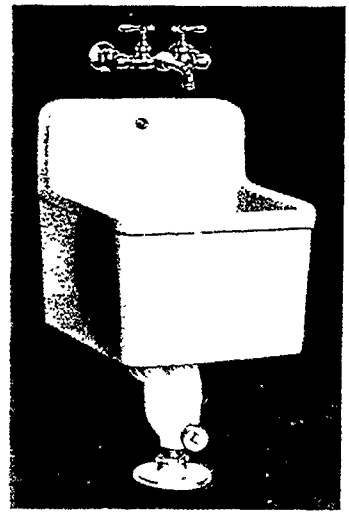
Sink: Duraclay, earthenware vitreous glazed, service sink with 8" high back and supporting screw.

Supply: Federal-Huber No. 18580 ½" rough chromium plated supply fitting with pail hook.

Trap: 7-620 3" porcelain enameled inside, cast iron adjustable "P" trap standard with metal strainer and rough brass cleanout plug.

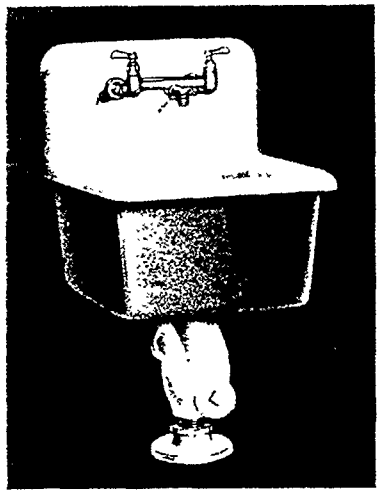
**Overall Dimensions**

Sizes. . 20x18x12½" deep and 22x20x12½" deep
Rim to floor. . . 27¾" Height of back. . 8"



7-505

*For rim guards to fit Duraclay service sinks, refer to page 8-16.*



7-563

# PORCELAIN ENAMELED SERVICE SINKS

*Acid-Resisting Enameled Cast Iron—12" High Back*

### 7-563

Sink: Acid resisting porcelain enameled inside only, cast iron roll rim service sink with 12" high back and concealed hanger.

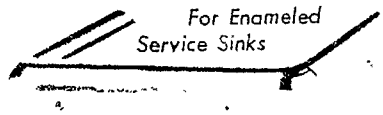
Supply: 8-101 ½" rough chromium plated utility sink faucet with *Dial-ese* trimming units; rigid hose end spout with pail hook.

Trap: 7-620 3" porcelain enameled inside, cast iron adjustable "P" trap standard with metal strainer and rough brass cleanout plug.

**Overall Dimensions**

Sizes. . . . . 22x18x12" and 24x20x12"
Rim to floor. . 27¼" Height of back . 12"

## Rim Guards




Rim guards with fastening bolts.
For sink sizes. . 22x18" and 24x20".

8-979 Chr. Pl. Sheet brass
8-980 Chr. Pl. Cast brass
8-983 Stainless steel—front rim only.

complete as illustrated

### SERVICE SINK PRICES COMPLETE

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| 7-500 | 20x18 | $125.78 | 150 |
| | 22x20 | 134.28 | 170 |
| 7-505 | 20x18 | 134.52 | 155 |
| | 22x20 | 143.02 | 175 |
| 7-563 | 22x18 | 139.56 | 150 |
| | 24x20 | 150.36 | 175 |
| 8-979 | 22x18 | 13.16 | 5 |
| | 24x20 | 13.94 | 7 |
| 8-980 | 22x18 | 31.54 | 10 |
| | 24x20 | 32.66 | 12 |
| 8-983 | — | 6.20 | 2 |
| 8-101 | ½ | 19.96 | 4½ |
| 8-212 | ½ | 3.84 | 1 |
| 18580 | ½ | 16.42 | 8 |

# PORCELAIN ENAMELED INSIDE TRAP STANDARDS

7-620

Porcelain enameled inside only, cast iron "P" trap standard with 3" iron pipe outlet, metal strainer, gaskets and rough brass cleanout plug.

7-625

Porcelain enameled inside only, cast iron "S" trap standard for 3" lead or iron pipe with metal strainer, gaskets and rough brass cleanout plug.

7-626

Porcelain enameled inside only, cast iron "S" trap standard with spigot outlet for 3" soil pipe, metal strainer, gaskets and rough brass cleanout plug.

### TRAP STANDARD PRICES

| Cat. No. | White Prices, Each: Reg. Enamel | White Prices, Each: A. R. Enamel | Shpg. Wt. Pounds |
|---|---|---|---|
| 7-620 | $36.30 | $40.20 | 30 |
| 7-625 | 40.50 | 44.90 | 40 |
| 7-626 | 40.50 | 44.90 | 45 |

Specify if required with regular or acid-resisting enameled inside finish.

*Unless otherwise specified, all exposed metal trim is chromium plated.*

*For rim guards and other supply trim for all service sinks, refer to Section 8.*



May 4, 1955
*Superseding September 16, 1954*

*Prices are subject to change without notice*

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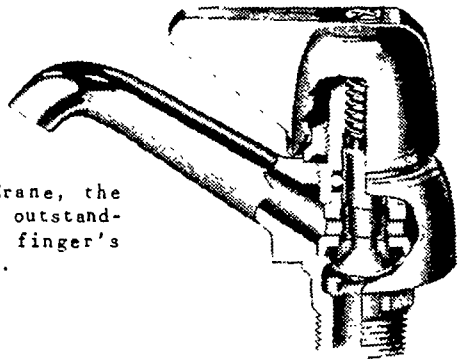
# *Dial-ese* typical of *Crane advanced engineering*



Of the many new features in plumbing developed by Crane, the *Dial-ese* Control unit for trim is without doubt the most outstanding. Faucets or valves can be opened or closed at a finger's touch with the consequent reduction in wear and dripping.

## *Dial-ese* FEATURES

Finger tip opening and closing.

Hooded three rib or hooded lever handles - as easy to turn as a radio dial.

The same *Dial-ese* unit fits all Crane trim, assuring complete interchangeability.

Stem threads are lubricated - lubrication cannot wash out.

Stem packing is below threads - prevents liming or corrosion of stem threads.

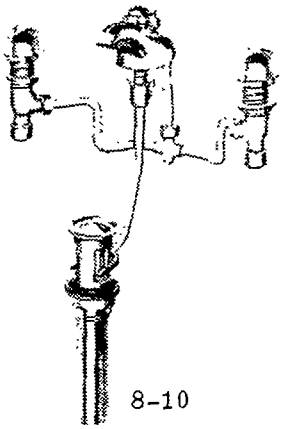
Water pressure below seat aids closing.

## TEMPLE LAVATORY SUPPLY AND WASTE TRIM
with Lever Action *Securo* Wastes

8-9

*Temple Dial-ese* combination lavatory supply and Lever Action *Securo* waste fitting with hooded three rib handles; 1¼" O.D. outlet connection, less 1¼" tailpieces.

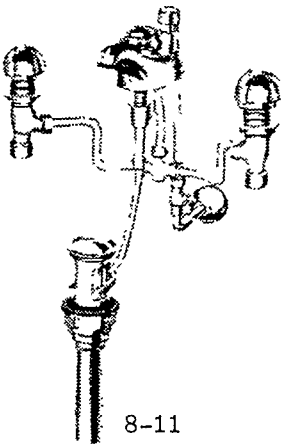
8-4 Same as 8-9 except with indexed hooded lever handles.



8-10

*Temple Dial-ese* combination lavatory supply and Lever Action *Securo* waste fitting with hooded three rib handles; 1¼" O.D. outlet connection, less 1¼" tailpieces.

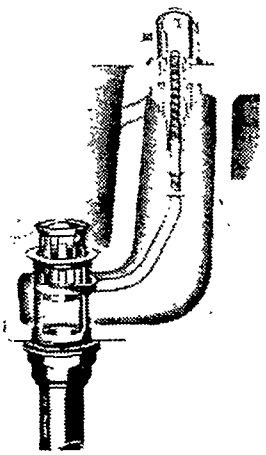
8-5 Same as 8-10 except with indexed hooded lever handles.



8-11

*Temple Dial-ese* combination lavatory supply and Lever Action *Securo* waste with integral push button ice water valve, hooded three rib handles; 1¼" O.D. outlet connection, less 1¼" tailpieces.

8-6 Same as 8-11 except with indexed hooded lever handles.



Section through lavatory overflow with *Temple Securo* waste.

Features - *Temple* Lever Action *Securo* Waste

*Lever Action lift mechanism - positive in action.*

*Lift mechanism accessible by unscrewing cap.*

*High lift and large slots in waste plug assure quick draining. Basin drains in approximately six seconds.*

*Adjusted for variation in ware when installed.*

*Large unobstructed outlet.*

*Operating through overflow exposes few metal parts to be kept clean.*

### 8-41

*Temple* Lever Action *Securo* waste with 1¼" O.D. outlet connection.

*Temple* Lever Action *Securo* trimmings are designed for use with Crane lavatories only.

8-41

| Catalog Number | Prices Each | Shpg. Wt. Pounds |
|---|---|---|
| 8-4 | $43.10 | 7 |
| 8-5 | 57.70 | [illegible] |
| 8-6 | 77.20 | [illegible] |
| 8-9 | 43.10 | 7 |
| *8-10 | 57.70 | [illegible] |
| 8-11 | 77.20 | [illegible] |
| 8-41 | 20.50 | [illegible] |

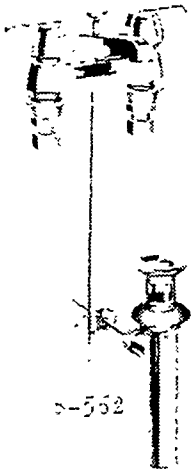
*8-10 Brush Finish C.P. Each $69.10

8-995 Assembly wrench for *Securo* Lever Action Wastes Each $2.70

*Prices are subject to change without notice.*

All exposed metal trim is chromium plated.

## LAVATORY SUPPLY AND WASTE TRIM

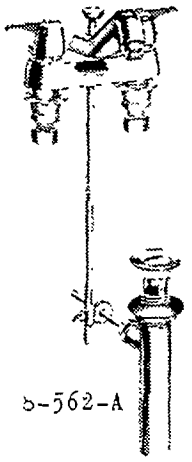


8-562 *New-Rainier Dial-ese* [illegible] combination lavatory supply and indirect lift waste fitting with indexed hooded lever [illegible] union rings; 1¼" O.D. outlet tailpiece.

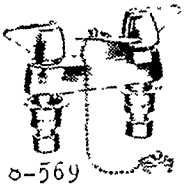
8-562-A *New-Rainier Dial-ese* centerset combination lavatory supply and indirect lift waste fitting with aerator, indexed hooded lever handles and union rings; 1¼" O.D. outlet tailpiece.

Inlets on 4" centers

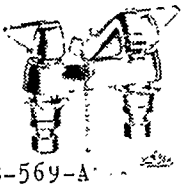
8-562



8-562-A



8-569

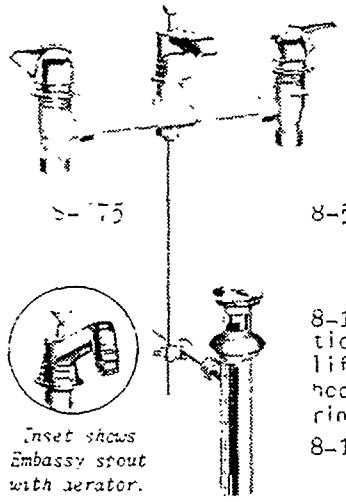


8-569-A

8-569 *New-Rainier Dial-ese* centerset lavatory supply fitting with bead chain and 1¼" rubber stopper; indexed hooded lever handles and union rings.

8-569-A, Same with aerator.

Inlets on 4" centers



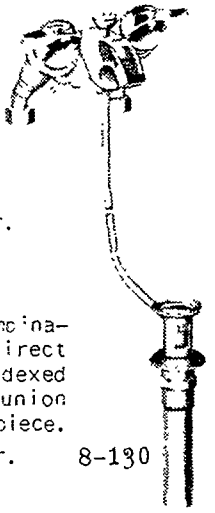
8-575 *Embassy Dial-ese* combination lavatory supply and indirect lift waste fitting with indexed hooded lever handles and union rings; 1¼" O.D. outlet tailpiece.

8-575-A, Same with aerator.

Inlets on 8" centers

8-575

*Inset shows Embassy spout with aerator.*



8-130

8-130 *Whitney Dial-ese* combination lavatory supply and direct lift waste fitting with indexed hooded lever handles and union rings; 1¼" O.D. outlet tailpiece.

8-130-A, Same with aerator.

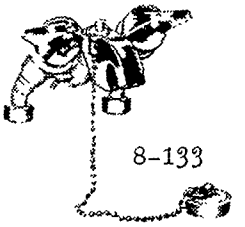
Inlets on 4" centers

*Whitney* trim is designed for use with Crane lavatories only.

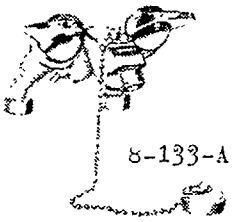
*View of spray face.*

8-572 *New-Spray Dial-ese* centerset lavatory supply fitting with rubber spout and integral spray; indexed hooded lever handles and union rings.

Inlets on 4" centers



8-133



8-133-A

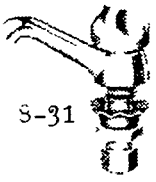
8-133 *Whitney Dial-ese* lavatory supply fitting with bead chain and 1¼" rubber stopper; indexed hooded lever handles and union rings.

8-133-A, Same with aerator.

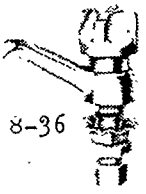
Inlets on 4" centers

Exposed metal trim is chromium plated.

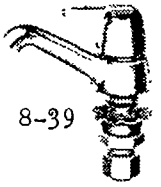
## LAVATORY FAUCETS



8-31



8-36



8-39

8-31 *Vantage Dial-ese* lavatory faucet with hooded four-arm handle and union ring.

8-36 *Victor Maglclose* self-closing lavatory faucet with hooded four-arm handle and union ring.

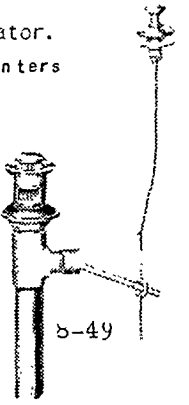
8-39 *Vantage Dial-ese* lavatory faucet with indexed hooded lever handle and union ring.

Fittings shown on this page can be used with vitreous china or enameled lavatories.

## LAVATORY WASTE

8-49

Indirect lift lavatory pop-up waste with 1¼" O.D. outlet connection. (For use with lavatories having regular P.O. plug outlet and chainstay punching.)



8-49

PRICE, EACH

| Number | Price | Shpg.Wt. |
|---|---|---|
| 8-31 ea. | $ 7.06 | 1¾ |
| 8-36 ea. | 9.24 | 2 |
| 8-39 ea. | 7.06 | 1¾ |
| 8-49 | 9.40 | 4 |
| 8-130 | 26.70 | 5½ |
| 8-130-A | 28.80 | 5½ |
| 8-133 | 21.40 | 4 |
| 8-133-A | 23.50 | 4 |

| Number | Price | Shpg.Wt. |
|---|---|---|
| 8-562 | $24.40 | 5 |
| 8-562-A | 26.50 | 5 |
| 8-569 | 15.80 | 4 |
| 8-569-A | 17.90 | 4 |
| 8-572 | 28.60 | 4 |
| 8-575 | 31.00 | 6 |
| 8-575-A | 33.10 | 6 |

*Prices are subject to change without notice.*

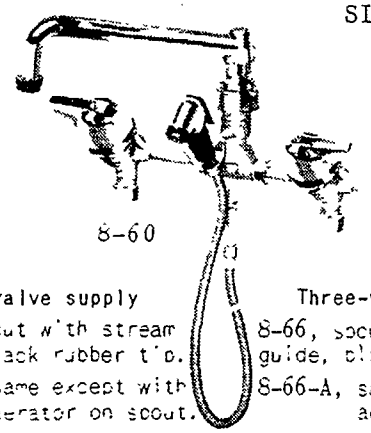
For 8-324 1/4" male tailpieces, Add Per Pair $.48



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## SINK AND LAUNDRY TUB SUPPLY TRIM



8-60

*Exposed metal trim is chromium plated.*

**Two-valve supply**

8-60, spout with stream guide, black rubber tip.

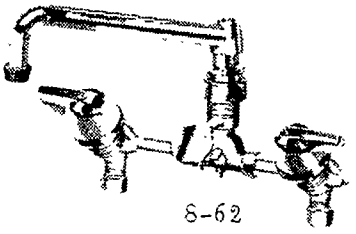
8-60-A, same except with aerator on spout.

**Three-valve supply**

8-66, spout with stream guide, black rubber tip.

8-66-A, same except with aerator on spout.

*Temple Dial-ese* swinging spout supply fitting with automatic diverter valve, thumb control spray with retractable rubber hose, indexed hooded lever handles and inlets on 4" centers with coupling nuts to slip on 1/2" O.D. tubing, or 1/4" I.P.S. tailpieces.



8-62

**Two-valve supply**

8-62, spout with stream guide, black rubber tip.

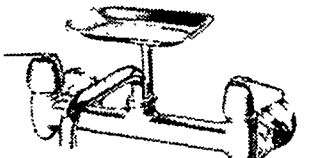
8-62-A, same except with aerator on spout.

**Three-valve supply**

8-68, spout with stream guide, black rubber tip.

8-68-A, same except with aerator on spout.

*Temple Dial-ese* swinging spout supply fitting with indexed hooded lever handles and inlets on 9" centers with coupling nuts to slip 7/16" or 1/2" O.D. tubing, or 1/4" I.P.S. tailpieces.



8-72 (5" spout)
8-72-L (8" spout)

8-73 (5" spout)
8-73-L (8" spout)

8-72 *Embassy Dial-ese* swinging spout sink faucet with removable soap dish and indexed hooded lever handles; 3/8" eccentric female flange inlets.

8-72-L Same as 8-72 except with 8" long spout.

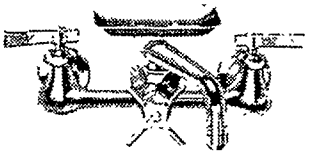
8-74 Same as 8-72 except with 3/8" male inlets.

8-73 *Embassy Dial-ese* swinging spout sink faucet with indexed hooded lever handles; 3/8" eccentric female flange inlets.

8-73-L Same as 8-73 except with 8" long spout.

*Inlets are adjustable for supplies 7 3/8" to 8 1/4" centers.*

Note: For any of the above *Embassy* sink faucets with aerator, add suffix "A" to catalog number.
For example: 8-72-A, 8-73-LA, etc. Add $1.30



No. 561

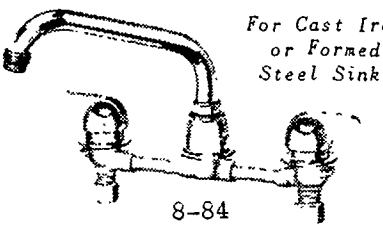
Three-water *Classic* swinging spout sink faucet with removable soap dish, indexed metal lever handles, four-arm handle on third water valve, and *Softflo* spout end; *Quaturn* valves with 3/8" female flange inlets on 4" centers.

## EMBASSY SUPPLY FITTINGS FOR LEDGE TYPE KITCHEN SINKS

### FOR DURACLAY LAUNDRY TUBS

B36HRR

*Regal* supply fitting with removable inlets and seats; 8" long swinging spout with hose end; inlets on 8" centers.



*For Cast Iron or Formed Steel Sinks*

8-84

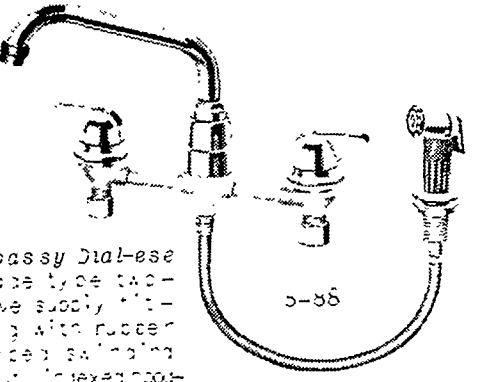
*Embassy Dial-ese* ledge type two-valve supply fitting with rubber tipped swinging spout and indexed hooded lever handles.

8-85 Same as 8-84 except with three supply valves.

**For Duraclay sinks or countertops**

8-86 Same as 8-84 two-valve.

8-87 Same as 8-85 three-valve.



8-88

*Embassy Dial-ese* ledge type two-valve supply fitting with rubber tipped swinging spout, indexed hooded lever handles and thumb control spray with retractable rubber hose.

8-89 Same as 8-88 except with three supply valves.

**Aerator with Male Adapter**

For use with Crane sink supply fittings

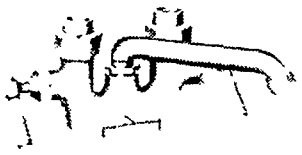
Each $1.80

Note: Specify catalog number and name of Crane sink faucet with which the aerator is to be used.

Note: For any of the above *Embassy* sink supply fittings with aerator, add suffix "A" to catalog number (for example: 8-84-A) Add $1.80

| Number | Price | Shpg.Wt | Number | Price | Shpg.Wt | Number | Price | Shpg.Wt |
|---|---|---|---|---|---|---|---|---|
| 8-60 | $36.40 | 6½ | 8-68-A | $40.60 | 7½ | 8-84 | $19.20 | 4½ |
| 8-60-A | 38.30 | 6½ | 8-72 | 22.10 | 5 | 8-85 | 27.00 | 5½ |
| 8-62 | 29.40 | 5½ | 8-72-L | 22.70 | 5½ | 8-86 | 21.50 | 5½ |
| 8-62-A | 31.30 | 5½ | 8-73 | 21.00 | 4½ | 8-87 | 28.80 | - |
| 8-66 | 45.70 | 5½ | 8-73-L | 21.60 | 5 | 8-88 | 27.10 | 5 |
| 8-66-A | 47.60 | 5½ | 8-74 | 22.10 | 4½ | 8-89 | 35.30 | 5 |
| 8-68 | 38.70 | 7½ | B36HRR | 16.22 | 5½ | 561 | 41.92 | - |

## SINK AND LAUNDRY TUB SUPPLY TRIM

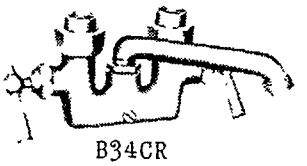


B34R

### B34R

*Regal* [illegible]

*(For Alberene or composition laundry tubs.)*



B34CR

### B34CR

*Regal* [illegible]

*(For flat rim cast iron enameled laundry tubs.)*

8-94

### 8-94

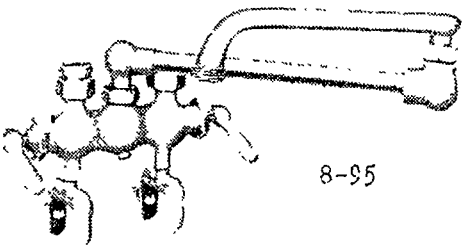
*Quaturn* rough nickel plated laundry tub supply fitting with swinging spout with hose end, indexed lever handles; ½" female flanged union inlets, inlets on 3⅜" centers.

*(For shelf type laundry tubs.)*

### 8-95

*Quaturn* rough nickel plated laundry tub supply fitting with double jointed swing spout with hose end, indexed lever handles; ½" female iron pipe union inlets for supplies from ceiling, inlets on 3⅜" centers.

*(For Alberene or composition laundry tubs.)*

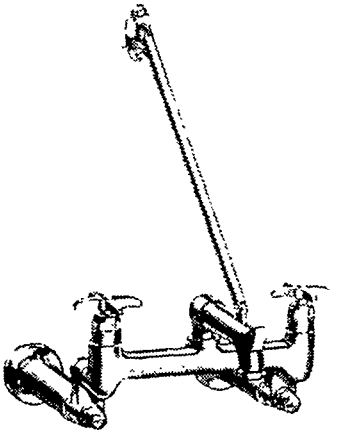


8-95

### 8-101

Rough chromium plated utility sink faucet with *Dial-ese* trimming units, rigid spout with pail hook and hose end; indexed lever handles; 1/2" eccentric female inlets with adjustable set screw flanges.

*Supply inlets adjustable 7⅞" to 8¼".*



### 8H-103

Exposed sink supply fitting with *Dial-ese* trimming units, rigid spout with pail hook and brace integral stops and adjustable screw flanges. ½" female inlets adjustable 5" to 11" centers. Wall to center of spout outlet 10½".

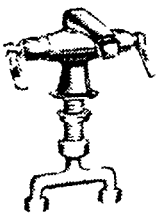
### 8-114

*Quaturn* single pantry faucet with rigid gooseneck spout and metal lever handle; ½" union tailpiece.

### 8H-180

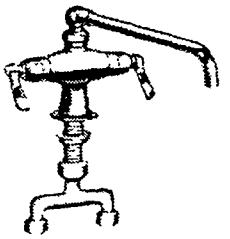
Double lavatory faucet with *Dial-ese* trimming units, gooseneck spout and lever handles with index buttons.

8H-180-A, same with *Spring-Plo* aerator.



### 8H-182

Double lavatory faucet with *Dial-ese* trimming units, low pattern spout, lever handles with index buttons.



### 8H-186

Double lavatory faucet with *Dial-ese* trimming units, and swinging spout, lever handles with index buttons.

| Number | Price | Shpg. Wt. |
|---|---|---|
| B34R | $ 9.92 | [illegible] |
| B34CR | 9.82 | [illegible] |
| 8-94 | 13.18 | 4¾ |
| 8-95 | 18.76 | 4½ |
| 8-101 | 19.96 | 4½ |
| 8H-103 | 49.90 | 8 |
| 8-114 | 10.64 | 2¼ |
| 8H-180 | 26.80 | 6 |
| 8H-180-A | 28.90 | 6 |
| 8H-182 | 26.80 | 6 |
| 8H-186 | 33.50 | 6 |

*Prices are subject to change without notice.*

*Unless otherwise specified all exposed parts are chromium plated.*



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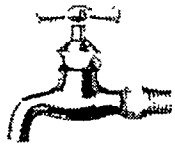
Printed in U. S. A.

## COMPRESSION SINK FAUCETS

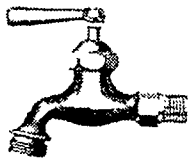
### PLAIN OR HOSE END

#### 1/2" MALE SHOULDER INLET

[illegible] Chromium Plated



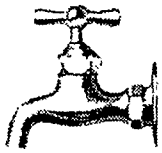
Tee Handle
8-204 Plain end
8-205 Hose end



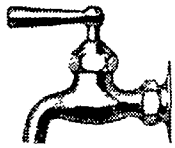
Lever Handle
8-207 Hose end
8-206 Plain end

#### 1/2" FEMALE FLANGED INLET

Chromium Plated



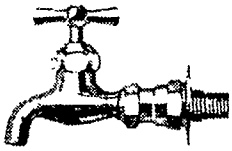
Tee Handle
8-212 Plain end
8-213 Hose end



Lever Handle
8-214 Plain end
8-215 Hose end

#### 1/2" MALE INLET, ADJUSTABLE SCREW FLANGE

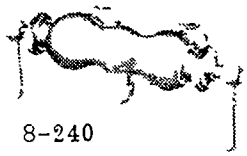
Chromium Plated



Tee Handle
8-220 Plain end
8-221 Hose end

Lever Handle
8-222 Plain end
8-223 Hose end

## DOUBLE WASH SINK FAUCETS



8-240

### 8-240

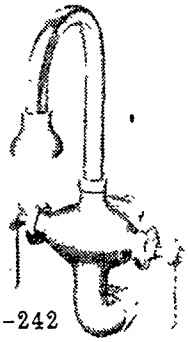
*Quaturn* rough nickel plated wash sink faucet with flow reducers and indexed lever handles; ⅜" iron pipe male tailpieces on 3-3/8" centers.

8-239 Same as 8-240 except with ½" female flanged inlets.

8-241

### 8-241

*Quaturn* rough nickel plated wash sink faucet with flow reducers, indexed lever handles, and 1¾" removable-face spray nozzle; ⅜" iron pipe male tailpieces on 3" vertical centers.



8-242

### 8-242

*Quaturn* rough nickel plated wash sink faucet with flow reducers, indexed lever handles, and gooseneck spout with 1¾" removable-face spray nozzle; ⅜" iron pipe male tailpieces on 3" vertical centers.

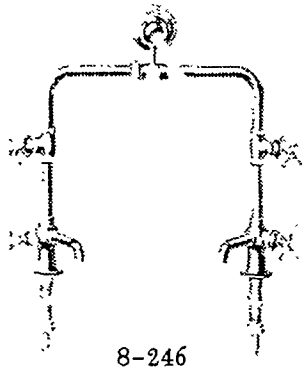
*Above faucets are available with ½" iron pipe male tailpieces at same prices.*

| Number | Finish | Price |
|---|---|---|
| 8-204 | Rgh.Br. | $2.00 |
| | Fin.Br. | 3.18 |
| | C.P. | 3.32 |
| 8-205 | Rgh.Br. | 2.04 |
| | Fin.Br. | 3.20 |
| | C.P. | 3.36 |
| 8-206 | Rgh.Br. | 2.32 |
| | Fin.Br. | 3.50 |
| | C.P. | 3.64 |
| 8-207 | Rgh.Br. | 2.34 |
| | Fin.Br. | 3.52 |
| | C.P. | 3.66 |
| 8-212 | C.P. | 3.84 |

| Number | Finish | Price |
|---|---|---|
| 8-213 | C.P. | $3.96 |
| 8-214 | C.P. | 3.98 |
| 8-215 | C.P. | 4.08 |
| 8-220 | C.P. | 4.30 |
| 8-221 | C.P. | 4.38 |
| 8-222 | C.P. | 4.42 |
| 8-223 | C.P. | 4.50 |
| 8-239 | Rgh.N.P. | 15.48 |
| 8-240 | Rgh.N.P. | 12.90 |
| 8-241 | Rgh.N.P. | 16.12 |
| 8-242 | Rgh.N.P. | 18.70 |
| 8-246 | C.P. | 36.46 |
| 8-247 | C.P. | 36.46 |

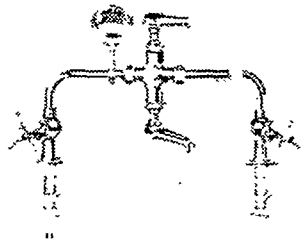
*All prices are subject to change without notice.*

## SHAMPOO FIXTURES



### 8-246

Lavatory and shampoo fitting with by-pass pattern faucets and control valves with 4-arm metal handles, 2½" spray with rubber hose and hook, ⅜" union tailpieces.



### 8-247

Lavatory and shampoo fitting with swinging spout and swinging hose nozzle, valves with 4-arm metal handles, 2½" spray with rubber hose and hook; ⅜" union tailpieces.

***Note: Water is shut off when spout or hose nozzle is swung back.***

*Unless otherwise specified exposed metal trim is chromium plated.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# LAVATORY SUPPLIES

## 8-295

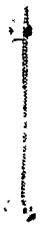
[illegible] straight supply with [illegible] upright, [illegible] and [illegible].

**Sizes 3/8" and 1/2" 5" and 8" long**

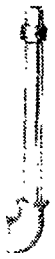
## 8-296

[illegible] angle supply with [illegible] upright, [illegible] and [illegible].

**Sizes 3/8" and 1/2" 5" and 8" long**



8-295



8-296

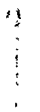
## 8-298

Rough [illegible] plated straight supply with [illegible] O.D. flexible copper upright.

## 8-299

Rough [illegible] plated angle supply with [illegible] O.D. flexible copper upright.

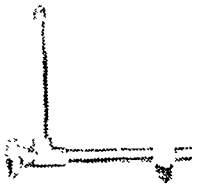
**Sizes 3/8" and 1/2"**
**Lengths 12", 20", 30" and 36"**



8-298



8-299



## 8-300

3/8" supply with wheel handle angle stop and escutcheon.

**Sizes 6x6" and 6x9"**

## 8-304

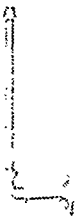
Supply with 3/8" I.P. O.D. wheel handle angle stop, escutcheon, and 7/16" O.D. flexible riser, less nipple.

**Riser 12" C. to E.**

## 8-306

3/8" angle supply with elbow, escutcheon, and 3/8 x 1/4" reducer.

**Size 6 x 8"**



## 8-307

3/8" angle supply with elbow, escutcheon, and 7/16" O.D. flexible [illegible].

**Size 3" nipple, 12" riser**

## 8-309

3/8" straight supply with escutcheon and 3/8 x 1/4" reducer.

**Length 26½"**

## 8-310

3/8" straight supply with wheel handle stop, escutcheon and 3/8 x 1/4" reducer.

**Length 26½"**

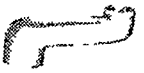
Unless otherwise specified all exposed metal trim is chromium plated.

8-309

8-310

8-324
Rgh.C.P.
male
tailpiece
1/4" I.P. x 2"

8-325
Rgh.N.P.
reducer
3/8 x 1/4"



8-327
Rgh.N.P.
offset
reducer
3/8 x 1/4 x 2"

## 8-312

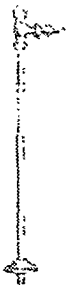
3/8" straight supply with 7/16" O.D. flexible copper upright and escutcheon.

## 8-313

3/8" straight supply with 7/16" O.D. flexible copper upright, wheel handle stop, and escutcheon.

**Lengths 31", 34", and 39"**

8-312



8-313

# SINK SUPPLIES

## 8-316

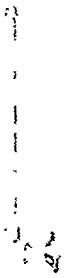
Angle sink supply with 12" flexible riser, 3" I.P. wheel handle and escutcheon, less nipple.

**Specify 3/8"O.D. or 1/2"O.D. riser**

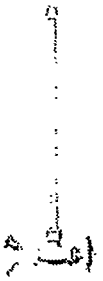
## 8-317

Angle sink supply with 12" flexible riser, 3" I.P. wheel handle angle stop with union connection and escutcheon, less nipple.

**Specify 3/8"O.D. or 1/2"O.D. riser**



8-316



8-317

## PRICES

| Number | Size | Per Pair | Number | Size | Per Pair |
|---|---|---|---|---|---|
| 8-295 | 3/8x5" | $1.44 | 8-300 | 3/8x6x6" | $9.90 |
| | 3/8x8" | 1.82 | | 3/8x6x9" | 10.30 |
| | 1/2x5" | 2.02 | 8-304 | 3/8x12" | 9.40 |
| | 1/2x8" | 2.34 | 8-306 | 3/8x6x8" | 8.30 |
| 8-296 | 3/8x5" | 2.48 | 8-307 | 3/8x3x12" | 6.18 |
| | 3/8x8" | 2.78 | 8-309 | 3/8x26½" | 8.26 |
| | 1/2x5" | 2.98 | 8-310 | 3/8x26½" | 15.60 |
| | 1/2x8" | 3.30 | 8-312 | 3/8x31" | 7.94 |
| 8-298 | 3/8x12" | 2.10 | | 3/8x34" | 8.16 |
| | 3/8x20" | 2.86 | | 3/8x39" | 8.48 |
| | 3/8x30" | 3.90 | 8-313 | 3/8x31" | 15.06 |
| | 3/8x36" | 5.12 | | 3/8x34" | 15.30 |
| 8-298 | 1/2x12" | 2.26 | | 3/8x39" | 15.76 |
| | 1/2x20" | 2.98 | 8-316 | 3/8 O.D. riser | 3.06 |
| | 1/2x30" | 4.06 | | 1/2 O.D. riser | 4.00 |
| | 1/2x36" | 5.26 | 8-317 | 3/8" O.D. riser | 6.12 |
| 8-299 | 3/8x12" | 2.40 | | 1/2" O.D. riser | 7.26 |
| | 3/8x20" | 3.14 | 8-324 | 1/4x2" | .48 |
| | 3/8x30" | 4.18 | 8-325 | 3/8x1/4" | .70 |
| | 3/8x36" | 5.38 | 8-327 | 1/4x2 | 1.20 |
| 8-299 | 1/2x12" | 2.54 | | | |
| | 1/2x20" | 3.30 | | | |
| | 1/2x30" | 4.32 | | | |
| | 1/2x36" | 5.58 | | | |



May 4, 1955
*Superseding December 13, 1954*

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Printed in U. S. A.

## CHROMIUM PLATED COMPRESSION STOPS

8-329

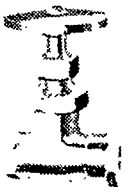
Straight stop with exposed stuffing box and composition disc.

**Sizes 3/8" and 1/2"**

8-330

Angle stop with exposed stuffing box and composition disc.

**Sizes 3/8" and 1/2"**



8-331

Straight stop with exposed stuffing box and composition disc for iron pipe and slip joint.

**Sizes**
3/8" I.P. x 3/8" O.D. Slip
1/2" I.P. x 3/8" O.D. Slip

8-332

Angle stop with exposed stuffing box and composition disc for iron pipe and slip joint.

**Sizes**
3/8" I.P. x 3/8" O.D. Slip
1/2" I.P. x 3/8" O.D. Slip

*Note: 8-329 to 8-334 stops can be furnished less stuffing box when so specified.*

8-333

Lock shield straight stop with exposed stuffing box and composition disc less key.

**Sizes 3/8" and 1/2"**

8-334

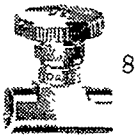
Lock shield angle stop with exposed stuffing box and composition disc less key.

**Sizes 3/8" and 1/2"**

8-335

Straight stop, metal to metal seat.

**Size 3/8"**

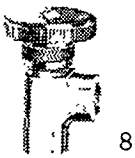


8-335

8-336

Angle stop, metal to metal seat.

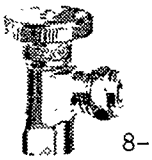
**Size 3/8"**



8-336

8-337

Angle stop, metal to metal seat, 3/8" I.P.S. female inlet, 7/16" O.D. slip joint outlet.



8-337

### LAWN FAUCET

8-340

Rough brass "Y" pattern lawn faucet with lock shield, composition disc, loose tee handle and 3/4" hose end

**Sizes 1/2" and 3/4"**

### SEDIMENT FAUCETS

8-341

Rough brass sediment faucet with handwheel, 3/4" hose end, female inlet.

**Size 1/2"**

8-342

Rough brass "Y" pattern sediment faucet with composition disc, non-heat handwheel, 3/4" hose end, male inlet.

**Sizes 1/2" and 3/4"**

8-339

Same, except with shank 1" longer.

**Size 3/4"**

### ROUGH BRASS COMPRESSION STOPS

*With Maroon Enameled Aluminum Handwheels*

8-343

8-343

Straight stop with composition disc.

8-344

Angle pattern.

**Sizes 1/2" and 3/4"**

8-345

8-345

Straight stop with independent drain and composition disc.

**Sizes 1/2" and 3/4"**

***Shipped in pairs, one R.H. and one L.H. drain unless otherwise specified.***

| Number | Size | Price |
|---|---|---|
| 8-329 | 3/8<br>1/2 | $3.96<br>4.38 |
| 8-330 | 3/8<br>1/2 | 3.96<br>4.38 |
| 8-331 | 3/8 x 3/8<br>1/2 x 3/8 | 4.70<br>5.12 |
| 8-332 | 3/8 x 3/8<br>1/2 x 3/8 | 4.70<br>5.12 |
| 8-333 | 3/8<br>1/2 | 3.96<br>4.38 |
| 8-334 | 3/8<br>1/2 | 3.96<br>4.38 |
| For Key, ADD | | .44 |
| Less Stuffing Box, DEDUCT | | .48 |
| 8-335<br>8-336<br>8-337 | 3/8<br>3/8<br>3/8 x 7/16 | $3.56<br>3.56<br>3.98 |
| 8-339 | 3/4 | 2.10 |
| 8-340 | 1/2<br>3/4 | 2.40<br>2.40 |
| 8-341 | 1/2 | 1.86 |
| 8-342 | 1/2<br>3/4 | 1.80<br>2.00 |
| 8-343 | 1/2<br>3/4 | 2.10<br>2.32 |
| 8-344 | 1/2<br>3/4 | 2.10<br>2.32 |
| 8-345 | 1/2<br>3/4 | 2.20<br>2.32 |

*Unless otherwise specified all exposed parts are chromium plated.*

*Prices are subject to change without notice.*

## SINK AND LAVATORY WASTE TRIM

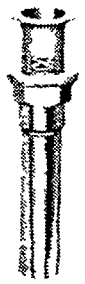
8-349

### 8-349

Wrought lavatory P.O. plug with 1½" O.D. tailpiece 5" long. Wack washer and bead chain with rubber stopper. [illegible] Each $1.92
[illegible] 2.46

### 8-350

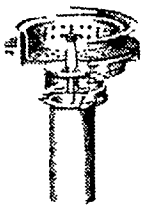
Wrought lavatory P.O. plug with 1¼" or 1½" O.D. tailpiece [illegible] long. For 1½" stopper. Each $3.90



8-350

### 8-353

Cast brass lavatory P.O. plug with perforated open strainer 1¼" or 1½" O.D. tailpiece [illegible] long. Each $4.50



8-361

### 8-361

Repeating hand-operated basket strainer with stopper and 1½" O.D. satin finish tailpiece 4" long. For Duraclay, enameled cast iron or formed metal sinks with 3½" diameter outlets.
Each $6.70

8-353

8-365

### 8-365

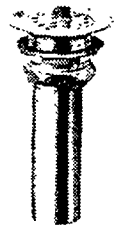
Wrought sink strainer with 1½" O.D. satin finish tailpiece 4" long. For enameled cast iron or formed metal sinks with 3½" diameter outlets.
Each $3.46

8-369

### 8-369

Open standing waste with 7" high removable overflow, 1½" O.D. tailpiece. For 9" deep Duraclay sinks.
Each $17.66

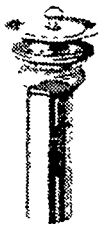
Unless otherwise specified, all exposed metal trim is chromium plated.



8-354

### 8-354

Wrought sink strainer with 1½" O.D. 20-gauge satin finish tailpiece 4" long. For sinks with 1-1/8" diameter outlets.
Each $2.38



8-355

### 8-355

Wrought waste plug with rubber stopper and 1½" O.D. 20-gauge satin finish tailpiece 4" long. For sinks with 1-1/8" diameter outlets.
Each $2.46

8-379

### 8-379 TAILPIECES FOR SINK STRAINERS

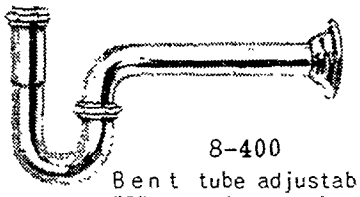
| 20-gauge | 1¼" O.D. Satin | 1¼" O.D. Chr.Pl. | 1½" O.D. Satin | 1½" O.D. Chr.Pl. |
|---|---|---|---|---|
| 1½ or 1½ x 4" | $.54 | $.64 | $.54 | $.66 |
| 1½ or 1½ x 6" | .66 | .86 | .72 | .90 |
| 1½ or 1½ x 8" | .86 | 1.04 | .90 | 1.15 |

8-389

### 8-389

Rough satin finish funnel connection with 1¼" or 1½" tailpiece.

| Size | Each | Size | Each |
|---|---|---|---|
| 1½ x 6" | $1.22 | 1½ x 6" | $1.26 |
| 1¼ x 8" | 1.36 | 1½ x 8" | 1.44 |



### 8-400

Bent tube adjustable "P" trap w/ escutcheon.

| Size | 20-gauge Satin | 20-gauge Chr.Pl. | 17-gauge Satin | 17-gauge Chr.Pl. |
|---|---|---|---|---|
| 1¼" | $2.96 | $3.22 | $3.92 | $4.22 |
| 1½" | 3.22 | 3.68 | 4.50 | 4.80 |

### 8-401

Same as above except with cleanout.

| Size | 20-gauge Satin | 20-gauge Chr.Pl. | 17-gauge Satin | 17-gauge Chr.Pl. |
|---|---|---|---|---|
| 1½" | $4.02 | $4.32 | $4.72 | $4.98 |
| 1½" | 4.66 | 5.34 | 5.26 | 5.92 |

### 8-410

NEW YORK REGULATION

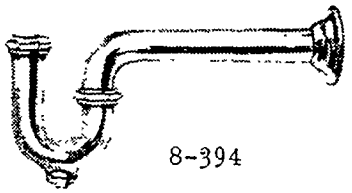
Cast brass "P" trap with cleanout and female iron pipe outlet.

| Size | Rgh.Brass | Chr.Pl. |
|---|---|---|
| 1½" | $4.48 | $7.10 |
| 1½ x 1½" | 4.74 | 8.26 |
| 1½" | 4.74 | 8.26 |

### 8-411

Cast brass adjustable ground joint swivel pattern "P" trap with cleanout and female iron pipe outlet.

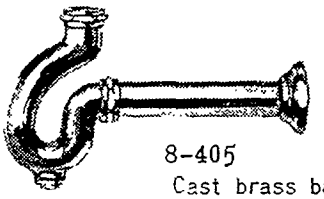
| Size | Rgh.Brass | Chr.Pl. |
|---|---|---|
| 1½" | $5.44 | $8.34 |
| 1½" or 1½x1½" | 6.72 | 9.34 |



8-394

Cast brass adjustable "P" trap with cleanout, and tubing waste to wall with escutcheon.

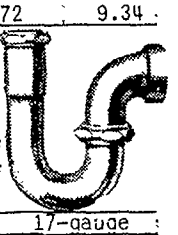
| Size | Chr.Pl. |
|---|---|
| 1½" | $8.16 |
| 1½" | 9.62 |
| 1½ x 1½" | 9.62 |



### 8-405

Cast brass bag offset "P" trap with cleanout, and tubing waste to wall with escutcheon.

| Size | Chr.Pl. |
|---|---|
| 1½" | $12.54 |
| 1½" | 16.00 |
| 1½ x 1½" | 16.00 |



### 8-420

Bent tube adjustable "P" trap with female iron pipe outlet

| Size | 20-gauge Satin | 20-gauge Chr.Pl. | 17-gauge Satin | 17-gauge Chr.Pl. |
|---|---|---|---|---|
| 1¼" | $3.22 | $5.28 | $3.46 | $5.84 |
| 1½" | 3.22 | 5.86 | 3.46 | 6.14 |

### 8-421

Same as above except with cleanout.

| Size | 20-gauge Satin | 20-gauge Chr.Pl. | 17-gauge Satin | 17-gauge Chr.Pl. |
|---|---|---|---|---|
| 1¼" | $4.14 | $6.40 | $4.38 | $6.66 |
| 1½" | 4.58 | 6.78 | 4.88 | 7.02 |

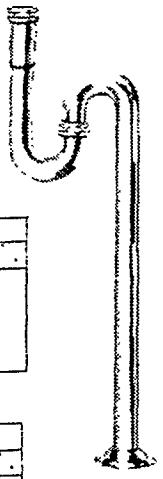
All prices are subject to change without notice.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

# TRAPS, ESCUTCHEONS AND CONTINUOUS WASTES



## 8-425

Bent tube adjustable "S" trap with floor escutcheon.

| Size | 20-gauge | |
|---|---|---|
| | Satin | Chr.Pl. |
| 1¼x20½" | $4.38 | $5.04 |
| 1¼x26½" | 5.98 | 6.74 |
| 1½x20½" | 4.72 | 5.60 |
| 1½x26½" | 6.22 | 7.34 |

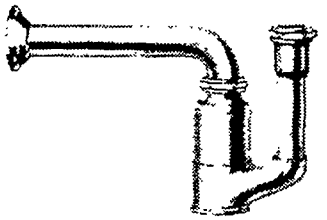
| Size | 17-gauge | |
|---|---|---|
| | Satin | Chr.Pl. |
| 1¼x20½" | $5.20 | $6.02 |
| 1¼x26½" | 6.66 | 7.50 |
| 1½x20½" | 6.40 | 6.86 |
| 1½x26½" | 7.36 | 8.22 |

## 8-426

Same as above except with cleanout.

| Size | 20-gauge | | 17-gauge | |
|---|---|---|---|---|
| | Satin | Chr.Pl. | Satin | Chr.Pl. |
| 1¼x20½" | $5.76 | $6.56 | $6.30 | $7.12 |
| 1¼x26½" | 6.80 | 7.60 | 7.50 | 8.32 |
| 1½x20½" | 5.92 | 7.14 | 6.58 | 7.74 |
| 1½x26½" | 7.06 | 8.24 | 7.74 | 8.88 |

*Unless otherwise specified exposed metal is chromium plated.*



## 8-427

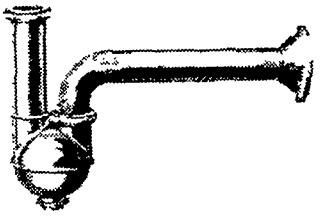
Semi-cast body anti-siphon "P" trap, with 17-gauge tubing waste to wall and escutcheon.

| Size | Satin | Chr.Pl. |
|---|---|---|
| 1¼x1½" | $12.32 | $15.46 |
| 1½x1½" | 13.10 | 16.38 |
| 1½x1½" | 13.10 | 16.38 |

## 8-428

Same except "S" trap with tubing waste to floor.

| Size | Satin | Chr.Pl. |
|---|---|---|
| 1¼x1½x20½" | $13.86 | $17.94 |
| 1¼x1½x26½" | 15.18 | 18.98 |
| 1½x1½x20½" | 15.18 | 18.98 |
| 1½x1½x26½" | 16.42 | 20.54 |
| 1½x1½x20½" | 15.18 | 18.98 |
| 1½x1½x26½" | 16.42 | 20.54 |



## 8-431

Wrought 20-gauge brass anti-siphon "P" trap with cleanout, tubing waste to wall and escutcheon.

| Size | Chr.Pl. |
|---|---|
| 1¼x1½" | $9.84 |
| 1½x1½" | 11.54 |

## 8-432

Same except "S" trap with tubing waste to floor.

| Size | Chr.Pl. |
|---|---|
| 1¼x1½x20½" | $12.40 |
| 1¼x1½x26½" | 13.30 |
| 1½x1½x20½" | 14.22 |
| 1½x1½x26½" | 15.50 |

## JOSAM HAIR INTERCEPTOR

Cast brass hair interceptor with screwed water tight cover, removable screen and cleanout plug; slip joint inlet and female iron pipe outlet.

| No. | Inlet | Outlet | Pol.Brass | Chr.Pl. |
|---|---|---|---|---|
| H-21¼ | 1¼" | 1½" | $72.00 | $80.00 |
| H-21½ | 1½" | 1½" | 72.00 | 80.00 |

## 8-445

Cast brass set screw escutcheon.

| For Iron Pipe | |
|---|---|
| Size | Price |
| 3/8" | $1.46 |
| 1/2" | 1.52 |
| 3/4" | 2.06 |
| 1" | 2.06 |
| 1¼" | 1.90 |
| 1½" | 2.14 |
| 2" | 2.16 |

| For O.D. Tubing | |
|---|---|
| Size | Price |
| 1" | $2.06 |
| 1¼" | 2.14 |
| 1⅜" | 2.06 |
| 1½" | 1.92 |
| 1¾" | 1.86 |
| 2" | 2.26 |

## 8-446

Pressed brass saw tooth escutcheon.

| For Iron Pipe | |
|---|---|
| Size | Price |
| 3/8" | $.24 |
| 1/2" | .24 |
| 3/4" | .34 |
| 1" | .34 |
| 1¼" | .40 |
| 1½" | .40 |

| For O.D. Tubing | |
|---|---|
| Size | Price |
| 1¼" | $.32 |
| 1⅜" | .34 |
| 1½" | .32 |
| 2" | .42 |

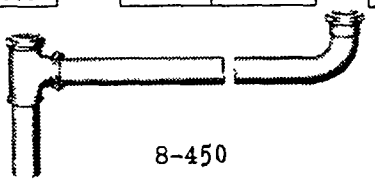
## 8-449

Pressed brass deep pattern saw tooth escutcheon.

| For Iron Pipe | |
|---|---|
| Size | Price |
| 3/8" | $.32 |
| 1/2" | .32 |

| For O.D. Tubing | |
|---|---|
| Size | Price |
| 3/8" or 1/2" | $.32 |
| 1/2" or 3/4" | .32 |
| 1¼", 1½" | .58 |

*Prices are subject to change without notice.*

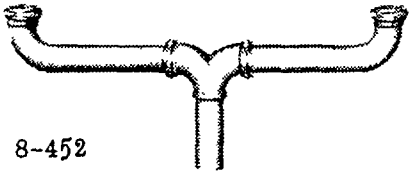


## 8-450

Brass 20-gauge end outlet continuous waste with inlets to slip 1½" O.D. and with 1½ x 4" tailpiece.

| 2 Part | Chr.Pl. | Satin |
|---|---|---|
| 16" C.to C. | $7.66 | $5.34 |
| 21" C.to C. | 8.00 | 5.74 |
| 24" C.to C. | 8.26 | 6.08 |
| 30" C.to C. | 9.02 | 6.54 |

| 3 Part | Chr.Pl. | Satin |
|---|---|---|
| 21" C.to C. | $14.32 | $10.24 |
| 24" C.to C. | 15.30 | 11.26 |



## 8-452

Brass 20-gauge center outlet continuous waste with inlets to slip 1½" O.D. and with 1½ x 4" tailpiece.

| 2 Part | Chr.Pl. | Satin |
|---|---|---|
| 16" C.to C. | $8.86 | $6.54 |
| 21" C.to C. | 9.52 | 6.94 |
| 24" C.to C. | 9.90 | 7.34 |
| 30" C.to C. | 10.62 | 8.24 |

| 3 Part | Chr.Pl. | Satin |
|---|---|---|
| 21" C.toC. | - | $11.22 |
| 24" C.toC. | $13.44 | 10.54 |

# CAST BRASS SLIP JOINT AND FINE THREAD FITTINGS

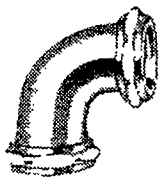
1¼" OR 1½" FINE THREAD OR O.D. SLIP JOINT

8-460
Cast brass 90° fine thread elbow.

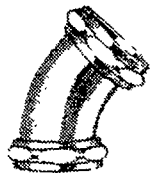
8-461
Cast brass 45° fine thread elbow.

8-463
Cast brass 90° fine thread and slip joint elbow.

8-464
Cast brass 45° fine thread and slip joint elbow.



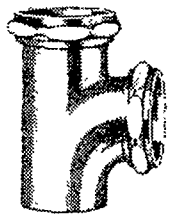
8-466
Cast brass 90° slip joint elbow.



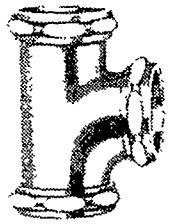
8-467
Cast brass 45° slip joint elbow.

8-469
Cast brass fine thread tee.

8-470
Cast brass fine thread and slip joint tee.



8-471
Cast brass fine thread and slip joint tee.

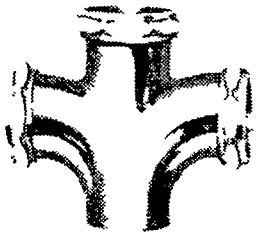


8-472
Cast brass slip joint tee.

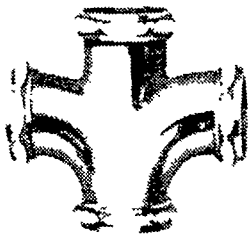
8-474
Cast brass slip joint and fine thread twin elbow.

8-475
Cast brass slip joint twin elbow.

8-479
Fine thread cap for waste.



8-477
Cast brass fine thread and slip joint sanitary cross.



8-478
Cast brass slip joint sanitary cross.

PRICES

| Number | 1¼" Satin | 1¼" Chr.Pl. | 1½" Satin | 1½" Chr.Pl. |
|---|---|---|---|---|
| 8-460 | $1.22 | $2.24 | $1.50 | $2.42 |
| 8-461 | 1.20 | 2.14 | 1.36 | 2.34 |
| 8-463 | 1.60 | 2.50 | 1.74 | 2.80 |
| 8-464 | 1.60 | 2.50 | 1.74 | 2.80 |
| 8-466 | 2.10 | 3.14 | 2.14 | 3.34 |
| 8-467 | 1.90 | 2.80 | 2.00 | 2.94 |
| 8-469 | 2.18 | 3.42 | 2.56 | 3.92 |
| 8-470 | 2.16 | 3.70 | 2.78 | 4.22 |
| 8-471 | 2.82 | 4.02 | 2.98 | 4.40 |
| 8-472 | 2.98 | 4.30 | 3.38 | 4.62 |
| 8-474 | 3.58 | 5.42 | 3.06 | 4.72 |
| 8-475 | 4.10 | 6.26 | 3.44 | 5.20 |
| 8-477 | - | - | 4.48 | 6.50 |
| 8-478 | 4.70 | 7.06 | 5.02 | 7.06 |
| 8-479 | - | - | - | 1.18 |

*Exposed metal is satin plated or polished chromium plated.*

*Prices are subject to change without notice.*



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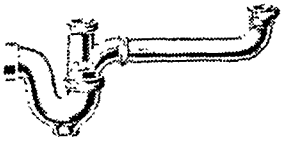
*Printed in U. S. A.*

### "DUO" PRINCIPLE OF SANITARY DRAINING

The diagram below illustrates how the patented SANITARY WALL construction prevents drain water of one compartment from backing up into other compartment.

## GENUINE "DUO" WASTES

END OR CENTER OUTLETS
INLETS ON 21" CENTERS

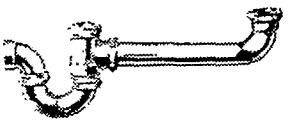


**No. 2001**

End outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and cast brass *Duo* trap with cleanout and 1½" female iron pipe outlet.

**No. 2000**

Same except *Duo* trap with 2" female iron pipe outlet.

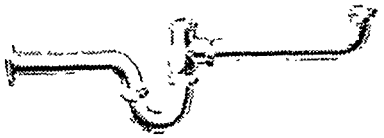


**No. 2002**

End outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and swivel pattern *Duo* tubing trap with 1½" female iron pipe outlet.

**No. 2003**

Same except with cast brass *Duo* trap.



**No. 2004**

End outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and *Duo* tubing "P" trap with 1½" O.D. waste to wall; 15" center to end.

**No. 2006**

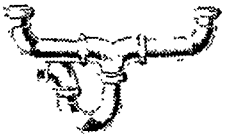
Same except "S" trap with 1½" O.D. x 19½" long waste to floor.

**No. 2021**

Center outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and cast brass *Twin Duo* trap with cleanout and 1½" female iron pipe outlet.

**No. 2020**

Same except *Twin Duo* trap with 2" female iron pipe outlet.



**No. 2022**

Center outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and swivel pattern *Twin Duo* tubing trap with 1½" female iron pipe outlet.

**No. 2023**

Same except with cast brass *Twin Duo* trap.

**No. 2024**

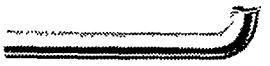
Center outlet 20-gauge *Duo* waste with 1½" O.D. slip joint inlets and *Twin Duo* tubing "P" trap with 1½" O.D. waste to wall; 15" center to end.

**No. 2026**

Same except "S" trap with 1½" O.D. x 19½" long waste to floor.

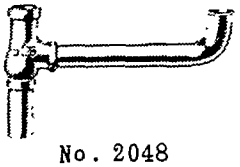
20-gauge brass waste bend, 1½" O.D. with 1½" slip nut inlet.

| No. | C. to E. | No. | C. to E. |
|---|---|---|---|
| 2200 | 6" | 2205 | 15" |
| 2201 | 7" | 2207 | 20" |
| 2204 | 12" | 2208 | 24" |



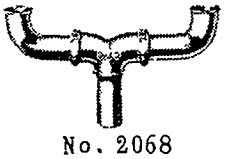
20-gauge brass waste bend, 1½" O.D. with collar inlet.

| No. | C. to E. | No. | C. to E. |
|---|---|---|---|
| 2240 | 9" | 2243 | 15" |
| | | 2244 | 20" |
| 2242 | 10" | 2245 | 24" |



**No. 2048**

End outlet *Duo* waste, *Duo* tee with 1½" O.D. tailpiece 4" long and 1½" O.D. 20-gauge waste bend with collar. (For direct connection to sink strainers.)



**No. 2068**

Center outlet *Duo* waste, *Twin Duo* tee with 1½" O.D. tailpiece 4" long and 1½" O.D. 20-gauge waste bends with collars. (For direct connection to sink strainers.)

| Number | Coni-Chr. | Pol.C.P. | Shpg.Wt. |
|---|---|---|---|
| 2000 | $13.60 | $18.56 | 5¼ Lbs. |
| 2001 | 10.90 | 15.62 | 4¼ |
| 2002 | 10.42 | 14.70 | 4¼ |
| 2003 | 11.92 | 16.78 | 5¼ |
| 2004 | 10.68 | 13.68 | 3¾ |
| 2006 | 12.08 | 15.68 | 4½ |
| 2020 | 14.42 | 19.42 | 5¼ |
| 2021 | 11.82 | 16.60 | 4¼ |
| 2022 | 11.36 | 15.70 | 4¼ |
| 2023 | 12.92 | 17.76 | 5¼ |
| 2024 | 11.62 | 14.64 | 3¾ |
| 2026 | 13.02 | 16.56 | 4½ |
| 2048 | 5.96 | 8.40 | 3¼ |
| 2068 | 6.16 | 8.26 | 3¼ |
| 2200 | 1.68 | 1.96 | ½ |
| 2201 | 1.78 | 2.04 | ½ |
| 2204 | 2.34 | 2.58 | ¾ |
| 2205 | 2.62 | 3.04 | 1 |
| 2207 | 3.10 | 3.50 | 1¼ |
| 2208 | 3.50 | 4.02 | 1½ |
| 2240 | 1.40 | 1.68 | ½ |
| 2242 | 1.78 | 2.04 | ½ |
| 2243 | 2.00 | 2.28 | ¾ |
| 2244 | 2.52 | 2.92 | 1 |
| 2245 | 2.86 | 3.36 | 1¼ |

**Prices are subject to change without notice.**

*For Sink Strainers and Traps refer to Page 8-10.*

## SINK AND LAVATORY WASTE TRIM

**8-650**
Wrought faucet hole cover, 1¾" diameter.
Each $.58

**8-653**
Wrought chain-stay, 1¾" diameter.
Each $.80

**8-655**
Wrought chainstay with 11" bead chain and (1" or 1¼") solid rubber stopper.

With 1" stopper Each $ .94
With 1¼" stopper Each 1.38

**8-656**
Solid white rubber basin and bath stopper with brass post and ring.
*Packed - one dozen per box.*

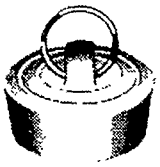
| Size | Per Doz. |
|---|---|
| 1" | $1.84 |
| 1⅛" | 1.98 |
| 1¼" | 2.10 |

| Size | Per Doz. |
|---|---|
| 1⅜" | $2.22 |
| 1½" | 2.42 |
| 1⅝" | 2.78 |

| Size | Per Doz. |
|---|---|
| 1¾" | $2.94 |
| 1⅞" | 3.58 |
| 2" | 3.92 |

**CHROMIUM PLATED BEAD CHAIN ON REELS**

No. 10 on 500 ft. reels Per Reel $106.66
No. 13 on 250 ft. reels Per Reel 80.00



**8-657**
Hollow white rubber basin and bath stopper.
*Packed - one dozen per box.*

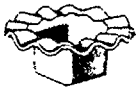
| Size | Per Doz. |
|---|---|
| 1" | $.66 |
| 1⅛" | .70 |
| 1¼" | .78 |

| Size | Per Doz. |
|---|---|
| 1⅜" | $.86 |
| 1½" | .90 |
| 1⅝" | 1.02 |

| Size | Per Doz. |
|---|---|
| 1¾" | $1.18 |
| 1⅞" | 1.70 |
| 2" | 2.00 |

**No. 10 BEAD CHAIN** with type "A" couplings
**No. 13 BEAD CHAIN** with type "A" couplings

| Chromium Plated Bead Chain | Length | 11" | 15" |
|---|---|---|---|
| No. 10 with type "A" couplings | Each | $.34 | .40 |
| No. 13 with type "A" couplings | Each | - | .54 |



**8-659**
Galvanized steel washer for basin faucet shank.
Per Hundred $6.94

**8-660**
Rough brass flush bushing.

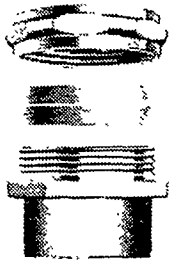
| I.P. Thread | O.D. Slip | Each |
|---|---|---|
| 1¼" | 1¼" | $.40 |
| 1½" | 1¼" | .56 |
| 1½" | 1⅝" | .58 |
| 1½" | 1½" | .42 |

**8-661**
Rough brass hexagon male solder bushing.

| I.P. Thread | O.D. Slip | Each |
|---|---|---|
| 1¼" | 1¼" | $.58 |
| 1½" | 1¼" | .74 |
| 1½" | 1½" | .66 |

*Unless otherwise specified exposed metal is chromium plated.*

**8-662**



**8-664**

**8-662** Brass male waste and vent connection with ground joint.

| Size | | Rgh.Br.Nut | C.P. Nut |
|---|---|---|---|
| 1¼x1¼" | Ea. | $1.18 | $1.34 |
| 1½x1¼" | Ea. | 1.26 | 1.42 |
| 1½x1⅜" | Ea. | 1.34 | 1.54 |
| 1½x1½" | Ea. | 1.28 | 1.46 |

**8-664** Brass female waste & vent connection with ground joint.

| Size | | Rgh.Br.Nut | C.P. Nut |
|---|---|---|---|
| 1¼x1¼" | Ea. | $1.22 | $1.42 |
| 1½x1¼" | Ea. | 1.34 | 1.50 |
| 1½x1⅜" | Ea. | 1.38 | 1.58 |
| 1½x1½" | Ea. | 1.34 | 1.50 |

Rough Brass ground joint rings for above Each $.16

**8-663**
Cast brass slip nut with friction ring and washer.

| I.P. Thread | O.D. Slip | Each Chr.Pl. | Each Rgh.Br. |
|---|---|---|---|
| 3/8" | 7/16" | $.38 | $.26 |
| 1/2" | 7/16" | .42 | .30 |
| 1/2" | 1/2" | .42 | .30 |
| 1/2" | 9/16" | .42 | .30 |
| 1" | 1" | .82 | .64 |
| 1¼" | 1¼" | .56 | .50 |
| 1½" | 1¼" | .62 | .56 |
| 1½" | 1½" | .62 | .56 |
| 2" | 1½" | 1.06 | .88 |
| 2" | 2" | .80 | .66 |

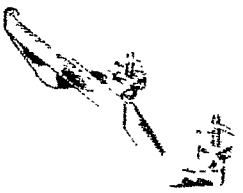
**Prices are subject to change without notice.**



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

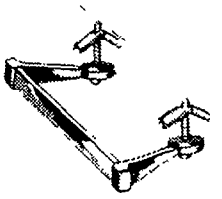
## REVERSIBLE TOWEL BARS



8-691
*(For China Lavatories)*

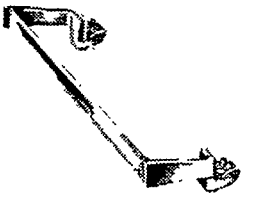
*Temple* all metal reversible towel bar with toggle bolts and washers.

Polished chromium plated or Brush finish chromium plated



8-697
*(For China Lavatories)*

*Crestmont* all metal reversible towel bar with toggle bolts and washers.



8-698
*(For Cast Iron Enameled Lavatories)*

*Crestmont* all metal reversible clamp-on towel bar with steel screw clamps.

*Unless otherwise specified exposed metal is polished chromium plated*

## METAL LAVATORY LEGS
(Adjustable)

8-700
SQUARE

For China Lavatories

8-700 *Temple* square leg.
8-710 *Crestmont* round leg.
8-711 *Crestmont* hexagon leg.

8-702 *Criterion* round leg.
*(See page 1-9 for description and illustration.)*

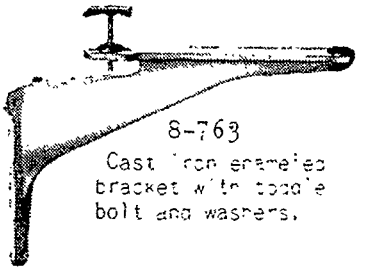
For Cast Iron Enameled Lavatories

8-714 *Crestmont* round leg.
8-715 *Crestmont* hexagon leg.

8-711 HEXAGON
8-710 ROUND

8-714 ROUND
8-715 HEXAGON

## BRACKETS FOR CHINA LAVATORIES



8-763
Cast iron enameled bracket with toggle bolt and washers.

Size 17" – for 20" and 24" lavatories
19⅜" – for 27" and larger lavatories

8-765
Stainless Steel wall bracket, 5" long, with toggle bolt and wall screws.

## BUILT-IN CAST IRON CHAIR AND WALL CARRIERS

**WALL CARRIERS are designed for installations where walls are of hollow tile. Carrier is concealed and affords rigid support with ample bearing on wall construction.**

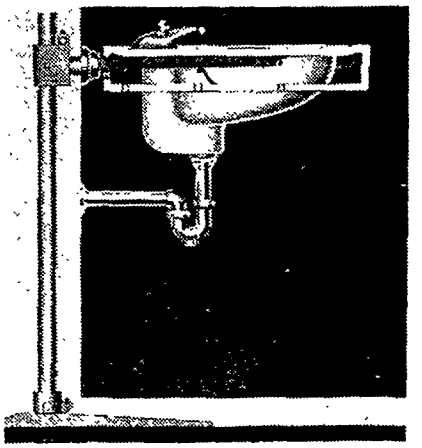
**CHAIR CARRIERS are for walls of insufficient strength to support fixtures. Carrier is concealed in wall and floor and provides full cantilever support to fixture.**

**Wall finish can be completed around carriers or chairs before installation of fixtures. Leveling screws on each arm provide for adjustment.**

8-780 WALL CARRIER
WITH EXPOSED BRACKETS

8-781 WALL CARRIER
WITH CONCEALED BRACKETS

*Note: Exposed bracket arms are painted white enamel finish.*



8-783 CHAIR CARRIER
WITH CONCEALED BRACKETS

8-782 CHAIR CARRIER
Same, except with Exposed Brackets

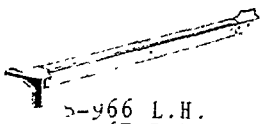
PRICES

| Cat.No. | Finish | Per Pair | Wt. Lbs. |
|---|---|---|---|
| 8-691 | Pol. C.P. | $18.90 | 4½ |
| 8-691 | Brush C.P. | 22.30 | 4½ |
| 8-697 | Pol. C.P. | 11.60 | 3½ |
| 8-698 | Pol. C.P. | 11.60 | 3½ |
| 8-700 | Pol. C.P. | 22.30 | 4½ |
| 8-702 | Brush C.P. | 31.00 | 4½ |
| 8-710 | Pol. C.P. | 16.50 | 3 |
| 8-710 | Brush C.P. | 19.30 | 3 |
| 8-711 | Pol. C.P. | 16.60 | 3 |
| 8-714 | Pol. C.P. | 16.60 | 3 |
| 8-715 | Pol. C.P. | 16.60 | 3 |

| Cat.No. | Arms | Per Unit | Wt. Lbs. |
|---|---|---|---|
| 8-763 | 17" | $16.40 | 15 |
| | 19⅜" | 20.20 | 23 |
| 8-765 | 5" | 5.60 | 3 |
| 8-780 | 15⅝" | 30.00 | 25 |
| 8-781 | 16½" | 34.00 | 18 |
| 8-782 | 15⅝" | 44.00 | 55 |
| | 18⅝" | 52.00 | 57 |
| 8-783 | 16½" | 50.00 | 51 |

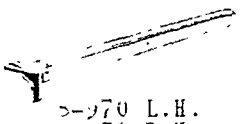
*Prices are subject to change without notice.*

## METAL MOULDING STRIPS FOR CRANE CABINET SINKS AND COUNTERTOPS



5-966 L.H.
5-967 R.H.

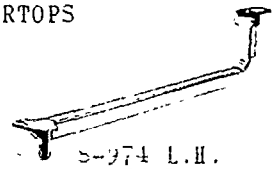
[illegible] $14.30



5-970 L.H.
5-971 R.H.

[illegible] $8.80

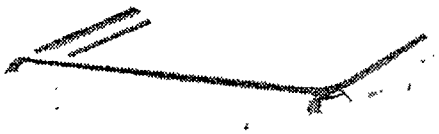
Crane metal moulding strips are designed to seal the joint between countertops and cabinet sinks. They are fastened to adjoining countertops with wood screws and a water proof mastic is used to seal moulding against sink rim to make a water-tight joint.



5-974 L.H.
5-975 R.H.

[illegible] $9.90

## RIM GUARDS FOR SERVICE SINKS



5-979 [illegible] brass

5-980 [illegible] brass

[illegible]

5-983 [illegible] steel plate, for front rim only.

[illegible] sizes: [illegible]

5-981

[illegible]

8-982 [illegible] steel plate, for front [illegible]

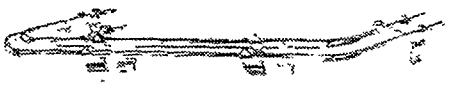
[illegible]

*When ordering rim guards specify catalog number and size of service sink with which guards are to be used.*

8-985

3-bar spring clamp brass rim guard for front rim of Duraclay or cast iron enameled service sinks.

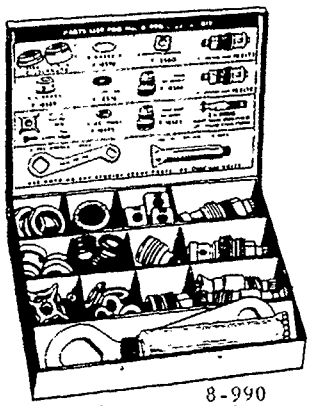
Sink Sizes
Cast Iron 22x18" and 24x20"
Duraclay 20x18" and 22x20"



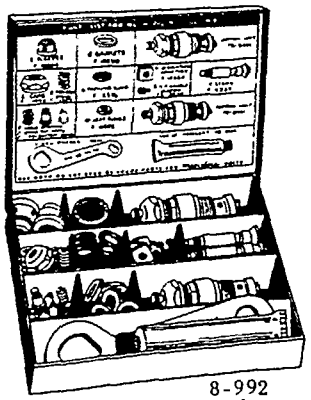
8-987

3-bar spring clamp brass rim guard for front and side rims of Duraclay or cast iron enameled service sinks.

Sink Sizes
Cast Iron [illegible] and [illegible]
Duraclay [illegible] and [illegible]



8-990
*Dial-ese* Parts Kit
Price Complete $13.90



8-992
*Magiclose* Parts Kit
Price Complete $22.20

**Parts Kits Contain:**

| *Dial-ese* Parts | Each |
|---|---|
| 1 Low Locknut | $.24 |
| 1 High Locknut | .34 |
| 8 Gaskets | .06 |
| 6 Insulating Adactors | .08 |
| 2 Sleeves | .24 |
| 6 Packing Rings | .06 |
| 2 Die Cast Adaptors | .08 |
| 6 Handle Screws | .06 |
| 12 Seat Rings | .10 |
| 1 R.H. Centerpiece | .40 |
| 1 L.H. Centerpiece | .40 |
| 1 R.H. Stem | .40 |
| 1 L.H. Stem | .40 |
| 1 R.H. Control Unit | 1.28 |
| 1 L.H. Control Unit | 1.28 |
| 1 Tube Lubricant | .40 |
| 1 Wrench | .20 |

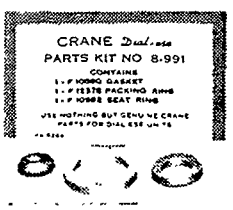
| *Magiclose* Parts | Each |
|---|---|
| 2 Sleeves | $.30 |
| 6 Gaskets | .06 |
| 2 Caps | .24 |
| 2 Top Cam Springs | .08 |
| 6 Packing Rings | .24 |
| 6 Insulating Adaptors | .08 |
| 6 Handle Screws | .06 |
| 4 Stems | .38 |
| 2 Springs | .12 |
| 2 Top Cams | .84 |
| 2 Bottom Cams | .68 |
| 12 Seat Rings | .12 |
| 2 Control Units | 4.68 |
| 1 Tube Lubricant | .40 |
| 1 Wrench | .20 |

*Prices are subject to change without notice.*

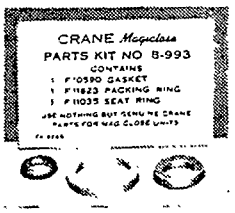
**Prices - Rim Guards**

| Cat. No. | Size Inches | Price Each | Shpg. Wt. |
|---|---|---|---|
| 8-979 | 22x18 | $13.16 | 5 |
| | 24x20 | 13.94 | 7 |
| 8-980 | 22x18 | 31.54 | 10 |
| | 24x20 | 32.66 | 12 |
| 8-981 | 20x18 | 26.32 | 5 |
| | 22x20 | 26.32 | 7 |

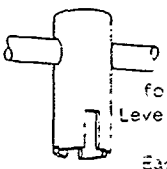
| Cat. No. | Price Each | Shpg. Wt. |
|---|---|---|
| 8-982 | $ 9.74 | – |
| 8-983 | 6.18 | – |
| 8-985 | 16.62 | [illegible] |
| 8-987 | 39.82 | [illegible] |




8-991 *Dial-ese* Parts Kit Each $.26

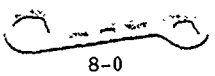



8-993 *Magiclose* Parts Kit Each $.48



8-995
Assembly wrench for *Securo* Lever Action wastes.
Each $2.70

8-995



8-0
Sheet steel wrench for *Dial-ese* and *Magiclose* trim.
Each $.20

*Dial-ese* Parts

*Unless otherwise specified, all exposed metal trim is chromium plated.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## BATH SUPPLY AND WASTE TRIM

9-15

*Criterion* concealed overrim bath supply fitting with clear Lucite handles and ½" union inlet valves on 8" centers with *Dial-ese* controls.

**All exposed metal parts are brush finish chromium plated.**

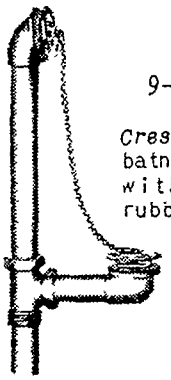
9-20

*Temple* concealed overrim bath supply fitting, ½" union inlet valves on 8" centers with *Dial-ese* controls.

9-22, same except with lever handles.

9-35

*Regal* concealed overrim bath supply fitting, ½" union inlet valves on 8" centers with *Dial-ese* controls.



9-50, 9-51, 9-52

*Crestmont* 1½" concealed bath waste and overflow with bead chain and rubber stopper.

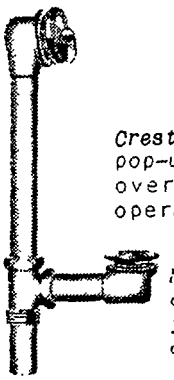
*Note: Waste tee is available with 1½" female I.P. outlet at no extra cost.*

Specify:

9-50 for *Criterion, Neuvogue* or *Ohio* baths.

9-51 for *Neuday, Albecor* and *Champion* baths.

9-52 for *Lahoma* baths.



9-55, 9-56,
9-58, 9-59

*Crestmont* 1½" concealed pop-up bath waste and overflow with lever operating mechanism.

*Note: Waste tee is available with 1½" female I.P. outlet at no extra cost.*

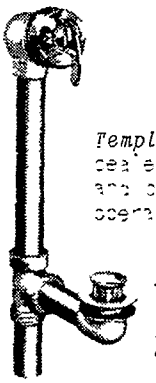
Specify:

9-55 for *Criterion*, and *Neuvogue* baths.

9-56 for *Neuday, Albecor* and *Champion* baths.

9-58 for *Lahoma* baths.

9-59 for *Ohio* baths.



9-60

*Temple Accesso* [illegible] concealed pop-up bath waste and overflow with lever operating mechanism.

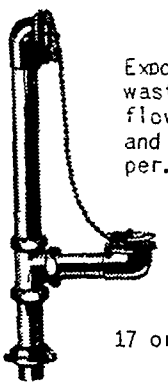
*Note: Waste tee is available with 1½" female I.P. outlet at no extra cost.*

Specify:

9-60 for *Criterion* or *Neuvogue* baths.

9-66 Brush finish chr. pl. *Criterion Accesso* for *Criterion* bath only.

**Operating parts of Accesso wastes are removable through overflow and outlet.**



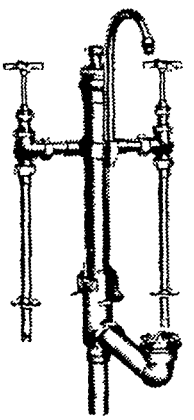
9-75

Exposed 1⅜" bath waste and overflow with chain and rubber stopper.

17 or 22 gauge

9-75

***Available all rough plated or with chromium plated strainers and overflow tube, balance rough plated.***



9-80

Exposed standing bath waste and overflow with overrim gooseneck spout.

Size ½ x 2 x 1½"

9-89

Rough plated bath faucet coupling nut with tailpiece for ½" iron pipe.

9-88

9/16" O.D. 16 gauge double offset bath supply pipe to slip ½" iron pipe, 21½" long.

| Number | Price | Shpg. Wt. |
|---|---|---|
| 9-15 | $72.80 | 8 Lbs. |
| 9-20 | 41.30 | 8 |
| 9-22 | 41.30 | 8 |
| 9-35 | 24.00 | 6¾ |
| 9-50 | 12.60 | 5 |
| 9-51 | 12.60 | 4¾ |
| 9-52 | 12.60 | 4½ |
| 9-55, 9-56 | 17.70 | 7 |
| 9-58, 9-59 | 17.70 | 7 |
| 9-60 | 27.70 | 8 |
| 9-66 | 48.50 | 8 |
| 9-75 | | |
| 22 Ga. Satin Pl. | 9.62 | 3½ |
| 22 Ga. Pol. C.P. | 10.94 | 3½ |
| 17 Ga. Satin Pl. | 10.48 | 3½ |
| 17 Ga. Pol. C.P. | 12.10 | 3½ |
| 9-80 | 75.20 | 30 |
| 9-88 Pr. | 7.78 | 2 |
| 9-89 Pr. | 2.80 | ½ |

*All prices are subject to change without notice.*

***Unless otherwise specified exposed metal is chromium plated.***

# SHOWER HEADS, ARMS AND VALVES

## ECONOMY SHOWER HEAD

ECONOMICAL TO OPERATE - Requires about 3 gallons of water per minute at 10 pounds flow pressure for a good shower.

NON-CLOGGING - Large single opening allows unrestricted flow.

ACTIVATED SPRAY - Coil in passageway breaks up solid stream into swirling and stimulating spray.

AERATED WATER - Air inlets in guide permit mixing of air with water to provide soothing, aerated spray.

9-221

*Economy* shower head with metal spray guide, ball joint and I.P.S. female inlet.

**Inlet 3/8" and 1/2"**

9-225

*Temple* shower head with ball joint and ½" I.P.S. female inlet.

9-235

9-235

*Rainbeau* easy-clean [illegible] shower head with [illegible] I.P.S. female inlet.

9-238

9-238

*Rainbeau* easy-clean shower head with ball joint and ⅜" or ½" I.P.S. female inlet.

9-248

9-248

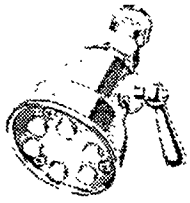
Vandal proof wall type 4" shower head with perforated face, ½" I.P.S. female back inlet.

*Face is removable with hexagon end wrench.*

## SPEAKMAN ANYSTREAM SHOWER HEADS

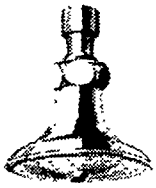
9-250

Anystream shower head with concealed volume control and integral ball joint with ½" I.P.S. female inlet.



9-251

Anystream shower head with integral ball joint, ½" I.P.S. female inlet.



9-242

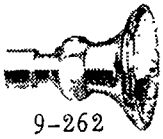
Brass shower head with removable face, and ball joint, ½" I.P.S. female inlet.

**Size 4"**

9-244

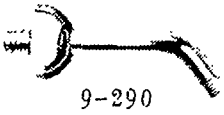
Brass shower head with removable tubular face, ball joint and ¾" I.P.S. female inlet.

**Sizes 6" and 8"**



9-262

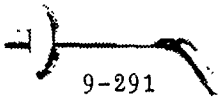
3" spray head with removable face, ball joint and ½" I.P.S. female inlet.



9-290

9-290

*Temple* bent shower arm with escutcheon, ½" I.P.S. male.



9-291

9-291

Bent shower arm with escutcheon, ½" I.P.S. male.

9-264

9-264

2" rigid spray head with removable face and 3/8" I.P.S. female inlet.

9-318 with lever handle
9-316 with 3 rib handle

*Temple* concealed by-pass pattern [illegible] and shower valve with ½" I.P.S. female inlet.

9H-312

Concealed straightway pattern supply valve with metal cross handle and index button. ½" I.P.S. female inlet and outlet.

9H-313

Concealed straightway pattern screw-driver stop with screw-down check. ½" I.P.S. female inlet and outlet.

| Catalog Number | Size Inches | Price Each |
|---|---|---|
| 9-221 | 3/8 | $ 3.20 |
| | 1/2 | 3.20 |
| 9-225 | 1/2 | 8.10 |
| 9-235 | 1/2 | 3.80 |
| 9-238 | ⅜, ½ | 5.10 |
| 9-242 | 4 | 9.70 |
| 9-244 | 6 | 43.00 |
| 9-248 | 4 | 31.30 |
| 9-250 | 1/2 | 17.90 |
| 9-251 | 1/2 | 13.40 |
| 9-262 | 3 | 8.60 |
| 9-264 | 2 | 4.60 |
| 9-290 | 1/2 | 4.40 |
| 9-291 | 3/8 | 2.40 |
| 9H-312 | 1/2 | 8.50 |
| 9H-313 | 1/2 | 8.80 |
| 9-316 | 1/2 | 12.80 |
| 9-318 | 1/2 | 12.80 |

*Prices are subject to change without notice.*

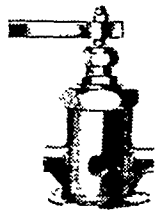
All exposed metal trim is chromium plated.



*May 4, 1955*
*Superseding August 17, 1953*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.



9-330

## CRANE MIXING VALVE

9-330

*Concorde* [illegible]

*Rough Nickel Plated or polished Chromium Plated.*

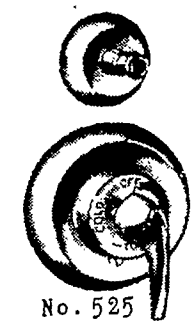
## SYMMONS SAFETYMIX VALVES

No. 525

Symmons [illegible] pressure balanced [illegible] *Safetymix* shower valve with push-button diverter.

No. 500

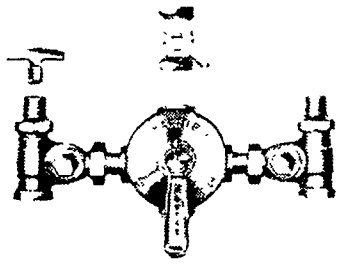
*Safetymix* [illegible] valve only.



No. 525

## POWERS THERMOSTATIC MIXING VALVES

Operating Range 65°-115°F.



1225-FHV

### 1225-FHV Exposed

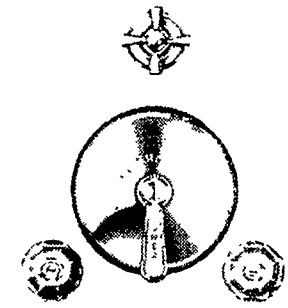
Exposed thermostatic mixing valve with built-in shut off valve, volume control shut off valve and loose key union angle check stops. Size 1/2"

### 1225-CHV Concealed

Concealed thermostatic mixing valve with built-in shut off valve, volume control shut off valve and screw driver check stops. Size 1/2"

**Capacity at 45 pounds pressure - 10 gallons per minute.**

*Note: 1225 mixers can be used without check valves if a volume control valve is not required in discharge line.*



1225-CHV

## LEONARD THERMOSTATIC MIXING VALVES

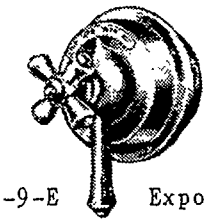
TAC Concealed

TAE Exposed
(not illustrated)

Leonard thermostatic shower mixing valve.
Size 1/2"

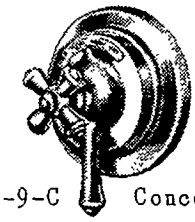
The above valves are also available with volume control and check stops as shown in illustration below.

**Capacity at 45 pounds pressure 7½ gallons per minute**



L-9-E Exposed

Leonard ½" exposed thermostatic mixing valve with volume control and temperature control.



L-9-C Concealed

Leonard ½" concealed thermostatic mixing valve with volume control and temperature control.

**Capacity at 45 pounds pressure - 9 gallons per minute**

T5WC/F & T10C/F

### T5WE/F and T10E/F Exposed
(not illustrated)

Leonard ½" exposed thermostatic valve with volume and shut off control and union angle check stops.

### T5WC/F and T10C/F Concealed

Leonard ½" concealed thermostatic valve with volume and shut off control and combination check stops.

**Capacities at 45 pounds pressure**

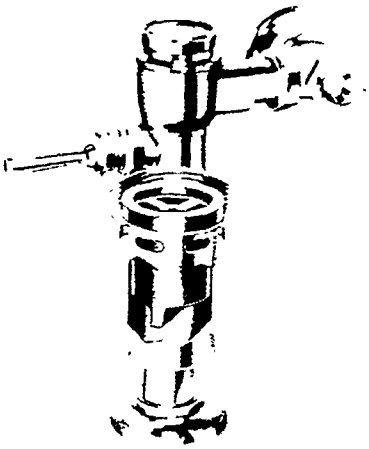
**T-5W - 5 gals. per minute**
**T-10 - 10 gals. per minute**

**Unless otherwise specified, all exposed metal trim is chromium plated.**

PRICES

| Catalog Number | Complete Assembly | Valve Only | Shpg. Wt. Pounds |
|---|---|---|---|
| 9-330 RNP | - | $26.00 | 6 |
| C.P. | - | 30.00 | 6 |
| 500 | - | 53.40 | 4 |
| 525 | - | 67.72 | 5½ |
| 1225-FHV | $118.50 | 90.00 | 16 |
| 1225-CHV | 129.00 | 90.00 | 22 |
| L-9-E | - | 172.80 | 12 |
| L-9-C | - | 182.40 | 13 |
| TAE/F | 90.08 | 63.20 | 10 |
| TAC/F | 93.92 | 63.20 | 10 |
| T5WE/F | 116.48 | 89.60 | 11 |
| T10E/F | 116.48 | 89.60 | 11 |
| T5WC/F | 126.72 | 96.00 | 14 |
| T10C/F | 126.72 | 96.00 | 14 |

*Prices are subject to change without notice.*



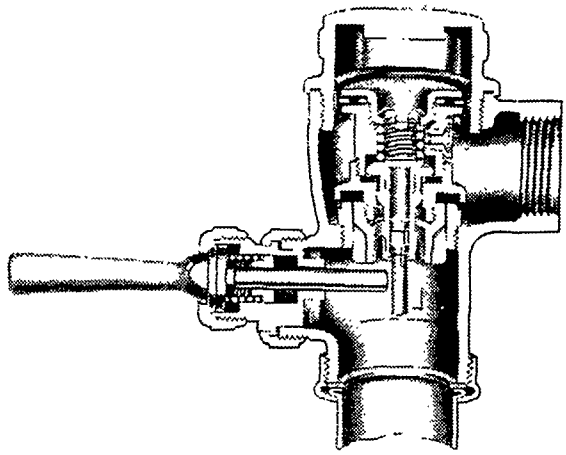
9-405-W

## CRANE TRIUMPH FLUSH VALVES
*(Patented)*

TRIUMPH flush valves are Crane Engineered to assure dependable, lasting and economical service. They are ruggedly constructed and of practical design with all parts subject to wear easily replaceable.

Exposed valves and all exposed parts of concealed valves are chromium plated.

Superior features are as follows:



*Sectional view of TRIUMPH valve.*

*Valve is non-hold-open type - sleeve stem of auxiliary valve rests on top of handle stem when handle is held in open position, allowing main valve to close.*

*Amount of water delivered at each flush can be regulated without shutting off the supply. The same valve can be used for all types of fixtures.*

*High lift plunger provides large waterway through valve - long refill lip assures ample water to reseal fixture after each operation of valve.*

*The double cup for the plunger is molded of a special synthetic rubber compound, developed for this kind of service.*

*Screwed-in renewable metal seat.*

*Nickel alloy strainer of large area, protects by-pass from clogging.*

*Flushing and cleansing of pipe lines on new installations is easily accomplished by removing plunger unit.*

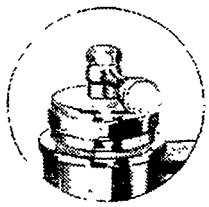
## COYNE and DELANY No. 50 BACKFLOW PREVENTER

Crane *Triumph* flush valves can now be furnished with the Coyne and Delany No. 50 backflow preventer illustrated at left and with 9-405-W *Triumph* flush valve above.

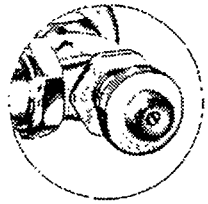
It has only one moving non-metallic part - a rubber sleeve, which cannot stick nor freeze. It provides positive protection against back siphonage.

The Coyne and Delany No. 50 backflow preventer complies with all state and local codes, including Federal Specifications No. 4[illegible]-54lb.

## CLOSET SEAT BUMPERS



SEAT BUMPER ON VALVE

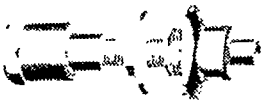


SEAT BUMPER ON STOP

*Closet seat bumpers can be furnished on valve bonnet for seat with cover or on stop handle for seat less cover.*

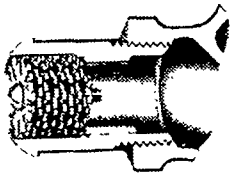
Note: When ordering Seat Bumpers with flush valves add suffix "P" to catalog number of valve for bumper on valve or suffix "G" for valve with bumper on stop.

## VANDAL-PROOF PUSH BUTTON



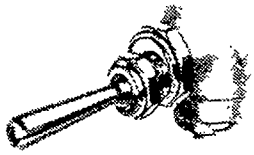
*Concealed valves have oscillating handles but vandal-proof push buttons can be supplied when required.*

## MUFFLERS FOR QUIET FLUSHING



FA-2024

*Rough nickel plated mufflers to subdue the noise of rushing water can be supplied where high water pressures exist. They can be inserted into the tailpieces of the stops.*



## REGULATING UNIT
### To Adjust Length of Flush

*The amount of water delivered at each flush can be controlled by a regulating feature at the handle base.*

*When ordering* Triumph *flush valves with the following features add suffix letter shown to catalog number of valve.*

- E – Wheel handle stop.
- G – Seat bumper on wheel handle stop (for exposed valves).
- P – Seat bumper on valve (for exposed valves).
- S – Vandal-proof push button (for concealed valves).
- W – Backflow Preventer (vacuum breaker).

To order mufflers specify Part FA-2024. (For 1" stops only).

# CRANE TRIUMPH FLUSH VALVES

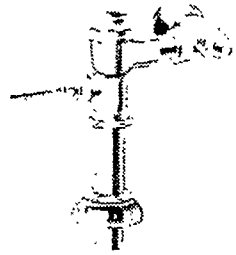
*(Patented)*

## EXPOSED

### 9-400

*Triumph* flush valve with oscillating handle, 9-587 1" straight lockshield stop, wall flange and 9-550 1½x6" straight flush connection with spud nut and covering flange.

9-401 Same except with 9-550 1½x23" connection.



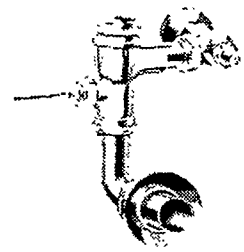
### 9-405

*Triumph* flush valve with oscillating handle, 9-589 1" angle lockshield stop, wall flange and 9-550 1½x6" straight flush connection with spud nut and covering flange.

9-406 Same except with 9-550 1½x23" connection.

9-407 Same except with 1¼x6" connection.

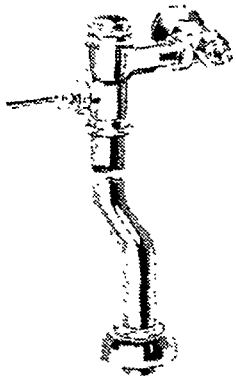
9-408 Same except with 1¼x16½" connection.



### 9-409

*Triumph* flush valve with oscillating handle, 9-589 1" angle lockshield stop, wall flange and 9-550 1½x10" elbow flush connection with spud nut and covering flange.

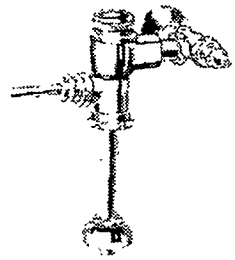
9-410 Same except with 9-550 1½x20" slip joint elbow flush connection.



### 9-411

*Triumph* flush valve with oscillating handle, 9-589 1" angle lockshield stop and 9-554 1½x21½" flush connection with 1½" offset, spud nut and covering flange.

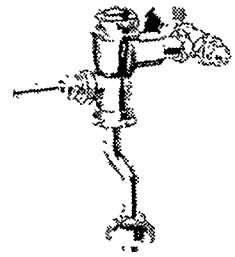
*Exposed metal is chromium plated.*



### 9-416

*Triumph* flush valve with oscillating handle, 9-599 ¾" angle lockshield stop and 9-552 ¾x6" straight flush connection with spud nut and covering flange.

9-417 Same except with 9-551 ¾x6" straight flush connection, less spud nut and covering flange.



### 9-418

*Triumph* flush valve with oscillating handle, 9-599 ¾" angle lockshield stop and 9-555 ¾x6" flush connection with 1" offset, spud nut and covering flange.

| Number | Price | Shpg. Wt. |
|---|---|---|
| 9-400 | $32.54 | 6¾ Los. |
| 9-401 | 34.94 | 7½ |
| 9-405 | 32.54 | 6¾ |
| 9-406 | 34.94 | 7¾ |
| 9-407 | 32.54 | 6¾ |
| 9-408 | 33.34 | 7½ |
| 9-409 | 34.66 | 7 |
| 9-410 | 37.06 | 7¾ |
| 9-411 | 40.54 | 7½ |
| 9-416 | 32.54 | 6½ |
| 9-417 | 32.14 | 6½ |
| 9-418 | 36.26 | 6½ |

*Prices are subject to change without notice.*

| *When ordering* Triumph *flush valves with the following features add suffix letter shown to catalog number of valve.* | EXTRA CHARGE |
|---|---|
| E – Wheel handle stop. | None |
| G – Seat bumper on wheel handle stop (for exposed valves). | $0.80 |
| L – Seat bumper on lockshield stop (for exposed valves). | 0.80 |
| P – Seat bumper on valve (for exposed valves). | 2.66 |
| W – Backflow preventer (vacuum breaker). | 4.54 |
| To order mufflers specify Part FA-2024. (For 1" stops only) | 1.20 |

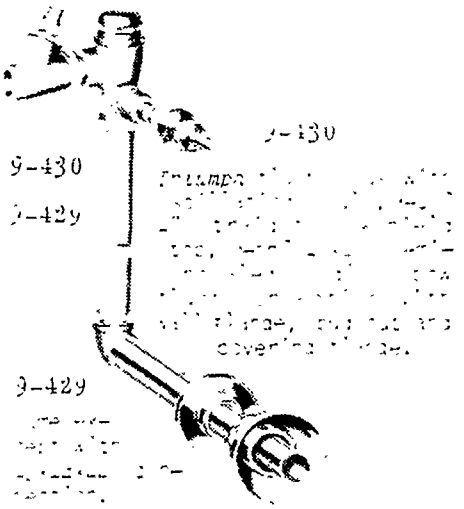
*For concealed Triumph flush valves see following page.*

*For flush valve stops refer to Page 9-10.*

# CRANE TRIUMPH FLUSH VALVES

*(Patented)*

CONCEALED



9-430

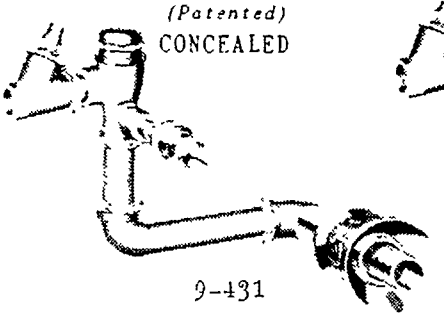
9-429

9-430

*Triumph* [illegible] with [illegible] flange, [illegible] and covering flange.

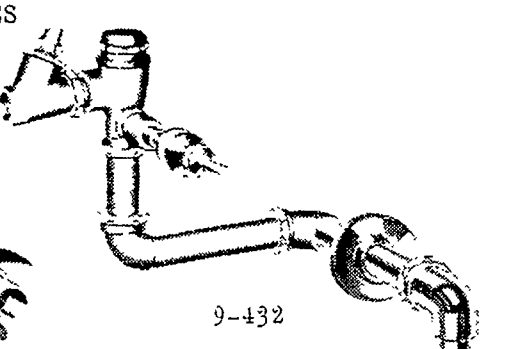
9-429

[illegible] connection.



9-431

*Triumph* flush valve with oscillating handle, [illegible] 2" straight locksnield stop, [illegible] 2x7" semi-concealed double elbow flush connection with wall flange, [illegible] and covering flange.



9-432

*Triumph* flush valve with oscillating handle, [illegible] straight locksnield stop, [illegible] 2x[illegible]" semi-concealed [illegible] elbow flush connection with wall flange, [illegible] and covering flange.

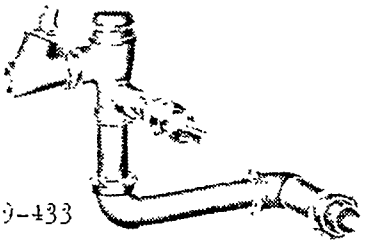
| Valve Number | For wall thickness up to 6" | For wall thickness 6" to 12" | Chrom. Mt. |
|---|---|---|---|
| 9-429 | $36.00 | $39.34 | [illegible] |
| 9-430 | 36.00 | 39.34 | [illegible] |
| 9-431 | 37.06 | 40.40 | [illegible] |
| 9-432 | 40.54 | 43.86 | [illegible] |

| Valve Number | For wall thickness up to 6" | For wall thickness 6" to 12" | Chrom. Mt. |
|---|---|---|---|
| 9-433 | $35.74 | $39.06 | [illegible] |
| 9-434 | 34.66 | 38.00 | [illegible] |
| 9-435 | 33.34 | 36.66 | [illegible] |
| 9-439 | 33.06 | 36.40 | [illegible] |
| 9-440 | 33.34 | 36.66 | [illegible] |

*Add suffix letter below to valve number.*

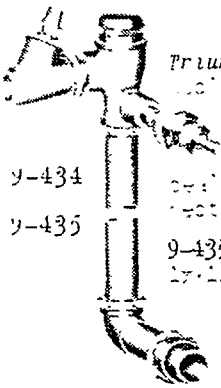
For (E) Wheel handle stop or (S) Vandal-proof push button No extra charge

For (W) Backflow preventer (vacuum breaker) – Rough brass Add $3.86



9-433

*Triumph* flush valve with oscillating handle, [illegible] 2" straight locksnield stop, [illegible] 2x7" semi-concealed double elbow flush connection with spud nut.



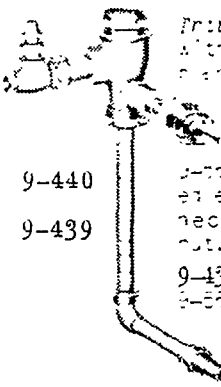
9-434

9-434

*Triumph* flush valve with oscillating handle, [illegible] 2" straight locksnield stop and [illegible] 2x22" concealed elbow flush connection with spud nut.

9-435

9-435, same except with 1½x1½" connection.



9-440

9-440

*Triumph* flush valve with oscillating handle, [illegible] 2" straight locksnield stop and [illegible] 2x9" concealed elbow flush connection with spud nut.

9-439

9-439, same except [illegible] flush connection [illegible] spud nut.

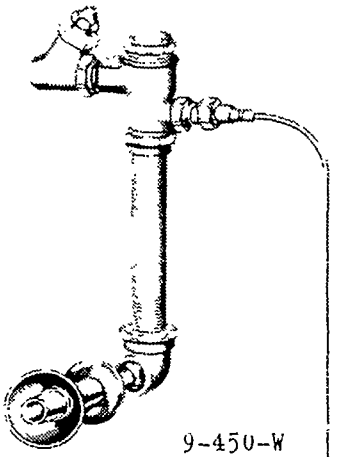
# CRANE TRIUMPH FLUSH VALVES

*With Push Button Operating Means In Floor*

This addition to our flush valve line has been Crane engineered and field tested with excellent results.

It is the Crane *Triumph* flush valve with all its top quality features, to which has been added the highly sanitary push button foot operated assembly, for installation in the floor. Backflow preventer is regularly furnished and is incorporated in the flush connection.

Select proper flush valve for use with various Crane fixtures from table below.



9-450-W

| Valve Number | For use with Crane fixtures listed below | Type Inlet | Price Each |
|---|---|---|---|
| 9-450-W | Sanuro pedestal urinal | Back | $89.86 |
| 9-451-W | Hy-San floor closet | Top | 87.60 |
| 9-452-W | Santon and Speedway floor closets | Top | 87.60 |
| 9-453-W | Lowall and Rapidway wall closets | Back | 79.06 |
| 9-454-W | Walton, San-Walton, Hy-San wall closets | Back | 79.06 |
| 9-455-W | Expedio wall urinal | Back | 79.06 |
| 9-456-W | Neu-Rio wall urinal | Back | 86.66 |
| 9-457-W | Correcto wall urinal | Back | 86.94 |
| 9-458-W | Sanitor stall urinal | Back | 86.94 |

*Prices are subject to change without notice.*

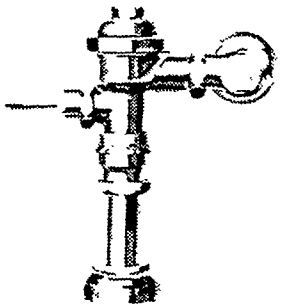


*May 4, 1955*
*Superseding September 28, 1953*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## SLOAN FLUSH VALVES



No. 110 F YV Royal

### No. 110 (ROYAL OR CROWN)

*Sloan* exposed flush valve with metal oscillating handle, 1" wheel handle angle stop, wall flange, and straight flush connection with flange. (For 1½" top spud bowls.)

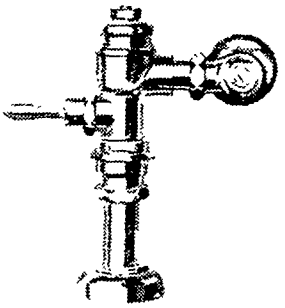
### No. 120 (ROYAL OR CROWN)

Same, except elbow connection. (For 1½" back spud bowls.)

For special features specify the following suffixes:

F – Screw-driver stop.
YG – Closet seat bumper on valve.
YO – Closet seat bumper on angle stop.
YV – Vacuum breaker.

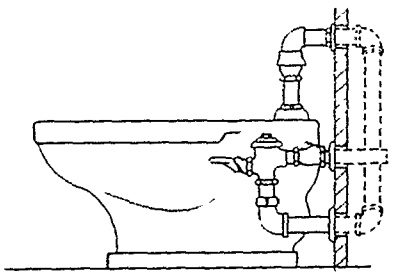
*When ordering Sloan exposed flush valves specify name of valve, number, and suffix for special features.*



No. 110 F YV Crown

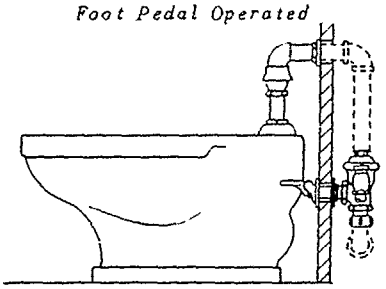
## SLOAN ROYAL FLUSH VALVES FOR CLOSETS

*Foot Pedal Operated*



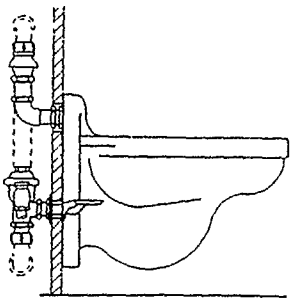
No. 310

*Sloan Royal* exposed flush valve with foot pedal, 1" screw-driver straight stop, 1¼" female union outlet, 1¼" street ell, casing to cover 1¼" pipe, vacuum breaker, 1¼" flush elbow, wall and spud couplings and flanges. (For 1½" top spud bowls.



No. 312

*Sloan Royal* concealed flush valve with 1" wheel handle angle stop, 1¼" female union outlet, foot pedal, vacuum breaker with 1¼" flush elbow, wall and spud couplings and flanges. (For 1½" top spud bowls.)



No. 313

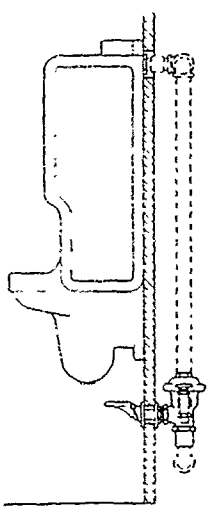
*Sloan Royal* concealed flush valve with 1" wheel handle angle stop, 1¼" female union outlet, foot pedal, vacuum breaker with 1¼" inlet and flush elbow. (For 1½" back spud bowls.)

## SLOAN ROYAL FLUSH VALVES FOR URINALS

*Foot Pedal Operated*

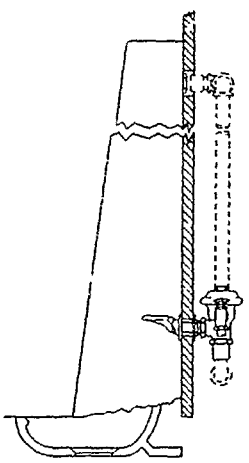
*Note: Orders for concealed valves must specify wall thickness.*

*Pipe connections shown in dotted lines are not included.*



No. 323

*Sloan Royal* concealed flush valve with ¾" wheel handle angle stop, 1" female union outlet, and foot pedal. (For back inlet washout urinals.)



No. 333

*Sloan Royal* concealed flush valve with ¾" wheel handle angle stop, 1" female union outlet and foot pedal. (For back inlet stall urinals.)

### PRICES

| Number | Royal | Crown | Shpg. Wt. |
|---|---|---|---|
| 110 | $35.20 | $32.54 | 7 Lbs. |
| 110 F YV | 39.74 | 37.06 | 7½ |
| 120 | 37.34 | 34.66 | 8 |
| 310 | 51.86 | 49.20 | 10 |
| 312 | 50.00 | 47.34 | 10 |
| 313 | 52.26 | 49.60 | 10 |
| 323 | 39.06 | 36.40 | 8 |
| 333 | 39.06 | 36.40 | 8 |

| Add for Special Features | | |
|---|---|---|
| Feature | Price | Shpg. Wt. |
| Style F | None | – |
| YG | $2.00 | – |
| YO | .80 | |
| YV C.P. | 4.54 | ½ |
| YV Rgh. Br. | 3.86 | ½ |

*All exposed metal parts are chromium plated.*

*Prices are subject to change without notice.*

## COYNE AND DELANY No. 50 BACKFLOW PREVENTER

9-549

[illegible]

[illegible]

## COMPRESSION STOPS FOR TRIUMPH FLUSH VALVES

Composition Disc – Exposed Stuffing Box
Female Hexagon Inlet
Male Ground Joint Union Outlet

9-587

Straightway stop with lockshield and screw-driver slot. Size 1"
Rough Brass or Chromium Plated

9-587

9-588

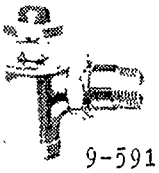
Straightway stop with wheel handle. Size 1"
Rgh. Brass or Chr. Plated

9-589

Angle stop with lockshield and screw-driver slot. Size 1"
Chromium Plated

9-590

Angle stop with wheel handle. Size 1"
Rgh. Brass or Chr. Plated



9-591

Angle stop with wheel handle and seat bumper. Size 1" Chromium Plated

9-592 not illustrated

Angle stop with lockshield, screw-driver slot and seat bumper. Size 1" Chromium Plated

9-597

Straightway stop with lockshield and screw-driver slot.
Size 3/4" Rough Brass

9-598

Straightway stop with wheel handle.
Size 3/4" Rough Brass

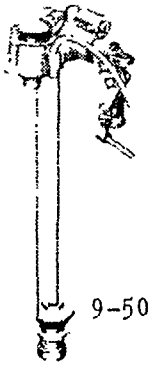
9-599

Angle stop with lockshield and screw-driver slot.
Size 3/4" Chr. Plated

9-600

Angle stop with wheel handle. Size 3/4"
Rgh. Brass or Chr. Plated

## FLOAT VALVES FOR LOW TANKS



9-503

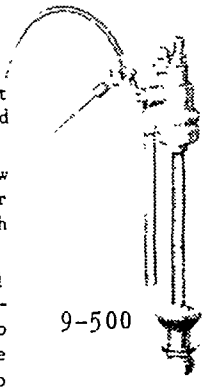
### CRANE-LINE Hy-Lo

FEATURES

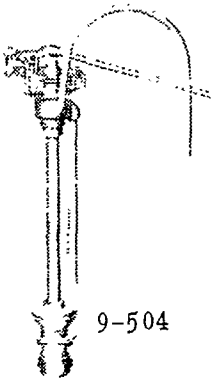
*STEATITE* Ceramic seat resists wire cutting and corrosion.

Discharge control screw provides adjustment for filling time under high or low pressures.

Quiet action - usual closing noises are eliminated. Inverted cup washer assembled to the ceramic seat breaks up turbulence of water.



9-500



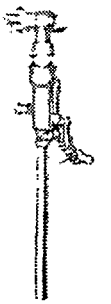
9-504

### M-VB "S" LINE

9-504 "S" Line elevated bottom supply float valve with float rod and refill tube.

9-505 Same except with vacuum breaker.

9-507 3/8" back supply float valve with shut-off valve, float rod and refill tube.



9-507

9-500 CRANE-LINE *Hy-Lo* quiet acting elevated bottom supply float valve with *Steatite* ceramic seat, float rod and refill tube.

9-503 Same, except with Vacuum Breaker.

When ordering specify name and number of tank.

PRICES

| Number | Rgh. Br. |
|---|---|
| 9-500 | $6.00 |
| 9-503 | 9.18 |
| 9-504 | 4.08 |
| 9-505 | 6.26 |
| 9-507 | 8.38 |

| Number | Rgh. Br. | Chr. Pl. |
|---|---|---|
| 9-549 | $3.86 | $4.54 |
| 9-587 | 7.74 | 8.94 |
| 9-588 | 7.74 | 8.94 |
| 9-589 | - | 8.94 |
| 9-590 | 7.74 | 8.94 |

| Number | Rgh. Br. | Chr. Pl. |
|---|---|---|
| 9-591 | -- | $9.86 |
| 9-592 | -- | 9.86 |
| 9-597 | $7.46 | - |
| 9-598 | 7.46 | - |
| 9-599 | - | 8.54 |
| 9-600 | 7.46 | 8.54 |

*Prices are subject to change without notice.*



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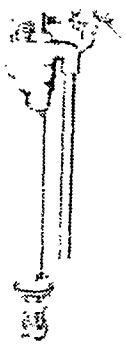
Printed in U. S. A.

## CURTIN ROTARY FLOAT VALVES
FOR LOW TANKS

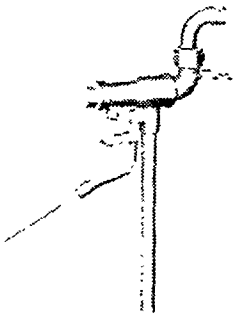


9-510

### 9-510
Curtin Rotary elevated bottom supply float valve with float rod and refill tube.

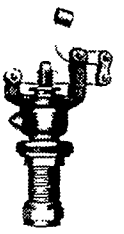
### 9-512
Curtin Rotary 3/8" bottom supply float valve with shut-off valve, float rod and refill tube.

## FLOAT VALVES FOR HIGH TANKS



### 9-515
Top supply float valve for high tank with float rod and 3/8" swivel elbow tailpiece.

M-VB "S" LINE



### 9-517
Bottom supply float valve for high tank with float rod, locknut and coupling nut.

3/8" tailpiece can be furnished at extra cost.

9-520

## FLUSH VALVE
FOR LOW TANK

### 9-520
2" flush valve with guide, lift wires, 1" O.D. x 11" copper overflow tube, cone rubber washer and locknut.

**Seats 2½" ball**

## OPEN TANK FLOATS

### 9-523
4x5" oval solderless copper float ball, spud tapped ¼" - 20 threads.

### 9-524
Seamless copper float ball, spud tapped ¼" - 20 threads.

4", 5", and 6" dia.

### 9-526
4x5" oval *Styron* plastic float ball, spud tapped ¼" - 20 threads.

## LOW TANK TRIM



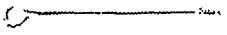
### 9-529
Brass float rod, ¼" - 20 Thrds.

**Lengths 8", 9", 10" and 12"**

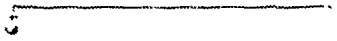


### 9-530
20-gauge, ½" O.D. copper refill tube threaded one end.

**Length 10"**



### 9-532
Brass lift wire, 4½" or 5¾" long.



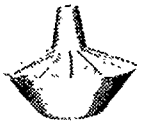
### 9-533
Brass lift wire, 7½" or 9" long.

### 9-535
Overflow tube, 11" long for tank flush valve, threaded one end.

O.D. 1" 1⅛" 1¼"

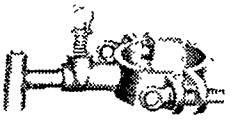
### 9-536
*Crane* black cone top tank ball.

**Sizes** 2½" (Crane) 2¾" (Unbranded)



### 9-538
*Triple Seal* tank ball.

**Sizes Standard & Large**



### 9-541
Adjustable guide arm - for 1", 1⅛" or 1¼" overflow tube.

### 9-542
Non-adjustable guide arm - for 1" overflow tube.

### 9-601
*Temple* single acting tank lever.

*Specify if with keyhole or square spud.*

| Number | Size | Price |
|---|---|---|
| 9-510 | 3/8" | $11.86 |
| 9-512 | 3/8" | 11.20 |
| 9-515 | 3/8" | 6.96 |
| *9-517 | 3/8" | 4.72 |
| 9-520 | 2" | 4.02 |
| 9-523 | 4x5" | .68 |
| *For ⅜" tailpiece - Add | | .90 |
| 9-524 | 4" | 3.02 |
| | 5" | 3.32 |
| | 6" | 3.98 |
| 9-526 | | .40 |
| 9-529 | 8" | 36.00 C |
| | 9" | 40.00 C |
| | 10" | 44.00 C |
| | 12" | 48.00 C |
| 9-530 | 10" | 52.00 C |
| 9-532 | 4½" | 10.20 C |
| | 5¾" | 10.60 C |
| 9-533 | 7½" | 14.40 C |
| | 9" | 16.20 C |
| 9-535 | 1" | 1.30 |
| | 1⅛" | 1.38 |
| | 1¼" | 1.44 |
| 9-536 | 2½" | .42 |
| | 2¾" | .42 |
| 9-538 | Std. | .90 |
| | Lge. | 1.00 |
| 9-541 | - | 1.02 |
| 9-542 | - | .48 |
| 9-601 | - | 1.42 |

*Prices are subject to change without notice.*

## LOW TANK SUPPLY PIPES

9-620

**9-620**

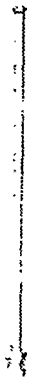
3/8" I.P.S. supply pipe to floor with collar and escutcheon. **Lengths 19" and 21"**

**9-621**

3/8" I.P.S. supply pipe to floor with collar, wheel handle straight stop and escutcheon.

**Length 19"**

9-621



9-625

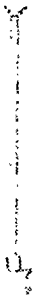
**9-625**

Copper tubing supply to floor with collar, female adaptor for 3/8" pipe, 20" long.

**9-626**

Copper tubing supply with collar, wheel handle straight stop, 3/8" I.P. nipple to floor with escutcheon, 20" long.

9-626



9-635

**9-635**

Copper tubing supply to wall with collar, female elbow for 3/8" pipe, less nipple to wall and escutcheon, 12" long.

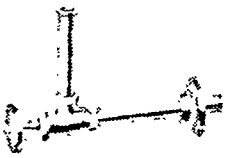
**9-636**

Copper tubing supply to wall with collar, wheel handle angle stop for 3/8" pipe, less nipple to wall and escutcheon, 12" long.

9-636

**9-630**

3/8" I.P.S. supply pipe to wall with collar and escutcheon.

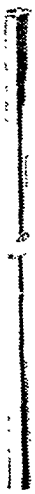


**9-631**

3/8" I.P.S. supply pipe to wall with collar, wheel handle angle stop and escutcheon.

**Dimensions: 4" Vertical, 6" Horizontal**

## HIGH TANK FLUSH PIPES



9-640

**9-640**

22-gauge straight flush pipe with collar for high tank, 6 feet long.

**Sizes 1¼" and 1½" O.D.**

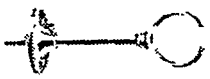
**9-641**

22-gauge offset flush pipe with collar for high tank, 3" offset, 6 feet long.

**Sizes 1¼" and 1½" O.D.**

9-641

## FLUSH PIPE HOLDER

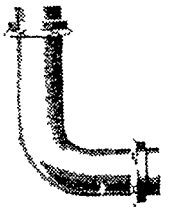


**9-644**

Brass flush pipe holder to slip 1⅛" or 1⅜" O.D. tubing.

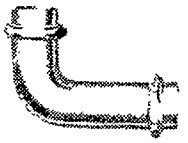
*Exposed finish is chromium plated.*

## FLUSH CONNECTIONS



**9-650**

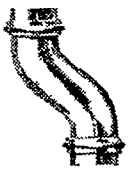
2" O.D. brass elbow flush connection with nuts and washers. **Sizes 4x6", 5x7" and 6x8"**



**9-652**

2" O.D. brass short radius elbow flush connection with nuts and washers. **Size 4x6"**

***Permits closer roughing-in of closet bowl.***



**9-654**

2" O.D. x 6" long brass offset flush connection with nuts and washers. **1", 1½", 2", or 2½" offset.**

**9-655**

Same, except straight flush connection.

**9-658**

Brass 90° slip joint elbow, 6" center to end, with nut and washer.

**Sizes 1¼" and 1½" O.D.**

| Number | Size | Price |
|---|---|---|
| 9-620 | 19" | $3.12 |
| | 21" | 3.36 |
| 9-621 | 19" | 7.74 |
| 9-625 | 20" | 2.54 |
| 9-626 | 20" | 6.96 |
| 9-630 | 4 x 6" | 3.66 |
| 9-631 | 4 x 6" | 5.98 |
| 9-635 | 12" | 1.62 |
| 9-636 | 12" | 3.14 |
| 9-640 | 1¼" O.D. x 6' | 8.80 |
| | 1½" O.D. x 6' | 9.82 |
| 9-641 | 1¼" O.D. x 6' | 9.60 |
| | 1½" O.D. x 6' | 10.78 |
| 9-644 | 1⅛" or 1⅜" O.D. | 4.14 |
| 9-650 | 4 x 6" | 3.14 |
| | 5 x 7" | 3.42 |
| | 6 x 8" | 3.84 |
| 9-652 | 4 x 6" | 3.52 |
| 9-654 | 1" offset | 5.14 |
| | 1½" | 5.46 |
| | 2" | 5.60 |
| | 2½" | 5.92 |
| 9-655 | 2" O.D. x 6" | 2.48 |
| 9-658 | 1¼" O.D. x 6" | 2.40 |
| | 1½" O.D. x 6" | 2.86 |

*Prices are subject to change without notice.*



*May 4, 1955*
*Superseding September 15, 1954*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## CLOSET SPUD CONNECTIONS

9-660

Rough closet spud with gasket.

Sizes
1¼", 1½" and 2"

9-663

Brass closet spud reducer.

Sizes
2x1¼" 2x1½"

9-665

Brass spud covering flange, 3½" diameter, 7/8" high.

Slips sizes-1¼" I.P., 2" I.P., 2" O.D.

*For cast brass slip nuts, see Page 8-14.*

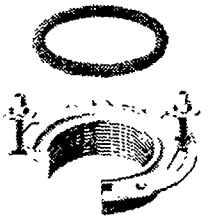
## BRASS CLOSET FLOOR FLANGES

### FOR 4" IRON PIPE

Outside Diameter 5¼" Bolt Holes C. to C. 5-13/16"
Inside Diameter 5¼" Height 2-1/8"

9-670 MALE

Cast brass male closet floor flange for 4" iron pipe with asbestos gasket, bolts and nuts.



9-671 FEMALE

Cast brass female closet floor flange for 4" iron pipe with asbestos gasket, bolts and nuts.

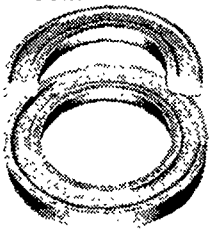
### FOR LEAD PIPE

O.D. 6-1/2" I.D. 4-5/16"
Bolt Holes 5-9/16" C. to C.

9-674

Cast brass closet floor flange for lead pipe.

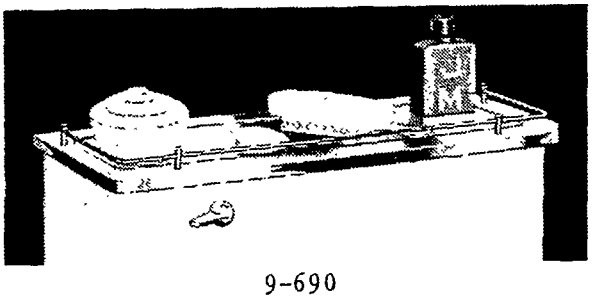
## CUSHION RING



9-677

Soft treated sponge rubber cushion ring for closet bowls, 3/4" thick.

O.D. 5-3/8" I.D. 3-1/2"



9-690

*Top-O-Tank* Chromium Plated brass adjustable cover-shelf with friction grip slides and railing.

Sizes: 20⅜ x 8" (for 6 gallon tank), 23½ x 8¼" (for 8 gallon tank)

## CLOSET BOLTS, SCREWS AND WASHERS

9-680

9-680

¼x2½" brass closet screw with cap nut and round washer.

Chromium plated finish.

9-682

¼x2¼" brass closet bolt with nut and oval washer.

9-682

Chromium plated finish.

9-684

Round Washer

9-685

Oval Washer

Chromium plated finish.

## BOLT CAPS

9-687

China bolt cap
Oval
Large Round
Small Round

9-689

Plastic bolt cap

Large Oval

## SEALING RING

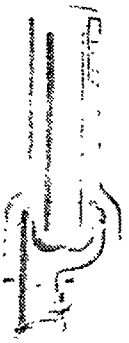
9-679

Preformed composition sealing ring for closet horns.

| Number | Size | Price |
|---|---|---|
| 9-660 | 1¼"<br>1½"<br>2" | $1.38<br>1.38<br>1.46 |
| 9-663 | 2x1¼"<br>2x1½" | 2.02<br>2.02 |
| 9-665 | 1¼", 1½", 2" | .34 |
| 9-670 | 4" I.P. | 14.34 |
| 9-671 | 4" I.P. | 12.62 |
| 9-674 | 6½" OD x 4⅝" ID | 1.36 |
| 9-677 | 5⅜" OD x 3½" ID | .42 |
| 9-679 | — | .60 |
| 9-680 | ¼x2½" Chr.Pl. | 19.18 C |
| 9-682 | ¼x2¼" Chr.Pl. | 23.92 C |
| 9-684 | Round Chr.Pl. | 4.24 C |
| 9-685 | Oval Chr.Pl. | 4.80 C |
| 9-687 | White<br>Colored | .30 Pr.<br>.60 Pr. |
| 9-689 | White | .32 Pr. |
| 9-690 | 20⅜ x 8"<br>23½ x 8¼" | 12.80 C<br>15.20 C |

Prices are subject to change without notice.

# URINAL TRIM



## ALERT AUTOMATIC SIPHON VALVE

No moving parts.

Siphons water from tank faster.

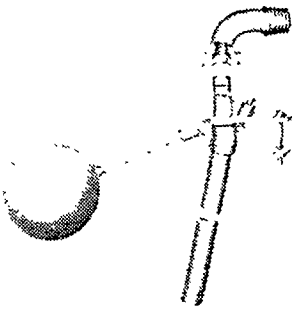
Flushes at intervals of from one to sixty minutes, depending on rate of tank refill.

Eccentric outlet permits use on either center or end outlet tanks.

9-890

*Alert* automatic siphon valve for urinal tanks, with [illegible] and locknut.

| Sizes | 3/4" | 1" | 1¼" | 1½" |
|---|---|---|---|---|
| [illegible] | $18.70 | $22.00 | $24.30 | $28.70 |



## MARVEL FLOAT VALVE

Single screw and locknut controls discharge rate. Can be adjusted to fill tank at intervals of from one to sixty minutes.

Valve Seat and tip of stem are non-metallic - wire cutting and corrosion are reduced to a minimum.

Removable beehive strainer protects seat and stem.

Air vents, above water level, prevent backflow.

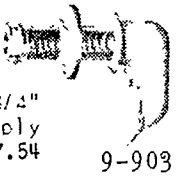
9-896

*Marvel* rough brass float valve with copper float and 3/8" male union connection. Each $9.90

## URINAL SPREADERS

9-900

Brass fan flush spreader with 3/4" slip joint inlet, for top supply [illegible] urinals. Each $7.10



9-903

Brass fan flush spreader with 3/4" slip joint inlet, for back supply [illegible] urinals. Each $7.54

9-903

## URINAL STRAINERS

9-906

METAL STRAINER
Each $8.94

9-907

BEEHIVE STRAINER
Slotted Openings
Each $10.26

9-908

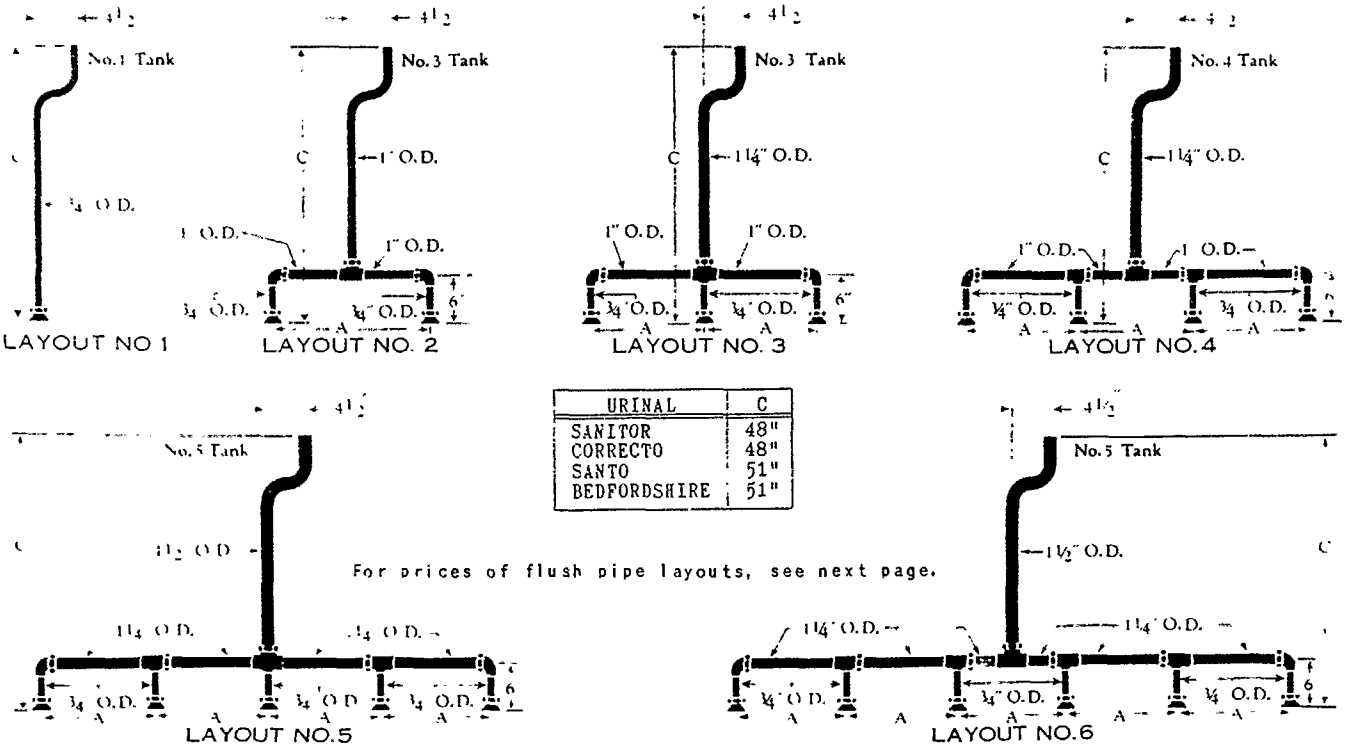
BEEHIVE STRAINER
Each $10.26

Universal strainers for 2" lead, iron, or soil pipe, 4-1/8" diameter flange.

Unless otherwise specified, all exposed metal trim is chromium plated.

## 9-915 FLUSH PIPE ASSEMBLIES FOR CRANE URINALS WITH HIGH TANKS

### SANITOR, CORRECTO, SANTO, AND BEDFORDSHIRE URINALS




| URINAL | C |
|---|---|
| SANITOR | 48" |
| CORRECTO | 48" |
| SANTO | 51" |
| BEDFORDSHIRE | 51" |

For prices of flush pipe layouts, see next page.

When ordering specify catalog and layout numbers, also "A" and "C" dimensions.



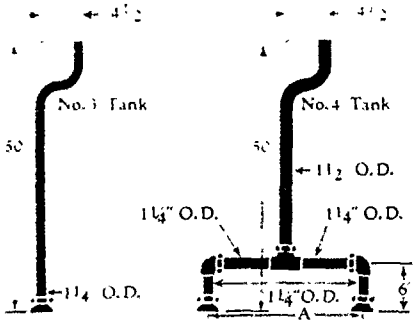
*May 4, 1955*
*Superseding December 13, 1954*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

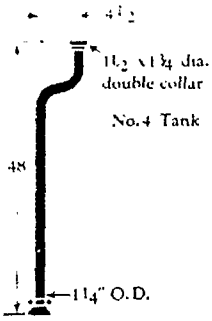
# 9-915 FLUSH PIPE ASSEMBLIES FOR CRANE URINALS WITH HIGH TANKS

## WALL HANGING AND PEDESTAL URINALS



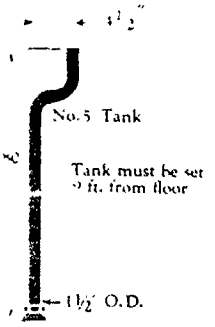

LAYOUT NO 11 LAYOUT NO.12

"Manhattan" siphon jet wall urinal



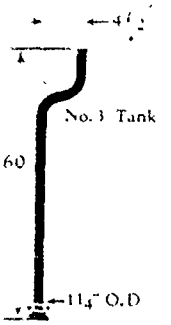

LAYOUT NO.13

"Neu-Rio" blow-out wall urinal




LAYOUT NO.14

"Expedio" blow-out wall urinal

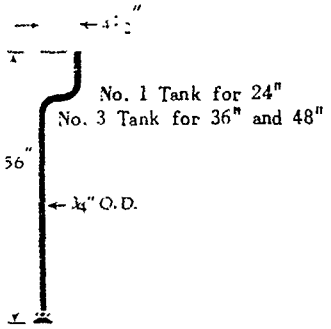



LAYOUT NO.15

"Sanuro" siphon jet pedestal urinal

When ordering specify catalog and layout numbers, also "A" and "C" dimensions.

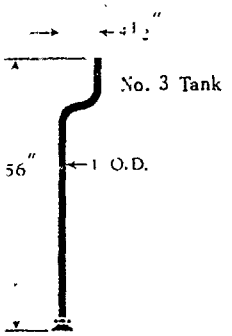
## FOR TROUGH URINALS




LAYOUT NO.18

24", 36" and 48"

Duraclay Trough Urinals



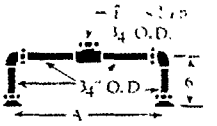

LAYOUT NO.19

60"

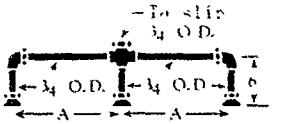
Duraclay Trough Urinal

## 9-917 FLUSH PIPE ASSEMBLIES FOR CRANE URINALS WITH FLUSH VALVES

### SANITOR, CORRECTO, SANTO, AND BEDFORDSHIRE URINALS




LAYOUT NO 2




LAYOUT NO. 3

Note: When used with 3 bar electrically operated flush valves, specify [illegible] flush pipe assembly with [illegible] O.D. inlet.

PRICES COMPLETE - with spud nuts and escutcheons

**9-915 Assemblies For single urinals with high tank**

| Layout No. | Price, Each |
|---|---|
| 1 | $10.96 |
| 11 | 14.50 |
| 13 | 15.50 |
| 14 | 24.96 |
| 15 | 16.74 |
| 18 | 12.78 |
| 19 | 13.94 |

*Unless otherwise specified, all exposed metal trim is chromium plated.*

**9-915 Flush Pipe Assemblies For urinals in batteries with high tank**

| Layout No. | Urinals with inlets on centers 18" | 21" | 24" | 27" |
|---|---|---|---|---|
| 2 | $26.88 | $27.68 | $28.48 | $29.28 |
| 3 | 31.84 | 32.96 | 34.08 | 35.20 |
| 4 | 41.86 | 44.06 | 46.26 | 48.48 |
| 5 | 57.34 | 59.98 | 62.62 | 65.26 |
| 6 | 68.56 | 71.90 | 75.22 | 78.56 |
| 12 | 34.94 | 35.58 | 36.22 | 36.86 |

**9-917 For urinals in batteries with flush valves**

| | | | | |
|---|---|---|---|---|
| 2 | - | $19.28 | $19.84 | $20.34 |
| 3 | - | 25.68 | 26.66 | 27.66 |

*Prices are subject to change without notice.*

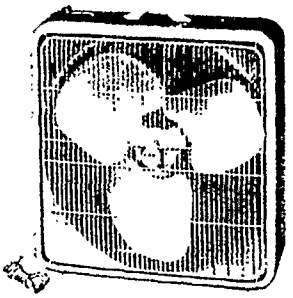
NOTE: All prices listed for flush pipe assemblies include spud nuts and escutcheons: if not required or specify on order.

Deductions from complete layout prices for each spud nut and escutcheon unit, when not furnished:

¾" Each $1.98 1¼" Each $2.48
1" Each 2.14 1½" Each 2.10

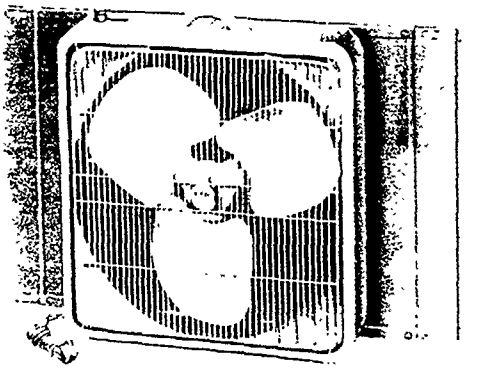
For flush pipe [illegible] all sizes:
Add each $3.20

# LAU ELECTRIC VENTILATING FANS



No. 12"
No. 16"

All models feature advanced design in style and safety. The rounded corner construction provides a compact, smart appearance. Fans are designed so that windows may be opened or closed without removing the fan. White rubber cushioned feet protect polished surfaces and absorb vibration. Motors are for 115 volt, 60 cycle A.C. operation. Finish is surf green baked enamel.



No. 20"
with Adjustable Side Spacers

## PORTABLE MODELS

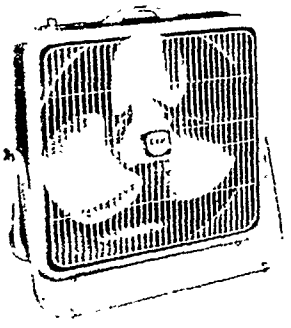
Nos. 12", 16" and 20"
For Floor, Window, Table or Stand Mounting

Portable models are three speed exhaust or intake fans. Each are equipped with a hanger supporting bar, carrying handle, finger proof front and rear guards, and an 8 ft. white rubber covered extension cord with plug. Fans may stand by themselves or be used with any of the following accessories:

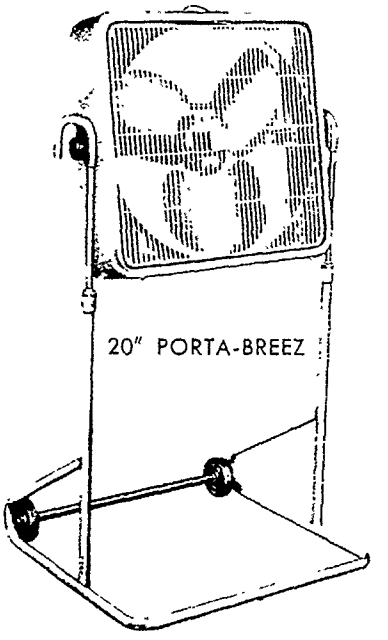
**Adjustable Side Spacers**—Available for window mounting all models at extra cost. (No. 20" fan is regularly furnished with spacers adjustable from 29" to 38".)

**Tilta-Breez Stand**—Regularly furnished with Nos. 12" and 16" fans—available for No. 20". Permits tilting fan to direct air at any angle.

**Porta-Breez**—20" fan on portable stand made of 1" seamless tubing finished to match fan. Permits raising fan to 58" high; lowering to 17". Has 4" hard rubber wheels with soft treads. Fan may be tilted to any angle.



No. 16"
on TILTA-BREEZ

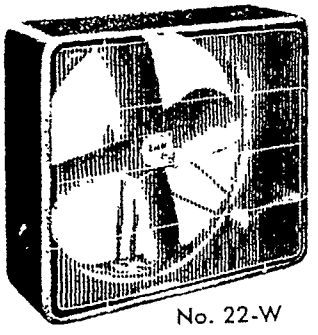


20" PORTA-BREEZ

## WINDOW FANS

No. 20WF is a direct driven fan for exhaust only. Spacer panels adjust from 30" to 38¾". 8 ft. white rubber cord and 3-speed control are included.

Six belt drive models in three blade sizes are available with single speed or two speed, electrically reversible motors. Easily installed, an adjustable 5-inch wide metal spacer is regularly furnished with 22" and 24" models for windows up to 36" wide. Additional spacers for windows up to 40" wide are available at extra cost. 8 ft. white rubber plug-in cord and metal hanger straps are included.



No. 22-W

Single speed fans are exhaust fans only. Two-speed models may be reversed with a flip of the switch to either bring in fresh air or exhaust stale air. On single speed models, the switch is located in the cord. On two-speed models, the switches are recessed in the side panel.

### With Belt Drive Fan

| With Single Speed Motor | With Two-Speed Reversible Motor |
|---|---|
| 22-W—22" Fan | —22-WR2 |
| 24-W—24" Fan | —24-WR2 |
| 30-W—30" Fan | —30-WR2 |

DATA AND PRICES—*All Prices are F.O.B. Dayton, Ohio

| Model Number | Blade Dia. Inches | Cfm. Free Delivery High | Cfm. Free Delivery Low | Rpm. High | Motor H.P. | Overall Fan Size Inches Width | Height | Depth | Shpg. Weight Pounds | *Price Each |
|---|---|---|---|---|---|---|---|---|---|---|
| 12" | 12 | 1200 | 680 | 1500 | 1/40 | 16 | 16 | 5¼ | 18 | $53.52 |
| 16" | 16 | 1700 | 1320 | 1020 | 1/30 | 18 | 18 | 5¼ | 24 | 66.92 |
| 20" | 20 | 2500 | 1460 | 970 | 1/20 | 22 | 22 | 5¼ | 37 | 78.94 |
| "Porta-Breez" | 20 | 2500 | 1460 | 970 | 1/20 | 22 | 22 | 5¼ | 60 | 110.44 |
| 20WF | 20 | 2500 | 1460 | 970 | 1/20 | 30 | 22¼ | 5 | 30 | 66.92 |
| 22-W | 22 | 3200 | — | 550 | 1/6 | 29½ | 24½ | 10 | 58 | 105.30 |
| 22-WR2 | 22 | 3200 | 2100 | 550 | 1/6 | 29½ | 24½ | 10 | 58 | 118.46 |
| 24-W | 24 | 4000 | — | 550 | 1/6 | 31 | 26½ | 10 | 67 | 118.46 |
| 24-WR2 | 24 | 4000 | 2600 | 550 | 1/6 | 31 | 26½ | 10 | 67 | 131.66 |
| 30-W | 30 | 6000 | — | 487 | 1/3 | 36 | 36 | 10 | 94 | 144.80 |
| 30-WR2 | 30 | 6000 | 3800 | 487 | 1/3 | 36 | 36 | 10 | 94 | 164.58 |
| Extra Accessories | Tilta-Breez stand for No. 20" | | | | | | | | | 4.56 |
| | Side Spacer Panels for No. 12" and No. 16" | | | | | | | | | 6.44 |
| | Extra Side Spacer Panels for Nos. 22-W or WR2 or Nos. 24-W or WR2 | | | | | | | | | 5.20 |
| | Rear Guard for Nos. 22-W or WR2 or Nos. 24-W or WR2 | | | | | | | | | 8.46 |
| | Rear Guard for Nos. 30-W or WR2 | | | | | | | | | 9.10 |

Fan Prices include Excise Tax.

*For Exhaust Louvers, refer to Page 15-28.*

*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# LAU ELECTRIC VENTILATING FANS

## For Attics and General Use

### "NITEAIR" PANEL FANS

*For Vertical Installation*

*The Niteair Series NA*

*Widely used for industrial, commercial, and home use. Ideal for attic installation*

Sturdy, compact fans designed for easy installation. Adaptable to any type of room construction. Operation is quiet. Four properly pitched blades provide maximum suction and air movement. Self-aligning pillow blocks with Durex bronze bearings hold the shaft rigidly, preventing vibration.

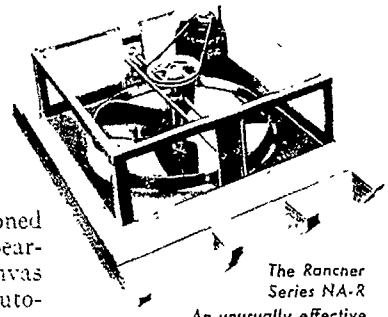
The motor is accessible and can be protected at the rear with a louver. Automatic shutters may be mounted directly on the discharge side of the panel. Louvers and shutters are priced below.

### "RANCHER" CEILING FANS

*For Horizontal Installation*

The Rancher is easily installed in any type of ceiling and is ideal for use in confined spaces. Mounted horizontally, it provides vertical flow. Operation is quiet and vibration-free.

Features a rubber-cushioned mounted motor, sealed bearings, and an air-tight canvas seal. Does not include an automatic ceiling shutter. For shutter sizes and prices see table below.



*The Rancher Series NA-R*

*An unusually effective fan, used universally. Designed especially for use where roofs are pitched low.*

DATA AND PRICES—*All Prices are F.O.B. Dayton, Ohio

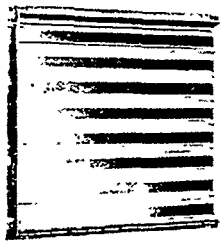
| Type | Catalog Number | Fan Size Inches | Cfm. Free Delivery | Approx Rpm. | Motor H.P. | Frame Dimensions, Inches Width | Height | Depth | Shutter Recess Size, In. | Shpg. Weight Pounds | *Price Each |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Niteair Panel Fans | NA-243 | 24 | 4750 | 655 | 1/3 | 30 | 30 | 11 | *For shutter sizes and prices, see table below.* | 66 | $109.90 |
| | NA-303 | 30 | 7611 | 564 | 1/3 | 36 | 36 | 11 | | 92 | 124.98 |
| | NA-363 | 36 | 9925 | 413 | 1/3 | 42 | 42 | 15 | | 111 | 147.86 |
| | NA-423 | 42 | 11929 | 318 | 1/3 | 48 | 48 | 15 | | 147 | 179.50 |
| | NA-425 | 42 | 14347 | 380 | 1/2 | 48 | 48 | 15 | | 169 | 275.74 |
| | NA-485 | 48 | 15679 | 317 | 1/2 | 54 | 54 | 15 | | 183 | 298.94 |
| | NA-487 | 48 | 17564 | 350 | 3/4 | 54 | 54 | 15 | | 186 | 324.94 |
| Rancher Fans | NA-223R | 22 | 3800 | 628 | 1/3 | 24 1/2 | 30 | 12 | 22x30 1/4 | 53 | 129.30 |
| | NA-243R | 24 | 4750 | 655 | 1/3 | 30 | 30 | 12 | 26x30 1/4 | 56 | 132.18 |
| | NA-303R | 30 | 6409 | 466 | 1/3 | 36 | 36 | 12 | 30x36 1/2 | 80 | 154.28 |
| | NA-363R | 36 | 8780 | 376 | 1/3 | 42 | 42 | 12 | 36 1/2x42 1/2 | 100 | 175.52 |
| | NA-423R | 42 | 11929 | 318 | 1/3 | 48 | 48 | 16 | 42x48 1/2 | 122 | 205.50 |

**Motors:** The price of each fan includes the pulley, belt, and a single speed, 60 cycle, single phase motor. 1/3 H.P. motors are 115-volt; 1/2 and 3/4 H.P. motors are 115/230 volt. When orders specify, two-speed and special motors will be furnished at added cost.

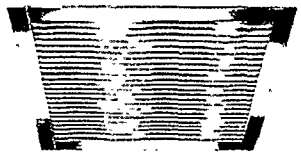
Above prices include Federal Excise Tax.

# LAU AUTOMATIC EXHAUST LOUVERS AND CEILING SHUTTERS

## For Electric Ventilating Fans



#556 Exhaust Louver
*Front View*



#610 Ceiling Shutter
*Overhead View*

#603 Ceiling Shutter
*Overhead View*

#556 automatic exhaust louvers have a steel frame, aluminum fins, protected inside bearings, and weather-stripping on all sides. Full opening assures capacity operation. A heavy reinforcing strip reduces motor load by counterbalancing open louvers—prevents rattling by adding weight to closed louvers.

#610 ceiling shutter quietly provides maximum free air opening in one continuous panel. Features adjustable spring counterbalance and fusible links. Neutral aluminum color.

#603 ceiling shutter has snap-on aluminum frame. One panel forms continuous louver. Installed practically flush with ceiling. Features adjustable counterbalance and fusible links.

RECOMMENDED SIZES AND PRICES
*All Prices are F.O.B. Dayton, Ohio

| Catalog Number of Fan | Automatic Louver or Shutter to use with Fan Indicated: #556 Exhaust Louvers Size Inches | Wt. Lbs. | *Price Each | #610 Ceiling Shutters Size Inches | Wt. Lbs. | *Price Each | #603 Ceiling Shutters Size Inches | Wt. Lbs. | *Price Each |
|---|---|---|---|---|---|---|---|---|---|
| NA-243 | 26x26 | 19 | $27.72 | 28x32 | 11 | $24.26 | 25x31 | 19 | $36.94 |
| NA-303 | 32x32 | 33 | 45.38 | 32x38 | 13 | 30.08 | 31x37 | 32 | 47.38 |
| NA-363 | 38x38 | 36 | 55.44 | 38x44 | 17 | 37.42 | 37x43 | 45 | 57.88 |
| NA-423 | 44x44 | 46 | 65.50 | 44x50 | 22 | 45.36 | 43x49 | 60 | 68.46 |
| NA-425 | 44x44 | 46 | 65.50 | 44x50 | 22 | 45.36 | 43x49 | 60 | 68.46 |
| NA-485 | 50x50 | 54 | 75.54 | 48x56 | 26 | 51.88 | — | — | — |
| NA-487 | 50x50 | 54 | 75.54 | 48x56 | 26 | 51.88 | — | — | — |
| NA-223R | — | — | — | 24x32 | 9 | 21.58 | — | — | — |
| NA-243R | 26x26 | 19 | 27.72 | 28x32 | 11 | 24.26 | 25x31 | 19 | 36.94 |
| NA-303R | 32x32 | 33 | 45.38 | 32x38 | 13 | 30.08 | 31x37 | 32 | 47.38 |
| NA-363R | 38x38 | 36 | 55.44 | 38x44 | 17 | 37.42 | 37x43 | 45 | 57.88 |
| NA-423R | 44x44 | 46 | 65.50 | 44x50 | 22 | 45.36 | 43x49 | 60 | 68.46 |

*Prices are subject to change without notice.*

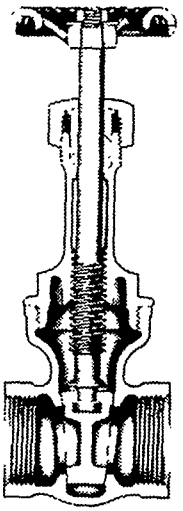


LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

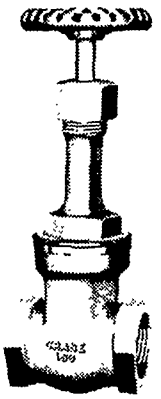
## 150-POUND BRASS GATE VALVES

150 POUNDS STEAM - 300 POUNDS COLD WATER, OIL, OR GAS



No. 431
Cross Section

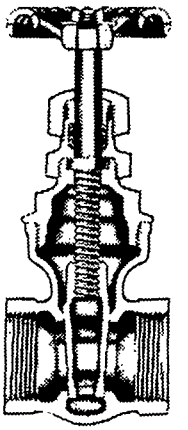
*Rising Stem*
*Wedge Disc*



No. 431

*Non-Rising Stem*
*Wedge Disc*

No. 437

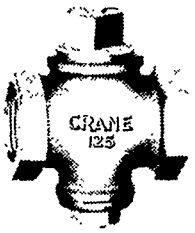


No. 437
Cross Section

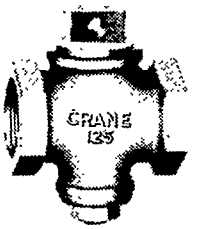
## 125-POUND BRASS STEAM COCKS

125 POUNDS STEAM, COLD WATER, OIL, AIR, OR GAS

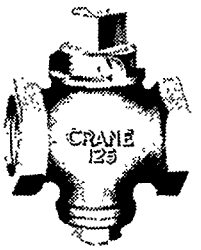
*Air Tested*




No. 250
Square Head

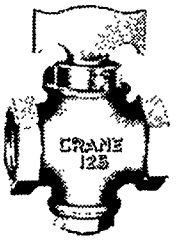



No. 252
Flat Head

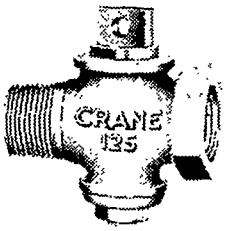



No. 254
Square Head
With Check

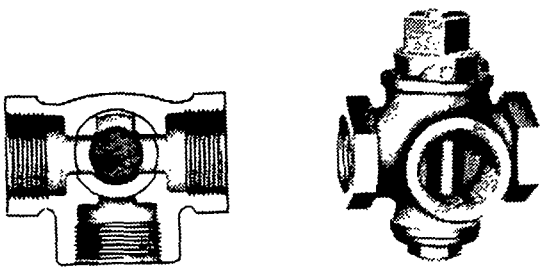
No. 256
Tee Head



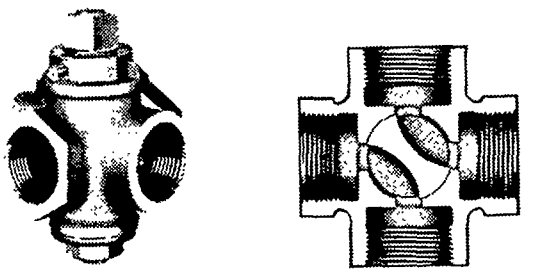

No. 258
Tee Head
with Check




No. 266
Male and Female
Flat Head



No. 268, Three-Way
Square Head, with Check



No. 269, Four-Way
Square Head, with Check

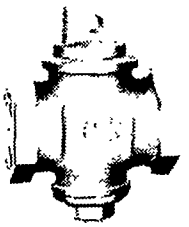
PRICES, EACH

| Number / Size, in. | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | - | $ 4.32 | $ 4.96 | $ 6.48 | $ 8.42 | $11.66 | $15.12 | $20.08 | $32.40 | - | - |
| 252 | - | 4.32 | 4.96 | 6.48 | 8.42 | 11.66 | 15.12 | 20.08 | 32.40 | - | - |
| 254 | - | - | - | 7.78 | 9.94 | 13.60 | 18.14 | 23.32 | 36.72 | - | - |
| 256 | $4.32 | 4.32 | 4.96 | 6.48 | - | - | - | - | - | - | - |
| 258 | 4.96 | 4.96 | 5.84 | 7.78 | - | - | - | - | - | - | - |
| 266 | - | 4.96 | 5.62 | 7.56 | 9.50 | 12.96 | - | - | - | - | - |
| 268 | - | 6.48 | 7.78 | 10.16 | 12.96 | 16.42 | 23.76 | 30.24 | 47.52 | - | - |
| 269 | - | - | - | 14.04 | 20.52 | 29.16 | 38.88 | 49.68 | 69.12 | - | - |
| 431 | - | 10.16 | 10.16 | 11.88 | 14.04 | 16.64 | 22.24 | 28.52 | 40.40 | $71.28 | $105.84 |
| 437 | - | 10.16 | 10.16 | 11.88 | 14.04 | 16.64 | 22.24 | 28.52 | 40.40 | 71.28 | 105.84 |

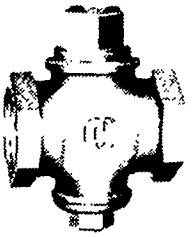
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

*For Wrenches, refer to Page 19-9.*

## BRASS GAS SERVICE STOPS



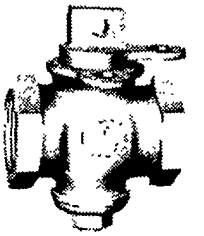
No. 270
Flat Head



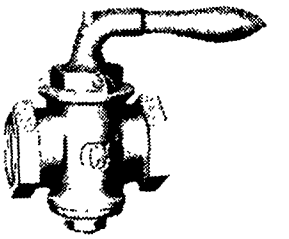
No. 272
Square Head

No. 276
Tee Head

No. 278
Tee Head
with Check



No. 284
Flat Head
with Lockup



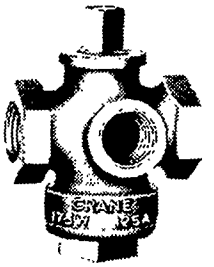
No. 298
Lever Handle
with Check

## BRASS SPRING-LOADED COCKS

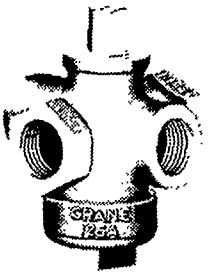
125 POUNDS AIR - 175 POUNDS COLD WATER

*Air Tested*

No. 305
Square Head



No. 306
Square Head
Three-Way

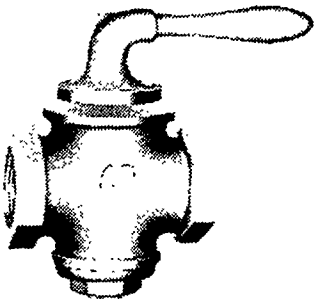


No. 307
Square Head
Four-Way

## ROUGH BRASS STOPS

*Round Way*

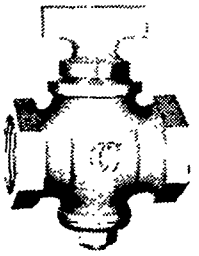
No. 812
Tee Head



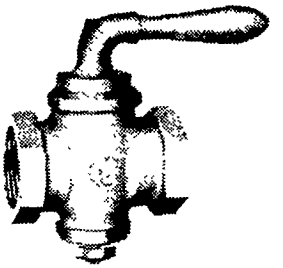
No. 812½
Lever Handle

## ROUGH BRASS STOPS

*Flat Way*
*Without Check or Drain*

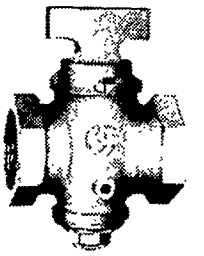


No. 804
Tee Head

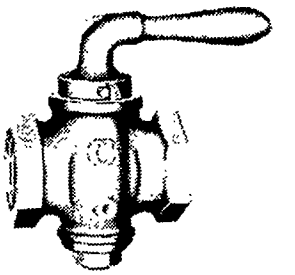


No. 804½
Lever Handle

*Flat Way*
*With Check and Drain*



No. 806
Tee Head



No. 806½
Lever Handle

PRICES, EACH

| Number Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| 270 | $ 3.68 | $ 4.10 | $ 4.76 | $ 6.04 | $ 7.78 | $10.80 | $14.48 | $23.76 |
| 272 | 3.68 | 4.10 | 4.76 | 6.04 | 7.78 | 10.80 | 14.48 | 23.76 |
| 276 | 3.68 | 4.10 | 4.76 | 6.04 | - | - | - | - |
| 278 | 4.32 | 4.76 | 5.62 | 6.92 | - | - | - | - |
| 284 | - | - | 6.04 | 7.78 | 9.94 | 12.96 | - | - |
| 298 | 4.54 | 5.18 | 5.84 | 7.12 | 9.28 | - | - | - |
| 305 | 10.80 | 11.88 | 13.40 | - | - | - | - | - |
| 306 | 12.96 | 16.20 | 20.52 | - | - | - | - | - |
| 307 | 15.12 | 18.80 | 23.76 | - | - | - | - | - |
| 804 | - | - | 5.62 | 7.34 | 10.58 | 14.68 | 20.08 | 33.26 |
| 804½ | - | 4.54 | 5.62 | 7.34 | 10.58 | 14.68 | 20.08 | 33.26 |
| *806 | - | - | 6.04 | 7.78 | 11.24 | 15.34 | 22.68 | 39.32 |
| 806½ | - | 5.40 | 6.04 | 7.78 | 11.24 | - | - | - |
| *812 | - | - | 6.70 | 9.72 | 14.04 | - | - | - |
| 812½ | - | - | 6.70 | 9.72 | 14.04 | - | - | - |

*5/8" size, Ea. No. 806 $6.92 - No. 812 $8.64

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

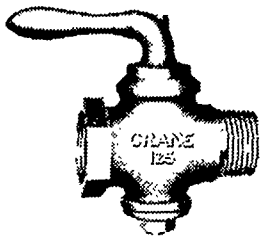
## BRASS GROUND KEY FAUCETS

No. 800, PLAIN

No. 801, HOSE

*When ordering, specify whether Rough or Polished.*
*No. 801 Faucets have Chicago Hose Thread on outlet.*

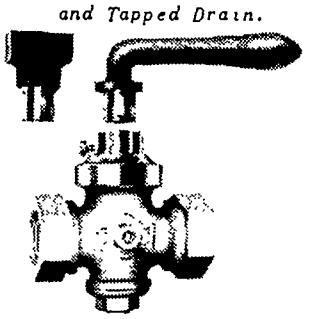
## BRASS BRINE COCKS




No. 814
Lever Handle

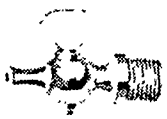
## GROUND KEY STOPS

*With Reversible Check and Tapped Drain.*



No. 821, Lever Handle
No. 824, Tee Head

## BRASS PET COCKS



No. 700
Tee Head

No. 702
Lever Handle

## BRASS CYLINDER COCKS

No. 724
Lever Handle

*For larger sizes use No. 800 Ground Key Faucets.*

## KEYS FOR LOCKSHIELD VALVES

Nos. 197, 198, and 199
Cadmium plated malleable iron L-Shaped key.

### PRICES, EACH

| Number | Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
|---|---|---|---|---|---|---|---|---|
| 700 | | $2.26 | $2.48 | $2.68 | $3.10 | - | - | - |
| 702 | | 2.88 | 3.10 | - | - | - | - | - |
| 724 | | 5.56 | 6.18 | - | - | - | - | - |
| 800 | Rough | - | - | 5.18 | 6.04 | - | $7.78 | $11.66 |
| | Polished | - | - | 8.00 | 8.86 | - | 10.80 | 14.90 |
| 801 | Rough | - | - | - | 6.92 | - | 9.08 | 13.60 |
| | Polished | - | - | - | 9.72 | - | 12.10 | 16.84 |
| 814 | | - | - | 4.96 | 6.04 | - | 7.34 | 10.80 |
| 821 | | - | - | - | 8.42 | $9.08 | 10.80 | 14.68 |
| 824 | | - | - | - | 8.42 | 9.08 | 10.80 | 14.68 |

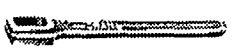
| Valve Size, Inches | Catalog Number of Valves | | |
|---|---|---|---|
| | No. 438 | No. 440 | No. 1240 No. 1241 |
| 1/4 | - | - | 197 |
| 3/8 | - | - | 197 |
| 1/2 | 197 | 198 | 197 |
| 3/4 | 198 | 198 | 197 |
| 1 | 198 | 198 | 198 |
| 1¼ | 198 or 199 | 199 | 198 |
| 1½ | 198 or 199 | 199 | - |
| 2 | 199 | 199 | - |

| Price Each | No. 197 | No. 198 | No. 199 |
|---|---|---|---|
| | $2.76 | $3.32 | $4.42 |

## MALLEABLE IRON WRENCHES

**For Brass and Iron Cocks**

| Catalog Number | Price Each | *Length Inches | SQUARE HEAD WRENCHES — Suitable For — Brass Cocks: Nos. 250, 254, 272 | Brass Cocks: Nos. 268, 269 | Brass Cocks: Nos. 305, 306 | Brass Cocks: No. 307 | Iron Cocks: Nos. 320, 321, 324, 325, 326, 330 | Iron Cocks: No. 1228 |
|---|---|---|---|---|---|---|---|---|
| 1-S | $ .32 | 3 | 1/4 | 1/4 | | | | |
| 2-S | .36 | 3½ | 3/8 | | ¼, ⅜, ½ | ¼, ⅜ | | |
| 3-S | .36 | 4 | 1/2 | 3/8 | | 1/2 | | 1/2 |
| 4-S | .50 | 5 | 3/4 | 1/2 | | | 1/2 | 3/4 |
| 5-S | .62 | 6½ | 1 | 3/4 | | | 3/4 | 1 |
| 6-S | .80 | 8 | 1¼ | 1 | | | | 1¼ |
| 6½-S | .94 | 7⅝ | | | | | 1 | |
| 7-S | 1.20 | 9½ | 1½ | 1¼, 1½ | | | | 1½ |
| 7½-S | 1.52 | 8½ | | | | | 1¼ | |
| 8-S | 1.80 | 12 | 2 | 2 | | | 1½ | 2 |
| 9-S | 2.92 | 14½ | | | | | 2 | |
| 10-S | 4.48 | 17 | | | | | 2½ | |
| 11-S | 6.04 | 22 | | | | | 3 | |
| 12-S | 16.80 | 30 | | | | | 4 | |



| Catalog Number | Price Each | *Length Inches | FLAT HEAD WRENCHES — Suitable For — Brass Cocks: Nos. 252, 266, 270, 284 | Brass Cocks: Nos. 320½, 324½, 334, 337 | Iron Cocks: Nos. 1232, 1234, 1236 |
|---|---|---|---|---|---|
| 1-F | $ .32 | 3 | 1/4 | | |
| 2-F | .36 | 3½ | 3/8 | | |
| 3-F | .36 | 4 | 1/2 | | 1/2 |
| 4-F | .50 | 5 | 3/4 | 1/2 | 3/4 |
| 5-F | .62 | 6½ | 1 | 3/4 | 1 |
| 6-F | .80 | 8 | 1¼ | 1 | 1¼ |
| 7-F | 1.20 | 9½ | 1½ | | 1½ |
| 8-F | 1.80 | 12 | 2 | | 2 |
| 23-F | 1.66 | 9¾ | | 1¼ | |
| 24-F | 2.10 | 10½ | | 1½ | |
| 25-F | 2.92 | 12½ | | 2 | |

*Center of Head to end.

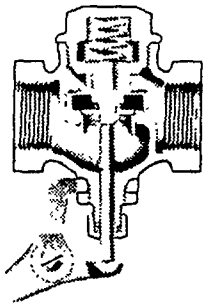
**ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.**

## 125-POUND BRASS GLOBE VALVES

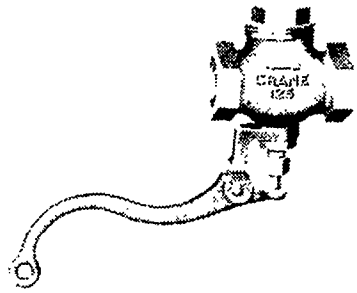
*Quick Opening - Self Closing*

125 POUNDS AIR OR GAS
125 POUNDS STEAM WITH NO. 1 DISC

*With Composition Disc*

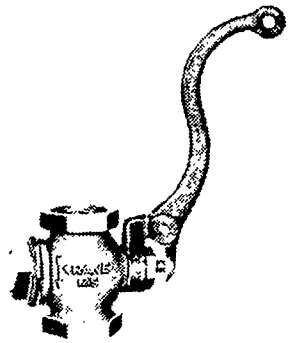


No. 12½
Cross Section

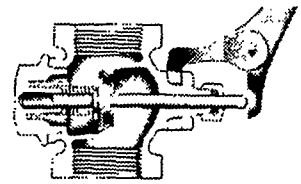


No. 12½
With Stuffing Box

125 POUNDS STEAM
*With Brass Disc*



No. 608
Without Stuffing Box



No. 608½
Cross Section

Unless otherwise ordered, No. 12½ valves are furnished with a No. 6 Disc suitable for air or gas service. Valves ordered for steam service will be furnished with a No. 1 Cranite Disc.

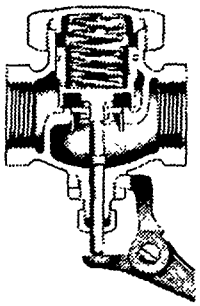
No. 608½
With Stuffing Box
(Not Illustrated)

## 150-POUND BRASS GLOBE VALVES

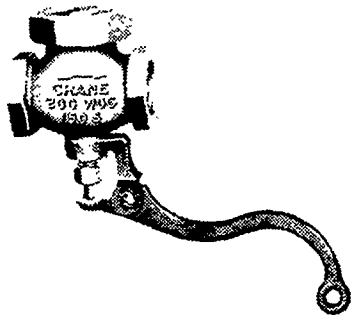
*Quick Opening - Self Closing*

200 POUNDS HOT WATER
200 POUNDS COLD WATER, LIGHT OILS, GASOLINE, AIR, OR GAS
150 STEAM WITH NO. 1 DISC

*With Composition Disc*



No. 7½
Cross Section



No. 7½
With Stuffing Box

Unless otherwise ordered, No. 7½ Valves are regularly furnished with a No. 6 Disc suitable for hot or cold water, for light oils or gasoline, and for air or gas. When ordered for steam service, the valves are furnished with a No. 1 Cranite Disc.

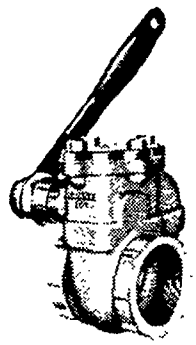
## 125-POUND BRASS GATE VALVES

*Quick Opening*

1/2 to 2-inch
125 POUNDS STEAM
200 POUNDS COLD WATER, OIL, OR GAS

2½ and 3-inch
100 POUNDS STEAM, COLD WATER, OIL, OR GAS

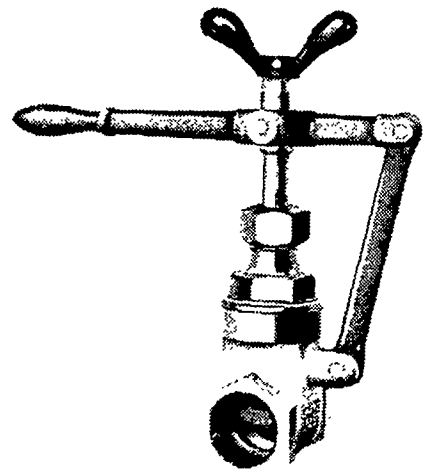
*CAM ACTION*
*Air Tested*



No. 432

125 POUNDS STEAM
200 POUNDS COLD WATER, OIL, OR GAS

*SLIDING STEM*



No. 442

PRICES, EACH

| Number | Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7½ | | - | - | $27.00 | $36.28 | $43.84 | $54.00 | $86.40 | $118.80 | - | - |
| 12½ | | $14.26 | $17.28 | 21.60 | 25.92 | 30.24 | 36.72 | 50.76 | - | - | - |
| 432 | | - | - | 20.96 | 23.32 | 29.60 | 36.72 | 45.36 | 50.48 | $120.96 | $162.00 |
| 442 | | - | - | - | 23.32 | 29.60 | 36.72 | 45.36 | 60.48 | 120.96 | 162.00 |
| 608 | | - | 12.96 | 15.12 | 17.92 | 23.32 | 31.32 | 38.88 | 56.15 | - | - |
| 608½ | | - | 14.04 | 16.20 | 20.08 | 25.92 | 34.12 | 43.20 | 60.48 | - | - |

*For Composition Discs, refer to Page 19-4.*

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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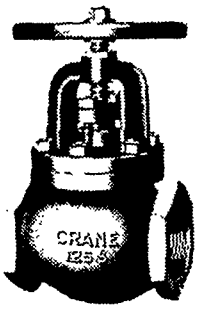
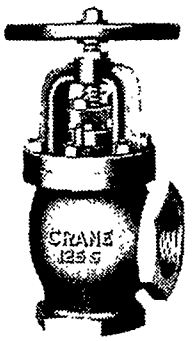
## 125-POUND IRON BODY GLOBE AND ANGLE VALVES

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

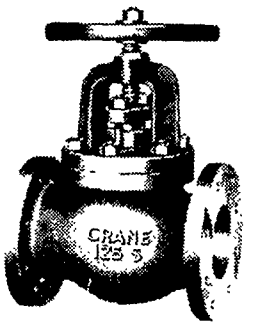
*Brass Trimmed*



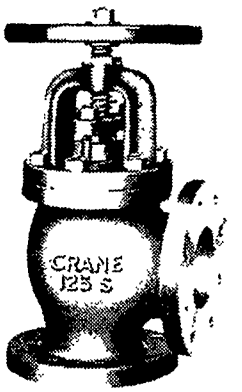

No. 350
Globe, Screwed




No. 352
Angle, Screwed




No. 351
Globe, Flanged

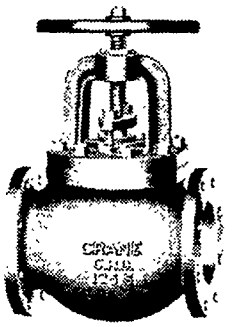



No. 353
Angle, Flanged

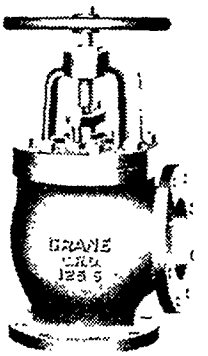
*Brass Trimmed with No. 1 Composition Disc*

No. 358
Globe, Screwed

No. 360½
Angle, Screwed




No. 359
Globe, Flanged




No. 361½
Angle, Flanged

These valves are regularly equipped with a No. 1 Cranite Disc, suitable for saturated steam or for hot water up to 300° F. Valves ordered for cold water, air, gas, oil, or gasoline are furnished with a No. 6 Disc. On hot water under 200° F., especially for frequent operation or easy seating, a No. 6 Disc is preferred to the No. 1.

PRICES, EACH

| Number | Size, Inches | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 350 | Screwed | $ 77.76 | $ 82.08 | $ 96.12 | $112.32 | $140.40 | $182.52 | $246.24 | - | - |
| 351 | Flanged, F.& D. | 86.40 | 92.88 | 110.16 | 135.00 | 165.24 | 207.36 | 272.16 | $453.60 | $723.60 |
| 352 | Screwed | 77.76 | 82.08 | 96.12 | 112.32 | 140.40 | 182.52 | 246.24 | - | - |
| 353 | Flanged, F.& D. | 86.40 | 92.88 | 110.16 | 135.00 | 165.24 | 207.36 | 272.16 | 453.60 | 723.60 |
| 358 | Screwed | - | 99.36 | 115.56 | - | 170.64 | - | - | - | - |
| 359 | Flanged, F.& D. | - | 110.16 | 129.60 | 156.60 | 194.40 | 248.40 | 315.36 | - | - |
| 360½ | Screwed | - | 99.36 | 115.56 | - | 170.64 | - | - | - | - |
| 361½ | Flanged, F.& D. | - | 110.16 | 129.60 | 156.60 | 194.40 | 248.40 | 315.36 | - | - |

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

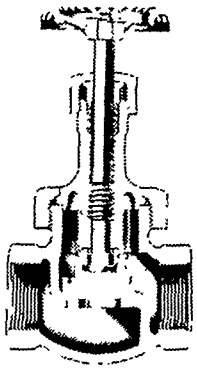
*For Composition Discs, refer to Page 19-4.*

Prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

## 150-POUND IRON BODY GLOBE AND ANGLE VALVES

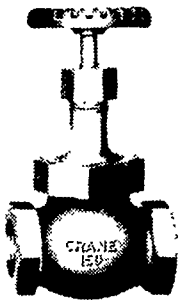
*Brass Trimmed*

150 POUNDS STEAM - 250 POUNDS COLD WATER, OIL, OR GAS



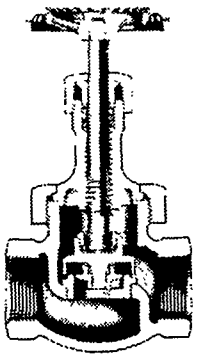
No. 314½ P Globe
Cross Section

*With Plug Type Disc*



No. 314½ P
Globe

No. 316½ P
Angle



No. 350½ C Globe
Cross Section

*With No. 1 Composition Disc*

No. 350½ C
Globe

No. 352½ C
Angle

These valves regularly have a No. 1 Cranite Disc, suitable for saturated steam or hot water up to 300° F. Valves ordered for cold water, air, gas, oil, or gasoline will have a No. 6 Disc. On hot water under 200° F., especially for easy seating, a No. 6 Disc is preferred to the No. 1.

BONNET CONSTRUCTION - **Nos. 314½ P, 316½ P, 350½ C, and 352½ C** globe and angle valves in sizes 2-inch and smaller have a union bonnet as shown in the illustrations above; larger sizes have a cast iron yoke-type bolted bonnet.

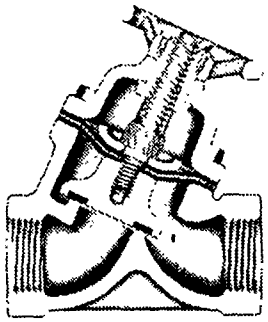
## DIAPHRAGM VALVES

*(Patent Pending)*

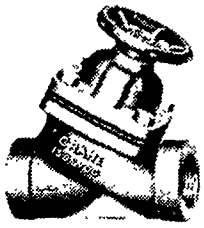
*IRON BODY - Y-PATTERN*

150 POUNDS WATER, OIL, OR GAS

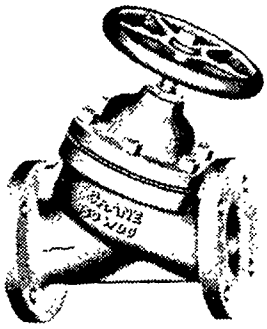
The body and bonnet of these valves are cast iron. The disc holder is cast iron with a Neoprene seating face permanently molded into a groove. The neoprene is soft enough to absorb small particles of foreign matter that may become lodged on the seat and cause leakage. The diaphragm is neoprene, having a strong reinforcing member to provide long life under flexing action. Valves are rising stem construction, the position of the stem indicates whether valves are open or closed. The valves have a rigid, leak-proof disc-diaphragm-stem connection.



No. 1610
Cross Section



No. 1610
Screwed



No. 1611
Flanged

Prices of flanged valves include facing and drilling. No deduction is made when valves are ordered faced only.

**PRICES, EACH**

| Number | Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 314½ P | Screwed | $16.48 | $17.10 | $18.12 | $21.02 | $25.76 | $33.78 | $45.32 | $59.74 | $93.74 | $121.54 | - |
| 316½ P | Screwed | 16.48 | 17.10 | 18.12 | 21.02 | 25.76 | 33.78 | 45.32 | 59.74 | 93.74 | 121.54 | - |
| 350½ C | Screwed | 15.46 | 15.86 | 16.48 | 19.78 | 23.90 | 29.46 | 37.08 | 49.02 | 87.56 | 105.06 | - |
| 352½ C | Screwed | 15.46 | 15.86 | 16.48 | 19.78 | 23.90 | 29.46 | 37.08 | 49.02 | 87.56 | 105.06 | - |
| 1610 | Screwed | - | - | 9.60 | 11.84 | 13.76 | 21.92 | 36.96 | 49.44 | - | - | - |
| 1611 | Flanged, F.&D. | - | - | 17.60 | 19.84 | 27.68 | 36.16 | 49.60 | 67.20 | 94.40 | 113.60 | $171.20 |

*For Composition Discs, refer to Page 19-4.*

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U S A

## 125-POUND IRON BODY WEDGE GATE VALVES

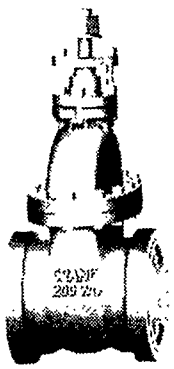
*Brass Trimmed*

125 POUNDS STEAM
200 POUNDS COLD WATER, OIL, OR GAS
*Non-Rising Stem*

Screwed
No. 460
Brass Seats
Brass Stem

Flanged
No. 461
Brass Seats
Brass Stem

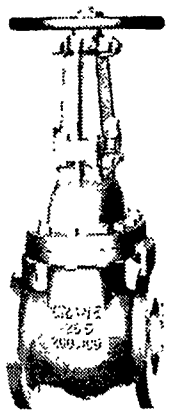
200 POUNDS
COLD WATER OR GAS
*Non-Rising Stem*



Hub Ends
No. 462
Brass Seats
Brass Stem

125 POUNDS STEAM
200 POUNDS COLD WATER, OIL, OR GAS
*Outside Screw and Yoke*

Screwed
No. 464
Brass Seats, Steel Stem
No. 464½
Brass Seats, Brass Stem



Flanged
No. 465
Brass Seats, Steel Stem
No. 465½
Brass Seats, Brass Stem

### PRICES, EACH

| Number | Size, Inches | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 460 | Screwed | $73.44 | $76.68 | $85.32 | $99.36 | $117.72 | $164.16 | $200.88 | $352.08 | - | - |
| 461 | Flanged, F.&D. | 81.00 | 86.40 | 96.12 | 113.40 | 135.00 | 182.52 | 220.32 | 378.00 | $596.16 | $853.20 |
| 462 | Hub Ends | 73.44 | - | 85.32 | - | 117.72 | - | 200.88 | 352.08 | 596.16 | 853.20 |
| 464 | Screwed | 86.40 | 92.88 | 111.24 | 130.68 | 153.36 | 201.96 | 252.72 | - | - | - |
| 464½ | Screwed | 86.40 | 92.88 | 111.24 | 130.68 | 153.36 | 201.96 | 252.72 | - | - | - |
| 465 | Flanged, F.&D. | 93.96 | 102.60 | 122.04 | 144.72 | 170.64 | 220.32 | 272.16 | 453.60 | 712.80 | 1010.88 |
| 465½ | Flanged, F.&D. | 93.96 | 102.60 | 122.04 | 144.72 | 170.64 | 220.32 | 272.16 | 453.60 | 712.80 | 1010.88 |

## IRON BODY CLAMP GATE VALVES

*Wedge Disc - Brass Trimmed*
*Air Tested*

### PRICES, EACH

| Size Inches | No. 486½ Screwed | No. 487½ Flanged F.&D. | No. 490 Screwed | No. 490½ Flanged F.&D. |
|---|---|---|---|---|
| 1/4 | - | - | $15.12 | - |
| 3/8 | - | - | 15.12 | - |
| 1/2 | $25.92 | - | 15.98 | - |
| 3/4 | 27.22 | - | 17.06 | - |
| 1 | 30.24 | - | 19.66 | - |
| 1¼ | 33.70 | - | 22.90 | - |
| 1½ | 39.74 | $54.00 | 26.36 | $40.40 |
| 2 | 48.60 | 63.72 | 34.12 | 49.68 |
| 2½ | 69.12 | 85.32 | 54.00 | 70.20 |
| 3 | 90.72 | 108.00 | 75.60 | 91.80 |
| 4 | 172.80 | 190.08 | 154.44 | 172.80 |

The prices of flanged valves include facing and drilling to the American Cast Iron Standard, Class 125. No deduction is made if valves are ordered faced only.

**ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.**

| WORKING PRESSURES | STEAM | COLD WATER, OIL, OR GAS |
|---|---|---|
| *Screwed* ¼ to 2" | 150 Pounds | 225 Pounds |
| *Screwed* 2½ to 4" | 125 Pounds | 175 Pounds |
| *Flanged* 1½ and 2" | 125 Pounds | 200 Pounds |
| *Flanged* 2½ to 4" | 125 Pounds | 175 Pounds |

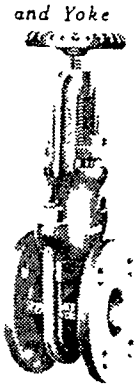
*Inside Screw, Rising Stem*

No. 490
Screwed

No. 490½
Flanged

*Outside Screw and Yoke*

No. 486½
Screwed



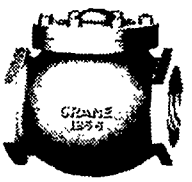
No. 487½
Flanged

## 125-POUND IRON BODY LIFT CHECK VALVES

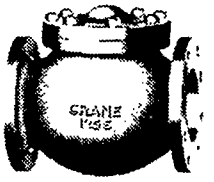
*Brass Trimmed*

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

No. 367 Horizontal Cross Section

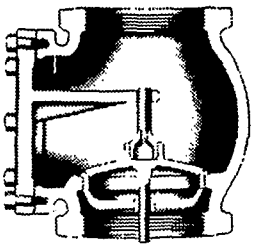


No. 366 Screwed



No. 367 Flanged

No. 368 Screwed



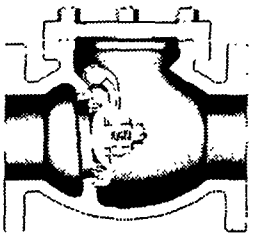
No. 368 Vertical Cross Section

## 125-POUND IRON BODY SWING CHECK VALVES

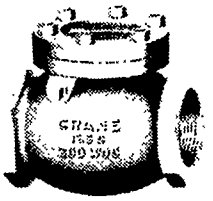
*Brass Trimmed*

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

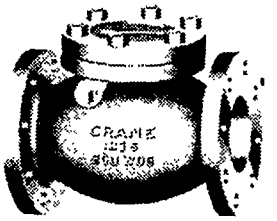
200 POUNDS COLD WATER OR GAS



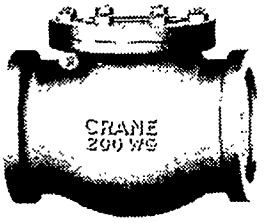
No. 373 Cross Section - Sizes 8" and smaller



No. 372 Screwed



No. 373 Flanged



No. 374¼ Hub Ends

Unless otherwise ordered, **Nos. 372, 373, and 374¼** valves are furnished with a brass faced disc. When so ordered these valves can be furnished with a leather faced disc. Such valves are recommended only for cold water. The extra charge for leather discs is shown in the table below.

These valves can be used either in a horizontal position or in a vertical position for upward flow.

The prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

**PRICES, EACH**

| Number | Size, Inches | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 366 | Screwed | $29.16 | $41.04 | $54.00 | - | $ 92.88 | - | - | - | - | - |
| 367 | Flanged F.&D. | - | - | 63.72 | - | 106.92 | $159.84 | $218.16 | - | - | - |
| 368 | Screwed | - | 51.84 | 69.12 | - | 110.16 | - | - | - | - | - |
| *372 | Screwed | 38.88 | 42.12 | 51.84 | $70.20 | 88.56 | 115.56 | 145.80 | - | - | - |
| *373 | Flanged F.&D. | 45.36 | 51.84 | 64.80 | 85.32 | 104.76 | 133.92 | 165.24 | $349.92 | $561.60 | $771.12 |
| *374¼ | Hub Ends | - | - | - | - | 104.76 | - | 165.24 | 349.92 | - | - |
| *For leather disc, Add | | 5.62 | 8.00 | 8.86 | 10.36 | 12.52 | 17.28 | 23.12 | 31.76 | 43.20 | 69.12 |

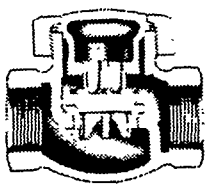
## 150-POUND IRON BODY LIFT CHECK VALVES

150 POUNDS STEAM - 250 POUNDS COLD WATER, OIL OR GAS

*Crane Nickel Alloy Seats*

*For Composition Discs, refer to Page 19-4.*

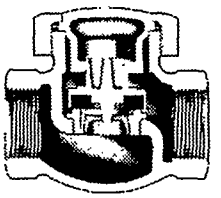
*With Nickel Alloy Disc*



No. 366½ Cross Section Nickel Alloy Disc

No. 366½ No. 366½ C Screwed

*With No. 1 Composition Disc*



No. 366½ C Cross Section Composition Disc

**PRICES, EACH**

| Size Inches | No. 366½ Screwed | No. 366½ C Screwed |
|---|---|---|
| 1/4 | $16.06 | $16.06 |
| 3/8 | 16.48 | 16.48 |
| 1/2 | 17.72 | 17.72 |
| 3/4 | 19.36 | 19.36 |
| 1 | 21.64 | 21.64 |
| 1¼ | 24.72 | 24.72 |
| 1½ | 29.88 | 29.88 |
| 2 | 39.14 | 39.14 |

No. 366½ C valves are regularly furnished with a No. 1 Granite Disc, suitable for steam, or not water from 200° to 300° F. When ordered for hot water up to 200° F., cold water, air, gas, oil, or gasoline, they are furnished with a No. 6 Disc.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



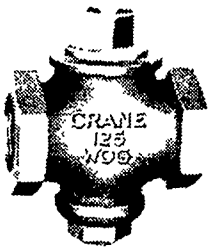
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price

Printed in U. S. A.

## 125-POUND W.O.G. IRON COCKS

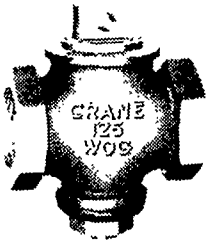
125 POUNDS COLD WATER, OIL, AIR, OR GAS

*Air Tested*



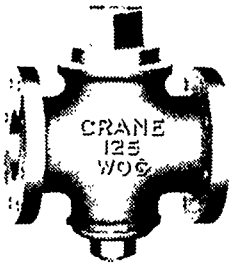

Square Head
No. 320 All Iron

No. 324
*With Brass Plug and Washer*

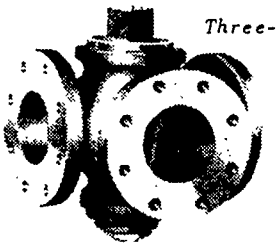



Flat Head
No. 320½ All Iron

No. 324½

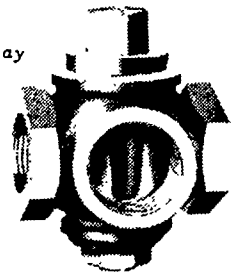



Square Head
No. 325 All Iron
Flanged



*Three-Way*

Square Head
No. 331 All Iron
Flanged



Square Head
No. 326 All Iron

No. 330
*With Brass Plug and Washer*

PRICES, EACH

| Number | Size, Inches | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 320 | Screwed | $ 5.60 | $ 6.50 | $ 7.40 | $ 9.64 | $11.88 | $15.68 | $35.84 | $58.24 | $ 96.32 |
| 320½ | Screwed | 5.60 | 6.50 | 7.40 | 9.64 | 11.88 | 15.68 | - | - | - |
| 324 | Screwed | 8.06 | 9.64 | 11.64 | 15.68 | 22.40 | 30.24 | 62.72 | 96.32 | 168.00 |
| 324½ | Screwed | 8.06 | 9.64 | 11.64 | 15.68 | 22.40 | 30.24 | - | - | - |
| 325 | Flanged F.&D. | - | - | - | - | - | 35.84 | 53.76 | 71.68 | 114.24 |
| 326 | Screwed | - | 8.96 | 10.08 | 12.54 | 15.24 | 21.06 | 47.04 | 64.96 | 116.48 |
| 330 | Screwed | - | 12.32 | 14.56 | 19.04 | 26.88 | 35.84 | 69.44 | 105.28 | 190.40 |
| 331 | Flanged F.&D. | - | - | - | - | - | 60.48 | 78.40 | 96.32 | 132.16 |

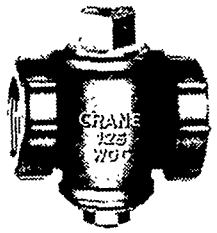
The prices of flanged cocks include facing and drilling to American Cast Iron Flange Standard, Class 125. No deduction when ordered faced only.

## IRON GAS LINE COCKS

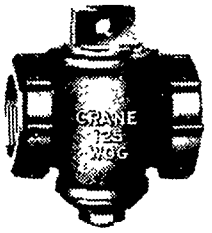
125 POUNDS COLD WATER, OIL AIR, OR GAS

*With Brass Plug and Washer*

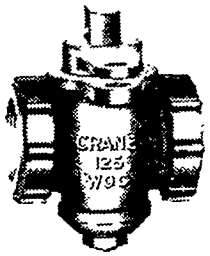
*Air Tested*



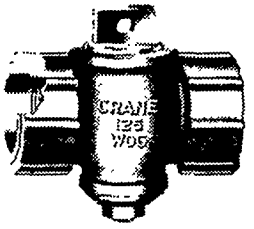

Square Head
No. 1228




Flat Head
No. 1232




Flat Head, with Lockup
No. 1234



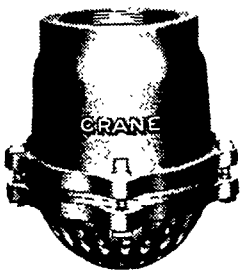

Flat Head, Recessed Ends
No. 1236

PRICES, EACH

| No. | Size, Inches | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| 1228 | Black | $4.48 | $5.16 | $6.28 | $8.28 | $12.10 | $17.92 |
| | Galv. | 4.70 | 5.38 | 6.72 | 8.96 | 12.76 | 18.60 |
| 1232 | Black | 4.48 | 5.16 | 6.28 | 8.28 | 12.10 | 17.92 |
| | Galv. | 4.70 | 5.38 | 6.72 | 8.96 | 12.76 | 18.60 |
| 1234 | Black | 5.16 | 6.04 | 7.40 | 9.64 | 13.88 | 20.16 |
| | Galv. | 5.38 | 6.28 | 7.84 | 10.30 | 14.56 | 20.84 |
| 1236 | Galv. | - | 6.72 | 8.06 | 10.30 | - | - |

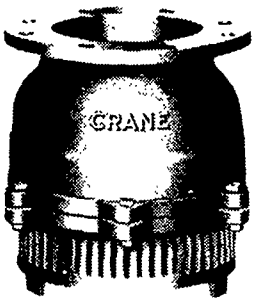
## IRON BODY FOOT VALVES

With Leather or Brass Disc




Screwed
No. 394 Leather Disc
No. 394½ Brass Disc

**Recommended for suction lines on shallow well pumps where pressure does not exceed 34-foot head (approx. 15#)**




Flanged
No. 395 Leather Disc
No. 395½ Brass Disc

PRICES, EACH

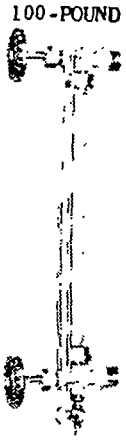
| Number | Size, Inches | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 394 Screwed, | Black, Leather Disc | $4.96 | $5.18 | $ 5.84 | $ 7.34 | $ 9.94 | $12.96 | $17.28 | $23.12 | $29.16 |
| | Galvanized, Leather Disc | 5.40 | 5.84 | 6.48 | 8.20 | 11.02 | 14.04 | 19.00 | 25.48 | 32.40 |
| 394½ | Screwed, Black, Brass Disc | - | - | 30.24 | 32.40 | 34.56 | 41.04 | 47.52 | - | 60.48 |
| 395 | Flanged F.&D., Black, Leather Disc | - | - | - | - | 20.30 | 23.32 | 30.24 | - | 42.34 |
| 395½ | Flanged F.&D., Black, Brass Disc | - | - | - | - | - | - | 60.48 | - | 78.84 |

*For Brass Foot Valves, see page 11-8.*

# WATER GAUGES AND ACCESSORIES

## CRANE BRASS WATER GAUGES

100-POUND



No. 624
Rough

**No. 624 1/2-inch**
½" connections, 14" C. to C.

5/8" glass, 12¾" long - Guard rods 15" long
Price, with 14" or shorter centers $15.98
Extra per inch over 14", up to 36" .18

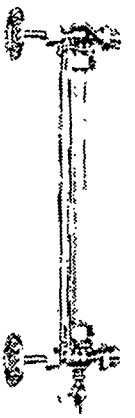
**No. 610 1/2-inch**
½" connections, 14" C. to C.

5/8" glass, 12¾" long - Guard rods 14" long
Price, with 14" or shorter centers $29.16
Extra per inch over 14", up to 36" .18

**No. 610 3/4-inch**
¾" connections, 18" C. to C.

¾" glass, 16" long - Guard rods, 17" long
Price, with 18" or shorter centers $43.20
Extra per inch over 18", up to 36" .18

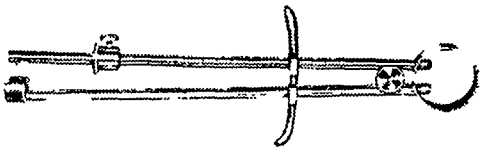
175-POUND



No. 610
Polished

## CHESTERTON GAUGE GLASS CUTTERS

*For Cutting Gauge Glasses to Length*



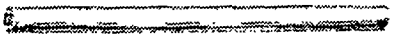
Price, Cutter complete Each **$7.00**
Extra Cutter Wheels Each **.68**

## CRANE EXTRA BRASS GUARDS FOR WATER GAUGES

| *Length Inches | Price Each | *Length Inches | Price Each |
|---|---|---|---|
| 9 | $ .64 | 23 | $1.16 |
| 11 | .64 | 25 | 1.30 |
| 13 | .64 | 27 | 1.42 |
| 14 | .70 | 29 | 1.56 |
| 15 | .78 | 31 | 1.72 |
| 17 | .86 | 33 | 1.90 |
| 19 | .96 | 35 | 2.28 |
| 21 | 1.04 | | |

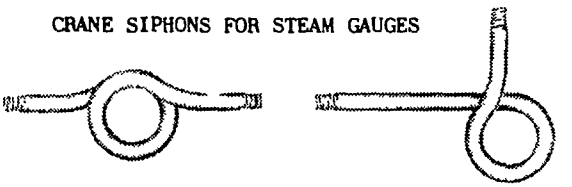
*Includes Acorn

## PYREX HIGH PRESSURE GAUGE GLASSES



| Length Inches | 1/2" Diameter Price Each | 1/2" Diameter Std. Pkge. 6 pieces | 5/8" Diameter Price Each | 5/8" Diameter Std. Pkge. 6 pieces | 3/4" Diameter Price Each | 3/4" Diameter Std. Pkge. 6 pieces |
|---|---|---|---|---|---|---|
| 8 | $1.02 | $3.66 | $1.18 | $4.24 | $1.36 | $4.90 |
| 9 | 1.10 | 4.00 | 1.30 | 4.66 | 1.50 | 5.38 |
| 10 | 1.22 | 4.38 | 1.40 | 5.04 | 1.62 | 5.86 |
| 11 | 1.30 | 4.72 | 1.52 | 5.46 | 1.74 | 6.24 |
| 12 | 1.42 | 5.10 | 1.62 | 5.86 | 1.86 | 6.72 |
| 13 | 1.52 | 5.46 | 1.74 | 6.28 | 2.00 | 7.20 |
| 14 | 1.62 | 5.86 | 1.86 | 6.72 | 2.14 | 7.72 |
| 15 | 1.70 | 6.12 | 1.98 | 7.14 | 2.26 | 8.16 |
| 16 | 1.82 | 6.54 | 2.12 | 7.62 | 2.52 | 9.10 |
| 17 | 1.92 | 6.94 | 2.22 | 7.98 | 2.62 | 9.46 |
| 18 | 2.04 | 7.32 | 2.36 | 8.46 | 2.70 | 9.76 |
| 19 | 2.16 | 7.80 | 2.46 | 8.88 | 2.90 | 10.42 |
| 20 | 2.26 | 8.14 | 2.60 | 9.36 | 3.10 | 11.20 |
| 21 | 2.36 | 8.52 | 2.70 | 9.76 | 3.20 | 11.56 |
| 22 | 2.46 | 8.86 | 2.82 | 10.18 | 3.30 | 11.86 |
| 23 | 2.58 | 9.30 | 3.00 | 10.78 | 3.52 | 12.66 |
| 24 | 2.70 | 9.72 | 3.10 | 11.20 | 3.74 | 13.44 |
| 30 | 3.32 | 11.94 | 3.84 | 13.80 | 4.44 | 15.96 |
| 36 | 4.06 | 14.58 | 4.68 | 16.84 | 5.40 | 19.48 |

## CRANE SIPHONS FOR STEAM GAUGES



Straight
8" Long
Brass or Steel

Angle
7½" long - 5½" high
Steel Only

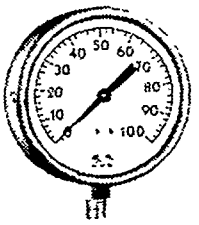
Made from 1/4-inch Standard weight pipe. Wrought Steel for 475 pounds, 750° F. and Red Brass for 250 pounds saturated steam.

Price, Straight Pattern, Brass Each **$3.70**
Straight Pattern, Steel **2.06**
Angle Pattern, Steel **2.06**

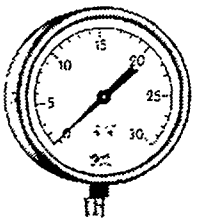
## MARSHALLTOWN GAUGES

Drawn Steel Case - Brass Bourdon Tube - White Enameled Dial

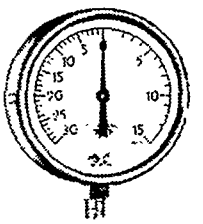
*Dial Sizes 2, 2½, 3½, and 4½-inch*



**No. 23**
Pressure.
Standard Dial
To 15, 30, 60, 100, 160
200, 300, 400, or 600 Pounds



**No. 22**
Vacuum
Standard Dial
0-30 inches of
Mercury



**No. 45**
Compound
Standard Dial,
0-30" Pressure 15,
30, 60, 100, 160,
200 or 300 Pounds

*For Prices of Marshalltown gauges, refer to Page 17-19*

**Prices are subject to change without notice.**

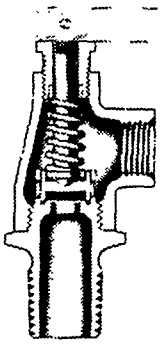


LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## BRASS RELIEF VALVES

*With Composition Disc*



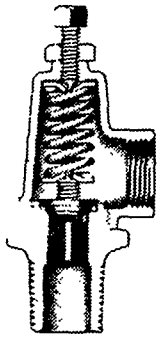
No. 1131
Cross Section

No. 1131
For Hot Water

No. A 1131
For Air

No. 1133½
For Cold Water

*With Brass Disc*



No. 1133
Cross Section

No. 1133
For Steam

*Above valves are set at following pressures:*

**ADJUSTABLE VALVES**

No. A 1131 25, 50, 75, 100 or 125 pounds
Adjustable through ranges of 10 to 25, 26 to 50, 51 to 75, and 76 to 125 pounds.

No. 1133 25, 50, 75, 100 or 125 pounds
Adjustable through ranges of 10 to 25, 30 to 75, and 80 to 125 pounds.

**NON-ADJUSTABLE VALVES**

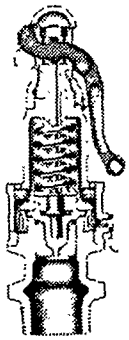
No. 1131 50, 75, 100, or 125 pounds
No. 1133½ 25, 50, 75, 100 or 125 pounds

*All orders must specify set pressure and catalog number.*
*Note: The outlet on the No. 1131 valve is one size smaller than the inlet.*

**For other relief and safety valves, refer to Section 17.**

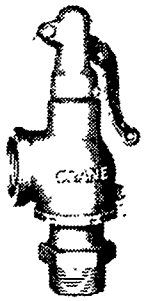
## BRASS POP SAFETY VALVES

FOR SATURATED STEAM
*With Wire Seal*



No. 2500
Cross Section

No. 2500
Top Outlet



No. 2501
Side Outlet

*Set at any specified pressure from 3 to 250 pounds; orders must specify the set pressure and catalog number.*

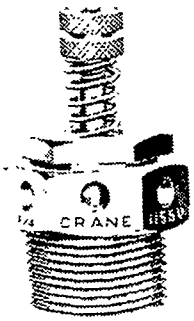
**CAPACITIES IN POUNDS OF STEAM PER HOUR**

90° Actual Discharge Capacity at 3% Above Set Pressure

| Set Pressure | Valve Size, Inches | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ |
| 10 | 45 | 96 | 171 | 180 | 238 | 387 | 415 |
| 20 | 72 | 148 | 256 | 279 | 378 | 549 | 675 |
| 25 | 82 | 169 | 290 | 317 | 441 | 630 | 765 |
| 30 | 92 | 189 | 324 | 351 | 495 | 711 | 900 |
| 40 | 113 | 225 | 387 | 423 | 594 | 874 | 1105 |
| 50 | 135 | 256 | 414 | 460 | 646 | 957 | 1191 |
| 60 | 148 | 288 | 465 | 532 | 748 | 1100 | 1329 |
| 70 | 162 | 332 | 527 | 604 | 849 | 1246 | 1508 |
| 75 | 169 | 360 | 558 | 640 | 899 | 1246 | 1597 |
| 80 | 176 | 369 | 589 | 675 | 950 | 1301 | 1687 |
| 90 | 192 | 369 | 651 | 747 | 1050 | 1411 | 1866 |
| 100 | 210 | 377 | 683 | 810 | 1170 | 1466 | 2095 |
| 125 | 241 | 495 | 738 | 855 | 1440 | 1718 | 2487 |
| 150 | 275 | 559 | 814 | 1080 | 1440 | 1922 | [illegible] |
| 175 | 308 | 603 | 945 | 1080 | 1561 | 2032 | 3240 |
| 200 | 342 | 621 | 1020 | 1260 | 1716 | 2301 | 3600 |
| 225 | 367 | 702 | 1095 | 1440 | 1871 | 2569 | 3960 |
| 250 | 392 | 810 | 1170 | 1620 | 2025 | 2838 | 4320 |

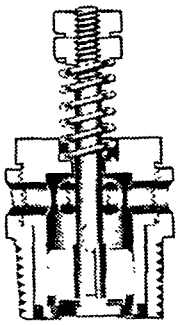
## BRASS VACUUM RELIEF VALVES

This valve is designed for use as a vacuum breaker on light, low pressure tanks, steam jacketed kettles, and similar apparatus, where there is a possibility of a vacuum forming which might cause injury to the apparatus because of the effect of atmospheric pressure upon it.




No. 1155 V
Vacuum
Relief Valve

*Brass Body, seat bushing, and disc.*



These valves are regularly furnished with springs for 10 inches of vacuum. They are set to open at 5 inches of vacuum but are adjustable for higher or lower vacuums.

**PRICES, EACH**

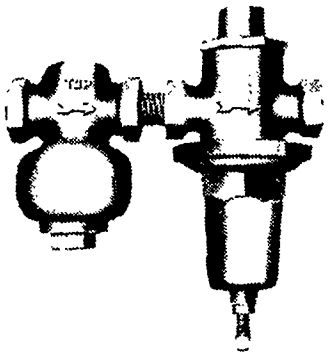
| Size, Inches | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ |
|---|---|---|---|---|---|---|---|---|
| No. 1131 | - | $16.66 | $20.18 | $23.52 | - | - | - | - |
| No. A 1131 | $20.78 | 20.78 | 25.48 | - | - | - | - | - |
| No. 1133 | - | 16.66 | 20.18 | - | - | - | - | - |
| No. 1133½ | - | 16.66 | 20.18 | - | - | - | - | - |
| No. 1155 V | - | 40.18 | 40.18 | 43.12 | $54.88 | $72.52 | - | - |
| No. 2500 | 30.38 | 30.38 | 33.32 | 39.20 | 45.08 | 56.84 | $78.40 | $112.70 |
| No. 2501 | 31.36 | 31.36 | 34.30 | 41.16 | 47.04 | 59.78 | 83.30 | 123.48 |

*Prices are subject to change without notice*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price

## MUELLER PRESSURE REDUCING AND REGULATING VALVES
FOR HOT AND COLD WATER, AIR, AND LIQUID SOAP LINES

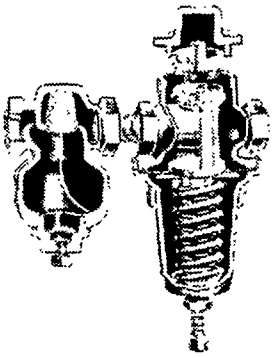


H-9000

These regulators are recommended where the supply pressure exceeds 45 pounds. They are made entirely of brass and bronze, except 2½" size which has a galvanized iron body. All sizes are regularly equipped with a galvanized iron body strainer; brass strainer will be furnished on request.

Valves are regularly made for initial pressures ranging from 45 to 250 pounds and delivery pressures from 25 to 75 pounds. They can be furnished upon request for any initial pressure up to 250 pounds or for delivery pressures from 5 to 125 pounds. Valves are set for 45 pounds delivery pressure unless otherwise ordered.

*Orders must specify catalog number, size, inlet and outlet pressures, and service.*



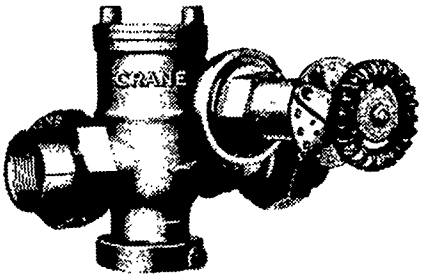
Cross Section

PRICES, EACH

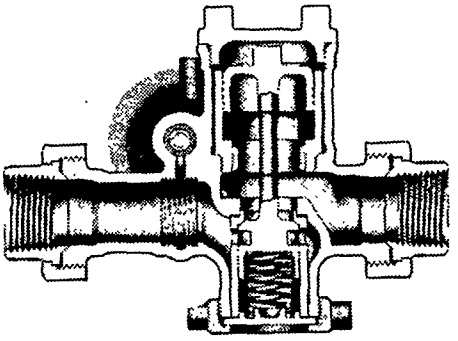
| Number Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ |
|---|---|---|---|---|---|---|---|---|---|
| H-9000 Iron Strainer | - | $19.48 | $24.42 | $29.84 | $42.88 | $ 89.52 | $115.48 | $181.12 | $333.00 |
| H-9000 Brass Strainer | $15.80 | 25.38 | 26.14 | 37.96 | 53.42 | 105.84 | 136.50 | 217.78 | 405.36 |

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

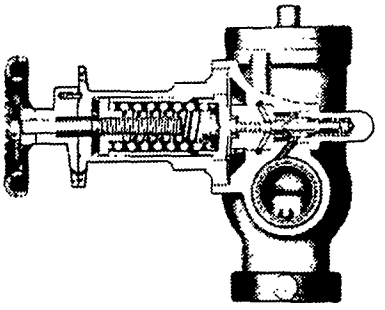
## CRANE BRASS PRESSURE REGULATORS
MAXIMUM INLET PRESSURES - 250 POUNDS STEAM 450° F. - 250 POUNDS AIR




No. 960
Pressure Regulator



Sectional view of main valve and piston assembly.



Sectional view of the auxiliary valve assembly.

Crane Pressure Regulators are designed to provide accurate, automatic pressure regulation on steam and air. They are suitable for use in modern process work, on vulcanizers, cookers, dryers, paper machines, heating systems, air tools, air blasts, and many other services. They may be used to reduce pressure to engines and pumps if ample receiver capacity to eliminate pulsations is provided between the engine or pump and the regulator.

These regulators should not be confused with ordinary reducing valves. They will not allow the outlet pressure to build up to the inlet pressure when no steam or air is being used in the outlet piping. Reasonable fluctuations of the inlet pressure do not affect the outlet pressure.

*Two essential but separate mechanisms* - the main valve assembly and auxiliary valve assembly - are features of Crane Pressure Regulators. Interconnected for transmission of pressure but independent mechanically, they operate in the same body. Except for necessary pipe connections, the regulator would function as well with the units separated.

*The main valve assembly* includes a disc and seat. The movement of the disc is controlled by a piston actuated by the pressure from the auxiliary valve.

*The auxiliary valve assembly* includes a devide to manually set the desired outlet pressure, an auxiliary valve to control the operation of the main valve, and a mechanism to operate the auxiliary valve itself.

The regulators are reliable and feature a wide range of available reduced pressures, simplicity of operation, accessibility for inspection, and convenience in making repairs. They have malleable iron union rings and tail-pieces on the inlet and outlet ends.

Each regulator is equipped with a locking device to permit protection of the pressure setting against tampering. Locks are furnished only when specified and at an additional cost.

They are fitted with regulating springs and diaphragms for any one of the following ranges of outlet pressures:

| | |
|---|---|
| *1 to 10 pounds* | *20 to 100 pounds* |
| *5 to 30 pounds* | *90 to 200 pounds* |

For Prices, Capacities, and other data, refer to your local Crane Branch or Crane Wholesaler.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

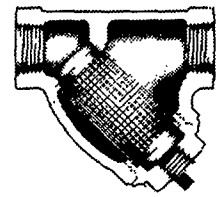
## IRON BODY Y-PATTERN SEDIMENT SEPARATORS

Crane Y-Pattern Sediment Separators are used to protect equipment against damage from dirt, grit, scale, and all foreign matter in steam, water, oil, and gas lines. Their large screening area makes them exceptionally efficient. The separators not only prevent passage of foreign matter, but also furnish a pocket for its accumulation, from which the matter can be easily removed through the blow-off connection.

The strainer element is a Monel mesh screen rolled into the shape of a cylinder. The ends are reinforced. One end fits into a recess in the diagonal wall of the body, and the other is retained by the cap. The screen is secure; it will not loosen in service.

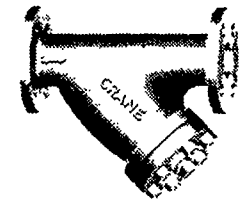
125-POUND
125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

250-POUND
250 POUNDS STEAM - 500 POUNDS COLD WATER, OIL, OR GAS



No. 988½
Cross Section

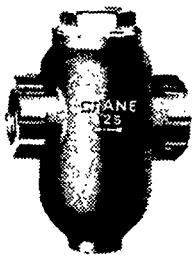
No. 988½, 125-Pound
No. 990½, 250-Pound




No. 989½, 125-Pound
No. 991½, 250-Pound

Sizes 1½-inch and smaller have screwed brass cap; larger sizes have bolted iron cap.

## IRON BODY SEDIMENT SEPARATORS

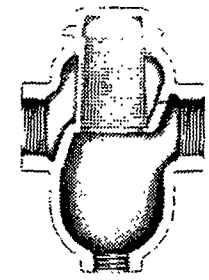



No. 986

125-POUND
125-POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

The strainer element is a brass screen rolled into the form of a frustrum of a cone, one end of which seats in the cap and the other on a machined surface in the bridge wall of the body. The area through the screen is much greater than the area of the pipe size. Unrestricted flow of the line fluid is assured even when some of the holes become clogged.

Unless otherwise ordered, these separators are furnished with screens having perforations .057-inch in diameter (135 holes per square inch) and are then suitable for steam, water, and medium or heavy oils. For air, gas, gasoline, volatile oils and fuel oils, screens having perforations .033-inch in diameter (331 holes per square inch) will be furnished.



No. 986
Cross Section

PRICES, EACH

| Number Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 986 Screwed | - | - | $6.92 | $ 8.64 | $11.24 | $13.82 | $19.00 | $29.38 | $41.04 | $ 54.00 | - | - | - |
| 988½ Screwed | $8.00 | 8.00 | 9.20 | 10.60 | 12.80 | 16.00 | 20.40 | 39.00 | 48.00 | 63.00 | - | - | - |
| 989½ Flanged, F.&D. | - | - | - | - | - | - | - | 56.00 | 68.00 | 88.00 | $177.00 | $244.00 | $356.00 |
| 990½ Screwed | - | - | 10.40 | 12.00 | 14.40 | 18.00 | 22.60 | 43.00 | - | - | - | - | - |
| 991½ Flanged, F.&D. | - | - | - | - | - | - | - | 65.00 | 78.00 | 102.00 | 204.00 | 306.00 | 446.00 |

Prices of flanged separators include facing and drilling. No deduction is made if they are ordered faced only.

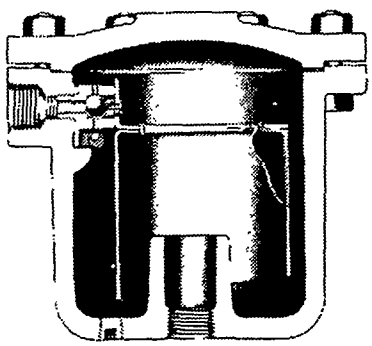
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

## INVERTED OPEN FLOAT STEAM TRAPS

*(Patent Pending)*

1 TO 300 POUNDS STEAM

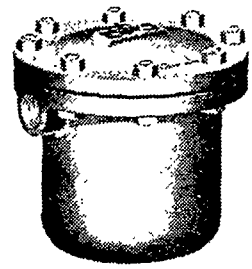
Fuel is wasted and efficiency reduced unless condensate is drained from steam lines as rapidly as it accumulates. At the same time, the practice of recovering condensate for heating, for hot water needs, or for return to boilers saves many fuel dollars. Both of these operations are performed efficiently and economically with Crane Inverted Open Float Steam Traps.



No. 9812
Cross Section

These traps are operated solely by the rise and fall of the float resting on the accumulated condensate. The float is buoyant when filled with incoming steam, and the discharge valve is closed. When incoming condensate floods the float, it sinks, thereby opening the valve and permitting the condensate to be discharged by the effective pressure.

Air or other non-condensable gas vents through a small hole in the top of the float and collects in the upper part of the trap. At each operation, this air or gas is discharged. The entire cycle of operation is practically instantaneous.



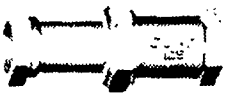
No. 9812

For prices, capacities, sizes, and other details, refer to your local Crane Branch or Crane Wholesaler.

## 125-POUND EXPANSION JOINTS

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

*Brass*



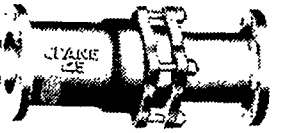
No. 404
Standard Traverse

No. 406
6-inch Traverse

*Iron Body*

No. 398
Standard Traverse

No. 400
6-inch Traverse



No. 401
Standard Traverse

No. 403
6-inch Traverse

Flanged end joints 6-inch and smaller and all screwed end joints have brass sleeves. Flanged end joints 8-inch and larger have steel sleeves, chromium-plated.

The prices of flanged iron joints include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when flanges are ordered faced only.

PRICES, EACH

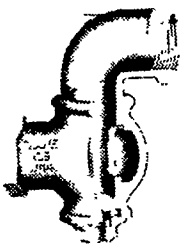
| Size Inches | Brass Screwed | | Size Inches | Iron Body | | | |
|---|---|---|---|---|---|---|---|
| | | | | Screwed | | Flanged F.&D. | |
| | No. 404 | No. 406 | | No. 398 | No. 400 | No. 401 | No. 403 |
| 1/2 | $ 8.78 | - | 1½ | $ 44.80 | $ 59.36 | $ 60.48 | $ 75.04 |
| 3/4 | 12.88 | $25.74 | 2 | 48.16 | 64.96 | 66.08 | 82.88 |
| 1 | 15.22 | 29.26 | 2½ | 56.00 | 76.16 | 78.40 | 98.56 |
| 1¼ | 19.90 | 36.28 | 3 | 72.80 | 104.16 | 99.68 | 131.04 |
| 1½ | 24.58 | 43.30 | 3½ | 101.92 | - | 138.88 | - |
| 2 | 43.30 | 66.70 | 4 | 118.72 | 168.00 | 160.16 | 209.44 |
| 2½ | 70.20 | - | 5 | - | - | 208.32 | 262.08 |
| 3 | 128.70 | - | 6 | - | - | 241.92 | 309.12 |
| | | | 8 | - | - | 302.40 | - |
| | | | 10 | - | - | 414.40 | - |
| | | | 12 | - | - | 604.80 | - |

## BRASS SWING JOINTS

150 POUNDS WATER, OIL, OR GAS, 200° F.

These swing joints are designed for use in making up adjustable connections in piping to tanks and other apparatus where permanently fixed connections cannot be made.

Basically, the joints consist of an ell-shaped plug held into the body with a nut and washer. All parts are brass to eliminate binding of the plug by corrosion. Operation is similar to that of an ordinary plug cock. The design of port and body assures free fluid flow; there is no restriction of port area regardless of the angle at which the plug is turned. No packing is used.



No. 300

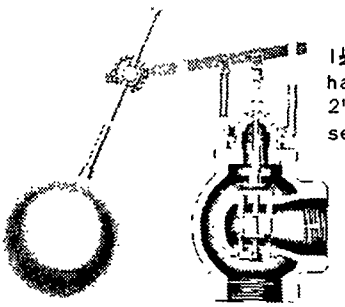
| No. 300 | Prices, Each | | |
|---|---|---|---|
| 1/4" | $9.86 | 3/4" | $18.36 |
| 3/8" | 10.30 | 1" | 26.88 |
| 1/2" | 12.10 | | |

## KLIPFEL TANK FLOAT VALVES

*Balanced Float Valves* are recommended to control the flow of water to open tanks where a perfectly tight seating valve is not required.

*Single Seated Float Valves* are designed to maintain the water level in open tanks where a tight closing valve is needed to prevent waste and overflow.

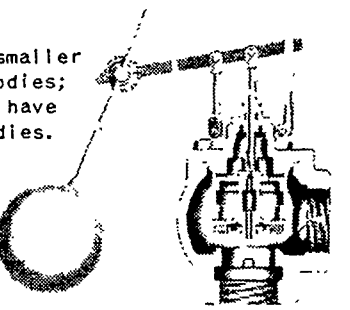
Balanced Type
*Globe or Angle*



No. 27, Angle
Cross Section

1½" size and smaller have bronze bodies; 2" and larger have semi-steel bodies.

Single Seated Type
*Globe or Angle*



No. 7, Angle
Cross Section

Standard Screwed PRICE EACH F.O.B. Hamilton, Ohio

| Size, Inches | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|
| No. 7 GLOBE | - | $72.00 | $80.00 | $90.00 | $100.00 | $120.00 | - | - |
| No. 7 ANGLE | - | 72.00 | 80.00 | 90.00 | 100.00 | 120.00 | - | - |
| No. 27 GLOBE | $60.00 | 60.00 | 70.00 | 76.00 | 90.00 | 100.00 | $130.00 | $160.00 |
| No. 27 ANGLE | 60.00 | 60.00 | 70.00 | 76.00 | 90.00 | 100.00 | 130.00 | 160.00 |
| Shpg.Wt. Pounds No. 7 | - | 14 | 15 | 16 | 17 | 43 | - | - |
| Shpg.Wt. Pounds No. 27 | 15 | 15 | 16 | 17 | 18 | 45 | 56 | 76 |

Note: Standard and Extra Heavy Flanged Float Valves in sizes 2" and larger also available. Contact your local Crane Branch or Crane Wholesaler for prices.

*All prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

## BRASS SOLDER-JOINT VALVES

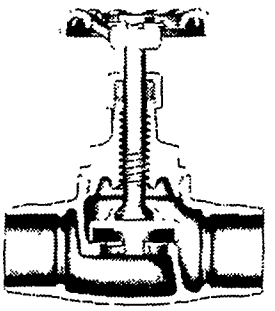
100 POUNDS STEAM - 150 POUNDS WATER, 200° F.

Solder-Joint Valves are recommended for steam or water lines. They are well suited for plumbing and heating systems, for low pressure steam and water piping in industrial plants, and for similar service.

*Important* - When valves are installed on steam lines, the solder used to make the joints must have a melting point that is high enough to remain unaffected by the temperature of the steam.

### GLOBE AND ANGLE VALVES

*Composition Discs*



No. 1310
Cross Section

No. 1310
Globe

No. 1310½
Globe
With R.H. Drain

No. 1311
Angle

Unless otherwise ordered, these valves are furnished with a No. 12 Low Pressure Disc, suitable for 150 pounds cold water or for hot water, 200° F. maximum temperature. When so ordered, the valves will be furnished with a No. 10 Low Pressure Disc suitable for 100 pounds steam.

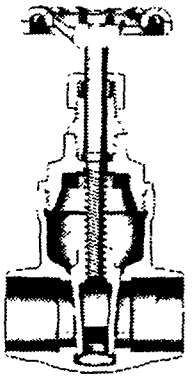
The No. 1310½ globe valve is regularly furnished with a right hand drain; orders must specify with "left hand drain" if left hand is wanted.

*For composition discs, refer to Page 19-4.*

### GATE VALVES

*Wedge Disc*

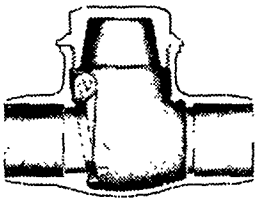
*Non-Rising Stem*



No. 1320
Cross Section

No. 1320

### SWING CHECK VALVES



No. 1303
Cross Section

No. 1303

Swing Check Valves may be used either in a horizontal position, or in a vertical position for upward flow.

**PRICES, EACH**

| Number Size, Inches | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| 1303 | - | $ 8.86 | $10.10 | $13.40 | $16.48 | $19.98 | $30.28 |
| 1310 | $ 6.60 | 8.04 | 11.12 | 15.24 | 20.60 | 26.78 | 41.20 |
| 1310½ | - | 8.86 | 12.36 | - | - | - | - |
| 1311 | 6.60 | 8.04 | 11.12 | 15.24 | 20.60 | 26.78 | 41.20 |
| 1320 | 8.86 | 10.30 | 12.16 | 14.42 | 19.36 | 24.72 | 35.02 |

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

*For solder-joint fittings, refer to Section 20.*

# STEEL NIPPLES

## Made from Welded Pipe Conforming to A.S.T.M. Specification A-120

### Standard Black Right Hand Nipples—Prices, Each

| Pipe Size, Inches | Length Inches, Close | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ⅛ | ¾ | $.12 | $.12 | $.12 | $.12 | $.14 | $.16 | $.18 | $.18 | $.20 | $.22 | $.24 | $.28 | $.30 | $.34 | $.36 | $.38 | $.42 |
| ¼ | ⅞ | .12 | .12 | .12 | .12 | .14 | .16 | .18 | .18 | .20 | .22 | .24 | .28 | .30 | .34 | .36 | .38 | .42 |
| ⅜ | 1 | .12 | .12 | .12 | .12 | .14 | .16 | .18 | .18 | .20 | .22 | .24 | .28 | .30 | .34 | .36 | .38 | .42 |
| ½ | 1⅛ | .12 | .12 | .12 | .12 | .14 | .16 | .18 | .18 | .20 | .22 | .24 | .32 | .36 | .38 | .42 | .44 | .48 |
| ¾ | 1¾ | .14 | — | .16 | .16 | .18 | .20 | .22 | .24 | .26 | .28 | .30 | .40 | .44 | .48 | .52 | .56 | .60 |
| 1 | 1½ | .22 | — | .24 | .24 | .26 | .28 | .30 | .34 | .36 | .40 | .42 | .56 | .62 | .68 | .72 | .78 | .84 |
| 1¼ | 1⅝ | .30 | — | .30 | .32 | .34 | .36 | .40 | .44 | .48 | .50 | .54 | .72 | .78 | .86 | .94 | 1.00 | 1.08 |
| 1½ | 1¾ | .34 | — | .36 | .38 | .38 | .44 | .48 | .52 | .56 | .60 | .66 | .84 | .92 | 1.00 | 1.10 | 1.20 | 1.28 |
| 2 | 2 | .46 | — | — | .48 | .52 | .56 | .62 | .68 | .72 | .80 | .86 | 1.08 | 1.20 | 1.32 | 1.44 | 1.56 | 1.68 |
| 2½ | 2½ | 1.08 | — | — | — | 1.18 | 1.22 | 1.30 | 1.40 | 1.46 | 1.54 | 1.64 | 1.78 | 1.96 | 2.16 | 2.36 | 2.54 | 2.74 |
| 3 | 2⅝ | 1.34 | — | — | — | 1.44 | 1.54 | 1.58 | 1.70 | 1.80 | 1.92 | 2.02 | 2.26 | 2.50 | 2.74 | 2.98 | 3.22 | 3.46 |
| 3½ | 2¾ | 1.92 | — | — | — | — | — | 2.06 | 2.12 | 2.26 | 2.44 | 2.64 | 2.98 | 3.26 | 3.60 | 3.88 | 4.22 | 4.56 |
| 4 | 2⅞ | 2.02 | — | — | — | — | — | 2.36 | 2.48 | 2.60 | 2.78 | 2.98 | 3.36 | 3.74 | 4.12 | 4.52 | 4.90 | 5.28 |
| 5 | 3 | 7.20 | — | — | — | — | — | — | 7.44 | 7.68 | 8.04 | 8.40 | 8.76 | 9.36 | 9.84 | 10.44 | 11.04 | 11.52 |
| 6 | 3⅛ | 8.64 | — | — | — | — | — | — | 9.12 | 9.36 | 9.72 | 10.08 | 10.92 | 11.52 | 12.12 | 12.72 | 13.32 | 13.92 |
| 8 | 3½ | 18.24 | — | — | — | — | — | — | — | 18.72 | 19.20 | 19.68 | 21.12 | 22.08 | 23.52 | 24.96 | 25.92 | 27.36 |
| 10 | 3⅞ | 24.00 | — | — | — | — | — | — | — | 24.48 | 25.44 | 26.40 | 27.84 | 29.76 | 31.68 | 33.60 | 35.52 | 36.96 |
| 12 | 4½ | 30.72 | — | — | — | — | — | — | — | — | — | 34.08 | 86.96 | 39.36 | 41.76 | 44.16 | 47.04 | 49.92 |

For Butt Nipples, Right Hand, Add 50% to price of close nipples.

### Standard Right and Left Nipples, 4-inches long—Prices, Each

| Size, Inches | ⅛x4 | ¼x4 | ⅜x4 | ½x4 | ¾x4 | 1x4 | 1¼x4 | 1½x4 | 2x4 | 2½x4 | 3x4 | 3½x4 | 4x4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black | $.34 | $.34 | $.34 | $.34 | $.46 | $.62 | $.80 | $.96 | $1.24 | $2.60 | $3.16 | $4.12 | $4.70 |
| Galvanized | .38 | .38 | .38 | .38 | .50 | .68 | .90 | 1.06 | 1.36 | 2.86 | 3.50 | 4.56 | 5.20 |

### Standard Galvanized Right Hand Nipples—Prices, Each

| Pipe Size, Inches | Length Inches, Close | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ⅛ | ¾ | $.12 | $.14 | $.14 | $.14 | $.16 | $.18 | $.20 | $.22 | $.24 | $.24 | $.26 | $.32 | $.34 | $.38 | $.40 | $.44 | $.46 |
| ¼ | ⅞ | .12 | .14 | .14 | .14 | .16 | .18 | .20 | .22 | .24 | .24 | .26 | .32 | .34 | .38 | .40 | .44 | .46 |
| ⅜ | 1 | .12 | .14 | .14 | .14 | .16 | .18 | .20 | .22 | .24 | .24 | .26 | .32 | .34 | .38 | .40 | .44 | .46 |
| ½ | 1⅛ | .12 | .14 | .14 | .14 | .16 | .18 | .20 | .22 | .24 | .24 | .26 | .36 | .40 | .42 | .46 | .50 | .54 |
| ¾ | 1⅜ | .16 | — | .18 | .18 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .44 | .50 | .54 | .58 | .64 | .68 |
| 1 | 1½ | .24 | — | .26 | .28 | .30 | .32 | .34 | .38 | .42 | .44 | .48 | .64 | .70 | .76 | .82 | .88 | .96 |
| 1¼ | 1⅝ | .32 | — | .34 | .36 | .38 | .42 | .46 | .50 | .54 | .58 | .62 | .80 | .88 | .96 | 1.04 | 1.14 | 1.22 |
| 1½ | 1¾ | .38 | — | .40 | .42 | .44 | .48 | .54 | .58 | .64 | .68 | .74 | .94 | 1.04 | 1.14 | 1.24 | 1.34 | 1.44 |
| 2 | 2 | .52 | — | — | .56 | .58 | .64 | .70 | .76 | .82 | .90 | .98 | 1.22 | 1.36 | 1.48 | 1.62 | 1.76 | 1.90 |
| 2½ | 2½ | 1.22 | — | — | — | 1.32 | 1.38 | 1.46 | 1.56 | 1.64 | 1.72 | 1.84 | 2.00 | 2.22 | 2.44 | 2.64 | 2.86 | 3.08 |
| 3 | 2⅝ | 1.52 | — | — | — | 1.62 | 1.72 | 1.78 | 1.92 | 2.02 | 2.16 | 2.26 | 2.54 | 2.80 | 3.08 | 3.34 | 3.62 | 3.88 |
| 3½ | 2¾ | 2.16 | — | — | — | — | — | 2.32 | 2.38 | 2.54 | 2.76 | 2.98 | 3.34 | 3.68 | 4.06 | 4.38 | 4.76 | 5.14 |
| 4 | 2⅞ | 2.26 | — | — | — | — | — | 2.64 | 2.78 | 2.92 | 3.14 | 3.34 | 3.78 | 4.22 | 4.64 | 5.08 | 5.50 | 5.94 |
| 5 | 3 | 8.10 | — | — | — | — | — | — | 8.38 | 8.64 | 9.04 | 9.46 | 9.86 | 10.54 | 11.08 | 11.74 | 12.42 | 12.96 |
| 6 | 3⅛ | 9.72 | — | — | — | — | — | — | 10.26 | 10.54 | 10.94 | 11.34 | 12.28 | 12.96 | 13.64 | 14.32 | 14.98 | 15.66 |

For Galvanized Butt Nipples, Right Hand, Add 50% to price of galvanized close nipples.

### Extra Strong Black Right Hand Nipples—Prices, Each

| Pipe Size, Inches | Length Inches, Close | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ⅛ | ¾ | $.16 | $.16 | $.18 | $.18 | $.20 | $.22 | $.24 | $.26 | $.28 | $.30 | $.32 | $.38 | $.42 | $.46 | $.50 | $.52 | $.56 |
| ¼ | ⅞ | .16 | .16 | .18 | .18 | .20 | .22 | .24 | .26 | .28 | .30 | .32 | .38 | .42 | .46 | .50 | .52 | .56 |
| ⅜ | 1 | .16 | .16 | .18 | .18 | .20 | .22 | .24 | .26 | .28 | .30 | .32 | .38 | .42 | .46 | .50 | .52 | .56 |
| ½ | 1⅛ | .16 | .16 | .18 | .18 | .20 | .22 | .24 | .26 | .28 | .30 | .32 | .44 | .48 | .52 | .58 | .62 | .66 |
| ¾ | 1¾ | .20 | — | .22 | .24 | .26 | .28 | .32 | .34 | .36 | .38 | .42 | .54 | .60 | .66 | .72 | .78 | .84 |
| 1 | 1½ | .30 | — | .32 | .34 | .36 | .38 | .42 | .46 | .50 | .54 | .58 | .78 | .86 | .92 | 1.00 | 1.08 | 1.16 |
| 1¼ | 1⅝ | .40 | — | .42 | .44 | .46 | .50 | .56 | .60 | .66 | .70 | .74 | .98 | 1.08 | 1.18 | 1.28 | 1.38 | 1.50 |
| 1½ | 1¾ | .48 | — | .50 | .52 | .54 | .60 | .66 | .72 | .78 | .84 | .90 | 1.14 | 1.26 | 1.38 | 1.52 | 1.64 | 1.76 |
| 2 | 2 | .64 | — | — | .68 | .72 | .78 | .86 | .92 | 1.00 | 1.08 | 1.18 | 1.48 | 1.66 | 1.82 | 1.98 | 2.14 | 2.32 |
| 2½ | 2½ | 1.48 | — | — | — | 1.62 | 1.68 | 1.78 | 1.92 | 2.02 | 2.12 | 2.24 | 2.44 | 2.70 | 2.98 | 3.24 | 3.50 | 3.76 |
| 3 | 2⅝ | 1.84 | — | — | — | 1.98 | 2.12 | 2.18 | 2.34 | 2.48 | 2.64 | 2.78 | 3.10 | 3.44 | 3.76 | 4.10 | 4.42 | 4.76 |
| 3½ | 2¾ | 2.64 | — | — | — | — | — | 2.84 | 2.90 | 3.10 | 3.36 | 3.64 | 4.10 | 4.48 | 4.96 | 5.34 | 5.80 | 6.28 |
| 4 | 2⅞ | 2.78 | — | — | — | — | — | 3.24 | 3.40 | 3.56 | 3.82 | 4.10 | 4.62 | 5.14 | 5.68 | 6.20 | 6.74 | 7.26 |
| 5 | 3 | 9.90 | — | — | — | — | — | — | 10.24 | 10.56 | 11.06 | 11.56 | 12.04 | 12.88 | 13.54 | 14.36 | 15.18 | 15.84 |
| 6 | 3⅛ | 11.88 | — | — | — | — | — | — | 12.54 | 12.88 | 13.36 | 13.86 | 15.02 | 15.84 | 16.66 | 17.50 | 18.32 | 19.14 |

### Standard Tank Right Hand Nipples, 6-Inches Long—Prices, Each

| Size, Inches | ¼x6 | ⅜x6 | ½x6 | ¾x6 | 1x6 | 1¼x6 | 1½x6 | 2x6 | 2½x6 | 3x6 |
|---|---|---|---|---|---|---|---|---|---|---|
| Black | $.60 | $.60 | $.60 | $.76 | $1.08 | $1.38 | $1.66 | $2.20 | $4.14 | $5.12 |
| Galvanized | .66 | .66 | .66 | .86 | 1.20 | 1.54 | 1.84 | 2.44 | 4.62 | 5.72 |

STANDARD and EXTRA STRONG Seamless Steel nipples are also available; for prices contact your local Crane Branch or Crane Wholesaler.

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

*May 4, 1955*
*Superseding December 13, 1954*

## PLUGS

CORED SOLID
SQUARE HEAD PLUGS

COUNTERSUNK PLUG

CORED

SOLID

BAR PLUGS

### PRICES, EACH

| Size Inches | Square Head - Right Hand | | | | Countersunk Right Hand | |
|---|---|---|---|---|---|---|
| | Cored | | Solid | | | |
| | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | - | - | $ .14 | $ .24 | - | - |
| 1/4 | - | - | .14 | .24 | $ .26 | $ .42 |
| 3/8 | - | - | .14 | .24 | .26 | .42 |
| 1/2 | - | - | .14 | .24 | .26 | .42 |
| 3/4 | $ .18 | $ .30 | .34 | .58 | .34 | .58 |
| 1 | .20 | .32 | .38 | .66 | .38 | .66 |
| 1¼ | .28 | .46 | .42 | .72 | .42 | .72 |
| 1½ | .36 | .62 | .56 | .96 | .56 | .96 |
| 2 | .52 | .90 | .78 | 1.32 | .78 | 1.32 |
| 2½ | .90 | 1.52 | 1.12 | 1.90 | 1.12 | 1.90 |
| 3 | 1.26 | 2.14 | 1.82 | 3.10 | 1.82 | 3.10 |
| 3½ | 1.94 | 3.30 | 2.82 | 4.76 | 3.20 | 5.44 |
| 4 | - | - | - | - | 5.44 | 9.22 |

### PRICES, EACH

| Size Inches | Bar Plugs - Right Hand | | | |
|---|---|---|---|---|
| | Cored | | Solid | |
| | Black | Galv. | Black | Galv. |
| 4 | $2.24 | $3.78 | $3.40 | $5.82 |
| 5 | 3.78 | 6.40 | 5.62 | 9.50 |
| 6 | 4.46 | 7.56 | 6.80 | 11.64 |
| 8 | 8.54 | 14.56 | 11.64 | 19.40 |

### MATERIALS

| Style | | Steel | Malleable Iron | Cast Iron |
|---|---|---|---|---|
| Square Head | Cored | | | All sizes |
| | Solid | ⅛ to ½" | | ¾" and larger |
| Bar | Cored | | | All sizes |
| | Solid | | | All sizes |
| Countersunk | | ¼" | ⅜ to 1¼" | 1½" and larger |

## BUSHINGS

OUTSIDE HEXAGON

INSIDE HEXAGON

FACE

ECCENTRIC

Prices shown apply only to regular items. A tabulation of regular sizes and the materials from which they are made - cast iron, malleable iron, or steel - is shown in the table below.

### PRICES, EACH

| Size, Inches | | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexagon | Black | $.26 | $.26 | $.28 | $.34 | $.38 | $ .46 | $ .56 | $ .66 | $ .92 | $1.26 | $1.98 | $2.54 | $ 4.40 | $ 5.28 | $ 9.90 |
| | Galv. | .40 | .40 | .44 | .48 | .58 | .70 | .84 | 1.00 | 1.38 | 1.88 | 2.98 | 3.86 | 6.60 | 7.92 | 14.74 |
| Face | Black | .40 | .40 | .44 | .52 | .62 | .80 | 1.00 | 1.34 | 1.76 | 2.32 | 3.86 | 4.62 | 7.04 | 10.56 | 28.60 |
| | Galv. | .60 | .60 | .66 | .80 | .92 | 1.18 | 1.52 | 2.02 | 2.64 | 3.52 | 5.84 | 6.94 | 10.56 | 15.84 | 42.90 |
| Eccentric | Black | - | - | - | - | - | 1.32 | 1.46 | 1.98 | 3.30 | 4.62 | 6.16 | 8.14 | 11.00 | 14.52 | - |
| | Galv. | - | - | - | - | - | 1.98 | 2.20 | 2.98 | 4.96 | 6.94 | 9.36 | 12.10 | 16.50 | 22.00 | - |

### BUSHINGS - REGULAR SIZES

| HEXAGON | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ¼x⅛ c | ¾x½ b | 1 x ⅜ a | 1¼x ⅜ a | 1½x ⅜ a | 2 x ½ a | 2 x1 a | 3 x1¼ a | 3½x2 a | 4x2½ a | 5x3½ a | 6x3½ a | 8x4 a | | |
| ⅜x¼ b | ¾x⅜ b | 1 x ¼ a | 1¼x ¼ a | 1½x ¼ a | 2 x ⅜ a | 2 x ¾ a | 3 x1 a | 3½x1½ a | 4x2 a | 5x3 a | 6x3 a | 8x3½ a | | |
| ⅜x⅛ b | ¾x¼ | 1 x ⅛ a | 1½x1¼ b | 2 x1½ b | 2 x ¼ a | 2 x ½ a | 3 x ¾ a | 3½x1¼ a | 4x1½ a | 5x2½ a | 6x2½ a | 8x3 a | | |
| ½x⅜ b | ¾x⅛ | 1¼x1 b | 1½x1 | 2 x1¼ | 2½x2 b | 3 x2½ | 3 x ½ a | 3½x1 a | 4x1¼ a | 5x2 a | 6x2 a | | | |
| ½x¼ b | 1 x¾ b | 1¼x ¾ | 1½x ¾ a | 2 x1 a | 2½x1½ a | 3 x2 a | 3½x3 | 4 x3½ | 4x1 a | 6x5 | 8x6 a | | | |
| ½x⅛ b | 1 x½ | 1¼x ½ a | 1½x ½ a | 2 x¾ a | 2½x1¼ a | 3 x1½ a | 3½x2½ a | 4 x3 | 5x4 | 6x4 a | 8x5 a | | | |
| FACE | | | | | | | | | | | | | | |
| ¼x⅛ c | ½x¼ c | ¾x ¼ c | 1 x ¼ b | 1½x1¼ b | 2 x1½ b | 2 x ½ b | 3 x2½ b | 3½x3 b | 4x3½ b | 5x4 b | 6x5 b | 8x6 b | | |
| ⅜x¼ c | ½x⅛ c | 1 x ¾ b | 1¼x1 b | 1½x1 b | 2 x1¼ b | 2½x2 b | 3 x2 b | 3½x2½ b | 4x3 b | 5x3 | 6x4 | | | |
| ⅜x⅛ c | ¾x½ c | 1 x ½ b | 1¼x ¾ b | 1½x ¾ b | 2 x1 b | 2½x1½ b | 3 x1½ b | 3½x2 b | 4x2½ b | | 6x3 | | | |
| ½x⅜ c | ¾x⅜ c | 1 x ⅜ b | 1¼x ½ b | 1½x ½ b | 2 x ¾ b | 2½x1¼ b | 3 x1¼ b | | 4x2 | | | | | |
| ECCENTRIC | | | | | | | | | | | | | | |
| 1¼x¾ | 1½x½ | 2 x ¾ | 2½x1¼ | 2½x ½ | 3 x1¼ | 3½x2½ | 3½x1¼ | 4 x2 | 4x1 | 5x3 | 6x4 | 8x2 | | |
| 1¼x½ | 2 x1¼ | 2 x ½ | 2½x1 | 3 x2 | 3 x1 | 3½x2 | 4 x3 | 4 x1½ | 5x4 | 5x2½ | 6x3 | | | |
| 1½x¾ | 2 x1 | 2½x1½ | 2½x ¾ | 3 x1½ | 3 x ¾ | 3½x1½ | 4 x2½ | 4 x1¼ | 5x3½ | 5x2 | 6x2½ | | | |

a - Indicates sizes made with inside hexagon; other sizes have outside hexagon.
b - Indicates sizes made of malleable iron. c - Indicates sizes made of steel.
Sizes not indicated by "b" or "c" are made of cast iron.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



March 22, 1954
Superseding Sept. 28, 1953

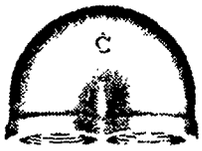
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U. S. A.

# 125-POUND ROUGH BRASS FITTINGS

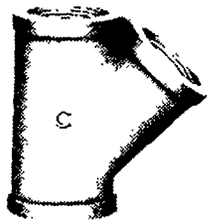
125 POUNDS STEAM - 175 POUNDS COLD WATER OR GAS - 200 POUNDS COLD OIL

*Screwed Ends - Air Tested*



RETURN BENDS - CLOSE PATTERN
RIGHT HAND

| Size Inches | C. to C. Inches | Price Each |
|---|---|---|
| 1/2 | 1 | $1.72 |
| 3/4 | 1¼ | 2.44 |
| 1 | 1½ | 3.42 |
| 1¼ | 1¾ | 5.76 |
| 1½ | 2⅜ | 9.00 |
| 2 | 2⅝ | 13.96 |



45° Y-BENDS

| Size Inches | Price Each | Size Inches | Price Each |
|---|---|---|---|
| 3/8 | $1.80 | 1¼ | $7.74 |
| 1/2 | 2.08 | 1½ | 10.80 |
| 3/4 | 2.70 | 2 | 18.00 |
| 1 | 4.68 | | |

REDUCERS

| Size Inches | Price Each | Size Inches | Price Each |
|---|---|---|---|
| ¼ x ⅛ | $ .62 | 1¼ x ¾ | $3.06 |
| ⅜ x ¼ | .62 | 1½ x 1¼ | 3.88 |
| ⅜ x ⅛ | .62 | 1½ x 1 | 3.88 |
| ½ x ⅜ | .78 | 1½ x ¾ | 4.24 |
| ½ x ¼ | .78 | 2 x 1½ | 5.76 |
| ¾ x ½ | 1.14 | 2 x 1¼ | 5.76 |
| ¾ x ⅜ | 1.14 | 2 x 1 | 6.30 |
| ¾ x ¼ | 1.26 | 2½ x 2 | 9.90 |
| 1 x ¾ | 1.90 | 3 x 2½ | 12.60 |
| 1 x ½ | 1.90 | 3 x 2 | 12.60 |
| 1¼ x 1 | 3.06 | 4 x 3 | 27.00 |

RETURN BENDS - OPEN PATTERN
RIGHT HAND

| Size Inches | C. to C. Inches | Price Each |
|---|---|---|
| 1/2 | 1½ | $2.26 |
| 3/4 | 2 | 3.24 |
| 1 | 2½ | 4.50 |
| 1¼ | 3 | 6.48 |
| 1½ | 3½ | 10.36 |
| 2 | 4 | 14.40 |

HEXAGON LOCKNUTS

| Size Inches | Price Each | Size Inches | Price Each |
|---|---|---|---|
| 1/8 | $ .28 | 1¼ | $1.22 |
| 1/4 | .28 | 1½ | 1.58 |
| 3/8 | .28 | 2 | 2.52 |
| 1/2 | .46 | 2½ | 4.50 |
| 3/4 | .54 | 3 | 7.20 |
| 1 | .82 | 4 | 14.40 |

CAPS

| Size Inches | Price Each | Size Inches | Price Each |
|---|---|---|---|
| 1/8 | $ .44 | 1¼ | $1.80 |
| 1/4 | .44 | 1½ | 2.44 |
| 3/8 | .44 | 2 | 4.14 |
| 1/2 | .58 | 2½ | 7.66 |
| 3/4 | .76 | 3 | 11.70 |
| 1 | 1.18 | 4 | 22.50 |

ROUND
FLOOR FLANGES

| FLOOR FLANGES RIGHT HAND | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
| | Diameter, Inches | 2½ | 2½ | 3 | 3 | 4 | 5 | 5 | 5 |
| | Prices, Each | $1.36 | $1.36 | $1.58 | $2.16 | $3.38 | $3.88 | $5.40 | $7.20 |

## ROUGH BRASS PLUGS AND BUSHINGS

CORED
SQUARE HEAD PLUGS

SOLID
SQUARE HEAD PLUGS

COUNTERSUNK
PLUG

BUSHING
OUTSIDE HEXAGON

BUSHING
* INSIDE HEXAGON

BUSHING
FACE

PLUGS - PRICES, EACH

| Size Inches | Square Head Cored | Square Head Solid | Counter-sunk |
|---|---|---|---|
| 1/8 | | $ .38 | |
| 1/4 | | .38 | |
| 3/8 | | .38 | |
| 1/2 | $ .60 | .60 | $ .60 |
| 3/4 | .68 | .72 | .72 |
| 1 | .90 | 1.08 | 1.08 |
| 1¼ | 1.36 | 1.62 | 1.62 |
| 1½ | 1.72 | 2.26 | 2.26 |
| 2 | 2.70 | 3.78 | 3.78 |
| 2½ | 4.50 | 6.66 | 6.66 |
| 3 | 7.20 | 10.80 | 10.80 |
| 4 | 13.50 | 26.10 | 26.10 |

BUSHINGS - PRICES, EACH

HEXAGON BUSHINGS

| Size | Price | Size | Price | Size | Price |
|---|---|---|---|---|---|
| ¼ x ⅛ | $ .36 | 1¼x1 | $1.62 | 2½x2 | $6.12 |
| ⅜ x ¼ | .36 | 1¼x ¾ | 1.62 | * 2½x1½ | 6.12 |
| ⅜ x ⅛ | .36 | * 1¼x ½ | 1.94 | * 2½x1¼ | 7.38 |
| ½ x ⅜ | .46 | * 1¼x ⅜ | 1.94 | * 2½x1 | 7.38 |
| ½ x ¼ | .46 | 1½x1¼ | 2.08 | 3 x2½ | 9.00 |
| ½ x ⅛ | .54 | 1½x1 | 2.08 | * 3 x2 | 9.00 |
| ¾ x ½ | .64 | * 1½x ¾ | 2.52 | * 3 x1½ | 10.80 |
| ¾ x ⅜ | .64 | * 1½x ½ | 2.52 | * 3 x1¼ | 10.80 |
| ¾ x ¼ | .76 | 2 x1½ | 3.06 | 4 x3 | 19.80 |
| 1 x ¾ | .96 | 2 x1¼ | 3.06 | * 4 x2½ | 19.80 |
| 1 x ½ | .96 | * 2 x1 | 3.70 | * 4 x2 | 23.40 |
| * 1 x ⅜ | 1.16 | * 2 x ¾ | 3.70 | * 4 x1½ | 23.40 |
| * 1 x ¼ | 1.16 | * 2 x ½ | 3.70 | | |

FACE BUSHINGS

| Size | Price |
|---|---|
| ¼ x ⅛ | $ .76 |
| ⅜ x ¼ | .76 |
| ½ x ⅜ | .86 |
| ½ x ¼ | .86 |
| ¾ x ½ | 1.18 |
| 1 x ¾ | 1.78 |
| 1 x ½ | 1.78 |
| 1¼x1 | 2.38 |
| 1½x1¼ | 2.98 |
| 2 x1½ | 3.78 |
| 2 x1¼ | 3.78 |

*Indicates bushings made with inside hexagon.

*Prices are subject to change without notice*

## RED BRASS NIPPLES

CLOSE NIPPLE

LONG NIPPLE

STANDARD - RIGHT HAND - PRICES, EACH

| Pipe Size Inches | Length Inches Close | Length - Inches | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Close | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 |
| 1/8 | 3/4 | $ .20 | $.20 | $ .22 | $ .24 | $ .26 | $ .30 | $ .32 | $ .34 | $ .36 | $ .38 | $ .42 |
| 1/4 | 7/8 | .24 | .24 | .26 | .30 | .32 | .36 | .40 | .46 | .50 | .54 | .60 |
| 3/8 | 1 | .26 | .30 | .34 | .40 | .44 | .50 | .54 | .60 | .66 | .70 | .80 |
| 1/2 | 1⅛ | .28 | .34 | .40 | .48 | .54 | .62 | .68 | .76 | .84 | .92 | 1.00 |
| 3/4 | 1⅜ | .38 | - | .48 | .58 | .68 | .80 | .90 | 1.00 | 1.10 | 1.18 | 1.30 |
| 1 | 1½ | .60 | - | .70 | .82 | .96 | 1.08 | 1.20 | 1.34 | 1.48 | 1.62 | 1.76 |
| 1¼ | 1⅝ | .88 | - | 1.04 | 1.22 | 1.40 | 1.60 | 1.78 | 1.96 | 2.16 | 2.34 | 2.54 |
| 1½ | 1¾ | 1.10 | - | 1.22 | 1.46 | 1.62 | 1.86 | 2.10 | 2.32 | 2.56 | 2.80 | 2.96 |
| 2 | 2 | 1.62 | - | - | 1.92 | 2.16 | 2.44 | 2.74 | 3.08 | 3.38 | 3.66 | 3.96 |
| 2½ | 2½ | 3.48 | - | - | - | 4.08 | 4.54 | 5.12 | 5.70 | 6.28 | 6.86 | 7.44 |
| 3 | 2⅝ | 5.24 | - | - | - | 5.82 | 6.40 | 7.22 | 8.02 | 8.84 | 9.66 | 10.46 |
| 3½ | 2¾ | 9.30 | - | - | - | - | - | 11.64 | 12.80 | 13.96 | 15.12 | 16.28 |
| 4 | 2⅞ | 10.46 | - | - | - | - | - | 12.80 | 14.24 | 15.70 | 17.16 | 18.60 |
| 5 | 3 | 18.60 | - | - | - | - | - | - | 22.10 | 24.42 | 26.74 | 29.08 |
| 6 | 3⅛ | 24.42 | - | - | - | - | - | - | 30.24 | 32.56 | 34.90 | 37.22 |

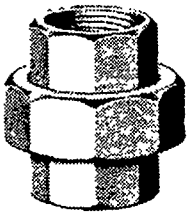
## BRASS GROUND JOINT UNIONS AND UNION ELBOWS

*Ground Joint - no gasket is required*

### 125-POUND

*Air Tested*

125 POUNDS STEAM
200 POUNDS COLD WATER,
OIL OR GAS

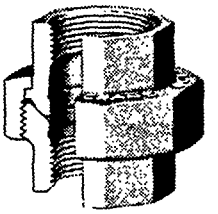


125-POUND
Octagon Ends

### GOVERNMENT PATTERN

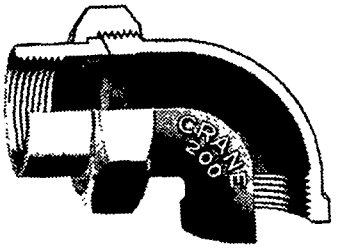
*Air Tested*

200 POUNDS STEAM - 400 POUNDS COLD WATER, OIL, OR GAS



No. 523½
Octagon Ends

### UNION ELBOW




No. 524½
90° UNION ELBOW

PRICES, EACH

| Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 125-POUND UNION | $1.84 | $1.84 | $1.84 | $2.22 | $3.06 | $4.06 | $5.94 | $ 7.02 | $10.80 | $19.80 | $30.60 |
| No. 523½ UNION | 2.26 | 2.26 | 2.26 | 2.88 | 4.06 | 5.40 | 7.56 | 9.72 | 15.30 | 24.66 | 42.12 |
| No. 524½ ELBOW | 3.88 | 3.88 | 3.88 | 5.22 | 7.02 | 10.26 | 14.40 | 18.00 | 27.00 | - | - |

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



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Printed in U. S. A.

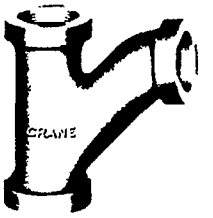
# CAST IRON DRAINAGE FITTINGS

*Screwed Ends*

***No. 1020 90° Y-BRANCH**

Tee Pattern

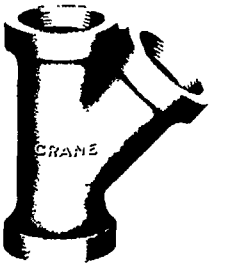
| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $1.38 | $1.78 |
| 1½ | 1.78 | 2.34 |
| 2 | 3.00 | 3.88 |
| 2½ | 5.68 | 7.38 |
| 3 | 7.46 | 9.72 |
| 4 | 12.48 | 16.20 |
| 5 | 21.06 | 27.38 |
| 6 | 32.40 | 42.12 |
| Reducing Sizes | | |
| 1½x1½x1¼<br>1½x1¼x1¼ | $1.94 | $2.52 |
| 2 x2 x1½<br>2 x2 x1¼<br>2 x1½x2<br>2 x1½x1½ | 3.32 | 4.30 |
| 2½x2½x2 | 6.24 | 8.10 |
| 3 x3 x2<br>3 x3 x1½<br>3 x3 x1¼ | 8.10 | 10.54 |
| 4 x4 x3<br>4 x4 x2<br>4 x4 x1½ | 13.78 | 17.82 |
| 5 x5 x4 | 23.50 | 32.40 |
| 6 x6 x5<br>6 x6 x4 | 34.02 | 44.56 |



***No. 1022 90° Y-BRANCH**

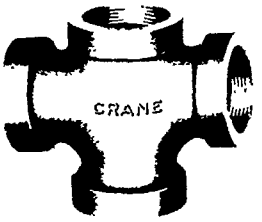
Long Turn, Tee Pattern

| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $2.34 | $3.08 |
| 1½ | 2.84 | 3.72 |
| 2 | 5.02 | 6.48 |
| 2½ | 9.08 | 11.18 |
| 3 | 13.44 | 17.50 |
| 4 | 22.68 | 29.16 |
| Reducing Sizes | | |
| 1½x1½x1¼ | $3.24 | $4.22 |
| 2 x2 x1½<br>2 x2 x1¼<br>2 x1½x2 | 5.34 | 6.96 |
| 2½x2½x2 | 9.88 | 12.96 |
| 3 x3 x2½<br>3 x3 x2<br>3 x3 x1½ | 14.58 | 18.96 |
| 4 x4 x3<br>4 x4 x2<br>4 x4 x1½ | 25.92 | 34.02 |



**No. 1028 45° Y-BRANCH**

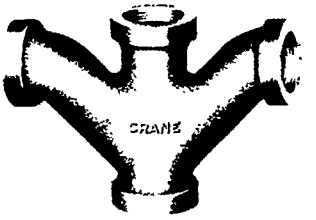
| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $1.70 | $2.26 |
| 1½ | 2.44 | 3.24 |
| 2 | 4.06 | 5.26 |
| 2½ | 7.20 | 9.32 |
| 3 | 9.48 | 12.32 |
| 4 | 17.82 | 23.50 |
| 5 | 26.74 | 34.84 |
| 6 | 42.94 | 55.90 |
| 8 | 103.68 | 134.46 |
| 10 | 157.14 | 204.12 |
| Reducing Sizes | | |
| 1½x1½x1¼ | $2.68 | $3.48 |
| 2 x2 x1½<br>2 x2 x1¼<br>2 x1½x1½ | 4.46 | 5.76 |
| 2½x2½x2<br>2½x2½x1½ | 7.62 | 9.96 |
| 3 x3 x2½<br>3 x3 x2<br>3 x3 x1½ | 10.70 | 13.94 |
| 4 x4 x3<br>4 x4 x2<br>4 x4 x1½ | 19.44 | 25.28 |
| 5 x5 x4 | 29.98 | 38.88 |
| 6 x6 x5<br>6 x6 x4 | 46.98 | 58.32 |
| 8 x8 x6<br>8 x8 x4 | 113.40 | 147.42 |



***No. 1024 90° DOUBLE Y-BRANCH**

Tee Pattern

| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $2.52 | $3.24 |
| 1½ | 3.00 | 3.88 |
| 2 | 4.46 | 5.76 |
| 3 | 12.16 | 15.80 |
| 4 | 22.68 | 29.16 |
| Reducing Sizes | | |
| 1½x1¼ | $3.32 | $4.30 |
| 2 x1½<br>2 x1¼ | 4.86 | 6.32 |
| 3 x2<br>3 x1½ | 13.78 | 17.82 |
| 4 x2<br>4 x1½ | 25.12 | 32.40 |

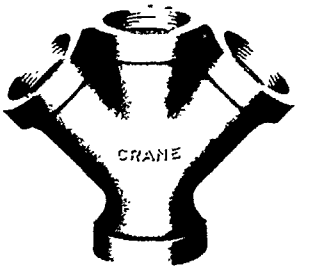


***No. 1026 90° DOUBLE Y-BRANCH**

Long Turn, Tee Pattern

| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $3.72 | $4.86 |
| 1½ | 4.46 | 5.68 |
| 2 | 7.30 | 9.40 |
| 3 | 19.44 | 25.12 |
| 4 | 34.84 | 45.36 |
| Reducing Sizes | | |
| 1½x1¼ | $4.86 | $6.32 |
| 2 x1½<br>2 x1¼ | 8.10 | 10.54 |
| 3 x2 | 21.06 | 27.54 |

*Inlets pitched ¼-inch per foot.



**No. 1030 45° DOUBLE Y-BRANCH**

| Size Inches | Black Each | Galv. Each |
|---|---|---|
| 1¼ | $3.56 | $4.70 |
| 1½ | 4.54 | 5.92 |
| 2 | 6.32 | 8.10 |
| 2½ | 10.54 | 13.78 |
| 3 | 15.88 | 20.58 |
| 4 | 29.16 | 38.08 |
| Reducing Sizes | | |
| 2x1½ | $6.96 | $9.08 |
| 3x2 | 17.50 | 22.68 |

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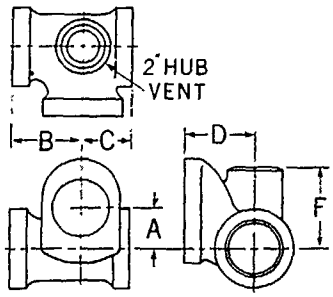
# CRANE-HULBERT DRAINAGE FITTINGS FOR WALL HUNG CLOSET BOWLS

*With Screwed Ends for Iron Pipe — 2-inch Hub Vents — Black or Galvanized*

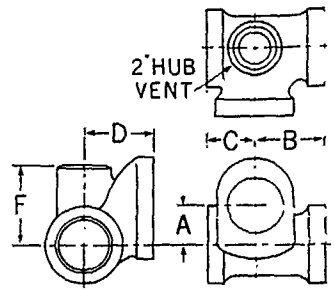
## Short Turn Single Fittings




**21-100** Right Hand

**21-100**
Crane *Hulbert* cast iron right hand short turn single fitting for threaded iron pipe.

**21-101**
Crane *Hulbert* cast iron left hand short turn single fitting for threaded iron pipe.




**21-101** Left Hand

TAPPINGS AND DIMENSIONS, 4x4-INCH SIZE ONLY

| Tapping No. | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 5T | 3¾ | 5¼ | 3½ | 5¼ | 0 | 6 |
| 7T | 3 | 5¼ | 3½ | 5¼ | 0 | 6 |

Nos. 21-100 and 21-101, 4x4" Short Turn Crane *Hulbert* fittings, are furnished with tapping No. 5T (for blowout bowls), and No. 7T (for siphon jet bowls). They are intended for installation next to the stack and should be used only where space will not permit the use of a Long Turn "Hulbert" fitting.

TAPPINGS AND DIMENSIONS, 5x4-INCH SIZE ONLY

| Tapping No. | 2T | 3T | 4T | 5T | 6T | 7T | 8T | 9T | 10T | 11T |
|---|---|---|---|---|---|---|---|---|---|---|
| "A" Inches | 4⅞ | 4½ | 4⅛ | 3¾ | 3⅜ | 3 | 2⅝ | 2¼ | 1⅞ | 1½ |

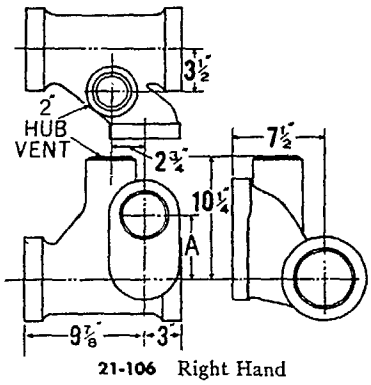
*Note:* 5x4" Short Turn fittings may be used in batteries; use only Tapping Nos. 7T to 11T inclusive for siphon jet bowls.

**21-116**

**21-116**
Cast iron pitch coupling for threaded pipe. Furnished with Right Hand or Right and Left Hand threads, as specified.

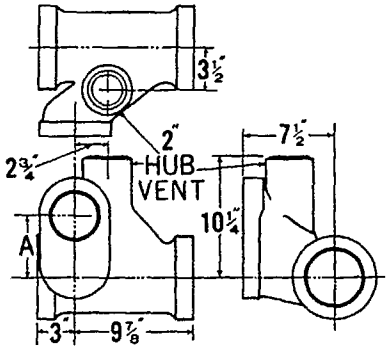
"B" DIMENSIONS: 2⅝" for 4-inch, 2 13/16" for 5-inch.

## Long Turn Single Fittings




**21-106** Right Hand

Crane *Hulbert* cast iron right hand long turn single fitting for threaded iron pipe.




**21-107** Left Hand

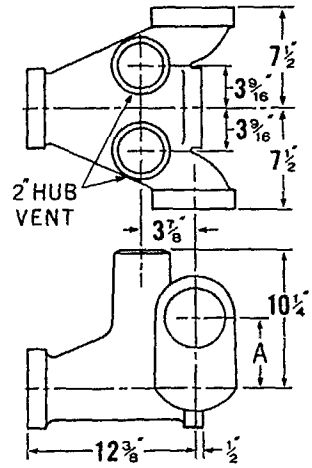
Crane *Hulbert* cast iron left hand long turn single fitting for threaded iron pipe.

TAPPINGS AND DIMENSIONS, 4x4-INCH AND 5x4-INCH LONG TURN FITTINGS

| Tapping No. | 1T | 2T | 3T | 4T | 5T | 6T | 7T | 8T | 9T | 10T | 11T | 12T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "A" Inches | 5¼ | 4⅞ | 4½ | 4⅛ | 3¾ | 3⅜ | 3 | 2⅝ | 2¼ | 1⅞ | 1½ | 1⅛ |

Use only Tapping Nos 7T to 12T inclusive for siphon jet bowls.

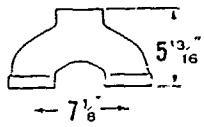
## Long Turn Double Fittings




**21-112**
Double

Crane *Hulbert* cast iron long turn double fitting for threaded iron pipe.

## Double Vent Fitting




**21-115**
Inlet and Outlet Tapped 2-inch American Standard Taper Pipe Threads

PRICES, EACH

| Catalog Number | 4x4-Inch Black | 4x4-Inch Galv. | Shpg. Wt. Pounds | 5x4-Inch Black | 5x4-Inch Galv. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| 21-100 | $32.14 | $39.16 | 34 | On application | | 45 |
| 21-101 | 32.14 | 39.16 | 34 | On application | | 45 |
| 21-106 | 57.86 | 71.18 | 51 | On application | | 60 |
| 21-107 | 57.86 | 71.18 | 51 | On application | | 60 |
| 21-112 | 80.76 | 102.80 | 84 | $96.82 | $124.44 | 100 |
| 21-116 | 11.88 | 16.28 | 7½ | On application | | 10¼ |
| 21-115 | Black.... $7.86 | | | Galvanized.... $8.92 | | 9½ |

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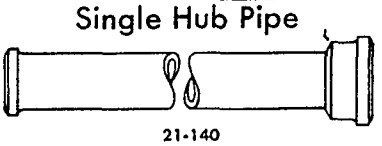
# CAST IRON SOIL PIPE AND FITTINGS

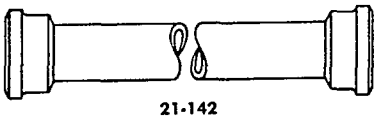
**MANUFACTURER'S LIST PRICES ARE SHOWN**
**For local prices refer to your Crane Branch or Crane Wholesaler.**

## Single Hub Pipe



21-140
Standard, Service, Medium or Extra Heavy

## Double Hub Pipe



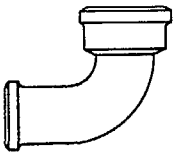
21-142
Standard, Service, Medium or Extra Heavy

LIST PRICES, PER 100 FEET

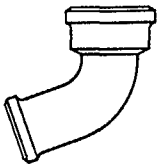
| Size Inches | 21-140 Single Hub Standard | Service | Medium | Extra Heavy | 21-142 Double Hub Standard | Service | Medium | Extra Heavy |
|---|---|---|---|---|---|---|---|---|
| 2 | $ 30.00 | $ 33.00 | $ 35.00 | $ 42.00 | $ 32.00 | $ 35.00 | $ 38.00 | $ 45.00 |
| 3 | 38.00 | 44.00 | 46.00 | 66.00 | 41.00 | 48.00 | 50.00 | 70.00 |
| 4 | 46.00 | 53.00 | 60.00 | 80.00 | 50.00 | 58.00 | 65.00 | 86.00 |
| 5 | 66.00 | 84.00 | 88.00 | 110.00 | 72.00 | 89.00 | 92.00 | 116.00 |
| 6 | 80.00 | 96.00 | 108.00 | 136.00 | 88.00 | 104.00 | 116.00 | 146.00 |
| 8 | 150.00 | 165.00 | 180.00 | 200.00 | 170.00 | 185.00 | 200.00 | 228.00 |
| 10 | 250.00 | 280.00 | 300.00 | 360.00 | 270.00 | 300.00 | 320.00 | 400.00 |
| 12 | 360.00 | 390.00 | 400.00 | 500.00 | 400.00 | 430.00 | 440.00 | 560.00 |
| 15 | 560.00 | 610.00 | 640.00 | 800.00 | 620.00 | 670.00 | 700.00 | 880.00 |

*When ordering, specify the catalog number and type desired.*

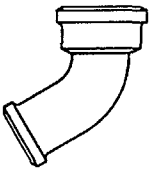
## Single Hub Bends



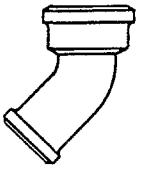
21-145
Quarter



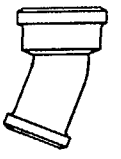
21-146
Fifth



21-147
Sixth



21-148
Eighth

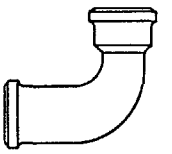


21-149
Sixteenth

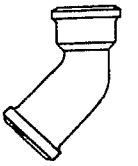
LIST PRICES, EACH

| Size | 21-145 Standard | 21-145 Extra Heavy | 21-146 Standard | 21-146 Extra Heavy | 21-147 Standard | 21-147 Extra Heavy | 21-148 Standard | 21-148 Extra Heavy | 21-149 Standard | 21-149 Extra Heavy |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | $ .40 | $ .55 | $ .45 | $ .60 | $ .40 | $ .45 | $ .35 | $ .40 | $ .35 | $ .40 |
| 3 | .55 | .70 | .80 | 1.00 | .60 | .75 | .45 | .55 | .50 | .70 |
| 4 | .80 | 1.00 | .80 | 1.00 | .75 | .90 | .65 | .80 | .60 | .75 |
| 5 | 1.05 | 1.25 | 1.05 | 1.25 | 1.05 | 1.25 | .80 | 1.00 | .80 | 1.00 |
| 6 | 1.45 | 1.85 | 1.30 | 1.55 | 1.30 | 1.55 | 1.05 | 1.25 | 1.00 | 1.25 |
| 8 | 4.00 | 5.00 | 4.00 | 5.00 | 4.00 | 5.00 | 4.00 | 5.00 | 4.00 | 5.00 |
| 10 | 5.90 | 6.50 | 5.95 | 6.50 | 5.90 | 6.50 | 5.90 | 6.50 | 5.90 | 6.50 |
| 12 | 8.65 | 10.80 | 8.65 | 10.80 | 8.65 | 10.80 | 8.65 | 10.80 | 8.65 | 10.80 |
| 15 | 16.80 | 21.00 | 16.80 | 21.00 | 16.80 | 21.00 | 16.80 | 21.00 | 16.80 | 21.00 |

### Reducing Bends



21-150
Quarter

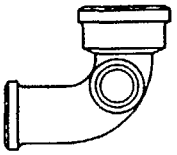


21-151
Eighth

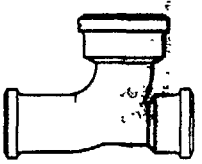
LIST PRICES, EACH

| Size Inches | 21-150 or 21-151 Standard | Extra Heavy |
|---|---|---|
| 3 x 2 | $ .90 | $1.10 |
| 4 x 2 | 1.25 | 1.50 |
| 4 x 3 | 1.30 | 1.60 |
| 5 x 4 | 1.90 | 2.20 |
| 6 x 4 | 2.40 | 3.00 |

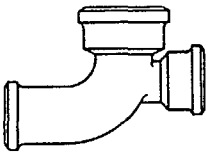
## Quarter Bends with Inlet



21-152
Side Inlet



21-153
Low Heel Inlet



21-154
High Heel Inlet

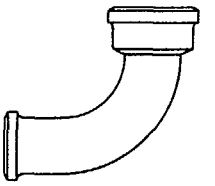
LIST PRICES, EACH — ANY TYPE

| Size, Inches Pipe | Inlet | Standard | Extra Heavy | Size, Inches Pipe | Inlet | Standard | Extra Heavy |
|---|---|---|---|---|---|---|---|
| 2 | 2 | $1.25 | $1.55 | 5 | 4 | $3.70 | $ 4.60 |
| 3 | 2 | 1.25 | 1.55 | 6 | 2 | 4.30 | 5.40 |
| | 3 | 1.25 | 1.55 | | 3 | 4.30 | 5.40 |
| 4 | 2 | 1.25 | 1.55 | | 4 | 4.30 | 5.40 |
| | 3 | 3.10 | 3.85 | 8 | 2 | 8.60 | 10.80 |
| | 4 | 3.10 | 3.85 | | 3 | 8.60 | 10.80 |
| 5 | 2 | 3.70 | 4.60 | | 4 | 8.60 | 10.80 |
| | 3 | 3.70 | 4.60 | | | | |

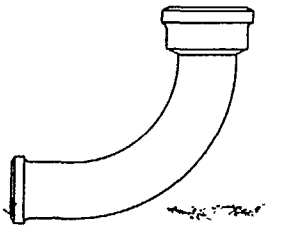
## Short and Long Sweep Quarter Bends

LIST PRICES, EACH

| Size Inches | Standard | Extra Heavy | Add For Foot Rest |
|---|---|---|---|
| **21-156, Short Sweep** | | | |
| 2 | $ .60 | $ .75 | $ .75 |
| 3 | .90 | 1.10 | 1.00 |
| 4 | 1.15 | 1.40 | 1.50 |
| 5 | 1.55 | 1.85 | 2.00 |
| 6 | 2.50 | 3.10 | 2.50 |
| 8 | 4.80 | 6.00 | 4.00 |
| 10 | 6.80 | 8.50 | 6.00 |
| **21-157, Long Sweep** | | | |
| 2 | $ .75 | $ .90 | $ .75 |
| 3 | .95 | 1.15 | 1.00 |
| 4 | 1.25 | 1.55 | 1.50 |
| 5 | 1.70 | 2.00 | 2.00 |
| 6 | 2.75 | 3.40 | 2.50 |
| 8 | 6.00 | 7.50 | 4.00 |
| 10 | 8.00 | 10.00 | 6.00 |
| 12 | 14.50 | 18.00 | 10.00 |
| 15 | 28.00 | 35.00 | 15.00 |



21-156, Short Sweep



21-157, Long Sweep

*All prices are subject to change without notice.*

*For Shipping Weights, refer to Page 21-18.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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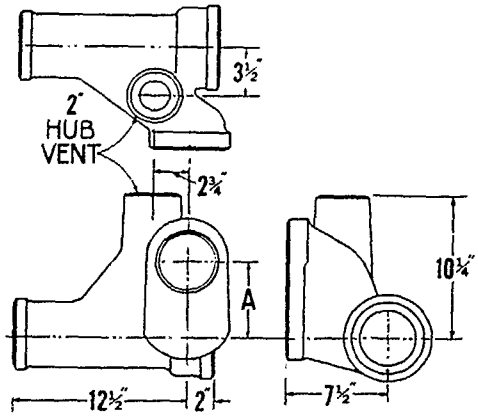
# CRANE-HULBERT DRAINAGE FITTINGS FOR WALL HUNG CLOSET BOWLS

*With Hub and Spigot Ends for Soil Pipe - 2-inch Hub Vents - Black or Galvanized*




21-120

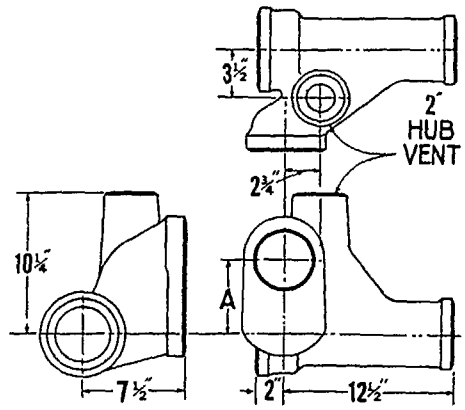
## Long Turn Single Fittings

**21-120**

Crane *Hulbert* cast iron right hand long turn single fitting with hub and spigot ends for 4-inch soil pipe.

**21-121**

Crane *Hulbert* cast iron left hand long turn single fitting with hub and spigot ends for 4-inch soil pipe.




21-121

TAPPINGS AND DIMENSIONS, 4 x 4-INCH SIZE ONLY

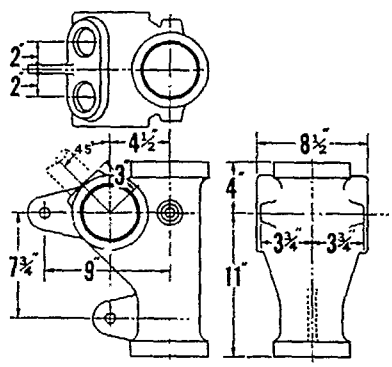
| Tapping No. | 1T | 2T | 3T | 4T | 5T | 6T | 7T | 8T | 9T | 10T | 11T | 12T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "A", Inches | 5¼ | 4⅞ | 4½ | 4⅛ | 3¾ | 3⅜ | 3 | 2⅝ | 2¼ | 1⅞ | 1½ | 1⅛ |

Use only Tapping Nos. 7T to 12T inclusive for siphon jet bowls.

## Double Vertical Stack Fittings

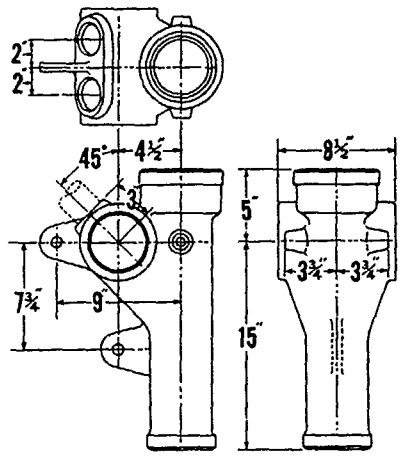
*With 2-inch I.P.S. Female Vents*
*For Rapidway Bowls Installed Back to Back on Stack*

**These fittings are designed to conserve space where bathrooms are located directly over each other. Bowls are installed back to back on 4-inch stack. They can be installed in walls 10 inches face to face.**



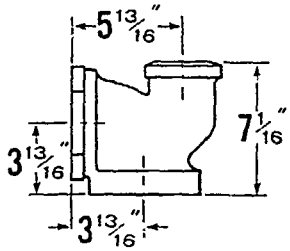

**21-126** Screwed Ends

Cast iron double vertical stack drainage fitting for 4" iron pipe.




**21-128** Hub and Spigot Ends

Cast iron double vertical stack fitting with hub and spigot for 4" soil pipe.




21-135

## Drainage Elbow

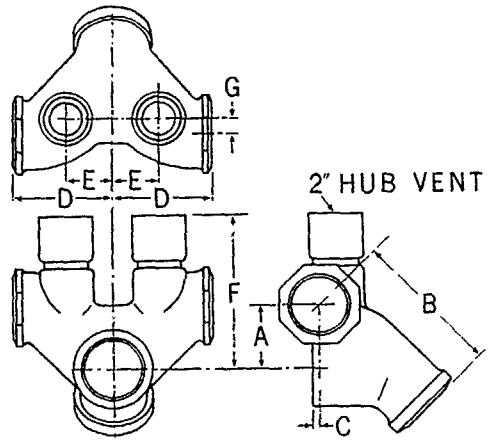
*With 2-inch Hub Vent*

**21-135**

This elbow has an octagon inlet so the fitting outlet can be placed vertically or 45° to the right or left. Inlet and outlet are tapped for 4" iron pipe.

## Double Near Stack Fitting

*Octagon Inlets—2-inch Hub Vents*




21-132

Cast iron double near stack drainage fitting for threaded iron pipe.

| Size | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 4x4" | 4 15/16" | 11" | 7/16" | 7½" | 3 9/16" | 11¾" | 1 3/16" |
| 5x4" | 5¼" | 11½" | ⅛" | 7½" | 3 9/16" | 12" | 1 3/16" |

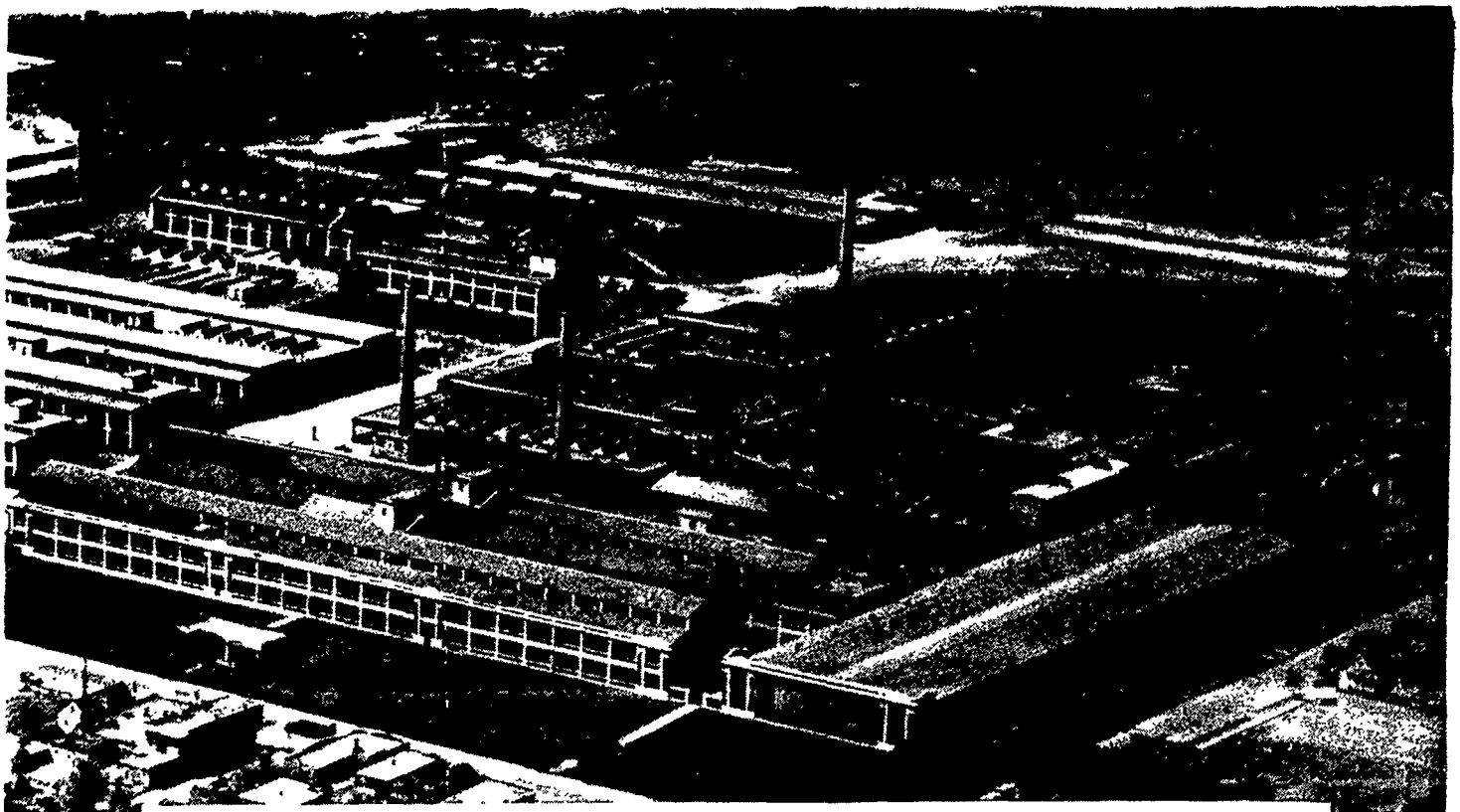
PRICES, EACH

| Catalog Number | Size Inches | Black Each | Galv. Each | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 21-120 | 4 x 4 | $49.46 | $62.48 | 52 |
| 21-121 | 4 x 4 | 49.46 | 62.48 | 52 |
| 21-126 | 4 x 4 | On application | | 48 |
| 21-128 | 4 x 4 | On application | | 48 |
| 21-132 | 4 x 4 | On application | | 53 |
| | 5 x 4 | On application | | 60 |
| 21-135 | 4 | 12.82 | 17.12 | 17 |

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.



# The Plants Behind the Products You Choose from this Catalog

Most products listed in this Catalog are made in the great Crane Chicago Works pictured above. Perhaps you know Crane Chicago Works is the world's largest factory of its kind. Here is a completely integrated operation for the production of valves, fittings, and piping specialties—from raw materials to ready-to-use equipment—in all kinds and types in general use today. More than 30,000 individual piping items are made at Crane Chicago Works. Part of the facilities of the Crane Chattanooga Plant are also used to make some of these products.

To you, a piping user, Crane Co.'s mighty production capacity is important. For whether you use much or little equipment, the factory is where your supply begins.

### Where Quality Sets the Pace for Mass Production

More important to you is that Crane mass production is quality-maintained production. For example, an ordinary pipe fitting made by Crane is produced with the same scientific care as a Crane alloy steel valve.

Quality first for bigger value to the customer has been the policy of Crane Co. from its humble beginning in 1855. Intensified constantly through the years for almost a century, that policy alone could justify the ever-growing customer confidence in Crane Quality Products.

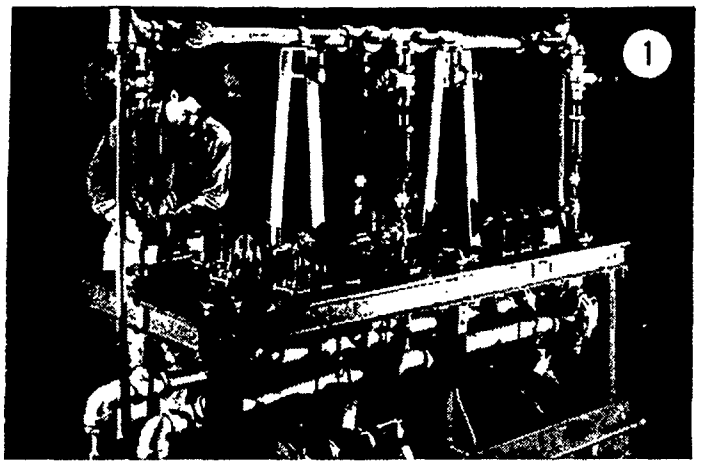
### Quality—the Foundation of Crane Co.'s Leadership

With each passing year, the foundation for Crane Quality grows firmer and broader. In control of raw materials, in product design, engineering, manufacturing, and testing techniques, Crane Co. is ever adding to its vast experience.

Not in years alone, but by outstanding achievements, can the leadership of Crane be measured best. Nowhere else in the industry are new piping products born in such an elaborate background as Crane Engineering Laboratories. Nowhere are there better and more complete facilities than those which Crane Co. has for efficient product engineering and manufacturing.

How you are assured of consistently high quality and value in Crane products—how these products are made available where you need them—and how Crane Co. meets the responsibilities of world leadership in supplying piping equipment needs, is evident in the following pages.

# Engineering and Development

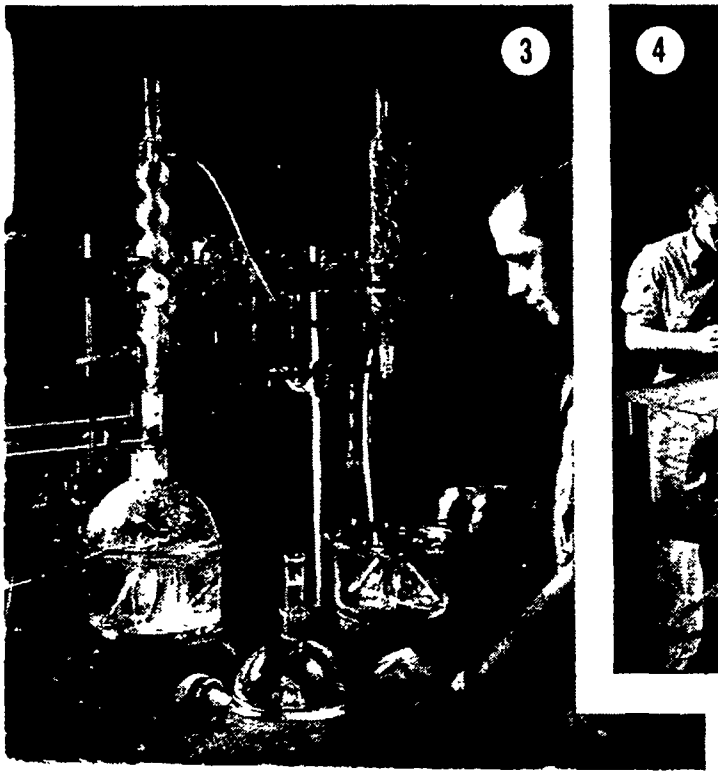


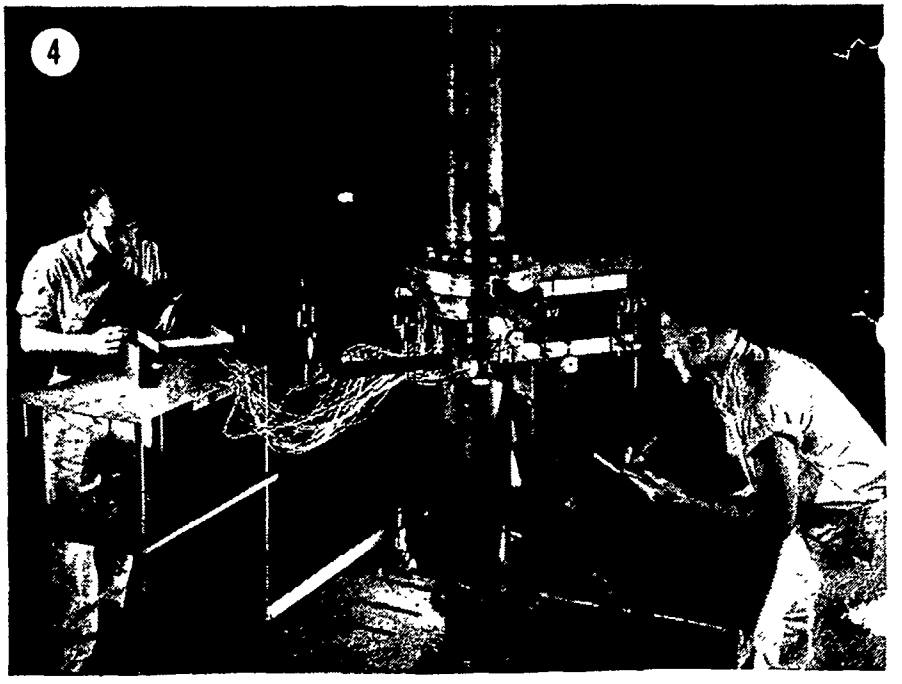
1 ***Brass Valve Studies***—How good is a brass valve? This multiple testing machine, simulating actual service conditions, gives Crane Engineers the facts. It helps evaluate not only the relative merits of valve constructions, but also to determine durability and service life of materials in stem and centerpiece combination. It is invaluable in study and development of thread profiles, clearances, alternative materials, etc. Such testing enables the constant improvement of performance and dependability.

2 ***Creep Research***—The study of elevated tensile properties of metals was started by Crane in 1908, and since 1924, Crane has designed and built its own tensile creep testing equipment. Photo shows battery of individually controlled test furnaces operating in constant-temperature room. They permit direct telescopic creep measurement throughout test runs lasting thousands of hours, and up to the point of rupture. The vast data accumulated by Crane Engineers on elevated temperature properties of metals, has accurately guided Crane in supplying valves and fittings for the ever higher temperatures and pressures demanded by industry.

3 ***Double-Check for Facts on Corrosion***—Crane doesn't depend on either laboratory findings or field tests alone for facts on corrosion. One complements the other, with Crane tests guiding field research for most effective results, and often eliminating excessive cost and great hazard to the customer.

4 ***Stress Analysis***—Theoretical calculations, alone, of high load stresses on piping equipment may be good, but not good enough for Crane Engineering Laboratories. Photo shows typical simulated service test of 1500-Pound Crane Pressure-Seal line joint, giving accurate measurement of actual strains, deflections and movements on every part of the design.





Rec'd Nov. 8, 1958

# CRANE

## NET PRICE SCHEDULE FF4
## OCTOBER 27, 1958

### FORGED STEEL FLANGES

This Net Price Schedule cancels:

Net Prices on Forged Steel Flanges in
Net Price Schedule FF3 dated May 8, 1958

List prices on Forged Steel Flanges,
Pages 294 and 295, Catalog No. 53.

Table on "Boring of Welding Neck Flanges",
Page 298, Catalog No. 53.

CATALOG NUMBER 53


**CRANE CO.**

836 S. Michigan Avenue Chicago 5, Illinois


PRICES SUBJECT TO CHANGE WITHOUT NOTICE


Printed in U. S. A.

# Materials

## Flanges

Forged Steel Flanges are Crane Carbon Steel, and are furnished faced, drilled, and spot faced.

Flanges in the 300-pound and higher pressure classes, made of Crane No. 4 Carbon-Molybdenum or Crane No. 5 Chrome-Molybdenum Forged Steel, can be furnished especially to order; prices on application.

# Extra Charges For Special Features

## Flanges

**Heat Treating:** When so ordered, 150 and 300-Pound Forged Carbon Steel Flanges can be furnished heat treated (normalized or annealed) to conform to ASTM Specification A-105; prices on request.

**Galvanizing:** Price on application.

For other extra charges on Forged Steel Flanges, refer to pages 12 to 14 of this price schedule.

# Forged Steel Flanges

## 150-Pound Pressure Class

(With 1/16-inch Raised Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 556 Screwed | No. 554 Slip-On Welding | No. 568 Welding Neck* | No. 572 Cranelap | No. 556½ Blind | No. 558½ Screwed | No. 554½ Slip-On Welding |
| ½ | 3½ | $ 2.32 | $ 1.93 | $ 3.53 | $ 2.32 | $ 3.23 | | |
| ¾ | 3⅞ | 2.32 | 1.93 | 3.53 | 2.32 | 3.23 | $ 5.45 | $ 4.68 |
| 1 | 4¼ | 2.32 | 1.93 | 3.53 | 2.32 | 3.23 | 5.45 | 4.68 |
| 1¼ | 4⅝ | 2.60 | 2.19 | 3.53 | 2.60 | 3.23 | 6.23 | 5.20 |
| 1½ | 5 | 2.85 | 2.46 | 3.53 | 2.85 | 3.23 | 6.76 | 5.97 |
| 2 | 6 | 3.23 | 2.71 | 3.53 | 3.23 | 3.50 | 7.28 | 6.23 |
| 2½ | 7 | 3.75 | 3.23 | 4.25 | 3.75 | 4.15 | 8.32 | 7.28 |
| 3 | 7½ | 4.41 | 3.75 | 4.81 | 4.41 | 4.93 | 9.62 | 8.32 |
| 3½ | 8½ | 5.97 | 4.93 | 6.53 | 5.97 | 6.76 | 12.49 | 10.92 |
| 4 | 9 | 5.97 | 4.93 | 6.53 | 5.97 | 6.76 | 12.49 | 10.92 |
| 5 | 10 | 9.10 | 7.80 | 10.22 | 9.10 | 10.67 | 18.47 | 16.65 |
| 6 | 11 | 9.10 | 7.80 | 10.22 | 9.10 | 10.67 | 18.47 | 16.65 |
| 8 | 13½ | 14.15 | 12.21 | 18.95 | 14.15 | 17.63 | 33.84 | 29.21 |
| 10 | 16 | 19.37 | 16.71 | 26.68 | 19.37 | 24.29 | 46.00 | 39.91 |
| 12 | 19 | 30.08 | 28.93 | 43.55 | 30.08 | 34.13 | 57.87 | 50.05 |
| 14 | 21 | 55.52 | 50.95 | 68.44 | 68.44 | 63.11 | | 97.35 |
| 16 | 23½ | 69.21 | 63.50 | 86.62 | 86.62 | 73.38 | | 121.71 |
| 18 | 25 | | 86.70 | 115.38 | 115.38 | 104.59 | On app. | 152.13 |
| 20 | 27½ | On app. | 103.82 | 151.79 | 151.79 | 125.51 | | 182.57 |
| 24 | 32 | | 166.21 | 199.14 | 199.14 | 189.04 | | 256.75 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# 300-Pound Pressure Class

(With 1/16-inch Raised Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 291E Screwed | No. 294E Slip-On Welding | No. 296E Welding Neck* | No. 496E Cranelap | No. 297E Blind | No. 292E Screwed | No. 290E Slip-On Welding |
| ½ | 3¾ | $ 3.37 | $ 2.79 | $ 4.69 | $ 3.37 | $ 4.92 | | |
| ¾ | 4⅝ | 3.37 | 2.79 | 4.69 | 3.37 | 4.92 | $ 7.16 | $ 6.15 |
| 1 | 4⅞ | 3.37 | 2.79 | 4.69 | 3.37 | 4.92 | 7.16 | 6.15 |
| 1¼ | 5¼ | 3.74 | 3.17 | 4.69 | 3.74 | 4.92 | 8.20 | 6.84 |
| 1½ | 6⅛ | 4.12 | 3.56 | 4.69 | 4.12 | 4.92 | 8.89 | 7.85 |
| 2 | 6½ | 4.40 | 3.93 | 4.69 | 4.40 | 5.32 | 9.58 | 8.20 |
| 2½ | 7½ | 5.44 | 4.69 | 5.62 | 5.44 | 6.31 | 10.94 | 9.58 |
| 3 | 8¼ | 5.81 | 5.25 | 6.38 | 5.81 | 7.50 | 12.66 | 10.94 |
| 3½ | 9 | 8.64 | 7.14 | 10.33 | 8.64 | 12.24 | 16.42 | 14.37 |
| 4 | 10 | 8.64 | 7.14 | 10.33 | 8.64 | 12.24 | 16.42 | 14.37 |
| 5 | 11 | 15.41 | 13.53 | 17.96 | 15.41 | 21.74 | 33.20 | 29.08 |
| 6 | 12½ | 15.41 | 13.53 | 17.96 | 15.41 | 21.74 | 33.20 | 29.08 |
| 8 | 15 | 22.56 | 21.35 | 27.85 | 22.56 | 32.06 | 54.77 | 47.16 |
| 10 | 17½ | 30.51 | 29.25 | 39.00 | 35.10 | 44.37 | 74.94 | 64.28 |
| 12 | 20½ | 52.65 | 50.15 | 68.73 | 61.85 | 63.71 | 93.96 | 80.65 |
| 14 | 23 | | 103.38 | 123.13 | 123.13 | 119.53 | | 149.42 |
| 16 | 25½ | | 129.10 | 156.60 | 156.60 | 139.26 | | 187.46 |
| 18 | 28 | On app. | 175.72 | 208.60 | 208.60 | 197.24 | On app. | 234.74 |
| 20 | 30½ | | 212.18 | 274.36 | 274.36 | 239.10 | | 282.56 |
| 24 | 36 | | 337.71 | 359.83 | 359.83 | 353.21 | | 396.67 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# Forged Steel Flanges

## 400-Pound Pressure Class

(With ¼-inch Male or 3/16-inch Female Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 651E Screwed | No. 694E Slip-On Welding | No. 656E Welding Neck* | No. 664E Cranelap | No. 657E Blind | No. 658E Screwed | No. 693E Slip-On Welding |
| 4 | 10 | $19.38 | $17.69 | $28.40 | $19.38 | $21.73 | $33.71 | $30.87 |
| 5 | 11 | 30.97 | 28.23 | 41.33 | 30.97 | 35.43 | 54.26 | 45.90 |
| 6 | 12½ | 30.97 | 28.23 | 41.33 | 30.97 | 35.43 | 54.26 | 45.90 |
| 8 | 15 | 36.78 | 33.53 | 53.52 | 36.78 | 50.10 | 69.79 | 56.33 |
| 10 | 17½ | On | 42.38 | 75.41 | 75.41 | 69.20 | 95.28 | 80.61 |
| 12 | 20½ | app. | 66.01 | 116.79 | 116.79 | 90.68 | 137.25. | 124.68 |
| 14 | 23 | | 126.05 | 169.76 | 169.76 | 153.55 | | 208.10 |
| 16 | 25½ | | 157.57 | 215.47 | 215.47 | 192.51 | | 260.15 |
| 18 | 28 | On app. | 211.12 | 287.32 | 287.32 | 255.97 | On app. | 352.62 |
| 20 | 30½ | | 253.34 | 361.23 | 361.23 | 307.17 | | 423.16 |
| 24 | 36 | | 405.41 | 496.31 | 496.31 | 426.95 | | 595.57 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# 600-Pound Pressure Class

(With ¼-inch Male or 3/16-inch Female Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 856E Screwed | No. 854E Slip-On Welding | No. 855E Welding Neck* | No. 862E Cranelap | No. 858E Blind | No. 857E Screwed | No. 853E Slip-On Welding |
| ½ | 3¾ | $ 5.88 | $ 5.31 | $12.36 | $ 5.88 | $ 6.88 | | |
| ¾ | 4⅝ | 5.88 | 5.31 | 12.36 | 5.88 | 6.88 | $10.35 | $ 9.41 |
| 1 | 4⅞ | 6.17 | 5.61 | 12.36 | 6.17 | 6.88 | 10.35 | 9.41 |
| 1¼ | 5¼ | 6.73 | 6.17 | 12.36 | 6.73 | 7.41 | 11.76 | 10.83 |
| 1½ | 6⅛ | 7.29 | 6.73 | 12.36 | 7.29 | 7.67 | 13.18 | 11.76 |
| 2 | 6½ | 8.42 | 7.29 | 12.36 | 8.42 | 7.94 | 13.65 | 12.72 |
| 2½ | 7½ | 9.54 | 8.42 | 14.62 | 9.54 | 9.53 | 16.01 | 14.61 |
| 3 | 8¼ | 11.78 | 10.67 | 17.43 | 11.78 | 11.12 | 18.37 | 16.48 |
| 3½ | 9 | 18.55 | 16.87 | 27.00 | 18.55 | 20.67 | 32.05 | 29.23 |
| 4 | 10¾ | 20.25 | 18.55 | 29.80 | 20.25 | 22.80 | 35.35 | 32.52 |
| 5 | 13 | 33.74 | 30.93 | 47.81 | 33.74 | 37.12 | 66.01 | 60.35 |
| 6 | 14 | 33.74 | 30.93 | 47.81 | 33.74 | 37.12 | 66.01 | 60.35 |
| 8 | 16½ | 49.50 | 45.56 | 68.07 | 49.50 | 54.62 | 95.72 | 87.70 |
| 10 | 20 | On | 70.89 | 104.08 | 104.08 | 84.87 | 149.49 | 136.75 |
| 12 | 22 | app. | 97.34 | 141.79 | 141.79 | 102.38 | 179.19 | 164.11 |
| 14 | 23¾ | | 158.92 | 188.80 | 188.80 | 166.45 | | 234.31 |
| 16 | 27 | | 211.69 | 255.57 | 255.57 | 221.34 | | 312.06 |
| 18 | 29¼ | On app. | 264.47 | 312.80 | 312.80 | 276.86 | On app. | 390.35 |
| 20 | 32 | | 317.87 | 378.28 | 378.28 | 332.34 | | 468.10 |
| 24 | 37 | | 476.84 | 557.59 | 557.59 | 498.82 | | 701.89 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# Forged Steel Flanges

## 900-Pound Pressure Class

(With ¼-inch Male or 3/16-inch Female Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 1266E Screwed | No. 1294E Slip-On Welding | No. 1265E Welding Neck* | No. 1262E Cranelap | No. 1267E Blind | No. 1263E Screwed | No. 1295E Slip-On Welding |
| 3 | 9½ | $19.88 | $18.02 | $21.74 | $19.88 | $21.74 | $32.92 | $29.82 |
| 4 | 11½ | 33.55 | 30.44 | 36.66 | 33.55 | 36.66 | 53.44 | 47.85 |
| 5 | 13¾ | 64.63 | 58.42 | 71.10 | 64.63 | 71.10 | 112.51 | 101.32 |
| 6 | 15 | 64.63 | 58.42 | 71.10 | 64.63 | 71.10 | 112.51 | 101.32 |
| 8 | 18½ | | 112.01 | 119.26 | 119.26 | 119.91 | 172.64 | 154.19 |
| 10 | 21½ | On app. | 147.60 | 168.68 | 168.68 | 170.00 | 252.38 | 226.69 |
| 12 | 24 | | 200.33 | 226.02 | 226.02 | 226.69 | 336.09 | 302.46 |
| 14 | 25¼ | | 305.71 | 419.82 | 419.82 | 305.08 | | 409.09 |
| 16 | 27¾ | | 368.76 | 520.04 | 520.04 | 371.90 | | 496.09 |
| 18 | 31 | On app. | 520.04 | 693.40 | 693.40 | 522.57 | On app. | 697.19 |
| 20 | 33¾ | | 639.83 | 869.91 | 869.91 | 640.45 | | 854.77 |
| 24 | 41 | | 1197.71 | 1575.94 | 1575.94 | 1206.53 | | 1608.72 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# 1500-Pound Pressure Class

(With ¼-inch Male or 3/16-inch Female Face)*

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 1556E Screwed | No. 1594E Slip-On Welding | No. 1565E Welding Neck* | No. 1562E Cranelap | No. 1557E Blind | No. 1558E Screwed | No. 1595E Slip-On Welding |
| ½ | 4¾ | $ 9.62 | $ 8.69 | $16.77 | $ 9.62 | $10.55 | | |
| ¾ | 5⅛ | 9.62 | 8.69 | 16.77 | 9.62 | 10.55 | $14.90 | $13.65 |
| 1 | 5⅞ | 9.62 | 8.69 | 16.77 | 9.62 | 10.55 | 14.90 | 13.65 |
| 1¼ | 6¼ | 9.62 | 8.69 | 16.77 | 9.62 | 10.55 | 14.90 | 13.65 |
| 1½ | 7 | 11.17 | 9.93 | 16.77 | 11.17 | 11.78 | 17.69 | 16.14 |
| 2 | 8½ | 15.53 | 13.65 | 16.77 | 15.53 | 16.77 | 23.60 | 21.74 |
| 2½ | 9⅝ | 19.88 | 18.02 | 21.74 | 19.88 | 21.74 | 32.92 | 29.82 |
| 3 | 10½ | 26.10 | 23.60 | 28.58 | 23.60 | 28.58 | 41.01 | 37.28 |
| 4 | 12¼ | 41.01 | 37.28 | 44.74 | 37.28 | 44.74 | 65.26 | 59.66 |
| 5 | 14¾ | 98.83 | 90.13 | 100.08 | 90.13 | 100.08 | 142.98 | 131.16 |
| 6 | 15½ | 98.83 | 90.13 | 100.08 | 90.13 | 100.08 | 142.98 | 131.16 |
| 8 | 19 | | 145.62 | 175.28 | 145.62 | 175.28 | 253.05 | 233.27 |
| 10 | 23 | On | 241.85 | 339.37 | 339.37 | 339.37 | 407.93 | 374.31 |
| 12 | 26½ | app. | 364.42 | 508.76 | 508.76 | 508.76 | 577.95 | 529.84 |
| 14 | 29½ | | On app. | On app. | On app. | On app. | On app. | On app. |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges and for special facings on all flanges except Cranelap.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

# Forged Steel Flanges

## 300-Pound Pressure Class

(With Female, Tongue, Groove, or Ring Type Joint Face)

| Size of Pipe Inches | Outside Diameter of Flange Inches | Straight | | | | | Concentric Reducing† | |
|---|---|---|---|---|---|---|---|---|
| | | No. 291E Screwed | No. 294E Slip-On Welding | No. 296E Welding Neck* | No. 496E Cranelap | No. 297E Blind | No. 292E Screwed | No. 290E Slip-On Welding |
| ½ | 3¾ | $10.08 | $ 9.51 | $16.56 | | $11.08 | | |
| ¾ | 4⅝ | 10.08 | 9.51 | 16.56 | | 11.08 | $14.55 | $13.61 |
| 1 | 4⅞ | 10.37 | 9.81 | 16.56 | | 11.08 | 14.55 | 13.61 |
| 1¼ | 5¼ | 10.93 | 10.37 | 16.56 | | 11.61 | 15.96 | 15.03 |
| 1½ | 6⅛ | 11.49 | 10.93 | 16.56 | | 11.87 | 17.38 | 15.96 |
| 2 | 6½ | 12.62 | 11.49 | 16.56 | | 12.14 | 17.85 | 16.92 |
| 2½ | 7½ | 13.74 | 12.62 | 18.82 | | 13.73 | 20.21 | 18.81 |
| 3 | 8¼ | 15.98 | 14.87 | 21.63 | | 15.32 | 22.57 | 20.68 |
| 3½ | 9 | 24.25 | 22.57 | 32.70 | | 26.37 | 37.75 | 34.93 |
| 4 | 10 | 24.25 | 22.57 | 32.70 | | 26.37 | 37.75 | 34.93 |
| 5 | 11 | 33.69 | 31.32 | 42.53 | | 39.09 | 53.81 | 46.42 |
| 6 | 12½ | 33.69 | 31.32 | 42.53 | | 39.09 | 53.81 | 46.42 |
| 8 | 15 | 41.30 | 38.34 | 55.44 | | 52.44 | 69.92 | 60.54 |
| 10 | 17½ | 51.59 | 48.05 | 76.95 | | 71.59 | 94.65 | 81.83 |
| 12 | 20½ | 76.64 | 70.74 | 116.14 | | 92.42 | 133.68 | 122.83 |
| 14 | 23 | | 131.05 | 183.46 | | 170.49 | | 204.26 |
| 16 | 25½ | | 163.48 | 215.61 | | 200.27 | | 255.59 |
| 18 | 28 | On app. | 214.44 | 300.12 | | 278.93 | On app. | 340.80 |
| 20 | 30½ | | 254.57 | 367.11 | | 332.81 | | 406.77 |
| 24 | 36 | | 395.86 | 477.89 | | 419.44 | | 565.81 |

*Refer to pages 12, 13, and 14 for borings on Welding Neck Flanges.

†Prices apply to all reductions; the outside diameter governs the price. For prices on Concentric Reducing Welding Neck, Eccentric Reducing Screwed, and Eccentric Reducing Slip-On Welding Flanges, refer to page 13.

Extra Charges on Forged Steel Flanges

are Shown on the Following Pages.

# Forged Steel Flanges

## Extra Charges

### Special Facings*

| Nominal Size of Flange Inches | | ½ to 24 |
|---|---|---|
| Large Female**<br>Large Tongue**<br>Small Tongue**<br>Large Groove**<br>Small Groove**<br>Ring Joint** | 150-Pound | Regular 300-POUND flange price PLUS net extras below. |
| | 300-Pound | See page 10 for net prices on flanges complete. |
| Large Tongue**<br>Small Tongue**<br>Large Groove**<br>Small Groove**<br>Ring Joint** | 400-Pound<br>600-Pound<br>900-Pound<br>1500-Pound | ADD net extras below to net prices of regular flanges. |
| Male Face† | 150-Pound | Same price as 300-POUND flanges with 1/16-inch raised face. |
| | 300-Pound | DEDUCT net prices below from net prices of FEMALE FACE flanges on page 10. |
| Plain (Flat) Face†† | 150-Pound<br>300-Pound | No extra charge. |
| Plain (Flat) Face 1/16-inch Raised Face† | 400-Pound<br>600-Pound<br>900-Pound<br>1500-Pound | ADD 15% to prices of regular flanges with ¼-inch male face. |

### Net Extras for Special Facings

| Nominal Size of Flange Inches | ½ to 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Extra Charge | $4.20 | $5.70 | $5.70 | $6.00 | $6.00 | $8.30 | $10.35 | $12.40 | $17.90 | $22.35 | $25.00 | $27.60 | $32.20 |

*Applies to straight sizes; however, on reducing flanges the extra charges are the same as on straight size flanges having equivalent outside diameters.

**Furnished with smooth finish.

†Furnished with concentric grooves (serrated), approximately 32 per inch. A smooth finish will be furnished, if specified, without additional charge.

††Furnished with a modified serrated form facing, approximately 32 serrations per inch.

## Special Reducing Flanges — All Pressure Classes

| Nominal Size Inches | ¾ to 12 | 14 and 16 | 18 | 20 and 24 |
|---|---|---|---|---|
| Concentric Welding Neck | 3 times straight size | 2½ times straight size | 2¼ times straight size | 2 times straight size |
| Eccentric Screwed<br>Eccentric Slip-On | Double the price of regular reducing flanges, all sizes. | | | |

# Bores on Welding Neck Flanges

## Regular Practice

| Nominal Size Inches | ½ to 2½ | 3 and 3½ | 4 to 12 | 14 to 24 |
|---|---|---|---|---|
| 150-Pound | Standard Pipe (Heaviest weight on 8, 10, and 12-inch) | | | O.D. Pipe, ⅜-inch thick |
| 300-Pound | | | | |
| 400-Pound | | | Extra Strong Pipe | O.D. Pipe, ½-inch thick |
| 600-Pound | Extra Strong Pipe | | | Orders must specify |
| 900-Pound | | Orders must specify | | |
| 1500-Pound | Orders must specify | | | |

## Furnished Without Extra Charge

| Nominal Size Inches | 12 and smaller | 14 and larger |
|---|---|---|
| 150-Pound | Schedule 40, Extra Strong, or Schedule 80 Pipe | Any bore not smaller than 1-inch less than the nominal pipe size |
| 300-Pound | | |
| 400-Pound | Standard, Schedules 40 or 80 | Any bore not smaller than 1½-inch less than the nominal pipe size |
| 600-Pound | | |
| 900-Pound | Any bore not smaller than minimum | Any bore not smaller than minimum |
| 1500-Pound | | |

## Furnished at 25% Extra Charge

All 150, 300, 400, and 600-Pound Welding Neck Flanges bored other than indicated in the foregoing but not less than the minimum bores listed in the table on page 14.

## Bores Smaller Than Minimum

Flanges 12-inch and smaller — Use price of next higher pressure class that will provide the bore required and add 20% for turning and facing.
Flanges 14-inch and larger — Price on application.

# Forged Steel Flanges

## Minimum Bores on Welding Neck Flanges and Inside Diameters of Pipe in Inches

| Size of Pipe Inches | Smallest diameter to which Welding Neck Flanges can be bored | | | | | | Inside Diameter of Pipe (Included for convenient reference) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | "S" | "X" | "XX" | A.S.A. Schedule Numbers | | | | | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |
| ½ | * | * | ... | * | ... | * | .622 | .546 | .252 | | | | .622 | | .546 | | | | .466 |
| ¾ | * | * | ... | * | ... | * | .824 | .742 | .434 | | | | .824 | | .742 | | | | .614 |
| 1 | * | * | ... | * | ... | * | 1.049 | .957 | .599 | | | | 1.049 | | .957 | | | | .815 |
| 1¼ | * | * | ... | * | ... | * | 1.380 | 1.278 | .896 | | | | 1.380 | | 1.278 | | | | 1.160 |
| 1½ | * | * | ... | * | ... | * | 1.610 | 1.500 | 1.100 | | | | 1.610 | | 1.500 | | | | 1.338 |
| 2 | 1.50 | 1.81 | ... | 1.53 | ... | * | 2.067 | 1.939 | 1.503 | | | | 2.067 | | 1.939 | | | | 1.689 |
| 2½ | 2.21 | 2.21 | ... | 2.21 | ... | * | 2.469 | 2.323 | 1.771 | | | | 2.469 | | 2.323 | | | | 2.125 |
| 3 | 2.80 | 2.80 | ... | 2.21 | 2.21 | 2.15 | 3.068 | 2.900 | 2.300 | | | | 3.068 | | 2.900 | | | | 2.626 |
| 3½ | 3.30 | 3.34 | ... | 3.34 | ... | ... | 3.548 | 3.364 | | | | | 3.548 | | 3.364 | | | | |
| 4 | 3.78 | 3.75 | 3.75 | 3.37 | 3.12 | 3.09 | 4.026 | 3.826 | 3.152 | | | | 4.026 | | 3.826 | | 3.626 | | 3.438 |
| 5 | 4.75 | 4.75 | 4.75 | 4.31 | 4.00 | 3.93 | 5.047 | 4.813 | 4.063 | | | | 5.047 | | 4.813 | | 4.563 | | 4.313 |
| 6 | 5.71 | 5.65 | 5.65 | 4.78 | 4.78 | 4.78 | 6.065 | 5.761 | 4.897 | | | | 6.065 | | 5.761 | | 5.501 | | 5.189 |
| 8 | 7.59 | 7.40 | 7.40 | 6.81 | 6.81 | 6.81 | 7.981 | 7.625 | 6.875 | | 8.125 | 8.071 | 7.981 | 7.813 | 7.625 | 7.439 | 7.189 | 7.001 | 6.813 |
| 10 | 9.43 | 9.43 | 9.43 | 9.00 | 8.34 | 8.15 | 10.020 | 9.750 | | | 10.250 | 10.136 | 10.020 | 9.750 | 9.564 | 9.314 | 9.064 | 8.750 | 8.500 |
| 12 | 11.34 | 11.25 | 11.25 | 10.62 | 10.12 | 10.12 | 12.000 | 11.750 | | | 12.250 | 12.090 | 11.938 | 11.626 | 11.376 | 11.064 | 10.750 | 10.500 | 10.126 |
| 14 | 12.78 | 12.71 | 12.71 | 12.50 | 12.50 | ... | 13.250 | 13.000 | | 13.500 | 13.376 | 13.250 | 13.126 | 12.814 | 12.500 | 12.126 | 11.814 | 11.500 | 11.188 |
| 16 | 14.71 | 14.69 | 14.50 | 14.19 | 14.50 | ... | 15.250 | 15.000 | | 15.500 | 15.376 | 15.250 | 15.000 | 14.688 | 14.314 | 13.938 | 13.564 | 13.126 | 12.814 |
| 18 | 17.00 | 16.88 | 16.50 | 16.50 | 16.50 | ... | 17.250 | 17.000 | | 17.500 | 17.376 | 17.126 | 16.876 | 16.500 | 16.125 | 15.688 | 15.250 | 14.876 | 14.438 |
| 20 | 19.00 | 18.81 | 18.50 | 18.37 | 18.50 | ... | 19.250 | 19.000 | | 19.500 | 19.250 | 19.000 | 18.814 | 18.376 | 17.938 | 17.438 | 17.000 | 16.500 | 16.064 |
| 24 | 23.00 | 22.88 | 22.50 | 22.50 | 22.50 | ... | 23.250 | 23.000 | | 23.500 | 23.250 | 22.876 | 22.626 | 22.064 | 21.564 | 20.938 | 20.376 | 19.876 | 19.314 |

"S" indicates Standard Pipe (heaviest weight on 8, 10, and 12-inch sizes and ⅜-inch thick O.D. Pipe on 14-inch and larger).

"X" indicates Extra Strong Pipe (½-inch thick O.D. Pipe on sizes 14-inch and larger).

"XX" indicates Double Extra Strong Pipe.

*These flanges are forged solid.

# CRANE

## VALVES
## FITTINGS
## PIPE
## FABRICATED
## PIPING

FF
3746

# Iron Flanged Fittings and Flanges

**125-Pound Fittings**
General Description.....pages 196 to 198
Dimensions.....pages 196 and 197
Working Pressures.....page 198
List Prices.....page 199

**250-Pound Fittings**
General Description.....page 200
Dimensions.....page 200
Working Pressures.....page 200
List Prices.....page 201

**125-Pound Flanges**.....pages 202 and 203
**250-Pound Flanges**.....page 204
**Round Floor Flanges**.....page 203

These products are made of quality materials and are accurately machined and finished. Crane Cast Iron, used for the smaller sizes, and Crane Ferrosteel, used for the larger sizes, exceed the minimum requirements of A.S.T.M. Specification A 126, covering Gray-Iron Castings for Valves, Flanges, and Pipe Fittings.

Crane also manufactures a complete line of steel flanged fittings and flanges, 18-8 Mo flanged fittings and flanges, and brass flanges. For information on these and other allied products, see the pages referred to below:

Cast Steel Flanged Fittings.....pages 267 to 274
Forged Steel Flanges.....pages 291 to 298
Welding Fittings.....pages 275 to 290
Brass Flanges.....page 188
18-8 Mo Fittings and Flanges.....page 383
Boiler Flanges.....page 290

Crane Cast Iron Flanged Fittings, Cast Iron Flanges, and Iron Body Wedge Gate Valves are standard equipment in many oil and gasoline refineries.

Quality, performance, and durability are built into all Crane products.

# 125-Pound Cast Iron Flanged Fittings

WORKING PRESSURES

1½ to 12-inch — 125 pounds saturated steam, 175 pounds cold water, oil, or gas, non-shock
14 to 24-inch — 100 pounds saturated steam, 150 pounds cold water, oil, or gas, non-shock

Pages 196 to 199 illustrate Crane 125-Pound Cast Iron Flanged Fittings. This line offers the user a complete selection of types and sizes. In addition, special fittings of any design can be made to order on receipt of drawings; prices on application.

**Sprinkler service; Underwriters' approved:** Crane 125-Pound Cast Iron Flanged Fittings sizes 1½ to 8-inch, inclusive, have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**American Standard:** The material, dimensions, and drilling of these fittings conform to the American Standard for Cast Iron Flanged Fittings, Class 125 (B16.1-1948).

**Material:** All fittings sizes 12-inch and smaller are made of Crane Cast Iron, conforming to A.S.T.M. Specification A 126 for Class A Castings. Sizes 14-inch and larger are made of Crane Ferrosteel, conforming to A.S.T.M. Specification A 126 for Class B higher strength Gray Iron Castings.

**Facing and drilling:** The end flanges are plain faced, with a smooth finish. They are furnished drilled unless ordered faced only; faced only fittings are furnished at the same price as faced and drilled fittings.

The bolt holes are in multiples of four so that the fitting may be turned to face in any quarter; they are regularly drilled to straddle the center lines.

For bolts smaller than 1¾-inch diameter, the bolt holes are drilled ⅛-inch larger than the diameter of the bolts; for bolts 1¾-inch diameter and larger, ¼-inch larger than the diameter of the bolts.

**Spot facing:** The bolt holes on sizes 16-inch and smaller are not spot faced unless so ordered, and then at an extra price. The list price for spot facing bolt holes is 20 cents per hole. Fittings 18-inch and larger are regularly furnished spot faced at no extra charge.

**Drilling to the 25-Pound Standard:** When so ordered, sizes 5 to 24-inch, inclusive, can be drilled with smaller bolt holes to conform to the 25-Pound American Tentative Cast Iron Flanged Fitting Standard (B16b2-1931). See page 459 for templates.

**Side outlet elbows:** On side outlet elbows, all openings are on the intersecting center lines.

**Base elbows:** The base on Base Elbows is neither faced nor drilled unless so ordered, and then at the extra price shown on page 199. The base is intended for support in compression and is not to be used for anchoring or supporting in tension or shear.

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The base on Round Base Elbows, when ordered faced and drilled, will be drilled to the template of the flange corresponding to the size of the supporting pipe, drilling only four holes in all cases, these being placed so as to miss or straddle the ribs.

When the base on Square Base Elbows is ordered faced and drilled, it also is drilled with four holes only, one in each corner. The center to center of opposite holes is the same as the diameter of the bolt circle on the base of the corresponding size Round Base Elbow.

**Special angle elbows:** Elbows from 1° to 45° have the same center to face dimensions as 45° Elbows; and from 46° to 90°, the same center to face as 90° Elbows. These fittings are made to order only.

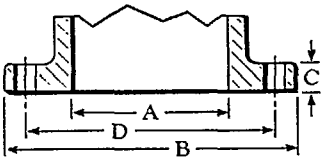
**Galvanized fittings:** Crane 125-Pound Cast Iron Flanged Fittings are regularly listed black only. Galvanized fittings, however, can be made to order, at an extra charge of 40 per cent over the price of the black fittings.

**Machine bolts:** On this class of material, ordinary practice in valve and fitting piping is to use steel machine bolts having a Regular Unfinished Square Head and equipped with a Heavy Unfinished Hexagon Nut. For machine bolts, see page 465.

**Gaskets:** A wide variety of gaskets for 125-pound cast iron flanged joints is listed on page 474, including 1/16-inch cloth inserted rubber, 1/16-inch "CC" Rubber, 4-ounce canvas, and 1/16-inch Cranite—all are either ring type or full face type.

**Thread lubricants:** Flanged joints are easier to make tight—and to take apart later if necessary—when a good thread lubricant is used on the bolts, flange faces, and gaskets. For thread lubricants, see page 464.

### Dimensions of End Flanges, in Inches

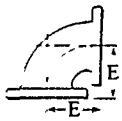



| Size | A | B | C | D | No. of bolts | Dia. of bolts |
|---|---|---|---|---|---|---|
| 1½ | 1½ | 5 | 9/16 | 3⅞ | 4 | ½ |
| 2 | 2 | 6 | ⅝ | 4¾ | 4 | ⅝ |
| 2½ | 2½ | 7 | 11/16 | 5½ | 4 | ⅝ |
| 3 | 3 | 7½ | ¾ | 6 | 4 | ⅝ |
| 3½ | 3½ | 8½ | 13/16 | 7 | 8 | ⅝ |
| 4 | 4 | 9 | 15/16 | 7½ | 8 | ⅝ |
| 5 | 5 | 10 | 15/16 | 8½ | 8 | ¾ |
| 6 | 6 | 11 | 1 | 9½ | 8 | ¾ |
| 8 | 8 | 13½ | 1⅛ | 11¾ | 8 | ¾ |
| 10 | 10 | 16 | 13/16 | 14¼ | 12 | ⅞ |
| 12 | 12 | 19 | 1¼ | 17 | 12 | ⅞ |
| 14 | 14 | 21 | 1⅜ | 18¾ | 12 | 1 |
| 16 | 16 | 23½ | 1 7/16 | 21¼ | 16 | 1 |
| 18 | 18 | 25 | 1 9/16 | 22¾ | 16 | 1⅛ |
| 20 | 20 | 27½ | 1 11/16 | 25 | 20 | 1⅛ |
| 24 | 24 | 32 | 1⅞ | 29½ | 20 | 1¼ |

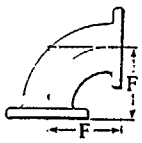
*List prices.....page 199*
*How to read reducing sizes....page 577*

# 125-Pound Cast Iron Flanged Fittings

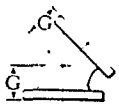
## Dimensions, in Inches



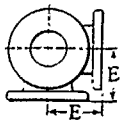

90° Elbow
No. 525, Straight
No. 545, Reducing



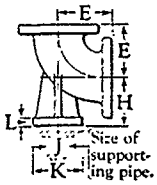

90° Long Radius Elbow
No. 551, Straight
No. 546, Reducing



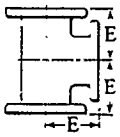

45° Elbow
No. 527
Straight



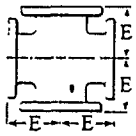

Side Outlet Elbow
No. 526
Straight



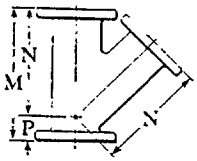

90° Base Elbow
No. 549, with Square Base
No. 550, with Round Base



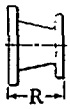

Tee
No. 529, Straight
No. 531, Reducing



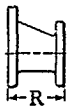

Cross
No. 537
Straight




45° Lateral
No. 541
Straight




Taper Reducer
No. 547




Eccentric Reducer
No. 548

| Size Inches | E Center to face, 90° Elbow, Tee, or Cross | EE Face to face, Tee or Cross | F Center to face, 90° Long Radius Elbow | G Center to face, 45° Elbow | H Center to base, 90° Base Elbow | J Size of Supporting Pipe for Base | K Diameter of Round Base or Size of Square | L Thickness of Base | M Face to face, 45° Lateral | N Center to face, 45° Lateral | P Center to face, 45° Lateral | R Face to face, Reducer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1½ | 4 | 8 | | 2¼ | | | | | | | | |
| 2 | 4½ | 9 | 6½ | 2½ | | | | | 10½ | 8 | 2½ | |
| 2½ | 5 | 10 | 7 | 3 | | | | | 12 | 9½ | 2½ | 5½ |
| 3 | 5½ | 11 | 7¾ | 3 | | | | | 13 | 10 | 3 | 6 |
| 3½ | 6 | 12 | 8½ | 3½ | | | | | | | | 6½ |
| 4 | 6½ | 13 | 9 | 4 | 5½ | 2 | 6 | ⅝ | 15 | 12 | 3 | 7 |
| 5 | 7½ | 15 | 10¼ | 4½ | 6¼ | 2½ | 7 | 11/16 | 17 | 13½ | 3½ | 8 |
| 6 | 8 | 16 | 11½ | 5 | 7 | 2½ | 7 | 11/16 | 18 | 14½ | 3½ | 9 |
| 8 | 9 | 18 | 14 | 5½ | 8⅜ | 4 | 9 | 15/16 | 22 | 17½ | 4½ | 11 |
| 10 | 11 | 22 | 16½ | 6½ | 9¾ | 4 | 9 | 15/16 | 25½ | 20½ | 5 | 12 |
| 12 | 12 | 24 | 19 | 7½ | 11¼ | 6 | 11 | 1 | 30 | 24½ | 5½ | 14 |
| 14 | 14 | 28 | 21½ | 7½ | | | | | | | | 16 |
| 16 | 15 | 30 | 24 | 8 | | | | | | | | 18 |
| 18 | 16½ | 33 | 26½ | 8½ | | | | | | | | |
| 20 | 18 | 36 | 29 | 9½ | | | | | | | | |
| 24 | 22 | 44 | 34 | 11 | | | | | | | | |

**Side outlet elbows:** The center to face dimensions of Side Outlet Elbows are alike for all three openings; all openings are on intersecting center lines.

**Reducing fittings and reducers:** The center to face dimensions of Reducing 90° Elbows, Reducing 90° Long Radius Elbows, and Reducing Tees are the same as for the straight sizes corresponding to the size of the largest opening.

The face to face dimensions of Reducers are governed by the size of the larger opening, regardless of the size of the smaller opening. The face to face of Taper and Eccentric Reducers are alike for corresponding sizes.

Dimensions of reducing elbows, reducing tees, and reducers apply only to regularly listed sizes; see page 199. Dimensions of other sizes furnished on request.

*Templates for drilling .. page 459*

*Taps and drains for flanged fittings... page 578*

# 125-Pound Cast Iron Flanged Fittings

WORKING PRESSURES
1½ to 12-inch—125 pounds saturated steam, 175 pounds cold water, oil, or gas, non-shock
14 to 24-inch—100 pounds saturated steam, 150 pounds cold water, oil, or gas, non-shock

No. 525
90° Elbow
Straight

No. 545
90° Elbow
*Reducing

No. 551
90° Long Radius Elbow
Straight

No. 546
90° Long Radius Elbow
*Reducing

No. 527
45° Elbow
Straight

No. 526
Side Outlet Elbow
Straight

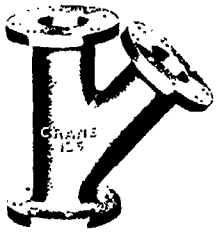
No. 549
90° Base Elbow
Square Base

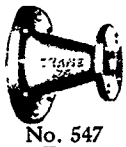
No. 550
90° Base Elbow
Round Base

No. 529
Tee
Straight

No. 531
Tee
*Reducing

No. 537
Cross
Straight

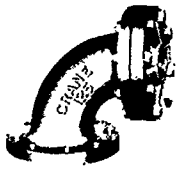

No. 541
45° Lateral
Straight


No. 547
*Taper
Reducer

No. 548
*Eccentric
Reducer

***Reducing fittings:** The prices of Reducing Elbows, Reducing Tees, and of Reducers apply only to the regularly listed sizes as shown on the opposite page; the price is determined by the size of the largest opening. All other sizes are special; prices are furnished on application.

**Reducing with flanges:** To avoid delays and the higher cost of special fittings, orders for non-listed reducing sizes can be filled by bolting reducing companion flanges on regular fittings. Orders should specify "Reduce with flanges". The illustration at the right shows a No. 525 90° Elbow with a No. 557 Reducing Screwed Flange bolted on one end. For Reducing Flanges, see page 203.


Elbow with Reducing Flange Bolted On

**Sprinkler service; Underwriters' approved:** Crane 125-Pound Cast Iron Flanged Fittings, sizes 1½ to 8-inch inclusive, have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Galvanized fittings:** Crane 125-Pound Cast Iron Flanged Fittings are regularly listed black only. Galvanized fittings, however, can be made to order, at an extra charge of 40 per cent over the price of the black fittings.

**Facing and drilling:** The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.

The fittings are furnished with the end flanges faced and drilled unless ordered faced only; faced only fittings are furnished at the same price as faced and drilled fittings.

The base on Base Elbows is neither faced nor drilled unless so ordered, and then at the extra price shown on the opposite page.

**Spot facing:** The bolt holes on sizes 16-inch and smaller are not spot faced unless so ordered, and then at an extra price. The list price for spot facing bolt holes is 20 cents per hole. Fittings 18-inch and larger are regularly furnished spot faced at no extra charge.

**Drilling to the 25-Pound Standard:** When so ordered, sizes 5 to 24-inch, inclusive, can be drilled with smaller bolt holes to conform to the 25-Pound American Tentative Cast Iron Flanged Fitting Standard (B16b2-1931). See page 459 for templates.

**Materials:** Crane 125-Pound Cast Iron Flanged Fittings, sizes 12-inch and smaller, are made of cast iron; larger sizes are made of Ferrosteel.

# 125-Pound Cast Iron Flanged Fittings

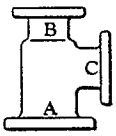
## List Prices, Black, Each—Faced and Drilled

| Size Inches | No. 525 90° Elbow Straight | No. 545 90° Elbow Reducing | No. 551 90° Long Radius Elbow Straight | No. 546 90° Long Radius Elbow Reducing | No. 527 45° Elbow | No. 526 Side Outlet Elbow | No. 549 90° Square Base Elbow Base Plain | No. 550 90° Round Base Elbow Base Plain | Extra for Facing and Drilling Base on No. 549 or No. 550 |
|---|---|---|---|---|---|---|---|---|---|
| 1½ | 7.20 | | | | 8.30 | | | | |
| 2 | 7.20 | 13.20 | 12.00 | | 8.30 | | | | |
| 2½ | 8.10 | 14.00 | 13.50 | | 9.30 | | | | |
| 3 | 9.40 | 15.00 | 15.00 | 21.50 | 11.00 | | | | |
| 3½ | 11.50 | | 18.50 | | 13.00 | | | | |
| 4 | 12.50 | 18.50 | 19.50 | 27.00 | 14.50 | 62.00 | 21.50 | 21.50 | 7.00 |
| 5 | 15.50 | 21.50 | 24.00 | 35.00 | 18.00 | 68.00 | 32.50 | 32.50 | 8.00 |
| 6 | 21.50 | 28.00 | 31.00 | 44.00 | 22.00 | 70.00 | 38.50 | 38.50 | 8.00 |
| 8 | 33.00 | 41.00 | 54.00 | 76.00 | 33.00 | 108.00 | 51.00 | 51.00 | 11.50 |
| 10 | 60.00 | 64.00 | 81.00 | 135.00 | 59.00 | 160.00 | 82.00 | 82.00 | 11.50 |
| 12 | 86.00 | 111.00 | 130.00 | 195.00 | 86.00 | 230.00 | 118.00 | 118.00 | 17.50 |
| 14 | 114.00 | 157.00 | 203.00 | | 114.00 | | | | |
| 16 | 162.00 | 190.00 | 270.00 | | 162.00 | | | | |
| 18 | 230.00 | | 338.00 | | 230.00 | | | | |
| 20 | 325.00 | | 433.00 | | 325.00 | | | | |
| 24 | 420.00 | | 810.00 | | 420.00 | | | | |

| Size Inches | No. 529 Tee Straight | No. 531 Tee Reducing | No. 537 Cross | No. 541 45° Lateral | No. 547 Taper Reducer | No. 548 Eccentric Reducer |
|---|---|---|---|---|---|---|
| 1½ | 9.50 | | | | | |
| 2 | 9.50 | 13.25 | 17.50 | 20.00 | | |
| 2½ | 11.00 | 14.50 | 19.00 | 22.00 | 14.00 | |
| 3 | 12.00 | 17.50 | 21.00 | 24.50 | 15.00 | 15.00 |
| 3½ | 19.00 | | | | 18.00 | |
| 4 | 20.00 | 25.00 | 30.00 | 34.00 | 20.00 | 20.00 |
| 5 | 24.50 | 30.00 | 38.00 | 43.00 | 24.50 | 24.50 |
| 6 | 29.00 | 35.00 | 49.00 | 58.00 | 30.00 | 30.00 |
| 8 | 43.00 | 60.00 | 76.00 | 86.00 | 38.00 | 38.00 |
| 10 | 86.00 | 90.00 | 113.00 | 130.00 | 68.00 | 68.00 |
| 12 | 108.00 | 130.00 | 162.00 | 189.00 | 103.00 | 103.00 |
| 14 | 189.00 | 200.00 | | | 148.00 | |
| 16 | 270.00 | | | | 190.00 | |
| 18 | 325.00 | | | | | |
| 20 | 400.00 | | | | | |
| 24 | 600.00 | | | | | |

## List of Reducing Tees

The prices of the No. 531 Reducing Tees apply only to the regularly listed sizes shown below; the price is determined by the size of the largest opening.




| A | B | C |
|---|---|---|
| 2 | ×2 | ×1½ |
| 2½×2½×2 | | |
| 3 | ×3 | ×2½ |
| | | ×2 |
| | | ×1½ |
| 3 | ×2½×3 | |
| | | ×2½ |
| 3 | ×2 | ×3 |
| | | ×2 |
| 2½×2½×3 | | |
| 4 | ×4 | ×3 |
| | | ×2½ |
| | | ×2 |
| | | ×1½ |
| 4 | ×3 | ×4 |
| | | ×3 |
| 4 | ×2½ | ×4 |
| | | ×3 |
| | | ×2½ |
| 4 | ×2 | ×4 |
| 3 | ×3 | ×4 |
| 5 | ×5 | ×4 |
| | | ×3 |
| | | ×2½ |
| | | ×2 |
| 5 | ×4 | ×5 |
| | | ×4 |
| 4 | ×4 | ×5 |

| A | B | C |
|---|---|---|
| 6×6×5 | | |
| | | ×4 |
| | | ×3 |
| | | ×2½ |
| | | ×2 |
| 6×5×6 | | |
| | | ×5 |
| | | ×4 |
| 6×4×6 | | |
| | | ×4 |
| | | ×3 |
| 6×3×6 | | |
| | | ×4 |
| | | ×3 |
| 6×2×6 | | |
| 5×5×6 | | |
| 4×4×6 | | |
| 8×8×6 | | |
| | | ×5 |
| | | ×4 |
| | | ×3 |
| 8×6×8 | | |
| | | ×6 |
| | | ×5 |
| | | ×4 |
| | | ×3 |
| 8×5×8 | | |
| 8×4×8 | | |
| | | ×6 |
| 6×6×8 | | |

| A | B | C |
|---|---|---|
| 10×10×8 | | |
| | | ×6 |
| | | ×5 |
| | | ×4 |
| | | ×3 |
| 10×8×10 | | |
| | | ×8 |
| | | ×6 |
| 8×8×10 | | |
| 12×12×10 | | |
| | | ×8 |
| | | ×6 |
| | | ×5 |
| | | ×4 |
| 12×10×12 | | |
| | | ×10 |
| | | ×8 |
| | | ×6 |
| 12×8×12 | | |
| | | ×8 |
| 10×10×12 | | |
| 14×14×8 | | |

## List of Reducing Elbows and of Reducers

The prices of the Nos. 545 and 546 Reducing Elbows and of the Nos. 547 and 548 Reducers apply only to the regularly listed sizes shown below; the price is determined by the size of the larger opening. All other non-listed sizes are special.

| No. 545 90° Elbows | | No. 546 90° Long Radius Elbows | No. 547 Taper Reducers | | | No. 548 Eccentric Reducers |
|---|---|---|---|---|---|---|
| 2 | ×1½ | 8 ×6 | 3 ×2½ | 2½×1½ | 6 ×5 | 12×10 | 3 ×2 |
| 2½×2 | | ×5 | ×2 | 3 ×2½ | ×4 | ×8 | 4 ×3 |
| 3 | ×2½ | ×4 | 4 ×3 | ×2 | ×3 | ×6 | 5 ×4 |
| ×2 | | 10×8 | 5 ×4 | ×1½ | ×2½ | 14×12 | 6 ×5 |
| 4 | ×3 | ×6 | 6 ×5 | 3½×3 | ×2 | ×10 | ×4 |
| | ×2½ | 12×10 | ×4 | 4 ×3½ | 8 ×6 | ×8 | 8 ×6 |
| | ×2 | ×8 | 8 ×6 | ×3 | ×5 | ×6 | 10×8 |
| 5 | ×4 | ×6 | ×5 | ×2½ | ×4 | 16×14 | 12×10 |
| | ×3 | 14×12 | 10×8 | ×2 | 10×8 | ×12 | |
| 6 | ×5 | 16×12 | 12×10 | 5 ×4 | ×6 | ×10 | |
| | ×4 | | | ×3 | | | |
| | ×3 | | | ×2½ | | | |

*Dimensions*.....*pages 196 and 197*
*Templates for drilling*.....*page 459*
*How to read reducing sizes*.... *page 577*
*Bolting on Flanges*..... .. *page 457*

# 250-Pound Cast Iron Flanged Fittings

WORKING PRESSURES
250 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock

**American Standard:** Crane 250-Pound Cast Iron Flanged Fittings conform to the American Standard for Cast Iron Flanged Fittings, Class 250 (B16b-1944). This Standard does not include Crosses and 45° Laterals.

**Sprinkler service; Underwriters' approved:** Sizes 2 to 8-inch, inclusive, have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Materials:** Except 45° Laterals, all fittings sizes 10-inch and smaller are made of Crane Cast Iron, conforming to A.S.T.M. Specification A 126 for Class A Castings; 12-inch fittings are made of Crane Ferrosteel, conforming to A.S.T.M. Specification A 126 for Class B higher strength Gray Iron Castings. Laterals in sizes 6-inch and smaller are made of cast iron; larger sizes are Ferrosteel.

**Facing and drilling:** The drilling of end flanges conforms to the American Cast Iron Flange Standard, Class 250. The flanges have a 1/16-inch raised face which is finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish. The fittings are regularly furnished with end flanges faced and drilled; faced only fittings are supplied only when so ordered, and then at the same price as the faced and drilled.

Bolt holes (1/8-inch larger than the diameter of the bolts) are in multiples of four so that the fittings may be turned to face in any quarter; they straddle the center lines.

**Base elbows:** The base on Base Elbows is neither faced nor drilled unless so ordered, and then at the extra price shown on the opposite page. When ordered faced and drilled, it is drilled to the template of the flange corresponding to the size of the supporting pipe, drilling only four holes in all cases, these being placed so as to miss or straddle the ribs. The base is intended for support in compression and is not to be used for anchoring or supporting in tension or shear.

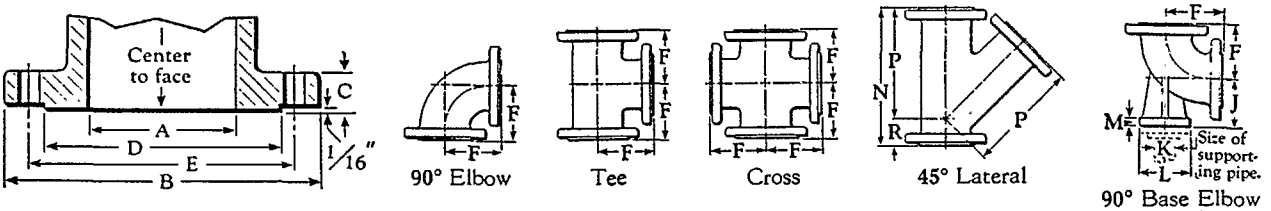
**Spot facing:** The bolt holes are not spot faced unless so ordered, and then at an extra list price of 20 cents per hole.

**Galvanized fittings:** These fittings are regularly listed black only, but galvanized fittings are made to order at an extra charge of 40 per cent over the price of black fittings.

**Gaskets:** Gaskets for 250-pound cast iron flanged joints are listed on page 474. These include 1/16-inch thick Cranite and "CC" rubber; corrugated copper gaskets can be furnished when ordered.

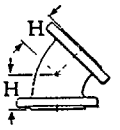
**Thread lubricants:** Flanged joints are easier to make tight—and to take apart later if necessary—when a good thread lubricant is used on the bolts, flange faces, and gaskets. See page 464 for a complete description of Crane lubricants.

## Dimensions, in Inches

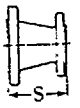



90° Elbow — Tee — Cross — 45° Lateral — 90° Base Elbow Round Base

| Size | End Flanges | | | | | | | Center to Face and Face to Face | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | No. of Bolts | Dia. of Bolts | F | FF | H | J | K | L | M | N | P | R | S |
| 2 | 2 | 6½ | ⅞ | 4 3/16 | 5 | 8 | ⅝ | 5 | 10 | 3 | | | | | | | | |
| 2½ | 2½ | 7½ | 1 | 4 15/16 | 5⅞ | 8 | ¾ | 5½ | 11 | 3½ | | | | | | | | 5½ |
| 3 | 3 | 8¼ | 1⅛ | 5 11/16 | 6⅝ | 8 | ¾ | 6 | 12 | 3½ | | | | | 14 | 11 | 3 | 6 |
| 3½ | 3½ | 9 | 1 3/16 | 6 5/16 | 7¼ | 8 | ¾ | 6½ | 13 | 4 | | | | | | | | |
| 4 | 4 | 10 | 1¼ | 6 15/16 | 7⅞ | 8 | ¾ | 7 | 14 | 4½ | 6 | 2 | 6½ | ⅞ | 16½ | 13½ | 3 | 7 |
| 5 | 5 | 11 | 1⅜ | 8 5/16 | 9¼ | 8 | ¾ | 8 | 16 | 5 | 6¾ | 2½ | 7½ | 1 | 18½ | 15 | 3½ | 8 |
| 6 | 6 | 12½ | 1 7/16 | 9 11/16 | 10⅝ | 12 | ¾ | 8½ | 17 | 5½ | 7½ | 2½ | 7½ | 1 | 21½ | 17½ | 4 | 9 |
| 8 | 8 | 15 | 1⅝ | 11 15/16 | 13 | 12 | ⅞ | 10 | 20 | 6 | 9 | 4 | 10 | 1¼ | 25½ | 20½ | 5 | 11 |
| 10 | 10 | 17½ | 1⅞ | 14 1/16 | 15¼ | 16 | 1 | 11½ | 23 | 7 | 10½ | 4 | 10 | 1¼ | 29½ | 24 | 5½ | 12 |
| 12 | 12 | 20½ | 2 | 16 7/16 | 17¾ | 16 | 1⅛ | 13 | 26 | 8 | | | | | | | | |




45° Elbow




Taper Reducer

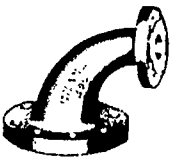
**Reducing fittings and reducers:** The center to face dimensions of reducing 90° elbows and reducing tees are the same as for the straight sizes corresponding to the size of the largest opening.

The face to face dimension of reducers is governed by the size of the larger opening, regardless of the size of the smaller opening.

Dimensions of reducing elbows, reducing tees, and reducers apply only to regularly listed sizes; see page 201. Dimensions of other sizes furnished on request.

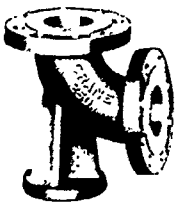
# 250-Pound Cast Iron Flanged Fittings

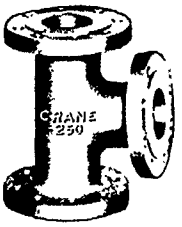
No. 101 E, 90° Elbow
Straight

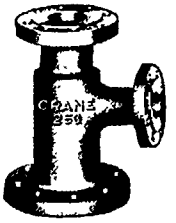

No. 121 E, 90° Elbow
*Reducing

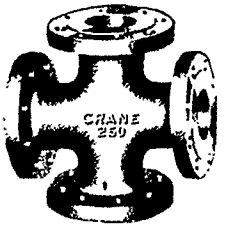
No. 103 E, 45° Elbow
Straight

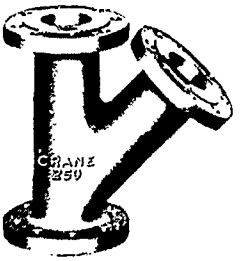
No. 123 E
*Taper Reducer


No. 125½ E
90° Base Elbow
Round Base


No. 105 E, Tee
Straight


No. 107 E, Tee
*Reducing

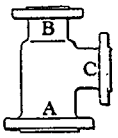

No. 113 E, Cross
Straight


No. 117 E
45° Lateral
Straight

## List Prices, Black, Each—Faced and Drilled

| Size Inches | No. 101 E 90° Elbow Straight | No. 121 E 90° Elbow Reducing | No. 103 E 45° Elbow | No. 125½ E 90° Round Base Elbow Base Plain | No. 125½ E Extra for Facing and Drilling Base | No. 105 E Tee Straight | No. 107 E Tee Reducing | No. 113 E Cross | No. 117 E 45° Lateral | No. 123 E Taper Reducer |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 11.00 | | 12.00 | | | 16.00 | | 32.00 | | |
| 2½ | 11.50 | 21.00 | 13.50 | | | 16.50 | 23.00 | 34.00 | | 19.50 |
| 3 | 13.50 | 23.00 | 15.50 | | | 18.50 | 26.00 | 38.00 | 42.00 | 21.00 |
| 3½ | 17.00 | | 20.00 | | | 27.00 | | | | |
| 4 | 18.00 | 34.00 | 21.00 | 51.00 | 10.50 | 28.00 | 36.00 | 49.00 | 54.00 | 30.00 |
| 5 | 22.00 | 41.00 | 26.00 | 58.00 | 12.00 | 39.00 | 49.00 | 65.00 | 71.00 | 37.00 |
| 6 | 31.00 | 50.00 | 31.00 | 69.00 | 12.00 | 49.00 | 61.00 | 80.00 | 88.00 | 44.00 |
| 8 | 48.00 | 83.00 | 47.00 | 102.00 | 17.50 | 75.00 | 88.00 | 124.00 | 136.00 | 60.00 |
| 10 | 86.00 | 122.00 | 86.00 | 186.00 | 17.50 | 117.00 | 132.00 | 195.00 | 215.00 | 101.00 |
| 12 | 125.00 | | 125.00 | | | 169.00 | | | | |

## *List of Reducing Fittings

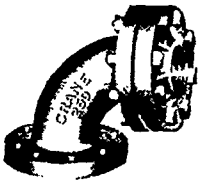


No. 107 E Tee

*The prices of the No. 121 E Reducing 90° Elbows, No. 107 E Reducing Tees, and No. 123 E Taper Reducers apply only to the regularly listed sizes, as shown below; the price is determined by the size of the largest opening. All other sizes are special, and prices are furnished on application.

| No. 121 E Reducing 90° Elbows | No. 107 E Reducing Tees A | B | C | A | B | C | A | B | C | A | B | C | No. 123 E Taper Reducers | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2½×2 | 2½ | ×2½ | ×2 | 5 | ×5 | ×4 | 8 | ×8 | ×6 | 10 | ×10 | ×8 | 2½ | ×2 |
| 3 ×2½ | | ×2 | ×2 | | | ×3 | | | ×5 | | | ×6 | 3 | ×2½ |
| 4 ×3 | 3 | ×3 | ×2½ | | | ×2½ | | | ×4 | | | ×5 | | ×2 |
| ×2½ | | | ×2 | | | ×2 | | | ×3 | | | ×4 | 4 | ×3 |
| 5 ×4 | 3 | ×2½ | ×3 | 5 | ×4 | ×5 | | | ×2½ | 10 | ×8 | ×10 | | ×2½ |
| ×3 | | | ×2½ | | | ×4 | | | ×2 | | | ×8 | | ×2 |
| 6 ×5 | 3 | ×2 | ×3 | 6 | ×6 | ×5 | 8 | ×6 | ×8 | | | ×6 | 5 | ×4 |
| ×4 | | | ×2 | | | ×4 | | | ×6 | | | ×5 | | ×3 |
| 8 ×6 | 4 | ×4 | ×3 | | | ×3 | | | | 10 | ×6 | ×10 | | ×2½ |
| ×5 | | | ×2½ | | | ×2½ | | | | | | ×8 | | ×2 |
| ×4 | | | ×2 | | | ×2 | | | | | | ×6 | | |
| 10 ×8 | 4 | ×3 | ×4 | 6 | ×5 | ×6 | | | | 8 | ×8 | ×10 | | |
| ×6 | | | ×3 | | | ×5 | | | | | | | | |
| ×5 | | | ×2 | | | | | | | | | | | |

## Reducing with Flanges



To avoid delays and the higher cost of special fittings, orders for non-listed reducing sizes can be filled by bolting reducing flanges on regular fittings. Orders should specify "Reduce with flanges". The illustration directly above shows a No. 101 E 90° Elbow with a No. 155 E Reducing Flange bolted on one end. See page 204 for flanges.

*How to read reducing sizes*.....page 577
*Taps and drains for flanged fittings*.....page 578
*Bolting on Companion Flanges*.....page 457
*Templates for drilling*.....page 460

## Cast Steel Fittings

For higher pressures and temperatures, Crane Cast Steel Flanged Fittings are recommended. They are available in seven pressure classes, in a wide variety of types, and in sizes as large as 24 inches. See pages 267 to 274.

# 125-Pound Cast Iron Flanges

No. 553
Screwed Flange

WORKING PRESSURES

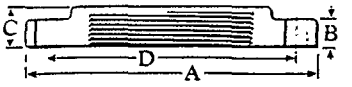
Sizes 1 to 12-inch
125 pounds saturated steam
175 pounds cold water, oil, or gas, non-shock

Sizes 14 to 24-inch
100 pounds saturated steam
150 pounds cold water, oil, or gas, non-shock

16 inches O.D. and smaller

19 inches O.D. and larger

No. 555
Blind Flange




## List Prices and Dimensions

| Size of pipe | List Prices, Black, Each | | Dimensions, in Inches | | | | | |
|---|---|---|---|---|---|---|---|---|
| | No. 553 Screwed Flanges | No. 555 Blind Flanges | A Diameter of flange | B Thickness of flange | C Length through hub | D Diameter of bolt circle | No. of Bolts | Dia. of Bolts |
| Inches | Faced and Drilled | Faced and Drilled | | | | | | |
| 1 | 1.35 | 1.50 | 4¼ | 7/16 | 11/16 | 3⅛ | 4 | ½ |
| 1¼ | 1.45 | 1.60 | 4⅝ | ½ | 13/16 | 3½ | 4 | ½ |
| 1½ | 1.53 | 1.70 | 5 | 9/16 | ⅞ | 3⅞ | 4 | ½ |
| 2 | 1.70 | 1.85 | 6 | ⅝ | 1 | 4¾ | 4 | ⅝ |
| 2½ | 1.87 | 2.05 | 7 | 11/16 | 13/16 | 5½ | 4 | ⅝ |
| 3 | 2.30 | 2.55 | 7½ | ¾ | 1¼ | 6 | 4 | ⅝ |
| 3½ | 2.90 | 3.20 | 8½ | 13/16 | 1¼ | 7 | 8 | ⅝ |
| 4 | 3.45 | 3.85 | 9 | 15/16 | 1 5/16 | 7½ | 8 | ⅝ |
| 5 | 4.15 | 5.20 | 10 | 15/16 | 1 7/16 | 8½ | 8 | ¾ |
| 6 | 5.00 | 6.30 | 11 | 1 | 1 9/16 | 9½ | 8 | ¾ |
| 8 | 7.50 | 9.30 | 13½ | 1⅛ | 1¾ | 11¾ | 8 | ¾ |
| 10 | 11.00 | 13.70 | 16 | 1 3/16 | 1 15/16 | 14¼ | 12 | ⅞ |
| 12 | 15.00 | 21.00 | 19 | 1¼ | 2 3/16 | 17 | 12 | ⅞ |
| 14 | 24.00 | 33.50 | 21 | 1⅜ | 2¼ | 18¾ | 12 | 1 |
| 16 | 35.00 | 49.00 | 23½ | 1 7/16 | 2½ | 21¼ | 16 | 1 |
| 18 | 42.00 | 59.00 | 25 | 1 9/16 | 2 11/16 | 22¾ | 16 | 1⅛ |
| 20 | 50.00 | 70.00 | 27½ | 1 11/16 | 2⅞ | 25 | 20 | 1⅛ |
| 24 | 70.00 | 98.00 | 32 | 1⅞ | 3¼ | 29½ | 20 | 1¼ |

**American Standard:** The dimensions and drilling of these flanges conform to the American Standard for Cast Iron Flanges, Class 125 (B16.1-1948).

**Sprinkler service; Underwriters' approved:** Sizes 1 to 8-inch, inclusive, have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Materials:** Sizes 12-inch (19 inches outside diameter) and smaller are made of cast iron; larger sizes are regularly made of Crane Ferrosteel, to conform to the American Standard.

**Facing and drilling:** Crane 125-Pound Cast Iron Flanges are regularly supplied faced and drilled unless ordered faced only. Faced only flanges are furnished at the same price as the faced and drilled.

Flanges are plain faced, with a smooth finish.

**Spot facing:** The bolt holes on these flanges are not spot faced unless so ordered, and then at an extra price. The list price for spot facing bolt holes is 20 cents per hole.

**Galvanized flanges:** Cast iron flanges are regularly listed black only, but galvanized flanges can be made to order at an extra price. For galvanizing, add 40 per cent to the list prices of black flanges.



*Templates for drilling . . . page 459*

*Gaskets . . . . page 474*

# 125-Pound Cast Iron Reducing Flanges

WORKING PRESSURES
125 pounds saturated steam
175 pounds cold water, oil, or gas, non-shock

No. 557
Reducing Screwed Flange

For information on facing, drilling, materials, sprinkler service, etc., see the opposite page.

**How to order reducing flanges:** When ordering reducing flanges, the screwed or reduced size should be designated first, and then the outside diameter of the flange. For example, a 125-Pound Flange to connect a 6-inch pipe to a 10-inch valve or fitting (outside diameter of flange on 10-inch valve or fitting: 16 inches) should be ordered:

6″ x 16″ Reducing Flange.

List Prices, Black, Each

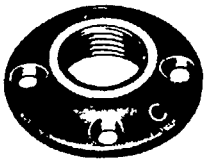
| Size Inches | No. 557 Faced and Drilled | Size Inches | No. 557 Faced and Drilled |
|---|---|---|---|
| 1 x5 | 2.20 | 3 x10 | 6.25 |
| 1 x6 | 2.45 | 4 x10 | |
| 1¼x6 | | 2 x11 | 7.50 |
| 1½x6 | | 2½x11 | |
| 1½x7 | 2.70 | 3 x11 | |
| 2 x7 | | 4 x11 | |
| 1½x7½ | 3.45 | 5 x11 | |
| 2 x7½ | | 3 x13½ | 11.20 |
| 2½x7½ | | 4 x13½ | |
| 3 x8½ | 4.35 | 5 x13½ | |
| 1½x9 | 5.20 | 6 x13½ | |
| 2 x9 | | 6 x16 | 16.50 |
| 2½x9 | | 8 x16 | |
| 3 x9 | | 8 x19 | 22.50 |
| 3½x9 | | 10 x19 | |

Extra list price for spot facing bolt holes is 20 cents per hole.

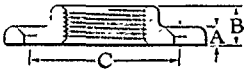
Galvanized flanges are made to order; add 40 per cent to the list prices of black flanges shown above.

# Round Floor Flanges

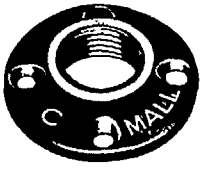
## Cast Iron or Malleable Iron




Cast Iron
Floor Flange




Floor Flanges are cast with countersunk holes for screws and are not faced.




Malleable Iron
Floor Flange

List Prices and Dimensions

| Size | Cast Iron Round Floor Flanges | | | | | | Malleable Iron Round Floor Flanges | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | List Prices | | Dimensions, in Inches | | | | List Prices | | Dimensions, in Inches | | | |
| Inches | Black Each | Galv. Each | Flange thickness A | Hub length B | Bolt circle C | No. and dia. of holes | Black Each | Galv. Each | Flange thickness A | Hub length B | Bolt circle C | No. and dia. of holes |
| ¼ x 2 13/16 | .26 | .52 | 7/32 | ½ | 1⅞ | 4-¼ | | | | | | |
| ⅜ x 3 | .26 | .52 | 7/32 | 7/16 | 2 | 4-¼ | | | | | | |
| ½ x 3½ | .32 | .64 | 9/32 | 9/16 | 2½ | 4-¼ | .32 | .64 | 9/32 | 9/16 | 2½ | 4-¼ |
| ¾ x 3½ | .32 | .64 | 5/16 | ⅝ | 2½ | 4-¼ | .32 | .64 | 5/16 | ⅝ | 2½ | 4-¼ |
| 1 x 4 | .40 | .80 | 11/32 | 11/16 | 3 | 4-¼ | .40 | .80 | 11/32 | 11/16 | 3 | 4-¼ |
| 1¼ x 4 | .40 | .80 | 11/32 | ¾ | 3 | 4-¼ | .40 | .80 | 11/32 | ¾ | 3 | 4-¼ |
| 1½ x 4½ | .50 | 1.00 | ⅜ | ⅞ | 3½ | 4-5/16 | .50 | 1.00 | ⅜ | ⅞ | 3½ | 4-5/16 |
| 2 x 5½ | .65 | 1.30 | 13/32 | 1 | 4¼ | 4-5/16 | .65 | 1.30 | 13/32 | 1 | 4¼ | 4-5/16 |

*Brass Floor Flanges page 184*

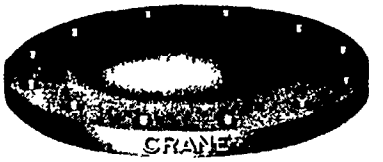
# 250-Pound Cast Iron Flanges

No. 151 E
Screwed Flange

WORKING PRESSURES
250 pounds saturated steam
400 pounds cold water, oil, or gas, non-shock

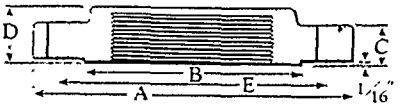
No. 155 E
Reducing Screwed Flange

15-inch O.D. and smaller




17½-inch O.D. and larger

No. 153 E
Blind Flange




Screwed Flange

## List Prices, Each, and Dimensions

| Size of pipe Inches | List Prices, Black: No. 151 E Screwed Flanges Faced and Drilled | No. 153 E Blind Flanges Faced and Drilled | Dimensions, in Inches: A | B | C | D | E | No. of Bolts | Dia. of Bolts |
|---|---|---|---|---|---|---|---|---|---|
| 1½ | 2.75 | 3.15 | 6⅛ | 3 9/16 | 13/16 | 1⅛ | 4½ | 4 | ¾ |
| 2 | 3.00 | 3.40 | 6½ | 4 3/16 | ⅞ | 1¼ | 5 | 8 | ⅝ |
| 2½ | 3.35 | 3.85 | 7½ | 4 15/16 | 1 | 1 7/16 | 5⅞ | 8 | ¾ |
| 3 | 4.15 | 4.50 | 8¼ | 5 11/16 | 1⅛ | 1 9/16 | 6⅝ | 8 | ¾ |
| 3½ | 5.20 | 5.60 | 9 | 6 5/16 | 1 3/16 | 1⅝ | 7¼ | 8 | ¾ |
| 4 | 6.20 | 6.80 | 10 | 6 15/16 | 1¼ | 1¾ | 7⅞ | 8 | ¾ |
| 5 | 7.50 | 9.40 | 11 | 8 5/16 | 1⅜ | 1⅞ | 9¼ | 8 | ¾ |
| 6 | 9.00 | 11.50 | 12½ | 9 11/16 | 1 7/16 | 2 | 10⅝ | 12 | ¾ |
| 8 | 13.50 | 17.00 | 15 | 11 15/16 | 1⅝ | 2 3/16 | 13 | 12 | ⅞ |
| 10 | 20.00 | 24.50 | 17½ | 14 1/16 | 1⅞ | 2⅜ | 15¼ | 16 | 1 |
| 12 | 27.00 | 38.00 | 20½ | 16 7/16 | 2 | 2 9/16 | 17¾ | 16 | 1⅛ |

| Size Inches | No. 155 E Reducing Screwed Flanges Faced and Drilled Black, Each |
|---|---|
| 2 ×8¼ | 6.20 |
| 2½×8¼ | |
| 3 ×10 | 9.50 |
| 4 ×11 | 11.00 |
| 4 ×12½ | 13.50 |
| 5 ×12½ | |
| 6 ×15 | 20.00 |

**American Standard:** The dimensions and drilling of these flanges conform to the American Standard for Cast Iron Flanges, Class 250 (B16b-1944).

**Sprinkler service; Underwriters' approved:** Sizes 1½ to 8-inch, inclusive, have been approved by the Underwriters' Laboratories, Inc., for sprinkler service.

**Materials:** Sizes 10-inch and smaller are made of cast iron; the 12-inch size is Crane Ferrosteel.

**Facing and drilling:** Crane 250-Pound Cast Iron Flanges are regularly supplied faced and drilled unless ordered faced only. Faced only flanges are furnished at the same price as the faced and drilled.

The flanges have a 1/16-inch raised face which is finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish.

**Spot facing:** The bolt holes on these flanges are not spot faced unless so ordered, and then at an extra price. The list price for spot facing bolt holes is 20 cents per hole.

**Galvanized Flanges:** Cast iron flanges are regularly listed black only, but galvanized flanges can be made to order at an extra price. For galvanizing, add 40 per cent to the list prices of black flanges.

**How to order reducing flanges:** When ordering reducing flanges, the screwed or reduced size should be designated first, and then the outside diameter of the flange. For example, a 250-Pound Flange to connect a 3-inch pipe to a 4-inch valve or fitting (O.D. of 4-inch flange, 10 inches) should be ordered:

3" x 10" Reducing Flange.

**Steel flanges; 800-Pound Hydraulic:** For higher pressures or for high temperature service, Crane Forged Steel Flanges are recommended; see pages 291 to 298.

When 800-Pound Hydraulic Iron Flanges are needed, use 600-Pound Forged Steel Flanges; they have the same outside diameter, the same facing, the same bolt circle, and take the same number and diameter of bolts or bolt-studs.

*Templates for drilling . page 460*

*Gaskets....page 474*

# Crane Pressure-Seal Bonnet and Lip-Seal Bonnet Valves

*(Patented and Patents Pending)*

**Pressure-Seal Bonnet Valves**
General Description of Pressure-Seal Bonnet . . . pages 206 and 207
Ratings, Tests, and Service Recommendations . . . . . page 208

Gate
Description . . . . . page 209
List Prices and Dimensions . . . . . pages 210 and 211

Globe and Angle
Description . . . . . page 212
List Prices and Dimensions . . . . . page 213

Stop-Check (Non-Return Valves)
Description . . . . . page 214
List Prices and Dimensions . . . . . page 215
Selecting the Proper Size . . . . . pages 216 and 217
Determining Pressure Drop . . . . . pages 216 and 217

**Pressure-Seal Line Joints** . . . . . page 220

**Lip-Seal Bonnet Valves**
Globe and Angle
Ratings and Tests . . . . . page 218
Description and Dimensions . . . . . pages 218 and 219

***Crane Pressure-Seal Bonnet*** Valves have revolutionized the design and construction of valves intended for high-pressure, high-temperature steam and general service in modern power industrial, and chemical plants. Utilization of the internal fluid pressure to seal the bonnet joint is the principal feature, but each type—gate, globe, angle, and stop-check—has individual requirements that contribute to greater efficiency.

New records for valve performance have been set, not only in the United States but also in many foreign countries. Backed by the tremendous facilities for research, engineering, and production which are Crane's, the line has grown rapidly.

The valves are now a part of the large family of "regular" Crane manufactured product. In addition, patterns and equipment for many other types and sizes are available, and the pressure-seal bonnet principle has been successfully applied to scores of special valves for unusual operating requirements. Inquiries for non-listed items in conventional sizes and types of valves, or for special designs for unique flow control problems, are given prompt attention.

***Crane Lip-Seal Bonnet*** Globe and Angle Valves mark the introduction of a new, superior design for small size steel valves. Developed by the same Crane resources which have made Pressure-Seal Bonnet Valves so outstanding in their field, thoroughly tested in rigorous experimental demands, and proved in actual installation service, they fulfill the need for small size valves required in high-pressure, high-temperature steam service.

The exclusive Crane Lip-Seal design has made it possible to produce a compact, relatively lightweight valve without sacrificing strength and without resorting to reduced seat area. Absolute tightness, freedom from bonnet joint maintenance, and easy installation are only a few of the features. See pages 218 and 219.

# Crane Pressure-Seal Bonnet

## Steel Gate, Globe, Angle, and Stop-Check Valves

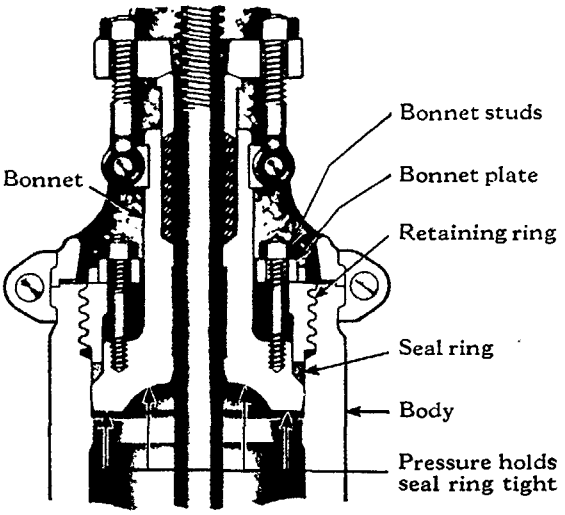
*(Patented and Patents Pending)*

## *General Description*

Crane Pressure-Seal Bonnet Valves herald a new era in valve engineering. Their design is unique in many respects and has eliminated the major problems attending the control of high pressure-temperature steam and water in modern power plant operation.

Announced a few years ago after extensive research and experimentation backed by exhaustive laboratory and field testing, they are rapidly being approved and preferred by leading power engineers throughout the country. Eagerly accepted for steam and boiler feed service in large central station installations, these valves are now receiving growing approval as standard equipment on high-pressure high-temperature services in the power stations of public utilities, oil refineries, and industrial and chemical plants, and for much process piping.

Their all-around superiority over conventional designs for power services is already well known.




Section of typical Crane Pressure-Seal Bonnet as used on the larger sizes of Gate Valves.

**Pressure-Seal Bonnet:** Although each type of valve in this new Crane line embodies many features of design that contribute to high efficiency and outstanding serviceability, each has in common the Crane Pressure-Seal Bonnet. The Pressure-Seal joint, being wholly contained within the valve body, utilizes the pressure inside the valve to seal the joint. Once the joint is initially made tight, it automatically remains so without further attention; no bolts or threads are relied upon to retain pressure.

Depending on the style and size of valve, several minor modifications in mechanical structure are employed to assemble the body, the bonnet, the yoke, and the seal ring, but the principle of design is alike in all of them. The illustration at the left shows a typical Crane Pressure-Seal Bonnet, as used on larger sizes of gate valves.

The bonnet fits into the body, followed by the wedge-shaped seal ring. The retaining ring is then screwed into the body, the bonnet plate added, and the assembly drawn together by the bonnet studs. Neither the threaded body and retaining ring connection nor the studs are expected to retain high pressure; they merely position the assembly and hold the parts firmly and snugly together.

Internal fluid pressure acting upon the entire underside of the bonnet reacts upon the smaller contacting area of the wedge-shaped ring, sealing the joint. Because of the design, the sealing pressure is always many times greater than the pressure of the fluid in the line; leakage is impossible. The higher the internal pressure, the greater is the sealing pressure.

Maintenance of the joint is eliminated, and yet the assembly can be dismantled and reassembled in a fraction of the time required to open or close any other type of bonnet joint.

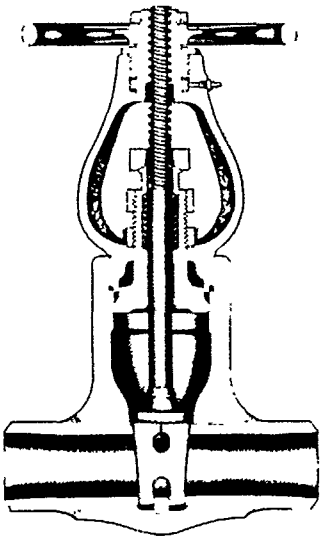
Wherever necessary, all mating parts are properly lubricated or plated to prevent corrosion or galling, and to eliminate "freezing" when subjected to high temperatures for long periods.

**Saving in weight and space:** Crane Pressure-Seal Bonnet Valves have liberal strength and a high factor of safety, but no unnecessary weight. The light weight of the parts of the Pressure-Seal Bonnet, the use of ample metal sections but without the extra thickness usually added for corrosion allowance on valves also recommended for oil refining services, and the unique compactness of design, make a surprising reduction in weight.

These valves are lighter in weight than corresponding sizes and types of conventional valves—as much as 60 per cent on the larger sizes in the 1500-Pound class. Less weight makes the valves easier to handle during erection and in maintenance. Savings in supporting structures or in the suspension of piping are thereby possible.

The end to end dimensions are as short as practicable, commensurate with good design. Close nesting of welding end valves is possible where necessary, without interference from overhanging flanges as is the case in conventional bolted bonnet valves.

*(Continued on next page.)*



Section of a 4-inch Crane 1500-Pound Pressure-Seal Bonnet Gate Valve. The smaller sizes, as illustrated here, have an integral yoke and retaining ring, which screws into the body.

# Crane Pressure-Seal Bonnet

## *General Description (Continued)*

In addition the over-all compactness of Crane Pressure-Seal Bonnet Valves [illegible] reduces the distance from the center to the top of the valve, thus requiring less head room.

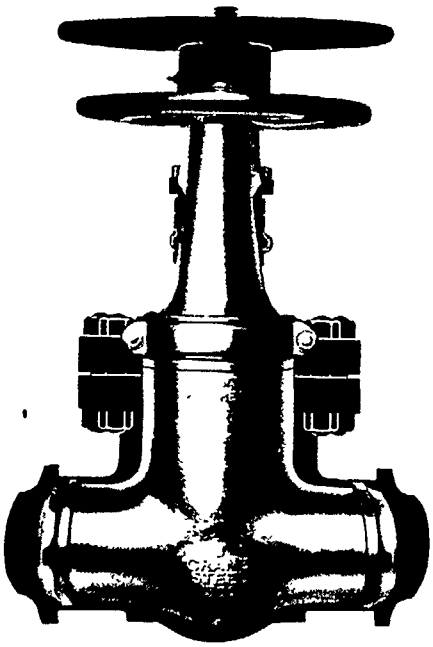
Illustrated at the right is an 8-inch 1500-Pound Pressure-Seal Bonnet Gate Valve with an 8-inch bolted bonnet valve silhouetted in the background. This comparison typifies the compactness and the space-saving advantages that are characteristic of the new valves.

**Designed for efficiency:** Pressure-Seal Bonnet Valves are built especially for the exacting requirements of high pressure-temperature steam and power piping systems. Each type of valve has in common, in addition to the new bonnet, other features of design and construction that contribute to efficient operation and long life.

**Streamlined body:** The bodies have smooth flowing contours without abrupt changes in metal thickness. On butt-welding end valves, starting with pipe wall thickness at the ends, the metal sections increase gradually to the full body thickness, eliminating areas where acute stresses might otherwise concentrate.

**Easy to insulate:** The application of insulation is made easier due to the streamlined body. Less insulating material and labor are required, and neater, more effective results are obtained.

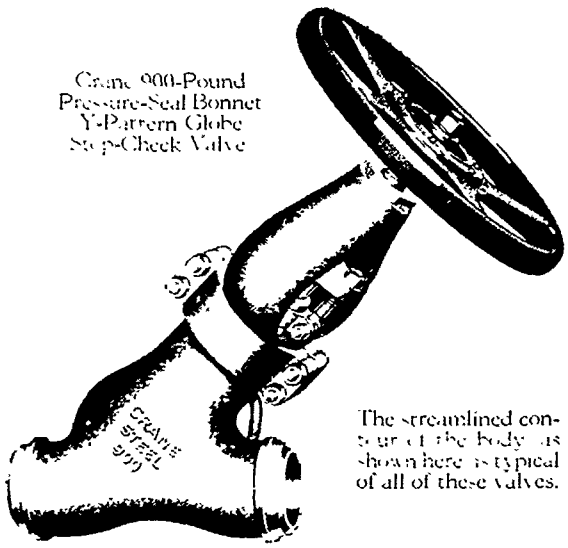
**Direct yoke-body mounting:** The yoke is mounted on the body instead of the bonnet. It transmits the forces required to operate the valve directly from the yoke sleeve or bushing to the valve body, without going through the bonnet. The yoke is rugged and is accurately centered; true alignment is maintained in relation to the stem.



Crane 8-inch 1500-Pound Pressure-Seal Bonnet Gate Valve compared with an 8-inch bolted bonnet valve. This illustrates the compactness of the new line and is suggestive of the saving in weight.

In smaller sizes, the yoke and retaining ring are integral, and screw into the body. In larger size valves, the yoke sets on top of the body, positioned by a male and female joint, and held rigidly in place by a simple circular clamp; this latter construction is especially desirable on large sizes which may be ordered geared or motor operated, since the yoke can be turned if necessary, providing an unlimited choice of positions for the operating unit.

**Liberal stuffing box:** The stuffing box has generous space for stem packing. All valves have a bolted gland, equipped with swinging gland eye bolts.




Crane 900-Pound Pressure-Seal Bonnet Y-Pattern Globe Stop-Check Valve

The streamlined contour of the body as shown here is typical of all of these valves.

**Stellited seating surfaces:** To assure extra long life on high pressure-temperature steam, boiler feed, and similar services, all Crane Pressure-Seal Bonnet Valves are regularly made with Stellited seating surfaces. All body seat rings are a new design, accurately fitted into the body and welded in place; they cannot loosen in service.

**Body and bonnet materials:** Depending upon the service, Crane Pressure-Seal Bonnet Valves have the body and bonnet made either of Crane No. 4 Carbon-Molybdenum Alloy Steel or Crane No. 7 Chrome-Molybdenum Alloy Steel. The former are recommended for a maximum temperature of 850° F.; valves made of No. 7 Steel are recommended for maximum temperatures of 950° F. with flanged ends and 1045° F. with welding ends.

These valves can be made to order of Crane No. 9 Chrome-Molybdenum Alloy Steel for steam temperatures up to 1050° F.

**Scope of line:** The Crane Pressure-Seal Bonnet line includes, in the full range of most commonly used sizes, 600, 900, and 1500-Pound Gate Valves, 1500-Pound Globe and Angle Valves, and 900 and 1500-Pound Stop-Check Valves.

Complete information on sizes, types, and pressure classes not listed in this section will be furnished on application.

*List prices and dimensions* ..... *pages 210 to 215*
*Pressure-temperature ratings* ..... *page 208*
*Description of materials* ..... *pages 1 to 9*

# Steel Pressure-Seal Bonnet Valves

## Flanged, Butt-Welding, and Socket-Welding Ends

### Ratings, Tests, and Service Recommendations

**Service recommendations:** Crane Steel Pressure-Seal Bonnet Valves are primarily intended for the high pressure-temperature steam and hot water services encountered in modern steam generating stations and for similar services in large industrial and chemical plants. Equipped with Stellite faced seating surfaces and an Exelloy stem, they also are well suited for air, gas, high hydraulic systems using water or low viscosity oil, and for other fluids where the service does not involve a major problem of corrosion, erosion, or coking.

Valves having the catalog number suffixed with the designation "U4" are made with Crane No. 4 Carbon-Molybdenum Alloy Steel body and bonnet and are recommended for a maximum temperature of 850° F.

Valves having the catalog number suffixed with the designation "U7" or "U" have the body and bonnet made of No. 7 Chrome-Molybdenum Steel and are recommended for maximum temperatures of 950° F. with flanged ends and 1045° F. with socket-welding or butt-welding ends. No. 7 Steel is a new material alloyed especially for welding end valves used on steam service at temperatures from 850° F. to 1045° F. It exhibits much greater stability against graphitization at these temperatures than does carbon-molybdenum steel; see page 7 for description.

PRESSURE-TEMPERATURE RATINGS

| | Temp. | Maximum Non-Shock Working Pressures Pounds per Square Inch | | | | |
|---|---|---|---|---|---|---|
| | | Flanged | | Butt-Welding and Socket-Welding | | |
| | | Male Face | Ring Joint Face | | | |
| | Deg. Fahr. | 600 Pound | 600 Pound | 600 Pound | 900 Pound | 1500 Pound |
| "U4" valves are limited to 850° F. maximum | 100 | 1200 | 1440 | 1440 | 2160 | 3600 |
| | 150 | 1180 | 1420 | 1420 | 2130 | 3550 |
| | 200 | 1160 | 1400 | 1400 | 2100 | 3500 |
| | 250 | 1140 | 1380 | 1380 | 2070 | 3450 |
| | 300 | 1120 | 1365 | 1365 | 2050 | 3415 |
| | 350 | 1095 | 1350 | 1350 | 2025 | 3375 |
| | 400 | 1075 | 1330 | 1330 | 2000 | 3330 |
| | 450 | 1050 | 1320 | 1320 | 1975 | 3295 |
| "U7" and "U" valves are limited to 1045° F. maximum | 500 | 1000 | 1250 | 1250 | 1875 | 3125 |
| | 550 | 950 | 1180 | 1180 | 1775 | 2955 |
| | 600 | 890 | 1110 | 1110 | 1660 | 2770 |
| | 650 | 830 | 1030 | 1030 | 1550 | 2580 |
| | 700 | 760 | 940 | 940 | 1410 | 2350 |
| | 750 | 720 | 850 | 850 | 1275 | 2125 |
| | 800 | 680 | 750 | 750 | 1125 | 1875 |
| | 850 | 640 | 700 | 700 | 1050 | 1750 |
| | 900 | **600** | 650 | 650 | 975 | 1625 |
| | 950 | | **600** | **600** | **900** | **1500** |
| | 1000 | | | 550 | 820 | 1370 |
| | 1010 | | | 530 | 795 | 1325 |
| | 1020 | | | 500 | 750 | 1250 |
| | 1030 | | | 460 | 690 | 1150 |
| | 1040 | | | 420 | 630 | 1050 |
| | 1045 | | | 400 | 600 | 1000 |

Subject to the foregoing temperature limitations, Crane Pressure-Seal Bonnet Valves are recommended for the pressures shown in the upper table.

**Standards:** Pressure-temperature ratings for Crane Pressure-Seal Bonnet Valves for temperatures up to and including 950° F. agree with those in Supplement No. 1 (ASA B16e6-1949) to American Standard ASA B16e-1939. Steam ratings for welding end valves at 1000° F. and higher are based on the permissible stresses defined in the ASME Boiler Code for the chrome-molybdenum steel to which Crane No. 7 Steel corresponds.

**Test pressures:** These valves, except Stop-Check, are regularly given a hydrostatic shell and seat test and an air-under-water test at the seat, as indicated in the table. For tests on Stop-Check Valves, see page 215.

Hydrostatic Test Pressures

| Pressure Class | Shell test | Seat test |
|---|---|---|
| 600-Pound | 2175 pounds | 1550 pounds |
| 900-Pound | 3250 pounds | 2250 pounds |
| 1500-Pound | 5400 pounds | 3700 pounds |
| Seat tested 100 pounds air-under-water. | | |

The larger sizes of butt-welding end valves have the ends of the body shaped to permit the use of a testing clamp; the smaller sizes are plain, being tested without the use of such a clamp.

### Higher Temperature Valves

For steam service at 1050° F. temperature and where greater strength and resistance to steam corrosion are desired at temperatures over 1000° F., 1500-Pound Pressure-Seal Bonnet Butt-Welding End Valves made of Crane No. 9 Chrome-Molybdenum Alloy Steel are recommended. They are made to order only; see page 7 for description.

Crane 1500-Pound Pressure-Seal Bonnet Valves With Butt-Welding Ends

Made of Crane No. 9 Chrome-Molybdenum Alloy Steel

| Service Temperature | Maximum Steam Working Pressure |
|---|---|
| 1000° F. | 1500 pounds |
| 1010° F. | 1430 pounds |
| 1020° F. | 1360 pounds |
| 1030° F. | 1290 pounds |
| 1040° F. | 1220 pounds |
| 1050° F. | 1150 pounds |

Pressure-temperature ratings shown at the left are based on allowable stresses defined by the ASME Boiler Code for this type of material. For temperatures of 950° F. and lower, the ratings are the same as those for 1500-Pound Valves made of No. 4 or No. 7 Steel; refer to the "1500-Pound Valve" column in the large table above.



*List prices and dimensions . . . . pages 210 to 215*

*Description of Pressure-Seal Bonnet . pages 206 and 207*

# Pressure-Seal Bonnet
# Cast Steel Wedge Gate Valves

*(Patented and Patent Pending)*

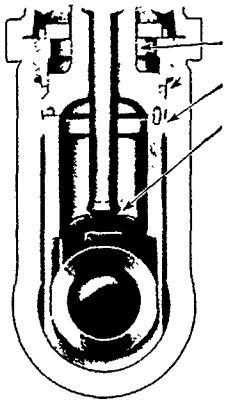
The sectional views at the right are typical of the larger size Crane Pressure-Seal Bonnet Gate Valves.

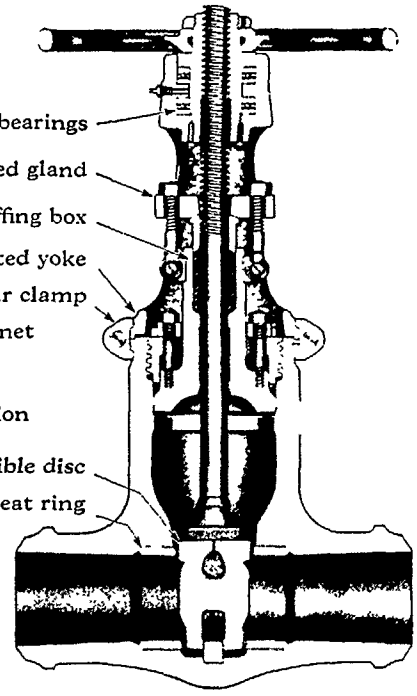
**Body:** The body is made without abrupt change in metal section, providing protection against a concentration of stresses produced by pressure, temperature differences, and pipe line strains. The valves have a slightly reduced seat area to improve flow characteristics, and there are no pockets between the end of the body and the seat to cause turbulence or friction.

**Body seat rings:** The body seat rings are Stellite faced. Accurately made to precision fit, they are slipped in parallel to the run of the valve and are seal-welded in place. In 900 and 1500-Pound Valves sizes 5-inch and smaller, the seat rings extend through the body to form the welding ends of the valve, and the body is welded to the rings.

## 600-Pound Flanged Ends
## 600, 900, and 1500-Pound Butt-Welding Ends

Sections showing typical construction of the larger size Pressure-Seal Bonnet Gate Valves




The section at the left illustrates the unusual disc guide and the tee-head disc-stem connection.

**Disc:** These valves have a wedge disc with Stellited seating faces. In sizes 3-inch and smaller, the disc is solid. In sizes 4-inch and larger, a one-piece flexible disc, solid through the center section but not around the outer portion, provides enough flexibility to eliminate sticking, thus requiring less torque to open the valve when cold after having been closed while hot. In addition, the disc seating faces adjust themselves to any slight variations in alignment caused by body contraction or pipe line strains.

**Disc guide:** Sizes 2½-inch and larger have an improved full length, separate "U" shaped disc guide extending along the sides of the body and fitted into a specially machined groove around the bottom of the body. Full disc guiding, even near the point of seating where the maximum force is exerted against the disc by the fluid flow, is assured by this design. The groove in the body for the disc guide and the machining for the body seat rings are made with the same machine setting to maintain proper alignment between the disc, guide, and body seat rings. Sizes 2-inch and smaller have the disc guides integral with the disc, and the body is slotted.

**Disc-stem connection:** The valves have a sturdy tee-head disc-stem connection. Ample clearance between the head on the stem and the slot in the disc prevents side strains on the stem. The stem is only required to move the disc up and down; it is not forced to also serve as a guide for the disc.

**Other features:** These valves have the other features common to all of the valves in this line, such as Pressure-Seal Bonnet, direct-mounted yoke, deep stuffing box, and two-piece bolted gland. In addition, 600-Pound Valves 8-inch and larger and 900 and 1500-Pound Valves 6-inch and larger are regularly supplied with a ball-bearing yoke sleeve; sizes 1½-inch and larger have a grease fitting to permit proper lubrication of the yoke sleeve.

In sizes 5-inch and smaller (in all three pressure classes), the yoke and the retaining ring are integral and screw into the body to hold the seal ring. Larger sizes have the separate yoke and retaining ring, with the yoke held to the body by the circular clamp. The lower end of the stem hole in the bonnet is Stellite faced on sizes 2½-inch and larger, assuring a better back-seat and guide for the stem.

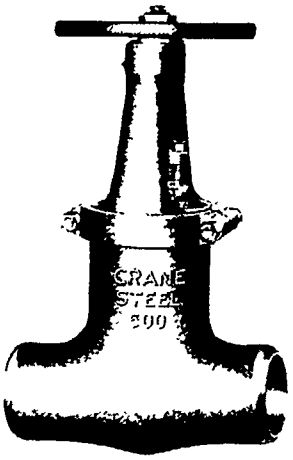
## 1500-Pound Socket-Welding Ends

The Crane line of Pressure-Seal Bonnet Gate Valves also includes 1500-Pound Valves with socket-welding ends in sizes 1, 1¼, 1½, and 2-inch. These valves are similar in construction to the smaller sizes of the butt-welding end described above. The body seat rings are long and are fillet welded into the body, the welded end of the ring forming the end of the socket in the body.

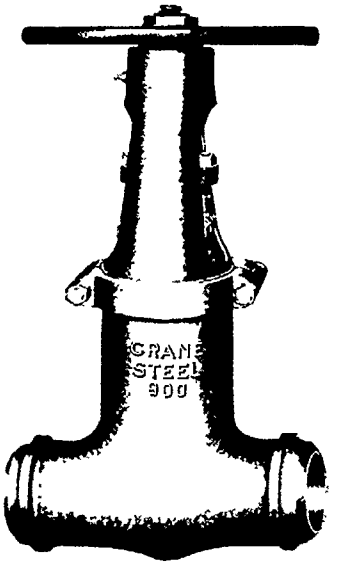
*General description . . . . pages 206 and 207*

*List prices and dimensions . . . . pages 210 and 211*

# Pressure-Seal Bonnet
# Cast Steel Wedge Gate Valves

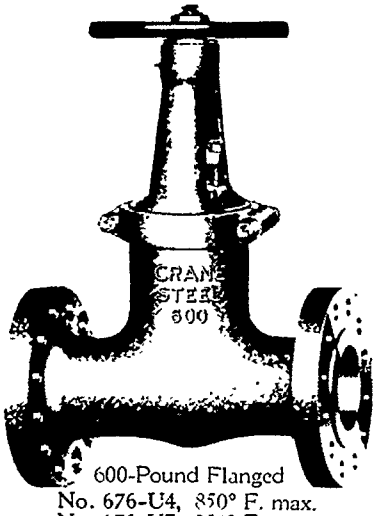



600-Pound Butt-Welding
No. 776-U4, 850° F. max.
No. 776-U7, 1045° F. max.

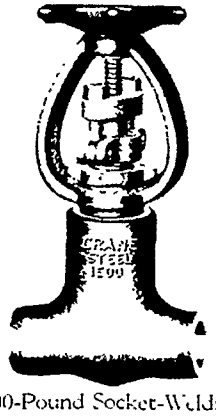



900-Pound Butt-Welding
No. 783-U4, 850° F. max.
No. 783-U7, 1045° F. max.

1500-Pound Butt-Welding
No. 787-U4, 850° F. max.
No. 787-U7, 1045° F. max.




600-Pound Flanged
No. 676-U4, 850° F. max.
No. 676-U7, 950° F. max.




1500-Pound Socket-Welding
No. 7811 U, 1045° F. max.

*For description, ratings, and recommendations, see pages 206 to 209.*

**Materials:** The body seat rings, welded in place, and the disc are made of the same material as the body and bonnet and have the seating surfaces faced with Stellite. The stem is made of Exelloy.

"U4" suffixed catalog numbers indicate valves have a Crane No. 4 Steel body and bonnet; such valves are recommended for a maximum temperature of 850° F.

"U7" or "U" suffixed catalog numbers indicate valves have a Crane No. 7 Chrome-Molybdenum Alloy Steel body and bonnet; such valves are recommended for a maximum temperature of 950° F. with flanged ends and 1045° F. with welding ends.

**Flanged valves:** End flanges conform to the 600-Pound American Standard (B16e-1939). They have a large male face ¼-inch high, with a serrated finish (approximately 32 concentric grooves per inch). When so ordered, flanged valves can be furnished with ring joint facing; see the Crane Discount Sheet for prices.

Prices include drilling to the 600-Pound American Standard, and spot facing; no deduction is made if valves are ordered faced only.

**Face to face:** Flanged valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged Valves (No. B16.10-1939).

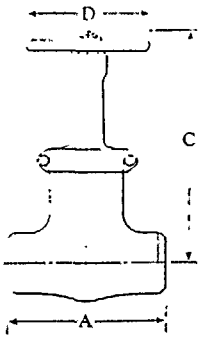
**Ordering butt-welding valves:** Orders for butt-welding valves must specify the inside diameter of the pipe with which they are to be used, or its wall thickness, so that the valve ends can be bored to match.

**List Prices, Each**

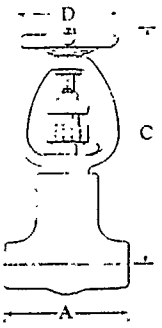
| Size | Flanged F. D. & S. F. | Butt-Welding | | | Socket-Welding |
|---|---|---|---|---|---|
| | 600-Pound | 600-Pound | 900-Pound | 1500-Pound | 1500-Pound |
| Inches | Nos. 676-U4 676-U7 | Nos. 776-U4 776-U7 | Nos. 783-U4 783-U7 | Nos. 787-U4 787-U7 | No. 7811 U |
| 1 | | | Use 1500-Pound Valves | 405.00 | 324.00 |
| 1¼ | | | | 445.00 | 356.00 |
| 1½ | | | | 490.00 | 392.00 |
| 2 | | | | 610.00 | 488.00 |
| 2½ | 430.00 | 430.00 | | 770.00 | |
| 3 | 525.00 | 525.00 | 815.00 | 1015.00 | |
| 4 | 805.00 | 805.00 | 1065.00 | 1395.00 | |
| 5 | 1205.00 | 1205.00 | 1435.00 | 2185.00 | |
| 6 | 1565.00 | 1565.00 | 1930.00 | 2845.00 | |
| 8 | 2245.00 | 2245.00 | 2870.00 | 4360.00 | |
| 10 | 3285.00 | 3285.00 | 4030.00 | 6715.00 | |
| 12 | 4325.00 | 4325.00 | 5465.00 | 9690.00 | |
| 14 | | 5745.00 | 7725.00* | 14100.00* | |
| 16 | | 7420.00 | 9680.00* | On request* | |
| 18 | | 9265.00 | 13300.00* | | |
| 20 | | 13830.00 | | | |
| 24 | | 22555.00 | | | |

*900 and 1500-Pound Butt-Welding Valves having the catalog number suffixed with the designation "U4" are not made in sizes 14-inch and larger.

# Pressure-Seal Bonnet
# Cast Steel Wedge Gate Valves




600, 900, and 1500-Pound Butt-Welding

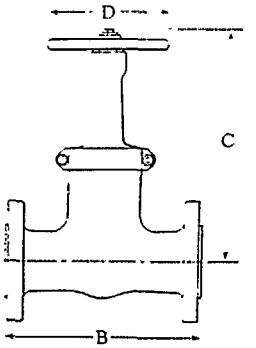



1500-Pound Socket-Welding

High in strength yet light in weight, Crane Pressure-Seal Bonnet Gate Valves offer unusual compactness and durability. Streamlined design permits close nesting of welding end valves—and installation in minimum space. Center to top dimensions, too, are noticeably smaller than usual, making less headroom necessary.

Face to face dimensions of flanged valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939. End to end dimensions of welding end valves, in almost all instances, are shorter than specified in this Standard.

Unless ring joint facing is specified, flanged valves will have 1/4-inch high large male faces.




600-Pound Flanged

## Dimensions, in Inches

| Class | Size | Butt-Welding or Socket-Welding Valves | | | Flanged Valves | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | C open | D | B* | C open | D | Diameter of flange | Thickness of flange (*) | Diameter of male face | Diameter of bolt circle | No. & diameter of bolt-studs |
| 600 Pound | 2½ | 8½ | 19¼ | 8 | 13 | 19¼ | 8 | 7½ | 1⅛ | 4⅛ | 5⅞ | 8-¾ |
| | 3 | 10 | 21 | 9 | 14 | 21 | 9 | 8¼ | 1¼ | 5 | 6⅝ | 8-¾ |
| | 4 | 12 | 25¾ | 10 | 17 | 25¾ | 10 | 10¾ | 1½ | 6 3/16 | 8½ | 8-⅞ |
| | 5 | 15 | 30½ | 12 | 20 | 30½ | 12 | 13 | 1¾ | 7 5/16 | 10½ | 8-1 |
| | 6 | 18 | 33½ | 14 | 22 | 33½ | 14 | 14 | 1⅞ | 8½ | 11½ | 12-1 |
| | 8 | 23 | 43⅜ | 20 | 26 | 43⅜ | 20 | 16½ | 2 3/16 | 10⅝ | 13¾ | 12-1⅛ |
| | 10 | 28 | 51½ | 24 | 31 | 51½ | 24 | 20 | [illegible] | 12¾ | 17 | 16-1¼ |
| | 12 | 32 | 59⅛ | 24 | 33 | 59⅛ | 24 | 22 | 2⅝ | 15 | 19¼ | 20-1¼ |
| | 14 | 35 | 65⅛ | 27 | | | | | | | | |
| | 16 | 39 | 72 | 30 | | | | | | | | |
| | 18 | On application | | | | | | | | | | |
| | 20 | | | | | | | | | | | |
| | 24 | | | | | | | | | | | |
| 900 Pound | 3 | 12 | 23 | 10 | | | | | | | | |
| | 4 | 14 | 27¾ | 14 | | | | | | | | |
| | 5 | 17 | 33½ | 16 | | | | | | | | |
| | 6 | 20 | 39½ | 20 | | | | | | | | |
| | 8 | 26 | 47 | 24 | | | | | | | | |
| | 10 | 31 | 52½ | 24 | | | | | | | | |
| | 12 | 36 | 61½ | 27 | | | | | | | | |
| | 14 | 39 | 67 | 30 | | | | | | | | |
| | 16 | 43 | 73½ | 36 | | | | | | | | |
| | 18 | On application | | | | | | | | | | |
| 1500 Pound | 1 | 5½† | 13 | 5 | | | | | | | | |
| | 1¼ | 6½† | 13¾ | 5 | | | | | | | | |
| | 1½ | 7† | 17¼ | 8 | | | | | | | | |
| | 2 | 8½† | 18½ | 8 | | | | | | | | |
| | 2½ | 10 | 20 | 9 | | | | | | | | |
| | 3 | 12 | 23 | 10 | | | | | | | | |
| | 4 | 16 | 27¾ | 14 | | | | | | | | |
| | 5 | 19 | 33½ | 16 | | | | | | | | |
| | 6 | 22 | 39 | 20 | | | | | | | | |
| | 8 | 28 | 46½ | 24 | | | | | | | | |
| | 10 | 34 | 52¾ | 27 | | | | | | | | |
| | 12 | 39 | 61¼ | 30 | | | | | | | | |
| | 14 | 42 | 66 | 36 | | | | | | | | |
| | 16 | 47 | 75¼ | 36 | | | | | | | | |

*Flanged Valve face to face dimensions (B) include the 1/4" male face; thickness of flange dimensions do not.
†Socket-Welding Valves 1½-inch and smaller have a 1/2" socket depth; the 2-inch size has a 5/8" socket depth.

**By-passes:** When specified, 600-Pound Valves 5-inch and larger and 900 and 1500-Pound Valves 4-inch and larger can be furnished with a by-pass for steam and general service.

An extra charge is made for the by-pass; prices and dimensions are furnished on request. The size of the by-pass will be as shown below.

The by-passes are rugged and durable, and have the necessary flexibility to compensate for expansion strains resulting from unequal temperatures or fluctuating operating conditions. Seamless Chrome-Molybdenum Alloy Steel pipe is used; all piping connections are welded. The by-pass valve is the full equivalent of the main valve insofar as ratings and service recommendations are concerned.

Unless otherwise ordered, the by-pass is attached to the main valve at an angle of 30° from the center line of the main valve stem; it is positioned as close as practicable to the side of the main valve body. The by-pass valve is mounted so that its stem is approximately 30° from vertical.

**Motor operation:** Valves installed in inaccessible locations, or used for emergency or other unusual purposes, are frequently required equipped with an electric, air, or gas motor unit; see pages 120 to 129 for complete description.

**Gearing:** To facilitate operation, valves in the larger sizes can be made to order with spur or bevel gearing, and with extension stems if they are to be installed in inaccessible locations; prices on request.

**By-Passes for 600, 900, and 1500-Pound Valves**

| Size of Main Valve | Size of By-Pass |
|---|---|
| 4" | [illegible] |
| 5 | [illegible] |
| 6 | [illegible] |
| 8 | [illegible] |
| 10 | [illegible] |
| 12 | [illegible] |
| 14 | [illegible] |
| 16 | [illegible] |
| 18 | [illegible] |
| 20 | [illegible] |
| 24 | [illegible] |

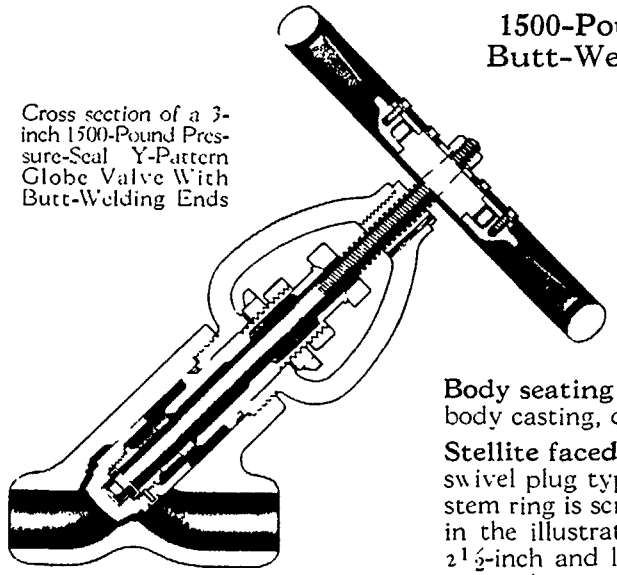
‡900 and 1500-Pound only.

*For ratings, tests, recommendations, and general description of the pressure-seal bonnet and the Pressure-Seal Bonnet Gate Valves, refer to pages 206 to 209.*

*Templates for drilling page 462* *Flange Facings pages 469 and 470*

# Pressure-Seal Bonnet
# Cast Steel Globe and Angle Valves

*(Patented and Patent Pending)*



Cross section of a 3-inch 1500-Pound Pressure-Seal Y-Pattern Globe Valve With Butt-Welding Ends

## 1500-Pound Globe Butt-Welding Ends

The illustration above shows the typical construction of the larger size Crane 1500-Pound Pressure-Seal Bonnet Globe Valves. Like the gate valves described on the preceding pages, the globe valve line features many advantages.

The Pressure-Seal Bonnet assures freedom from bonnet joint leakage and maintenance. Valves are compact, light in weight, and save space. Because of the shape of the interior, pressure drop is low.

For general description, see pages 206 and 207.

**Body:** The body is "Y" pattern; it has unusually smooth contours with only gradual changes in metal thickness. The area above the seat is considerably enlarged, and the low side of the seat is practically on the centerline of the body. The design of the seat and disc in combination with the special shape of the interior of the body produces minimum turbulence and offers little resistance to flow. Pressure drop through these valves is surprisingly low for globe type construction.

**Body seating surface:** The body seating surface is integral with the body casting, consisting of a wide layer of Stellite facing.

**Stellite faced disc:** The valves feature a newly designed, improved, swivel plug type disc faced with Stellite. In the 2-inch size, the disc stem ring is screwed onto the disc and tack welded in place, as shown in the illustration of the socket-welding end valve below. In sizes 2½-inch and larger, the disc is piston guided; the disc stem ring is screwed in, pinned, and tack welded to the disc as shown in the illustration at the left.

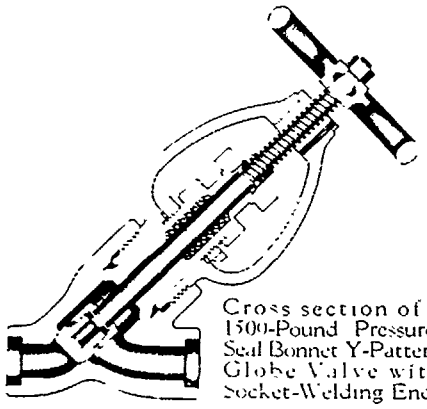
**Rising, turning stem:** The stem is the rising, turning type and operates through a threaded yoke bushing screwed into and pinned to the yoke. The stem is fully guided by long engagement with the yoke bushing and the lower end of the bonnet.

**Bonnet and yoke:** The valves have the Crane Pressure-Seal Bonnet, the yoke and retaining ring being integral. The wide yoke arms permit easy accessibility to the stuffing box.

**Stuffing box and gland:** The stuffing box is large and deep; it is filled with high grade packing. The two-piece gland consists of a gland and gland flange held in place by swinging gland eye bolts; the bolts will not loosen in service.

**Handwheel:** Sizes 2 and 2½-inch have a conventional style malleable iron wheel; sizes 3 and 4-inch have a cast steel hammer-blow wheel.

## 1500-Pound Globe and Angle Socket-Welding Ends



Cross section of a 1500-Pound Pressure-Seal Bonnet Y-Pattern Globe Valve with Socket-Welding Ends

Socket-welding end 1500-Pound Globe and Angle Valves in sizes 1, 1¼, 1½, and 2-inch also are included in the Crane Pressure-Seal Bonnet line. They are similar in construction to the 2-inch butt-welding end Globe Valves described above, except for the end connections; they are also made in the angle pattern.

The globe valve is the Y-pattern design, having an integral Stellite faced seat. The angle valves have a low seat, with a separate Stellite faced seat ring welded into the body. Both valves have unusually good flow characteristics, assuring low pressure drop.

The Stellite faced disc is the improved Crane swivel plug type with a new disc stem ring connection and a long vertical fit between the bore of the disc and the pilot end of the stem. The characteristics of this construction assure the maximum in rigidity, while still permitting the disc to swivel.



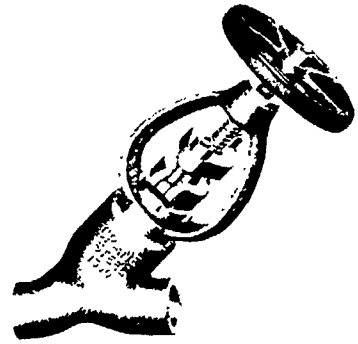
*General description . pages 206 and 207* *List prices and dimensions....page 213*

# Pressure-Seal Bonnet
# Cast Steel Globe and Angle Valves

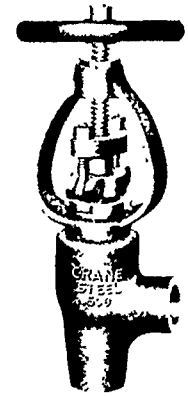
List Prices, Each

| Size | 1500-Pound Socket-Welding End | | 1500-Pound Butt-Welding End | |
|---|---|---|---|---|
| Inches | No. 7852 U Globe | No. 7853 U Angle | No. 7189-U4 Globe | No. 7189-U7 Globe |
| 1 | 121.00 | 121.00 | | |
| 1¼ | 176.00 | 176.00 | | |
| 1½ | 239.00 | 239.00 | | |
| 2 | 322.00 | 322.00 | 550.00 | 550.00 |
| 2½ | | | 800.00 | 800.00 |
| 3 | | | 1060.00 | 1060.00 |
| 4 | | | 1500.00 | 1500.00 |

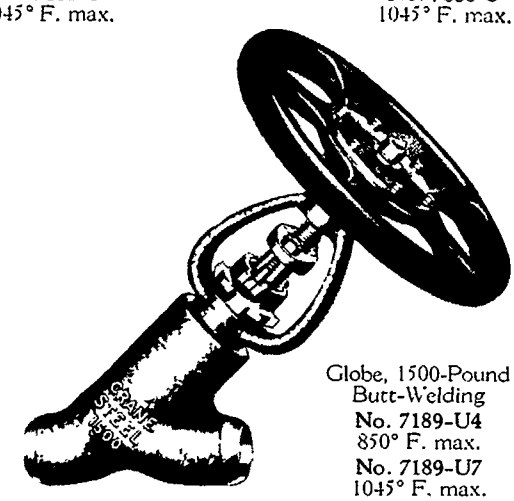
***For additional description, see the preceding page.***



Globe, 1500-Pound Socket-Welding
No. 7852 U
1045° F. max.



Angle, 1500-Pound Socket-Welding
No. 7853 U
1045° F. max.



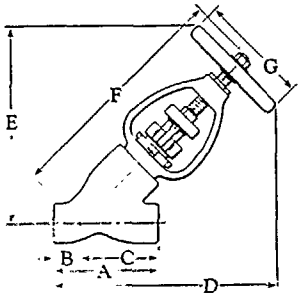
Globe, 1500-Pound Butt-Welding
No. 7189-U4
850° F. max.
No. 7189-U7
1045° F. max.

**Materials:** Valves having the catalog number suffixed with the designation "U4" are furnished with a Crane No. 4 Carbon-Molybdenum Alloy Steel body, bonnet, and disc with Stellited face.

Valves having the catalog number suffixed with the designation "U7" or "U" are furnished with a Crane No. 7 Chrome-Molybdenum Alloy Steel body, bonnet, and disc with Stellited face.

All valves have an Exelloy stem, Crane No. 7 Chrome-Molybdenum disc stem ring, cast carbon steel yoke, and Cast Manganese Bronze yoke bushing. Handwheels are malleable iron conventional type on sizes 2½-inch and smaller and cast steel hammer-blow type on the 3 and 4-inch sizes.

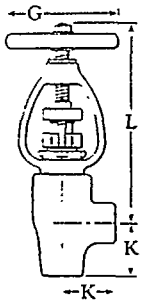
**Recommendations:** Crane No. 4 Carbon-Molybdenum Alloy Steel Globe Valves, designated as "U4", are suitable for a maximum temperature of 850° F. Crane No. 7 Chrome-Molybdenum Alloy Steel Globe and Angle Valves, designated as "U" or "U7", are suitable for a maximum temperature of 1045° F. See page 208 for pressure-temperature ratings and test pressures.




Globe

**Ordering butt-welding end valves:** Orders for butt-welding end valves must always specify the inside diameter of the pipe with which they are to be used, or its wall thickness, so that the ends of the valve can be bored to match.

**Smaller size and higher pressure valves:** If smaller size or higher pressure valves are desired, use the new Crane Lip-Seal Bonnet Globe and Angle Valves shown on pages 218 and 219. They are made in sizes ½ to 2-inch with screwed and socket-welding ends and in the 1500 and 2500-Pound pressure classes.




Angle

Dimensions, in Inches

| Type of Valve | Size | A | B | C | D open | E open | F open | G | K | L open | Depth of socket |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Socket-Weld Globe and Angle | 1 | 5½ | 1⅜ | 4⅛ | 12⅝ | 11¼ | 13⅝ | 5½ | 2¾ | 12⅛ | ½ |
| | 1¼ | 6½ | 1⅝ | 4⅞ | 16 | 13⅜ | 16⅛ | 7 | 3¼ | 14 | ½ |
| | 1½ | 7 | 2 | 5 | 17½ | 15½ | 18⅞ | 8 | 3½ | 16¼ | ½ |
| | 2 | 8½ | 2 7/16 | 6 1/16 | 19¾ | 17¼ | 20⅝ | 10 | 4¼ | 17½ | ⅝ |
| Butt-Weld Globe Only | 2 | 8½ | 2 7/16 | 6 1/16 | 20 | 17½ | 20½ | 10 | | | |
| | 2½ | 10 | 2⅞ | 7⅛ | 24⅝ | 21¾ | 25 | 14 | | | |
| | 3 | 12 | 3⅜ | 8⅝ | 28⅜ | 25 | 26 | 20 | | | |
| | 4 | 16 | 4½ | 11½ | 33¾ | 29¼ | 32½ | 20 | | | |

***General description of Pressure-Seal Bonnet....pages 206 and 207***
***Ratings, tests, and service recommendations.....page 208***

# Pressure-Seal Bonnet
# Cast Steel Stop-Check Valves

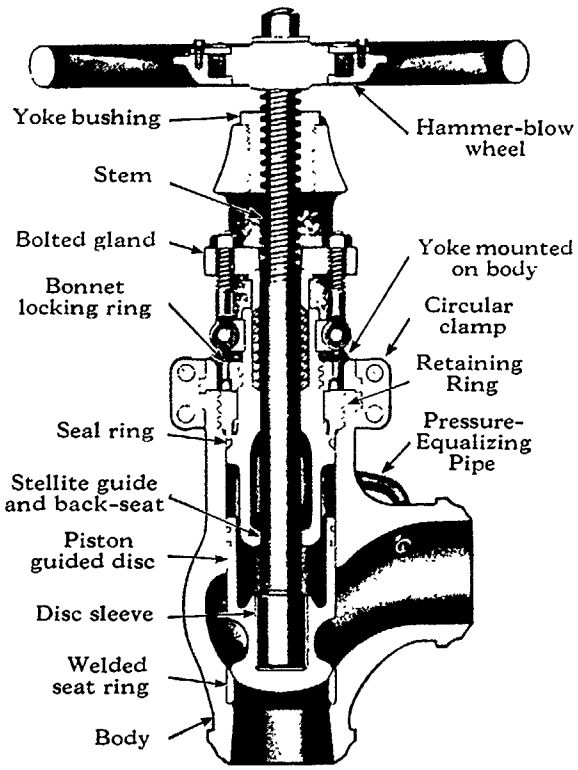
*(Patented and Patent Pending)*

## 900 and 1500-Pound Butt-Welding Ends

Freedom from bonnet joint leakage and maintenance, savings in space and weight, long service life, unusually low pressure drop—these and other benefits accrue to the user of Crane Pressure-Seal Bonnet Stop-Check Valves.

**Body:** The body of these valves—Y-pattern in the Globe type—has streamlined contours with liberal internal area above the seat. Combined with the special shape of the seat and disc, this design offers minimum resistance to flow. Pressure drop through the valve is lower than is usually accepted as good performance for non-return or stop-check valve service.

The body is equipped with a specially designed external pressure-equalizing pipe, welded in place, connecting the chamber above the disc with the outlet end of the body. The pipe is so assembled to the body that the end on the outlet protrudes into the path of flow. Under high flow conditions, an aspirator effect is produced by the pipe, assuring lower pressure above the disc than beneath the disc and permitting high disc lift; should the flow reverse, the pipe admits the higher pressure to the top of the disc chamber, thereby forcing the disc to close quickly.




Cross section of a 6-inch 900-Pound Pressure-Seal Bonnet Angle Stop-Check Valve

**Body seat ring:** The body seat ring is of special design; it is slipped into an accurately machined recess in the body and is seal-welded in place. It will not loosen in service. The seating surface is Stellite faced.

**Disc:** The disc, also Stellite faced, is of piston guided construction, and is equipped with two piston rings. It fits snugly in the body, and is additionally guided by the long shoulder on the end of the stem. This shoulder operates in a sleeve fastened in the disc; to prevent galling and scoring, the sleeve and the washer between the stem end and the disc are made of a steel having extreme hardness.

**Stem:** The stem is of liberal diameter, amply strong, and well guided. It has a long thread engagement with the yoke bushing.

The stem hole in the lower end of the bonnet is Stellite faced to provide a good bearing and back-seat for the stem.

**Pressure-Seal Bonnet:** These valves have the Crane Pressure-Seal Bonnet described on pages 206 and 207. On the 6 and 8-inch sizes, the retaining ring and bonnet are drawn together by a threaded bonnet locking ring as shown on the cross section at the left.

10 and 12-inch sizes have a bonnet plate with bonnet studs, similar to the construction illustrated on page 206.

**Direct yoke-body mounting:** The yoke is mounted directly on the body, and the connection is secured by a simple but efficient circular clamp, using two Triplex Steel Bolt-Studs on each side of the two halves of the clamp.

**Handwheel:** The handwheel is steel and is mounted on the stem end. It is of hammer-blow construction to enable closing the valve under unbalanced pressure conditions or against boiler test pressure.

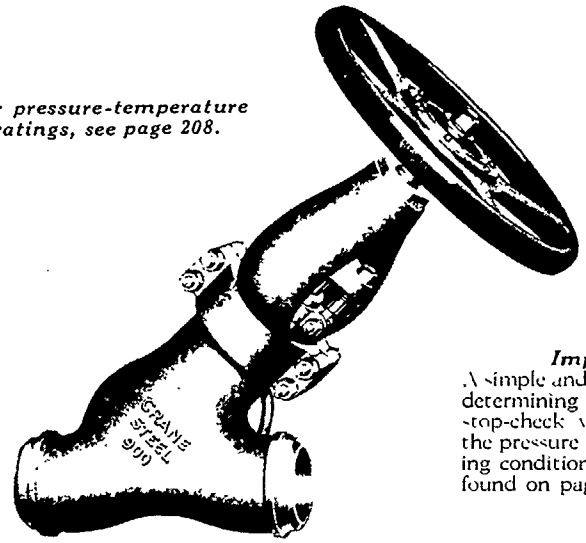
**Stuffing box:** A tight stem seal is provided by the large and deep stuffing box, which is filled with high grade packing.

The valves have a two-piece ball-type gland, consisting of a gland and gland flange. This construction maintains an even load on the packing and prevents the gland from binding on the stem. The swinging gland eye bolts move out of the way when the stuffing box is being repacked.

*List prices and dimensions* .. . *page 215*
*Pressure-temperature ratings* .. . . *page 208*
*Description of Pressure-Seal Bonnet* .. *pages 206 and 207*

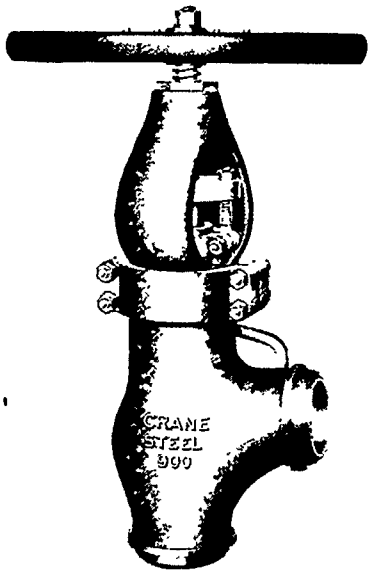
# Pressure-Seal Bonnet
# Cast Steel Stop-Check Valves

*For pressure-temperature ratings, see page 208.*




Globe Y-Pattern
Butt-Welding, 1045° F. max.
900-Pound—No. 7186 U
1500-Pound—No. 7192 U

***Important***
A simple and direct method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow will be found on pages 216 and 217.



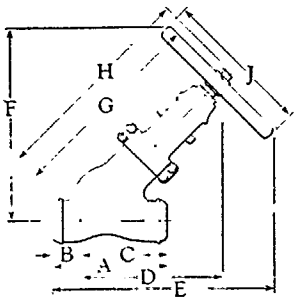

Angle
Butt-Welding, 1045° F. max.
900-Pound—No. 7188 U
1500-Pound—No. 7194 U

**Materials:** These valves have Crane No. 7 Chrome-Molybdenum Alloy Steel body seat ring and disc, the seating surfaces being faced with Stellite; the seat ring is seal-welded in the body. The stem, strong and durable, is made of Crane Exelloy.

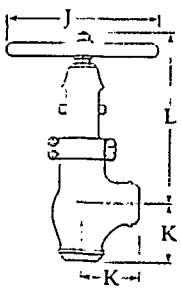
The body and bonnet also are made of Crane No. 7 Chrome-Molybdenum Alloy Steel, and the valves are recommended for 1045° F. maximum temperature.

**List Prices, Each**

| Size Inches | 900-Pound No. 7186 U Globe | 900-Pound No. 7188 U Angle | 1500-Pound No. 7192 U Globe | 1500-Pound No. 7194 U Angle |
|---|---|---|---|---|
| 6 | 2830.00 | 2830.00 | | |
| 8 | 4410.00 | 4410.00 | 6190.00 | 6190.00 |
| 10 | 7030.00 | 7030.00 | 9450.00 | 9450.00 |
| 12 | 9450.00 | 9450.00 | 13280.00 | 13280.00 |




Globe Y-Pattern




Angle

**Test pressures:** 900-Pound Valves are given a 3250 pound shell test; 1500-Pound Valves are given a 5400 pound shell test. The valves are also given a 100 pound air-under-water seat test. They are suitable for boiler test conditions one and one-half times the nominal ratings to comply with the ASME Boiler Code.

The valves are equipped with a hammer-blow handwheel and can be manually closed against boiler test pressure. They can also be equipped with toggle operators, gears, or motor operators at a special price.

**Ordering butt-welding end valves:** These valves are made with butt-welding ends. Orders must specify the inside diameter of the pipe with which they are to be used, or its wall thickness, so that the ends of the valve can be bored to match.

**Dimensions, in Inches**

| Pressure Class | Size | A | B | C | D open | E open | F open | G open | H open | J | K | L open |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 900-Pound | 6 | 20 | 5 | 15 | 26⅞ | 41⅛ | 36⅛ | 38 | 39¾ | 26 | 10 | 32 |
| | 8 | 26 | 6¾ | 19¼ | 32½ | 49⅞ | 43⅛ | 46 | 47¾ | 30 | 13 | 37⅝ |
| | 10 | 31 | 7¾ | 23¼ | 37½ | 57½ | 49⅞ | 52¾ | 54¾ | 36 | 15½ | 42⅜ |
| | 12 | 36 | 9 5/16 | 26 11/16 | 44¾ | 66⅜ | 57 | 63¼ | 65¼ | 36 | 18 | 50⅝ |
| 1500-Pound | 8 | 28 | 7¾ | 20¼ | 32½ | 50⅞ | 43⅛ | 46 | 47¾ | 30 | 14 | 37⅝ |
| | 10 | 34 | 9 | 25 | 37½ | 58¾ | 49⅞ | 52¾ | 54¾ | 36 | 17 | 42⅜ |
| | 12 | 39 | 11 5/16 | 27 11/16 | 44¾ | 68⅜ | 57 | 63¼ | 65¼ | 36 | 19½ | 50⅝ |

*General description of Pressure-Seal Bonnet....pages 206 and 207*

# Crane Pressure-Seal Bonnet Stop-Check Valves
# Selecting the Proper Size—Determining Pressure Drop

A problem confronting the power piping designer is the selection of the best size of stop-check valve for his service conditions. This type valve has a floating disc member, hence it is important the valve be sized to provide full disc lift under conditions prevailing during the major portion of the service life of the installation. If the valve is too large, the disc will float in a partially open position: this may result in fluttering of the disc and rapid wear of valve parts. Conversely, if the valve is too small, pressure drop will be excessive.

Crane has conducted numerous tests both in the laboratory and in the field over a period of many years to establish the flow characteristics of Crane Stop-Check Valves. As a result, Crane Engineers have developed the chart shown on the opposite page. The chart is a graphical solution of the flow formula and incorporates the valve flow factors which were determined by test. Its use offers a simple and direct method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow, without any computation.

### *How to Use the Chart Shown on the Opposite Page*

**Given:** Steam Pressure.....1,000 pounds per sq. in., gauge
Steam Temperature 850° F
Flow Rate..... 200,000 pounds per hour, maximum

**Find:** The catalog number of the valve and the best size for the above installation.

**Solution:** Reference to the pressure-temperature ratings on page 208 indicates a stop-check valve of the 900-pound pressure class will be required: thus, either of the following may be used:

No. 7186 U, Globe
No. 7188 U, Angle

The choice between the globe or angle depends, of course, upon the piping arrangement. The flow characteristics of Crane Pressure-Seal Bonnet Stop-Check Valves are identical for both globe and angle types. *Now, follow the text below and proceed as indicated by the arrows on the chart.*

1. Enter the chart at the lower left at a temperature of 850° F. Move vertically upward to the curved line for 1000 psi gauge pressure, then horizontally to the right to establish a point on the specific volume line. From this point, draw a diagonal line through the flow rate being investigated (200,000 pounds per hour) and establish a point on Index 1.

2. From the point on Index 1, draw another diagonal line through any assumed size of the No. 7186 U or No. 7188 U (for example, the 6-inch size) and establish a point on Index 2. Move horizontally to the diagonal line in the right side of the chart and read the pressure drop at the intersection as 12 psi.

Chart solutions resulting in a point on Index 2 that falls below Line A-A indicate the valve disc will not be fully lifted under the flow conditions used. Operation under such conditions is not recommended, but at times, must be tolerated for short periods during the low load portion of the operating cycle.

3. Enter the chart where Line A-A intersects Index 2. Move diagonally upward through the size being investigated (6-inch) and establish a second point on Index 1. From this point, extend a line to the specific volume established in Step 1, and at its intersection with the flow rate line, read 74,000 pounds per hour as the minimum flow rate at which the disc will be in the fully lifted position. The pressure drop at this flow rate is 2 psi. At all flow rates less than 74,000 pounds per hour through 6-inch valves, the pressure drop may be expressed as "less than 2 psi".

4. Repeat Steps 2 and 3 for all other probable sizes and determine the pressure drop and minimum flow rate for the wide open position. Results are shown at the right.

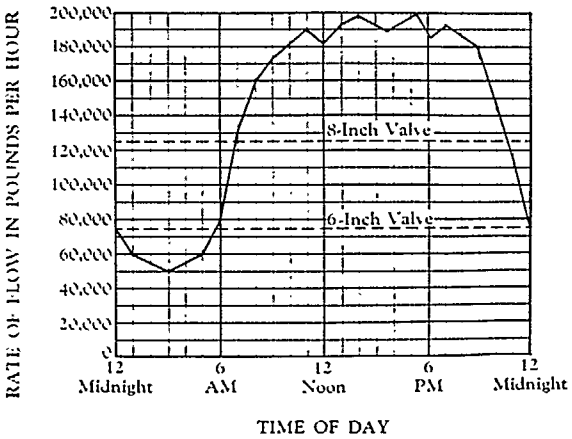
| Valve Size Inches | Pressure Drop at Maximum Flow Rate of 200,000 lbs. per hour (In Psi) | Minimum Flow Rate for Wide Open Valve Lbs. per hour |
|---|---|---|
| 6 | 12 | 74,000 |
| 8 | 4.8 | 125,000 |
| 10 | 2.2 | 190,000 |
| 12 | Less than two | 280,000 |

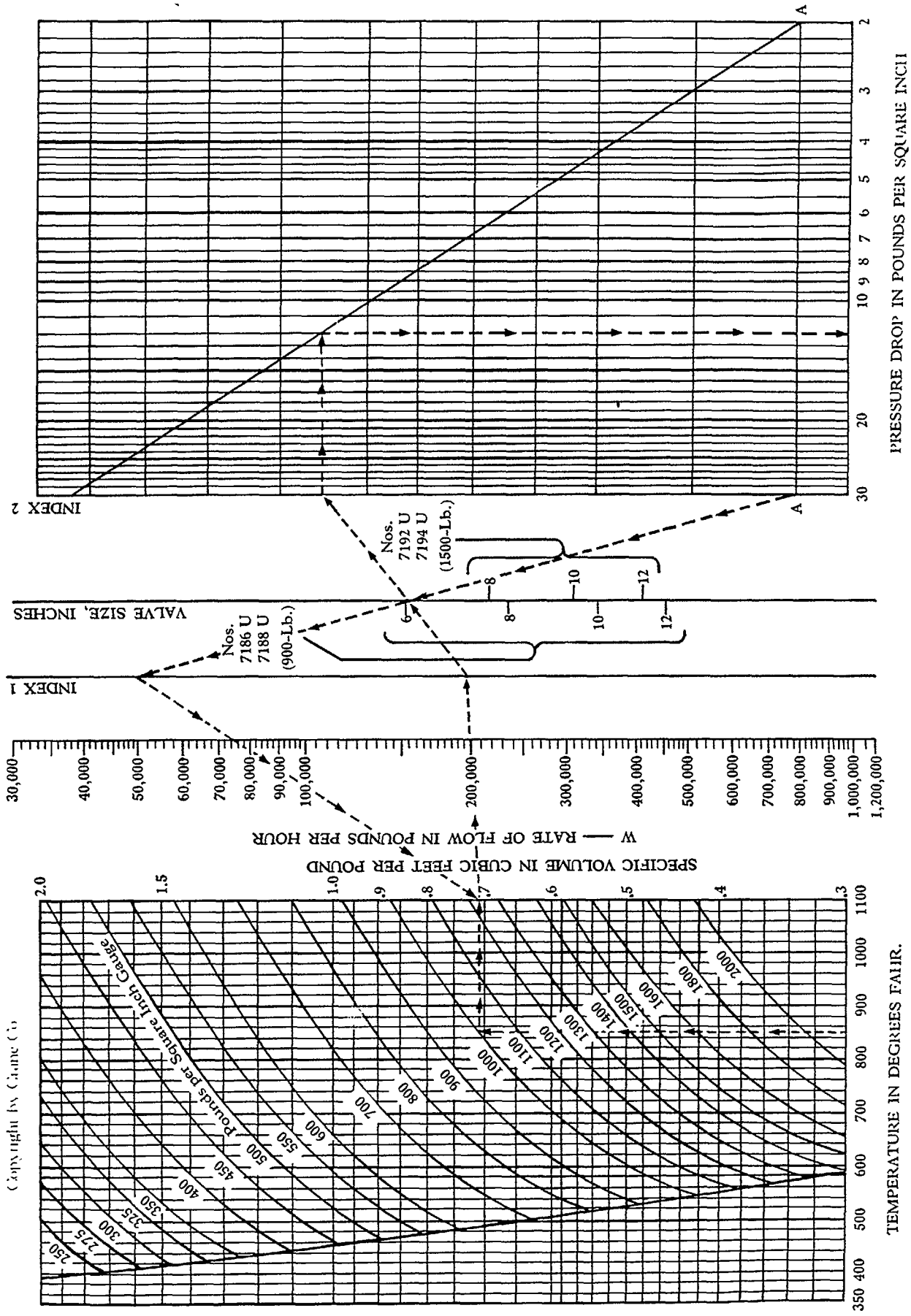
5. Since the flow rate of 200,000 pounds per hour is designated as maximum, it may be assumed the boiler will frequently be operated at lower flow rates. On this basis, it is obvious both the 10 and 12-inch sizes would be too large. The choice between the 6 and 8-inch size depends upon the load-demand curve, and the final selection rests with the piping designer.

6. A typical daily load-demand curve, as shown in the chart below, indicates the advisable size is 8-inch. Minimum flow rates for a fully lifted disc for both 6 and 8-inch sizes are shown in the chart. The disc will not be fully lifted for about 6 hours in the 6-inch valve and for about 8 hours in the 8-inch valve. However, since the pressure drop for the 8-inch is so much lower during high-load operation, it appears to be a better choice than the 6-inch.

Pressure drop for any intermediate flow condition can be determined as outlined in Steps 1 and 2.

**Typical Daily Load-Demand Curve**

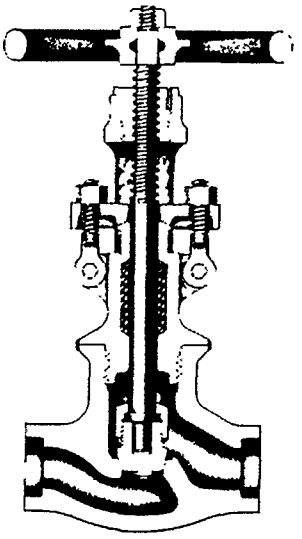





Copyright by Crane Co.

# Lip-Seal Bonnet
# Cast Steel Globe and Angle Valves

(Patented)



Typical Cross Section
Lip-Seal Bonnet Globe Valve
Outside Screw and Yoke
Socket-Welding Ends

***New, Small Size 1500 and 2500-Pound Valves***
***For High-Pressure, High-Temperature Power Service***

Crane Cast Steel Globe and Angle Valves with the new, patented Lip-Seal Bonnet Joint are a marked advancement in small steel valve construction. The Crane Lip-Seal design has made possible the production of compact, relatively light-weight valves without sacrificing strength or durability. Absolute tightness, full seating area, freedom from bonnet joint maintenance, minimum weight and bulk, and easy dismantling and reassembly are a few of the advantages.

Made in both 1500 and 2500-Pound pressure classes, the valves are especially recommended for use in modern power, industrial, and chemical plants on main steam, auxiliary steam, boiler feed, and miscellaneous piping, as well as for drips, drains, by-pass, blowdown, and similar service. Sizes 1½ to 2-inch inclusive with screwed or socket-welding ends are available.

**Lip-Seal Bonnet Joint:** The Crane Lip-Seal design features an extremely simple construction. The body and bonnet are screwed together until a firm metal-to-metal contact is made between the smoothly machined flat surfaces on the shoulder of the bonnet and the top of the body. The small lips around the periphery are then seal welded.

The welded seal is not subjected to bending moments which might break the seal, nor is it ever required to carry the mechanical load exerted upon the body-bonnet joint by pressure and stem thrust. Threaded members—plated to resist corrosion and to prevent galling or seizure—carry the entire mechanical load at relatively low stresses. The welded seal simply guards against any leakage.

**Easy dismantling and reassembly:** Dismantling the valves is easy. Simply grind off the seal weld and unscrew the bonnet. With ordinary care, the seal weld may be repeatedly ground off for dismantling and welded upon reassembling, without damaging the valve.

**Disc and seat:** The plug type disc and seat, ideal for rigorous service, provide a wide seating contact not easily affected by foreign matter or wiredrawing. The seating surfaces are faced with Stellite, a material that withstands corrosion and erosion unusually well and displays excellent resistance to wear, seizure, galling, and abrasion.

PRESSURE-TEMPERATURE RATINGS

| Crane Alloy Steel | Temp. Deg. Fahr. | Maximum Pounds Per Square Inch, Non-Shock: 1500-Lb. Valves | Maximum Pounds Per Square Inch, Non-Shock: 2500-Lb. Valves |
|---|---|---|---|
| No. 7 Chrome-Moly. | 100 | 3600 | 6000 |
| | 150 | 3550 | 5915 |
| | 200 | 3500 | 5830 |
| | 250 | 3450 | 5750 |
| | 300 | 3415 | 5690 |
| | 350 | 3375 | 5625 |
| | 400 | 3330 | 5550 |
| | 450 | 3295 | 5490 |
| | 500 | 3125 | 5210 |
| | 550 | 2955 | 4925 |
| | 600 | 2770 | 4620 |
| | 650 | 2580 | 4300 |
| | 700 | 2350 | 3920 |
| | 750 | 2125 | 3550 |
| | 800 | 1875 | 3125 |
| | 850 | 1750 | 2925 |
| | 900 | 1625 | 2700 |
| | 950 | **1500** | **2500** |
| | 1000 | 1370 | 2285 |
| | 1010 | 1325 | 2205 |
| | 1020 | 1250 | 2085 |
| | 1030 | 1150 | 1915 |
| | 1040 | 1050 | 1750 |
| | 1045 | 1000 | 1665 |
| No. 9 Chrome-Moly. (Made to order) | At 950° F. and lower, ratings are same as for No. 7 Steel. | | |
| | 1000 | **1500** | **2500** |
| | 1010 | 1430 | 2383 |
| | 1020 | 1360 | 2266 |
| | 1030 | 1290 | 2149 |
| | 1040 | 1220 | 2032 |
| | 1050 | 1150 | 1915 |

HYDROSTATIC TEST PRESSURES

| Valve | 1500-Lb. Valves | 2500-Lb. Valves |
|---|---|---|
| Shell | 5400 pounds | 9000 pounds |
| Seat | 3700 pounds | 6100 pounds |

Seat tested 100 pounds air-under-water.

*Rigid, swivel type disc-stem connection with disc tapered to permit close regulation of flow when throttling*

**Disc-stem connection:** An improved disc-stem connection holds all clearances to a minimum and places the seating load closer to the actual seating surface of the valve. In assembly, the disc stem ring is screwed down hand tight, axially forming a continuous metal-to-metal contact between the disc and stem. The disc stem ring is then locked to the disc by a tack weld. The stem is fully guided by a yoke bushing and by long engagement with the lower end of the bonnet.

Minimum radial clearance, the long vertical fit between the pilot end of the stem and the bore in the disc, and no axial clearance produce maximum rigidity while permitting the disc to swivel.

**Yoke and yoke bushing.** The yoke has heavy metal sections and is cast integral with the bonnet. The yoke bushing, screwed into the yoke and firmly locked in place by a Groov-Pin, will not loosen in service.

**Stuffing box and gland:** The stuffing box, of liberal proportions and filled with the finest quality packing, provides a tight seal around the stem. The two-piece ball type gland, consisting of a gland and a gland flange maintains an even load on the packing and prevents binding of the stem. The gland flange is held in place by swinging eye bolts.

*(continued on the next page)*

# Lip-Seal Bonnet
# Cast Steel Globe and Angle Valves

(Patented)

*(continued from the preceding page)*

**Materials:** Crane 1500 and 2500-Pound Lip-Seal Bonnet Globe and Angle Valves are regularly furnished with the body and bonnet made of Crane No. 7 Chrome-Molybdenum Alloy Steel. This steel exhibits a high resistance to steam corrosion and excellent strength retention at elevated temperatures. Valves made of No. 7 Steel are recommended for temperatures up to 1045° F.

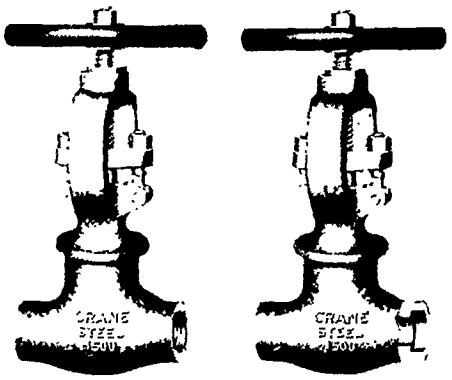
Where somewhat greater strength and better resistance to steam corrosion are desired at extremely high temperatures, the valves can be made to order of Crane No. 9 Chrome-Molybdenum Alloy Steel; prices will be furnished on application.

All valves have an Exelloy stem. The yoke bushing is made of Cast Manganese Bronze. The gland is Cast Manganese Bronze on sizes 1-inch and smaller and Thrigized steel on the larger sizes. The gland flange is forged steel.

**Standards:** The pressure-temperature ratings for Crane 1500 and 2500-Pound Lip-Seal Bonnet Globe and Angle Valves are shown in the table on the opposite page. The ratings, at temperatures up to and including 950° F., agree with those in Supplement No. 1 (B16e6-1949) to American Standard B16e-1939. The ratings at higher temperatures are based on the permissible stresses defined in the A.S.M.E. Boiler Code for the chrome-molybdenum steels to which Crane No. 7 and No. 9 Steels correspond.

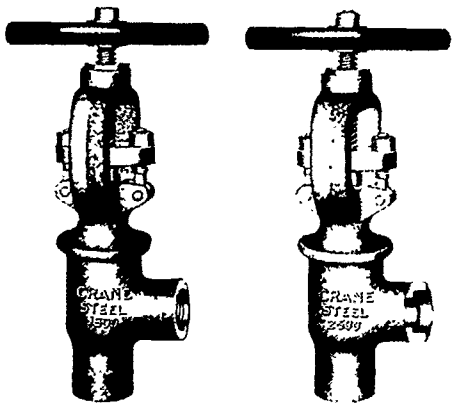
**Full seating area:** The diameter of the seat opening in these valves is the same as the port diameter, being at least equivalent to the inside diameter of Schedule 160 pipe on 1500-Pound Valves and to Double Extra Strong pipe on 2500-Pound Valves.

**Repacking:** These valves can be repacked while under pressure. When wide open, the top of the disc stem ring meets the underside of the bonnet in an angle-to-ball seat, forming a tight, line bearing contact.



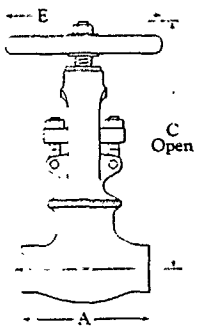
Globe, Screwed
No. 3860 U
1500-Pound
No. 3960 U
2500-Pound

Globe, Socket-Welding
No. 3862 U
1500-Pound
No. 3962 U
2500-Pound

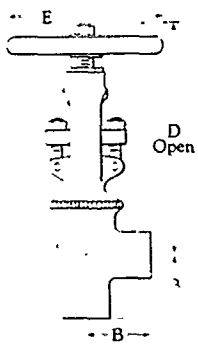


Angle, Screwed
No. 3861 U
1500-Pound
No. 3961 U
2500-Pound

Angle, Socket-Welding
No. 3863 U
1500-Pound
No. 3963 U
2500-Pound




Globe




Angle

## List Prices and Dimensions

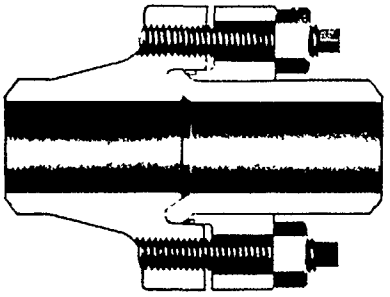
| Class | Valve Type and Catalog No. | | | | Size | List Prices | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Screwed End | | Socket-Welding End | | | | A | B | C | D | E* | Dia. of port and seat opening | Depth of socket |
| | Globe | Angle | Globe | Angle | Inches | Each | | | | | | | |
| 1500 Pound Valves | No. 3860 U | No. 3861 U | No. 3862 U | No. 3863 U | ½ | Prices on request | 4 | 2 | 9 | 8½ | 4⅛ | ½ | ⅜ |
| | | | | | ¾ | | 4¾ | 2⅜ | 11¼ | 10¾ | 6 | ⅝ | ½ |
| | | | | | 1 | | 5½ | 2¾ | 11¾ | 11⅛ | 7 | 13/16 | ½ |
| | | | | | 1¼ | | 6½ | 3¼ | 14 | 13⅛ | 8 | 15/32 | ½ |
| | | | | | 1½ | | 7 | 3½ | 16 | 15 | 10 | 1 11/32 | ½ |
| | | | | | 2 | | 8½ | 4¼ | 18¼ | 17⅛ | 12 | 1 11/16 | ⅝ |
| 2500 Pound Valves | No. 3960 U | No. 3961 U | No. 3962 U | No. 3963 U | ½ | Prices on request | 4 | 2 | 8⅞ | 8⅜ | 4⅛ | ⅜ | ⅜ |
| | | | | | ¾ | | 4¾ | 2⅜ | 11⅝ | 11 3/16 | 6 | ½ | ½ |
| | | | | | 1 | | 5½ | 2¾ | 12⅛ | 11⅝ | 7 | ⅝ | ½ |
| | | | | | 1¼ | | 6½ | 3¼ | 14 | 13 5/16 | 8 | ⅞ | ½ |
| | | | | | 1½ | | 7 | 3½ | 16 3/16 | 15⅜ | 10 | 15/32 | ½ |
| | | | | | 2 | | 8½ | 4¼ | 18¾ | 17¾ | 12 | 1½ | ⅝ |

*Dimension "E" indicates the length of the handle or the diameter of the wheel. ½ and ¾-inch valves have a Style S Tee Handle (not illustrated); larger sizes have a Style D Wheel.

# Pressure-Seal Line Joints

## Butt-Welding Ends

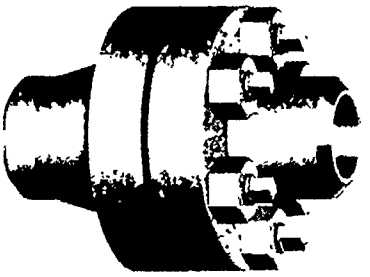
*Patented*



Cross Section
1500-Pound Line Joint

Crane Pressure-Seal Line Joints are designed for use on high-pressure high-temperature steam service in welded piping where access to equipment may be desired without necessitating torch-cutting of a line and where conventional flanged joints are susceptible to leakage or require constant maintenance.

***Prices and dimensions are furnished on application.***



1500-Pound
Pressure-Seal Line Joint

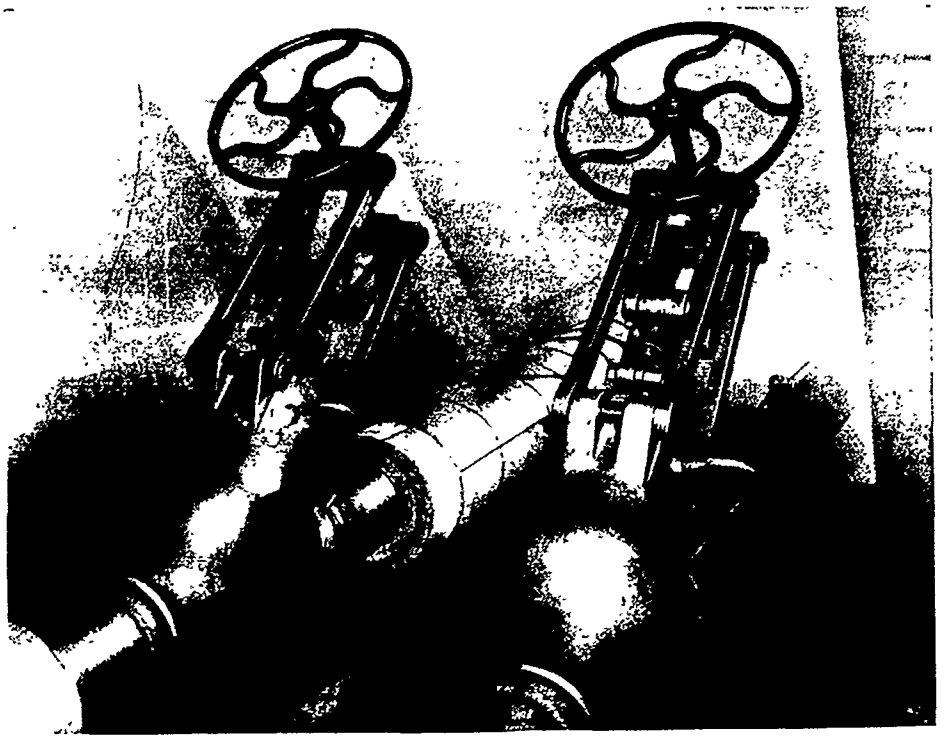
**Construction:** These joints are considerably smaller and lighter in weight than regular bolted joints of corresponding size made with American Standard flanges. They utilize the internal fluid pressure to assist in forcing the seal ring and mating parts together; the seal ring loading increases as the pressure increases, thus maintaining tightness. All Pressure-Seal Line Joints have butt-welding ends.

The smaller sizes are made with a screwed union ring, a stub end, a seal ring, and a socket end. Larger sizes are semi-flanged, as illustrated above; they are made with a stub end, a ring flange, a seal ring, a socket flange with welding end, and studs and nuts.

**Pressure classes and sizes:** Pressure-Seal Line Joints are made to order in the 600, 900, and 1500-Pound pressure classes, in sizes 1 to 16-inch, with the ends bored for any schedule of pipe.

**Material:** These joints can be made of a variety of alloy steels to meet specific requirements, or of a combination of alloys, one for each half of the joint. In the latter case, they provide an ideal means of joining dissimilar metals in a piping system, where the welding together of those metals might present an extremely difficult problem.

**Inquiries and orders:** Inquiries and orders should specify: quantity; size; service conditions in terms of fluid, pressure, and temperature; materials required on each or both ends; schedule number or the outside and inside diameter of the pipe or tubing being used.



Special 12-inch 1500-Pound Crane Pressure-Seal Bonnet Globe Y-Pattern Stop Check Valves installed in the main steam lines of a central station operating at 900 pounds, 900° F.

# Cast Steel Wedge Gate Valves

## (And Cast Steel Pipe-Line Valves)

Crane Steel Wedge Gate Valves can be classified into two general groups. The first group covers valves 2-inch and smaller; these are frequently considered general utility valves and are used in a wide variety of services, often at pressures and temperatures lower than the recommended maximum. The second group covers valves ranging in size as large as 24-inch, all made similar in design and available in each of the American Standard pressure classes; the sizes range below 2-inch in some of the pressure classes.

**Cast Steel Valves, Sizes 2-Inch and Smaller**
600-Pound, with Union Bonnet.....page 223
600-Pound, with Bolted Bonnet.....pages 224 and 225

**Cast Steel Valves, 150, 300, 400, 600, 900, and 1,500-Pound**
Pressure-Temperature Ratings.....page 226
Service Recommendations.....page 226
Description and Specification of Materials.....pages 227 and 228
List Prices.....page 229
Dimensions.....page 230

By-Passes.....page 231
Gearing.....page 234
2500-Pound.....page 234

**Cast Steel Pipe-Line Valves**
Class 600.....pages 232 and 233

***For Pressure-Seal Bonnet Valves, see Section 21.***

***For Crane-Paul Venturi Ball Valves, see pages 392 and 393.***

The Steel Valves listed above comprise only a part of the complete line of Crane Steel products.

Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

Steel Globe and Angle Valves.....pages 235 to 248
Steel Check Valves.....pages 249 to 256
Steel Stop-Check Valves
Pressure-Seal Bonnet.....pages 214 to 217
Bolted Bonnet.....pages 301 to 307

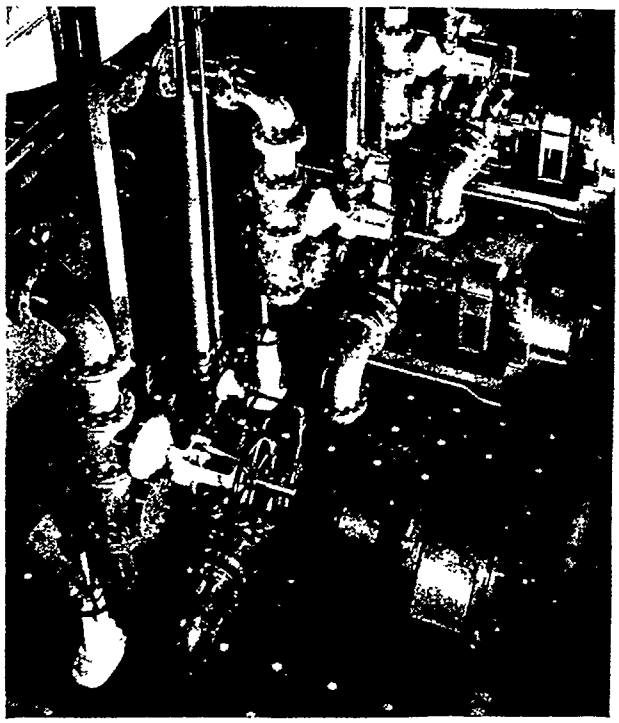
Steel Safety Valves.....page 324
Steel Relief Valves.....pages 333 and 334
Steel Sediment Separators.....page 356

Steel Flanged Fittings.....pages 267 to 274
Steel Welding Fittings.....pages 275 to 290
Steel Flanges.....pages 291 to 298
Steel Screwed Fittings.....pages 257 to 262

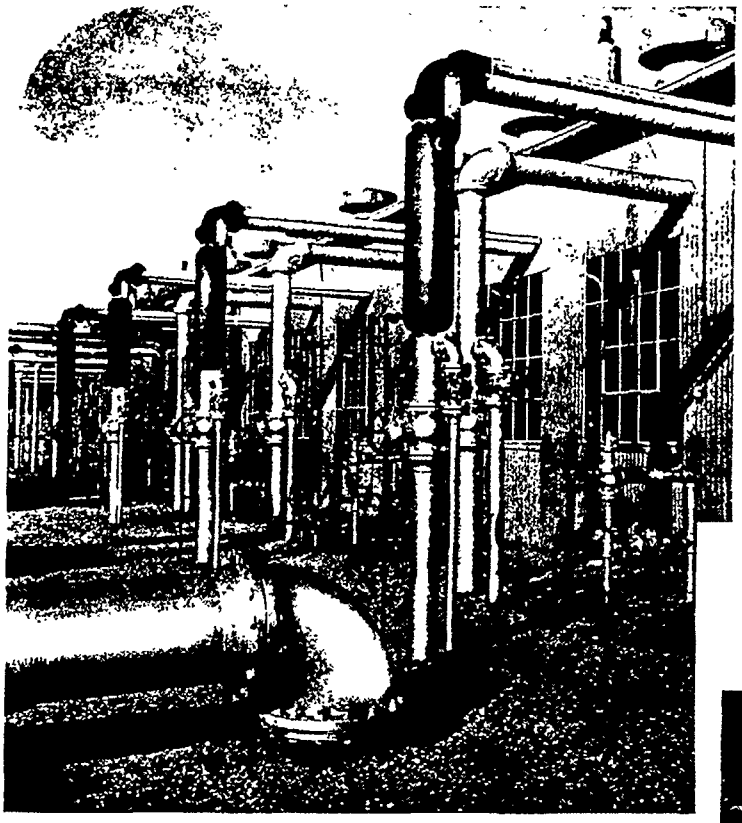
Forged Steel Unions.....pages 263 and 264
Forged Steel Flange Unions.....pages 182 and 265

Corrosion-Resistant Alloy Products.....pages 375 to 396

***Fabricated Piping... pages 497 to 522***



Condensate and feed water piping in an electric power plant. Crane valves and fittings assure safe, efficient operation.



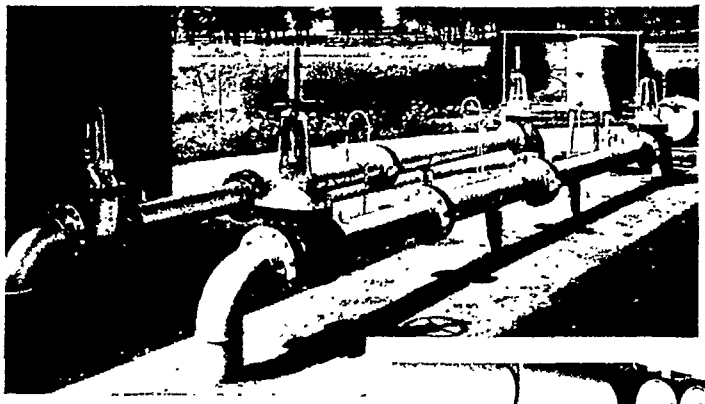
## *Crane Products For Every Service*

***At the left***

Flanged fittings, flanges, and valves made by Crane in lines between compressors and distillation unit in a natural gasoline plant.

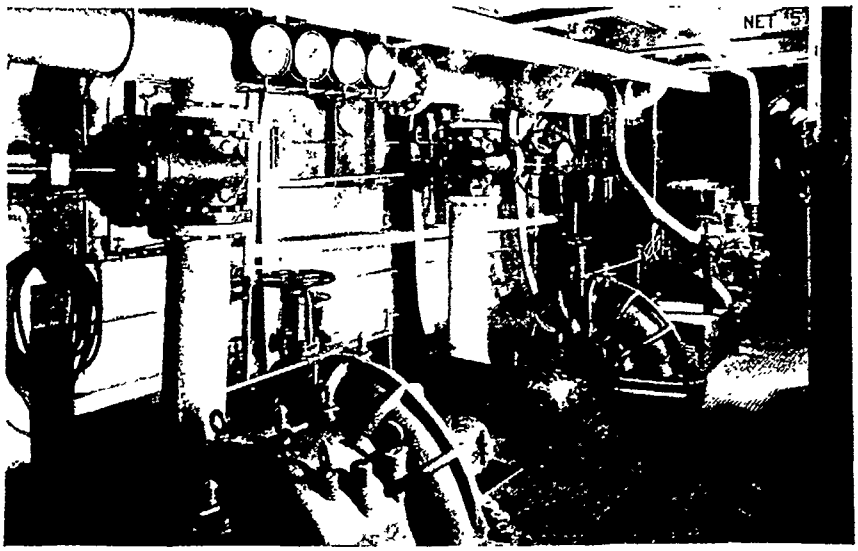
***Below***

Crane welding ell and chain wheel operated valve on exhaust steam in a rubber plant



***Above***

Crane welding fittings, flanges and double disc gate valves in natural gas pipe line.

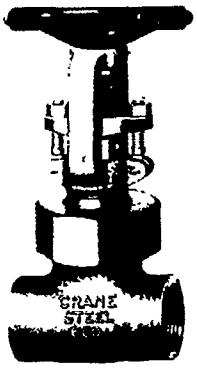



***At the right***

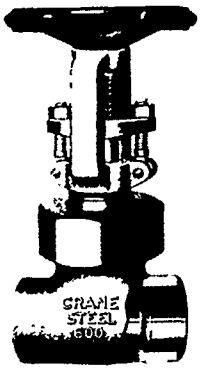
A municipal fire boat with Crane steel gate valves in water pumping lines, and other Crane marine equipment.

# 600-Pound Cast Steel Wedge Gate Valves

## Union Bonnet—Outside Screw and Yoke



Gate
Screwed
No. 3602 X
No. 3602 XW
No. 3602 L



Gate
Socket-Welding
No. 3603 X
No. 3603 XW
No. 3603 L

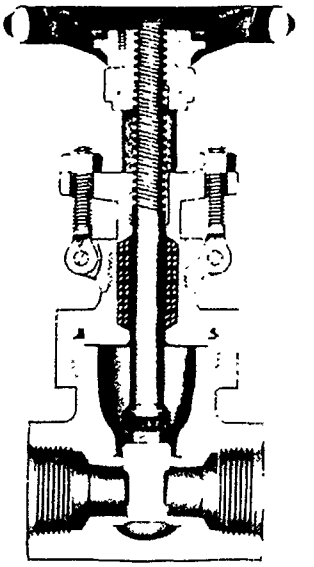
***For additional information on working pressures, refer to paragraph on "Service Recommendations" shown below.***

WORKING PRESSURES

| Temperature Degrees F. | Pounds Non-Shock |
|---|---|
| [illegible]0 | 2000 |
| 150 | 1910 |
| 200 | 1820 |
| 250 | 1730 |
| 300 | 1640 |
| 350 | 1550 |
| 400 | 1460 |
| 450 | 1370 |
| 500 | 1280 |
| 550 | 1190 |
| 600 | 1110 |
| 650 | 1030 |
| 700 | 940 |
| 750 | 850 |
| *800 | 780 |
| *850 | 700 |
| *900 | 600 |
| *950 | 530 |
| *1000 | 380 |

TEST PRESSURES

Shell—**2175** pounds hydrostatic
Seat—**2100** pounds hydrostatic
Seat tested 100 pounds air-under-water



Cross Section
Gate

### List Prices and Dimensions

| Size | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 3602 X, XW, or L, Screwed | | Each | 20.00 | 20.00 | 23.50 | 28.50 | 34.00 | 44.00 | 55.00 | 75.00 |
| No. 3603 X, XW, or L, Socket-Welding | | Each | 20.00 | 20.00 | 23.50 | 28.50 | 34.00 | 44.00 | 55.00 | 75.00 |
| Dimensions, in Inches | End to end | | 2 1/2 | 2 1/2 | 3 | 3 1/2 | 3 7/8 | 4 1/4 | 4 1/2 | 5 1/4 |
| | Depth of Socket | | 7/16 | 9/16 | 5/8 | 11/16 | 3/4 | 13/16 | 7/8 | 1 |
| | Center to top, open | | 5 5/8 | 5 5/8 | 6 3/8 | 7 | 8 | 9 5/8 | 10 1/2 | 12 1/8 |
| | Diameter of wheel | | 2 1/2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 5 | 6 |

***Service recommendations:** These valves are made with three types of trim: Class "X" (Exelloy seats, disc, and stem) for oil or oil vapor up to 1000° F.; Class "XW" (Crane Hardened Stainless Steel disc and Exelloy seats and stem) for steam (850° F. maximum), water, gas, or air; and Class "L" (18-8 Mo Alloy seats, disc, and stem) for liquids and gases (not steam), up to 750° F. temperature, that may be corrosive to Exelloy but not 18-8 Mo Alloy.

For more details on "X" and "XW" trim, see "Service Recommendations" on page 226 (Class "XW" is recommended for the same services as defined there for "XR" trim).

The valves find wide application in oil refineries, oil and gas fields, power stations, and industrial plants. Low in price, unusually compact, and light in weight yet amply strong, these union bonnet valves are well suited for many services which do not require the bolted bonnet valves shown on the following two pages.

**Body, bonnet, and yoke:** The body, bonnet, and yoke are high quality carbon steel. The valves have the bonnet and yoke made in separate pieces and joined by long, fine threads; they are held to the body by a heavy steel union ring.

**Bonnet joint:** Bonnet joints are fitted with a soft iron gasket, assuring tightness and ease of maintenance. The male and female joint between body and bonnet eliminates possibility of a gasket blowout.

**Body seat rings:** Body seat rings have heavy sections. They seat against a square shoulder. Being securely rolled into place, there is no danger of leakage around the ring, and they will not loosen in service.

**Disc:** Long machined guide ribs on each side of the disc operate in channels in the valve body. With the disc closely guided throughout its entire travel, seating surfaces are protected against unnecessary wear.

**Stem:** The stem is finished with a tapered shoulder for back-seating in the bonnet. The lower end has an integral tee-head which fits into a slot in the disc.

**Bolted gland:** A bolted gland avoids threading, and thereby weakening, the yoke legs. Steel swinging type eye bolts, hinged to the yoke, hold a steel one-piece gland and gland flange rigidly in place; the bolts will not come off in service.

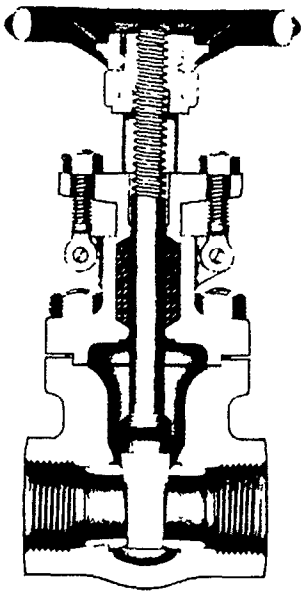
**Stuffing box:** A wide and deep stuffing box provides liberal packing space for a tight seal. It is filled with high quality packing. These valves, when wide open, can be repacked while under pressure.

*Small 600-Pound Bolted Bonnet Valves....pages 224 and 225*

*Description of materials....pages 1 to 9*

# 600-Pound Cast Steel Wedge Gate Valves

## Bolted Bonnet — Outside Screw and Yoke



Cross Section
Wedge Gate—Bolted Bonnet
Outside Screw and Yoke

*For list prices, dimensions, and recommendations, see the opposite page.*

This Crane line answers the need for high quality, compact, light but strong, small steel gate valves. Unusually rugged and durable, their design includes features heretofore found only in larger size or more expensive valves.

The valves are made with a bolted bonnet, and screwed, flanged, or socket-welding ends in the ½ to 2-inch sizes. For union bonnet valves in sizes ¼ to 2-inch, see the preceding page.

**Body, bonnet, and yoke:** The body and one-piece bonnet and yoke are cast from high quality carbon steel.

The valves have a larger port than is usual for valves of this type; the seat opening diameter is approximately the same as the nominal valve size.

**Bonnet joint:** Bonnet joints are fitted with a soft iron gasket, assuring tightness and ease of maintenance. The male and female joint eliminates any possibility of a gasket blowout.

The bonnet joint has generous strength and can be quickly and easily dismantled and reassembled. For greater compactness, the valves are fitted with studs, made of Triplex Steel.

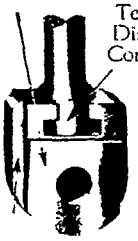
**Disc and body seat rings:** In "X" trimmed valves, for oil or oil vapor, the disc and body seat rings are Exelloy; in "XW" trimmed valves for steam or water, the body seat rings are Exelloy and the disc is Crane Hardened Stainless Steel (surface of seating area hardened to 500 Brinell). Body seat rings have heavy sections. They seat against a square shoulder. Being securely rolled into place, there is no danger of leakage around the rings, and they will not loosen in service.

**Disc guides:** Full length machined guide ribs on each side of the disc operate in channels in the valve body. With the disc closely guided throughout its entire travel, seating surfaces are protected against unnecessary wear.

**Stem:** The stem is Exelloy. Of liberal diameter, the lower end has an integral tee-head and is finished with a tapered shoulder for back-seating in the bonnet.

Accurately cut threads on the upper end provide positive control with minimum friction; being outside of the valve, they are easily lubricated.

**Disc-stem connection:** These valves have a tee-head disc-stem connection, providing a safe, rugged, but flexible coupling between the stem and disc. The tee-head on the stem slips into a machined slot of corresponding shape in the disc. The connection is exceptionally strong, yet it cannot distort the stem; binding of parts is avoided.




Long Disc Guides

WORKING PRESSURES

| Temp. Deg. F. | Pounds, Non-Shock: Screwed or Socket-Welding Valves | Flanged Valves: *With ¼-inch Male Facing | Flanged Valves: With Ring Joint Facing |
|---|---|---|---|
| Class "XW", for Steam or Water | | | |
| Class "X", for Oil or Oil Vapor | | | |
| 100 | 2000 | 1200 | 1440 |
| 150 | 1910 | 1180 | 1420 |
| 200 | 1820 | 1160 | 1400 |
| 250 | 1730 | 1140 | 1380 |
| 300 | 1640 | 1120 | 1365 |
| 350 | 1550 | 1095 | 1350 |
| 400 | 1460 | 1075 | 1330 |
| 450 | 1370 | 1050 | 1320 |
| 500 | 1280 | 1000 | 1250 |
| 550 | 1190 | 950 | 1180 |
| 600 | 1110 | 890 | 1110 |
| 650 | 1030 | 830 | 1030 |
| 700 | 940 | 760 | 940 |
| 750 | 850 | 680 | 850 |
| 800 | 780 | 600 | 730 |
| 850 | 700 | 490 | 600 |
| Class "X", for Oil or Oil Vapor | | | |
| 900 | 600 | 420 | 420 |
| 950 | 530 | 330 | 330 |
| 1000 | 380 | 240 | 240 |

*When an all-metal gasket (corrugated or flat) is used with large male and female facings, these ratings will apply only when the contact area of the gasket is not greater than that of a large tongue and groove gasket.

TEST PRESSURES

| Valve | Pounds Hydrostatic: Screwed or Socket-Welding Valves | Flanged Valves: With ¼-inch Male Facing | Flanged Valves: With Ring Joint Facing |
|---|---|---|---|
| Shell | 2175 | 1800 | 2175 |
| Seat | 2100 | 1550 | 1550 |

Seat tested 100 pounds air-under-water.

**Bolted gland:** The bolted gland avoids threading, and thereby weakening, the yoke legs. Steel swinging type eye bolts, hinged to the bonnet, hold the steel one-piece gland and gland flange rigidly in place; the bolts will not come off in service. The packing load can be easily adjusted.

**Stuffing box:** A wide and deep stuffing box provides liberal packing space for a tight seal. It is filled with high quality cut ring packing.

**Yoke sleeve:** The yoke sleeve has excellent bearing qualities, strength, and a high melting point.

**Handwheel:** Wheels are malleable iron; those for 1¼-inch valves and smaller are of the dished design with gripping knobs around the outer edge. They are locked to the yoke sleeve by means of a setscrew.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

# 600-Pound Cast Steel Wedge Gate Valves

## Bolted Bonnet — Outside Screw and Yoke

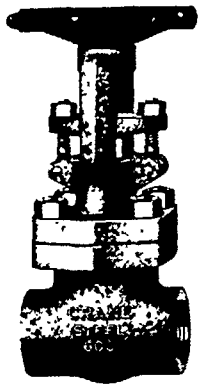
**Service recommendations:** These valves are ideal for a wide variety of services in oil refineries, oil and gas fields, central power stations, and industrial plants, on high pressure hydraulic lines and on high pressure-temperature steam or oil lines.

Valves with "XW" trim are particularly satisfactory for steam, water, air, gas, and other non-lubricating and relatively non-corrosive fluids such as gasoline, fuel oil, etc.; also for oil having low viscosity such as used in hydraulic systems, especially where seating loads are extremely high. They are recommended for maximum temperatures of 850° F. on steam and 500° F. on all other services.

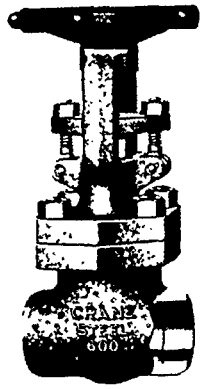
Valves with "X" trim should always be used for oil or oil vapor service at temperatures over 500° F. up to 1000° F., and for most corrosive and unrefined oils regardless of temperature.

For lubricating oils up to 500° F., either "X" or "XW" trim should give equal satisfaction.

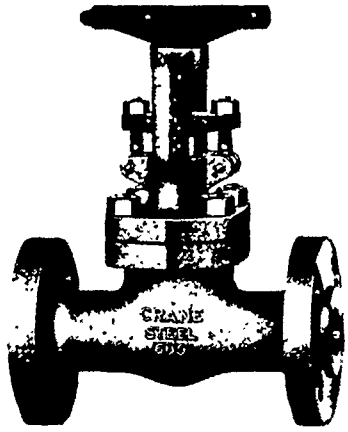
These are high quality valves, having large area seat opening and full size, rugged construction throughout. Their bolted bonnet makes it easy to dismantle even the larger sizes with a small wrench.



Gate
Screwed
No. 3607 X
No. 3607 XW



Gate
Socket-Welding
No. 3611 X
No. 3611 XW



Gate
Flanged
No. 3615 X
No. 3615 XW

*For working pressures and general description, see the preceding page.*

### List Prices, Each, and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 3607 X or XW, Screwed | | | 28.20 | 34.20 | 40.80 | 52.80 | 66.00 | 90.00 |
| No. 3611 X or XW, Socket-Welding | | | 28.20 | 34.20 | 40.80 | 52.80 | 66.00 | 90.00 |
| No. 3615 X or XW, Flanged, F.D. & S.F. | | | 48.00 | 56.00 | 69.00 | 85.00 | 106.00 | 136.00 |
| Dimensions in Inches | End to end, Screwed | | 3 | 3½ | 4⅛ | 4¼ | 4½ | 5¼ |
| | End to end, Socket-Welding | | 3½ | 4 | 4⅛ | 4¼ | 4½ | 5¼ |
| | Depth of socket | | ⅝ | 11/16 | ¾ | 13/16 | ⅞ | 1 |
| | *Face to face, Flanged | | 6½ | 7½ | 8½ | 9 | 9½ | 11½ |
| | Center to top, open | | 6⅜ | 7 13/16 | 9 3/16 | 10 5/16 | 12 | 14½ |
| | Diameter of wheel | | 3½ | 4 | 5 | 5 | 6 | 7 |
| | Diameter of flange | | 3¾ | 4⅝ | 4⅞ | 5¼ | 6⅛ | 6½ |
| | *Thickness of flange | | 9/16 | ⅝ | 11/16 | 13/16 | ⅞ | 1 |
| | Diameter of male face | | 1⅜ | 1 11/16 | 2 | 2½ | 2⅞ | 3⅝ |
| | Diameter of bolt circle | | 2⅝ | 3¼ | 3½ | 3⅞ | 4½ | 5 |
| | Number of bolts | | 4 | 4 | 4 | 4 | 4 | 8 |
| | Diameter of bolts | | ½ | ⅝ | ⅝ | ⅝ | ¾ | ⅝ |

*Face to face dimensions include the ¼" male face; thickness of flange dimensions do not.

**Face to face:** Face to face dimensions of the flanged valves, sizes 1-inch and larger, conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged Valves (No. B16.10-1939). This Standard does not include sizes ½ and ¾-inch.

**Flange dimensions, facing, and drilling:** End flanges on flanged valves conform to the 600-Pound American Standard (B16e-1939). They have a male face ¼-inch high (large male), finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

When so ordered, flanged valves can be furnished with ring joint, female, tongue, or groove facing; see the Crane Discount Sheet for prices.

List prices include drilling to the 600-Pound American Standard (B16e-1939), and spot facing. No deduction is made if valves are ordered faced only.

**Valves with 150-Pound flanges:** Flanged valves having end flanges conforming to the 150-Pound American Steel Flange Standard can be made to order; prices will be furnished on application.

**Monel trimmed valves:** Monel trimmed steel gate and globe valves for corrosion-resistant service are listed on page 387.

**Union bonnet valves:** Crane also manufactures a complete line of 600-Pound Cast Steel Wedge Gate Valves with Union Bonnet; see page 223.

*Description of materials, pages 1 to 9* *Templates for drilling page 462*
*For dimensions of ring joint and special facings, see pages 469 to 471.*

22

# Cast Steel Wedge Gate Valves

Working Pressures, Pounds per Square Inch, Non-Shock
For Valves Shown on pages 227 to 231 and 234

| [3]Fluid | Temp. Deg. Fahr. | [1]Flanged Valves with Standard Facings Other Than Ring Joint: Carbon Steel 150 Lb. | 300 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | Flanged Valves with Ring Joint Facing, Butt-Welding and Screwed End Valves: Carbon Steel 150 Lb. | 300 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steam, Water, Air, or Gas [3]*Class XR* | 100 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 5000 | 275 | 720 | 960 | 1440 | 2160 | 3600 | 6000 |
| | 150 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 4915 | 255 | 710 | 945 | 1420 | 2130 | 3550 | 5915 |
| | 200 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 4830 | 240 | 700 | 930 | 1400 | 2100 | 3500 | 5830 |
| | 250 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 4750 | 225 | 690 | 920 | 1380 | 2070 | 3450 | 5750 |
| | 300 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 4660 | 210 | 680 | 910 | 1365 | 2050 | 3415 | 5690 |
| | 350 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 4565 | 195 | 675 | 900 | 1350 | 2025 | 3375 | 5625 |
| | 400 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 4475 | 180 | 665 | 890 | 1330 | 2000 | 3330 | 5550 |
| | 450 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 4380 | 165 | 660 | 875 | 1320 | 1975 | 3295 | 5490 |
| | 500 | **150** | 500 | 665 | 1000 | 1500 | 2500 | 4165 | **150** | 625 | 835 | 1250 | 1875 | 3125 | 5210 |
| | 550 | 140 | 475 | 630 | 950 | 1420 | 2370 | 3950 | 140 | 590 | 790 | 1180 | 1775 | 2955 | 4925 |
| | 600 | 130 | 445 | 590 | 890 | 1330 | 2220 | 3700 | 130 | 555 | 740 | 1110 | 1660 | 2770 | 4620 |
| Oil or Oil Vapor *Class X* | 650 | 120 | 415 | 550 | 830 | 1240 | 2070 | 3450 | 120 | 515 | 690 | 1030 | 1550 | 2580 | 4300 |
| | 700 | 110 | 380 | 500 | 760 | 1140 | 1900 | 3160 | 110 | 470 | 635 | 940 | 1410 | 2350 | 3920 |
| | 750 | 100 | 360 | 475 | 720 | 1080 | 1800 | 2995 | 100 | 425 | 575 | 850 | 1275 | 2125 | 3550 |
| | 800 | 92[5] | 340 | 450 | 680 | 1020 | 1700 | 2830 | 92[5] | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 850 | 82[5] | 320 | 425 | 640 | 960 | 1600 | 2665 | 82[5] | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| Steam *Class U* | 900 | 470[5] | **300** | **400** | **600** | **900** | **1500** | **2500** | 470[5] | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 950 | 455[5] | [4]265 | [4]350 | [4]530 | [4]795 | [4]1325 | [4]2205 | 455[5] | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1000 | 440[5] | [4]190 | [4]250 | [4]380 | [4]570 | [4]950 | [4]1580 | 440[5] | [4]230 | [4]310 | [4]470 | [4]700 | [4]1170 | [4]1950 |
| Oil Vapor, Oil, *Class X* | 1050 | | | | | | | | | [4]135 | [4]180 | [4]270 | [4]405 | [4]675 | [4]1125 |
| | 1100 | | | | | | | | | [4]90 | [4]120 | [4]180 | [4]270 | [4]450 | [4]750 |

Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)

| | | [1]Facings Other Than Ring Joint | | | | | | Ring Joint Facing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oil or Oil Vapor only *Class X* | 100 to 750 | For temperatures up to 900° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves shown above. | | | | | | For temperatures up to 800° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves shown above. | | | | | |
| | 800 | | | | | | | 400 | 525 | 800 | 1200 | 2000 | 3325 |
| | 850 | | | | | | | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 900 | 310 | 410 | 620 | 930 | 1550 | 2580 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 950 | **300** | **400** | **600** | **900** | **1500** | **2500** | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 1000 | 200 | 275 | 400 | 600 | 1000 | 1675 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1050 | 135 | 180 | 270 | 405 | 675 | 1125 | 225 | 275 | 425 | 650 | 1075 | 1775 |
| | 1100 | 90 | 120 | 180 | 270 | 450 | 750 | 150 | 200 | 275 | 425 | 700 | 1175 |

[1]When an all-metal gasket (corrugated or flat) is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]When welding end valves are used at temperatures over 850° F. in services where graphitization may be a problem, valves made of Crane No. 7 or No. 9 Chrome-Molybdenum Steel are recommended.

[3]**Service recommendations:** Valves with "XR" trim are particularly satisfactory for steam, water, air, gas, and other non-lubricating and relatively non-corrosive fluids such as gasoline, fuel oil, etc.; also for oil having low viscosity such as used in hydraulic systems, especially where seating loads are extremely high. They are recommended for maximum temperatures of 850° F. on steam and 500° F. on all other services.

Valves with "X" trim should always be used for oil or oil vapor service at temperatures over 500° F. and for most corrosive and unrefined oils regardless of temperature. Maximum recommended temperatures are: 1000° F. on 150-Pound, and 1100° F. on 300 to 2500-Pound Valves.

For lubricating oils up to 500° F., either "X" or "XR" should give equal satisfaction.

"U" trim is provided primarily for high temperature (up to 950° F.) steam lines.

[4]These ratings apply only to oil or oil vapor service.

[5]Ratings for 150-Pound Valves for 800° F. and higher apply to sizes 12-inch and smaller only.

**Cold service:** For temperatures between 0° and 100° F., the ratings for 100° F. apply. For sub-zero service, materials with suitable impact resistance must be used; recommendations on request.

**Flange facings:** Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with 1/16-inch raised faces, and 400-Pound and higher pressure valves, with 1/4-inch male faces.

**Standards:** Crane pressure-temperature ratings agree with those in Supplement No. 1 (ASA B16e0-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939 and those in the American Petroleum Institute (API) Standard No. 600, Second Edition, 1951.

# Cast Steel Wedge Gate Valves

Crane Cast Steel Outside Screw and Yoke Wedge Gate Valves are exceptionally sturdy, rugged and durable. Carefully selected materials of superior quality combined with designs of outstanding merit assure the highest utility. The valves are particularly well suited for high-pressure, high-temperature services and have a wide application in long-distance pipe lines, in modern industrial plants and central power stations, and in oil refineries.

The Crane line is complete and includes valves in a wide range of sizes, in seven pressure classes (150, 300, 400, 600, 900, 1500, and 2500-Pound), and with flanged, screwed or butt-welding ends. Made of carbon or alloy steels, the valves are furnished with trim materials especially suited for the recommended services, assuring maximum valve performance. The general design of Crane Cast Steel Wedge Gate Valves is described on the next page and material specifications are shown in the table below.

List prices and dimensions are shown on pages 229 and 230 (prices and dimensions of 2500-Pound Valves are furnished on application).

HYDROSTATIC TEST PRESSURES, IN POUNDS

| Pressure Class | Flanged Valves With Facing Other Than Ring Joint | | Flanged Valves With Ring Joint Face / Screwed and Butt-Welding Valves | |
|---|---|---|---|---|
| | Shell | Seat | Shell | Seat |
| 150-Pound | 350 | 350 | 425 | 350 |
| 300-Pound | 900 | 775 | 1100 | 775 |
| 400-Pound | 1200 | 1000 | 1450 | 1000 |
| 600-Pound | 1800 | 1550 | 2175 | 1550 |
| 900-Pound | 2700 | 2250 | 3250 | 2250 |
| 1500-Pound | 4500 | 3700 | 5400 | 3700 |

*Valve seats are tested 100 pounds air-under-water.*

***For working pressures, see opposite page.***

## Specification of Materials

150-Pound Valves are regularly made of Crane Carbon Steel. 300, 400, 600, 900, 1500, and 2500-Pound Valves are regularly made of Crane No. 4 Carbon-Molybdenum Alloy Steel.

The valves are furnished with a variety of trim materials as indicated below.

Orders should specify both catalog number and letter suffix; catalog numbers are listed on page 229.

For extremely severe oil or oil vapor services, valves can be made of Crane No. 5 Chrome-Molybdenum Alloy Steel. They are made to order only; see the Crane Discount Sheet for prices.

| Kind of Trim | Names of Parts | | 150 Pound Valves | 300 Pound Valves | 400 Pound Valves | 600 Pound Valves | 900 Pound Valves | 1500 Pound Valves | 2500 Pound Valves |
|---|---|---|---|---|---|---|---|---|---|
| *Class "X" Oil or Oil Vapor 1100° F. Max. | Body and Bonnet | | Carbon Steel | No. 4 Carbon-Molybdenum Steel | | | | | |
| | Disc | 6" and smaller | | | | | | Exelloy | Exelloy or Exelloy-Faced Alloy Steel |
| | | 8" and smaller | | | Exelloy | | | | |
| | | 12" and smaller | Exelloy | | | | | | |
| | | Larger sizes | Exelloy-Faced Carbon Steel | Exelloy-Faced Alloy Steel | | | | | |
| | Body Seat Rings | | Exelloy | | | | | | |
| | Stem | | Exelloy | | | | | | |
| | Bonnet Gasket | | Corrugated Soft Iron | Soft Steel Ring Joint Gasket | | | | | |
| | Bonnet Bolt-Studs | | Triplex Steel | | | | | | |
| *Class "XR" Steam or Water 850° F. Max. | Body and Bonnet | | Carbon Steel | No. 4 Carbon-Molybdenum Steel | | | | | 2500-Pound Valves with "XR" trim are not regularly furnished. |
| | Disc | 6" and smaller | | | | | | Exelloy | |
| | | 8" and smaller | | | Exelloy | | | | |
| | | 12" and smaller | Exelloy | | | | | | |
| | | Larger sizes | Exelloy-Faced Carbon Steel | Exelloy-Faced Alloy Steel | | | | | |
| | Body Seat Ring | | No. 49 Nickel Alloy | | | | | | |
| | Stem | | Exelloy | | | | | | |
| | Bonnet Gasket | | Corrugated Soft Iron | Soft Steel Ring Joint Gasket | | | | | |
| | Bonnet Bolt-Studs | | Triplex Steel | | | | | | |
| *Class "U" Steam or Water 950° F. Max. | Body and Bonnet | | 150-Pound Valves with "U" trim are not listed. | No. 4 Carbon-Molybdenum Steel | | | | | |
| | Disc | | | Stellite-Faced Alloy Steel | | | | | |
| | Body Seat Rings | | | Stellite-Faced Alloy Steel | | | | | |
| | Stem | | | Exelloy | | | | | |
| | Bonnet Gasket | | | †Soft Iron | Soft Steel Ring Joint Gasket | | | | |
| | Bonnet Bolt-Studs | | | Templex Steel | | | | | |

*For detailed service recommendations, see the opposite page. †Corrugated Soft Iron.

*List prices . page 229* *Description of materials . . . pages 1 to 9* *Dimensions . . page 230*

# Cast Steel Wedge Gate Valves

**Body and bonnet:** The body and bonnet are unusually rugged, having heavy metal sections and ample reinforcement at points subjected to greatest stress. The body has straight-through ports without recess except between the seats, assuring minimum turbulence, erosion, and resistance to flow. The bonnet is equipped with a bonnet bushing.

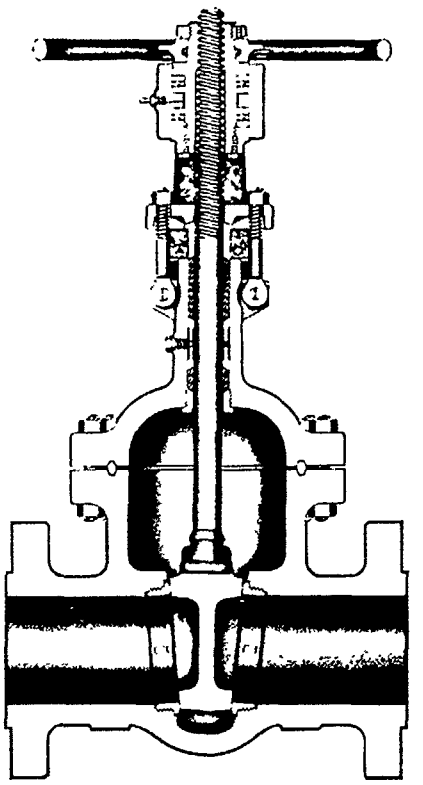
**Bonnet joint:** The bonnet joint of 150-Pound Valves is plain faced, accurately machined, and fitted with a gasket. 300-Pound Valves have a self-centering male and female joint equipped with a gasket. All other valves have a ring-type joint.

Triplex or Templex Steel through bolt-studs produce a tight, strong bonnet joint.

**Ball-bearing yoke:** The following valves are regularly equipped with a ball-bearing yoke to facilitate operation:

400-Pound.....8-inch and larger
600 and 900-Pound...6-inch and larger
1500 and 2500-Pound.5-inch and larger

300-Pound Valves 14-inch and larger can be equipped with a ball-bearing yoke when orders so specify; prices on application.



Outside Screw and Yoke
Wedge Gate Valve
(With Ball-Bearing Yoke)

**Body seat rings:** All valves have shoulder-type body seat rings. In "X" and "XR" trimmed valves, the seat rings are screwed into the body. In "U" trimmed valves, they are either screwed into the body or slipped in and welded, depending on the valve size.

**Disc and stem:** The disc is of the solid web type, with long close-fitting guides to maintain accurate seating and to reduce wear. A tee-head disc-stem connection prevents lateral strains on the stem. The stem is of liberal diameter with long and accurately cut threads, and has ample engagement with the yoke sleeve.

**Stuffing box:** The stuffing box on all valves is deep, assuring tightness and long packing life. The stuffing box is the lantern type on all except the 150-Pound Valves. The valves, when wide open, can be repacked while under pressure.

**Gland:** All valves have a two-piece ball-type gland and gland flange which exert an even pressure on the packing without binding the stem.

**Flange facings:** The 150 and 300-Pound Flanged Valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a 1/4-inch male face (large male). When so ordered, valves can be furnished with other types of facing, such as ring joint, female, tongue, groove, etc.; see the Crane Discount Sheet for prices.

**Finish of flange faces:** The 1/16-inch raised faces and the 1/4-inch male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

A smooth finish can be furnished on the raised or male faces, when specified; see the Crane Discount Sheet for prices.

**By-passes:** Valves can be furnished with a by-pass. See page 231 for prices and description.

**Gearing:** Larger size valves can be made with gears to facilitate operation; prices on application. See page 234 for information and description.

**Motor or cylinder operation:** These valves can be equipped with an electric, air, or gas motor, or an operating cylinder; prices on application. See pages 124 to 129 for description.

**Standards:** In design and materials Crane Cast Steel Gate Valves exceed the requirements of Standards issued by the American Standards Association and the American Petroleum Institute.

End flanges on flanged valves conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class.

All flanged and butt-welding valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939, for their respective pressure class. (This Standard does not include 3½-inch 600-Pound Valves, or butt-welding valves larger than 8-inch.)

All flanged and butt-welding end valves, with Exelloy ("X") trimmings, conform to the API Standard for Flanged and Welding End Steel Wedge Gate Valves for Refinery Use, No. 600, Second Edition, 1951. (This Standard does not include sizes 3½ and 5-inch.)

150, 300, 400, and 600-Pound Flanged and 300, 400, and 600-Pound Butt-Welding End Valves, with Exelloy ("X") trimmings, conform also to the API Standard for Pipe Line Valves, No. 6-D, Sixth Edition, May, 1949. (This Standard does not include sizes 1½, 3½, and 5-inch, nor 150-Pound Butt-Welding End Valves.)

*Pressure-temperature ratings*.....page 226
*Service recommendations*.....page 226
*Material specifications*.....page 227

# By-Passes for Cast Steel Wedge Gate Valves

When so ordered, Crane Cast Steel Wedge Gate Valves can be furnished with a Built-Up By-Pass, suitable for "warming up" on steam line service or for equalizing the pressure around main control valves used on steam or other fluids.

**Construction:** The Crane Built-Up By-Pass is designed to provide maximum strength, durability, and flexibility with a minimum of additional weight on the main valve.

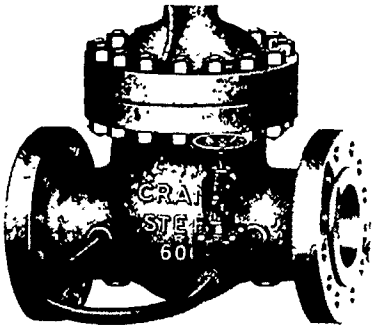
The by-pass is furnished with a steel bolted bonnet outside screw and yoke socket-welding end globe valve. All connections in the by-pass are socket-welded to assure a permanently tight and strong assembly.

Pipe bends are used on all pressure classes to provide the necessary flexibility and to compensate for expansion strains resulting from unequal temperatures or fluctuating operating conditions.

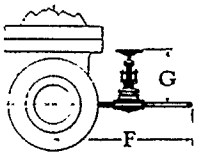
**Materials:** The materials used in the by-pass piping and in the by-pass valve are of high quality. The pipe bend is seamless steel. The pipe and by-pass valves are of ample weight to withstand the pressures and temperatures for which the main valve is recommended, and the by-pass valve is trimmed with materials that are suitable for the same services as the main valves.

**List prices:** Extra list prices, shown below, include the Built-Up By-Pass completely assembled and attached to either of the sides or to the bottom of the main valve. Unless otherwise specified, by-passes will be attached to the side of the main valve, with the stems of the main valve and the by-pass valve parallel and pointing vertically upward.

**Special by-passes:** By-passes of other designs or specifications can be made to order; prices on application. Inquiries should be accompanied by complete description, drawings, or specifications.



Typical Built-Up By-Pass




By-Pass for Gate Valves
(Side Mounting illustrated)

Clearance dimensions F and G are identical for bottom mounting.

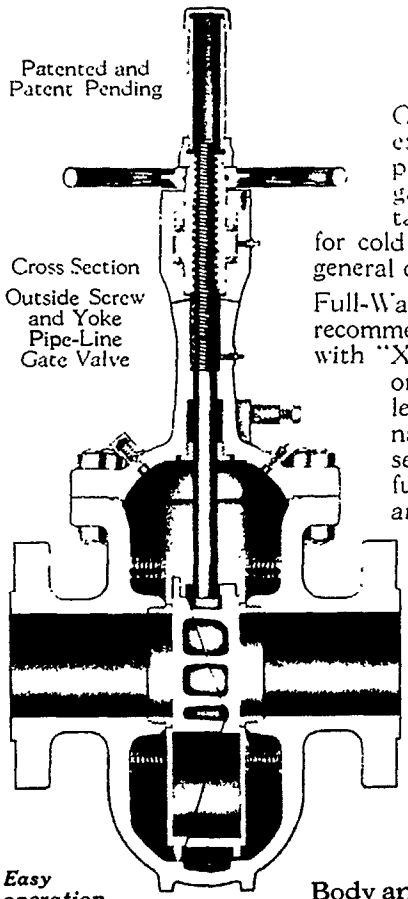
## Extra List Prices and Dimensions for Built-Up By-Passes

| Main Valve | | Size of By-Pass Used | Built-Up By-Passes for Use with Main Valves Of Pressure Classes Specified Below | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extra List Prices Per By-Pass | | | | | | Approximate Clearance Dimensions, in Inches | | | | | | | |
| | | | | | | | | | F | | | | | | G Open | |
| Class of Trim | Size of Valve | | 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 150 to 600-Lb. | 900 or 1500-Lb. |
| | Inches | Inches | | | | | | | | | | | | | | |
| "XR" Trim | 4 | 3/4 | | | | | 400.00 | 400.00 | | | | | 21 1/4 | 21 3/4 | | 9 1/8 |
| | 5 | 3/4 | | 210.00 | 278.00 | 278.00 | 400.00 | 400.00 | | 19 3/4 | 20 1/8 | 20 1/4 | 22 5/8 | 22 7/8 | 8 7/8 | 9 1/8 |
| | 6 | 3/4 | | 210.00 | 278.00 | 278.00 | 400.00 | 400.00 | | 20 1/4 | 21 1/4 | 21 1/2 | 23 1/8 | 23 7/8 | 8 7/8 | 9 1/8 |
| | 8 | 3/4 | | 210.00 | 278.00 | 278.00 | 400.00 | 400.00 | | 22 1/4 | 22 3/4 | 22 7/8 | 25 | 26 5/8 | 8 7/8 | 9 1/8 |
| | 10 | 1 | | 235.00 | 310.00 | 310.00 | 475.00 | 475.00 | | 25 | 26 1/4 | 26 5/8 | 28 7/8 | 30 7/8 | 9 3/8 | 10 3/4 |
| | 12 | 1 | 215.00 | 235.00 | 310.00 | 310.00 | 475.00 | 475.00 | 25 3/8 | 26 1/2 | 28 1/8 | 28 1/2 | 30 5/8 | 32 3/4 | 9 3/8 | 10 3/4 |
| | 14 | 1 1/4 | 255.00 | 280.00 | 370.00 | 370.00 | 545.00 | 545.00 | 27 1/2 | 30 | 30 1/4 | 30 3/4 | 33 5/8 | 35 7/8 | 11 | 13 |
| | 16 | 1 1/4 | 255.00 | 280.00 | 370.00 | 370.00 | 545.00 | | 29 3/8 | 31 3/4 | 31 7/8 | 32 1/2 | 35 1/4 | | 11 | 13 |
| | 18 | 1 1/2 | 310.00 | 340.00 | 450.00 | 450.00 | 660.00 | | 32 | 35 1/2 | 35 1/2 | 35 3/4 | 38 1/4 | | 12 | 13 5/8 |
| | 20 | 1 1/2 | 310.00 | 340.00 | 450.00 | 450.00 | | | 33 1/4 | 36 5/8 | 36 7/8 | 37 1/8 | | | 12 | |
| | 24 | 2 | 380.00 | 420.00 | 550.00 | 550.00 | | | 38 3/4 | 44 | 44 3/8 | 45 3/8 | | | 14 | |
| "U" Trim | 4 | 3/4 | | | | | 400.00 | 400.00 | | | | | 21 1/4 | 21 3/4 | 9 1/8 | |
| | 5 | 3/4 | | 265.00 | 333.00 | 333.00 | 400.00 | 400.00 | | 20 5/8 | 21 1/8 | 21 1/4 | 22 5/8 | 22 7/8 | 9 1/8 | |
| | 6 | 3/4 | | 265.00 | 333.00 | 333.00 | 400.00 | 400.00 | | 21 1/4 | 22 1/4 | 22 1/2 | 23 1/8 | 23 7/8 | 9 1/8 | |
| | 8 | 3/4 | | 265.00 | 333.00 | 333.00 | 400.00 | 400.00 | | 23 1/4 | 23 3/4 | 23 7/8 | 25 | 26 5/8 | 9 1/8 | |
| | 10 | 1 | | 295.00 | 370.00 | 370.00 | 475.00 | 475.00 | | 26 1/2 | 27 | 27 3/8 | 28 7/8 | 30 7/8 | 10 3/4 | |
| | 12 | 1 | | 295.00 | 370.00 | 370.00 | 475.00 | 475.00 | | 28 | 28 7/8 | 29 1/4 | 30 5/8 | 32 3/4 | 10 3/4 | |
| | 14 | 1 1/4 | | 377.00 | 467.00 | 467.00 | 545.00 | 545.00 | | 31 5/8 | 31 7/8 | 32 3/8 | 33 5/8 | 35 7/8 | 13 | |
| | 16 | 1 1/4 | | 377.00 | 467.00 | 467.00 | 545.00 | | | 33 3/8 | 33 1/2 | 34 1/8 | 35 1/4 | | 13 | |
| | 18 | 1 1/2 | | 477.00 | 587.00 | 587.00 | 660.00 | | | 37 1/8 | 37 1/8 | 37 7/8 | 38 1/4 | | 13 5/8 | |
| | 20 | 1 1/2 | | 477.00 | 587.00 | 587.00 | | | | 38 1/4 | 38 1/2 | 39 1/4 | | | 13 5/8 | |
| | 24 | 2 | | 610.00 | 740.00 | 740.00 | | | | 47 3/4 | 48 1/8 | 48 5/8 | | | 16 1/2 | |

*Taps and drains for valves . . . page 579*

*Location of by-passes . page 579*

# Class 600 Cast Steel Pipe-Line Gate Valves



Patented and Patent Pending

Cross Section Outside Screw and Yoke Pipe-Line Gate Valve

***Easy operation***

Note in illustration above, only the outlet or "stem" half of the disc is connected to the stem. The inlet or "floating" half is held loosely to this half by four assembly links (see below). Contact between the halves is in the form of finished flat surfaces disposed at two angles—one provides tight seating when the valve is closed; the other, tight seating when the valve is open.

Disc and Plate Assembly

***For ratings, prices, and dimensions, see the next page.***

## *Double-Seating, Grease-Packed Valves Designed for Petroleum and Gas Industries*

Crane Pipe-Line Gate Valves are excellently suited for oil or gas pipe lines and pump houses, for gathering lines in the field, for tank farms and storage stations, for cold lines in the refinery, and for general oil and gas service.

Full-Way Valves with "X" trim are recommended for crude oil service, and with "XH" trim, for use in gas piping or lines carrying refined petroleum products of a non-corrosive nature, such as gasoline, kerosene, fuel oil, etc. Venturi Valves, furnished with "XH" trim only, are recommended for gas service.

**Materials:** The body and bonnet are carbon cast steel. The stem is Exelloy. The disc halves, Exelloy in "X" trimmed and steel in "XH" trimmed valves, have chromium-plated faces. The screwed-in shoulder type body seat rings, made of steel, are faced with Stellite in "X" trimmed valves and with aluminum bronze in "XH" trimmed valves.

**Body and bonnet:** The body and bonnet chambers are filled with high grade grease which thoroughly lubricates internal parts, assuring easier operation and providing a tight seal throughout.

Triplex Steel bolt-studs, drawn up only enough to form a rubber "O" ring gasket into a wedge-shaped groove in the face of the body flange, join body and bonnet into a firm, metal-to-metal contact. Internal pressure against the gasket insures permanent tightness.

**Double-seating disc:** The disc consists of two, parallel face, expanding gates, each with a circular "conduit" extension at the bottom. The disc wedges tightly against the seats in both the open and closed positions. Flow through the wide open valve is smooth and continuous. There is no erosion or turbulence, nor are there pockets to accumulate dirt.

Spring-actuated plates, closely fitted around the body rings, press firmly against each side of the disc at all times to retain lubricant in the body. Pressure of these plates on the disc faces also permits the unwedged disc to ride freely between the seats during opening and closing operations.

**Stem and yoke sleeve:** The valves have a loose fitting, tee-head, disc-stem connection. Stem threads are well lubricated. Above the yoke sleeve, the stem is enclosed in a capped protector. For easier operation, Full-Way Valves 6-inch and larger and Venturi Valves 8 x 6-inch and larger have a ball-bearing yoke sleeve.

**Packing chamber:** To maintain a tight, durable stem seal, these valves utilize a special plastic packing contained between V-type end rings. The packing is easily replenished through a ball-check injector fitting in the bonnet.

**Relief valve:** As a safeguard against excessive pressure build-up due to high outside temperatures expanding the grease in the lubricating chambers, valves handling oil or refined products are equipped with a spring-loaded relief valve in the bonnet.

**Gearing:** To facilitate operation of large size and/or high pressure valves when used at or near their maximum rating, the use of ball bearings, gearing, or other means of reducing operating torque should be considered.

When specified, these valves can be furnished with bevel or spur gearing in an enclosed case; it is particularly recommended that Full-Way Valves 10-inch and larger and Venturi Valves 16 x 12-inch and larger be so equipped. Prices on application.

**Indicator:** The valves can be equipped with an indicator when so ordered; prices on application.

**Standards:** End flanges on flanged valves conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for the 600-Pound pressure class.

Face to face dimensions of flanged valves and end to end dimensions of butt-welding valves conform to the American Standard (ASA) for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939, and to the American Petroleum Institute (API) Standard for Pipe Line Valves, No. 6D, Sixth Edition, May, 1949 for the 600-Pound pressure class.

The above Standards do not include 22, 26, and 30-inch sizes; nor does American Standard B16.10-1939 include butt-welding valves larger than 8-inch.

# Class 600 Cast Steel Pipe-Line Gate Valves

| WORKING PRESSURES | | | |
|---|---|---|---|
| | Flanged Valves | | Butt-Welding Valves |
| For Cold Oil or Gas | With Facings Other Than Ring Joint | With Ring Joint Face Facing | |
| | 1200 pounds | 1440 pounds | 1440 pounds |

HYDROSTATIC TEST PRESSURES
Shell—2175 pounds Seat—1550 pounds

Valve seat tested 100 pounds air-under-water.

**Flange facings:** Flanged valves are regularly furnished with a 1/4-inch male face (large male); the faces are finished with concentric grooves, approximately 32 per inch, known as a "serrated" finish.

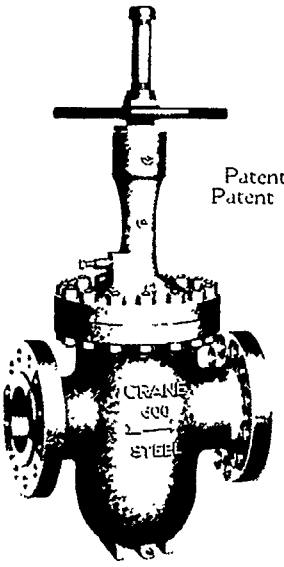
Male faced valves with a smooth finish, and flanged valves with other types of facings such as ring joint, female, tongue, groove, etc., can be made to order when so specified, at an extra charge.

**Drilling:** Unless otherwise ordered, flanged valves are furnished faced, drilled, and spot faced. Prices include drilling to the 600-Pound American Standard. No deduction is made for valves ordered faced only.

**Butt-welding valves:** Ends of butt-welding valves are bored to match the inside diameter of the pipe to be used; orders must specify the diameter of bore.

**Flanged valves:** Flanged valves, in sizes included in the 400-Pound American Standard, can be furnished with end flanges and face to face dimensions conforming to that Standard; prices on request.

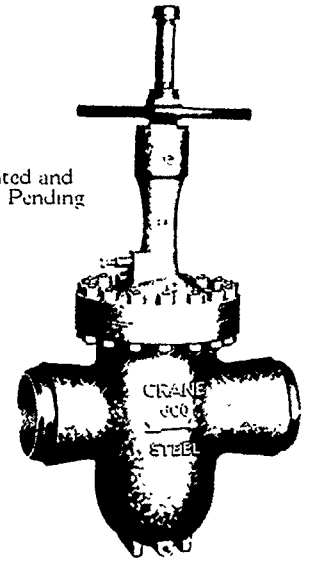
## Full-Way




For Crude Oil
No. 1660 X, Flanged
*No. 1661 X, Butt-Welding

For Finished Products or Gas
No. 1660 XH, Flanged
*No. 1661 XH, Butt-Welding

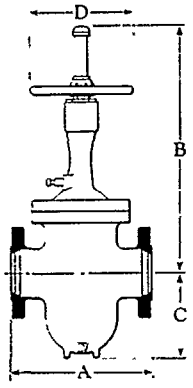
## Venturi




Patented and Patent Pending

For Gas
*No. 1664 XH, Flanged
No. 1665 XH, Butt-Welding

*Asterisk indicates valves which are not illustrated.*




All Valves

### Notes

aSizes for Venturi Valves indicate the valve ends first, and then the seat.

bDimension "A" (for flanged valves) includes the 1/4" male faces; the flange thickness does not.

†Full-Way "XH" trimmed valves are not made in sizes larger than 20-inch

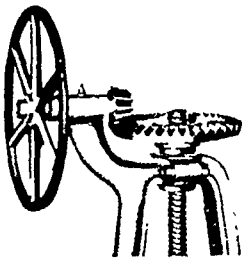
‡Dimensions apply to flanged end valves only; butt-welding on request.

### List Prices and Dimensions

| Valve Type and Catalog Number | Size (See Note a) | List Prices | Dimensions, in Inches: A (See Note b) | B | C | D | End Flanges: Diameter | Thickness (See Note b) | Dia. of male face | Dia. of bolt circle | No. & dia. of bolts | Inside Diameter: Ends | Seats |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | Each | | | | | | | | | | | |
| FULL-WAY No. 1660 X No. 1660 XH Flanged, F. D. & S. F. No. 1661 X No. 1661 XH Butt-Welding | 2 | Prices on request | 11½ | 18½ | 5¾ | 8 | 6½ | 1 | 3⅝ | 5 | 8-⅝ | 2 1/16 | |
| | 2½ | | 13 | 20¼ | 6⅝ | 9 | 7½ | 1⅛ | 4⅛ | 5⅞ | 8-¾ | 2½ | |
| | 3 | | 14 | 23½ | 7½ | 10 | 8¼ | 1¼ | 5 | 6⅝ | 8-¾ | 3 1/16 | |
| | 4 | | 17 | 28½ | 9¾ | 12 | 10¾ | 1½ | 6 3/16 | 8½ | 8-⅞ | 4 1/16 | |
| | 6 | | 22 | 38 | 12⅞ | 16 | 14 | 1⅞ | 8½ | 11½ | 12-1 | 6 1/16 | |
| | 8 | | 26 | 47¼ | 16¼ | 20 | 16½ | 2 3/16 | 10⅝ | 13¾ | 12-1⅛ | 8 1/16 | |
| | 10 | | 31 | 56¾ | 20 | 24 | 20 | 2½ | 12¾ | 17 | 16-1¼ | 10 | |
| | 12 | | 33 | 63 | 23¼ | 24 | 22 | 2⅝ | 15 | 19¼ | 20-1¼ | 12 | |
| | 14 | | 35 | 71 | 26 | 27 | 23¾ | 2¾ | 16¼ | 20¾ | 20-1⅜ | 13¼ | |
| | 16 | | 39 | 78 | 29½ | 27 | 27 | 3 | 18½ | 23¾ | 20-1½ | 15¼ | |
| | 18 | | 43 | 87 | 32¾ | 30 | 29¼ | 3¼ | 21 | 25¾ | 20-1⅝ | 17 | |
| | 20 | | 47 | 95 | 36¾ | 36 | 32 | 3½ | 23 | 28½ | 24-1⅝ | 19 | |
| | 22† | | 51 | 106 | 40 | 36 | 34¼ | 3¾ | 25¼ | 30⅝ | 24-1¾ | 21 | |
| | 24† | | 55 | 113 | 43¼ | 36 | 37 | 4 | 27¼ | 33 | 24-1⅞ | 23 | |
| | 26† | | 57‡ | 123 | 47½ | On | 40 | 4¼ | 29½ | 36 | 28-1⅞ | 25 | |
| | 30† | | 64‡ | 142 | 54 | app. | 44½ | 4½ | 33¾ | 40¼ | 28-2 | 29 | |
| VENTURI No. 1664 XH Flanged, F. D. & S. F. No. 1665 XH Butt-Welding | 8 . 6 | Prices on request | 26 | 38 | 12⅞ | 16 | 16½ | 2 3/16 | 10⅝ | 13¾ | 12-1⅛ | 8 1/16 | 6 1/16 |
| | 10 . 8 | | 31 | 47¼ | 16¼ | 20 | 20 | 2½ | 12¾ | 17 | 16-1¼ | 10 | 8 1/16 |
| | 12 . 8 | | 33 | 47¼ | 16¼ | 20 | 22 | 2⅝ | 15 | 19¼ | 20-1¼ | 12 | 8 1/16 |
| | 16 . 12 | | 39 | 63 | 23¼ | 24 | 27 | 3 | 18½ | 23¾ | 20-1½ | 15¼ | 12 |
| | 20 . 16 | | 47 | 78 | 29½ | 27 | 32 | 3½ | 23 | 28½ | 24-1⅝ | 19 | 15¼ |
| | 24 . 16 | | 55 | 78 | 29½ | 27 | 37 | 4 | 27¼ | 33 | 24-1⅞ | 23 | 15¼ |
| | 26 . 16 | | 57‡ | 78 | 29½ | 27 | 40 | 4¼ | 29½ | 36 | 28-1⅞ | 25 | 15¼ |

*Added description page 232*

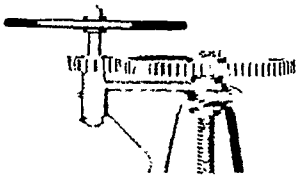
# Gearing for Cast Steel Wedge Gate Valves



Style N
Bevel Gearing
For O.S. & Y.
Gate Valves

***Prices and dimensions on application.***

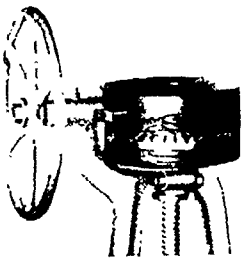
Larger sizes of gate valves or gate valves used for unusually high pressures frequently require gearing in order to facilitate operation. Under other conditions where valves are inaccessibly installed, gearing can be used effectively to provide for more convenient operation. Prices are furnished on application.



Style P
Spur Gearing
For O.S. & Y. Gate Valves

**Bevel gearing:** On orders for gate valves with bevel gearing, Style "N", with the pinion shaft extending at right angles to the run of the valve will be supplied unless otherwise specified.

When so ordered, gate valves with bevel gearing, having the pinion shaft extending parallel to the run of the valve, can be furnished. In this position the bevel gearing will be known as Style "O".



Gear Covers
For Spur or Bevel
Geared Steel O.S. & Y.
Wedge Gate Valves

When bevel gearing is ordered separately for use on circular bonnet valves (300-Pound or heavier), Style "N" gearing will regularly be supplied. For assembly on the valve in positions other than with the pinion shaft at right angles to the run, the bonnet of the valve must be unbolted and turned to suit the condition desired.

**Spur gearing:** Style "P" spur gearing is regularly mounted with the pinion shaft at one side of the valve and the handwheel above the gearing.

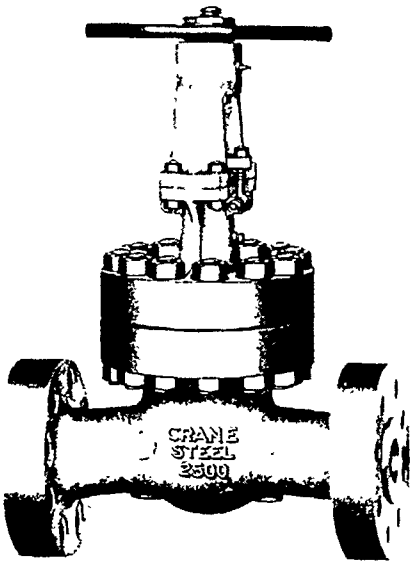
**Gear covers:** Gear covers can be supplied for geared steel valves, to prevent obstruction of or damage to the gears and also to guard against injury of the operator.

**Ordering:** Orders for geared gate valves must specify the Style of gearing (and on bevel gearing, the position of the pinion shaft). When ordering gearing separately, also indicate the size, catalog number, and complete marking of the valve.

# 2500-Pound Alloy Cast Steel Wedge Gate Valves

***Prices and dimensions on application.***

Crane 2500-Pound Alloy Cast Steel Outside Screw and Yoke Wedge Gate Valves are available in the 1½, 2, 2½, 3, 4, 5, 6, 8, 10, and 12-inch sizes, with either flanged or butt-welding ends. In these valves are many outstanding features of design necessary for safe, reliable service under the severe operating conditions of the high pressures and elevated temperatures for which they are recommended.




Some of the more important developments in the Crane 2500-Pound Valves are: straight-through port design—eliminates excessive turbulence; shoulder-type body seat rings—provide tightness and security at this point; long, machined disc guides—assure accurate seating with minimum wear; tee-head disc-stem connection—prevents lateral strains on the stem; ring-type bonnet joint with high tensile bolting—makes the joint strong and tight; ball-bearing yoke sleeve on sizes 5-inch and larger—facilitates operation; and deep, lantern-type stuffing box with ball-type gland—assures tightness with minimum wear.

It is recommended that 2500-Pound Alloy Steel Gate Valves be equipped with a by-pass on sizes 4-inch and larger; sizes 8-inch and larger should have gearing.

*Working pressures ..... page 226*
*General description ... pages 227 and 228*
*Specifications of Materials ..... page 227*
*Description of Materials ..... pages 1 to 9*

*For Crane Pressure-Seal Bonnet Valves, see Section 21*

Steel Globe &
Angle Valves;
Bar Stock Valves

# Cast and Forged Steel Globe and Angle Valves



The Crane line of Steel Globe and Angle Valves can be classified into two general groups. The first group covers valves 2-inch and smaller of forged steel cast steel or bar stock; these are frequently considered general utility valves and are used in a wide variety of services, often at pressures and temperatures lower than the recommended maximum. The second group covers cast steel valves ranging in size as large as 8-inch, all made similar in design and available in each of the American Standard pressure classes.

**Cast and Forged Steel Valves**
**Sizes 2-Inch and Smaller**

Bar Stock Valves.....page 236
[illegible]-Pound Cast Steel, for Locomotive Service.....page 240
600-Pound Forged Steel, Inside Screw.....page 237
[illegible]-Pound Forged Steel, O.S. & Y.....pages 238 and 239
1500-Pound Cast Steel, O. S. & Y.....page 241
6000-Pound Hydraulic Forged Steel.....page 242

**Cast Steel Valves**
**150, 300, 400, 600, 900, and 1500-Pound**

Pressure-Temperature Ratings.....page 243
Description and Specification of Materials.....pages 244 and 245
List Prices.....page 246
Dimensions.....page 247
Service Recommendations.....page 243

Gearing.....page 248
2500-Pound.....page 248

***For Pressure-Seal and Lip-Seal Bonnet Valves, see Section 21, pages 205 to 220.***

The Cast and Forged Steel Globe and Angle Valves listed above comprise only a part of the complete line of Crane steel products.

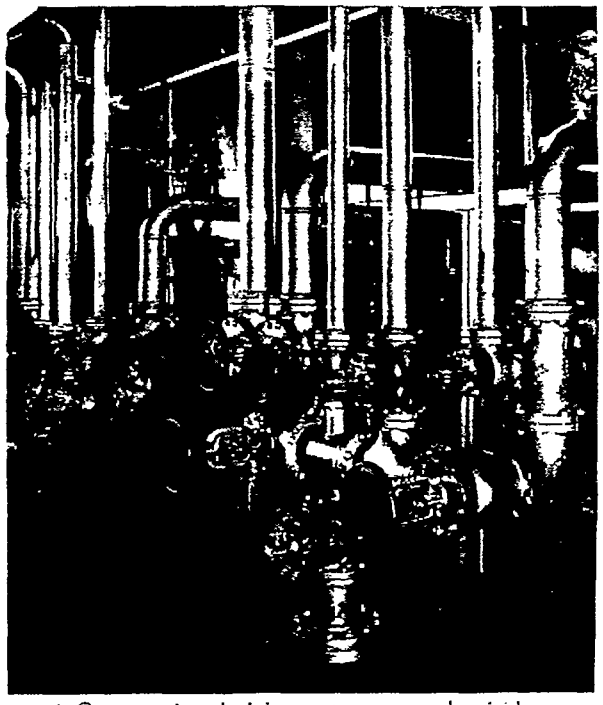
Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

Steel Globe and Angle for Chlorine Service.....page 386
Steel Gate Valves.....pages 221 to 234
Steel Check Valves.....pages 249 to 256
Steel Stop-Check Valves
Pressure-Seal Bonnet.....pages 214 to 217
Bolted Bonnet.....pages 301 to 307

Steel Safety Valves.....page 324
Steel Relief Valves.....pages 3[illegible] and 334
Steel Sediment Separators.....page 356

Steel Flanged Fittings.....pages 267 to 274
Steel Welding Fittings.....pages 275 to 290
Steel Flanges.....pages 291 to 298
Steel Screwed Fittings.....pages 257 to 262
Steel Bushings.....page 260
Steel Plugs.....page 260

Corrosion-Resistant Products.....pages 375 to 396
Wrought Steel Nipples.....pages 108 and 109
Forged Steel Unions.....pages 203 and 204
Forged Steel Flange Unions.....pages 182 and 205
Fabricated Piping.....pages 497 to 522



A Crane-equipped piping system meets the rigid requirements of high pressure-temperature installations.

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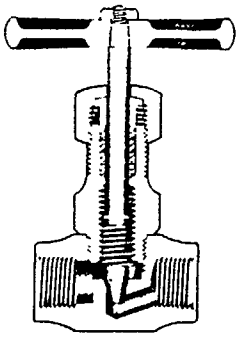
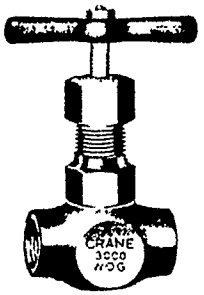
# High Pressure
# Steel, Exelloy, or 18-8 Mo Bar Stock Valves

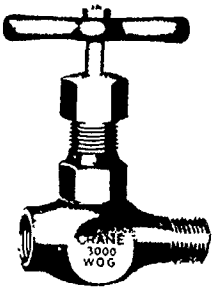
WORKING PRESSURE
3000 pounds cold water, oil, or gas, non-shock
*Air Tested*



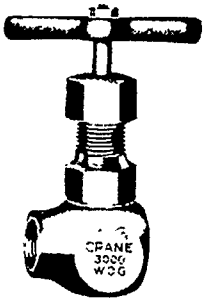
Cross Section
Globe
Female
Steel, Exelloy, or 18-8 Mo



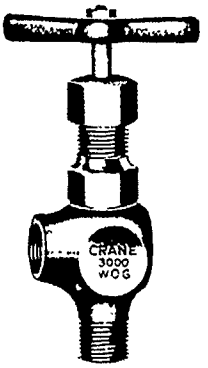

Globe
Female
No. 222 H, Steel
No. 222 X, Exelloy
No. 222 SS, 18-8 Mo




Globe
Male and Female
No. 222½ H, Steel
No. 222½ X, Exelloy
No. 222½ SS, 18-8 Mo




Angle
Female
No. 223 H, Steel
No. 223 X, Exelloy
No. 223 SS, 18-8 Mo




Angle
Male and Female
No. 223½ H, Steel
No. 223½ X, Exelloy
No. 223½ SS, 18-8 Mo

## List Prices, Each

| Size | | | Inches[1] | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|---|---|---|
| Steel Valves | Globe | No. 222 H, Female | | 6.50 | 6.50 | 7.70 | 10.20 | 28.00 | 39.00 |
| | | No. 222½ H, Male and Female | | 7.80 | 7.80 | 9.30 | 12.20 | 33.70 | |
| | Angle | No. 223 H, Female | | 6.50 | 6.50 | 7.70 | 10.20 | 28.00 | 39.00 |
| | | No. 223½ H, Male and Female | | 11.00 | 11.00 | 13.00 | 17.00 | 40.50 | |
| Exelloy Valves | Globe | No. 222 X, Female | | 10.60 | 10.60 | 12.20 | 16.30 | 55.00 | 77.00 |
| | | No. 222½ X, Male and Female | | 13.00 | 13.00 | 15.40 | 20.30 | 69.00 | |
| | Angle | No. 223 X, Female | | 10.60 | 10.60 | 12.20 | 16.30 | 55.00 | 77.00 |
| | | No. 223½ X, Male and Female | | 18.30 | 18.30 | 21.50 | 28.50 | 83.00 | |
| 18-8 Mo Valves | Globe | No. 222 SS, Female | | 14.20 | 14.20 | 16.30 | 22.00 | 61.00 | 87.00 |
| | | No. 222½ SS, Male and Female | | 18.00 | 18.00 | 20.30 | 27.00 | 76.00 | |
| | Angle | No. 223 SS, Female | | 14.20 | 14.20 | 16.30 | 22.00 | 61.00 | 87.00 |
| | | No. 223½ SS, Male and Female | | 24.00 | 24.00 | 27.60 | 36.60 | 91.00 | |

**Service recommendations:** Made of three different metals with female or male and female ends, these neat, small, rugged valves find wide application in almost every industry. They are ideal for use on orifice meters, regulator leads, by-passes, gauges, and many similar services.

The Exelloy Valves are particularly suitable for handling oil or gas containing sulphur compounds, or for installations where steel valves do not have sufficient resistance to atmospheric corrosion.

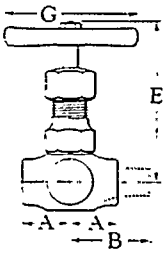
The 18-8 Mo Alloy Valves are especially suited for oil containing hydrogen sulphide and sulphur dioxide when moisture is apt to be present.

**Construction:** The body and bonnet are made from solid bar stock. The thread chambers are extra long. The plug type disc is exceptionally resistant to wear and to foreign matter, and permits accurate flow regulation. The disc is integral with the stem.

The stuffing box is deep, has a gland, and is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Materials:** Steel Valves have a steel body, bonnet, packing nut, and gland, and a chromium plated steel stem. In the Exelloy Valves, all of these parts are made of Exelloy; and in the 18-8 Mo Alloy Valves, of Crane 18-8 Mo Chrome-Nickel-Molybdenum Alloy Steel. All valves have a malleable iron tee handle.

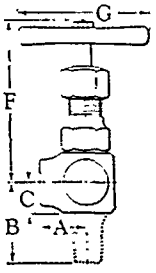
Exelloy is a specially heat-treated chromium iron having a chromium content of about 12 per cent. Crane 18-8 Mo Alloy is a steel having a minimum content of 18 per cent chromium and 12 per cent nickel, with 2.5 to 3 per cent molybdenum.




## Dimensions, in Inches

| Size | ⅛ | ¼ | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|
| A | 31/32 | 31/32 | 1 3/32 | 1¼ | 1⅝ | 2⅛ |
| B | 1½ | 1⅝ | 1⅞ | 2⅛ | 2⅝ | |
| C | 9/16 | 9/16 | 11/16 | 13/16 | 1 | 1¼ |
| E or F — Open | 3 7/16 | 3 7/16 | 3 15/16 | 4⅞ | 6⅜ | 7⅝ |
| G | 2 9/16 | 2 9/16 | 2 9/16 | 3 9/16 | 4¾ | 4¾ |
| Diameter of seat opening | 3/16 | 3/16 | ¼ | 5/16 | 7/16 | 9/16 |

The opening in the male end on male and female valves leads to the underside of the disc.

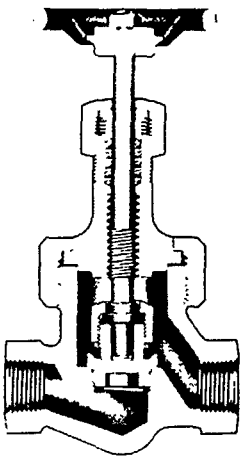


# 600-Pound Forged Steel Globe and Angle Valves

## Inside Screw



### Union Bonnet



Cross Section, Globe

No. 3620 X
Globe, Screwed

No. 3621 X
Angle, Screwed

### SERVICE RECOMMENDATIONS

These small, rugged, Inside Screw Globe and Angle Valves are made with a plug type disc and seat. They can be used wherever durable inside screw valves are wanted. The valves are recommended for cold oil and for hot oil and oil vapor on temperatures up to 800° F.

**Body and bonnet:** The body and bonnet are forged carbon steel. Heavy metal sections assure liberal safety.

**Bonnet joint:** Bonnet joints are fitted with a corrugated soft iron gasket. Sizes 1/4 to 3/4-inch have a union bonnet, the ring being forged steel; sizes 1 to 2-inch have a compact bolted bonnet, male and female type, equipped with Triplex Steel studs. Both types are strong and can be easily taken apart and reassembled.

**Disc, seat, and stem:** The plug type disc and seat, ideal for throttling services, are made of Exelloy. Their wide, carefully finished seating surfaces are unusually resistant to foreign matter and to wiredrawing. The body seat ring is screwed into the body.

The valves feature a new, improved swivel disc-stem construction, as illustrated. Clearances are held to a minimum, and the seating load, exerted by the end of the stem on the disc, is much closer to the actual seating surfaces of the valves. The stem, made of Exelloy, is of generous diameter with long thread engagement in the bonnet. The disc stem ring is locked to the disc by tack welding and will not loosen in service.

**Stuffing box; repacking:** The stuffing box is exceptionally wide and deep; it is equipped with a gland and filled with cut ring packing. The valves, when wide open, can be repacked while under pressure.

**Handwheel:** Wheels are malleable iron. For easier handling, valves 1 1/4-inch and smaller have a dished design wheel, made with small gripping knobs on the outer edge.

### WORKING PRESSURES

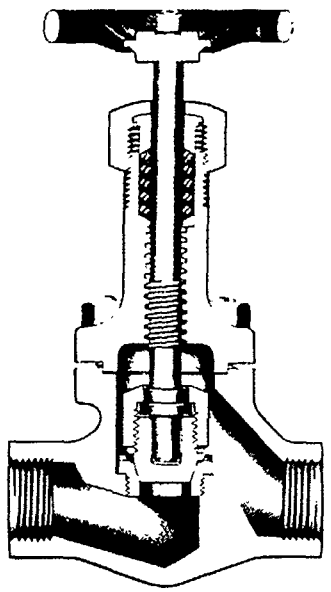
| | Temp. Deg. F. | Pounds Non-Shock |
|---|---|---|
| Class "X" For Oil or Oil Vapor only | 100 | 2000 |
| | 150 | 1910 |
| | 200 | 1820 |
| | 250 | 1730 |
| | 300 | 1640 |
| | 350 | 1550 |
| | 400 | 1460 |
| | 450 | 1370 |
| | 500 | 1280 |
| | 550 | 1190 |
| | 600 | 1110 |
| | 650 | 1030 |
| | 700 | 940 |
| | 750 | 850 |
| | 800 | 780 |

### HYDROSTATIC TEST PRESSURES

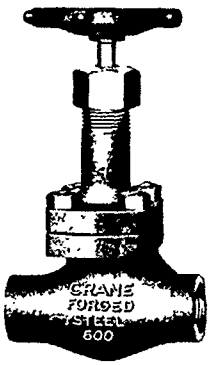
Shell — 2175 pounds
Seat — 2100 pounds

Valve seat tested
100 pounds air-under-water

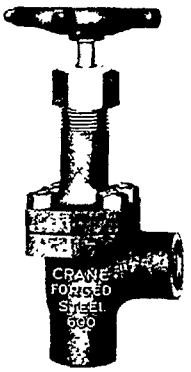
### Bolted Bonnet



Cross Section, Globe




No. 3624 X
Globe, Screwed




No. 3625 X
Angle, Screwed

### List Prices and Dimensions

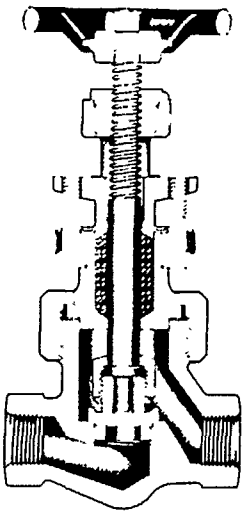
| Union Bonnet Valves | | | | | | |
|---|---|---|---|---|---|---|
| Size | | Inches | 1/4 | 3/8 | 1/2 | 3/4 |
| No. 3620 X, Globe | | Each | 16.50 | 16.50 | 19.70 | 22.80 |
| No. 3621 X, Angle | | Each | 16.50 | 16.50 | 19.70 | 22.80 |
| Dimensions, in Inches | Center to end | | 1 1/4 | 1 1/2 | 1 3/4 | 2 1/4 |
| | Center to top, open | Globe | 4 3/4 | 5 3/16 | 6 7/16 | 7 13/16 |
| | | Angle | 4 3/4 | 5 1/16 | 6 1/4 | 7 1/2 |
| | Diameter of wheel | | 2 1/2 | 2 1/2 | 3 | 3 1/2 |

| Bolted Bonnet Valves | | | | | | |
|---|---|---|---|---|---|---|
| Size | | Inches | 1 | 1 1/4 | 1 1/2 | 2 |
| No. 3624 X, Globe | | Each | 29.00 | 40.20 | 59.00 | 80.40 |
| No. 3625 X, Angle | | Each | 29.00 | 40.20 | 59.00 | 80.40 |
| Dimensions, in Inches | Center to end | | 2 9/16 | 3 1/8 | 3 1/2 | 4 3/16 |
| | Center to top, open | Globe | 8 3/4 | 10 3/4 | 10 15/16 | 12 9/16 |
| | | Angle | 7 5/8 | 9 5/16 | 9 1/8 | 10 7/8 |
| | Diameter of wheel | | 4 | 5 | 6 | 7 |

# 600-Pound Forged Steel Globe and Angle Valves

23

## Outside Screw and Yoke



Cross Section, Globe Union Bonnet

Low in cost and high in quality, these small Crane 600-Pound Forged Steel Outside Screw and Yoke Valves are compact, rugged, and durable.

The line includes union bonnet valves with screwed ends in sizes ¼ to ¾-inch or socket-welding ends in sizes ¼ and ⅜-inch; and bolted bonnet valves with screwed, socket-welding, or flanged ends in sizes ½ to 2-inch.

**Service recommendations:** These valves are ideal for a wide variety of services in oil refineries, oil and gas fields, central power stations, and industrial plants, on high pressure hydraulic lines and on high pressure-temperature steam or oil lines.

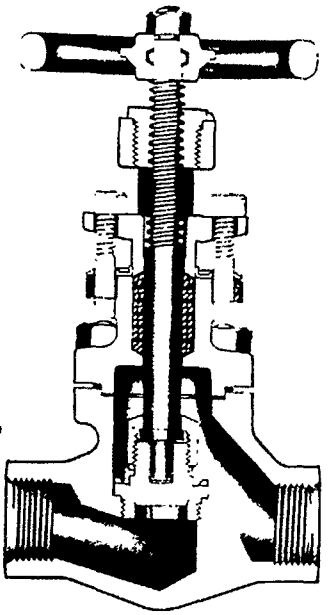
Two classes of trim are available: Class "X", for oil or oil vapor up to 1000° F., and Class "W", for steam (850° F. max.), water, air, or gas. For details, see "Service Recommendations" on page 243 ("W" trim is recommended for the same services as defined there for "XR").

WORKING PRESSURES

| Temp. Deg. F. | Pounds, Non-Shock: Screwed or Socket Welding Valves | Flanged Valves: *With ¼-inch Male Facing | Flanged Valves: With Ring Joint Facing |
|---|---|---|---|
| Class "X", for Oil or Oil Vapor | | | |
| Class "W", for Steam or Water | | | |
| 100 | 2000 | 1200 | 1440 |
| 150 | 1910 | 1180 | 1420 |
| 200 | 1820 | 1160 | 1400 |
| 250 | 1730 | 1140 | 1380 |
| 300 | 1640 | 1120 | 1365 |
| 350 | 1550 | 1095 | 1350 |
| 400 | 1460 | 1075 | 1330 |
| 450 | 1370 | 1050 | 1320 |
| 500 | 1280 | 1000 | 1250 |
| 550 | 1190 | 950 | 1180 |
| 600 | 1110 | 890 | 1110 |
| 650 | 1030 | 830 | 1030 |
| 700 | 940 | 750 | 940 |
| 750 | 850 | 680 | 850 |
| 800 | 780 | 600 | 730 |
| 850 | 700 | 490 | 600 |
| Class "X", for Oil or Oil Vapor | | | |
| 900 | 600 | 420 | 420 |
| 950 | 530 | 330 | 330 |
| 1000 | 380 | 240 | 240 |

*When an all-metal gasket (corrugated or flat) is used with large male and female facings, these ratings apply only if the contact area of the gasket is the same as in large tongue and groove joints.

***Valve seat tested 100 pounds air-under-water***



Section, Globe, Bolted Bonnet

TEST PRESSURES

| Valve | Pounds Hydrostatic: Screwed or Socket-Welding Valves | Flanged Valves: With ¼" Male | Flanged Valves: With Ring Joint |
|---|---|---|---|
| Shell | 2175 | 1800 | 2175 |
| Seat | 2100 | 1550 | 1550 |

**Body, bonnet, and yoke:** The body, bonnet, and yoke are forged carbon steel; heavy metal sections assure generous strength. On union bonnet valves the bonnet and yoke are separate pieces, joined by long, fine threads. On bolted bonnet valves the bonnet and yoke are forged integral.

**Bonnet joint:** The bonnet joint is equipped with a corrugated soft iron gasket, assuring tightness and ease of maintenance. Union bonnet valves have a forged steel union ring. Bolted bonnet valves have a male and female joint fitted with Triplex Steel studs. Both types of joints are unusually strong and can be easily dismantled and reassembled.

**Plug type disc and seat:** These valves have a Crane plug type disc and seat, well known for ability to maintain tightness and for effectiveness on throttling services. The wide, tapered seating surfaces offer excellent resistance to foreign matter and to wiredrawing. In "X" trimmed valves, the disc and seat are Exelloy; in "W" trimmed valves, the seat and disc are made of Crane Nitri-Hard, a stainless steel having an extremely hard surface. The body seat ring has heavy metal sections, with a long thread engagement in the body.

**Stem:** The Exelloy stem has precision cut lifting threads to assure smooth operation.

**Disc-stem connection:** These valves feature an improved swivel disc-stem connection. The new design holds all clearances to a minimum and places the seating load closer to the actual seating surface of the valve. The disc stem ring is locked to the disc by tack welding and will not loosen in service.

**Yoke bushing:** The heavy yoke bushing, long with liberal stem-thread engagement, is screwed into the yoke and tack welded; it is sturdy and secure.

**Bolted gland:** The bolted gland eliminates the danger of weakening—by threading—the yoke legs. Steel tee-head bolts hold the forged steel one-piece gland and gland flange rigidly in place. The packing load is easily adjusted; bolts are quickly removed when necessary. A steel gland bolt retainer anchors the bolts; the bolts will not come off in service.

**Stuffing box:** An unusually wide and deep stuffing box provides liberal packing space for a tight seal. It is filled with high quality cut ring packing.

**Handwheel:** Wheels are tough malleable iron. For easier handling, valves ¼ to 1-inch have a dished design wheel, with small rounded gripping knobs.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

*Prices and dimensions page 239*

*Description of materials ...pages 1 to 9*

# 600-Pound Forged Steel Globe and Angle Valves

## Outside Screw and Yoke



### Union Bonnet Valves

List Prices, Each, and Dimensions

| Size | | | Inches | 1/4 | 3/8 | 1/2 | 3/4 |
|---|---|---|---|---|---|---|---|
| Globe | No. 3640 X or W, Screwed | | | 22.30 | 22.30 | 26.40 | 30.80 |
| | No. 3648 X or W, Socket-Welding | | | 22.30 | 22.30 | | |
| Angle | No. 3641 X or W, Screwed | | | 22.30 | 22.30 | 26.40 | 30.80 |
| | No. 3649 X or W, Socket-Welding | | | 22.30 | 22.30 | | |
| Dimensions, in Inches | Center to end | | | 1 1/2 | 1 1/2 | 1 3/4 | 2 1/4 |
| | Center to top, open | Globe | | 6 1/2 | 6 1/2 | 7 5/16 | 9 |
| | | Angle | | 6 3/8 | 6 3/8 | 7 | 8 1/2 |
| | Depth of socket | | | 7/16 | 9/16 | | |
| | Diameter of wheel | | | 3 | 3 | 3 1/2 | 4 |

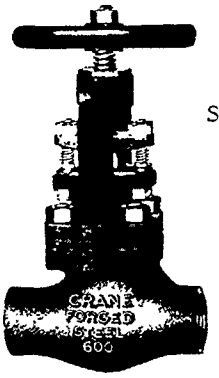
Angle, Screwed
(Not illustrated)
No. 3641 X
No. 3641 W

Angle, Socket-Welding
No. 3649 X
No. 3649 W

Globe, Screwed
No. 3640 X
No. 3640 W

Globe, Socket-Welding
(Not illustrated)
No. 3648 X
No. 3648 W

### Bolted Bonnet Valves




Globe

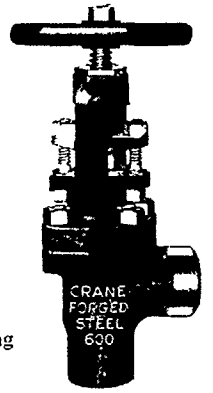
Screwed
No. 3644 X
No. 3644 W

Socket-Welding
No. 3652 X
No. 3652 W

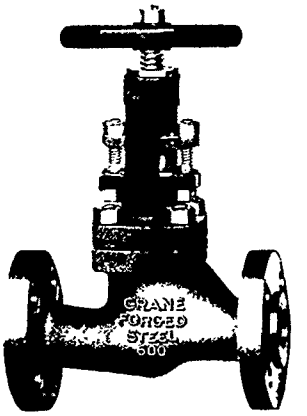
Angle

Screwed
No. 3645 X
No. 3645 W

Socket-Welding
No. 3653 X
No. 3653 W




Globe valves with socket-welding ends and angle valves with screwed ends are not illustrated.




Globe, Flanged
No. 3656 X or 3656 W

Angle, Flanged
No. 3657 X or 3657 W

**Flanged valves:** End flanges conform to the 600-Pound American Standard (B16e-1939). They have a large male face 1/4-inch high with a serrated finish (approximately 32 concentric grooves per inch). Prices include drilling and spot facing; no deduction if ordered faced only.

Valves with 150-Pound end flanges are made to order; prices on request.

**Face to face:** 600-Pound flanged valves have American Standard B16.10-1939 face-to-face dimensions; the 1/2-inch size is not included in the Standard.

List Prices, Each, and Dimensions

| Size | | | Inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| Globe | No. 3644 X or W, Screwed | | | 29.50 | 34.40 | 40.70 | 58.50 | 80.40 | 108.00 |
| | No. 3652 X or W, Socket-Welding | | | 29.50 | 34.40 | 40.70 | 58.50 | 80.40 | 108.00 |
| | No. 3656 X or W, Flanged, F.D. & S. F. | | | 56.30 | 68.00 | 80.50 | 98.50 | 123.00 | 155.00 |
| Angle | No. 3645 X or W, Screwed | | | 29.50 | 34.40 | 40.70 | 58.50 | 80.40 | 108.00 |
| | No. 3653 X or W, Socket-Welding | | | 29.50 | 34.40 | 40.70 | 58.50 | 80.40 | 108.00 |
| | No. 3657 X or W, Flanged, F.D. & S.F. | | | 56.30 | 68.00 | 80.50 | 98.50 | 123.00 | 155.00 |
| Dimensions, in Inches | Screwed or Socket-Welding Valves | Center to end | | 1 13/16 | 2 3/16 | 2 9/16 | 3 1/8 | 3 1/2 | 4 3/16 |
| | | Center to top, open | Globe | 7 5/16 | 8 7/8 | 9 3/8 | 11 | 11 15/16 | 14 |
| | | | Angle | 6 3/4 | 8 | 8 1/4 | 9 9/16 | 10 1/8 | 11 15/16 |
| | Depth of socket | | | 5/8 | 11/16 | 3/4 | 13/16 | 7/8 | 1 |
| | Flanged Valves | *Center to face | | 3 1/4 | 3 3/4 | 4 1/4 | 4 1/2 | 4 3/4 | 5 3/4 |
| | | Center to top, open | Globe | 7 3/8 | 9 | 9 3/4 | 11 3/16 | 12 3/16 | 14 9/16 |
| | | | Angle | 6 11/16 | 8 | 8 5/16 | 9 5/8 | 10 5/16 | 12 1/16 |
| | Diameter of wheel | | | 3 1/2 | 4 | 5 | 6 | 7 | 9 |
| | Diameter of flange | | | 3 3/4 | 4 5/8 | 4 7/8 | 5 1/4 | 6 1/8 | 6 1/2 |
| | *Thickness of flange | | | 9/16 | 5/8 | 11/16 | 13/16 | 7/8 | 1 |
| | Diameter of male face | | | 1 3/8 | 1 11/16 | 2 | 2 1/2 | 2 7/8 | 3 5/8 |
| | Diameter of bolt circle | | | 2 5/8 | 3 1/4 | 3 1/2 | 3 7/8 | 4 1/2 | 5 |
| | No. and dia. of bolts | | | 4—1/2 | 4—5/8 | 4—5/8 | 4—5/8 | 4—3/4 | 8—5/8 |

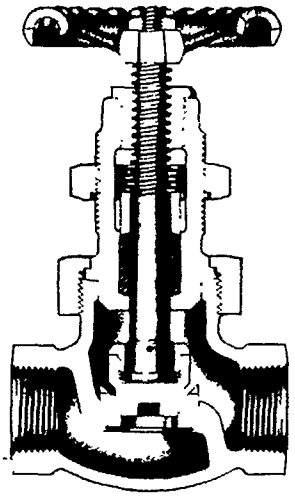
*The center to face dimension includes the 1/4-inch male face; the thickness of flange does not

*For working pressures and description, see the preceding page.*
*Dimensions of ring joint and special facings . . . pages 469 to 471*
*Monel trimmed valves . page 387*
*Templates for drilling page 462*

# 600-Pound Alloy Cast Steel Globe Valves

23

## Outside Screw and Yoke



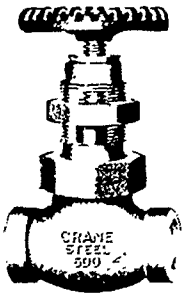
Cross Section
No. 496 P, Globe

***All valves shown on this page are made to order only.***

WORKING PRESSURE
600 pounds steam, 750° F.

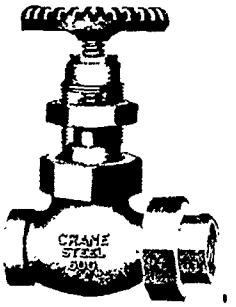
HYDROSTATIC TEST PRESSURES
Body—1500 pounds Seat—1100 pounds

***Valves are tested at the seat with 100 pounds air-under-water.***



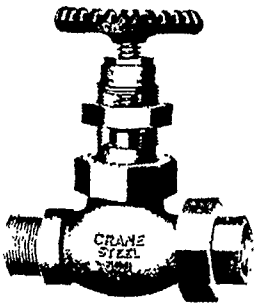
No. 496 P
Globe

Female Inlet
Female Outlet



No. 1880 P
Globe

Female Inlet
Female Union Outlet



No. 1884 P
Globe

Male Inlet
Female Union Outlet

On the No. 496 P and No. 1880 P Valves both ends are the same pipe size.
On the No. 1884 P Valves the male end is one pipe size larger than the female union end

### List Prices

| | Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| Female Inlet | No. 496 P, Female Outlet | Each | 36.00 | 43.00 | 50.00 | 63.50 | 80.50 | 94.50 |
| | No. 1880 P, Female Union Outlet | Each | 53.00 | 58.00 | 65.00 | 80.50 | 108.00 | 149.00 |
| Male Inlet | Size | Inches | ¾×½ | 1×¾ | 1¼×1 | 1½×1¼ | 2×1½ | 2½×2 |
| | No. 1884 P, Female Union Outlet | Each | 57.00 | 65.50 | 73.50 | 88.50 | 123.00 | 165.00 |

These valves, patterned after AAR 300-Pound O. S. & Y. Bronze Valves shown on page 39, are especially recommended for service on railroad locomotives using high pressure superheated steam. They are liberally reinforced and ruggedly constructed.

**Materials and construction:** The body and bonnet on these valves are well-proportioned and unusually strong. They are made from Crane No. 4 Carbon-Molybdenum Steel, an alloy particularly suitable for service on elevated pressures and temperatures. The stem is made of Exelloy. Stem threads, long and accurately cut, are on the outside where they do not come in contact with the fluid in the line. They can be easily lubricated when necessary. The valves have a malleable iron handwheel.

**Plug type seat and disc:** The plug type disc and seat, excellent for throttling services, have wide, carefully finished seating surfaces which are unusually resistant to foreign matter and to wiredrawing.

The disc and body seat ring are Crane Nitri-Hard, a stainless steel offering excellent resistance to erosion, galling, and scoring.

**Yoke bushing:** The yoke bushing, made of Crane Cast Manganese Bronze, is long and heavy with liberal stem-thread engagement. Screwed into the yoke and tack welded, it is sturdy and secure.

**Stuffing box:** The stuffing box is deep and is filled with high grade packing. It is equipped with an Ihrigized steel gland.

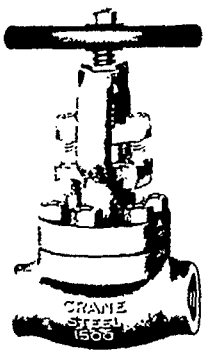
**Repacking:** These valves, when wide open, can be repacked while under pressure.

### Dimensions, in Inches

| | Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 496 P or No. 1880 P Female Inlet Valves | Center to female end | | 1 9/16 | 1 7/8 | 2 1/4 | 2 9/16 | 2 13/16 | 3 3/8 |
| | Center to union end, No. 1880 P | | 2 9/16 | 3 | 3 7/16 | 3 15/16 | 4 5/16 | 5 1/8 |
| | Center to top, open | | 5 11/16 | 6 | 7 11/16 | 8 1/8 | 9 3/4 | 10 5/8 |
| | Diameter of wheel | | 3 1/16 | 3 5/8 | 4 1/16 | 4 3/4 | 5 3/8 | 6 |
| | Size | Inches | ¾ x ½ | 1 x ¾ | 1¼ x 1 | 1½ x 1¼ | 2 x 1½ | 2½ x 2 |
| No. 1884 P Male Inlet Valves | Center to male end | | 2 9/16 | 3 1/8 | 3 1/2 | 3 13/16 | 4 5/16 | 4 7/8 |
| | Center to union end | | 2 9/16 | 3 | 3 7/16 | 3 15/16 | 4 5/16 | 5 1/8 |
| | Center to top, open | | 5 11/16 | 6 | 7 11/16 | 8 1/8 | 9 3/4 | 10 5/8 |
| | Diameter of wheel | | 3 1/16 | 3 5/8 | 4 1/16 | 4 3/4 | 5 3/8 | 6 |

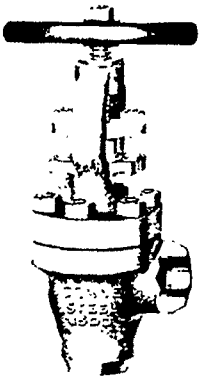
# 1500-Pound Screwed and Socket-Welding
# Alloy Cast Steel Globe and Angle Valves
## Bolted Bonnet—Outside Screw and Yoke

23




Globe, Screwed
No. 3844 X
No. 3844 U

Globe, Socket-Welding
(Not illustrated)
No. 3852 X
No. 3852 U



Angle, Screwed
(Not illustrated)
No. 3845 X
No. 3845 U

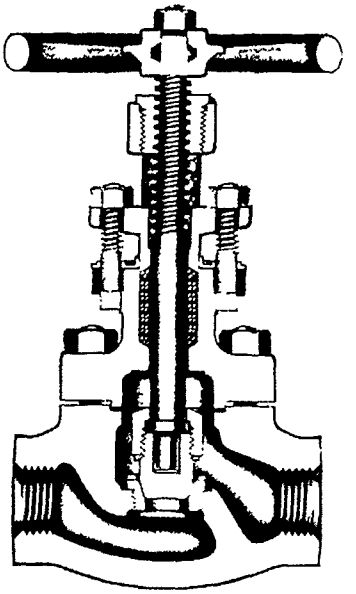
Angle, Socket-Welding
No. 3853 X
No. 3853 U

***The valve seat is tested 100 pounds air-under-water.***

WORKING PRESSURES

| Temperature Deg. F. | Pounds Non-Shock |
|---|---|
| Class "X" for Oil or Oil Vapor<br>Class "U" for Steam or Water | |
| 100 | 3600 |
| 150 | 3550 |
| 200 | 3500 |
| 250 | 3450 |
| 300 | 3415 |
| 350 | 3375 |
| 400 | 3330 |
| 450 | 3295 |
| 500 | 3125 |
| 550 | 2955 |
| 600 | 2770 |
| 650 | 2580 |
| 700 | 2350 |
| 750 | 2125 |
| 800 | 1875 |
| 850 | 1750 |
| 900 | 1625 |
| 950 | 1500 |
| Class "X", for Oil or Oil Vapor | |
| 1000 | 1170 |

TEST PRESSURES
Shell — **5400** pounds hydrostatic
Seat — **3700** pounds hydrostatic



Cross Section
Globe
Screwed
"X" Trimmed

### List Prices and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| Screwed | No. 3844 X or No. 3845 X | Each | 71.00 | 83.00 | 98.00 | 141.00 | 193.00 | 260.00 |
| | No. 3844 U or No. 3845 U | Each | 88.00 | 106.00 | 121.00 | 176.00 | 239.00 | 322.00 |
| Socket-Welding | No. 3852 X or No. 3853 X | Each | 71.00 | 83.00 | 98.00 | 141.00 | 193.00 | 260.00 |
| | No. 3852 U or No. 3853 U | Each | 88.00 | 106.00 | 121.00 | 176.00 | 239.00 | 322.00 |
| Dimensions, in Inches | Center to end, Screwed | | 2⅛ | 2¾ | 3⅛ | 3⅝ | 3¾ | 4¾ |
| | Center to end, Socket-Welding | | 2 1/16 | 2 11/16 | 3 1/16 | 3 9/16 | 3 11/16 | 4 11/16 |
| | Center to top, open — Globe | | 9½ | 9⅛ | 10¾ | 13 | 13⅝ | 16½ |
| | Center to top, open — Angle | | 9¼ | 9¼ | 10⅜ | 12⅜ | 12⅝ | 15⅜ |
| | Depth of socket | | ⅝ | 11/16 | ¾ | 13/16 | ⅞ | 1 |
| | Diameter of wheel | | 4 | 5 | 7 | 8 | 9 | 14 |

Cross Section
Through
Seat of
"U" Trimmed

These small 1500-Pound Valves, except for heavier, more rugged metal sections, are similar to and feature the same swivel plug disc design as the 600-Pound Bolted Bonnet Valves shown on pages 238 and 239.

The valves are exceptionally compact and durable, yet they have many refinements usually found only in larger size high-pressure valves, such as a deep stuffing box and heavy yoke bushing with liberal stem-thread engagement.

**Service recommendations:** They are ideal for the severe services encountered in oil refineries and modern power plants, on high-pressure hydraulic installations, and on high pressure-temperature steam or oil lines.

There are two classes of trim materials available: Class "X," for oil or oil vapor up to 1000° F., and Class "U" for steam, water, air, gas, and other non-lubricating and relatively non-corrosive fluids such as gasoline, fuel oil, etc., up to 950° F.

**Materials:** The body and yoke bonnet are cast from Crane No. 4 Carbon-Molybdenum Steel and have a male and female joint with steel gasket to assure tightness and ease of maintenance. The stem is Exelloy. Precision cut stem threads assure smooth operation. The bolted one-piece gland eliminates the danger of weakening—by threading—the yoke legs. The packing load can be adjusted easily, and a gland bolt retainer prevents the tee-head bolts from coming off in service.

The "X" trimmed valves have Triplex steel body studs, and the plug type disc and seat are Exelloy with carefully ground seating surfaces.

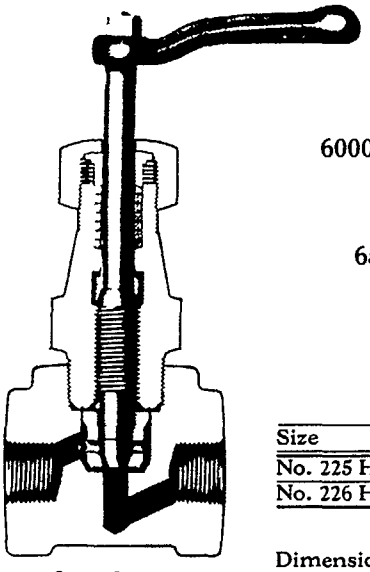
The "U" trimmed valves have Templex steel body studs, the disc is Stellite faced alloy steel, and the body has an integral seat which is Stellite faced, offering excellent resistance to wear.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

*Description of materials....pages 1 to 9*

23

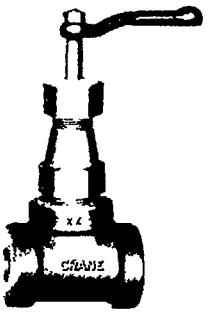
# 6000-Pound Hydraulic
# Forged Steel Globe and Angle Valves
## Plug Type Disc



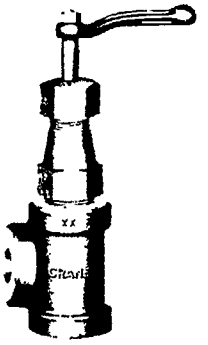
Cross Section
No. 225 H
Globe

WORKING PRESSURE
6000 pounds cold water or oil, non-shock

TEST PRESSURE
6500 pounds hydrostatic



No. 225 H, Globe
Screwed



No. 226 H, Angle
Screwed

### List Prices and Dimensions

| Size | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 225 H, Globe | | Each | 49.00 | 49.00 | 54.00 | 63.00 | 77.00 | 105.00 | 304.00 | 409.00 |
| No. 226 H, Angle | | Each | 49.00 | 49.00 | 54.00 | 63.00 | 77.00 | 105.00 | 304.00 | 409.00 |
| Dimensions, in Inches | End to end, Globe | | 2 7/8 | 2 7/8 | 3 5/8 | 5 | 5 1/4 | 7 | 7 3/4 | 9 |
| | Center to end, Angle | | 1 7/16 | 1 7/16 | 1 13/16 | 2 1/2 | 2 5/8 | 3 1/2 | 3 7/8 | 4 1/2 |
| | Center to top, open | | 6 3/4 | 6 3/4 | 7 5/8 | 9 3/4 | 10 3/4 | 12 5/8 | 14 1/4 | 16 |
| | Center to end of handle | | 3 1/8 | 3 1/8 | 3 1/2 | 4 1/4 | 5 | 5 3/4 | | |
| | Diameter of wheel | | | | | | | | 12 | 14 |

**Service recommendations:** These valves have very heavy metal sections and are exceptionally rugged. They are recommended for severe and extremely high pressure service on hydraulic lines not subject to shock.

**Plug type disc and seat:** The plug type disc and seat are unusually resistant to wiredrawing and to foreign matter. The wide tapered seating surface permits easy flow regulation when throttling.

The seat bushing is made of Exelloy and can be easily renewed. The disc is made of brass.

**Body and bonnet:** The body is made from a solid steel forging. On sizes 1-inch and smaller, the bonnet is screwed into the body as illustrated in the cross section. On larger sizes the bonnet and body are bolted together (not illustrated).

The bonnet is brass on sizes 1 1/4-inch and smaller and cast carbon steel on the larger sizes.

**Disc-stem connection:** The disc and stem are made in one piece for sizes 1-inch and smaller, as shown in the cross section, and in two pieces with a swivel type connection for sizes 1 1/4-inch and larger (not illustrated).

The stem in all sizes is made of brass.

**Handle or wheel:** Sizes 1 1/4-inch and smaller have a lever handle, as illustrated above; larger sizes are equipped with a wheel.

**Stuffing box:** These valves have a deep stuffing box, filled with high grade packing.

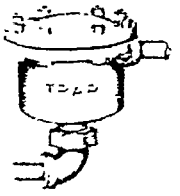
The stuffing box is equipped with a gland.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Seat opening:** The diameter of the port opening in these valves is slightly smaller than the inside diameter of Extra Strong Pipe.


***Stop Drainage Waste!***

When lines or equipment are not fully drained, waste is inevitable. All too frequently accumulation of condensate robs steam of its heat. Excessive heating costs, unsatisfactory operation, and sometimes damaged equipment are the results.



Crane Inverted Open Float Steam Traps provide a complete and efficient method of handling condensate from piping, coils, heaters, and steam heated equipment of many kinds. Low in price and simple in design, they give long and trouble-free service. See pages 345 to 347.

# Cast Steel Globe and Angle Valves



## Working Pressures, Pounds per Square Inch, Non-Shock
For Valves Shown on pages 244 to 248

| Fluid | Temp. Deg. Fahr. | Flanged Valves with Standard Facings Other Than Ring Joint: Carbon Steel 150 Lb. | 300 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | Flanged Valves with Ring Joint Facing, Butt-Welding[2] and Screwed End Valves: Carbon Steel 150 Lb. | 300 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steam, Water, Air, or Gas [3]*Class XR* | 100 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 5000 | 275 | 720 | 960 | 1440 | 2160 | 3600 | 6000 |
| | 150 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 4915 | 255 | 710 | 945 | 1420 | 2130 | 3550 | 5915 |
| | 200 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 4830 | 240 | 700 | 930 | 1400 | 2100 | 3500 | 5830 |
| | 250 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 4750 | 225 | 690 | 920 | 1380 | 2070 | 3450 | 5750 |
| | 300 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 4660 | 210 | 680 | 910 | 1365 | 2050 | 3415 | 5690 |
| | 350 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 4565 | 195 | 675 | 900 | 1350 | 2025 | 3375 | 5625 |
| | 400 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 4475 | 180 | 665 | 890 | 1330 | 2000 | 3330 | 5550 |
| | 450 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 4380 | 165 | 660 | 875 | 1320 | 1975 | 3295 | 5490 |
| | 500 | **150** | 500 | 665 | 1000 | 1500 | 2500 | 4165 | **150** | 625 | 835 | 1250 | 1875 | 3125 | 5210 |
| | 550 | 140 | 475 | 630 | 950 | 1420 | 2370 | 3950 | 140 | 590 | 790 | 1180 | 1775 | 2955 | 4925 |
| | 600 | 130 | 445 | 590 | 890 | 1330 | 2220 | 3700 | 130 | 555 | 740 | 1110 | 1660 | 2770 | 4620 |
| Oil or Oil Vapor *Class X* | 650 | 120 | 415 | 550 | 830 | 1240 | 2070 | 3450 | 120 | 515 | 690 | 1030 | 1550 | 2580 | 4300 |
| | 700 | 110 | 380 | 500 | 760 | 1140 | 1900 | 3160 | 110 | 470 | 635 | 940 | 1410 | 2350 | 3920 |
| | 750 | 100 | 360 | 475 | 720 | 1080 | 1800 | 2995 | 100 | 425 | 575 | 850 | 1275 | 2125 | 3550 |
| | 800 | 92 | 340 | 450 | 680 | 1020 | 1700 | 2830 | 92 | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 850 | 82 | 320 | 425 | 640 | 960 | 1600 | 2665 | 82 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| Steam *Class U* | 900 | [4]70 | **300** | **400** | **600** | **900** | **1500** | **2500** | [4]70 | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 950 | [4]55 | [4]265 | [4]350 | [4]530 | [4]795 | [4]1325 | [4]2205 | [4]55 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| Oil Vapor, Oil, *Class X* | 1000 | [4]40 | [4]190 | [4]250 | [4]380 | [4]570 | [4]950 | [4]1580 | [4]40 | [4]230 | [4]310 | [4]470 | [4]700 | [4]1170 | [4]1950 |
| | 1050 | | | | | | | | | [4]135 | [4]180 | [4]270 | [4]405 | [4]675 | [4]1125 |
| | 1100 | | | | | | | | | [4]90 | [4]120 | [4]180 | [4]270 | [4]450 | [4]750 |

### Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)

| | | [1]Facings Other Than Ring Joint | | | | | | Ring Joint Facing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oil or Oil Vapor only *Class X* | 100 to 750 | For temperatures up to 900° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves shown above. | | | | | | For temperatures up to 800° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves shown above. | | | | | |
| | 800 | | | | | | | 400 | 525 | 800 | 1200 | 2000 | 3325 |
| | 850 | | | | | | | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 900 | 310 | 410 | 620 | 930 | 1550 | 2580 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 950 | **300** | **400** | **600** | **900** | **1500** | **2500** | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 1000 | 200 | 275 | 400 | 600 | 1000 | 1675 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1050 | 135 | 180 | 270 | 405 | 675 | 1125 | 225 | 275 | 425 | 650 | 1075 | 1775 |
| | 1100 | 90 | 120 | 180 | 270 | 450 | 750 | 150 | 200 | 275 | 425 | 700 | 1175 |

[1]When an all-metal gasket (corrugated or flat) is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]When welding end valves are used at temperatures over 850° F. in services where graphitization may be a problem, valves made of Crane No. 7 or No. 9 Chrome-Molybdenum Steel are recommended.

[3]**Service recommendations:** Valves with "XR" trim are particularly satisfactory for steam, water, air, gas, and other non-lubricating and relatively non-corrosive fluids such as gasoline, fuel oil, etc.; also for oil having low viscosity such as used in hydraulic systems, especially where seating loads are extremely high. They are recommended for maximum temperatures of 850° F. on steam and 500° F. on all other services.

Valves with "X" trim should always be used for oil or oil vapor service at temperatures over 500° F. and for most corrosive and unrefined oils regardless of temperature. Maximum recommended temperatures are: 1000° F. on 150-Pound, and 1100° F. on 300 to 2500-Pound Valves.

For lubricating oils up to 500° F., either "X" or "XR" should give equal satisfaction.

"U" trim is provided primarily for high temperature (up to 950° F.) steam lines.

[4]These ratings apply only to oil or oil vapor service.

**Cold service:** For temperatures between 0° and 100° F., the ratings for 100° F. apply. For sub-zero service, materials with suitable impact resistance must be used; recommendations on request.

**Flange facings:** Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with 1/16-inch raised faces, and 400-Pound and higher pressure valves, with 1/4-inch male faces.

**Standards:** Crane pressure-temperature ratings agree with those in Supplement No. 1 (ASA B16e-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939 and those in the American Petroleum Institute (API) Standard No. 600, Second Edition, 1951.

# Cast Steel Globe and Angle Valves

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Crane Cast Steel Globe and Angle Valves are rugged and substantial in construction. Made from carefully selected materials and of improved designs, they possess the necessary qualifications to meet the severe demands of modern installations.

Recognizing the service requirements they must satisfy—accurate control and regulation of flow—extreme care has been exercised in their design, particularly in the case of the disc and seat. For steam and general service, the wide bearing of the plug type disc is exceptionally well fitted. Oil services are more efficiently served by a ball-shaped disc contacting a beveled seat in a line bearing.

To avoid the difficulties attending the operation of the larger size or higher pressure valves when used under maximum working pressures, these valves are regularly furnished with gearing. In addition to facilitating operation, the gearing assures accurate regulation of flow.

The valves are available in a wide range of sizes, 150, 300, 400, 600, 900, 1500, and 2500-Pound pressure classes, and with flanged, screwed, or butt-welding ends, as required. Prices and dimensions for 2500-Pound Valves furnished on request.

Made of carbon or alloy steels and supplied with various kinds of trim, the valves are suitable for a variety of services. They are particularly suited for the severe services so common in modern industrial and power plants, and in oil refineries.

HYDROSTATIC TEST PRESSURES, IN POUNDS

| Pressure Class | Flanged Valves With Facing Other Than Ring Joint | | Flanged Valves With Ring Joint Face | |
|---|---|---|---|---|
| | | | Screwed and Butt-Welding Valves | |
| | Shell | Seat | Shell | Seat |
| 150-Pound | 350 | 350 | 425 | 350 |
| 300-Pound | 900 | 775 | 1100 | 775 |
| 400-Pound | 1200 | 1000 | 1450 | 1000 |
| 600-Pound | 1800 | 1550 | 2175 | 1550 |
| 900-Pound | 2700 | 2250 | 3250 | 2250 |
| 1500-Pound | 4500 | 3700 | 5400 | 3700 |

*Valve seats are tested 100 pounds air-under-water.*

***For working pressures, see page 243.***

## Specification of Materials

150-Pound Valves are regularly made of Crane Carbon Steel; 300, 400, 600, 900, 1500, and 2500-Pound Valves are regularly made of Crane No. 4 Carbon-Molybdenum Steel.

The valves are furnished with a variety of trim materials as indicated below.

Orders should specify both the catalog number and letter suffix; catalog numbers are listed on page 240.

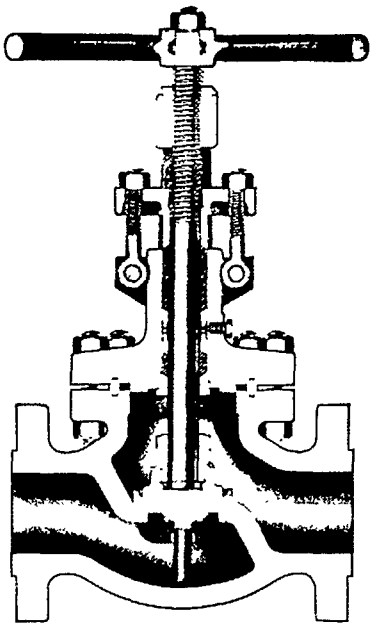
For extremely severe oil or oil vapor services, valves can be made of Crane No. 5 Chrome-Molybdenum Alloy Steel. They are made to order only; see the Crane Discount Sheet for prices.

| Trim | Names of Parts | 150 Pound Valves | 300 Pound Valves | 400 Pound Valves | 600 Pound Valves | 900 Pound Valves | 1500 Pound Valves | 2500 Pound Valves |
|---|---|---|---|---|---|---|---|---|
| *Class "X" Oil or Oil Vapor 1100° F. Max. | Body and Bonnet | Carbon Steel | No. 4 Carbon-Molybdenum Steel | | | | | |
| | Disc | Exelloy | | | | | | ‡Exelloy |
| | Body Seat Ring | Exelloy | | | | | | |
| | Stem | Exelloy | | | | | | |
| | Bonnet Gasket | Corrugated Soft Iron | Soft Steel Ring Joint Gasket | | | | | |
| | Bonnet Bolt-Studs | Triplex Steel (150-Pound Valves are furnished with studs.) | | | | | | |
| *Class "XR" Steam or Water 850° F. Max. | Body and Bonnet | Carbon Steel | No. 4 Carbon-Molybdenum Steel | | | | | 2500-Pound Valves with "XR" trim are not regularly furnished. |
| | Disc | No. 49 Nickel-Alloy | | | | | | |
| | Body Seat Ring | Exelloy | | | | | | |
| | Stem | Exelloy | | | | | | |
| | Bonnet Gasket | Corrugated Soft Iron | Soft Steel Ring Joint Gasket | | | | | |
| | Bonnet Bolt-Studs | Triplex Steel (150-Pound Valves are furnished with studs.) | | | | | | |
| *Class "U" Steam or Water 950° F. Max. | Body and Bonnet | Not listed | No. 4 Carbon-Molybdenum Steel | | | | | |
| | Disc | | Stellite-Faced Alloy Steel | | | | | |
| | Body Seat Ring | | Stellite-Faced Alloy Steel | | | | | |
| | Stem | | Exelloy | | | | | |
| | Bonnet Gasket | | §Soft Iron | Soft Steel Ring Joint Gasket | | | | |
| | Bonnet Bolt-Studs | | Templex Steel | | | | | |

*For detailed service recommendations, see page 243. ‡Exelloy or Exelloy-Faced Alloy Steel. §Corrugated Soft Iron.

# Cast Steel Globe and Angle Valves





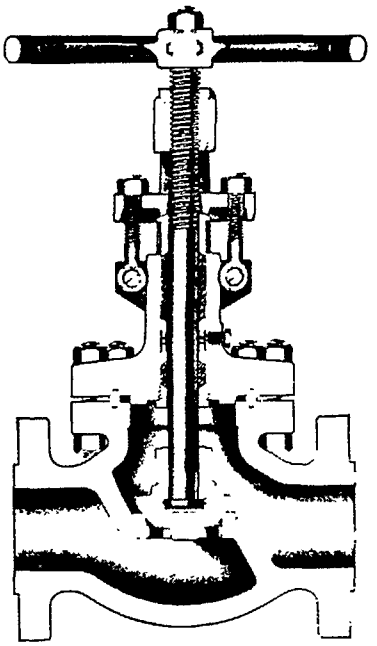
Plug Type Disc

Crane Cast Steel Globe and Angle Valves embody the many refinements in design and materials that are necessary in valves used on severe services.

**Disc and seat:** "XR" and "U" trimmed valves (for steam, water, or general service) in sizes 8-inch and smaller are furnished with a plug type disc and seat (illustrated at left); the 8-inch size is furnished with a flat disc and seat (not illustrated).

All sizes of "X" trimmed valves (for oil or oil vapor service) are furnished with a 35° taper seat and a ball shaped seating face on the disc (illustrated at right).

**Body seat ring:** All valves have the shoulder-type screwed-in body seat ring for utmost tightness and security; in "U" trimmed valves, the rings are also seal brazed or seal welded.



Ball Type Disc

**Body and bonnet:** The body and bonnet have heavy metal sections with liberal reinforcement at points subjected to greatest stress. The bonnet is fitted with a stem hole bushing.

**Bonnet joint:** A ring-type bonnet joint holds pressure easily on the 400, 600, 900, 1500, and 2500-Pound Valves, assuring tightness and maximum strength. On 150 and 300-Pound Valves, a close-fitting male and female bonnet joint retains the gasket and accurately centers the working parts.

300-Pound and higher pressure valves have through bolt-studs in the bonnet joint. 150-Pound Valves employ studs, threaded into the bonnet flange on the body.

**Stuffing box:** The stuffing box on all valves is deep, assuring tightness and long packing life. The stuffing box is the lantern-type on all except the 150-Pound Valves. When wide open, the valves can be repacked while under pressure.

**Gland:** A two-piece ball-type gland and gland flange assures even pressure on the packing without binding on the stem. The gland flange is held in place by swinging eye bolts on 300-Pound and higher pressure valves; 150-Pound Valves use square head bolts for this purpose.

**Stem:** The stem is of liberal diameter and has unusual strength. Threads are clean and accurately cut and have long engagement with the yoke bushing. The stem and disc are held together by a disc stem ring, which permits the disc to swivel.

**Drilling:** Flanged valves of each pressure class are furnished with the end flanges faced, drilled, and spot faced (F.D. & S.F.) unless otherwise ordered. List prices include drilling to the corresponding pressure class of the American Standard. No deduction is made if flanged valves are ordered faced only.

**Flange facings:** The 150 and 300-Pound Flanged Valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a 1/4-inch male face (large male).

When so ordered, valves can be furnished with other types of facings, such as ring joint, female, tongue, groove, etc.; see the Crane Discount Sheet for prices.

**Finish of flange faces:** The 1/16-inch raised faces and the 1/4-inch male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

A smooth finish can be furnished on the raised or male faces, when specified; see the Crane Discount Sheet for prices.

**American Standard:** In design and materials, Crane Cast Steel Globe and Angle Valves exceed the requirements of Standards issued by the American Standards Association.

The dimensions and drilling of the end flanges on flanged valves conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class.

Flanged and butt-welding valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939, for their respective pressure class. This Standard does not include 3½-inch 600-Pound Valves.

*Pressure-temperature ratings* page 243
*Service recommendations* page 243
*List prices* page 246

# Cast Steel Globe and Angle Valves

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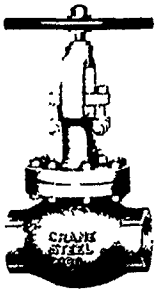
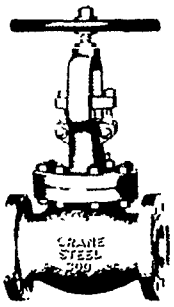
*When ordering, specify catalog number and suffix.*



Globe, Screwed
For Oil or Oil Vapor
No. 142 X, 150-Pound
No. 150 X, 300-Pound
For Steam or Water
No. 142 XR, 150-Pound
No. 150 XR, 300-Pound



Globe, Flanged
For Oil or Oil Vapor
No. 143 X, 150-Pound
No. 151 X, 300-Pound
No. 161 X, 400-Pound
No. 171 X, 600-Pound
No. 183 X, 900-Pound
No. 189 X, 1500-Pound
For Steam or Water
No. 143 XR, 150-Pound
Nos. 151 XR or U, 300-Pound
Nos. 161 XR or U, 400-Pound
Nos. 171 XR or U, 600-Pound
Nos. 183 XR or U, 900-Pound
Nos. 189 XR or U, 1500-Pound

## List Prices, Each, Globe or Angle

| Size In. | 150 Pound | 300 Pound | 400 Pound | 600 Pound | 900 Pound | 1500 Pound |
|---|---|---|---|---|---|---|
| **Screwed** | | | | | | |
| 2 | 194.00 | 221.00 | | | | |
| 2½ | 221.00 | 254.00 | | | | |
| 3 | 254.00 | 294.00 | | | | |
| 4 | 334.00 | 395.00 | | | | |
| **Flanged, F.D. & S.F., or Butt-Welding** | | | | | | |
| 2 | 207.00 | 234.00 | See 600 Pound Valves | **262.00 | | 610.00 |
| 2½ | 234.00 | 268.00 | | 319.00 | | 885.00 |
| †3 | 268.00 | †308.00 | | †387.00 | 899.00 | ‡1600.00 |
| *3½ | *308.00 | *361.00 | | *455.00 | | |
| 4 | 348.00 | 415.00 | 592.00 | 626.00 | ‡1566.00 | ‡1983.00 |
| 5 | 468.00 | 562.00 | 773.00 | ‡1251.00 | ‡1813.00 | ‡2898.00 |
| 6 | 562.00 | 695.00 | ‡1326.00 | ‡1570.00 | ‡2538.00 | ‡3813.00 |
| 8 | 843.00 | ‡1378.00 | ‡1931.00 | | | |

*For valves smaller than those listed, refer to the note at the top of the opposite page.*

†When 3-inch 300 and 600-Pound Flanged Valves with ring joint facing are to be bolted to Cranelap joints, orders must so specify. A groove of special pitch diameter is required; see page 470 for dimensions.

*Butt-welding end valves are not made in the 3½-inch size; these prices apply only to the flanged end.

**600-Pound Angle Valves are not made in the 2-inch size; this price applies only to the Globe Valve.

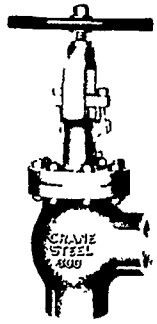
**‡Ball-bearing yoke; gearing:** Crane Cast Steel Globe and Angle Valves are regularly furnished with a ball-bearing yoke and spur or bevel gears on the following sizes and pressure classes:

300-Pound.....8" 600-Pound.....5 and 6"
400-Pound.....6 and 8" 900-Pound.....4, 5, and 6"
1500-Pound....3, 4, 5, and 6"

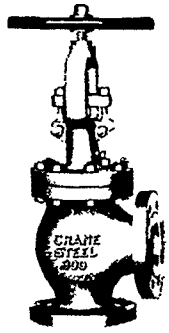
For description, see page 248. Orders must state whether spur or bevel gears are wanted.

When specified, valves can be furnished without gears (plain bearing yoke); prices on application.

**Butt-welding valves:** Unless otherwise ordered, 150 and 300-Pound Butt-Welding Valves are bored to match the inside diameter of Standard pipe (the heaviest weight on the 8-inch size). For all other pressure classes, orders must specify the diameter of the bore (I.D. of pipe).

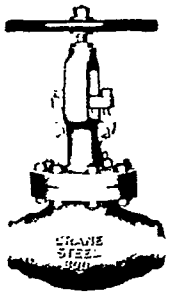


Angle, Screwed
For Oil or Oil Vapor
No. 144 X, 150-Pound
No. 152 X, 300-Pound
For Steam or Water
No. 144 XR, 150-Pound
No. 152 XR, 300-Pound



Angle, Flanged
For Oil or Oil Vapor
No. 145 X, 150-Pound
No. 153 X, 300-Pound
No. 163 X, 400-Pound
No. 173 X, 600-Pound
No. 185 X, 900-Pound
No. 190 X, 1500-Pound
For Steam or Water
No. 145 XR, 150-Pound
Nos. 153 XR or U, 300-Pound
Nos. 163 XR or U, 400-Pound
Nos. 173 XR or U, 600-Pound
Nos. 185 XR or U, 900-Pound
Nos. 190 XR or U, 1500-Pound

***Prices of flanged valves include facing, drilling, and spot facing to the corresponding pressure class of the American Standard. No deduction will be made if valves are ordered faced only.***



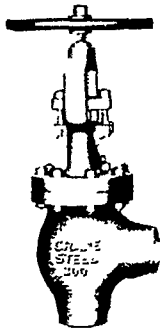
Globe
Butt-Welding

For Oil or Oil Vapor
No. 143½ X, 150-Pound
No. 151½ X, 300-Pound
No. 171½ X, 600-Pound
No. 183½ X, 900-Pound
No. 189½ X, 1500-Pound
For Steam or Water
No. 143½ XR, 150-Pound
Nos. 151½ XR or U, 300-Pound
Nos. 161½ XR or U, 400-Pound
Nos. 171½ XR or U, 600-Pound
Nos. 183½ XR or U, 900-Pound
Nos. 189½ XR or U, 1500-Pound

***For service recommendations, see page 243.***

***For specification of materials, see page 244.***

For Oil or Oil Vapor
No. 145½ X, 150-Pound
No. 153½ X, 300-Pound
No. 173½ X, 600-Pound
No. 185½ X, 900-Pound
No. 190½ X, 1500-Pound
For Steam or Water
No. 145½ XR, 150-Pound
Nos. 153½ XR or U, 300-Pound
Nos. 163½ XR or U, 400-Pound
Nos. 173½ XR or U, 600-Pound
Nos. 185½ XR or U, 900-Pound
Nos. 190½ XR or U, 1500-Pound



Angle
Butt-Welding

# Cast Steel Globe and Angle Valves



NOTE

***For smaller size 600, 900, and 1500-Pound Valves, refer to the following:***

**600-Pound Valves:** For 600-Pound Valves in sizes smaller than those listed on the preceding page, use the forged steel valves shown on pages 235 and 236.

**900-Pound Valves:** For sizes ½ to 2-inch screwed and socket-welding, use the 1500-Pound Steel Valves shown on page 241.

For sizes 2 and 2½-inch flanged and butt-welding, use the 1500-Pound Alloy Cast Steel Valves shown on the preceding page.

**1500-Pound Valves:** For sizes smaller than 2-inch screwed and socket-welding, use the steel valves shown on page 241.

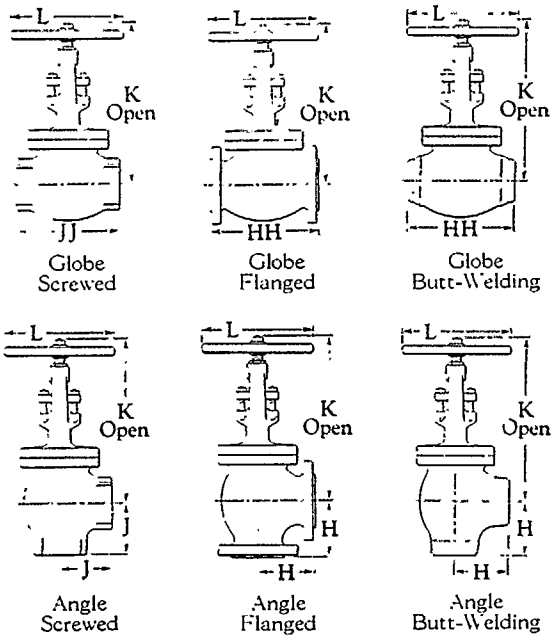
* * * * * *

**By-passes:** Crane Cast Steel Globe and Angle Valves can be equipped with a by-pass; prices on request.

**Motor operation:** To facilitate operation, the valves can be equipped with an electric, air, or gas motor; prices are furnished on application.

See pages 120 to 129 for complete details.

## Dimensions, in Inches




**Center to face:** 150 and 300-Pound Flanged Valves are regularly furnished with a 1/16-inch raised face. 400, 600, 900, 1500, and 2500-Pound Flanged Valves are regularly furnished with a 1/4-inch high large male face. The center to face and face to face dimensions shown in the table include this facing.

Flanged and butt-welding valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939. The 3½-inch 600-Pound Valves are not included in this Standard.

| Pressure Class | Size of Valve | HH | JJ | H | J | K Globe | K Angle | L |
|---|---|---|---|---|---|---|---|---|
| 150 Pound | 2 | 8 | 8 | 4 | 4 | 13¾ | 12½ | 8 |
| | 2½ | 8½ | 8½ | 4¼ | 4¼ | 14½ | 13 | 8 |
| | 3 | 9½ | 9½ | 4¾ | 4¾ | 16½ | 15 | 9 |
| | †3½ | 10½ | | 5¼ | | 17¼ | 15½ | 9 |
| | 4 | 11½ | 11½ | 5¾ | 5¾ | 19¾ | 17¾ | 10 |
| | 5 | 14 | | 7 | | 23 | 20¾ | 10 |
| | 6 | 16 | | 8 | | 24½ | 21¾ | 12 |
| | 8 | 19½ | | 9¾ | | 26 | 23½ | 16 |
| 300 Pound | 2 | 10½ | 9½ | 5¼ | 4¾ | 17¾ | | 9 |
| | 2½ | 11½ | 10¾ | 5¾ | 5⅜ | 19 | | 10 |
| | 3 | 12½ | 11¾ | 6¼ | 5⅞ | 20½ | | 10 |
| | †3½ | 13¼ | | 6⅝ | | 22½ | | 12 |
| | 4 | 14 | 13 | 7 | 6½ | 24¾ | | 14 |
| | 5 | 15¾ | | 7⅞ | | 26½ | | 16 |
| | 6 | 17½ | | 8¾ | | 29¾ | | 18 |
| | 8 | 22 | | 11 | | *36½ | | *24 |
| 400 Pound | 4 | 16 | | 8 | | 25¼ | | 14 |
| | 5 | 18 | | 9 | | 28½ | | 18 |
| | 6 | 19½ | | 9¾ | | *31¼ | | *20 |
| | 8 | 23½ | | 11¾ | | *38¼ | | *27 |
| 600 Pound | 2 | 11½ | | | | 19 | | 10 |
| | 2½ | 13 | | 6½ | | 21¼ | | 12 |
| | 3 | 14 | | 7 | | 23½ | | 12 |
| | †3½ | 15 | | 7½ | | 25 | | 14 |
| | 4 | 17 | | 8½ | | 27½ | | 18 |
| | 5 | 20 | | 10 | | *30¾ | | *20 |
| | 6 | 22 | | 11 | | *35 | | *24 |
| 900 Pound | 3 | 15 | | 7½ | | 24 | | 12 |
| | 4 | 18 | | 9 | | *29½ | | *20 |
| | 5 | 22 | | 11 | | *34¼ | | *24 |
| | 6 | 24 | | 12 | | *37¾ | | *27 |
| 1500 Pound | 2 | 14½ | | 7¼ | | 25⅛ | 25¼ | 14 |
| | 2½ | 16½ | | 8¼ | | 28⅛ | 28¼ | 18 |
| | 3 | 18½ | | 9¼ | | *33½ | | *24 |
| | 4 | 21½ | | 10¾ | | 37⅝ | | *27 |
| | 5 | 26½ | | 13¼ | | *41⅞ | | *30 |
| | 6 | 27¾ | | 13⅞ | | *45⅞ | | *30 |

*These dimensions apply only to valves without gearing; for dimensions of geared valves, see page 248.

†Butt-welding valves are not made in the 3½-inch size; the dimensions shown for this size apply only to flanged valves.

*Pressure-temperature ratings* ..... page 243
*Service recommendations* ..... page 243
*Specification of materials* ..... page 244
*List prices* ..... page 246
*Description of construction* ..... pages 244 to 246

*Templates for drilling* ..... pages 461 to 463
*Taps and drains for valves* ..... page 579

*Special facings* ..... pages 468 to 471
*Gearing* ..... page 248

# Gearing for Cast Steel Globe and Angle Valves

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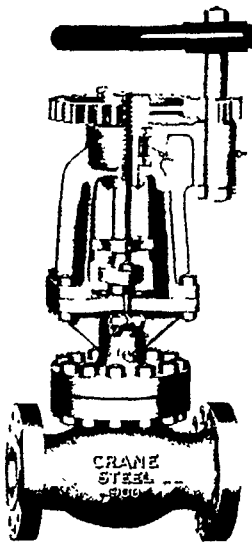
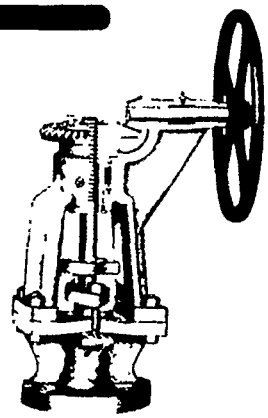


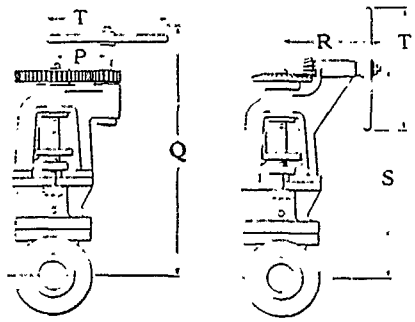

Spur Gearing with Ball-Bearing Yoke Sleeve for Steel Globe and Angle Valves (Gearing, Bonnet, and Yoke are shown turned 90° from position regularly furnished).



Bevel Gearing with Ball-Bearing Yoke Sleeve for Steel Globe and Angle Valves

To avoid the difficulty encountered in opening or closing large size or high pressure globe and angle valves when used under the maximum recommended working pressures, these valves are regularly equipped with a ball-bearing yoke sleeve and either bevel or spur gearing.

In addition to facilitating operation, the gearing provides closer control of flow under the severest service conditions.




Spur Geared  Bevel Geared

**Bevel gearing:** Globe and angle valves equipped with bevel gearing will have the pinion shaft extending at right angles to the run of the valve with the handwheel on the left side when facing the port opening from above the valve seat.

**Spur gearing:** Spur gearing will have the pinion shaft, extending upward, parallel to the main valve stem, with the handwheel above the gearing and on the left side when facing the port opening from above the valve seat.

**Ordering:** Orders should specify whether bevel or spur gears are wanted. Orders for gearing placed in positions other than those mentioned above must clearly indicate what is wanted.

**Dimensions, in Inches**

| Valve | | Spur | | Bevel | | |
|---|---|---|---|---|---|---|
| Class | Size | P | Q | R | S | T |
| 300-Pound | 8 | 9⅜ | 44 | 15 | 38 | 20 |
| 400-Pound | 6 | 8⅝ | 40¼ | 13¼ | 34½ | 18 |
| | 8 | 10¾ | 48½ | 17¼ | 41¾ | 24 |
| 600-Pound | 5 | 8⅝ | 40½ | 13¼ | 34¾ | 18 |
| | 6 | 9⅜ | 43¼ | 15 | 37¼ | 20 |
| 900-Pound | 4 | 8⅝ | 39¾ | 13¼ | 34 | 18 |
| | 5 | 9⅜ | 42¾ | 15 | 36¾ | 20 |
| | 6 | 10¾ | 47¼ | 17¼ | 40½ | 24 |
| 1500-Pound | 3 | 9⅜ | 42½ | 15 | 36½ | 20 |
| | 4 | 10¾ | 47½ | 17¼ | 40¾ | 24 |
| | 5 | 10⅝ | 52½ | 20⅝ | 45½ | 27 |
| | 6 | 14⅛ | 56 | 24⅝ | 48¾ | 27 |
| 2500-Pound | On application | | | | | |

*List prices....page 246*

*Dimensions not shown are the same as for valves without gears; see page 247.*

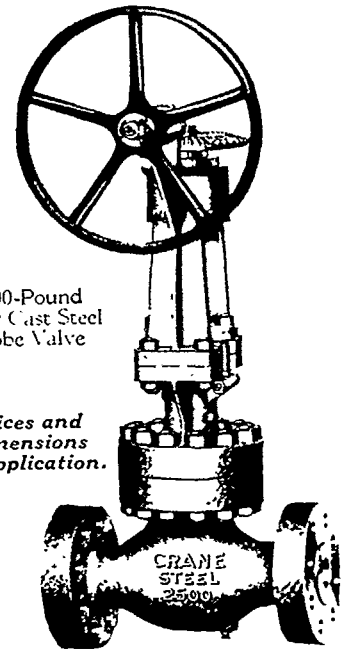
# 2500-Pound Alloy Cast Steel Globe and Angle Valves

Crane 2500-Pound Alloy Cast Steel Globe and Angle Valves are available in the 1½, 2, 2½, 3, 4, 5, and 6-inch sizes, with either flanged or butt-welding ends. In addition, the Globe Valves are made in the ¾, 1, and 1¼-inch sizes, with either butt or socket-welding ends.

For steam, water, and general services, the globe and angle valves are supplied with Class "U" trimming; the disc is of the plug type. For oil or oil vapor service, Class "X" trimming is recommended, the valves having a 35° taper seat and a ball shaped seating face on the disc.

Globe and angle valves in sizes 3-inch and larger are regularly equipped with a ball-bearing yoke and gearing, to facilitate operation.

*Working pressures and service recommendations ..... page 243*
*General description and specifications of materials pages 244 and 245*




2500-Pound Alloy Cast Steel Globe Valve

*Prices and dimensions on application.*

For high-pressure high-temperature steam, boiler feed, and similar service in central stations and industrial plants, Crane Pressure-Seal and Lip-Seal Bonnet Valves are available. They embody many excellent features which contribute to long life and efficient operation. Refer to Section 21.

Steel Check Valves

# Cast and Forged Steel Check Valves



The Crane line of Steel Check Valves can be classified into two general groups. The first group covers lift check valves 2-inch and smaller, of forged or cast steel; these are frequently considered general utility valves and are used in a wide variety of services, often at pressures and temperatures lower than the recommended maximum. The second group covers cast steel swing check valves ranging in size as large as 12-inch, all made similar in design and available in each of the American Standard pressure classes; the sizes range below 2-inch in some of the pressure classes.

**Lift Check Valves**
**Sizes 2-Inch and Smaller**

600-Pound Forged Steel, Screwed, Flanged, or Socket-Welding.. pages 250 and 251
600-Pound Cast Steel, Ball, Screwed..... page 251
6000-Pound Hydraulic, Forged Steel, Screwed..... page 250

**Cast Steel Swing Check Valves**
**150, 300, 400, 600, 900, and 1500-Pound**

Pressure-Temperature Ratings..... page 252
Description and Specification of Materials..... pages 253 and 254
List Prices..... page 255
Dimensions..... page 255

Lever and Weight..... page 253
2500-Pound..... page 256

The Cast and Forged Steel Check Valves listed above comprise only a part of the complete line of Crane steel products.

Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

Pressure-Seal Bonnet Valves.....pages 205 to 220
Steel Gate Valves.....pages 221 to 234
Steel Globe and Angle Valves.....pages 235 to 248
Steel Stop-Check Valves
Pressure-Seal Bonnet.....pages 214 to 217
Bolted Bonnet.....pages 301 to 307

Steel Safety Valves.....page 324
Steel Relief Valves.....pages 333 and 334
Steel Sediment Separators.....page 356

Steel Flanged Fittings.....pages 267 to 274
Steel Welding Fittings.....pages 275 to 290
Steel Flanges.....pages 291 to 298
Steel Screwed Fittings.....pages 257 to 262
Steel Bushings.....page 260
Steel Plugs.....page 260

Corrosion-Resistant Products.....pages 375 to 396
Wrought Steel Nipples.....pages 168 and 169
Forged Steel Unions.....pages 263 and 264
Forged Steel Flange Unions.....pages 182 and 265

Fabricated Piping.....pages 497 to 522

# 600-Pound Forged Steel Lift Check Valves

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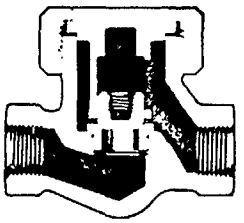
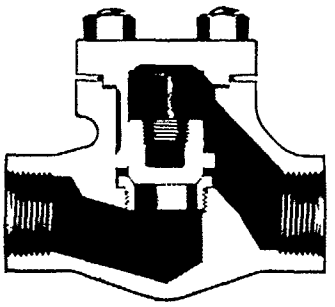


Cross Section
Horizontal Check—Union Cap

*List prices and dimensions at the bottom of this page.*



Cross Section
Horizontal Check—Bolted Cap

*List prices and dimensions at the top of the next page.*

Crane 600-Pound Forged Steel Lift Check Valves are made to withstand severe service on high-pressure, high-temperature steam and oil lines.

Rugged and durable, the valves have been carefully designed to assure maximum strength and long life. Their Exelloy seat and disc make them suitable for oil or oil vapor service on temperatures up to 1000° F. and for steam, water, air, gas, and general service on temperatures up to 850° F.

The valves are available with a union cap and screwed ends in sizes ¼ to ¾-inch or socket-welding ends in sizes ¼ and ⅜-inch; and with a bolted cap and screwed, socket-welding, or flanged ends in sizes ½ to 2-inch.

**Body:** The body is forged carbon steel. Unusual compactness and heavy metal sections provide a high margin of safety.

**Cap joint:** The cap joint in both the union and bolted cap valves is furnished with a corrugated soft iron gasket; tightness and ease of maintenance are assured.

On union cap valves, a large, strong union ring reinforces the joint. On bolted cap valves, maximum compactness has been secured through the use of studs instead of through-bolts; the studs are made of Triplex Steel, and the joint is the male and female type. Cap joints, even on the larger sizes, can be easily dismantled and reassembled.

**Disc and seat:** Both the disc and the seat are made of wear-resisting Exelloy, an ideal material for seating surfaces in check valves. The disc has a ball shaped face which seats against a flat, angular shaped face on the body seat ring, forming what is virtually a line bearing seating contact. The disc operates in a specially designed cap, which assures proper guiding and square seating, eliminates chattering, and produces high disc lift with resultant low pressure drop. To facilitate regrinding when necessary, the top of the disc is tapped with pipe threads so that a nipple can be inserted.

The seat ring has long thread engagement with the body. Shoulder-seated and screwed in under machine power, it will not loosen in service.

WORKING PRESSURES

| Temp. Deg. F. | Pounds, Non-Shock: Screwed or Socket-Welding Valves | Flanged Valves: *With ¼-inch Male Facing | Flanged Valves: With Ring Joint Facing |
|---|---|---|---|
| Class "X", for Steam, Water, Oil, or Oil Vapor | | | |
| 100 | 2000 | 1200 | 1440 |
| 150 | 1910 | 1180 | 1420 |
| 200 | 1820 | 1160 | 1400 |
| 250 | 1730 | 1140 | 1380 |
| 300 | 1640 | 1120 | 1365 |
| 350 | 1550 | 1095 | 1350 |
| 400 | 1460 | 1075 | 1330 |
| 450 | 1370 | 1050 | 1320 |
| 500 | 1280 | 1000 | 1250 |
| 550 | 1190 | 950 | 1180 |
| 600 | 1110 | 890 | 1110 |
| 650 | 1030 | 830 | 1030 |
| 700 | 940 | 760 | 940 |
| 750 | 850 | 680 | 850 |
| 800 | 780 | 600 | 730 |
| 850 | 700 | 490 | 600 |
| Class "X", for Oil or Oil Vapor | | | |
| 900 | 600 | 420 | 420 |
| 950 | 530 | 330 | 330 |
| 1000 | 380 | 240 | 240 |

*When an all-metal gasket (corrugated or flat) is used with large male and female facings, these ratings apply only if the contact area of the gasket is the same as in large tongue and groove joints.

TEST PRESSURES

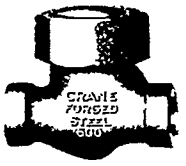
| Valve | Pounds Hydrostatic: Screwed or Socket-Welding Valves | Flanged Valves: With ¼-inch Male Facing | Flanged Valves: With Ring Joint Facing |
|---|---|---|---|
| Shell | 2175 | 1800 | 2175 |
| Seat | 2100 | 1550 | 1550 |

Valve seat is also tested hydrostatically at 40 pounds.

***For description of materials, see pages 1 to 9.***

## Union Cap Horizontal Check Valves

Crane 600-Pound Forged Steel Union Cap Check Valves, as described above, are made of high quality materials and are exceptionally strong and rugged. Their compactness and durability fit them for a wide variety of services in oil refineries, oil and gas fields, central power stations, and in general industrial installations.



No. 3670 X
Screwed
Horizontal Check

List Prices and Dimensions

| Size | | Inches | ¼ | ⅜ | ½ | ¾ |
|---|---|---|---|---|---|---|
| No. 3670 X, Screwed | | Each | 16.40 | 16.40 | 19.50 | 22.60 |
| No. 3678 X, Socket-Welding | | Each | 16.40 | 16.40 | | |
| Dimensions, in Inches | End to end | | 3 | 3 | 3½ | 4½ |
| | Center to top | | 2 | 2 | 2⅜ | 3 |
| | Depth of socket | | 7/16 | 9/16 | | |

No. 3678 X
Socket-Welding
Horizontal Check

# 600-Pound Forged Steel Lift Check Valves

## Bolted Cap Horizontal Check Valves



These Bolted Cap Check Valves, described on the preceding page, are recommended for oil or oil vapor on temperatures up to 1000° F., and for steam or water up to 850° F.

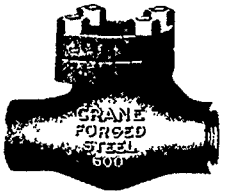
**Flanged valves:** End flanges conform to the 600-Pound American Standard (B16e-1939). They have a large male face ¼-inch high with a serrated finish (approximately 32 concentric grooves per inch). Prices include drilling and spot facing; no deduction if ordered faced only.

When so ordered, flanged valves can be furnished with ring joint, female, tongue, or groove facing; refer to the Crane Discount Sheet for prices.

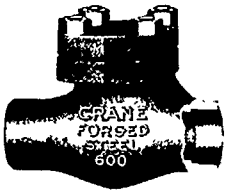
Valves with 150-Pound end flanges are made to order; prices on application.

**Socket-Welding Fittings:** For socket-welding fittings, see pages 275 to 279.

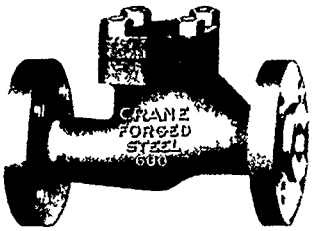
*Templates for drilling . . . page 462*




Bolted Cap, Horizontal
No. 3674 X, Screwed




Bolted Cap, Horizontal
No. 3682 X, Socket-Welding




Bolted Cap, Horizontal
No. 3686 X, Flanged

### List Prices and Dimensions

| Size | | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|
| No. 3674 X, Screwed | | | Each | 21.30 | 25.00 | 30.00 | 43.00 | 65.00 | 87.00 |
| No. 3682 X, Socket-Welding | | | Each | 21.30 | 25.00 | 30.00 | 43.00 | 65.00 | 87.00 |
| No. 3686 X, Flanged, F.D. & S.F. | | | Each | 49.70 | 57.70 | 70.00 | 87.00 | 110.00 | 142.00 |
| Dimensions, in Inches | End to end | Screwed | | 3⅝ | 4⅜ | 5⅛ | 6¼ | 7 | 8⅜ |
| | | Socket-Welding | | 3⅝ | 4⅜ | 5⅛ | 6¼ | 7 | 8⅜ |
| | Depth of Socket | | | ⅝ | 11/16 | ¾ | 13/16 | ⅞ | 1 |
| | *Face to face, Flanged | | | 6½ | 7½ | 8½ | 9 | 9½ | 11½ |
| | Center to top | Screwed | | 2½ | 3 1/16 | 3 11/16 | 4⅛ | 5⅛ | 6 |
| | | Socket-Welding | | 2½ | 3 1/16 | 3 11/16 | 4⅛ | 5⅛ | 6 |
| | | Flanged | | 2 9/16 | 3¼ | 4 1/16 | 4 5/16 | 5⅜ | 6 9/16 |
| | Diameter of flange | | | 3¾ | 4⅝ | 4⅞ | 5¼ | 6⅛ | 6½ |
| | *Thickness of flange | | | 9/16 | ⅝ | 11/16 | 13/16 | ⅞ | 1 |
| | Diameter of male face | | | 1⅜ | 1 11/16 | 2 | 2½ | 2⅞ | 3⅝ |
| | Diameter of bolt circle | | | 2⅝ | 3¼ | 3½ | 3⅞ | 4½ | 5 |
| | No. and diameter of bolts | | | 4—½ | 4—⅝ | 4—⅝ | 4—¾ | 4—¾ | 8—⅝ |

*Face to face dimensions include ¼" male faces; thickness of flange dimensions do not.

*Dimensions of ring joint and special facings . . . . pages 469 to 471*

# Cast Steel Ball Check Valves

These unusually compact 600-Pound Ball Check Valves are specially designed for oil or oil vapor service on temperatures up to 1000° F.

**Design:** The body, made in two parts of cast carbon steel, is held together by Triplex Steel studs; the joint is male and female and is fitted with a corrugated soft iron gasket. The seat is integral with the body. The highly polished ball disc is solid Exelloy and is uniform in diameter. Ribs in the outlet half of the body guide the ball.

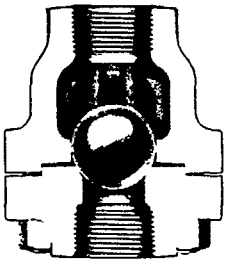
**Installation:** The valves preferably should be installed in a horizontal line to reduce pressure drop and to eliminate the possibility of chattering at very low flow. They can also be installed in vertical lines with upward flow, but in such use, the valve size should not be larger than the outlet end of the pump connection.

### WORKING PRESSURES

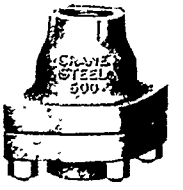
| Temp. Deg. F. | Pounds Non-Shock | Temp. Deg. F. | Pounds Non-Shock |
|---|---|---|---|
| Class "XS" For Oil or Oil Vapor | | | |
| 100 | 2000 | 600 | 1110 |
| 150 | 1910 | 650 | 1030 |
| 200 | 1820 | 700 | 940 |
| 250 | 1730 | 750 | 850 |
| 300 | 1640 | 800 | 780 |
| 350 | 1550 | 850 | 700 |
| 400 | 1460 | 900 | 600 |
| 450 | 1370 | 950 | 530 |
| 500 | 1280 | 1000 | 380 |
| 550 | 1190 | | |

### TEST PRESSURES

Shell—2175 pounds hydrostatic
Seat —2100 pounds hydrostatic



Cross Section




Ball Check
No. 3692 XS
Screwed

### List Prices and Dimensions

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| No. 3692 XS | Each | 23.00 | 25.70 | 32.00 | 41.70 | 53.30 | 74.50 |
| End to end | Inches | 3⅛ | 3 11/16 | 4⅛ | 4⅞ | 5⅝ | 6⅞ |
| Width over all | Inches | 2 15/16 sq. | 3⅛ sq. | 3⅝ sq. | 4 1/16 sq. | 5⅞ dia. | 6⅝ dia. |

Valve seat also tested hydrostatically at 40 pounds.

# Cast Steel Swing Check Valves

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Working Pressures, Pounds per Square Inch, Non-Shock
For Valves Shown on pages 253 to 256

| [3]Fluid | Temp. Deg. Fahr. | [1]Flanged Valves with Standard Facings Other Than Ring Joint: Carbon Steel 150 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | Flanged Valves with Ring Joint Facing, Butt-Welding[2] and Screwed End Valves: Carbon Steel 150 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steam, Water, Oil, Oil Vapor, Gas, or Air [3]*Class X* | 100 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 5000 | 275 | 720 | 960 | 1440 | 2160 | 3600 | 6000 |
| | 150 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 4915 | 255 | 710 | 945 | 1420 | 2130 | 3550 | 5915 |
| | 200 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 4830 | 240 | 700 | 930 | 1400 | 2100 | 3500 | 5830 |
| | 250 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 4750 | 225 | 690 | 920 | 1380 | 2070 | 3450 | 5750 |
| | 300 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 4660 | 210 | 680 | 910 | 1365 | 2050 | 3415 | 5690 |
| | 350 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 4565 | 195 | 675 | 900 | 1350 | 2025 | 3375 | 5625 |
| | 400 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 4475 | 180 | 665 | 890 | 1330 | 2000 | 3330 | 5550 |
| | 450 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 4380 | 165 | 660 | 875 | 1320 | 1975 | 3295 | 5490 |
| | 500 | **150** | 500 | 665 | 1000 | 1500 | 2500 | 4165 | **150** | 625 | 835 | 1250 | 1875 | 3125 | 5210 |
| | 550 | 140 | 475 | 630 | 950 | 1420 | 2370 | 3950 | 140 | 590 | 790 | 1180 | 1775 | 2955 | 4925 |
| | 600 | 130 | 445 | 590 | 890 | 1330 | 2220 | 3700 | 130 | 555 | 740 | 1110 | 1660 | 2770 | 4620 |
| | 650 | 120 | 415 | 550 | 830 | 1240 | 2070 | 3450 | 120 | 515 | 690 | 1030 | 1550 | 2580 | 4300 |
| | 700 | 110 | 380 | 500 | 760 | 1140 | 1900 | 3160 | 110 | 470 | 635 | 940 | 1410 | 2350 | 3920 |
| | 750 | 100 | 360 | 475 | 720 | 1080 | 1800 | 2995 | 100 | 425 | 575 | 850 | 1275 | 2125 | 3550 |
| | 800 | 92 | 340 | 450 | 680 | 1020 | 1700 | 2830 | 92 | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 850 | 82 | 320 | 425 | 640 | 960 | 1600 | 2665 | 82 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 900 | [4]70 | **300** | **400** | **600** | **900** | **1500** | **2500** | [4]70 | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 950 | [4]55 | [4]265 | [4]350 | [4]530 | [4]795 | [4]1325 | [4]2205 | [4]55 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1000 | [4]40 | [4]190 | [4]250 | [4]380 | [4]570 | [4]950 | [4]1580 | [4]40 | [4]230 | [4]310 | [4]470 | [4]700 | [4]1170 | [4]1950 |
| | 1050 | | | | | | | | | [4]135 | [4]180 | [4]270 | [4]405 | [4]675 | [4]1125 |
| | 1100 | | | | | | | | | [4]90 | [4]120 | [4]180 | [4]270 | [4]450 | [4]750 |

Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)

| | | [1]Facings Other Than Ring Joint | | | | | | Ring Joint Facing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oil or Oil Vapor only *Class X* | 100 to 750 | For temperatures up to 900° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves, above. | | | | | | For temperatures up to 800° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Valves, above. | | | | | |
| | 800 | | | | | | | 400 | 525 | 800 | 1200 | 2000 | 3325 |
| | 850 | | | | | | | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 900 | 310 | 410 | 620 | 930 | 1550 | 2580 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 950 | **300** | **400** | **600** | **900** | **1500** | **2500** | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 1000 | 200 | 275 | 400 | 600 | 1000 | 1675 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1050 | 135 | 180 | 270 | 405 | 675 | 1125 | 225 | 275 | 425 | 650 | 1075 | 1775 |
| | 1100 | 90 | 120 | 180 | 270 | 450 | 750 | 150 | 200 | 275 | 425 | 700 | 1175 |

[1]When an all-metal gasket (corrugated or flat) is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]When welding end valves are used at temperatures over 850° F. in services where graphitization may be a problem, valves made of Crane No. 7 or No. 9 Chrome-Molybdenum Steel are recommended.

[3]**Service recommendations:** The seating surfaces of swing check valves are subject to different operating conditions than those in gate, globe, or angle valves. The contact area is wide and flat, and since the disc swings and swivels freely, there is no tendency to gall or score.

Crane Steel Swing Check Valves are made with only one trim: "X", Exelloy to Exelloy. They can be used in any installation where the fluid being handled requires either "X", "XR", or "U" trim gate, globe, or angle valves; see pages 226 or 243.

The following are maximum recommended temperatures: 1000° F. on 150-Pound Valves, except 850° F. for steam; and 1100° F. on 300 to 2500-Pound Valves, except 950° F. for steam.

For services in which the disc must be more sensitive to flow reversal or must be balanced for low velocities, valves with outside lever and weight can be furnished; see page 253.

[4]These ratings apply only to oil or oil vapor service.

**Cold service:** For temperatures between 0° and 100° F., the ratings for 100° F. apply. For sub-zero service, materials with suitable impact resistance must be used; recommendations on request.

**Flange facings:** Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with 1/16-inch raised faces, and 400-Pound and higher pressure valves, with 1/4-inch male faces.

**Standards:** Crane pressure-temperature ratings agree with those in Supplement No. 1 (ASA B16e0-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939 and those in the American Petroleum Institute (API) Standard No. 600, Second Edition, 1951.

# Cast Steel Swing Check Valves

Crane Cast Steel Swing Check Valves are unusually strong and rugged in construction.

Low working stresses secured through the careful distribution of metal and by the use of heavy metal sections, assure a maximum of safety over the recommended pressures and temperatures.

The valves are well suited for services such as are found in modern industrial and power plants, long distance pipe lines, and in oil refineries.

HYDROSTATIC TEST PRESSURES, IN POUNDS

| Pressure Class | Flanged Valves With Facing Other Than Ring Joint | | Flanged Valves With Ring Joint Face | |
|---|---|---|---|---|
| | | | Screwed and Butt-Welding Valves | |
| | Shell | Seat | Shell | Seat |
| 150-Pound | 350 | 350 | 425 | 350 |
| 300-Pound | 900 | 775 | 1100 | 775 |
| 400-Pound | 1200 | 1000 | 1450 | 1000 |
| 600-Pound | 1800 | 1550 | 2175 | 1550 |
| 900-Pound | 2700 | 2250 | 3250 | 2250 |
| 1500-Pound | 4500 | 3700 | 5400 | 3700 |

Valve seats are also hydrostatically tested at 40 pounds.

*For working pressures, see page 252.*

The line is complete and includes valves in a wide range of sizes, in seven pressure classes (150, 300, 400, 600, 900, 1500, and 2500-Pound), and with flanged, screwed, or butt-welding ends, as required. Prices and dimensions for the 2500-Pound Valves are furnished on application.

Swing Check Valves are used to prevent the reversal of flow in horizontal or vertical pipe lines. In vertical lines, or for any angle from horizontal to vertical, they should be used for upward flow only.

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## Specification of Materials

150-Pound Valves are regularly made of Crane Carbon Steel; 300, 400, 600, 900, 1500, and 2500-Pound Valves are regularly made of Crane No. 4 Carbon-Molybdenum Alloy Steel.

The valves are furnished with "X" trim; for complete specifications, see the table below.

For extremely severe oil or oil vapor service, valves can be made of Crane No. 5 Chrome-Molybdenum Steel. They are made to order only; see the Crane Discount Sheet for prices.

Orders for these valves should specify the catalog number and suffix. Refer to page 254.

| Trim | Names of Parts | | 150 Pound Valves | 300 Pound Valves | 400 Pound Valves | 600 Pound Valves | 900 Pound Valves | 1500 Pound Valves | 2500 Pound Valves |
|---|---|---|---|---|---|---|---|---|---|
| †Class "X" Oil, Oil Vapor, Steam, or Water 1100° F. Max. | Body and Cap | | Carbon Steel | No. 4 Carbon-Molybdenum Alloy Steel | | | | | |
| | Disc | 8" and smaller | Exelloy | | | | | | |
| | | 10 and 12" | Exelloy-Faced Carbon Steel | Exelloy-Faced Alloy Steel | | Exelloy | | | |
| | Body Seat Ring | | Exelloy | | | | | | |
| | Hinge | | Alloy Steel | | | | | | |
| | Cap Gasket | | Corrugated Soft Iron | ‡Soft Steel Ring Joint Gasket | | | | | |
| | §Cap Bolt-Studs | | Triplex | | | | | | |

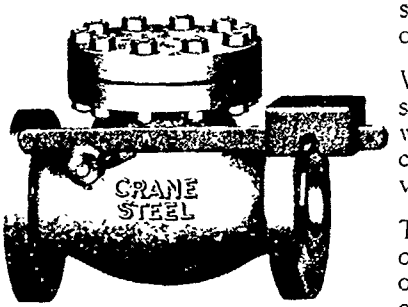
†For detailed service recommendations, see page 252.
‡600-Pound valves, sizes ½, ¾, and 1-inch, have a corrugated soft iron cap gasket (male and female).
§150-Pound Valves in all sizes and 600-Pound Valves in sizes ½, ¾, and 1-inch use Triplex Steel cap studs.

*List prices and dimensions . . . page 255* *Description of materials . . . . page 1 to 9*

# Valves with Outside Lever and Weight

When so ordered, Crane Cast Steel Swing Check Valves can be furnished with an outside lever and an adjustable weight. Orders must specify whether the weight is to balance the disc or to assist it in closing. Unless otherwise ordered, the lever and weight are mounted on the right hand side of the valve when facing the inlet. Prices are furnished on application.

With the lever and weight mounted so that the weight assists the disc in closing, the valves close the instant the flow stops. Valves so fitted are especially recommended for liquid lines where a sudden reversal of flow may gather considerable momentum before an ordinary valve disc would close, resulting in dangerous or damaging shock. By closing instantly and preventing reversal of flow, they eliminate shock.



Cast Steel Swing Check Valve
With Outside Lever and Weight

With the lever and weight mounted so that the weight balances the weight of the disc, the valve becomes more sensitive to low inlet velocities.

The floating or feathering action of the disc causes the valve to open with a minimum of pressure, and resistance to flow past the disc is minimized.

# Cast Steel Swing Check Valves

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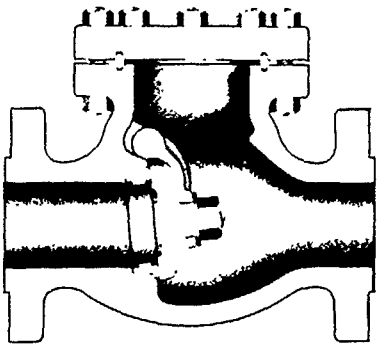
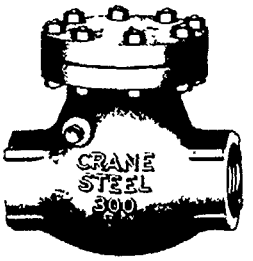
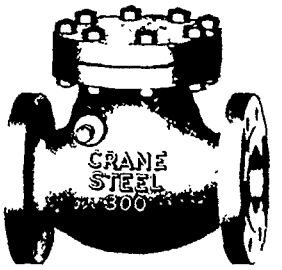


Cross Section of Cast Steel Swing Check Valve




Screwed
For Oil, Oil Vapor, Steam, or Water
No. 148 X, 150-Pound
No. 158 X, 300-Pound
No. 174 X, 600-Pound




Flanged
For Oil, Oil Vapor, Steam, or Water
No. 147 X, 150-Pound
No. 159 X, 300-Pound
No. 169 X, 400-Pound
No. 175 X, 600-Pound
No. 187 X, 900-Pound
No. 199 X, 1500-Pound

Butt-Welding
For Oil, Oil Vapor, Steam, or Water
No. 147½ X, 150-Pound
No. 159½ X, 300-Pound
No. 169½ X, 400-Pound
No. 175½ X, 600-Pound
No. 187½ X, 900-Pound
No. 199½ X, 1500-Pound

The Crane line of Cast Steel Swing Check Valves embodies the many refinements in design and materials necessary to withstand severe service.

**Materials:** These valves are regularly furnished with body and cap made of Crane Carbon Steel on the 150-Pound Valves, and of Crane No. 4 Carbon-Molybdenum Alloy Steel on 300-Pound and higher pressure valves. Seating materials are Exelloy to Exelloy (Class "X" trim), suitable for steam, water, oil, oil vapor, air, or gas.

**Design:** On flanged and butt-welding valves the full port area is maintained without pockets, from the inlet port to the valve seat, to avoid turbulence. On the outlet side of the valve seat, the body is of generous proportions, allowing full swing of the disc and minimizing erosion and flow resistance.

**Body seat ring:** A shoulder-type screwed-in body seat ring provides maximum tightness and security.

**Cap joint:** The 150 and 300-Pound Valves, and sizes 1-inch and smaller of the 600-Pound Valves, have a male and female type cap joint. The 400, 600 (sizes larger than 1-inch), 900, 1500, and 2500-Pound Valves have the ring-type cap joint.

**Cap studs and bolt-studs:** Valves of the 300-Pound and higher pressure classes, except ½, ¾, and 1-inch 600-Pound, have through bolt-studs of Crane Triplex Steel. 150-Pound Valves and the ½, ¾, and 1-inch 600-Pound Valves have Triplex Steel studs. Both types provide an unusually strong and tight cap joint.

**Drilling:** Flanged valves of each pressure class are furnished with the end flanges faced, drilled, and spot faced (F.D. & S.F.) unless otherwise ordered. List prices include drilling to the corresponding pressure class of the American Standard. No deduction is made for valves ordered faced only.

**Flange facings:** The 150 and 300-Pound Flanged Valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a ¼-inch male face (large male).

When so ordered, valves can be furnished with other types of facings, such as ring joint, female, tongue, groove, etc.; see the Crane Discount Sheet for prices.

**Finish of flange faces:** The 1/16-inch raised faces and the ¼-inch male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

A smooth finish can be furnished on raised or male faces, when specified; see the Crane Discount Sheet for prices.

**Standards:** In design and materials, Crane Cast Steel Swing Check Valves exceed the requirements of Standards issued by the American Standards Association and the American Petroleum Institute.

End flanges on flanged valves conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class.

150, 300, 400, and 600-Pound Flanged and Butt-Welding Valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1939, for their respective pressure class. This Standard does not include 8, 10, and 12-inch 150-Pound Valves, 5-inch 400-Pound Valves, 3½ and 5-inch 600-Pound Valves, or butt-welding valves in the 10 and 12-inch sizes.

The 300, 400, and 600-Pound Flanged and Butt-Welding Valves, and 6-inch and smaller 150-Pound Flanged Valves conform also to the API Standard for Pipe Line Valves, No. 6-D, Sixth Edition, May, 1949. This Standard does not include 1¼, 1½, 3½, and 5-inch valves, 150-Pound Butt-Welding Valves, or 8-inch and larger 150-Pound Flanged Valves.

*Working pressures* ..... *page 252*
*Service recommendations* ..... *page 252*
*Test pressures* ..... *page 253*
*Specification of materials* ..... *page 253*
*Lever and Weight Valves* ..... *page 253*
*2500-Pound Valves* ..... *page 256*

# Cast Steel Swing Check Valves

## List Prices, Each

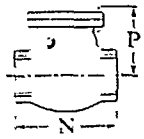
| Size Inches | Screwed End Valves 150 Pound | 300 Pound | 600 Pound | Flanged End Valves, F.D. & S.F. or Butt-Welding End Valves 150 Pound | 300 Pound | 400 Pound | 600 Pound | 900 Pound | 1500 Pound |
|---|---|---|---|---|---|---|---|---|---|
| ½ | | | 86.30 | | | | | | |
| ¾ | | | 97.70 | | | | | | |
| 1 | | | 115.00 | | | | | | |
| 1¼ | | | 132.00 | | | Use 600 Pound Valves | 144.00 | | |
| 1½ | | | 149.00 | | | | 161.00 | Use 1500 Pound Valves | 388.00 |
| 2 | 140.00 | 167.00 | 184.00 | 147.00 | 174.00 | | 195.00 | | 481.00 |
| 2½ | 161.00 | 187.00 | | 167.00 | 194.00 | | 253.00 | | 589.00 |
| *3 | 181.00 | 214.00 | | 187.00 | *221.00 | | *288.00 | 726.00 | 775.00 |
| †3½ | | | | †227.00 | †268.00 | | †334.00 | | |
| 4 | 241.00 | 281.00 | | 247.00 | 294.00 | 386.00 | 437.00 | 990.00 | 1085.00 |
| 5 | | | | 334.00 | 401.00 | 515.00 | 598.00 | 1270.00 | 1550.00 |
| 6 | | | | 401.00 | 495.00 | 631.00 | 805.00 | 1617.00 | 2015.00 |
| 8 | | | | 589.00 | 736.00 | 953.00 | 1150.00 | 2393.00 | 2945.00 |
| 10 | | | | †840.00 | 1030.00 | 1287.00 | 1553.00 | 3300.00 | 4340.00 |
| 12 | | | | †1133.00 | 1404.00 | 1738.00 | 2013.00 | 4455.00 | 5890.00 |

*When 3-inch 300 and 600-Pound Flanged Valves with ring joint facing are to be bolted to Cranelap joints, orders must so specify. A groove of special pitch diameter is required; see page 470 for dimensions.
†Prices shown for all 3½-inch valves and for 10 and 12-inch 150-Pound Valves apply only to flanged end valves.

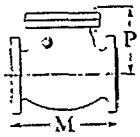
**Drilling:** Flanged valves are furnished with the end flanges faced, drilled, and spot faced (F.D. & S.F.), unless otherwise ordered. List prices include drilling to the corresponding pressure class of the American Standard. No deduction is made if flanged valves are ordered faced only.

**Butt-welding valves:** Unless otherwise ordered, 150 and 300-Pound Butt-Welding Valves are bored to match the inside diameter of Standard pipe (the heaviest weight on the 8, 10, and 12-inch sizes). For all other pressure classes, orders must specify the diameter of the bore (I.D. of pipe).

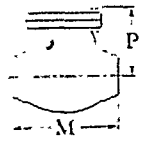
***When ordering, specify the catalog number and suffix; see the preceding page.***



Screwed



Flanged



Butt-Welding
(Not made in 3½-inch size nor in 10 and 12-inch 150-Pound Class)

## Dimensions, in Inches

| Class | Size | M | N | P |
|---|---|---|---|---|
| 150 Pound | 2 | 8 | 8 | 5 |
| | 2½ | 8½ | 8½ | 5½ |
| | 3 | 9½ | 9½ | 6 |
| | 3½ | 10½ | | 6½ |
| | 4 | 11½ | 11½ | 7 |
| | 5 | 13 | | 8 |
| | 6 | 14 | | 9 |
| | 8 | 19½ | | 10¼ |
| | 10 | 24½ | | 12⅛ |
| | 12 | 27½ | | 13¾ |
| 300 Pound | 2 | 10½ | 9½ | 6¾ |
| | 2½ | 11½ | 10¾ | 8 |
| | 3 | 12½ | 11¾ | 8½ |
| | 3½ | 13¼ | | 9¼ |
| | 4 | 14 | 13 | 9¾ |
| | 5 | 15¾ | | 10¾ |
| | 6 | 17½ | | 11¾ |
| | 8 | 21 | | 14 |
| | 10 | 24½ | | 15 |
| | 12 | 28 | | 16¾ |

| Class | Size | M | N | P |
|---|---|---|---|---|
| 400 Pound | 4 | 16 | | 10 |
| | 5 | 18 | | 12 |
| | 6 | 19½ | | 12½ |
| | 8 | 23½ | | 14½ |
| | 10 | 26½ | | ** |
| | 12 | 30 | | ** |
| 600 Pound | ½ | | 4⅝ | 3½ |
| | ¾ | | 6 | 4 |
| | 1 | | 7 | 4½ |
| | 1¼ | 9 | 7½ | 6¼ |
| | 1½ | 9½ | 8½ | 6¾ |
| | 2 | 11½ | 9½ | 7 |
| | 2½ | 13 | | 8¼ |
| | 3 | 14 | | 9 |
| | 3½ | 15 | | 9¾ |
| | 4 | 17 | | 10¼ |
| | 5 | 20 | | 12¾ |
| | 6 | 22 | | 13½ |
| | 8 | 26 | | 15¼ |
| | 10 | 31 | | 18¾ |
| | 12 | 33 | | 21½ |

| Class | Size | M | P |
|---|---|---|---|
| 900 Pound | 3 | 15 | 9½ |
| | 4 | 18 | 11 |
| | 5 | 22 | 13¼ |
| | 6 | 24 | 13¾ |
| | 8 | 29 | 16½ |
| | 10 | 33 | ** |
| | 12 | 38 | ** |
| 1500 Pound | 1½ | 12 | 8¼ |
| | 2 | 14½ | 9¾ |
| | 2½ | 16½ | 10½ |
| | 3 | 18½ | 11¼ |
| | 4 | 21½ | 13¼ |
| | 5 | 26½ | 15¼ |
| | 6 | 27¾ | 15¾ |
| | 8 | 32¾ | 18¼ |
| | 10 | 39 | ** |
| | 12 | 44½ | ** |
| 2500 Pound | On application | | |

**These dimensions will be furnished on application.

**Face to face:** 150 and 300-Pound Flanged Valves regularly have a 1/16-inch raised face; and 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a ¼-inch high large male face. Face to face dimensions (dimension "M") shown in the above table include these facings.

*Templates for drilling and flange dimensions....pages 461 to 463*
*Description....pages 253 and 254*
*Special facings....pages 468 to 471*

# 2500-Pound
# Alloy Cast Steel Swing Check Valves

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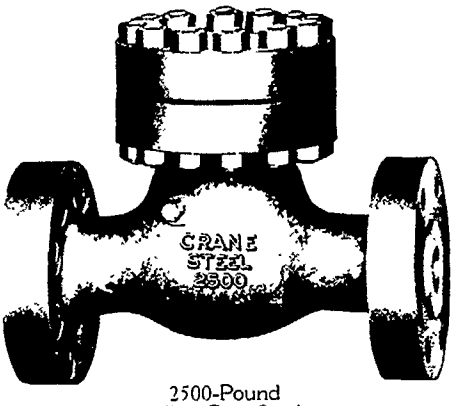
Crane 2500-Pound Alloy Cast Steel Swing Check Valves with flanged or butt-welding ends are available in the 4, 5, 6, 8, and 10-inch sizes.

The valves are recommended for the high pressures and temperatures encountered in modern central power stations and oil refineries. They are regularly furnished with Class "X" trimming (Exelloy to Exelloy) and are suitable for oil, oil vapor, steam, water, or general service.




2500-Pound
Alloy Cast Steel
Swing Check Valve

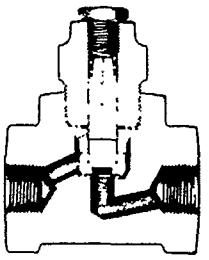
These are extremely heavy valves. They are ruggedly constructed and are amply proportioned throughout.

The full port area is maintained without pockets, from the inlet flange to the valve seat, to avoid turbulence. On the outlet side of the valve seat, the body is of generous proportions, allowing full swing of the disc and minimizing erosion and flow resistance.

Prices and dimensions will be furnished on application.

*Working pressures and service recommendations.... page 252*
*General description.....pages 253 and 254*
*Specification of materials.....page 253*
*Description of materials.....pages 1 to 9*

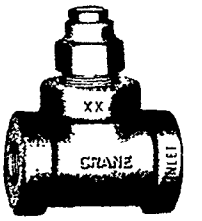
# 6000-Pound Hydraulic
# Forged Steel Lift Check Valves



Cross Section
No. 227 H

WORKING PRESSURE
**6000** pounds cold water or oil, non-shock

TEST PRESSURE
**6500** pounds hydrostatic




No. 227 H
Horizontal
Screwed

List Prices and Dimensions

| Size | Inches | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 |
|---|---|---|---|---|---|---|
| No. 227 H, Horizontal | Each | 49.00 | 54.00 | 63.00 | 77.00 | 105.00 |
| End to end | Inches | 2 7/8 | 3 5/8 | 5 | 5 1/4 | 7 |
| Center to top | Inches | 2 5/8 | 3 1/4 | 4 3/8 | 4 7/8 | 4 5/8 |

**Service recommendations:** These valves are recommended for severe and extremely high pressure service on hydraulic lines not subject to shock. They have very heavy metal sections and are exceptionally rugged.

**Body and cap:** The body is made from a solid steel forging. Sizes 1-inch and smaller have a screwed cap as illustrated. The 1 1/4-inch size has a bolted cap (not illustrated).

**Disc and seat:** The disc is made of brass and is accurately guided, assuring square seating. The seat bushing, made of Exelloy, is easily renewed.

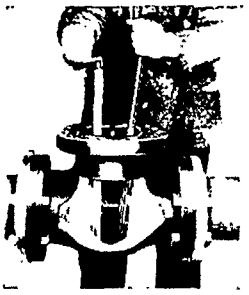
The valves have a small spring between the disc and cap.

**Seat opening:** The diameter of the port opening in these valves is slightly smaller than the inside diameter of Extra Strong Pipe.

# Steel Screwed Fittings, Plugs, Bushings, Unions, & Flange Unions

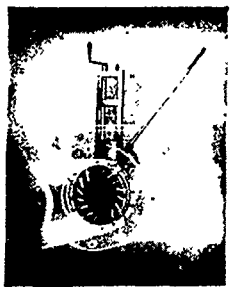
# Dexter Valve Reseating Equipment

## For Gate Valves

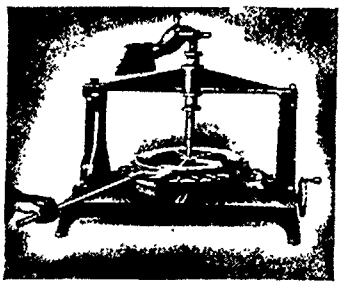


Simple operation of a reseating machine refacing a valve seat.

Phantom view of a reseating machine showing the cutter support.



Phantom view of a gate valve reseating machine showing the cutter.



Gate valve disc being refaced in a Dexter Gate Valve Disc Cutting Machine.

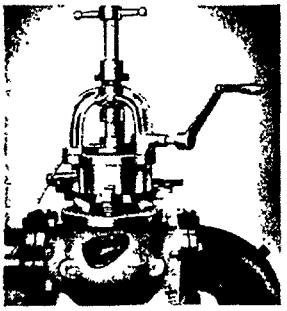
Dexter (Leavitt) valve reseating equipment reseats valves right on the line in a few minutes, ending expensive leakage at extremely low cost. They are easily operated, reliable, efficient, and durable.

Equipment includes cutter supports, disc cutting machines for refacing discs, risers, wrenches, and screw drivers. Rotary cutters are furnished with cutter blades, to meet individual requirements.

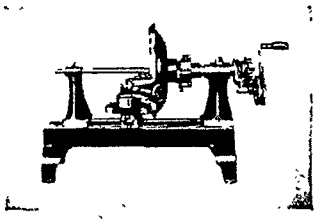
**Sets and Capacities**

| No. | | 2-3-C | 2-4-C | 2-6-C | 2-8-C | 2-10-C | 2-12-C | 2-14-C | 2-16-C |
|---|---|---|---|---|---|---|---|---|---|
| For Valve Sizes | Inches | 1½-3 | 1½-4 | 1½-6 | 1½-8 | 1½-10 | 1½-12 | 1½-14 | 1½-16 |

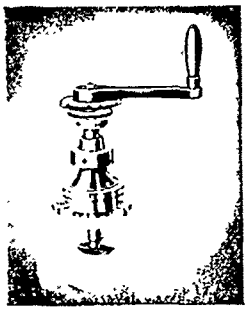
## For Globe Valves



No. 12MO
Reseating Machine
In Operating Position



No. 7LDC
Lathe Disc Cutting Machine



No. 4MO
Reseating Machine
In Operating Position

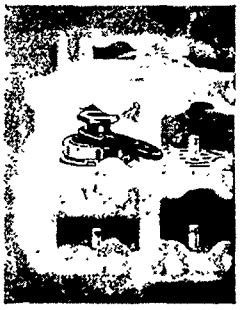
The globe valve reseating equipment includes improved reseating machines, a patented disc cutting machine, a disc holding chuck, an extension spindle, and related equipment.

Cutters have 45°, 55°, and 75° angles. Carbon tool steel cutters are used for low pressure valves, and Universal cutters are used for all valves including high pressure types with seats of toughest metals.

Cutter types and angles are chosen according to individual requirements. Globe equipment can be furnished in variable range capacities.

Reseating machines and lathe disc cutting machines are each made in three sizes suitable for the following valve sizes: ¼ to 4-inch, ¼ to 7-inch, or ¼ to 12-inch.

## For Pump Valves



Re-cutting pump valve seats in water chest, using ratchet handle.

No. DPC-7½
Pump Valve
Reseating Equipment

When pumps become defective and inefficient due to worn or badly scored valve seats, they can quickly and inexpensively be restored to full service with Dexter pump valve reseating equipment. Simple, compact, and easy to operate, the equipment keeps suction and discharge valves in all types of pumps working at top efficiency. There is no lengthy interruption in service.

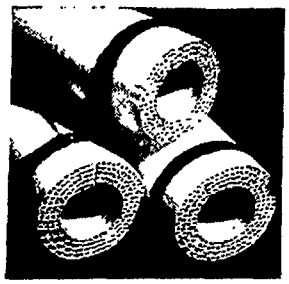
Equipment for pump valve reseating consists of a reseating machine, brackets, ratchet wrench, and pump valve cutters.

No. DPC-7½, shown above, includes an improved No. D60 Pump Machine and a complete set of pump cutters, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, and 7½-inch. Cutter ranges to meet individual requirements are available.

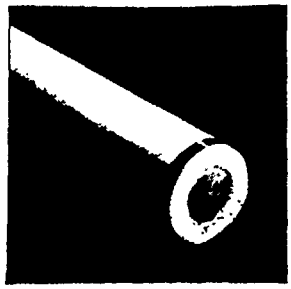
38

*Prices on application*

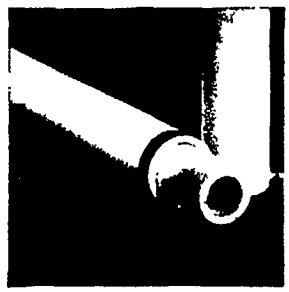
# Johns-Manville Insulating Materials



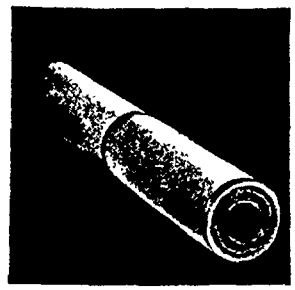
**Asbestocel**
For Temperatures Up to 300° F.



**85% Magnesia**
For Temperatures Up to 600° F.



**Wool Felt**
For Hot and Cold Water Service Lines up to 225° F.



**Zero**
To Prevent Cold Water Pipes from Freezing

### Pre-Shrunk Asbestocel

Johns-Manville Pre-Shrunk Asbestocel is a cellular type of insulation, made of alternate layers of plain and corrugated asbestos felts. Used on pipe lines carrying low pressure steam and hot water.

This material will not absorb moisture while in stock or during handling and consequently expand. Pre-Shrunk Asbestocel is made of specially-treated, moisture-resistant asbestos paper which prevents "breathing" and thus removes the cause of objectionable shrinkage cracks. It is also fabricated with an improved type of corrugation which affords greater strength and a more uniform appearance.

Pre-Shrunk Asbestocel is made in sections three feet long for pipe sizes of ½ to 12-inch. 3 and 4-ply thicknesses (¾-inch per ply) or thicknesses of 6 or 8 plies to the inch are available. The following finishes are furnished: regular canvas covered, asbestos paper covered high-speed finish, and glazed white high-speed finish.

### Zero Pipe Insulation

Zero Pipe Insulation is designed for insulating cold water pipes that are exposed to moderate (ordinary) rather than extremely low temperatures, or where the time that the surrounding atmosphere would be below the freezing point is of short duration.

It is constructed of layers of hair felt surrounded by several layers of wool felt, with a layer of saturated wool felt inside the hair felt to keep the hair from direct contact with the pipe. Hair felt greatly retards the flow of heat from the water in the pipe to the colder surrounding air and is protected by a wool felt jacket and an inner layer of saturated felt.

For outdoor lines, for extremely low temperatures, or for temperatures below the freezing point that are of long duration, Zero Pipe Insulation with a separate jacket is recommended.

Zero Pipe Insulation is furnished in 3-foot lengths, split for ready application, covered with canvas and equipped with metal bands. Made for pipe sizes from ½ to 8-inch, and in one thickness, approximately 1¼ inches.

### 85% Magnesia

Johns-Manville 85% Magnesia insulation combines the high insulating qualities of basic carbonate of magnesia and asbestos, affording a light weight and efficient insulation. It contains a maximum number of dead-air cells which increases its natural resistance to heat transmission and reduces its weight.

Johns-Manville 85% Magnesia Pipe Insulation is moulded in 3-foot lengths in Standard, 1½-inch, 2-inch, Double Standard, 2½-inch, and 3-inch thicknesses (double layer), to fit standard pipe sizes from ½ to 12-inch.

For smaller pipe, 85% Magnesia Pipe Insulation is furnished in sectional form, packed in crates or cartons with canvas jacket and metal bands. For larger pipe sizes it is supplied in segmental form, without canvas or bands.

### Pre-Shrunk Wool Felt

Johns-Manville Pre-Shrunk Wool Felt Pipe Insulation is an effective and economical material for hot water lines and for use on moderately cold water lines where humidity conditions are not severe.

Like Pre-Shrunk Asbestocel, Johns-Manville Pre-Shrunk Wool Felt is made of moisture-resisting felts which prevent the objectionable absorption of moisture in storage, thus minimizing drying shrinkage and pulling apart at the joints after application.

The sheets of wool felt of which this material is composed are indented, which reduces the conductivity of the finished material approximately 25 per cent as compared with ordinary wool felt. It is also up to 20 per cent lighter in weight.

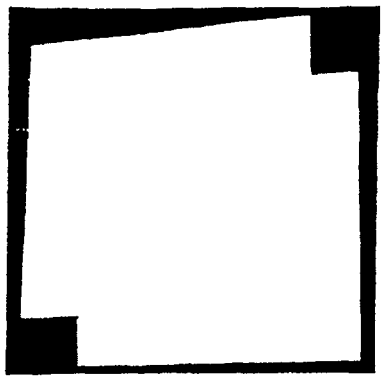
This wool felt has a dual-service felt liner which is waterproof, making it perfectly suited to cold water lines. Since the liner will withstand temperatures as high as 225° F., the material is equally satisfactory for hot water lines.

Available in sections 3 feet long, in thicknesses of ½-inch, ¾-inch, and 1-inch for pipe sizes from ½ to 12-inch. It is available with a canvas finish or with an integral, weather-proof jacket.

*Prices and additional information on application*

# Johns-Manville Insulating Materials

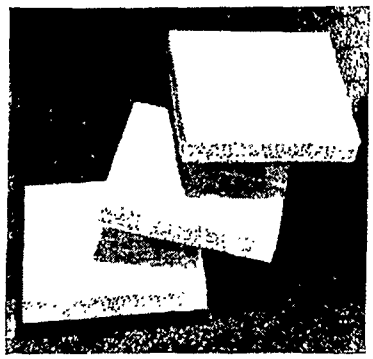
## Asbestos Sheet Millboard



Asbestos Sheet Millboard is recommended for general uses requiring sheet or board for protection against fire, heat, acid fumes, etc. It is frequently used as a fireproof lining for floors, partitions, ceilings, elevator shafts, ranges, stoves, grates, etc.

Millboard can be cut with shears to any size desired and fastened with nails or screws. Standard sheet size is 42 x 48 inches; cut pieces can also be furnished. Thicknesses of 1/32 to 1/2-inch are available.

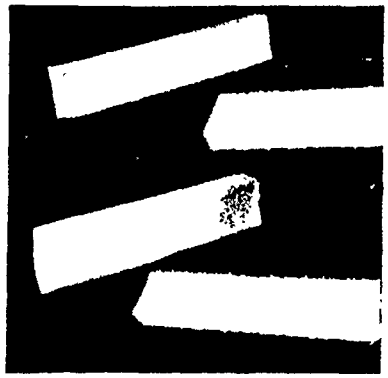
## Asbestocel Blocks



An economical insulation for temperatures up to 300° F. Ideal for boilers, warm air ducts, etc.

The blocks are made of built-up asbestos felt layers, alternately plain and corrugated. Available in widths from 6 to 30-inch and in lengths from 30 to 90-inch. Coarse Blocks are furnished in thicknesses of 1 to 8 plies with four plies per inch of thickness. Fine Blocks are furnished in thicknesses of 1 to 16 plies with six or eight plies per inch of thickness.

## 85% Magnesia Blocks



These blocks are used to insulate flat, curved, or irregular surfaces where temperatures do not exceed 600° F. They are widely used where high insulating value and light weight are needed, and where surfaces are so irregular that an easily cut insulation is required for proper fitting.

Regularly furnished flat or curved in 3 and 6-inch widths, in 18 and 36-inch lengths, and up to 4 inches thick. Flat blocks are available in 9 and 12-inch widths also.

## Finishing and Insulating Cements

Johns-Manville cements are unexcelled for insulation of irregular surfaces such as on valves, flanges, pipe fittings, etc., or as a surface finish over block or sheet insulations in order to seal joints and to provide a smooth, durable finish.

***Finishing cements*** include two types: The No. 302 is made of asbestos fiber and suitable binding materials. It produces a hard, durable surface which will not crack, break, or peel off.

The No. 352 is a general utility short-fiber asbestos finishing cement, ideal for finishing insulation on heating boilers and pipe fittings.

***Insulating cements*** also include two types: The 85% Magnesia which features a high insulating value and which, except for its powdered form is similar to the 85% Magnesia Blocks described above.

The No. 450 is a high grade, mineral wool cement with superior insulating properties. Provides high covering capacity and excellent adhesion to either hot or cold surfaces. It is usually applied in thicknesses equal to block insulation where conditions prevent the use of the latter.

Temperature Limits and Covering Capacities of Cements

| Type of Cement | | Max. Temp. Deg. F. | Covering Capacity Applied and Dried 1-inch thick: Sq. Ft. per 100 lbs. | Covering Capacity Applied and Dried 1-inch thick: Sq. Ft. per Bag | Approx. pounds of water to mix 100 pounds cement | Weight per Bag Pounds |
|---|---|---|---|---|---|---|
| Finishing | No. 302 | — | 25 | 25 | 175 | 100 |
| | No. 352 | — | 19 | 9½ or 19 | 100 | 50 or 100 |
| Insulating | 85% Magnesia | 600 | 58 | 35 | 450 | 60 |
| | No. 450 | 1500 | 50 | 25 | 250 | 50 |

*Prices and additional information on application*

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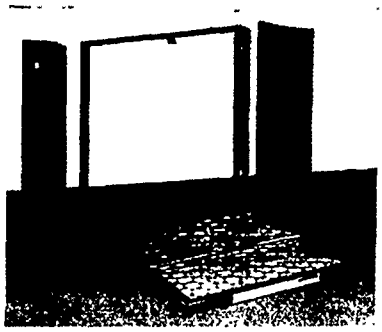
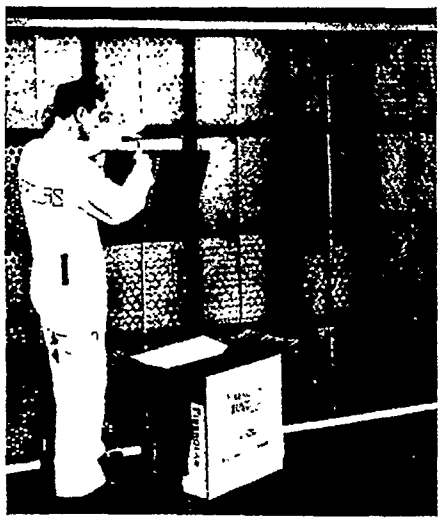
# Fiberglas Dust-Stop Air Filters

## For "V" and Flat Bank Installations



**Fiberglas Dust-Stop Filter**
With Frame and Angle Uprights

Universal "Unit" Fiberglas Dust-Stop Filter Frames can be combined with front, back, and side angle uprights to form "V" banks



Filter Frames are manufactured to take 2 or 4 inches of filtering media. Filters 1-inch thick, used in series, are recommended.

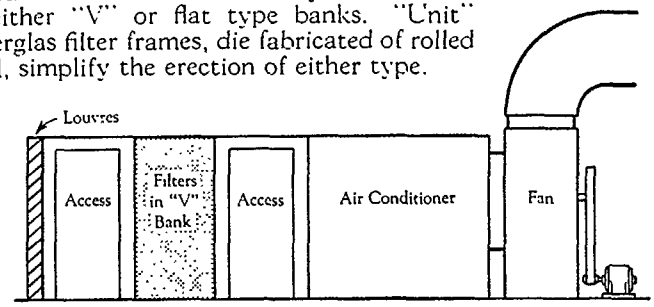
***Fiberglas Dust-Stop Air Filters Assure Efficient, Low-Cost Air Filtration***

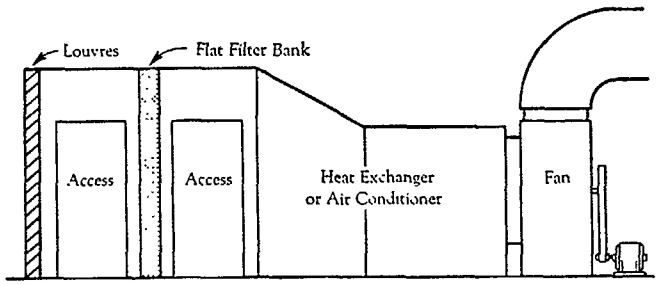
Fiberglas Dust-Stop Air Filters provide an economical means of cleaning the air in unit heating, central heating, ventilating, and air conditioning systems. Designed specifically as a replacement, throw-away type of filter, their use simplifies maintenance problems and insures efficient filtration of air.

The filters will remove dust, dirt, lint, soot, paint spray, etc., from mechanically circulated air in manufacturing and assembly plants, paint shops, laboratories, distilleries, canneries, packing and processing plants, public buildings, theatres, hotels, shops, and institutions.

**Construction:** Fiberglas Dust-Stop Air Filters are composed of a maze of glass fibers which are coated with a patented, dust catching adhesive. The filters are faced with metallic grilles and bound on the edges with a fiberboard frame.

**Installation:** The filters may be installed in either "V" or flat type banks. "Unit" Fiberglas filter frames, die fabricated of rolled steel, simplify the erection of either type.




Flat banks occupy less depth within the duct area than "V" banks but they require a larger face area for the same capacity. "V" frames are used where face areas are limited. The angle at which the frames are attached may be adjusted to provide the correct filter area in the space available.

**Underwriters' approved:** Fiberglas Dust-Stop Air Filters have been awarded an unqualified Class 2 rating by the Underwriters' Laboratories, Inc. This is the highest rating issued an impingement type filter.

**Resistance indicators:** The resistance of the bank and the pressure drop increase with the amount of dust accumulated in the filter. A Dust-Stop Resistance Indicator (not illustrated) is available to measure the pressure drop. Its use will serve as a guide in determining the proper time to replace filters.

*Fiberglas and Dust-Stop are U.S. Registered Trademarks of the Owens-Corning Fiberglas Corporation.

***Prices and additional data on application.***

# Steel
# Screwed Fittings, Unions, and Flange Unions



Forged and Cast Steel Screwed Fittings are available in a wide range of straight and reducing sizes for a variety of service requirements. Forged Steel Fittings are regularly made in the 2000, 3000, and 6000-Pound W.O.G. pressure classes. Cast Steel Fittings are regularly made in the 1000-Pound W.O.G. pressure class. Special fittings and fittings for higher pressures can be furnished to order; fittings shown in this section include:

| | | |
|---|---|---|
| 90° Elbows | Crosses | Reducers |
| 90° Street Elbows | 45° Y-Bends | Caps |
| 45° Elbows | Couplings | Plugs |
| Tees | Half Couplings | Bushings |

**Forged Steel Fittings**
2000, 3000, and 6000-Pound W.O.G.
General description.....page 258
Working pressures.....page 258
List prices.....pages 259 and 260
Dimensions.....page 261

**Cast Steel Fittings**
1000-Pound W.O.G.....page 262

**Forged Steel Unions**
2000-Pound W.O.G.....page 263
3000-Pound W.O.G.....page 263
6000-Pound W.O.G.....page 264

**Forged Steel Flange Unions**
2000 and 6000-Pound W.O.G.....page 265

**Forged Steel Combination Elbows**.....page 266

*For AAR Forged Steel Unions, see page 180*

The items listed above comprise only a part of the complete line of Crane steel products. Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

Steel Couplings.....page 170
Wrought Steel Nipples.....pages 168 and 169
Forged Steel Tongue and Groove Flange Unions.....page 182

Steel Flanged Fittings.....pages 267 to 274
Steel Welding Fittings.....pages 275 to 290
Steel Flanges.....pages 291 to 298

Steel Pressure-Seal Bonnet Valves.....pages 205 to 217
Steel Lip-Seal Bonnet Valves.....pages 218 and 219
Steel Gate Valves.....pages 221 to 234
Steel Globe and Angle Valves.....pages 235 to 248
Steel Check Valves.....pages 249 to 256
Steel Stop-Check Valves.....pages 304 and 305

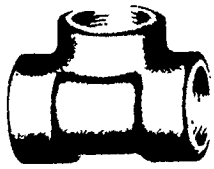
Steel Safety Valves.....page 324
Steel Relief Valves.....pages 333 and 334
Corrosion-Resistant Valves and Fittings.....pages 375 to 396
Valves and Fittings for Marine Service.....pages 397 to 408
Steel Sediment Separators.....page 350
Fabricated Piping.....pages 497 to 522

*How to read reducing fittings....page 577*

# Forged Steel Screwed Fittings

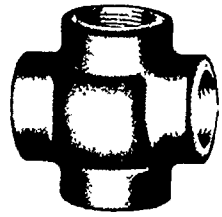
## 2000, 3000, and 6000-Pound W.O.G.

90° Elbow
No. 240, 2000-Lb. WOG
No. 380, 3000-Lb. WOG
No. 660, 6000-Lb. WOG

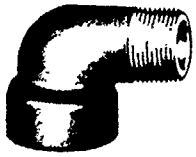


Tee
No. 241, 2000-Lb. WOG
No. 381, 3000-Lb. WOG
No. 661, 6000-Lb. WOG

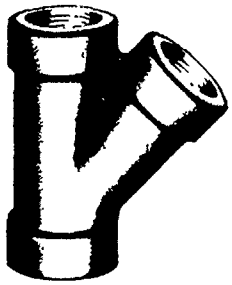
45° Elbow
No. 242, 2000-Lb. WOG
No. 382, 3000-Lb. WOG
No. 662, 6000-Lb. WOG



Cross
No. 243, 2000-Lb. WOG
No. 383, 3000-Lb. WOG
No. 663, 6000-Lb. WOG



90° Street Elbow
No. 384, 3000-Lb. WOG
No. 664, 6000-Lb. WOG



45° Y-Bend
No. 245, 2000-Lb. WOG
No. 385, 3000-Lb. WOG
No. 665, 6000-Lb. WOG

*For list prices, see the opposite page.*

Coupling
No. 386, 3000-Lb. WOG
No. 666, 6000-Lb. WOG

Reducer
No. 387, 3000-Lb. WOG
No. 667, 6000-Lb. WOG

Half Coupling
No. 388, 3000-Lb. WOG
No. 668, 6000-Lb. WOG

**Service recommendations:** These fittings are unusually strong and rugged. They are ideally suited for high pressure hydraulic lines and for high pressure-temperature service in oil refineries, oil and gas fields, central power stations, and industrial and chemical plants. The 2000-Pound W.O.G. Fittings, exceptionally compact and light in weight, are intended for services beyond the temperature range of malleable iron fittings and for use on many relatively low pressure installations where the extra strength and safety afforded by steel fittings are desired.

**Design and construction:** The elbows, tees, crosses, and Y-bends are forged solid; caps, couplings, reducers, plugs, and bushings are machined from solid steel. All openings are drilled. The fittings have liberal metal sections throughout; they have an ample factor of safety over the recommended working pressures.

WORKING PRESSURES
Pounds, Non-Shock
For Steam, Water, Oil, Oil Vapor, Gas, or Air

| Temp. | Carbon Steel Fittings | | | Carbon-Molybdenum Steel Fittings | | |
|---|---|---|---|---|---|---|
| Deg. F. | 2000 Pound W.O.G. | 3000 Pound W.O.G. | 6000 Pound W.O.G. | 2000 Pound W.O.G. | 3000 Pound W.O.G. | 6000 Pound W.O.G. |
| 100 | 2000 | 3000 | 6000 | 2000 | 3000 | 6000 |
| 150 | 1980 | 2960 | 5915 | 1980 | 2960 | 5915 |
| 200 | 1950 | 2920 | 5830 | 1950 | 2920 | 5830 |
| 250 | 1920 | 2880 | 5750 | 1920 | 2880 | 5750 |
| 300 | 1900 | 2840 | 5690 | 1900 | 2840 | 5690 |
| 350 | 1880 | 2820 | 5625 | 1880 | 2820 | 5625 |
| 400 | 1850 | 2780 | 5550 | 1850 | 2780 | 5550 |
| 450 | 1830 | 2740 | 5490 | 1830 | 2740 | 5490 |
| 500 | 1740 | 2600 | 5210 | 1740 | 2600 | 5210 |
| 550 | 1640 | 2460 | 4925 | 1640 | 2460 | 4925 |
| 600 | 1550 | 2310 | 4620 | 1550 | 2310 | 4620 |
| 650 | 1440 | 2150 | 4300 | 1440 | 2150 | 4300 |
| 700 | 1320 | 1960 | 3920 | 1320 | 1960 | 3920 |
| 750 | 1190 | 1775 | 3550 | 1190 | 1775 | 3550 |
| 800 | 1020 | 1525 | 3050 | 1045 | 1560 | 3125 |
| 850 | 835 | 1250 | 2500 | 975 | 1460 | 2925 |
| 900 | 585 | 875 | 1750 | 900 | 1350 | 2700 |
| 950 | 460 | 690 | 1375 | 835 | 1250 | 2500 |
| 1000 | 335 | 500 | 1000 | 650 | 975 | 1950 |

The forged fittings have each opening reinforced with a wide band. It completely surrounds the thread chamber, extending beyond the last thread. This design not only provides the requisite strength but also makes the fittings more compact and neater in appearance, and permits a better wrench grip.

**Materials:** High grade carbon steel billets or bar stock, purchased under rigid specifications and carefully inspected and tested for quality, are used in the manufacture of these fittings. The material has been especially selected for its strength, toughness, and resistance to temperature and shock.

**Threading:** The threads are long and are accurately cut to gauge. The openings are chamfered to permit easy entrance of the pipe. All of the openings are in true alignment.

*Caps, Plugs, and Bushings . . . page 260*

*Dimensions page 261*

# Forged Steel Screwed Fittings

## 2000, 3000, and 6000-Pound W.O.G.

*For working pressures and description, see the opposite page.*



List Prices, Each—Carbon Steel Fittings

| Type of Fitting | Size Inches | 90° Elbows | Tees | 45° Elbows | Crosses | 90° Street Elbows | 45° Y-Bends | Couplings | Reducers | Half Couplings |
|---|---|---|---|---|---|---|---|---|---|---|
| 2000-Pound W.O.G. | | No. 240 | No. 241 | No. 242 | No. 243 | | No. 245 | | | |
| | 1/8 | .55 | .80 | .68 | 1.10 | | | Use 3000-Pound W.O.G. | | |
| | 1/4 | .55 | .80 | .68 | 1.10 | Use 3000-Pound W.O.G. | 1.40 | | | |
| | 3/8 | .55 | .80 | .68 | 1.10 | | 1.85 | | | |
| | 1/2 | .65 | .95 | .78 | 1.30 | | 2.00 | | | |
| | 3/4 | .75 | 1.10 | .90 | 1.50 | | 2.50 | | | |
| | 1 | .90 | 1.35 | 1.08 | 1.90 | | 3.00 | | | |
| | 1 1/4 | 1.20 | 1.75 | 1.44 | 2.80 | | 3.75 | | | |
| | 1 1/2 | 1.50 | 2.30 | 1.80 | 3.50 | | 4.75 | | | |
| | 2 | 1.90 | 2.90 | 2.28 | 5.00 | | 5.80 | | | |
| | 2 1/2 | 2.90 | 4.40 | 3.48 | 7.30 | | | | | |
| | 3 | 5.00 | 7.50 | 6.00 | 10.00 | | | | | |
| | 4 | 12.50 | 17.00 | 14.00 | 23.00 | | | | | |
| 3000-Pound W.O.G. | Size Inches | No. 380 | No. 381 | No. 382 | No. 383 | No. 384 | No. 385 | No. 386 | No. 387 | No. 388 |
| | 1/8 | .55 | .80 | .68 | 1.10 | | | .40 | | .25 |
| | 1/4 | .55 | .80 | .68 | 1.10 | .75 | 1.40 | .40 | .55 | .25 |
| | 3/8 | .55 | .80 | .68 | 1.10 | .85 | 1.85 | .40 | .55 | .25 |
| | 1/2 | .65 | .95 | .78 | 1.30 | .85 | 2.00 | .40 | .70 | .25 |
| | 3/4 | .75 | 1.10 | .90 | 1.50 | 1.05 | 2.50 | .45 | 1.00 | .30 |
| | 1 | .90 | 1.35 | 1.08 | 1.90 | 1.40 | 3.00 | .55 | 1.20 | .35 |
| | 1 1/4 | 1.20 | 1.75 | 1.44 | 2.80 | 2.00 | 3.75 | .70 | 1.35 | .40 |
| | 1 1/2 | 1.50 | 2.30 | 1.80 | 3.50 | 2.50 | 4.75 | .85 | 1.60 | .50 |
| | 2 | 1.90 | 2.90 | 2.28 | 5.00 | 3.15 | | 1.15 | 1.85 | .70 |
| | 2 1/2 | 2.90 | 4.40 | 3.48 | 7.30 | | | 1.60 | 2.75 | .95 |
| | 3 | 5.00 | 7.50 | 6.00 | 10.00 | | | 2.75 | 3.75 | 1.65 |
| | 3 1/2 | 12.50 | 17.00 | 14.00 | 23.00 | | | 3.85 | 5.50 | 2.30 |
| | 4 | 12.50 | 17.00 | 14.00 | 23.00 | | | 4.80 | 6.75 | 2.85 |
| 6000-Pound W.O.G. | Size Inches | No. 660 | No. 661 | No. 662 | No. 663 | No. 664 | No. 665 | No. 666 | No. 667 | No. 668 |
| | 1/8 | .55 | .80 | .68 | 1.10 | | | .60 | | .35 |
| | 1/4 | .55 | .80 | .68 | 1.10 | 1.05 | | .60 | .75 | .35 |
| | 3/8 | .65 | .95 | .78 | 1.30 | 1.40 | 2.00 | .60 | .75 | .35 |
| | 1/2 | .75 | 1.10 | .90 | 1.50 | 1.40 | 2.50 | .60 | .90 | .35 |
| | 3/4 | .90 | 1.35 | 1.08 | 1.90 | 2.00 | 3.00 | .65 | 1.25 | .40 |
| | 1 | 1.20 | 1.75 | 1.44 | 2.80 | 2.50 | 3.75 | .85 | 1.50 | .50 |
| | 1 1/4 | 1.50 | 2.30 | 1.80 | 3.50 | 3.15 | 4.75 | 1.05 | 1.70 | .60 |
| | 1 1/2 | 1.90 | 2.90 | 2.28 | 5.00 | 3.75 | | 1.30 | 2.10 | .80 |
| | 2 | 2.90 | 4.40 | 3.48 | 7.30 | | | 1.75 | 2.50 | 1.05 |
| | 2 1/2 | 5.00 | 7.50 | 6.00 | 10.00 | | | 2.40 | 3.60 | 1.45 |
| | 3 | 12.50 | 17.00 | 14.00 | 23.00 | | | 4.75 | 5.75 | 2.85 |
| | 3 1/2 | 12.50 | 17.00 | 14.00 | 23.00 | | | 8.50 | 9.50 | 5.10 |
| | 4 | | | | | | | 10.90 | 11.75 | 6.50 |

**Reducing fittings:** Reducing fittings can be made in any reduction from straight size forging blanks; they use the same list price as straight size fittings. The list prices of Reducers apply to any reduction. See the Crane Discount Sheet for prices.

**Galvanized fittings:** Galvanized fittings can be made to order; see the Crane Discount Sheet.

**Alloy steel fittings:** Fittings made of Carbon-Molybdenum Steel, Chromium-Molybdenum Steel (4 to 6% Chrome), or Stainless Steel (18-8) can be made to order; prices will be furnished on application.

**Other types of fittings:** The Crane line includes an unusually complete assortment of steel fittings.

In addition to the fittings listed here, steel plugs, bushings, and caps are shown on the following page. Steel screwed unions, flange unions, and combination elbows are shown on pages 263 to 266. 1000-Pound W.O.G. Cast Steel Screwed Fittings in sizes as large as 12-inch are listed on page 262.

# Steel Screwed Caps, Plugs, and Bushings

## 3000 and 6000-Pound W.O.G.

25

### Caps

No. 389
Cap
3000-Pound W.O.G.

### Plugs

No. 309
Square Head
Plug
3000-Pound
W.O.G.

No. 308
Round Head
Plug
3000-Pound
W.O.G.

No. 602
Hexagon Head
Plug
6000-Pound
W.O.G.

### Bushings

No. 600
Hexagon
Bushing
6000-Pound
W.O.G.

No. 601
Face
Bushing
6000-Pound
W.O.G.

**Design and construction:** The caps, plugs, and bushings listed on this page have liberal metal sections throughout; they have an ample factor of safety over the recommended working pressures. For added description and working pressures, refer to page 258.

**Galvanized fittings:** Galvanized caps, plugs, and bushings can be made to order; see the Crane Discount Sheet for prices.

**Alloy steel fittings:** Caps, plugs, and bushings made of Carbon-Molybdenum Steel, Chromium-Molybdenum Steel (4 to 6% Chrome), or Stainless Steel (18-8) can be made to order; prices are furnished on application.

*Description and working pressures . page 258*
*Dimensions of caps page 261*

### List Prices, Each—Carbon Steel Caps and Plugs

| Size | Caps | Plugs | | |
|---|---|---|---|---|
| | No. 389 | No. 309 Square Head | No. 308 Round Head | No. 602 Hexagon Head |
| Inches | 3000 Pound | 3000 Pound | 3000 Pound | 6000 Pound |
| 1/8 | .35 | Use Solid Plugs shown on page 166; they are made of steel | .25 | .25 |
| 1/4 | .35 | | .25 | .25 |
| 3/8 | .35 | | .25 | .25 |
| 1/2 | .45 | | .25 | .25 |
| 3/4 | .65 | .30 | .30 | .30 |
| 1 | .90 | .35 | .35 | .40 |
| 1 1/4 | 1.00 | .50 | .50 | .55 |
| 1 1/2 | 1.30 | .75 | .75 | .85 |
| 2 | 2.00 | 1.50 | 1.50 | 1.65 |
| 2 1/2 | 3.65 | 3.00 | 3.00 | 3.30 |
| 3 | 4.35 | 5.00 | 5.00 | 5.50 |
| 3 1/2 | 5.45 | 5.75 | 5.75 | 6.35 |
| 4 | 13.00 | 6.50 | 6.50 | 7.15 |

### List Prices, Each—Carbon Steel Bushings

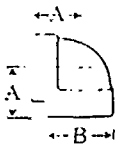
| Size | No. 600 Hexagon Bushings | No. 601 Face Bushings |
|---|---|---|
| Inches | 6000 Pound | 6000 Pound |
| 1/4 × 1/8 | * | * |
| 3/8 × 1/4 | * | * |
| × 1/8 | | |
| 1/2 × 3/8 | .45 | * |
| × 1/4 | | |
| × 1/8 | | |
| 3/4 × 1/2 | .45 | * |
| × 3/8 | | |
| × 1/4 | | |
| × 1/8 | | .... |
| 1 × 3/4 | .50 | .60 |
| × 1/2 | | |
| × 3/8 | | |
| × 1/4 | | |
| × 1/8 | | .... |
| 1 1/4 × 1 | .66 | .75 |
| × 3/4 | | |
| × 1/2 | | |
| × 3/8 | | .... |
| × 1/4 | | .... |
| 1 1/2 × 1 1/4 | .83 | .95 |
| × 1 | | |
| × 3/4 | | |
| × 1/2 | | |
| × 3/8 | | .... |
| × 1/4 | | .... |

| Size | No. 600 Hexagon Bushings | No. 601 Face Bushings |
|---|---|---|
| Inches | 6000 Pound | 6000 Pound |
| 2 × 1 1/2 | 1.32 | 1.50 |
| × 1 1/4 | | |
| × 1 | | |
| × 3/4 | 1.20 | |
| × 1/2 | | .... |
| × 3/8 | | .... |
| × 1/4 | | .... |
| 2 1/2 × 2 | 5.00 | 2.00 |
| × 1 1/2 | | |
| × 1 1/4 | 4.50 | |
| × 1 | | .... |
| × 3/4 | | .... |
| × 1/2 | | .... |
| 3 × 2 1/2 | 8.00 | 5.00 |
| × 2 | | |
| × 1 1/2 | 7.25 | |
| × 1 1/4 | | .... |
| × 1 | | .... |
| × 3/4 | | .... |
| × 1/2 | | . |
| 3 1/2 × 3 | 9.00 | 6.00 |
| × 2 1/2 | | |
| × 2 | | |
| × 1 1/2 | 8.25 | .... |
| × 1 1/4 | | .... |
| × 1 | | .... |
| 4 × 3 1/2 | 10.50 | 7.50 |
| × 3 | | |
| × 2 1/2 | | |
| × 2 | | |
| × 1 1/2 | 9.50 | .... |
| × 1 1/4 | | .... |
| × 1 | | .... |

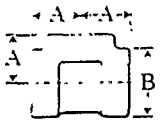
*For sizes indicated with an asterisk, use the hexagon and face bushings shown on page 167; they are made of steel.

# Forged Steel Screwed Fittings

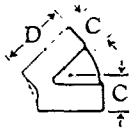
## Dimensions, in Inches



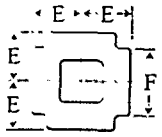
90° Elbow



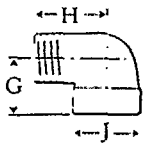
Tee



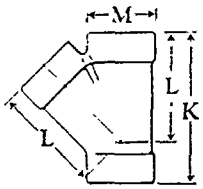
45° Elbow



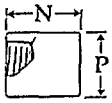
Cross



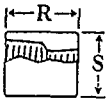
90° Street Elbow



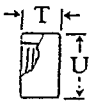
45° Y-Bend



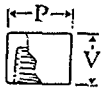
Coupling



Reducer



Half Coupling



Cap

***Dimensions of reducing sizes are the same as those of the straight size corresponding to the largest opening.***

| Size | A | B | C | D | E | F | G | H | J | K | L | M | N | P | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2000-Pound W.O.G. Fittings** | | | | | | | | | | | | | | | | | | | |
| 1/8 | 13/16 | 29/32 | 11/16 | 15/16 | 31/32 | 1 | | | | | | | | | | | | | |
| 1/4 | 13/16 | 29/32 | 3/4 | 1 1/32 | 31/32 | 1 | | | | 2 5/16 | 1 5/8 | 13/16 | | | | | | | |
| 3/8 | 31/32 | 1 1/32 | 3/4 | 1 1/32 | 31/32 | 1 | | | | 2 11/16 | 1 7/8 | 1 | | | | | | | |
| 1/2 | 1 1/8 | 1 5/16 | 7/8 | 1 5/16 | 1 1/8 | 1 5/16 | | | | 3 | 2 1/8 | 1 5/16 | | | | | | | |
| 3/4 | 1 5/16 | 1 1/2 | 1 | 1 1/2 | 1 5/16 | 1 1/2 | | | | 3 9/16 | 2 9/16 | 1 1/2 | | | | | | | |
| 1 | 1 1/2 | 1 13/16 | 1 1/8 | 1 13/16 | 1 1/2 | 1 13/16 | | | | 4 1/8 | 3 | 1 13/16 | | | | | | | |
| 1 1/4 | 1 3/4 | 2 7/32 | 1 5/16 | 2 7/32 | 1 3/4 | 2 3/16 | | | | 4 13/16 | 3 1/2 | 2 3/16 | | | | | | | |
| 1 1/2 | 2 | 2 15/32 | 1 7/16 | 2 15/32 | 2 | 2 7/16 | | | | 5 3/8 | 3 15/16 | 2 7/16 | | | | | | | |
| 2 | 2 3/8 | 3 | 1 11/16 | 3 | 2 3/8 | 2 31/32 | | | | 6 7/16 | 4 3/4 | 2 31/32 | | | | | | | |
| 2 1/2 | 3 | 3 5/8 | 2 1/16 | 4 | 3 1/4 | 4 | | | | | | | | | | | | | |
| 3 | 3 3/8 | 4 5/16 | 2 1/2 | 4 5/8 | 3 3/8 | 4 5/8 | | | | | | | | | | | | | |
| 4 | 4 3/16 | 5 3/4 | 3 1/8 | 5 3/4 | 4 3/16 | 5 3/4 | | | | | | | | | | | | | |
| **3000-Pound W.O.G. Fittings** | | | | | | | | | | | | | | | | | | | |
| 1/8 | 13/16 | 29/32 | 11/16 | 15/16 | 31/32 | 1 | | | | | | | 1 1/8 | 19/32 | | 3/4 | 5/8 | 3/4 | 1 1/2 |
| 1/4 | 31/32 | 1 1/32 | 3/4 | 1 1/32 | 31/32 | 1 | 7/8 | 1 1/4 | 1 | | | | 1 3/8 | 3/4 | 1 3/8 | 3/4 | 1 1/16 | 3/4 | 1 11/16 |
| 3/8 | 1 1/8 | 1 5/16 | 7/8 | 1 5/16 | 1 1/8 | 1 5/16 | 1 | 1 1/2 | 1 1/4 | | | | 1 5/8 | 15/16 | 1 1/2 | 7/8 | 3/4 | 7/8 | 3/4 |
| 1/2 | 1 5/16 | 1 1/2 | 1 | 1 1/2 | 1 5/16 | 1 1/2 | 1 1/4 | 1 5/8 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 7/8 | 1 1/8 | 1 7/8 | 1 1/8 | 1 5/16 | 1 1/8 | 1 1/4 |
| 3/4 | 1 1/2 | 1 13/16 | 1 1/8 | 1 13/16 | 1 1/2 | 1 13/16 | 1 3/8 | 1 7/8 | 1 3/4 | 4 1/8 | 3 | 1 13/16 | 2 1/8 | 1 3/8 | 2 | 1 3/8 | 1 | 1 3/8 | 1 1/4 |
| 1 | 1 3/4 | 2 7/32 | 1 5/16 | 2 7/32 | 1 3/4 | 2 3/16 | 1 3/4 | 2 1/4 | 2 | 4 13/16 | 3 1/2 | 2 3/16 | 2 3/8 | 1 3/4 | 2 3/8 | 1 3/4 | 1 3/16 | 1 3/4 | 1 1/2 |
| 1 1/4 | 2 | 2 15/32 | 1 7/16 | 2 15/32 | 2 | 2 7/16 | 2 | 2 5/8 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 2 7/8 | 2 1/4 | 2 5/8 | 2 1/4 | 1 5/16 | 2 1/4 | 1 5/8 |
| 1 1/2 | 2 3/8 | 3 | 1 11/16 | 3 | 2 3/8 | 2 31/32 | 2 1/8 | 2 13/16 | 2 3/4 | 6 7/16 | 4 3/4 | 2 31/32 | 2 7/8 | 2 1/2 | 3 1/8 | 2 1/2 | 1 9/16 | 2 1/2 | 1 5/8 |
| 2 | 2 1/2 | 3 9/16 | 1 23/32 | 3 5/16 | 2 1/2 | 3 5/16 | 2 1/2 | 3 5/16 | 3 5/16 | | | | 3 3/8 | 3 | 3 3/8 | 3 | 1 11/16 | 3 | 2 |
| 2 1/2 | 3 3/8 | 4 3/8 | 2 1/16 | 4 | 3 1/4 | 4 | | | | | | | 3 5/8 | 3 5/8 | 3 5/8 | 3 5/8 | 1 13/16 | 3 5/8 | 2 3/8 |
| 3 | 3 3/4 | 4 3/4 | 2 1/2 | 4 5/8 | 3 3/8 | 4 5/8 | | | | | | | 4 1/4 | 4 1/4 | 4 1/4 | 4 1/4 | 2 1/8 | 4 1/4 | 2 9/16 |
| 3 1/2 | 4 1/2 | 6 | 3 1/8 | 5 3/4 | 4 3/16 | 5 3/4 | | | | | | | 4 1/2 | 4 3/4 | 4 1/2 | 4 3/4 | 2 1/4 | 4 3/4 | 2 5/8 |
| 4 | 4 1/2 | 6 | 3 1/8 | 5 3/4 | 4 3/16 | 5 3/4 | | | | | | | 4 3/4 | 5 1/2 | 4 3/4 | 5 1/2 | 2 3/8 | 5 1/2 | 2 11/16 |
| **6000-Pound W.O.G. Fittings** | | | | | | | | | | | | | | | | | | | |
| 1/8 | 31/32 | 1 1/32 | 3/4 | 1 1/16 | 31/32 | 1 | | | | | | | 1 1/4 | 7/8 | | 1 | 5/8 | 3/4 | |
| 1/4 | 1 1/8 | 1 5/16 | 7/8 | 1 5/16 | 1 1/8 | 1 5/16 | 1 | 1 1/2 | 1 1/4 | | | | 1 3/8 | 1 | 1 3/8 | 1 | 1 1/16 | 1 | |
| 3/8 | 1 5/16 | 1 1/2 | 1 | 1 1/2 | 1 5/16 | 1 1/2 | 1 1/8 | 1 5/8 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 1/2 | 1 1/4 | 1 1/2 | 1 1/4 | 3/4 | 1 1/4 | |
| 1/2 | 1 1/2 | 1 13/16 | 1 1/8 | 1 13/16 | 1 1/2 | 1 13/16 | 1 3/8 | 1 7/8 | 1 3/4 | 4 1/8 | 3 | 1 13/16 | 1 7/8 | 1 1/2 | 1 7/8 | 1 1/2 | 1 5/16 | 1 1/2 | |
| 3/4 | 1 3/4 | 2 7/32 | 1 5/16 | 2 3/16 | 1 3/4 | 2 3/16 | 1 3/4 | 2 1/4 | 2 | 4 13/16 | 3 1/2 | 2 3/16 | 2 | 1 3/4 | 2 | 1 3/4 | 1 | 1 3/4 | |
| 1 | 2 | 2 15/32 | 1 11/32 | 2 7/16 | 2 | 2 7/16 | 2 | 2 5/8 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 2 3/8 | 2 1/4 | 2 3/8 | 2 1/4 | 1 3/16 | 2 1/4 | |
| 1 1/4 | 2 3/8 | 3 | 1 11/16 | 2 31/32 | 2 3/8 | 2 31/32 | 2 1/8 | 2 13/16 | 2 3/4 | 6 7/16 | 4 3/4 | 2 31/32 | 2 5/8 | 2 1/2 | 2 5/8 | 2 1/2 | 1 5/16 | 2 1/2 | |
| 1 1/2 | 2 1/2 | 3 9/16 | 1 23/32 | 3 5/16 | 2 1/2 | 3 5/16 | 2 1/2 | 3 5/16 | 3 5/16 | | | | 3 1/8 | 3 | 3 1/8 | 3 | 1 9/16 | 3 | |
| 2 | 3 3/8 | 4 3/8 | 2 1/16 | 4 | 3 1/4 | 4 | | | | | | | 3 3/8 | 3 5/8 | 3 3/8 | 3 5/8 | 1 11/16 | 3 5/8 | |
| 2 1/2 | 3 3/4 | 4 3/4 | 2 1/2 | 4 5/8 | 3 3/8 | 4 5/8 | | | | | | | 3 5/8 | 4 1/4 | 3 5/8 | 4 1/4 | 1 13/16 | 4 1/4 | |
| 3 | 4 3/16 | 5 3/4 | 3 1/8 | 5 3/4 | 4 3/16 | 5 3/4 | | | | | | | 4 1/4 | 5 | 4 1/4 | 5 | 2 1/8 | 5 | |
| 3 1/2 | 4 1/2 | 6 | 3 1/8 | 5 3/4 | 4 3/16 | 5 3/4 | | | | | | | 4 1/2 | 5 3/4 | 4 1/2 | 5 3/4 | 2 1/4 | 5 3/4 | |
| 4 | | | | | | | | | | | | | 4 3/4 | 6 1/4 | 4 3/4 | 6 1/4 | 2 3/8 | 6 1/4 | |

*Description, prices, and ratings . . . . pages 258 to 260*

*Thread engagement . . page 494*

# 1000-Pound W.O.G. Cast Steel Screwed Fittings

25

No. 760 D
90° Elbow

No. 762 D
45° Elbow

No. 764 D
Tee

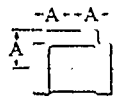
WORKING PRESSURES

For Steam, Water, Oil, Oil Vapor, Gas, or Air

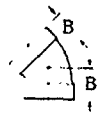
| Temp. Deg. F. | Pounds Non-Shock | Temp. Deg. F. | Pounds Non-Shock |
|---|---|---|---|
| 100 | 1000 | 600 | 775 |
| 150 | 990 | 650 | 720 |
| 200 | 975 | 700 | 660 |
| 250 | 960 | 750 | 595 |
| 300 | 950 | 800 | 510 |
| 350 | 940 | 850 | 415 |
| 400 | 925 | 900 | 290 |
| 450 | 915 | 950 | 230 |
| 500 | 870 | 1000 | 165 |
| 550 | 820 | ... | |

TEST PRESSURE
1000 pounds hydrostatic

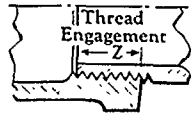
90° Elbow




Tee




45° Elbow




For explanation, see page 494.

## List Prices and Dimensions

| Size | | Inches | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|
| No. 760 D, 90° Elbows | | Each | 32.00 | 39.00 | 80.00 | 144.00 | 217.00 |
| No. 762 D, 45° Elbows | | Each | 32.00 | 39.00 | 80.00 | 144.00 | 217.00 |
| No. 764 D, Tees | | Each | 48.00 | 59.00 | 120.00 | 215.00 | 326.00 |
| Dimensions, in Inches | A—Center to end | | 5½ | 6¼ | 7¾ | 9¼ | 11½ |
| | B—Center to end | | 3 3/16 | 3½ | 4 5/16 | 5 3/16 | 6 |
| | Z—Thread engagement | | 1¼ | 1 5/16 | 1 7/16 | 1⅝ | 1¾ |

**Reducing fittings:** Reducing Elbows and Tees can be made to order. Reducing sizes use the same list prices as straight size fittings but are sold at an advance in price; see the Crane Discount Sheet for prices.

**Service recommendations:** Crane 1000-Pound W.O.G. Cast Steel Fittings are recommended for services that are beyond the pressure-temperature range of malleable or cast iron fittings, or where stronger, more rugged fittings are desired. They are well suited for service on steam, hot oil, gas, and water lines.

**Material and construction:** The fittings are made of Crane Carbon Steel. They are cast from special patterns and are not to be compared with cast steel fittings made from patterns designed for cast iron fittings. Metal sections are ample throughout, and heavy bands reinforce the ends of the fittings.

**Threading:** Threads are long and are accurately cut to gauge; all openings are in true alignment. Openings are chamfered to permit easy entrance of the pipe.

**Alloy steel:** Fittings made of Crane No. 5 Chrome-Molybdenum Alloy Cast Steel to withstand elevated temperatures, corrosion, and erosion can be made to order. Prices on application.

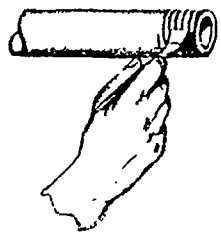
**Smaller sizes:** For smaller sizes, use the forged steel fittings shown on pages 258 and 259.

*Steel Screwed Unions* . . . . . *pages 263 and 264*
*Steel Flange Unions* . . . . . *page 265*
*Steel Tongue and Groove Flange Unions* . . . . *page 182*

### *Applying Thread Lubricant*

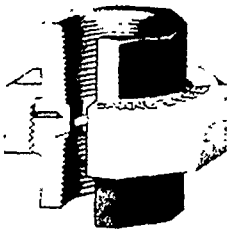
Pipe dope or thread lubricant should always be used when making up screwed joints. But, apply it to the male end of the joint only, not to the female threads in valves or fittings. The excess will then be forced to the outside, and not into the line where it is likely to cause trouble.

Crane High Temperature Thread Lubricant is unusually well suited for use on installations where high temperatures will be encountered. For complete information and recommendations, see page 404.

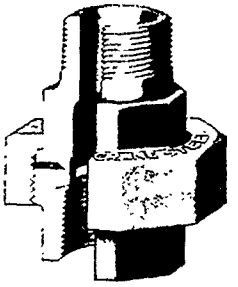


# Forged Steel Ground Joint Unions

## 2000-Pound W.O.G.
Brass to Steel Seat



No. 250 H
Female



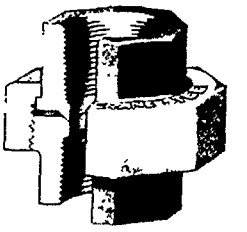
No. 253 H
Male and Female

WORKING PRESSURES
(Steam, Water, Oil, Oil Vapor, Gas, or Air)

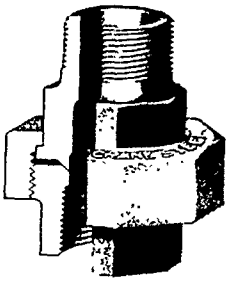
| Temp. Fahr. | Pounds, Non-Shock: Brass to Steel Seat Unions | Pounds, Non-Shock: Steel to Steel Seat Unions |
|---|---|---|
| 100 | 2000 | 3000 |
| 150 | 1980 | 2960 |
| 200 | 1950 | 2920 |
| 250 | 1920 | 2880 |
| 300 | 1900 | 2840 |
| 350 | 1880 | 2820 |
| 400 | 1850 | 2780 |
| 450 | 1830 | 2740 |
| 500 | 1740 | 2600 |
| 550 | 1640 | 2460 |
| 600 | .... | 2310 |
| 650 | .... | 2150 |
| 700 | .... | 1960 |
| 750 | .... | 1775 |
| 800 | .... | 1525 |
| 850 | .... | 1250 |
| 900 | .... | 875 |
| 950 | .... | 690 |
| 1000 | .... | 500 |

***Tested 300 pounds air-under-water***

## 3000-Pound W.O.G.
Steel to Steel Seat



No. 252 H
Female



No. 254 H
Male and Female

25

### List Prices, Each

| Size | | Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black with Cadmium Plated Ring | Female | No. 250 H, Brass to Steel | 2.25 | 2.25 | 2.50 | 3.00 | 3.50 | 4.25 | 5.50 | 6.80 | 8.50 | 17.00 | 26.00 |
| | | No. 252 H, Steel to Steel | 2.15 | 2.15 | 2.35 | 2.70 | 3.30 | 4.00 | 5.25 | 6.30 | 8.00 | 16.00 | 24.50 |
| | Male & Female | No. 253 H, Brass to Steel | | 2.80 | 3.10 | 3.70 | 4.35 | 5.25 | 6.75 | 8.50 | 10.50 | 21.00 | 32.50 |
| | | No. 254 H, Steel to Steel | | 2.70 | 2.95 | 3.40 | 4.15 | 5.00 | 6.50 | 8.00 | 10.00 | 20.00 | 31.00 |
| Cadmium Plated All Over | Female | No. 250 H, Brass to Steel | 2.50 | 2.50 | 2.75 | 3.30 | 3.85 | 4.65 | 6.00 | 7.50 | 9.35 | 18.75 | 28.50 |
| | | No. 252 H, Steel to Steel | 2.40 | 2.40 | 2.60 | 3.00 | 3.65 | 4.40 | 5.75 | 7.00 | 8.85 | 17.75 | 27.00 |
| | Male & Female | No. 253 H, Brass to Steel | | 3.10 | 3.40 | 4.10 | 4.80 | 5.75 | 7.40 | 9.35 | 11.50 | 23.00 | 36.00 |
| | | No. 254 H, Steel to Steel | | 3.00 | 3.25 | 3.80 | 4.60 | 5.50 | 7.15 | 8.85 | 11.00 | 22.00 | 34.50 |

***1/8-inch unions have round ends; larger sizes have octagon ends.***

***On Male and Female Unions sizes 2 1/2 and 3-inch, the male tail-piece is cast steel.***

**Service recommendations:** These unions are recommended for high pressures and temperatures or for unusually severe service on steam, oil, water, air, or gas. Although light in weight, they are exceptionally tough and rugged.

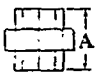
**Seat:** The unions have steel to steel seats or brass to steel seats. In the former, the seats are integral with the end-pieces. In the latter, a large brass ring is rolled under high pressure into the thread-piece; it will not loosen in service.

**Cadmium plating:** These unions are furnished with black end-pieces and cadmium plated union ring or are cadmium plated all over. The parts are plated inside and outside after being machined and before being assembled. Cadmium plating offers excellent resistance to atmospheric corrosion (rust) and is a permanent and effective lubricant.

**AAR design:** In design and dimensions, the No. 252 H and No. 253 H Unions sizes 1/4 to 3-inch comply with the specifications of the Association of American Railroads for 3000-pound unions.

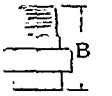
**Identification of seat:** Brass to steel seat unions are marked "2000 W.O.G." on the union ring; steel to steel seat unions are marked "3000 W.O.G."

### Dimensions, in Inches



No. 250 H
or
No. 252 H

| Size | | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| End to end | A | 1 1/2 | 1 5/8 | 1 13/16 | 1 15/16 | 2 1/4 | 2 7/16 | 2 13/16 | 3 | 3 3/8 | 4 | 4 5/16 |
| | B | | 2 1/4 | 2 1/2 | 2 11/16 | 3 1/8 | 3 3/8 | 3 3/4 | 3 15/16 | 4 5/16 | 5 1/16 | 5 1/2 |



No. 253 H
or
No. 254 H

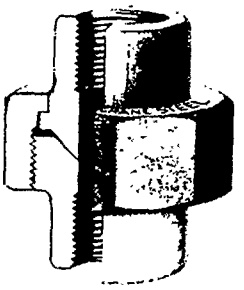
*AAR Forged Steel Unions....page 180* *Thread engagement....page 494*

# Forged Steel Ground Joint Unions

## 6000-Pound W.O.G.

With Steel to Steel Seat and Chromium Plated Thread-Piece

25



No. 246 X, Female

These are exceptionally heavy, superior quality unions, designed for very high pressure-temperature service. All three parts are forged steel; the thread-piece is chromium plated to prevent seizing and to resist corrosion at the seat and at the joint with the union ring.

The unions can be identified by the marking "Ecco W.O.G." on the union ring.

Working Pressures, Non-Shock
(Steam, Water, Oil, Oil Vapor, Gas, or Air)

| Temp. | Pounds | Temp. | Pounds |
|---|---|---|---|
| 100° F. | 6000 | 600° F. | 4620 |
| 150 | 5915 | 650 | 4300 |
| 200 | 5830 | 700 | 3920 |
| 250 | 5750 | 750 | 3550 |
| 300 | 5690 | 800 | 3050 |
| 350 | 5625 | 850 | 2500 |
| 400 | 5550 | 900 | 1750 |
| 450 | 5490 | 950 | 1375 |
| 500 | 5210 | 1000 | 1000 |
| 550 | 4925 | .... | .... |

***Tested 300 pounds air-under-water***

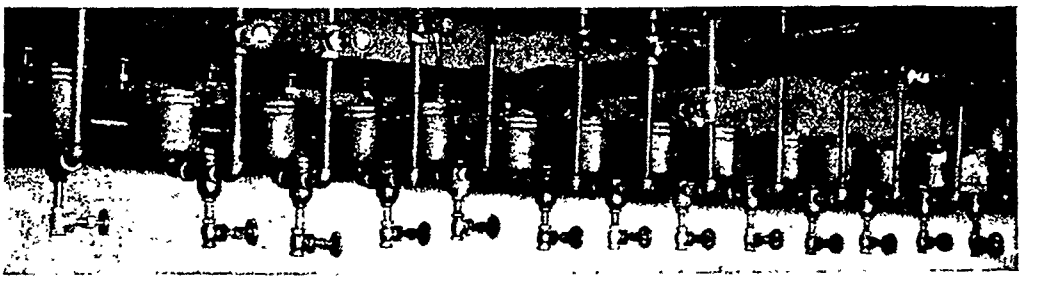
### List Prices and Dimensions

| Size | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
|---|---|---|---|---|---|---|
| No. 246 X, Female | Each | 4.00 | 5.00 | 6.25 | 8.00 | 11.50 |
| A—End to end | Inches | 2 | 2 1/8 | 2 7/16 | 2 13/16 | 3 9/16 |

For larger sizes, use No. 330 D or No. 331 D Flange Unions; page 205.

***AAR Forged Steel Unions....page 180*** ***Thread engagement....page 494***

## *Save Material and Labor with Crane Unions and Union Fittings*



Photograph of a battery of 13 Crane Inverted Open Float Steam Traps draining condensate from cooking kettles in a candy manufacturing plant.

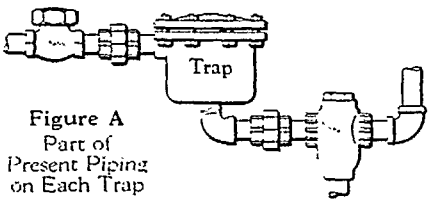



Figure A
Part of Present Piping on Each Trap

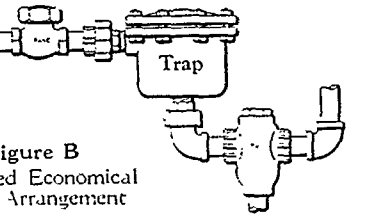



Figure B
Improved Economical Piping Arrangement

***Figure "A"*** illustrates a portion of the piping on each of the traps shown in the photograph. Only female unions are used.

* * * * * * * *

For your convenience, Crane manufactures a complete line of unions and union fittings. Worthwhile savings of labor and material, as illustrated here, can be made through the careful selection of the particular type best suited to the individual installation.

***Figure "B"*** shows an improved and more economical arrangement.

Through the use of a male and female union and a union fitting the installation has been simplified and made compact, providing easy and direct access for removal of the trap. Two nipples, one fitting, and three joints are saved on each trap connection. Using this arrangement on the battery of traps would result in a very substantial saving of time, material, and labor.

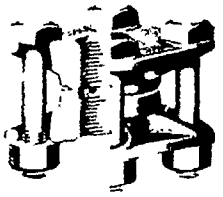
# Forged Steel Ground Joint Flange Unions

2000-Pound W.O.G. 6000-Pound W.O.G.

With
Steel to Steel Seat

No. 328 D
2000-Pound

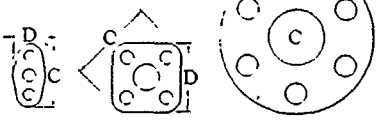
No. 340 D
2000-Pound,
with
Triplex Steel Bolt-Studs
threaded full length and
fitted with a nut on each end.



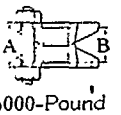
With
Brass to Steel Seat

No. 329 D
2000-Pound

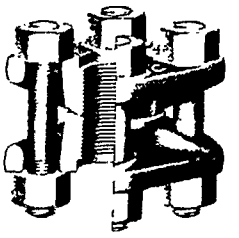
2000-Pound




Oval Square Round




6000-Pound



With Steel to Seat Seat

No. 330 D
6000-Pound, with
Cold Rolled Steel Bolt-Studs

No. 331 D
6000-Pound, with
Triplex Steel Bolt-Studs
threaded full length and
fitted with a nut on each end.

## List Prices and Dimensions

**2000-Pound Flange Unions**

| Size Inches | List Prices No. 328 D Each | No. 329 D Each | No. 340 D Each | Dimensions, in Inches A | C | D | No. & dia. of bolts | Style of flange |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 5.70 | 6.50 | 7.00 | 1 3/4 | 3 5/8 | 1 5/8 | 2-1/2 | Oval |
| 3/8 | 6.00 | 6.90 | 7.30 | 1 7/8 | 3 13/16 | 1 3/4 | 2-1/2 | Oval |
| 1/2 | 6.50 | 7.40 | 8.00 | 2 | 4 | 2 | 2-9/16 | Oval |
| 3/4 | 7.00 | 8.00 | 8.80 | 2 1/8 | 4 3/4 | 2 1/4 | 2-3/4 | Oval |
| 1 | 7.50 | 8.60 | 10.00 | 2 3/8 | 4 3/4 | 2 5/8 | 2-3/4 | Oval |
| 1 1/4 | 8.70 | 10.00 | 12.00 | 2 5/8 | 5 | 3 15/16 | 4-5/8 | Square |
| 1 1/2 | 10.00 | 11.50 | 14.00 | 2 3/4 | 6 | 4 11/16 | 4-5/8 | Square |
| 2 | 12.00 | 14.00 | 16.50 | 2 3/4 | 6 1/2 | 5 1/16 | 4-3/4 | Square |
| 2 1/2 | 17.50 | 20.00 | 23.00 | 3 3/8 | 7 1/2 | 5 13/16 | 4-7/8 | Square |
| 3 | 28.00 | 32.00 | 36.00 | 3 3/8 | 8 1/4 | | 6-7/8 | Round |
| 4 | 43.00 | 48.00 | 53.00 | 3 5/8 | 10 | | 8-1 | Round |

**6000-Pound Flange Unions**

| Size Inches | List Prices No. 330 D Each | No. 331 D Each | Dimensions, in Inches A | B | C | D | No. & dia. of bolts | Style of flange |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 6.85 | 8.25 | 2 1/4 | 1 11/16 | 3 7/8 | 2 | 2-5/8 | Oval |
| 3/8 | 6.85 | 8.25 | 2 1/4 | 1 11/16 | 3 7/8 | 2 | 2-5/8 | Oval |
| 1/2 | 6.85 | 8.25 | 2 1/4 | 1 11/16 | 3 7/8 | 2 | 2-5/8 | Oval |
| 3/4 | 9.00 | 10.75 | 2 1/8 | 1 13/16 | 3 5/8 | 3 | 4-9/16 | Square |
| 1 | 10.00 | 12.00 | 2 1/2 | 2 | 4 1/2 | 3 5/8 | 4-5/8 | Square |
| 1 1/4 | 11.80 | 14.00 | 2 3/4 | 2 3/16 | 5 1/4 | 4 1/4 | 4-3/4 | Square |
| 1 1/2 | 14.50 | 17.50 | 2 7/8 | 2 5/16 | 5 7/8 | 4 3/4 | 4-7/8 | Square |
| 2 | 22.50 | 27.00 | 3 11/16 | 3 | 6 7/8 | 5 1/2 | 4-1 1/8 | Square |
| 2 1/2 | 35.00 | | 3 15/16 | 3 1/8 | 7 13/16 | 6 1/4 | 4-1 1/4 | Square |
| 3 | 71.00 | | 4 5/8 | 3 7/8 | 9 1/2 | | 6-1 1/4 | Round |

**Service recommendations:** The 2000-Pound Unions are compact, yet amply strong. They are recommended especially for hydraulic lines. In addition, the No. 340 D, having Triplex Steel bolting, are suitable for high pressure-temperature service.

The 6000-Pound Flange Unions are made for the extreme pressures and temperatures encountered in some steam plants and oil refineries, and for very high hydraulic pressures. They are unusually massive and rugged, and they have liberal bolting.

**Construction:** These unions are forged from a high grade steel especially selected for its strength and toughness. They have long thread lengths. They will withstand hard usage and repeated dismantling; their ground joints holds pressure easily, and no gasket is required.

**Bolting:** The No. 328 D and No. 329 D Unions have commercial bolts. The No. 330 D Unions have cold rolled steel bolt-studs.

The Nos. 340 D and 331 D have Triplex Steel bolt-studs, threaded full length and fitted with medium carbon oil-quenched semi-finished hexagon steel nuts. Triplex Steel has excellent physical properties.

## Working Pressures

Steam, Water, Oil, Oil Vapor, Gas, or Air

| Temperature Degrees Fahr. | Working Pressures—Pounds (Non-Shock) 2000-Pound No. 328 D and No. 329 D | 2000-Pound No. 340 D | 6000-Pound No. 330 D | 6000-Pound No. 331 D |
|---|---|---|---|---|
| 100 | 2000 | 2000 | 6000 | 6000 |
| 150 | 1980 | 1980 | 5915 | 5915 |
| 200 | 1950 | 1950 | 5830 | 5830 |
| 250 | 1920 | 1920 | 5750 | 5750 |
| 300 | 1900 | 1900 | 5690 | 5690 |
| 350 | 1880 | 1880 | 5625 | 5625 |
| 400 | 1850 | 1850 | 5550 | 5550 |
| 450 | 1830 | 1830 | 5490 | 5490 |
| 500 | 1740 | 1740 | 5210 | 5210 |
| 550 | .... | 1640 | .... | 4925 |
| 600 | .... | 1550 | .... | 4620 |
| 650 | .... | 1440 | .... | 4300 |
| 700 | .... | 1320 | .... | 3920 |
| 750 | .... | 1190 | .... | 3550 |
| 800 | .... | 1020 | .... | 3050 |
| 850 | .... | 835 | .... | 2500 |
| 900 | .... | 585 | .... | 1750 |
| 950 | .... | 460 | .... | 1375 |
| 1000 | .... | 335 | .... | 1000 |

*For Forged Steel Tongue and Groove Flange Unions, see page 182.*

# Forged Steel Combination Elbows

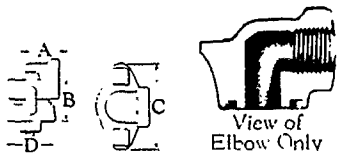
25

No. 1529, Complete
With Flange, Bolts, and Cranite or Lead Gasket

WORKING PRESSURES
300 pounds steam or oil (500° F.)—300 pounds ammonia
1000 pounds cold water, oil, or gas, non-shock

List Prices and Dimensions

| Size | Inches | 1/2 | 3/4 | 1 | 1 1/4 |
|---|---|---|---|---|---|
| No. 1529, Complete | Each | 5.65 | 6.10 | 6.85 | 7.75 |
| A | Inches | 1 1/8 | 1 5/16 | 1 7/16 | 1 3/4 |
| B | Inches | 1 15/16 | 2 1/8 | 2 3/8 | 2 11/16 |
| C | Inches | 4 | 4 3/4 | 4 3/4 | 5 1/4 |
| D | Inches | 2 | 2 1/4 | 2 5/8 | 3 |
| No. and dia. of bolts | | 2-1/2 | 2-5/8 | 2-5/8 | 2-5/8 |




***Combination Elbows are furnished complete only.***

Strong, compact connections are made conveniently and economically with these elbows. They are ideal where a union angle joint is needed in close quarters and for making meter, small by-pass, and similar connections.

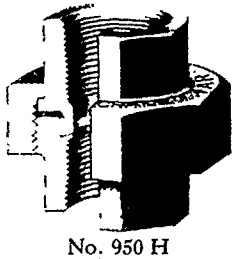
The flange portion is the No. 1547 Tongue Flange on the 1/2 and 3/4-inch sizes and the No. 1582 1/2 Tongue Flange on the 1 and 1 1/4-inch sizes; see the illustrations shown on page 415.

When used in place of ordinary screwed fittings, the No. 1529 replaces an elbow, a nipple, and a flange, eliminating two joints. When used in place of a flanged elbow, it eliminates one gasket joint. In both cases, the No. 1529 takes up considerably less space.

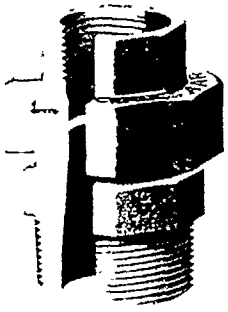
No. 1529 Combination Elbows are regularly furnished with a Cranite gasket; when orders so specify, they will be furnished with a lead gasket at no extra charge.

***Extra gaskets....page 416***

## *AAR Forged Steel Unions*



No. 950 H
AAR Union



No. 953 1/2 H
AAR Reducing Air Pump Union

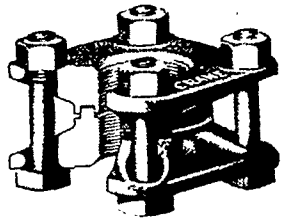
AAR Forged Steel Unions have a brass to steel seat and a ground joint. Refer to page 180.

Supplementing the Crane line of forged steel screwed unions, flange unions, and combination elbows shown in this section are the AAR Forged Steel Unions and Forged Steel Tongue and Groove Flange Unions illustrated in the adjacent columns; for description and prices, refer to pages 180 and 182 respectively.

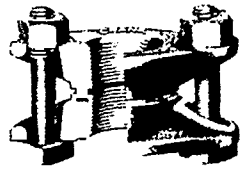
In addition to forged steel, Crane manufactures screwed unions, union fittings, and flange unions in an extensive assortment of metals suitable for a wide variety of services. For prices and description, refer to the following pages:

Malleable Iron Unions and Union Fittings, including Railroad and AAR types.....pages 174 to 180
Malleable Iron and Cast Iron Flange Unions.....page 181
Brass Unions and Union Elbows.....page 187
18-8 Mo Alloy Steel Unions.....page 383
Brass Solder-Joint Unions.....page 423
Circulating Boiler Fittings...page 145

## *Forged Steel Tongue and Groove Flange Unions*



No. 1589
Flange Union
With Cranite or Lead Gasket



No. 1591 1/2
Flange Union
With Cranite or Lead Gasket

Forged Steel Tongue and Groove Flange Unions with either a Cranite or lead gasket, are described and priced on page 182.

The No. 1591 1/2 is particularly adapted to making pipe coils with close centers.

Steel Flanged Fittings

# Cast Steel Flanged Fittings



The Crane line of Cast Steel Flanged Fittings, embracing a wide range of sizes and types in 150, 300, 400, 600, 900, 1500, and 2500-Pound pressure classes, is described in detail on the pages that follow. Special fittings will be made to order; fittings listed in this section include:

| | |
|---|---|
| 90° Elbows | Crosses |
| 90° Long Radius Elbows | 45° Laterals |
| 90° Base Elbows | Taper Reducers |
| 45° Elbows | Eccentric Reducers |
| Tees | Return Bends |

Pressure-Temperature Ratings.....page 268
General Description and Tests.....page 269
List Prices
150 and 300-Pound.....page 270
400, 600, 900, and 1500-Pound.....page 271
Dimensions
150 and 300-Pound.....page 272
400, 600, 900, 1500, and 2500-Pound.....page 273
4000-Pound Fittings.....page 274

The Cast Steel Flanged Fittings listed above comprise only a part of the complete line of Crane steel products.

Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

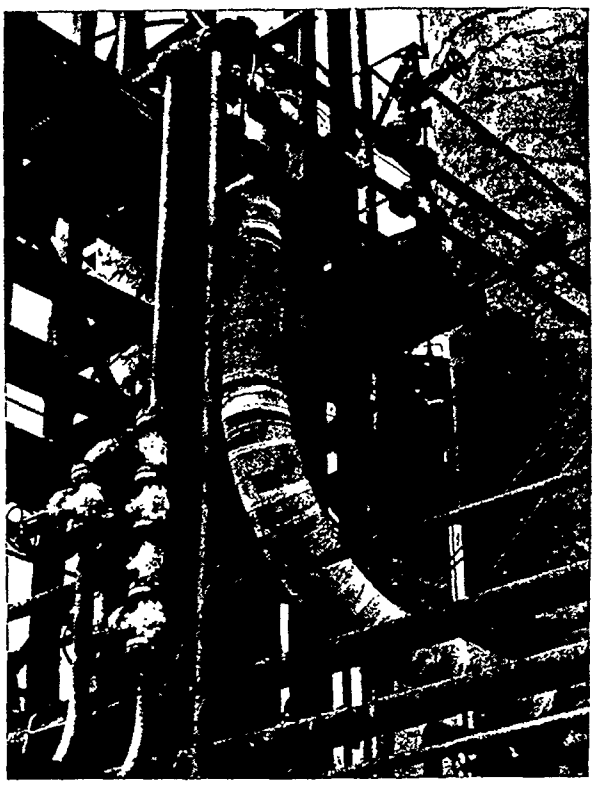
Steel Flanges.....pages 291 to 298
Steel Welding Fittings.....pages 275 to 290
Forged Steel Flange Unions.....page 265
Forged Steel Unions.....pages 263 and 264
Forged Steel Unions, AAR.....page 180

Steel Screwed Fittings.....pages 257 to 262
Steel Couplings.....page 170
Wrought Steel Nipples.....pages 168 and 169
Corrosion-Resistant Products.....pages 375 to 396

Steel Gate Valves.....pages 221 to 234
Steel Globe and Angle Valves.....pages 235 to 248
Steel Check Valves.....pages 249 to 256
Steel Stop-Check Valves.....pages 304 and 305

Steel Safety Valves.....page 324
Steel Relief Valves.....pages 333 and 334
Steel Pressure-Seal Bonnet Valves.....pages 205 to 217
Steel Lip-Seal Bonnet Valves.....pages 218 and 219
Steel Sediment Separators.....page 356

*How to read reducing fittings....page 577*
*Fabricated Piping....pages 497 to 522*



Severe services, tough materials —
Crane Steel Valves, Fittings, and Flanges

# Cast Steel Flanged Fittings

26

## Working Pressures, Pounds per Square Inch, Non-Shock
For Fittings Shown on pages 269 to 273

| Fluid | Temp. Deg. Fahr. | [1]Flanged Fittings with Standard Facings Other Than Ring Joint: Carbon Steel 150 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | Flanged Fittings with Ring Joint Facing: Carbon Steel 150 Lb. | No. 4 Carbon-Molybdenum Alloy Steel 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steam, Water, Oil, Oil Vapor, Gas, or Air | 100 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 5000 | 275 | 720 | 960 | 1440 | 2160 | 3600 | 6000 |
| | 150 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 4915 | 255 | 710 | 945 | 1420 | 2130 | 3550 | 5915 |
| | 200 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 4830 | 240 | 700 | 930 | 1400 | 2100 | 3500 | 5830 |
| | 250 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 4750 | 225 | 690 | 920 | 1380 | 2070 | 3450 | 5750 |
| | 300 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 4660 | 210 | 680 | 910 | 1365 | 2050 | 3415 | 5690 |
| | 350 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 4565 | 195 | 675 | 900 | 1350 | 2025 | 3375 | 5625 |
| | 400 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 4475 | 180 | 665 | 890 | 1330 | 2000 | 3330 | 5550 |
| | 450 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 4380 | 165 | 660 | 875 | 1320 | 1975 | 3295 | 5490 |
| | 500 | **150** | 500 | 665 | 1000 | 1500 | 2500 | 4165 | **150** | 625 | 835 | 1250 | 1875 | 3125 | 5210 |
| | 550 | 140 | 475 | 630 | 950 | 1420 | 2370 | 3950 | 140 | 590 | 790 | 1180 | 1775 | 2955 | 4925 |
| | 600 | 130 | 445 | 590 | 890 | 1330 | 2220 | 3700 | 130 | 555 | 740 | 1110 | 1660 | 2770 | 4620 |
| | 650 | 120 | 415 | 550 | 830 | 1240 | 2070 | 3450 | 120 | 515 | 690 | 1030 | 1550 | 2580 | 4300 |
| | 700 | 110 | 380 | 500 | 760 | 1140 | 1900 | 3160 | 110 | 470 | 635 | 940 | 1410 | 2350 | 3920 |
| | 750 | 100 | 360 | 475 | 720 | 1080 | 1800 | 2995 | 100 | 425 | 575 | 850 | 1275 | 2125 | 3550 |
| | 800 | 92 | 340 | 450 | 680 | 1020 | 1700 | 2830 | 92 | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 850 | 82 | 320 | 425 | 640 | 960 | 1600 | 2665 | 82 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 900 | [2]270 | **300** | **400** | **600** | **900** | **1500** | **2500** | [2]270 | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 950 | [2]255 | [2]265 | [2]350 | [2]530 | [2]795 | [2]1325 | [2]2205 | [2]255 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1000 | [2]240 | [2]190 | [2]250 | [2]380 | [2]570 | [2]950 | [2]1580 | [2]240 | [2]230 | [2]310 | [2]470 | [2]700 | [2]1170 | 1950 |
| | 1050 | | | | | | | | | [2]135 | [2]180 | [2]270 | [2]405 | [2]675 | [2]1125 |
| | 1100 | | | | | | | | | [2]90 | [2]120 | [2]180 | [2]270 | [2]450 | [2]750 |

| Fluid | Temp. Deg. Fahr. | [1]Flanged Fittings with Standard Facings Other Than Ring Joint: No. 5 Chrome-Molybdenum Alloy Steel (Made to order) 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | Flanged Fittings with Ring Joint Facing: No. 5 Chrome-Molybdenum Alloy Steel (Made to order) 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oil or Oil Vapor | 100 to 750 | For temperatures up to 900° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Flanged Fittings, above. | | | | | | For temperatures up to 800° F., these ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Flanged Fittings, above. | | | | | |
| | 800 | | | | | | | 400 | 525 | 800 | 1200 | 2000 | 3325 |
| | 850 | | | | | | | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| | 900 | 310 | 410 | 620 | 930 | 1550 | 2580 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| | 950 | **300** | **400** | **600** | **900** | **1500** | **2500** | 325 | 425 | 650 | 975 | 1625 | 2700 |
| | 1000 | 200 | 275 | 400 | 600 | 1000 | 1675 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| | 1050 | 135 | 180 | 270 | 405 | 675 | 1125 | 225 | 275 | 425 | 650 | 1075 | 1775 |
| | 1100 | 90 | 120 | 180 | 270 | 450 | 750 | 150 | 200 | 275 | 425 | 700 | 1175 |

[1]When an all-metal gasket (corrugated or flat) is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]These ratings apply only to oil or oil vapor service.

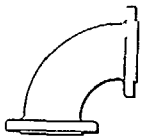
**Flange facings:** Unless otherwise ordered, 150 and 300-Pound Flanged Fittings are furnished with 1/16-inch raised faces, and 400-Pound and higher pressure Flanged Fittings, with 1/4-inch male faces.

**Cold service:** For temperatures between 0° and 100° F., the ratings for 100° F. apply. For sub-zero service, materials with suitable impact resistance must be used: recommendations on request.

**Standards:** Crane pressure-temperature ratings agree with those in Supplement No. 1 (ASA B16e-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, and those in the American Petroleum Institute (API) Standard No. 600, Second Edition, 1951.

# Cast Steel Flanged Fittings

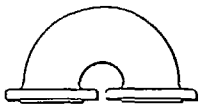
90° Elbow
Straight
No. 525 D, 150-Pound
No. 401 D, 300-Pound
No. 601 D, 400-Pound
No. 845 D, 600-Pound
No. 1245 D, 900-Pound
No. 1545 D, 1500-Pound
Reducing
No. 545 D, 150-Pound
No. 421 D, 300-Pound
No. 621 D, 400-Pound
No. 841 D, 600-Pound
No. 1241 D, 900-Pound
No. 1541 D, 1500-Pound



90° Long Radius Elbow
No. 551 D, 150-Pound
No. 427 D, 300-Pound

45° Elbow
No. 527 D, 150-Pound
No. 403 D, 300-Pound
No. 603 D, 400-Pound
No. 846 D, 600-Pound
No. 1246 D, 900-Pound
No. 1546 D, 1500-Pound

90° Base Elbow
With Round Base
No. 550 D, 150-Pound
No. 425½ D, 300-Pound
No. 625 D, 400-Pound
No. 854 D, 600-Pound
No. 1254 D, 900-Pound
No. 1554 D, 1500-Pound



Return Bend
No. 553 D, 150-Pound
No. 429 D, 300-Pound

HYDROSTATIC TEST PRESSURES

| Pressure Class | With Facing Other Than Ring Joint | With Ring Joint Facing |
|---|---|---|
| 150-Pound | 350 pounds | 425 pounds |
| 300-Pound | 900 pounds | 1100 pounds |
| 400-Pound | 1200 pounds | 1450 pounds |
| 600-Pound | 1800 pounds | 2175 pounds |
| 900-Pound | 2700 pounds | 3250 pounds |
| 1500-Pound | 4500 pounds | 5400 pounds |

*For working pressures, see opposite page.*

Crane Cast Steel Flanged Fittings are available in a complete assortment of types and a wide range of straight and reducing sizes. They are made in a variety of materials and with various flange facings, providing fittings for every requirement.

The Crane line includes fittings in the 150, 300, 400, 600, 900, 1500, and 2500-Pound pressure classes. Prices and dimensions are shown on pages 270 to 273 (prices for 2500-Pound on application).

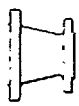
**Materials:** The 150-Pound Flanged Fittings are regularly made of Crane Carbon Steel. All other fittings are made of Crane No. 4 Carbon-Molybdenum Steel, unless otherwise ordered.

300-Pound and higher fittings of Crane No. 5 Chrome-Molybdenum Steel can be supplied to order; see the Crane Discount Sheet for prices.

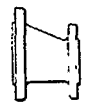
**Base elbows:** Base elbows have a round base flange, plain faced. The base flange is not drilled unless so ordered. The base is suitable only for support in compression and is not to be installed for service as an anchor or support in tension or shear.

**Special fittings:** Special Angle Elbows, Base and Anchorage Tees, and other unusual fittings can be made to order; prices on application. Inquiries should be accompanied by drawings.

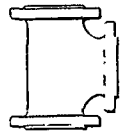
**American Standard:** Crane Cast Steel Flanged Fittings, with the exception of the fabricated base on 90° Base Elbows, conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class. This Standard does not include Return Bends or ½ and ¾-inch 45° Laterals in the 1500-Pound class.



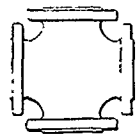
Taper Reducer
No. 547 D, 150-Pound
No. 423 D, 300-Pound
No. 623 D, 400-Pound
No. 853 D, 600-Pound
No. 1253 D, 900-Pound
No. 1553 D, 1500-Pound



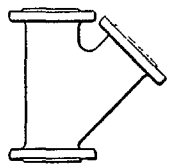
†Eccentric Reducer
No. 548 D, 150-Pound
No. 423½ D, 300-Pound
No. 624 D, 400-Pound
No. 855 D, 600-Pound
No. 1255 D, 900-Pound
No. 1555 D, 1500-Pound



Tee
Straight
No. 534 D, 150-Pound
No. 412 D, 300-Pound
No. 605 D, 400-Pound
No. 847 D, 600-Pound
No. 1247 D, 900-Pound
No. 1547 D, 1500-Pound
Reducing
No. 531 D, 150-Pound
No. 407 D, 300-Pound
No. 607 D, 400-Pound
No. 848 D, 600-Pound
No. 1248 D, 900-Pound
No. 1548 D, 1500-Pound



Cross
Straight
No. 537 D, 150-Pound
No. 413 D, 300-Pound
No. 613 D, 400-Pound
No. 849 D, 600-Pound
No. 1249 D, 900-Pound
No. 1549 D, 1500-Pound
Reducing
No. 539 D, 150-Pound
No. 415 D, 300-Pound
No. 615 D, 400-Pound
No. 850 D, 600-Pound
No. 1250 D, 900-Pound
No. 1550 D, 1500-Pound



45° Lateral
Straight
No. 541 D, 150-Pound
No. 417 D, 300-Pound
No. 617 D, 400-Pound
No. 851 D, 600-Pound
No. 1251 D, 900-Pound
No. 1551 D, 1500-Pound
Reducing
No. 543 D, 150-Pound
No. 419 D, 300-Pound
No. 619 D, 400-Pound
No. 852 D, 600-Pound
No. 1252 D, 900-Pound
No. 1552 D, 1500-Pound

†Eccentric reducers are made to order only; prices on application.

*List prices . . pages 270 and 271* *Description of materials pages 1 to 9* *Dimensions . . pages 272 and 273*

# Cast Steel Flanged Fittings

**Drilling:** End flanges are faced, drilled and spot faced, unless otherwise ordered. Prices include drilling to the corresponding pressure class of the American Standard. No deduction is made if fittings are ordered faced only.

**Flange facing and finish:** 150 and 300-Pound Fittings regularly have an American Standard 1/16-inch raised face on the end flanges; 400, 600, 900, 1500, and 2500-Pound Fittings regularly have a 1/4-inch male face (large male).

Other facings such as ring joint, female, etc., are available when specified. See the Crane Discount Sheet for prices.

Raised and male faces are furnished with concentric grooves (serrated), approximately 32 per inch. A smooth finish can be furnished, when specified; see the Crane Discount Sheet for prices.

**Prices of reducing fittings:** Prices of Reducing Tees, Crosses, and 45° Laterals apply to any reduction.

Prices of 90° Reducing Elbows and Taper Reducers apply only to the reductions shown in the table at the right; other reductions or reducing sizes are made to order; prices on application.

Reducing fitting prices are governed by the size of the largest opening.

**Sizes of Reducing Elbows and Taper Reducers**

| Size | | Pressure Class | | |
|---|---|---|---|---|
| 2 | ×1½" | | | |
| 2½ | ×2 | | | 1500 Lb. |
| 3 | ×2½ | | | |
| | ×2 | | | |
| 3½ | ×3 | | | |
| 4 | ×3 | | | |
| | ×2½ | | | |
| | ×2 | | | 1500 Lb. |
| 5 | ×4 | 150, 300, and 600 Lb. | | |
| | ×3 | | | |
| 6 | ×5 | | 400 and 900 Lb. | |
| | ×4 | | | |
| | ×3 | | | |
| 8 | ×6 | | | |
| | ×5 | | | |
| | ×4 | | | |
| 10 | ×8 | | | |
| | ×6 | | | |
| 12 | ×10 | | | |
| | ×8 | | | |

*Catalog numbers, description, and tests....page 269*
*Taps and drains for flanged fittings .page 578*
*How to read reducing sizes.....page 577*
*Dimensions.....pages 272 and 273*
*Galvanized fittings.....page 476*

## List Prices. Each—Faced, Drilled, and Spot Faced
## 150-Pound Carbon Steel and 300-Pound No. 4 Carbon-Molybdenum Steel Fittings

| Pressure Class | Size Inches | Elbows 90° or 45° | Elbows 90° Reducing (Sizes above) | Elbows 90° Long Radius | 90° Base Elbows With Base Faced Only | 90° Base Elbows Extra to Drill & Spot Face Base | Tees Straight | Tees Reducing Any reduction | Crosses or 45° Laterals Straight | Crosses or 45° Laterals Reducing Any reduction | Taper Reducers (Sizes above) | Return Bends Size by Center to Center Inches | Return Bends List Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150-Pound | 1 | 26.00 | | | | | 39.00 | | 52.00 | | | 2×7 | 47.50 |
| | 1¼ | 28.00 | | | | | 41.50 | 47.00 | 54.50 | 61.00 | | 3×7½ | 60.00 |
| | 1½ | 31.00 | | | | | 44.00 | 49.50 | 60.00 | 67.50 | | ×8 | 62.00 |
| | 2 | 34.00 | 41.50 | 44.00 | | | 47.00 | 52.50 | 65.00 | 73.50 | 34.00 | ×9 | 64.00 |
| | 2½ | 39.00 | 47.00 | 49.50 | | | 52.00 | 58.50 | 75.50 | 86.00 | 39.00 | 4×9 | 80.50 |
| | 3 | 44.00 | 52.00 | 57.00 | | | 60.00 | 67.50 | 86.00 | 96.00 | 44.00 | ×10 | 84.50 |
| | 3½ | 52.00 | 62.50 | 67.50 | | | 67.50 | 77.00 | 100.00 | 112.00 | 52.00 | ×11 | 88.00 |
| | 4 | 57.00 | 67.50 | 75.50 | 83.00 | 7.80 | 75.50 | 86.00 | 110.00 | 124.00 | 57.00 | ×12 | 91.00 |
| | 5 | 70.00 | 83.00 | 101.00 | 107.00 | 7.80 | 96.00 | 110.00 | 135.00 | 151.00 | 70.00 | ×13 | 94.50 |
| | 6 | 86.00 | 101.00 | 125.00 | 130.00 | 7.80 | 120.00 | 135.00 | 165.00 | 186.00 | 86.00 | ×14 | 97.50 |
| | 8 | 125.00 | 146.00 | 182.00 | 182.00 | 15.60 | 170.00 | 192.00 | 240.00 | 268.00 | 125.00 | ×18 | 114.00 |
| | 10 | 174.00 | 205.00 | 240.00 | 252.00 | 21.00 | 235.00 | 265.00 | 330.00 | 374.00 | 174.00 | 6×12 | 134.00 |
| | 12 | 218.00 | 260.00 | 300.00 | 312.00 | 26.00 | 285.00 | 325.00 | 416.00 | 473.00 | 218.00 | ×15 | 150.00 |
| | 14 | 280.00 | | 408.00 | 416.00 | 31.00 | 380.00 | 435.00 | 535.00 | 608.00 | | | |
| | 16 | 365.00 | | 535.00 | 535.00 | 39.00 | 495.00 | 565.00 | 690.00 | 785.00 | | | |
| | 18 | 468.00 | | 700.00 | 700.00 | 39.00 | 640.00 | 730.00 | 885.00 | 1010.00 | | | |
| | 20 | 585.00 | | 910.00 | 910.00 | 39.00 | 830.00 | 950.00 | 1120.00 | 1275.00 | | | |
| | 24 | 925.00 | | 1420.00 | 1430.00 | 39.00 | 1275.00 | 1455.00 | 1755.00 | 2000.00 | | | |
| 300-Pound | 1 | 34.00 | | | | | 50.50 | | 67.50 | | | 2×7½ | 63.50 |
| | 1¼ | 37.00 | | | | | 54.00 | 60.50 | 71.00 | 79.50 | | *3×8½ | 81.00 |
| | 1½ | 40.50 | | | | | 57.50 | 64.00 | 77.50 | 88.00 | | * ×12 | 89.50 |
| | 2 | 44.00 | 54.00 | 57.50 | | | 60.50 | 68.50 | 84.50 | 95.50 | 44.00 | 4×10 | 110.00 |
| | 2½ | 50.50 | 60.50 | 64.00 | | | 67.50 | 76.00 | 98.00 | 111.00 | 50.50 | ×11 | 114.00 |
| | *3 | 57.50 | 67.50 | 74.50 | | | 77.50 | 88.00 | 111.00 | 125.00 | 57.50 | ×11½ | 116.00 |
| | 3½ | 67.50 | 81.00 | 88.00 | | | 88.00 | 100.00 | 128.00 | 145.00 | 67.50 | ×12 | 118.00 |
| | 4 | 74.50 | 88.00 | 98.00 | 108.00 | 10.00 | 98.00 | 111.00 | 142.00 | 160.00 | 74.50 | ×16½ | 141.00 |
| | 5 | 91.00 | 108.00 | 132.00 | 138.00 | 10.00 | 125.00 | 142.00 | 172.00 | 196.00 | 91.00 | ×17 | 143.00 |
| | 6 | 111.00 | 132.00 | 162.00 | 169.00 | 10.00 | 155.00 | 176.00 | 213.00 | 241.00 | 111.00 | ×17½ | 146.00 |
| | 8 | 162.00 | 189.00 | 236.00 | 236.00 | 20.50 | 219.00 | 250.00 | 307.00 | 348.00 | 162.00 | ×18 | 149.00 |
| | 10 | 226.00 | 267.00 | 311.00 | 327.00 | 27.00 | 304.00 | 344.00 | 429.00 | 486.00 | 226.00 | 6×14 | 189.00 |
| | 12 | 284.00 | 338.00 | 388.00 | 405.00 | 34.00 | 371.00 | 422.00 | 540.00 | 614.00 | 284.00 | ×15 | 194.00 |
| | 14 | 365.00 | | 530.00 | 540.00 | 40.50 | 496.00 | 567.00 | 692.00 | 790.00 | | ×16½ | 206.00 |
| | 16 | 473.00 | | 692.00 | 692.00 | 50.50 | 640.00 | 732.00 | 894.00 | 1020.00 | | ×17 | 209.00 |
| | 18 | 608.00 | | 910.00 | 910.00 | 50.50 | 827.00 | 945.00 | 1150.00 | 1310.00 | | ×18 | 216.00 |
| | 20 | 760.00 | | 1180.00 | 1180.00 | 50.50 | 1080.00 | 1230.00 | 1450.00 | 1655.00 | | 8×17½ | 304.00 |
| | 24 | 1200.00 | | 1840.00 | 1855.00 | 50.50 | 1655.00 | 1890.00 | 2280.00 | 2600.00 | | | |

*Specify when 3" size with ring joint facing is to be bolted to Cranelap Joints. A groove having a special pitch diameter is required; page 470 for dimensions.

## List Prices, Each—Faced, Drilled, and Spot Faced
## 400, 600, 900, and 1500-Pound No. 4 Carbon-Molybdenum Steel Fittings

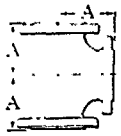
| Pressure Class | Size | Elbows | | 90° Base Elbows | | Tees | | Crosses or 45° Laterals | | Taper Reducers |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 90° or 45° | 90° Reducing | With Base Faced Only | Extra to Drill & Spot Face Base | Straight | Reducing | Straight | Reducing | |
| | Inches | | Page 270 For Sizes | | | | Any reduction | | Any reduction | Page 270 For Sizes |
| 400-Pound | 4 | 105.00 | 125.00 | 151.00 | 13.50 | 154.00 | 174.00 | 213.00 | 241.00 | 105.00 |
| | 5 | 135.00 | 159.00 | 201.00 | 13.50 | 192.00 | 219.00 | 267.00 | 304.00 | 135.00 |
| | 6 | 162.00 | 192.00 | 241.00 | 13.50 | 230.00 | 260.00 | 317.00 | 361.00 | 162.00 |
| | 8 | 243.00 | 287.00 | 351.00 | 27.00 | 341.00 | 388.00 | 476.00 | 540.00 | 243.00 |
| | 10 | 338.00 | 405.00 | 479.00 | 36.30 | 476.00 | 540.00 | 662.00 | 753.00 | 338.00 |
| | 12 | 450.00 | 540.00 | 631.00 | 44.70 | 631.00 | 719.00 | 878.00 | 1000.00 | 450.00 |
| For smaller sizes, use 600-Pound. | 14 | 590.00 | | 840.00 | 54.00 | 834.00 | 948.00 | 1160.00 | 1325.00 | |
| | 16 | 776.00 | | 1100.00 | 67.50 | 1095.00 | 1245.00 | 1525.00 | 1740.00 | |
| | 18 | 980.00 | | 1385.00 | 67.50 | 1380.00 | 1575.00 | 1925.00 | 2195.00 | |
| | 20 | 1250.00 | | 1770.00 | 67.50 | 1760.00 | 2005.00 | 2455.00 | 2800.00 | |
| | 24 | 1905.00 | | 2700.00 | 67.50 | 2685.00 | 3065.00 | 3745.00 | 4260.00 | |
| 600-Pound | ½ | 40.50 | | | | 59.00 | | 82.50 | | |
| | ¾ | 44.00 | | | | 64.00 | 72.50 | 89.50 | 101.00 | |
| | 1 | 49.00 | | | | 72.50 | 82.50 | 101.00 | 115.00 | |
| | 1¼ | 52.50 | | | | 77.50 | 88.00 | 106.00 | 120.00 | |
| | 1½ | 57.50 | | | | 84.50 | 96.00 | 116.00 | 132.00 | |
| | 2 | 64.00 | 77.50 | | | 94.50 | 106.00 | 132.00 | 149.00 | 64.00 |
| | 2½ | 74.50 | 89.50 | | | 110.00 | 123.00 | 152.00 | 172.00 | 74.50 |
| | *3 | 84.50 | 101.00 | | | 125.00 | 141.00 | 172.00 | 196.00 | 84.50 |
| | 3½ | 98.00 | 118.00 | | | 145.00 | 164.00 | 203.00 | 230.00 | 98.00 |
| *Specify when 3" size with ring joint facing is to be bolted to Cranelap Joints. A groove having a special pitch diameter is required; page 470 for dimensions. | 4 | 115.00 | 138.00 | 169.00 | 16.20 | 172.00 | 196.00 | 240.00 | 272.00 | 115.00 |
| | 5 | 161.00 | 194.00 | 246.00 | 16.20 | 244.00 | 278.00 | 339.00 | 386.00 | 161.00 |
| | 6 | 206.00 | 248.00 | 314.00 | 16.20 | 307.00 | 351.00 | 425.00 | 483.00 | 206.00 |
| | 8 | 300.00 | 361.00 | 445.00 | 32.00 | 457.00 | 521.00 | 635.00 | 722.00 | 300.00 |
| | 10 | 473.00 | 567.00 | 665.00 | 44.00 | 705.00 | 803.00 | 986.00 | 1125.00 | 473.00 |
| | 12 | 614.00 | 736.00 | 857.00 | 54.00 | 932.00 | 1065.00 | 1300.00 | 1480.00 | 614.00 |
| | 14 | 780.00 | | 1065.00 | 64.00 | 1170.00 | 1335.00 | 1625.00 | 1855.00 | |
| | 16 | 1095.00 | | 1500.00 | 81.00 | 1635.00 | 1870.00 | 2280.00 | 2600.00 | |
| | 18 | 1370.00 | | Prices on application | | 1930.00 | 2200.00 | 2695.00 | 3070.00 | |
| | 20 | 1750.00 | | | | 2460.00 | 2805.00 | 3440.00 | 3920.00 | |
| | 24 | 2670.00 | | | | 3755.00 | 4290.00 | 5245.00 | 5990.00 | |
| 900-Pound | 3 | 130.00 | | | | 206.00 | 234.00 | 287.00 | 325.00 | |
| | 4 | 197.00 | 237.00 | 296.00 | 22.00 | 308.00 | 350.00 | 427.00 | 485.00 | 197.00 |
| | 5 | 283.00 | 339.00 | 425.00 | 22.00 | 445.00 | 507.00 | 613.00 | 697.00 | 283.00 |
| | 6 | 365.00 | 438.00 | 548.00 | 22.00 | 566.00 | 642.00 | 785.00 | 891.00 | 365.00 |
| | 8 | 646.00 | 777.00 | 956.00 | 44.00 | 1005.00 | 1145.00 | 1390.00 | 1585.00 | 646.00 |
| | 10 | 960.00 | 1155.00 | 1360.00 | 58.50 | 1515.00 | 1725.00 | 2095.00 | 2385.00 | 960.00 |
| | 12 | 1315.00 | 1575.00 | 1845.00 | 73.00 | 2060.00 | 2345.00 | 2865.00 | 3265.00 | 1315.00 |
| For smaller sizes, use 1500-Pound. | 14 | 1645.00 | | 2265.00 | 87.50 | 2575.00 | 2925.00 | 3560.00 | 4050.00 | |
| | 16 | 2135.00 | | 2920.00 | 110.00 | 3350.00 | 3805.00 | 4635.00 | 5275.00 | |
| | 18 | 2665.00 | | Prices on application | | 3755.00 | 4280.00 | 5240.00 | 5980.00 | |
| | 20 | 3400.00 | | | | 4790.00 | 5455.00 | 6695.00 | 7630.00 | |
| | 24 | 5195.00 | | | | 7300.00 | 8350.00 | 10210.00 | 11660.00 | |
| 1500-Pound | ½ | 65.50 | | | | 96.00 | | 130.00 | | |
| | ¾ | 70.00 | | | | 105.00 | 119.00 | 138.00 | 157.00 | |
| | 1 | 77.00 | | | | 118.00 | 136.00 | 157.00 | 178.00 | |
| | 1¼ | 84.00 | | | | 130.00 | 147.00 | 180.00 | 206.00 | |
| | 1½ | 94.50 | | | | 145.00 | 164.00 | 200.00 | 230.00 | |
| | 2 | 112.00 | 136.00 | | | 173.00 | 196.00 | 238.00 | 270.00 | 112.00 |
| | 2½ | 137.00 | 164.00 | | | 215.00 | 243.00 | 297.00 | 337.00 | 137.00 |
| | 3 | 209.00 | 252.00 | | | 332.00 | 380.00 | 458.00 | 514.00 | 209.00 |
| | 4 | 316.00 | 380.00 | 472.00 | 35.00 | 493.00 | 560.00 | 683.00 | 770.00 | 316.00 |
| | 5 | 453.00 | 547.00 | 678.00 | 35.00 | 720.00 | 818.00 | 982.00 | 1120.00 | 453.00 |
| | 6 | 584.00 | 700.00 | 880.00 | 35.00 | 907.00 | 1030.00 | 1260.00 | 1425.00 | 584.00 |
| | 8 | 1035.00 | 1240.00 | 1535.00 | 70.00 | 1615.00 | 1845.00 | 2225.00 | 2525.00 | 1035.00 |
| | 10 | 1540.00 | | 2185.00 | 93.50 | 2425.00 | 2760.00 | 3350.00 | 3835.00 | |
| | 12 | 2105.00 | | 2950.00 | 117.00 | 3305.00 | 3765.00 | 4585.00 | 5235.00 | |
| | 14 | 2640.00 | | 3645.00 | 140.00 | 4160.00 | 4720.00 | 5750.00 | 6545.00 | |

Prices of 2500-Pound Flanged Fittings furnished on application.

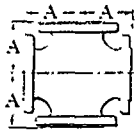
# Cast Steel Flanged Fittings

## Dimensions, in Inches

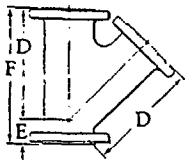
90° Elbow



Tee

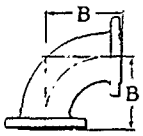


Cross

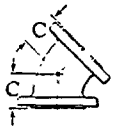


45° Lateral

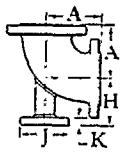
26



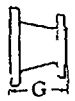
90° Long Radius Elbow



45° Elbow



90° Base Elbow



Taper Reducer

Return Bend

| Class | Size | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 Pound | 1 | 3½ | 5 | 1¾ | 5¾ | 1¾ | 7½ | | | | |
| | 1¼ | 3¾ | 5½ | 2 | 6¼ | 1¾ | 8 | | | | |
| | 1½ | 4 | 6 | 2¼ | 7 | 2 | 9 | | | | |
| | 2 | 4½ | 6½ | 2½ | 8 | 2½ | 10½ | 5 | | | |
| | 2½ | 5 | 7 | 3 | 9½ | 2½ | 12 | 5½ | | | |
| | 3 | 5½ | 7¾ | 3 | 10 | 3 | 13 | 6 | | | |
| | 3½ | 6 | 8½ | 3½ | 11½ | 3 | 14½ | 6½ | | | |
| | 4 | 6½ | 9 | 4 | 12 | 3 | 15 | 7 | 5½ | 6 | 11/16 |
| | 5 | 7½ | 10¼ | 4½ | 13½ | 3½ | 17 | 8 | 6¼ | 7 | 13/16 |
| | 6 | 8 | 11½ | 5 | 14½ | 3½ | 18 | 9 | 7 | 7 | 13/16 |
| | 8 | 9 | 14 | 5½ | 17½ | 4½ | 22 | 11 | 8⅜ | 9 | ⅞ |
| | 10 | 11 | 16½ | 6½ | 20½ | 5 | 25½ | 12 | 9¾ | 9 | ⅞ |
| | 12 | 12 | 19 | 7½ | 24½ | 5½ | 30 | 14 | 11¼ | 11 | 15/16 |
| | 14 | 14 | 21½ | 7½ | 27 | 6 | 33 | | 12½ | 11 | 15/16 |
| | 16 | 15 | 24 | 8 | 30 | 6½ | 36½ | | 13¾ | 11 | 15/16 |
| | 18 | 16½ | 26½ | 8½ | 32 | 7 | 39 | | 15 | 13½ | 11/16 |
| | 20 | 18 | 29 | 9½ | 35 | 8 | 43 | | 16 | 13½ | 11/16 |
| | 24 | 22 | 34 | 11 | 40½ | 9 | 49½ | | 18½ | 13½ | 11/16 |
| 300 Pound | 1 | 4 | 5 | 2¼ | 6½ | 2 | 8½ | | | | |
| | 1¼ | 4¼ | 5½ | 2½ | 7¼ | 2¼ | 9½ | | | | |
| | 1½ | 4½ | 6 | 2¾ | 8½ | 2½ | 11 | | | | |
| | 2 | 5 | 6½ | 3 | 9 | 2½ | 11½ | 5 | | | |
| | 2½ | 5½ | 7 | 3½ | 10½ | 2½ | 13 | 5½ | | | |
| | 3 | 6 | 7¾ | 3½ | 11 | 3 | 14 | 6 | | | |
| | 3½ | 6½ | 8½ | 4 | 12½ | 3 | 15½ | 6½ | | | |
| | 4 | 7 | 9 | 4½ | 13½ | 3 | 16½ | 7 | 6 | 6½ | 13/16 |
| | 5 | 8 | 10¼ | 5 | 15 | 3½ | 18½ | 8 | 6¾ | 7½ | 15/16 |
| | 6 | 8½ | 11½ | 5½ | 17½ | 4 | 21½ | 9 | 7½ | 7½ | 15/16 |
| | 8 | 10 | 14 | 6 | 20½ | 5 | 25½ | 11 | 9 | 10 | 13/16 |
| | 10 | 11½ | 16½ | 7 | 24 | 5½ | 29½ | 12 | 10½ | 10 | 13/16 |
| | 12 | 13 | 19 | 8 | 27½ | 6 | 33½ | 14 | 12 | 12½ | 1⅜ |
| | 14 | 15 | 21½ | 8½ | 31 | 6½ | 37½ | | 13½ | 12½ | 1⅜ |
| | 16 | 16½ | 24 | 9½ | 34½ | 7½ | 42 | | 14¾ | 12½ | 1⅜ |
| | 18 | 18 | 26½ | 10 | 37½ | 8 | 45½ | | 16¼ | 15 | 1 9/16 |
| | 20 | 19½ | 29 | 10½ | 40½ | 8½ | 49 | | 17⅞ | 15 | 1 9/16 |
| | 24 | 22½ | 34 | 12 | 47½ | 10 | 57½ | | 20¾ | 17½ | 1 13/16 |

Drilling of Base on 90° Base Elbow

| Size Elbow | 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. |
|---|---|---|---|---|---|---|
| | Diameter of Bolt Circle | | | | | |
| 4 | 4¾ | 5 | 5 | 5⅞ | 5⅞ | 7⅞ |
| 5 | 5½ | 5⅞ | 5⅞ | 7⅞ | 7⅞ | 7⅞ |
| 6 | 5½ | 5⅞ | 5⅞ | 7⅞ | 7⅞ | 10⅝ |
| 8 | 7½ | 7⅞ | 7⅞ | 10⅝ | 10⅝ | 10⅝ |
| 10 | 7½ | 7⅞ | 7⅞ | 10⅝ | 10⅝ | 13 |
| 12 | 9½ | 10⅝ | 10⅝ | 13 | 13 | 13 |
| 14 | 9½ | 10⅝ | 10⅝ | 13 | 13 | 15¼ |
| 16 | 9½ | 10⅝ | 10⅝ | 13 | 13 | |
| 18 | 11¾ | 13 | 13 | | | |
| 20 | 11¾ | 13 | 13 | | | |
| 24 | 11¾ | 15¼ | 15¼ | | | |
| | Diameter of Bolts | | | | | |
| 4 | ⅝ | ⅝ | ⅝ | ¾ | ¾ | ¾ |
| 5 | ⅝ | ¾ | ¾ | ¾ | ¾ | ¾ |
| 6 | ⅝ | ¾ | ¾ | ¾ | ¾ | ¾ |
| 8 | ⅝ | ¾ | ¾ | ¾ | ¾ | ¾ |
| 10 | ⅝ | ¾ | ¾ | ¾ | ¾ | ⅞ |
| 12 | ¾ | ¾ | ¾ | ⅞ | ⅞ | ⅞ |
| 14 | ¾ | ¾ | ¾ | ⅞ | ⅞ | 1 |
| 16 | ¾ | ¾ | ¾ | ⅞ | ⅞ | |
| 18 | ¾ | ⅞ | ⅞ | | | |
| 20 | ¾ | ⅞ | ⅞ | | | |
| 24 | ¾ | 1 | 1 | | | |
| | Number of Bolts | | | | | |
| All sizes | 4 | 4 | 4 | 4 | 4 | 4 |

90° Base Elbows are regularly furnished with the base flange plain faced. When drilling is ordered, the base flange will be drilled (unless otherwise specified) to the corresponding pressure class of the American Standard, as indicated above, and spot faced. Extra list prices apply; see pages 270 and 271.

| Return Bends | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 Pound | Size | 2 | 3 | | | | 4 | | | | | | | | 6 | | | |
| | L | 7 | 7½ | 8 | 9 | 9 | 10 | 11 | 12 | 13 | 14 | 18 | 12 | 15 | | | | |
| | M | 6 | 7 | 7¼ | 7¾ | 8⅝ | 9⅛ | 9⅝ | 10⅛ | 10⅝ | 11⅛ | 13⅛ | 11¼ | 12¾ | | | | |
| 300 Pound | Size | 2 | 3 | | | 4 | | | | | 6 | | | | 8 | | | |
| | L | 7½ | 8½ | 12 | 10 | 11 | 11½ | 12 | 16½ | 17 | 17½ | 18 | 14 | 15 | 16½ | 17 | 18 | 17½ |
| | M | 6⅝ | 8 | 9¾ | 9⅝ | 10⅛ | 10⅜ | 10⅝ | 12⅞ | 13⅛ | 13⅜ | 13⅝ | 13 | 13½ | 14¼ | 14½ | 15 | 16 |

# Dimensions, in Inches (Cont.)

| Class | Size | A | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| 400 Pound | 4 | 8 | 5½ | 16 | 4½ | 20½ | 8¼ | 6 | 6½ | 13/16 |
| | 5 | 9 | 6 | 16¾ | 5 | 21¾ | 9¼ | 6¾ | 7½ | 15/16 |
| | 6 | 9¾ | 6¼ | 18¾ | 5¼ | 24 | 10 | 7½ | 7½ | 15/16 |
| | 8 | 11¾ | 6¾ | 22¼ | 5¾ | 28 | 12 | 9 | 10 | 13/16 |
| | 10 | 13¼ | 7¾ | 25¾ | 6¼ | 32 | 13½ | 10½ | 10 | 13/16 |
| | 12 | 15 | 8¾ | 29¾ | 6½ | 36¼ | 15¼ | 12 | 12½ | 1⅜ |
| | 14 | 16¼ | 9¼ | 32¾ | 7 | 39¾ | | 13½ | 12½ | 1⅜ |
| | 16 | 17¾ | 10¼ | 36¼ | 8 | 44¼ | | 14¾ | 12½ | 1⅜ |
| | 18 | 19¼ | 10¾ | 39¼ | 8½ | 47¾ | | 16¼ | 15 | 19/16 |
| | 20 | 20¾ | 11¼ | 42¾ | 9 | 51¾ | | 17⅞ | 15 | 19/16 |
| | 24 | 24¼ | 12¾ | 50¼ | 10½ | 60¾ | | 20¾ | 17½ | 1 13/16 |
| 600 Pound | ½ | 3¼ | 2 | 5¾ | 1¾ | 7½ | | | | |
| | ¾ | 3¾ | 2½ | 6¾ | 2 | 8¾ | | | | |
| | 1 | 4¼ | 2½ | 7¼ | 2¼ | 9½ | | | | |
| | 1¼ | 4½ | 2¾ | 8 | 2½ | 10½ | | | | |
| | 1½ | 4¾ | 3 | 9 | 2¾ | 11¾ | | | | |
| | 2 | 5¾ | 4¼ | 10¼ | 3½ | 13¾ | 6 | | | |
| | 2½ | 6½ | 4½ | 11½ | 3½ | 15 | 6¾ | | | |
| | 3 | 7 | 5 | 12¾ | 4 | 16¾ | 7¼ | | | |
| | 3½ | 7½ | 5½ | 14 | 4½ | 18½ | 7¾ | | | |
| | 4 | 8½ | 6 | 16½ | 4½ | 21 | 8¾ | 7 | 7½ | 15/16 |
| | 5 | 10 | 7 | 19½ | 6 | 25½ | 10¼ | 8¼ | 10 | 13/16 |
| | 6 | 11 | 7½ | 21 | 6½ | 27½ | 11¼ | 9 | 10 | 13/16 |
| | 8 | 13 | 8½ | 24½ | 7 | 31½ | 13¼ | 11 | 12½ | 1⅜ |
| | 10 | 15½ | 9½ | 29½ | 8 | 37½ | 15¾ | 12½ | 12½ | 1⅜ |
| | 12 | 16½ | 10 | 31½ | 8½ | 40 | 16¾ | 13¼ | 15 | 19/16 |
| | 14 | 17½ | 10¾ | 34¼ | 9 | 43¼ | | 14¾ | 15 | 19/16 |
| | 16 | 19½ | 11¾ | 38½ | 10 | 48½ | | 16 | 15 | 19/16 |
| | 18 | 21½ | 12¼ | 42 | 10½ | 52½ | | Dimensions on application | | |
| | 20 | 23½ | 13 | 45½ | 11 | 56½ | | | | |
| | 24 | 27½ | 14¾ | 53 | 13 | 66 | | | | |
| 900 Pound | 3 | 7½ | 5½ | 14½ | 4½ | 19 | | | | |
| | 4 | 9 | 6½ | 17½ | 5½ | 23 | 9¼ | 7 | 7½ | 15/16 |
| | 5 | 11 | 7½ | 21 | 6½ | 27½ | 11¼ | 8¼ | 10 | 13/16 |
| | 6 | 12 | 8 | 22½ | 6½ | 29 | 12¼ | 9 | 10 | 13/16 |
| | 8 | 14½ | 9 | 27½ | 7½ | 35 | 14¾ | 11 | 12½ | 1⅜ |
| | 10 | 16½ | 10 | 31½ | 8½ | 40 | 16¾ | 12½ | 12½ | 1⅜ |
| | 12 | 19 | 11 | 34½ | 9 | 43½ | 17¾ | 13¼ | 15 | 19/16 |
| | 14 | 20¼ | 11½ | 36½ | 9½ | 46 | | 14¾ | 15 | 19/16 |
| | 16 | 22¼ | 12½ | 40¾ | 10½ | 51¼ | | 16 | 15 | 19/16 |
| | 18 | 24 | 13¼ | 45½ | 12 | 57½ | | Dimensions on application | | |
| | 20 | 26 | 14½ | 50¼ | 13 | 63¼ | | | | |
| | 24 | 30½ | 18 | 60 | 15½ | 75½ | | | | |
| 1500 Pound | ½ | 4¼ | 3 | | | | | | | |
| | ¾ | 4½ | 3¼ | | | | | | | |
| | 1 | 5 | 3½ | 9 | 2½ | 11½ | | | | |
| | 1¼ | 5½ | 4 | 10 | 3 | 13 | | | | |
| | 1½ | 6 | 4¼ | 11 | 3½ | 14½ | | | | |
| | 2 | 7¼ | 4¾ | 13¼ | 4 | 17¼ | 7¼ | | | |
| | 2½ | 8¼ | 5¼ | 15¼ | 4½ | 19¾ | 8¼ | | | |
| | 3 | 9¼ | 5¾ | 17¼ | 5 | 22¼ | 9¼ | | | |
| | 4 | 10¾ | 7¼ | 19¼ | 6 | 25¼ | 10¾ | 7¾ | 10 | 13/16 |
| | 5 | 13¼ | 8¾ | 23¼ | 7½ | 30¾ | 13¾ | 9 | 10 | 13/16 |
| | 6 | 13⅞ | 9⅜ | 24⅞ | 8⅛ | 33 | 14½ | 9¾ | 12½ | 1⅜ |
| | 8 | 16⅜ | 10⅞ | 29⅞ | 9⅛ | 39 | 17 | 11½ | 12½ | 1⅜ |
| | 10 | 19½ | 12 | 36 | 10⅛ | 46¼ | | 13¾ | 15 | 19/16 |
| | 12 | 22¼ | 13¼ | 40¾ | 12 | 52¾ | | 15½ | 15 | 19/16 |
| | 14 | 24¾ | 14¼ | 44 | 12½ | 56½ | | 17¼ | 17½ | 1 13/16 |
| | 16 | 27¼ | 16¼ | 48¼ | 14¾ | 63 | | | | |
| | 18 | 30¼ | 17¾ | 53¼ | 16½ | 69¾ | | | | |
| | 20 | 32¾ | 18¾ | 57¾ | 17¾ | 75½ | | | | |
| | 24 | 38¼ | 20¾ | 67¼ | 20½ | 87¾ | | | | |

| Class | Size | A | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 2500 Pound | ½ | 5 3/16 | | | | | |
| | ¾ | 5⅜ | | | | | |
| | 1 | 6 1/16 | 4 | | | | |
| | 1¼ | 6⅞ | 4¼ | | | | |
| | 1½ | 7 9/16 | 4¾ | | | | |
| | 2 | 8⅞ | 5¾ | 15¼ | 5¼ | 20½ | 9½ |
| | 2½ | 10 | 6¼ | 17¼ | 5¾ | 23 | 10½ |
| | 3 | 11⅜ | 7¼ | 19¾ | 6¾ | 26½ | 11¾ |
| | 4 | 13¼ | 8½ | 23 | 7¾ | 30¾ | 13½ |
| | 5 | 15⅝ | 10 | 27¼ | 9¼ | 36½ | 15¾ |
| | 6 | 18 | 11½ | 31¼ | 10½ | 41¾ | 18 |
| | 8 | 20⅛ | 12¾ | 35¼ | 11¾ | 47 | 20½ |
| | 10 | 25 | 16 | 43¼ | 14¾ | 58 | 25½ |
| | 12 | 28 | 17¾ | 49¼ | 16¼ | 65½ | 29 |

### Center to Face

The 150 and 300-Pound Fittings are regularly furnished with an American Standard 1/16-inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Fittings regularly have a ¼-inch high large male facing. Center to face and face to face dimensions include the facing.

### Special Angle Elbows

The center to face dimensions of 45° elbows are used for special angle elbows of 1° to 45°; for angles greater than 45° and up to 90°, use the center to face dimensions of 90° elbows.

### Reducing Fittings

Center to face dimensions of reducing fittings correspond to those of straight fittings of the same size as the largest opening.

### American Standard

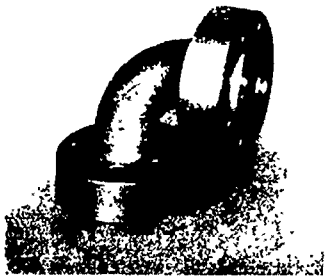
Crane Cast Steel Flanged Fittings, with the exception of the fabricated base on 90° Base Elbows, conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective working pressures.

The American Standard does not include Return Bends or ½ and ¾-inch 45° Laterals in the 1500-Pound pressure class.

*Working pressures.....page 268*
*List prices.....pages 270 and 271*
*Description.....page 269*
*Drilling templates....pages 461 to 463*
*Flange dimensions ..pages 461 to 463*
*Special facings.....pages 468 to 471*

# 4000-Pound Pressure Class

26



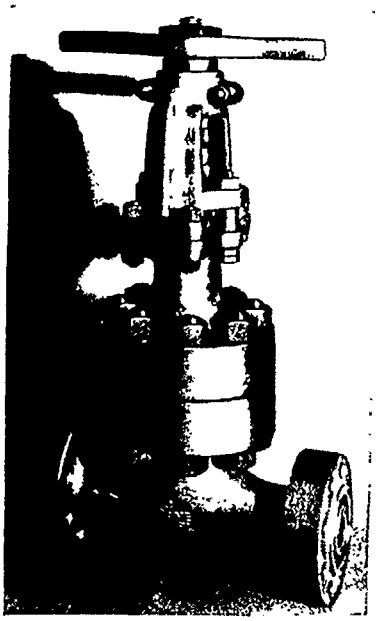
90° Elbow

For pressures and temperatures beyond the scope of the 1500 and 2500-Pound Pressure Classes, Crane is equipped to supply valves, fittings, and flanges in the 4000-Pound Pressure Class.

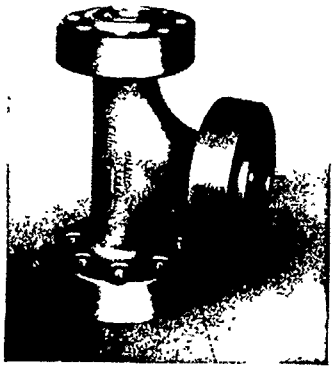
These products are generally made of Crane No. 5 Chrome-Molybdenum Alloy Cast Steel, and finished with ring joint facing. When so desired, they can be supplied in other alloys, such as Crane No. 4 Carbon-Molybdenum Alloy Cast Steel, or furnished with other types of facings.

Inquiries should be accompanied by complete specifications including operating pressures and temperatures, and plans of proposed installation.

***Prices, description, dimensions, and complete information furnished on application.***



Globe Valve



Tee

The illustrations on this page are actual photographs of Crane Valves and Fittings with flanged ends and ring joint facing supplied for a 4000-Pound installation. They are made of Crane No. 5 Chrome-Molybdenum Alloy Cast Steel, and are recommended for operating service at 4000 pounds pressure at 900° F. temperature.

Group of Fittings for 4000-Pound Pressure Class

# Steel Welding Fittings

**Socket-Welding Fittings**
Description and Ratings.....pages 277 and 278
List Prices.....pages 277 and 278
Dimensions.....pages 278 and 279
Reducer Inserts, List Prices and Dimensions.....page 278

**Butt-Welding Fittings**
For Use with Standard Pipe.....pages 280 and 281
For Use with Extra Strong Pipe.....pages 282 and 283
For Use with Schedule 160 Pipe.....page 284
For Use with Double Extra Strong Pipe.....page 284
Reducers, Welding Saddles, and Welding Sleeves...page 285
Dimensions.....page 286
Pressure-Temperature Ratings.....pages 288 and 289

**Bonney WeldOlets**.....page 287

**Boiler Flanges**.....page 290

The Crane line of Steel Welding Fittings — comprising two types, socket-welding and butt-welding — includes all of the popular kinds of fittings in a wide range of sizes, and in all regular, commercially available weights.

Wherever the user of welding fittings demands easy installation — wherever maintenance costs are carefully considered — wherever quality, completeness, and adaptability are of prime importance — Crane Steel Welding Fittings are chosen.

**Socket-Welding Fittings:** Forged Steel Socket-Welding Fittings (see pages 270 to 279) are ideal when welding fittings are wanted for use in small pipe lines.

The fittings are of high quality throughout; they are forged solid from high grade steel or are machined from bar stock, depending upon the type of fitting; the openings are drilled and the ends are bored to slip over pipe.

**Butt-Welding Fittings:** Butt-Welding Fittings (see pages 280 to 286), recommended for general all-around welding service, are designed to combine serviceability with ease of installation; the use of these fittings reduces the welder's task to its simplest form — that of making circumferential butt-welds. The materials from which the fittings are made are especially selected to assure strength, resistance to piping strains and temperature, and easy weldability.

Crane Steel Butt-Welding Fittings are fully as strong as, or stronger than, Grade A Seamless Steel Pipe of corresponding thickness. They can be used for any pressure or temperature for which the pipe is used, with equal safety; see pages 288 and 289.

The fittings have a uniform circular section of full diameter, uniform center to end dimensions, and accurately beveled, true, round ends.

**Other welding end products:** Crane supplies a complete welding line—not the fittings only! Real advantages accrue to the user by being able to secure welding valves and other accessories for welded piping, as well as fittings and flanges, from one reliable source—and all of the highest quality. A uniformly satisfactory installation is within reach when Crane welding materials are used.

Forged Steel Flanges—Welding Neck, Slip-On Welding, and Cranelap (for use with Cranelap Stub Ends) —are available in a full range of sizes in all pressure classes; see pages 291 to 298. Steel Gate, Globe, Angle, and Check Valves with welding ends also are available in a complete range of sizes and in all pressure classes; see pages 205 to 256.

In addition, Crane Fabricating Shops are unusually well equipped, as explained in Section 41, to supply pre-fabricated piping, assembled in units for final erection with a minimum of field effort.

**American Standard:** Crane Steel Butt-Welding Fittings conform to the American Standard for Steel Butt-Welding Fittings, B16.9-1951. This Standard includes the following types of fittings in sizes 1 to 24-inch inclusive:

**90° Elbows**, Long Radius
**45° Elbows**, Long Radius
**Tees**...The Standard includes dimensions for the center to end of run on all sizes up to 24-inch, and the center to the end of outlet on all sizes up to 12-inch
**Caps**
**Return Bends**, Long Radius
**Reducers**...The Standard does not include sizes 3 x 1, 4 x 1¼, 4 x 1, 6 x 2, 8 x 3, and 10 x 3-inch.
**Lapped Joint Stub Ends** (Cranelap Stub Ends)

27

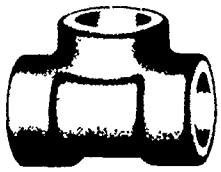
# Forged Steel Socket-Welding Fittings

## 2000, 3000, 4000, and 6000-Pound W.O.G.

*For list prices, see the opposite page.*

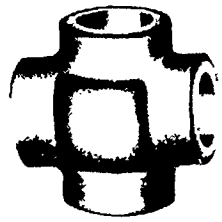
27

90° Elbow
No. 1240, 2000-Lb. WOG
No. 1380, 3000-Lb. WOG
No. 1460, 4000-Lb. WOG
No. 1660, 6000-Lb WOG

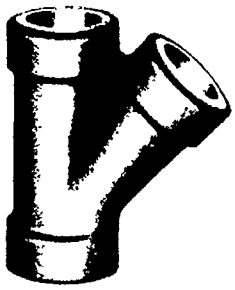


Tee
No. 1241, 2000-Lb. WOG
No. 1381, 3000-Lb. WOG
No. 1461, 4000-Lb. WOG
No. 1661, 6000-Lb. WOG

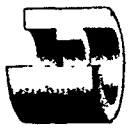
45° Elbow
No. 1242, 2000-Lb. WOG
No. 1382, 3000-Lb. WOG
No. 1462, 4000-Lb. WOG
No. 1662, 6000-Lb WOG



Cross
No. 1243, 2000-Lb. WOG
No. 1383, 3000-Lb. WOG
No. 1463, 4000-Lb WOG
No. 1663, 6000-Lb. WOG



45° Y-Bend
No. 1245, 2000-Lb. WOG
No. 1385, 3000-Lb. WOG
No. 1465, 4000-Lb. WOG
No. 1665, 6000-Lb. WOG



Coupling
No. 1246, 2000-Lb. WOG
No. 1386, 3000-Lb. WOG
No. 1466, 4000-Lb. WOG
No. 1666, 6000-Lb. WOG

Reducer
No. 1247, 2000-Lb. WOG
No. 1387, 3000-Lb. WOG
No. 1467, 4000-Lb. WOG
No. 1667, 6000-Lb. WOG

Cap
No. 1249, 2000-Lb. WOG
No. 1389, 3000-Lb. WOG
No. 1469, 4000-Lb. WOG
No. 1669, 6000-Lb. WOG

***2000-Pound W.O.G. Fittings are for use with Schedule 40 or Standard Pipe.***
***3000-Pound W.O.G. Fittings are for use with Schedule 80 or Extra Strong Pipe.***
***4000-Pound W.O.G. Fittings are for use with Schedule 160 Pipe.***
***6000-Pound W.O.G. Fittings are for use with Double Extra Strong Pipe.***

These unusually rugged, durable fittings are ideally suited for small (up to and including 4-inch size) welded lines on relatively low pressure service, or for high pressure hydraulic lines and high pressure-temperature service.

**Design and construction:** Elbows, tees, crosses, and Y-bends are forged solid; reducer inserts (illustrated on page 278), couplings, reducers, and caps are machined from solid steel. All openings are drilled, and the ends are bored to slip over pipe.

Elbows, tees, crosses, and Y-bends have each opening reinforced with a wide band. It completely surrounds the socket chamber, extending well beyond the back of the socket, and complies with recognized requirements for socket weld dimensions.

WORKING PRESSURES
Pounds, Non-Shock
For Steam, Water, Oil, Oil Vapor, Gas, or Air

| Temp. | Carbon Steel Fittings | | | | Carbon-Molybdenum Steel Fittings | | | |
|---|---|---|---|---|---|---|---|---|
| Deg. F. | 2000 Pound W.O.G. | 3000 Pound W.O.G. | 4000 Pound W.O.G. | 6000 Pound W.O.G. | 2000 Pound W.O.G. | 3000 Pound W.O.G. | 4000 Pound W.O.G. | 6000 Pound W.O.G. |
| 100 | 2000 | 3000 | 4000 | 6000 | 2000 | 3000 | 4000 | 6000 |
| 150 | 1980 | 2960 | 3960 | 5915 | 1980 | 2960 | 3960 | 5915 |
| 200 | 1950 | 2920 | 3890 | 5830 | 1950 | 2920 | 3890 | 5830 |
| 250 | 1920 | 2880 | 3840 | 5750 | 1920 | 2880 | 3840 | 5750 |
| 300 | 1900 | 2840 | 3800 | 5690 | 1900 | 2840 | 3800 | 5690 |
| 350 | 1880 | 2820 | 3760 | 5625 | 1880 | 2820 | 3760 | 5625 |
| 400 | 1850 | 2780 | 3700 | 5550 | 1850 | 2780 | 3700 | 5550 |
| 450 | 1830 | 2740 | 3660 | 5490 | 1830 | 2740 | 3660 | 5490 |
| 500 | 1740 | 2600 | 3480 | 5210 | 1740 | 2600 | 3480 | 5210 |
| 550 | 1640 | 2460 | 3290 | 4925 | 1640 | 2460 | 3290 | 4925 |
| 600 | 1550 | 2310 | 3090 | 4620 | 1550 | 2310 | 3090 | 4620 |
| 650 | 1440 | 2150 | 2880 | 4300 | 1440 | 2150 | 2880 | 4300 |
| 700 | 1320 | 1960 | 2620 | 3920 | 1320 | 1960 | 2620 | 3920 |
| 750 | 1190 | 1775 | 2370 | 3550 | 1190 | 1775 | 2370 | 3550 |
| 800 | 1020 | 1525 | 2040 | 3050 | 1045 | 1560 | 2090 | 3125 |
| 850 | 835 | 1250 | 1670 | 2500 | 975 | 1460 | 1950 | 2925 |
| 900 | 585 | 875 | 1170 | 1750 | 900 | 1350 | 1800 | 2700 |
| 950 | 460 | 690 | 920 | 1375 | 835 | 1250 | 1670 | 2500 |
| 1000 | 335 | 500 | 665 | 1000 | 650 | 975 | 1300 | 1950 |

**Materials:** The fittings are made from high grade carbon steel, having unusual strength and toughness. It is particularly suitable for fusion welding.

**American Standard:** These fittings conform to the American Standard for Steel Socket-Welding Fittings (B16.11-1940). This Standard includes elbows, tees, crosses, and couplings in sizes 1/8 to 3 inches for use with Schedule 40 and 80 Pipe and in sizes 1/2 to 3 inches for use with Schedule 160 Pipe.

The Standard specifies that the fittings may be used for the same pressure-temperature ratings as the pipe of the indicated schedule number.

*Reducer Inserts....page 278*

*Dimensions....page 279*

# Forged Steel Socket-Welding Fittings

## 2000, 3000, 4000, and 6000-Pound W.O.G.

List Prices, Each—Carbon Steel Fittings

*For working pressures and description, see the opposite page.*

| Type of Fittings | Size Inches | 90 Elbows | Tees | 45° Elbows | Crosses | 45° Y-Bends | Couplings | Reducers | Caps |
|---|---|---|---|---|---|---|---|---|---|
| | | No. 1240 | No. 1241 | No. 1242 | No. 1243 | No. 1245 | No. 1246 | No. 1247 | No. 1249 |
| 2000-Pound W.O.G. Fittings *For use with Schedule 40 or Standard Pipe* | 1/8 | .55 | .80 | .68 | 1.10 | | .40 | | .35 |
| | 1/4 | .55 | .80 | .68 | 1.10 | 1.40 | .40 | .55 | .35 |
| | 3/8 | .55 | .80 | .68 | 1.10 | 1.85 | .40 | .55 | .35 |
| | 1/2 | .65 | .95 | .78 | 1.30 | 2.00 | .40 | .70 | .45 |
| | 3/4 | .75 | 1.10 | .90 | 1.50 | 2.50 | .45 | 1.00 | .65 |
| | 1 | .90 | 1.35 | 1.08 | 1.90 | 3.00 | .55 | 1.20 | .90 |
| | 1 1/4 | 1.20 | 1.75 | 1.44 | 2.80 | 3.75 | .70 | 1.35 | 1.00 |
| | 1 1/2 | 1.50 | 2.30 | 1.80 | 3.50 | 4.75 | .85 | 1.60 | 1.30 |
| | 2 | 1.90 | 2.90 | 2.28 | 5.00 | 5.80 | 1.15 | 1.85 | 2.00 |
| | 2 1/2 | 2.90 | 4.40 | 3.48 | 7.30 | | 1.60 | 2.75 | 3.65 |
| | 3 | 5.00 | 7.50 | 6.00 | 10.00 | | 2.75 | 3.75 | 4.35 |
| | 4 | 12.50 | 17.00 | 14.00 | 23.00 | | 4.80 | 6.75 | 13.00 |
| | Size Inches | No. 1380 | No. 1381 | No. 1382 | No. 1383 | No. 1385 | No. 1386 | No. 1387 | No. 1389 |
| 3000-Pound W.O.G. Fittings *For use with Schedule 80 or Extra Strong Pipe* | 1/4 | .55 | .80 | .68 | 1.10 | 1.40 | .40 | .55 | .35 |
| | 3/8 | .55 | .80 | .68 | 1.10 | 1.85 | .40 | .55 | .35 |
| | 1/2 | .65 | .95 | .78 | 1.30 | 2.00 | .40 | .70 | .45 |
| | 3/4 | .75 | 1.10 | .90 | 1.50 | 2.50 | .45 | 1.00 | .65 |
| | 1 | .90 | 1.35 | 1.08 | 1.90 | 3.00 | .55 | 1.20 | .90 |
| | 1 1/4 | 1.20 | 1.75 | 1.44 | 2.80 | 3.75 | .70 | 1.35 | 1.00 |
| | 1 1/2 | 1.50 | 2.30 | 1.80 | 3.50 | 4.75 | .85 | 1.60 | 1.30 |
| | 2 | 1.90 | 2.90 | 2.28 | 5.00 | 5.80 | 1.15 | 1.85 | 2.00 |
| | 2 1/2 | 2.90 | 4.40 | 3.48 | 7.30 | | 1.60 | 2.75 | 3.65 |
| | 3 | 5.00 | 7.50 | 6.00 | 10.00 | | 2.75 | 3.75 | 4.35 |
| | 4 | 12.50 | 17.00 | 14.00 | 23.00 | | 4.80 | 6.75 | 13.00 |
| | Size Inches | No. 1460 | No. 1461 | No. 1462 | No. 1463 | No. 1465 | No. 1466 | No. 1467 | No. 1469 |
| 4000-Pound W.O.G. Fittings *For use with Schedule 160 Pipe* | 1/2 | .75 | 1.10 | .90 | 1.50 | 2.50 | .60 | .90 | .65 |
| | 3/4 | .90 | 1.35 | 1.08 | 1.90 | 3.00 | .65 | 1.25 | .90 |
| | 1 | 1.20 | 1.75 | 1.44 | 2.80 | 3.75 | .85 | 1.50 | 1.00 |
| | 1 1/4 | 1.50 | 2.30 | 1.80 | 3.50 | 4.75 | 1.05 | 1.70 | 1.30 |
| | 1 1/2 | 1.90 | 2.90 | 2.28 | 5.00 | 5.80 | 1.30 | 2.10 | 2.00 |
| | 2 | 2.90 | 4.40 | 3.48 | 7.30 | | 1.75 | 2.50 | 3.65 |
| | 2 1/2 | 5.00 | 7.50 | 6.00 | 10.00 | | 2.40 | 3.60 | 4.35 |
| | 3 | 12.50 | 17.00 | 14.00 | 23.00 | | 4.75 | 5.75 | 5.45 |
| | 4 | 18.00 | 25.00 | 21.00 | 31.50 | | 10.90 | 11.75 | 18.00 |
| | Size Inches | No. 1660 | No. 1661 | No. 1662 | No. 1663 | No. 1665 | No. 1666 | No. 1667 | No. 1669 |
| 6000-Pound W.O.G. Fittings *For use with Double Extra Strong Pipe* | 3/8* | .65 | .95 | .78 | 1.30 | 2.00 | .60 | .75 | .45 |
| | 1/2 | .75 | 1.10 | .90 | 1.50 | 2.50 | .60 | .90 | .65 |
| | 3/4 | .90 | 1.35 | 1.08 | 1.90 | 3.00 | .65 | 1.25 | .90 |
| | 1 | 1.20 | 1.75 | 1.44 | 2.80 | 3.75 | .85 | 1.50 | 1.00 |
| | 1 1/4 | 1.50 | 2.30 | 1.80 | 3.50 | 4.75 | 1.05 | 1.70 | 1.30 |
| | 1 1/2 | 1.90 | 2.90 | 2.28 | 5.00 | 5.80 | 1.30 | 2.10 | 2.00 |
| | 2 | 2.90 | 4.40 | 3.48 | 7.30 | | 1.75 | 2.50 | 3.65 |
| | 2 1/2 | 5.00 | 7.50 | 6.00 | 10.00 | | 2.40 | 3.60 | 4.35 |
| | 3 | 12.50 | 17.00 | 14.00 | 23.00 | | 4.75 | 5.75 | 5.45 |
| | 4 | 18.00 | 25.00 | 21.00 | 31.50 | | 10.90 | 11.75 | 18.00 |

*3/8 inch 6000-Pound W.O.G. Fittings are bored for pipe having an I.D. of .187" and a wall thickness of .244".

**Reducing fittings:** Reducing fittings can be made in any reduction from straight size forging blanks; see the Crane Discount Sheet for prices.

**Alloy steel fittings:** Fittings of Carbon-Molybdenum Steel or of stainless steel, Type 347, can be made to order; prices are furnished on application.

*Reducer Inserts . . . page 278*

**Sleeve and half couplings:** Couplings, unless otherwise ordered, are the socket-end type listed above. Sleeve couplings, made without the internal shoulder, and half couplings can be furnished when ordered; they use the same list prices as regular couplings. See the Crane Discount Sheet for prices.

*Dimensions . . . . page 279*

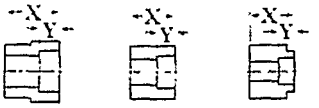
# Steel Socket-Welding Reducer Inserts

Reducer Insert

No. 1250
For use with Standard or Schedule 40 Pipe

No. 1390
For use with Extra Strong or Schedule 80 Pipe

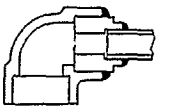





Type No. 1 Type No. 2 Type No. 3

Socket-Welding Reducer Inserts serve the same purpose as threaded bushings used with screwed fittings. They simplify the problem of making reductions in the sizes of pipe in socket-welded lines and avoid the delays and extra costs involved in procuring reducing fittings. By carrying an assorted stock of Reducer Inserts, the user can make up many combinations of reducing sizes in any type of fitting in the least amount of time and at low cost.

The illustration at the right shows one of these fittings inserted in a straight size 90° elbow to make a reducing size. The Insert is placed in the end of the fitting and fillet welded; the smaller size pipe is then inserted in the smaller pipe end of the Reducer Insert and welded.



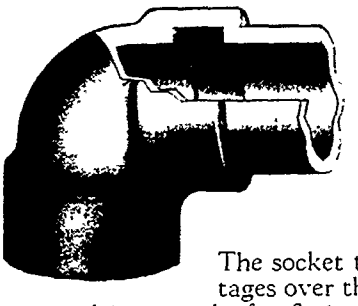
Illustrating the application of a Socket-Welding Reducer Insert to a Socket-Welding 90° Elbow.

Reducer Inserts are available in 1, 1¼, 1½, and 2-inch sizes, the No. 1250 being made for use with Standard or Schedule 40 Pipe and the No. 1390 being made for use with Extra Strong or Schedule 80 Pipe. Regularly supplied of Carbon Steel, they can be furnished made of Carbon-Molybdenum Steel; prices on application. The fittings are made in three types, depending on the size, as illustrated above.

List Prices, Carbon Steel, and Dimensions

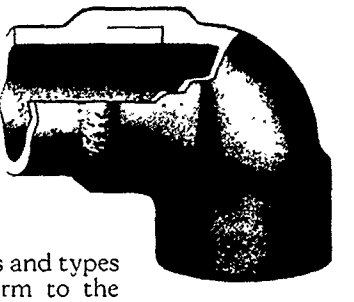
| Size | List Prices, Each | | Dimensions, in Inches | | |
|---|---|---|---|---|---|
| Inches | No. 1250 | No. 1390 | Type No. | X | Y |
| 1 × ¾ | .45 | .45 | 1 | 1½ | 9/16 |
| × ½ | | | 2 | 1 5/16 | ½ |
| 1¼ × 1 | .55 | .55 | 1 | 1 11/16 | ⅝ |
| × ¾ | | | 2 | 1⅜ | 9/16 |
| × ½ | | | 3 | 1⅜ | ½ |
| 1½ × 1¼ | .70 | .70 | 1 | 1⅞ | 11/16 |
| × 1 | | | 2 | 1 7/16 | ⅝ |
| × ¾ | | | 3 | 1 7/16 | 9/16 |
| × ½ | | | 3 | 1 7/16 | ½ |
| 2 × 1½ | 1.10 | 1.10 | 2 | 1 9/16 | ¾ |
| × 1¼ | | | 3 | 1 9/16 | 11/16 |
| × 1 | | | 3 | 1 9/16 | ⅝ |
| × ¾ | | | 3 | 1 9/16 | 9/16 |
| × ½ | | | 3 | 1 9/16 | ½ |

# Advantages of Steel Socket-Welding Fittings



On installations where the pipe need not butt against the shoulder, the socket compensates for inaccuracies in measuring and cutting the pipe.

On installations where the pipe must butt against the shoulder, free, uninterrupted flow is assured. Fitting and pipe have the same inside diameter.



The socket type weld has advantages over the butt weld that recommend it strongly for fittings for small size pipe lines. The pipe used with it does not require beveling.

Since the pipe end slips into, and is supported by the socket, the joint is self-aligning; tack welding and special clamps to line up and hold the joint are unnecessary. Because the weld metal is deposited on the outer surface of the pipe, there is no danger of forming welding icicles which would clog the line and restrict flow.

These fittings have the same inside diameter as Standard or Schedule 40, Extra Strong or Schedule 80, Schedule 160, or Double Extra Strong Pipe, depending upon the weight of fitting ordered. On installations where the pipe is butted against the shoulder at the back of the socket, the fittings permit free, uninterrupted flow of the fluid in the line.

The fittings, in the sizes and types covered therein, conform to the American Standard, A.S.A. B16.11–1946, as explained on page 276. The bore diameter of the socket is the same for all fittings regardless of the pressure class.

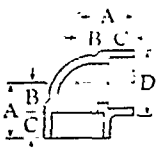
Forged Steel Socket-Welding Fittings have ample metal sections throughout; the long, low band forming the socket wall extends beyond the shoulder at the back of the bore, leaving no weak corner. Exhaustive tests show conclusively that the fittings are as strong as, or stronger than, pipe.

| Size of Fitting | Bore Diameter of Socket (Minimum) |
|---|---|
| ⅛" | 0.420" |
| ¼ | 0.555 |
| ⅜ | 0.690 |
| ½ | 0.855 |
| ¾ | 1.065 |
| 1 | 1.330 |
| 1¼ | 1.675 |
| 1½ | 1.915 |
| 2 | 2.406 |
| 2½ | 2.906 |
| 3 | 3.535 |
| 4 | 4.545 |

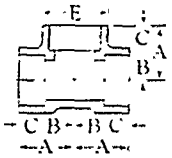
Being only slightly larger than pipe, the fittings, when welded in place, make an exceptionally neat appearing, workmanlike installation.

# Forged Steel Socket-Welding Fittings

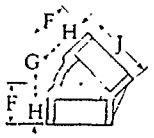
## Dimensions, in Inches



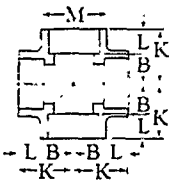
90° Elbow



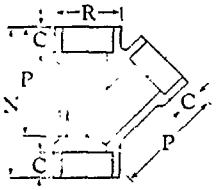
Tee



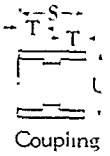
45° Elbow



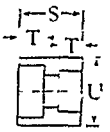
Cross



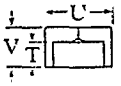
45° Y-Bend



Coupling



Reducer



Cap

***Dimensions of reducing sizes are the same as those of the straight size corresponding to the largest opening.***

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| Size | A | B | C | D | E | F | G | H | J | K | L | M | N | P | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2000-Pound W.O.G. Fittings, for use with Schedule 40 or Standard Pipe** | | | | | | | | | | | | | | | | | | | |
| 1/8 | 13/16 | 7/16 | 3/8 | 15/16 | 7/8 | 11/16 | 5/16 | 3/8 | 15/16 | 31/32 | 17/32 | 1 | | | | 1 | 3/8 | 3/4 | 5/8 |
| 1/4 | 13/16 | 7/16 | 3/8 | 29/32 | 29/32 | 3/4 | 5/16 | 7/16 | 1 1/32 | 31/32 | 17/32 | 1 | 25/16 | 1 5/8 | 13/16 | 1 | 3/8 | 3/4 | 5/8 |
| 3/8 | 31/32 | 17/32 | 7/16 | 1 1/32 | 1 1/32 | 3/4 | 5/16 | 7/16 | 1 1/32 | 31/32 | 7/16 | 1 | 2 11/16 | 1 7/8 | 1 | 1 1/8 | 7/16 | 1 | 11/16 |
| 1/2 | 1 1/8 | 5/8 | 1/2 | 15/16 | 15/16 | 7/8 | 7/16 | 7/16 | 15/16 | 1 1/8 | 1/2 | 1 5/16 | 3 | 2 1/8 | 1 1/4 | 1 3/8 | 1/2 | 1 1/4 | 3/4 |
| 3/4 | 15/16 | 3/4 | 9/16 | 1 1/2 | 1 1/2 | 1 | 1/2 | 1/2 | 1 1/2 | 15/16 | 9/16 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 1/2 | 9/16 | 1 1/2 | 13/16 |
| 1 | 1 1/2 | 7/8 | 5/8 | 1 13/16 | 1 13/16 | 1 1/8 | 9/16 | 9/16 | 1 13/16 | 1 1/2 | 5/8 | 1 13/16 | 4 1/8 | 3 | 1 13/16 | 1 3/4 | 5/8 | 1 3/4 | 1 |
| 1 1/4 | 1 3/4 | 1 1/16 | 11/16 | 2 7/32 | 2 7/32 | 1 5/16 | 11/16 | 5/8 | 2 7/32 | 1 3/4 | 11/16 | 2 3/16 | 4 13/16 | 3 1/2 | 2 3/16 | 1 7/8 | 11/16 | 2 1/4 | 1 1/16 |
| 1 1/2 | 2 | 1 1/4 | 3/4 | 2 15/32 | 2 15/32 | 1 7/16 | 13/16 | 5/8 | 2 15/32 | 2 | 3/4 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 2 | 3/4 | 2 1/2 | 1 3/16 |
| 2 | 2 3/8 | 1 1/2 | 7/8 | 3 | 3 | 1 11/16 | 1 | 1 11/16 | 3 | 2 3/8 | 7/8 | 2 31/32 | 6 7/16 | 4 3/4 | 2 31/32 | 2 1/2 | 7/8 | 3 | 1 3/8 |
| 2 1/2 | 3 | 1 5/8 | 1 3/8 | 3 5/8 | 3 5/8 | 2 1/16 | 1 1/8 | 1 5/16 | 4 | 3 1/4 | 1 5/8 | 4 | | | | 2 1/2 | 7/8 | 3 5/8 | 1 1/2 |
| 3 | 3 3/8 | 2 1/4 | 1 1/8 | 4 5/16 | 4 5/16 | 2 1/2 | 1 1/4 | 1 1/4 | 4 5/8 | 3 3/8 | 1 1/8 | 4 5/8 | | | | 2 3/4 | 1 | 4 1/8 | 1 5/8 |
| 4 | 4 3/16 | 2 5/8 | 1 9/16 | 5 3/4 | 5 3/4 | 3 1/8 | 1 5/8 | 1 1/2 | 5 3/4 | 4 3/16 | 1 9/16 | 5 3/4 | | | | 3 | 1 1/8 | 5 1/4 | 1 7/8 |
| **3000-Pound W.O.G. Fittings, for use with Schedule 80 or Extra Strong Pipe** | | | | | | | | | | | | | | | | | | | |
| 1/4 | 13/16 | 7/16 | 3/8 | 29/32 | 29/32 | 3/4 | 5/16 | 7/16 | 1 1/32 | 31/32 | 17/32 | 1 | 25/16 | 1 5/8 | 13/16 | 1 | 3/8 | 7/8 | 11/16 |
| 3/8 | 31/32 | 17/32 | 7/16 | 1 1/32 | 1 1/32 | 3/4 | 5/16 | 7/16 | 1 1/32 | 31/32 | 7/16 | 1 | 2 11/16 | 1 7/8 | 1 | 1 1/8 | 7/16 | 1 | 3/4 |
| 1/2 | 1 1/8 | 5/8 | 1/2 | 15/16 | 15/16 | 7/8 | 7/16 | 7/16 | 15/16 | 1 1/8 | 1/2 | 1 5/16 | 3 | 2 1/8 | 1 1/4 | 1 3/8 | 1/2 | 1 1/4 | 7/8 |
| 3/4 | 15/16 | 3/4 | 9/16 | 1 1/2 | 1 1/2 | 1 | 1/2 | 1/2 | 1 1/2 | 15/16 | 9/16 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 1/2 | 9/16 | 1 1/2 | 1 |
| 1 | 1 1/2 | 7/8 | 5/8 | 1 13/16 | 1 13/16 | 1 1/8 | 9/16 | 9/16 | 1 13/16 | 1 1/2 | 5/8 | 1 13/16 | 4 1/8 | 3 | 1 13/16 | 1 3/4 | 5/8 | 1 3/4 | 1 1/16 |
| 1 1/4 | 1 3/4 | 1 1/16 | 11/16 | 2 7/32 | 2 7/32 | 1 5/16 | 11/16 | 5/8 | 2 7/32 | 1 3/4 | 11/16 | 2 3/16 | 4 13/16 | 3 1/2 | 2 3/16 | 1 7/8 | 11/16 | 2 1/4 | 1 3/16 |
| 1 1/2 | 2 | 1 1/4 | 3/4 | 2 15/32 | 2 15/32 | 1 7/16 | 13/16 | 5/8 | 2 15/32 | 2 | 3/4 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 2 | 3/4 | 2 1/2 | 1 1/4 |
| 2 | 2 3/8 | 1 1/2 | 7/8 | 3 | 3 | 1 11/16 | 1 | 1 11/16 | 3 | 2 3/8 | 7/8 | 2 31/32 | 6 7/16 | 4 3/4 | 2 31/32 | 2 1/2 | 7/8 | 3 | 1 1/2 |
| 2 1/2 | 3 | 1 5/8 | 1 3/8 | 3 5/8 | 3 5/8 | 2 1/16 | 1 1/8 | 1 5/16 | 4 | 3 1/4 | 1 5/8 | 4 | | | | 2 1/2 | 7/8 | 3 5/8 | 1 1/2 |
| 3 | 3 3/8 | 2 1/4 | 1 1/8 | 4 5/16 | 4 5/16 | 2 1/2 | 1 1/4 | 1 1/4 | 4 5/8 | 3 3/8 | 1 1/8 | 4 5/8 | | | | 2 3/4 | 1 | 4 1/4 | 1 3/4 |
| 4 | 4 3/16 | 2 5/8 | 1 9/16 | 5 3/4 | 5 3/4 | 3 1/8 | 1 5/8 | 1 1/2 | 5 3/4 | 4 3/16 | 1 9/16 | 5 3/4 | | | | 3 | 1 1/8 | 5 1/2 | 1 7/8 |
| **4000-Pound W.O.G. Fittings, for use with Schedule 160 Pipe** | | | | | | | | | | | | | | | | | | | |
| 1/2 | 15/16 | 3/4 | 9/16 | 1 1/2 | 1 1/2 | 1 | 1/2 | 1/2 | 1 1/2 | 15/16 | 9/16 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 3/8 | 1/2 | 1 1/2 | 7/8 |
| 3/4 | 1 1/2 | 7/8 | 5/8 | 1 13/16 | 1 13/16 | 1 1/8 | 9/16 | 9/16 | 1 13/16 | 1 1/2 | 5/8 | 1 13/16 | 4 1/8 | 3 | 1 13/16 | 1 1/2 | 9/16 | 1 3/4 | 15/16 |
| 1 | 1 3/4 | 1 1/16 | 11/16 | 2 3/16 | 2 3/16 | 1 5/16 | 11/16 | 5/8 | 2 3/16 | 1 3/4 | 11/16 | 2 3/16 | 4 13/16 | 3 1/2 | 2 3/16 | 1 3/4 | 5/8 | 2 1/4 | 1 1/8 |
| 1 1/4 | 2 | 1 1/4 | 3/4 | 2 7/16 | 2 7/16 | 1 11/32 | 13/16 | 17/32 | 2 7/16 | 2 | 3/4 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 1 7/8 | 11/16 | 2 1/2 | 1 3/16 |
| 1 1/2 | 2 3/8 | 1 1/2 | 7/8 | 2 31/32 | 2 31/32 | 1 11/16 | 1 | 11/16 | 2 31/32 | 2 3/8 | 7/8 | 2 31/32 | 6 7/16 | 4 3/4 | 2 31/32 | 2 | 3/4 | 3 | 1 3/8 |
| 2 | 2 1/2 | 1 5/8 | 7/8 | 3 5/16 | 3 5/16 | 1 23/32 | 1 1/8 | 1 9/32 | 3 5/16 | 2 1/2 | 7/8 | 3 5/16 | | | | 2 1/2 | 7/8 | 3 5/8 | 1 1/2 |
| 2 1/2 | 3 1/4 | 2 1/4 | 1 | 4 | 4 | 2 1/16 | 1 1/4 | 1 3/16 | 4 | 3 1/4 | 1 | 4 | | | | 2 1/2 | 7/8 | 4 1/8 | 1 5/8 |
| 3 | 3 3/4 | 2 1/2 | 1 1/4 | 4 3/4 | 4 3/4 | 2 1/2 | 1 3/8 | 1 1/8 | 4 5/8 | 3 3/8 | 7/8 | 4 5/8 | | | | 2 3/4 | 1 | 4 5/8 | 1 3/4 |
| 4 | 4 3/16 | 2 5/8 | 1 9/16 | 5 3/4 | 5 3/4 | 3 1/8 | 1 5/8 | 1 1/2 | 5 3/4 | 4 3/16 | 1 9/16 | 5 3/4 | | | | 3 | 1 1/8 | 6 | 2 |
| **6000-Pound W.O.G. Fittings, for use with Double Extra Strong Pipe** | | | | | | | | | | | | | | | | | | | |
| 3/8 | 1 1/8 | 17/32 | 19/32 | 15/16 | 15/16 | 7/8 | 3/8 | 1/2 | 15/16 | 1 1/8 | 19/32 | 1 5/16 | 3 | 2 1/8 | 1 1/4 | 1 1/8 | 7/16 | 1 5/16 | 15/16 |
| 1/2 | 15/16 | 5/8 | 11/16 | 1 1/2 | 1 1/2 | 1 | 3/8 | 5/8 | 1 1/2 | 15/16 | 11/16 | 1 1/2 | 3 9/16 | 2 9/16 | 1 1/2 | 1 3/8 | 1/2 | 1 1/2 | 1 |
| 3/4 | 1 1/2 | 3/4 | 3/4 | 1 13/16 | 1 13/16 | 1 1/8 | 7/16 | 11/16 | 1 13/16 | 1 1/2 | 3/4 | 1 13/16 | 4 1/8 | 3 | 1 13/16 | 1 1/2 | 9/16 | 1 3/4 | 1 1/16 |
| 1 | 1 3/4 | 7/8 | 7/8 | 2 3/16 | 2 3/16 | 1 5/16 | 1/2 | 13/16 | 2 3/16 | 1 3/4 | 7/8 | 2 3/16 | 4 13/16 | 3 1/2 | 2 3/16 | 1 3/4 | 5/8 | 2 1/4 | 1 1/4 |
| 1 1/4 | 2 | 1 1/16 | 15/16 | 2 7/16 | 2 7/16 | 1 11/32 | 5/8 | 23/32 | 2 7/16 | 2 | 15/16 | 2 7/16 | 5 3/8 | 3 15/16 | 2 7/16 | 1 7/8 | 11/16 | 2 1/2 | 1 5/16 |
| 1 1/2 | 2 3/8 | 1 1/4 | 1 1/8 | 2 31/32 | 2 31/32 | 1 11/16 | 19/32 | 13/32 | 2 31/32 | 2 3/8 | 1 1/8 | 2 31/32 | 6 7/16 | 4 3/4 | 2 31/32 | 2 | 3/4 | 3 | 1 3/8 |
| 2 | 2 1/2 | 1 1/2 | 1 | 3 5/16 | 3 5/16 | 1 23/32 | 7/8 | 27/32 | 3 5/16 | 2 1/2 | 1 | 3 5/16 | | | | 2 1/2 | 7/8 | 3 5/8 | 1 5/8 |
| 2 1/2 | 3 1/4 | 1 3/4 | 1 1/2 | 4 | 4 | 2 1/16 | 1 | 1 1/16 | 4 | 3 1/4 | 1 1/2 | 4 | | | | 2 1/2 | 7/8 | 4 1/4 | 1 5/8 |
| 3 | 3 3/4 | 2 1/8 | 1 5/8 | 4 3/4 | 4 3/4 | 2 1/2 | 1 1/4 | 1 1/4 | 4 5/8 | 3 3/8 | 1 1/4 | 4 5/8 | | | | 2 3/4 | 1 | 5 | 1 7/8 |
| 4 | 4 1/2 | 2 5/8 | 1 7/8 | 6 | 6 | 3 1/8 | 1 5/8 | 1 1/2 | 5 3/4 | 4 3/16 | 1 9/16 | 5 3/4 | | | | 3 | 1 1/8 | 6 1/4 | 2 1/8 |

*Description, prices, and ratings....pages 276 to 278*

*Reducer Inserts....page 278*

# Steel Butt-Welding Fittings

## For Use With Standard Pipe

No. 352 E
90° Elbow
Long Radius

*For pressure-temperature ratings, see pages 288 and 289.*
*For list prices, see the following page.*

Return Bend
No. 372 E, Short Radius
No. 373 E, Long Radius

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No. 331 E
90° Elbow
Short Radius

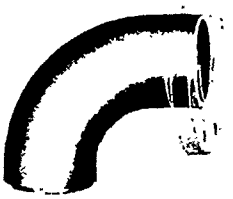
**Thickness:** Standard fittings in sizes 12-inch and smaller are made for use with Standard pipe (the heaviest weight on 8, 10, and 12-inch sizes); and in sizes 14-inch and larger, for use with O.D. pipe ⅜-inch thick.

**Materials:** Unless otherwise specified, butt-welding fittings will be Carbon Steel, Grade A variety, conforming to A.S.T.M. Specification A-234.

Butt-welding fittings made of Grade B Carbon Steel, genuine wrought iron, stainless steel, or other materials can be furnished when ordered; prices on application.

**American Standard:** These fittings, in the sizes and types included in the Standard, conform to the American Standard for Steel Butt-Welding Fittings, B16.9-1951; see page 275.

No. 574
Cranelap Stub End



No. 335 E
90° Long Radius Elbow
with Long Tangent
On One End

**90° Elbow with long tangent:** The No. 335 E 90° Long Radius Elbows have a long tangent on one end to permit welding on a slip-on welding flange. That end is not beveled; the other end is beveled.

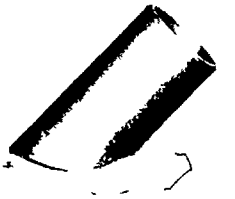
**Cranelap Stub Ends:** Cranelap Stub Ends, made of Grade A Seamless Steel Pipe lapped to the full thickness of the pipe wall, and Cranelap Flanges (see page 294) afford an ideal method of installing flanged equipment in a welded line. The swivel flange eliminates the difficulty of aligning bolt holes and permits installing the equipment at any angle.

No. 350 E
Shaped Nipple
90° Type

No. 357 E
Cap

**Shaped Nipples:** Shaped Nipples eliminate the use of templates when saddling one pipe upon another; they save time and assure an accurate fit. Both ends are beveled for welding. When ordering, be sure to specify nominal size of header on which Nipple will be used.

No. 354 E
45° Long Radius Elbow

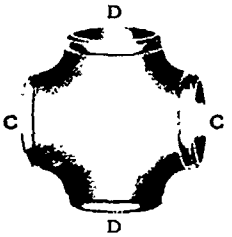


No. 351 E
Shaped Nipple
45° Type

**List of Sizes of Reducing Fittings**
(List prices, shown on the following page, apply only to these sizes.)

| No. 352 E 90° Elbows | | No. 353 E, Tees | | | | | | No. 336 E, Crosses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | A | B | A | B | A | B | C | D |
| 2 ×1½ | 5 ×4 | 1 ×¾ | | 3 ×2½ | 6 ×5 | 14×12 | | 2 ×1½ | 4×3½ | 8 ×6 | |
| ×1¼ | ×3½ | 1¼×1 | | ×2 | ×4 | ×10 | | ×1¼ | ×3 | ×5 | |
| ×1 | ×3 | ×¾ | | ×1½ | ×3½ | ×8 | | ×1 | ×2½ | ×4 | |
| 2½×2 | ×2½ | 1½×1¼ | | ×1¼ | ×3 | ×6 | | ×¾ | ×2 | ×3½ | |
| ×1½ | 6 ×5 | ×1 | | 3½×3 | ×2½ | 16×14 | | 2½×2 | ×1½ | 10×8 | |
| ×1¼ | ×4 | ×¾ | | ×2½ | 8 ×6 | ×12 | | ×1½ | 5×4 | ×6 | |
| 3 ×2½ | ×3½ | 2 ×1½ | | ×2 | ×5 | ×10 | | ×1¼ | ×3½ | ×5 | |
| ×2 | ×3 | ×1¼ | | ×1½ | ×4 | ×8 | | ×1 | ×3 | ×4 | |
| ×1½ | 8 ×6 | [illegible] | | 4 ×3½ | ×3½ | 18×16 | | 3 ×2½ | ×2½ | 12×10 | |
| 3½×3 | ×5 | ×¾ | | ×3 | 10×8 | ×14 | | ×2 | ×2 | ×8 | |
| ×2½ | ×4 | 2½×2 | | ×2½ | ×6 | ×12 | | ×1½ | 6×5 | ×6 | |
| ×2 | 10×8 | ×1½ | | ×2 | ×5 | ×10 | | ×1¼ | ×4 | ×5 | |
| 4 ×3½ | ×6 | ×1¼ | | ×1½ | ×4 | 20×18 | | 3½×3 | ×3½ | | |
| ×3 | ×5 | ×1 | | 5 ×4 | 12×10 | ×16 | | ×2½ | ×3 | | |
| ×2½ | 12×10 | | | ×3½ | ×8 | ×14 | | ×2 | ×2½ | | |
| ×2 | ×8 | | | ×3 | ×6 | ×12 | | ×1½ | | | |
| | ×6 | | | ×2½ | ×5 | 24×20 | | | | | |
| | | | | ×2 | | ×18 | | | | | |
| | | | | | | ×16 | | | | | |

No. 353 E, Tee




No. 336 E, Cross

Reducer
*See page 285*

No. 374 E
Backing Ring
Nub Type

*General description....page 275* *Dimensions....page 286*

# Steel Butt-Welding Fittings

## For Use With Standard Pipe

List Prices, Each, Standard

| Size of Pipe | 90° Elbows | | | | 45° Elbows | Tees | | Crosses | | Caps |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 352 E Long Radius | | No. 331 E Short Radius | No. 335 E With Long Tangent One End | No. 354 E Long Radius | No. 353 E | | No. 336 E | | No. 357 E |
| Inches | Straight | *Reducing | | | | Straight | *Reducing | Straight | *Reducing | |
| ¾ | 1.00 | | | | .90 | 2.15 | | | | |
| 1 | 1.20 | | 1.20 | | 1.08 | 2.15 | 2.70 | | | 1.70 |
| 1¼ | 1.40 | | 1.40 | | 1.26 | 2.90 | 3.60 | | | 1.70 |
| 1½ | 1.70 | | 1.70 | 3.00 | 1.53 | 3.65 | 4.55 | | | 1.70 |
| 2 | 2.10 | 3.60 | 2.10 | 3.70 | 1.90 | 5.00 | 6.25 | 7.50 | 9.40 | 1.85 |
| 2½ | 3.40 | 5.80 | 3.40 | 5.95 | 3.05 | 7.30 | 9.10 | 10.95 | 13.65 | 2.00 |
| 3 | 4.90 | 8.35 | 4.90 | 8.60 | 4.40 | 9.50 | 11.85 | 14.25 | 17.80 | 2.40 |
| 3½ | 6.35 | 10.80 | 6.35 | 11.10 | 5.70 | 12.50 | 15.60 | 18.75 | 23.40 | 3.20 |
| 4 | 7.65 | 13.00 | 7.65 | 13.40 | 6.90 | 13.00 | 16.25 | 19.50 | 24.40 | 3.70 |
| 5 | 10.85 | 18.45 | 10.85 | 19.00 | 9.80 | 24.00 | 30.00 | 36.00 | 45.00 | 4.90 |
| 6 | 15.80 | 25.30 | 15.80 | 27.65 | 14.25 | 28.00 | 35.00 | 42.00 | 52.50 | 5.95 |
| 8 | 30.00 | 48.00 | 30.00 | 52.50 | 27.00 | 45.00 | 56.25 | 67.50 | 84.40 | 10.10 |
| 10 | 53.40 | 85.45 | 53.40 | 93.45 | 48.00 | 76.00 | 95.00 | 114.00 | 142.50 | 14.60 |
| 12 | 80.70 | 129.10 | 80.70 | 141.25 | 72.75 | 110.00 | 137.50 | 165.00 | 206.25 | 20.85 |
| 14 | 120.00 | | 120.00 | Prices above do not include Flange. | 108.00 | 165.00 | 165.00 | | | 24.00 |
| 16 | 175.00 | | 175.00 | | 158.00 | 200.00 | 200.00 | | | 28.00 |
| 18 | 235.00 | | 235.00 | | 212.00 | 245.00 | 245.00 | | | 32.00 |
| 20 | 270.00 | | 270.00 | | 245.00 | 295.00 | 295.00 | | | 35.50 |
| 24 | 340.00 | | 340.00 | | 315.00 | 380.00 | 380.00 | | | 41.75 |

| Size of Pipe | Return Bends | | | | Cranelap Stub Ends | Shaped Nipples | | | Backing Rings | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 372 E Short Radius | | No. 373 E Long Radius | | No. 574 | Shaped to Fit Headers (Nominal Sizes) | No. 350 E 90° Type | No. 351 E 45° Type | Number of Nubs | No. 374 E Nub Type |
| Inches | Center to center | List Price | Center to center | List Price | | | | | | |
| ¾ | | | 2¼" | 2.20 | 3.55 | | | | | |
| 1 | 2" | 2.65 | 3 | 2.65 | 3.55 | | | | 3 | .16 |
| 1¼ | 2½ | 3.10 | 3¾ | 3.10 | 4.00 | | | | 3 | .17 |
| 1½ | 3 | 3.75 | 4½ | 3.75 | 4.45 | | | | 3 | .18 |
| 2 | 4 | 4.65 | 6 | 4.65 | 5.75 | 2 to 10" | .95 | 1.05 | 3 | .19 |
| 2½ | 5 | 7.50 | 7½ | 7.50 | 6.50 | 2½ to 16 | 1.20 | 1.35 | 3 | .22 |
| 3 | 6 | 10.80 | 9 | 10.80 | 7.30 | 3 to 20 | 1.50 | 1.80 | 3 | .24 |
| 3½ | 7 | 14.00 | 10½ | 14.00 | 8.10 | 3½ to 20 | 1.85 | 2.30 | 4 | .26 |
| 4 | 8 | 17.00 | 12 | 17.00 | 9.30 | 4 to 24 | 2.20 | 2.75 | 4 | .29 |
| 5 | 10 | 23.90 | 15 | 23.90 | 10.75 | 5 to 24 | 3.70 | 4.70 | 5 | .33 |
| 6 | 12 | 34.80 | 18 | 34.80 | 12.75 | 6 to 24 | 4.50 | 6.00 | 6 | .40 |
| 8 | 16 | 66.00 | 24 | 66.00 | 16.00 | 8 to 24 | 7.50 | 10.25 | 8 | .53 |
| 10 | 20 | 117.50 | 30 | 117.50 | 22.75 | 10 to 24 | 12.00 | 17.00 | 8 | .61 |
| 12 | 24 | 177.50 | 36 | 177.50 | 30.75 | 12 to 24 | 15.75 | 23.00 | 9 | .66 |
| 14 | 28 | 264.00 | 42 | 264.00 | 53.00 | | | | | |
| 16 | 30 | 385.00 | 48 | 385.00 | 72.00 | | | | | |
| 18 | 33 | 517.00 | 54 | 517.00 | 92.00 | | | | | |
| 20 | 41 | 594.00 | 60 | 594.00 | 113.00 | | | | | |
| 24 | 44 | 748.00 | 72 | 748.00 | 138.00 | | | | | |

*Reducing fittings: The prices of Reducing 90° Elbows, Tees, and Crosses shown above apply only to the list of sizes shown in the table on the opposite page. The price is determined by the size of the largest opening. When ordering reducing tees and crosses, specify the size of openings in the sequence of the letters shown on the illustrations in the lower left hand corner of the preceding page.

*General description . . pages 275 and 280*

*Dimensions . . . . page 286*

# Steel Butt-Welding Fittings

## For Use With Extra Strong Pipe

*For pressure-temperature ratings, see pages 288 and 289.*
*For list prices, see the following page.*

No. 452 E
90° Elbow
Long Radius

Return Bend
No. 472 E. Short Radius
No. 473 E. Long Radius

27

No. 431 E
90° Elbow
Short Radius

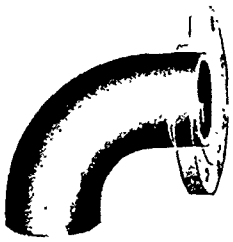
No. 497 E
Cranelap Stub End

**Thickness:** Extra Strong fittings in sizes 12-inch and smaller are made for use with Extra Strong pipe; and in sizes 14-inch and larger, for use with O.D. pipe ½-inch thick.

**Materials:** Unless otherwise specified, butt-welding fittings will be Carbon Steel, Grade A variety, conforming to A.S.T.M. Specification A-234.

Butt-Welding fittings made of Grade B Carbon Steel, genuine wrought iron, stainless steel, or other materials can be furnished when ordered; prices on application.

**American Standard:** These fittings, in the sizes and types included in the Standard, conform to the American Standard for Steel Butt-Welding Fittings, B16.9-1951; see page 275.



No. 458 E
90° Long Radius Elbow
with Long Tangent
On One End

**90° Elbow with long tangent:** The No. 458 E 90° Long Radius Elbows have a long tangent on one end to permit welding on a slip-on welding flange. That end is not beveled; the other end is beveled.

**Cranelap Stub Ends:** Cranelap Stub Ends, made of Grade A Seamless Steel Pipe lapped to the full thickness of the pipe wall, and Cranelap Flanges (see page 294) afford an ideal method of installing flanged equipment in a welded line. The swivel flange eliminates the difficulty of aligning bolt holes and permits installing the equipment at any angle. Cranelap Stub Ends can be made to order of heavier than Extra Strong Pipe; prices on application.

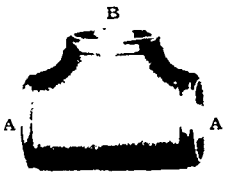
No. 450 E
Shaped Nipple
90° Type

No. 457 E
Cap

**Shaped Nipples:** Shaped Nipples eliminate the use of templates when saddling one pipe upon another; they save time and assure an accurate fit. Both ends are beveled for welding. When ordering, be sure to specify nominal size of header on which Nipple will be used.

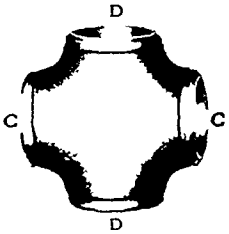
No. 454 E
45° Long Radius Elbow

No. 451 E
Shaped Nipple
45° Type

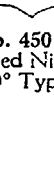



No. 453 E, Tee

Reducer
*See page 285*




No. 436 E, Cross



No. 474 E
Backing Ring
Nub Type

### List of Sizes of Reducing Fittings

(List prices, shown on the following page, apply only to these sizes.)

| No. 452 E 90° Elbows | | No. 453 E, Tees | | | | | | | | No. 436 E, Crosses | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | A | B | A | B | A | B | C | D | C | D | C | D |
| 2 | ×1½ | 5 | ×4 | 1 | ×¾ | 3 | ×2½ | 6 | ×5 | 14 | ×12 | 2 | ×1½ | 4 | ×3½ |
| | ×1¼ | | ×3½ | 1¼ | ×1 | | ×2 | | ×4 | | ×10 | | ×1¼ | | ×3 |
| | ×1 | | ×3 | | ×¾ | | ×1½ | | ×3½ | | ×8 | | ×1 | | ×2½ |
| 2½ | ×2 | | ×2½ | 1½ | ×1¼ | | ×1¼ | | ×3 | | ×6 | | ×¾ | | ×2 |
| | ×1½ | 6 | ×5 | | ×1 | 3½ | ×3 | | ×2½ | 16 | ×14 | 2½ | ×2 | | ×1½ |
| | ×1¼ | | ×4 | | ×¾ | | ×2½ | 8 | ×6 | | ×12 | | ×1½ | 5 | ×4 |
| 3 | ×2½ | | ×3½ | 2 | ×1½ | | ×2 | | ×5 | | ×10 | | ×1¼ | | ×3½ |
| | ×2 | | ×3 | | ×1¼ | | ×1½ | | ×4 | | ×8 | | ×1 | | ×3 |
| | ×1½ | 8 | ×6 | | ×1 | 4 | ×3½ | | ×3½ | 18 | ×16 | 3 | ×2½ | | ×2½ |
| 3½ | ×3 | | ×5 | | ×¾ | | ×3 | 10 | ×8 | | ×14 | | ×2 | | ×2 |
| | ×2½ | | ×4 | 2½ | ×2 | | ×2½ | | ×6 | | ×12 | | ×1½ | 6 | ×5 |
| | ×2 | 10 | ×8 | | ×2 | | ×2 | | ×5 | | ×10 | | ×1¼ | | ×4 |
| 4 | ×3½ | | ×6 | | ×1½ | | ×1½ | | ×4 | 20 | ×18 | 3½ | ×3 | | ×3½ |
| | ×3 | | ×5 | | ×1¼ | 5 | ×4 | 12 | ×10 | | ×16 | | ×2½ | | ×3 |
| | ×2½ | 12 | ×10 | | ×1 | | ×3½ | | ×8 | | ×14 | | ×2 | | ×2½ |
| | ×2 | | ×8 | | | | ×3 | | ×6 | | ×12 | | ×1½ | | |
| | | | ×6 | | | | ×2½ | | ×5 | 24 | ×20 | | | | |
| | | | | | | | ×2 | | | | ×18 | | | | |
| | | | | | | | | | | | ×16 | | | | |

*General description page 275* *Dimensions page 286*

# Steel Butt-Welding Fittings

## For Use With Extra Strong Pipe

### List Prices, Each, Extra Strong

| Size of Pipe | 90° Elbows | | | | 45° Elbows | Tees | | Crosses | | Caps |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 452 E Long Radius | | No. 431 E Short Radius | No. 458 E With Long Tangent One End | No. 454 E Long Radius | No. 453 E | | No. 436 E | | No. 457 E |
| Inches | Straight | *Reducing | | | | Straight | *Reducing | Straight | *Reducing | |
| ¾ | 1.50 | | | | 1.35 | 2.15 | | | | |
| 1 | 1.50 | | | | 1.35 | 2.15 | 2.70 | | | 2.10 |
| 1¼ | 1.75 | | | | 1.60 | 2.90 | 3.60 | | | 2.10 |
| 1½ | 2.15 | | 2.15 | 3.90 | 1.95 | 3.65 | 4.55 | | | 2.10 |
| 2 | 2.65 | 4.50 | 2.65 | 4.65 | 2.40 | 5.00 | 6.25 | 7.50 | 9.40 | 2.25 |
| 2½ | 4.25 | 7.20 | 4.25 | 7.45 | 3.80 | 7.30 | 9.10 | 10.95 | 13.65 | 2.50 |
| 3 | 6.15 | 10.45 | 6.15 | 10.80 | 5.55 | 12.00 | 15.00 | 18.00 | 22.50 | 3.30 |
| 3½ | 7.95 | 13.50 | 7.95 | 14.00 | 7.15 | 16.00 | 20.00 | 24.00 | 30.00 | 4.25 |
| 4 | 9.55 | 16.25 | 9.55 | 16.70 | 8.60 | 17.00 | 21.25 | 25.50 | 31.90 | 4.90 |
| 5 | 13.55 | 23.05 | 13.55 | 23.70 | 12.20 | 30.00 | 37.50 | 45.00 | 56.25 | 5.85 |
| 6 | 19.75 | 31.60 | 19.75 | 34.50 | 17.80 | 35.00 | 43.75 | 52.50 | 65.65 | 7.50 |
| 8 | 37.50 | 60.00 | 37.50 | 65.50 | 33.75 | 58.00 | 72.50 | 87.00 | 108.75 | 12.20 |
| 10 | 67.00 | 107.20 | 67.00 | 117.00 | 60.50 | 97.00 | 120.00 | 145.00 | 180.00 | 18.50 |
| 12 | 101.00 | 161.60 | 101.00 | 177.00 | 91.00 | 135.00 | 168.00 | 202.50 | 252.00 | 25.00 |
| 14 | 150.00 | | 150.00 | Prices above do not include Flange. | 135.00 | 205.00 | 205.00 | | | 30.00 |
| 16 | 219.00 | | 219.00 | | 197.00 | 255.00 | 255.00 | | | 34.50 |
| 18 | 294.00 | | 294.00 | | 265.00 | 320.00 | 320.00 | | | 38.50 |
| 20 | 340.00 | | 340.00 | | 310.00 | 355.00 | 355.00 | | | 45.00 |
| 24 | 410.00 | | 410.00 | | 370.00 | 490.00 | 490.00 | | | 49.00 |

| Size of Pipe | Return Bends | | | | Cranelap Stub Ends | Shaped Nipples | | | Backing Rings | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. 472 E Short Radius | | No. 473 E Long Radius | | No. 497 E | Shaped to Fit Headers (Nominal Sizes) | No. 450 E 90° Type | No. 451 E 45° Type | Number of Nubs | No. 474 E Nub Type |
| Inches | Center to center | List Price | Center to center | List Price | | | | | | |
| ¾ | | | | | 3.80 | | | | | |
| 1 | | | 3" | 3.30 | 3.80 | | | | 3 | .19 |
| 1¼ | 2½" | 3.85 | 3¾ | 3.85 | 4.25 | | | | 3 | .20 |
| 1½ | 3 | 4.75 | 4½ | 4.75 | 4.70 | | | | 3 | .21 |
| 2 | 4 | 5.85 | 6 | 5.85 | 6.25 | 2 to 16" | 1.25 | 1.40 | 3 | .22 |
| 2½ | 5 | 9.35 | 7½ | 9.35 | 7.15 | 2½ to 16 | 1.70 | 1.95 | 3 | .26 |
| 3 | 6 | 13.55 | 9 | 13.55 | 8.25 | 3 to 20 | 2.25 | 2.65 | 3 | .29 |
| 3½ | 7 | 17.60 | 10½ | 17.60 | 9.40 | 3½ to 20 | 2.50 | 3.10 | 4 | .32 |
| 4 | 8 | 21.00 | 12 | 21.00 | 10.90 | 4 to 24 | 2.75 | 3.50 | 4 | .34 |
| 5 | 10 | 29.70 | 15 | 29.70 | 13.50 | 5 to 24 | 5.00 | 6.40 | 5 | .40 |
| 6 | 12 | 43.50 | 18 | 43.50 | 16.35 | 6 to 24 | 6.75 | 9.00 | 6 | .48 |
| 8 | 16 | 82.50 | 24 | 82.50 | 24.00 | 8 to 24 | 11.50 | 15.50 | 8 | .63 |
| 10 | 20 | 147.40 | 30 | 147.40 | 35.75 | 10 to 24 | 18.50 | 26.00 | 8 | .73 |
| 12 | 24 | 222.20 | 36 | 222.20 | 48.75 | 12 to 24 | 23.50 | 35.00 | 9 | .79 |
| 14 | 28 | 330.00 | 42 | 330.00 | 72.00 | | | | | |
| 16 | 30 | 482.00 | 48 | 482.00 | 93.00 | | | | | |
| 18 | 33 | 647.00 | 54 | 647.00 | 114.00 | | | | | |
| 20 | 41 | 748.00 | 60 | 748.00 | 136.00 | | | | | |
| 24 | 44 | 902.00 | 72 | 902.00 | 162.00 | | | | | |

***Reducing fittings:** The prices of Reducing 90° Elbows, Tees, and Crosses shown above apply only to the list of sizes shown in the table on the opposite page. The price is determined by the size of the largest opening. When ordering reducing tees and crosses, specify the size of openings in the sequence of the letters shown on the illustrations in the lower left hand corner of the preceding page.

*General description....pages 275 and 282*

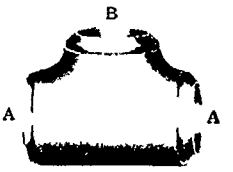
*Dimensions....page 286*

# Steel Butt-Welding Fittings

## For Use With Schedule 160 or Double Extra Strong Pipe

90° Long Radius Elbow
No. 552 E, Schedule 160
No. 652 E, Double Extra Strong

45° Long Radius Elbow
No. 554 E, Schedule 160
No. 654 E, Double Extra Strong




Tee
No. 553 E, Schedule 160
No. 653 E, Double Extra Strong



### List Prices, Each

| Size of Pipe | Schedule 160 | | | | Double Extra Strong | | | |
|---|---|---|---|---|---|---|---|---|
| | No. 552 E 90° Elbows Long Radius | No. 554 E 45° Elbows Long Radius | No. 553 E Tees | | No. 652 E 90° Elbows Long Radius | No. 654 E 45° Elbows Long Radius | No. 653 E Tees | |
| Inches | | | Straight | *Reducing | | | Straight | *Reducing |
| 1 | 4.00 | 4.00 | 5.00 | 5.00 | 4.50 | 4.50 | 7.00 | 7.00 |
| 1¼ | 5.00 | 4.50 | 6.00 | 6.00 | 5.50 | 5.00 | 9.00 | 9.00 |
| 1½ | 6.00 | 5.50 | 7.00 | 7.00 | 6.50 | 6.00 | 11.00 | 11.00 |
| 2 | 7.00 | 6.50 | 10.00 | 10.00 | 8.00 | 7.50 | 15.00 | 15.00 |
| 2½ | 11.00 | 10.00 | 20.00 | 20.00 | 13.00 | 12.00 | 22.00 | 22.00 |
| 3 | 16.00 | 14.50 | 35.00 | 35.00 | 18.50 | 17.00 | 60.00 | 60.00 |
| 4 | 27.00 | 24.50 | 60.00 | 60.00 | 29.00 | 26.00 | 85.00 | 85.00 |
| 5 | 38.00 | 35.50 | 110.00 | 110.00 | 41.00 | 37.00 | 150.00 | 150.00 |
| 6 | 57.00 | 52.00 | 126.00 | 126.00 | 60.00 | 54.00 | 175.00 | 175.00 |
| 8 | 125.00 | 113.00 | 240.00 | 240.00 | 125.00 | 113.00 | 240.00 | 240.00 |
| 10 | 190.00 | 171.00 | 420.00 | 420.00 | | | | |
| 12 | 280.00 | 252.00 | 620.00 | 620.00 | | | | |

**Thickness:** Schedule 160 Fittings are for use with Schedule 160 Pipe; Double Extra Strong Fittings are for use with Double Extra Strong Pipe. Fittings made for pipe thicknesses other than listed here or on the preceding four pages can be furnished when ordered; prices on application.

**Materials:** These fittings are regularly made of Grade A Carbon Steel. Fittings made of Grade B Carbon Steel or of other materials can be furnished when ordered; prices on application.

***Reducing Tees:** The prices of reducing tees shown above apply only to the list of sizes shown in the table at the right. The price is determined by the size of the largest opening. When ordering reducing tees, specify the size of openings in the sequence of the letters shown on the illustration above.

**American Standard:** These fittings, in the sizes and types included in the Standard, conform to the American Standard for Steel Butt-Welding Fittings, B16.9-1951; see page 275.

### List of Sizes of Reducing Tees

(List prices shown above apply only to these sizes.)

| No. 553 E Schedule 160 | | No. 653 E Double Extra Strong | |
|---|---|---|---|
| A B | A B | A B | A B |
| 1 ×¾ | 5 ×4 | 1 ×¾ | 4×3 |
| 1¼×1 | ×3 | 1¼×1 | ×2½ |
| ×¾ | ×2½ | ×¾ | ×2 |
| 1½×1¼ | ×2 | 1½×1¼ | ×1½ |
| ×1 | 6 ×5 | ×1 | 5×4 |
| ×¾ | ×4 | ×¾ | ×3 |
| 2 ×1½ | ×3 | 2 ×1½ | ×2½ |
| ×1¼ | ×2½ | ×1¼ | ×2 |
| ×1 | 8 ×6 | ×1 | 6×5 |
| ×¾ | ×5 | ×¾ | ×4 |
| 2½×2 | ×4 | 2½×2 | ×3 |
| ×1½ | 10×8 | ×1½ | ×2½ |
| ×1¼ | ×6 | ×1¼ | 8×6 |
| ×1 | ×5 | ×1 | ×5 |
| 3 ×2½ | ×4 | 3 ×2½ | ×4 |
| ×2 | 12×10 | ×2 | |
| ×1½ | ×8 | ×1½ | |
| ×1¼ | ×6 | ×1¼ | |
| 4 ×3 | ×5 | | |
| ×2½ | | | |
| ×2 | | | |
| ×1½ | | | |

*General description . . . . page 275*

*Dimensions . . page 286*

# Steel Butt-Welding Reducers

## For Use With Standard or Extra Strong Pipe

Concentric Reducer
No. 359 E Standard
No. 459 E Extra Strong

*For pressure-temperature ratings, see pages 288 and 289.*

Standard Reducers in sizes 12-inch and smaller are made for use with Standard pipe (heaviest weight on 8, 10, and 12" sizes); and in sizes 12-inch and larger, for use with O.D. pipe 3/8-inch thick. Extra Strong Reducers in sizes 12-inch and smaller are made for use with Extra Strong pipe; and in sizes 14-inch and larger, for use with O.D. pipe 1/2-inch thick.

In the sizes covered by the Standard, these reducers conform to the American Standard for Steel Butt-Welding Fittings, B16.9-1951.

Eccentric Reducer
No. 360 E Standard
No. 460 E Extra Strong

27

### List Prices

| Size of Pipe In. | Price, Each Concentric or Eccentric Standard | Extra Strong | Size of Pipe In. | Price, Each Concentric or Eccentric Standard | Extra Strong | Size of Pipe In. | Price, Each Concentric or Eccentric Standard | Extra Strong | Size of Pipe In. | Price, Each Concentric or Eccentric Standard | Extra Strong | Size of Pipe In. | Price, Each Concentric or Eccentric Standard | Extra Strong |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/4×1/2 | 1.25* | 2.25* | 3×2 1/2 | 3.00 | 5.25 | 5×4 | 6.00 | 10.50 | 10×8 | 18.00 | 40.00 | 18×16 | 85.00 | 148.00 |
| 1×3/4 | 1.50 | 2.75 | ×2 | 3.00 | 5.25 | ×3 1/2 | 6.50 | 11.50 | ×6 | 20.00 | 44.00 | ×14 | 85.00 | 148.00 |
| ×1/2 | 1.50 | 2.75 | ×1 1/2 | 3.25 | 5.70 | ×3 | 6.50 | 11.50 | ×5 | 26.00 | 48.00 | ×12 | 95.00 | 166.00 |
| 1 1/4×1 | 2.00 | 3.50 | ×1 1/4 | 3.25 | 5.70 | ×2 1/2 | 6.50 | 11.50 | ×4 | 26.00 | 48.00 | ×10 | 105.00 | 184.00 |
| ×3/4 | 2.00 | 3.50 | ×1 | 3.25* | 5.70* | ×2 | 6.50 | 11.50 | ×3 | 30.00* | | 20×18 | 90.00 | 157.50 |
| ×1/2 | 2.50 | 4.50 | 3 1/2×3 | 3.50 | 6.00 | 6×5 | 8.00 | 14.00 | 12×10 | 32.00 | 56.00 | ×16 | 90.00 | 157.50 |
| 1 1/2×1 1/4 | 2.00 | 3.50 | ×2 1/2 | 3.50 | 6.00 | ×4 | 8.00 | 14.00 | ×8 | 36.00 | 63.00 | ×14 | 100.00 | 175.00 |
| ×1 | 2.00 | 3.50 | ×2 | 3.50 | 6.00 | ×3 1/2 | 9.00 | 15.75 | ×6 | 36.00 | 63.00 | ×12 | 100.00 | 175.00 |
| ×3/4 | 2.50 | 4.50 | ×1 1/2 | 3.75 | 6.50 | ×3 | 9.00 | 15.75 | ×5 | 40.00 | 70.00 | 24×20 | 140.00 | 245.00 |
| ×1/2 | 2.50 | 4.50 | ×1 1/4 | 3.75 | 6.50* | ×2 1/2 | 9.00 | 15.75 | 14×12 | 40.00 | 70.00 | ×18 | 155.00 | 270.00 |
| 2×1 1/2 | 2.25 | 3.75 | 4×3 1/2 | 4.00 | 7.00 | ×2 | 10.00* | 17.50* | ×10 | 40.00 | 70.00 | ×16 | 170.00 | 295.00 |
| ×1 1/4 | 2.25 | 3.75 | ×3 | 4.00 | 7.00 | 8×6 | 12.00 | 26.25 | ×8 | 45.00 | 78.75 | | | |
| ×1 | 2.25 | 3.75 | ×2 1/2 | 4.00 | 7.00 | ×5 | 15.00 | 30.60 | ×6 | 50.00 | 87.50 | | | |
| ×3/4 | 2.75 | 4.75 | ×2 | 4.00 | 7.00 | ×4 | 15.00 | 30.60 | 16×14 | 70.00 | 105.00 | | | |
| 2 1/2×2 | 2.50 | 4.50 | ×1 1/2 | 4.50 | 8.00 | ×3 1/2 | 15.00 | 30.60 | ×12 | 70.00 | 105.00 | | | |
| ×1 1/2 | 2.75 | 5.00 | ×1 1/4 | 4.50* | 8.00* | ×3 | 18.00* | 35.00* | ×10 | 80.00 | 122.50 | | | |
| ×1 1/4 | 2.75 | 5.00 | ×1 | 4.50* | | | | | ×8 | 85.00 | 140.00 | | | |
| ×1 | 2.75 | 5.00 | | | | | | | | | | | | |

*Note: Prices with an asterisk indicate sizes made only in the Concentric style.

*General description of butt-welding fittings, page 275.*

*Dimensions, page 286.*

# Welding Saddles

### List Prices

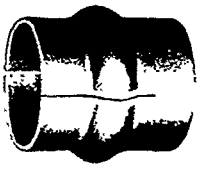
| Size of Pipe (Outlet) Inches | Shaped to Fit Headers (Nominal Sizes) | No. 358 E Reinforcing Welding Saddles Each |
|---|---|---|
| 1 | 1 1/4 to 8" | 4.90 |
| 1 1/4 | 1 1/2 to 8 | 4.90 |
| 1 1/2 | 1 1/2 to 12 | 4.90 |
| 2 | 2 to 24 | 4.90 |
| 2 1/2 | 2 1/2 to 24 | 5.35 |
| 3 | 3 to 24 | 5.85 |
| 3 1/2 | 3 1/2 to 24 | 6.80 |
| 4 | 4 to 24 | 7.80 |
| 5 | 5 to 24 | 10.75 |
| 6 | 6 to 24 | 13.65 |
| 8 | 8 to 24 | 21.50 |
| 10 | 10 to 24 | 27.25 |
| 12 | 12 to 24 | 31.00 |
| 14 | 14 to 24 | 36.00 |
| 16 | 16 to 24 | 43.00 |
| 18 | 18 to 24 | 50.00 |
| 20 | 20 to 24 | 58.00 |
| 24 | 24 | 70.00 |

Reinforcing Welding Saddle, No. 358 E

***Welding Saddles*** are used to reinforce 90° welded outlet connections on headers or pipes. They relieve the weld of the greater part of the tensile, bending, and shearing stresses to which it would otherwise be subjected.

***Be sure to specify nominal size of header.***

# Welding Sleeves



Welding Sleeve
No. 361 E

***Welding Sleeves*** are ideal for reinforcing butt-welds in pipe lines. They relieve the weld of any bending stress and of much of the tensile stress to which it would otherwise be subjected.

The large transverse recess at the center provides more than ample space for the conventional type of butt-weld used between two lengths of pipe.

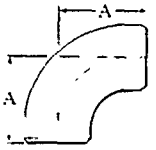
### List Prices

| Size of Pipe Inches | No. 361 E Welding Sleeve Each |
|---|---|
| 1 | 4.00 |
| 1 1/4 | 4.00 |
| 1 1/2 | 4.00 |
| 2 | 4.00 |
| 2 1/2 | 4.60 |
| 3 | 5.00 |
| 3 1/2 | 5.50 |
| 4 | 6.20 |
| 5 | 7.25 |
| 6 | 8.30 |
| 8 | 11.40 |
| 10 | 15.75 |
| 12 | 20.40 |
| 14 | 23.70 |
| 16 | 28.60 |
| 18 | 34.50 |
| 20 | 41.50 |
| 24 | 57.00 |

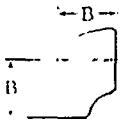
# Steel Butt-Welding Fittings

## Dimensions, in Inches

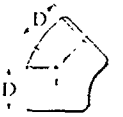
*For list prices and description, see pages 280 to 285.*



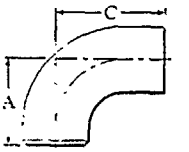
90° Long Radius Elbow Straight and Reducing



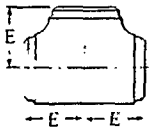
90° Short Radius Elbow



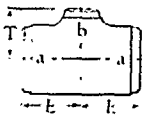
45° Long Radius Elbow



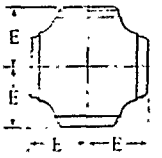
90° Long Radius Elbow Long Tangent One End



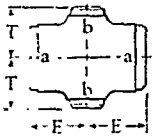
Straight Tee



Reducing Tee

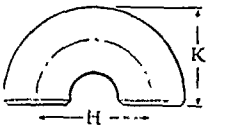


Straight Cross

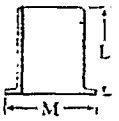


Reducing Cross

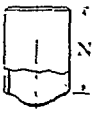
Short Radius Return Bend



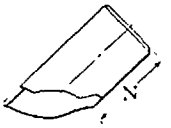
Long Radius Return Bend



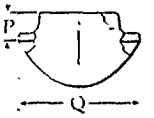
Cranelap Stub End



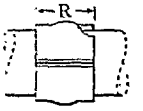
90° Type Shaped Nipples



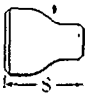
45° Type Shaped Nipples



Reinforcing Welding Saddle

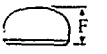


Welding Sleeve



Concentric Reducer

Eccentric Reducer



Cap

| Size | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | Pipe Schedule Numbers: For Std. Ftgs. | Pipe Schedule Numbers: For Extra Strong |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ¾ | 1⅛ | | | 9/16 | 1⅛* | | | 2¼ | | 1 11/16 | 4 | 1 11/16 | | | | | 2 | 40 | 80 |
| 1 | 1½ | 1 | | ⅞ | 1½* | 1½ | 2 | 3 | 1⅝ | 2 3/16 | 4 | 2 | | 1 | 4⅛ | 3 | 2 | 40 | 80 |
| 1¼ | 1⅞ | 1¼ | | 1 | 1⅞* | 1½ | 2½ | 3¾ | 2 1/16 | 2¾ | 4 | 2½ | | 1⅛ | 4¾ | 3 | 2 | 40 | 80 |
| 1½ | 2¼ | 1½ | 3¼ | 1⅛ | 2¼* | 1½ | 3 | 4½ | 2 7/16 | 3¼ | 4 | 2⅞ | | 1⅛ | 5¼ | 3 | 2½ | 40 | 80 |
| 2 | 3 | 2 | 4¼ | 1⅜ | 2½ | 1½ | 4 | 6 | 3 3/16 | 4 3/16 | 6 | 3⅝ | 6 | 1⅛ | 5 15/16 | 3 | 3 | 40 | 80 |
| 2½ | 3¾ | 2½ | 5 | 1¾ | 3 | 1½ | 5 | 7½ | 3 15/16 | 5 3/16 | 6 | 4⅛ | 6 | 1⅛ | 6 7/16 | 3 | 3½ | 40 | 80 |
| 3 | 4½ | 3 | 5¾ | 2 | 3⅜ | 2 | 6 | 9 | 4¾ | 6¼ | 6 | 5 | 6 | 1⅛ | 7 9/16 | 3 | 3½ | 40 | 80 |
| 3½ | 5¼ | 3½ | 6¾ | 2¼ | 3¾ | 2½ | 7 | 10½ | 5½ | 7¼ | 6 | 5½ | 6 | 1¼ | 8 1/16 | 3½ | 4 | 40 | 80 |
| 4 | 6 | 4 | 7½ | 2½ | 4⅛ | 2½ | 8 | 12 | 6¼ | 8¼ | 6 | 6 3/16 | 6 | 1⅜ | 8 9/16 | 4 | 4 | 40 | 80 |
| 5 | 7½ | 5 | 9 | 3⅛ | 4⅞ | 3 | 10 | 15 | 7¾ | 10 5/16 | 8 | 7 5/16 | 8 | 1⅜ | 9⅝ | 5 | 5 | 40 | 80 |
| 6 | 9 | 6 | 10¾ | 3¾ | 5⅝ | 3½ | 12 | 18 | 9 5/16 | 12 5/16 | 8 | 8½ | 8 | 1½ | 11¾ | 6 | 5½ | 40 | 80 |
| 8 | 12 | 8 | 13¾ | 5 | 7 | 4 | 16 | 24 | 12 5/16 | 16 5/16 | 8 | 10⅝ | 8 | 2 | 14¾ | 8 | 6 | 40 | 80 |
| 10 | 15 | 10 | 17 | 6¼ | 8½ | 5 | 20 | 30 | 15⅜ | 20⅜ | 10 | 12¾ | 10 | 2½ | 17⅞ | 10 | 7 | 40 | 60 |
| 12 | 18 | 12 | 20½ | 7½ | 10 | 6 | 24 | 36 | 18⅜ | 24⅜ | 10 | 15 | 10 | 2¾ | 20⅞ | 12 | 8 | ..... | ..... |
| 14 | 21 | 16 | | 8¾ | 11* | 6½ | 28 | 42 | 21 | 28 | 12 | 16¼ | | 3¼ | 22⅛ | 14 | 13 | 30 | ..... |
| 16 | 24 | 18 | | 10 | 12* | 7 | 32 | 48 | 23 | 32 | 12 | 18½ | | 3½ | 24⅛ | 16 | 14 | 30 | 40 |
| 18 | 27 | 20 | | 11¼ | 13½* | 8 | 36 | 54 | 25½ | 36 | 12 | 21 | | 4 | 26⅛ | 18 | 15 | ..... | ..... |
| 20 | 30 | 20 | | 12 7/16 | 15* | 9 | 40 | 60 | 30½ | 40 | 12 | 23 | | 4 | 30⅛ | 20 | 20 | 20 | 30 |
| 24 | 36 | 24 | | 14 15/16 | 17* | 10½ | 48 | 72 | 34 | 48 | 12 | 27¼ | | 4 | 34⅛ | 24 | 20 | 20 | ..... |

### Reducing Tees and Crosses—Center to End of Outlet

| Size a | Size b | T |
|---|---|---|
| 1 | ×¾* | 1½ |
| 1¼ | ×1* | 1⅞ |
| | ×¾* | 1⅞ |
| 1½ | ×1¼* | 2¼ |
| | ×1* | 2¼ |
| | ×¾* | 2¼ |
| 2 | ×1½ | 2⅜ |
| | ×1¼ | 2¼ |
| | ×1 | 2 |
| | ×¾ | 1¾ |
| 2½ | ×2 | 2¾ |
| | ×1½ | 2⅝ |
| | ×1¼ | 2½ |
| | ×1 | 2¼ |
| 3 | ×2½ | 3¼ |
| | ×2 | 3 |
| | ×1½ | 2⅞ |
| | ×1¼ | 2¾ |
| 3½ | ×3 | 3⅝ |
| | ×2½ | 3½ |
| | ×2 | 3¼ |
| | ×1½ | 3⅛ |
| 4 | ×3½ | 4 |
| | ×3 | 3⅞ |
| | ×2½ | 3¾ |
| | ×2 | 3½ |
| | ×1½ | 3⅜ |
| 5 | ×4 | 4⅝ |
| | ×3½ | 4½ |
| | ×3 | 4⅜ |
| | ×2½ | 4¼ |
| | ×2 | 4⅛ |
| 6 | ×5 | 5⅜ |
| | ×4 | 5⅛ |
| | ×3½ | 5 |
| | ×3 | 4⅞ |
| | ×2½ | 4¾ |
| 8 | ×6 | 6⅝ |
| | ×5 | 6⅜ |
| | ×4 | 6⅛ |
| | ×3½ | 6 |
| 10 | ×8 | 8 |
| | ×6 | 7⅝ |
| | ×5 | 7½ |
| | ×4 | 7¼ |
| 12 | ×10 | 9½ |
| | ×8 | 9 |
| | ×6 | 8⅝ |
| | ×5 | 8½ |
| 14 | ×12* | 10⅝ |
| | ×10* | 10⅛ |
| | ×8* | 9⅝ |
| | ×6* | 9¼ |
| 16 | ×14* | 12 |
| | ×12* | 11⅝ |
| | ×10* | 11⅛ |
| | ×8* | 10⅝ |
| 18 | ×16* | 13 |
| | ×14* | 13 |
| | ×12* | 12⅝ |
| | ×10* | 12⅛ |
| 20 | ×18* | 14½ |
| | ×16* | 14 |
| | ×14* | 14 |
| | ×12* | 13⅝ |
| 24 | ×20* | 17 |
| | ×18* | 16½ |
| | ×16* | 16 |

*Only Tees are made in these sizes

***Standard, Extra Strong, Schedule 160, and Double Extra Strong Fittings have the same outside dimensions.***

**American Standard:** These fittings, in the sizes and types included in the Standard, conform to the American Standard, B16.9-1951; see page 275.

**Thickness:** Standard Fittings in sizes 12-inch and smaller are made for use with Standard pipe (heaviest weight on 8, 10, and 12-inch sizes); and in sizes 14-inch and larger, for use with O.D. pipe ⅜-inch thick.

Extra Strong Fittings in sizes 12-inch and smaller are made for use with Extra Strong pipe; and in sizes 14-inch and larger, for use with O.D. pipe ½-inch thick.

Schedule 160 Fittings are made for use with Schedule 160 pipe; and Double Extra Strong Fittings, for use with Double Extra Strong pipe.

# Bonney WeldOlets

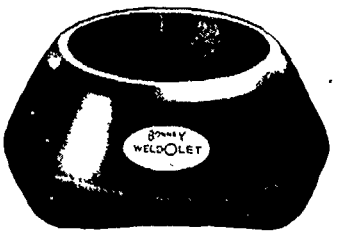
Bonney WeldOlets are welding fittings forged from steel of low carbon content. They are designed for making right angle branch pipe outlets such as tees, crosses, and side outlets by welding. They eliminate the preparation of preliminary layouts of main and branch pipes. No templates are used, nor is any complicated cutting, threading, forming, and fitting of the main pipe necessary. Branch connections made with WeldOlets are strong, permanent, and leakproof.

## Types and Sizes Available

| Pipe Class | Outlet Pipe Size Inches | Size of Run Pipe, in Inches: Reducing Fittings: Welding Outlets | Reducing Fittings: Socket Outlets | Reducing Fittings: Threaded Outlets | Full Size Fittings: Welding Outlets | Full Size Fittings: Socket or Threaded Outlets |
|---|---|---|---|---|---|---|
| For Standard Pipe | 1/8 | 3/8 to 24 | 3/8 to 24 | | .. | .. |
| | 1/4 | 3/8 to 24 | 3/8 to 24 | | .. | .. |
| | 3/8 | 3/4 to 24 | 3/4 to 24 | | .. | .. |
| | 1/2 | 3/4 to 24 | 3/4 to 24 | | 1/2 | 1/2 |
| | 3/4 | 1 to 24 | 1 to 24 | | 3/4 | 3/4 |
| | 1 | 1 1/4 to 24 | 1 1/4 to 24 | | 1 | 1 |
| | 1 1/4 | 1 1/2 to 24 | 1 1/2 to 24 | | 1 1/4 | 1 1/4 |
| | 1 1/2 | 2 to 24 | 2 to 24 | | 1 1/2 | 1 1/2 |
| | 2 | 2 1/2 to 24 | 2 1/2 to 24 | | 2 | 2 |
| | 2 1/2 | 3 to 24 | 3 to 24 | | 2 1/2 | 2 1/2 |
| | 3 | 3 1/2 to 24 | 3 1/2 to 24 | | 3 | 3 |
| | 3 1/2 | 4 to 24 | 4 to 24 | | 3 1/2 | 3 1/2 |
| | 4 | 5 to 24 | 5 to 24 | | 4 | 4 |
| | 5 | 6 to 24 | 6 to 24 | | 5* | 5* |
| | 6 | 8 to 24 | 8 to 24 | | 6 | 6* |
| | 8 | 10 to 24* | 10 to 24* | | 8* | |
| | 10 | 12 to 24* | 12 to 24* | | 10* | |
| | 12 | 14 to 24* | .. | | 12* | |
| | 14 | 16 to 24* | .. | | 14* | |
| | 16 | 18 to 24* | .. | | 16* | |
| | 18 | 20 to 24* | .. | | 18* | |
| | 20 | 24* | .. | | 20* | |
| | 24 | .. | .. | | 24* | |
| For Extra Strong Pipe | 1/8 | 3/8 to 24 | 3/8 to 24 | 3/8 to 24 | .. | |
| | 1/4 | 3/8 to 24 | 3/4 to 24 | 3/4 to 24 | .. | |
| | 3/8 | 1/2 to 24 | 3/4 to 24 | 3/4 to 24 | .. | |
| | 1/2 | 3/4 to 24 | 1 to 24 | 1 to 24 | 1/2 | |
| | 3/4 | 1 to 24 | 1 1/4 to 24 | 1 1/4 to 24 | 3/4 | |
| | 1 | 1 1/4 to 24 | 1 1/2 to 24 | 1 1/2 to 24 | 1 | |
| | 1 1/4 | 1 1/2 to 24 | 2 to 24 | 2 to 24 | 1 1/4 | |
| | 1 1/2 | 2 to 24 | 2 1/2 to 24 | 2 1/2 to 24 | 1 1/2 | |
| | 2 | 2 1/2 to 24 | 3 to 24 | 3 to 24 | 2 | |
| | 2 1/2 | 3 to 24 | 3 1/2 to 24 | .. | 2 1/2 | |
| | 3 | 3 1/2 to 24 | 4 to 24 | .. | 3 | |
| | 3 1/2 | 4 to 24 | 5 to 24 | .. | 3 1/2 | |
| | 4 | 5 to 24 | 6 to 24 | .. | 4 | |
| | 5 | 6 to 24 | .. | .. | 5* | |
| | 6 | 8 to 24 | .. | .. | 6 | |
| | 8 | 10 to 24* | .. | .. | 8* | |
| | 10 | 12 to 24* | .. | .. | 10* | |
| | 12 | 14 to 24* | .. | .. | 12* | |
| | 14 | 16 to 24* | .. | .. | 14* | |
| | 16 | 18 to 24* | .. | .. | 16* | |
| | 18 | 20 to 24* | .. | .. | 18* | |
| | 20 | 24* | .. | .. | 20* | |
| | 24 | .. | .. | .. | 24* | |
| For Schedule 160 Pipe | 1/2 | 3/4 to 12 | 1 to 24 | 1 1/4 to 24 | 1/2 | |
| | 3/4 | 1 1/4 to 12 | 1 1/4 to 24 | 1 1/2 to 24 | 3/4 | |
| | 1 | 1 1/4 to 12 | 1 1/2 to 24 | 2 to 24 | 1 | |
| | 1 1/4 | 1 1/2 to 12 | 2 to 24 | 2 1/2 to 24 | 1 1/4 | |
| | 1 1/2 | 2 1/2 to 12 | 2 1/2 to 24 | 3 to 24 | 1 1/2 | |
| | 2 | 2 1/2 to 12 | 3 to 24 | 4 to 24 | 2 | |
| | 2 1/2 | 3 to 12 | .. | .. | 2 1/2 | |
| | 3 | 4 to 12 | .. | .. | 3 | |
| | 4 | 5 to 12 | .. | .. | 4 | |
| | 5 | 6 to 12* | .. | .. | 5* | |
| | 6 | 8 to 12* | .. | .. | 6* | |
| | 8 | 10 to 12* | .. | .. | 8* | |
| | 10 | 12* | .. | .. | 10* | |
| | 12 | .. | .. | .. | 12* | |

*Carbon steel castings

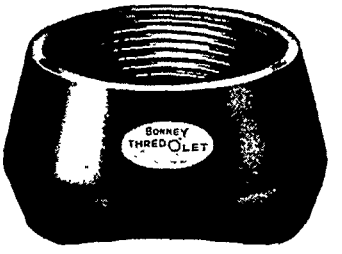
***Prices on application.***




### Welding Outlets

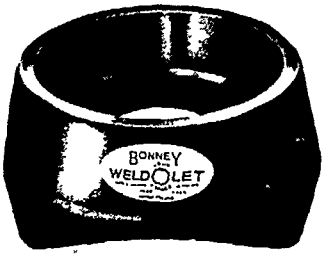
A right angle branch pipe outlet can be made by welding a Welding Outlet to the main pipe. An ordinary V-weld is used. The button may be removed before or after the fitting is attached to the main pipe. The junction is completed by welding the branch pipe to the outlet. Where the Outlet saddles on the run pipe, it tapers at the proper angles and provides a single bevel groove joint at the crotch section blending into a V-butt joint at the ear portion.






### Threaded Outlets

Threaded Outlets are installed on the main line in the same manner as Welding Outlets. A V-weld is used. The threaded branch pipe is screwed into position in the tapped outlet of the fitting. Threaded Outlets are widely used as radiator take-offs, and in other locations where it is desirable to make connections without disturbing the main pipe.




### Socket Outlets

Socket Outlets are similar to the Welding and Threaded types except the outlet is bored to accept standard outside pipe diameters. They are installed in the same manner as the Welding and Threaded Outlets. No beveling nor threading of the branch pipe is necessary.

# Steel Butt-Welding Fittings

## Pressure-Temperature Ratings Based on the Code for Pressure Piping

When computing the thickness of pipe for a given service condition, it is the generally accepted practice among designers to use the formulas provided by the Code for Pressure Piping, the A.S.M.E. Boiler Construction Code, or such other codes as may apply.

For the convenience of users, Crane engineers have calculated the working pressures shown on this and the opposite page. They apply to Grade A Seamless Steel Pipe used in accordance with Section 1 and Section 3 of the Code for Pressure Piping. See the explanation below.

Crane Steel Butt-Welding Fittings, made for use with Standard or Extra Strong Pipe, are as strong as, or stronger than Grade A Seamless Steel Pipe. They can, therefore, be used for any pressure or temperature for which Grade A Pipe of corresponding thickness is suitable, with equal safety.

*Note:* The pressure ratings given in the following tables do not necessarily comply with the rules given in the A.S.M.E. Boiler Construction Code. Where ratings are to comply with these rules, the formulas given in the A.S.M.E. Code should be used.

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* * * * * * * * * * * * *

**Code for Pressure Piping:** The Code for Pressure Piping, American Standard B31.1-1942, with 1944 Supplement No. 1 and 1947 Supplement No. 2, includes five sections on piping systems: Section 1, Power; Section 2, Gas and Air; Section 3, Oil; Section 4, District Heating; and Section 5, Refrigeration. The tables shown here apply to Power Piping (Section 1) and to Oil Piping (Section 3), the latter being further limited to "Within Refinery Limits".

The formula used for calculating the working pressures for Section 1, Power Piping is as follows:

$$P = \frac{2S\,(t - c)}{D - .8(t - c)}$$

and for Section 3, Oil Piping, the formula is:

$$P = \frac{2S\,(t - c)}{D}$$

**Where:** P = maximum working pressure, psi (gauge)
S = allowable stress for material, psi
t = minimum pipe wall thickness, inches
c = allowance for threading, mechanical strength, and for corrosion, inches
D = outside diameter of pipe, inches

**"S" Value:** The stresses permitted by the Code for Grade A Seamless Steel Pipe, A.S.T.M. Specification A 106, are shown in the table at the right.

**Wall thickness:** Wall thicknesses correspond to those used in Crane Steel Butt-Welding Fittings. To establish minimum thickness, "t", required by the formula, the nominal thickness was reduced 12½% to compensate for the tolerance required by pipe mills.

**"C" Value:** "C" value for plain end steel pipe is:

Power Piping — ¾ and 1-inch sizes . . . . 0.05"
— 1¼-inch and larger . . . 0.065"
Oil Piping — All sizes . . . . . 0.05"

**"S" Values, Pounds per Square Inch**

| Temp. Fahr. | Power Piping | †Oil Piping | Temp. Fahr. | Power Piping | †Oil Piping |
|---|---|---|---|---|---|
| 100° | 12,240 | 18,000 | 600° | 9,840 | 12,550 |
| 150° | 12,000 | 17,450 | 650° | 9,600 | 12,000 |
| 200° | 11,760 | 16,900 | 700° | 9,250 | 11,550 |
| 250° | 11,520 | 16,350 | 750° | 8,700 | 10,900 |
| 300° | 11,280 | 15,800 | 800° | 8,000 | 10,000 |
| 350° | 11,040 | 15,300 | 850° | 6,850 | 8,550 |
| 400° | 10,800 | 14,700 | 900° | 5,600 | 7,000 |
| 450° | 10,560 | 14,150 | 950° | 3,800 | 4,750 |
| 500° | 10,320 | 13,600 | 1000° | 2,000 | 2,500 |
| 550° | 10,080 | 13,100 | | | |

†Values apply to Oil Piping Within Refinery Limits.

**Other ratings:** A simplified method for calculating other ratings is explained on pages 541 to 545.

### Standard Grade A Seamless Steel Pipe
### For Power Piping, Section 1, Code for Pressure Piping

| Size of Pipe | *Wall Thickness | Temperature — Degrees Fahrenheit | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | | Working Pressures, Pounds per Square Inch | | | | | | | | | | | | | | | | | | |
| ¾" | .113" | 1185 | 1165 | 1140 | 1115 | 1095 | 1070 | 1050 | 1025 | 1000 | 980 | 955 | 930 | 895 | 845 | 775 | 665 | 545 | 370 | 195 |
| 1 | .133 | 1285 | 1260 | 1235 | 1210 | 1185 | 1160 | 1135 | 1110 | 1085 | 1060 | 1035 | 1010 | 970 | 915 | 840 | 720 | 590 | 400 | 210 |
| 1¼ | .140 | 870 | 850 | 835 | 820 | 800 | 785 | 765 | 750 | 735 | 715 | 700 | 680 | 655 | 620 | 570 | 485 | 400 | 270 | 140 |
| 1½ | .145 | 820 | 805 | 790 | 770 | 755 | 740 | 725 | 710 | 690 | 675 | 660 | 645 | 620 | 585 | 535 | 460 | 375 | 255 | 135 |
| 2 | .154 | 735 | 720 | 705 | 690 | 675 | 660 | 650 | 635 | 620 | 605 | 590 | 575 | 555 | 520 | 480 | 410 | 335 | 230 | 120 |
| 2½ | .203 | 990 | 970 | 955 | 935 | 915 | 895 | 875 | 855 | 835 | 815 | 795 | 780 | 750 | 705 | 650 | 555 | 455 | 310 | 160 |
| 3 | .216 | 895 | 875 | 860 | 840 | 825 | 805 | 790 | 770 | 755 | 735 | 720 | 700 | 675 | 635 | 585 | 500 | 410 | 275 | 145 |
| 3½ | .226 | 830 | 815 | 800 | 785 | 765 | 750 | 735 | 720 | 700 | 685 | 670 | 655 | 630 | 590 | 545 | 465 | 380 | 260 | 135 |
| 4 | .237 | 795 | 780 | 765 | 750 | 735 | 720 | 700 | 685 | 670 | 655 | 640 | 625 | 600 | 565 | 520 | 445 | 365 | 245 | 130 |
| 5 | .258 | 720 | 710 | 695 | 680 | 665 | 650 | 635 | 625 | 610 | 595 | 580 | 565 | 545 | 515 | 470 | 405 | 330 | 225 | 120 |
| 6 | .280 | 685 | 670 | 660 | 645 | 630 | 620 | 605 | 590 | 580 | 565 | 550 | 540 | 520 | 485 | 450 | 385 | 315 | 215 | 110 |
| 8 | .322 | 625 | 610 | 600 | 590 | 575 | 565 | 550 | 540 | 525 | 515 | 500 | 490 | 470 | 445 | 410 | 350 | 285 | 195 | 100 |
| 10 | .365 | 590 | 575 | 565 | 555 | 540 | 530 | 520 | 505 | 495 | 485 | 470 | 460 | 445 | 420 | 385 | 330 | 270 | 180 | 95 |
| 12 | .375 | 515 | 505 | 495 | 485 | 475 | 465 | 455 | 445 | 435 | 425 | 415 | 405 | 390 | 365 | 335 | 290 | 235 | 160 | 85 |
| 14 OD | .375 | 465 | 455 | 445 | 440 | 430 | 420 | 410 | 400 | 390 | 385 | 375 | 365 | 350 | 330 | 305 | 260 | 215 | 145 | 75 |
| 16 OD | .375 | 405 | 395 | 390 | 380 | 370 | 365 | 355 | 350 | 340 | 335 | 325 | 315 | 305 | 285 | 265 | 225 | 185 | 125 | 65 |
| 18 OD | .375 | 365 | 360 | 355 | 345 | 340 | 330 | 325 | 315 | 310 | 300 | 295 | 290 | 280 | 260 | 240 | 205 | 170 | 115 | 60 |
| 20 OD | .375 | 330 | 325 | 320 | 310 | 305 | 300 | 290 | 285 | 280 | 270 | 265 | 260 | 250 | 235 | 215 | 185 | 150 | 105 | 55 |
| 24 OD | .375 | 270 | 265 | 260 | 255 | 250 | 245 | 240 | 230 | 225 | 220 | 215 | 210 | 205 | 190 | 175 | 150 | 125 | 85 | 45 |

*These are the nominal wall thicknesses; they correspond to the thickness of Standard and Extra Strong Butt-Welding Fittings.

*Pressure-Temperature Ratings Based on Code for Pressure Piping*

## Extra Strong Grade A Seamless Steel Pipe For Power Piping, Section 1, Code for Pressure Piping

| Size of Pipe | *Wall Thickness | Temperature – Degrees Fahrenheit | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | | Working Pressures, Pounds per Square Inch | | | | | | | | | | | | | | | | | | |
| 1" | .179 | 2120 | 2075 | 2035 | 1990 | 1950 | 1910 | 1870 | 1825 | 1785 | 1745 | 1700 | 1660 | 1600 | 1505 | 1385 | 1185 | 970 | 655 | 345 |
| 1¼ | .191 | 1580 | 1550 | 1515 | 1485 | 1455 | 1425 | 1395 | 1360 | 1330 | 1300 | 1270 | 1240 | 1195 | 1120 | 1030 | 885 | 720 | 490 | 260 |
| 1½ | .200 | 1480 | 1450 | 1420 | 1395 | 1365 | 1335 | 1305 | 1280 | 1250 | 1220 | 1190 | 1160 | 1120 | 1055 | 970 | 830 | 680 | 460 | 240 |
| 2 | .218 | 1360 | 1330 | 1305 | 1280 | 1250 | 1225 | 1200 | 1170 | 1145 | 1120 | 1090 | 1065 | 1025 | 965 | 890 | 760 | 620 | 420 | 220 |
| 2½ | .276 | 1580 | 1550 | 1515 | 1485 | 1455 | 1425 | 1395 | 1360 | 1330 | 1300 | 1270 | 1240 | 1195 | 1120 | 1030 | 885 | 720 | 490 | 260 |
| 3 | .300 | 1445 | 1415 | 1390 | 1360 | 1330 | 1305 | 1275 | 1245 | 1220 | 1190 | 1160 | 1135 | 1090 | 1025 | 945 | 810 | 660 | 450 | 235 |
| 3½ | .318 | 1360 | 1330 | 1305 | 1280 | 1250 | 1225 | 1200 | 1170 | 1145 | 1120 | 1090 | 1065 | 1025 | 965 | 890 | 760 | 620 | 420 | 220 |
| 4 | .337 | 1310 | 1285 | 1260 | 1230 | 1205 | 1180 | 1155 | 1130 | 1105 | 1080 | 1055 | 1025 | 990 | 930 | 855 | 735 | 600 | 405 | 215 |
| 5 | .375 | 1200 | 1175 | 1150 | 1130 | 1105 | 1080 | 1060 | 1035 | 1010 | 990 | 965 | 940 | 905 | 855 | 785 | 670 | 550 | 370 | 195 |
| 6 | .432 | 1200 | 1175 | 1150 | 1130 | 1105 | 1080 | 1050 | 1035 | 1010 | 990 | 965 | 940 | 905 | 855 | 785 | 670 | 550 | 370 | 195 |
| 8 | .500 | 1090 | 1070 | 1045 | 1025 | 1005 | 985 | 960 | 940 | 920 | 895 | 875 | 855 | 825 | 775 | 710 | 610 | 500 | 340 | 180 |
| 10 | .500 | 870 | 850 | 835 | 820 | 800 | 785 | 765 | 750 | 735 | 715 | 700 | 680 | 655 | 620 | 570 | 485 | 400 | 270 | 140 |
| 12 | .500 | 735 | 720 | 705 | 690 | 675 | 660 | 650 | 635 | 620 | 605 | 590 | 575 | 555 | 520 | 480 | 410 | 335 | 230 | 120 |
| 14 OD | .500 | 660 | 650 | 635 | 620 | 610 | 595 | 585 | 570 | 555 | 545 | 530 | 520 | 500 | 470 | 430 | 370 | 300 | 205 | 110 |
| 16 OD | .500 | 575 | 565 | 550 | 540 | 530 | 520 | 510 | 495 | 485 | 475 | 460 | 450 | 435 | 410 | 375 | 320 | 265 | 180 | 95 |
| 18 OD | .500 | 515 | 505 | 495 | 485 | 475 | 465 | 455 | 435 | 425 | 425 | 415 | 405 | 390 | 365 | 335 | 290 | 235 | 160 | 85 |
| 20 OD | .500 | 465 | 455 | 445 | 440 | 430 | 420 | 410 | 400 | 390 | 385 | 375 | 365 | 350 | 330 | 305 | 260 | 215 | 145 | 75 |
| 24 OD | .500 | 380 | 370 | 365 | 355 | 350 | 340 | 335 | 325 | 320 | 310 | 305 | 300 | 285 | 270 | 250 | 210 | 175 | 120 | 60 |

## Standard Grade A Seamless Steel Pipe For Oil Piping Within Refinery Limits, Section 3, Code for Pressure Piping

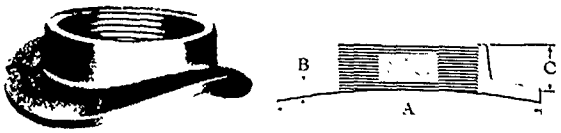
| Size of Pipe | *Wall Thickness | Temperature —— Degrees Fahrenheit | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | | Working Pressures, Pounds per Square Inch | | | | | | | | | | | | | | | | | | |
| ¾" | .113" | 1675 | 1625 | 1570 | 1520 | 1470 | 1425 | 1365 | 1315 | 1265 | 1220 | 1165 | 1115 | 1075 | 1015 | 930 | 795 | 650 | 450 | 235 |
| 1 | .133 | 1820 | 1760 | 1705 | 1650 | 1595 | 1545 | 1485 | 1430 | 1375 | 1325 | 1270 | 1210 | 1165 | 1100 | 1010 | 865 | 705 | 480 | 255 |
| 1¼ | .140 | 1565 | 1520 | 1470 | 1420 | 1375 | 1330 | 1280 | 1230 | 1185 | 1140 | 1090 | 1045 | 1005 | 950 | 870 | 745 | 610 | 415 | 220 |
| 1½ | .145 | 1460 | 1415 | 1370 | 1325 | 1280 | 1240 | 1190 | 1145 | 1100 | 1060 | 1015 | 970 | 935 | 885 | 810 | 695 | 565 | 385 | 205 |
| 2 | .154 | 1280 | 1240 | 1200 | 1160 | 1120 | 1085 | 1045 | 1005 | 965 | 930 | 890 | 850 | 820 | 775 | 710 | 605 | 495 | 335 | 180 |
| 2½ | .203 | 1600 | 1555 | 1505 | 1455 | 1405 | 1360 | 1310 | 1260 | 1210 | 1165 | 1115 | 1070 | 1030 | 970 | 890 | 780 | 625 | 425 | 225 |
| 3 | .216 | 1420 | 1380 | 1335 | 1290 | 1250 | 1210 | 1160 | 1120 | 1075 | 1035 | 990 | 950 | 910 | 860 | 790 | 675 | 555 | 375 | 200 |
| 3½ | .226 | 1330 | 1290 | 1255 | 1210 | 1170 | 1130 | 1090 | 1045 | 1005 | 970 | 930 | 890 | 855 | 805 | 740 | 635 | 520 | 350 | 185 |
| 4 | .237 | 1260 | 1220 | 1185 | 1145 | 1105 | 1070 | 1030 | 990 | 950 | 915 | 880 | 840 | 810 | 765 | 700 | 600 | 490 | 335 | 175 |
| 5 | .258 | 1135 | 1100 | 1065 | 1030 | 995 | 965 | 925 | 890 | 855 | 825 | 790 | 755 | 730 | 685 | 630 | 540 | 440 | 300 | 160 |
| 6 | .280 | 1060 | 1030 | 995 | 965 | 930 | 905 | 865 | 835 | 800 | 775 | 740 | 710 | 680 | 645 | 590 | 505 | 415 | 280 | 150 |
| 8 | .322 | 970 | 940 | 915 | 885 | 855 | 825 | 795 | 765 | 735 | 705 | 680 | 650 | 625 | 590 | 540 | 460 | 380 | 255 | 135 |
| 10 | .365 | 900 | 875 | 845 | 820 | 790 | 765 | 735 | 710 | 680 | 655 | 630 | 600 | 580 | 545 | 500 | 430 | 350 | 240 | 125 |
| 12 | .375 | 790 | 770 | 745 | 720 | 695 | 675 | 645 | 625 | 600 | 575 | 550 | 530 | 510 | 480 | 440 | 375 | 310 | 210 | 110 |
| 14 OD | .375 | 720 | 700 | 675 | 655 | 630 | 610 | 590 | 565 | 545 | 525 | 500 | 480 | 460 | 435 | 400 | 340 | 280 | 190 | 100 |
| 16 OD | .375 | 630 | 610 | 590 | 570 | 555 | 535 | 515 | 495 | 475 | 460 | 440 | 420 | 405 | 380 | 350 | 300 | 245 | 165 | 90 |
| 18 OD | .375 | 560 | 540 | 525 | 505 | 490 | 475 | 455 | 440 | 420 | 405 | 390 | 370 | 360 | 340 | 310 | 265 | 215 | 145 | 80 |
| 20 OD | .375 | 505 | 490 | 475 | 460 | 440 | 430 | 410 | 395 | 380 | 365 | 350 | 335 | 325 | 305 | 280 | 240 | 195 | 135 | 70 |
| 24 OD | .375 | 415 | 400 | 390 | 375 | 365 | 350 | 340 | 325 | 315 | 300 | 290 | 275 | 265 | 250 | 230 | 195 | 160 | 110 | 60 |

## Extra Strong Grade A Seamless Steel Pipe For Oil Piping Within Refinery Limits, Section 3, Code for Pressure Piping

| Size of Pipe | *Wall Thickness | Temperature —— Degrees Fahrenheit | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| | | Working Pressures, Pounds per Square Inch | | | | | | | | | | | | | | | | | | |
| 1" | .179 | 2915 | 2825 | 2740 | 2650 | 2560 | 2480 | 2380 | 2290 | 2205 | 2120 | 2035 | 1945 | 1870 | 1765 | 1620 | 1385 | 1135 | 770 | 405 |
| 1¼ | .191 | 2540 | 2460 | 2385 | 2305 | 2230 | 2155 | 2075 | 1995 | 1920 | 1845 | 1770 | 1690 | 1630 | 1535 | 1410 | 1205 | 985 | 670 | 355 |
| 1½ | .200 | 2375 | 2305 | 2230 | 2160 | 2085 | 2020 | 1940 | 1870 | 1795 | 1730 | 1655 | 1585 | 1525 | 1440 | 1320 | 1130 | 925 | 625 | 330 |
| 2 | .218 | 2140 | 2075 | 2010 | 1945 | 1880 | 1820 | 1750 | 1685 | 1620 | 1560 | 1495 | 1430 | 1375 | 1295 | 1190 | 1015 | 835 | 565 | 300 |
| 2½ | .276 | 2395 | 2320 | 2250 | 2175 | 2100 | 2035 | 1955 | 1880 | 1810 | 1740 | 1670 | 1595 | 1535 | 1450 | 1330 | 1135 | 930 | 630 | 335 |
| 3 | .300 | 2180 | 2110 | 2045 | 1980 | 1910 | 1850 | 1780 | 1710 | 1645 | 1585 | 1520 | 1450 | 1400 | 1320 | 1210 | 1035 | 845 | 575 | 305 |
| 3½ | .318 | 2050 | 1990 | 1925 | 1865 | 1800 | 1745 | 1675 | 1615 | 1550 | 1495 | 1430 | 1370 | 1315 | 1245 | 1140 | 975 | 800 | 540 | 285 |
| 4 | .337 | 1960 | 1900 | 1840 | 1780 | 1720 | 1670 | 1600 | 1540 | 1480 | 1430 | 1370 | 1310 | 1260 | 1190 | 1090 | 930 | 765 | 520 | 275 |
| 5 | .375 | 1800 | 1745 | 1690 | 1635 | 1580 | 1530 | 1470 | 1415 | 1360 | 1310 | 1255 | 1200 | 1155 | 1090 | 1000 | 855 | 700 | 475 | 250 |
| 6 | .432 | 1780 | 1730 | 1675 | 1620 | 1565 | 1515 | 1455 | 1400 | 1345 | 1295 | 1240 | 1190 | 1145 | 1080 | 990 | 845 | 695 | 470 | 245 |
| 8 | .500 | 1620 | 1570 | 1520 | 1470 | 1420 | 1375 | 1325 | 1275 | 1225 | 1180 | 1130 | 1080 | 1040 | 980 | 900 | 770 | 630 | 430 | 225 |
| 10 | .500 | 1295 | 1255 | 1215 | 1175 | 1140 | 1100 | 1060 | 1020 | 980 | 945 | 905 | 865 | 830 | 785 | 720 | 615 | 505 | 340 | 180 |
| 12 | .500 | 1100 | 1065 | 1030 | 995 | 965 | 935 | 895 | 865 | 830 | 800 | 765 | 730 | 705 | 665 | 610 | 520 | 425 | 290 | 155 |
| 14 OD | .500 | 990 | 960 | 930 | 900 | 870 | 840 | 810 | 780 | 750 | 720 | 690 | 660 | 635 | 600 | 550 | 470 | 385 | 260 | 140 |
| 16 OD | .500 | 865 | 840 | 810 | 785 | 760 | 735 | 705 | 680 | 655 | 630 | 600 | 575 | 555 | 525 | 480 | 410 | 335 | 230 | 120 |
| 18 OD | .500 | 775 | 750 | 725 | 705 | 680 | 660 | 635 | 610 | 585 | 565 | 540 | 515 | 495 | 470 | 430 | 370 | 300 | 205 | 110 |
| 20 OD | .500 | 700 | 680 | 660 | 640 | 615 | 595 | 575 | 550 | 530 | 510 | 490 | 470 | 450 | 425 | 390 | 335 | 275 | 185 | 100 |
| 24 OD | .500 | 575 | 560 | 540 | 525 | 505 | 490 | 470 | 455 | 435 | 420 | 400 | 385 | 370 | 350 | 320 | 275 | 225 | 150 | 80 |

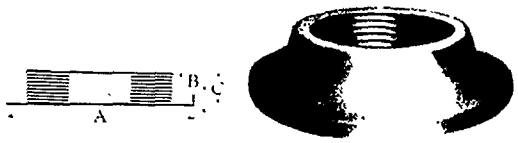
* These are the nominal wall thicknesses, they correspond to the thickness of Standard and Extra Strong Butt-Welding Fittings.

# Kropp Forged Steel Boiler Flanges




Standard or Extra Heavy Boiler Flanges

*Prices on application*




Extra Heavy Welding Flange

**Boiler flanges:** Boiler flanges are fastened to boilers, pipe lines, tanks, and similar vessels by means of rivets. They are regularly furnished without rivet holes; when wanted drilled for rivets, specify whether for single, double, or staggered riveting, and give the pitch, spacing, and size of rivets.

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The flanges regularly are furnished flat or are bent to standard diameter circles. Sizes 6-inch and smaller will be bent to circles as small as 18 inches; sizes 8-inch and larger will be bent to circles as small as 30 inches. The flanges can be bent to smaller diameter circles, and also to fit the center of dished head or spherical surfaces, at an added charge.

**Welding flanges:** Welding flanges are fastened to boilers, pipe lines, tanks, and similar vessels by welding around the outer edge of the flange. Regularly furnished flat, they can be bent to any reasonable radius at an added charge.

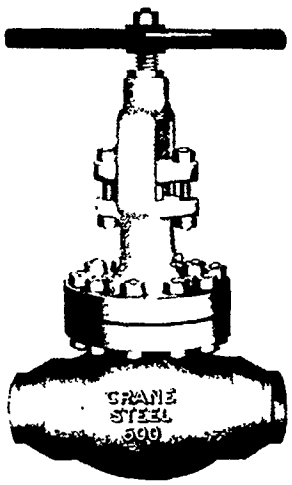
**Dimensions, in Inches**

| Size | Standard Boiler Flange | | | Extra Heavy Boiler Flange | | | Extra Heavy Welding Flange | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C |
| 3/4 | 6 | 5/16 | 1 | | | | | | |
| 1 | 6 | 5/16 | 1 | 6 | 3/8 | 1 1/16 | 2 3/4 | 5/16 | 5/8 |
| 1 1/4 | 6 1/2 | 5/16 | 1 | 6 1/2 | 3/8 | 1 1/16 | 3 | 5/16 | 5/8 |
| 1 1/2 | 7 | 3/8 | 1 1/4 | 7 | 1/2 | 1 3/8 | 3 1/2 | 3/8 | 3/4 |
| 2 | 8 | 3/8 | 1 1/4 | 8 | 1/2 | 1 3/8 | 4 | 3/8 | 3/4 |
| 2 1/2 | 8 1/2 | 3/8 | 1 1/2 | 8 1/2 | 1/2 | 1 3/8 | 4 1/2 | 3/8 | 7/8 |
| 3 | 9 | 3/8 | 1 1/2 | 9 | 1/2 | 1 5/8 | 5 | 3/8 | 1 |
| 3 1/2 | 9 1/2 | 7/16 | 1 1/2 | 9 1/2 | 9/16 | 1 5/8 | 5 1/2 | 7/16 | 1 |
| 4 | 10 | 7/16 | 1 3/4 | 10 | 9/16 | 1 7/8 | 6 1/2 | 7/16 | 1 1/4 |
| 5 | 11 1/2 | 1/2 | 2 | 11 1/2 | 5/8 | 2 1/8 | 7 1/2 | 1/2 | 1 1/2 |
| 6 | 12 1/2 | 1/2 | 2 | 12 1/2 | 5/8 | 2 1/8 | 8 1/2 | 1/2 | 1 1/2 |
| 8 | 15 | 5/8 | 2 1/2 | 15 | 3/4 | 2 5/8 | 10 1/2 | 5/8 | 1 3/4 |
| 10 | 17 1/2 | 3/4 | 2 1/2 | 17 1/2 | 7/8 | 2 5/8 | 13 | 3/4 | 2 |
| 12 | 20 | 13/16 | 3 | 20 | 1 | 3 3/16 | 15 | 13/16 | 2 |

**Other flanges:** Double Hub, High Hub, Horseshoe, Offset, Marine, and other type flanges are also available; information furnished on request.

## *Other Products for Welding*

In close association with the Crane line of Steel Butt-Welding and Socket-Welding Fittings shown on the preceding pages, is the wide variety of Butt-Welding and Socket-Welding Steel Valves and welding type Steel Flanges, available in a complete range of sizes and pressures.

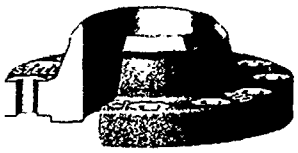



**Butt-Welding Valves**
(Globe illustrated)

Gate . . . . . see pages 210 and 229
Globe. . . see pages 213 and 240
Angle see pages 213 and 240
Swing Check. . see pages 252 to 255

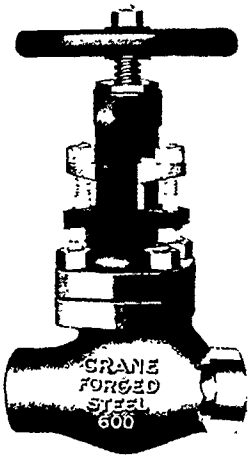
Included in the line offered by Crane are materials to satisfy the needs of every welded installation.

The butt-welding and socket-welding steel valves and the welding type steel flanges illustrated on this page are representative of the products that make up the complete Crane welding line. For prices, see the pages indicated below the illustrations.



**Welding Flanges**
(Welding Neck Flange illustrated)

Welding Neck Flanges. . . see pages 291 to 298
Slip-On Welding Flanges. see pages 291 to 298
Cranelap Flanges. . . . . see pages 291 to 298
Stub Ends for use in combination with Cranelap Flanges see pages 280 to 283




**Socket-Welding Valves**
(Globe illustrated)

Gate. . . see pages 210, and 223 to 225
Globe. see pages 213 and 239
Angle. . see pages 213 and 239
Lift Check. . . . . see pages 250 and 251

# Forged Steel Flanges

The Crane line of Forged Steel Flanges includes a complete assortment of types in a wide range of straight and reducing sizes. The flanges are regularly manufactured for the 150, 300, 400, 600, 900, 1500, and 2500-Pound pressure classes. Special flanges can be made to order; flanges listed and described in this section include:

| | |
|---|---|
| Screwed Flanges | Reducing Screwed Flanges |
| Blind Flanges | Cranelap Flanges |
| Welding Neck Flanges | Slip-On Welding Flanges |

Reducing Slip-On Welding Flanges

**Pressure-Temperature Ratings**.....page 292
**General Description**.....page 293

**List Prices**
150 and 300-Pound.....page 294
400, 600, 900, and 1500-Pound.....page 295

**Dimensions**
150, 300, and 400-Pound.....page 296
600, 900, 1500, and 2500-Pound.....page 297

**Boring of Welding Neck Flanges**.....page 298

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The Forged Steel Flanges listed above comprise only a part of the complete line of Crane steel products.

Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

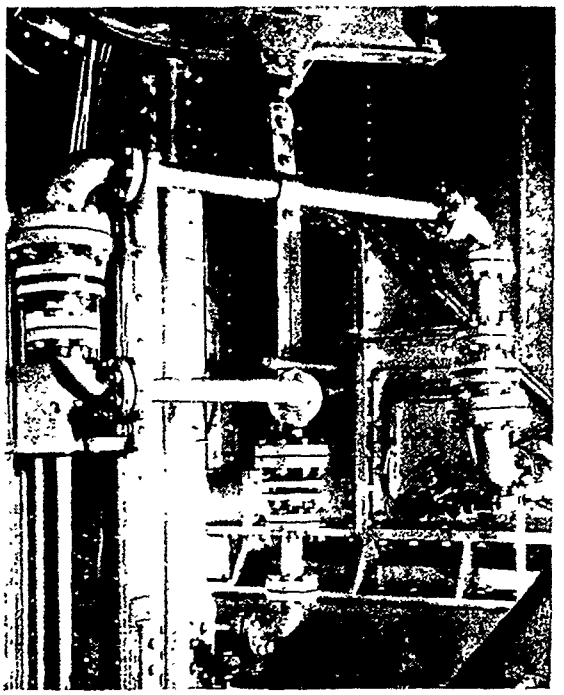
Steel Welding Fittings.....pages 275 to 290
Steel Flanged Fittings.....pages 267 to 274
Steel Screwed Fittings.....pages 257 to 262
18-8 Mo Flanges.....page 383

Steel Couplings.....page 170
Wrought Steel Nipples.....pages 168 and 169
Forged Steel Unions.....pages 203 and 204
Forged Steel Flange Unions.....page 265

Steel Pressure-Seal Bonnet Valves.....pages 205 to 217
Steel Lip-Seal Bonnet Valves.....pages 218 and 219
Steel Gate Valves.....pages 221 to 234
Steel Globe and Angle Valves.....pages 235 to 248
Steel Check Valves.....pages 249 to 256

Steel Stop-Check Valves.....pages 304 and 305
Steel Safety Valves.....page 324
Steel Relief Valves.....pages 333 and 334
Steel Sediment Separators.....page 356

*Fabricated Piping.. pages 497 to 522*



Crane steel flanges and flanged fittings meet the severe requirements of high pressure, high temperature service.

# Forged Steel Flanges

Working Pressures, Pounds per Square Inch, Non-Shock
For Flanges Shown on pages 293 to 298

For Steam, Water, Oil, Oil Vapor, Gas, or Air

| Temp. | Carbon Steel | | | | | | | No. 4 Carbon-Molybdenum Alloy Steel | | | | | | No. 5 Chrome-Molybdenum Alloy Steel (Made to order) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Deg. F. | 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | 2500 Lb. |
| **[1]Flanges with Standard Facings Other Than Ring Joint** | | | | | | | | | | | | | | | | | | | |
| 100 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 5000 | | | | | | | | | | | | |
| 150 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 4915 | | | | | | | | | | | | |
| 200 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 4830 | | | | | | | | | | | | |
| 250 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 4750 | | | | | | | | | | | | |
| 300 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 4660 | | | | | | | | | | | | |
| 350 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 4565 | For temperatures up to 750° F., these ratings are the same as those for Carbon Steel Flanges, shown at the left. | | | | | | For temperatures up to 750° F., these ratings are the same as those for Carbon Steel Flanges. For temperatures up to 900° F., the ratings are the same as those for No. 4 Carbon-Molybdenum Alloy Steel Flanges. (See ratings at left) | | | | | |
| 400 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 4475 | | | | | | | | | | | | |
| 450 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 4380 | | | | | | | | | | | | |
| 500 | **150** | 500 | 665 | 1000 | 1500 | 2500 | 4165 | | | | | | | | | | | | |
| 550 | 140 | 475 | 630 | 950 | 1420 | 2370 | 3950 | | | | | | | | | | | | |
| 600 | 130 | 445 | 590 | 890 | 1330 | 2220 | 3700 | | | | | | | | | | | | |
| 650 | 120 | 415 | 550 | 830 | 1240 | 2070 | 3450 | | | | | | | | | | | | |
| 700 | 110 | 380 | 500 | 760 | 1140 | 1900 | 3160 | | | | | | | | | | | | |
| 750 | 100 | 340 | 450 | 680 | 1020 | 1700 | 2830 | 360 | 475 | 720 | 1080 | 1800 | 2995 | | | | | | |
| 800 | 92 | **300** | **400** | **600** | **900** | **1500** | **2500** | 340 | 450 | 680 | 1020 | 1700 | 2830 | | | | | | |
| 850 | 82 | 245 | 330 | 490 | 740 | 1230 | 2050 | 320 | 425 | 640 | 960 | 1600 | 2665 | | | | | | |
| 900 | [2]270 | [2]210 | [2]280 | [2]420 | [2]630 | [2]1050 | [2]1750 | **300** | **400** | **600** | **900** | **1500** | **2500** | 310 | 410 | 620 | 930 | 550 | 2580 |
| 950 | [2]55 | [2]165 | [2]220 | [2]330 | [2]495 | [2]825 | [2]1375 | [2]265 | [2]350 | [2]530 | [2]795 | [2]1325 | [2]2205 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| 1000 | [2]40 | [2]120 | [2]160 | [2]240 | [2]360 | [2]600 | [2]1000 | [2]190 | [2]250 | [2]380 | [2]570 | [2]950 | [2]1580 | 200 | 275 | 400 | 600 | 1000 | 1675 |
| 1050 | | | | | | | | | | | | | | 135 | 180 | 270 | 405 | 675 | 1125 |
| 1100 | | | | | | | | | | | | | | 90 | 120 | 180 | 270 | 450 | 750 |
| **Flanges with Ring Joint Facing** | | | | | | | | | | | | | | | | | | | |
| 100 | 275 | 720 | 960 | 1440 | 2160 | 3600 | 6000 | | | | | | | | | | | | |
| 150 | 255 | 710 | 945 | 1420 | 2130 | 3550 | 5915 | | | | | | | | | | | | |
| 200 | 240 | 700 | 930 | 1400 | 2100 | 3500 | 5830 | | | | | | | | | | | | |
| 250 | 225 | 690 | 920 | 1380 | 2070 | 3450 | 5750 | | | | | | | | | | | | |
| 300 | 210 | 680 | 910 | 1365 | 2050 | 3415 | 5690 | | | | | | | | | | | | |
| 350 | 195 | 675 | 900 | 1350 | 2025 | 3375 | 5625 | For temperatures up to 800° F., these ratings are the same as those for Carbon Steel Flanges, shown at the left. | | | | | | | | | | | |
| 400 | 180 | 665 | 890 | 1330 | 2000 | 3330 | 5550 | | | | | | | | | | | | |
| 450 | 165 | 660 | 875 | 1320 | 1975 | 3295 | 5490 | | | | | | | | | | | | |
| 500 | **150** | 625 | 835 | 1250 | 1875 | 3125 | 5210 | | | | | | | | | | | | |
| 550 | 140 | 590 | 790 | 1180 | 1775 | 2955 | 4925 | | | | | | | | | | | | |
| 600 | 130 | 555 | 740 | 1110 | 1660 | 2770 | 4620 | | | | | | | | | | | | |
| 650 | 120 | 515 | 690 | 1030 | 1550 | 2580 | 4300 | | | | | | | | | | | | |
| 700 | 110 | 470 | 635 | 940 | 1410 | 2350 | 3920 | | | | | | | | | | | | |
| 750 | 100 | 425 | 575 | 850 | 1275 | 2125 | 3550 | | | | | | | | | | | | |
| 800 | 92 | 365 | 490 | 730 | 1100 | 1830 | 3050 | 375 | 500 | 750 | 1125 | 1875 | 3125 | 400 | 525 | 800 | 1200 | 2000 | 3325 |
| 850 | 82 | **300** | **400** | **600** | **900** | **1500** | **2500** | 350 | 475 | 700 | 1050 | 1750 | 2925 | 375 | 500 | 750 | 1125 | 1875 | 3125 |
| 900 | [2]270 | [2]210 | [2]280 | [2]420 | [2]630 | [2]1050 | [2]1750 | 325 | 425 | 650 | 975 | 1625 | 2700 | 350 | 475 | 700 | 1050 | 1750 | 2925 |
| 950 | [2]55 | [2]165 | [2]220 | [2]330 | [2]495 | [2]825 | [2]1375 | **300** | **400** | **600** | **900** | **1500** | **2500** | 325 | 425 | 650 | 975 | 1625 | 2700 |
| 1000 | [2]40 | [2]120 | [2]160 | [2]240 | [2]360 | [2]600 | [2]1000 | [2]230 | [2]310 | [2]470 | [2]700 | [2]1170 | [2]1950 | **300** | **400** | **600** | **900** | **1500** | **2500** |
| 1050 | | | | | | | | [2]135 | [2]180 | [2]270 | [2]405 | [2]675 | [2]1125 | 225 | 275 | 425 | 650 | 1075 | 1775 |
| 1100 | | | | | | | | [2]90 | [2]120 | [2]180 | [2]270 | [2]450 | [2]750 | 150 | 200 | 275 | 425 | 700 | 1175 |

[1]When an all-metal gasket (corrugated or flat) is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]These ratings apply only to oil or oil vapor service.

**Flange facings:** Unless otherwise ordered, 150 and 300-Pound Flanges are regularly furnished with a 1/16-inch raised face, and 400-Pound and higher pressure flanges are regularly furnished with a 1/4-inch male face.

**Cold service:** For temperatures between 0° and 100° F., the ratings for 100° F. apply. For sub-zero service, materials having a suitable impact resistance must be used; recommendations will be furnished on request.

**Cranelap Flanges and Joints:** These ratings also apply to Cranelap Flanges, the rating being dependent upon the type of facing applied to the lapped pipe end. Ratings for Cranelap Joints are contingent upon the use of pipe of proper material having an equal or higher rating.

**Standards:** Crane pressure-temperature ratings agree with those in Supplement No. 1 (ASA B16e6-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, and those in the American Petroleum Institute (API) Standard No. 600, Second Edition, 1951.

# Forged Steel Flanges

*For working pressures, see the preceding page.*

**A complete line:** The Crane line of Forged Steel Flanges includes a complete assortment of types in a wide range of straight and reducing sizes for seven different pressure classes (150, 300, 400, 600, 900, 1500, and 2500-Pound). The flanges are made in a variety of materials and with various flange facings, providing flanges for every service requirement.

**Materials:** Flanges made of Crane Forged Carbon Steel will be furnished unless otherwise ordered. List prices are shown on the two pages following (list prices of 2500-Pound Flanges are furnished on application).

Flanges in 300-Pound and higher pressure classes, made of Crane No. 4 Carbon-Molybdenum or Crane No. 5 Chrome-Molybdenum Forged Steel, can be furnished when orders so specify. See the Crane Discount Sheet for prices.

When so ordered, 150 and 300-Pound Forged Carbon Steel Flanges can be furnished heat treated (normalized or annealed) to conform to A.S.T.M. Specification A 105; prices on request.



**Drilling:** Flanges of each pressure class are furnished faced, drilled, and spot faced (F.D. & S.F.) unless otherwise ordered. List prices include drilling to the corresponding pressure class of the American Standard. No deduction is made if flanges are ordered faced only.

**Flange facings:** The 150 and 300-Pound Forged Steel Screwed, Slip-On Welding, Welding Neck, and Blind Flanges are regularly furnished with an American Standard 1/16-inch raised face.

In the 400, 600, 900, 1500, and 2500-Pound pressure classes, these flanges are regularly furnished with an American Standard 1/4-inch male face (large male) or an American Standard 3/16-inch female face (large female); unless otherwise specified, flanges with large male face will be furnished.

When so ordered, the flanges can be furnished with other types of facing, such as ring joint, tongue, groove, etc. See the Crane Discount Sheet for prices.

**Finish of flange faces:** The 1/16-inch raised faces and the 1/4-inch large male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish. A smooth finish can be furnished on the raised or male faces, when so specified; refer to the Crane Discount Sheet for prices.

Large female faces have a smooth finish.

**List prices of reducing flanges:** The list prices of Reducing Screwed and Reducing Slip-On Welding Flanges apply to any reduction. The price is governed by the outside diameter of the flange.

**Ordering reducing flanges:** When ordering reducing flanges, the reduced size should be designated first, and then the outside diameter of the flange. For example, a 600-Pound Flange to connect a 6-inch pipe to a 10-inch valve or fitting (O.D. of flange, 20 inches) should be ordered:

6" x 20" Reducing Flange.

**Reducing Welding Neck Flanges:** Reducing Welding Neck Flanges can be made to order. For prices, see the Crane Discount Sheet.

**Eccentric Reducing Flanges:** Forged Steel Eccentric Reducing Screwed and Slip-On Welding Flanges can be made to order. For prices, see the Crane Discount Sheet.

**Reducing Cranelap Flanges:** Reducing Cranelap Flanges are not recommended or manufactured; another type of flanged joint or connection should be used.

**American Standard:** The dimensions and drilling of all flanges conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1930, for their respective pressure class.

The American Standard does not include 400, 600, 900, or 1500-Pound Slip-On Welding Flanges. Crane flanges of this type have the same dimensions as American Standard Steel Screwed Flanges, being bored instead of threaded.

**3-inch 300 and 600-Pound Cranelap Joints:** When 3-inch 300 or 600-Pound Flanges with ring joint facing are to be bolted to Cranelap joints, orders must so specify; they require a groove of special pitch diameter. See page 470 for dimensions.

*List prices . . . . pages 294 and 295*
*Dimensions pages 296 and 297*

*Description of materials . . . pages 1 to 9*
*Templates for drilling pages 461 to 463*

# Forged Steel Flanges

***For working pressures and description, see the preceding two pages.***

Screwed Flange

No. 556, 150-Pound
No. 291 E, 300-Pound
No. 651 E, 400-Pound
No. 856 E, 600-Pound
No. 1266 E, 900-Pound
No. 1556 E, 1500-Pound

Reducing Screwed Flange
*(See "Ordering Reducing Flanges", page 295.)*

No. 558½, 150-Pound
No. 292 E, 300-Pound
No. 658 E, 400-Pound
No. 857 E, 600-Pound
No. 1263 E, 900-Pound
No. 1558 E, 1500-Pound

Blind Flange

No. 556½, 150-Pound
No. 297 E, 300-Pound
No. 657 E, 400-Pound
No. 858 E, 600-Pound
No. 1267 E, 900-Pound
No. 1557 E, 1500-Pound

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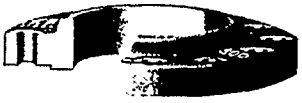
Cranelap Flange

No. 572, 150-Pound
No. 496 E, 300-Pound
No. 664 E, 400-Pound
No. 862 E, 600-Pound
No. 1262 E, 900-Pound
No. 1562 E, 1500-Pound

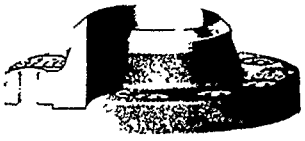


Slip-On Welding Flange

No. 554, 150-Pound
No. 294 E, 300-Pound
No. 694 E, 400-Pound
No. 854 E, 600-Pound
No. 1294 E, 900-Pound
No. 1594 E, 1500-Pound

Reducing
Slip-On Welding Flange
*(See "Ordering Reducing Flanges", page 295.)*

No. 554½, 150-Pound
No. 290 E, 300-Pound
No. 693 E, 400-Pound
No. 853 E, 600-Pound
No. 1295 E, 900-Pound
No. 1595 E, 1500-Pound



Welding Neck Flange
*(For boring, see page 298.)*

No. 568, 150-Pound
No. 296 E, 300-Pound
No. 656 E, 400-Pound
No. 855 E, 600-Pound
No. 1265 E, 900-Pound
No. 1565 E, 1500-Pound

## List Prices, Each—Faced, Drilled, and Spot Faced

| Class | Size of Pipe Inches | Straight Size Flanges: Screwed, Cranelap, or Slip-On Welding | Straight Size Flanges: Welding Neck (For boring, see page 298.) | Straight Size Flanges: Blind | Reducing Flanges: Outside Diameter of Flange Inches | Reducing Flanges: Screwed or Slip-On Welding |
|---|---|---|---|---|---|---|
| 150 Pound | ½ | 8.00 | 11.00 | 11.50 | | |
| | ¾ | 8.00 | 11.00 | 11.50 | | |
| | 1 | 8.00 | 11.00 | 11.50 | 4¼ | 16.00 |
| | 1¼ | 9.00 | 11.00 | 11.50 | 4⅝ | 18.00 |
| | 1½ | 10.00 | 11.00 | 11.50 | 5 | 20.00 |
| | 2 | 11.00 | 11.00 | 12.60 | 6 | 21.00 |
| | 2½ | 13.00 | 13.00 | 14.70 | 7 | 24.50 |
| | 3 | 15.00 | 15.00 | 17.05 | 7½ | 28.00 |
| | 3½ | 19.00 | 19.00 | 21.65 | 8½ | 35.00 |
| | 4 | 20.00 | 20.00 | 23.70 | 9 | 37.00 |
| | 5 | 24.00 | 24.00 | 28.20 | 10 | 44.00 |
| | 6 | 27.00 | 27.00 | 31.60 | 11 | 49.00 |
| | 8 | 35.00 | 44.00 | 42.00 | 13½ | 63.00 |
| | 10 | 48.00 | 62.00 | 58.00 | 16 | 86.00 |
| | 12 | 60.00 | 96.00 | 76.00 | 19 | 108.00 |
| | 14 | 80.00 | 130.00 | 126.00 | 21 | 144.00 |
| | 16 | 100.00 | 165.00 | 147.00 | 23½ | 180.00 |
| | 18 | 125.00 | 220.00 | 210.00 | 25 | 225.00 |
| | 20 | 150.00 | 290.00 | 252.00 | 27½ | 270.00 |
| | 24 | 240.00 | 380.00 | 320.00 | 32 | 380.00 |
| 300 Pound | ½ | 8.00 | 11.00 | 11.50 | | |
| | ¾ | 8.00 | 11.00 | 11.50 | | |
| | 1 | 8.00 | 11.00 | 11.50 | 4⅞ | 16.00 |
| | 1¼ | 9.00 | 11.00 | 11.50 | 5¼ | 18.00 |
| | 1½ | 10.00 | 11.00 | 11.50 | 6⅛ | 20.00 |
| | 2 | 11.00 | 11.00 | 12.60 | 6½ | 21.00 |
| | 2½ | 13.00 | 13.00 | 14.70 | 7½ | 24.50 |
| | *3 | 15.00 | 15.00 | 17.05 | 8¼ | 28.00 |
| | 3½ | 19.00 | 19.00 | 21.65 | 9 | 35.00 |
| | 4 | 20.00 | 20.00 | 23.70 | 10 | 37.00 |
| | 5 | 24.00 | 24.00 | 28.20 | 11 | 44.00 |
| | 6 | 27.00 | 27.00 | 31.60 | 12½ | 49.00 |
| | 8 | 35.00 | 44.00 | 42.00 | 15 | 63.00 |
| | 10 | 48.00 | 62.00 | 58.00 | 17½ | 86.00 |
| | 12 | 60.00 | 96.00 | 76.00 | 20½ | 108.00 |
| | 14 | 80.00 | 130.00 | 126.00 | 23 | 144.00 |
| | 16 | 100.00 | 165.00 | 147.00 | 25½ | 180.00 |
| | 18 | 125.00 | 220.00 | 210.00 | 28 | 225.00 |
| | 20 | 150.00 | 290.00 | 252.00 | 30½ | 270.00 |
| | 24 | 240.00 | 380.00 | 320.00 | 36 | 380.00 |

*3" 300-Pound flanges with ring joint facing to bolt against a Cranelap joint must be specially ordered, they require a groove of special pitch diameter. See page 470 for dimensions.

*(Continued on the following page)*

***Galvanized Flanges....page 476***

# Forged Steel Flanges

List Prices, Each—Faced, Drilled, and Spot Faced (Cont.)

| Class | Size of Pipe Inches | Straight Size Flanges: Screwed, Cranelap, or Slip-On Welding | Straight Size Flanges: Welding Neck (For boring see page 298.) | Straight Size Flanges: Blind | Reducing Flanges: Outside Diameter of Flange Inches | Reducing Flanges: Screwed or Slip-On Welding |
|---|---|---|---|---|---|---|
| 400 Pound | 4 | 20.00 | 20.00 | 23.70 | 10 | 37.00 |
| | 5 | 24.00 | 24.00 | 28.20 | 11 | 44.00 |
| | 6 | 27.00 | 27.00 | 31.60 | 12½ | 49.00 |
| | 8 | 35.00 | 44.00 | 42.00 | 15 | 63.00 |
| For smaller sizes, use 600 Pound. | 10 | 48.00 | 62.00 | 58.00 | 17½ | 86.00 |
| | 12 | 60.00 | 96.00 | 76.00 | 20½ | 108.00 |
| | 14 | 80.00 | 130.00 | 126.00 | 23 | 144.00 |
| | 16 | 100.00 | 165.00 | 147.00 | 25½ | 180.00 |
| | 18 | 125.00 | 220.00 | 210.00 | 28 | 225.00 |
| | 20 | 150.00 | 290.00 | 252.00 | 30½ | 270.00 |
| | 24 | 240.00 | 380.00 | 320.00 | 36 | 380.00 |
| 600 Pound | ½ | 9.50 | 16.30 | 11.50 | | |
| | ¾ | 9.50 | 16.30 | 11.50 | | |
| | 1 | 10.00 | 16.30 | 11.50 | 4⅞ | 16.00 |
| | 1¼ | 10.75 | 16.30 | 11.50 | 5¼ | 18.00 |
| | 1½ | 11.75 | 16.30 | 11.50 | 6⅛ | 20.00 |
| | 2 | 13.00 | 16.30 | 12.60 | 6½ | 21.00 |
| | 2½ | 15.00 | 19.00 | 14.70 | 7½ | 24.50 |
| | *3 | 18.50 | 23.00 | 17.05 | 8¼ | 28.00 |
| | 3½ | 22.50 | 29.00 | 21.65 | 9 | 35.00 |
| | 4 | 33.00 | 39.00 | 40.00 | 10¾ | 57.00 |
| | 5 | 46.00 | 53.50 | 56.00 | 13 | 79.00 |
| | 6 | 55.00 | 63.50 | 66.00 | 14 | 94.00 |
| | 8 | 80.00 | 90.00 | 96.00 | 16½ | 136.00 |
| | 10 | 125.00 | 138.00 | 150.00 | 20 | 212.50 |
| | 12 | 150.00 | 188.00 | 180.00 | 22 | 255.00 |
| | 14 | 180.00 | 200.00 | 216.00 | 23¾ | 306.00 |
| | 16 | 240.00 | 270.00 | 288.00 | 27 | 408.00 |
| | 18 | 300.00 | 330.00 | 360.00 | 29¼ | 510.00 |
| | 20 | 360.00 | 400.00 | 432.00 | 32 | 612.00 |
| | 24 | 540.00 | 590.00 | 648.00 | 37 | 918.00 |
| 900 Pound | 3 | 29.00 | 35.00 | 35.00 | 9½ | 48.00 |
| | 4 | 51.00 | 62.00 | 62.00 | 11½ | 81.00 |
| | 5 | 71.00 | 85.00 | 85.00 | 13¾ | 113.00 |
| | 6 | 86.00 | 104.00 | 104.00 | 15 | 137.00 |
| | 8 | 155.00 | 190.00 | 190.00 | 18½ | 245.00 |
| For smaller sizes, use 1500 Pound. | 10 | 225.00 | 270.00 | 270.00 | 21½ | 360.00 |
| | 12 | 300.00 | 360.00 | 360.00 | 24 | 480.00 |
| | 14 | 380.00 | 560.00 | 455.00 | 25¼ | 610.00 |
| | 16 | 460.00 | 690.00 | 555.00 | 27¾ | 740.00 |
| | 18 | 650.00 | 925.00 | 780.00 | 31 | 1040.00 |
| | 20 | 795.00 | 1160.00 | 955.00 | 33¾ | 1275.00 |
| | 24 | 1500.00 | 2100.00 | 1800.00 | 41 | 2400.00 |
| 1500 Pound (Prices of 14-inch Flanges on request) | ½ | 14.00 | 27.00 | 17.00 | | |
| | ¾ | 14.00 | 27.00 | 17.00 | | |
| | 1 | 14.00 | 27.00 | 17.00 | 5⅞ | 22.00 |
| | 1¼ | 14.00 | 27.00 | 17.00 | 6¼ | 22.00 |
| | 1½ | 16.00 | 27.00 | 19.00 | 7 | 26.00 |
| | 2 | 22.00 | 27.00 | 27.00 | 8½ | 35.00 |
| | 2½ | 29.00 | 35.00 | 35.00 | 9⅝ | 48.00 |
| | 3 | 38.00 | 46.00 | 46.00 | 10½ | 60.00 |
| | 4 | 60.00 | 72.00 | 72.00 | 12¼ | 96.00 |
| | 5 | 105.00 | 125.00 | 125.00 | 14¾ | 170.00 |
| | 6 | 132.00 | 160.00 | 160.00 | 15½ | 210.00 |
| | 8 | 220.00 | 265.00 | 265.00 | 19 | 350.00 |
| | 10 | 365.00 | 440.00 | 440.00 | 23 | 565.00 |
| | 12 | 550.00 | 660.00 | 660.00 | 26½ | 800.00 |

*Dimensions....pages 296 and 297* *Description....page 293*

### Ordering Reducing Flanges

When ordering reducing flanges, the reduced size should be designated first, and then the outside diameter of the flange. For example, a 600-Pound Flange to connect a 6-inch pipe to a 10-inch valve or fitting (O.D. of flange, 20 inches) should be ordered:

6" x 20" Reducing Flange.

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### Facings

In the 150 and 300-Pound pressure classes, Screwed, Slip-On Welding, Welding Neck, and Blind Flanges are regularly furnished with a 1/16-inch raised face.

In the 400, 600, 900, and 1500-Pound pressure classes, the flanges are furnished with a ¼-inch large male or (if specified) a 3/16-inch large female face.

Other flange facings such as ring joint, tongue, groove, etc., can be furnished on order; see the Crane Discount Sheet for prices.

### Welding Neck Flanges

For information on boring of Welding Neck Flanges, see page 298.

### Cranelap Flanges

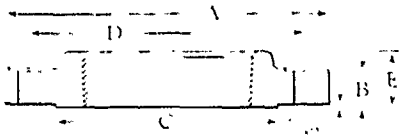
For information on complete Cranelap Joints, see page 505. Cranelap Flanges also are recommended for use in combination with Cranelap Stub Ends; see pages 280 to 283.

### *3-inch Cranelap Joints (300 or 600-Pound)

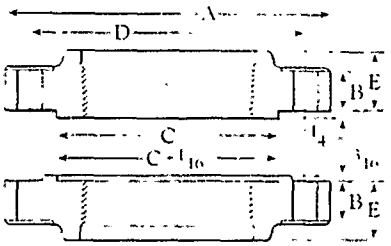
When 3-inch 300 or 600-Pound Flanges with ring joint facing are to be bolted to Cranelap joints, orders must so specify; they require a groove of special pitch diameter. See page 470 for dimensions.

# Forged Steel Flanges

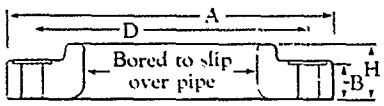




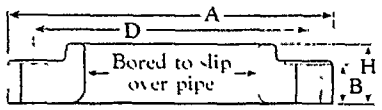

Screwed Flange
150 and 300-Pound



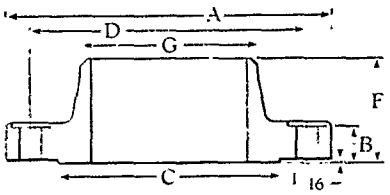

Screwed Flanges
400, 600, 900, 1500, and 2500-Pound



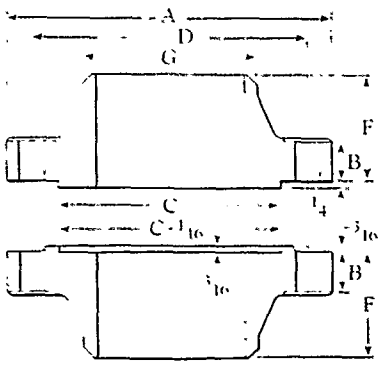

Cranelap Flange
150 and 300-Pound




Cranelap Flange
400, 600, 900, 1500, and 2500-Pound

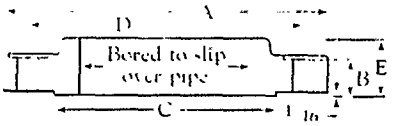



Welding Neck Flange
150 and 300-Pound
For boring, see page 298.

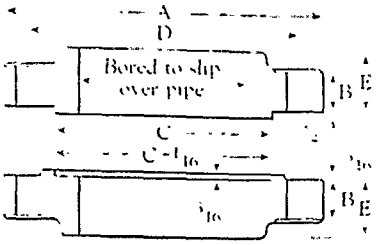



Welding Neck Flanges
400, 600, 900, 1500, and 2500-Pound
For boring, see page 298.

## Dimensions, in Inches




Slip-On Welding Flange
150 and 300-Pound




Slip-On Welding Flanges
400, 600, 900, and 1500-Pound

| Class | Pipe Size | A | B | C | D | Bolts No. | Bolts Dia. | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 Pound | 1/2 | 3 1/2 | 7/16 | 1 3/8 | 2 3/8 | 4 | 1/2 | 5/8 | 1 7/8 | 0.84 | 5/8 |
| | 3/4 | 3 7/8 | 1/2 | 1 11/16 | 2 3/4 | 4 | 1/2 | 5/8 | 2 1/16 | 1.05 | 5/8 |
| | 1 | 4 1/4 | 9/16 | 2 | 3 1/8 | 4 | 1/2 | 11/16 | 2 3/16 | 1.32 | 11/16 |
| | 1 1/4 | 4 5/8 | 5/8 | 2 1/2 | 3 1/2 | 4 | 1/2 | 13/16 | 2 1/4 | 1.66 | 13/16 |
| | 1 1/2 | 5 | 11/16 | 2 7/8 | 3 7/8 | 4 | 1/2 | 7/8 | 2 7/16 | 1.90 | 7/8 |
| | 2 | 6 | 3/4 | 3 5/8 | 4 3/4 | 4 | 5/8 | 1 | 2 1/2 | 2.38 | 1 |
| | 2 1/2 | 7 | 7/8 | 4 1/8 | 5 1/2 | 4 | 5/8 | 1 1/8 | 2 3/4 | 2.88 | 1 1/8 |
| | 3 | 7 1/2 | 15/16 | 5 | 6 | 4 | 5/8 | 1 3/16 | 2 3/4 | 3.50 | 1 3/16 |
| | 3 1/2 | 8 1/2 | 15/16 | 5 1/2 | 7 | 8 | 5/8 | 1 1/4 | 2 13/16 | 4.00 | 1 1/4 |
| | 4 | 9 | 15/16 | 6 3/16 | 7 1/2 | 8 | 5/8 | 1 5/16 | 3 | 4.50 | 1 5/16 |
| | 5 | 10 | 15/16 | 7 5/16 | 8 1/2 | 8 | 3/4 | 1 7/16 | 3 1/2 | 5.56 | 1 7/16 |
| | 6 | 11 | 1 | 8 1/2 | 9 1/2 | 8 | 3/4 | 1 9/16 | 3 1/2 | 6.63 | 1 9/16 |
| | 8 | 13 1/2 | 1 1/8 | 10 5/8 | 11 3/4 | 8 | 3/4 | 1 3/4 | 4 | 8.63 | 1 3/4 |
| | 10 | 16 | 1 3/16 | 12 3/4 | 14 1/4 | 12 | 7/8 | 1 15/16 | 4 | 10.75 | 1 15/16 |
| | 12 | 19 | 1 1/4 | 15 | 17 | 12 | 7/8 | 2 3/16 | 4 1/2 | 12.75 | 2 3/16 |
| | 14 | 21 | 1 3/8 | 16 1/4 | 18 3/4 | 12 | 1 | 2 1/4 | 5 | 14.00 | 3 1/8 |
| | 16 | 23 1/2 | 1 7/16 | 18 1/2 | 21 1/4 | 16 | 1 | 2 1/2 | 5 | 16.00 | 3 7/16 |
| | 18 | 25 | 1 9/16 | 21 | 22 3/4 | 16 | 1 1/8 | 2 11/16 | 5 1/2 | 18.00 | 3 13/16 |
| | 20 | 27 1/2 | 1 11/16 | 23 | 25 | 20 | 1 1/8 | 2 7/8 | 5 11/16 | 20.00 | 4 1/16 |
| | 24 | 32 | 1 7/8 | 27 1/4 | 29 1/2 | 20 | 1 1/4 | 3 1/4 | 6 | 24.00 | 4 3/8 |
| 300 Pound | 1/2 | 3 3/4 | 9/16 | 1 3/8 | 2 5/8 | 4 | 1/2 | 7/8 | 2 1/16 | 0.84 | 7/8 |
| | 3/4 | 4 5/8 | 5/8 | 1 11/16 | 3 1/4 | 4 | 5/8 | 1 | 2 1/4 | 1.05 | 1 |
| | 1 | 4 7/8 | 11/16 | 2 | 3 1/2 | 4 | 5/8 | 1 1/16 | 2 7/16 | 1.32 | 1 1/16 |
| | 1 1/4 | 5 1/4 | 3/4 | 2 1/2 | 3 7/8 | 4 | 5/8 | 1 1/16 | 2 9/16 | 1.66 | 1 1/16 |
| | 1 1/2 | 6 1/8 | 13/16 | 2 7/8 | 4 1/2 | 4 | 3/4 | 1 3/16 | 2 11/16 | 1.90 | 1 3/16 |
| | 2 | 6 1/2 | 7/8 | 3 5/8 | 5 | 8 | 5/8 | 1 5/16 | 2 3/4 | 2.38 | 1 5/16 |
| | 2 1/2 | 7 1/2 | 1 | 4 1/8 | 5 7/8 | 8 | 3/4 | 1 1/2 | 3 | 2.88 | 1 1/2 |
| | 3 | 8 1/4 | 1 1/8 | 5 | 6 5/8 | 8 | 3/4 | 1 11/16 | 3 1/8 | 3.50 | 1 11/16 |
| | 3 1/2 | 9 | 1 3/16 | 5 1/2 | 7 1/4 | 8 | 3/4 | 1 3/4 | 3 3/16 | 4.00 | 1 3/4 |
| | 4 | 10 | 1 1/4 | 6 3/16 | 7 7/8 | 8 | 3/4 | 1 7/8 | 3 3/8 | 4.50 | 1 7/8 |
| | 5 | 11 | 1 3/8 | 7 5/16 | 9 1/4 | 8 | 3/4 | 2 | 3 7/8 | 5.56 | 2 |
| | 6 | 12 1/2 | 1 7/16 | 8 1/2 | 10 5/8 | 12 | 3/4 | 2 1/16 | 3 7/8 | 6.63 | 2 1/16 |
| | 8 | 15 | 1 5/8 | 10 5/8 | 13 | 12 | 7/8 | 2 7/16 | 4 3/8 | 8.63 | 2 7/16 |
| | 10 | 17 1/2 | 1 7/8 | 12 3/4 | 15 1/4 | 16 | 1 | 2 5/8 | 4 5/8 | 10.75 | 3 3/4 |
| | 12 | 20 1/2 | 2 | 15 | 17 3/4 | 16 | 1 1/8 | 2 7/8 | 5 1/8 | 12.75 | 4 |
| | 14 | 23 | 2 1/8 | 16 1/4 | 20 1/4 | 20 | 1 1/8 | 3 | 5 5/8 | 14.00 | 4 3/8 |
| | 16 | 25 1/2 | 2 1/4 | 18 1/2 | 22 1/2 | 20 | 1 1/4 | 3 1/4 | 5 3/4 | 16.00 | 4 3/4 |
| | 18 | 28 | 2 3/8 | 21 | 24 3/4 | 24 | 1 1/4 | 3 1/2 | 6 1/4 | 18.00 | 5 1/8 |
| | 20 | 30 1/2 | 2 1/2 | 23 | 27 | 24 | 1 1/4 | 3 3/4 | 6 3/8 | 20.00 | 5 1/2 |
| | 24 | 36 | 2 3/4 | 27 1/4 | 32 | 24 | 1 1/2 | 4 3/16 | 6 5/8 | 24.00 | 6 |
| 400 Pound | 4 | 10 | 1 3/8 | 6 3/16 | 7 7/8 | 8 | 7/8 | 2 | 3 1/2 | 4.50 | 2 |
| | 5 | 11 | 1 1/2 | 7 5/16 | 9 1/4 | 8 | 7/8 | 2 1/8 | 4 | 5.56 | 2 1/8 |
| | 6 | 12 1/2 | 1 5/8 | 8 1/2 | 10 5/8 | 12 | 7/8 | 2 1/4 | 4 1/16 | 6.63 | 2 1/4 |
| | 8 | 15 | 1 7/8 | 10 5/8 | 13 | 12 | 1 | 2 11/16 | 4 5/8 | 8.63 | 2 11/16 |
| | 10 | 17 1/2 | 2 1/8 | 12 3/4 | 15 1/4 | 16 | 1 1/8 | 2 7/8 | 4 7/8 | 10.75 | 4 |
| | 12 | 20 1/2 | 2 1/4 | 15 | 17 3/4 | 16 | 1 1/4 | 3 1/8 | 5 3/8 | 12.75 | 4 1/4 |
| | 14 | 23 | 2 3/8 | 16 1/4 | 20 1/4 | 20 | 1 1/4 | 3 5/16 | 5 7/8 | 14.00 | 4 5/8 |
| | 16 | 25 1/2 | 2 1/2 | 18 1/2 | 22 1/2 | 20 | 1 3/8 | 3 11/16 | 6 | 16.00 | 5 |
| | 18 | 28 | 2 5/8 | 21 | 24 3/4 | 24 | 1 3/8 | 3 7/8 | 6 1/2 | 18.00 | 5 3/8 |
| | 20 | 30 1/2 | 2 3/4 | 23 | 27 | 24 | 1 1/2 | 4 | 6 5/8 | 20.00 | 5 3/4 |
| | 24 | 36 | 3 | 27 1/4 | 32 | 24 | 1 3/4 | 4 1/2 | 6 7/8 | 24.00 | 6 1/4 |

## Dimensions, in Inches (Cont.)

| Class | Pipe Size | A | B | C | D | Bolts No. | Bolts Dia. | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 600 Pound | 1/2 | 3 3/4 | 9/16 | 1 3/8 | 2 5/8 | 4 | 1/2 | 7/8 | 21/16 | 0.84 | 7/8 |
| | 3/4 | 4 5/8 | 5/8 | 1 11/16 | 3 1/4 | 4 | 5/8 | 1 | 2 1/4 | 1.05 | 1 |
| | 1 | 4 7/8 | 11/16 | 2 | 3 1/2 | 4 | 5/8 | 1 1/16 | 2 7/16 | 1.32 | 1 1/16 |
| | 1 1/4 | 5 1/4 | 13/16 | 2 1/2 | 3 7/8 | 4 | 5/8 | 1 1/8 | 2 5/8 | 1.66 | 1 1/8 |
| | 1 1/2 | 6 1/8 | 7/8 | 2 7/8 | 4 1/2 | 4 | 3/4 | 1 1/4 | 2 3/4 | 1.90 | 1 1/4 |
| | 2 | 6 1/2 | 1 | 3 5/8 | 5 | 8 | 5/8 | 1 7/16 | 2 7/8 | 2.38 | 1 7/16 |
| | 2 1/2 | 7 1/2 | 1 1/8 | 4 1/8 | 5 7/8 | 8 | 3/4 | 1 5/8 | 3 1/8 | 2.88 | 1 5/8 |
| | 3 | 8 1/4 | 1 1/4 | 5 | 6 5/8 | 8 | 3/4 | 1 13/16 | 3 1/4 | 3.50 | 1 13/16 |
| | 3 1/2 | 9 | 1 3/8 | 5 1/2 | 7 1/4 | 8 | 7/8 | 1 15/16 | 3 3/8 | 4.00 | 1 15/16 |
| | 4 | 10 3/4 | 1 1/2 | 6 3/16 | 8 1/2 | 8 | 7/8 | 2 1/8 | 4 | 4.50 | 2 1/8 |
| | 5 | 13 | 1 3/4 | 7 5/16 | 10 1/2 | 8 | 1 | 2 3/8 | 4 1/2 | 5.56 | 2 3/8 |
| | 6 | 14 | 1 7/8 | 8 1/2 | 11 1/2 | 12 | 1 | 2 5/8 | 4 5/8 | 6.63 | 2 5/8 |
| | 8 | 16 1/2 | 2 3/16 | 10 5/8 | 13 3/4 | | 1 1/8 | 3 | 5 1/4 | 8.63 | 3 |
| | 10 | 20 | 2 1/2 | 12 3/4 | 17 | 16 | 1 1/4 | 3 3/8 | 6 | 10.75 | 4 3/8 |
| | 12 | 22 | 2 5/8 | 15 | 19 1/4 | 20 | 1 1/4 | 3 5/8 | 6 1/8 | 12.75 | 4 5/8 |
| | 14 | 23 3/4 | 2 3/4 | 16 1/4 | 20 3/4 | 20 | 1 3/8 | 3 11/16 | 6 1/2 | 14.00 | 5 |
| | 16 | 27 | 3 | 18 1/2 | 23 3/4 | 20 | 1 1/2 | 4 3/16 | 7 | 16.00 | 5 1/2 |
| | 18 | 29 1/4 | 3 1/4 | 21 | 25 3/4 | 20 | 1 5/8 | 4 5/8 | 7 1/4 | 18.00 | 6 |
| | 20 | 32 | 3 1/2 | 23 | 28 1/2 | 24 | 1 5/8 | 5 | 7 1/2 | 20.00 | 6 1/2 |
| | 24 | 37 | 4 | 27 1/4 | 33 | 24 | 1 7/8 | 5 1/2 | 8 | 24.00 | 7 1/4 |
| 900 Pound | 3 | 9 1/2 | 1 1/2 | 5 | 7 1/2 | 8 | 7/8 | 2 1/8 | 4 | 3.50 | 2 1/8 |
| | 4 | 11 1/2 | 1 3/4 | 6 3/16 | 9 1/4 | 8 | 1 1/8 | 2 3/4 | 4 1/2 | 4.50 | 2 3/4 |
| | 5 | 13 3/4 | 2 | 7 5/16 | 11 | 8 | 1 1/4 | 3 1/8 | 5 | 5.56 | 3 1/8 |
| | 6 | 15 | 2 3/16 | 8 1/2 | 12 1/2 | 12 | 1 1/8 | 3 3/8 | 5 1/2 | 6.63 | 3 3/8 |
| | 8 | 18 1/2 | 2 1/2 | 10 5/8 | 15 1/2 | 12 | 1 3/8 | 4 | 6 3/8 | 8.63 | 4 1/2 |
| | 10 | 21 1/2 | 2 3/4 | 12 3/4 | 18 1/2 | 16 | 1 3/8 | 4 1/4 | 7 1/4 | 10.75 | 5 |
| | 12 | 24 | 3 1/8 | 15 | 21 | 20 | 1 3/8 | 4 5/8 | 7 7/8 | 12.75 | 5 5/8 |
| | 14 | 25 1/4 | 3 3/8 | 16 1/4 | 22 | 20 | 1 1/2 | 5 1/8 | 8 3/8 | 14.00 | 6 1/8 |
| | 16 | 27 3/4 | 3 1/2 | 18 1/2 | 24 1/4 | 20 | 1 5/8 | 5 1/4 | 8 1/2 | 16.00 | 6 1/2 |
| | 18 | 31 | 4 | 21 | 27 | 20 | 1 7/8 | 6 | 9 | 18.00 | 7 1/2 |
| | 20 | 33 3/4 | 4 1/4 | 23 | 29 1/2 | 20 | 2 | 6 1/4 | 9 3/4 | 20.00 | 8 1/4 |
| | 24 | 41 | 5 1/2 | 27 1/4 | 35 1/2 | 20 | 2 1/2 | 8 | 11 1/2 | 24.00 | 10 1/2 |
| 1500 Pound | 1/2 | 4 3/4 | 7/8 | 1 3/8 | 3 1/4 | 4 | 3/4 | 1 1/4 | 2 3/8 | 0.84 | 1 1/4 |
| | 3/4 | 5 1/8 | 1 | 1 11/16 | 3 1/2 | 4 | 3/4 | 1 3/8 | 2 3/4 | 1.05 | 1 3/8 |
| | 1 | 5 7/8 | 1 1/8 | 2 | 4 | 4 | 7/8 | 1 5/8 | 2 7/8 | 1.32 | 1 5/8 |
| | 1 1/4 | 6 1/4 | 1 1/8 | 2 1/2 | 4 3/8 | 4 | 7/8 | 1 5/8 | 2 7/8 | 1.66 | 1 5/8 |
| | 1 1/2 | 7 | 1 1/4 | 2 7/8 | 4 7/8 | 4 | 1 | 1 3/4 | 3 1/4 | 1.90 | 1 3/4 |
| | 2 | 8 1/2 | 1 1/2 | 3 5/8 | 6 1/2 | 8 | 7/8 | 2 1/4 | 4 | 2.38 | 2 1/4 |
| | 2 1/2 | 9 5/8 | 1 5/8 | 4 1/8 | 7 1/2 | 8 | 1 | 2 1/2 | 4 1/8 | 2.88 | 2 1/2 |
| | 3 | 10 1/2 | 1 7/8 | 5 | 8 | 8 | 1 1/8 | 2 7/8 | 4 5/8 | 3.50 | 2 7/8 |
| | 4 | 12 1/4 | 2 1/8 | 6 3/16 | 9 1/2 | 8 | 1 1/4 | 3 9/16 | 4 7/8 | 4.50 | 3 9/16 |
| | 5 | 14 3/4 | 2 7/8 | 7 5/16 | 11 1/2 | 8 | 1 1/2 | 4 1/8 | 6 1/8 | 5.56 | 4 1/8 |
| | 6 | 15 1/2 | 3 1/4 | 8 1/2 | 12 1/2 | 12 | 1 3/8 | 4 11/16 | 6 3/4 | 6.63 | 4 11/16 |
| | 8 | 19 | 3 5/8 | 10 5/8 | 15 1/2 | 12 | 1 5/8 | 5 5/8 | 8 3/8 | 8.63 | 5 5/8 |
| | 10 | 23 | 4 1/4 | 12 3/4 | 19 | 12 | 1 7/8 | 6 1/4 | 10 | 10.75 | 7 |
| | 12 | 26 1/2 | 4 7/8 | 15 | 22 1/2 | 16 | 2 | 7 1/8 | 11 1/8 | 12.75 | 8 5/8 |
| | 14 | 29 1/2 | 5 1/4 | 16 1/4 | 25 | 16 | 2 1/4 | | 11 3/4 | 14.00 | 9 1/2 |
| 2500 Pound | 1/2 | 5 1/4 | 13/16 | 1 3/8 | 3 1/2 | 4 | 3/4 | 1 9/16 | 2 7/8 | 0.84 | 1 9/16 |
| | 3/4 | 5 1/2 | 1 1/4 | 1 11/16 | 3 3/4 | 4 | 3/4 | 1 11/16 | 3 1/8 | 1.05 | 1 11/16 |
| | 1 | 6 1/4 | 1 3/8 | 2 | 4 1/4 | 4 | 7/8 | 1 7/8 | 3 1/2 | 1.32 | 1 7/8 |
| | 1 1/4 | 7 1/4 | 1 1/2 | 2 1/2 | 5 1/8 | 4 | 1 | 2 1/16 | 3 3/4 | 1.66 | 2 1/16 |
| | 1 1/2 | 8 | 1 3/4 | 2 7/8 | 5 3/4 | 4 | 1 1/8 | 2 3/8 | 4 3/8 | 1.90 | 2 3/8 |
| | 2 | 9 1/4 | 2 | 3 5/8 | 6 3/4 | 8 | 1 | 2 3/4 | 5 | 2.38 | 2 3/4 |
| | 2 1/2 | 10 1/2 | 2 1/4 | 4 1/8 | 7 3/4 | 8 | 1 1/8 | 3 1/8 | 5 5/8 | 2.88 | 3 1/8 |
| | 3 | 12 | 2 5/8 | 5 | 9 | 8 | 1 1/4 | 3 5/8 | 6 5/8 | 3.50 | 3 5/8 |
| | 4 | 14 | 3 | 6 3/16 | 10 3/4 | 8 | 1 1/2 | 4 1/4 | 7 1/2 | 4.50 | 4 1/4 |
| | 5 | 16 1/2 | 3 5/8 | 7 5/16 | 12 3/4 | 8 | 1 3/4 | 5 1/8 | 9 | 5.56 | 5 1/8 |
| | 6 | 19 | 4 1/4 | 8 1/2 | 14 1/2 | 8 | 2 | 6 | 10 3/4 | 6.63 | 6 |
| | 8 | 21 3/4 | 5 | 10 5/8 | 17 1/4 | 12 | 2 | 7 | 12 1/2 | 8.63 | 7 |
| | 10 | 26 1/2 | 6 1/2 | 12 3/4 | 21 1/4 | 12 | 2 1/2 | 9 | 16 1/2 | 10.75 | 9 |
| | 12 | 30 | 7 1/4 | 15 | 24 3/8 | 12 | 2 3/4 | 10 | 18 1/4 | 12.75 | 10 |

**Facings:** In the 150 and 300-Pound pressure classes, Screwed, Slip-On Welding, Welding Neck, and Blind Flanges are regularly furnished with a 1/16-inch high raised face.

In the 400, 600, 900, 1500, and 2500-Pound pressure classes, the flanges are furnished with either a 1/4-inch large male or (if specified) a 3/16-inch large female face.

For description and dimensions of special facings, see pages 468 to 471.

**Cranelap joints:** Complete dimensions of Cranelap joints (except 2500-Pound) are shown on page [illegible].

Complete dimensions of 2500-Pound Cranelap Joints will be furnished on application. Requests should be accompanied by detailed specifications, including the thickness of the pipe, the kind of lap, and the type of facing required on the lap.

**American Standard:** The dimensions and drilling of flanges conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class.

The American Standard does not include 400, 600, 900, or 1500-Pound Slip-On Welding Flanges. Crane flanges of this type have the same dimensions as American Standard Steel Screwed Flanges, being bored instead of threaded.

*Templates for drilling ....pages 461 to 463*
*Special facings. pages 468 to 471*
*Boring of Welding Neck Flanges.... ...page 298*
*Working pressures. page 292*

*List prices..... pages 294 and 295* *Description.....page 293*

# Boring of Welding Neck Flanges

Unless otherwise specified, Crane Forged Steel Welding Neck Flanges are regularly bored to match the inside diameter of the pipe listed in the table below:

| Size of Pipe Inches | No. 568 150-Pound Flanges | No. 296 E 300-Pound Flanges | No. 656 E 400-Pound Flanges | No. 855 E 600-Pound Flanges | No. 1265 E 900-Pound Flanges | No. 1565 E 1500-Pound Flanges | Equivalent A.S.A. Schedule Numbers: For Standard Pipe | Equivalent A.S.A. Schedule Numbers: For Extra Strong Pipe |
|---|---|---|---|---|---|---|---|---|
| ½ | *Standard Pipe (Heaviest weight on 8, 10, and 12-inch sizes) | | *Extra Strong Pipe | | †Orders must specify diameter of bore. (900 and 1500-Pound Flanges not listed in 3½-inch size.) | | Schedule 40 | Schedule 80 |
| ¾ | | | | | | | | |
| 1 | | | | | | | | |
| 1¼ | | | | | | | | |
| 1½ | | | | | | | | |
| 2 | | | | | | | | |
| 2½ | | | | | | | | |
| 3 | | | | | | | | |
| 3½ | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 8 | | | | | | | | |
| 10 | | | | | | | | Schedule 60 |
| 12 | | | | | | | None | None |
| 14 | | | | | | | Schedule 30 | None |
| 16 | *O.D. Pipe ⅜-inch Thick | | *O.D. Pipe ½-inch Thick | †Orders must specify diameter of bore. | | | | Schedule 40 |
| 18 | | | | | | | ‡ None | § None |
| 20 | | | | | | | Schedule 20 | Schedule 30 |
| 24 | | | | | | | | None |

*An extra charge is made if any other bore is specified.
†An extra charge is made if a bore smaller than that listed in the left hand portion of the table below is specified.
‡This is O.D. Pipe, ⅜-inch thick. §This is O.D. Pipe, ½-inch thick.

**All Dimensions Are In Inches**

| Size of Pipe Inches | ***Smallest diameter to which Crane Welding Neck Flanges can be bored. 150 Lb. | 300 Lb. | 400 Lb. | 600 Lb. | 900 Lb. | 1500 Lb. | Inside Diameter of Pipe (Included for convenient reference) "S" | "X" | "XX" | A.S.A. Schedule Numbers 10 | 20 | 30 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ½ | ** | ** | ..... | ** | ..... | ** | .622 | .546 | .252 | | | | .622 | | .546 | | | | .466 |
| ¾ | ** | ** | ..... | ** | ..... | ** | .824 | .742 | .434 | | | | .824 | | .742 | | | | .614 |
| 1 | .91 | .95 | ..... | .95 | ..... | ** | 1.049 | .957 | .599 | | | | 1.049 | | .957 | | | | .815 |
| 1¼ | 1.25 | 1.27 | ..... | 1.27 | ..... | ** | 1.380 | 1.278 | .896 | | | | 1.380 | | 1.278 | | | | 1.160 |
| 1½ | 1.50 | 1.46 | ..... | 1.46 | ..... | ** | 1.610 | 1.500 | 1.100 | | | | 1.610 | | 1.500 | | | | 1.338 |
| 2 | 1.93 | 1.91 | ..... | 1.91 | ..... | 1.46 | 2.067 | 1.939 | 1.503 | | | | 2.067 | | 1.939 | | | | 1.689 |
| 2½ | 2.31 | 2.28 | ..... | 2.31 | ..... | 1.72 | 2.469 | 2.323 | 1.771 | | | | 2.469 | | 2.323 | | | | 2.125 |
| 3 | 2.84 | 2.84 | ..... | 2.87 | 2.59 | 2.22 | 3.068 | 2.900 | 2.300 | | | | 3.068 | | 2.900 | | | | 2.626 |
| 3½ | 3.28 | 3.28 | ..... | 3.28 | ..... | ..... | 3.548 | 3.364 | | | | | 3.548 | | 3.364 | | | | |
| 4 | 3.78 | 3.68 | 3.81 | 3.78 | 3.41 | 3.03 | 4.026 | 3.826 | 3.152 | | | | 4.026 | | 3.826 | | 3.626 | | 3.438 |
| 5 | 4.78 | 4.72 | 4.81 | 4.72 | 4.22 | 4.06 | 5.047 | 4.813 | 4.063 | | | | 5.047 | | 4.813 | | 4.563 | | 4.313 |
| 6 | 5.75 | 5.72 | 5.72 | 5.75 | 5.12 | 4.84 | 6.065 | 5.761 | 4.897 | | | | 6.065 | | 5.761 | | 5.501 | | 5.189 |
| 8 | 7.59 | 7.56 | 7.59 | 7.62 | 7.12 | 6.81 | 7.981 | 7.625 | 6.875 | | 8.125 | 8.071 | 7.981 | 7.813 | 7.625 | 7.439 | 7.189 | 7.001 | 6.813 |
| 10 | 9.75 | 9.72 | 9.56 | 9.56 | 8.96 | 8.25 | 10.020 | 9.750 | | | 10.250 | 10.136 | 10.020 | 9.750 | 9.564 | 9.314 | 9.064 | 8.750 | 8.500 |
| 12 | 11.75 | 11.59 | 11.37 | 11.34 | 10.75 | 10.12 | 12.000 | 11.750 | | | 12.250 | 12.090 | 11.938 | 11.626 | 11.376 | 11.064 | 10.750 | 10.500 | 10.126 |
| 14 | 12.96 | 13.00 | 13.00 | 12.12 | 13.00 | ..... | 13.250 | 13.000 | | 13.500 | 13.376 | 13.250 | 13.126 | 12.814 | 12.500 | 12.126 | 11.814 | 11.500 | 11.188 |
| 16 | 14.96 | 15.00 | 15.00 | 13.93 | 15.00 | ..... | 15.250 | 15.000 | | 15.500 | 15.376 | 15.250 | 15.000 | 14.688 | 14.314 | 13.938 | 13.564 | 13.126 | 12.814 |
| 18 | 17.00 | 16.87 | 16.87 | 16.50 | 17.00 | ..... | 17.250 | 17.000 | | 17.500 | 17.376 | 17.126 | 16.876 | 16.500 | 16.125 | 15.688 | 15.250 | 14.876 | 14.438 |
| 20 | 19.00 | 18.81 | 18.81 | 18.50 | 19.00 | ..... | 19.250 | 19.000 | | 19.500 | 19.250 | 19.000 | 18.814 | 18.376 | 17.938 | 17.438 | 17.000 | 16.500 | 16.064 |
| 24 | 23.00 | 23.00 | 22.50 | 22.50 | 23.00 | ..... | 23.250 | 23.000 | | 23.500 | 23.250 | 22.876 | 22.626 | 22.064 | 21.564 | 20.938 | 20.376 | 19.876 | 19.314 |

"S" indicates Standard Pipe (heaviest weight on 8, 10, and 12-inch sizes and ⅜-inch thick O.D. Pipe on 14-inch and larger.)
"X" indicates Extra Strong Pipe (½-inch thick O.D. Pipe on sizes 14-inch and larger).
"XX" indicates Double Extra Strong Pipe.
**These flanges are forged solid. ***Flanges suitable for pipe with smaller inside diameter are entirely special; prices on application

**Note:** The actual diameter of bore in Crane Forged Steel Welding Neck Flanges is subject to the following tolerances as defined by the American Standard B16e-1939: sizes 10-inch and smaller plus or minus 1/32-inch; sizes 12 to 18-inch, inclusive, plus or minus 1/16-inch; and 20 and 24-inch sizes plus ⅛-inch or minus 1/16-inch.

*List prices of flanges* . . . . . *pages 294 and 295*
*Dimensions of flanges* . . . . . *pages 296 and 297*
*Pressure-temperature ratings* . . . . . *page 292*

# Pulp Stock, Stop-Check, Blow-Off, Back Pressure, Lubricated Plug, and Float Valves

**Pulp Stock Valves** ..... page 300

**Stop-Check Valves** (Non-Return Valves)
- Service and General Description ..... page 301
- Features and Recommended Installation ..... page 302
- Selecting the Proper Size ..... pages 306 and 307
- Determining Pressure Drop ..... pages 306 and 307
- 250-Pound Ferrosteel ..... page 303
- 300-Pound Cast Steel ..... page 304
- 400-Pound Cast Steel ..... page 305
- 600-Pound Cast Steel ..... page 305

**Blow-Off Valves** ..... page 308
**Locomotive Steam Heat End Valves** ..... page 309
**Exhaust Relief Valves** ..... page 310
**Back Pressure Valves** ..... pages 310 and 311
**Pressure Relief Valves** ..... page 311

**Nordstrom Lubricated Plug Valves** ..... pages 312 and 313
**Clayton Valves and Controls** ..... pages 314 to 316
**Klipfel Tank Float and Lever Valves** ..... page 317
**Backflow Preventers** ..... page 318

***For Stop-Check Valves for Higher Pressures, Use Crane Pressure-Seal Bonnet Valves; see pages 214 to 217***

Nearly every piping installation requires the use of at least a few items which are generally called "specialties", or more specifically "special duty valves"—valves which are designed for only one particular service or which automatically perform a special function. The Crane line of such valves includes a wide assortment of types and sizes to fill all normal requirements.

For greater convenience in catalog use, the Crane line of special duty valves and of specialties has been divided into several groups. In addition to those indexed above, the line includes:

Safety and Relief Valves ..... pages 319 to 334
Pressure Regulators and Pressure Reducing Valves ..... pages 336 to 342
Steam Traps ..... pages 345 to 348
Steam and Oil Separators; Sediment Separators ..... pages 354 to 357
Expansion Joints ..... pages 350 to 352

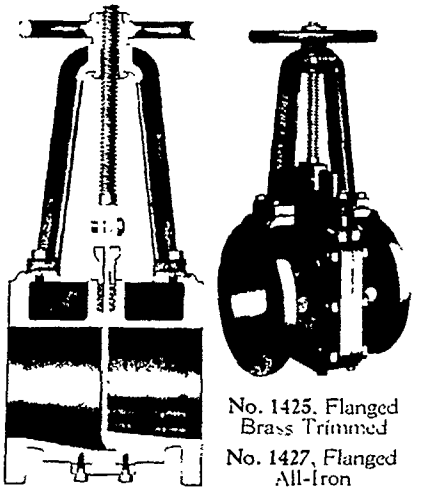
Water Gauges and Accessories ..... pages 360 and 361
Whistles and Fusible Plugs ..... page 362
Flexible Joints ..... pages 363 to 365
Gauges and Thermometers ..... pages 366 and 367
Lubricators; Oilers; Injectors; Ejectors; Boiler Controls ..... pages 372 to 374

Brass Lever-Operated Quick-Opening Valves ..... pages 54 to 56
Brass Butterfly and Throttle Valves ..... page 57
Bronze Chronometer Valves ..... page 403
Iron Butterfly Valves ..... page 111

# Iron Body Pulp Stock Valves

## Brass Trimmed or All-Iron

Outside Screw, Rising Stem



No. 1425, Flanged Brass Trimmed

No. 1427, Flanged All-Iron

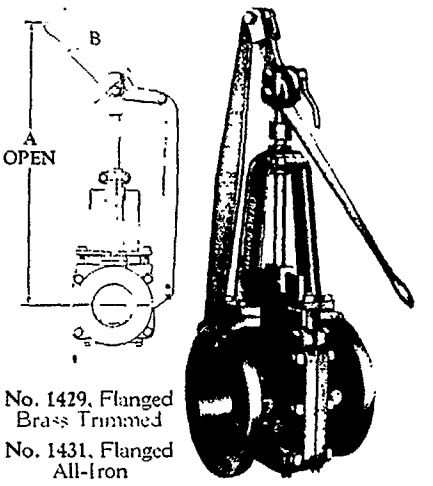
60 pounds water working pressure

***Self-Cleaning—Non-Clogging***
***Easy Operating—Full Port Area***
***Shearing Action***

These valves are especially designed and recommended for pulp stock lines in pulp and paper mills. In this service they provide a tight shut-off because the wood pulp packs itself around the disc when the valve is closed and effectively seals it against leakage.

All-iron valves are used where the liquid would corrode brass but not iron.

Quick-Opening




No. 1429, Flanged Brass Trimmed

No. 1431, Flanged All-Iron

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### List Prices, and Dimensions, in Inches

| Size | Inches | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Price, Each F. & D. | No. 1425, Brass Trimmed | 195.00 | 235.00 | 315.00 | 410.00 | 520.00 | 655.00 | 815.00 | 1100.00 | 1730.00 | 2450.00 |
| | No. 1427, All-Iron | 215.00 | 260.00 | 345.00 | 450.00 | 570.00 | 715.00 | 900.00 | 1200.00 | 1900.00 | 2700.00 |
| | No. 1429, Brass Trimmed | 215.00 | 265.00 | 355.00 | 460.00 | 580.00 | 735.00 | 920.00 | | | |
| | No. 1431, All-Iron | 235.00 | 290.00 | 385.00 | 500.00 | 630.00 | 795.00 | 1000.00 | | | |
| Face to face | | 9 | 10½ | 11½ | 13 | 14 | 15 | 16 | 17 | 18 | 20 |
| O. S. & Y. | Center to top, open | 22¼ | 27½ | 34⅞ | 41 | 47¾ | 52⅝ | 58¼ | 64 | 72 | 85¼ |
| | Diameter of wheel | 10 | 10 | 12 | 14 | 16 | 16 | 18 | 20 | 20 | 30 |
| Quick-Opening | A | 33¼ | 43¼ | 57 | 68¾ | 80¾ | 90½ | 95 | | | |
| | B | 12 | 23 | 29 | 41 | 41 | 41 | 41 | | | |
| Diameter of flanges | | 9 | 11 | 13½ | 16 | 19 | 21 | 23½ | 25 | 27½ | 32 |
| Thickness of flanges | | 15/16 | 1 | 1⅛ | 13/16 | 1¼ | 1⅜ | 1 7/16 | 1 9/16 | 1 11/16 | 1⅞ |
| Diameter of bolt circle | | 7½ | 9½ | 11¾ | 14¼ | 17 | 18¾ | 21¼ | 22¾ | 25 | 29½ |
| No. and diameter of bolts | | 8-⅝ | 8-¾ | 8-¾ | 12-⅞ | 12-⅞ | 12-1 | 16-1 | 16-1⅛ | 20-1⅛ | 20-1¼ |

**Body:** The cast iron body is divided on the vertical centerline and bolted together. A special gasket in the joint prevents leakage. Circular end ports and rectangular shape at the center assure full area flow.

**Disc:** In brass trimmed valves, the disc is brass; in all-iron valves, it is Exelloy. Made in a rectangular shape with a sharp cutting edge at the bottom, the disc is fully guided by machined slots in the body.

**Stem:** The stem in all these valves is made of Crane Cast Manganese Bronze. It does not come in contact with the fluid in the line.

**Seat:** A lead filler in the bottom of the valve acts as a seat and protects the cutting edge of the disc at the point of closing.

**Self-cleaning:** The lower portion of the outlet half of the body has a series of notches which entrap small units of the pulp stock; large single accumulations are avoided in closing the valve, and the cutting edge of the disc easily shears the successive small units and also any stock lodged at the seat.

**Cleanout:** The disc-stop holder, which carries the lead seat, is fastened to the valve with cap screws. This holder can be removed to clean out the valve.

**Stuffing box:** A rectangular shaped stuffing box, equipped with a gland, completely surrounds the valve disc. It is unusually deep and is filled with a special packing which minimizes friction.

**Bosses:** Each valve body has six bosses, two on each side and two on the bottom. When specified, the bosses will be drilled, tapped, and plugged.

**End flanges:** End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish. Prices include facing and drilling. No deduction is made for valves ordered faced only.

**Face to face:** These valves also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939). They will replace 125-Pound Wedge Gate Valves used on pulp stock lines without necessitating piping changes.

***Gears, to facilitate operation of large size outside screw valves, can be made to order; prices on application.***

*Chain Wheels....page 136* *Motor Operators....pages 126 to 129* *Floor Stands . .page 130*

# Ferrosteel and Cast Steel Stop-Check Valves

## Boiler Service and Fundamental Duties

The Crane line of Stop-Check Valves includes a complete range of sizes and types ideal for use on new or existing boiler installations. Stop-Check Valves are as essential to the safe operation of a boiler plant as are the safety valves or other safety devices attached to the boiler. They should be installed in the pipe line between each boiler and the main steam header, when more than one boiler is connected to the same header. These valves should always be placed so that the pressure in the boiler is under the disc.

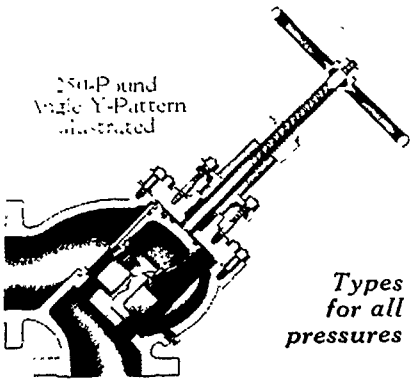
The Stop-Check Valve is intended to perform four important functions in boiler steam piping:

*First:* To act as an automatic non-return valve, preventing a back flow of steam from the main steam header to the boiler to which it is connected, in the event of a failure in that boiler.

*Second:* To assist, when ceasing to fire, in cutting out a boiler. In this case the disc will close automatically and prevent header pressure from entering the boiler.

*Third:* To assist in bringing a boiler into service after it has been shut down. This operation requires considerable care when performed manually, but the Stop-Check Valve performs this function automatically, without pressure fluctuations or disturbance of the water level.

*Fourth:* To act as a "safety first" valve in preventing back flow of steam from the header into a boiler which has been shut down for inspection or repair, should an attendant accidentally open the valve.




***Types for all pressures***

**250-Pound Ferrosteel:** Available with flanged ends in either the Straight-Way or Angle Y-Pattern. See page 303

**300-Pound Cast Steel:** Available with flanged or butt-welding ends in either the Straight-Way or Angle Y-Pattern. See page 304.

**400-Pound Cast Steel:** Available with flanged or butt-welding ends in either the globe or angle pattern. See page 305.

**600-Pound Cast Steel:** Available with flanged or butt-welding ends in either the globe or angle pattern. See page 305.



## General Description

**Construction:** In design and construction, these valves are unusually simple, strong, and rugged. Made with but one moving part, the disc, and embodying only carefully selected materials, they are durably built for long, reliable service.

**Simplicity of design:** Because of the simplicity of design, all internal parts are easily accessible, and when the occasion arises, replacements can be made without removing the valve from the line.

**Manual operation:** These valves are equipped with a handwheel which permits them to be closed while under pressure, or if they are already closed automatically, to hold the disc in the closed position. No mechanical connection is made between the disc and the stem, and when the stem is raised by the handwheel, only the boiler pressure can lift the disc.

This equipment for manual operation of the valves is of the outside screw and yoke type, wherein the stem threads are not directly exposed to the high temperature of the steam.

**Bonnet joint:** The 250-Pound Ferrosteel and 300-Pound Cast Steel Valves have a male and female bonnet joint, bolted with studs driven into the body. The 250-Pound Valves are fitted with a Cranite gasket, and the 300-Pound Valves, with a corrugated soft iron gasket.

The 400 and 600-Pound Cast Steel Valves have ring joint bonnet facing, a soft steel ring joint gasket, and Crane Templex Steel through type bolt-studs. Tightness and liberal strength are assured.

**Body seat ring:** The body seat ring is of the shoulder seated type. It is held in place by the removable liner in Ferrosteel Valves and is screwed into the body in Cast Steel Valves.

**Piston type disc:** The piston type disc, operating in the removable liner, is the only pressure actuated part in the valve; see the following page for features and full description of the internal parts of the valve.

**Stuffing box:** All Cast Steel Valves have a lantern type stuffing box equipped with an Ihrigized steel ball type gland and a steel gland flange. Packing above and below the lantern assures tight sealing. The lantern provides space for a cooling chamber, which is tapped and fitted with a steel plug.

Ferrosteel Valves have an exceptionally deep stuffing box, filled with a high grade packing, and fitted with a two-piece gland and gland flange.

**Repacking:** All Stop-Check Valves, when the stem is in the wide open position, can be repacked while under pressure.

**Code conformance:** Crane Ferrosteel and Steel Stop-Check Valves conform to the A.S.M.E. Boiler Construction Code for Non-Return Stop Valves.

**Closing tight against boiler test pressures:** All of these Crane Stop-Check Valves can be closed tight against boiler test pressure (one and one-half times the recommended working pressure). For this purpose, 8 and 10-inch 250-Pound Ferrosteel and 300-Pound Steel, 8, 10, and 12-inch 400-Pound Steel, and 6, 8, 10, and 12-inch 600-Pound Steel Valves are regularly equipped with a hammer-blow handwheel.

*Added description, prices, etc. pages 302 to 305*

*Selecting the proper size pages 306 and 307*

# Ferrosteel and Cast Steel Stop-Check Valves

## Features of Crane Stop-Check Valves

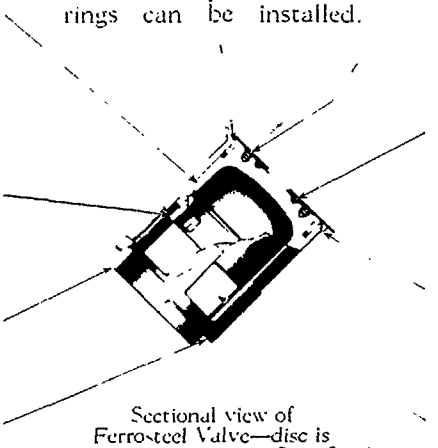
**Cylindrical-shaped disc** is the one moving part. Light in weight with ample guiding surface, it is specially designed to produce a maximum lift at minimum velocities. There are no wing guides to cause "spinning" and rapid wear.

**Long throttling lip** on disc retards flow when seating position is approached. Disc chattering is prevented and wiredrawing of seating surfaces is reduced.

**Flat seats**, accurately machined, facilitate true seating.

**Removable liner** guides the disc throughout the full travel. Being entirely independent of the body, it is not subject to distortion by expansion strains.

**Piston ring** adds to dashpot's ability to avoid rapid disc movements. Where pulsations are extremely severe, two rings can be installed.



Sectional view of Ferrosteel Valve—disc is in the open position. Cast Steel Valves feature the same design.

**Easy regrinding**—tapped bosses on top of the disc permit inserting nipples or eye bolts to facilitate quick removal of the disc and regrinding.

**Dashpot** is self-contained in the liner. It provides an effective cushion for the disc to prevent pipe line vibrations or hammering on the seat at low velocities or on pulsating loads.

**Dashpot vent** acts as a governor to control the disc speed and to assure smooth action and operation of the valve.

**Large port areas** in the liner produce only a minimum of pressure drop through the valve and assure unrestricted movement of the disc.

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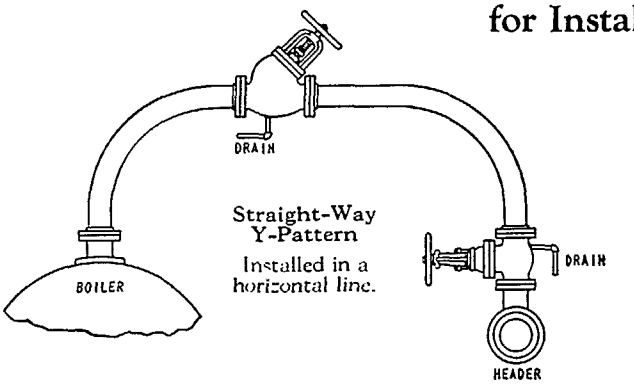
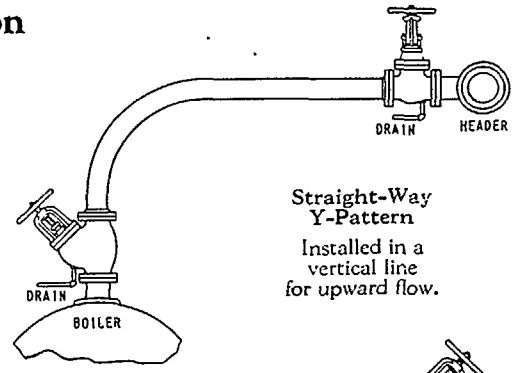
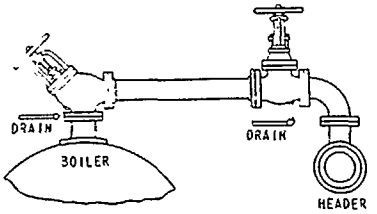
## Recommendations for Installation




**Straight-Way Y-Pattern**
Installed in a horizontal line.



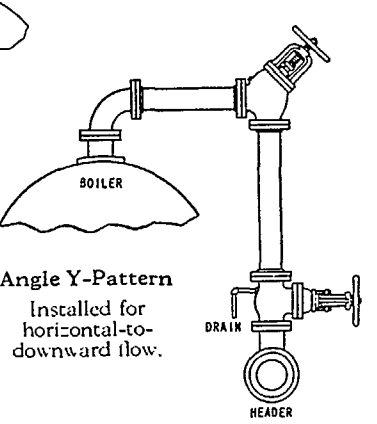

**Straight-Way Y-Pattern**
Installed in a vertical line for upward flow.




**Angle Y-Pattern**
Installed for upward-to-horizontal flow.

Crane 250-Pound Ferrosteel and 300-Pound Cast Steel Stop-Check Valves are available in two styles, the Straight-Way Y-Pattern and the Angle Y-Pattern. Each style can be used in two positions in a boiler installation as illustrated in the diagrams.

The proper method for draining is shown for each position.




**Angle Y-Pattern**
Installed for horizontal-to-downward flow.

*For additional description, see page 301.*

*For list prices and dimensions, see pages 303 to 305.*

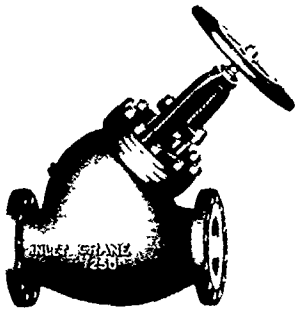
*For selection of proper size, see pages 306 and 307.*

# 250-Pound Ferrosteel Stop-Check Valves

WORKING PRESSURE
250 pounds steam 450° F. maximum temperature

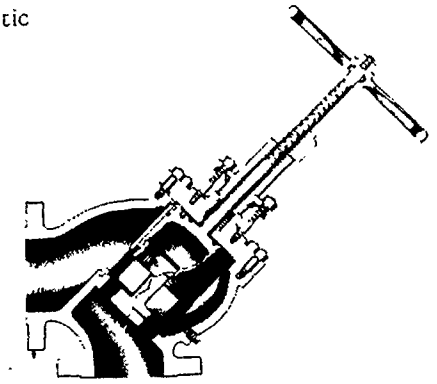
TEST PRESSURE
Shell test — 500 pounds hydrostatic

These valves are suitable for boiler test conditions one and one-half times the nominal rating to comply with the A.S.M.E. Boiler Code.



No. 28 E
Straight-Way Y-Pattern

***Important***
***The size of a stop-check valve should be based on the boiler capacity, rather than on the size of the boiler outlet or existing piping. "Selecting the Proper Size Stop-Check Valve" is explained on pages 306 and 307.***



Cross Section
No. 30 E
Angle Y-Pattern

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## List Prices

| Size | | Inches | 2½ | 3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Flanged, F. & D. | No. 28 E | Each | 169.00 | 188.00 | 225.00 | 300.00 | 356.00 | 544.00 | 900.00 |
| | No. 30 E | Each | 169.00 | 188.00 | 225.00 | 300.00 | 356.00 | 544.00 | 900.00 |

**Service recommendations:** Crane Stop-Check Valves are recommended for use in the pipe line between each boiler and the main steam header, when more than one boiler supplies the same header. For complete explanation of this service, see page 301.

In addition, these valves render excellent service in discharge lines from boiler feed pumps or from other high pressure pumps where a high quality check valve is desired.

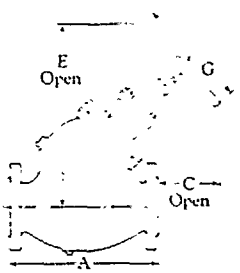
Straight-Way Valves may be used in horizontal lines or in vertical lines for upward flow. Angle Valves are suited for horizontal-to-downward flow or for upward-to-horizontal flow. For recommendations on installation, see page 302.

**Materials and construction:** These valves have a Ferrosteel body, bonnet, and yoke. Their renewable liner is made of cast iron. The stem is cold rolled steel, nickel-plated. The seat ring in all sizes and the disc in sizes 5-inch and smaller are made of Crane Special Bronze, a high grade leaded tin bronze; in sizes 6-inch and larger, the disc is iron with a Crane Special Bronze seating face and throttling lip. 8 and 10-inch valves have a hammer-blow handwheel.

**Flange dimensions and drilling:** The end flanges on these valves conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944). They are furnished faced and drilled unless otherwise ordered.

List prices include facing and drilling to this Standard, and no deduction is made if valves are ordered faced only.

**Flange facing:** The valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges, finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish.

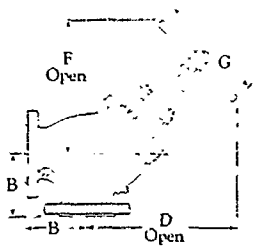



Straight-Way Y-Pattern

## Dimensions, in Inches

| Size | 2½ | 3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|
| *A | 13 | 14¾ | 17 | 19 | 21½ | 26 | 30 |
| *B | 5¾ | 6¼ | 7 | 7⅞ | 8¾ | 10½ | 12¼ |
| C | 5 | 7¼ | 7¾ | 10½ | 11¾ | 16¼ | 17¾ |
| D | 14½ | 16½ | 18½ | 22 | 25½ | 33¼ | 37¾ |
| E | 15¾ | 19¾ | 21¾ | 25¾ | 29¼ | 36¾ | 41¾ |
| F | 13¼ | 14¾ | 16¼ | 19½ | 22½ | 28¾ | 32½ |
| G | 9 | 10 | 10 | 14 | 16 | 20 | 20 |

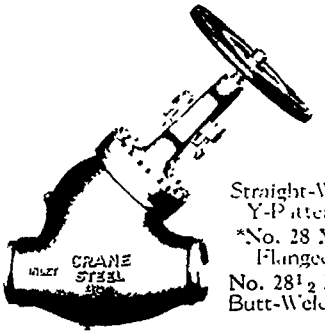
*Dimensions "A" and "B" include the 1/16-inch raised face on the end flanges.




Angle Y-Pattern

*General description and features....pages 301 and 302*
*Dimensions of end flanges ...page 460*
*Templates for drilling... page 460*

# 300-Pound Cast Steel Stop-Check Valves




Straight-Way Y-Pattern
*No. 28 XU
Flanged
No. 28½ XU
Butt-Welding

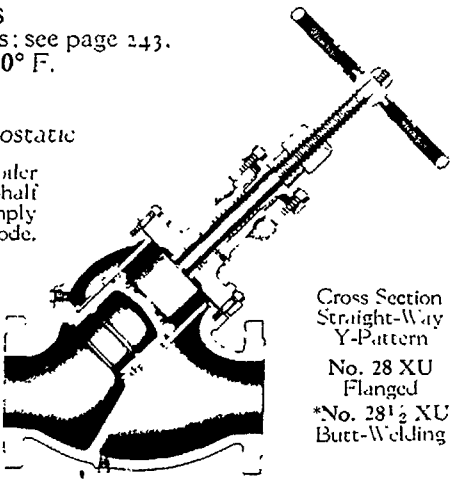
**WORKING PRESSURES**
Same as Steel Globe and Angle Valves; see page 243.
Maximum temperature, 850° F.

**TEST PRESSURE**
Shell test — 900 pounds hydrostatic

These valves are suitable for boiler test conditions one and one-half times the nominal rating to comply with the A.S.M.E. Boiler Code.

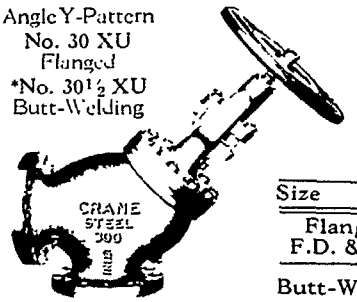
Tested 100 pounds air-under-water

***Important***
***The size of a stop-check valve should be based on the boiler capacity, rather than on the size of the boiler outlet or existing piping. "Selecting the Proper Size Stop-Check Valve" is explained on pages 306 and 307.***



Cross Section
Straight-Way
Y-Pattern
No. 28 XU
Flanged
*No. 28½ XU
Butt-Welding

Angle Y-Pattern
No. 30 XU
Flanged
*No. 30½ XU
Butt-Welding

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* Asterisk indicates valve is not illustrated.

## List Prices

| Size | | Inches | 2½ | †3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Flanged, F.D. & S.F. | No. 28 XU | Each | 428.00 | 523.00 | 700.00 | 855.00 | 1070.00 | 1607.00 | 2417.00 |
| | No. 30 XU | Each | 428.00 | 523.00 | 700.00 | 855.00 | 1070.00 | 1607.00 | 2417.00 |
| Butt-Welding | No. 28½ XU | Each | 428.00 | 523.00 | 700.00 | 855.00 | 1070.00 | 1607.00 | 2417.00 |
| | No. 30½ XU | Each | 428.00 | 523.00 | 700.00 | 855.00 | 1070.00 | 1607.00 | 2417.00 |

**Service recommendations:** Crane 300-Pound Cast Steel Stop-Check Valves perform all the duties of a non-return boiler stop valve efficiently and completely. For explanation, see page 301.

Wherever check valves of outstanding quality are desired, such as in discharge lines from boiler feed pumps or from other high pressure pumps, these valves render excellent service.

Straight-Way Valves may be used in horizontal lines or in vertical lines for upward flow. Angle Valves may be used for upward-horizontal flow or for horizontal-downward flow. See page 302 for installation.

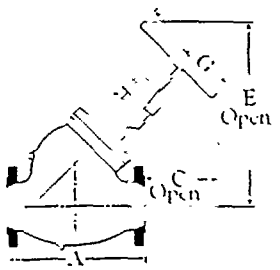
**Materials and construction:** These valves have high quality materials throughout. The body, bonnet, and removable liner are Crane No. 4 Carbon-Molybdenum Alloy Steel; the stem and the seat ring are Exelloy; the disc is Stellite faced No. 4 Steel; and the yoke bushing is cast manganese bronze. Triplex Steel studs equip the bonnet joint; 8 and 10-inch sizes have a hammer-blow handwheel.

**Flanged valves:** The end flanges on flanged valves conform to the American Standard for 300-Pound Steel Pipe Flanges and Flanged Fittings, B16e-1939. They are furnished faced, drilled, and spot faced (F.D. & S.F.), having an American Standard 1/16-inch raised face, finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

A smooth finish on the 1/16-inch raised face or ring joint, male, female, or other types of facing can be furnished when so ordered; see the Crane Discount Sheet for prices.

**†3-inch Cranelap Joints:** When 3-inch 300-Pound Valves with ring joint facing are to be bolted to Cranelap Joints, orders must so specify. They require a groove of special diameter; see page 470 for dimensions.

**Butt-welding valves:** Butt-welding valves have the ends bored to match the inside diameter of Standard pipe (heaviest weight on 8 and 10-inch sizes).



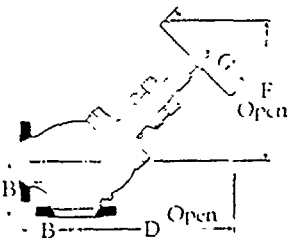

Straight-Way Y-Pattern
Flanged or Butt-Welding

## Dimensions, in Inches

| Size | 2½ | 3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|
| ‡A | 13 | 14¾ | 17 | 19 | 21½ | 26 | 30 |
| ‡B | 5¾ | 6¼ | 7 | 7⅞ | 8¾ | 10½ | 12¼ |
| C | 9½ | 9½ | 12½ | 13½ | 16 | 20 | 23 |
| D | 17½ | 18½ | 23 | 25 | 29½ | 36½ | 43 |
| E | 20½ | 21½ | 26½ | 29 | 33½ | 40½ | 47½ |
| F | 16 | 16½ | 21 | 22½ | 26½ | 32 | 38 |
| G | 10 | 10 | 14 | 16 | 18 | 20 | 20 |

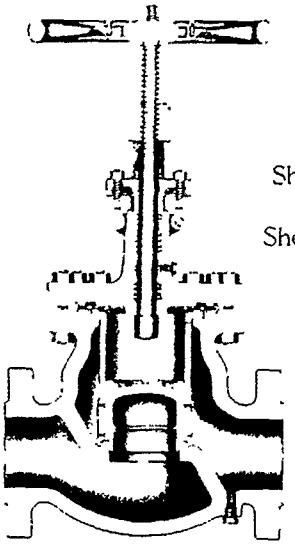
‡"A" and "B" include the 1/16 inch raised face on the end flanges.

*General description and features* . . . *pages 301 and 302*
*Dimensions of end flanges* . . . . . *page 461*
*Templates for drilling* . . . . . *page 461*




Angle Y-Pattern
Flanged or Butt-Welding

# 400 and 600-Pound
# Cast Steel Stop-Check Valves



Cross Section, Globe Pattern
400-Pound
No. 164 U, Flanged
*No. 164½ U, Butt-Welding
600-Pound
No. 179 U, Flanged
*No. 179½ U, Butt-Welding

WORKING PRESSURES
Same as Steel Globe and Angle Valves; see page 243.
Maximum temperature, 950° F.

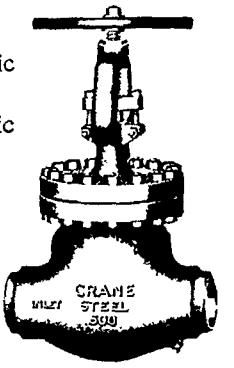
TEST PRESSURES
400-Pound Valves
Shell test — 1200 pounds hydrostatic
600-Pound Valves
Shell test — 1800 pounds hydrostatic

400 and 600-Pound Valves are suitable for boiler test conditions one and one-half times the nominal rating to comply with the A.S.M.E. Boiler Code.

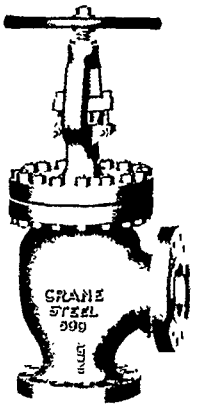
All valves are tested
100 pounds air-under-water

***Important***
***The size of a stop-check valve should be based upon the boiler capacity, rather than on the size of the boiler outlet or existing piping.***
***"Selecting the Proper Size Stop-Check Valve" is explained on pages 306 and 307.***

*Valve is not illustrated.




400-Pound Globe Pattern
*No. 164 U, Flanged
*No. 164½ U, Butt-Welding
600-Pound Globe Pattern
*No. 179 U, Flanged
No. 179½ U, Butt-Welding




400-Pound Angle Pattern
*No. 166 U, Flanged
*No. 166½ U, Butt-Welding
600-Pound Angle Pattern
No. 180 U, Flanged
*No. 180½ U, Butt-Welding

***For proper operation, valves must be installed with the stem in a vertical position.***

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## List Prices, Each, and Dimensions

| Size | | Inches | 2½ | †3 | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Flanged, F.D. & S.F. | Nos. 164 U or 166 U, 400-Pound | | | | 803.00 | 1056.00 | 1228.00 | 1802.00 | 2907.00 | 4790.00 |
| | Nos. 179 U or 180 U, 600-Pound | | 532.00 | 606.00 | 983.00 | 1294.00 | 1507.00 | 2227.00 | 4037.00 | 5977.00 |
| Butt-Welding | Nos. 164½ U or 166½ U, 400-Pound | | | | 803.00 | 1056.00 | 1228.00 | 1802.00 | 2907.00 | 4790.00 |
| | Nos. 179½ U or 180½ U, 600-Pound | | 532.00 | 606.00 | 983.00 | 1294.00 | 1507.00 | 2227.00 | 4037.00 | 5977.00 |
| Dimensions, in Inches | Globe | ‡Face to face, or end to end | 13 | 14 | 18 | 20½ | 23 | 28 | 32½ | 42 |
| | | Center to top, open | 24 | 26¼ | 28¾ | 33 | 37½ | 47½ | 56½ | 66¾ |
| | Angle | ‡Center to face, or center to end | 6½ | 7 | 9 | 10¼ | 11½ | 14 | 16¼ | 21 |
| | | Center to top, open | 23¾ | 26 | 28 | 32 | 36 | 44¾ | 53½ | 63½ |
| | Diameter of wheel | | 10 | 12 | 14 | 16 | 20 | 26 | 30 | 30 |

‡Face to face and center to face dimensions include the ¼-inch male face on the end flanges.

**Materials and construction:** The materials from which the parts of these valves are made are of exceptionally high quality. Crane No. 4 Carbon-Molybdenum Alloy Steel body, bonnet, and liner; Stellite faced No. 4 Alloy seat and disc; and Exelloy stem. The bonnet joint utilizes a soft steel ring joint gasket and Crane Templex Steel bolt-studs.

The general construction of these valves follows those described on pages 301 and 302, except for the stem position, the bonnet joint, and the materials. 400-Pound Valves 8-inch and larger and 600-Pound Valves 6-inch and larger have a hammer-blow handwheel.

**Flanged valves:** The end flanges on 400 and 600-Pound Flanged Valves conform respectively to the 400 and 600-Pound American Standards for Steel Pipe Flanges and Flanged Fittings, B16e-1939. The valves are furnished faced, drilled, and spot faced (F.D. & S.F.), and have an American Standard ¼-inch male face (large male) on the end flanges, finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

A smooth finish or ring joint, female, or other types of facing can be furnished; see the Crane Discount Sheet for prices.

**†3-inch Cranelap Joints:** When 3-inch 600-Pound Valves with ring joint facing are to be bolted to Cranelap Joints, orders must specify; they require a groove of special diameter (dimensions on page 475).

**Butt-welding valves:** Orders for butt-welding valves must specify the inside diameter of the pipe or its wall thickness so that the valve ends can be bored to match the pipe.

***900 and 1500-Pound Pressure-Seal Bonnet Alloy Cast Steel Stop-Check Valves***

For higher pressures, Crane has developed the Pressure-Seal Bonnet Valve. For complete description, see pages 214 and 215.

*General description and features . . . pages 301 and 302*
*Templates for drilling . . . . . page 462*
*Dimensions of end flanges . . . . . page 462*

# Crane Bolted Bonnet Stop-Check Valves
# Selecting the Proper Size—Determining Pressure Drop

A problem confronting the power piping designer is the selection of the best size of stop-check valve for his service conditions. This type valve has a floating disc member, hence it is important the valve be sized to provide full disc lift under conditions prevailing during the major portion of the service life of the installation. If the valve is too large, the disc will float in a partially open position; this may result in fluttering of the disc and rapid wear of valve parts. Conversely, if the valve is too small, pressure drop will be excessive.

Crane has conducted numerous tests both in the laboratory and in the field over a period of many years to establish the flow characteristics of Crane Stop-Check Valves. As a result, Crane Engineers have developed the chart shown on the opposite page. The chart is a graphical solution of the flow formula and incorporates the valve flow factors which were determined by test. Its use offers a simple and direct method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow, without any computation.

### *How to Use the Chart Shown on the Opposite Page*

**Given:** Steam Pressure . . . . 300 pounds per sq. in., gauge
Steam Temperature 750° F.
Flow Rate 100,000 pounds per hour, maximum

**Find:** Valve Catalog No. and best size for above installation

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**Solution:** Reference to the pressure-temperature ratings on page 243 indicates a valve of the 300-pound pressure class will be required. Therefore, the following valves may be used

Globe. No. 28 XU, Flanged or No. 28½ XU, Butt-Welding
Angle. No. 30 XU, Flanged or No. 30½ XU, Butt-Welding

The choice between the globe and angle, as well as between flanged and butt-welding ends depends, of course, upon the piping arrangement and local conditions. *Now follow the text below and proceed as indicated by the arrows on the chart.*

**1.** Enter the chart at the lower left at a temperature of 750° F. Move vertically upward to the curved line for 300 psi gauge pressure, then horizontally to the right to establish a point on the specific volume line. From this point, draw a diagonal line through the flow rate being investigated (100,000 pounds per hour) and establish a point on Index 1.

**2.** From the point on Index 1, draw another diagonal line through any assumed valve size, for example the 8-inch size, and establish a point on Index 2. Now move horizontally to the diagonal line in the right hand portion of the chart which represents the pressure drop through the valve being investigated. Where these lines intersect, read the pressure drop as 9 psi for the 8-inch 300-Pound Globe Valve and 10 psi for the 8-inch 300-Pound Angle Valve.

Chart solutions resulting in a point on Index 2 that falls below the Line A-A for 250 and 300-Pound Valves, or below Line B-B for 400 and 600-Pound Valves, indicate the valve disc will not be fully lifted under the flow conditions used. Operation under such conditions is not recommended but, at times, must be tolerated for short periods during the low load portion of the operating cycle.

**3.** Enter the chart where Line A-A intersects Index 2. Move diagonally upward through the size being investigated (8-inch) and establish a second point on Index 1. From this point, extend a line to the specific volume established in Step 1, and at its intersection with the flow rate line, read 42,000 pounds per hour as the minimum flow rate at which the disc will be in the fully lifted position. The pressure drop at this flow rate is 1.9 psi for globe and 2.1 psi for angle valves. At all flow rates less than 42,000 pounds per hour through 8-inch valves, the pressure drop may be expressed as "less than 1.9 psi" for globe and "less than 2.1 psi" for angle valves.

**4.** Repeat Steps 2 and 3 for all other probable sizes and determine the pressure drop and minimum flow rate for the wide open position. Results are shown at the right.

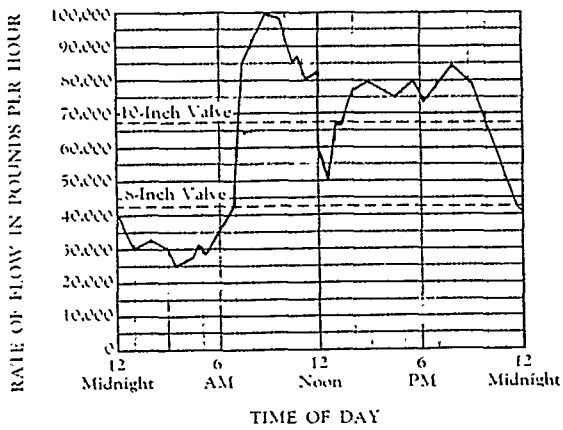
| Valve Size | Pressure Drop at Maximum Flow Rate of 100 000 lbs. per hour (In Psi) | | Minimum Flow Rate for Wide Open Valve |
|---|---|---|---|
| Inches | Globe | Angle | Lbs. per hour |
| 6 | 24 | 26 | 24 000 |
| 8 | 9 | 10 | 42 000 |
| 10 | 3.8 | 4.2 | 68,000 |
| 12 | 2.1 | 2.3 | 95 000 |

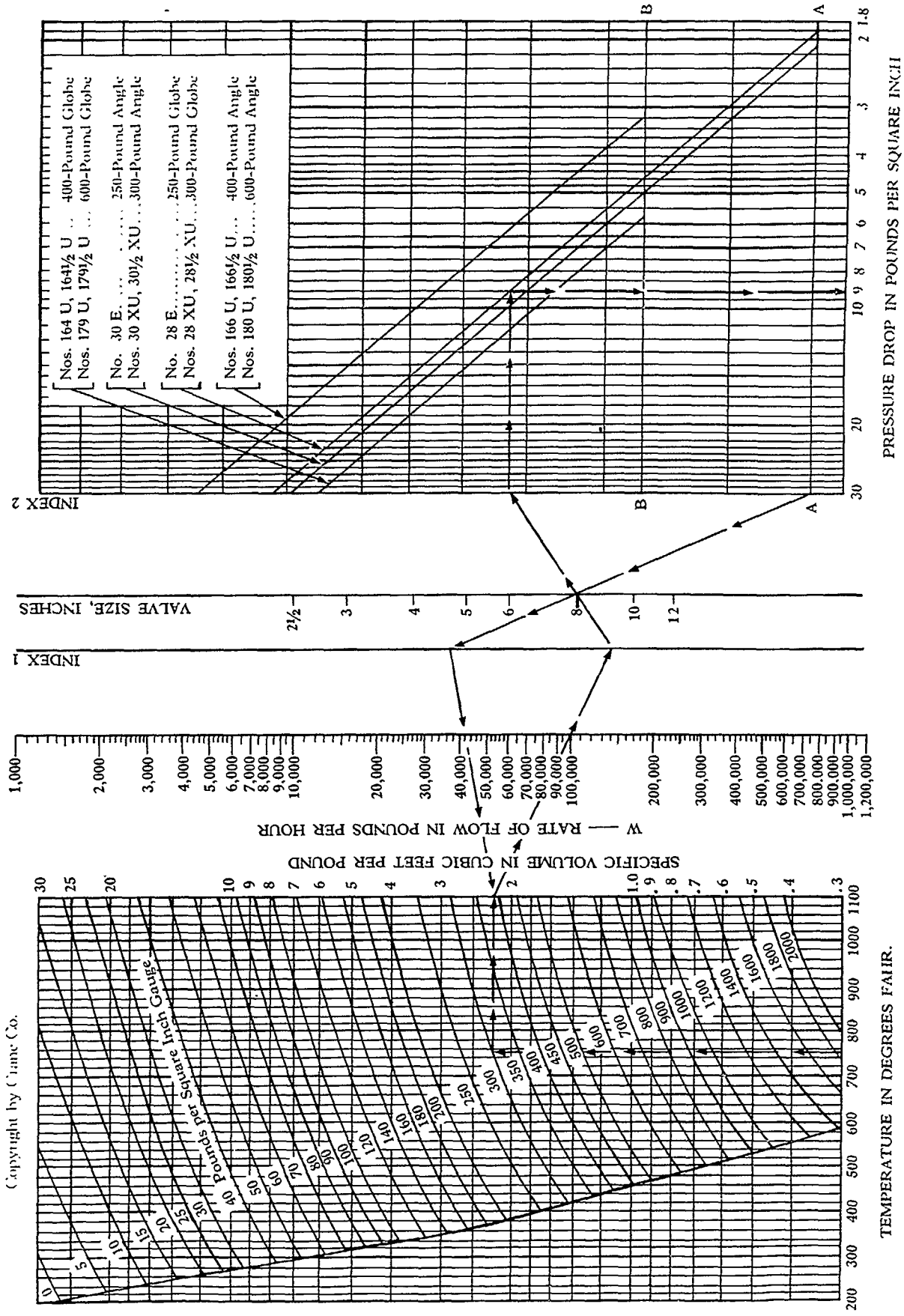
**5.** Since the flow rate of 100,000 pounds per hour is designated as maximum, it may be assumed the boiler will frequently be operated at lower flow rates. On this basis, the 12-inch size would obviously be too large and pressure drop through the 6-inch valve would probably be considered excessive. The choice between the 8 or 10-inch size depends upon the load-demand curve, and the final selection rests with the piping designer.

**6.** A typical daily load-demand curve, shown in the chart below, indicates the advisable size is 10-inch. Minimum flow rates for a fully lifted disc for both 8 and 10-inch sizes are shown in the chart. The disc will not be fully lifted for about 7 hours in the 8-inch valve and for about 10½ hours in the 10-inch valve. However, since the pressure drop for the 10-inch is so much lower during high-load operation, it appears to be a better choice than the 8-inch.

Pressure drop for any intermediate flow condition can be determined as outlined in Steps 1 and 2.

**Typical Daily Load-Demand Curve**



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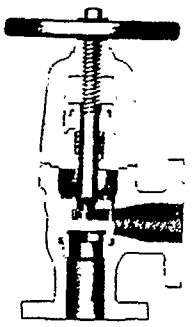
# 250-Pound Ferrosteel Blow-Off Valves



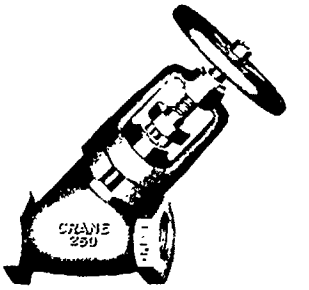
Angle Valves
No. 390
Screwed
No. 391
Flanged

WORKING PRESSURE
250 pounds boiler blow-off service

HYDROSTATIC TEST PRESSURES
550 pounds seat — 800 pounds shell

BOILER CODE REQUIREMENTS

Nos. 393 and 393½ Y-Pattern Valves do not comply with the requirements of the 1940 edition of the A.S.M.E. Boiler Code. Nos. 390 and 391 Valves comply with the Code for bottom blow-off, except that the maximum allowable working pressure under the Code is 200 pounds instead of 250.




Y-Pattern Valves
No. 393
Screwed
No. 393½
Flanged

List Prices, Each

| Size | | Inches | 1½ | 2 | 2½ |
|---|---|---|---|---|---|
| Angle | No. 390, Screwed | | 36.50 | 45.50 | 61.00 |
| | No. 391, Flanged, F. & D. | | 40.00 | 50.00 | 67.00 |
| Y-Pattern | No. 393, Screwed | | 36.50 | 45.50 | 61.00 |
| | No. 393½, Flanged, F. & D. | | 40.00 | 50.00 | 67.00 |
| Replacement Parts | Body Seat Ring | | 2.00 | 2.70 | 3.50 |
| | Disc | | 4.40 | 5.20 | 6.00 |

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**Service recommendations:** These valves have been particularly designed for boiler blow-off service, but are also well suited for blow-off service on tanks or receivers where dirty, gritty water is to be handled.

**Features of construction:** The valves are made with a renewable seat and slip-on disc, in order to permit quick repair. Contrary to ordinary globe valve construction, the seating surface in these valves is on the outside of the seat ring where it is protected from the cutting effect of the water passing the seat.

The bonnet is held to the body with two bolts, which facilitates dismantling the valve for inspection and repair. The outside screw and yoke construction keeps the stem threads outside the flow of water; it improves the life of the stem threads and prevents the valves from becoming inoperative due to scale and foreign matter jamming the threads. All parts of these valves are sturdily constructed.

The stuffing box is unusually deep and holds ample high grade packing, eliminating frequent repacking.

**Materials:** The body and bonnet are Ferrosteel, a high grade cast iron. Cast iron, proven very satisfactory for blow-off service is used also for the disc and body seat ring. The stem is Cast Manganese Bronze. The two-piece gland consists of an Ihrigized steel gland and a malleable iron gland flange.

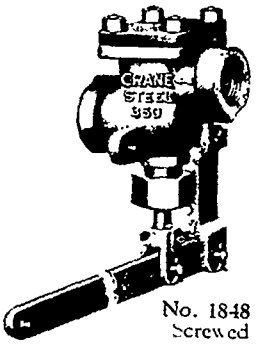
**Flanged valves:** End flanges conform to the American Cast Iron Flange Standard, Class 250 (No. B-16b-1944). They have a 1/16-inch raised face, and are furnished faced and drilled (F. & D.).

Dimensions, in Inches

| Size | | 1½ | 2 | 2½ | Size | | 1½ | 2 | 2½ |
|---|---|---|---|---|---|---|---|---|---|
| Angle Valves | Center to end, No. 390 | 4 | 4½ | 5 | Y-Pattern Valves | End to end, No. 393 | 7¼ | 8 | 9⅛ |
| | Center to face, No. 391 | 4½ | 5 | 5¾ | | Face to face, No. 393½ | 9⅞ | 11 | 12¼ |
| | Center to top, open | 12½ | 13¾ | 15½ | | Center to rim of wheel, open | 12¾ | 14 | 15¾ |
| | Diameter of wheel | 8 | 9 | 10 | | Diameter of wheel | 8 | 9 | 10 |

*Templates for drilling and flange dimensions....page 460*

# Cast Steel Sliding Stem Blow-Off Valve




No. 1848
Screwed

Cast Steel Body
Exelloy Seat—Steel Stem
Stellite Faced Steel Disc

WORKING PRESSURE
350 pounds saturated steam

The No. 1848 Valve is recommended for blow-off lines on high pressure oil or gas field boilers such as are used for deep well drilling operations.

The long lever and sliding stem construction enable the user to open the valve quickly and easily. The valve closes automatically with the pressure when the lever is released. The body is made of cast steel. The body seat ring is made of Exelloy and is renewable.

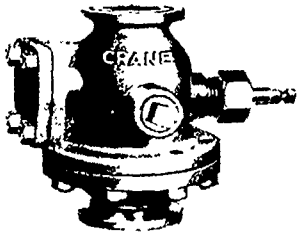
List Price and Dimensions

| Size | Inches | 2 |
|---|---|---|
| No. 1848, Screwed | Each | 146.00 |
| End to end | Inches | 6⅝ |
| Center of stem to end of lever | Inches | 17⅛ |

The cap and the one-piece disc and stem are made of forged steel. The disc is faced with Stellite and the lower end of the stem is nickel-plated.

# 300-Pound Steel
# Locomotive Steam Heat End Valves

(Patent Pending)

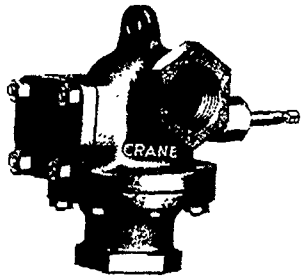


No. 1815 P
Straight-Way
With Ring Joint
Faced Flanges for
Quick Coupling Adaptation

WORKING PRESSURE
300 pounds steam, 600° F. max. temp.

TEST PRESSURES
Shell — 600 pounds hydrostatic
Seats — 300 pounds hydrostatic

These valves are designed for easy manual operation and dependability under severe operating conditions. Rugged construction, specialized two-disc design, and high grade materials assure efficient performance, whether the requirements are to shut off flow, to provide full flow, or to effect a reduction in flow (bleed).



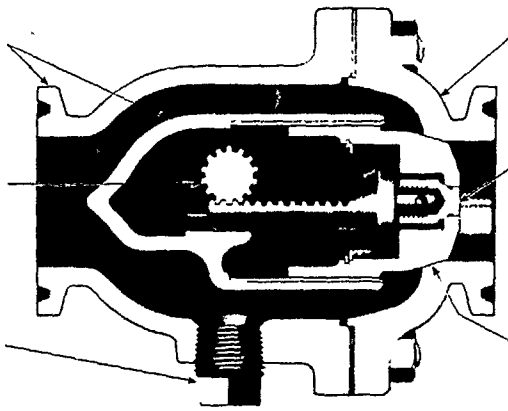
No. 1816 P
Angle
With Screwed Female
Inlet and Outlet

### *Two-Disc Design Provides Three-Position Operation*

Inlet body has an integral cylinder forming a piston chamber in which the main disc rides.

Pinion gear, integral with stem, engages the rack. As the stem is rotated clockwise, the rack lifts the pilot disc, and subsequently, the main disc from their seats.

Removal of plug on straight-way valve permits installation of a steam trap to drain condensation. Angle valve drains automatically when valve is open.



Section of Straight-Way Valve in horizontal position with main and pilot discs closed.

Outlet body has integral seats.

Pilot disc is held closed by the pressure load. It can be lifted off its seat to a bleed position by a 25° clockwise rotation of the stem. This position is retained until further rotation of the stem, up to 180°, opens the main disc for full flow.

Main disc has plug type seating face. It is held closed by the pressure load and remains closed while the pilot disc is in the bleed position.

**Bleed position:** To avoid freezing of lines and valves during cold weather, a low rate of flow is required to provide rapid movement of steam and evacuation of condensate. To accomplish this function, the stem is rotated clockwise approximately 25°; this lifts the pilot disc from its seat and permits restricted flow; the main disc remains closed. At this point, a detent cam at the end of the stem presents a depression into which a spring-actuated roller snaps, retaining the pilot disc in the bleed position until further rotation of the stem is effected.

**Open position:** Additional clockwise rotation of the stem (25° to 180°) causes the detent cam to leave its position, lifts the pilot disc so that flow through its seat opening is no longer restricted, and lifts the main disc to permit full flow. When the valve is wide open, the detent cam once again presents a depression into which the spring-actuated roller snaps, retaining the main disc in the wide open position.

**Closed position:** A 180° counter-clockwise rotation of the stem closes the valve completely.

**Materials:** The valves have a cast steel inlet body with an internal, integral cylinder. The outlet body is made of Exelloy and has integral seating faces. The stem and rack are aluminum bronze; the external end of the stem is machined for an AAR Universal Joint connection. Both main disc and pilot disc are made of Crane No. 49 Nickel Alloy. The cover, made of cast steel, is held in place by means of Triplex Steel studs and is fitted with a Cranite gasket.

**Installation:** The valves should be installed with the pressure above the discs; an arrow cast on the body indicates the correct direction of flow.

Blowing new lines clear before installing the valves will assure proper action. Where excessive dirt, pipe scale, etc., are encountered, the use of a sediment separator is recommended; see pages 356 and 357.

**List Prices, Each**

| Size | Inches | 2½ |
|---|---|---|
| No. 1815 P, Straight-Way | | 312.50 |
| No. 1816 P, Angle | | 312.50 |

These valves are furnished without a handle; their stem end is machined for an AAR Universal Joint connection.

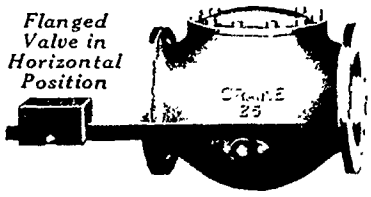
*600-Pound Steel Valves for Locomotive Service page 240*

*Dimensions will be furnished on application.*

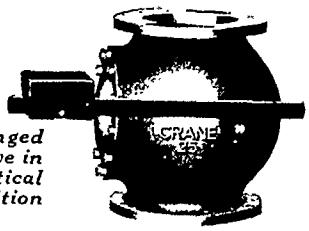
# Iron Body Back Pressure Valves

*Weighted for back pressures up to 5 pounds*

*Flanged Valve in Horizontal Position*



*Flanged Valve in Vertical Position*



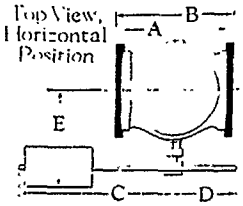
No. 384, Screwed (Not Illustrated)
No. 385, Flanged (Illustrated)

Screwed valves are used only in a vertical position. Flanged valves can be used in a horizontal or vertical position (the vertical position is preferred because wear is reduced).

**Service recommendations:** These valves are ideal for use on non-condensing engine installations, where the exhaust steam is largely used for heating, and where the valve, therefore, is not called upon to operate frequently. For vacuum service, use Spring Loaded Valves shown below.

**Construction:** The valves have an iron body, cap, and weight, and a brass seat and disc or disc face. The lever made of malleable iron, and an adjustable weight are mounted on the cap on screwed valves (not illustrated), and on the side of the valve body on flanged valves.

Dimensions of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish. Prices of flanged valves include facing and drilling to the 25-Pound American Tentative Cast Iron Flange Standard. No deduction is made for valves ordered faced only.




Same dimensions apply for vertical position.

**List Prices, Each, and Dimensions**

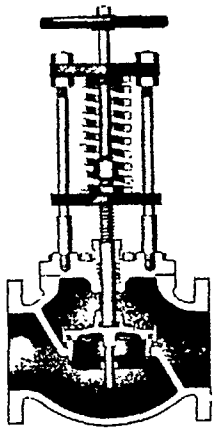
| Size | | Inches | 2 | 2½ | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| No. 384, Screwed | | | 40.50 | 47.50 | 55.00 | | | | |
| No. 385, Flanged, F. & D. | | | | | | 95.00 | 135.00 | 172.00 | 328.00 |
| Dimensions in Inches | A | | 6½ | 7 | 8 | | | | |
| | B | | | | | 11½ | 13 | 14 | 19½ |
| | C | | 12½ | 14¼ | 16¼ | 18¾ | 20½ | 24 | 26¼ |
| | D | | 4 | 4½ | 5¼ | 7 | 7½ | 7½ | 9¼ |
| | E | | 6½ | 6¾ | 7¾ | 9½ | 10½ | 11¾ | 14 |

29

# Iron Body Relief and Back Pressure Valves

## Spring Loaded

**Service recommendations:** These valves are used as back pressure valves between the exhaust from auxiliary engines and condensers, and as exhaust relief valves on condensers to protect the equipment if the vacuum is lost. Although they are primarily intended for marine service, they are also suitable for stationary plants.



Cross Section
No. 4387, Horizontal

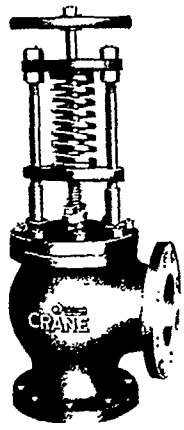
**Materials:** The body and bonnet are cast iron; the seat, disc, stem, gland, and stem hole bushing are brass.

**Features of design:** These valves have a deep stuffing box, an adjustable popping chamber which assures a high disc lift, large discharging capacity, and definite opening and closing pressures. The blow-down of pressure can be regulated without dismantling the valve.

When desired, the valves can be manually opened and left in that position; turning the handwheel to the left gradually releases the spring tension, and when the spring is no longer under compression, the disc is lifted from its seat.

**Pressure setting:** When relieving to atmosphere, the valves are set at any specified pressure from 10 to 35 pounds gauge. They can be used for discharging into a vacuum but are then set at a lower gauge pressure of from 1 to 20 pounds to compensate for the vacuum on the outlet side.

**Information required:** Orders and inquiries should specify the pressure on the inlet side, the pressure or inches of vacuum on the outlet, and the back pressure to be maintained. Capacities will be furnished on application.



No. 4389, Angle

**List Prices and Dimensions**

| Size | Inches | 2½ | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|
| No. 4387 or No. 4389, F. & D. | Each | 255.00 | 285.00 | 370.00 | 505.00 | 600.00 | 900.00 |
| Center to face | Inches | 4¼ | 4¾ | 5¾ | 6½ | 7 | 9¾ |
| Center to top, open | Inches | 14 | 16 | 21 | 25½ | 28 | 34 |
| Diameter of wheel | Inches | 6 | 7 | 9 | 10 | 10 | 12 |

*Templates for drilling . page 459*

**End flanges:** The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.

# McAlear
# Back Pressure and Atmospheric Relief Valves

## Weight Loaded

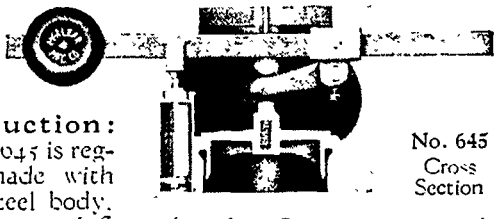
**Service recommendations:** The No. 645 Back Pressure Valve is of the single-seated vertical type, and is recommended for operation with condensing and non-condensing engines.

When used in connection with condensing engines, the valve will be equipped with water sealed, vacuum-tight seat rings.

When used with non-condensing engines, it will maintain automatically, within the pressure limits indicated below, any desired back pressure on the exhaust line so that the steam may be used for heating or any other low pressure service.

This valve also operates dependably as an atmospheric relief valve. When specified for this service, the valve is furnished with scale weights, in addition to the ball weight. These scale weights are placed on the opposite end of the lever so that the valve will open automatically and permit the exhaust steam to escape to atmosphere.

**Operating pressures:** The body of this valve will withstand steam working pressures up to 125 pounds. In sizes 2 to 8 inches it will maintain a back pressure up to 10 pounds; larger sizes, up to 6 pounds.



No. 645 Cross Section

**Construction:** The No. 645 is regularly made with a semi-steel body, brass trim, and flanged ends. Sizes 2 to 24-inch are available (12 to 24-inch with flanged door only).

Noiseless, steadied operation upon closing is assured by an outside oil dashpot.

**When ordering:** Specify the catalog number and size; whether the valve is for use in connection with condensing or non-condensing engines, and whether for back pressure or atmospheric relief. If for back pressure, specify the pressure to be maintained and the service for which the exhaust steam is to be used.

Companion flanges are extra and are furnished only when ordered.

**Face to Face, in Inches**

| Size | 2 | 2½ | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|
| Face to face | 7½ | 7½ | 8½ | 8¾ | 10¼ | 12¼ | 15 | 15 | 17¼ | 18 |

29

# Fisher Pressure Relief Valves

## Spring Loaded

**Service recommendations:** The No. 555 Pressure Relief Valve is used to automatically maintain a constant upstream or back pressure. It is designed for throttling relief service on water, oil, steam, air, gas, and other fluids.

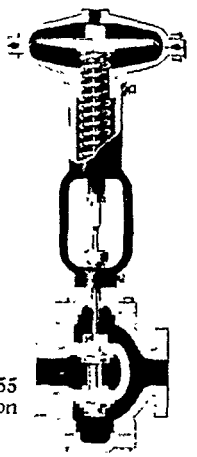
A wide range of diaphragm sizes and springs allows adaptation to many back pressure installations.

**Construction:** The double port and balanced inner valve has beveled ground seats and is connected to the valve stem by a patented "Flexaline" connection.

Single seated bodies, with either a composition disc or with a bevel seated inner valve, are also available.

The extra heavy enclosed yoke protects the spring from dirt and weather. A long, high quality steel spring assures freedom from any change in the control point.

**Installation:** The valves can be installed with the diaphragm either above or below the pipe line. The inner valve is inverted; the body can be easily turned over for conversion to a reducing valve.



No. 555 Cross Section

**Types Available, Range of Sizes, and Ratings**

| Types Available | | | Range of Sizes | Working Pressures Psi | Deg. F. | Psi | Deg. F. |
|---|---|---|---|---|---|---|---|
| High-Tensile Iron Body with Bronze or Stainless Steel Trim | Screwed | | ½ to 2-inch | 250 | 410° | 400 | 100° |
| | Flanged | 125-Pound | 1 to 8-inch | 125 | 360° | 175 | 100° |
| | | 250-Pound | 1 to 8-inch | 250 | 410° | 400 | 100° |
| Cast Steel Body with Stainless Steel Trim | Screwed | | ½ to 2-inch | 600 | 800° | 1200 | 100° |
| | Flanged | 150-Pound | 1 to 8-inch | 150 | 500° | 230 | 100° |
| | | 300-Pound | 1 to 8-inch | 300 | 800° | 600 | 100° |
| | | 400-Pound | 1 to 8-inch | 400 | 800° | 800 | 100° |
| | | 600-Pound | 1 to 8-inch | 600 | 800° | 1200 | 100° |

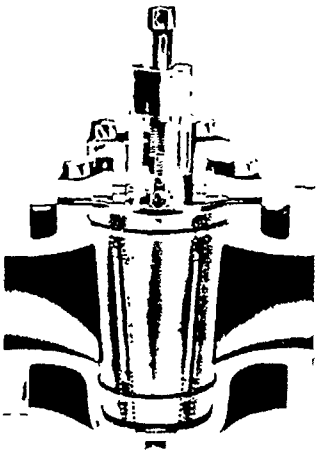
**Relief Pressure Ranges**

| Nominally Standard |
|---|
| ½ to 2 psi |
| 1 to 4 psi |
| 2 to 5 psi |
| 3 to 10 psi |
| 5 to 15 psi |
| 10 to 35 psi |
| 20 to 55 psi |
| 30 to 75 psi |
| 40 to 100 psi |

*Prices on application*

# Nordstrom Lubricated Plug Valves

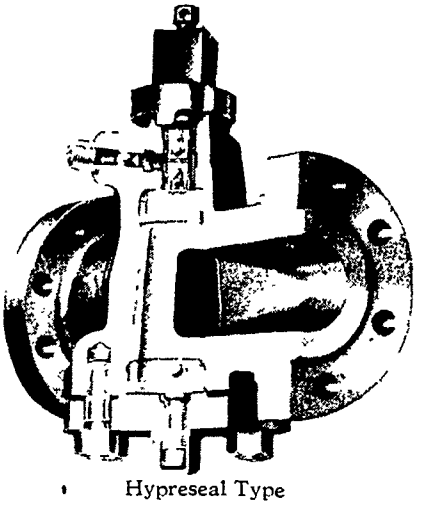
## Pressure Lubricated



Standard Type

Nordstrom lubricated plug valves meet the demands of the piping industry, particularly in the petroleum, refining, gas, and chemical fields. The valves are suitable for an extreme range of working pressures.

The functions of pressure lubrication in Nordstrom valves are: (1) hydraulic action, keeping plug in free working condition; (2) maintain positive seal against internal and external leakage; (3) free turning, even of the largest sizes and against heavy differential pressure; (4) protection of working surfaces from wear and corrosion.



Hypreseal Type

29

**Standard type:** These valves are for industrial services and are furnished for working pressures of 200 pounds and higher. They are available in semi-steel and Nordco steel, with a bolted gland in the larger sizes and a screwed gland in the smaller sizes; with screwed or flanged ends; wrench or gear operation; and regular, venturi, gate valve replacement, or multiport patterns.

**Hypreseal type:** This valve has an inverted, full-floating plug, with separate adjusting and rotating members located at opposite ends of the plug. The stem is independent of the plug, except that the two parts are coupled as to rotation by a floating equalizer ring. A plastic packing, injected under pressure applies a plastic seal on stem threads. This valve can be repacked under full working pressure.

No. 142

No. 143

*No. 143

*No. 149

No. 114

No. 115

No. 167

No. 305

No. 524

No. 525

## Features

**Non-sticking plug:** In all Nordstrom valves, lubricant forced in under pressure produces a momentary unseating movement of the plug, which overcomes any adhesion and, because of the taper, creates space for a lubricant film between plug and body. The unseating occurs only at the time of lubrication; therefore, the seat is not exposed to line fluid.

The tapered form of plug and seat provides an intimate fit, regardless of the absence of a lubricant or of the thickness of lubricant film.

**Positive rotary action:** These valves are built on the tapered rotary principle. The taper of the plug and seat maintains an intimate working contact between the two parts at all times. Since the valve is opened and closed by rotation only, and not by raising and lowering the movable valve member, the vital seating surfaces are self-protecting and self-cleaning.

**Semi-Steel Valves**

| No. | Size Inches | Ends | Working Pressure Pounds SWP | Working Pressure Pounds WOG | Test Pressure Pounds | Operation |
|---|---|---|---|---|---|---|
| 142 | 1 to 4 | Screwed | | 175 | 350 | Wrench |
| 143 | 1 to 4 | Flanged | | 175 | 350 | Wrench |
| *143 | 6 to 12 | Flanged | 125 | 200 | 400 | Wrench |
| *149 | 6 to 12 | Flanged | 125 | 200 | 400 | Worm Gear |
| 114 | 1/2 to 3 | Screwed | 125 | 200 | 400 | Wrench |
| 115 | 1 to 4 | Flanged | 125 | 200 | 400 | Wrench |
| 167 | 4 to 12 | Flanged | 125 | 200 | 400 | Spur Gear |
| 167 | 14 and 16 | Flanged | 125 | 175 | 350 | Worm Gear |
| 214 | 1/2 to 3 | Screwed | 250 | 400 | 800 | Wrench |
| 305 | 2 to 4 | Flanged | 250 | 400 | 800 | Wrench |
| 524 | 1/2 to 4 | Screwed | 250 | 500 | 1000 | Wrench |
| 824 | 1/2 to 4 | Screwed | | 800 | 1600 | Wrench |
| †2815 | 1 to 3 | Flanged | | 150 | 300 | Wrench |
| †2965 | 4 and 6 | Flanged | | 250 | 500 | Wrench |
| 23141 | 2 to 4 | Dresser | | 175 | 350 | Wrench |
| 24191 | 6 and 8 | Dresser | | 200 | 400 | Wrench |

*Short Venturi Pattern. †Steam-Jacketed.

*Prices on application*

# Nordstrom Lubricated Plug Valves (Cont.)

No. 824

No. 2815

No. 2965

No. 23141

No. 24191

No. 1924

No. 1925

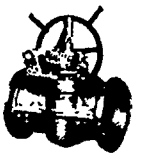
Steel Valves

| No. | Size, Inches | Ends | Steel | A.S.A. Rating | Operation |
|---|---|---|---|---|---|
| 1924 | 2 to 4 | Screwed | Carbon | 150 | Wrench |
| 1925 | 1 to 4 | Flanged | Carbon | 150 | Wrench |
| 1985 | 6 and 8 | Flanged | Carbon | 150 | Wrench |
| 1989 | 6 to 12 | Flanged | Carbon | 150 | Worm Gear |
| *4169 | 10 to 24 | Flanged | Carbon | 150 | Worm Gear |
| 2024 | ½ to 4 | Screwed | Carbon | 300 | Wrench |
| 2025 | 1 to 4 | Flanged | Carbon | 300 | Wrench |
| ‡1945 | 2 to 6 | Flanged | Carbon | 150 | Wrench |
| 1949 | 6 to 12 | Flanged | Carbon | 150 | Worm Gear |
| *‡4249 | 10 to 16 | Flanged | Carbon | 300 | Worm Gear |

*Venturi Pattern. ‡Hypreseal.

No. 1985

No. 1989


No. 4169

No. 2024

29

Semi-Steel Multiport Valves

| No. | Size Inches | Ends | Working Pressure Pounds SWP | Working Pressure Pounds WOG | Test Pressure Pounds | Port | Operation |
|---|---|---|---|---|---|---|---|
| 3402 | ½ to 2½ | Screwed | 125 | 200 | 400 | 3-way, 2-port | Wrench |
| 3412 | ½ to 2½ | Screwed | 125 | 200 | 400 | 3-way, 3-port | Wrench |
| 3422 | ½ to 2½ | Screwed | 125 | 200 | 400 | 4-way | Wrench |
| 3403 | 1½ to 2½ | Flanged | 125 | 200 | 400 | 3-way, 3-port | Wrench |
| 3413 | 1½ to 2½ | Flanged | 125 | 200 | 400 | 3-way, 3-port | Wrench |
| 3423 | 1½ to 2½ | Flanged | 125 | 200 | 400 | 4-way | Wrench |
| 3469 | 6 to 12 | Flanged | 125 | 200 | 400 | 3-way, 2-port | Worm Gear |
| | 16 | Flanged | 125 | 175 | 350 | 3-way, 2-port | Worm Gear |
| 3479 | 6 to 12 | Flanged | 125 | 200 | 400 | 3-way, 3-port | Worm Gear |
| | 16 | Flanged | 125 | 175 | 350 | 3-way, 3-port | Worm Gear |
| 3489 | 6 to 12 | Flanged | 125 | 200 | 400 | 4-way | Worm Gear |
| | 16 | Flanged | 125 | 175 | 350 | 4-way | Worm Gear |

No. 2025

No. 1945

No. 1949

No. 4249

Carbon Steel Multiport Valves

| No. | Size, Inches | Ends | A.S.A. Rating | Port | Operation |
|---|---|---|---|---|---|
| 4802 | ½ to 2½ | Screwed | 300 | 3-way, 2-port | Wrench |
| 4812 | ½ to 2½ | Screwed | 300 | 3-way, 3-port | Wrench |
| 4822 | ½ to 2½ | Screwed | 300 | 4-way | Wrench |
| 4803 | 1½ to 2½ | Flanged | 300 | 3-way, 2-port | Wrench |
| 4813 | 1½ to 2½ | Flanged | 300 | 3-way, 3-port | Wrench |
| 4823 | 1½ to 2½ | Flanged | 300 | 4-way | Wrench |

No. 3402
No. 3412
No. 3422

No. 3403
No. 3413
No. 3423

Air, Meter, Gauge, and Service Cocks

| No. | Type | Size Inches | Ends | Working Pressure Pounds WOG | Operation |
|---|---|---|---|---|---|
| 1018 | Meter & Air Cocks | ½, ¾, 1 | Screwed | 125 | Wrench |
| 1004 | Service Cocks | ¾ to 1½ | Screwed | 40 | Wrench |
| 1036 | Service Cocks | ¾ to 2 | Dresser | 40 | Wrench |
| 2222 | Gauge Cocks | ¼, ⅜, ½ | Screwed | 2000 | Wrench |

No. 3469
No. 3479
No. 3489

No. 4802
No. 4812
No. 4822

No. 1018

No. 1004

No. 1036

No. 2222

## Nordstrom Valve Lubricants

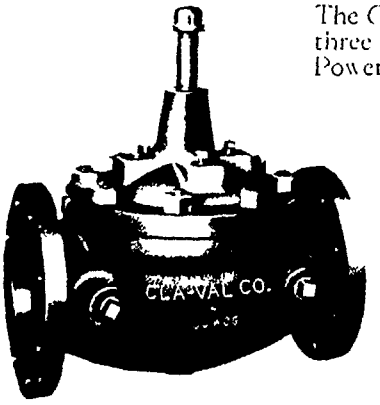
Nordstrom valve lubricants are compounded in various consistencies and formulas to obtain the best results in specific services. Information and recommendations will be furnished on request. Two basic types are available:

Nordcoseal—the standard non-compressible type of lubricant.
Hypermatic—the miracle lubricant. Converts Nordstrom Valves to automatic lubrication.

Both lubricants are available in stick or in bulk form. Users should closely follow the recommendations and instructions pertaining to each lubricant.

*Prices on application*

# Clayton Valves

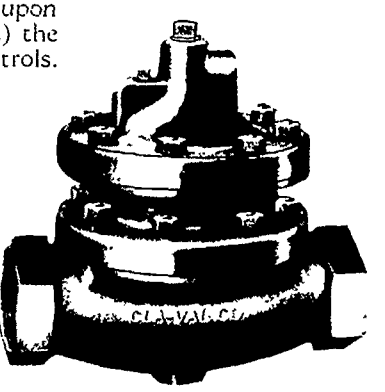



No. 100 Hy-Trol Valve

The Clayton line of valve equipment is founded upon three main elements: (1) the Hy-Trol Valve; (2) the Power-Trol Valve; and (3) Feather-Touch Controls.

The Hy-Trol is the basic valve which can be furnished with a variety of Feather-Touch Controls to simplify the control of liquids or gases for almost any application within the temperature limits of 200° F. and pressures in either the 150 or 300-pound class.

The Power-Trol, also basic, has numerous applications when used with one or more Feather-Touch Controls.



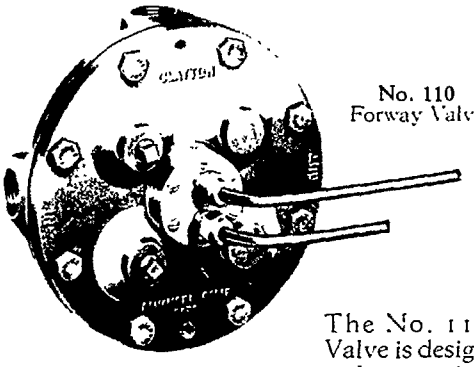
No. 100-P Power-Trol Valve

29

**Hy-Trol Valve:** The No. 100 Hy-Trol Valve is of a modified globe design, employing a diaphragm as the means of operation. It may be operated hydraulically or pneumatically, and may be installed in a horizontal, vertical, or inverted position. The Hy-Trol Valve is designed to handle water, oil, or gas, with either direct or remote control.

**Power-Trol Valve:** The No. 100-P Power-Trol Valve is designed primarily for gasoline, aromatic liquids, oils, or gases, where an independent source of pressure for both opening and closing is desirable. The pressure of the operating medium, either water or air, need be no greater than the line pressure. This valve is also used on low pressure service.

## Hydraulic Forway Valve



No. 110
Forway Valve

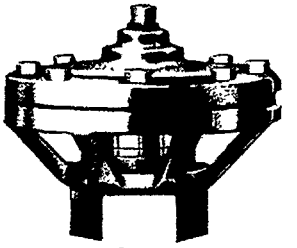
The No. 110 Forway Valve is designed to control operation of fluid motors, hydraulic cylinders, pistons, and similar power devices. It operates efficiently on either air or water at pressures up to 300 pounds per square inch, and is made in the ¾-inch pipe size only.

The Forway is actually four Hy-Trol Valves combined in one brass housing. The valve seats are brass; the diaphragm and discs are synthetic rubber.

Cla-Val pilot controls, such as the Manual, Solenoid, Float or Float Chamber, and Pressure Differential, are used to actuate the valve. The valve and pilot control provide an easy, dependable means of greatly increasing the operations that can be efficiently handled by remote hydraulic control.

The Forway Valve is installed on or near the power device, and the pilot control at a convenient remote location. The controlling fluid, transmitted by means of copper tubing, may be the same line pressure as handled by the Forway or an independent source of air or water under pressure.

## Vacuum Relief Valve



No. 31
Vacuum Relief Valve

The No. 31 Vacuum Relief Valve is of the pressure type design for operation on the supply side of a control valve. The stem of the valve has a tubular opening through which pressure flows to the cover chamber, forcing the diaphragm and disc assembly to the closed position.

The valve remains closed under normal pressure. It will open as soon as the pressure drops below zero, and as the water flows out of the valve cover into the line, atmospheric pressure forces the valve open to admit air.

The inlet ports are designed to admit the full capacity of the valve seat area without restriction.

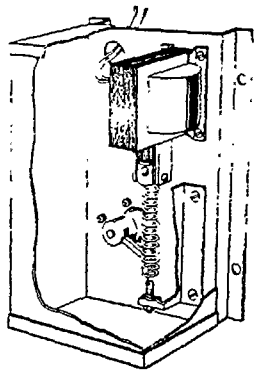
The No. 31 Valve is available in the 1-inch size of all brass construction. In the 2-inch size, the valve is of cast iron construction and is equipped with brass working parts.

The disc and diaphragm are made of a special nonmetallic material which will not stick or vulcanize to the seat.

*Prices on application*

# Clayton Valves

## Remote Controls

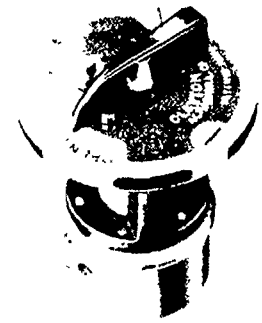


Type CS Solenoid

***Type CS Solenoid Controls*** are used extensively for automatic operation of valves in pump lines, sprinkler systems, and automatic fire protection equipment. The electric actuator may be a float or pressure switch, time clock, or thermostat. The control is available in 110, 220, or 440 volt A.C., 50 or 60 cycles, and in a variety of D.C. voltages.

The Solenoid, ruggedly constructed for service, is housed in a steel case. Installation may be directly on the valve or at any convenient remote location.

***Type CM Controls,*** known as Clayton Feather-Touch Controls permit remote control of flow on Clayton Hy-Trol or Power-Trol Valves. The controls, small multiport pilot valves, equipped with various types of actuators, are designed to transmit the flow of non-corrosive liquids or gases for hydraulic or pneumatic operation of valves.



Type CM Manual Controls

Type CM Controls are actuated manually, electrically, hydraulically, or by means of a float. These controls are available with as many as twelve outlets.

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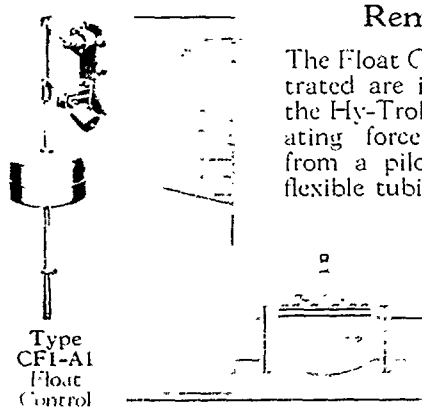
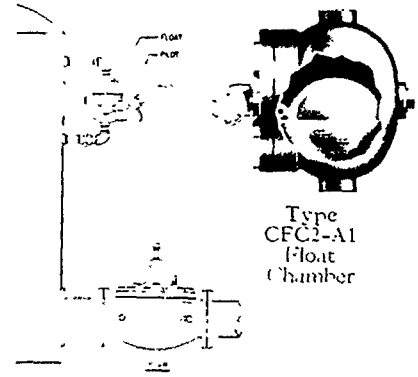
## Remote Controls for Float Valves



Type CF1-A1 Float Control

The Float Control and Float Chamber illustrated are ideal for the remote control of the Hy-Trol or Power-Trol Valve. An actuating force is hydraulically transmitted from a pilot control by means of either flexible tubing or small pipe. Line pressure is generally used for operation; however, an independent source of pressure may be used.

The controls are furnished with tubing for installing valves at a 12-foot distance.

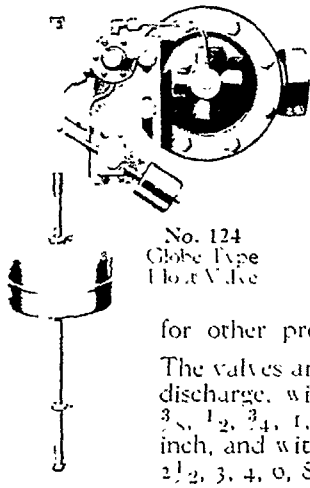


Type CFC2-A1 Float Chamber

***Type CF1-A1 Float Control*** regulates the Hy-Trol Valve for open tank service. The control is mounted in the tanks; the valve is installed in the line either above or below the control. Any level differential up to 24 inches can be maintained by adjusting the upper and lower stop collars on the float rod.

***Type CFC2-A1 Float Chamber*** is designed for use with the Hy-Trol Valve, where an external installation is desired. The vertical distance is limited by flowing pressure at the valve inlet, which is popular on feed water heaters, closed surge tanks, etc. The control is tapped for 1-inch pipe connections.

## Automatic Valves



No. 124 Globe Type Float Valve

***No. 124 Float Valves,*** completely hydraulic in operation, automatically maintain maximum and minimum levels at any desired point. They are used for water service at moderate temperatures for pressures from 10 to 150 pounds; valves for other pressures made to order.

The valves are available for horizontal discharge, with screwed ends in sizes $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, and 3-inch, and with flanged ends in sizes 2, $2\frac{1}{2}$, 3, 4, 6, 8, 10, 12, 14, and 16-inch.

***No. 95 Pressure Reducing Valves*** handle relatively small volumes of water, oil, and some gases within extremely close limits such as on drinking fountains, water coolers, humidifiers, and gas refrigerators. One inlet and two discharge outlets for straight or angle installation permit their use where gauge attachments are required.

No. 95 Pressure Reducing Valve

The valve is spring-loaded, direct acting, with a good working area. The bronze body has a stainless steel seat. The large diaphragm and disc are synthetic rubber. Initial pressures to 200 pounds and delivery pressures from 30 to 110 pounds are available; when not specified, the set delivery pressure is 60 pounds. Sizes $\frac{1}{4}$ and $\frac{3}{8}$-inch are available.

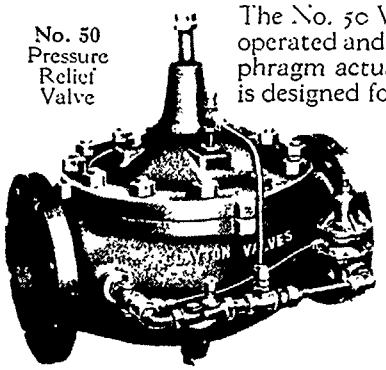
***Prices on application***

# Clayton Valves

## Automatic

These valves are of a modified globe design, employing a diaphragm as the operating means. They are designed to handle water, oil, and some gases. Installation may be in a horizontal, vertical or inverted position, with either direct or remote control. They can be either hydraulically or pneumatically operated.

### Pressure Relief Valves



No. 50 Pressure Relief Valve

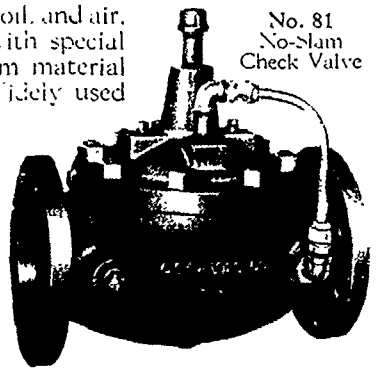
The No. 50 Valve, hydraulically operated and controlled by a diaphragm actuated pressure pilot, is designed for automatic service for relief or back-pressure duty, and will open at the pressure for which the control is set. It opens and closes without shock.

The valve may be installed so that the discharge is to atmosphere, a zone of lower pressure, a tank; or in the case of a pump installation, it may discharge into the pump suction.

This valve is set to open at 60 pounds pressure unless otherwise ordered; it can be furnished in a range of operating pressures from 5 to 300 pounds.

Available sizes are: screwed ends in sizes 1¼, 1½, 2, 2½, and 3-inch; flanged ends in sizes 2, 2½, 3, 4, 6, 8, 10, 12, 14, and 16-inch.

### No-Slam Check Valves

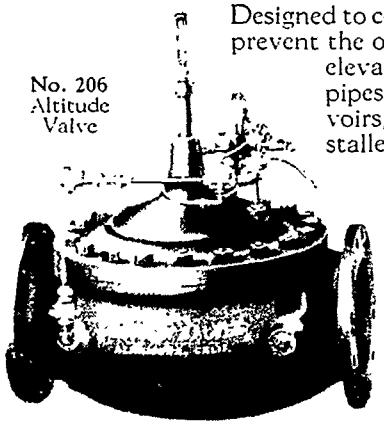


No. 81 No-Slam Check Valve

Designed for water, oil, and air. Can be equipped with special discs and diaphragm material for other fluids. Widely used for installations with turbine or centrifugal pumps where shock must be minimized. It opens and closes at a controlled rate of speed; if desired, use a speed control or needle valve to vary the speed.

The valve uses the full line pressure to open and close. Positive pipe line protection against water hammer is assured—there are no hinged parts to stick or break; no fast moving parts to "flutter" and cause line pulsations; no outside stuffing box or packing gland to cause leakage. Install horizontally or vertically. Screwed ends available in sizes ⅜, ½, ¾, 1, 1¼, 1½, 2, 2½, and 3-inch; flanged ends, in sizes 2, 2½, 3, 4, 6, 8, 10, 12, 14, and 16-inch.

### Altitude Valves

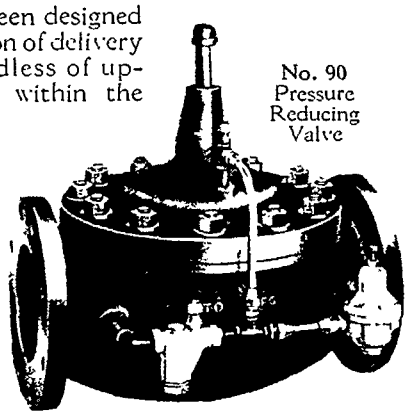


No. 206 Altitude Valve

Designed to control the level and prevent the overflow of water in elevated tanks, standpipes, or storage reservoirs, this valve is installed in the tank filling line; it automatically closes when the water reaches a predetermined level. Depending upon the type of valve, water may be withdrawn from the storage tank through a check valve, in a by-pass line around the Altitude Valve, through a separate discharge line, or, may flow back into the system through the Altitude Valve.

A hydraulic balance type of control, virtually frictionless, assures efficient control in elevated tanks or ground storage reservoirs. The valve functions dependably on low or high pressures. Available sizes are the same as those listed for the No. 50 above.

### Pressure Reducing Valves



No. 90 Pressure Reducing Valve

This valve has been designed for close regulation of delivery pressure regardless of upstream pressure within the operation limits of the valve.

The valve is particularly suited for use in water distribution systems, or in a "closed" system, since it will close tight on dead-end service without any build-up in discharge.

Pilot Control springs provide a wide range of delivery pressure. Unless otherwise specified, valves are factory set at 60 pounds with a delivery pressure range of 30 to 110 pounds.

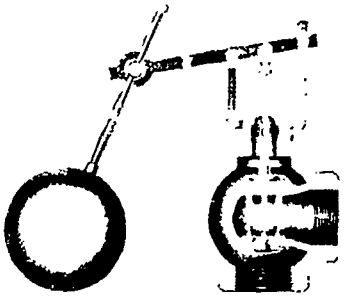
Available sizes are: screwed ends in sizes 2½ and 3-inch; flanged ends in sizes 2½, 3, 4, 6, 8, 10, 12, 14, and 16-inch.

*Prices on application*

29

# Klipfel Tank Float Valves and Lever Valves

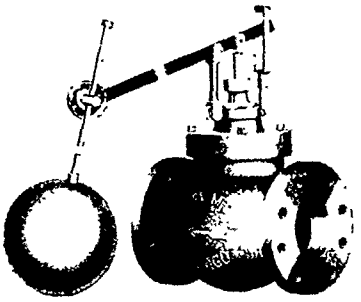
## Balanced Type



Cross Section

**Tank Float Valve**
No. 27, Angle

**Lever Valve**
No. 62, Angle
*(Same as No. 27, less float parts)*



**Tank Float Valve**
No. 27, Globe

**Lever Valve**
No. 62, Globe
*(Same as No. 27, less float parts)*

**Service recommendations:** Balanced type valves are recommended to control the flow of hot or cold water to open tanks where a perfectly tight seating valve is not required.

Single seated valves are designed to maintain the water level in open tanks where a tight closing valve is needed to prevent waste and overflow.

For automatic control, use the Tank Float Valves; for manual control, use the Lever Valves.

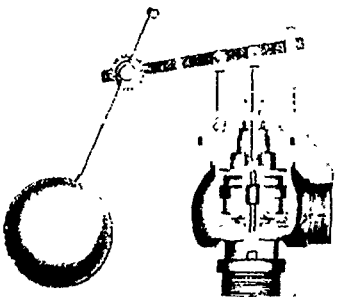
**Materials and construction:** The valves are furnished with integral seats and bronze bodies on sizes 1½-inch and smaller; larger sizes have screwed-in renewable seat and semi-steel bodies. Except for the rubber composition discs, all internal parts are brass.

Balanced type valves have two beveled discs which close on correspondingly beveled seats to provide a practically balanced construction.

Single seated valves have an internal piston, a disc holder, and a pilot valve. The lower end of the piston forms a holder in which the composition disc is retained by a disc nut. The pilot valve, actuated by the valve stem, controls the water pressure above the piston. As the stem is loosely attached to the piston, movements of the float also serve to operate the main valve.

No. 77 and No. 773 Valves are equipped with a leather cup piston seal.

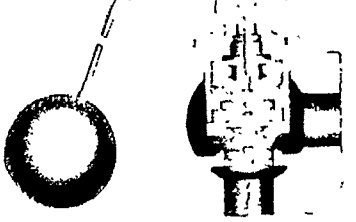
## Single Seated Type



Cross Section

**Tank Float Valves**
No. 7, Globe or Angle
(Angle illustrated)

**Lever Valves**
No. 73, Globe or Angle
*(Same as No. [illegible] less float parts)*



Cross Section

**Tank Float Valves**
No. 77, Globe or Angle
(Angle illustrated)

**Lever Valves**
No. 773, Globe or Angle
*(Same as No. 77, less float parts)*

29

**Installation:** All valve bodies are marked to indicate the correct direction of flow.

**When ordering:** Specify the catalog number, pipe size, angle or globe pattern, screwed ends, 125-pound or 250-pound flanges, inlet pressure, outlet pressure unless zero, capacity required, kind of liquid, and approximate temperature unless below 125° F.

**Other types of float valves:** Other valves and mechanisms such as the following are available for unusual services or irregular installations. Prices and detailed information furnished on application.

No. 177—Equipped with a separate pilot valve for remote operation. Sizes 2 to 8-inch.

No. 20—Float mechanism only. Consists of the float, shaft, packing box, and lever.

### Type and Sizes Available

| Catalog Numbers: Tank Float Valves | Catalog Numbers: Lever Valves | Valve Ends | Sizes Available, in Inches | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 27 Globe or Angle | No. 62 Globe or Angle | Screwed | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | | | | | |
| | | 125-Pound Flanged, F. & D. | | | | | | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
| | | 250-Pound Flanged, F. & D. | | | | | | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
| No. 7 Globe or Angle | No. 73 Globe or Angle | Screwed | | ¾ | 1 | 1¼ | 1½ | 2 | | | | | | | | |
| | | 125-Pound Flanged, F. & D. | | | | | | 2 | | | | | | | | |
| | | 250-Pound Flanged, F. & D. | | | | | | 2 | | | | | | | | |
| No. 77 Globe or Angle | No. 773 Globe or Angle | Screwed | | | | | | 2 | 2½ | 3 | | | | | | |
| | | 125-Pound Flanged, F. & D. | | | | | | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | | |
| | | 250-Pound Flanged, F. & D. | | | | | | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | | |

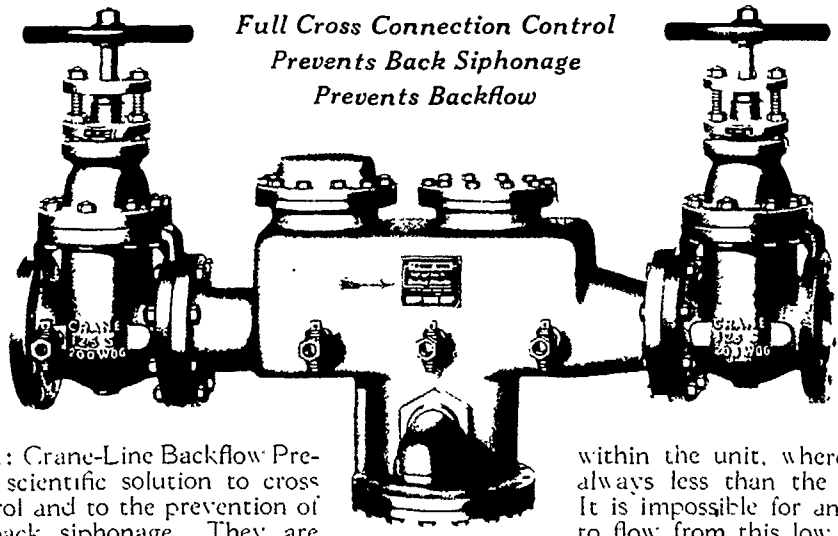
*Prices on application*

# Crane-Line Reduced Pressure Backflow Preventers

*Full Cross Connection Control*
*Prevents Back Siphonage*
*Prevents Backflow*

*Used wherever water creates health hazards.*

*Complete unit includes Crane valves, cocks, and fittings.*



*Prevents and controls water pollution.*

*Prices, dimensions, and additional data on request.*

29

**Full protection:** Crane-Line Backflow Preventers are the scientific solution to cross connection control and to the prevention of backflow and back siphonage. They are widely used for the control and prevention of water pollution in various types of cross connections and inter-connections in piping systems common to manufacturing, processing, and food plants, public buildings, hospitals, laboratories, cooling towers, oil wells, and similar installations.

In certain systems, the units will economically replace costly booster pumps and tanks.

**Automatic operation:** Crane-Line Backflow Preventers operate automatically by means of the line pressure; no manual attention is required. Under ordinary usage, they will give years of trouble-free service with minimum maintenance.

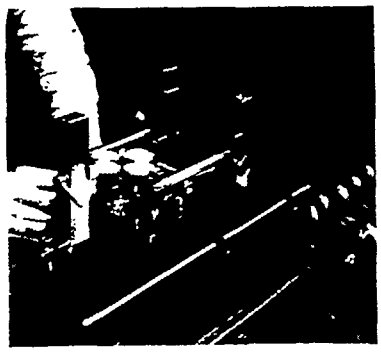
Size for size, the units are the same in operating principle and differ only in external appearance. They combine double check protection and an air gap break to atmosphere with the "reduced pressure" principle. This design provides a zone, within the unit, where the pressure is always less than the supply pressure. It is impossible for any polluted water to flow from this low pressure zone to a zone of higher pressure. In the event of failure to any part vital to the prevention of backflow, the relief valve automatically emits a continuous discharge.

**High grade materials:** A typical unit, as illustrated above, includes i[illegible] quality Crane valves, fittings, and cocks as part of the standard assembly. The backflow device as well as the accessories are of rugged, durable construction. All parts are made of high grade materials to withstand long, rigorous service.

**Easy repairs:** Any moving part can be easily removed and replaced without taking the backflow preventer unit out of the line.

**Sizes available:** Crane-Line Backflow Preventers are available for 1, 1½, 2, 2½, 3, 4, 6, 8, 10, and 12-inch pipe lines. Prices, dimensions, and additional information will be furnished on request.

***If It's a Crane Product—It's a Tested Product!***



Checking disc taper. P[illegible]rts, like finished products, are thor[illegible]y checked

Stress distribution is revealed photoelastically.

Metal structure is examined through a metallographic microscope

Safety &
Relief Valves

# Safety and Relief Valves

**Pop Safety Valves**
Brass, for Saturated Steam ... page 320
Brass, for Air and Gas ... page 321
Brass, for Heating Boilers, Low Pressure ... page 323
Iron, for Heating Boilers, Low Pressure ... page 322
Iron, for Air and Gas ... page 323
Iron, for Steam—Crosby ... page 324
Steel, for Steam—Crosby ... page 324

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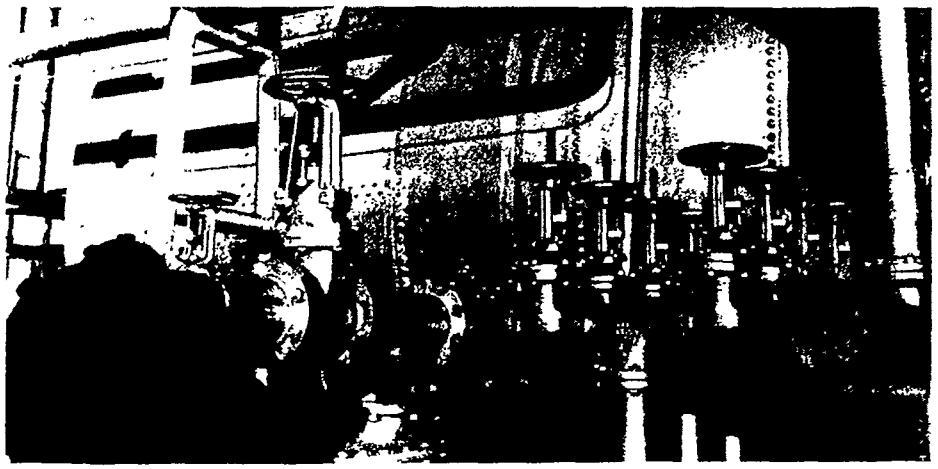
**Relief Valves**
Brass, Small Sizes, for Steam, Water, and Air ... page 326
Brass, for Vacuum Service ... page 327
Brass, for Water Heaters ... page 327
Brass, for Steam, Water, and Oil ... page 328
Brass, for Air and Gas ... page 329
Brass, for Gasoline or Noxious Gases ... page 329
Brass, for Hydraulic Services, High Pressure ... page 330
All-Iron, for Ammonia, Air, and Gas ... page 331
Iron, Inside Spring, for Water and Oil ... page 331
Iron, Outside Spring, for Steam, Water, Oil, and Gas ... page 332
Iron—Crosby ... page 334
Steel, Outside Spring, for Steam, Water, Oil, and Gas ... page 333
Steel—Crosby ... page 334

**Cast Iron Drip Pan Elbows** ... page 325

Crane Safety and Relief Valves are shown on the pages referred to above. For other Crane special duty valves and for specialities, see pages 299 to 318 and pages 335 to 374.

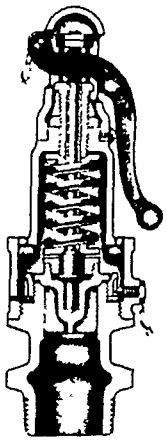
***For Corrosion-Resistant Alloy Relief Valves, see page 382.***



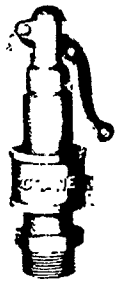
A natural gas installation . Crane-equipped

# Brass Pop Safety Valves

## For Saturated Steam



Cross Section
No. 2500



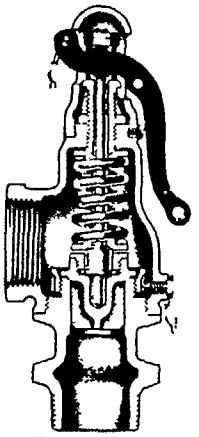
No. 2500
Top Outlet
With Wire Seal

***Set at any specified pressure***
from 3 to 250 pounds

***Orders must specify the set pressure as well as the catalog number.***

SERVICE RECOMMENDATIONS
Crane Brass Pop Safety Valves are recommended for saturated steam for use on boilers, miniature boilers, and on unfired pressure vessels, such as receivers, pipe lines, etc.

No. 2501
Side Outlet
With Wire Seal



Cross Section
No. 2501

### List Prices, Each

| Size Inches | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
|---|---|---|---|---|---|---|---|---|
| No. 2500, Top Outlet | 15.50 | 15.50 | 17.00 | 20.00 | 23.00 | 29.00 | 40.00 | 57.50 |
| No. 2501, Side Outlet | 16.00 | 16.00 | 17.50 | 21.00 | 24.00 | 30.50 | 42.50 | 63.00 |

30

**Boiler Code requirements:** Valves 1/2-inch and larger comply with the 1940 A.S.M.E. Construction Codes for Power Boilers up to 250 pounds, for Miniature Boilers up to 100 pounds, and for Unfired Pressure Vessels, from 15 to 250 pounds.

**Pressure setting:** The screwed regulating sleeve adjustment for the main spring permits the set pressure of these valves to be increased or decreased 10 per cent; however, this maximum variation in the set pressure must be strictly observed as one spring cannot cover the complete range of pressures at which the valve may be set.

A wire seal prevents tampering with adjustments after the valves have been set at the factory.

**Design:** The valves are of the single disc type. All sizes except the 3/8-inch have blow-back regulating rings which permit readjustment of the blow-back when the set pressure is changed.

**Materials:** The valves have a brass body, base, and disc and a malleable iron lifting lever. The spring, spring washer, and stem are made of steel.

**Installation:** The valves should be installed in an upright position directly on the apparatus to be protected. Horizontal or angular installation may result in damage to the seating surfaces.

Piping should be carefully planned. Outlet piping should be as short as possible, with a minimum number of turns, and never smaller in size than the outlet of the valve. Inlet piping, if any is necessary, should be full size and not longer than an extra heavy fitting of equal nominal pipe size.

**Lifting lever:** The lifting lever is reversible and can be arranged for pull-up operation (illustrated) or reversed for push-or-pull-down operation. When installing, ample clearance should be allowed. Complete rotation of the lever is possible without disturbing the setting of the valve.

**Maintenance:** It is recommended that these valves be manually operated at regular intervals to assure proper action. This operation should be performed only when there is sufficient pressure available within the boiler, pressure vessel, or line to blow any accumulated foreign matter clear of the seating surfaces, particularly when starting up a new boiler.

### Capacities in Pounds of Steam per Hour

90° Actual Discharge Capacity at 3% Above Set Pressure

| Set Pressure | Valve Size, Inches 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
|---|---|---|---|---|---|---|---|
| 10 | 45 | 96 | 171 | 180 | 238 | 387 | 415 |
| 20 | 72 | 148 | 256 | 279 | 378 | 549 | 675 |
| 25 | 82 | 169 | 290 | 317 | 441 | 630 | 785 |
| 30 | 92 | 189 | 324 | 351 | 495 | 711 | 900 |
| 40 | 113 | 225 | 387 | 423 | 594 | 874 | 1105 |
| 50 | 135 | 256 | 414 | 460 | 646 | 957 | 1191 |
| 60 | 148 | 288 | 465 | 532 | 748 | 1100 | 1329 |
| 70 | 162 | 332 | 527 | 604 | 849 | 1246 | 1508 |
| 75 | 169 | 360 | 558 | 640 | 899 | 1246 | 1597 |
| 80 | 176 | 369 | 589 | 675 | 950 | 1301 | 1687 |
| 90 | 192 | 369 | 651 | 747 | 1050 | 1411 | 1866 |
| 100 | 210 | 377 | 683 | 810 | 1170 | 1466 | 2095 |
| 125 | 241 | 495 | 738 | 855 | 1440 | 1718 | 2487 |
| 150 | 278 | 559 | 814 | 1080 | 1440 | 1922 | 2880 |
| 175 | 308 | 603 | 945 | 1080 | 1561 | 2032 | 3240 |
| 200 | 342 | 621 | 1020 | 1260 | 1716 | 2301 | 3600 |
| 225 | 367 | 702 | 1095 | 1440 | 1871 | 2569 | 3960 |
| 250 | 392 | 810 | 1170 | 1620 | 2025 | 2838 | 4320 |

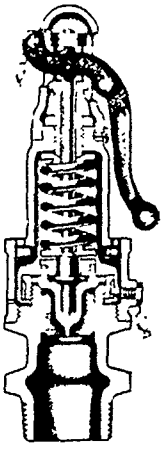
***Capacities for other set pressures are furnished on application.***

### Dimensions, in Inches

| Size (Size of inlet) | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
|---|---|---|---|---|---|---|---|---|
| Size of outlet (No. 2501 Valve) | 1/2 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
| Over-all height to top of cap | 6 | 6 | 6 1/2 | 7 7/8 | 7 7/8 | 9 1/8 | 10 5/8 | 12 3/4 |
| Center to top of cap | 3 3/4 | 3 3/4 | 3 3/4 | 4 5/8 | 4 3/8 | 5 1/4 | 6 1/8 | 7 3/4 |
| Center to end of male inlet | 2 1/4 | 2 1/4 | 2 3/4 | 3 1/4 | 3 1/2 | 3 7/8 | 4 1/2 | 5 |
| Center to end of side outlet | 1 1/8 | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/4 | 2 1/8 | 2 7/16 | 2 7/8 |

# Brass Safety Valves

## For Air and Gas



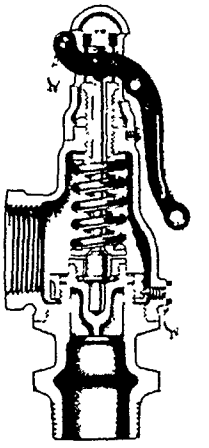
Cross Section
No. 2550

No. 2550
Top Outlet
With Wire Seal

***Set at any specified pressure***
from 3 to 250 pounds, 450° F. max.

SERVICE RECOMMENDATIONS
These valves are recommended for receivers, tanks, pipe lines, and similar vessels, on temperatures not exceeding 450° F. For air, either top or side outlet valves are suitable, but for gases, the side outlet type is generally used, the discharge being piped away.

No. 2551
Side Outlet
With Wire Seal



Cross Section
No. 2551

***Orders must specify the set pressure as well as the catalog number.***

30

### List Prices, Each

| Size Inches | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
|---|---|---|---|---|---|---|---|---|
| No. 2550, Top Outlet, with Wire Seal | 18.50 | 18.50 | 20.00 | 24.00 | 27.00 | 34.00 | 47.50 | 68.00 |
| No. 2551, Side Outlet, with Wire Seal | 19.00 | 19.00 | 20.50 | 25.00 | 28.50 | 36.00 | 50.50 | 75.00 |

**Pressure setting:** These valves can be set at any pressure between 3 and 250 pounds. Safety valves for air and gas service always should be set 25 per cent higher than the normal operating pressure.

The main spring regulating adjustment p[illegible]ts increasing or decreasing the set pressure 10 [illegible] cent. This must be strictly observed as one spring cannot cover the complete range of pressures at which the valve may be set. A wire seal, inserted in the pin of the lifting lever at the factory, prevents tampering with the adjustment of the set pressure.

**Design:** Of the single disc type, the valves except in the 3/8-inch size have blow-back regulating rings to permit readjustment of the blow-back when the set pressure is changed. Seating surfaces are carefully prepared by grinding to assure audible tightness at all pressures up to 80 per cent of the set pressure.

**Materials:** The body, base, and disc are brass. The lifting lever is malleable iron. The spring, spring washer, and stem are steel.

**Lifting lever:** The reversible type lifting lever is illustrated above in the pull-up position; it can be reversed for push-or-pull-down operation. Complete rotation of the lever is possible without disturbing the set pressure of the valve.

**Installation:** Safety valves should be installed with the stem in a vertical position and preferably inverted to allow moisture to collect and seal the seating surfaces. Best results are obtained by mounting the valve directly on the apparatus to be protected without any intervening pipe or fittings between the vessel and the safety valve.

**Code requirements:** These valves comply with the requirements of the 1946 A.S.M.E. Code for Unfired Pressure Vessels for pressures above 15 pounds.

**Capacities:** Capacities are furnished on application. Inquiries should advise size, catalog number, air or gas pressure, and set pressure desired.

**Maintenance:** It is recommended that these valves be manually operated at regular intervals to assure proper action. This operation should be performed only when there is sufficient pressure available within the vessel or line to blow any accumulation of foreign matter clear of the seating surfaces, particularly when starting up a new installation.

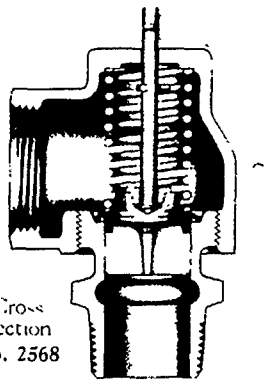
**Noxious gases:** For noxious or inflammable gases, side outlet valves having a pressure tight outlet side are recommended. They are made to order; prices on application. Brass relief valves with side outlet are made regularly for such services; see page 320.

### Dimensions, in Inches

| Size Size of inlet | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
|---|---|---|---|---|---|---|---|---|
| Size of outlet No. 2551 Valve | 1/2 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 |
| Over-all height to top of cap | 6 | 6 | 6 1/2 | 7 7/8 | 7 7/8 | 9 1/8 | 10 5/8 | 12 3/4 |
| Center to top of cap | 3 3/4 | 3 3/4 | 3 3/4 | 4 5/8 | 4 3/8 | 5 1/4 | 6 1/8 | 7 3/4 |
| Center to end of male inlet | 2 1/4 | 2 1/4 | 2 3/4 | 3 1/4 | 3 1/2 | 3 7/8 | 4 1/2 | 5 |
| Center to end of side outlet | 1 1/8 | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/4 | 2 1/8 | 2 7/16 | 2 7/8 |

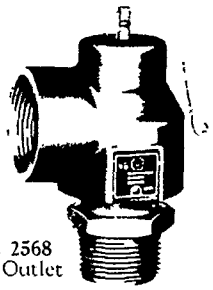
# Low Pressure Iron Body Pop Safety Valves

## For Steam Heating Boilers



Cross Section No. 2568

No. 2567 Top Discharge



No. 2568 Side Outlet

***Set Pressures—Non-Adjustable***
5, 10, or 15 pounds, as specified

On special order, valves can be furnished for any other set pressure between 5 and 15 pounds, at an increased price.

*Important:* The valves are non-adjustable. They are set at the factory and sealed by means of a sealing pin. The popping pressure cannot be altered nor can valves be taken apart without breaking the seal, thereby showing evidence of tampering. An attached identification plate indicates the setting.

***A New, Advanced Line***—High capacity, tested design, and sturdy construction make these the ideal valves for use on low pressure steam heating boilers, or on receivers, tanks, piping, and other apparatus carrying steam pressures not exceeding 15 pounds.

**Efficiency through high capacity:** Because safety valves used on steam heating boilers should have a relieving capacity sufficient to discharge all of the steam generated, their selection is based on capacity rather than size.

Crane's high capacity valves permit the use of smaller sizes, and frequently, fewer valves. The result is a saving in size and number of boiler openings, in discharge piping, and in over-all cost.

**Features:** These are flat seat valves. The seat, and a recess which forms a huddling chamber, are machined in the top surface of the base. The disc has wing guides to assure accurate guidance in the seat opening; a lip on the outer edge of the disc forms the top of the huddling chamber. This construction provides the desired "popping" action.

A long, flexible spring contributes to the high disc-lift so necessary to high relieving capacity. The spring, compressed within the body, bears down on the top of the disc. The body is screwed on the top of the base and locked in place by the sealing pin.

**Materials and finish:** To resist corrosion, the base and all internal parts except the spring are brass. Valves 1¼-inch and smaller have a stainless steel spring and a brass lever; on larger valves, the spring is carbon steel, cadmium-plated and the lever is malleable iron. All valves have a cast iron body.

The body and malleable iron lever have an attractive black enamel finish.

**Blow-back:** The blow-back pressure, fixed and non-adjustable, is about 2 pounds for settings from 5 to 10 and 3 pounds for settings from 10 to 15. Thus, a valve set at 10, "pops" open when the inlet pressure mounts to 10 pounds, and closes when the pressure drops to about 8 pounds.

**Proper installation:** Always install valves with the stem vertical and the lifting lever at the top. When side outlet valves are used, the discharge piping should be independent of the valve. It should be supported close to the valve and sloped slightly downward so as to drain away condensate. Full instructions accompany each valve.

**Maintenance:** To assure proper action, manually operate the valves at regular intervals. Do this only when sufficient pressure is available within the boiler or pressure vessel to blow any accumulated foreign matter clear of the seating surfaces. This applies particularly when a new boiler is started up.

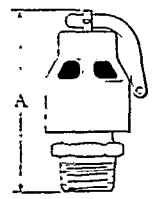
**Code conformance:** At settings from 5 to 15 pounds, these valves comply with requirements of the 1949 A.S.M.E. Code for Low Pressure Heating Boilers.

### List Prices, Capacities, and Dimensions

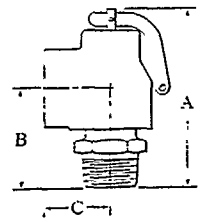
| Valve No. | Size of Male Inlet Inches | List Prices Each | *Capacity Lbs. of Steam Per Hr. | Dimensions, in Inches A | B | C | Size of Outlet No. 2568 |
|---|---|---|---|---|---|---|---|
| No. 2567 | 1 | 8.50 | 510 | 4¾ | | | |
| | 1¼ | 10.00 | 735 | 5⅜ | | | |
| | 1½ | 12.00 | 1025 | 6⅛ | | | |
| | 2 | 16.00 | 1930 | 7¼ | | | |
| No. 2568 | ¾ | 7.50 | 360 | 4¼ | 2½ | 1½ | 1 |
| | 1 | 8.50 | 580 | 4¾ | 2¾ | 1¾ | 1¼ |
| | 1¼ | 10.00 | 870 | 5⅜ | 3⅛ | 2 | 1½ |
| | 1½ | 12.00 | 1125 | 6⅛ | 3½ | 2¼ | 2 |
| | 2 | 16.00 | 2140 | 7¼ | 4⅛ | 3 | 2½ |
| | 2½ | 27.00 | 3485 | 9 | 5⅛ | 3 9/16 | 3 |
| | 3 | 35.50 | 4865 | 10½ | 6¼ | 4 1/16 | 3½ |

*Capacities apply to any setting from 5 to 15 pounds

***Specify catalog number, inlet size, and set pressure desired.***



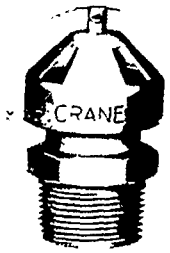

No. 2567




No. 2568

# Low Pressure Brass Pop Safety Valves

## For Steam Heating Boilers

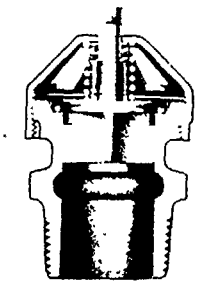



No. 2565
Open Discharge

***Set Pressure — Non-Adjustable***
Regularly set at 15 pounds pressure.

**List Prices, Dimensions, and Capacities**

| Size (Size of Inlet) | Inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|
| No. 2565 | Each | 3.30 | 3.70 | 4.50 | 6.00 | 8.20 |
| Overall height, open | Inches | 3 3/8 | 3 5/8 | 4 | 4 3/8 | 5 1/4 |
| Capacity in pounds steam per hour | | 212 | 374 | 571 | 656 | 954 |



Cross Section

No. 2565 Brass Pop Safety Valves are especially recommended for use on low pressure steam heating boilers. They are also used on tanks, receivers, pipe lines, etc., where safety valves set at 15 pounds are required.

**Features:** These valves, although relatively inexpensive, are particularly compact and sturdy. Made of all brass except for a steel spring, they will give excellent service if properly installed and maintained.

**Pressure setting:** The valves are non-adjustable. After they have been adjusted for pressure in the factory, they are permanently locked by indenting the cap into a recess in the body threads. The indentation is made with a steel stamp bearing the word "SEAL"; the valves cannot be taken apart or readjusted.

**Maintenance:** The valves should be manually operated at regular intervals to assure proper action. The operation should be performed only when sufficient pressure is available within the boiler to blow any accumulated foreign matter clear of the seating surfaces. This applies particularly when a new boiler is started up.

**Code conformance:** They comply with the requirements of the A.S.M.E. Code for Low Pressure Heating Boilers, and bear the Code cloverleaf symbol.

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# Iron Body Pop Safety Valves

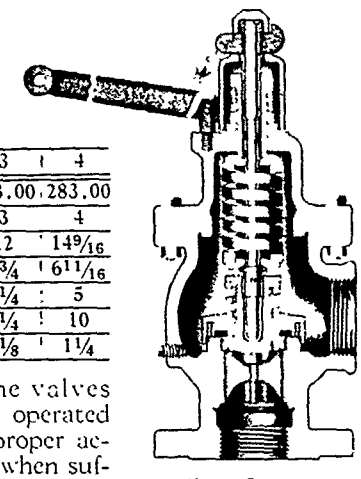
## For Air and Gas

No. 1102 Pop Safety Valves are especially designed for use on air and gas receivers, pipe lines, etc., where pressures do not exceed 150 pounds.

***Set at any specified pressure***
from 5 to 150 pounds

**List Prices and Dimensions**

| Size (Size of Inlet) | Inches | 2 1/2 | 3 | 4 |
|---|---|---|---|---|
| No. 1102 (Inlet flange F. & D.) | Each | 167.00 | 193.00 | 283.00 |
| Size of outlet | Inches | 2 1/2 | 3 | 4 |
| Center to top of cap | Inches | 11 | 12 | 14 9/16 |
| Center to face of inlet | Inches | 5 1/4 | 5 3/4 | 6 11/16 |
| Center to end of outlet | Inches | 3 7/8 | 4 1/4 | 5 |
| Diameter of flange | Inches | 7 1/2 | 8 1/4 | 10 |
| Thickness of flange | Inches | 1 | 1 1/8 | 1 1/4 |



Cross Section
No. 1102
Combination Screwed and Flanged Inlet
Screwed Side Outlet
Renewable Composition Disc

**Features of design:** The valves have a renewable type Crane medium-hard composition disc to assure tight seating. A patented Crane auxiliary disc, installed directly above and acting against the main disc holder, enables the valve to accommodate large capacities with a small blow-back. Two springs control the action of this valve—a large spring for the main valve and a smaller spring for the auxiliary valve.

**Pressure setting:** The valves are set at any pressure specified between 5 and 150 pounds. The set pressure should be 25 per cent above the normal working pressure in the system. Orders must specify the set pressure wanted.

After the pressure is set at the factory, a wire seal is installed through the stem key to prevent removal of the cap and tampering with the adjustment.

**Code conformance:** No. 1102 Valves comply with requirements of the A.S.M.E. Code for Unfired Pressure Vessels for pressures above 30 pounds.

**Maintenance:** The valves should be manually operated regularly to assure proper action, and then, only when sufficient pressure is available within the receiver or pipe line to blow any accumulated foreign matter clear of the seating surface. This applies particularly when starting up a new installation.

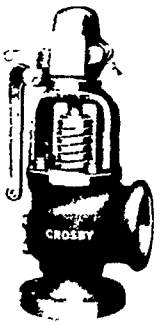
**Inlet flange; drilling:** The inlet flange conforms to the American Cast Iron Flange Standard, Class 250 (B16b-1944). The flange has a 1/16-inch raised face finished with concentric grooves, about 16 per inch, known as a "serrated" finish. Prices include drilling to the American Standard; no deduction is made for valves ordered "faced only".

*Templates for drilling....page 460*

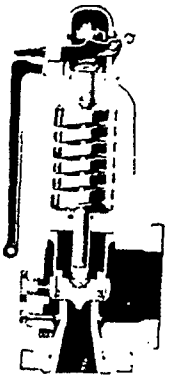
*Capacities on application*

# Crosby Nozzle Safety Valves

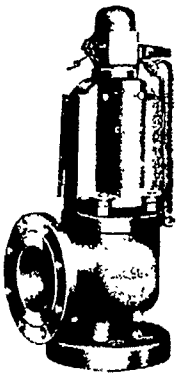
## High Capacity Valves for Steam Service



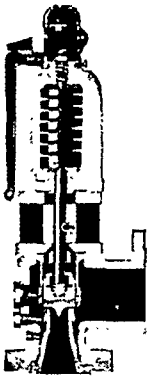

Style HR
Style HO



Industrial Service



*Marine Service
Styles HN and HS



Style HNA
Style HSA

*Depending on orifice size, Styles HN and HS can be furnished with spring cover and test clamp suitable for marine boiler service.

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These high capacity Safety Valves are recommended for steam only. They are ideally suited for the protection of boilers, superheaters, turbines, and pipe lines, and for general service in marine and industrial power plants and central stations.

Crosby Nozzle Safety Valves have been tested and approved by the National Board of Boiler and Pressure Vessel Inspectors.

All flanges are drilled and spot-faced according to American Standards.

The valves feature the Venturi Nozzle design, assuring smooth operation. The full throat nozzle on the steel valves provides maximum strength and freedom from distortion, with no possibility of leakage between the body and nozzle.

The disc on these valves is guided from above the seating surfaces, permitting free flow of the fluid. The nozzle and disc seating surfaces are flat and of the same width, providing absolute tightness and easy maintenance.

***Prices and additional information will be furnished on request.***

**Style HR** Valve body is made of cast iron and is available with inlet size range 2 to 4 inches, an outlet size range 2½ to 4 inches, and an inlet pressure limit of 250 pounds at 450° F. Furnished with a semi-exposed spring and regular lifting gear. A closed bonnet is furnished if specified. The semi-nozzle and disc are made either of bronze or forged stainless steel, as specified.

**Style HN** Valve body is made of cast carbon steel and is available with inlet size range 1½ to 4 inches, an outlet size range 2½ to 6 inches, and an inlet pressure of 600 pounds or 900 pounds at 650°-750° F. Furnished with a fully exposed spring test clamp, and regular lifting gear. The full-throat nozzle and disc insert are made of forged stainless steel. The disc holder is made of Nicoloy.

**Style HNA** Valve body is made of cast carbon steel or cast alloy steel depending upon temperature rating. This valve is available with inlet size range 1½ to 4 inches, an outlet size range 2 to 6 inches, and an inlet pressure limit of 600 to 2000 pounds at 650°-1000° F. Furnished with a fully exposed spring, test clamp, and regular lifting gear. The full-throat nozzle and disc insert are made of forged stainless steel. The disc holder is made of Nicoloy or Monel.

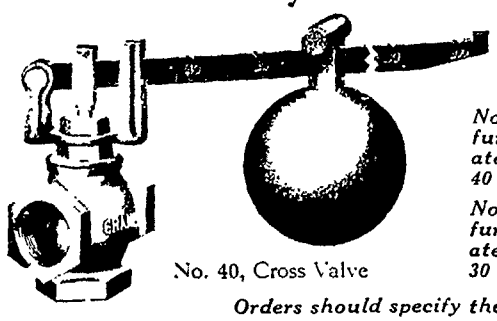
**Style HO** Valve body is made of cast iron and is available with inlet size range 1½ to 6 inches, an outlet size range 2 to 8 inches, and an inlet pressure limit of 250 pounds at 450° F. Furnished with a semi-exposed spring and regular lifting gear. A closed bonnet is furnished if specified. The semi-nozzle and disc are made either of bronze or forged stainless steel, as specified.

**Style HS** Valve body is made of cast carbon steel and is available with inlet size range 1 to 6 inches, an outlet size range 2 to 8 inches, and an inlet pressure limit of 300, 450, or 600 pounds at 650° F. Furnished with a fully exposed spring and regular lifting gear. The full-throat nozzle and disc insert are made of forged stainless steel. The disc holder is made of Nicoloy.

**Style HSA** Valve body is made of cast carbon steel or cast alloy steel depending upon temperature rating. This valve is available with inlet size range 1 to 6 inches, an outlet size range 2 to 8 inches, and an inlet pressure limit of 300, 450, or 600 pounds at 750°-900° F. Furnished with a fully exposed spring and regular lifting gear. The full-throat nozzle and disc insert are made of forged stainless steel. The disc holder is made of Nicoloy.

# Lever and Weight Safety Valves

## Brass Body



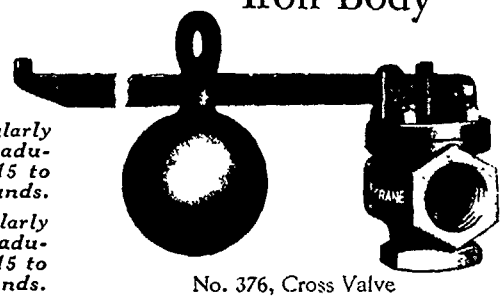
No. 40, Cross Valve

***Pressure Range***
15 to 100 pounds steam

***No. 40 Valves are regularly furnished with levers graduated for pressures from 15 to 40 or from 41 to 100 pounds.***

***No. 376 Valves are regularly furnished with levers graduated for pressures from 15 to 30 or from 31 to 100 pounds.***

## Iron Body



No. 376, Cross Valve

***Orders should specify the pressure range as well as the catalog number.***

### List Prices, Each, and Dimensions, in Inches

| Size | | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 40 Valve | With Lever and Weight | For 41 to 100 pounds | | 6.20 | 7.00 | 9.10 | 10.90 | 13.20 | | | | | | |
| | | For 15 to 40 pounds | | 7.70 | 8.40 | 9.00 | 10.80 | 12.60 | | | | | | |
| | Without Lever and Weight | | | 4.50 | 5.20 | 7.00 | 8.40 | 9.80 | | | | | | |
| No. 376 Valve | With Lever and Weight | For 31 to 100 pounds | | | | | | | 15.50 | 18.00 | 24.20 | 41.00 | 53.50 | 89.00 |
| | | For 15 to 30 pounds | | | | | | | 13.20 | 15.70 | 20.50 | 31.80 | 40.30 | 72.00 |
| | Without Lever and Weight | | | | | | | | 9.30 | 10.90 | 13.50 | 22.50 | 28.70 | 45.70 |
| Center to end of valve | | | | 13/16 | 15/16 | 1 1/8 | 1 3/8 | 1 5/8 | 2 | 2 3/8 | 3 1/4 | 3 1/2 | 4 | 5 |
| Center to end of lever | No. 40 | 41 to 100 pounds | | 8 1/16 | 9 13/16 | 10 3/16 | 10 11/16 | 16 7/16 | | | | | | |
| | | 15 to 40 pounds | | 5 3/4 | 9 9/16 | 8 5/8 | 10 15/16 | 11 3/4 | | | | | | |
| | No. 376 | | | | | | | | 18 | 22 1/4 | 21 3/16 | 27 5/8 | 35 1/2 | 42 5/8 |

For price of Levers and Weights, deduct price for "valve only" from price of "valve with lever and weight".

These valves are used for ordinary low pressure steam relief service where simple, inexpensive valves are wanted; they should not be used on air or gas.

Unlike spring-loaded pop safety and relief valves, they have large blowdown of pressure, low capacity, and no positive opening or closing point.

Pressure settings should be at least 20 per cent above the normal working pressure in the system to avoid continual leakage past the disc.

**Installation:** The valves have two inlet openings and one outlet. They can be installed on vertical lines with the side inlet plugged or on horizontal lines with the bottom inlet plugged. In either case, the stem must be vertical and the lever horizontal.

**Materials:** All parts of the No. 40 Valves are brass except the cast iron yoke and weight (japanned maroon) and the steel lever.

No. 376 Valves have a cast iron body and weight, a brass disc, and a steel lever. Sizes 1 1/4 and 1 1/2-inch have an integral seat; larger sizes have a brass seat ring. Sizes 2-inch and smaller have a brass screwed bonnet and a brass stem; larger sizes have a bolted type cast iron bonnet and a steel stem.

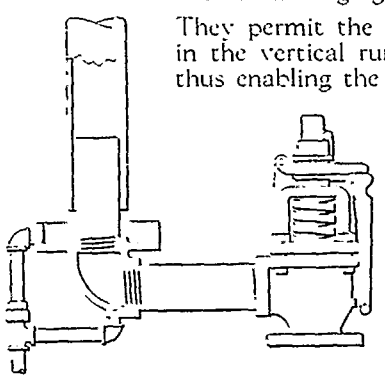


# Cast Iron Drip Pan Elbows

These elbows have been especially designed for use in the vent piping from the outlets of boiler safety valves discharging to atmosphere.

They permit the use of a slip joint in the vertical run of outlet piping, thus enabling the weight of the vertical piping to be supported independently. Unnecessary strains on the body of the valve are avoided and possible seat distortion is eliminated. They provide means for collecting and removing condensate and rain water from the outlet piping.

When more than one safety valve discharges into the same outlet piping, the leakage of vapor from the drip pan will indicate if any one of the valves requires attention.



Application of Drip Pan Elbow to Safety Valve Piping

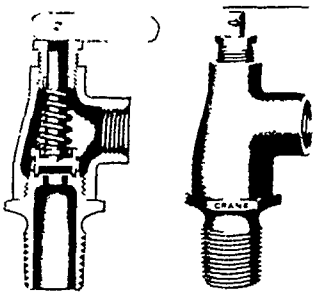
No. 1100 Drip Pan Elbow

### List Prices and Dimensions

| Size | Inches | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| No. 1100 | Each | 11.00 | 12.00 | 13.50 | 15.50 | 18.00 | 22.50 |
| Center to inlet end | Inches | 2 1/4 | 2 11/16 | 3 1/8 | 3 7/16 | 3 3/4 | 4 7/16 |
| Center to top of pan | Inches | 4 3/4 | 5 1/4 | 5 5/8 | 6 3/16 | 6 3/4 | 7 7/16 |
| Diameter of pan | Inches | 5 | 7 | 7 1/2 | 8 1/2 | 9 | 11 |
| Size of drain tappings | Inches | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| Length, outlet nipple | Inches | 9 | 9 | 9 | 9 | 9 | 9 |

# Brass Relief Valves

## For Hot Water



No. 1131

***Set at following pressures:***

Non-Adjustable Valves

*No. 1131—50, 75, 100, or 125 pounds

*No. 1133½—50, 75, 100, or 125 pounds

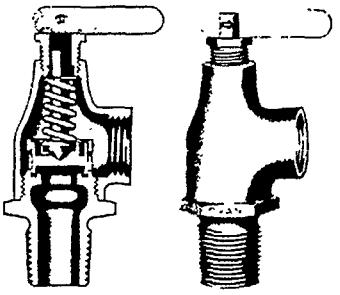
Adjustable Valves

No. A1131—25, 50, 75, or 125 pounds
Adjustable through ranges of 10 to 25, 26 to 50, 51 to 75, and 76 to 125 pounds.

No. 1133—25, 75, or 125 pounds
Adjustable through ranges of 10 to 25, 30 to 75, and 80 to 125 pounds.

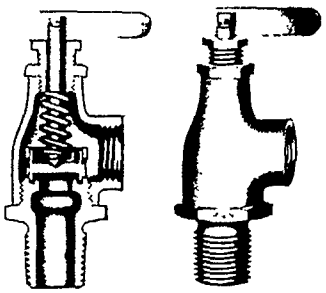
***All orders must specify the set pressure and catalog number.***

## For Cold Water



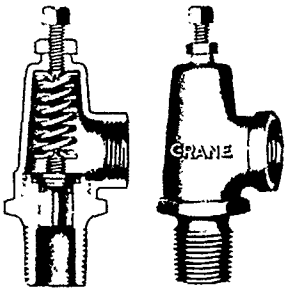
No. 1133½

## For Air



No. A 1131

## For Steam



No. 1133

### List Prices and Dimensions

| Size (Size of inlet) | | | Inches | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|---|
| List Prices | No. 1131, for Hot Water | | Each | | 8.50 | 10.30 | 12.00 |
| | No. A 1131, for Air | | Each | 10.60 | 10.60 | 13.00 | |
| | No. 1133, for Steam | | Each | | 8.50 | 10.30 | |
| | No. 1133½, for Cold Water | | Each | | 8.50 | 10.30 | |
| Dimensions, in Inches | No. 1131 | Size of outlet | | | ⅜ | ½ | ¾ |
| | | Over-all height, closed | | | 4 1/16 | 4¾ | 5⅛ |
| | | Center to inlet | | | 1⅞ | 2 5/16 | 2 11/16 |
| | | Center to outlet | | | ⅞ | 1 1/16 | 1¼ |
| | No. A 1131 | Size of outlet | | ⅜ | ½ | ¾ | |
| | | Over-all height, closed | | 4 1/16 | 4 9/16 | 4 15/16 | |
| | | Center to inlet | | 1¾ | 2 | 2⅜ | |
| | | Center to outlet | | ⅞ | 1 1/16 | 1¼ | |
| | No. 1133 | Size of outlet | | | ½ | ¾ | |
| | | Over-all height | | | 3⅞ | 5⅛ | |
| | | Center to inlet | | | 1⅞ | 2¼ | |
| | | Center to outlet | | | 1 | 1 3/16 | |
| | No. 1133½ | Size of outlet | | | ½ | ¾ | |
| | | Over-all height, closed | | | 4 7/16 | 4 13/16 | |
| | | Center to inlet | | | 2 | 2⅜ | |
| | | Center to outlet | | | 1 1/16 | 1¼ | |

*These valves, while non-adjustable, can be made to order set at any pressure between 10 and 125 pounds; prices on application.

**Recommendations:** No. 1131 Valves are especially designed for use on domestic hot water heaters, but will give excellent service on any hot water line. They should not be used on steam, air, or cold water service.

No. A 1131 Valves are used on air compressors in garages, service stations, etc. where economy is wanted. They should not be used on steam or water service.

No. 1133 Valves can be recommended for steam lines when metal disc valves without lifting levers are wanted. They should not be used on air or water.

No. 1133½ Valves are particularly designed for domestic water pumping systems, and will give excellent service on cold water lines. They should not be used on hot water, steam, or air service.

**Pressure setting:** Nos. 1131 and 1133½ are non-adjustable and cannot be re-set in the field

The Nos. A 1131 and 1133 are adjustable, and although regularly set at the factory, they can be re-set in the field through a definite range.

**Materials and design:** These valves are made of high grade materials throughout. Simple in design and inexpensive in initial cost, they will give excellent service under all ordinary conditions.

No. 1133 Valves have a brass disc; they do not have a lifting lever. The other valves are furnished with a composition disc especially selected for the specified recommended service and have a lifting lever so that the disc may be raised from the seat manually. The disc alone is not readily renewable; however, in the event replacement is necessary, disc holders complete with disc can be furnished

Except for the steel spring in Nos. A 1131 and 1133 and for composition discs, all parts are brass.

**Capacities:** Capacities are furnished on application. Inquiries should advise size, catalog number, type of service, and set pressure.

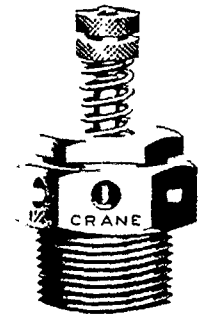
**Maintenance:** Manual operation of the valves at regular intervals will assure proper action. This operation should be performed only when there is sufficient pressure available to blow any accumulated foreign matter clear of the seating surfaces, particularly when starting up a new installation.

# Brass Vacuum Relief Valves

**Service recommendations:** This valve is designed for use as a vacuum breaker on light, low pressure tanks, steam jacketed kettles, and similar apparatus where there is a possibility of a vacuum forming which might cause injury to the apparatus because of the effect of atmospheric pressure upon it.

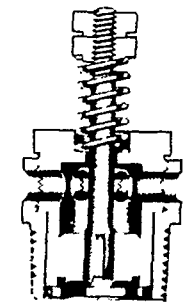
In service, the disc of the valve is normally held to its seat, both by spring tension and by the pressure in the apparatus to which the valve is attached. When the pressure in the vessel falls below atmosphere, the spring tension is overcome, and the disc is forced from its seat. Air is then admitted through the valve, thus preventing the vacuum from reaching a dangerous point.

**Pressure setting:** These valves are regularly furnished with springs for 10 inches of vacuum. They are set to open at 5 inches of vacuum but are adjustable for higher or lower vacuums. Valves are regularly tested for tightness at the seat with 50 pounds water pressure.




No. 1155 V Vacuum Relief Valve

The body, seat bushing, and disc are made of brass.



**List Prices**

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|
| No. 1155 V | Each | 20.50 | 20.50 | 22.00 | 28.00 | 37.00 |
| Height | Inches | 2⅞ | 3 | 3⅜ | 3½ | 4¼ |

**Construction:** The No. 1155 V Valve is made with a two-piece body and seat bushing which removes the seat from the influence of body distortion when the valve is being installed.

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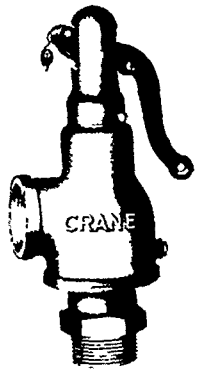
# Brass Relief Valves for Water Heaters

***Can be set at any specified pressure within the following range:***
5 to 250 pounds pressure. Maximum temperature 400° F.

***Orders must specify the set pressure and the catalog number.***



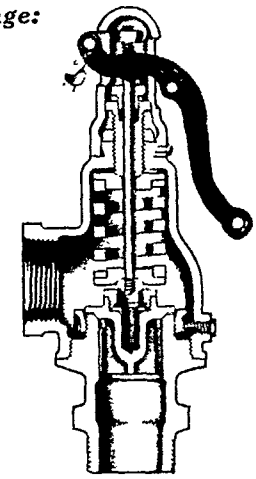

No. 2606
Male Inlet
Side Outlet

**Service recommendations:** This high grade and sturdy brass relief valve is especially recommended for use on water heaters, where a valve of outstanding quality is desired.

**Features:** The No. 2606 Valve has a pop chamber and blowback regulating ring, which enables it to operate with the same positive action of a pop safety valve, should steam develop in the water heater. A stuffing box around the stem prevents leakage of hot water from the valve top.

**List Prices and Dimensions**

| Size (Inlet and Outlet) | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 2606 | List Prices | Each | 15.80 | 17.20 | 21.00 | 24.00 | 30.50 | 42.50 |
| | Center to top | Inches | 3¾ | 3¾ | 4⅝ | 5¼ | 6⅛ | 7¾ |
| | Center to male inlet | Inches | 2¼ | 2¾ | 3¼ | 3¾ | 4⅜ | 4½ |
| | Center to outlet | Inches | 1⅛ | 1⅜ | 1⅝ | 2 1/16 | 2 7/16 | 2¾ |



Cross Section

**Construction:** This brass relief valve has a bottom guide for the disc and is similar in design to the relief valves shown on page 328, except that it has a lifting lever, cap, and wire seal. The lever, japanned maroon, is suitable for up-pull operation, or when reversed, for down-pull.

**Maintenance:** The stuffing box gland should be pulled up only to "finger tightness". Excessive tightness on the packing is apt to interfere with the operation of the valve.

It is recommended that this valve be manually opened at regular intervals to assure proper action. This operation should be performed only when there is sufficient pressure available within the tank to flush any accumulated scale or foreign matter clear of the seating surfaces, particularly when starting up a new heater installation.

**Pressure setting:** Relief valves on liquid service should always be set 25 per cent above the normal working pressure of the system to avoid waste due to minor fluctuations of pressure.

These valves can be set for any pressure within the range of 5 to 250 pounds. Orders must specify the set pressure and the catalog number.

The original setting of the valve may be readjusted for pressures 10 per cent higher or lower, but not exceeding the maximum range stated above. For greater changes in set pressures, new springs may be required, since one spring cannot cover the entire range of pressures at which the valve can be set.

# Brass Relief Valves

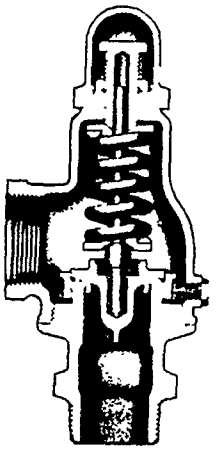
## For Steam, Water, or Oil

***Set at any specified pressure within the following ranges:***

½ to 2½-inch — 5 to 250 pounds steam, water, or oil 400° F.
251 to 300 pounds water or oil 100° F.

3-inch — 5 to 200 pounds steam, water, or oil, 400° F.
201 to 250 pounds water or oil, 100° F.

***Specify the set pressure and catalog number.***



Cross Section

No. 2601
Male Inlet
Side Outlet
With Cap

These valves are recommended for pipe lines, presses, pumps, cylinders, etc., where a blow-back or pressure drop of 10% is permissible. Relief valves are intended to relieve excessive pressures; they should not be used in an attempt to relieve shock pressures in hydraulic lines. When a pressure drop smaller than 10% is required on steam service, use pop safety valves.

The side outlet valves are pressure tight on the outlet and can discharge against low head pressures.

No. 2602
Male Inlet
Side Outlet
With Wheel

No. 2604
Female Inlet
Side Outlet
With Cap

30

### List Prices and Dimensions

| Size (Size of Inlet) | | | Inches | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Prices | No. 2601 | | Each | 14.00 | 14.00 | 15.40 | 18.70 | 21.50 | 27.20 | 38.00 | | |
| | No. 2602 | | Each | 13.80 | 13.80 | 15.00 | 18.00 | 20.50 | 25.50 | 36.00 | | |
| | No. 2604 | | Each | | 14.00 | 15.40 | 18.70 | 21.50 | 27.20 | 38.00 | 56.50 | 113.00 |
| Dimensions in Inches | No. 2601 | Size of outlet | | ½ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | | |
| | | Overall height | | 5⅜ | 5⅜ | 6 | 6⅞ | 8 | 9¾ | 11⅛ | | |
| | | Center to inlet | | 2¼ | 2¼ | 2¾ | 3¼ | 3¾ | 4⅜ | 4½ | | |
| | | Center to outlet | | 1⅛ | 1⅛ | 1⅜ | 1⅝ | 2 1/16 | 2 7/16 | 2¾ | | |
| | No. 2602 | Size of outlet | | ½ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | | |
| | | Overall height | | 5⅝ | 5⅝ | 6⅛ | 7⅛ | 8⅛ | 9½ | 11¼ | | |
| | | Center to inlet | | 2¼ | 2¼ | 2¾ | 3¼ | 3¾ | 4⅜ | 4½ | | |
| | | Center to outlet | | 1⅛ | 1⅛ | 1⅜ | 1⅝ | 2 1/16 | 2 7/16 | 2¾ | | |
| | | Diameter of wheel | | 2 9/16 | 2 9/16 | 2 9/16 | 3 1/16 | 3⅝ | 4 1/16 | 4¾ | | |
| | No. 2604 | Size of outlet | | | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
| | | Overall height | | | 5⅛ | 5⅝ | 6⅜ | 7⅝ | 9¼ | 11 | 12½ | 13 11/16 |
| | | Center to inlet | | | 2 | 2⅜ | 2¾ | 3⅜ | 3⅞ | 4⅜ | 4⅞ | 5 3/16 |
| | | Center to outlet | | | 1⅛ | 1⅜ | 1⅝ | 2 1/16 | 2 7/16 | 2¾ | 3 | 3½ |

**Features of design:** To assure true seating, the single disc has a long bottom guide which operates in the finished bore of the base. The seat is integral with the base of the valve

These valves except in ⅜, 2½, and 3-inch sizes are equipped with adjustable blow-back regulating rings around the seat, which provide a means of adjusting the blow-down of pressure when changing or regulating the set pressure. The adjustment of this ring may be made from the outside of the valve without interfering with the pressure setting. A locking plug screwed into, and projecting through, the wall of the body prevents the regulating ring from loosening once it has been set for blow-down.

A stuffing box filled with asbestos packing and surrounding the main spring adjusting screw under the locknut forms an effective seal for the body.

**Installation:** Relief valves should always be installed with the stem in a vertical position, in order to insure proper seating of the disc.

**Materials:** The base, body, and disc of all of these valves are made of a high grade brass. The spring is steel; the stem is either steel with the stem point casehardened, or is made of bronze.

**Fire protection service:** Relief valves used in connection with fire protection installations ordinarily must comply with various Underwriters' specifications. Before ordering valves for this service, a careful study should be made of all such specifications applying to the locality in which the valves will be used so that suitable valves are obtained.

**Pressure setting:** These valves can be set at any pressure within the ranges specified above. On steam service, relief valves should be set at least 10% higher than the normal working pressure in the system; on water or oil service, 25% higher.

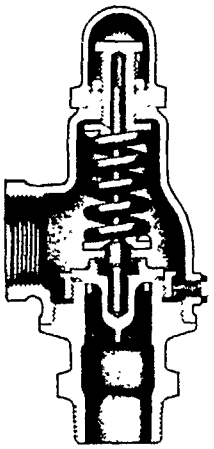
**Pressure adjustment:** The set pressure of these valves can be adjusted after installation to any pressure within a range of 10% above or below the original factory setting, but not exceeding the maximum pressure for which the valve is recommended.

*Capacities on application*

# Brass Relief Valves

## For Air or Gas

### 250-Pound



Cross Section
No. 2651

No. 2651
Male Inlet
Side Outlet

***Set at any specified pressure within the following ranges:***

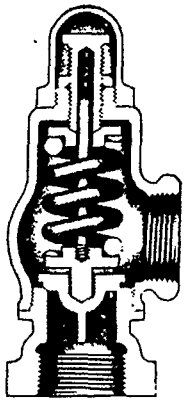
250-Pound Valves—10 to 250 pounds
300-Pound Valves—10 to 300 pounds
500-Pound Valves—301 to 500 pounds

Maximum temperature — 400° F

***Orders must specify the set pressure and the catalog number.***

### 500-Pound

No. 2674
Female Inlet
Side Outlet



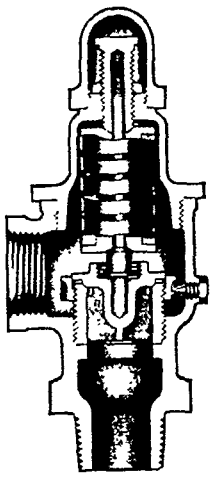
Cross Section
No. 2674

SERVICE RECOMMENDATIONS

The valves shown on this page are recommended for air or gas compressors, cylinders, pipe lines, etc., where a blow-back or pressure drop of 10% is permissible. When a pressure drop smaller than 10% is required, pop safety valves should be used.

The valves are pressure tight on the outlet and may discharge against low back pressures. The No. 2668 Valve is especially suitable for gasoline and noxious gases. It can be dismantled without disturbing the piping connections.

### 300-Pound



Cross Section
No. 2668

No. 2668
Male Inlet
Side Outlet

For Gasoline or Noxious Gases

### List Prices and Dimensions

| Size (Size of Inlet) | | Inches | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| List Prices | No. 2651 | Each | 17.50 | 17.50 | 19.00 | 23.00 | 26.50 | 33.50 | 46.50 |
| | No. 2668 | Each | 18.70 | 18.70 | 20.50 | 25.00 | 28.50 | 36.00 | 50.50 |
| | No. 2674 | Each | | 20.50 | 22.30 | 27.20 | 31.20 | 39.50 | 55.00 |
| Dimensions in Inches | No. 2651 | Size of outlet | | 1/2 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| | | Center to top | | 3 1/8 | 3 1/8 | 3 1/4 | 3 5/8 | 4 1/4 | 5 3/8 | 6 5/8 |
| | | Ctr. to male inlet | | 2 1/4 | 2 1/4 | 2 3/4 | 3 1/4 | 3 3/4 | 4 3/8 | 4 1/2 |
| | | Center to outlet | | 1 1/8 | 1 1/8 | 1 3/8 | 1 5/8 | 2 1/16 | 2 7/16 | 2 3/4 |
| | No. 2668 | Size of outlet | | 1/2 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| | | Center to top | | 3 5/16 | 3 5/16 | 3 3/8 | 4 | 4 7/8 | 6 1/4 | 7 3/8 |
| | | Ctr. to male inlet | | 2 5/16 | 2 7/16 | 2 7/8 | 3 3/16 | 3 11/16 | 4 | 4 11/16 |
| | | Center to outlet | | 1 1/16 | 1 1/16 | 1 5/16 | 1 5/8 | 2 1/16 | 2 3/8 | 2 3/4 |
| | No. 2674 | Size of outlet | | | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| | | Center to top | | | 3 1/4 | 3 1/4 | 3 1/2 | 4 1/4 | 5 3/8 | 6 1/4 |
| | | Ctr. to female inlet | | | 2 1/8 | 2 1/8 | 2 1/2 | 2 15/16 | 3 1/8 | 3 5/8 |
| | | Center to outlet | | | 1 3/8 | 1 3/8 | 1 5/8 | 1 3/4 | 2 | 2 1/2 |

**Features of design:** The valves are of the single disc type with bottom guide to assure proper seating. No. 2651 and No. 2668 in sizes 1/2-inch and larger have blow-back regulating rings which enable the user to adjust the blow-down when changing or regulating the set pressure. A stuffing box around the spring adjusting screw is filled with asbestos packing to form an effective seal for the body.

The No. 2668 have a screwed-in seat bushing; the seat is integral with the base on the other types.

**Materials:** The base, body, and disc are brass. All valves have a steel spring and stem, the stem point being casehardened.

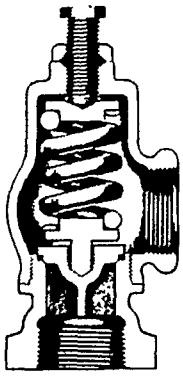
**Pressure setting:** Relief valves used on air or gas should be set at least 25% higher than the normal working pressure in the system. Orders must specify the set pressure as well as the catalog number.

**Pressure adjustment:** The set pressure of these valves can be adjusted after installation to any pressure within a range of 10% above or below the original factory setting, but should not exceed the maximum pressure for which the valve is recommended.

**Seat tightness:** The seating surfaces are carefully ground to insure audible tightness at all pressures up to 80 per cent of the set pressure.

**Installation:** Relief valves should always be installed with the stem in a vertical position. For air and gas service, these valves should preferably be installed inverted to allow moisture to collect and seal the seating surfaces.

# Brass Hydraulic Relief Valves



Cross Section
No. 1128

No. 1128

***Set at any specified pressure within the following ranges:***

No. 1128 Valves

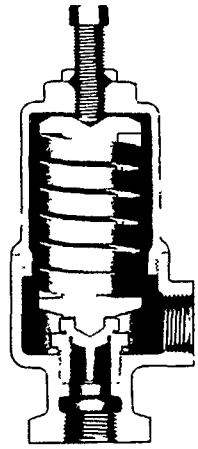
All sizes.....300 to 600 pounds

No. 1130 Valves

½-inch.....800 to 8000 pounds
¾-inch.....800 to 6000 pounds
1-inch.....800 to 4500 pounds
1¼-inch.....800 to 4000 pounds
1½-inch.....800 to 2600 pounds
2-inch.....800 to 2600 pounds

***Orders for valves must specify the set pressure and catalog number.***

No. 1130



Cross Section
No. 1130

## List Prices

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| No. 1128 | Each | 33.50 | 36.00 | 43.50 | 50.00 | 62.50 | 87.50 |
| No. 1130 | Each | 74.50 | 74.50 | 81.50 | 126.00 | 134.00 | 193.00 |

30

**Recommendations:** These valves are particularly designed to safeguard high pressure oil lines, hydraulic apparatus operating at high pressures such as hydraulic presses and elevators, or high pressure pumping systems. The valves are to be used at atmospheric temperatures and for services discharging to atmosphere.

Hydraulic Relief Valves should never be used as unloading valves or in an attempt to relieve shock in hydraulic systems.

**Features:** This line of valves is characterized by rugged construction, simplicity of design, and the use of high grade materials.

The No. 1128 Valves have a base and disc cast in Crane Special Bronze, a strong, hard, leaded tin bronze; the body seat ring is integral with the base. The bonnet is made of brass.

On No. 1130 Valves, the base and bonnet are brass. The disc is Exelloy on ½ and ¾-inch sizes and Crane 18-8 Mo Alloy Steel on larger sizes. The renewable, screwed-in body seat ring is made of Crane No. 49 Nickel Alloy.

Both valves feature an exceptionally long spring made of the best quality steel. The valves have an adjusting screw with a hexagon end for wrench engagement. A lock nut is provided so that the adjusting screw may be locked at the desired set pressure.

The valves are pressure tight on discharge. A stuffing box around the adjusting screw, and under the lock nut, is filled with high grade packing to seal the top end of the valve.

**Pressure setting:** All hydraulic relief valves can be readjusted for pressures 10 per cent above or below the original set pressure, but should never be set at pressures in excess of the maximum rating for which the valve is designed. If a greater change in the set pressure is to be made, a new spring may be required, since one spring will not cover the entire range of pressures at which the valve can be set.

Relief valves should be set at least 25 per cent higher than the normal working pressure in the system in order to avoid wasting water or oil in discharges due to minor fluctuations of pressures.

The function of these valves is to safeguard the apparatus and the piping against excessive pressures, and they should not be used in an attempt to maintain pressure at a maximum point. Operating pressures maintained continuously close to the set pressure of the valve will tend to cause leakage and maintenance difficulties.

Orders for relief valves must specify the set pressure desired and the catalog number.

## Dimensions, in Inches

| Size | (Size of Inlet) | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| No. 1128 | Size of outlet | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
| | Center to top | 2⅞ | 2⅞ | 3⅝ | 3⅞ | 4½ | 5⅝ |
| | Center to inlet | 2⅛ | 2⅛ | 2½ | 2 15/16 | 3⅛ | 3⅝ |
| | Center to outlet | 1⅜ | 1⅜ | 1⅝ | 1¾ | 2 | 2½ |
| No. 1130 | Size of outlet | 1 | 1 | 1 | 1½ | 1½ | 2 |
| | Center to top | 7¼ | 7¼ | 7¼ | 9½ | 9½ | 11¾ |
| | Center to inlet | 3 | 3 | 3 | 3⅝ | 3⅝ | 4⅛ |
| | Center to outlet | 2 11/16 | 2 11/16 | 2 11/16 | 3 3/16 | 3 3/16 | 3 13/16 |

*Capacities on application*

# All-Iron Relief Valves

## For Ammonia, Air, or Gas

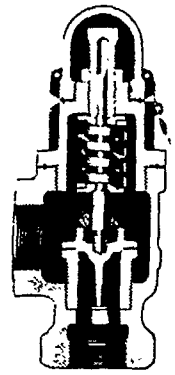
No. 1118
Screwed Inlet and Outlet

***Can be set at any specified pressure within the following range:***
10 to 300 pounds Maximum temperature 400° F.

This relief valve has been particularly designed for ammonia service, but may also be used wherever all-iron construction is preferred because of conditions corrosive to brass. For air or gas service, the seat should be oil-sealed. Service temperatures should not exceed 400° F.

Valves ½ to 1¼-inch have a screwed bonnet; sizes 1½ and 2-inch have a bolted bonnet. The bonnet and cap joint are sealed with a lead gasket.

**Features:** The No. 1118 Valve is of sturdy construction and simple design. The body and bonnet are Crane Ferrosteel, the body seat ring and disc are steel, and the stem is steel with a casehardened point. Seating surfaces are easily reground; pipe threads tapped into the top of the disc permit insertion of a pipe nipple for rotating the disc.



Cross Section

**Pressure setting:** Relief valves should always be set at least 25 per cent above the normal working pressure in the system in order to prevent wastage of fluid when minor fluctuations of pressure occur. The pressure setting can be readjusted 10 per cent above or below the original set pressure, but not in excess of the maximum given above.

### List Prices and Dimensions

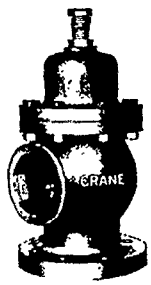
| Size (Size of Inlet) | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 1118 | List Prices | Each | 41.50 | 44.00 | 52.50 | 62.50 | 92.50 | 113.00 |
| | Size of outlet | Inches | ¾ | 1 | 1¼ | 1½ | 2 | 2½ |
| | Center to top | Inches | 3⅜ | 4¼ | 5⅜ | 6¾ | 6⅞ | 7½ |
| | Center to end of inlet | Inches | 2¼ | 2⅝ | 3⅛ | 3¾ | 3 5/16 | 4⅜ |
| | Center to end of outlet | Inches | 1⅜ | 1⅝ | 2 | 2½ | 3 | 3 15/16 |

***Capacities on application***
***Orders must specify the set pressure and catalog number.***

30

# Inside Spring
# Iron Body Relief Valves

## For Water or Oil




No. 1123

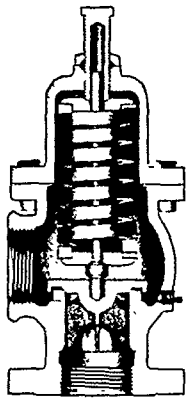
***Orders must specify set pressure and Catalog No.***

***Can be set at any specified pressure within the following range:***
10 to 300 pounds Maximum temperature 200° F.
Outlet pressures are not to exceed 20 pounds gauge.

This relief valve is designed for service on water or oil, where the temperature does not exceed 200° F. It is commonly used on pump discharge lines, on standpipes, pipe lines, cylinders, oil lines, etc. The valve should not be used as an unloading valve or to relieve shock from hydraulic lines.

**Pressure setting:** Relief valves on liquid service should be set 25 per cent above the normal working pressure of the system to assure tightness at the seat. They may be readjusted for pressures 10 per cent above or below the original set pressure, but not exceeding the maximum given above

**Materials:** The No. 1123 Valve has an iron body and bonnet, a steel spring, and a brass stem. The seat and disc are regularly made of brass.



Cross Section

**Construction:** The valve is of the inside spring type with a flanged bonnet securely bolted to the body, making a pressure tight joint. A machined recess filled with packing is provided around the adjusting screw to seal this point and render the valve pressure tight on discharge.

### List Prices and Dimensions

| Size (Size of Inlet and Outlet) | | Inches | 2½ | 3 | 4 |
|---|---|---|---|---|---|
| No. 1123 F. & D. | List Prices | Each | 92.50 | 110.00 | 165.00 |
| | Center to top | Inches | 11 | 11½ | 12½ |
| | Center to face of inlet | Inches | 5¼ | 5¾ | 6 11/16 |
| | Center to end of outlet | Inches | 3⅞ | 4¼ | 5 |

The inlet connection is suitable for a flanged or a screwed joint. The outlet connection is screwed.

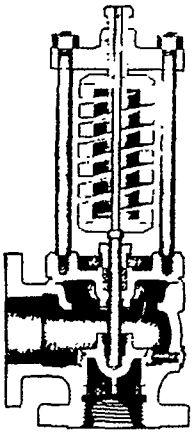
**Flange dimensions and facing:** The dimensions and drilling of the inlet flange conforms to the American Cast Iron Flange Standard, Class 250 (B16b-1944). It has a 1/16-inch raised face finished with concentric grooves, approximately 10 grooves per inch, known as a "serrated" finish.

**Drilling:** List prices include facing and drilling (F. & D.) of the inlet flange to the American Cast Iron Flange Standard, Class 250. No deduction is made when valves are ordered faced only.

***Capacities on application***

***Templates for drilling . . . . page 460***

# Outside Spring
# Iron Body Relief Valves



Cross Section

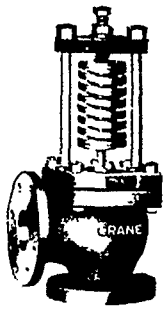
WORKING PRESSURE — 250 pounds
MAXIMUM SET PRESSURE — 300 pounds

For steam, gas, hot water, or oil
Maximum temperature 450° F.

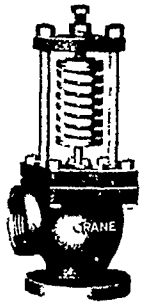
Outlet pressures not to exceed 20 pounds gauge.

***Order must specify the set pressure and catalog number.***

***If order does not specify fluid on which valve is to be used, valves for steam will be furnished.***



No. 1113
Flanged Inlet
Flanged Outlet



No. 1114
Flanged Inlet
Screwed Outlet

**Recommendations:** Nos. 1113 and 1114 Valves are recommended for steam, gas, hot water, or oil services at working pressures up to 250 pounds and temperatures up to 450° F. They may be set for a maximum pressure of 300 pounds and are suitable for outlet pressures not exceeding 20 pounds gauge.

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### List Prices and Dimensions

| Size (Size of Inlet) | | | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|
| List Prices, F. & D. | No. 1113 | Each | | | | 400.00 |
| | No. 1114 | Each | 170.00 | 227.00 | 270.00 | |
| Dimensions, Inches | Size of outlet | | 2½ | 3 | 4 | 5 |
| | Center to top | | 12½ | 15½ | 19 | 24½ |
| | Center to face of inlet | | 6½ | 7 | 7½ | 9½ |
| | Center to end of outlet | | 3 15/16 | 4½ | 4⅞ | |
| | Center to face of outlet | | | | | 7 |

**Construction:** These valves are of the outside spring and yoke construction, in which the spring is not directly exposed to the temperature of the fluid within the body. They have a bolted bonnet equipped with a stuffing box. The seat bushing is renewable.

The valves are pressure tight on the outlet side and are suitable for use when discharging into a line operating under low head pressures, or for handling noxious or inflammable fluids.

In addition, these valves have a pop chamber and an adjustable blow-back regulating ring which, on steam and gas service, give them an action more positive than ordinary relief valves, as well as a means of regulating the blowdown of pressure.

The inlet of these valves is regularly made with a combination flanged and screwed connection.

**Seat and disc:** The seat and disc are made of Crane Special Bronze, a hard, leaded tin bronze.

**Pressure setting:** To insure tight seating of relief valves, they should be set at slightly higher pressures than the normal working pressure of the installation. Valves for steam or gas should be set at least 10 per cent higher, and valves for water or oil, 25 per cent above the normal working pressure.

These valves may be readjusted for pressures 10 per cent above or below the original set pressure, but not exceeding the maximum given above.

**Flange dimensions and facing:** The dimensions of the inlet flange conforms to the American Cast Iron Flange Standard, Class 250 (B16b-1944). It has a 1/16-inch raised face, finished with concentric grooves, approximately 10 grooves per inch, known as a "serrated" finish.

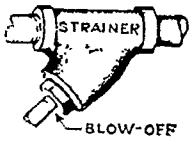
The outlet flange of the No. 1113 Valve conforms to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). This flange is plain faced and has a smooth finish.

**Drilling:** List prices include facing and drilling (F. & D.) to the particular Standard applying, as indicated in the preceding paragraphs. No deduction is made when valves are ordered faced only.

### *Dirt in Piping*

Pipe scale and dirt in piping systems are the greatest enemies of valves, regulators, meters, and other mechanical devices. They cause endless trouble and frequently serious damage. Such foreign matter lodges on valve seats and starts leakage; it gets into automatic devices with close-fitting, moving parts and prevents proper operation; and it collects at points of low velocity, obstructing the passage of flow.

Regardless of how clean piping materials are when being installed, a generous use of strainers or sediment separators is a sound but small investment, considering the protection provided. For the Crane line, see pages 356 and 357.




Be sure to blow out the accumulated sediment at regular intervals.

*Capacities on application*

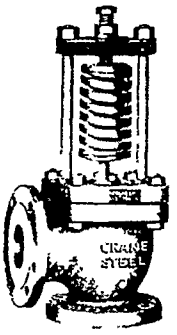
*Templates for drilling . . . . pages 459 and 460*

# Outside Spring
# Alloy Cast Steel Relief Valves

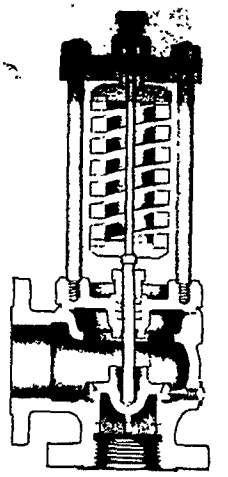
WORKING PRESSURE — 300 pounds
MAXIMUM SET PRESSURE — 360 pounds

For steam, hot water, oil, or gas; maximum temperature 900° F.
Outlet pressure not to exceed 20 pounds gauge.

***When ordering be sure to specify set pressure and catalog number.***
***If order does not specify fluid on which valve is to be used, valves for steam will be furnished.***


No. 1113 LX

**Pressure setting:** This valve, when used for steam or gas, should be set at least 10 per cent higher than the normal working pressure, and when used for water or oil, at least 25 per cent higher. It may be readjusted for pressures 10 per cent above or below the original set pressure, but not exceeding the maximum given above. For a greater adjustment, new springs may be required, since one spring will not cover the entire range of pressures at which this valve can be set.


Cross Section



## List Prices and Dimensions

| Size (Size of Inlet) | | Inches | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|
| No. 1113 LX, Flanged, F.D.& S.F. | | Each | 307.00 | 375.00 | 455.00 | 717.00 |
| Dimensions, in Inches | Size of outlet | | 2½ | 3 | 4 | 5 |
| | Diameter of seat opening | | 2 | 2½ | 3 | 4 |
| | Center to top | | 12½ | 15½ | 19 | 24½ |
| | *Center to face of inlet | | 6½ | 7 | 7½ | 9½ |
| | *Center to face of outlet | | 4¾ | 5½ | 6 | 7 |

*Includes 1/16-inch raised face.

**Service recommendations:** The Crane No. 1113LX Alloy Steel Relief Valve is recommended for high temperature service on steam, hot water, oil, and gases (maximum temperature not to exceed 900° F). It is suitable for outlet pressures up to 20 pounds gauge.

**Construction:** This valve is of the outside spring and yoke construction, in which the spring is not directly exposed to the temperature of the fluid within the body. It has a bolted bonnet equipped with a stuffing box. The seat bushing is renewable.

The valve is pressure tight on the outlet side and is suitable for use when discharging into a line operating under low head pressures, or for handling noxious or inflammable gases and fluids.

In addition, the No. 1113 LX Valve has an adjustable blow-back regulating ring which, on steam and gas service, provides a means for adjusting the blowdown of pressure when changing or regulating the set pressure.

**Materials:** The body is made of Crane No. 4 Carbon-Molybdenum Steel; the bonnet, of Carbon Cast Steel; and the disc and stem, of Exelloy. The seat bushing is Crane 18–8 Mo Alloy; and the spring, a high grade alloy steel. The bonnet bolt-studs are Triplex Steel.

**Flange dimensions and facing:** The end flanges conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939.

The inlet flange conforms to the 300-Pound Standard; the outlet flange, to the 150-Pound Standard.

End flanges are furnished faced, drilled, and spot faced (F.D.& S.F.) and have an American Standard 1/16-inch raised face, finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish.

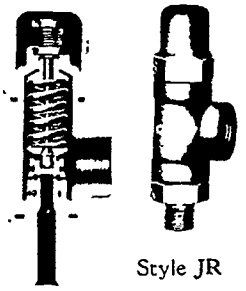
A smooth finish can be furnished on raised or male faces. Ring joint, male, female, or other types of facing can also be furnished. See the Crane Discount Sheet for prices.

*Capacities on application*

*Templates for drilling . . . page 461*

# Crosby Nozzle Relief Valves

Low Capacity

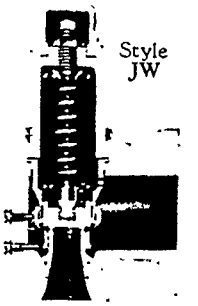


Style JR

Medium Capacity

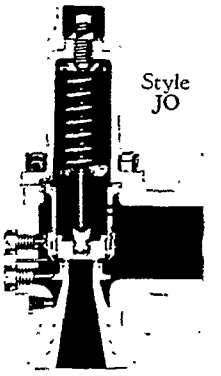
Style JMB

Medium-High Capacity



Style JW

High Capacity



Style JO

Styles, Sizes, Pressure Limits, and Materials

| Capacity | Style No. | Size Range (Inches) Inlet | Size Range (Inches) Outlet | *Pressure-Temperature Limits at Inlet Psi-Fahr. | *Pressure-Temperature Limits at Inlet Psi-Fahr. | Materials See Note |
|---|---|---|---|---|---|---|
| Low | JR-c | ½-1 | 1 | 2000 @ 400° | — | Note 1 |
| | JR-t | ½-1 | 1 | 2000 @ 750° | — | |
| Medium | JMB-c | ¾-1 | 1-1½ | 5000 @ 400° | — | Note 1 |
| | JMB-t | ¾-1 | 1-1½ | 5000 @ 750° | — | |
| Medium High | JW-a | 1½-6 | 2-10 | 400 @ 150° | 250 @ 450° | Note 2 |
| | JW-b | 1½-6 | 2-10 | 400 @ 150° | 250 @ 450° | Note 3 |
| | JW-25 | 1½-4 | 2-6 | 230 @ 100° | 160 @ 450° | Note 4 |
| | JW-35 | 1½-4 | 2-6 | 450 @ 100° | 450 @ 450° | |
| | JW-26 | 1½-4 | 2-6 | 160 @ 450° | 120 @ 650° | |
| | JW-36 | 1½-4 | 2-6 | 450 @ 450° | 415 @ 650° | |
| High | JO-25 | 1-6 | 2-10 | 230 @ 100° | 160 @ 450° | Note 5 |
| | JO-35 | 1-6 | 2-8 | 600 @ 100° | 525 @ 450° | |
| | JO-45 | 1-6 | 2-8 | 1200 @ 100° | 1050 @ 450° | |
| | JO-55 | 1½-4 | 2-6 | 3000 @ 100° | 2630 @ 450° | |
| | JO-26 | 1-6 | 2-10 | 160 @ 450° | 92 @ 800° | Note 5 |
| | JO-36 | 1-6 | 2-8 | 525 @ 450° | 300 @ 800° | |
| | JO-46 | 1-6 | 2-8 | 1050 @ 450° | 600 @ 800° | |
| | JO-56 | 1½-4 | 2-6 | 2630 @ 450° | 1500 @ 800° | |

[1]Forged stainless steel base and disc; cast steel cylinder and cap.
[2]Cast iron body; bronze semi-nozzle, disc, and trim.
[3]Cast iron body; stainless steel semi-nozzle, disc, and trim.
[4]Cast steel body; stainless steel semi-nozzle, disc, and trim.
[5]Cast steel body; stainless steel full-throat nozzle, disc, and trim.

30

Crosby Nozzle Relief Valves provide exact operation with uniform blowdown, full relieving capacity that assures positive protection, and continued as well as initial tightness. They are easy to install and maintain.

All valves are furnished with flat seats and top guided connections. They have a closed bonnet and a screwed cap unless otherwise specified.

***Low capacity valves (JR)*** are used for non-coking refinery service, preferably on liquids, and for pumps or pump lines carrying sour crude oil or oil vapors. They should not be used for steam, air, or oil vapor service where exact operation is required.

***Medium capacity valves (JMB)*** are recommended for steam, air or gas (up to 1000 psi), oil, and oil vapor. They are used on oil cracking equipment (non-coking), caustic pump discharge lines, ammonia lines, and for general service corrosive to bronze.

***Medium-High capacity valves (JW)*** are recommended for low and moderate pressures and temperatures. They are used in oil refineries, process plants, and for general service on steam, air, gas vapor, and liquids where full nozzle construction is deemed unnecessary.

***High capacity valves (JO)*** are recommended for steam, air, gas, oil, oil vapors and liquids. They are widely used in refinery, chemical, and industrial plants where positive, dependable action is needed.

**Steam boiler service:** These valves are not recommended for steam boiler service; for such service, use the Crosby Safety Valves shown on page 324.

**Springs:** Valves having catalog numbers ending with either "t" or "6" have an alloy steel spring; all other valves have a carbon steel spring.

***Ratings:** Since ratings vary with the valve size, those shown in the table above apply specifically to the smallest size valve.

The ratings also apply only to valves having standard facings. Full nozzle steel valves are available with a ring joint inlet, and when so furnished, are suitable for pressures higher than those listed in the table.

**Other styles:** The complete Crosby line includes valves having a wide variety of body, nozzle, and disc materials such as stainless steel, alloy steel, Monel, and Hastelloy; complete data on request.

**Special tops and lifting gears:** Style JMB, JW, and JO Valves are regularly furnished with a screwed cap and without a lifting gear.

When specified, the following special types of top construction can be furnished:

*Regular lifting gear:* Used for services where the valves need not be tight on the discharge side but where periodic testing is desirable.

*Packed lifting gear:* Used where tightness on the discharge side and periodic testing of the valves are desirable; it eliminates having a stuffing box around the main spindle.

*Testing rod:* A testing rod is available on valves having a packed lifting gear or cap. The rod holds the valve shut against over-pressure when the equipment on which the valve is installed is being given a hydrostatic test.

***Prices and additional information furnished on application.***

Pressure Regulators;
Traps; Separators;
Expansion Joints

# Pressure Regulators, Steam Traps, Separators, and Expansion Joints

**Regulators and Pressure Reducing Valves**
Crane Pressure Regulators.....pages 336 to 339
Klipfel Pressure Reducing Valves.....pages 340 and 341
Mueller Pressure Regulators.....page 342
Fulton Sylphon Temperature Regulators.....page 342

**Air Vent or Water Drain Valves**.....pages 343 and 344

**Steam Traps**
Crane Inverted Open Float Type .....pages 344 to 347
Hoffman Thermostatic Type. .....page 343
Velan Bimetallic Type.....page 348

**Separators and Strainers**
Steam and Oil Separators.....pages 354 and 355
Sediment Separators.....pages 356 and 357
Dexter Automatic Separators.....page 353
Logan Aridifiers.....page 353
Swartwout Exhaust Heads.....page 349

**Expansion Joints**
Brass.....page 350
Iron Body.....page 350
Copper, Stainless Steel, and Rubber.....page 351
Adsco, Iron and Steel.....page 352

**Drip Pockets**.....page 355
**Expansion in Pipe Lines**.....page 349

***For suggested installation of Crane Air Vent or Water Drain Valves and Inverted Open Float Steam Traps, see page 344.***

To make this catalog more convenient to use, the complete Crane line of special duty valves and of specialties has been divided into several groups. Special duty valves are shown on pages 299 to 334, and specialties not referred to above are shown on pages 359 to 374.

***Standard Types of Pipe Bends . pages 502 and 503***

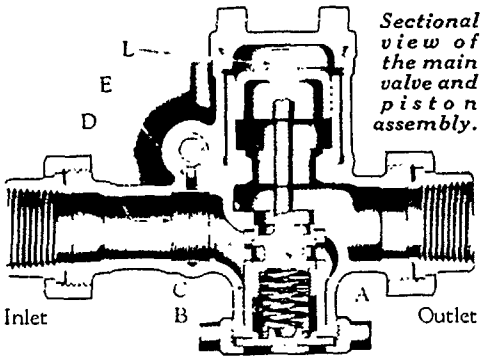
# Bronze Pressure Regulators

***Two essential but separate mechanisms***—the main valve assembly and auxiliary valve assembly—are features of Crane Pressure Regulators. Interconnected for transmission of pressure but independent mechanically, they operate in the same body.

Except for necessary pipe connections, the regulator would function as well with the units separated.

***The main valve assembly*** includes a disc and seat. The movement of the disc is controlled by a piston actuated by pressure from the auxiliary valve.

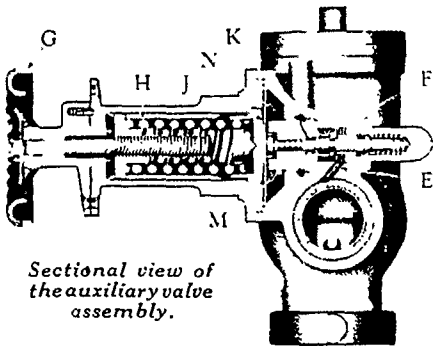
***The auxiliary valve assembly*** includes a device to manually set the desired outlet pressure, an auxiliary valve to control the operation of the main valve, and a mechanism to operate the auxiliary valve itself.




*Sectional view of the main valve and piston assembly.*

## Operation of Crane Pressure Regulators

With the regulator properly installed in the line and ready to go into service, the successive steps which take place in its operation are as follows:




*Sectional view of the auxiliary valve assembly.*

1. High pressure steam (or air) from the inlet piping flows into the inlet side of the regulator as far as the main disc A, which is held lightly to its seat by the main disc spring B.

2. This high pressure then passes into the main disc spring chamber through the ports in the liner C and acts to hold the main disc tightly to its seat.

3. A portion of the high pressure steam (or air) in the regulator inlet passes through the screen D into the high pressure port E and fills the chamber around the auxiliary valve F, which is held lightly to its seat by the auxiliary valve spring.

4. When the handwheel G is turned in a clockwise direction, the regulating spring H is compressed, deflecting the diaphragm J. This deflection of the diaphragm moves the auxiliary valve F off its seat and allows pressure to flow through the intermediate pressure port K into the chamber above the piston L.

5. The piston then moves downward, overcoming resistance of the main disc A, forcing it off its seat.

6. Steam (or air) then flows past the main disc A and fills the outlet piping system. Pressure from the outlet of the regulator is transmitted back through the low pressure port M to the diaphragm chamber N. As the pressure builds up in this chamber, it finally overcomes the tension on the diaphragm J, caused by the regulating spring H, and forces the diaphragm back toward its original position.

7. Just as soon as the diaphragm returns to its original position, the auxiliary valve closes, thus cutting off the pressure to the top of the piston L.

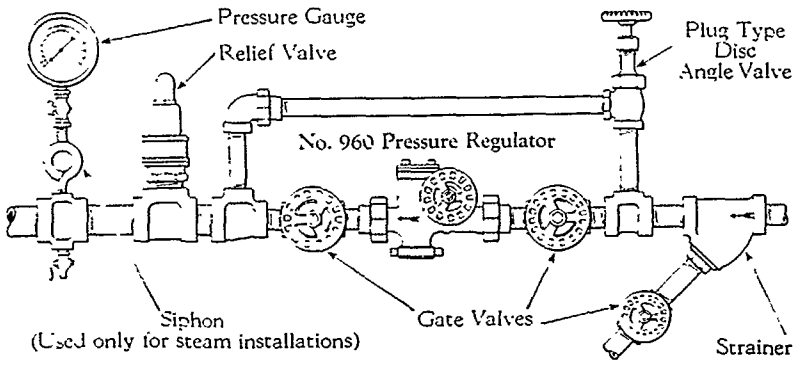
8. The high pressure in the spring chamber of the main disc A then forces the main disc back to its seat, cutting off the steam (or air) supply to the outlet side of the regulator.

9. As the outlet pressure falls, the pressure in the diaphragm chamber also falls, with the result that the regulating spring tension again deflects the diaphragm and moves the auxiliary valve off its seat.

10. The entire cycle of operations is then repeated. The cycle is automatic and practically instantaneous; there is no lag between operations.



### Recommended Piping Arrangement for Pressure Regulator



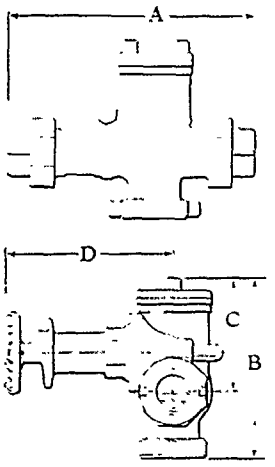

***Automatically Maintained Pressure***

When the handwheel is set to obtain any desired outlet pressure, this pressure is maintained within close limits if the quantity of steam or air being used remains fairly constant.

***Continually Proportioned Flow***

When steam or air is being used in the outlet system, the regulator actually operates in a "floating" position; that is, both the main disc and the auxiliary valve move back and forth without pausing at any one position, and thus continually proportion the flow of steam or air to satisfy the outlet requirements.

# Bronze Pressure Regulators

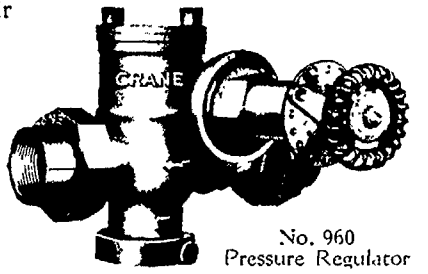



MAXIMUM INLET PRESSURES
250 pounds steam, 450° F. 250 pounds air

*For description, operation, and recommended installation, see the preceding page.*

### List Prices and Dimensions

| Size Inches | Price Each | Dimensions, in Inches A | B | C | D |
|---|---|---|---|---|---|
| ½ | 89.00 | 7 | 4⅝ | 3 | 6 |
| ¾ | 99.00 | 8¼ | 5¾ | 3⅝ | 6¼ |
| 1 | 111.00 | 9 | 6⅜ | 4 | 7¼ |
| 1¼ | 138.00 | 9⅝ | 7 | 4½ | 7½ |
| 1½ | 171.00 | 10¾ | 8 | 5 | 7½ |
| 2 | 215.00 | 12 | 9⅛ | 5⅝ | 7½ |




No. 960
Pressure Regulator

*For steam and air capacities, see the following two pages.*

**Service recommendations:** Crane Pressure Regulators have been specifically designed to provide accurate, automatic pressure regulation on steam and air. They are particularly suitable for use in modern process work, on vulcanizers, cookers, dryers, paper machines, heating systems, air tools, air blasts, and many other services. They may be used to reduce pressure to engines and pumps if ample receiver capacity to eliminate pulsations is provided between the engine or pump and the regulator.

**Fundamental characteristics:** These regulators should not be confused with ordinary reducing valves. They will not allow the outlet pressure to build up to the inlet pressure when no steam or air is being used in the outlet piping. Reasonable fluctuations of the inlet pressure do not affect the outlet pressure.

The regulators are reliable and feature a wide range of available reduced pressures, simplicity of operation, accessibility for inspection, and convenience in making repairs. They have malleable iron union rings and tail-pieces on the inlet and outlet ends.

**Locking:** Each regulator is equipped with a locking device to permit protection of the pressure setting against tampering. Locks are furnished only when specified and at an advance in price.

**Outlet pressure ranges:** Regulators are fitted with regulating springs and diaphragms to suit any one of the following ranges of outlet pressures:

| | |
|---|---|
| 1 to 10 pounds | 20 to 100 pounds |
| 5 to 30 pounds | 90 to 200 pounds |

**How to order regulators:** Orders should specify the size of the regulator (or capacity desired; see pages 338 and 339) and the outlet pressure. Unless otherwise specified, regulators suitable for steam will be furnished; if wanted for air, specify "for air".

These regulators should not be used where the outlet pressure is more than 80% of the inlet pressure.

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## Operating Characteristics of Crane Pressure Regulators

A Pressure Regulator should be chosen on the basis of its capacity to provide the rate of flow required in the outlet piping. The nearer correct it is to the proper size, the more trouble-free it will be and the longer it will last. A regulator that is too large is not only subject to extreme throttling and undue wear but may also supply steam or air in surges, causing pulsations. A regulator that is too small, particularly on low pressures, will dance and chatter.

Best results are obtained when the regulator is selected to supply flow rates that are approximately 50 per cent of the maximum obtainable through the regulator. This condition keeps the disc unseated—keeps it properly throttling the flow by holding the disc in a "floating" position—while at the same time permitting variations in flow demand in either direction. In addition, the damaging effects of wire-drawing and the danger of having small particles of foreign matter adhere to the seating surfaces and cause an increase in the outlet pressure, are substantially reduced.

Theoretically, if the flow demand remained fixed at all times, it would be possible to select a regulator (an orifice would give the same results) that would deliver the required amount of steam or air at exactly the desired outlet pressure. Actually, however, such ideal conditions seldom exist, because the flow demand in outlet piping varies with many factors, such as shut-off intervals, number of pieces of equipment in operation, warming-up periods, etc. Under practical operating conditions, therefore, when a regulator is set for one condition of flow demand and this condition changes, the regulator will strive automatically to compensate for the change, but in so doing will produce some variation in the outlet pressure. An increase in demand will cause a decrease in the outlet pressure, up to the point where the regulator is delivering its fullest possible capacity; in other words, is providing no regulation at all, if the demand is great enough. A decrease in demand will cause an increase in the outlet pressure, up to the point of the actual outlet or dead-end pressure setting on the regulator, if the demand ceases entirely.

***Important:*** Select the regulator on the basis of its capacity. See pages 338 and 339 for capacity tables. Orders should always specify the desired outlet pressure. The regulator is then equipped with the proper springs and diaphragm as indicated under "outlet pressure ranges" above; the regulating wheel permits adjustment throughout the range.

# Capacities of No. 960 Pressure Regulators

## Explanation of Tables

The capacity tables ("Steam" below and "Air" on the opposite page) show (1) inlet pressures at convenient increments from 30 to 250 pounds, (2) capacities or rates of flow at various pounds change in the outlet pressure, and (3) last column in each half of table, maximum rate of flow.

***The columns showing pounds change in outlet pressure*** to obtain rate of flow apply to ***any*** outlet pressure. For example, assume steam at 100 psi is to be reduced through a ½-inch regulator to a maximum or dead-end outlet pressure of 20 psi: at 19 psi outlet pressure (1-pound decrease), the regulator would deliver 41 pounds of steam per hour; at 18 psi outlet pressure (2-pound decrease), 72 pounds of steam per hour; at 12 psi outlet pressure (8-pound decrease), 225 pounds of steam per hour, etc. In this example, if the selected maximum or dead-end outlet pressure were 60 psi, the capacity would be the same at 59, 58, and 52 psi outlet pressure (1, 2, and 8-pound change or decrease), respectively, etc.

***The heavy black line*** through the tables separates the rates of flow at each inlet pressure at approximately 52 per cent of the maximum capacity of the regulator. The normal flow demand of the outlet system should correspond with the capacity of the regulator as shown near this black line. This will assure the use of a regulator that operates properly, has long life, and provides practical variation in lower or higher capacity when the flow demand varies from normal.

***The "maximum — no regulation" columns*** show the maximum rate of flow, which occurs when the flow demand is so great that the outlet pressure has dropped to the point where the regulator is delivering full capacity (no regulation). This latter figure is provided so that the safety valve which should be installed in the outlet piping can be properly sized; for proper protection and maximum safety, the safety valve should be capable of discharging at least the maximum flow through the regulator.

*(Continued on the following page)*

## Steam Capacities

31

| Inlet Pressure Psi | Rate of Flow of Saturated Steam In Pounds per Hour — Pounds Change in Outlet Pressure to Obtain Rate of Flow: 1 | 2 | 3 | 4 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | Maximum No Regulation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **½-inch Regulators** | | | | | | | | | | | | |
| 30 | 27 | 50 | 70 | 90 | 110 | 150 | | | | | | 187 |
| 40 | 29 | 55 | 80 | 100 | 125 | 175 | | | | | | 228 |
| 50 | 31 | 58 | 85 | 110 | 135 | 200 | 225 | | | | | 270 |
| 60 | 33 | 60 | 88 | 113 | 138 | 205 | 230 | 270 | | | | 311 |
| 70 | 35 | 62 | 91 | 116 | 141 | 210 | 240 | 280 | | | | 353 |
| 80 | 37 | 64 | 94 | 119 | 144 | 215 | 250 | 290 | 320 | | | 394 |
| 90 | 39 | 68 | 97 | 122 | 147 | 220 | 260 | 300 | 340 | | | 436 |
| 100 | 41 | 70 | 100 | 125 | 150 | 225 | 270 | 310 | 360 | 410 | | 478 |
| 125 | 43 | 76 | 108 | 135 | 165 | 245 | 295 | 340 | 390 | 450 | | 580 |
| 150 | 45 | 82 | 117 | 150 | 185 | 270 | 325 | 375 | 425 | 490 | 520 | 685 |
| 175 | 47 | 88 | 126 | 160 | 200 | 295 | 355 | 405 | 460 | 535 | 565 | 790 |
| 200 | 49 | 95 | 135 | 175 | 215 | 320 | 385 | 435 | 495 | 580 | 610 | 895 |
| 250 | 55 | 110 | 165 | 215 | 270 | 410 | 485 | 540 | 605 | 685 | 710 | 1060 |
| **¾-inch Regulators** | | | | | | | | | | | | |
| 30 | 48 | 89 | 124 | 160 | 195 | 265 | | | | | | 330 |
| 40 | 51 | 97 | 142 | 175 | 220 | 310 | | | | | | 405 |
| 50 | 55 | 103 | 150 | 195 | 240 | 355 | 400 | | | | | 480 |
| 60 | 58 | 106 | 155 | 200 | 245 | 365 | 405 | 480 | | | | 550 |
| 70 | 62 | 110 | 160 | 205 | 250 | 370 | 425 | 495 | | | | 625 |
| 80 | 65 | 113 | 165 | 210 | 255 | 380 | 440 | 515 | 565 | | | 695 |
| 90 | 69 | 120 | 170 | 215 | 260 | 390 | 460 | 530 | 600 | | | 770 |
| 100 | 73 | 124 | 175 | 220 | 265 | 400 | 480 | 550 | 635 | 725 | | 845 |
| 125 | 76 | 135 | 190 | 240 | 290 | 435 | 520 | 600 | 690 | 795 | | 1025 |
| 150 | 80 | 145 | 205 | 265 | 325 | 480 | 575 | 665 | 750 | 865 | 920 | 1210 |
| 175 | 83 | 155 | 225 | 285 | 355 | 520 | 630 | 715 | 815 | 945 | 1000 | 1400 |
| 200 | 87 | 170 | 240 | 310 | 380 | 565 | 680 | 770 | 875 | 1025 | 1080 | 1585 |
| 250 | 97 | 195 | 290 | 380 | 480 | 725 | 860 | 955 | 1070 | 1210 | 1255 | 1875 |
| **1-inch Regulators** | | | | | | | | | | | | |
| 30 | 84 | 155 | 215 | 280 | 340 | 465 | | | | | | 580 |
| 40 | 90 | 170 | 250 | 310 | 390 | 540 | | | | | | 705 |
| 50 | 96 | 180 | 265 | 340 | 420 | 620 | 700 | | | | | 835 |
| 60 | 102 | 185 | 275 | 350 | 430 | 635 | 715 | 835 | | | | 965 |
| 70 | 108 | 190 | 280 | 360 | 435 | 650 | 745 | 870 | | | | 1095 |
| 80 | 115 | 200 | 290 | 370 | 445 | 665 | 775 | 900 | 990 | | | 1220 |
| 90 | 121 | 210 | 300 | 380 | 455 | 680 | 805 | 930 | 1055 | | | 1350 |
| 100 | 127 | 215 | 310 | 390 | 465 | 700 | 835 | 960 | 1115 | 1270 | | 1480 |
| 125 | 133 | 235 | 335 | 420 | 510 | 760 | 915 | 1055 | 1210 | 1395 | | 1800 |
| 150 | 140 | 255 | 365 | 465 | 575 | 835 | 1010 | 1165 | 1320 | 1520 | 1610 | 2125 |
| 175 | 146 | 275 | 390 | 495 | 620 | 915 | 1100 | 1255 | 1425 | 1660 | 1750 | 2450 |
| 200 | 152 | 295 | 420 | 540 | 665 | 990 | 1195 | 1350 | 1535 | 1800 | 1890 | 2775 |
| 250 | 170 | 340 | 510 | 665 | 835 | 1270 | 1505 | 1675 | 1875 | 2125 | 2200 | 3285 |

| Inlet Pressure Psi | Rate of Flow of Saturated Steam In Pounds per Hour — Pounds Change in Outlet Pressure to Obtain Rate of Flow: 1 | 2 | 3 | 4 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | Maximum No Regulation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1¼-inch Regulators** | | | | | | | | | | | | |
| 30 | 145 | 270 | 380 | 490 | 595 | 815 | | | | | | 1015 |
| 40 | 155 | 300 | 435 | 545 | 680 | 950 | | | | | | 1240 |
| 50 | 170 | 315 | 460 | 595 | 735 | 1085 | 1220 | | | | | 1465 |
| 60 | 180 | 325 | 480 | 615 | 750 | 1115 | 1250 | 1465 | | | | 1690 |
| 70 | 190 | 335 | 495 | 630 | 765 | 1140 | 1305 | 1520 | | | | 1915 |
| 80 | 200 | 350 | 510 | 645 | 780 | 1165 | 1360 | 1575 | 1740 | | | 2140 |
| 90 | 210 | 370 | 525 | 660 | 800 | 1195 | 1410 | 1630 | 1845 | | | 2365 |
| 100 | 225 | 380 | 545 | 680 | 815 | 1220 | 1465 | 1685 | 1955 | 2225 | | 2595 |
| 125 | 235 | 415 | 585 | 735 | 895 | 1330 | 1600 | 1845 | 2120 | 2445 | | 3150 |
| 150 | 245 | 445 | 635 | 815 | 1005 | 1465 | 1765 | 2035 | 2310 | 2660 | 2925 | 3720 |
| 175 | 255 | 480 | 685 | 870 | 1085 | 1600 | 1930 | 2200 | 2500 | 2905 | 3070 | 4290 |
| 200 | 265 | 515 | 735 | 950 | 1165 | 1740 | 2090 | 2360 | 2690 | 3150 | 3310 | 4860 |
| 250 | 300 | 595 | 895 | 1165 | 1465 | 2225 | 2635 | 2930 | 3285 | 3720 | 3855 | 5755 |
| **1½-inch Regulators** | | | | | | | | | | | | |
| 30 | 190 | 350 | 490 | 630 | 770 | 1050 | | | | | | 1310 |
| 40 | 205 | 385 | 560 | 700 | 875 | 1225 | | | | | | 1595 |
| 50 | 215 | 405 | 595 | 770 | 945 | 1400 | 1575 | | | | | 1890 |
| 60 | 230 | 420 | 615 | 790 | 965 | 1435 | 1610 | 1890 | | | | 2175 |
| 70 | 245 | 435 | 635 | 810 | 985 | 1470 | 1680 | 1960 | | | | 2470 |
| 80 | 260 | 450 | 660 | 835 | 1010 | 1505 | 1750 | 2030 | 2240 | | | 2760 |
| 90 | 275 | 475 | 680 | 855 | 1030 | 1540 | 1820 | 2100 | 2380 | | | 3050 |
| 100 | 285 | 490 | 700 | 875 | 1050 | 1575 | 1890 | 2170 | 2520 | 2870 | | 3345 |
| 125 | 300 | 530 | 755 | 945 | 1155 | 1715 | 2065 | 2380 | 2730 | 3150 | | 4060 |
| 150 | 315 | 575 | 820 | 1050 | 1295 | 1890 | 2275 | 2625 | 2975 | 3430 | 3640 | 4795 |
| 175 | 330 | 615 | 880 | 1120 | 1400 | 2065 | 2485 | 2835 | 3220 | 3745 | 3955 | 5530 |
| 200 | 345 | 665 | 945 | 1225 | 1505 | 2240 | 2695 | 3045 | 3465 | 4060 | 4270 | 6265 |
| 250 | 385 | 770 | 1155 | 1505 | 1890 | 2870 | 3395 | 3780 | 4235 | 4795 | 4970 | 7420 |
| **2-inch Regulators** | | | | | | | | | | | | |
| 30 | 215 | 400 | 560 | 720 | 880 | 1200 | | | | | | 1495 |
| 40 | 230 | 440 | 640 | 800 | 1000 | 1400 | | | | | | 1825 |
| 50 | 250 | 465 | 680 | 880 | 1080 | 1600 | 1800 | | | | | 2160 |
| 60 | 265 | 480 | 705 | 905 | 1105 | 1640 | 1840 | 2160 | | | | 2490 |
| 70 | 280 | 495 | 730 | 930 | 1130 | 1680 | 1920 | 2240 | | | | 2825 |
| 80 | 295 | 510 | 750 | 950 | 1150 | 1720 | 2000 | 2320 | 2560 | | | 3150 |
| 90 | 310 | 545 | 775 | 975 | 1175 | 1760 | 2080 | 2400 | 2720 | | | 3490 |
| 100 | 330 | 560 | 800 | 1000 | 1200 | 1800 | 2160 | 2480 | 2880 | 3280 | | 3825 |
| 125 | 345 | 610 | 865 | 1080 | 1320 | 1960 | 2360 | 2720 | 3120 | 3600 | | 4640 |
| 150 | 360 | 655 | 935 | 1200 | 1480 | 2160 | 2600 | 3000 | 3400 | 3920 | 4160 | 5480 |
| 175 | 375 | 705 | 1010 | 1280 | 1600 | 2360 | 2840 | 3240 | 3680 | 4280 | 4520 | 6320 |
| 200 | 390 | 760 | 1080 | 1400 | 1720 | 2560 | 3080 | 3480 | 3960 | 4640 | 4880 | 7160 |
| 250 | 440 | 880 | 1320 | 1720 | 2160 | 3280 | 3880 | 4320 | 4840 | [illegible] | 5680 | 8480 |

*(Continued from the preceding page)*

***Example:*** Unlike most capacity tables, these are designed to show accurate and complete capacity ratings under any combination of varying operating conditions. For example, assume a regulator is desired that will reduce 100 psi inlet steam pressure to approximately 40 psi on the outlet and deliver steam at a normal rate of 225 pounds per hour. Adjusted for 40 psi maximum or dead-end outlet pressure, the ½-inch regulator will deliver this rate of flow when the outlet pressure has dropped 8 pounds, or is 32 psi; this regulator would have additional capacity (up to 410 pounds per hour with an outlet pressure of 20 psi) for warming up periods, and at the same time, would have an ample range of lower capacity at 35, 36, 37, 38, and 39 psi outlet pressure, when the required rate of flow was less than normal. If originally adjusted to 48 psi maximum or dead-end outlet pressure, this regulator would deliver the desired rate of flow at 40 psi, but the pressure in the outlet would build up to a maximum of 48 psi when the flow demand ceased entirely.

The ¾-inch regulator would also deliver this rate of flow, at about 30 psi if adjusted to 40 psi dead-end outlet pressure, or at about 40 psi if adjusted to 44 psi dead-end outlet pressure. The 1-inch regulator would also deliver this rate of flow with only about 2 pounds change between the dead-end and the normal-flow outlet pressures, but it would be too large for most satisfactory operation, etc.

Choose the regulator on the basis of its capacity to provide the desired rate of flow without requiring manual attention of the regulating wheel and within acceptable limits of variation between the dead-end outlet pressure and the actual outlet pressure under the desired flow conditions. Use of the regulating wheel can, of course, narrow these limits if manual adjustment is made following changes in flow demand.

These regulators are not recommended for use where the desired outlet pressure is more than 80 per cent of the inlet pressure.

***See pages 336 and 337 for description of regulators and explanation of operating characteristics.***

## Air Capacities

| Inlet Pressure | Rate of Flow of Free Air In Cubic Feet per Minute, at 70° F. — Pounds Change in Outlet Pressure to Obtain Rate of Flow | | | | | | | | | | | Maximum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Psi | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | No Regulation |
| **½-inch Regulators** | | | | | | | | | | | | |
| 30 | 10 | 18 | 25 | 32 | 39 | 53 | | | | | | 66 |
| 40 | 10 | 19 | 28 | 35 | 44 | 62 | | | | | | 81 |
| 50 | 11 | 20 | 30 | 39 | 48 | 71 | | | | | | 96 |
| 60 | 12 | 21 | 31 | 40 | 49 | 72 | 81 | 92 | | | | 110 |
| 70 | 12 | 22 | 32 | 41 | 50 | 74 | 85 | 99 | | | | 125 |
| 80 | 13 | 23 | 33 | 42 | 51 | 76 | 89 | 103 | 114 | | | 140 |
| 90 | 14 | 24 | 34 | 43 | 52 | 78 | 92 | 107 | 121 | | | 155 |
| 100 | 15 | 26 | 35 | 44 | 53 | 80 | 96 | 111 | 128 | 146 | | 170 |
| 125 | 16 | 27 | 38 | 48 | 58 | 87 | 105 | 121 | 138 | 160 | | 206 |
| 150 | 16 | 29 | 41 | 53 | 65 | 96 | 115 | 133 | 151 | 174 | 184 | 244 |
| 175 | 17 | 34 | 45 | 57 | 71 | 105 | 126 | 144 | 163 | 190 | 200 | 280 |
| 200 | 18 | 37 | 48 | 62 | 76 | 114 | 137 | 154 | 176 | 206 | 216 | 318 |
| 250 | 20 | 39 | 59 | 76 | 96 | 146 | 172 | 192 | 215 | 243 | 252 | 376 |
| **¾-inch Regulators** | | | | | | | | | | | | |
| 30 | 18 | 32 | 44 | 57 | 69 | 94 | | | | | | 117 |
| 40 | 18 | 34 | 50 | 62 | 78 | 110 | | | | | | 143 |
| 50 | 19 | 35 | 53 | 69 | 85 | 126 | | | | | | 170 |
| 60 | 21 | 37 | 55 | 71 | 87 | 127 | 143 | 163 | | | | 195 |
| 70 | 21 | 39 | 57 | 73 | 88 | 131 | 150 | 175 | | | | 221 |
| 80 | 23 | 41 | 58 | 74 | 90 | 135 | 158 | 182 | 202 | | | 248 |
| 90 | 25 | 42 | 60 | 76 | 92 | 138 | 163 | 189 | 214 | | | 274 |
| 100 | 27 | 46 | 62 | 78 | 94 | 142 | 170 | 196 | 227 | 258 | | 300 |
| 125 | 28 | 48 | 67 | 85 | 103 | 154 | 186 | 214 | 244 | 283 | | 365 |
| 150 | 28 | 51 | 73 | 94 | 115 | 170 | 204 | 235 | 267 | 308 | 326 | 432 |
| 175 | 30 | 60 | 80 | 101 | 126 | 186 | 225 | 255 | 289 | 336 | 354 | 495 |
| 200 | 32 | 65 | 85 | 110 | 135 | 202 | 242 | 273 | 312 | 365 | 382 | 565 |
| 250 | 35 | 69 | 104 | 135 | 170 | 258 | 304 | 340 | 380 | 430 | 446 | 665 |
| **1-inch Regulators** | | | | | | | | | | | | |
| 30 | 31 | 56 | 77 | 99 | 121 | 164 | | | | | | 205 |
| 40 | 31 | 59 | 87 | 109 | 136 | 192 | | | | | | 251 |
| 50 | 34 | 62 | 93 | 121 | 149 | 220 | | | | | | 298 |
| 60 | 37 | 65 | 96 | 124 | 152 | 223 | 251 | 285 | | | | 341 |
| 70 | 37 | 68 | 99 | 127 | 155 | 229 | 264 | 307 | | | | 388 |
| 80 | 40 | 71 | 102 | 130 | 158 | 236 | 276 | 319 | 353 | | | 434 |
| 90 | 43 | 74 | 105 | 133 | 161 | 242 | 285 | 332 | 375 | | | 480 |
| 100 | 47 | 81 | 109 | 136 | 164 | 248 | 298 | 344 | 397 | 453 | | 525 |
| 125 | 50 | 84 | 118 | 149 | 180 | 270 | 326 | 375 | 428 | 496 | | 640 |
| 150 | 50 | 90 | 127 | 164 | 202 | 298 | 356 | 412 | 468 | 540 | 570 | 755 |
| 175 | 53 | 105 | 140 | 177 | 220 | 326 | 390 | 446 | 505 | 590 | 620 | 870 |
| 200 | 56 | 115 | 149 | 192 | 236 | 353 | 425 | 477 | 545 | 640 | 670 | 985 |
| 250 | 62 | 121 | 183 | 236 | 298 | 453 | 533 | 595 | 665 | 755 | 780 | 1165 |

| Inlet Pressure | Rate of Flow of Free Air In Cubic Feet per Minute, at 70° F. — Pounds Change in Outlet Pressure to Obtain Rate of Flow | | | | | | | | | | | Maximum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Psi | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | No Regulation |
| **1¼-inch Regulators** | | | | | | | | | | | | |
| 30 | 54 | 98 | 136 | 174 | 212 | 288 | | | | | | 358 |
| 40 | 54 | 103 | 152 | 190 | 239 | 337 | | | | | | 440 |
| 50 | 60 | 109 | 163 | 212 | 261 | 386 | | | | | | 520 |
| 60 | 65 | 114 | 168 | 217 | 266 | 391 | 440 | 500 | | | | 595 |
| 70 | 65 | 119 | 174 | 223 | 272 | 402 | 462 | 540 | | | | 680 |
| 80 | 71 | 125 | 179 | 228 | 277 | 413 | 483 | 560 | 620 | | | 760 |
| 90 | 76 | 130 | 185 | 233 | 282 | 424 | 500 | 580 | 655 | | | 840 |
| 100 | 81 | 141 | 190 | 239 | 288 | 434 | 520 | 605 | 695 | 795 | | 925 |
| 125 | 87 | 147 | 206 | 261 | 315 | 472 | 570 | 655 | 750 | 870 | | 1120 |
| 150 | 87 | 157 | 223 | 288 | 353 | 520 | 625 | 720 | 820 | 945 | 1000 | 1325 |
| 175 | 92 | 185 | 244 | 310 | 386 | 570 | 685 | 780 | 885 | 1030 | 1085 | 1520 |
| 200 | 98 | 201 | 261 | 337 | 413 | 620 | 745 | 835 | 955 | 1120 | 1175 | 1725 |
| 250 | 109 | 212 | 320 | 413 | 520 | 795 | 935 | 1045 | 1165 | 1320 | 1370 | 2040 |
| **1½-inch Regulators** | | | | | | | | | | | | |
| 30 | 70 | 126 | 175 | 224 | 273 | 371 | | | | | | 462 |
| 40 | 70 | 133 | 196 | 245 | 308 | 434 | | | | | | 565 |
| 50 | 77 | 140 | 210 | 273 | 336 | 497 | | | | | | 670 |
| 60 | 84 | 147 | 217 | 280 | 343 | 505 | 565 | 645 | | | | 770 |
| 70 | 84 | 154 | 224 | 287 | 350 | 520 | 595 | 695 | | | | 875 |
| 80 | 91 | 161 | 231 | 294 | 357 | 530 | 625 | 720 | 800 | | | 980 |
| 90 | 98 | 168 | 238 | 301 | 364 | 545 | 645 | 750 | 845 | | | 1085 |
| 100 | 105 | 182 | 245 | 308 | 373 | 560 | 670 | 775 | 895 | 1020 | | 1190 |
| 125 | 112 | 189 | 266 | 336 | 406 | 610 | 735 | 845 | 965 | 1120 | | 1440 |
| 150 | 112 | 203 | 287 | 371 | 455 | 670 | 805 | 930 | 1055 | 1220 | 1290 | 1710 |
| 175 | 119 | 238 | 315 | 399 | 497 | 735 | 880 | 1010 | 1140 | 1330 | 1400 | 1960 |
| 200 | 126 | 259 | 336 | 435 | 530 | 800 | 960 | 1080 | 1230 | 1440 | 1510 | 2225 |
| 250 | 140 | 273 | 413 | 530 | 670 | 1020 | 1205 | 1345 | 1505 | 1700 | 1765 | 2630 |
| **2-inch Regulators** | | | | | | | | | | | | |
| 30 | 80 | 144 | 200 | 256 | 312 | 424 | | | | | | 530 |
| 40 | 80 | 152 | 224 | 280 | 352 | 496 | | | | | | 650 |
| 50 | 88 | 160 | 240 | 312 | 384 | 570 | | | | | | 770 |
| 60 | 96 | 168 | 248 | 320 | 392 | 575 | 650 | 735 | | | | 880 |
| 70 | 96 | 176 | 256 | 328 | 400 | 590 | 680 | 790 | | | | 1000 |
| 80 | 104 | 184 | 264 | 336 | 408 | 610 | 710 | 825 | 910 | | | 1120 |
| 90 | 112 | 192 | 272 | 344 | 416 | 625 | 735 | 855 | 965 | | | 1240 |
| 100 | 120 | 208 | 280 | 352 | 424 | 640 | 770 | 890 | 1025 | 1170 | | 1360 |
| 125 | 128 | 216 | 304 | 384 | 464 | 695 | 840 | 970 | 1105 | 1280 | | 1650 |
| 150 | 128 | 232 | 328 | 424 | 520 | 770 | 920 | 1065 | 1210 | 1390 | 1470 | 1950 |
| 175 | 136 | 272 | 360 | 456 | 570 | 840 | 1010 | 1150 | 1305 | 1520 | 1600 | 2240 |
| 200 | 144 | 296 | 384 | 496 | 610 | 910 | 1095 | 1230 | 1410 | 1650 | 1730 | 2545 |
| 250 | 160 | 312 | 472 | 610 | 770 | 1170 | 1375 | 1535 | 1720 | 1945 | 2015 | 3010 |

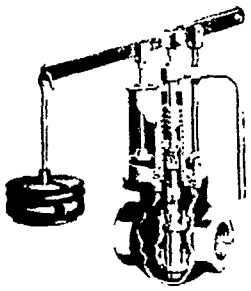
# Klipfel Pressure Reducing Valves

Maximum Inlet Pressures

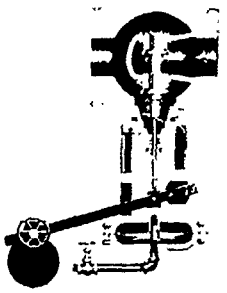
| Valve Ends | Steam 475° F., Max. | *Water, Air, or Gas |
|---|---|---|
| Screwed | 200 pounds | 200 pounds |
| Standard Flanged | 125 pounds | 150 pounds |
| Extra Heavy Flanged | 250 pounds | 300 pounds |

*Water, air, and gas ratings do not apply to the No. 1 Valve.

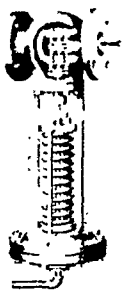
***Prices on application***



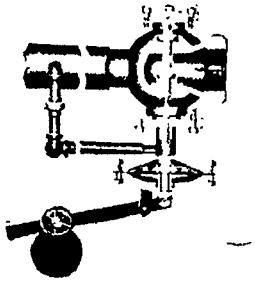
No. 1, For Steam Only (Piston Type)
10 to 150 pounds reduced pressure



No. 38, For Steam, Water, Air, or Gas
Vacuum to medium reduced pressures



No. 300, For Steam, Water, Air, or Gas
10 to 75 pounds reduced pressure



No. 310, For Steam, Water, Air, or Gas
Vacuum to 20 pounds reduced pressures

31

**Range of sizes:** All valves are furnished with screwed ends in sizes ⅜ to 3-inch and with standard or extra heavy flanged ends in sizes 2 to 6-inch. Nos. 38 and 310 are also available with standard or extra heavy flanged ends in sizes 8 to 12-inch. End flanges on flanged valves are furnished faced and drilled.

**Materials:** These valves have a bronze body in sizes 1½-inch and smaller and a semi-steel body in sizes 2-inch and larger. All sizes are bronze trimmed.

**No. 1:** No. 1, for steam only, has a long water-sealed piston which is balanced between the reduced pressure in the valve outlet and the weighted lever. The oil-filled dashpot insures steady operation. The desired reduced pressure should be specified so that the right piston size and correct number of weights can be furnished. The inner valve has a close sliding fit in the seats.

***Operation:*** Steam enters at the right end of the body and flows through the ports of the balanced inner valve into the outlet chamber where its pressure balances the piston against the weight and lever. Any rise or fall in reduced pressure moves the piston which gradually closes or opens the valve until normal pressure is restored.

**No. 38:** This valve is suitable for ordinary fluids, not injurious to a rubber diaphragm, for reduced pressures ranging from vacuum up to 45 pounds, depending on the valve size. The diaphragm chamber is separated from the valve body for cooler operation of the diaphragm on steam lines. The valve may be used as a steam pump governor by connecting the feeler pipe from the pump discharge to the diaphragm chamber. The double seated inner valve is almost tight closing. This valve will also operate in the inverted position.

***Operation:*** Used as a reducing valve, a feeler pipe with a restricting valve connects the tapped opening in the diaphragm chamber to the outlet pipe. The weight on the left end of the lever holds the valve open until the reduced pressure is sufficient to raise the diaphragm and close the valve. Regardless of changes in initial pressure, a constant reduced pressure is maintained as it must always balance the diaphragm against the constant force exerted by the weight and lever.

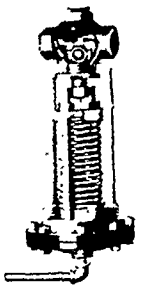
**No. 300:** This valve is well adapted for use on steam, water, or air where infrequent adjustment is required. The springs are made extra long and compressed nearly solid when installed. Much more accurate regulation at a specified pressure is obtained in this way than is possible with a short spring or one only partly compressed. Interchangeable springs of different gauge wire are available, each for the best regulation within a moderate range of adjustment. Adjustment of the reduced pressure is accomplished by turning the nuts on the side rods.

***Operation:*** The spring holds the valve fully open until the reduced pressure transmitted from the outlet pipe through the feeler pipe is sufficient to force the diaphragm down and partially close the valve. Any change in reduced pressure moves the diaphragm and inner valve in a direction to restore the normal set pressure. The valve will operate just as well in an inverted position.

**No. 310:** This valve is suitable for handling any ordinary fluid, not injurious to a rubber diaphragm, for reduced pressures ranging from vacuum up to 20 pounds. It is widely used for low pressure steam or vacuum heating. The large area of the diaphragm and the absence of packing box friction promote sensitive and accurate regulation regardless of changes in inlet pressure and required capacity. When used for cold fluids, this valve may be inverted.

***Operation:*** The reduced pressure, transmitted to the diaphragm through a feeler pipe in sizes 3-inch and larger (illustrated) or through a diagonal drilled hole in the body in smaller sizes, balances the diaphragm against the force exerted by the weight and lever. Any rise in this pressure moves the inner valve toward the closed position. A drop in outlet pressure allows the valve to open farther. The reduced pressure is raised by adding more weights on the lever.

# Klipfel Ball-Type Pressure Reducing Valves



No. 400
Spring Loaded
For 10 to 75 pounds
reduced pressure

No. 410, Single Lever
For vacuum to 20 pounds
reduced pressure

No. 411, Twin Levers
For 0 to 40 pounds
reduced pressure

| Valve Ends | Steam 475° F., Max. | Water, Air, or Gas |
|---|---|---|
| Screwed | 200 pounds | 200 pounds |
| Standard Flanged | 125 pounds | 150 pounds |
| Extra Heavy Flanged | 250 pounds | 300 pounds |

***Prices on application***

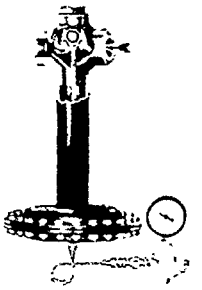
These valves embody many improvements contributing to close regulation of reduced pressure, increased capacity, tight closing, and durability. Their ball is free to seat perfectly. Grinding-in is never required. The streamlined form of the opening between the ball and seat and the large body passages permit a great volume of flow. The seat is beveled at a sharp angle to fit the ball tightly along a narrow line of contact. The guides are integral with the seat.

The internal Pitot tube control in Nos. 410, 411, 431, and 432 Valves avoids the use of an external feeler pipe. The Pitot tube, rather than an external feeler pipe, is more satisfactory for most applications.

**Range of sizes:** The valves are available with screwed ends in sizes 3/8 to 2½-inch and with standard or extra heavy flanged ends in sizes 2 and 2½-inch. End flanges on flanged valves are faced and drilled.

**Materials:** The valves have a bronze body in sizes 1½-inch and smaller; larger sizes have a semi-steel body. All sizes have a stainless steel ball and a stainless steel or Monel seat. No. 400 has a semi-steel bracket and diaphragm chamber. The other valves have a wrought steel water leg, diaphragm chamber, or air dome.

No. 431
Air Loaded—Dome Type
For 5 to 150 pounds
reduced pressure



No. 432
Air Loaded—Pilot Controlled
For 0 to 150 pounds
reduced pressure

**No. 400:** In this valve, several interchangeable springs are available, each adapted to handle a limited portion of the 10 to 75-pound reduced pressure range. The bracket is attached directly to the body in all sizes for increased strength and rigidity. The valve will operate in any position.

***Operation:*** The spring holds the valve open until the reduced pressure, transmitted through the feeler pipe, is great enough to move the diaphragm and force the ball to the seat.

**No. 410:** This valve is recommended for steam heating service, process work, and other applications where reduced pressures from 5 to 20 pounds are required. When so ordered, the lever can be arranged for vacuum service. The reduced pressure is adjusted by changing the weights on the lever.

***Operation:*** The diaphragm is balanced between the loading force exerted by the weight and the reduced pressure transmitted through the diagonal Pitot tube from the body outlet into the water leg. Any increase or decrease in the reduced pressure induces the diaphragm to close or open the valve until the normal pressure is restored and the diaphragm is once again in balance.

**No. 411:** This valve is the same as the No. 410 except it is equipped with two independent levers for symmetrical distribution of loading on reduced pressures up to 40 pounds.

**No. 431:** This improved dome type valve can accommodate reduced pressures from 5 to 150 pounds by merely changing the air pressure pumped into the dome to equal the desired reduced pressure. The accuracy and sensitivity of regulation is uniform over the entire range of adjustment.

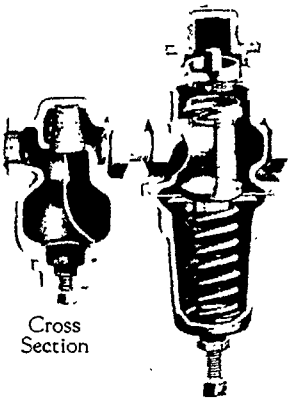
***Operation:*** The tank or dome is filled with air to the required pressure by an ordinary tire pump. The elastic pressure of air (or other gas) confined in the tank or dome is utilized to load the diaphragm and balance it against the reduced pressure.

**No. 432:** This valve is recommended for use where the reduced pressure must be changed frequently. When connected to a source of compressed air at sufficiently high pressure, the pilot valve is adjusted to maintain a loading pressure on the diaphragm equal to the desired reduced pressure. This valve is convenient for remote control.

The complete valve includes pressure gauge, 6 feet of copper tubing, fittings, Schrader air valve, and pilot valve, where such parts are required.

***Operation:*** A small, adjustable pilot valve maintains a constant air pressure under the diaphragm equal to the desired reduced pressure. The Pitot tube produces a sucking effect which lowers the pressure in the water leg as the flow increases, thereby causing the valve to open more and deliver a slightly rising pressure as the demand increases.

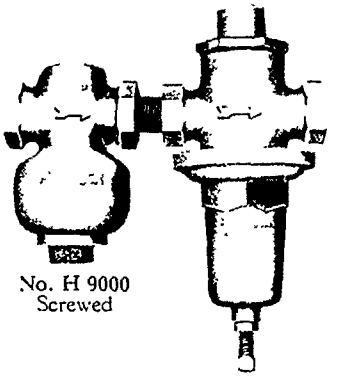
# Mueller Pressure Regulators



Cross Section

**Service recommendations:** The No. H 9000 Regulators, suitable for use on hot and cold water, air, oil, and other fluids, are particularly adapted for industrial service.

**Pressure range:** The valves are regularly made for initial pressures from 40 to 250 pounds and delivery pressures from 25 to 75 pounds. They can be furnished to order for any initial pressure up to 300 pounds or for delivery pressures from 5 to 125 pounds (special springs required). The valves are set for 45 pounds delivery pressure unless otherwise ordered. Orders should specify catalog number, size, inlet and outlet pressures, and service.



No. H 9000
Screwed

**Construction:** These regulators are furnished with strainers, completely assembled. The regulating valve, made entirely of bronze (2½-inch size has an iron body), features a full seat opening and can supply a full volume of water at the reduced pressure. The special composition diaphragm will withstand a pressure of 800 pounds. A special composition disc is not affected by hot water. The removable seat ring, disc, and diaphragm make repair possible without removing the valve from the line.

**Dimensions, in Inches**

| Size | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ |
|---|---|---|---|---|---|---|---|---|---|
| End to end, assembly | 5 1/16 | 6⅜ | 7 7/16 | 8 15/16 | 9 13/16 | 12 11/16 | 14½ | 17⅜ | 20 |
| Center to top | 1 7/16 | 2¼ | 2¼ | 3½ | 3⅛ | 3½ | 4 1/16 | 4 13/16 | 5⅜ |
| Center to bottom | 4 15/16 | 5½ | 7 1/16 | 8 | 8 1/16 | 10 5/16 | 10 13/16 | 14 3/16 | 16¼ |

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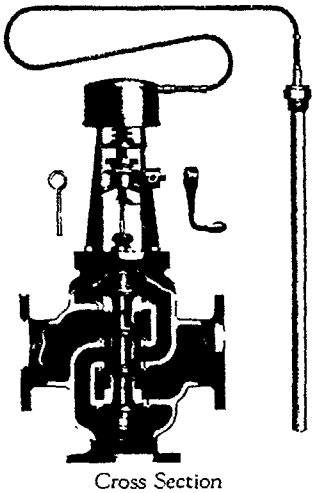
# Fulton Sylphon Temperature Regulators



Cross Section
No. 923-3
(Shown with Type "WB" Valve)

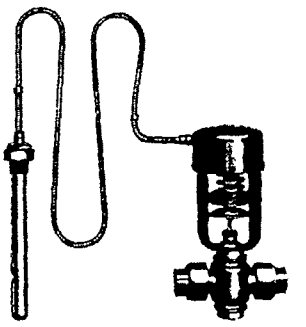
No. 923-3 have a bronze body and trim (cast iron body on 6-inch size). They can be manually operated independently of the regulator thermostat by means of a crank.

No. 923-3 Regulators are used to control the circulation of cooling water through the jacket of internal combustion engines. Sizes ½ to 1½-inch have a three-way type "WC" Valve; larger sizes have a three-way type "WB" Valve.

No. 999 Regulators are used for heating, ventilating, storage water heaters, industrial process temperature control, etc.

Both regulators are available for temperatures ranging from 40° to 420° F. and are adjustable between limits of any selected range. They are regularly equipped with a copper bulb having brass fittings and eight feet of brass armored, copper connecting tube (other lengths furnished to order).

**Automatic radiator valves** (not illustrated): Valves to automatically control the supply of steam to radiators include No. 885 Valves for exposed type radiators and No. 895 Valves, for concealed type radiators. Both are furnished in sizes ½ to 1½-inch for steam pressures up to 15 pounds.



No. 999

No. 999 have a stainless steel frame. They are available with bronze or stainless steel trim, direct or reverse-acting valve, and a thermometer mounted on the regulator head; specify on order.

**Valve Sizes and *Maximum Pressures (Pounds)**

| Valve Size Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 923-3 | | | 100 | 60 | 35 | 25 | 15 | 35 | 65 | 85 | 60 | 50 | 40 |
| No. 999 | 250 | 250 | 250 | 250 | 250 | 250 | 225 | 85 | 65 | 55 | 40 | | |

*Indicates pressure drop across valve.

*Prices on application*

# Air Vent or Water Drain Valves

## Ball Float Type

(Patent Pending)

### List Prices, Dimensions, and Continuous Discharge Capacities at 70° F.

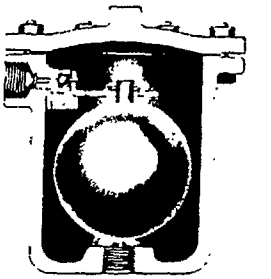
| Catalog No. | | No. 976 | | No. 977 | |
|---|---|---|---|---|---|
| List Price | Each | 17.00 | | 34.50 | |
| Pipe Size | In | 1/2 | | 3/4 | |
| Height | In | 6 3/8 | | 7 3/8 | |
| Diameter | In. | 5 5/8 | | 7 1/2 | |
| Orifice Size | In | 5/32 | 5/64 | 3/16 | 3/32 |
| Seat Number | | 11A | 14A | 23A | 26A |
| *Effective Seat Pressure Pounds per Square Inch | | Capacities as Air Vent Valve Cubic Feet of Free Air per Minute | | | |
| 1 | | 2.3 | | 3.3 | |
| 2 to 4 | | 3.2 | | 4.6 | |
| 5 to 9 | | 5.0 | | 7.2 | |
| 10 to 14 | | 7.0 | 1.8 | 10.0 | 2.6 |
| 15 to 19 | | 8.7 | 2.2 | 12.3 | 3.1 |
| 20 to 24 | | 10.0 | 2.5 | 14.4 | 3.7 |
| 25 to 29 | | 11.6 | 2.9 | 16.5 | 4.2 |
| 30 | | 13.0 | 3.3 | 18.6 | 4.7 |
| 31 to 39 | | | 3.3 | | 4.7 |
| 40 to 49 | | | 4.0 | | 5.8 |
| 50 to 74 | | | 4.7 | | 6.8 |
| 75 to 99 | | | 6.6 | | 9.4 |
| 100 to 124 | | | 8.4 | | 12.0 |
| 125 to 149 | | | 10.2 | | 14.7 |
| 150 | | | 12.0 | | 17.3 |
| *Effective Seat Pressure Pounds per Square Inch | | Capacities as Water Drain Valve Pounds Water per Hour (Inverted Position) | | | |
| 1 | | 270 | | 385 | |
| 2 to 4 | | 370 | | 535 | |
| 5 to 9 | | 575 | | 830 | |
| 10 to 14 | | 785 | 195 | 1130 | 280 |
| 15 to 19 | | 955 | 240 | 1380 | 345 |
| 20 to 24 | | 1090 | 275 | 1575 | 390 |
| 25 to 29 | | 1225 | 305 | 1765 | 440 |
| 30 | | 1320 | 330 | 1905 | 475 |
| 31 to 39 | | | 330 | | 475 |
| 40 to 49 | | | 380 | | 545 |
| 50 to 74 | | | 420 | | 605 |
| 75 to 99 | | | 510 | | 710 |
| 100 to 124 | | | 575 | | 825 |
| 125 | | | 650 | | 930 |

*Effective seat pressure is the net difference between the inlet and outlet pressures.

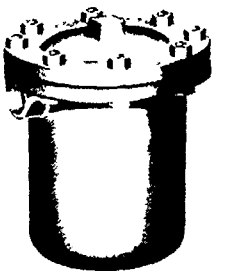
**RANGE OF WORKING PRESSURES**

As Air Vent Valve
1 to 30 pounds or 10 to 150 pounds
(Maximum pressure is marked on cap)

As Water Drain Valve
1 to 30 pounds or 10 to 125 pounds



Cross Section



No. 976 or No. 977

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*See page 344 for installation suggestions.*

These simple, efficient, and economical devices automatically remove air from water piping, oil piping, and pressure vessels, or water or oil from compressed air systems. They should not be used on steam lines.

**Air vent valve:** To remove air from water or oil-laden systems, the valve should be installed at the highest point in the system where air will collect. Normally the valve is filled with water or oil; as the air accumulates, it displaces the liquid in the body causing the float to drop and the valve to open. As the air is discharged and the water or oil re-enters the body, the float rises and closes the valve to prevent the escape of the liquid.

**Water drain valve:** To remove water or oil from air-laden systems, the valve must be installed in an inverted position (with cap down) at the lowest point in the system. The cycle of operation is the reverse of that described in the paragraph above. It is recommended that a sediment separator be installed in the line leading to the drain valve (see typical installation on page 344); for description of sediment separators, see pages 356 and 357.

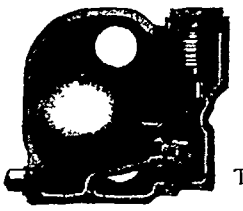
**Materials:** The valves are ruggedly constructed. Their body and cap are cast iron; the joint is fitted with a Cranite gasket and is bolted. The ball-type disc, made of 16 to 18 per cent chromium steel, is guided to an Exelloy seat. The ball float is copper.

**Capacity and pressure range:** Each valve is furnished with one of two sizes of seat orifices. The size of the orifice determines both the discharge capacity at various effective seat pressures and the pressure range of the valve, as indicated in the table at the left.

**Selecting the proper valve:** Select a valve on the basis of its capacity. To assure intermittent discharge, allow an ample factor of safety (at least 2 to 1) between the maximum capacity required for the system and the continuous discharge capacity of the valve.

**Ordering:** Orders must specify the catalog number, the maximum operating pressure, and either the orifice size or seat number.

# Float and Thermostatic Traps



50 Series Float and Thermostatic Trap

These Hoffman Traps find wide application in steam heating installations. The 50 Series Float Trap (not illustrated) is used for removing condensate only; the 50 Series Float and Thermostatic Trap (illustrated at the left) has both a float mechanism for removing condensate and a thermostatic element, permitting air to by-pass to the trap outlet to avoid air binding. The traps are made in sizes 3/4 to 2-inch, with capacities up to 12,000 pounds of condensate per hour; prices and additional information will be furnished on request.

# Installation of Steam Traps and Air Vent or Water Drain Valves

***Use Crane Plug Type Disc Globe or Angle Valves for all throttling service.***

Crane Inverted Open Float Steam Traps, Air Vent Valves and Water Drain Valves can only be used for discharging to regions where the pressure is less than that in the trap or valve. They can be used to discharge into a back pressure or vacuum, but the pressure rating of the trap or valve must be greater than, (a) the difference between the back pressure and the inlet pressure, or (b) the sum of the vacuum and the inlet pressure. For complete description, capacities, etc., see pages 343 and 345 to 347.

These products are thoroughly and carefully tested before shipment. Properly selected and installed, they will give many years of satisfactory and efficient service. The illustrations on this page show a preferred, typical piping arrangement for each of these products, so designed that the trap or valve is accessible for the periodic inspection and cleaning that usually accompanies the use of any automatic device.

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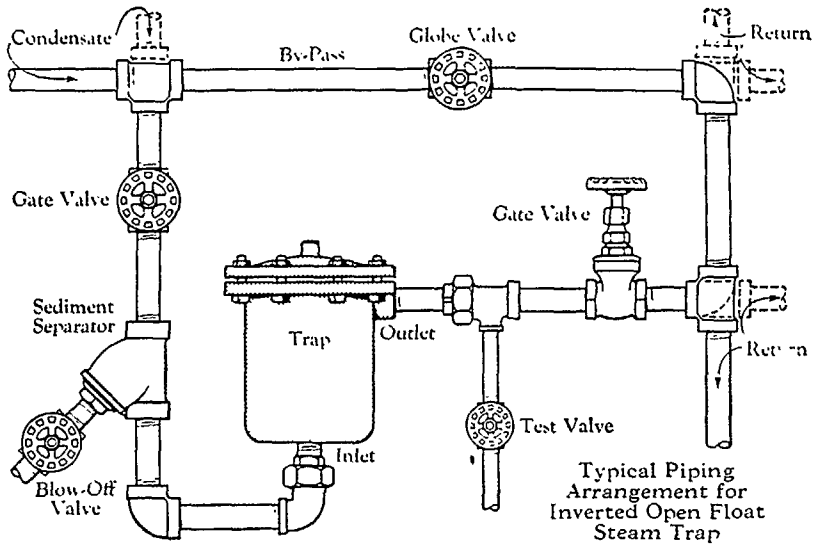
***Blow new lines clear of all foreign matter before installing traps, air vent valves, or water drain valves.***

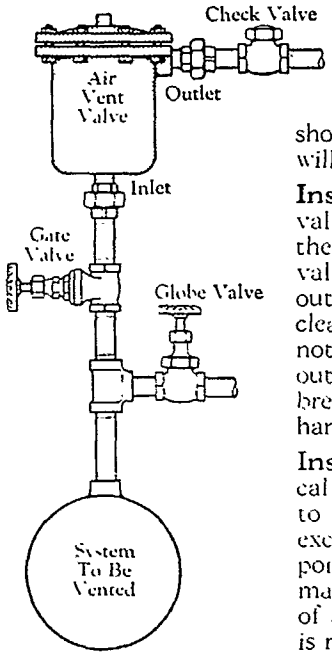



Typical Piping Arrangement for Inverted Open Float Steam Trap

**Installation of Steam Traps:** Wherever possible, install the trap below the lowest point in the system, with the line leading to the trap pitched downward to assure good drainage. Use a sediment separator just ahead of the trap to prevent scale, sediment, and other foreign matter from entering the trap and interfering with proper operation; a valve on the separator will make it possible to periodically blow-out accumulated foreign matter. The gate valves in the inlet and outlet lines, when shut, permit isolating the trap for inspection and cleaning. If only the gate valve in the outlet line is closed, the test valve can be opened to observe the operation of the trap; if the trap is functioning properly, there will be no flow of water between periods of discharge, nor any flow of steam. A by-pass line with a globe valve makes it possible to rid the system of condensate by hand throttling while the trap is out of service. A check valve (not illustrated) should be used in the outlet or return line where two or more traps are discharging into a common line; should one trap be shut down, the check valve will prevent back-flow from the remaining units.

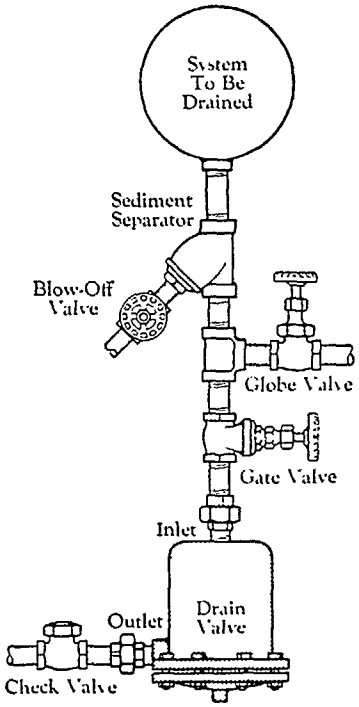
**Installation of Air Vent Valves:** Install the valve at the highest point in the system, pitching the inlet line upward to the vent valve. A gate valve in the inlet line and the check valve in the outlet make it possible to isolate the valve for cleaning and inspection. The check valve will not allow air to pass back into the system; without it, the air vent valve will also act as a vacuum breaker. The globe valve permits venting by hand throttling when the gate valve is shut.

**Installation of Water Drain Valves:** The typical installation for the water drain valve is similar to that of the air vent valve described above except inverted, with the valve at the lowest point in the system. In addition, since foreign matter will tend to collect at low points, the use of a sediment separator with blow-off valve also is recommended.




Typical Piping Arrangement for Air Vent Valve

***Do not install an air vent or water drain valve where it can freeze.***



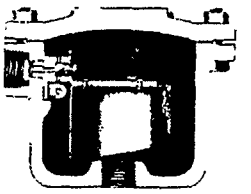

Typical Piping Arrangement for Water Drain Valve

# Inverted Open Float Steam Traps

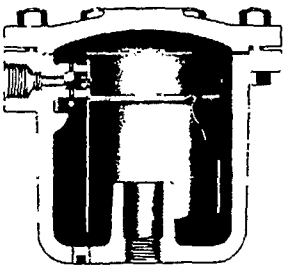
Patented

## General Description

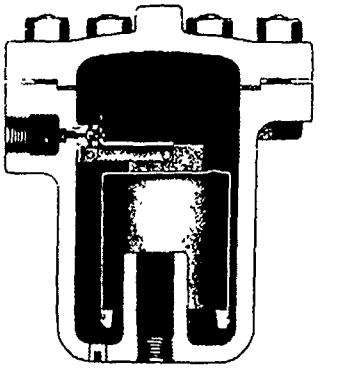
Fuel is wasted and efficiency greatly reduced unless condensate is drained from steam lines as rapidly as it accumulates. At the same time, the practice of recovering condensate for heating, for hot water needs, or for return to boilers saves many fuel dollars.



No. 9810



No. 9812



No. 9820

*Typical cross sections of Crane Inverted Float Steam Traps*

Both of these operations are performed efficiently and economically with Crane Inverted Open Float Steam Traps. They provide a simple, trouble-free method for removing condensate from steam piping, separators, and all types of steam heated equipment.

**Construction:** These traps are small and compact, but have high discharging capacities and are free from complex operating mechanisms. They are extremely simple, having only one major moving part, the float, which actuates the disc through a simple lever. The disc is ball-type and is guided to its seat; it holds pressure easily. The body has an internal inlet nozzle which retains the water seal and precludes the possibility of live steam passing through the trap. A small hole in the top of the float allows air and other non-condensable gases to accumulate at the top of the trap.

The cover or cap is bolted to the body, the joint being fitted with a Cranite gasket. ½-inch traps have a 1/16-inch raised face on the body and cap; larger sizes have a male and female joint. Bolts are arranged so that the cap can be assembled in one position only, at which the word "Outlet" on the cap is directly over that opening on the side of the body.

**Materials:** On the Nos. 9810, 9811, 9812, 9813, and 9814 Traps the body and cap are made of cast iron; On the Nos. 9820 and 9821, these parts are Ferrosteel. All traps have a renewable Exelloy seat bushing and fulcrum rod, and a 10 per cent to 18 per cent chromium steel ball disc; these parts have excellent resistance to wear, erosion, and corrosion. The float, lever, and lever supports are made of brass, copper, or other non-corrosive materials. The traps are unusually strong and durable.

**Capacity:** The capacity of any trap depends upon the effective seat pressure and the orifice size. The only force available to open the disc against the effective seat pressure in the trap is the weight of the float multiplied by the lever arm attached to the disc, and this is a fixed quantity for any one trap. As the effective seat pressure is increased, the orifice area must be decreased. If the area is too large, the trap will fail to function. If the area is too small, the trap will function properly, but its capacity will be reduced.

Each trap is furnished with one of several sizes of seat orifices. Since both the capacity of the trap and the maximum pressure at which it can be used depend upon the size of the seat orifice, care should be exercised when ordering to see that both pressure and capacity are considered. See pages 346 and 347.

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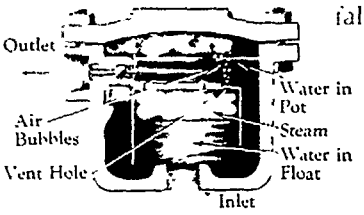
## Operation

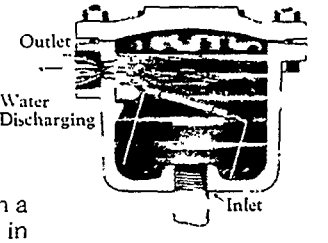



*Trap Closed*

Incoming steam under the float buoys the float up keeping the outlet closed

These traps are actuated solely by the rise and fall of the float resting on the accumulated condensate. The float is buoyant when filled with incoming steam and the discharge valve is closed. When incoming condensate floods the float, it sinks, thereby opening the valve and permitting the condensate to be discharged by the effective pressure.

Air or other non-condensable gas vents through a small hole in the top of the float and collects in the upper part of the trap. At each operation, this air or gas is discharged. The entire cycle of operation is practically instantaneous. If the condensate accumulates at a rate equal to the trap capacity, continuous discharge may occur; for these conditions a larger capacity trap should be used.



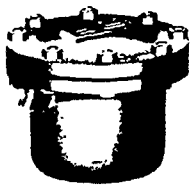

*Trap Open*

Incoming condensate fills the float, sinks it, and opens the outlet.

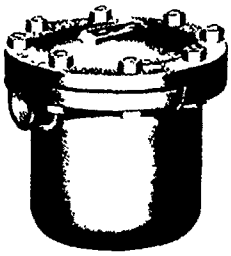
*Suggestions for installing traps* . *page 344*
*List prices, pressures, and dimensions* *page 346*
*Capacities* . . . . . *page 347*
*Sediment Separators* . . *pages 356 and 357*

# Inverted Open Float Steam Traps

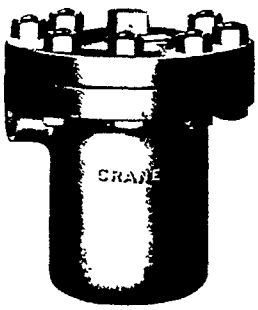
(Patented)



No. 9810



No. 9811
No. 9812
No. 9813
No. 9814




No. 9820
No. 9821

RANGE OF WORKING PRESSURES
1 to 300 pounds saturated steam

**How to order:** Each trap is furnished with one of several sizes of seat orifices. Since both the capacity of the trap and the maximum pressure at which it can be used depend upon the size of the seat orifice, care must be exercised when selecting a trap to be sure that it will satisfy the needs of the installation. Capacities are shown on the opposite page; orifice sizes, maximum pressures, and seat numbers are shown in the table at the right.

When ordering, be sure to specify the catalog number and the maximum pressure. If the maximum pressure is not included, the order should state either the orifice size or the seat number.

### List Prices and Dimensions

| Catalog No. of Trap | List Price Each | Dimensions, in Inches: Pipe Size | Height | Diameter |
|---|---|---|---|---|
| No. 9810 | 13.50 | 1/2 | 4 1/2 | 5 3/8 |
| No. 9811 | 21.00 | 1/2 | 7 3/8 | 7 1/2 |
| No. 9812 | 21.00 | 3/4 | 7 3/8 | 7 1/2 |
| No. 9813 | 33.50 | 3/4 | 11 | 8 1/2 |
| No. 9814 | 50.00 | 1 | 12 3/16 | 8 3/4 |
| No. 9820 | 37.50 | 3/4 | 9 5/8 | 8 3/8 |
| No. 9821 | 65.00 | 1 | 11 15/16 | 9 7/8 |

### Orifice Sizes, Maximum Pressures, and Seat Numbers

| Catalog No. of Trap | Size of Orifice, Inches | Maximum Pressure (Marked on Trap), Psi | Seat Number |
|---|---|---|---|
| No. 9810 | .059 | 150 | 16A |
| | 1/16 | 125 | 15A |
| | 5/64 | 75 | 14A |
| | 3/32 | 50 | 13A |
| | 1/8 | 30 | 12A |
| | 5/32 | 15 | 11A |
| | 3/16 | 5 | 10A |
| No. 9811 and No. 9812 | 3/32 | 200 | 26A |
| | 1/8 | 150 | 25A |
| | 5/32 | 100 | 24A |
| | 3/16 | 50 | 23A |
| | 1/4 | 30 | 22A |
| | 5/16 | 15 | 21A |
| | 11/32 | 5 | 20A |
| No. 9813 | 5/32 | 200 | 38A |
| | 3/16 | 150 | 37A |
| | 7/32 | 100 | 36A |
| | 5/16 | 50 | 34A |
| | 3/8 | 30 | 33A |
| | 1/2 | 15 | 32A |
| | 5/8 | 5 | 31A |
| No. 9814 | 7/32 | 200 | 36A |
| | 1/4 | 150 | 35A |
| | 5/16 | 100 | 34A |
| | 3/8 | 50 | 33A |
| | 1/2 | 30 | 32A |
| | 5/8 | 15 | 31A |
| | 11/16 | 5 | 30A |
| No. 9820 | 3/32 | 300 | 13A |
| | 1/8 | 250 | 12A |
| No. 9821 | 5/32 | 300 | 24A |
| | 3/16 | 250 | 23A |

**Capacity:** Pipe size is not a measure of the capacity of a trap to discharge condensate or water. Capacity is determined by the design and construction of the trap, the size of the orifice, and the effective seat pressure. Crane Inverted Open Float Steam Traps have large capacity, as shown on the opposite page; they should be selected on the basis of their ability to discharge the maximum rate of condensation expected in the system.

**Safety factor:** Since condensate loads are difficult to determine and since intermittent discharge is preferred to continuous discharge, it is necessary to select a trap which allows some factor of safety between its actual continuous discharge capacity and the condensation rate of the system. A 2 to 1 safety factor is the smallest recommended, and selecting traps with three or four times more capacity than is expected is often considered good practice. Where heavy condensate loads must be discharged in a short time, as during warming-up periods, the selection of the trap should be based on the period in minutes in which it will be necessary to evacuate the condensate.

**Maximum pressure:** The maximum pressure at which each orifice for each trap will operate is shown in the large table on this page and also across the top of the table on the opposite page; this pressure is stamped on the cover of the trap. The traps will operate at the lower pressures for which capacities are given, but not at pressures higher than the maximum.

**Effective seat pressure:** The effective seat pressure, also known as "differential pressure", is the net difference between the inlet and outlet pressures on the trap. To determine the effective seat pressure, subtract the outlet pressure from the inlet pressure; when discharging into a vacuum, the effective seat pressure is the inlet pressure plus 1 pound for each 2 inches of vacuum. Where the inlet and outlet pressures vary, use the minimum effective seat pressure to determine the size of orifice for the capacity required, and use the maximum effective seat pressure to determine the maximum pressure of the trap.

*General description and operation . . . page 345*
*Suggestions for installation . . page 344*
*Capacities . . . . . page 347*

| Effective Seat Pressure Lbs. per Sq. in. | | No. 9810 | | | | | | | No. 9811 and No. 9812 | | | | | | | No. 9813 | | | | | | | No. 9814 | | | | | | | No. 9820 | | No. 9821 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Orifice Size, Inches | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | .059 | 1/16 | 5/64 | 3/32 | 1/8 | 5/32 | 3/16 | 3/32 | 1/8 | 5/32 | 3/16 | 1/4 | 5/16 | 11/32 | 5/32 | 3/16 | 7/32 | 5/16 | 3/8 | 1/2 | 5/8 | 7/32 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 11/16 | 3/32 | 1/8 | 5/32 | 3/16 |
| | | Maximum Pressure Pressure Marking on Trap | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 150 | 125 | 75 | 50 | 30 | 15 | 5 | 200 | 150 | 100 | 50 | 30 | 15 | 5 | 200 | 150 | 100 | 50 | 30 | 15 | 5 | 200 | 150 | 100 | 50 | 30 | 15 | 5 | 300 | 250 | 300 | 250 |
| 1 | | | | | | | | 385 | | | | | | | 1300 | | | | | | | 4295 | | | | | | | 5200 | | | |
| 2 | 3 & 4 | | | | | 240 | 370 | 535 | | | | | 955 | 1490 | 1805 | | | | | | 3815 | 5970 | | | | | 3815 | 5970 | 7225 | | | | |
| 5 | | | | 145 | 205 | 370 | 575 | 830 | | | 575 | 830 | 1475 | 2300 | 2785 | | | | 2300 | 3315 | 5890 | 9205 | | | 2300 | 3315 | 5890 | 9205 | 11135 | | | | |
| | 6 to 9 | | | 145 | 205 | 370 | 575 | | | | 575 | 830 | 1475 | 2300 | | | | | 2300 | 3315 | 5890 | | | | 2300 | 3315 | 5890 | 9205 | | | | | |
| 10 | 11 to 14 | 110 | 125 | 195 | 280 | 500 | 785 | | | 500 | 785 | 1130 | 2015 | 3145 | | | | 1540 | 3145 | 4530 | 8050 | | 1540 | 2015 | 3145 | 4530 | 8050 | 12580 | | | | | |
| 15 | | 135 | 155 | 240 | 345 | 615 | 955 | | 345 | 615 | 955 | 1380 | 2455 | 3835 | | | 1380 | 1880 | 3835 | 5520 | 9815 | | 1880 | 2455 | 3835 | 5520 | 9815 | 15340 | | | | | |
| | 16 to 19 | 135 | 155 | 240 | 345 | 615 | | | 345 | 615 | 955 | 1380 | 2455 | | | | 1380 | 1880 | 3835 | 5520 | | | 1880 | 2455 | 3835 | 5520 | 9815 | | | | | | |
| 20 | 21 to 24 | 155 | 175 | 275 | 390 | 700 | | | 390 | 700 | 1090 | 1575 | 2800 | | | 1090 | 1575 | 2140 | 4370 | 6295 | | | 2140 | 2800 | 4370 | 6295 | 11190 | | | | | | |
| 25 | 26 to 29 | 175 | 195 | 305 | 440 | 785 | | | 440 | 785 | 1225 | 1765 | 3140 | | | 1225 | 1765 | 2405 | 4895 | 7060 | | | 2405 | 3140 | 4895 | 7060 | 12540 | | | | 785 | | 1765 |
| 30 | | 185 | 210 | 330 | 475 | 850 | | | 475 | 850 | 1320 | 1905 | 3385 | | | 1320 | 1905 | 2595 | 5290 | 7620 | | | 2595 | 3385 | 5290 | 7620 | 13350 | | | | 850 | | 1905 |
| | 31 to 39 | 185 | 210 | 330 | 475 | | | | 475 | 850 | 1320 | 1905 | | | | 1320 | 1905 | 2595 | 5290 | | | | 2595 | 3385 | 5290 | 7620 | | | | | 850 | | 1905 |
| 40 | 41 to 49 | 215 | 245 | 380 | 545 | | | | 545 | 970 | 1550 | 2180 | | | | 1550 | 2180 | 2970 | 6060 | | | | 2970 | 3880 | 6060 | 8725 | | | | 545 | 970 | 1550 | 2180 |
| 50 | | 240 | 270 | 420 | 605 | | | | 605 | 1075 | 1690 | 2430 | | | | 1690 | 2430 | 3310 | 6735 | | | | 3310 | 4320 | 6735 | 9710 | | | | 605 | 1075 | 1690 | 2430 |
| | 51 to 59 | 240 | 270 | 420 | | | | | 605 | 1075 | 1690 | | | | | 1690 | 2430 | 3310 | | | | | 3310 | 4320 | 6735 | | | | | 605 | 1075 | 1690 | 2430 |
| 60 | 61 to 74 | 260 | 295 | 460 | | | | | 660 | 1175 | 1840 | | | | | 1840 | 2650 | 3610 | | | | | 3610 | 4715 | 7365 | | | | | 660 | 1175 | 1840 | 2650 |
| 75 | | 285 | 325 | 510 | | | | | 710 | 1295 | 2030 | | | | | 2030 | 2915 | 3975 | | | | | 3975 | 5190 | 8095 | | | | | 710 | 1295 | 2030 | 2915 |
| | 76 to 89 | 285 | 325 | | | | | | 710 | 1295 | 2030 | | | | | 2030 | 2915 | 3975 | | | | | 3975 | 5190 | 8095 | | | | | 710 | 1295 | 2030 | 2915 |
| 90 | 91 to 99 | 310 | 355 | | | | | | 795 | 1410 | 2205 | | | | | 2205 | 3175 | 4320 | | | | | 4320 | 5645 | 8820 | | | | | 795 | 1410 | 2205 | 3175 |
| 100 | | 325 | 370 | | | | | | 825 | 1470 | 2300 | | | | | 2300 | 3305 | 4505 | | | | | 4505 | 5880 | 9170 | | | | | 825 | 1470 | 2300 | 3305 |
| | 101 to 124 | 325 | 370 | | | | | | 825 | 1470 | | | | | | 2300 | 3305 | | | | | | 4505 | 5880 | | | | | | 825 | 1470 | 2300 | 3305 |
| 125 | | 365 | 415 | | | | | | 930 | 1655 | | | | | | 2590 | 3725 | | | | | | 5075 | 6625 | | | | | | 930 | 1655 | 2590 | 3725 |
| | 126 to 149 | 365 | | | | | | | 930 | 1655 | | | | | | 2590 | 3725 | | | | | | 5075 | 6625 | | | | | | 930 | 1655 | 2590 | 3725 |
| 150 | | 390 | | | | | | | 1000 | 1770 | | | | | | 2775 | 3990 | | | | | | 5435 | 7100 | | | | | | 1000 | 1770 | 2775 | 3990 |
| | 151 to 174 | | | | | | | | 1000 | | | | | | | 2775 | | | | | | | 5435 | | | | | | | 1000 | 1770 | 2775 | 3990 |
| 175 | 176 to 199 | | | | | | | | 1105 | | | | | | | 3065 | | | | | | | 6005 | | | | | | | 1105 | 1955 | 3065 | 4405 |
| 200 | | | | | | | | | 1170 | | | | | | | 3250 | | | | | | | 6365 | | | | | | | 1170 | 2075 | 3250 | 4670 |
| | 201 to 224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1170 | 2075 | 3250 | 4670 |
| 225 | 226 to 249 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1270 | 2270 | 3545 | 5000 |
| 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 | 2325 | 3640 | 5110 |
| | 251 to 274 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 | | 3640 | |
| 275 | 276 to 299 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1345 | | 3740 | |
| 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1375 | | 3825 | |

## Inverted Open Float Steam Traps
## Continuous Discharge Capacities in Pounds of Water per Hour

**Safety factor:** The table above shows actual continuous discharge capacities. A safety factor of at least 2 to 1 should be used when selecting a trap, to assure intermittent discharge and reserve capacity in case of errors in estimating condensate loads; see explanation on opposite page.

**Effective seat pressures:** The increments commonly used for listing effective seat pressures are shown in bold face in the column at the left. To avoid unnecessary interpolation and the danger of overlooking the maximum pressure of the trap, intermediate pressure ranges have been added in light face. See opposite page for explanation of effective seat pressures.

**Figures enclosed by heavy lines:** For easy identification, the most advantageous capacities for each orifice in each trap have been enclosed by heavy black lines. For example, assume a trap is needed on a 15-pound line to discharge (including safety factor) 250 pounds of water per hour against 5 pounds outlet pressure (10 pounds effective seat pressure).

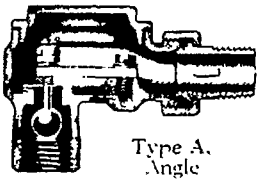
The No. 9810 Trap would fill this need, with orifices and capacities as follows: 3/32-inch, 280 lbs.; 1/8-inch, 500 lbs.; or 5/32-inch, 785 lbs. The latter (figure enclosed within heavy black lines) would be the best choice from the standpoint of intermittent discharge, liberal safety factor, etc.

# Velan Universal Steam Traps

(Patent Pending)

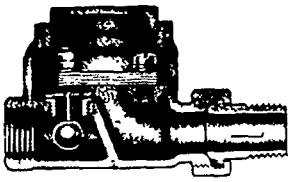
## Plain Types

With Air Vent and Check Valve



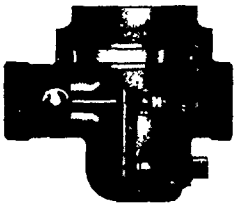
Type A, Angle

For high pressure radiators and heating units in marine and stationary service. 1/2 and 3/4-inch screwed connections.



Type C, Convector

A light weight, economical trap. 1/2 and 3/4-inch screwed connections.



Type P, Junior

For heating, processing, and air vent service. Fits all standard installations. 1/2 and 3/4-inch screwed connections.

***High Capacity Drainage Controls***

***For Steam Pressures Up to 1400 Pounds***

***For Temperatures Up to 1000° F.***

Velan Steam Traps have an extensive application in oil refinery, power, chemical, textile, rubber, printing, and other industries. The traps can be mounted at any angle and are frostproof when installed in a vertical position. A single trap can be used for a wide range of pressures and temperatures.

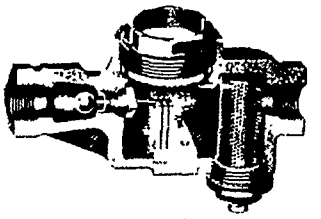
**Simplified operations:** Each Velan trap combines the functions of a steam trap, air by-pass valve, and check valve. Some also include a strainer and control glass.

The heart of the Velan trap is a bimetallic element which controls a free floating ball valve. As the trap fills with steam, the increased temperature reacts on the element and causes it to deflect, thus closing the valve tightly against the seat.

When condensate and air collect in the trap, the temperature drops and causes the element to revert to its original position; this permits the line pressure to push the valve off its seat, instantly discharging accumulated condensate and air.

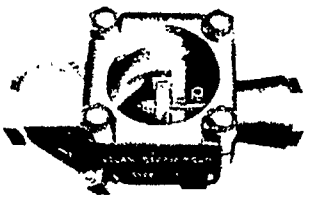
## Strainer Types

With Air Vent, Check Valve, and Control Glass



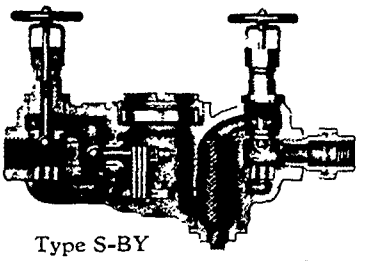
Type S

An all-purpose steam trap ideal for process industries. 1/2, 3/4, and 1-inch screwed or flanged connections.



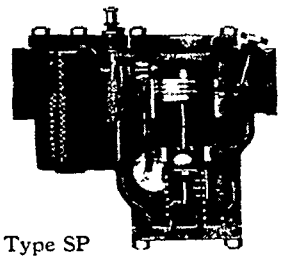
Type SS

Excellent for rapid handling of large quantities of air and condensate. 3/4, 1, and 1 1/2-inch screwed or flanged connections.



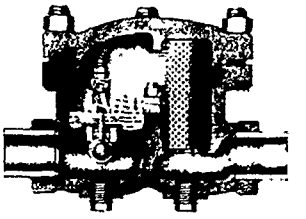
Type S-BY

By-pass type with two valves. Saves space. Eliminates many troublesome, leaky joints. Signalling feature indicates when trap and by-pass are operating. Valves can be repacked while under full pressure. Same connections as Type S.



Type SP

Piston operated. Discharges air as efficiently as water. Capacities up to 500,000 pounds per hour. 1 to 3-inch screwed or flanged connections.



Type N

Designed especially for marine service. Operates in any position. High capacity at both low and high pressures. 1/2, 3/4 and 1-inch screwed, flanged, or socket-weld connections.

**Materials:** Plain Types A and C have a bronze body. Type P has a bronze or semi-steel body.

Strainer types have a semi-steel body for pressures below 200 pounds, a cast steel body for pressures up to 600 pounds, and a molybdenum-chrome body for higher pressures.

All of the traps have stainless steel working parts.

**Temperature control:** The traps can be adjusted to discharge condensate at predetermined temperatures. Where continuous operation is important, strainer type traps (except Type N) can be furnished with a thermometer and outside assembly for temperature adjustment.

**Ordering:** Specify the type, size and kind of connection, orifice size, and maximum pressure.

***Prices on application.***

### Ratings, Orifices, and Capacities

| Type of Trap | Pressure Rating Psi | Orifice Size Inches | Capacity Pounds Per Hour |
|---|---|---|---|
| Type A | 0-25 | 7/16 | 5,600[a] |
| | 0-100 | 7/16 | |
| | 0-200 | 7/16 | |
| Type C | 0-25 | 7/16 | 5,600[a] |
| | 0-100 | 7/16 | |
| Type P | 0-50 | 1/2 | 20,500[b] |
| | 0-200 | 1/2 | |
| Type S | 0-50 | 1/2 or 5/8 | 22,000[b] |
| | 0-200 | 1/2 or 5/8 | |
| | 0-300 | 1/2 or 5/8 | |
| Type SS | 0-250 | 7/8 | 62,000[b] |
| | 0-350 | 9/16 | |
| | 0-650 | 9/16 | |
| Type S-BY | 0-200 | 1/2 | 20,500[b] |
| | 0-350 | 1/2 | |
| | 0-650 | 3/8 | |
| Type SP | 0-250 | 2 | 350,000[b] |
| | 0-650 | 2 | |
| Type N | 0-150 | 1/2 | 22,000[b] |
| | 0-300 | 1/2 | |
| | 0-650 | 5/16 | |
| | 600-1400 | 5/16 | |

[a] At 25 psi pressure. [b] At 200 psi pressure.

31

# Swartwout Cast Iron Exhaust Heads

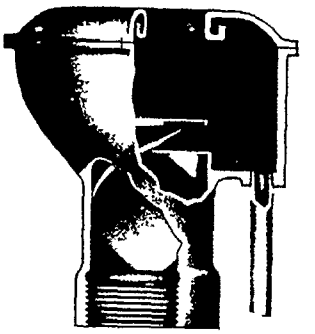
Swartwout Exhaust Heads effectively remove water and oil from exhaust steam discharging to atmosphere. If exhausted direct from the pipe, water and oil would tend to deteriorate roofs and side walls of buildings.

These exhaust heads neither interrupt nor slow down the flow of steam; nor is there any appreciable back pressure. Oil and water are removed simultaneously and only dry steam passes out into the atmosphere.

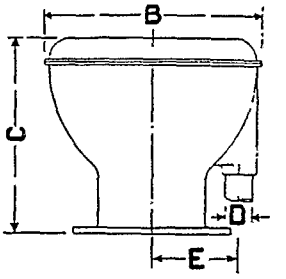
**Construction:** Centrifugal force, utilized in the design of the Swartwout Exhaust Head, is responsible for the removal of oil and water without any change in the direct flow of steam. Although made of cast iron, the exhaust heads are light in weight. They are exceptionally durable, ornamental, and rustproof. Once in position, there is no further expense for replacement, except where plant expansion necessitates the use of a larger head.

**Flange dimensions and drilling:** The end flange on flanged exhaust heads conforms to the American Cast Iron Flange Standard, Class 125 (B16.1-1948).

Prices include facing and drilling to this Standard. No reduction in price is made if Exhaust Heads are ordered faced only.



Swartwout Exhaust Head




These exhaust heads are made with a screwed connection in sizes 5-inch and smaller, and with a flanged connection in larger sizes.

***Prices on application***

**Dimensions, in Inches**

| Screwed | | | | | Flanged, F. & D. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Size Inches | B | C | D | E | Size Inches | B | C | D | E |
| 1 | 7¾ | 8⅛ | ½ | 2⅞ | 6 | 16 | 14⅞ | 1 | 6⅜ |
| 1¼ | 7¾ | 8⅛ | ½ | 2⅞ | 8 | 18¾ | 17⅞ | 1¼ | 7½ |
| 1½ | 7¾ | 8⅛ | ½ | 2⅞ | 10 | 23 | 21¾ | 2 | 9⅜ |
| 2 | 9 | 10 | ¾ | 3 5/16 | 12 | 28½ | 25 | 2½ | 11¾ |
| 2½ | 9 | 10 | ¾ | 3 5/16 | 14 | 30½ | 27 | 2½ | 12⅞ |
| 3 | 9¾ | 10¾ | ¾ | 4 1/16 | 16 | 34¼ | 30½ | 3 | 14 |
| 3½ | 9¾ | 10¾ | ¾ | 4 1/16 | 18 | 38 | 33⅞ | 3 | 15 11/16 |
| 4 | 11½ | 11 11/16 | 1 | 4 15/16 | 20 | 41¼ | 38⅜ | 3½ | 16¾ |
| 5 | 13⅞ | 13¼ | 1 | 5½ | 24 | 56½ | 46 | 4 | 19½ |
| | | | | | 30 | 62 | 57 | 4 | 24½ |

31

# Expansion in Pipe Lines

The expansion for any length of pipe may be found by the following method: from the table below, obtain the difference in increased length at the minimum and maximum temperatures, divide this result by 100 to obtain the increase in length per foot, and multiply by the length of the line in feet.

**Linear Expansion**

| Temp. | Inches per 100 Feet | | | | Temp. | Inches per 100 Feet | | | | Temp. | Inches per 100 Feet | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Degrees F. | Steel | Wrought Iron | Brass | Copper | Degrees F. | Steel | Wrought Iron | Brass | Copper | Degrees F. | Steel | Wrought Iron |
| 0 | 0 | 0 | 0 | 0 | 340 | 2.76 | 2.87 | 4.30 | 3.95 | 680 | 5.965 | 6.20 |
| 20 | .15 | .155 | .25 | .25 | 360 | 2.935 | 3.05 | 4.58 | 4.15 | 700 | 6.17 | 6.42 |
| 40 | .30 | .31 | .45 | .45 | 380 | 3.11 | 3.235 | 4.85 | 4.40 | 720 | 6.375 | 6.625 |
| 60 | .455 | .475 | .67 | .65 | 400 | 3.29 | 3.43 | 5.14 | 4.64 | 740 | 6.58 | 6.835 |
| 80 | .61 | .63 | .92 | .87 | 420 | 3.465 | 3.62 | 5.45 | 4.89 | 760 | 6.79 | 7.05 |
| 100 | .77 | .80 | 1.17 | 1.10 | 440 | 3.65 | 3.805 | 5.73 | 5.15 | 780 | 6.99 | 7.275 |
| 120 | .915 | .96 | 1.41 | 1.35 | 460 | 3.835 | 4.00 | 5.96 | 5.37 | 800 | 7.21 | 7.49 |
| 140 | 1.075 | 1.13 | 1.69 | 1.57 | 480 | 4.02 | 4.19 | 6.25 | 5.64 | 820 | 7.415 | 7.73 |
| 160 | 1.235 | 1.29 | 1.91 | 1.77 | 500 | 4.21 | 4.39 | 6.55 | 5.88 | 840 | 7.63 | 7.93 |
| 180 | 1.40 | 1.46 | 2.15 | 2.00 | 520 | 4.39 | 4.58 | | | 860 | 7.84 | 8.145 |
| 200 | 1.57 | 1.64 | 2.43 | 2.25 | 540 | 4.59 | 4.78 | | | 880 | 8.055 | 8.37 |
| 220 | 1.73 | 1.81 | 2.71 | 2.52 | 560 | 4.78 | 4.975 | | | 900 | 8.28 | 8.60 |
| 240 | 1.89 | 1.98 | 2.97 | 2.74 | 580 | 4.975 | 5.175 | | | 920 | 8.495 | 8.82 |
| 260 | 2.065 | 2.16 | 3.22 | 2.95 | 600 | 5.17 | 5.38 | | | 940 | 8.72 | 9.05 |
| 280 | 2.23 | 2.335 | 3.47 | 3.17 | 620 | 5.365 | 5.58 | | | 960 | 8.945 | 9.28 |
| 300 | 2.41 | 2.52 | 3.76 | 3.42 | 640 | 5.565 | 5.785 | | | 980 | 9.17 | 9.52 |
| 320 | 2.59 | 2.70 | 4.07 | 3.70 | 660 | 5.765 | 5.99 | | | 1000 | 9.40 | 9.75 |

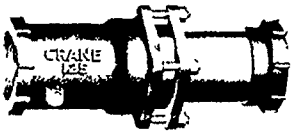
# 125-Pound Expansion Joints

## Brass

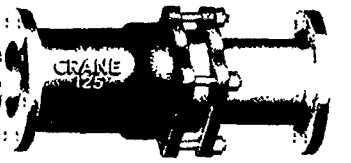
Semi-Guided, Screwed
No. 404
Standard Traverse
No. 406
Special Traverse

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas

## Iron Body




Semi-Guided, Screwed
No. 398
Standard Traverse
No. 400
Special Traverse




Semi-Guided, Flanged
No. 401
Standard Traverse
No. 403
Special Traverse

### List Prices and Dimensions

| Size | Brass Expansion Joints Screwed | | | |
|---|---|---|---|---|
| | No. 404 Standard Traverse | | | No. 406 Special 6-inch Traverse |
| Inches | List Price Each | Traverse Inches | End to end, open Inches | List Price Each |
| 1/2 | 3.75 | 2 | 6 3/8 | |
| 3/4 | 5.50 | 2 1/4 | 7 1/4 | 11.00 |
| 1 | 6.50 | 2 1/4 | 7 3/8 | 12.50 |
| 1 1/4 | 8.50 | 2 1/4 | 7 3/8 | 15.50 |
| 1 1/2 | 10.50 | 2 1/4 | 7 5/8 | 18.50 |
| 2 | 18.50 | 2 1/2 | 8 3/8 | 28.50 |
| 2 1/2 | 30.00 | 2 1/2 | 9 1/8 | |
| 3 | 55.00 | 2 3/4 | 10 3/8 | |

| Size | Iron Body Expansion Joints | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Screwed | | | | Flanged, F. & D. | | | |
| | No. 398 Standard Traverse | | | No. 400 Special 6-inch Traverse | No. 401 Standard Traverse | | | No. 403 Special 6-inch Traverse |
| Inches | List Price Each | Traverse Inches | End to end, open Inches | List Price Each | List Price Each | Traverse Inches | Face to face, open Inches | List Price Each |
| 1 1/2 | 20.00 | 2 1/2 | 13 3/4 | 26.50 | 27.00 | 2 1/2 | 13 3/8 | 33.50 |
| 2 | 21.50 | 2 1/2 | 13 3/4 | 29.00 | 29.50 | 2 1/2 | 12 1/8 | 37.00 |
| 2 1/2 | 25.00 | 2 1/2 | 14 1/2 | 34.00 | 35.00 | 2 1/2 | 12 1/4 | 44.00 |
| 3 | 32.50 | 2 3/4 | 15 1/4 | 46.50 | 44.50 | 2 3/4 | 13 | 58.50 |
| 3 1/2 | 45.50 | 3 | 17 1/4 | | 62.00 | 3 | 15 | |
| 4 | 53.00 | 3 1/4 | 18 1/8 | 75.00 | 71.50 | 3 1/4 | 15 3/4 | 93.50 |
| 5 | | | | | 93.00 | 4 | 17 1/2 | 117.00 |
| 6 | | | | | 108.00 | 4 | 19 1/8 | 138.00 |
| 8 | | | | | 135.00 | 4 | 19 3/4 | |
| 10 | | | | | 185.00 | 4 | 21 3/4 | |
| 12 | | | | | 270.00 | 4 | 23 5/8 | |

**Brass Expansion Joints:** Crane brass semi-guided expansion joints are chiefly used in interior piping work, on steam and hot water heating lines, domestic hot water lines, and for air, oil, and gas service. The joints are sturdily constructed and well-proportioned. A large packing nut provides ample space for packing.

**Iron Body Expansion Joints:** The iron body semi-guided expansion joints are of good proportions throughout and are made of high quality materials. The stuffing box is of ample size; the bolted packing gland, carefully machined to guide the sleeves, assures uniform pressure on the packing.

Flanged end joints 6-inch and smaller and all screwed end joints have brass sleeves. Flanged end joints 8-inch and larger have steel sleeves, chromium-plated; brass sleeves can be furnished when desired; prices on application.

Iron joints are furnished with drain bosses. They will be tapped, when so ordered, at an extra price.

**Packing:** Expansion Joints are regularly furnished without packing in the stuffing box, unless specifically ordered packed, in which case an extra charge is made. Orders for packed joints must specify the kind of packing wanted, or give complete information on the fluid to be handled.

*Crane Pipe Bends . . pages 502 to 504*

**Installation:** To obtain the maximum efficiency from expansion joints and to assure satisfactory operation, the pipe line must be properly anchored and guided to force the joints to compensate for expansion and contraction.

**Over-all length of special traverse joints:** To find the over-all length of special traverse joints, take the over-all length of the standard traverse joint of the same size and add twice the difference between the special traverse and the standard traverse.

**End flanges:** End flanges of flanged iron joints conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). List prices include facing and drilling to this Standard. When ordered faced only, they will be furnished at the same price as for faced and drilled. See page 459 for drilling templates.

**Special Iron Body Joints:** When required, iron body joints can be furnished with an anchor base which will be drilled with four bolt holes. A service outlet which will be screwed can also be furnished. Prices on application.

All-Iron Expansion Joints will be furnished with steel sleeves, chromium-plated, unless otherwise specified. Prices on application.

*Guided Expansion Joints . . . . page 352*

# Badger Expansion Joints

## Non-Equalizing

Non-Equalizing
Flanged or
Welding Ends

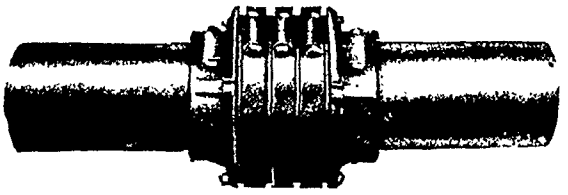
The Non-Equalizing "Packless" Expansion Joint is used to relieve stress and absorb vibration between connecting equipment, and to compensate for changes in lengths of pipe lines due to temperature fluctuations.

This expansion joint is formed from single pieces of tubing. Heat-treated after forming, it retains its strength and flexing qualities, assuring long life. It is made of copper for normal pressures and temperatures and of stainless steel where corrosion is a problem. Special metals furnished to order.

This joint is limited to use on pipe lines with traverses not exceeding ½-inch, and for pressures from high vacuum to 25 psi in copper and 50 psi in stainless steel. It can be furnished round (any diameter), oval, rectangular, or in any special shape required, with either flanged or welding ends, and in any required length.

## Self-Equalizing

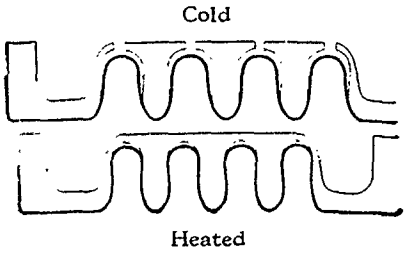
### With Directed Flexing Action



Self-Equalizing
Welding Ends

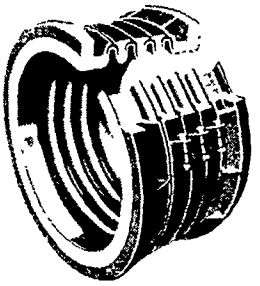
This joint features "directed flexing," which distributes the flexing stress. The corrugations, working with the Directed-Flexing Rings, avoid excessive stress. The equalizing rings progressively control and limit the flexing movement as well as support the corrugated members for high pressures.

The joints are furnished in sizes ranging from 4 to 30-inch. Single joints are available in traverses up to 6-inch; double joints, in traverses up to 12-inch.




***Directed Flexing*** is based on the progressively-controlled movement of the all-curve corrugations by the correspondingly shaped equalizing rings.

This principle of operation is illustrated at the left. The upper portion of the illustration shows the position of the corrugations and equalizing rings while the pipe line is cold. The lower portion shows their positions after the pipe line is heated.



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# U. S. Rubber Spool-Type Expansion Joints

**For Vacuum Service—Style 4039**
**For Pressure Service—Style 4140**

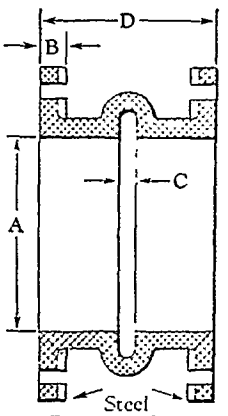
### Dimensions and Ratings

| Size | Dimensions in Inches | | | | *Ratings for Style 4140 | |
|---|---|---|---|---|---|---|
| | | | | | Compression | Working Pressure |
| Inches | A | B | C | D min | Inches | 180° F. Max. |
| 6 | 6 | 1 | ½ | 6 | .43 | 125 pounds |
| 8 | 8 | 1⅛ | ¾ | 6 | .43 | 115 pounds |
| 10 | 10 | 1⅛ | ¾ | 6½ | .43 | 115 pounds |
| 12 | 12 | 1⅛ | ¾ | 6½ | .68 | 115 pounds |
| 14 | 14 | 1¼ | ¾ | 7½ | .68 | 75 pounds |
| 16 | 16 | 1¼ | ¾ | 7½ | .68 | 60 pounds |
| 18 | 18 | 1¼ | ¾ | 8 | .68 | 60 pounds |
| 20 | 20 | 1⅜ | ⅞ | 8 | .68 | 60 pounds |
| 24 | 24 | 1⅜ | ⅞ | 8¼ | .81 | 50 pounds |
| 30 | 30 | 1⅜ | 1 | 8¼ | .93 | 50 pounds |
| 36 | 36 | 1⅜ | 1 | 8½ | .93 | 40 pounds |

*Style 4039 is recommended for 30 inches of mercury.

Rubber Spool-Type Expansion Joints are used on piping installations to avoid excessive stress, absorb vibration, and to eliminate undesirable sounds. The joints are reinforced with solid metal rings embedded in the carcass and with heavy duck. They also have full faced, fabric reinforced rubber flanges.

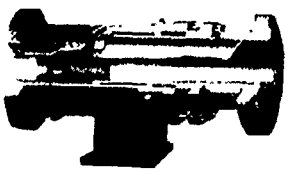
Smaller sizes, larger sizes, and other types of Rubber Expansion Joints can be furnished when required.




*Prices on application*

# Adsco Iron and Steel Body Expansion Joints

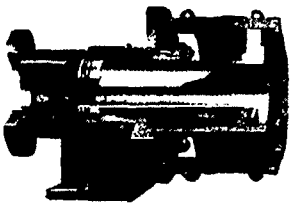
## Internally Guided Type



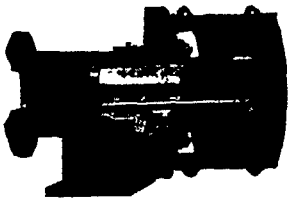
The small over-all diameter permits installation in limited space. The slip is guided internally and cannot pull out of the body. The polished surface of the slip is not in contact with other metal parts.

## Piston Ring (Externally Guided Type)

This type is furnished complete with a two-piece removable external guide. ***It can be unpacked and completely repacked under full operating pressure.*** Piston rings hold the line pressure during the packing operation.



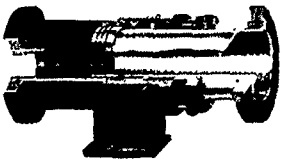
## Internally — Externally Guided Type



The slip is fully guided at extreme ends throughout its entire length of travel. This feature is frequently called for in Army and Navy specifications. A two-piece removable external guide permits smaller manholes.

## Piston Ring (Internally Guided Type)

Has no external guide, permitting installation in limited space; otherwise it is similar to the type above. ***It can be unpacked and completely repacked under full operating pressure.*** Piping should be well guided.



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### Catalog Numbers of Types Available

| Type | Semi-Steel 1¼ to 20-inch Pipe Size | | Fabricated Steel 1½ to 20-inch Pipe Size | | Semi-Steel 1½ to 20-inch Pipe Size | | Fabricated Steel 1½ to 20-inch Pipe Size | |
|---|---|---|---|---|---|---|---|---|
| | 125-Pound Standard | 250-Pound Standard | 150-Pound Standard | 300-Pound Standard | 125-Pound Standard | 250-Pound Standard | 150-Pound Standard | 300-Pound Standard |
| | Internally Guided Type | | | | Piston Ring, Externally Guided Type | | | |
| Single, No Base | S-1-IS | S-5-IS | S-151-IS | S-301-IS | S-1-PG | S-5-PG | S-151-PG | S-301-PG |
| Single, With Base | S-2-IS | S-6-IS | S-152-IS | S-302-IS | S-2-PG | S-6-PG | S-152-PG | S-302-PG |
| Double, With Base | D-2-IS | D-6-IS | D-152-IS | D-302-IS | D-2-PG | D-6-PG | D-152-PG | D-302-PG |
| | Internally-Externally Guided Type | | | | Piston Ring, Internally Guided Type | | | |
| Single, No Base | S-1-GIS | S-5-GIS | S-151-GIS | S-301-GIS | S-1-P | S-5-P | S-151-P | S-301-P |
| Single, With Base | S-2-GIS | S-6-GIS | S-152-GIS | S-302-GIS | S-2-P | S-6-P | S-152-P | S-302-P |
| Double, With Base | D-6-GIS | D-6-GIS | D-152-GIS | D-302-GIS | D-2-P | D-6-P | D-152-P | D-302-P |

***Bodies,*** single or double, are fabricated steel or cast semi-steel, and are provided with a drip connection when specified. The bodies of these expansion joints can also be furnished with or without a base or service outlet connection for a branch line.

***Slips,*** in cast semi-steel joints, are bronze in sizes 3½-inch and smaller, and chromium-plated steel in sizes 4-inch and larger. Both types of slips are equipped with Van Stone flanges. In fabricated steel joints, all slips are chromium-plated steel with steel flanges welded to the slips.

***Stuffing boxes*** hold ample packing, assuring tight joints with minimum repacking.

***Packing*** is not regularly furnished with the expansion joints unless specified. When joints are ordered packed, the pressure, temperature, and fluid handled should be specified.

***Packing glands*** are accurately machined. They have a long lip to permit compression of the packing to one-half the original depth.

***Glands studs and nuts*** are of non-corrosive metal to prevent freezing. The studs are embedded in the body and furnish rigidity to the packing gland.

***Service outlets*** for branch lines are in the form of a service fitting in the Piston-Ring Type Joint. On the other styles, the outlets are integral with the body.

***Bases*** are integral with the body and have four bolt holes. Their heavy webs withstand severe strain.

***The standard traverse*** is 4 inches per slip. Also furnished with 8 and 12-inch traverses per slip.

***Drip connections*** are provided when specified.

***Lubrication fittings*** are provided when specified. Otherwise holes are tapped and plugged.

***Prices on application***

# Dexter Automatic Separators

Type A

**Service recommendation:** Dexter (Leavitt) Separators, used to remove water, oil and dirt from compressed air lines are recommended for pressures up to 125 pounds.

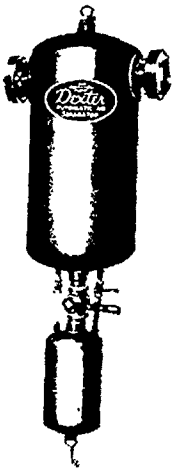
Tools and equipment operate better and last longer when protected by these separators, since the elimination of water from the compressed air permits adequate lubrication, and prevents clogging by foreign matter or subjection to the abrasive action of pipe scale particles.

Spoilage of work is eliminated. Spray painting, air-jet cleaning, blowing dust from band saws, are typical operations that require the clean, dry air furnished by the Dexter Automatic Separators.

***Type A Separators*** are used mainly for point-of-use installations—on service outlets in factory systems, and on portable compressors. These separators should be installed as close as possible to service outlets so there can be no further condensation in the lines. A shut-off cock at the inlet is recommended, to permit removal of the screen for cleaning.

The separators can be furnished complete with pressure regulating valve and pressure gauge for paint spray applications.

***Type C Separators*** are made in the larger sizes required for installation in main lines of distribution systems. A shut-off cock permits removal of the screen for cleaning without interrupting the operation of the pipe line.



Type C

**Construction:** Types A and C are basically similar. They have the same welded tubular construction that provides strength and compactness without excessive weight.

**Operation:** Operation is based upon the simple principle that when compressed air is allowed to expand, the water and oil vapors contained in the air are precipitated.

The practical application of this principle involves: (1) bringing about the necessary expansion without interrupting the free flow of air through the separator, (2) segregating the precipitated water and oil so that they cannot be picked up by the flowing air stream; and (3) venting the separated water and oil into the atmosphere.

Operation is entirely automatic and continuous except for the occasional cleaning of the screen to remove dirt and scum collected in the eliminator.

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**Dimensions, in Inches**

| Size | | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type A | Width | 1 3/4 | 2 3/4 | 2 3/4 | 2 3/4 | 5 1/2 | 5 1/2 | 8 | 8 | 9 1/2 | | | | | | | | |
| | Height | 8 | 15 | 15 | 15 | 19 1/2 | 19 1/2 | 25 | 25 | 25 | | | | | | | | |
| Type C | Width | | | | 2 3/4 | 5 1/2 | 5 1/2 | 8 | 8 | 9 1/2 | 19 1/2 | 22 | 23 1/2 | 26 1/2 | 31 1/2 | 37 3/8 | 52 1/2 | 61 1/8 |
| | Height | | | | 20 | 30 1/2 | 30 1/2 | 35 1/2 | 35 1/2 | 36 | 62 1/8 | 72 | 84 9/16 | 87 3/4 | 98 1/16 | 111 3/8 | 127 3/16 | 141 13/16 |

# Logan Aridifiers

The Logan Aridifier quickly removes oil, moisture, dirt, rust, fine scale, and other impurities from compressed air and gas lines. Equipment operates better, lasts longer. Corrosion, freezing, fouling, and caking are eliminated. Rapid tool wear and clogged orifices are prevented. Air used for spraying provides a smooth finish.

**Types and Data**

| Size No. | CFM Free Air at 100 psi | Pipe Size Inches | Width Inches | Length Inches |
|---|---|---|---|---|
| 2T | 7-33 | 3/4 | 4 1/2 | 5 1/4 |
| 3T | 17-53 | 1 | 4 3/4 | 7 1/2 |
| 4T | 35-145 | 1 1/2 | 7 | 9 |
| 5T | 90-350 | 2 | 7 3/4 | 9 3/4 |
| 6T | 175-575 | 2 | 8 7/8 | 10 1/8 |
| 7T | 400-1200 | 3 | 12 3/4 | 9 |
| 9F | 700-2200 | 4 | 14 1/2 | 10 3/16 |
| 10F | 1500-5000 | 6 | 18 5/8 | 12 |

The aridifier is recommended for pressures up to 150 pounds. Its cast iron housing encloses four multi-bladed rotors which are mounted on a vertical spindle and rotate on oil-sealed stainless steel bearings.

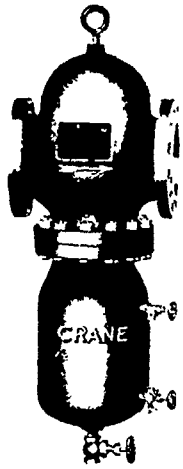
Install the unit in an upright position. Air passes upward through the aridifier forcing the rotors to rotate at high speed in opposite directions. Moisture and impurities in the air stream impinge upon the rotor blades, from where they are hurled centrifugally to the outer wall of the housing into a trap, and finally down through the drain. The clean, dried air passes to the outlet at the top of the housing. Self-cleaning, the aridifier requires minimum attention.

Order by size number. The line pressure and estimated cfm of free air at the installation point should be considered.

***Prices on application***

Aridifier with a section of the casing cut out to show top spider, rotors, and drainage well. Note opposite rotation of four multi-bladed rotors.

# Steam and Oil Separators




Horizontal
No. 07, 125-Pound
No. 011, 250-Pound

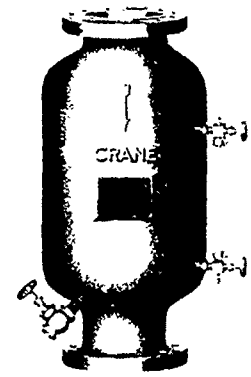
WORKING PRESSURES
125-Pound — 125 pounds saturated steam
250-Pound — 250 pounds saturated steam

**Service Recommendations:** Horizontal Separators are recommended for use in live steam lines to remove condensation from the steam before it is used in steam-heated apparatus, such as cooking kettles, evaporators, heating systems, etc. They can also be used as oil separators.

Vertical Separators are used to remove condensation from vertical lines with downward flow, such as steam lines to turbines, pumps, etc

***List prices of 125-Pound Horizontal Separators include a nipple, a No. 438 Brass Gate Valve for drain, and a No. 610 Water Gauge.***

***List prices of 250-Pound Horizontal and Vertical Separators include a nipple, a No. 362 E Bronze Globe Valve for drain, and a No. 616 Water Gauge.***




Vertical
With Top Inlet
No. 013, 250-Pound

**List Prices, Each (Flanged, Faced, and Drilled)**

| Size | Inches | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizontal | No. 07, 125-Pound | 85.00 | 99.50 | 121.00 | 149.00 | 178.00 | 206.00 | 270.00 | 348.00 | 476.00 | 603.00 | 710.00 |
| Horizontal | No. 011, 250-Pound | 94.00 | 110.00 | 133.00 | 163.00 | 195.00 | 227.00 | 298.00 | 383.00 | 522.00 | | |
| Vertical | No. 013, 250-Pound | 94.00 | 110.00 | 133.00 | 163.00 | 195.00 | 227.00 | 298.00 | 383.00 | 522.00 | | |

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**Construction and materials:** These separators afford an efficient, economical means of removing free oil and condensate. Their large areas, the ample size and proper shape of their baffle surfaces, and the location of their openings, assure the highest degree of efficiency with the lowest possible pressure drop.

The 125-Pound Separators are made of cast iron. The 250-Pound Separators are made of Ferrosteel, the No. 011 having a cast iron drip pocket.

**Flange dimensions:** End flanges of 125-Pound and 250-Pound Separators conform to the American Cast Iron Flange Standards, Class 125 (B16.1-1948) and Class 250 (B16b-1944), respectively.

**Drilling:** List prices of all separators include facing and drilling to the particular standard applying, as listed above. No deduction is made for separators ordered faced only.

**Importance of proper size:** To secure maximum efficiency, separators should be selected on the basis of the amount of steam to be handled, not on existing pipe sizes. Too small a separator means too high a velocity, resulting in poor separation. To obtain a proper size separator, use the following formula:

$$C = \frac{A \times B \times 2.4}{V}$$

in which C = Area of inlet in square inches
A = Pounds of steam per hour
B = Volume in cubic feet per pound of steam at given pressure
V = Velocity in feet per minute (7000 max.)

**Welded Steel Steam Receiver Separators**

Crane can supply Steel Steam Receiver Separators of the welded type. Of high quality, and carefully and accurately fabricated, they conform to the A.S.M.E. Boiler Construction Code for Unfired Pressure Vessels.

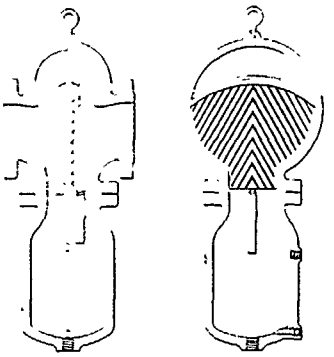
Inquiries and orders for receiver separators must be accompanied by complete specifications, including drawings showing the size and location of all openings. Prices on application.

**Dimensions, in Inches**

| Size of Separator | | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horizontal | Face to face | 10 | 10 | 11 | 12 | 14 | 14 | 16 | 17 | 20 | 23 | 26 |
| | Center to top | 4 | 4¾ | 5½ | 9½ | 11 | 11¼ | 12¾ | 15 | 18 | 22 | 26½ |
| | Center to bottom | 17 | 17 | 18½ | 20⅛ | 22½ | 23¼ | 26⅛ | 28¾ | 34½ | 40⅜ | 45 |
| | Greatest width | 6⅝ | 7¾ | 8¾ | 9½ | 11⅛ | 12 | 14¼ | 16½ | 21 | 25 | 29 |
| Vertical | Face to face | 27 | 27 | 27 | 29 | 31 | 31 | 33 | 38 | 41 | | |
| | Greatest diameter | 11 | 10¾ | 10⅞ | 12⅜ | 14 | 14 | 15⅞ | 17⅜ | 20 | | |
| Size of drain | | ½ | ½ | ¾ | 1 | 1 | 1 | 1¼ | 1¼ | 1¼ | 1½ | 1½ |
| Size of valve for drain | | ½ | ½ | ½ | ½ | ½ | ½ | ½ | ½ | 1 | 1 | 1½ |
| Center to center of water gauge | | 6 | 6 | 6 | 6 | 6 | 10 | 10 | 10 | *14 | 14 | 14 |

*General description* page 355 *10" on the No. 013 *Templates for drilling . . . . pages 459 and 460*

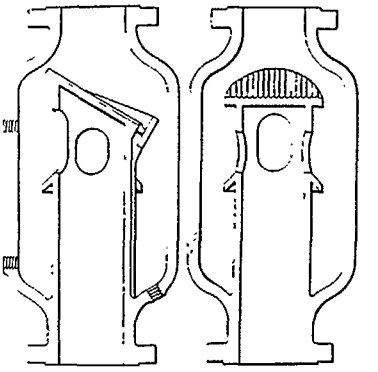
# Steam and Oil Separators (Cont.)



Side Section End Section
**Horizontal Separators**

### PRINCIPLE OF DESIGN

The design of Crane Steam and Oil Separators is based upon a scientific principle involving the tendency of a non-elastic body to move in a straight line. Water and oil entrained in flowing steam are non-elastic; therefore, if the direction of the steam flow is abruptly changed, these fluids will tend to be precipitated out of the current. If the velocity of the flowing steam is greatly decreased at the same time, the precipitation of the fluids will be increased, and there will be no tendency to pick them up again as the dry steam passes the baffle plates.



Side Section End Section
**Vertical Separators**

**A necessity in steam-consuming plants:** In handling steam, it is essential the steam be delivered at its point of usage as moisture-free as possible.

In live steam lines, condensation is always a source of loss, whether the steam is to be used to drive an engine, turbine, or pump, or whether the steam is to be used as a heating medium.

In exhaust steam lines, oil from the engines or pumps renders the steam unfit for further use as a heating medium or for direct return to the boilers. Oil in pipes, radiators, etc., checks free radiation of heat. Oil in boilers combines with water impurities, and if present in any appreciable quantity, forms a thick insulating coating over the heating surface.

Crane Steam and Oil Separators remove such condensation and oil efficiently and economically.

**Horizontal separators:** The bodies of horizontal separators provide a greatly enlarged cross section resulting in a lower velocity of the entering steam. Midway of this enlarged section, a corrugated baffle plate, interposed in the flow, frees the steam of most of its entrained moisture. The steam rises over the top of the baffle, and deflected by the curved walls of the head, strikes the corrugations of the reverse side of the baffle before passing on.

The corrugations of the baffle plate run at an angle to the current of steam, affording ready drainage as well as effectively preventing the steam from picking up and carrying globules of water or oil over the top of the baffle. The normal flow of steam is away from the accumulation of condensate in the separator, which also aids in separation.

**Vertical separators:** Vertical separators employ the same principles of design as the horizontal type, but due to the change in form, there are certain necessary changes in structural details which do not alter their effectiveness.

**Automatic drainage:** To secure maximum efficiency, all separators must be properly drained. This drainage should be automatic and only the best of steam traps should be used; see pages 345 to 348.



# Cast Iron Drip Pockets

No. 420, 125-Pound
No. 422 E, 250-Pound

### WORKING PRESSURES

125-Pound—**125** pounds steam
250-Pound—**250** pounds steam

Drip Pockets are tapped for water gauge. Drip Pockets for 250 pounds steam, 450° F., are made to order of Ferrosteel at a 25 per cent advance in price.

**Service recommendations:** Drip pockets are used primarily as condensation collectors, but also aid in keeping the pipe line clean by receiving foreign matter. They should be located where condensation is most likely to collect.

**Size:** Full size drip pockets, corresponding to the size of the line on which they are applied, should always be used except on lines larger than 12-inch. The 12-inch size, used with a reducing fitting, is large enough for steam lines from 12 to 24-inch.

**Flange dimensions:** Flanges on 125-Pound and 250-Pound Drip Pockets conform to the American Cast Iron Flange Standards, Class 125 (B16.1-1948) and Class 250 (B16b-1944), respectively. Prices include facing and drilling (F. & D.) to the Standard applying; no deduction is made for drip pockets ordered faced only.

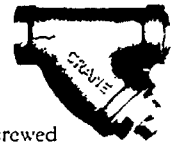
*Templates for drilling, pages 459 and 460.*

**List Prices, Each, and Dimensions, in Inches**

| Size | Inches | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Flanged, F. & D. | No. 420, 125-Pound | 33.00 | 36.50 | 40.00 | 43.00 | 50.00 | 61.50 | 91.50 | 133.00 | 200.00 |
| | No. 422 E, 250-Pound | 40.50 | 44.50 | 48 | 52.70 | 60.70 | 75.00 | 111.00 | | |
| Over-all height | | 13⅛ | 14⅛ | 1· | 16¼ | 18⅛ | 20¼ | 24½ | 28½ | 32 |
| Size of drain | | ¾ | 1 | 1 | 1 | 1¼ | 1¼ | 1¼ | 1½ | 1½ |
| Size of tapping for water gauge | | ½ | ½ | ½ | ½ | ½ | ½ | ½ | ½ | ½ |
| Center to center of tappings | | 6 | 6 | 6 | 10 | 10 | 10 | 14 | 14 | 14 |

# Y-Pattern Sediment Separators

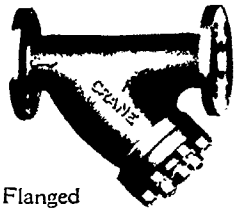
## Iron Body



Screwed

No. 988½, 125-Pound
No. 990½, 250-Pound

Separators above have a screwed cap on sizes 1½-inch and smaller, as illustrated; larger sizes have a bolted cap.

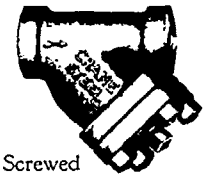


Flanged

No. 989½, 125-Pound
No. 991½, 250-Pound

31

## Cast Steel



Screwed

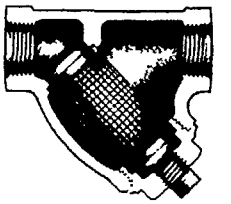
No. 994 D, 600-Pound

WORKING PRESSURES

| | Sediment Separator | Saturated Steam | Cold water, oil, or gas |
|---|---|---|---|
| Iron Body | 125-Pound | 125 pounds | 200 pounds |
| | 250-Pound | 250 pounds | 500 pounds |
| Cast Steel | Rated for 600 pounds steam, 900° F. Other ratings same as 600-Pound Screwed Gate Valves, page 224. | | |

**Service recommendations:** Crane Y-Pattern Sediment Separators protect equipment against damage from dirt, grit, scale, and all foreign matter in steam, water, air, oil, and gas lines. The No. 994 D Separators are used where severe services require the strength and durability of steel.

**Features:** The separators are simple in design and rugged in construction. Their large screening area makes them exceptionally efficient. Their internal parts are readily accessible. The separators not only prevent passage of foreign matter, but also furnish a pocket for its accumulation, from which the matter can be easily removed through the blow-off connection. The connection is fitted with a plug.



Typical Cross Section (Iron Body, Screwed)

**Materials:** Iron body separators have a screwed brass cap on sizes 1½-inch and smaller and a bolted iron cap on larger sizes. Cast steel separators have a body and bolted cap made of carbon steel. The joint between the body and cap, of the male and female type, is equipped with a metallic gasket; Triplex Steel studs are used.

**Screens:** The strainer element is a Monel mesh screen rolled into the shape of a cylinder. The ends are reinforced. One end fits into a recess in the diagonal wall of the body and the other is retained by the cap. The screen is secure; it will not loosen in service.

The mesh type of screen is furnished for greater efficiency and increased screening area. The screening area in Crane Separators, much greater than the area of the pipe (more than 500 per cent on the 20 mesh screen), assures free fluid flow with minimum pressure loss.

If not otherwise specified, separators are furnished with a 20 mesh Monel screen (400 holes per square inch) suitable for steam, water, and medium or heavy oils.

When specified, separators will be furnished at no extra charge with a 40 mesh Monel screen (1600 holes per square inch) suitable for steam, air, gas, gasoline, light oils, and Grades 1, 2, and 3 fuel oils. To strain dirt from air or gases, a 40 mesh Monel screen packed with Everdur wool is recommended.

Finer mesh screens, perforated screens, or screens made of steel or 18-8 Chrome-Nickel Alloy can be furnished when so ordered; prices on application.

**Flange dimensions and drilling:** Inlet and outlet flanges on No. 989½ Separators conform to American Cast Iron Flange Standard, Class 125 (B16.1-1948); on the No. 991½, the flanges conform to American Cast Iron Flange Standard, Class 250 (B16b-1944).

Prices of flanged sediment separators include facing and drilling (F.&D.) to the Standard applying. No deduction is made if they are ordered faced only.

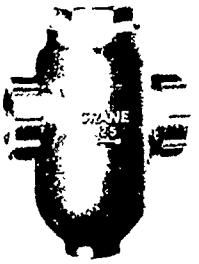
### List Prices and Dimensions

| Catalog Number and Type | Size Inches | List Prices Each | Dimensions, in Inches: End to end or face to face | Center to extreme bottom | Size of blow-off |
|---|---|---|---|---|---|
| No. 988½ 125-Pound Screwed | ¼ | 4.00 | 3¼ | 2¼ | ⅜ |
| | ⅜ | 4.00 | 3¼ | 2¼ | ⅜ |
| | ½ | 4.60 | 3¾ | 2¾ | ⅜ |
| | ¾ | 5.30 | 4¼ | 3 | ½ |
| | 1 | 6.40 | 5 | 3¾ | ¾ |
| | 1¼ | 8.00 | 6 | 4½ | ¾ |
| | 1½ | 10.20 | 7 | 5¼ | 1 |
| | 2 | 19.50 | 8½ | 8 | 1 |
| | 2½ | 24.00 | 10 | 9¼ | 1¼ |
| | 3 | 31.50 | 11½ | 10½ | 1¼ |
| No. 990½ 250-Pound Screwed | ½ | 5.20 | 3¾ | 2¾ | ⅜ |
| | ¾ | 6.00 | 4¼ | 3 | ½ |
| | 1 | 7.20 | 5 | 3¾ | ¾ |
| | 1¼ | 9.00 | 6 | 4½ | ¾ |
| | 1½ | 11.30 | 7 | 5¼ | 1 |
| | 2 | 21.50 | 8½ | 8 | 1 |
| No. 989½ 125-Pound Flanged F. & D. | 2 | 28.00 | 10¾ | 8 | 1 |
| | 2½ | 34.00 | 11⅞ | 9¼ | 1¼ |
| | 3 | 44.00 | 13¼ | 10½ | 1¼ |
| | 4 | 88.50 | 16¼ | 13 | 1¼ |
| | 5 | 122.00 | 18 | 15 | 1½ |
| | 6 | 178.00 | 20½ | 16½ | 1½ |
| | 8 | 243.00 | 25 | 20 | 2 |
| | 10 | 455.00 | 31 | 24½ | 2 |
| | 12 | On request | 34½ | 28 | 2 |
| No. 991½ 250-Pound Flanged F. & D. | 2 | 32.50 | 11¼ | 8 | 1 |
| | 2½ | 39.00 | 12½ | 9¼ | 1¼ |
| | 3 | 51.00 | 14 | 10½ | 1¼ |
| | 4 | 102.00 | 17 | 13 | 1¼ |
| | 5 | 153.00 | 19 | 15½ | 1½ |
| | 6 | 223.00 | 21½ | 17 | 1½ |
| | 8 | On request | 26 | 20½ | 2 |
| | 10 | | 33 | 25 | 2 |
| | 12 | | 36 | 28 | 2 |
| No. 994 D 600-Pound Screwed | ½ | 18.00 | 3¾ | 3⅝ | ½ |
| | ¾ | 26.00 | 4¼ | 4 | ½ |
| | 1 | 33.00 | 5 | 4½ | ¾ |
| | 1¼ | 44.00 | 6 | 5½ | ¾ |

*Templates for drilling ... pages 459 and 460*

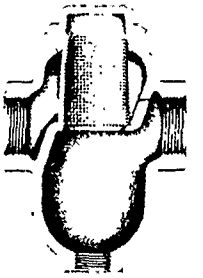
# Iron Body Sediment Separators

## 125-Pound



No. 986
Screwed

WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water, oil, or gas



Cross Section

### List Prices and Dimensions

| Size | Inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|---|---|
| No. 986 | Each | 3.20 | 4.00 | 5.20 | 6.40 | 8.80 | 13.60 | 19.00 | 25.00 |
| End to end | Inches | 3 1/8 | 3 3/4 | 4 1/4 | 5 | 5 1/2 | 6 3/4 | 8 | 9 1/2 |
| Center to top | Inches | 1 3/4 | 2 1/4 | 2 7/8 | 3 5/16 | 3 13/16 | 5 | 7 | 8 |
| Center to bottom | Inches | 2 3/8 | 2 3/4 | 3 3/8 | 4 | 4 9/16 | 5 1/2 | 7 | 8 1/2 |
| Size of drain | Inches | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 1/4 | 1 1/4 |

**Service recommendation:** Dirt and pipe scale in piping conveying steam, water, air, oil, and other fluids are serious trouble makers, frequently cutting the seats and discs of valves and interfering with the operation of automatic devices and machines.

Crane Sediment Separators will effectively remove all foreign matter passing through the lines in which they are installed. They not only prevent the passage of such matter but furnish a pocket for its accumulation, from which the matter can be easily blown.

**Construction:** No. 986 Separators have a cast iron body and a brass screwed cap in sizes 1 1/2-inch and smaller; 2-inch and larger have a bolted iron cap.

The strainer element is a brass screen rolled into the form of a frustrum of a cone, one end of which seats in the cap and the other on a machined surface in the bridge wall of the body. The area through the screen is much greater than the area of the pipe size. Unrestricted flow of the line fluid is assured even when some of the holes are clogged with foreign matter.

**Screens:** Unless otherwise ordered, these separators are furnished with screens having perforations .257-inch in diameter (135 holes per square inch) and are then suitable for steam, water, and medium or heavy oils. For air, gas, gasoline, volatile oils, and fuel oils, screens having perforations .033-inch in diameter (331 holes per square inch) will be furnished.

When finer perforations are desired, .02-inch diameter perforated screens (952 holes per square inch) can be furnished from stock. Screens having any other diameter perforations can be furnished on special order.

31

## 250-Pound

No. 988
Screwed

WORKING PRESSURES
250 pounds saturated steam
400 pounds cold water, oil, or gas

Cross Section

### List Prices and Dimensions

| Size | Inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|---|---|
| No. 988 | Each | 5.00 | 6.20 | 8.00 | 10.00 | 13.50 | 21.00 | 26.00 | 34.50 |
| End to end | Inches | 3 | 3 1/2 | 3 1/2 | 3 3/4 | 4 | 4 1/2 | 5 3/8 | 6 |
| Center to top | Inches | 2 1/8 | 2 5/8 | 3 | 3 1/2 | 3 7/8 | 4 3/4 | 5 3/4 | 6 1/2 |
| Center to bottom | Inches | 3 1/8 | 4 | 4 | 4 5/8 | 5 1/4 | 6 1/2 | 8 | 9 1/4 |
| Size of drain | Inches | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 1 1/4 | 1 1/4 |

**Features:** Crane 250-Pound Sediment Separators, like the 125-Pound described above, embody the four essential principles of a good separator: arrestment of foreign matter, a pocket for its accumulation, large screen area, and a vertical screen, allowing a large percentage of the heavy particles to drop naturally to the pocket.

**Materials:** The strainer element is a flat brass screen supported between the body and cap by a malleable iron grate.

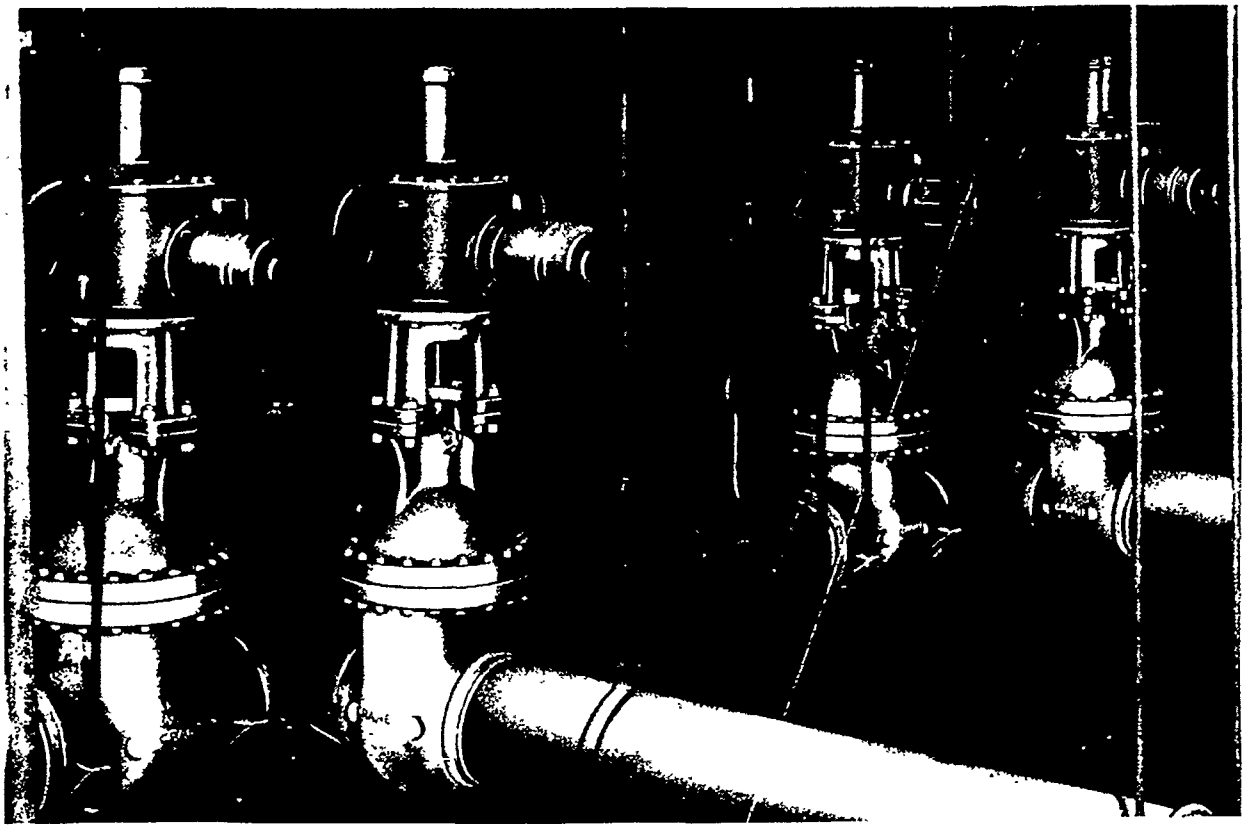
The body and bolted cap are made of cast iron.

**Screens:** Unless otherwise ordered, these separators are furnished with screens having perforations .257-inch in diameter (135 holes per square inch) and are then suitable for steam, water, and medium or heavy oils. For air, gas, gasoline, volatile oils, and fuel oils, screens having perforations .033-inch in diameter (331 holes per square inch) will be furnished.

When finer perforations are desired, .02-inch diameter perforated screens (952 holes per square inch) can be furnished from stock. Screens having any other diameter perforations can be furnished on special order.

- *For Dependable Plant Operation*
- *For Reduced Maintenance*
- *Use Crane Products*

*Crane Air Vent Valves and Iron Body Gate Valves on a condenser installation in a municipal electric plant.*



*Crane Steel Gate Valves in central station service—motorized for easier operation.*
*For a description of Crane cylinder and motor operated valves, see pages 124 to 129.*

Gauges; Joints;
Unit Heaters;
Miscellaneous Specialties

# Gauges, Joints, Unit Heaters, and Miscellaneous Specialties


Water Gauges and Accessories
- Brass Water Gauges ..... page 300
- Gauge Glasses ..... page 301
- Gauge Glass Cutters ..... page 301
- Extra Guards for Water Gauges ..... page 301

Brass Try Cocks ..... page 301

Joints
- Brass Swing Joints ..... page 361
- Chiksan Swivel Joints ..... page 363
- Perfecting Service Rotary Unions ..... page 363
- Barco Flexible Joints ..... pages 364 and 365

Buckeye Brass Whistles ..... page 362

Sherman Fusible Plugs ..... page 362

Gauges and Thermometers
- Crosby Gauges ..... page 306
- Marshalltown Gauges and Thermometers ..... page 307

Siphons for Steam Gauges ..... page 361

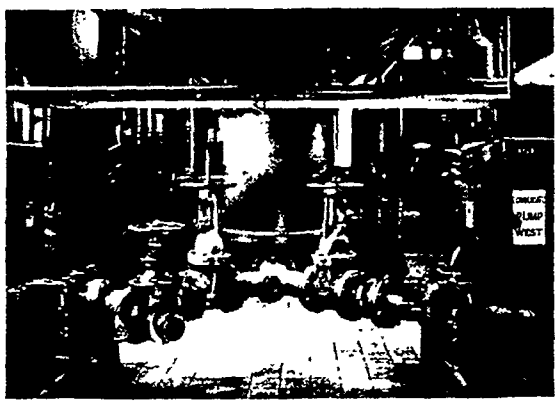
Heating and Ventilating Equipment
- Sturtevant Unit Heaters ..... page 368
- Trane Unit Heaters ..... page 369
- Reznor Gas-Fired Unit Heaters ..... page 371
- Ilg Fans and Ventilators ..... page 370

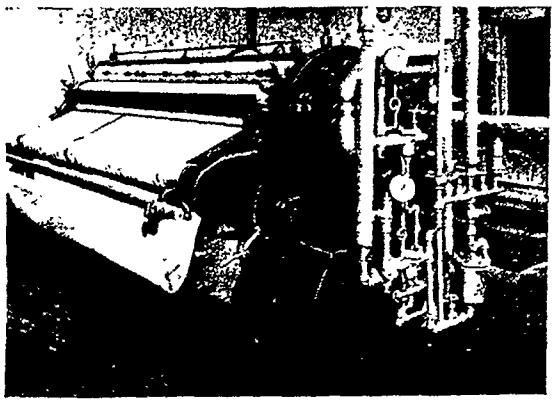
Pumps and Boiler Controls
- Hoffman Condensation Pumps ..... page 371
- McDonnell Boiler Controls ..... page 372
- Blakeslee Steam Jet Pumps or Ejectors ..... page 372
- Penberthy Injectors and Ejectors ..... page 373

Lubricators, Oil and Grease Cups ..... page 374


The items referred to above are only a portion of the complete Crane line of specialties and of special duty valves. For other products of this nature, see pages 299 to 357.


*Brass Whistle Valves* ..... *page 54*
*Corrosion-Resistant Alloy Liquid Level Gauges* ..... *page 382*
*All-Iron Liquid Level Gauges* ..... *page 413*

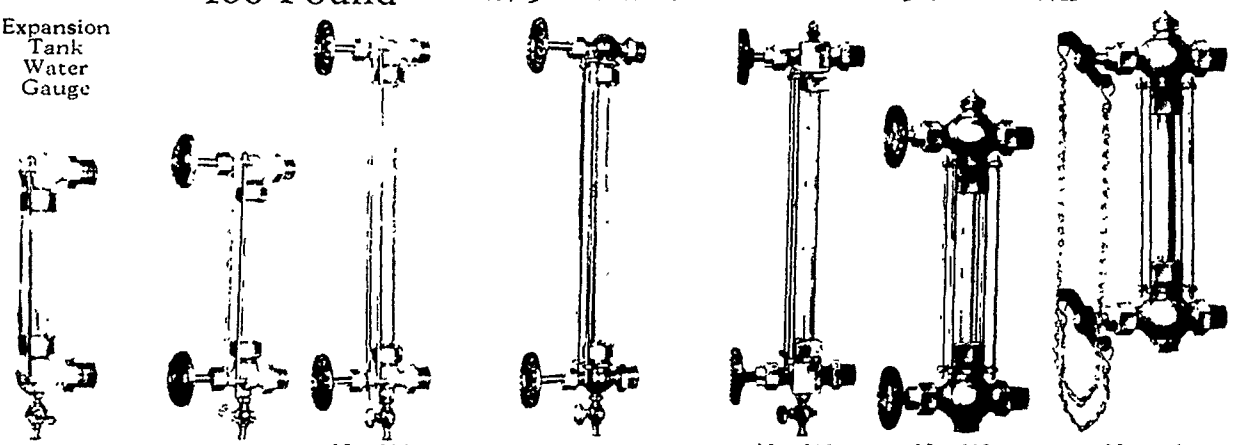


*For the best in piping equipment——for any installation——specify Crane.*

# Brass Water Gauges

## 100-Pound 175-Pound 250-Pound

Expansion Tank Water Gauge



No. 623 Rough | No. 625 Rough | No. 624 Rough | No. 610 Polished | No. 616 Polished | No. 613 Polished | No. 615 Polished

For 100 pounds working pressure | For 175 pounds working pressure | For 250 pounds working pressure

Made with Crane Special Bronze Bodies.

### Center to Center of Valves

Unless otherwise ordered, the No. 610, No. 613, No. 615, No. 616, No. 624, and No. 625 Gauges are furnished with the centers shown below:

32

- ½-inch No. 610 . . . with 14-inch centers
- ¾-inch No. 610 . . . with 18-inch centers
- ¾-inch No. 613 . . . with 18-inch centers
- ¾-inch No. 615 . . . with 18-inch centers
- ½-inch No. 616 . . . with 14-inch centers
- ½-inch No. 624 . . . with 14-inch centers
- ½-inch No. 625 . . . with 8-inch centers

When other centers are required, orders must so specify.

The No. 623 Gauge regularly is furnished with 13½-inch centers, as listed in the table at the right; any other center is considered special.

**Centers over 36 inches:** When Water Gauges with centers greater than 36 inches are required, two Gauges of shorter lengths, staggered on the boiler, are recommended.

**No. 613 Gauge:** The lower valve of the No. 613 Water Gauge is drilled and tapped for a ⅜-inch drain.

By closing both valves and removing the cap at the top of the upper valve, the glass in this Gauge can be renewed while the boiler is under pressure.

### List Prices and Dimensions

| | | | |
|---|---|---|---|
| ½-inch No. 610 | Price, with 14" or shorter centers | Each | 13.50 |
| | Extra for each inch over 14", up to 36" | | .08 |
| | Size of glass for 14" centers | Inches | ⅝×12¾ |
| | Length of guard rod for 14" centers | Inches | 14 |
| ¾-inch No. 610 | Price, with 18" or shorter centers | Each | 20.00 |
| | Extra for each inch over 18", up to 36" | | .08 |
| | Size of glass for 18" centers | Inches | ¾×16 |
| | Length of guard rods for 18" centers | Inches | 17 |
| ¾-inch No. 613 | Price, with 18" or shorter centers | Each | 27.00 |
| | Extra for each inch over 18", up to 36" | | .11 |
| | Size of glass for 18" centers | Inches | ⅝×16 |
| | Length of guard rods for 18" centers | Inches | 17 |
| ¾-inch No. 615 | Price, with 18" or shorter centers | Each | 45.00 |
| | Extra for each inch over 18", up to 36" | | .11 |
| | Size of glass for 18" centers | Inches | ⅝×16 |
| | Length of guard rods for 18" centers | Inches | 17 |
| ½-inch No. 616 | Price, with 14" or shorter centers | Each | 16.00 |
| | Extra for each inch over 14", up to 36" | | .08 |
| | Size of glass for 14" centers | Inches | ½×12½ |
| | Length of guard rods for 14" centers | Inches | 14 |
| ½-inch No. 623 | Price, with 13½" centers | Each | * |
| | Size of glass | Inches | ⅝×12 |
| ½-inch No. 624 | Price, with 14" or shorter centers | Each | 7.40 |
| | Extra for each inch over 14", up to 36" | | .08 |
| | Size of glass for 14" centers | Inches | ⅝×12¾ |
| | Length of guard rods for 14" centers | Inches | 15 |
| ½-inch No. 625 | Price, with 8" or shorter centers | Each | 7.40 |
| | Extra for each inch over 8", up to 36" | | .08 |
| | Size of glass for 8" centers | Inches | ⅝×6¾ |
| | Length of guard rods for 8" centers | Inches | 9 |

*Price on application.

**No. 615 Gauge:** The No. 615 Gauge is especially suited for service on boilers having the Water Gauge above the reach of the operator. It is chain operated and regularly is furnished with chains that drop 12½ feet below the lower valve.

When the valves are open, the levers stand in a horizontal position. When the valves are closed, the levers stand at an angle of 45 degrees, with the right hand side down.

The lower valve of the No. 615 Water Gauge is drilled and tapped for a ⅜-inch drain.

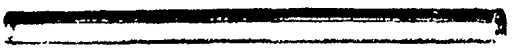
By closing both valves and removing the cap at the top of the upper valve, the glass in this Gauge can be renewed while the boiler is under pressure.

*Corrosion-Resistant Liquid Level Gauges . . . page 382*

*Ammonia Liquid Gauges . . . page 413*

# Water Gauge Accessories

## PYREX High Pressure Gauge Glasses

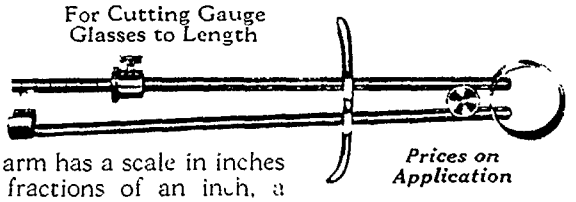


Dimensions, in Inches

| Length | Outside Dia. 1/2 | 5/8 | 3/4 | 1 | Length | Outside Dia. 1/2 | 5/8 | 3/4 | 1 |
|---|---|---|---|---|---|---|---|---|---|
| 8 | | | | | 18 | | | | |
| 9 | | | | | 19 | | | | |
| 10 | | | | | 20 | | | | |
| 11 | | | | | 21 | | | | |
| 12 | *Prices on Application* | | | | 22 | *Prices on Application* | | | |
| 13 | | | | | 23 | | | | |
| 14 | | | | | 24 | | | | |
| 15 | | | | | 30 | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |

## Chesterton Gauge Glass Cutters

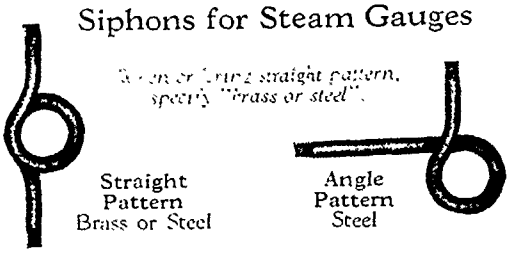
For Cutting Gauge Glasses to Length



*Prices on Application*

One arm has a scale in inches and fractions of an inch, a slide stop with set screw, a rotary cutter at the end. This arm is inserted in the end of the glass tube to the required distance, against the slide stop or gauge, the outside of the glass tube resting in the circled end of the other arm. With a slight pressure of thumb and finger on the lever, and a rotation of the glass with the other hand, the rotary cutter makes an even cut around the inside of the tube and a very little pressure breaks it off. Extra cutter wheels are available.

## Siphons for Steam Gauges



*Brass or Steel straight pattern, specify "Brass or steel".*

Straight Pattern Brass or Steel

Angle Pattern Steel

| List Each | Straight Pattern Brass | Straight Pattern Steel | Angle Pattern Steel only |
|---|---|---|---|
| | 1.80 | .80 | .80 |

Made from 1/4" Standard weight pipe: Wrought Steel for 475 lbs., 750° F. and Red Brass for 250 lbs. saturated steam. Straight pattern is 8" long. Center of loop to long end of angle type is 6"; to short end, 4".

## Extra Brass Guards for Water Gauges

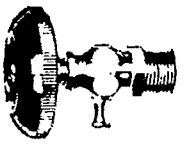
List Prices

| *Overall Length In Inches | Price Each | *Overall Length In Inches | Price Each |
|---|---|---|---|
| 9 | .30 | 23 | .54 |
| 11 | .30 | 25 | .60 |
| 13 | .30 | 27 | .66 |
| 14 | .32 | 29 | .72 |
| 15 | .36 | 31 | .80 |
| 17 | .40 | 33 | .88 |
| 19 | .44 | 35 | 1.06 |
| 21 | .48 | | |

*Length includes acorn.

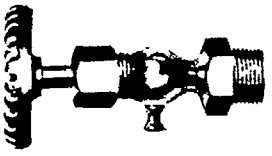
32

# Brass Try Cocks



Low Pressure
No. 731, with Moulded Composition Wheel
*15 pounds steam working pressure*

125-Pound
No. 730
(Short Pattern)
*125 pounds steam working pressure*



250-Pound
No. 734
With Stuffing Box
*250 pounds steam working pressure*

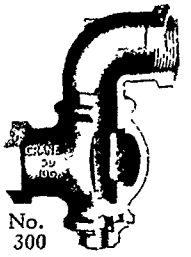
For list prices and description of Brass Cylinder Cocks, Gauge Cocks, and Pet Cocks, see page 67.

List Prices, Each

| Size In. | 3/8 | 1/2 | 3/4 |
|---|---|---|---|
| No. 730 | 3.10 | 3.20 | |
| No. 731 | 2.60 | | |
| No. 734 | 3.50 | 3.80 | 4.20 |

# Brass Swing Joints

WORKING PRESSURE
150 pounds
water, oil, or gas, 200° F.



No. 300

These swing joints are designed for use in making up adjustable connections in piping to tanks and other apparatus where permanently fixed connections cannot be made.

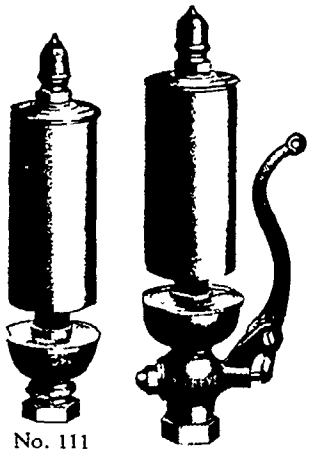
Basically, the joints consist of an ell-shaped plug held into the body with a nut and washer. All parts are brass to eliminate binding of the plug by corrosion. Operation is similar to that of an ordinary plug cock. The design of port and body assures free fluid flow; there is no restriction of port area regardless of the angle at which the plug is turned. No packing is used.

List Prices, and Dimensions, in Inches

| Size | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
|---|---|---|---|---|---|---|
| No. 300 | Each | 4.40 | 4.60 | 5.40 | 8.20 | 12.00 |
| Center to end | | 13/16 | 7/8 | 11/16 | 1 1/4 | 1 1/2 |
| Center to center of pipe | | 1 5/32 | 1 5/16 | 1 9/16 | 1 7/8 | 2 1/4 |

# Buckeye Brass Whistles

## Plain



No. 111 Without Valve — No. 109 With Valve

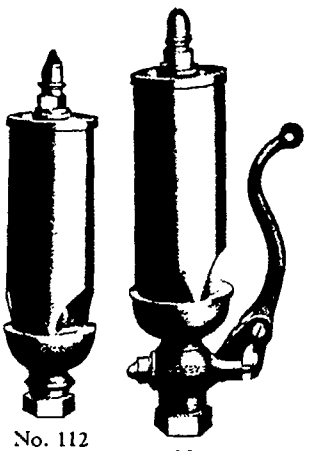
These all-brass whistles produce clear, emphatic signals. They are accurately designed and constructed to produce distinct, even tones with a minimum amount of compressed air or steam pressure. Ideal for use on factories and public buildings, they will work satisfactorily on steam or air pressures of 80 to 150 pounds.

The chime whistle is furnished with or without a valve in the base. The bell is cast in one piece and the chime construction gives a pleasing, composite tone.

The plain whistle is constructed with extra quality brass tubing in the bell which gives a clear, resonant sound and which can be adjusted by screwing the bell up or down.

The size of the whistle is determined by the diameter of the bell and not by the pipe connection. Orders should specify both the bell diameter and the size of the pipe connection wanted.

## Chime



No. 112 Without Valve — No. 110 With Valve

### Sizes and Dimensions, in Inches

| Sizes to Specify | | Diameter of bell | 1 | 1½ | 2 | 2½ | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| | | Size of pipe connection | ⅜ | ⅜ or ½ | ½ or ¾ | ¾ or 1 | ¾ or 1 | 1 or 1¼ |
| Length of Bell | Plain Whistles | No. 109, with Valve | | 3⅛ | 4¾ | 5½ | 6¼ | 8¼ |
| | | No. 111, without Valve | 2 | 3⅛ | 4¾ | 5½ | 6¼ | 8¼ |
| | Chime Whistles | No. 110, with Valve | | 4 | 5 | 6⅛ | 7¾ | 10¼ |
| | | No. 112, without Valve | | 4 | 5 | 6⅛ | 7¾ | 10¼ |

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# Sherman Fusible Plugs

## Short Pattern

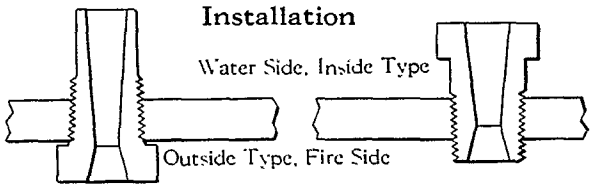
No. 99 Fire Side Type (Outside)

No. 99 A Water Side Type (Inside)

## Tube Plug

No. 99 F Tube Plug

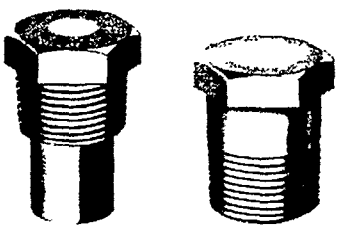
### Installation




### Minimum Diameter Core Size, in Inches

| Plug Size | Inches | ⅜ | ½ | ¾ | 1 |
|---|---|---|---|---|---|
| Short Pattern | No. 99 | ⅜ | ½ | ½ | ½ |
| | No. 99 A | ⅜ | ½ | ½ | ½ |
| Long Pattern | No. 99 B or 99 C | ¼ | ½ | ½ | ½ |
| | No. 99 D or 99 E | | ⅜ | ⅜ | ⅜ |
| Tube | No. 99 F | ⅜ | ⅜ | | |
| A.S.M.E. and API | No. 991 | | ⅜ | ⅜ | ⅜ |
| | No. 992 | ⅜ | ⅜ | ⅜ | ⅜ |

## Long Pattern



Fire Side Type (Outside) — Water Side Type (Inside)

No. 99 B Standard — No. 99 C Standard

No. 99 D High Pressure — No. 99 E High Pressure

Short Pattern, Long Pattern, and Tube Plugs are made from standard high grade brass and filled with pure tin.

The Short Pattern are suitable for low pressures only and do not conform to code. Standard Long Pattern are suitable for pressures up to 175 pounds, High Pressure Long Pattern for pressures over 175 pounds up to 225 pounds, and Tube Plugs for pressures not exceeding 225 pounds.

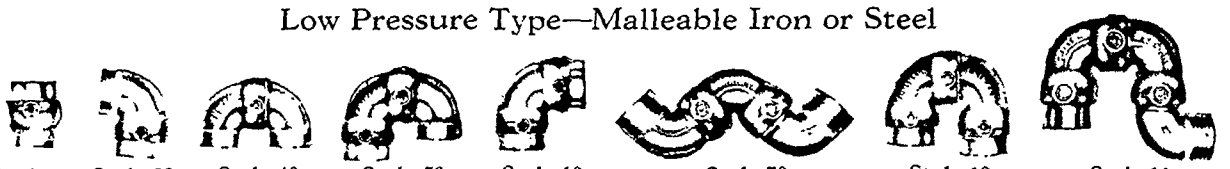
**Massachusetts Standard:** Tube plugs and long pattern plugs ½-inch and larger comply with Massachusetts Steam Boiler Rules when marked "Mass. Std."; when specified they will be so marked.

**A.S.M.E. and API Plugs:** No. 991 Fire Side Plugs and No. 992 Water Side Plugs (not illustrated) are made of bronze, filled with pure tin, and conform with A.S.M.E. and API Codes. They are stamped "A.S.M.E. STD.". The A.S.M.E. Code does not recommend the use of fusible plugs when boilers are operated at working pressures in excess of 250 pounds.

*Prices on application*

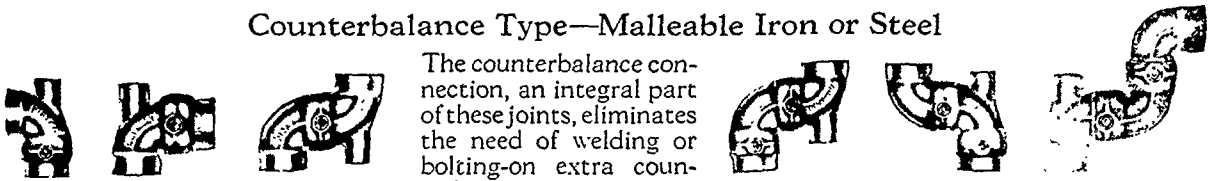
# Chiksan Ball-Bearing Swivel Joints

## Low Pressure Type—Malleable Iron or Steel



Style 20 Style 30 Style 40 Style 50 Style 60 Style 70 Style 10 Style 80

## Counterbalance Type—Malleable Iron or Steel



Style 30x4 Style 30x5 Style 40x5 Style 50x5 Style 50x1 Style 70x5

The counterbalance connection, an integral part of these joints, eliminates the need of welding or bolting-on extra counterbalance connections.

***High Pressure and High Temperature Type Joints (not illustrated) are also available; see the table below for ratings and sizes.***

Types, Ratings, and Sizes

| Type of Swing Joint | Material | Maximum Rating, Pounds 225° F. | Maximum Rating, Pounds 500° F. | Sizes Available, in Inches Threaded | Sizes Available, in Inches Flanged | Sizes Available, in Inches Welding |
|---|---|---|---|---|---|---|
| *Low Pressure | Mall. Iron | 300 | — | ⅜ to 4 | 3 & 4 | — |
| | Steel | 1000 | — | ⅜ to 4 | 2 to 12† | 6 to 12† |
| Counterbalance | Mall. Iron | 300 | — | 2 to 4 | 2½ to 4 | — |
| | Steel | 1000 | — | 2 to 4 | 2 to 4 | — |
| High Pressure | Steel | 3000 | — | ⅜ to 5 | — | 2 to 5 |
| High Temperature | Steel | — | 700 | ⅜ to 4 | 2 to 4 | — |

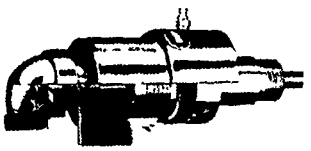
*Low Pressure Joints are also available in bronze or aluminum.

†Welding joints (ends bored for welding) and 6 to 12-inch flanged joints are made by welding swivel units to standard weld elbows. Flanged joints are not furnished in the 5-inch size.

Chiksan Joints have rotating members locked together by double rows of ball bearings. This maintains a pre-regulated load upon the packing element, assuring a pressure-tight, perfectly aligned joint at all times. Specially designed packing units are properly compounded for various services handling liquids, vapors, or gas. The joints are easily dismantled and serviced. Steel joints are forged in the smaller sizes and cast in larger sizes. Joints with one end threaded and one end flanged are also available.

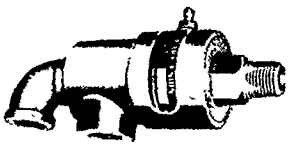
32

# Perfecting Service Rotary Unions



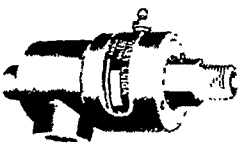
***Heavy Monel bellows, tough pressure-tight graphite seal ring, ball bearing radial thrust, and special steel shaft assure long use.***

These ball bearing rotary unions are designed to convey fluids or gases from a stationary pipe line to a revolving shaft or drum. They are widely used on dryer rolls, cooling rolls, ball mills, rubber mills, calenders, air clutches, etc.



Type S—Siphon Type

For use where entrance and exit of liquids or gas are desired in the same unit, or for siphon drainage of condensate from roll or drum. Sizes ½ to 3-inch.



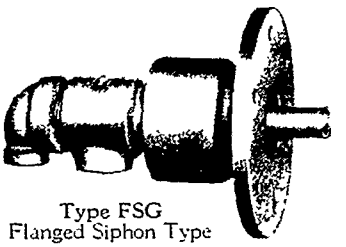
Type P—Single Inlet Type

Used to introduce or extract liquids or gas from either end of a roll or other revolving equipment. Sizes ¼ to 3-inch.

The unions feature a low friction, drop-tight mechanical seal. No packing is used. No adjustments are needed.

***Types S and P*** are all-purpose unions furnished with a rubber hose for coolant service and an all-bronze metal hose for steam and soluble fluid service. The units are suitable for steam pressures up to 150 pounds, hot oil up to 550° F., coolants, air, gases, water, brine, vacuum, alternate fluids, etc. They can be used for speeds up to 1000 rpm.

***Type FSG*** is designed for continuous heavy duty service at steam pressures up to 200 pounds. The unit, bolted directly to the revolving equipment becomes a part of the equipment eliminating any over-hang. The low friction, metal-backed graphite bearings require no lubrication.



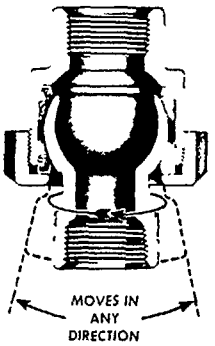
Type FSG
Flanged Siphon Type

Heavy duty. Sizes 1¼ to 5-inch N.P.T. Plain type also available.

***Prices on application***

# Barco Flexible Joints

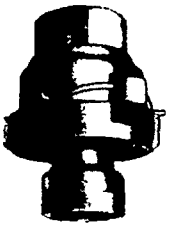
## Ball Joints




Cross Section of Style 7-8

Flexible Ball Joints provide movement in all planes in a single joint. They provide a 360° swivel or rotating movement plus a 30° to 40° flexing or angular movement. The use of the proper gasket assures a tight seal and maximum safety. A choice of materials renders the joints suitable for use on steam, water, oil, air, gasoline, corrosive acids and caustics, tar, and similar fluids.

Each style is available in the Standard or Series 600 pressure class. The Style 7-8C is also available in the Series 2500 class.



Style 7-8

**Standard Ball Joints** are available in sizes ¼ to 6-inch in bronze, and in sizes ½ to 6-inch in malleable iron, steel, and aluminum, (or as specials, in stainless steel and other alloys). A choice of gaskets, identified by service numbers, makes the joints suitable for the following services:

*Service No. 11:* For 300 pounds steam and, except in the larger sizes, for 1500 pounds hydraulic. Temperature range from −50° to 425° F.

*Service No. 11LA:* For water, oil, air, gas, and gasoline at pressures up to 150 pounds. Temperature range from −20° to 220° F.

*Service No. 11L:* For water, oil, air, gas, and gasoline at pressures up to 300 pounds. Temperature range from −20° to 220° F.

*Service No. 11CT:* Has minimum torque. Suitable for corrosive chemical and caustics or for severe steam service. Recommended for 300 pounds steam and, except in the larger sizes, for 1500 pounds hydraulic. Temperature range from −50° to 500° F.

Style 7-8B

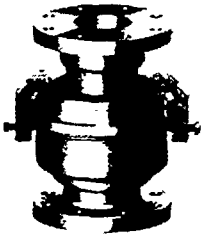
**Series 600 Ball Joints** are made in sizes ½ to 6-inch in malleable iron and steel or, as specials, in stainless steel. A choice of gaskets (identified by service numbers) makes the joints suitable for the following services:

*Service No. 11:* For 300 pounds steam and, except in the larger sizes, for 2000 pounds hydraulic. Temperature range from −50° to 425° F.

*Service No. 11M:* For 600 pounds steam and, except in the larger sizes, for 4000 pounds hydraulic. Temperature range up to 750° F. for steel, and up to 500° F. for malleable iron.

Style 7A-8

Style 7A-8B



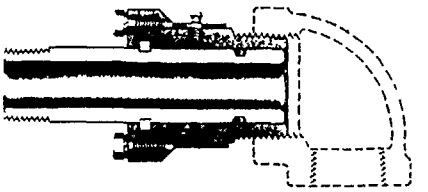
Style 7F-8F
Flanged connections. Sizes 4 and 6" only.

**Series 2500 Ball Joints** are available only in Style 7-8C, sizes 1 to 4-inch. Suitable for 750 pounds steam, 7500 pounds hydraulic, and for temperatures up to 1000° F.

**Ordering:** Specify series, size, style number, material, and service number.

## Swing Joints

**For temperatures from -40° to 225° F.**



Cross section of a Style 5011 Swing Joint. Other styles, described below, are available. All are the straight type.

Barco Swing Joints are designed to handle air, gas, water, gasoline, oil, and chemicals. Their simple "O" ring construction assures quick, inexpensive maintenance and provides a seal equally effective for vacuum or pressure service. The long bearing surface assures adequate piping support.

The joints rotate a full 360° in one plane. They provide a swivel or slow and steady rotating movement without any side flexibility. They are ideal for use on overhead loading lines, hose reels, and swing lines where joints moving in one plane only are required to support the piping.

Several swing joints can be connected together with elbows to provide rotation in more than one plane.

**Style 5001,** available in sizes ⅜, ½, and ¾-inch, has a steel casing and a steel sleeve. The thrust is absorbed by metal washers at each end of the casing. Recommended for hydraulic service up to 500 pounds and for air or gas service up to 250 pounds.

**Style 5011** has a steel sleeve and a malleable iron casing. The thrust ring carries the load in either direction. The ring is held by a flange which is easily removed for servicing without disturbing the piping. Recommended for hydraulic, air, or gas service. Sizes 1, 1¼, and 1½-inch are suitable for pressures up to 250 pounds; sizes 2, 2½, and 3-inch, for pressures up to 200 pounds.

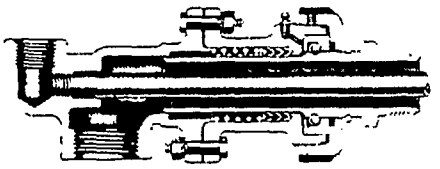
**Style 5021** is available in sizes 4, 6, 8, 10, and 12-inch with flanged connections. The sleeve is steel; casing and flanges are semi-steel. Recommended for hydraulic, air, or gas service up to 150 pounds.

Dimensions, data, and installation combinations furnished on request.

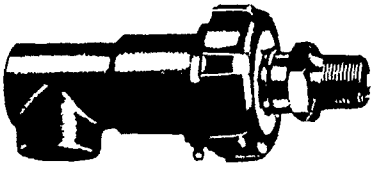
***Prices on application***

# Barco Flexible Joints

## Revolving Joints



Siphon Design
Type IBRA Angle
Type IBR Straight Way



Single Flow Design
Type IBRSA Angle
Type IBRS Straight Way

*Straight Way Joints are not illustrated.*

The revolving joints shown above are designed for steam, air, gas, and hydraulic service at temperatures up to 450° F. Light in weight, compact, and easily installed, they are recommended for the continuous rotation necessary to the heating or cooling of all types of rolls, drums, and dryers.

Types IBR and IBRA are designed for use where liquids, gas, or steam must both enter and leave through a single joint. The siphon serves as a return line for steam condensate but may also be used as the inlet pipe.

Types IBRS and IBRSA convey liquids, gas, or steam into, or out of, revolving drums.

All types except IBRA are furnished in sizes ½, ¾, 1, 1¼, 1½, and 2-inch, and in a 1-inch 14 NF straight thread size. Type IBRA is furnished in sizes 1 to 2-inch. Each type is available with right or left hand threads on the rotating shaft.

Sizes ½ and ¾-inch are suitable for 250 pounds steam and 1000 pounds hydraulic pressures; larger sizes are suitable for 150 pounds steam and 200 pounds hydraulic. Speeds up to 500 rpm on steam, and 750 rpm on hydraulic service at temperatures under 100° F., are possible.

**Other revolving joints:** Other revolving joints suitable for steam pressures up to 250 pounds and temperatures up to 450° F. are available. They are:

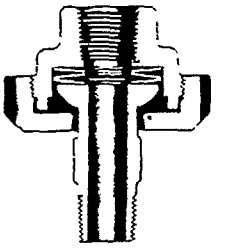
Type R (siphon) and Type RS (single flow), made in sizes 2½ and 3-inch; also suitable for hydraulic pressures up to 500 pounds. When ordering specify whether for steam or hydraulic service.

Type V, ideal for machine tool, air, and hydraulic clutch applications, as well as for general steam use, is suitable for hydraulic pressures up to 1000 pounds. Speeds up to 2500 rpm on cold liquids can be obtained. Available with either a right or left hand ¼-inch pipe thread or ⅝-inch, 18NF straight thread.

**Ordering:** When ordering, specify the type designation, size, fluid handled, temperature, pressure, and any special operating condition.

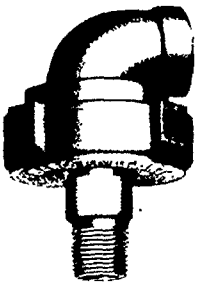
## Rotary Swivel Joints

Rotary Swivel Joints feature easy movement, low torque, and a tight seal. They will not leak under rapid temperature changes, as from steam to cold water. The rotary swivel provides a 360° swivel movement, plus a 10° angular movement which relieves piping strains or misalignment.



Cross Section
Style SA-7S-8CS
Straight Swivel

Except for their spring-seated, single gasket design, swivel joints are similar to the ball joints shown on page 364. They are widely used to convey steam to movable platens and molds in rubber, plastic, and tire presses, or to convey oil to moving parts on hydraulic die casting machines or presses.



Style SA-7AS-8CS
90° Swivel

**Standard Swivel Joints** have a steel ball. The casing is bronze on sizes ⅜, ½, ¾, and 1-inch and malleable iron on sizes 1¼, 1½, and 2-inch. A choice of gaskets (identified by service numbers) makes the joints suitable for the following services:

*Swivel Joints are available in the Standard and the Series 600 Class.*

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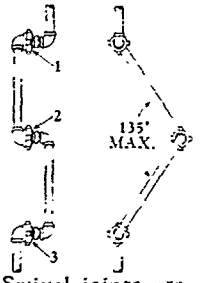
*Service No. 11:* For general use at 300 pounds steam and up to 1000 pounds hydraulic. Temperature range, −50° to 425° F.

*Service No. 11CT:* For severe conditions, as where there is frequent or rapid movement, or where low torque is needed. Suitable for 300 pounds steam pressure and up to 1000 pounds hydraulic. Temperature range from −50° to 500° F.

**Series 600 Swivel Joints,** made in sizes ⅜ to 2-inch, have a steel ball and a malleable iron casing. A choice of gaskets (identified by service numbers) makes the joints suitable for the following services:

*Service No. 11:* For 300 pounds steam pressure and up to 2000 pounds hydraulic. Temperature range from −50° to 425° F.

*Service No. 11M:* For 600 pounds steam pressure and up to 2500 pounds hydraulic. Temperature range from −50° to 600° F.




Swivel joints are most commonly used to provide movement in one plane; this requires three swivel joints installed in dog-leg fashion, as shown.

**Hydraulic ratings:** Hydraulic ratings vary according to size; complete data on request.

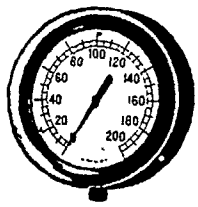
**Ordering:** When ordering, specify series, pipe size, style number, and service number.

***Prices on application***

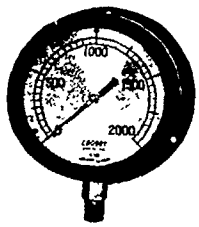
# Crosby Gauges

## Pressure, Vacuum, Compound, or Altitude

Bellows Gauge
Style AZ



Standard
Single Tube Gauge
Style AA



Heavy Duty
Single Tube Gauges
Styles
AAO, AIO, ASO,
AIH, and ASH

Crosby Gauges are high quality instruments designed for accuracy and durability. Illustrations show, in part, the extent of the Crosby line. The table below lists some of the various types available, materials, dial ranges, etc.

**Movements:** Movements on Crosby Gauges are mounted on a socket extension and are entirely independent of the case. Bronze movements have a hard phosphor bronze sector and pinion with milled teeth and lapped bushings. Steel movements have a hard Monel sector, hardened stainless steel pinion with milled teeth and stainless steel bushings, line reamed and lapped.

**Tubes:** All tubes are heat treated. Drawn bronze tubes have soldered connections. Drawn alloy steel tubes have welded connections. Bored steel tubes, bored and turned from forged alloy steel billets, have threaded connections.

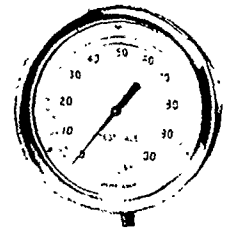
**Test gauges:** Test gauges are made in a variety of sizes and pressure classes for use in various services. Style ACV, for testing gasoline and related fluids by the Reid Vapor Test Method, conforms to A.S.T.M. Specifications.

**Illuminated dials:** When orders so specify, Style AAO and Style AIH Gauges in sizes 10 and 12-inch will be furnished with an illuminated dial; an extra charge applies. The metal dial is illuminated without shadows or glare by a circular, neon-type tube attached to a reflector ring.

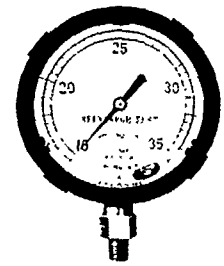
**Protectors and diaphragms:** Protectors and diaphragms are available for all gauges used in corrosive services. A special cleanout-type protector can be furnished where viscous matter such as paper pulp or soap accumulates and must be removed.

**Gauge testers:** Gauge testers, in dead weight or fluid pressure scale types, are available for pressures up to 25,000 pounds; information furnished on request.

**Ordering:** When ordering, specify the style number, the dial size and range, and the size of the connection.



Standard Test Gauge
Style AC



Reid Test Gauge
Style ACV

*Style AAO or AIH can be furnished with an illuminated dial on sizes 10 and 12-inch.*

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### Styles, Sizes, Materials, Services, and Dial Ranges

| Type | Style No. and Description | [1]Cases, and Dial Sizes in Inches: Brass Case | [1]Cases, and Dial Sizes in Inches: [2]Iron Case | Materials: Tube and Socket | Materials: Movement | Services and Standard Dial Ranges (Min-Max. Ranges From Zero): Pressure Psi | Vacuum Hg. | Compound Hg. | Compound Pressure Psi | Altitude Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| Bellows | AZ.....Low Pressure | — | 4½-8½ | Brass | Same as AC | ½-15 | 30" | On request | | 1¼-35 |
| Single Tube | AA.....Standard | 3½-12 | 3½-12 | Brass | Same as AC | 15-1000 | 30" | 30" | 15-300 | 40-500 |
| | AAO....Heavy Duty | 4½-12 | 4½-12 | Brass | Stainless steel; hard Monel sector | 15-1000 | 30" | 30" | 15-300 | — |
| | AIO.....Heavy Duty | | | Steel[3] | | | | | | |
| | ASO.....Heavy Duty | | | Steel[3] | | | | | | |
| | AIH.....Heavy Duty | 4½-12 | 4½-12 | Steel[3] | | 100-10000 | — | 30" | 100-300 | — |
| | ASH....Heavy Duty | | | | | | | | | |
| | AH.....Hydrostatic | 4½-12 | 4½-12 | Steel[3] | Same as AC | 100-10000 | — | — | — | — |
| Test | AC.....Standard | 3½-12 | — | Brass | Phosphor Bronze | 15-1000 | 30" | 30" | 15-300 | — |
| | ACI.....Inspectors | 3 | | | | | | | | |
| | ACV.....Reid Vapor | 4½ | — | Brass | | 15-250[4] | — | — | — | — |
| | ACU... Underwriters | 3½ | | | | 200 or 400 | | | | |
| | ACIH....Bored Tube | 4½-12 | 4½-12 | Steel[3] | Same as AAO | 100-10000 | — | — | — | — |
| | ACSH....Bored Tube | 6-12 | 6-12 | | | | | | | |

[1]Phenol cases are available for 4, 6, and 8½-inch Single Tube Gauges and for 4½-inch Style AZ and ACV Gauges.

[2]In sizes 10 and 12-inch, cases are made of aluminum instead of cast iron.

[3]The tube is drawn steel on Style AIO; bored steel on Styles AIH, AH, and ACIH; drawn stainless steel on Style ASO; and bored stainless steel on Styles ASH and ACSH.

[4]Style ACV is also available with dial graduating from 5-25, 15-35, 25-45, 30-60, or 50-100 psi.

***Prices and additional information furnished on application.***

# Marshalltown Gauges and Thermometers

Marshalltown Gauges and Thermometers are precision instruments. They are available with drawn steel, flanged iron, or flanged brass cases. Steel and iron cases have a steel ring, the assembly being finished in black enamel. Brass cases are polished and include a brass ring (threaded); the assembly will be nickel or chrome-plated, if specified.

**Gauges:** Vacuum, Pressure, and Compound Gauges are suitable for air, gas, oil, water, and other fluids non-corrosive to bronze; when used on steam, a siphon should be used. Do not use a vacuum gauge on pressures above atmosphere or subject a Pressure Gauge to a partial vacuum; for such conditions, use a Compound Gauge.

No. 83 and No. 86 Gauges have a phosphor bronze diaphragm. Other gauges have a bourdon tube. The movements, mounted independently of the case, operate smoothly. White enameled dials are easy to read.

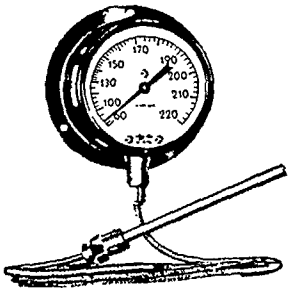
Gauges have a ¼-inch male bottom connection (½-inch on No. 51), unless otherwise specified.

**Thermometers:** No. 90 Thermometers have a back or bottom outlet, six feet of double braided tubing, and a ½-inch union connection.

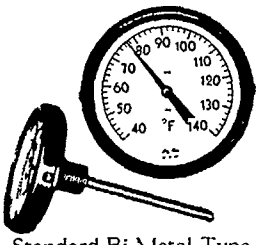
Nos. 99 and 100 Thermometers are bi-metallic helix actuated; they have neither gears nor pinions. The center back connection is ¼-inch on 2 and 2½-inch sizes, and ½-inch on 3½ and 4½-inch sizes.

**Ordering:** Specify catalog number, dial size and range, style of mounting, and the size and position of the connection.

## Thermometers

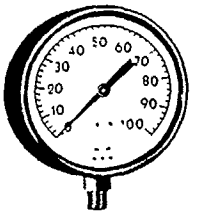


No. 90
Vapor Tension Type
For Distant Reading

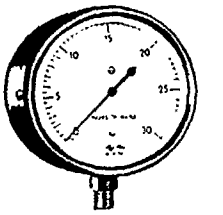


Standard Bi-Metal Type
With Drawn Steel Case
No. 99
Brass Bulb and Stem
No. 100
Stainless Steel Bulb and Stem

## Standard Pressure

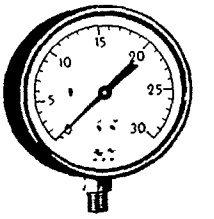


## Low Pressure Diaphragm

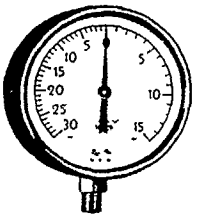


No. 23———Drawn Steel Case———No. 83
No. 24—Flanged Iron or Brass Case—No. 86

## Vacuum

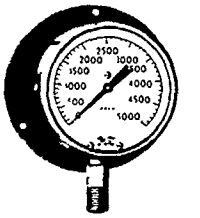


## Compound

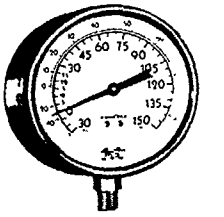


No. 22———Drawn Steel Case———No. 45
No. 25—Flanged Iron or Brass Case—No. 42

## Hydraulic



## Ammonia



No. 50———Drawn Steel Case———No. 52
No. 51—Flanged Iron or Brass Case—No. 54

***For freon service,*** use No. 56 or 57 Gauge listed in table below; they are similar in design and construction to the Ammonia Gauge shown above.

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### Styles, Sizes, Material, Services, and Dial Ranges

| Type | | Catalog Nos. and Dial Sizes: Drawn Steel Case (No Back Flange) Cat. No. | Dial Sizes Inches | Flanged Iron or Brass Case Cat. No. | Dial Sizes Inches | Materials: Bourdon Tube | Movement | Standard Dial Ranges Minimum—Maximum Ranges from Zero: Vacuum Hg. | Pressure Psi. |
|---|---|---|---|---|---|---|---|---|---|
| Gauges | Pressure | No. 23 | 2 to 4½ | No. 24 | 3½ to 12 | Brass | Brass | — | 15-1000 |
| | | No. 83 | 2½ to 4½ | No. 86 | 4½ to 12 | Bronze | Brass | — | 15 or 10 |
| | Vacuum | No. 22 | 2 to 4½ | No. 25 | 3½ to 12 | Brass | Brass | 30" | — |
| | Compound | No. 45 | 2 to 4½ | No. 42 | 3½ to 12 | Brass | Brass | 30" | 15-300 |
| | Hydraulic | No. 50 | 3½ | No. 51 | 3½ to 12 | Steel | Monel | — | 1000-30000 |
| | Ammonia | [2]No. 52 | 2½ & 3½ | [2]No. 54 | 4½ to 12 | Chr-Moly. | Monel | 30" | 150 or 300 |
| | Freon | No. 56 | 2½ & 3½ | No. 57 | 4½ to 12 | Brass | Bronze | 30" | 150 or 300 |
| Thermometers | | — | — | No. 90 | 4½ to 12 | Brass | Brass | See Note 3 | |
| | | No. 99 | 2 to 4½ | — | — | Bi-metallic helix actuation | | | |
| | | No. 100 | 2 to 4½ | — | — | | | | |

[1]Graduations also available from zero to 15-200 ounces (or inches of water).

[2]No. 52 has a black enameled, stainless steel case and ring; No. 54 is made with a flanged iron case only. Either is available with straight pressure readings (no vacuum or pressure scale) from zero to ranges of 30 up to 400 pounds.

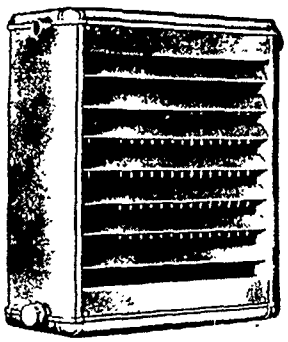
[3]Thermometers are furnished with the following Fahrenheit temperature readings:
No. 90. . . . −40 to 120, 0 to 100, 40 to 150, 40 to 220, 50 to 300, 60 to 220, or 80 to 270 degrees.
No. 99 or 100. . . . . 20 to 140, 50 to 300, 50 to 400, 50 to 500, 60 to 220, or 80 to 270 degrees.

*Prices and additional information on application.*

*Siphons for steam gauges . . .page 361*

# Sturtevant Unit Heaters

## Horizontal Type



Design 14
Standard Steam Type—Single Speed

***Horizontal Heaters*** are designed to deflect the heat downward to cold areas by means of individual adjustable louvers. Inlet and outlet connections on both sides permit direct piping runs. Soft steel hangers supplied with the unit can be bent to fit all mounting requirements. Steel casing has a rust-resisting coating and a green baked enamel finish.

***These heaters are available with single, double, or multi-speed motor controls.***

Sturtevant Unit Heaters for steam and hot water are adaptable to any industrial or commercial application where an even flow of heat over a large area is desired. The units, easily installed, combine high efficiency with attractive, aerodynamic design.

Other units, similar to the Standard Steam Type illustrated, but with specially designed radiators, are:

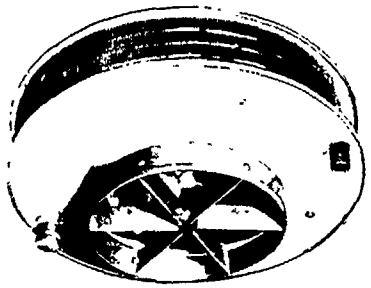
*Low Temperature Steam Type*—for use where lower "leaving air temperatures" than those offered by the Standard Steam Type are required.

*Hot Water Type*—for use with forced circulation hot water.

*Textile Mill Type*—for use in textile mills. Non-clogging and easy to clean.

**Diffusers for Vertical Heaters:** Optional equipment for vertical units include directional vanes (illustrated) and single cone or double cone diffusers. All provide a more desirable spread of the air stream.

## Vertical Type



Design 12
Standard Steam Type—Single Speed
With Directional Vanes

***Vertical Heaters*** are of the downblast type. They project the heated air downward to the working level—and recirculate the heated air ordinarily pocketed at the ceiling. They are widely used where large roof areas, obstructions, or location problems require a vertical heat source. Steam supply and return headers on both sides of the unit simplify installation and reduce piping costs.

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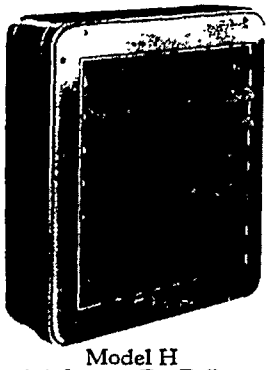
### Motor Ratings, Steam Capacities, and Dimensions

| Type | Size Number | Motor H.P. | Motor Single High Speed R.P.M. | Capacities at 2 Pounds Steam 60° Entering Air: Btu per hour | EDR in sq. ft. | Condensate in lbs. per hour | Final Temp. | C.F.M. 70° Air Basis | Outlet Velocity | Dimensions, in Inches: Height | Width or Diam. | Max. Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Design 14 Horizontal Heaters Standard Steam Type | 25 | 1/100 | 1080 | 25,800 | 107 | 26.7 | 119.7° | 398 | 431 | 20 | 15¾ | 16½ |
| | 40 | 1/50 | 1080 | 41,500 | 173 | 43.0 | 114.5° | 700 | 526 | 22½ | 18⅛ | 17⅜ |
| | 55 | 1/20 | 1080 | 57,000 | 238 | 59.0 | 113.5° | 978 | 590 | 24¾ | 19½ | 21 |
| | 75 | 1/20 | 1080 | 76,000 | 317 | 78.6 | 112.3° | 1336 | 638 | 26¼ | 22 | 23½ |
| | 85 | 1/20 | 1080 | 85,600 | 357 | 88.6 | 124.5° | 1220 | 538 | 26¾ | 24½ | 24¼ |
| | 100 | 1/12 | 1080 | 100,500 | 419 | 104.0 | 118.5° | 1580 | 690 | 26¾ | 24½ | 24¼ |
| | 115 | 1/12 | 1080 | 114,500 | 478 | 118.5 | 120.5° | 1740 | 596 | 30⅝ | 25¾ | 25 |
| | 125 | ⅙ | 1080 | 125,500 | 523 | 129.8 | 116.3° | 2050 | 696 | 30⅝ | 25¾ | 25½ |
| | 135 | ⅙ | 1080 | 134,500 | 561 | 139.2 | 120.0° | 2060 | 632 | 32½ | 27 | 26⅛ |
| | 150 | ⅙ | 1080 | 150,700 | 628 | 156.0 | 114.4° | 2550 | 772 | 32½ | 27 | 26⅛ |
| | 175 | ¼ | 1080 | 176,600 | 736 | 182.5 | 113.0° | 3060 | 836 | 33¾ | 28¼ | 27⅜ |
| | 200 | ¼ | 1080 | 200,700 | 837 | 207.5 | 111.0° | 3620 | 894 | 35⅞ | 29½ | 28 |
| | 250 | ¼ | 820 | 251,000 | 1045 | 259.5 | 115.2° | 4180 | 781 | 38⅞ | 34½ | 32¼ |
| | 300 | ⅓ | 820 | 300,500 | 1253 | 311.0 | 113.2° | 5200 | 838 | 40⅞ | 37 | 34⅜ |
| Design 12 Vertical Heaters Standard Steam Type | D 40 | ⅙ | 1725 | 40,000 | 167 | 41.5 | 113° | 695 | 1230 | | 21 | 19 |
| | D 55 | ⅙ | 1725 | 55,000 | 229 | 57.0 | 110° | 1010 | 1380 | | 26½ | 19 |
| | D 75 | ⅙ | 1725 | 75,000 | 312 | 77.5 | 113° | 1300 | 1650 | | 29¼ | 18 7/16 |
| | D100 | ⅙ | 1725 | 100,000 | 417 | 104.0 | 113° | 1735 | 1900 | | 32¼ | 19½ |
| | D125 | ⅙ | 1725 | 125,000 | 520 | 130.0 | 126° | 1740 | 1240 | | 32¼ | 18¼ |
| | D150 | ¼ | 1140 | 150,000 | 625 | 155.0 | 126° | 2090 | 1340 | | 32¼ | 21 1/16 |
| | D175 | ¼ | 1140 | 175,000 | 730 | 181.0 | 126° | 2440 | 1440 | | 37¼ | 21 1/16 |
| | D200 | ⅓ | 1140 | 200,000 | 833 | 207.0 | 125° | 2830 | 1545 | | 37¼ | 23⅛ |
| | D250 | ½ | 1140 | 250,000 | 1040 | 259.0 | 125° | 3540 | 1605 | | 42½ | 23 3/16 |
| | D300 | ½ | 1140 | 300,000 | 1250 | 310.0 | 125° | 4250 | 1750 | | 44½ | 24 7/16 |
| | D350 | ¾ | 1140 | 350,000 | 1460 | 362.0 | 125° | 4980 | 1885 | | 52½ | 21 7/16 |
| | D400 | ¾ | 1140 | 400,000 | 1665 | 414.0 | 123° | 5800 | 2040 | | 52½ | 22 11/16 |

*Prices on application*

# Trane Unit Heaters

## Horizontal Type



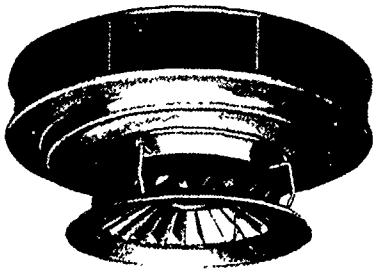
Model H
With Louver Fin Diffuser

***These heaters are available with constant-speed, two-speed, or three-speed motors in both the Standard and High CFM Models.***

***Model H*** Horizontal Heaters feature the sturdiness necessary for severe industrial applications with the quiet efficiency and attractive appearance desired for use in modern shops and similar installations. The sides, top, and bottom of the casing are of one-piece construction. The bonderized casing is finished in brown enamel. The heaters are equipped with a quiet, four-blade fan.

A louver fin diffuser (shown in the illustration above) permits easy control over the spread of the heated air and the distance of the throw and provides a great number of diffusion patterns as well; it is available at extra charge. Units regularly include louvers only.

## Vertical Type



Model P
With Louver Cone Diffuser

***Model P*** Vertical Heaters, efficient and streamlined throughout, blend well with a wide range of building types. They have an extensive industrial application wherever vertical heaters are desired.

The Model P is a draw-through, vertical discharge propeller unit heater. It can be suspended at heights from ten to sixty feet. The heater consists of an extended surface circular coil sandwiched between two circular plates, a four-blade propeller fan, and a standard motor mounted out of the air stream. Standard Models have a two-row coil; High CFM Models, a one-row coil.

Cone attachments, louvers, Free-Flo grilles, anemostats, and the louver cone diffuser (illustrated) are optional. The latter provides many diffusion patterns and permits focusing the air stream for up to 60% greater throw.

### Motor Ratings, Steam Capacities, and Dimensions

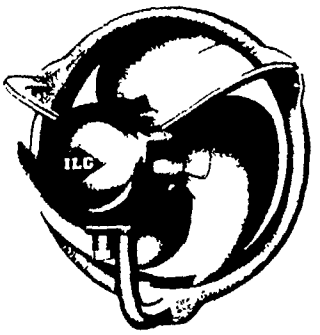
| Model and Number | | Motor H.P. | Motor Constant High Speed R.P.M. | Capacities at 2 Pounds Steam 60° Entering Air: Btu per hour | EDR in sq. ft. | Condensate in lbs. per hour | Final Temp. | C.F.M. 70° Air Basis | Outlet Velocity | Dimensions, in Inches: Height | Width or Diam. | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model H Standard Horizontal Heaters | 71H | 1/30 | 1500 | 22,000 | 92 | 23 | 106° | 438 | 577 | 19 | 16 | 15⅝ |
| | 72H | 1/30 | 1500 | 36,000 | 150 | 37 | 125° | 511 | 702 | 19 | 16 | 15⅝ |
| | 74H | 1/30 | 1500 | 44,000 | 183 | 46 | 129° | 587 | 811 | 19 | 16 | 15⅝ |
| | 76H | 1/30 | 1500 | 53,000 | 220 | 55 | 135° | 648 | 702 | 20½ | 17½ | 15⅞ |
| | 78H | 1/30 | 1500 | 63,000 | 262 | 65 | 139° | 736 | 506 | 23½ | 20½ | 20⅜ |
| | 80H | 1/20 | 1500 | 78,000 | 325 | 82 | 135° | 955 | 678 | 23½ | 20½ | 20⅜ |
| | 82H | ⅛ | 1140 | 86,000 | 358 | 88 | 126° | 1205 | 842 | 23½ | 20½ | 20⅜ |
| | 84H | ⅛ | 1140 | 125,000 | 521 | 130 | 130° | 1648 | 818 | 26½ | 23½ | 20⅜ |
| | 86H | ⅙ | 1140 | 144,000 | 600 | 150 | 122° | 2150 | 1050 | 26½ | 23½ | 21⅜ |
| | 88H | ⅙ | 1140 | 180,000 | 750 | 188 | 130° | 2370 | 843 | 29½ | 26½ | 22½ |
| | 90H | ⅙ | 1140 | 200,000 | 833 | 207 | 131° | 2600 | 758 | 32 | 29½ | 26¼ |
| | 92H | ¼ | 1140 | 240,000 | 1000 | 250 | 127° | 3310 | 952 | 32 | 29½ | 26¼ |
| | 94H | ¼ | 1140 | 297,000 | 1235 | 310 | 136° | 3590 | 637 | 40 | 35½ | 26¼ |
| | 96H | ½ | 1140 | 352,000 | 1465 | 367 | 129° | 4700 | 826 | 40 | 35½ | 26¼ |
| Model P Standard Vertical Heaters | 100 P | 1/30 | 1500 | 55,300 | 230 | 57 | 132° | 710 | 1390 | | 24¾ | 10⅜ |
| | 120 P | ⅛ | 1725 | 97,000 | 405 | 101 | 123° | 1420 | 1730 | | 24¾ | 15 11/16 |
| | | 1/20 | 1140 | 76,000 | 317 | 79 | 135° | 940 | 1165 | | | |
| | 150 P | ⅓ | 1725 | 141,500 | 590 | 147 | 118° | 2250 | 1790 | | 33¼ | 17½ |
| | | ⅛ | 1140 | 120,000 | 500 | 125 | 132° | 1535 | 1245 | | | |
| | 180 P | ½ | 1725 | 194,000 | 807 | 201 | 111° | 3500 | 2040 | | 33¼ | 19 9/16 |
| | | ⅙ | 1140 | 158,500 | 660 | 164 | 123° | 2320 | 1395 | | | |
| | 200 P | ⅓ | 1140 | 233,000 | 970 | 241 | 126° | 3250 | 1545 | | 33¼ | 20 1/16 |
| | 220 P | ½ | 1140 | 327,000 | 1365 | 341 | 120° | 5010 | 1900 | | 38½ | 23 13/16 |
| | 250 P | 1 | 1140 | 435,000 | 1815 | 454 | 123° | 6360 | 1985 | | 46¼ | 22¾ |
| | 275 P | 1 | 1140 | 451,000 | 1880 | 466 | 122° | 6700 | 1460 | | 46¼ | 23¼ |
| | 300 P | 1 | 1140 | 560,000 | 2330 | 580 | 128° | 7580 | 1660 | | 46¼ | 24⅛ |

The heaters listed above are available also in High CFM Models.

***Prices on application***

# Ilg Heating and Ventilating Equipment

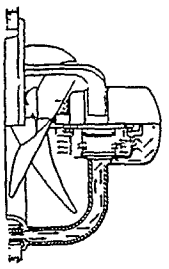
## Self-Cooled Motor Propeller Fans



Type Q: The Type "Q" Propeller Fan, illustrated at the left, is used to exhaust stale air, fumes, odor, dust, etc. The patented, self-cooled motor is designed specifically for use in polluted air systems. The fan wheel, dynamically balanced, is connected directly to the motor. The fans are available in sizes ranging from 6 to 48 inches.

**Other types:** For moving greater air capacities with maximum physical dimension, the Type "P" Fan is recommended. Type "P" is a high speed, self-cooled motor propeller fan. It combines the Type "Q" wheel with a Type "P" motor.

Also available is a Type "X" Explosion-Proof Propeller Fan. This type embodies all the fine performance features of the Type "Q" Propeller Fan with the use of a ball-bearing, explosion-proof motor. The motor has been approved by the Underwriters' Laboratories, Inc., as suitable for all Class I, Group D hazardous applications.



Type Q
Self-Cooled Fan

Clean, cool, fresh air, drawn from the outside, is circulated through the vent pipe and motor, and then exhausted through the front of the motor. The motor remains clean and is self cooling.

**Type "Q" Specifications***
60 Cycle Alternating Current
Constant Speed, Single-Phase

| Size No. 115 Volts | Size No. 230 Volts | Rpm | Cfm | Decibel Rating |
|---|---|---|---|---|
| 48078 | 48079 | 2750 | 250 | 50 |
| 48080 | 48081 | 1550 | 350 | 47 |
| 48090 | 48091 | 1550 | 500 | 46 |
| 48095 | 48096 | 1550 | 1000 | 54 |
| 48106 | 48107 | 1140 | 1700 | 53 |
| 48108 | 48109 | 1140 | 2600 | 56 |
| 48110 | 48111 | 1140 | 3600 | 58 |
| 48112 | 48113 | 855 | 4700 | 54 |
| 48114 | 48115 | 685 | 7800 | 61 |
| 48116 | 48117 | 570 | 10750 | 62 |
| ..... | 48119 | 490 | 15500 | 61 |
| ..... | 48121 | 490 | 23300 | 65 |

*Type "Q" is also available with 60 cycle motors of the two speed, single-phase or the constant speed, three-phase type.

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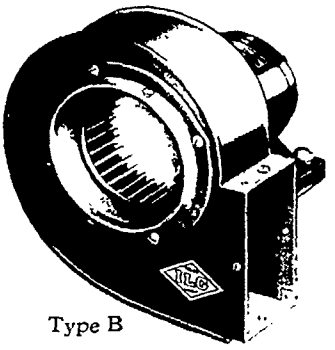
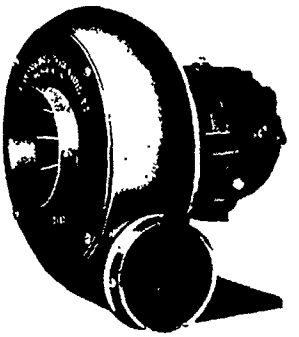
## Volume Centrifugal Fans



Type B



Type P

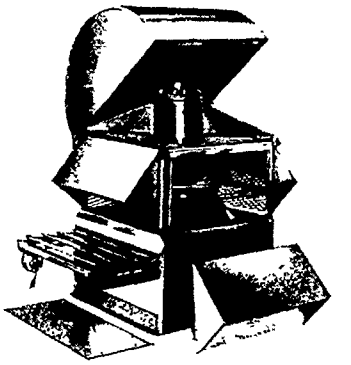
**Type B:** Type "B" Centrifugal Fans are used for all types of blow-in or exhaust duty requiring low pressure, small volume, and quiet operation. Rotation is clock-wise or counter clock-wise. The discharge is easily changed by rotating the housing. Units are available with free air deliveries ranging up to 2040 cubic feet per minute.

**Motor ratings:** 60 cycle A.C., either single-phase, 110-220 volts or three-phase, 220-440 volts. Also 115-230 volts, direct current.

**Type P:** Type "P" Centrifugal Fans handle small quantities of air over a pressure range of ¼ to 6½ inches. They are excellently used to exhaust steam, vapors, and chemical fumes, to handle dust from polishing wheels and grinders, and for many other exhaust purposes.

**Motor ratings:** 60 cycle A.C., either single-phase (constant speed), 110-220 volts, two or three-phase, 220-440 volts. Also, 25 cycle A.C., single-phase, 110-220 volts or direct current 115-230 volts.

## Power Roof Ventilators



Type PRV—Open View

**Type PRV:** Type "PRV" Roof Ventilators, consisting of a housed, direct-connected, centrifugal fan and motor, offer accurately controlled ventilation regardless of weather conditions. Sizes are available to provide air deliveries over an extensive range of pressures, from free air to 1½-inch static.

The self-cooled motor, mounted in a separate compartment, is protected from exhaust fumes, heat, dust, and excessive moisture. The weather-tight housing contains the complete fan unit and all air control accessories; there is no need for an expensive high profile curbing, with air control accessories fitted into the roof or curbing section. The unit is easy to install, wire, and service.

*Prices on application*

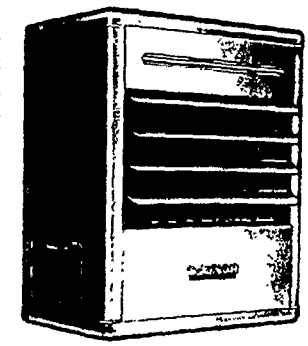
# Reznor Gas-Fired Unit Heaters

**Recommendations:** Reznor Gas-Fired Unit Heaters, designed for commercial and industrial application, are A.G.A. and Underwriters' approved for use with natural, manufactured, mixed, and liquefied petroleum (LP) gases.

**Safety features:** The heaters have a limit control which automatically shuts off the gas supply in case of excessive temperature and a fan control which responds to the temperature of the heater, and not the room thermostat. The fan control delays operation of the fan until the air is warm enough for forced circulation; the fan runs as long as the unit is warm.

**Construction:** The heaters have a cold rolled steel cabinet with a gray-green, baked-on enamel finish. Heat exchanger tubes are corrosion-resistant aluminized steel; the combustion chamber is welded steel. Adjustable horizontal shutters provide proper air distribution.

**Other models:** Blower Heaters, similar to the Suspended Fan Model and available in the same sizes and capacities, have a centrifugal type or multi-blade blower instead of a propeller fan. Duct Heaters, with input capacities of 100,000, 150,000, or 200,000 btu, are also available.



Suspended Fan Model

### Ratings and Dimensions

| Model No. | Motor H. P. | Input Btu per hour | Output Btu per hour | Output EDR Sq. Ft. | Air delivery Max. C.F.M. | Gas connection Inches | Over-all Dimensions, in Inches Height | Width | Depth |
|---|---|---|---|---|---|---|---|---|---|
| US 25F | 1/125 | 25,000 | 20,750 | 87 | 410 | ½ | 22¼ | 18¾ | 19⅝ |
| US 50F | 1/80 | 50,000 | 41,500 | 173 | 800 | ½ | 22¼ | 18¾ | 23¼ |
| US 75F | 1/40 | 75,000 | 62,250 | 260 | 1200 | ¾ | 29½ | 24 | 24⅜ |
| US 100F | 1/20 | 100,000 | 83,000 | 346 | 1500 | ¾ | 31½ | 24 | 26⅞ |
| US 125F | 1/8 | 125,000 | 103,750 | 432 | 1500 | ¾ | 31½ | 24 | 33½ |
| US 150F | 1/8 | 150,000 | 124,500 | 519 | 1800 | ¾ | 31½ | 24 | 36⅛ |
| US 175F | 1/6 | 175,000 | 145,250 | 605 | 2100 | 1 | 33½ | 24 | 38½ |
| US 200F | 1/6 | 200,000 | 166,000 | 692 | 2400 | 1 | 33½ | 24 | 42⅛ |

***Standard equipment*** includes an electric gas valve, automatic safety pilot valve, manual pilot valve, manual shut-off, fan control, limit control, summer-winter switch, and gas pressure regulator (the latter is not supplied with heaters for LP gas).

Models US 25F through US 100F are furnished with a two-speed motor; other models are furnished with a one-speed motor.

***Optional equipment*** at extra cost includes vertical louvers, hanger boards, lift assemblies, room thermostats, etc.

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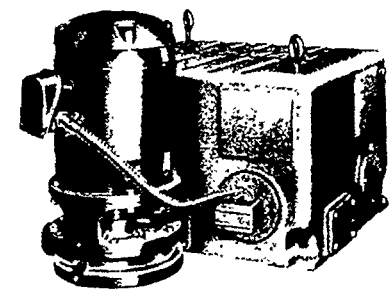
# Hoffman Condensation Pumps

**Recommendations:** Hoffman Condensation Pumps are the vertical close-coupled centrifugal type. Compact, efficient, and ruggedly constructed, they are built for long trouble-free service. The pumps, which include a motor and receiver, are designed to operate at a wide range of pressures without danger of overloading the motor. They are especially adaptable to the high temperatures encountered in condensation pump service.

### Capacities and Connections

| | Capacities EDR Sq. Ft. | Pump Gpm | Receiver Gal. | Size of inlet and discharge Inches |
|---|---|---|---|---|
| Type CS Single Units or Type CD Double Units | 1,000 | 2 | 12 on Single | 2 and ¾ |
| | 2,000 | 3 | | 2 and ¾ |
| | 4,000 | 6 | 20 on Double | 2 and ¾ |
| | 6,000 | 9 | | 2 and ¾ |
| | 8,000 | 12 | | 2 and ¾ |
| | 10,000 | 15 | 20 | 2 and ¾ |
| | 15,000 | 22½ | 36 | 2 and 1¼ |
| When ordering, specify EDR capacity | 20,000 | 30 | 36 | 2 and 1¼ |
| | 25,000 | 37½ | 52 | 3 and 1½ |
| | 30,000 | 45 | 52 | 3 and 1½ |
| | 40,000 | 60 | 52 | 3 and 1½ |
| | 65,000 | 97½ | 75 | 4 and 2 |
| | 75,000 | 112½ | 75 | 4 and 2 |
| | 100,000 | 150 | 150 | 4 and 2½ |
| | 150,000 | 225 | 150 | 4 and 2½ |

Note: Each type is available with an outlet discharge pressure of 10, 15, 20, 30, 40, 50, or 60 psi, as specified; complete data on request.



Type CS—Single Unit (Illustrated)
Type CD—Double Unit (Not Ill.)

**Function:** In Hoffman pumps, the water flows directly from the tank to the centrifugal pump without passing through any intermediate piping. Single Units provide the complete equipment necessary for receiving condensate from the system and discharging it to the boiler. Duplex Units provide a stand-by pump and motor for insurance against shut-down, as well as double capacity when both pumps are operating simultaneously.

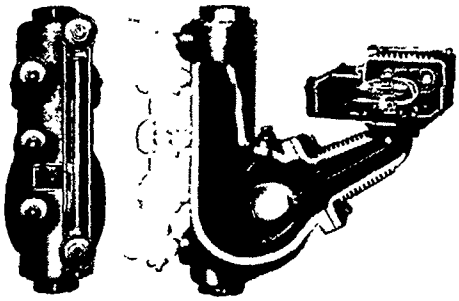
**Features:** All submerged parts are bonze or of non-corrosive material. Motors are the 40° C., continuous rating, heavy duty, vertical, ball bearing type. A float switch mechanism, easily adjusted, automatically controls the operation of the centrifugal pump according to the water level in the cast iron receiver. A split-type packing gland is standard on all models.

***Prices on application***

# McDonnell Boiler Controls

## Low Water Column Type

The No. 157 McDonnell Pump Control, Low Water Cut-Off, and Alarm is used to control boiler water level, increase boiler efficiency, and promote safety in boilers of any size operating at pressures up to 150 pounds.



No. 157
Pump Control and Low Water Cut-off.
(Try-cocks and water glass are not furnished.)

**Dimensions, in Inches**

| No. | Equalizing Pipe Tap | Try-Cock Tap | Water Glass Tap | Overall Height | Overall Width |
|---|---|---|---|---|---|
| 157 | 1 | 1/2 | 1/2 | 16 | 13 5/8 |
| 157A | 1 1/4 | 3/4 | 3/4 | 16 | 13 5/8 |
| 157B | 1 | 1/2 | 1/2 | 18 1/16 | 13 5/8 |
| 157C | 1 1/4 | 1/2 | 1/2 | 18 1/16 | 13 5/8 |
| 157D | 1 1/4 | 3/4 | 3/4 | 18 1/16 | 13 5/8 |

All have automatic reset. If manual reset is required, order No. 157M, 157AM, 157BM, 157CM, 157DM.

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**Construction:** The No. 157 is built to withstand the arduous conditions imposed by high temperature and pressure. All operating parts are away from heat and are sealed from the float chamber by an extra heavy bellows which totally eliminates packing. Switch leads have porcelain bead insulation. The junction box cover is in two parts; the main section is factory sealed to protect switches against tampering or accidental damage.

**Installation:** To simplify installation, this control is made an integral part of the water column, using the water glass and try cocks removed from the old column. By making the No. 157 integral with the water column, practically all equalizing pipe and fittings are eliminated.

This control also eliminates the need for a separate blow-off valve. Since the float chamber actually is the water column, the No. 157 is directly and effectively blown down by the blow-off valve below it.

**Switches:** The two switches used have five terminals which may be wired to provide a pump control circuit, a low water cutoff circuit, a low water alarm circuit, or any combination of these functions. Both switches are the dependable mercury type especially designed for high temperature service. "Cut-off" and "cut-in" points of both switches can be adjusted within the range of practical requirements to meet individual needs.

**Electrical ratings:** Electrical ratings, approved by the Underwriters' Laboratories, are as follows:

Cut-off and pump control: A.C. 1/2 h.p., 115-230 volts.
D.C. 1/4 h.p., 115-230 volts.
Pilot duty service: 125 volt amps., 115-230 volts.
Alarm circuit: A.C. 1 amp. or D.C. 1/2 amp., 115 volts.
A.C. 1/2 amp. or D.C. 1/4 amp., 230 volts.

# Blakeslee Steam Jet Pumps or Ejectors

**Dimensions and Capacities**

| Size of Pump Inches | Capacity Gallons per Minute | Suction Pipe Inches | Discharge Pipe Inches | Steam Pipe Inches | Steam Opening Inches | H.P. Required to operate |
|---|---|---|---|---|---|---|
| 3/4 | 8 | 3/4 | 1/2 | 3/8 | 3/16 | 2 |
| 1 | 15 | 1 | 3/4 | 1/2 | 1/4 | 3 |
| 1 1/4 | 20 | 1 1/4 | 1 | 1/2 | 5/16 | 4 |
| 1 1/2 | 30 | 1 1/4 | 1 1/4 | 3/4 | 3/8 | 6 |
| 2 | 40 | 2 | 1 1/2 | 3/4 | 7/16 | 8 |
| 2 1/2 | 50 | 2 1/2 | 2 | 1 | 1/2 | 10 |
| 3 | 60 | 3 | 2 1/2 | 1 | 9/16 | 15 |
| 4 | 250 | 4 | 3 | 2 | | |

Note: The above capacities are based on 50-pound steam pressures.

These Jet Pumps or Ejectors are used for filling tanks, transferring liquids from one part of a building to another, substituting for water tank on railroads, and unwatering shallow mines, pits, cellars, coffer-dams, quarries, wells, etc.

Liquids may be forced to an elevation equal to about one foot to each pound of steam pressure; however, it is recommend that two pumps be used, one placed above the other, for elevations above 50 feet.

The limit of perpendicular suction is 14 feet and will require a steam pressure of at least 25 pounds; special pumps are furnished for higher suction power.

These pumps will work in any position.

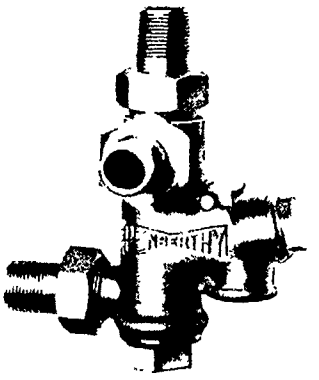
*Prices on application*

# Penberthy Automatic Injectors

Sizes and Capacities

| Size No. | Horsepower: Based on Ordinary Tubular Boiler | Horsepower: Based on 30 lbs. Water per H.P. per Hour | Pipe Connection Inches | Capacity per Hour 1 to 3 feet lift 60 to 110 pounds steam pressure: Maximum Gallons | Capacity per Hour: Minimum Gallons |
|---|---|---|---|---|---|
| OO-21 | 4 to 8 | 6 to 12 | 3/8 | 80 | 45 |
| AA-21 | 12 to 22 | 15 to 30 | 1/2 | 180 | 100 |
| BB-21 | 20 to 45 | 25 to 60 | 3/4 | 360 | 180 |
| CC-21 | 45 to 80 | 50 to 100 | 1 | 600 | 325 |
| DD-21 | 75 to 135 | 85 to 165 | 1 1/4 | 1000 | 525 |
| EE-23 | 115 to 255 | 150 to 320 | 1 1/2 | 1900 | 850 |
| FF-23 | 200 to 400 | 250 to 500 | 2 | 3000 | 1600 |
| GG-21 | 375 to 600 | 400 to 750 | 2 1/2 | 4200 | 2150 |

Stock Model Injectors are the "suction lift overflow front, delivery back" design. Injectors with special connections or for other pressures can be furnished.



Stock Model Injector

Penberthy Injectors are efficient, re-starting, automatic boiler feeding pumps designed for use on steam lines having pressures from 25 to 100 pounds. Compact, with no moving parts, the unit is low in initial cost and requires minimum attention.

The injectors are designed for suction lift but will also work well with water under pressure. At the lower steam services, however, more efficiency will be gained if a special steam jet is substituted when the unit is connected directly to a city pressure line.

They have many industrial uses and are well adapted to steam processing boilers, vulcanizing shops, boats, laundries, portable boilers, sawmills, etc.

In installations where cold water is handled the injectors provide quick delivery of hot water and the return of operating steam to the boiler.

Where mechanical pumps are used in hot water installations, the injectors often serve as dependable reserve units for use with cold water.

# Penberthy "XL-96" Ejectors

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Penberthy XL-96, Series 1 are forcing ejectors designed to operate efficiently against heads equal to one foot for each 1 1/2 pounds of operating steam pressure. They have both lifting and elevating power but on deep suction lifts with slight elevation, the water can be delivered cooler with Penberthy Series 20 or 40 Ejectors; data furnished on request.

In size numbers 1 to 4, the ejectors are furnished all-bronze. In size numbers 5 to 10, they are furnished either all-bronze or with iron body and brass jet; orders must specify the type desired.

Series 1, Stock Model
Siphon or Steam Jet Pump

Sizes and Capacities

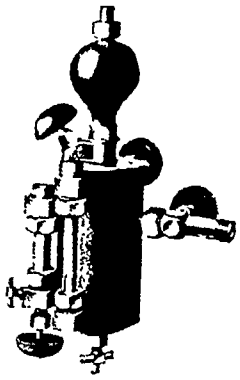
| Size No. | Pipe Connection, in Inches: Steam | Pipe Connection: Suction and Delivery | Capacity, Gallons per Hour: 40 to 65 pounds Steam 3 Feet Lift | 20 to 40 pounds 65 to 100 pounds | 40 to 65 pounds 50 Feet Elevation | 40 to 65 pounds 25 Feet Elevation | Vertical Lift: 40 to 75 pounds Steam Feet | 25 to 40 or 75 to 100 pounds Feet |
|---|---|---|---|---|---|---|---|---|
| 1 | 3/8 | 1/2 | 240 | 235 | 120 | 180 | 23 | 20 |
| 2 | 1/2 | 3/4 | 500 | 450 | 250 | 375 | 25 | 22 |
| 3 | 3/4 | 1 | 840 | 700 | 420 | 625 | 25 | 22 |
| 4 | 1 | 1 1/4 | 1,350 | 1,300 | 650 | 950 | 25 | 22 |
| 5 | 1 | 1 1/2 | 1,950 | 1,850 | 975 | 1,450 | 25 | 22 |
| 6 | 1 1/4 | 2 | 3,500 | 3,000 | 1,750 | 2,600 | 25 | 22 |
| 7 | 1 1/2 | 2 1/2 | 5,700 | 4,350 | 2,500 | 3,750 | 25 | 22 |
| 8 | 2 | 3 | 9,500 | 8,160 | 4,750 | 7,200 | 25 | 22 |
| 9 | 2 | 3 1/2 | 13,600 | 12,400 | 6,800 | 10,200 | 25 | 22 |
| 10 | 2 1/2 | 4 | 18,400 | 17,100 | 9,200 | 13,800 | 25 | 22 |

When Ejector is lifting 10 feet or over, suction pipe should be one size large than suction connection of Ejector, enlarging close to Ejector. A foot valve should be used on deep lifts.

When Ejector is elevating more than 20 feet, the discharge pipe should be one size larger than coupling on Ejector, enlarging close to Ejector.

*Prices on application*

# Lubricators, Oil Cups, and Grease Cups



**Double Connection**
Double Connection Lubricators should be installed with both connections between the boiler and the throttle.

## "Detroit" Standard Lubricators

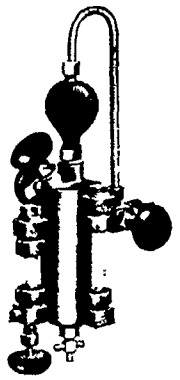
Detroit Lubricators are made in a variety of styles designed to properly lubricate the valves and cylinders of all types of steam engines, steam pumps, gas engines, air compressors, and similar operating units. Standard Lubricators are not to be used for pressures in excess of 150 pounds.

All metal parts are made of brass. Handles are made of a durable, non-heating composition. The support arm is threaded for ½-inch pipe.

Both double and single connection lubricators are available with the following capacities:

½ pint, 1 pint, or 1 quart

When ordering lubricators, specify whether the double or single connection type is wanted and, in addition, state the capacity desired.



**Single Connection**
Single Connection Lubricators can be connected either above or below the throttle or into the steam chest direct.

## Glass Body Oil Cups

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No. 600 Oil Cup

When ordering glass body oil cups, specify the catalog size numbers shown in the table below.

**No. 600** Series Oil Cups (illustrated) are for use on machinery and bearings. They have set feed, sight feed, and stop feed features. The stop feed consists of a lever at the top of the cup, which permits the oil to be shut off, fed at a regular rate or in a stream, without disturbing the set feed adjustment.

The cap and base are pressed brass and the sight feed post is made of rod brass.

**No. 500** Series Oil Cups are for use on machinery and all types of bearings. They have set feed and sight feed features.

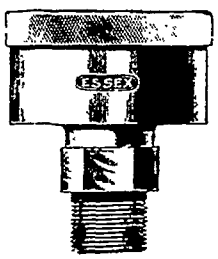
The cap and base are pressed brass and the sight feed post is made of rod brass.

**No. 200** Series Oil Cups are used on gas, gasoline, or oil engines. They are furnished with a screw filler cap. An equalizing tube, to overcome back pressure from engine and a ball check in base are provided to meet all requirements where back pressure is apt to occur.

**Dimensions and Capacities**

| Catalog Size Numbers | | Nos. 600 500 | Nos. 601 501 | Nos. 601½ 501½ 201½ | Nos. 602 502 202 | Nos. 604 504 204 | Nos. 605 505 205 | Nos. 606 506 206 |
|---|---|---|---|---|---|---|---|---|
| Outside diameter of glass | Inches | 1¼ | 1½ | 1¾ | 2 | 2½ | 3 | 3½ |
| Height of glass | Inches | 1⅛ | 1⅜ | 1⅝ | 1⅞ | 2⅜ | 3 | 4 |
| Pipe thread on shank | Inches | ⅛ | ¼ | ¼ | ⅜ | ⅜ | ½ | ½ |
| Oil capacity | Ounces | ⅝ | 1⅛ | 1½ | 2½ | 5 | 10 | 18 |

## Plain Compression Grease Cups




No. 75 Grease Cup

A plain brass compression grease cup is a very satisfactory lubricating device in many applications, and is particularly suited for rough work.

The No. 75 Grease Cup is available in seven sizes with grease capacities ranging from ¼ up to 5 ounces and inside cup diameters from ¾ up to 3 inches.

**Dimensions and Capacities**

| Size Number | | 000 | 00 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Inside diameter | Inches | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
| Pipe thread on shank | Inches | ⅛ | ⅛ | ⅛ or ¼ | ¼ | ⅜ | ½ | ½ |
| Grease capacity | Ounces | ¼ | ½ | ⅔ | 1 | 2 | 3½ | 5 |

*Prices on application*

Corrosion-Resistant
Valves & Fittings;
Diaphragm & Ball Valves

# Corrosion-Resistant Alloy Valves and Fittings

## (Including Diaphragm Valves)

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## Service Recommendations

Crane Corrosion-Resistant Alloy Valves are regularly made of 18-8 Mo Alloy Steel and Monel. The fittings are regularly made of 18-8 Mo.

All castings made of corrosion-resistant metals and alloys are produced in Crane foundries under the constant supervision of expert metallurgists. Bar stock used in valves and fittings is purchased under rigid specifications which assure the use of material adequate in both physical and chemical properties. This page and the following page are devoted to service recommendations for 18-8 Mo and Monel.

It should be remembered that service recommendations are tentative in nature, and obscure factors often greatly alter circumstances and thus alter recommendations. These recommendations can be followed in most instances, however, and Crane engineers are always available to make specific recommendations based on a detailed study of the individual corrosion problem.

**Marking:** Crane 18-8 Mo Valves and Fittings are marked "18-10 M" to indicate the chromium and nickel content; Monel material is marked "MONEL".

### Crane 18-8 Mo Alloy Steel
**(Casting Equivalent of A.I.S.I. Type 316)**

Crane 18-8 Mo Alloy Steel is an exceptionally high grade stainless steel that is highly resistant to many forms of corrosive action.

Crane 18-8 Mo Alloy Steel contains 18 to 22% chromium, 10 to 12% nickel, and 2.5 to 3% molybdenum, and conforms to but exceeds the minimum requirements of A.S.T.M. Specification A-296, Grade CF-8M, and A.I.S.I. (American Iron and Steel Institute) Type 316 wrought stainless steel.

Crane 18-8 Mo Alloy Steel Valves and Fittings have a wide range of application in the food, pulp, paper, textile, dye, chemical, and related industries. They are recommended for service in handling acetic acid, nitric acid, alkalies (such as caustic soda, soda ash, etc.), bleaching solutions, corrosive mine waters, fatty acids, food products, fruit juices, sulfate and sulfite liquors and vapors in paper mills, sulfurous acid, tanning liquors, and a large number of other industrial chemicals.

***(Continued on the following page)***

## Crane 18-8 Mo Alloy Steel

*Continued from the preceding page*

18-8 Mo Alloy Steel is satisfactorily resistant under most conditions to all fatty acids both pure and in the presence of customary organic impurities; but it may not be completely resistant when salt and or other inorganic impurities are present. It can be used with these acids at temperatures up to 500° F., but processing at such temperatures introduces special problems other than corrosion. Valves and fittings for this high temperature service should receive special consideration.

For services with chromic acid, 18-8 Mo alloy is often recommended when contamination with iron must be avoided, also in many services with nitric acid it is recommended, although there are some cases where it gives inferior corrosion resistance to that of the straight chromium alloy steels. It is apparently satisfactory for handling pure phosphoric up to 85 per cent acid at ordinary temperatures, but should not be offered for use with crude acid under any circumstances. Again it shows excellent resistance to hot 98 per cent sulfuric acid and to dilute solutions (less than 10%) under oxidizing conditions at ordinary temperatures. When used with cold full strength acid and with the intermediate concentrations, the results are not so good.

18-8 Mo is practically immune to corrosion by many food products and should be acceptable, although not necessarily required, in most cases. It can also be used in service with carbonated beverages. It resists well all organic acids in the concentrations which are apt to be present; is not attacked by carbonic and sulfurous acid under similar circumstances; and in addition, is capable of resisting corrosion by the small amounts of phosphoric acid which are occasionally encountered.

18-8 Mo is also resistant to alkaline cleaning solutions and to some of the chemical sterilizers.

***Thread lubricants:*** Crane 18-8 Mo Alloy has such excellent resistance to corrosion that it will be used in contact with a wider variety of fluids than are the more common piping materials. Some of these fluids either dissolve or react chemically with the lubricating and sealing compounds that are normally used in making up screwed joints. It is essential, therefore, that suitably compounded thread lubricants be used when assembling 18-8 Mo Alloy screwed pipe, valves, and fittings. Crane Thread Lubricant has given excellent results in many applications. Specific recommendations will be furnished upon request.

## Monel

Monel is a nickel-copper alloy containing approximately two-thirds nickel and one-third copper. It has high tensile strength, ductility, and offers excellent resistance to corrosion. This alloy finds many applications in the bottling, brewing, canning, ceramic, chemical, dyestuffs, food, paint, refining, rubber, soap, sugar, tanning, textile, and related industries.



Monel may be used in handling hydrochloric acid in low concentrations when air is absent; higher concentrations are strongly corrosive. Caution should be exercised in using it in contact with hot or highly aerated solutions of this acid. Monel resists phosphoric acid over a wide range of concentrations; however, it is corroded appreciably by oxidizing impurities present in the crude acid when made by the treatment of phosphate rock with sulfuric acid. Its resistance to this crude concentrated acid is probably not quite as good as that of the copper-base alloys. It has good corrosion resistance to organic acids such as acetic, formic, and butyric, and is apparently less affected by the presence of oxidizing agents than the copper-base alloys. In all of the foregoing cases, the corrosion rate of Monel is apt to be affected adversely by the presence of air and or other oxidizing acids. Best results are obtained from this metal when oxygen is absent or present in very small concentrations. Monel is not recommended for use with chromic acid, nitric acid, or other oxidizing acids.

Monel has excellent resistance to corrosion by solutions of fixed alkalis, such as sodium hydroxide and potassium hydroxide, but should not be used with ammonium hydroxide. Caution should be used when the service involves the handling of the fixed alkalis in high concentrations and at high temperatures; as contamination with copper may be an important consideration in some cases, Nickel may be required in preference to Monel in some cases. Monel is widely used for handling a variety of neutral, alkaline, and acid salts.

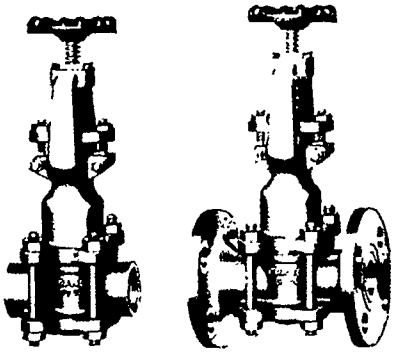
This alloy is very useful in the handling of food products due to the fact that it shows good resistance to the acids, cleaning solutions, organic acid salt mixtures, and brines encountered in the food industry. However, before any material is specified in the handling of food products, the stage of the process at which the equipment is to be used should be known.

## Alloy Trimmed Valves

There are many services in which the corrosion rate of common metals, i.e. iron, steel, and brass is not objectionable from the standpoint of the fluid being handled, but is sufficient to cause the seats to leak and the rubbing surfaces to wear rapidly. For these services Crane offers various regular products in which these critical parts are made of corrosion-resistant materials. In most cases these valves are offered for specific service conditions, e.g., the No. 1644 Valve for chlorine service, the No. 14477 Valve for use with kraft liquors in paper mills, and the No. 3642 A for handling hydrofluoric acid.

It should be borne in mind, however, that all of these types of valves have application in other services as well. Further, other commercial valves frequently can be trimmed with these same corrosion-resistant alloys. Recommendations will be supplied on request.

# 18-8 Mo and Monel Plug Gate Valves



Outside Screw and Yoke

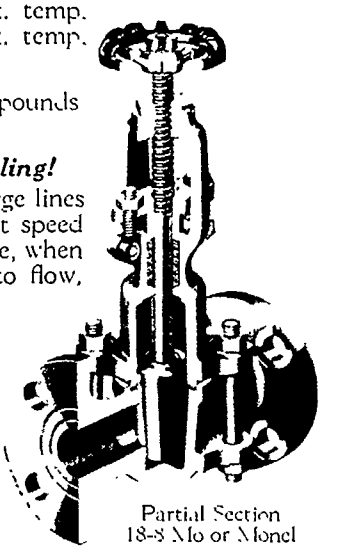
| Screwed | Flanged |
|---|---|
| No. 18850 18-8 Mo Alloy | No. 18851 18-8 Mo Alloy |
| No. 17750 Monel | No. 17751 Monel |

**Non-Shock Working Pressures**
150 pounds liquid or gas; 500° F. max. temp.
230 pounds liquid or gas; 100° F. max. temp.

**Hydrostatic Test Pressures**
Shell—300 pounds Seat—275 pounds

***For Unrestricted Flow! For Throttling!***

In some services, particularly on discharge lines in the handling of fluids where constant speed pumps are used, a conventional gate valve, when wide open, offers minimum resistance to flow, but when used for throttling is subjected to rapid wear. A globe valve in the same service, while suited for throttling, introduces high resistance to flow even when wide open, consequently reducing the maximum capacity of pumps. Crane Plug Gate Valves perform perfectly for unrestricted flow or throttling. They are excellent for two-way flow; either end serves as the inlet.



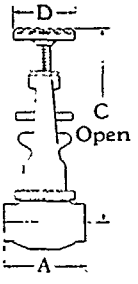
Partial Section 18-8 Mo or Monel

**List Prices, Each**

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| 18-8 Mo | No. 18850, Screwed | 64.00 | 71.00 | 83.00 | 103.00 | 130.00 | 160.00 |
| | No. 18851, Flanged, F.D. & S.F. | 77.00 | 85.00 | 100.00 | 124.00 | 156.00 | 192.00 |
| Monel | No. 17750, Screwed | 67.00 | 75.00 | 87.00 | 108.00 | 137.00 | 168.00 |
| | No. 17751, Flanged, F.D. & S.F. | 80.00 | 90.00 | 104.00 | 130.00 | 164.00 | 202.00 |

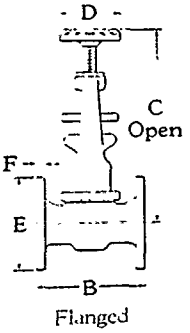
**Materials:** In 18-8 Mo Valves, the body, bonnet, disc, stem, disc-stem plug, and gland are made of Crane 18-8 Mo Alloy Steel, a material equivalent to A.I.S.I. Type 316 wrought stainless steel. In Monel Valves, these parts are made of Monel. In all valves the yoke bushing is made of Cast Manganese Bronze, and the bonnet gasket is Cranite.

**Body:** These are outside screw and yoke valves. The stem threads, being on the outside of the valve, can be lubricated easily and are not exposed to corrosion or sediment in the line. The body features straight-through ports, circular in shape and full in area. When the valves are wide open, the disc is entirely clear of the seat opening, providing a clear, unobstructed passageway through the valve. Curved seat-faces, cast as part of the body, are accurately machined to match the curved surface of the disc.




Screwed

**Bolted bonnet:** The yoke and bonnet are cast in one piece to assure strength and stiffness. The bonnet is bolted to a flange at the bottom of the valve body by four bolt-studs spaced close to each other to provide compactness and a uniform pressure on the gasket.




Flanged

**Dimensions, in Inches**

| Size | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| A | 3 | 3¼ | 3¾ | 4¼ | 4¾ | 5½ |
| B | 4¼ | 4⅝ | 5 | 5½ | 6½ | 7 |
| C | 7⅛ | 8 | 9⅝ | 10¾ | 12¾ | 15 |
| D | 29/16 | 29/16 | 2¾ | 31/16 | 3⅝ | 41/16 |
| E | 3½ | 3⅞ | 4¼ | 4⅝ | 5 | 6 |
| F | 5/16 | 11/32 | ⅜ | 13/32 | 7/16 | ½ |

*Templates for drilling page 458*

**Tapered plug disc:** The disc, a tapered plug riding loosely on the end of the stem, is held in place by a collar on the stem and by a threaded plug screwed into the bottom of the disc. The connection is strong, serviceable, and provides accurate seating. The disc will not fall off the stem in service, even though the disc-stem plug should accidentally loosen.

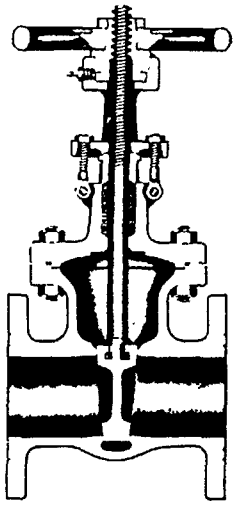
The curved surface of the disc seats against two curved faces in the body when the valve is closed. Two sides of the disc are flat, permitting the disc to fit between similarly shaped faces on the inside of the bonnet. The disc rises into the bonnet but the flat faces keep it from turning. Even wear on the seating surfaces during operation, and freedom from foreign matter when the valve is closed, assure long-time seat tightness.

**Stuffing box; repacking:** The large, deep stuffing box has a one-piece bolted gland and is filled with high grade packing. The gland is pulled up by means of two eye-bolts hinged to the bonnet.

Although sometimes considered inadvisable on chemical services, these valves when wide open can be repacked while under pressure. The yoke is designed with liberal space above and around the gland.

**Flanged valves:** Face to face and end flange dimensions conform to the MSS 150-Pound Corrosion Resistant Standard, No. SP-42-1951, for Gate Valves. Flanges are plain faced with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to this Standard, and spot facing; no deduction is made for valves ordered faced only. Full face gaskets should be used; see page 472.

# 18-8 Mo and Monel Wedge Gate Valves



Cross Section
18-8 Mo or Monel

**Working Pressures**

150 pounds liquid or gas, non-shock; 500° F. max. temp.
230 pounds liquid or gas, non-shock; 100° F. max. temp.

**Hydrostatic Test Pressures**

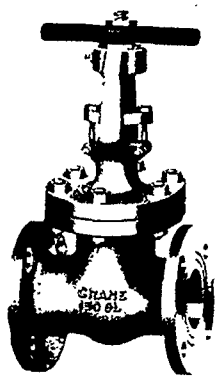
Shell—300 pounds Seat—275 pounds

***Large Size Wedge Gates In 18-8 Mo Alloy Steel or Monel***

To provide chemical and process industries with a more complete selection of efficient, trouble-free valves for corrosive fluids, Crane offers this line of specially designed Wedge Gate Valves in either 18-8 Mo Alloy Steel or Monel.

Except for the materials, the valves are alike. They are of the outside screw and yoke type construction and have a bolted bonnet and a wedge disc.

***For screwed or flanged gate valves in sizes smaller than 2½-inch, use the Crane 18-8 Mo and Monel Plug Gate Valves shown on page 377.***



Outside Screw and Yoke, Flanged
No. 18843
18-8 Mo Alloy Steel
No. 17743
Monel

**List Prices**

| Size | | Inches | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|---|---|
| Flanged, F.D. & S.F. | No. 18843, Gate, 18-8 Mo | Each | 210.00 | 250.00 | 338.00 | 537.00 |
| | No. 17743, Gate, Monel | Each | 263.00 | 311.00 | 424.00 | 671.00 |

**Materials:** All parts of the valves coming into contact with the fluid in the line, including the body, one-piece bonnet and yoke, disc, stem, and gland are made of Crane 18-8 Mo Alloy Steel in the No. 18843 Valves, and of Monel in the No. 17743 Valves. Crane 18-8 Mo Alloy Steel is a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

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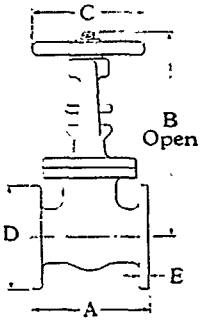
The yoke sleeve is made of Crane Cast Manganese Bronze, a material having superior strength and wear resistance. The wheel is malleable iron.

**Construction:** The valves are the outside screw and yoke type. This construction is often preferred in chemical and process industries. The stem threads are on the outside of the valve, eliminating the danger of damage to the threads by corrosion and sediment from the fluid in the line; stem thread lubrication is simplified, and the rising stem effectively indicates the position of the disc. A lubricating fitting is provided for easy lubrication of the yoke sleeve.

The body seats are cast as part of the body and are carefully and accurately machined to match the seating surfaces of the disc.




**Bolted bonnet:** The yoke and bonnet are cast in one piece to assure maximum strength and rigidity. The bonnet features a male and female joint for added tightness. The bonnet joint is strong and secure, yet it can be easily dismantled and reassembled without danger of injury to the valve.

**Dimensions, in Inches**

| Size | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|
| A | 7½ | 8 | 9 | 10½ |
| B | 15⅜ | 17⅞ | 22⅜ | 31⅜ |
| C | 7 | 8 | 9 | 10 |
| D | 7 | 7½ | 9 | 11 |
| E | 9/16 | ⅝ | 11/16 | 13/16 |

*Templates for drilling . . . page 458*

**Disc:** The valves have a solid wedge disc. The disc is carefully directed throughout its travel by long, accurately fitted guides; this minimizes "drag" and wear on the seating faces and reduces the possibility of damage to the seats.

The disc-stem connection is in the form of a T-head on the end of the stem which fits loosely into a notched slot in the disc, permitting the disc to be raised and lowered easily and safely.

**Stuffing box and gland:** The stuffing box is filled with high grade packing and is unusually large and deep to assure pressure-tightness.

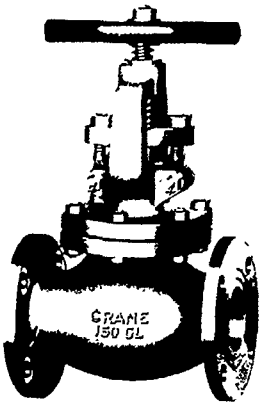
The stuffing box is equipped with a two-piece bolted gland consisting of a steel gland flange and a ball-type gland follower. The gland flange is held securely by two eye-bolts hinged to the bonnet. The ball-type gland follower prevents binding the stem if the eye-bolts are drawn up unevenly.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Dimensions:** Face to face and end flange dimensions conform to the MSS 150-Pound Corrosion Resistant Standard, No. SP-42-1951. Flanges are plain faced with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to this Standard, and spot facing; no deduction is made for valves ordered faced only.

Full face gaskets should be used; see page 472.

# 18-8 Mo and Monel Globe Valves




Outside Screw and Yoke Flanged

No. 18807
18-8 Mo Alloy Steel

No. 17707
Monel

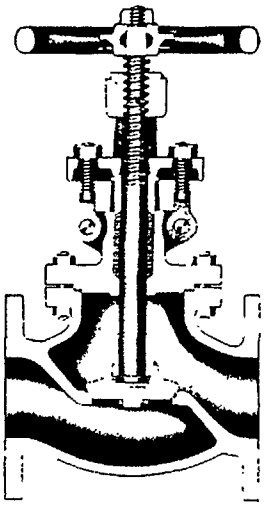
**Working Pressures**
150 pounds liquid or gas, non-shock; 500° F. max. temp.
230 pounds liquid or gas, non-shock; 100° F. max. temp.

**Hydrostatic Test Pressures**
Shell—300 pounds Seat—275 pounds

***Large Size Globe Valves In 18-8 Mo Alloy Steel or Monel***

These valves, specially designed for corrosive fluids, are available in either 18-8 Mo Alloy Steel or Monel. Except for materials, the valves are alike. They embody the same fine features such as outside screw and yoke construction—a bolted bonnet for maximum rigidity—smooth flowing contours within the body, with full port area to reduce pressure drop and to minimize flow resistance—and a ball-shaped seating surface for seat tightness.

***For screwed or flanged globe valves in sizes smaller than 2½-inch, use the Crane 18-8 Mo and Monel Plug Gate Valves shown on page 377.***



Cross Section
18-8 Mo or Monel

**List Prices**

| Size | | Inches | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|---|---|
| Flanged, F.D. & S.F. | No. 18807, Globe, 18-8 Mo | Each | 237.00 | 303.00 | 422.00 | 657.00 |
| | No. 17707, Globe, Monel | Each | 247.00 | 309.00 | 482.00 | 741.00 |

**Materials:** All parts in contact with the fluid in the line, including the body, one-piece bonnet and yoke, disc, stem, disc stem ring, and gland are made of Crane 18-8 Mo Alloy Steel in the No. 18807 Valve, and of Monel in the No. 17707 Valve. Crane 18-8 Mo Alloy Steel is a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

The yoke bushing is made of Crane Cast Manganese Bronze, a material having superior strength and high resistance to wear. The wheel is malleable iron.

**Construction:** The valves are the outside screw and yoke type. This construction is often preferred in chemical and process industries. The stem threads are on the outside of the valve, eliminating the danger of damage to the threads by corrosion and sediment from the fluid in the line; stem thread lubrication is simplified and the rising stem effectively indicates the position of the disc.

**Bolted bonnet:** The yoke and bonnet are cast in one piece to assure maximum strength and rigidity. The bonnet features a male and female joint for added tightness. The bonnet joint is strong and secure, yet it can be easily dismantled and reassembled without danger of injury to the valve.

**Ball-to-35° seat:** The disc in these valves has an accurately machined, ball-shaped seating surface. The seating surface in the body (seat cast integral with body) is finished at a 35 degree taper. The contact between the two surfaces results in a narrow line bearing. When the valves are used to handle fluids that leave a deposit of heavy or crusty substance, the narrow line bearing breaks through such deposits and helps to maintain seat tightness.

**Disc-stem connection:** The disc swivels on the stem. The disc and stem are attached by means of a disc stem ring screwed tightly into the disc. The ring will not loosen in service. The disc is amply guided. Seating is quick and accurate.

**Stuffing box and gland:** The stuffing box is filled with high grade packing and is unusually large and deep to assure pressure-tightness. It is equipped with a two-piece bolted gland consisting of a steel gland flange and a ball-type gland follower. The gland flange is held securely by two eye-bolts hinged to the bonnet. The ball-type gland follower prevents binding the stem if eye-bolts are drawn up unevenly.

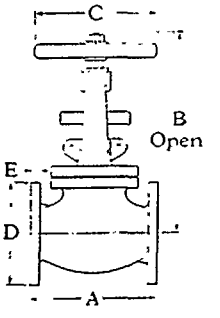
**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Dimensions:** Face to face and end flange dimensions conform to the MSS 150-Pound Corrosion Resistant Standard, No. SP-42-1951. Flanges are plain faced with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to this Standard, and spot facing; no deduction is made for valves ordered faced only. Full face gaskets should be used; see page 472.

**Dimensions, in Inches**

| Size | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|
| A | 8½ | 9½ | 11½ | 16 |
| B | 13⅞ | 15⅞ | 18½ | 21⅜ |
| C | 8 | 9 | 10 | 12 |
| D | 7 | 7½ | 9 | 11 |
| E | 9/16 | ⅝ | 11/16 | 13/16 |

*Templates for drilling.... page 458*

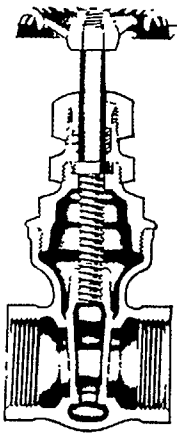


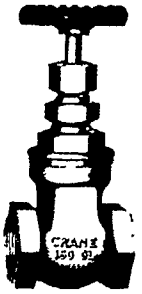
# 18-8 Mo Gate and Globe Valves

## Gate Valves
Wedge Disc—Non-Rising Stem

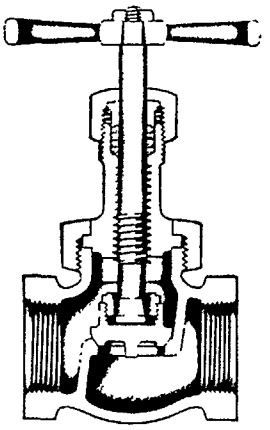
## Globe Valves
Union Bonnet

WORKING PRESSURES
Gate — 150 pounds liquid or gas, non-shock
Globe — 200 pounds liquid or gas, non-shock
350° F. maximum temperature


Cross Section
Gate


No. 18840
Gate, Screwed
18-8 Mo Alloy Steel

No. 18801
Globe, Screwed
18-8 Mo Alloy Steel


Cross Section
Globe

### List Prices

| Size | | Inches | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Screwed | No. 18840, Gate | Each | 33.00 | 34.00 | 36.50 | 40.00 | 49.00 | 60.50 | 75.50 | 100.00 |
| | No. 18801, Globe | Each | 24.50 | 28.00 | 34.00 | 41.00 | 50.00 | 62.50 | 78.00 | 106.00 |

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These valves are carefully designed and assembled to assure efficient operation and long life. Metal sections are more than ample.

**Materials:** In these gate and globe valves, all parts which come in contact with the fluid in the line are made entirely from Crane 18-8 Mo Alloy Steel, a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

In the ¼ and ⅜-inch sizes, globe valves are made of bar stock.

**Gate valve:** Crane No. 18840 Gate Valves are the non-rising stem, wedge disc type. They have a screwed bonnet and are similar in design to the Crane No. 437 Brass Gate Valve. The seats are cast integral with the body. All sizes are equipped with a Style F Wheel.

**Globe valve:** Crane No. 18801 Globe Valves on sizes ½-inch and larger have a union bonnet and are equipped with a cross handle (illustrated). The union bonnet type construction utilizes a union ring which reinforces the bonnet joint and facilitates dismantling and reassembling without danger of injuring the valve. Valves smaller than ½-inch have a screwed bonnet and are equipped with a tee handle.

On ¼ to ½-inch globe valves, the disc is integral with the stem; in larger sizes, the disc swivels on the stem as illustrated in the cross section.

**Stuffing box:** Both the gate and globe valves have a stuffing box equipped with a gland. The stuffing box is of ample depth and is filled with high grade packing.

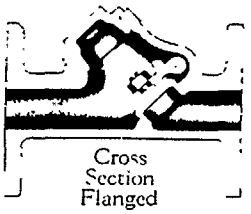
**Repacking:** These valves, when wide open, can be repacked while under pressure.

### Dimensions, in Inches

| Size | | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|
| Gate Valve | End to end | 1⅞ | 1 15/16 | 2⅛ | 2⅜ | 2 13/16 | 3 3/16 | 3 7/16 | 3⅞ |
| | Center to top | 3¾ | 3¾ | 4⅛ | 4¾ | 5⅝ | 6½ | 7¼ | 8¾ |
| | Diameter of wheel | 1¾ | 1¾ | 2 1/16 | 2 9/16 | 2¾ | 3 1/16 | 3⅝ | 4 1/16 |
| Globe Valve | End to end | 1⅞ | 2 7/16 | 2¼ | 2¾ | 3 5/16 | 3⅞ | 4½ | 5¼ |
| | Center to top of stem, open | 3⅛ | 3½ | 4¼ | 5 | 5⅝ | 6½ | 7½ | 8¼ |
| | Distance across handle | 2 9/16 | 2 9/16 | 3¾ | 3¾ | 4¾ | 4¾ | 6 | 7 |

# 18-8 Mo and Monel Swing Check Valves

## Y-Pattern
*Sizes ½ to 2-inch*



Cross Section Flanged

Screwed
No. 18826 18-8 Mo Alloy Steel
No. 17726 Monel

Flanged
No. 18827 18-8 Mo Alloy Steel
No. 17727 Monel

### Working Pressures
150 pounds liquid or gas, non-shock; 500° F. max. temp.
230 pounds liquid or gas, non-shock; 100° F. max. temp.

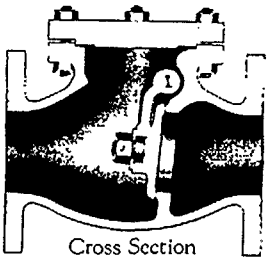
### Hydrostatic Test Pressures
Shell—300 pounds Seat—275 pounds

### *A Choice of 18-8 Mo Alloy Steel or Monel*

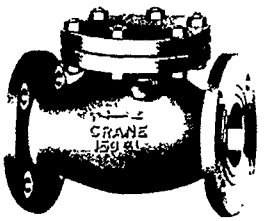
These valves, available in 18-8 Mo Alloy Steel or Monel, are specially designed for corrosive service. In sizes ½ to 2-inch, the valves are the regrinding type. They feature an improved Y-pattern body design. Because of the wide usage of small flanged valves in chemical and process industries, this line includes flanged as well as screwed valves.

In sizes 2½ to 6-inch, the valves are the straightway design, permitting straightway flow with a minimum of flow-resistance and pressure drop.

## Straightway
*Sizes 2½ to 6-inch*



Cross Section



Flanged
No. 18829 18-8 Mo Alloy Steel
No. 17729 Monel

**Materials:** In 18-8 Mo Valves, the body, cap, disc, hinge, and disc nut are made of Crane 18-8 Mo Alloy Steel, a material equivalent to A.I.S.I. Type 316 wrought stainless steel. In Monel valves, these parts are made of Monel.

### List Prices, Each

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-8 Mo | No. 18826, Screwed | | 25.00 | 29.50 | 37.00 | 49.00 | 68.00 | 89.00 | | | | |
| | No. 18827, Flanged, F.D. & S.F. | | 37.50 | 44.50 | 55.50 | 73.50 | 102.00 | 133.00 | | | | |
| | No. 18829, Flanged, F.D. & S.F. | | | | | | | | 222.00 | 281.00 | 369.00 | 591.00 |
| Monel | No. 17726, Screwed | | 27.50 | 32.50 | 41.00 | 54.00 | 75.00 | 97.50 | | | | |
| | No. 17727, Flanged, F.D. & S.F. | | 41.50 | 49.00 | 61.00 | 81.00 | 112.00 | 146.00 | | | | |
| | No. 17729, Flanged, F.D. & S.F. | | | | | | | | 281.00 | 354.00 | 517.00 | 857.00 |

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**Y-Pattern valves:** These are regrinding type valves. The body, Y-pattern in shape, has a smooth contour at all points to allow swift, easy flow. The cap, screwed into the body with long, accurately machined threads, is on the same center line as the seat opening. The cap is large and permits ready access to the internal parts when it is removed.

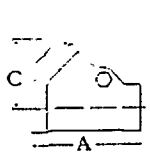
Seating surfaces, integral with the body, can be reground without removing the body from the line; a slot in the end of the disc-spud enables rotating the disc with a screwdriver.

**Straightway valves:** These valves feature a straightway type body with a seat-face at only a slight angle from vertical so as to permit full flow. The bolted cap construction provides a very strong, tight joint, yet it can be easily dismantled for cleaning and repairing. The seat is integral with the body.

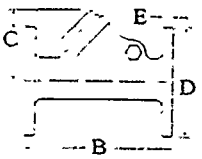
**Disc and hinge:** On all valves, the disc and hinge, suspended from the body by means of a hinge pin, swing freely. The disc is designed to close of its own weight and to rest on the seat when there is no flow. This prevents back-flow from gaining sufficient velocity to cause slamming or "water hammer".

**Outside lever and weight:** Valves 2½-inch and larger can be furnished with an outside lever and adjustable weight when orders so specify; prices on application. The lever and weight can be applied to assist the disc in closing, or to balance the disc so that the valve will open under minimum pressure.

**Flanged valves:** End flanges conform to the MSS 150-Pound Corrosion Resistant Standard, No. SP-42-1951. Flanges are plain faced with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to the MSS 150-Pound Standard, and spot facing; no deduction is made for flanged valves ordered faced only. Full face gaskets should be used; see page 472.




Screwed



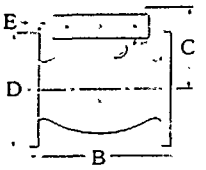

Flanged

Y-Pattern

### Dimensions, in Inches

| Size | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 3 | 3½ | 4¼ | 5 | 5½ | 6½ | | | | |
| B | 4½ | 5 | 5¾ | 6½ | 7¼ | 8½ | 8½ | 9½ | 11½ | 14 |
| C | 1⅞ | 2⅛ | 2¾ | 3⅛ | 3½ | 4¼ | 5⅛ | 5½ | 6½ | 8½ |
| D | 3½ | 3⅞ | 4¼ | 4⅝ | 5 | 6 | 7 | 7½ | 9 | 11 |
| E | 5/16 | 11/32 | 3/8 | 13/32 | 7/16 | ½ | 9/16 | ⅝ | 11/16 | 13/16 |

*Templates for drilling....page 458*




Straightway, Flanged

# 18-8 Mo Relief Valves

No. 18859
Relief Valve
Female Inlet
Side Outlet
18-8 Mo Alloy Steel

**Maximum Set Pressure**
250 pounds
600° F. maximum temperature

***When ordering, be sure to specify set pressure.***

**Materials:** All parts of these relief valves coming in contact with the fluid in the line, including the body, bonnet, stem, disc, disc nut, regulating ring, gland, bonnet bushing, seat ring, and locking plug are made of Crane 18-8 Mo Alloy Steel, a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

The ⅜-inch size valves do not have a regulating ring and locking plug.

**Gas service:** When specifically ordered for manufactured gases, the valve seat is ground special.

**Construction:** The valves are ruggedly constructed. They are the outside spring type and have a screwed bonnet and a lifting lever.

A stuffing box around the stem prevents the escape of the fluid while the valve is discharging.

A blow-back regulating ring is provided for adjusting the blow-down of pressure when changing or regulating the set pressure. The adjustment of this ring may be made from the outside, without interfering with the setting of the valve.

**List Prices and Dimensions**

| Size | | Inches | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|
| No. 18859, Relief Valve | | Each | 70.00 | 76.00 | 84.00 | 100.00 | 122.00 | 150.00 | 185.00 |
| Dimensions, in Inches | Size of inlet | | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
| | Size of outlet | | ½ | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
| | Center to top of cap | | 5⅝ | 5⅝ | 5⅞ | 7 | 8¼ | 9¼ | 11½ |
| | Center to end of female inlet | | 1 11/16 | 1 11/16 | 2 | 2 3/16 | 2⅝ | 2⅞ | 3 7/16 |
| | Center to end of side outlet | | 1 1/16 | 1 1/16 | 1 5/16 | 1⅝ | 2 1/16 | 2⅜ | 2¾ |

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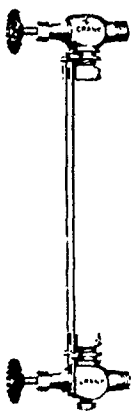
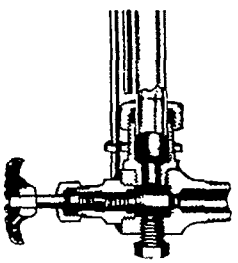
# 18-8 Mo Liquid Level Gauge



No. 18898
Liquid Level Gauge
(With Guard and
Glass Tube)
18-8 Mo Alloy Steel

For **150** pounds liquid
**350°** F. maximum temperature

**Materials:** These Crane No. 18898 Liquid Level Gauges are sturdy and well-constructed.



Sectional View

All parts which come in contact with the fluid in the line including the bodies, bonnets, stems, packing nuts, glands, glass retainers, and drain plug are made of Crane 18-8 Mo Alloy Steel, a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

**Construction:** The gauges are regularly made in the ½-inch size and with 14-inch centers.

Gauges with other centers can be furnished when ordered.

The valve bodies are square type and have an integral seat. The disc and stem also are integral. The Gauges have ⅝-inch O.D. glass and are equipped with two guard rods.

**Special gauges:** When ordered with a drain, the bottom valve will be fitted with a ¼-inch short nipple and a ¼-inch No. 18840 (see page 380) Gate Valve. An extra charge is made for the drain.

Gauges with an automatic check can be furnished when ordered, at a special price. The bottom valve is made with a special adapter, a special stem, and a 9/16-inch diameter ball.

**List Price**

| Size | Inches | ½ |
|---|---|---|
| No. 18898, Liquid Level Gauge with 14" centers | Each | 148.00 |

# 18-8 Mo Fittings

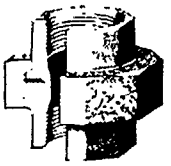
## Screwed Fittings

No. 18860
90° Elbow

No. 18862
45° Elbow

No. 18868
Tee

## Unions



No. 18890

## Flanged Fittings

No. 18861
90° Flanged Elbow

No. 18863
45° Flanged Elbow

No. 18878
Cap

No. 18882
Coupling

No. 18884
Plug

No. 18886
Bushing

***Prices of bushings*** (larger opening determines the price) apply only to the following stock sizes:

| | | |
|---|---|---|
| 1/4×1/8 | 1 ×3/4 | 1 1/2×1 1/4 |
| 3/8×1/4 | ×1/2 | ×1 |
| 1/2×3/8 | | |
| ×1/4 | 1 1/4×1 | 2 ×1 1/2 |
| 3/4×1/2 | ×3/4 | ×1 1/4 |

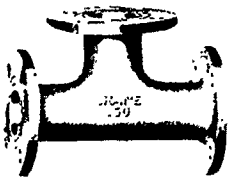
### Non-Shock Working Pressures

150 pounds liquid or gas; 500° F. max. temp.
230 pounds liquid or gas; 100° F. max. temp.

### *18-8 Mo Alloy Steel*

Except for the plugs, bushings, 1/4 and 3/8-inch caps and couplings, and the 1/4 and 3/8-inch union tail-piece and thread-piece which are A.I.S.I. Type 316 bar stock, the fittings, flanges, and union shown on this page are made of Crane 18-8 Mo Alloy Steel, a casting material equivalent to A.I.S.I. Type 316 wrought stainless steel.

**Unions:** 18-8 Mo Alloy Steel Unions are regularly made with a galvanized malleable iron union ring unless specifically ordered with an 18-8 Mo ring, for which an extra charge will be made.



No. 18869, Flanged Tee

No. 18889, Screwed Companion Flange

No. 18891, Blind Flange

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### List Prices, and Dimensions, in Inches

| Size | | | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Screwed Fittings and Unions | Prices Each | No. 18860, 90° Elbow | | 2.60 | 2.90 | 3.30 | 3.90 | 5.00 | 6.40 | 8.40 | 12.30 | | | | |
| | | No. 18862, 45° Elbow | | 2.60 | 2.90 | 3.30 | 3.90 | 5.00 | 6.40 | 8.40 | 12.30 | | | | |
| | | No. 18868, Tee | | 3.00 | 3.60 | 4.50 | 5.50 | 7.00 | 9.30 | 12.00 | 17.50 | | | | |
| | | No. 18878, Cap | | 1.60 | 2.00 | 2.40 | 3.00 | 3.90 | 5.30 | 7.20 | 10.00 | | | | |
| | | No. 18882, Coupling | | 2.00 | 2.30 | 2.70 | 3.40 | 4.40 | 6.00 | 8.20 | 11.30 | | | | |
| | | No. 18884, Plug | | 1.30 | 1.60 | 2.10 | 3.30 | 5.30 | 9.00 | 12.50 | 20.00 | | | | |
| | | No. 18886, Bushing | | 1.80 | 2.10 | 2.60 | 3.40 | 5.00 | 7.50 | 12.00 | 18.50 | | | | |
| | | No. 18890, Union | | 7.00 | 7.50 | 8.00 | 9.00 | 12.00 | 16.50 | 22.00 | 29.50 | | | | |
| | Center to end | 90° Elbow or Tee | | 13/16 | 15/16 | 1 1/8 | 1 5/16 | 1 1/2 | 1 3/4 | 1 15/16 | 2 1/4 | | | | |
| | | 45° Elbow | | 3/4 | 13/16 | 7/8 | 1 | 1 1/8 | 1 5/16 | 1 7/16 | 1 11/16 | | | | |
| | End to end | Coupling | | 1 | 1 1/8 | 1 5/16 | 1 1/2 | 1 11/16 | 1 15/16 | 2 1/8 | 2 1/2 | | | | |
| | | Union | | 1 5/8 | 1 13/16 | 1 15/16 | 2 1/4 | 2 7/16 | 2 13/16 | 3 | 3 3/8 | | | | |
| | Over-all height, Cap | | | 11/16 | 3/4 | 7/8 | 1 1/16 | 1 3/16 | 1 1/4 | 1 5/16 | 1 7/16 | | | | |
| | *Thread engagement | | | 3/8 | 3/8 | 1/2 | 9/16 | 11/16 | 11/16 | 11/16 | 3/4 | | | | |
| Flanged Fittings and Flanges | Prices Each | No. 18861, 90° Elbow | | | | | | 34.50 | 39.00 | 45.00 | 57.00 | 72.00 | 90.00 | 124.00 | 215.00 |
| | | No. 18863, 45° Elbow | | | | | | 34.50 | 39.00 | 45.00 | 57.00 | 72.00 | 90.00 | 124.00 | 215.00 |
| | | No. 18869, Tee | | | | | | 48.00 | 60.00 | 73.50 | 88.50 | 105.00 | 135.00 | 180.00 | 318.00 |
| | | No. 18889, Scrd. Flange | | | | | | 12.50 | 14.00 | 17.00 | 21.00 | 26.50 | 34.00 | 45.00 | 90.00 |
| | | No. 18891, Blind Flange | | | | | | 13.50 | 16.00 | 19.50 | 24.00 | 30.00 | 39.00 | 52.50 | 98.00 |
| | Center to face | 90° Elbow or Tee | | | | | | 3 1/2 | 3 3/4 | 4 | 4 1/2 | 5 | 5 1/2 | 6 1/2 | 8 |
| | | 45° Elbow | | | | | | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 3 | 3 | 4 | 5 |
| | Diameter of flanges | | | | | | | 4 1/4 | 4 5/8 | 5 | 6 | 7 | 7 1/2 | 9 | 11 |
| | Thickness of flanges | | | | | | | 3/8 | 13/32 | 7/16 | 1/2 | 9/16 | 5/8 | 11/16 | 13/16 |

**Flanged fittings and flanges:** The dimensions of flanged fittings and flanges conform to the MSS 150-Pound Corrosion Resistant Standard, No. SP-42-1951. Flanges are plain faced with two V-shaped concentric grooves between the port and bolt holes. Prices include drilling to this Standard, and spot facing; no deduction is made for fittings or flanges ordered faced only. Use full face gaskets; see page 472.

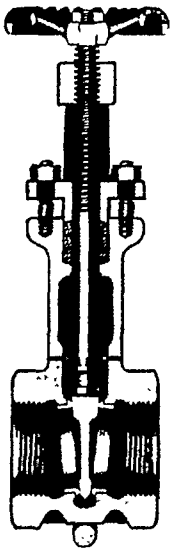
*Explanation of thread engagement . . page 494*

*Templates for drilling . . page 458*

# Ni-Resist Cast Iron Gate Valves

## Wedge Disc—Outside Screw and Yoke

*Sizes 3-inch and smaller*



Cross Section

No. 1670
Screwed

No. 1671
Flanged

*Templates for drilling, page 459.*

**Working Pressures**

Screwed valves—**225** pounds cold water, oil, or gas, non-shock
Flanged valves—**200** pounds cold water, oil, or gas, non-shock

***Air tested***

**Service recommendations:** Crane Ni-Resist Valves are safely used where the strength of ordinary cast iron is adequate. They are especially suitable for soda and sulfate pulp mill service, for creosote used in wood preserving, for handling sour distillates and crudes in petroleum refineries, and for kindred services.

**Materials:** In valves 3-inch and smaller, the body and bonnet are made of Ni-Resist Cast Iron. The disc, stem, and body seat rings are Crane 18-8 Mo Alloy Steel.

In 4-inch valves and larger, the body, bonnet, and disc are made of Ni-Resist Cast Iron. The seating faces and the stem are Crane 18-8 Mo Alloy Steel.

***Ni-Resist*** is an alloy cast iron containing approximately 14% nickel, 2% chromium, and 6% copper. Its strength and physical characteristics are similar to ordinary cast iron, but its resistance to erosion and wear is definitely superior to ordinary cast iron; its corrosion resistance is substantially greater. Ni-Resist parts are stamped "NR". Copper-free Ni-Resist is available on special order; prices on application.

***Crane 18-8 Mo Alloy Steel*** is a material equivalent to A.I.S.I. Type 316 wrought stainless steel.

**Construction:** The valves are of the outside screw and yoke type. Stem threads, on the outside of the valve, are readily lubricated and are not exposed to the corrosive action of the fluid in the line. On valves ½ to 4-inch, the yoke is integral with the bonnet; on 6 and 8-inch valves, the yoke is bolted to the bonnet.

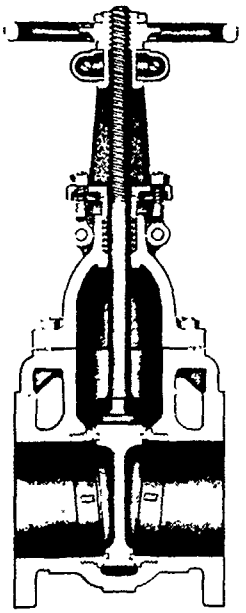
Valves 3-inch and smaller have a clamp type bolted bonnet and a one-piece bolted gland. Larger sizes have the conventional bolted bonnet and a two-piece bolted gland, consisting of a malleable iron gland flange and a ball-type gland follower. Both types of bolted bonnets are easily disassembled for cleaning or repairs.

The valves have a solid wedge disc. The seating faces are integral with the disc in sizes 3-inch and smaller and rolled into the disc in sizes 4-inch and larger. The disc-stem connection is in the form of a T-head on the end of the stem which fits loosely into a matching slot in the disc, permitting the disc to be operated easily and safely.

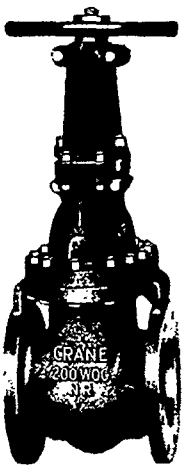
**Stuffing box:** The deep stuffing box is filled with high grade packing. The valves when wide open can be repacked while under pressure.

**End flanges:** End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Prices of flanged valves include facing and drilling to this Standard; no deduction is made for valves ordered faced only. Flanges are plain faced with a smooth finish.

*Sizes 4-inch and larger*



Cross Section




No. 1671
Flanged

**List Prices, Each, and Dimensions**

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 4 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1670, Screwed | | 27.00 | 30.00 | 33.00 | 38.00 | 42.00 | 55.00 | | | | | |
| No. 1671, Flanged, F. & D. | | | | 39.00 | 48.00 | 54.00 | 70.00 | 90.00 | 110.00 | 170.00 | 310.00 | 500.00 |
| Dimensions, in Inches | End to end | 2 1/16 | 2 5/16 | 2 9/16 | 2 7/8 | 3 1/8 | 3 5/8 | | | | | |
| | Face to face | | | 3 3/16 | 3 1/2 | 3 3/4 | 4 1/4 | 4 15/16 | 5 1/16 | 9 | 10 1/2 | 11 1/2 |
| | Center to top, open | 6 5/8 | 7 5/8 | 9 1/8 | 10 | 12 1/8 | 14 1/8 | 16 1/4 | 19 | 23 3/4 | 32 3/4 | 42 1/8 |
| | Diameter of wheel | 2 9/16 | 2 9/16 | 2 3/4 | 3 1/16 | 3 5/8 | 4 1/16 | 4 3/4 | 5 3/8 | 10 | 12 | 16 |
| | Diameter of flanges | | | 4 1/4 | 4 5/8 | 5 | 6 | 7 | [illegible] | 9 | 11 | 13 1/2 |
| | Thickness of flanges | | | 7/16 | ½ | 9/16 | ⅝ | 11/16 | ¾ | 15/16 | 1 | 1 1/8 |

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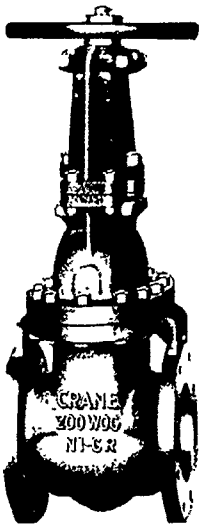
# Alloy Cast Iron Wedge Gate Valves

## For Process Industries




Outside Screw & Yoke
18-8 Mo Trimmed

No. 14477
Flanged

**Working Pressure**
200 pounds cold water, oil, or gas, non-shock

**Hydrostatic Test Pressures**
Shell—350 pounds Seat—225 pounds

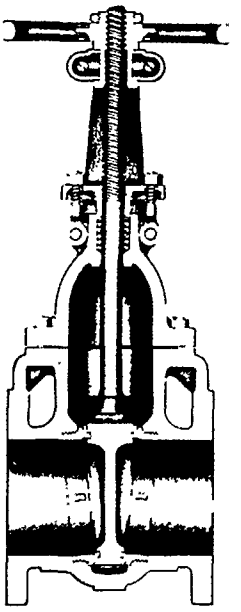
**18-8 Mo Alloy Trimmed**
18-8 Mo Body Seat Rings 18-8 Mo Stem
18-8 Mo Faced Alloy Cast Iron Disc
Alloy Cast Iron Body Nickel-Plated Steel Gland

**Service Recommendations**

Crane No. 14477 Wedge Gate Valves are offered for use in services where the conventional "all-iron" and "brass trimmed" valves fail because of corrosion of seating surfaces.

The valves are used in the petroleum industry handling oils which contain traces of mineral acids. They are also used in the wood treating industry handling creosote vapors and oils, and in the pulp and paper industry handling alkaline liquors of various kinds.

***No. 14477 Valves are similar in design to the Crane 125-Pound Iron Body Wedge Gate Valves shown on page 79.***



Cross Section
No. 14477

**List Prices**

| Size | Inches | 2 | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| No. 14477, Flanged, F. & D. | Each | 95.00 | 105.00 | 125.00 | 168.00 | 260.00 | 400.00 | 650.00 | 975.00 |

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**Alloy cast iron:** The valve body and disc are made of a nickel low alloy cast iron, developed to meet the need for an iron having better physical properties and resistance to corrosion when subjected to services where ordinary gray iron is not adequate.

**Body and bonnet:** The body and bonnet are made with liberal metal sections to assure maximum strength. Tie ribs between the bonnet flange and the end flanges provide exceptional resistance to line strains. The body has straight-through ports to minimize turbulence and thereby obtain a more uniform flow through the valve.

**Disc:** The valves have a solid web disc, with extra long disc guides in order to minimize drag on the seating surfaces.

**Stem:** Stem threads have long engagement in the yoke sleeve; the valves have a tee-head disc-stem connection.

**Gland and stuffing box:** A two-piece ball-type gland maintains an even load on the packing and prevents binding on the stem even when the gland bolts are not pulled up evenly.

The valves have swinging gland eye bolts which move out of the way when the stuffing box is being repacked; they will not loosen in service.

**Standards:** These valves conform to the American Petroleum Institute (API) Standard No. 6-D, Sixth Edition, May, 1949, for 175-Pound Iron Pipe Line Gate Valves.

The valves also conform to the American Standard for Face to Face Dimensions (B16.10-1939), for 125-Pound Iron Wedge Gate Valves.

**Flange dimensions and facing:** The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced with smooth finish.

**Dimensions, in Inches**

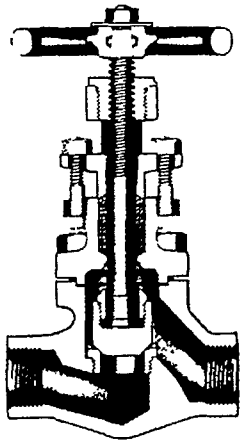
| Size | 2 | 2½ | 3 | 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|
| Face to face | 7 | 7½ | 8 | 9 | 10½ | 11½ | 13 | 14 |
| Center to top, open | 14⅞ | 17 | 19½ | 23⅝ | 32⅝ | 41⅞ | 50⅛ | 58 |
| Diameter of wheel | 8 | 8 | 9 | 10 | 12 | 16 | 20 | 20 |
| Diameter of flanges | 6 | 7 | 7½ | 9 | 11 | 13½ | 16 | 19 |
| Thickness of flanges | ⅝ | 11/16 | ¾ | 15/16 | 1 | 1⅛ | 13/16 | 1¼ |
| No. of turns to open | 7 | 8½ | 10½ | 9 | 13 | 17 | 21 | 25½ |

**Drilling:** Flanges are furnished faced and drilled unless ordered faced only. No deduction is made when valves are ordered faced only.

***Templates for drilling, page 459.***

# Forged Steel Globe and Angle Valves

## For Chlorine Service



Cross Section Globe

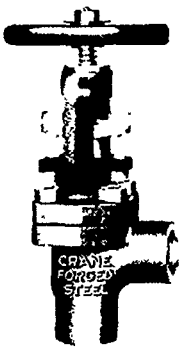
*Tested 300 pounds air-under-water*

### Service Recommendations

These valves are recommended for chlorine gas and liquid service, free from water, at temperatures not to exceed 300° F. They are strong, durable, compact valves—suitable for severe service conditions.

The valves have proven unusually satisfactory for chlorine work. They are fully dependable, providing maximum safety, long packing life, easy servicing, high corrosion resistance, and tight seating.

No. 1644, Globe Screwed



No. 1645, Angle Screwed

### List Prices and Dimensions

| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 1644, Globe | | Each | 51.00 | 57.50 | 65.50 | 89.00 | 115.00 | 148.00 |
| No. 1645, Angle | | Each | 51.00 | 57.50 | 65.50 | 89.00 | 115.00 | 148.00 |
| Dimensions, in Inches | End to end, Globe | | 3⅝ | 4⅜ | 5⅛ | 6¼ | 7 | 8⅜ |
| | Center to end, Angle | | 1 13/16 | 2 3/16 | 2 9/16 | 3⅛ | 3½ | 4 3/16 |
| | Center to top, open | Globe | 7 5/16 | 8⅞ | 9 7/16 | 11 1/16 | 12 | 14⅛ |
| | | Angle | 6¾ | 8 | 8 5/16 | 9⅝ | 10 3/16 | 12 1/16 |
| | Diameter of wheel | | 3½ | 4 | 5 | 6 | 7 | 9 |

**Design:** These are bolted bonnet, outside screw and yoke valves. Their body and one-piece bonnet and yoke are made of forged carbon steel. The disc, disc stem ring, and body seat ring are made of Hastelloy "C" to resist the corrosive action of chlorine.

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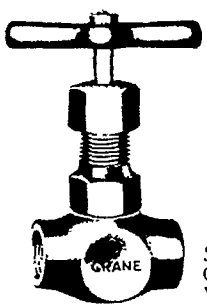
The valves have a 45° narrow bearing seat. The stem is made of Monel and is fitted with a malleable iron handwheel. The gland is forged steel.

The body-bonnet joint is fitted with a corrugated soft Monel gasket; bonnet bolt studs are Triplex Steel. These valves, when wide open, can be repacked while under pressure.

**Flanged valves:** Flanged valves are available on special order; prices and information on request.

## 18-8 Mo Bar Stock Valves



Bar Stock Globe Valve

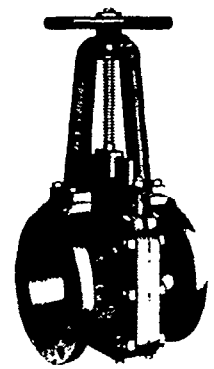
Bar Stock Angle Valve

These valves are suitable for many corrosive services, being made with Crane 18-8 Mo Alloy Steel body, bonnet, packing nut, gland, and stem. Thread chambers are extra long. The plug type disc accurately regulates flow and resists wear very well.

The line includes, in addition to the female end valves illustrated above, globe and angle valves with male and female ends, and valves made of steel and of Exelloy. See page 236 for prices, dimensions, and complete description.

## Pulp Stock Valves

Self-cleaning, non-clogging Crane Iron Body Pulp Stock Valves are specially designed for use in pulp stock lines. In such service they provide a tight shut-off because the wood pulp packs itself around the disc when the valve is closed and effectively seals it against leakage.



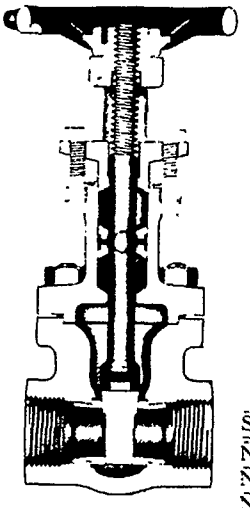
Outside Screw Rising Stem Valve

The body design features circular end ports and a rectangular shape at the center to assure full flow area. The disc, fully guided, has a sharp cutting edge at the bottom.

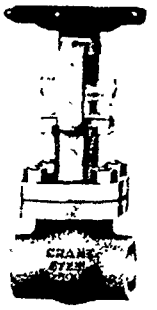
The complete line includes flanged valves in both outside screw, rising stem and quick-opening types. Each of these is available either brass trimmed or all-iron. For prices, dimensions, and complete description, see page 300.

# Steel Gate and Globe Valves

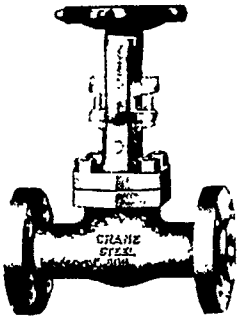
## Monel Trimmed



Cross Section
No. 3609 A
Gate Valve
Screwed
Bolted Bonnet



No. 3609 A
Screwed



No. 3617 A
Flanged

### Gate Valves

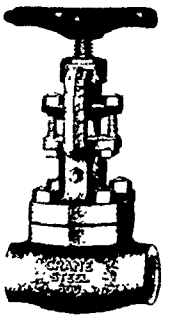
These are unusually sturdy and rugged valves, patterned after the Crane small size 600-Pound Steel Gate Valves shown on page 225. They have a heavy but compact cast steel body and bonnet, tee-head disc-stem connection, male and female bonnet joint with soft iron gasket, bolted gland, and long disc guides. The disc, stem, and body seat rings are made of Monel. The valves have an extra deep stuffing box, providing a tighter stem seal, longer packing life, and greater protection against leakage. The No. 3608 A Valves (not illustrated) have a union bonnet.

**List Prices, Each, and Dimensions, in Inches**

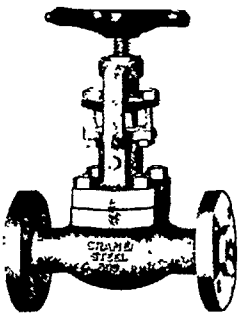
| Size Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|
| No. 3608 A, Union Bonnet, Screwed | 20.00 | 20.00 | | | | | |
| No. 3609 A, Bolted Bonnet, Screwed | | | 28.20 | 34.20 | 40.80 | 66.00 | 90.00 |
| No. 3617 A, Bolted Bonnet, Flanged, F.D. & S.F. | | | 48.00 | 56.00 | 69.00 | 106.00 | 136.00 |
| End to end, Screwed | 2 3/4 | 2 3/4 | 3 | 3 1/2 | 4 1/8 | 4 1/2 | 5 1/4 |
| Face to face, Flanged | | | 6 1/2 | 7 1/2 | 8 1/2 | 9 1/2 | 11 1/2 |
| Center to top, open | 6 1/8 | 6 1/8 | 7 1/4 | 8 3/4 | 10 1/4 | 13 | 15 1/2 |
| Diameter of wheel | 3 | 3 | 3 1/2 | 4 | 5 | 6 | 7 |

### Globe Valves

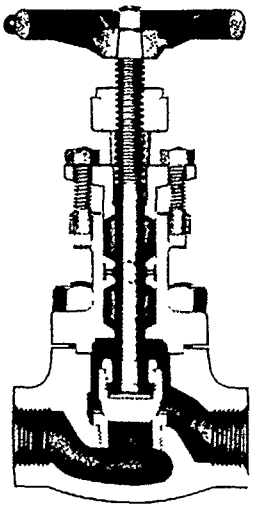
These exceptionally sturdy and rugged globe valves are patterned after the Crane small size 600-Pound Steel Valves shown on page 239. The body and bonnet are cast or forged steel. The male and female bonnet joint is equipped with a soft iron gasket. The valves have a ball-to-35° seat. The disc, body seat ring, disc stem ring, and stem are Monel. The extra deep stuffing box provides a tighter stem seal, longer packing life, and greater safety. No. 3642 A Valves (not illustrated) have a union bonnet.



No. 3646 A
Screwed



No. 3658 A
Flanged



Cross Section
No. 3646 A
Globe Valve
Screwed
Bolted Bonnet

**List Prices, Each, and Dimensions, in Inches**

| Size Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|
| No. 3642 A, Union Bonnet, Screwed | 22.30 | 22.30 | | | | | |
| No. 3646 A, Bolted Bonnet, Screwed | | | 29.50 | 34.40 | 40.70 | 80.40 | 108.00 |
| No. 3658 A, Bolted Bonnet, Flanged, F.D. & S.F. | | | 56.30 | 68.00 | 80.50 | 123.00 | 155.00 |
| End to end, Screwed | 3 | 3 | 3 5/8 | 4 3/8 | 5 1/8 | 7 | 8 3/8 |
| Face to face, Flanged | | | 6 1/2 | 7 1/2 | 8 1/2 | 9 1/2 | 11 1/2 |
| Center to top, open | 7 1/8 | 7 1/8 | 8 | 9 1/2 | 9 7/8 | 12 3/8 | 14 3/8 |
| Diameter of wheel | 3 | 3 | 3 1/2 | 4 | 5 | 7 | 9 |

**Recommendations:** The valves above are used on refining units by the petroleum industry and for various processes in chemical plants where high quality steel valves with Monel trim are desired. They give good service in hydrofluoric alkylation units handling anhydrous H.F., and where mixtures of the acid and hydrocarbons are found. They are not recommended for aqueous solutions of hydrofluoric acid where the concentration drops below 80% H.F.

**Stuffing box; packing:** The valves have a special design, extra deep stuffing box. A tapped and plugged hole is provided in the bonnet which opens to the spacer between the upper and lower packing; this enables the user to properly lubricate the packing, a necessity on hydrofluoric acid service. These valves are regularly furnished without packing (must be packed in the field); if a packing is specified, prices are quoted on application.

**Flanged valves:** The end flanges on flanged valves conform to the 600-Pound American Standard (B16e-1939). They have a large male face, 1/4-inch high, finished with concentric grooves and known as a "serrated" finish. Prices include drilling to the 600-Pound Standard; for drilling templates, see page 402.

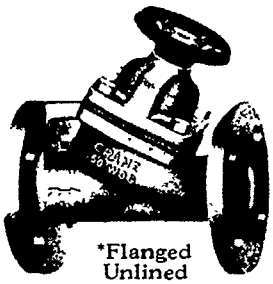
# Y-Pattern Diaphragm Valves

## *Unlined and Lined — For General and Corrosive Services*

### *With Brass, Iron, Aluminum, or 18-8 Mo Body*

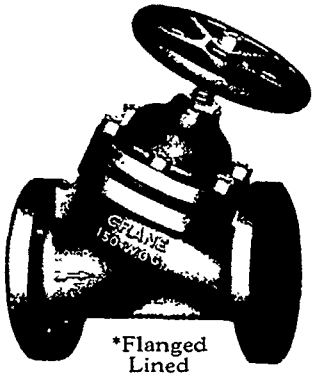
***Screwed Unlined Only**

Sizes ½ to 2-inch with brass, cast iron, aluminum, or 18-8 Mo body and disc; these are furnished with neoprene, Buna N, or natural rubber diaphragm and disc insert.



***Flanged Unlined**

Sizes ½ to 6-inch with cast iron, aluminum, or 18-8 Mo body and disc; these are furnished with neoprene, Buna N, or natural rubber diaphragm and disc insert.



***Flanged Lined**

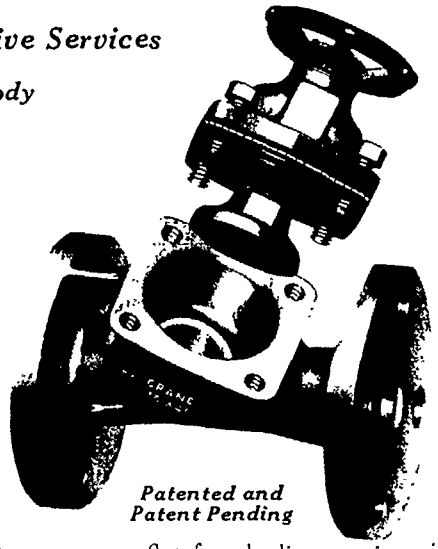
Sizes ½ to 6-inch with cast iron body lined with neoprene or hard natural rubber and disc coated with neoprene or soft natural rubber. Flanged ends only.

**Upper illustrations are typical of ½ to 2-inch sizes, larger sizes have a rising, turning stem as shown in lower illustration*

Crane Y-Pattern Diaphragm Valves, distinguished by advancements in design and a wide choice of body, disc insert, and diaphragm materials, fulfill the need for moderately priced unlined and lined valves effective on both general and corrosive services.

The valves belong to the general class known as "packless" valves, so called because the customary stuffing box around the stem has been eliminated through the use of a flexible diaphragm mounted between the body and bonnet.

The diaphragm keeps a tight stem seal. There is no chance for leakage and no need for stuffing box maintenance. Because line fluids cannot enter the valve bonnet, operating parts are not exposed to corrosion; nor can costly fluids be contaminated through contact with working parts. Since the diaphragm is used only to form a pressure-tight bonnet closure—and not for seating—it is not subject to cutting, crushing, and rapid wear.



***Patented and Patent Pending***

A separate, flat-faced disc equipped with a soft insert, or completely coated on lined valves, performs the seating operation. The disc is attached to the end of the stem and fastened to the center of the diaphragm by means of a plunger. When the valve is operated, the stem raises or lowers the non-turning disc and the diaphragm flexes to permit this travel.

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### Working Pressures

| Sizes | Valves For Water, Oil, Air, or Gas 180° F. Max. Temp. | Nos. 1650 and 1651 Valves Only For Vacuum | No. 1652 Valves Only For Oxygen | No. 1652 Valves Only For Acetylene |
|---|---|---|---|---|
| ½ to 4-inch | 150 pounds | 29 inches hg. (mercury) | 150 pounds | 15 pounds |
| 6-inch | 125 pounds | | | |

***Air Tested***

### Service Recommendations

Crane Diaphragm Valves are built for hard usage. Being packless, they are used for many services where ordinary valves may fail, or be only moderately effective, due to difficulties with stuffing box leakage. All parts exposed to line fluids are available in a choice of corrosive-resistant materials, making the valves suitable for an extensive list of corrosive services.

The selection of proper materials combined with the "packless" construction and tight-seating design render both unlined and lined valves ideal for use on compressed air, compressed and liquefied gases of many commercial kinds, corrosive gases, solvents, natural and corrosive waters such as mine water, process fluids such as alcohols, sodiums, and potassiums, pulp and paper mill liquors, etc.

Included in the category of unlined valves are those recommended for vacuum service and Underwriters' approved valves for sprinkler systems and for oxygen or acetylene service.

On lined valves, the body is lined and the disc is coated with neoprene or natural rubber. Such valves are recommended for fluids corrosive to metals but non-active chemically upon neoprene or rubber. In addition to the recommendations above, the valves offer excellent resistance to the action of many types of corrosive process fluids, to sandy waters, sludges, slurries, sewage, liquids with solids in suspensions, etc. The neoprene-lined valves are particularly effective where abrasion is a destructive factor.

Specific advice on handling corrosive fluids will be furnished on request.

# Y-Pattern Diaphragm Valves

### *Crane Design Offers Many Advantages*

***Long diaphragm life*** is assured. Since the diaphragm is not the seating member, it is not subjected to the crushing, cutting, and abrasion incident to seating.

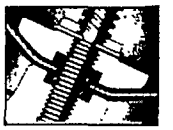
***No escape of fluids*** even if the diaphragm should fail. Flow through the seat opening is regulated by the disc and is independent of the diaphragm. Costly or hazardous fluids are always under control.

***"Packless" construction*** eliminates the annoyance and expense of stuffing box leakage.

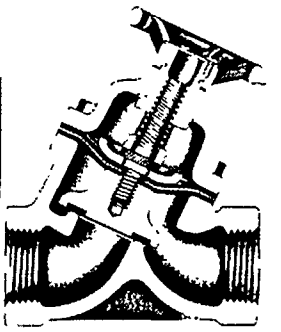
***Y-pattern body design*** offers less resistance to flow and minimizes pressure drop.

***Easy operation*** because the Crane design reduces the torque—and number of turns—needed to open and close the valves.

***Easy maintenance*** because all parts are readily accessible. Simply unbolt the bonnet and diaphragm; the working parts can then be lifted out without removing the body from the line.



*1½ to 2-inch valves have the plunger locked to the stem with a steel pin, as shown above.*



Cross Section, Unlined Screwed Valve

***Typical construction of 1/2 to 2-inch valves***

### *High Quality Materials and Rugged Construction*

Crane Diaphragm Valves are the compact, bolted bonnet type. They are built for long service.

Unlined valves have a brass, cast iron, aluminum, or 18-8 Mo body and disc. Each of these combinations is furnished with a neoprene, Buna N, or natural rubber diaphragm and disc insert.

Tight seating is accomplished by the disc operating on the end of the stem. A thick neoprene, Buna N, or natural rubber insert, vulcanized into a recess in the face of the disc, closes against the crowned seating surface in the body. The disc insert is pliable enough to absorb small particles of foreign matter that might otherwise cause leakage.

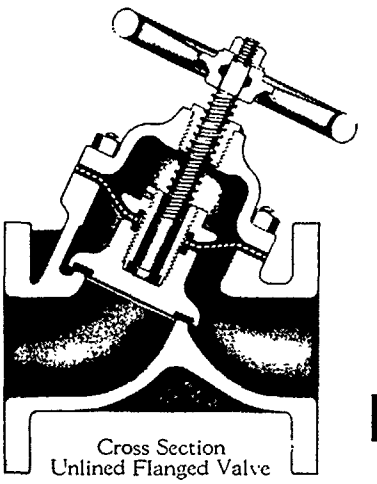
The diaphragm, having a hole through its center, is locked between the disc and a plunger. The diaphragm is not used as the seating member; it merely retains the fluid. When the valve is being operated, the diaphragm flexes enough to accommodate the travel of the disc.

Valves ½ to 2-inch have a concealed non-turning brass stem operating in a brass yoke sleeve. Guide lugs on the plunger above the diaphragm ride in recesses in the bonnet to keep the stem from turning. Valves with exposed stem threads are also available; data on request.

Valves 2½-inch and larger have a turning bronze stem operating in a bronze bonnet bushing. The disc is held to the stem by a threaded brass sleeve on the plunger which allows the stem to rotate freely.

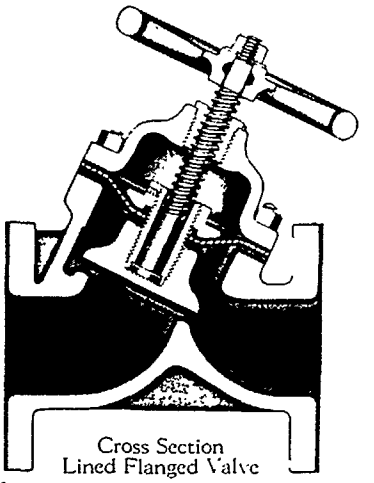
All valves have a cast iron bonnet and a malleable wheel. The plunger is brass on sizes 1-inch and smaller and cast iron on larger sizes.

Lined valves are the same as unlined valves, except the body and flange faces are neoprene or hard rubber lined and the disc is neoprene or soft rubber coated. Thus, all parts contacting the fluid in the line are protected. The lining is 1/16-inch thick on 1¼-inch and smaller valves, ⅛-inch thick on 1½ to 4-inch valves, and 3/16-inch thick on 6-inch valves.



Cross Section
Unlined Flanged Valve

***Typical construction of 2½ to 6-inch valves***



Cross Section
Lined Flanged Valve

Lined Valves are available in sizes ½ to 6-inch with flanged ends only. Except for their body lining and coated disc, they are the same, size for size, as Unlined Valves.

### *Underwriters' Approved Valves*

Valves tested and approved by the Underwriters' Laboratories, Inc., include the No. 1610 for sprinkler service and the No. 1652 for oxygen and acetylene service. For complete details, see page 390.

### *Conformance to Standards*

The dimensions (excluding lining) and drilling of end flanges on valves 1-inch and larger conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Sizes ½ and ¾-inch have the same diameter and drilling as 150-Pound American Standard Steel Flanges, but the thickness and facing are different.

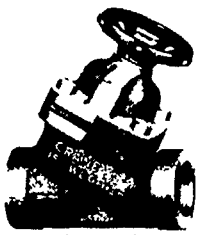
The face to face dimensions of unlined flanged valves 2-inch and larger conform to the American Ferrous Flanged Valve Standard, B16.10-1939, for 125-Pound Cast Iron Globe Valves. Lined valves are longer because of the lining. The Standard does not include valves smaller than 2-inch.

***Prices, dimensions, and catalog numbers.....pages 390 and 391***

# Y-Pattern Diaphragm Valves

## Brass, Iron, Aluminum, or 18-8 Mo Body — Unlined

***For General and Corrosive Services***

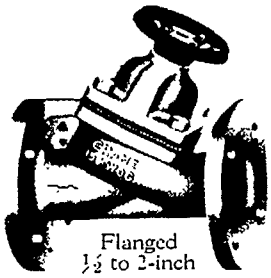


Screwed
All Sizes

*Working Pressures: Water, Oil, Air, or Gas, 180° F. Maximum
Sizes ½ to 4-inch—150 pounds 6-inch size—125 pounds
*Air Tested*

**Screwed:** Body and disc are made of brass, cast iron, aluminum, or 18-8 Mo; these are available with neoprene, Buna N, or natural rubber diaphragm and disc insert.

**Flanged:** Body and disc are made of cast iron, aluminum, or 18-8 Mo; these are available with neoprene, Buna N, or natural rubber diaphragm and disc insert.



Flanged
½ to 2-inch

*2½ to 6-inch flanged valves have a rising, turning stem.*

***Vacuum, oxygen, or acetylene service:** The Crane line of valves having a cast iron body and disc and neoprene diaphragm and disc insert includes:

Nos. 1650 and 1651—prepared for vacuum service up to 29 inches hg. (mercury); specify conditions. Valves for higher degree of vacuum are also available.

No. 1652—for 150 pounds oxygen and 15 pounds acetylene. Valves are specially handled and all working parts are treated with a non-inflammable lubricant.

### List Prices, Each

| Trim | Size Inches | With Brass Body Screwed | With Cast Iron Body Screwed | With Cast Iron Body Flanged F. & D. | With Aluminum Body Screwed | With Aluminum Body Flanged F. & D. | With 18-8 Mo Body Screwed | With 18-8 Mo Body Flanged F. & D. | With Cast Iron Body For Special Services: Vacuum Screwed | Vacuum Flanged F. & D. | Oxygen or Acetylene Screwed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Neoprene Diaphragm and Disc Insert | | No. 1600 | †No. 1610 | No. 1611 | No. 1620 | No. 1621 | No. 1630 | No. 1631 | No. 1650 | No. 1651 | †No. 1652 |
| | ½ | 20.60 | 6.00 | 11.00 | 18.80 | 27.40 | 23.60 | 43.90 | 6.00 | 11.00 | 6.50 |
| | ¾ | 22.40 | 7.40 | 12.40 | 19.60 | 29.00 | 24.40 | 45.40 | 7.40 | 12.40 | 7.90 |
| | 1 | 26.00 | 8.60 | 17.30 | 22.40 | 33.40 | 35.20 | 61.80 | 8.60 | 17.30 | 9.10 |
| | 1¼ | 32.20 | 13.70 | 22.60 | 27.70 | 39.60 | 43.30 | 73.00 | 13.70 | 22.60 | 14.30 |
| | 1½ | 45.50 | 23.10 | 31.00 | 38.30 | 53.00 | 62.10 | 94.30 | 23.10 | 31.00 | 23.70 |
| | 2 | 69.60 | 30.90 | 42.00 | 52.00 | 70.60 | 96.30 | 136.70 | 30.90 | 42.00 | 31.50 |
| | 2½ | | | 59.00 | | 97.50 | | 174.80 | | 59.00 | |
| | 3 | | | 71.00 | | 115.30 | | 250.00 | | 71.00 | |
| | 4 | | | 107.00 | | 192.00 | | 413.50 | | 107.00 | |
| | 6 | | | 245.30 | | 342.00 | | 716.00 | | 245.30 | |
| Buna N Diaphragm and Disc Insert | | No. 1600-SB | No. 1610-SB | No. 1611-SB | No. 1620-SB | No. 1621-SB | No. 1630-SB | No. 1631-SB | | | |
| | ½ | 20.60 | 6.00 | 11.00 | 18.80 | 27.40 | 23.60 | 43.90 | | | |
| | ¾ | 22.40 | 7.40 | 12.40 | 19.60 | 29.00 | 24.40 | 45.40 | | | |
| | 1 | 26.00 | 8.60 | 17.30 | 22.40 | 33.40 | 35.20 | 61.80 | | | |
| | 1¼ | 32.20 | 13.70 | 22.60 | 27.70 | 39.60 | 43.30 | 73.00 | | | |
| | 1½ | 45.50 | 23.10 | 31.00 | 38.30 | 53.00 | 62.10 | 94.30 | | | |
| | 2 | 69.60 | 30.90 | 42.00 | 52.00 | 70.60 | 96.30 | 136.70 | | | |
| | 2½ | | | 59.00 | | 97.50 | | 174.80 | | | |
| | 3 | | | 71.00 | | 115.30 | | 250.00 | | | |
| | 4 | | | 107.00 | | 192.00 | | 413.50 | | | |
| | 6 | | | 245.30 | | 342.00 | | 716.00 | | | |
| Natural Rubber Diaphragm and Disc Insert | | No. 1600-RN | No. 1610-RN | No. 1611-RN | No. 1620-RN | No. 1621-RN | No. 1630-RN | No. 1631-RN | | | |
| | ½ | 20.60 | 6.00 | 11.00 | 18.80 | 27.40 | 23.60 | 43.90 | | | |
| | ¾ | 22.40 | 7.40 | 12.40 | 19.60 | 29.00 | 24.40 | 45.40 | | | |
| | 1 | 26.00 | 8.60 | 17.30 | 22.40 | 33.40 | 35.20 | 61.80 | | | |
| | 1¼ | 32.20 | 13.70 | 22.60 | 27.70 | 39.60 | 43.30 | 73.00 | | | |
| | 1½ | 45.50 | 23.10 | 31.00 | 38.30 | 53.00 | 62.10 | 94.30 | | | |
| | 2 | 69.60 | 30.90 | 42.00 | 52.00 | 70.60 | 96.30 | 136.70 | | | |
| | 2½ | | | 59.00 | | 97.50 | | 174.80 | | | |
| | 3 | | | 71.00 | | 115.30 | | 250.00 | | | |
| | 4 | | | 107.00 | | 192.00 | | 413.50 | | | |
| | 6 | | | 245.30 | | 342.00 | | 716.00 | | | |

**Drilling:** Flanged valves 1-inch and larger are faced and drilled to the American Cast Iron Flange Standard, Class 125; sizes ½ and ¾-inch are drilled to the 150-Pound American Steel Flange Standard, but the facing is different.

Flanges are plain faced with a smooth finish. Prices include facing and drilling; no deduction is made if valves are ordered faced only.

**†Underwriters' Approved**
No. 1610 Valves (for sprinkler service) and No. 1652 (for oxygen or acetylene) have been tested and approved by the Underwriters' Laboratories, Inc., Chicago. They are marked "UL".

*Description and recommendations....pages 388 and 389* *Dimensions....page 391*

# Y-Pattern Diaphragm Valves

## Iron Body—Lined with Neoprene or Hard Natural Rubber

***For Corrosive Process Fluids, Sludges, and Slurries***

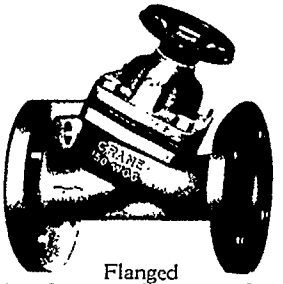
**Working Pressures:** Water, Oil, Air, or Gas, 180° F. Maximum
Sizes ½ to 4-inch—150 pounds 6-inch size—125 pounds
***Air Tested***

Diaphragm Valves having a cast iron body lined on the inside and on the flange faces with neoprene or hard natural rubber are specially designed for services corrosive to iron but non-active chemically upon neoprene or rubber. For further recommendations and general description, see pages 388 and 389.

**Drilling:** Valves 1-inch and larger are faced and drilled to the American Cast Iron Flange Standard, Class 125; sizes ½ and ¾-inch are drilled to the 150-Pound American Steel Flange Standard, but the facing is different. Flange are plain faced with a smooth finish. No deduction in price is made for valves ordered faced only.

**List Prices, Each**

| Size | Flanged F. & D. | |
|---|---|---|
| | No. 1615 | No. 1615-RN |
| Inches | Neoprene Lined | Rubber Lined |
| ½ | 44.70 | 44.70 |
| ¾ | 46.20 | 46.20 |
| 1 | 51.30 | 51.30 |
| 1¼ | 59.00 | 59.00 |
| 1½ | 65.00 | 65.00 |
| 2 | 80.30 | 80.30 |
| 2½ | 111.20 | 111.20 |
| 3 | 147.00 | 147.00 |
| 4 | 205.00 | 205.00 |
| 6 | 410.00 | 410.00 |



Flanged
With Cast Iron Body and Disc

***No. 1615**

Body.....lined with neoprene
Disc.....neoprene-coated
Diaphragm.....made of neoprene

***No. 1615-RN**

Body.....lined with hard natural rubber
Disc.....soft natural rubber-coated
Diaphragm.....made of natural rubber

**Sizes 2-inch and smaller have a non-turning, rising stem, as shown above. Larger sizes have a rising, turning stem identical to that used on larger size unlined valves; see cutaway illustration on the preceding page.*

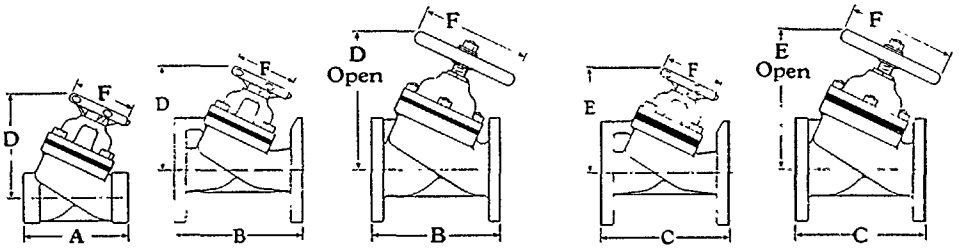
# Dimensions of Diaphragm Valves

**Standards:** The dimensions (excluding lining) and drilling of end flanges on sizes 1-inch and larger conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948); this Standard does not include sizes smaller than 1-inch.

Sizes ½ and ¾-inch have the same diameter and drilling as 150-Pound American Standard Steel Flanges, but the thickness and facing are different.

The face to face dimensions of unlined valves 2-inch and larger conform to the American Ferrous Flanged Standard, B16.10-1939, for 125-Pound Cast Iron Globe Valves. The lined valves are longer because of the thickness of the lining. This Standard does not include valves smaller than 2-inch.

***For additional description, see pages 388 to 390.***




Screwed All Sizes | Flanged ½ to 2-inch | Flanged 2½ to 6-inch | Flanged ½ to 2-inch | Flanged 2½ to 6-inch

**Unlined Valves**
*For prices, see table on page 390.*

**Lined Valves**
*For prices, see table above.*

**Dimensions, in Inches**

| Size | A | B | C | D | E | F | End Flanges: Diameter | End Flanges: Thickness† | End Flanges: Diam. of bolt circle | End Flanges: No. and diam. of bolts | No. of turns to open |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ½ | 3 | 4¼ | 4⅜ | 3 5/16 | 3 5/16 | 2 | 3½ | ⅜ | 2⅜ | 4-½ | 1½ |
| ¾ | 3½ | 4½ | 4⅝ | 3 15/16 | 3 15/16 | 2¼ | 3⅞ | 13/32 | 2¾ | 4-½ | 2 |
| 1 | 4¼ | 5¼ | 5⅜ | 4⅜ | 4⅜ | 2½ | 4¼ | 7/16 | 3⅛ | 4-½ | 2¾ |
| 1¼ | 5¼ | 5¾ | 5⅞ | 5¼ | 5¼ | 3 | 4⅝ | ½ | 3½ | 4-½ | 3½ |
| 1½ | 6 | 6½ | 6¾ | 6⅛ | 6⅛ | 4 | 5 | 9/16 | 3⅞ | 4-½ | 3¾ |
| 2 | 7 | 8 | 8¼ | 7¼ | 7¼ | 5 | 6 | ⅝ | 4¾ | 4-⅝ | 3½ |
| 2½ | | 8½ | 8¾ | 9⅞ | 10 | 7 | 7 | 11/16 | 5½ | 4-⅝ | 4¼ |
| 3 | | 9½ | 9¾ | 11⅜ | 11½ | 8 | 7½ | ¾ | 6 | 4-⅝ | 4 |
| 4 | | 11½ | 11¾ | 13⅞ | 14 | 10 | 9 | 15/16 | 7½ | 8-⅝ | 5¼ |
| 6 | | 14 | 14⅜ | 17½ | 17 11/16 | 14 | 11 | 1 | 9½ | 8-¾ | 7½ |

†Thickness of flange dimensions do not include the lining on neoprene or rubber lined valves; the lining is 1/16" thick on ½ to 1¼-inch sizes, ⅛" thick on 1½ to 4-inch sizes, and 3/16" thick on the 6-inch size.

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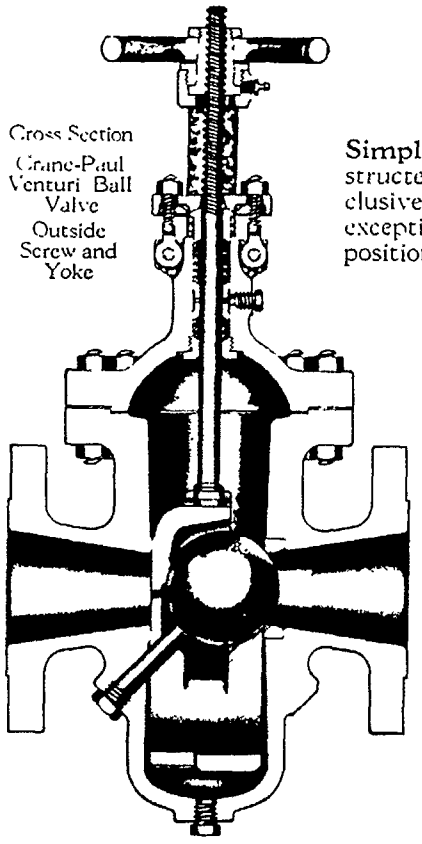
# Crane-Paul Venturi Ball Valves

(Patented and Patent Pending)



Cross Section Crane-Paul Venturi Ball Valve Outside Screw and Yoke

***Free, Easy Operating Valves***
***For Full Flow, Throttling, or Tight Shut-Off***

**Simplified operation:** Ruggedly constructed Crane-Paul Valves feature an exclusive, venturi ball design which provides exceptionally accurate flow control in all positions from wide open to a tight shut-off. The valves resemble rising stem gate valves but have a loose ball disc instead of the conventional type. The ball is actuated and carried by a cage attached to the valve stem. The rolling action of the ball permits unusually free, easy operation.

In operation, the ball moves to and from the center of flow, rolling into and out of the body seat ring. In the closed position, the ball is mechanically locked against the seat by a wedging surface on the ball cage.

**Cast Steel Valves:** Cast steel valves have a body, integral bonnet and yoke, and ball cage made of carbon steel in the 150-Pound pressure class; in the 300 and 600-Pound pressure classes, these parts are made of Crane No. 4 Carbon-Molybdenum Alloy Steel.

Cast steel valves 2-inch and smaller have an Exelloy, shoulder-type, screwed-in body seat ring; larger sizes have a Stellite-faced, steel seat ring which is slipped in and welded. The stem and guide pin are Exelloy. Smaller sizes have a one-piece, forged steel gland; larger sizes have a two-piece gland consisting of an Ihrigized steel gland and a forged steel gland flange. Triplex Steel bolt-studs produce a tight body-bonnet joint.

**18-8 Mo Valves:** 18-8 Mo Valves have an 18-8 Mo Alloy Steel body, integral bonnet and yoke, ball cage, stem, guide pin, and bolt-studs. The body seat ring is integral with the body. Smaller sizes have a one-piece 18-8 Mo gland; larger sizes have a two-piece 18-8 Mo gland and gland flange.

**Ball cage:** In all valves, the ball cage is finished with a Stellite-faced wedging surface.

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## Working Pressures—Pounds per Sq. Inch, Non-Shock

| Fluid | Temp. Deg. Fahr. | [1]With Standard Facings Other Than Ring Joint: 150-Lb. Carbon Steel or 18-8 Mo[3] | 300-Lb. No. 4 Steel or 18-8 Mo[3] | 600-Lb. No. 4 Steel | With Ring Joint Facing: 300-Lb. No. 4 Steel | 600-Lb. No. 4 Steel |
|---|---|---|---|---|---|---|
| [3]Steam, Water, Air, Gas, Oil, or Oil Vapor | 100 | 230 | 600 | 1200 | 720 | 1440 |
| | 150 | 220 | 590 | 1180 | 710 | 1420 |
| | 200 | 210 | 580 | 1160 | 700 | 1400 |
| | 250 | 200 | 570 | 1140 | 690 | 1380 |
| | 300 | 190 | 560 | 1120 | 680 | 1365 |
| | 350 | 180 | 550 | 1095 | 675 | 1350 |
| | 400 | 170 | 540 | 1075 | 665 | 1330 |
| | 450 | 160 | 525 | 1050 | 660 | 1320 |
| | 500 | **150** | 500 | 1000 | 625 | 1250 |
| | 550 | 140 | 475 | 950 | 590 | 1180 |
| | 600 | 130 | 445 | 890 | 555 | 1110 |
| | 650 | 120 | 415 | 830 | 515 | 1030 |
| | 700 | 110 | 380 | 760 | 470 | 940 |
| | 750 | 100 | 360 | 720 | 425 | 850 |
| | 800 | 92 | 340 | 680 | 375 | 750 |
| | 850 | 82 | 320 | 640 | 350 | 700 |
| | 900 | 70[2] | **300** | **600** | 325 | 650 |
| | 950 | 55[2] | 265[2] | 530[2] | **300** | **600** |
| | 1000 | 40[2] | 190[2] | 380[2] | 230[2] | 470[2] |

[1]When an all-metal gasket corrugated or flat is used with raised face, lapped, or large male and female facings, these ratings will apply only when the contact area of the gasket is not greater, and the inside diameter of the gasket is not less, than that of a large tongue and groove gasket.

[2]These ratings apply only to oil or oil vapor service.

[3]**Ratings for 18-8 Mo Valves:** 18-8 Mo Valves are recommended for liquid or gas service only and for a maximum temperature of 500° F. For flange facings furnished with 18-8 Mo Valves, refer to page 393.

**Ball guide:** The ball disc is directed to the seat at the point of closure by a center guide pin in the smaller sizes and by a side guide pin in the larger sizes.

**Stuffing box; repacking:** The valves have a large, deep stuffing box. When wide open, they can be repacked while under pressure.

**Lubrication:** Larger sizes of all valves are equipped with a lubricating fitting to facilitate lubrication of the yoke sleeve.

**Sliding stem valves:** Valves with a sliding stem and without a handwheel and yoke sleeve, suitable for assembly with power operators, are also available. Such valves are generally used for special flow control services. Prices and information will be furnished on application.

## Hydrostatic Test Pressures, in Pounds

| Material and Pressure Class | | With Facing Other Than Ring Joint: Shell | Seat | With Ring Joint Face: Shell | Seat |
|---|---|---|---|---|---|
| *Cast Steel | 150-Lb. | 350 | 350 | 425 | 350 |
| | 300-Lb. | 900 | 775 | 1100 | 775 |
| | 600-Lb. | 1800 | 1550 | 2175 | 1550 |
| 18-8 Mo | 150-Lb. | 300 | 275 | — | — |
| | 300-Lb. | 900 | 775 | — | — |

*Valve seats are tested 100 pounds air-under-water.

***For prices and dimensions, see next page.***

# Crane-Paul Venturi Ball Valves

(Patented and Patent Pending)

***For working pressures and description, see the preceding page.***

**Standards:** The end flanges of all Cast Steel Valves and of the 300-Pound 18-8 Mo Valves conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939, for their respective pressure class.

Face to face dimensions of all Cast Steel Valves and of the 300-Pound 18-8 Mo Valves conform to the American Standard for Face-to-Face Dimensions of Steel Flanged Globe Valves, B16.10-1939, for their respective pressure class. This Standard does not include 150 and 300-Pound Valves in sizes smaller than 2-inch.

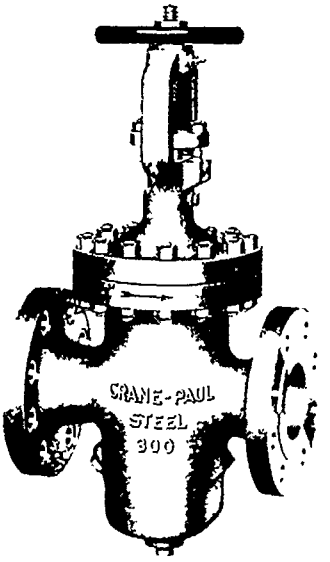
End flanges and face to face dimensions of the 150-Pound 18-8 Mo Valves conform to the MSS Corrosion Resistant Standard, No. SP-42-1951, for Cast Flanged Globe Valves, Fittings, and Flanges.

**Flange facings:** End flanges of 150-Pound 18-8 Mo Valves are regularly furnished plain faced with two V-shaped concentric grooves between the port and bolt holes.

150 and 300-Pound Cast Steel Valves and 300-Pound 18-8 Mo Valves are regularly furnished with a 1/16-inch raised face on the end flanges. 600-Pound Valves are regularly furnished with a 1/4-inch male face (large male) on the end flanges.

The 1/16-inch raised and 1/4-inch male facings are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish. A smooth finish can be furnished to order; see the Crane Discount Sheet for prices.

Cast Steel Valves are available with other types of flange facings when so specified; see the Crane Discount Sheet for prices.




**150-Pound**
**No. 19901**, Carbon Steel
**No. 19951**, 18-8 Mo Alloy

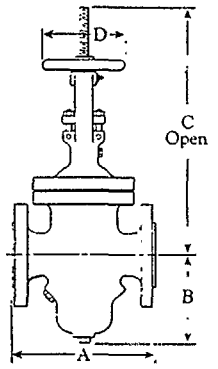
**300-Pound**
**No. 19903**, No. 4 Carbon-Moly
**No. 19953**, 18-8 Mo Alloy

**600-Pound**
**No. 19905**, No. 4 Carbon-Moly

## List Prices and Dimensions

| Class | Size Inches | List Prices, Each Flanged, F.D. & S.F. Carbon Steel | No. 4 Carbon-Moly. | 18-8 Mo Alloy Steel | Dimensions, in Inches A* | B | C | D |
|---|---|---|---|---|---|---|---|---|
| 150 Pound | | No. 19901 | | No. 19951 | | | | |
| | 1 | 120.00 | | 168.00 | 5 | 2 7/8 | 9 3/8 | 3 |
| | 1 1/4 | 127.00 | | 192.00 | 5 1/2 | 3 1/2 | 10 1/4 | 3 |
| | 1 1/2 | 144.00 | | 214.00 | 6 1/2 | 3 3/4 | 11 5/8 | 4 |
| | 2 | 185.00 | | 308.00 | 8 | 4 7/8 | 15 3/8 | 6 |
| | 2 1/2 | 241.00 | | 385.00 | 8 1/2 | 5 3/8 | 17 1/2 | 6 |
| | 3 | 289.00 | | 481.00 | 9 1/2 | 6 1/2 | 19 5/8 | 6 |
| | 4 | 481.00 | | 795.00 | 11 1/2 | 8 1/4 | 25 | 8 |
| | 6 | 963.00 | | 1565.00 | 16 | 11 1/2 | 35 5/8 | 10 |
| 300 Pound | | | No. 19903 | No. 19953 | | | | |
| | 1 | | 132.00 | 195.00 | 8 | 2 7/8 | 10 5/8 | 4 |
| | 1 1/4 | | 144.00 | 216.00 | 8 1/2 | 3 1/2 | 11 1/2 | 4 |
| | 1 1/2 | | 178.00 | 279.00 | 9 | 3 7/8 | 13 5/8 | 6 |
| | 2 | | 229.00 | 361.00 | 10 1/2 | 4 7/8 | 15 3/8 | 6 |
| | 2 1/2 | | 289.00 | 481.00 | 11 1/2 | 5 3/8 | 17 1/2 | 6 |
| | 3 | | 349.00 | 626.00 | 12 1/2 | 6 1/4 | 21 | 8 |
| | 4 | | 554.00 | 1035.00 | 14 | 8 1/2 | 24 5/8 | 8 |
| | 6 | | 1084.00 | 1926.00 | 17 1/2 | 11 1/2 | 38 | 14 |
| | 8 | | 1806.00 | 3372.00 | 22 | 15 | 44 5/8 | 14 |
| 600 Pound | | | No. 19905 | | | | | |
| | 1 | | 142.00 | | 8 1/2 | 2 7/8 | 10 5/8 | 4 |
| | 1 1/4 | | 163.00 | | 9 | 3 1/2 | 11 5/8 | 4 |
| | 1 1/2 | | 204.00 | | 9 1/2 | 3 7/8 | 13 5/8 | 6 |
| | 2 | | 265.00 | | 11 1/2 | 4 5/8 | 17 1/4 | 8 |
| | 2 1/2 | | 325.00 | | 13 | 5 1/2 | 18 7/8 | 8 |
| | 3 | | 421.00 | | 14 | 6 1/4 | 22 1/8 | 9 |
| | 4 | | 722.00 | | 17 | 8 1/4 | 27 7/8 | 10 |

*Dimension "A" includes the 1/16-inch raised faces on the 150 and 300-Pound Valves and the 1/4-inch male faces on the 600-Pound Valves.




Dimensions—All Valves

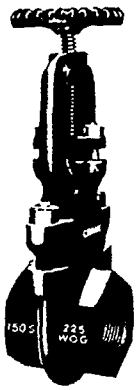
**Drilling:** Unless otherwise ordered, valves are furnished with the end flanges faced, drilled, and spot faced. Prices include drilling to the corresponding pressure class of the Standard applying; no deduction is made if valves are ordered faced only.

***For description of materials, see pages 1 to 9.***

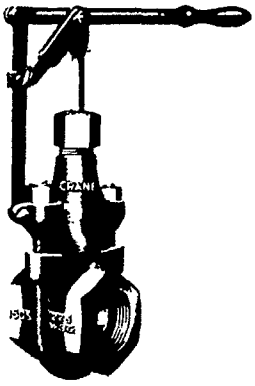
***For templates for drilling and flange dimensions, see pages 458, 461, and 462.***

# All-Iron Valves

Inside Screw Valve



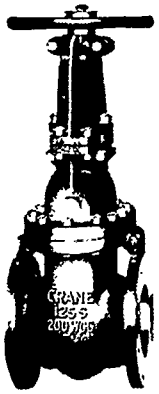
O.S. & Y. Valve



Quick-Opening Valve

*For All-Iron Clamp Gate Valves, see pages 74 and 75.*

Non-Rising Stem Valve



O.S. & Y. Valve

*For All-Iron Wedge and Double Disc Gate Valves, see pages 79, 83, and 97.*

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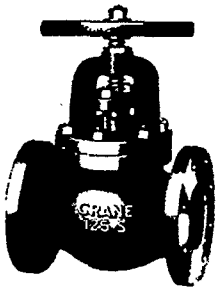
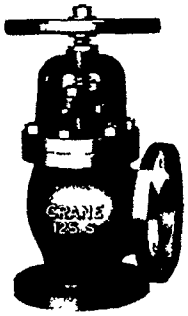
Union Bonnet Globe Valve

Union Bonnet Angle Valve

*For All-Iron Union Bonnet Globe and Angle Valves, see page 105.*

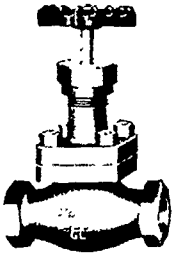


Bolted Bonnet Globe Valve



Bolted Bonnet Angle Valve

*For All-Iron Bolted Bonnet Globe and Angle Valves, see page 108.*



Ferrosteel Bolted Bonnet Globe Valve With Lead-Faced or Steel Disc

*For Ferrosteel Globe and Angle Valves, see page 411.*

Relief Valve

*For All-Iron Relief Valves, see page 331.*

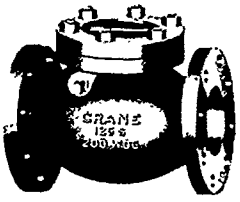
Crane manufactures an unusually complete assortment of All-Iron Gate, Globe, Angle, and Check Valves, including a wide variety of types and a full range of sizes.

Although cast iron cannot be listed specifically as one of the corrosion resisting metals, all-iron valves find wide application in many services where brass or brass trimmed valves are not entirely suited. Without good inherent resistance to corrosion, cast iron frequently depends for its general serviceability upon the fact that, in many situations, the initial corrosion is followed by the formation of protective coatings which slow up the rate of corrosion or entirely prevent it.

For greater convenience, All-Iron Valves are listed with related products in other sections of this catalog. A few of the common types are illustrated above, together with page references.

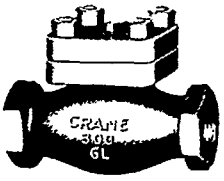
Malleable Iron Swing Check Valve

*For Malleable Iron Swing Check Valves, see page 114.*



All-Iron Swing Check Valve

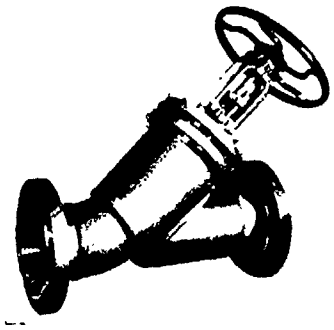
*For All-Iron Swing Check Valves, see page 117.*



Ferrosteel Lift Check Valve

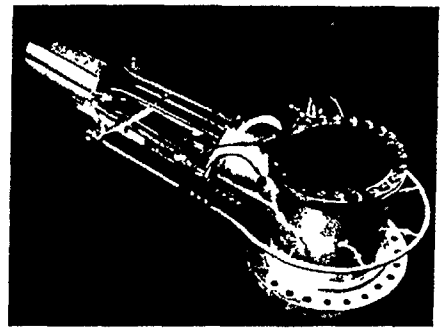
*For Ferrosteel Lift Check Valves, see page 412.*

# Other Corrosion-Resisting Products

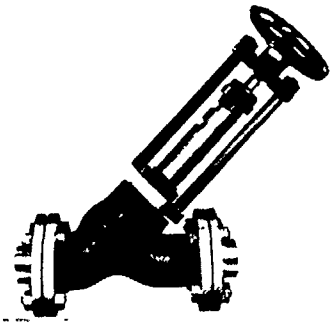


18-8 Stainless Steel
Bellow Sealed Fabricated Valve
For Extreme Vacuum

In addition to the corrosion-resistant materials described on the foregoing pages, Crane is equipped to furnish on special order most regular designs in a variety of alloys, or combination of special alloys, to suit almost any corrosive condition existing in the chemical process and food industries. Our foundries are skilled in the production of a wide range of special alloys, including the austenitic and ferritic stainless steels, acid and silicon bronzes, nickel and nickel alloys, aluminum and aluminum base alloys. Crane metallurgists are constantly searching for improved metals and methods to meet the ever changing needs of the chemical industries.



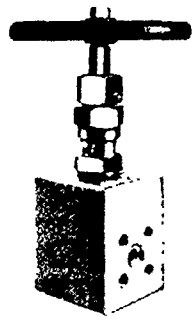
Clad 18-8 Stainless Steel
Fabricated Wood Chip Valve



25–20 Per Cent Chrome-Nickel Steel
Y-Valve with Extended Bonnet
For High Temperature Service

Where metallic materials are not available in the desired form nor suitable for the corrosive conditions, iron valve and fitting castings or fabricated piping can be coated with rubber, glass, synthetic resin, or other types of linings. Every part of the valve, fitting, or piping that comes in contact with the corrosive fluid in the line is covered with a protective coating.

Crane is also prepared to furnish especially designed valves and piping materials in corrosion-resisting alloys to meet unusual requirements. The photographs on this page illustrate some of the unusual designs manufactured to meet the particular needs of an individual customer.



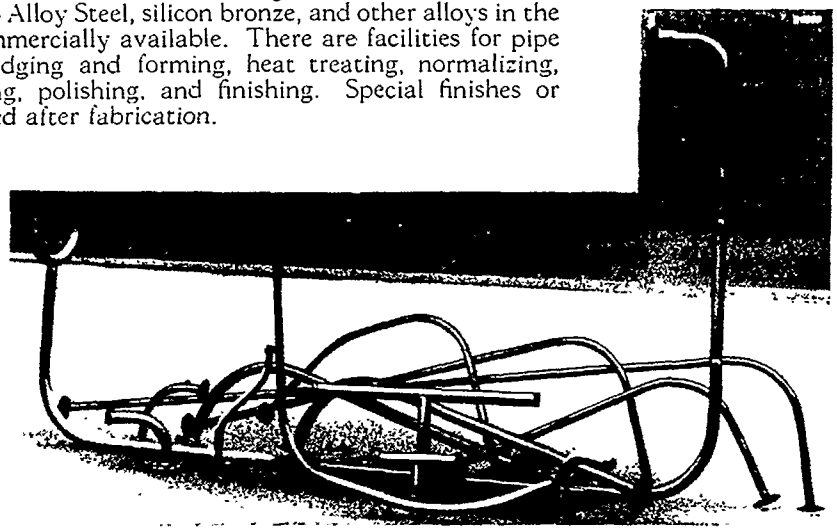
Block
Stainless Steel
Angle Valve
For High Pressure
Processing



Crane pipe fabricating shop facilities embrace the full range of fabrication in brass, aluminum, nickel, Monel, 18-8 Mo Alloy Steel, silicon bronze, and other alloys in the sizes, thicknesses, and ranges commercially available. There are facilities for pipe bending, welding, flanging, swedging and forming, heat treating, normalizing, quenching, pickling, sand-blasting, polishing, and finishing. Special finishes or polishing operations can be applied after fabrication.

A major part of the facilities of the Crane Engineering Laboratories is devoted to the improvement of piping materials for the chemical process and food industry.

Crane engineers, backed by the facilities of the Crane Engineering Division, are always available for field surveys of unusual corrosion problems and to render technical assistance to overcome them.



Typical Austenitic Stainless Steel Piping Fabricated by Bending and Welding

# Corrosion Questionnaire

### Information Required for Developing Recommendations

The behavior of metals and alloys in contact with corrosive fluids is often affected by factors which are not obvious. Because of this, it is difficult to submit a sufficiently comprehensive questionnaire without appearing unduly inquisitive. The questions below are those which apply to practically any installation; and the answers to them will, in many cases, provide all the necessary information. It is not to be expected, however, that the information so obtained will be sufficient in all cases; and it is hoped that the questions will be considered as a guide to the type of information desired rather than as a limitation to the amount that is needed.

Since apparently extraneous physical factors often exert a tremendous influence on the progress of corrosion, it is also desirable to know something about the installation itself. This is particularly true when there is a background of previous experience; and when a rough sketch of the layout of tanks, piping, etc. can be accompanied by notations showing the locations at which corrosion has been the most severe. An opportunity to examine corroded pipe, valves, or fittings will often aid materially in the making of recommendations.



1. What is the name or composition of fluid to be handled?
2. What is the concentration (percentage strength, specific gravity, pH value, etc.)?
3. What is the operating temperature and pressure in pipe lines?
4. If the fluid is not a water solution but a gas, organic fluid, etc., is water or water vapor apt to be present at any time or at any particular location? If so, explain.
5. If the fluid is a water solution, are substances other than water (abrasive solids, oil, etc.) present at any time or at any particular location? If so, explain.
6. Is there much opportunity for air in-leakage?
7. Is the flow through the system intermittent or continuous?
8. If intermittent, is the system ever drained entirely of fluid and allowed to dry?
9. Is the piping system washed or rinsed at regular intervals, and if so, with what materials?
10. Is a slight amount of corrosion objectionable from the standpoint of contamination or discoloration of product?
11. If so, what metals are particularly objectionable?
12. What materials are being used or proposed for piping, tanks, etc.?
13. Has any specific trouble been experienced with these materials?
14. What materials have been used for valves and fittings?
15. In general, what is the comparative life of the different materials which have been used?
16. What packings give the best service?

# Valves and Fittings For Marine Service

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General Requirements.....pages 398 and 399

Recommendations for Class I and Class II Piping
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Fittings and Flanges.....page 399
Steel Valves.....page 401

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Miscellaneous Valves
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Part of this section is devoted to comments on the "Marine Engineering Regulations and Material Specifications" issued November, 1949 by the United States Coast Guard, and its requirements in general. In addition, there are recommendations of Crane Valves, Fittings, and Flanges as regularly manufactured for commercial purposes, which also conform to the requirements for marine service, valves made especially for marine service, and valves most commonly used in marine piping.

The extra quality built into Crane Valves and Fittings makes them accepted everywhere. It is this quality that has long maintained for Crane its enviable position for meeting marine requirements—safety, ruggedness, and durability. Then too, the completeness of the Crane line is important. Whether it be the smallest tug or the largest passenger liner—a vessel for river, lake, or ocean service—a wide selection of Crane products is available.

# Valves and Fittings for Marine Service

## Marine Engineering Regulations and Material Specifications

The "Marine Engineering Regulations and Material Specifications" issued by the United States Coast Guard set forth the requirements for valves, fittings, and other products used for marine service.

These Regulations meet the requirements specified in the Rules for Building and Classing Steel Vessels (1952) in accordance with the American Bureau of Shipping.

There are numerous requirements and limitations governing marine service which prohibit the use of many ordinary commercial items. For convenient reference, the most important of these are given on this and the opposite page.

Although certain types of piping, like fuel oil service piping and boiler mountings and attachments, are covered separately, as explained later, the Marine Engineering Regulations divide piping on board ship into two general classes, as follows:

***Class I Piping*** which includes the various systems conveying mediums exceeding either pressures or temperatures as shown in the following table:

Pressure and Temperature Limitations

| Service | Pressure Psi | Temperature Degree F. |
|---|---|---|
| Lethal gases and liquids | Any | Any |
| Gases or vapors | Over 150 | Over 500°–*650° |
| Water | Over 150 | Over 300° |
| Fuel oil | Over 150 | Over 150° |
| Lubricating oil | Over 150 | Over 200° |
| Compressed gases | Over 150 | ..... |

*For temperatures exceeding 500° F., the pressures shall exceed the following:

| | |
|---|---|
| 150 psi at 500° F. | 130 psi at 600° F. |
| 140 psi at 550° F. | 120 psi at 650° F. |

***Class II Piping*** includes all piping for pressures and temperatures that do not require Class I Piping. (Products suitable for Class I can, of course, be used on Class II.)

## General Requirements

The limitations given below are based on the Marine Engineering Regulations (November, 1949) and do not necessarily agree with Crane recommendations for commercial services.

**Metals:** Regular Crane metals comply with the requirements for marine service as outlined below:

Grade A Bronze for valves and fittings for pressures up to 150 psi and/or temperatures not exceeding 366° F. (This is Crane Steam Brass.)

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Grade B Bronze for valves, fittings, boiler mountings, expansion joints, and similar appliances for steam pressures up to 300 psi or temperatures not exceeding 450° F., and for air or water at pressures over 300 psi but at temperatures not exceeding 150° F. (This is Crane Special Bronze.)

Gray Iron Castings for valves, fittings, and flanges for pressures and temperatures not exceeding 125 psi or 450° F. (This is Crane Cast Iron, Ferrosteel, and High Tensile Iron.)

Malleable Iron Castings (cupola process) for fittings, flanges, and valve parts for pressures and temperatures not over 150 psi or 450° F. (This is Crane Malleable Iron.)

Forged or Cast Carbon Steel for temperatures not exceeding 800° F. and Forged or Cast Alloy Steel for temperatures not exceeding 1000° F., for flanges, fittings, and valves. (These are Crane Carbon Forged or Cast Steel and †No. 4 Carbon-Molybdenum Alloy Forged or Cast Steel, respectively.)

**Working pressures:** Working pressures shall not be higher than those outlined above for the material specified. For ratings for Crane Brass, Bronze, Iron, and Steel Valves, see pages 400 to 402. In addition, for boiler feed or blow-off service, valves and fittings can only be used for working pressures up to 83⅓% of the recommended steam working pressure.

**Tests:** Brass, bronze, malleable iron, and cast iron valves and fittings for steam service must be given a hydrostatic shell test equal to 2 times the primary pressure rating marked thereon; brass, bronze, or malleable iron valves and fittings for liquid or gas service at 150° F. maximum temperature must be given a hydrostatic shell test equal to 1½ times the secondary pressure rating marked thereon. In many cases, regular Crane tests comply, but in others, products must be specially tested.

Tests on steel valves and fittings must comply with those specified in American Standard B16e6-1949; regular Crane tests meet these requirements.

Boilers must be hydrostatically tested to 1½ times the working pressure; Stop-Check Valves also are subject to this requirement.

**Pipe connections:** For Class I piping, screwed, socket-welding, and slip-on welding joints are restricted to sizes 2-inch and smaller. Sizes 2½-inch and larger must have flanged or butt-welded joints; flanged joints must be made with lap joint (Cranelap) flanges or Welding Neck Flanges.

For boiler mountings and attachments, flanged joints must be used on sizes 1½-inch and larger.

For Class II Piping, there is no limitation on the size of screwed, slip-on welding, or socket welding joints.

Carbon-Molybdenum Steel is not permitted for design temperatures exceeding 900° F.

*(continued on the next page)*

# General Requirements (Cont.)

**Marking:** Regular Crane markings comply with marine requirements, except that 125-Pound Cast Iron Screwed Fittings are not marked to show the pressure rating, this being manufacturers' standard practice.

**Valve design:** For Class I Piping, brass, bronze, cast iron, and steel valves sizes 2-inch and smaller can have screwed bonnets but they must be of the union type, except that check valves can have ordinary screwed caps. In sizes 2½-inch and larger, brass, bronze, and cast iron valves must have a bolted bonnet; steel valves in those sizes must have a bolted or pressure-seal bonnet. Non-rising stem valves must have approved indicators. Discs, disc faces, seats, stems, and other wearing parts should be made of noncorrosive material.

For Class II Piping, brass valves can have ordinary screwed bonnets on all sizes, and non-rising stem valves for oil transfer and filling systems need not have an indicator.

**Boiler mountings and attachments:** All valves, fittings, and flanges must be cast or forged steel, except that Crane Special Bronze may be used where the temperature does not exceed 450° F. and cast iron may be used where the pressure is 30 pounds or less. Sizes 1½-inch and larger must be flanged end. Main and auxiliary globe stop valves must be installed with the pressure under the disc, and sizes larger than 6-inch require a by-pass.

**Fuel oil service piping:** Valves and fittings for fuel oil pressure piping from pumps to burners (not including cargo oil transfer or discharge piping) must conform to Class I requirements and, in addition, be designed for at least 250 pounds steam working pressure. Cast iron valves and fittings are not permitted; bushings and street elbows are not permitted.

**Cocks:** For Class I Piping, cocks must be designed so that the cap holds the plug in place; the conventional type with a nut holding the plug is not allowed. There are no restrictions on cocks for Class II Piping.

**Specialties:** Relief valves, safety valves, expansion joints, fusible plugs, and similar specialties must be of approved design.

# Fittings and Flanges for Class I and Class II Piping

Numerous Crane Valves and Fittings as regularly manufactured conform to the requirements for marine service, and these fill the need for a large majority of Class I and Class II Piping.

The valves most commonly used are itemized on pages 400 and 401. In addition, the following Crane Fittings are acceptable, within the limitations mentioned:

**Brass screwed fittings:** 125-Pound Brass Screwed Fittings are suitable for a maximum of 125 psi, 353° F. All sizes can be used for Class II Piping, and sizes 2-inch and smaller for Class I Piping except for gases or vapors. See pages 184 and 185.

250-Pound Brass Screwed Fittings are suitable for a maximum of 150 psi, 366° F. All sizes can be used for Class II Piping, and sizes 2-inch and smaller for Class I Piping except gases or vapors. See page 186.

**Brass screwed unions:** Brass screwed unions, page 187, can be used for Class II Piping in all sizes and for Class I Piping in sizes 2-inch and smaller except the No. 523½ and No. 524½ which are not suitable on gases or vapors. Maximum ratings for unions are as follows: Nos. 523½ and 524½, 150 psi—366° F.; and No. 696 E, 300 psi—450° F.

**Brass flanges:** Brass flanges, page 188, can be used in all sizes on Class II Piping. For Class I Piping, the flanges are permitted in sizes 2-inch and smaller only except on gases or vapors. The 150-Pound are suitable for a maximum of 150 psi, 366° F.; and the 300-Pound, 300 psi, 450° F.

**Cast and malleable iron screwed fittings:** 125-Pound Cast Iron Screwed Fittings (pages 150 to 159) are suitable for a maximum of 125 psi and 353° F.

150-Pound Malleable Iron Screwed Fittings (pages 140 to 144) are suitable for a maximum of 150 psi and 366° F. All sizes of cast iron and malleable iron fittings can be used for Class II Piping. Malleable iron fittings in sizes 2-inch and smaller can be used for Class I Piping, except on gases or vapors.

**Cast iron flanged fittings and flanges:** 125-Pound Cast Iron Flanged Fittings and Flanges (pages 196 to 203) are suitable for a maximum of 125 psi, 353° F. on sizes 12-inch and smaller, and 100 psi, 338° F. on sizes 14-inch and larger. On Class II Piping, both the fittings and flanges are acceptable.

**Steel screwed fittings:** All sizes of Crane Steel Screwed Fittings (pages 258 to 261) are suitable for Class II Piping, and sizes 2-inch and smaller are also suitable for Class I.

**Steel flanged fittings and flanges:** Crane Cast Steel Flanged Fittings (pages 267 to 273) and Crane Forged Steel Flanges (pages 291 to 298) are suitable for both Class I and Class II Piping, but they are not suitable for gases or vapors for Class I. For Class I Piping, screwed, slip-on welding, and socket-welding flanges can only be used in sizes 2-inch and smaller. See page 402 for ratings.

**Welding fittings:** Crane Forged Steel Socket-Welding Fittings, which are made in sizes 2-inch and smaller (see pages 276 to 279), and Steel Butt-Welding Fittings (see pages 280 to 286) can be used for either Class I or Class II Piping.

# Valves for Class I and Class II Piping

**Explanation:** The tables on this and the following page show the Crane Brass, Bronze, Iron, and Steel Valves most commonly used in marine service. For the "Class" of piping indicated and within the pressure and temperature ratings shown, all of them comply with the †"Marine Engineering Regulations and Material Specifications" issued by the United States Coast Guard. The tables show not only the type of valve and catalog number but also whether suitable for Class I or Class II Piping, and the maximum pressure-temperature ratings for each of the several fluids involved. The ratings are not necessarily the same as those for ordinary commercial service; marine ratings are governed by valve design, materials, end connections, and other limitations as set forth in the Marine Engineering Regulations.

## Brass, Bronze, and Iron Valves for Class I or Class II Piping

| Class I Piping: Steam Over 150 Psi | Hot Water Over 300° Fahr. | Hot Oil Over 150° Fahr. | Cold Water, Oil, or Gas | Sizes for Class I Inches | Crane Valves Recommended: Valve Type | | Catalog Numbers | See Page | Sizes for Class II Inches | Class II Piping: Steam 150 Psi *Max. | Hot Water 300° Fahr. *Max. | Hot Oil 150° Fahr. *Max. | Cold Water, Oil, or Gas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum Ratings | | | | | Brass and Bronze Valves | | | | | Maximum Ratings | | | |
| ... | ... | ... | ... | .... | Hose Gate | | No. 4448 | 403 | 1½-2½ | ... | ... | ... | 100 psi |
| ... | ... | ... | ... | .... | | | No. 4449 | 403 | 1½-2½ | ... | ... | ... | |
| ... | ... | ... | ... | .... | | | No. 453 | 60 | 1½, 2½ | ... | ... | ... | 150 psi |
| ... | ... | ... | ... | .... | Angle Hose | | No. 117 | 61 | ¾-2 | ... | ... | ... | |
| ... | ... | ... | ... | .... | Gate | Scrd. | No. 4436 | 15 | 2-3 | 100 psi | 100 psi | | 100 psi |
| ... | 100 psi-338°F. | | ... | 2-10 | | Flgd. | No. 4437 | 15 | 2-10 | | ... | ... | |
| ... | ... | ... | ... | .... | | Q.O. | No. 432 | 56 | 2½, 3 | | 100 psi | | |
| ... | ... | ... | ... | .... | | | No. 432 | 56 | ½-2 | | | | |
| ... | ... | ... | ... | .... | | Scrd. | No. 428, 430, 440 | 16 | ¼-3 | 125 psi 353° F. | 125 psi | | 125 psi |
| ... | ... | ... | ... | .... | Globe | Scrd. | No. 1 | 26 | ⅛-3 | | | | |
| ... | ... | ... | ... | .... | Angle | | No. 2 | 26 | ⅛-3 | | | | |
| ... | ... | ... | ... | .... | Gate | Scrd. | No. 431 | 17 | ¼-3 | 366° F. | 150 psi | | 150 psi |
| ... | ... | ... | ... | .... | Globe or Angle | Scrd. | No. 85, 88, 89 | 27 | ⅛-¾ | | | | |
| ... | 150 psi-366° F. | | ... | ⅛-2 | | | No. 7 | 28 | ⅛-2 | | ... | ... | |
| ... | | | ... | ⅛-2 | | | No. 14½ P, 16½ P | 29 | ⅛-2 | | ... | .. | |
| ... | ... | ... | ... | .... | | | No. 7 | 28 | 2½, 3 | | 150 psi | | |
| ... | ... | ... | ... | .... | | | No. 14½ P, 16½ P | 29 | 2½, 3 | | | | |
| ... | | | ... | 1-3 | | Flgd. | No. 9 | 28 | 1-3 | | ... | ... | |
| ... | | | ... | 1-2 | | | No. 71 | 32 | 1-3 | | ... | ... | |
| ... | 150 psi-366° F. | | ... | 1½-6 | | | No. 4197, 4199 | 34 | ... | ... | ... | ... | ... |
| ... | | | ... | 1½-6 | | | No. 4297, 4299 | 408 | ... | ... | ... | ... | .. |
| ... | | | ... | 1-3 | Check | Flgd. | No. 38 | 48 | 1-3 | 366° F. | ... | ... | 150 psi |
| ... | | | ... | 2-6 | | | No. 4033, 4063 | 50 | 2-6 | | ... | ... | |
| 200 psi-388° F. | ... | | ... | ⅜-1 | Radiator | | No. 4270 | 58 | ... | ... | ... | ... | ... |
| 200 psi-388° F. | | | 200 psi | ¼-2 | Gate | Scrd. | No. 422, 423 | 18 | 2½, 3 | 366° F. | 150 psi | | |
| ... | ... | ... | ... | .... | | Flgd. | No. 429 | 17 | 1-3 | | | | |
| | | | | ⅛-2 | Globe or Angle | Scrd. | No. 70 | 33 | 2½, 3 | | | | |
| | | | | ¼-2 | | | No. 212 C, 214 C | 32 | ... | ... | ... | ... | ... |
| | | | | ¼-2 | | | No. 212 P, 214 P | 32 | 2½, 3 | 366° F. | 150 psi | | |
| 200 psi-388° F. | | | 200 psi | 1½-2 | | | No. 4196, 4198 | 34 | 2½, 3 | | | | |
| | | | | 1½-2 | | | No. 4296, 4298 | 408 | 2½, 3 | | | | |
| | | | | ¼-2 | Check | Scrd. | No. 36, 72 | 48 | 2½, 3 | | | | |
| | | | | 1½-2 | | | No. 4032, 4062 | 50 | 2½, 3 | | | | |
| | | | 1000 psi | ¼-2 | Gate | Scrd. | No. 622 E, 623 E | 21 | 2½, 3 | | | | |
| | | | 500 psi | 1-3 | | Flgd. | No. 623½ E | 21 | ... | ... | ... | ... | ... |
| | | | 1000 psi | ¼-2 | Globe or Angle | Scrd. | No. 382 P, 384 P | 36 | 2½, 3 | 366° F. | 150 psi | | |
| 300 psi-450° F. | | | 500 psi | 1-3 | | Flgd. | No. 383 P, 385 P | 36 | ... | ... | ... | ... | .. |
| | | | | 1½-3 | | | No. 87 P, 87½ P | 37 | ... | .. | .. | .. | ... |
| | | | 1000 psi | ¼-2 | Check | Scrd. | No. 76 E, 366 E | 51 | 2½, 3 | 366° F. | 150 psi | | |
| | | | 500 psi | 1-3 | | Flgd. | No. 77 E | 51 | ... | ... | ... | .. | .. |
| | | | | | Iron Valves | | | | | Maximum Ratings | | | |
| | | | | | Gate | Flgd. | No. 4461, 4465 | 405 | 2-12 | 125 psi 353° F. | 125 psi 200° F. | ... | 125 psi |
| | | | | | | | No. 4467 | 405 | 3-12 | | | ... | |
| | | | | | Globe | Flgd. | No. 351 | 108 | 2-10 | | | ... | |
| | | | | | Angle | Flgd. | No. 353 | 108 | 2-10 | | | ... | |
| | | | | | Check | Flgd. | No. 373 | 117 | 2-24 | | | ... | |

†November, 1949 issue

*Brass and Bronze Valves for Class II Piping are recommended for the maximum ratings if not otherwise indicated.

***Valves for Class I Piping can also be used for Class II.***

(Continued on the page following)

# Valves for Class I and Class II Piping (Cont.)

**Boiler feed or blow-off service:** For boiler feed or blow-off service, the Marine Engineering Regulations specify that valves and fittings can only be used for working pressures up to 83⅓ per cent of the recommended steam working pressure.

**Iron valves:** Iron valves can be used on steam, water, and oil transfer and filling systems (not fuel oil pumps to burners), and for boiler mountings where the maximum pressure does not exceed 30 pounds.

**Fuel oil service piping:** For fuel oil pressure piping from pumps to burners (not including cargo oil transfer or discharge piping), valves and fittings must conform to Class I requirements and be designed for at least 250 pounds steam working pressure; cast iron valves and fittings, and bushings and street elbows, are not permitted.

**Steel valves:** In addition to the types shown in the table below, other Crane Steel Valves are available, as follows:

Bolted bonnet valves in sizes 2-inch and larger are available with screwed and butt-welding ends and also in the 900 and 1500-Pound pressure classes.

Pressure-Seal Bonnet Valves are available in sizes 1-inch and larger in 600, 900, and 1500-Pound pressure classes; Lip-Seal Bonnet Globe and Angle Valves are available in sizes ½ to 2-inch in 1500 and 2500-Pound pressure classes. Refer to Section 21 for complete details.

Flanged End Steel Valves in sizes ½ to 2-inch are available with 150-Pound end flanges; these are made special from patterns of the Nos. 3015 XW, 3656 W, 3657 W, and 3686 X; see 600-Pound Valves in the left hand portion of the table below.

**Body and bonnet materials:** The body and bonnet of all of the 600-Pound Valves shown in the left hand portion of the table below except the No. 174 X Swing Check Valves are made of carbon steel. The No. 174 X and the 1500-Pound Valves have these parts made of Crane No. 4 Carbon-Molybdenum Alloy Steel.

Of the valves shown in the right hand portion of the table, the 150-Pound Valves have a carbon steel body and bonnet and the 300, 400, and 600-Pound Valves have Crane No. 4 Carbon-Molybdenum Alloy Steel bodies and bonnets.

**Flange facings:** Crane 150 and 300-Pound Flanged Steel Valves are regularly furnished with 1/16-inch raised "serrated" faces. The 400 and 600-Pound Valves are regularly furnished with ¼-inch large male "serrated" faces.

Other types of facing, such as ring joint, can be supplied when ordered, but those just mentioned are most commonly used on marine piping.

**Other valves for marine service:** The tables on this and the preceding page show the Crane Valves that are most popular for marine piping. Other sizes, types, and designs also are available; additional information will be furnished on request.

## Steel Valves for Class I Piping

**Sizes ¼ to 2-inch, inclusive** (Screwed, Socket-Welding, and Flanged Valves)

| Pressure Class and Type of Valve | | Type of Ends | Crane Valves Recommended: Catalog Nos. With Union Bonnet | Catalog Nos. With Bolted Bonnet | Range of Sizes | For ratings, see page 402 | For data, see page |
|---|---|---|---|---|---|---|---|
| 600 Pound | Gate | Screwed | 3602XW | | ¼-2" | Col. 1 | 223 |
| | | | | 3607 XW | ½-2 | Col. 1 | 225 |
| | | Socket-Weld. | | 3611 XW | ½-2 | Col. 1 | 225 |
| | | Flanged | | 3615 XW | ½-2 | Col. 2 | 225 |
| | Globe | Screwed | 3640 W | | ¼-¾ | Col. 1 | 239 |
| | | | | 3644 W | ½-2 | Col. 1 | 239 |
| | | Socket-Weld. | 3648 W | | ¼, ⅜ | Col. 1 | 239 |
| | | | | 3652 W | ½-2 | Col. 1 | 239 |
| | | Flanged | | 3656 W | ½-2 | Col. 2 | 239 |
| | Angle | Screwed | 3641 W | | ¼-¾ | Col. 1 | 239 |
| | | | | 3645 W | ½-2 | Col. 1 | 239 |
| | | Socket-Weld. | 3649 W | | ¼, ⅜ | Col. 1 | 239 |
| | | | | 3653 W | ½-2 | Col. 1 | 239 |
| | | Flanged | | 3657 W | ½-2 | Col. 2 | 239 |
| | Lift Check | Screwed | 3670 X | | ¼-¾ | Col. 1 | 250 |
| | | | | 3674 X | ½-2 | Col. 1 | 251 |
| | | Socket-Weld. | 3678 X | | ¼, ⅜ | Col. 1 | 250 |
| | | | | 3682 X | ½-2 | Col. 1 | 251 |
| | | Flanged | | 3686 X | ½-2 | Col. 2 | 251 |
| | Swing | Screwed | | 174 X | ½-2 | Col. 12 | 255 |
| 1500 Pound | Globe | Screwed | | 3844 U | ½-2 | Col. 3 | 241 |
| | | Socket-Weld. | | 3852 U | ½-2 | Col. 3 | 241 |
| | Angle | Screwed | | 3845 U | ½-2 | Col. 3 | 241 |
| | | Socket-Weld. | | 3853 U | ½-2 | Col. 3 | 241 |

*For marine ratings of steel valves, see page 402.*

**Sizes 2-inch and larger** (Flanged Valves Only)

| Pressure Class | Type of Valve | Crane Valves Recommended: Catalog Nos. | Range of Sizes | For ratings, see page 402 | For data, see page |
|---|---|---|---|---|---|
| 150 Pound | Gate | 47 XR | 2-24" | Col. 4 | 229 |
| | Globe | 143 XR | 2-8 | Col. 4 | 246 |
| | Angle | 145 XR | 2-8 | Col. 4 | 246 |
| | Check | 147 X | 2-8 | Col. 4 | 255 |
| 300 Pound | Gate | 33 XR | 2-24 | Col. 10 | 229 |
| | | 33 U | 2-24 | Col. 10 | 229 |
| | Globe | 151 XR | 2-8 | Col. 10 | 246 |
| | | 151 U | 2-8 | Col. 10 | 246 |
| | Angle | 153 XR | 2-8 | Col. 10 | 246 |
| | | 153 U | 2-8 | Col. 10 | 246 |
| | Check | 159 X | 2-12 | Col. 10 | 255 |
| 400 Pound | Gate | 61 XR | 4-24 | Col. 11 | 229 |
| | | 61 U | 4-24 | Col. 11 | 229 |
| | Globe | 161 XR | 4-8 | Col. 11 | 246 |
| | | 161 U | 4-8 | Col. 11 | 246 |
| | Angle | 163 XR | 4-8 | Col. 11 | 246 |
| | | 163 U | 4-8 | Col. 11 | 246 |
| | Check | 169 X | 4-12 | Col. 11 | 255 |
| 600 Pound | Gate | 76 XR | 2-24 | Col. 12 | 229 |
| | | 76 U | 2-24 | Col. 12 | 229 |
| | Globe | 171 XR | 2-6 | Col. 12 | 246 |
| | | 171 U | 2-6 | Col. 12 | 246 |
| | Angle | 173 XR | 2½-6 | Col. 12 | 246 |
| | | 173 U | 2½-6 | Col. 12 | 246 |
| | Check | 175 X | 2-12 | Col. 12 | 255 |

# Pressure-Temperature Ratings—Steel Valves for Marine Service

***Based on Marine Engineering Regulations—U.S. Coast Guard***

The pressure-temperature ratings shown below apply to Crane Steel Valves and also to Crane Steel Flanged Fittings and Flanges when used in piping aboard ship. They were taken from the Marine Engineering Regulations issued November, 1949 by the United States Coast Guard, and are the same as ratings published in the American Standard for Steel Pipe Flanges and Flanged Fittings, ASA B16e-1949 up to the maximum ratings established in the Regulations. No ratings are shown in the Marine Engineering Regulations for steel screwed and socket-welding valves: those in Columns 1 and 3 are, therefore, Crane ratings.

**Flanged fittings and flanges:** Flanged fittings in the 150-pound class are carbon steel and in the 300 to 1500-pound classes are Crane No. 4 Carbon-Molybdenum Alloy Steel. 150 and 300-Pound classes have 1/16-inch raised faces; 400-pound and higher pressure classes have 1/4-inch high large male faces.

Flanges in all pressure classes are carbon steel with a 1/16-inch raised face on 150 and 300-pound classes and a 1/4-inch large male or, if specified, a 3/16-inch large female face on 400 to 1500-Pound pressure classes. When so specified, 300, 400, 600, 900, and 1500-Pound Flanges can be furnished of Crane No. 4 Carbon-Molybdenum Alloy Steel.

**Valve trim recommendations:** ***Valves with XR trim*** (Exelloy to No. 49 Nickel Alloy) are particularly satisfactory for steam, water, air, gas, and other non-lubricating and relatively non-corrosive fluids such as gasoline, fuel oil, etc. They also are well suited for oil having low viscosity such as used in hydraulic systems especially where seating loads are extremely high. Maximum recommended temperatures for "XR" trimmed valves are: 850° F. on steam and 500° F. on all other services.

***W and XW trim*** ("W" is hardened stainless steel), supplied only in the small 600-Pound Gate, Globe, and Angle Valves, may be used for the services mentioned below; the maximum recommended temperature is the same as for the valves.

***U trim*** (Stellite) is provided primarily for high temperature steam lines up to the maximum temperature limitation on valves in which this trim is used.

***X trim*** (Exelloy) as used in Check Valves, because of the particular operating conditions to which check valve seating surfaces are subjected, is recommended for any fluid requiring "W", "XR", "U", "XW", or "X" trimmed Gate, Globe, and Angle Valves. The maximum steam temperature limitation is the same as for the Check Valves in which this trim is used.

Since "X" trimmed Gate, Globe, and Angle Valves are infrequently used in marine service, they are not covered in the table or on page 401; for details, refer to Section 22 for Gate Valves and Section 23 for Globe and Angle. "X" trimmed Gate, Globe, and Angle Valves should be used for all oil and oil vapor service at temperatures over 500° F. and for most corrosive and unrefined oils, regardless of temperature. For lubricating oils up to 500° F., either "X" or "XR" trim should give equal satisfaction.



| Valve Trim | Temp. Deg. F. | Maximum Non-Shock Working Pressures—Pounds per Square Inch | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Valves—1/4 to 2-inch | | | Valves—2-inch and Larger Flanged Fittings and Flanges—All Sizes | | | | | | | | | | |
| | | Carbon Steel | | No. 4 Steel | Carbon Steel 150-Pound Flanged Valves 150-Pound Flanged Fittings 150 to 1500-Pound Flanges | | | | | | No. 4 Alloy Steel Flanged Valves Flanged Fittings Flanges | | | | |
| | | Screwed and Socket-Welding | Flanged with 1/4-inch Male Face | Screwed and Socket-Welding | 1/16" Raised Face | | 1/4" Large Male Face | | | | 1/16" Raised Face | 1/4" Large Male Face | | | |
| See explanation above | | 600 Lb. Col. 1 | 600 Lb. Col. 2 | 1500 Lb. Col. 3 | 150 Lb. Col. 4 | 300 Lb. Col. 5 | 400 Lb. Col. 6 | 600 Lb. Col. 7 | 900 Lb. Col. 8 | 1500 Lb. Col. 9 | 300 Lb. Col. 10 | 400 Lb. Col. 11 | 600 Lb. Col. 12 | 900 Lb. Col. 13 | 1500 Lb. Col. 14 |
| *Class XR* 850° F. Max. | 100 | 2000 | 1200 | 3600 | 230 | 600 | 800 | 1200 | 1800 | 3000 | 600 | 800 | 1200 | 1800 | 3000 |
| | 150 | 1910 | 1180 | 3550 | 220 | 590 | 785 | 1180 | 1770 | 2950 | 590 | 785 | 1180 | 1770 | 2950 |
| | 200 | 1820 | 1160 | 3500 | 210 | 580 | 770 | 1160 | 1740 | 2900 | 580 | 770 | 1160 | 1740 | 2900 |
| | 250 | 1730 | 1140 | 3450 | 200 | 570 | 760 | 1140 | 1710 | 2850 | 570 | 760 | 1140 | 1710 | 2850 |
| *Class X* For Check Valves on Steam | 300 | 1640 | 1120 | 3415 | 190 | 560 | 740 | 1120 | 1680 | 2800 | 560 | 740 | 1120 | 1680 | 2800 |
| | 350 | 1550 | 1095 | 3375 | 180 | 550 | 725 | 1095 | 1645 | 2740 | 550 | 725 | 1095 | 1645 | 2740 |
| | 400 | 1460 | 1075 | 3330 | 170 | 540 | 710 | 1075 | 1615 | 2690 | 540 | 710 | 1075 | 1615 | 2690 |
| | 450 | 1370 | 1050 | 3295 | 160 | 525 | 700 | 1050 | 1580 | 2630 | 525 | 700 | 1050 | 1580 | 2630 |
| | 500 | 1280 | 1000 | 3125 | 150 | 500 | 665 | 1000 | 1500 | 2500 | 500 | 665 | 1000 | 1500 | 2500 |
| | 550 | 1190 | 950 | 2955 | 140 | 475 | 630 | 950 | 1420 | 2370 | 475 | 630 | 950 | 1420 | 2370 |
| | 600 | 1110 | 890 | 2770 | 130 | 445 | 590 | 890 | 1330 | 2220 | 445 | 590 | 890 | 1330 | 2220 |
| | 650 | 1030 | 830 | 2580 | 120 | 415 | 550 | 830 | 1240 | 2070 | 415 | 550 | 830 | 1240 | 2070 |
| *Class U W or XW* | 700 | 940 | 760 | 2350 | 110 | 380 | 500 | 760 | 1140 | 1900 | 380 | 500 | 760 | 1140 | 1900 |
| | 750 | 850 | 680 | 2125 | 100 | 340 | 450 | 680 | 1020 | 1700 | 360 | 475 | 720 | 1080 | 1800 |
| | 800 | 780 | 600 | 1875 | 92 | 300 | 400 | 600 | 900 | 1500 | 340 | 450 | 680 | 1020 | 1700 |
| | 850 | | | 1750 | | | | | | | 320 | 425 | 640 | 960 | 1600 |
| | 900 | | | 1625 | | | | | | | 300 | 400 | 600 | 900 | 1500 |

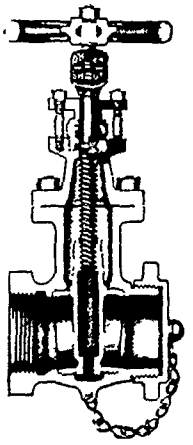
*For limitations on boiler feed service, see page 401.*

*Ratings for steel flanged valves with other types of flange facings will be furnished on request.*

# Brass Hose Gate Valves

## Non-Rising Stem Type with Indicator

100 pounds cold water working pressure



Cross Section
No. 4448
Screwed

These are strong, durable valves with non-rising stems. An approved type indicator shows whether the valve is open or closed.

The body, bonnet, stem, body seat rings, and solid wedge disc are brass. Sizes 1½ and 2-inch have a screwed bonnet and integral seats; their hexagonal packing nut and gland are brass. The 2½-inch size has a bolted bonnet, renewable seats, and a brass bolted gland.

**Stuffing box; repacking:** The stuffing box is deep, and is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

**Flanged valves:** End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling; no duction for valves ordered faced only. Use full face gaskets; see page 472.

**Hose Thread:** These valves will be regularly furnished with any recognized standard hose thread used in marine work; see page 59. Orders must specify the type of hose thread desired. When other hose threads are required, send detailed information or a sample, preferably the male end of a hose coupling, and special prices will be quoted.

**Globe and angle hose valves:** Brass globe and angle hose valves made from the patterns of the No. 7 and No. 9 valves shown on page 28 can be made to order; prices on application.

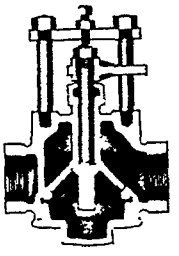
No. 4449
Flanged

**List Prices, Each, and Dimensions, in Inches**

| Size Inches | 1½ | 2 | 2½ |
|---|---|---|---|
| No. 4448, Screwed | 53.50 | 80.50 | 107.00 |
| No. 4449, Flanged, F. & D. | 62.50 | 98.00 | 134.00 |
| Center to female end, Screwed | 1⅝ | 1⅞ | 2¾ |
| Center to face, Flanged | 2 3/16 | 2¾ | 2½ |
| Center to hose end | 2 1/16 | 2 5/16 | 2⅝ |
| Center to top | 8⅝ | 9¾ | 11½ |
| Diameter of wheel | 3⅝ | 4 1/16 | 6 |
| Diameter of flanges | 5 | 6 | 7 |
| Thickness of flanges | 7/16 | ½ | 9/16 |

# Bronze Chronometer Valves

250 pounds saturated steam working pressure



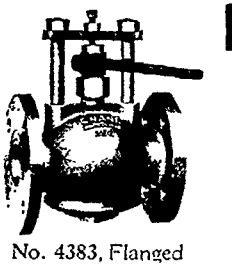
Cross Section
No. 4382, Screwed

**Recommendations:** Crane Bronze Chronometer Valves are designed for regulating and governing purposes and should not be used as stop valves.

The valves open or close completely in one-eighth turn of the lever. The pressure of the disc against the seat bearing can be adjusted, when easier operation is desired, by means of the screw at the stem end. With proper adjustment, the valves can be operated by a float.

**Design:** The valves have a Crane Special Bronze body, cap, and disc, brass stem, and malleable iron lever. Sizes 1½-inch and smaller have a screwed cap and packing nut; larger sizes have a bolted cap and gland.

**Flanged valves:** End flanges conform to the MSS 250-Pound SP Bronze Flange Standard (No. SP-2-1937). They are plain faced, with two V-shaped concentric grooves between the port and bolt holes.



No. 4383, Flanged

**Drilling:** Prices of flanged valves include drilling to the MSS 250-Pound Standard; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 472.

**List Prices, Each, and Dimensions, in Inches**

| Size Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ |
|---|---|---|---|---|---|---|---|
| No. 4382, Screwed | 82.50 | 82.50 | 82.50 | 121.00 | 121.00 | 242.00 | 363.00 |
| No. 4383, Flanged, F. & D. | | | | 161.00 | 161.00 | 314.00 | 468.00 |
| End to end, Screwed | 5¼ | 5¼ | 5¼ | 6½ | 6½ | 8¾ | 10¾ |
| Face to face, Flanged | | | | 7 | 7 | 9¾ | 11¾ |
| Center of valve to top | 5¾ | 5¾ | 5¾ | 7 | 7 | 8½ | 9¾ |
| Center of stem to end of handle | 4¾ | 4¾ | 4¾ | 6¼ | 6¼ | 7½ | 8¾ |
| Diameter of flange | | | | 5¼ | 6⅛ | 6½ | 7½ |
| Thickness of flange | | | | 17/32 | 9/16 | ⅝ | 11/16 |

*Templates for drilling . page 458*

34

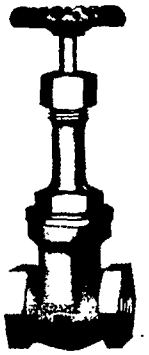
# Comments

Illustrated in this section are some of the valves regularly manufactured for commercial use, which also conform to the requirements for Class I or Class II Piping in marine service.

For information on maximum pressure-temperature ratings to which these valves may be subjected, as defined in the Marine Engineering Regulations, see pages 308 to 422. Commercial service ratings other than those referred to will be found on the pages on which the valves are regularly listed.

Regularly manufactured valves used primarily for marine installations—hose gate valves and chronometer valves—are illustrated and listed on page 403. Other valves furnished especially to order, such as: iron body gate valves with cleanouts, steel main injection valves, manifold valves of brass, ferro-steel, or cast steel, and screw-down check valves of brass, iron, or steel are shown on pages 405, 406, and 408.

## Brass Gate Valves

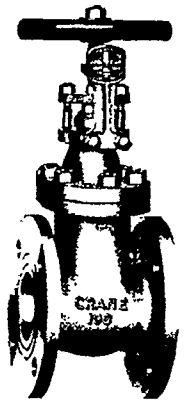


No. 428 Gate Screwed

Crane Brass Gate Valves are liberally proportioned to assure a high factor of safety against pressure, operating strains, and expansion and contraction of piping.

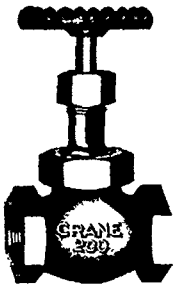
**No. 428 Valves:** These valves are of the inside screw, rising stem type, with screwed ends and solid wedge disc and are made in sizes ¼ to 3-inch. Recommended commercially for 125 pounds saturated steam and 200 pounds cold water, oil, or gas pressure.

**No. 4437 Valves:** These valves are of the bolted bonnet, non-rising stem type, with flanged ends and solid wedge disc and are made in sizes 2 to 10-inch. They are regularly furnished with an indicator but are also available without this feature. The body seat rings are renewable. Valves with screwed ends (No. 4436), in sizes 2 to 3-inch are also available. All are rated commercially for 100 pounds saturated steam, 125 pounds water at 200° F., and 125 pounds oil or gas at 150° F.



No. 4437 Gate, Flanged with Indicator

## Bronze Globe and Angle Valves

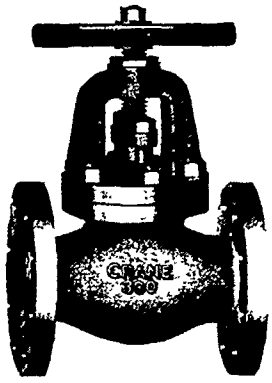


No. 70 Globe Screwed

Both of the conventional types of valves illustrated are also available in the screw-down check type, shown on page 408.

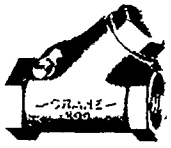
**No. 70 Valves:** This line of union bonnet, integral seat, regrinding type valves consists of both the globe and angle patterns with screwed ends (No. 70), sizes ⅛ to 3-inch, and with flanged ends (No. 71), sizes 1 to 3-inch. They are rated commercially for 500° F. steam—at 200 pounds pressure on the screwed end valves and 150 pounds pressure on the flanged end valves.

**No. 87 P Valves:** These bolted bonnet, outside screw and yoke valves with renewable seat ring and plug type disc and seat combination are made in the globe (No. 87 P) and angle (No. 87½ P) patterns with flanged ends only, in sizes 1½ to 3-inch. They are rated commercially for 550° F. steam at 300 pounds pressure.



No. 87 P Globe, Flanged

## Bronze Swing Check Valves

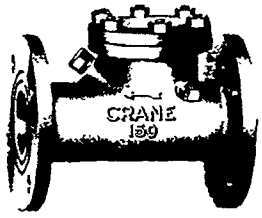


No. 36 Y-Pattern Swing Check Screwed

The swing check valves illustrated have integral seats. The seats in all sizes on the No. 36 line with threaded cap, and sizes 4-inch and smaller on the No. 4033 line with bolted cap, can be reground without removing the bodies from the line. All sizes are rated commercially for 500° F. steam—at 200 pounds pressure on the screwed valves and 150 pounds pressure on the flanged valves.

**No. 36 Valves:** This line includes the screwed end pattern (No. 36) in sizes ¼ to 3-inch, and the flanged end pattern (No. 38) in sizes 1 to 3-inch.

**No. 4033 Valves:** These valves are available with screwed ends (No. 4032) in sizes 2 to 3-inch, and with flanged ends (No. 4033) in sizes 2 to 6-inch.



No. 4033 Swing Check Flanged

*For prices, dimensions, complete descriptions, and other ratings on above valves, refer to the following:*
*Gate....pages 15 and 16* *Globe and angle ...pages 33 and 37* *Swing check....pages 48 and 50*

# Iron Body Wedge Gate Valves

WORKING PRESSURE
125 pounds saturated steam, water, or oil

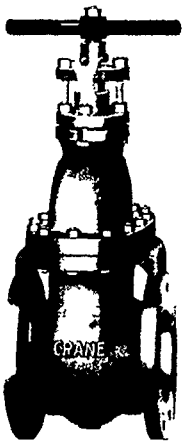
***Prices on application***

These valves are similar in design to the regular Crane 125-Pound Iron Body Wedge Gate Valves shown on pages 77 to 81, but are specially fitted for marine service.

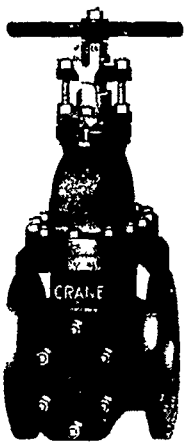
The Nos. 4461 and 4465 valves are regularly made in sizes 2 to 12-inch, inclusive, flanged end only.

The No. 4467 valve, recommended for marine cargo oil systems, is regularly made in sizes 3, 4, 6, 8, 10, and 12-inch, flanged end only.

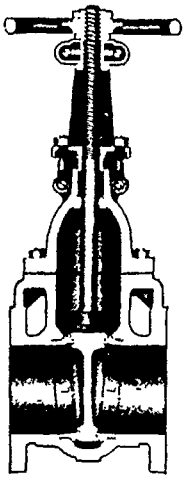
Screwed end valves, specially trimmed valves, other sizes, and other modifications of these valves can be furnished on special order.




No. 4461, Flanged Non-Rising Stem With Indicator




No. 4467, Flanged Non-Rising Stem With Cleanout and Indicator



Cross Section No. 4465, Flanged Outside Screw and Yoke

**Body and bonnet:** The valves have an oval-shaped cast iron body and bonnet; liberal metal sections combined with proper metal distribution assure maximum strength. Straight through ports with tie ribs between the bonnet flange and the end flanges provide additional resistance to line strains.

No. 4467 valve bodies have a single side cleanout. Bottom cleanouts can be furnished when ordered. They have two tapped and plugged bosses, one on the side opposite the cleanout and one on the bottom, suitable for ¾-inch steaming out connections.

The gland bolts and nuts are brass.

**Disc and seats:** The body seat rings are brass and are screwed into the body. No. 4467 valves in sizes 10 and 12-inch have pressed-in body seat rings.

All of these valves are regularly furnished with a cast iron disc having brass seating faces; it is brass-bushed where it engages the stem threads. A solid brass disc can be furnished when so ordered.

**Stem:** The brass stem is of liberal diameter and amply strong. Stem threads have long engagement in the disc or yoke sleeve. Outside screw and yoke valves have a tee-head disc-stem connection.

**Gland and stuffing box:** These valves have a two-piece ball-type gland, consisting of a gland and a gland flange. This construction maintains an even load on the packing and prevents binding on the stem even when the gland bolt nuts are not pulled up evenly.

Non-rising stem valves have bronze gland bolts holding the gland flange to the stuffing box; the stem collar recess is brass-bushed, top and bottom, to minimize friction and to prevent corrosion. Outside screw and yoke valves have swinging gland eye bolts made of bronze, which move out of the way when the stuffing box is being repacked but which will not become detached and lost.

The stuffing box is exceptionally deep and is filled with high grade packing.

**Repacking:** These valves, when wide open, can be repacked while under pressure. Outside screw and yoke valves have a brass bonnet bushing, offering a better back seat for the stem and making this point non-corrosive.

**Indicator on Non-Rising Stem Valves:** No. 4461 Valves are regularly furnished with an approved type indicator to show whether the valve is open or closed. No. 4467 Valves, not regularly furnished with an indicator, will be so equipped when specified on orders.

**Flange dimensions and facing:** The dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish.

**Drilling:** Prices include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

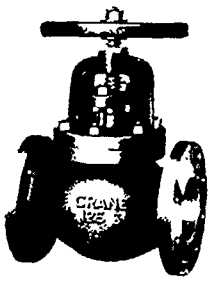
**Standards:** Flanged valves conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939) for 125-Pound Cast Iron Wedge Gate Valves.

Flanged valves in the sizes included therein, also conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Sixth Edition, May, 1949, except for markings.

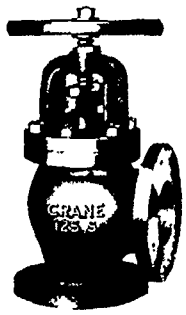
**Dimensions:** Dimensions of these valves are the same as given for the regular line of Crane 125-Pound Iron Body Wedge Gate Valves; see page 81.

***For Marine specifications, boiler feed service, general requirements, etc., see pages 398 and 399.***

# Iron Body Globe and Angle Valves



No. 351
Globe, Flanged
Brass Trimmed



No. 353
Angle, Flanged
Brass Trimmed

These valves, made in sizes 2 to 10-inch, have a cast iron yoke-type bolted bonnet and cast iron body, and are brass fitted throughout. They have a screwed-in brass body seat ring, a solid brass disc on sizes 6-inch and smaller, an iron disc with brass seating face on larger sizes, a Cast Manganese Bronze stem and yoke bushing, a brass stem hole bushing, and bronze gland studs and nuts.

The disc is accurately guided throughout its travel by a guide stem through the bridge which is cast integral with the body seat ring. The gland is of the two-piece ball-type construction, consisting of an Ihrigized steel gland and a malleable iron gland flange.

The valves are rated commercially for 125 pounds saturated steam, and 200 pounds cold water, oil, or gas working pressure.

For prices, dimensions, and complete description, see pages 107 and 108. Screw-down check valves can be made to order; see page 408.

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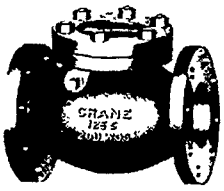
# Iron Body Swing Check Valves



No. 373
Swing, Flanged
Brass Trimmed

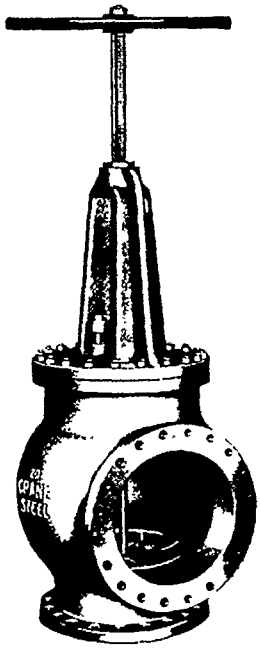
These valves, made in sizes 2 to 24-inch, are sturdily constructed and well proportioned. The body is oval or globular in shape, providing an ample flow area around the disc when the valve is wide open.

The body and cap are cast iron, the body seat ring is brass, screwed into the body; the disc is solid brass on sizes 3-inch and smaller, and cast iron with a brass seating face on larger sizes. Valves with solid brass disc in sizes larger than 3-inch can be made to order; prices will be furnished on application.

For prices, working pressures, dimensions, and complete description, see pages 116 and 117.

# Main Injection Valves

Cast Steel
High Lift Angle
Main Injection
Valve

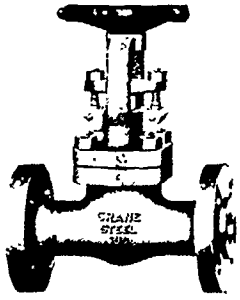


Illustrated at the right is a 20-inch Crane Cast Steel Main Injection Valve with the disc raised out of the path of flow and the disc guide stem extending through the bridge of the body seat ring.

These valves are made to order in a wide range of sizes in either cast steel or iron, with brass trimmings; prices on request.

*For Marine specifications, boiler feed service, general requirements, etc., see pages 398 and 399.*

# Steel Gate Valves



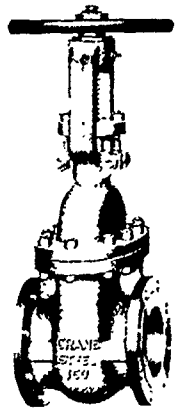
No. 3615 XW
Gate
Flanged

The bolted bonnet gate valves illustrated are of the outside screw and yoke type with cast carbon steel bodies, bonnets, and yokes. The discs are of the solid wedge or solid web type with close-fitting guides to maintain accurate seating and to reduce wear. A tee-head disc-stem connection prevents lateral strains on the Exelloy stem.

These valves are rated commercially for a maximum of 850° F. steam or water, at working pressures shown on pages 224 and 226.

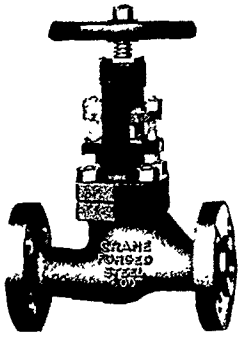
**No. 3615 XW Valves:** This line of sturdy, compact cast steel gate valves is made in sizes ½ to 2-inch—with screwed ends (No. 3607 XW), socket-welding ends (No. 3611 XW), and flanged ends (No. 3615 XW).

**No. 47 XR Valves:** This line is made with screwed ends (No. 46 XR) in sizes 2, 2½, 3, and 4-inch; with butt-welding ends (No. 47½ XR) in sizes 2 to 3-inch and 4 to 24-inch, and with flanged ends (No. 47 XR) in sizes 2 to 24-inch.



No. 47 XR
Gate
Flanged

# Steel Globe and Angle Valves



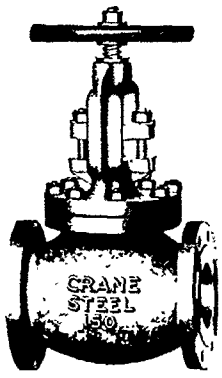
No. 3656 W
Globe
Flanged

These valves are all of the bolted bonnet, outside screw and yoke type. All have Exelloy stems; sizes 6-inch and smaller have plug type discs and seats; the 8-inch size has a flat disc and seat. They are rated commercially for a maximum of 850° F. steam or water, at working pressures shown on pages 238 and 243.

**No. 3656 W Valves:** The Crane line of small forged steel globe and angle valves includes the screwed type (No. 3644 W Globe, No. 3645 W Angle), the socket-welding type (No. 3652 W Globe, No. 3653 W Angle), and the flanged type (No. 3656 W Globe, No. 3657 W Angle), in sizes ½ to 2-inch.

**No. 143 XR Valves:** Crane 150-Pound Cast Steel Globe and Angle Valves are made with screwed ends (No. 142 XR Globe, No. 144 XR Angle) in sizes 2, 2½, 3, and 4-inch; with butt-welding ends (No. 143½ XR Globe, No. 145½ XR Angle) in sizes 2 to 3-inch and 4 to 8-inch, and with flanged ends (No. 143 XR Globe, No. 145 XR Angle) in sizes 2 to 8-inch.

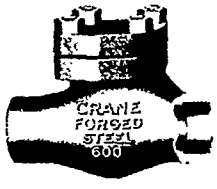
**Screw-Down Check Valves:** Refer to page 408 for 150-Pound Cast Steel Globe and Angle Valves made screw-down check type.



No. 143 XR
Globe
Flanged

34

# Steel Check Valves

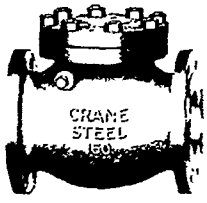


No. 3682 X
Check
Socket-Welding

These bolted cap check valves are recommended commercially for a maximum temperature of 850° F. steam or water, at working pressures shown on pages 250 and 252.

**No. 3682 X Valves:** This line, in sizes ½ to 2-inch, consists of the following forged steel lift check valves: screwed ends (No. 3674 X), socket-welding ends (No. 3682 X), and flanged ends (No. 3686 X).

**No. 147 X Valves:** This line of carbon cast steel swing check valves is made with screwed ends (No. 148 X) in sizes 2, 2½, 3, and 4-inch; with butt-welding ends (No. 147½ X) in sizes 2 to 3-inch and 4 to 8-inch, and with flanged ends (No. 147 X) in sizes 2 to 12-inch.

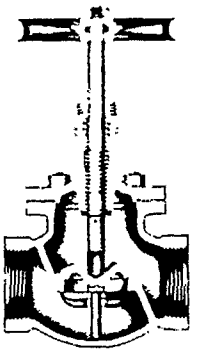


No. 147 X
Check
Flanged

*Prices, dimensions, complete description, and ratings on valves:*
*Gate....pages 221 to 231* *Globe and Angle....pages 235 to 248* *Check....pages 249 to 256*

# Special Valves for Marine Service

## Screw-Down Check Valves



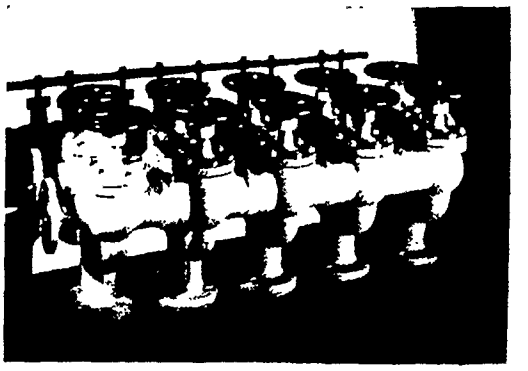
Bronze Screw-Down Check Valves

No. 4296, Globe, Screwed
No. 4297, Globe, Flanged
No. 4298, Angle, Screwed
No. 4299, Angle, Flanged

The cross section above (No. 4296, with stem raised) shows a typical Crane Globe Type Screw-Down Check Valve. The Crane design makes it possible for one valve to serve as both a stop valve and a check valve.

The complete Crane line of Screw-Down Check Valves includes bolted or union bonnet bronze valves with flanged or screwed ends as well as bolted bonnet iron and steel valves with flanged ends. The valves are made to order only; prices will be furnished on application.

## Manifold Valves



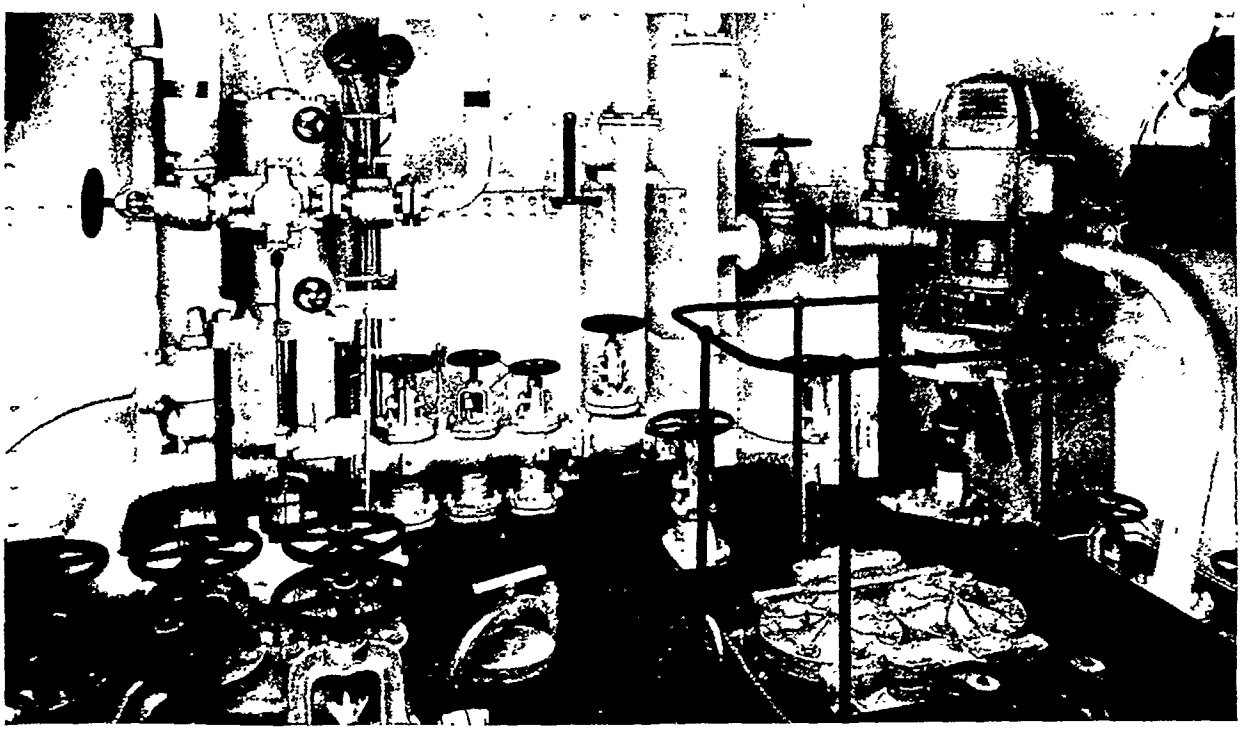
Cast Steel Manifold Valve

The illustration above is that of a ten-valve Crane 150-Pound Cast Steel Manifold Valve.

Manifold valves made of brass, ferrosteel, or fabricated cast steel are ideal for the transfer of cargo oil, bilge water, or salt water from one point to another.

Complete details on types and sizes will be furnished on request.





Crane valves for marine service are used extensively in piping installations aboard ship.

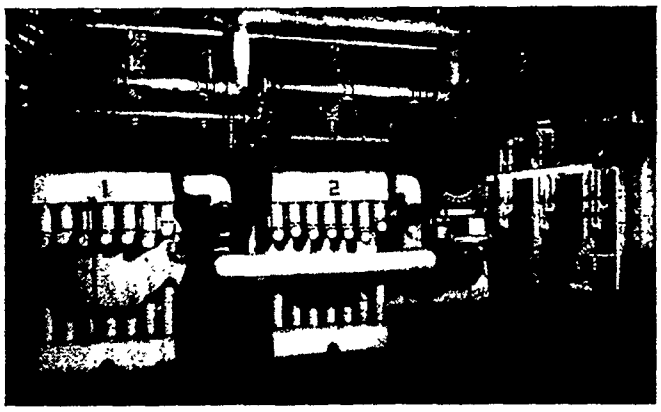
# Valves and Fittings for Ammonia

General Description.....page 410

Valves
Globe and Angle, Bolted Bonnet.....page 411
Globe and Angle, Union Bonnet.....page 412
Lift Check.....page 412
Expansion.....page 413

Fittings
Flanged.....page 414
Double Pipe.....page 415

Other Ammonia Products
Flanges.....pages 414 and 415
Liquid Gauges.....page 413
Gaskets.....page 416
Atmospheric Condensers.....page 417
Pipe Stands.....page 417



Crane ammonia products in the refrigeration section of a large hotel.

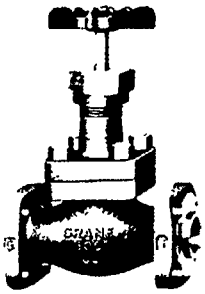
For greater convenience, the following valves and fittings, suitable for ammonia, are shown in other sections of this catalog because of their adaptability to general piping service:

Screwed Fittings.....pages 146 and 147
Plugs.....page 166
Bushings.....page 167
Wrought Steel Nipples.....pages 168 and 169
Steel Pipe Couplings.....page 170
Screwed Unions.....pages 177 and 263
Flange Unions, Tongue and Groove.....page 182
Combination Elbows.....page 266
Welding Fittings.....pages 275 to 286
Relief Valves.....page 331
Pressure Gauges.....pages 366 and 367

*Fabricated Double Pipe Heat Exchangers.....page 522*

# Valves and Fittings for Ammonia

*— From Crane — A Complete Line*

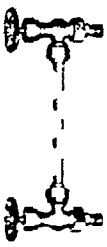


***Valves*** of many types, such as bolted and union bonnet globes and angles, expansion type, and lift checks—all with Crane quality and dependability. See pages 411 to 413.

***Fittings*** designed for a variety of needs include elbows, tees, return bends, and double pipe fittings for water cooler use. See pages 414 and 415.

***Flanges,*** both screwed and blind with tongue or groove ends, are shown on pages 414 and 415.

35



***Liquid Gauges*** feature a special lead seat. See page 413.

***Gaskets*** for ammonia service. See page 416.

On the seven pages that follow, Crane presents a complete line of piping equipment designed specifically for use on hazardous liquids and gases.

***Service recommendations*** are not limited to ammonia. The Crane line, unexcelled for high pressure (300 pounds) ammonia refrigeration service, is equally suited for air, gas, oil, or chemical service, or in special process work where all-iron construction is desired.

The valves, flanged fittings, and liquid gauge are given a 300-pound air-under-water test and, in addition to their ammonia rating, are suitable for:

500 pounds oil (non-shock), gas, or air up to 100° F.
300 pounds oil (non-shock), gas, or air up to 300° F.

The heavy duty, all-iron construction of the valves render them ideal for use in pulp and paper mills, wood treating plants, tanneries, in paint and varnish manufacture, textile and dyeing plants, sugar refineries, and in many other plants, including those manufacturing chemicals.

***Metals*** are chosen for their effectiveness in ammonia service. The valves have durable Crane Ferrosteel bodies and, except for their stem and disc, are all-iron. Crane Ferrosteel is a high grade iron, approximately 35 per cent stronger than cast iron. Fittings are Crane Ferrosteel or malleable iron. Flanges are forged steel or malleable iron, depending on the size and style.

Copper and brass, unsuitable for ammonia, are not used.

***Design and construction*** are pointed toward maximum safety at low cost. Metal sections are massive and rugged to provide a high safety factor and to minimize distortion. The valves have long, sweeping interior body contours to reduce flow resistance. A variety of seating combinations are available.

***Stems*** are made of steel. They have a tapered, machined shoulder which seats against a machined chamfer in the bonnet when the valve is wide open. This seals pressure from the packing, assures tightness at the stuffing box, and enables repacking the valve when it is wide open and under pressure.

***Stuffing boxes*** are unusually deep and are filled with high grade packing. Valves 1½-inch and smaller have a screwed packing nut; larger sizes have a one-piece bolted gland.

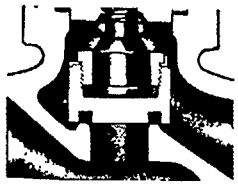
***Valve and fitting ends*** include both flanged and screwed types. Flanged ends have tongue and groove faces to assure tightness at the joints and to protect against gasket blowouts. On valves, the tongue face is on the end flange next to the upper side of the disc.

Screwed ends feature long threads which are recessed to permit soldering the joints.

***Interchangeability*** between flanged valves and flanged fittings provides for quick changes when necessary. The center to face and the face to face dimensions are the same for corresponding sizes. Thus, a flanged globe valve, for example, can be substituted for a flanged tee.

***For detailed description and prices of the complete Crane line, see pages 410 to 417.***

*Seating Designed For Long Service*

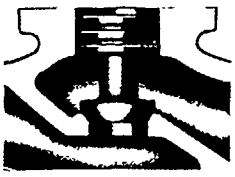


***Lead-faced disc***—with facing securely rolled into machined dovetail—regularly furnished with bolted bonnet globe and angle valves.

***Case-hardened steel disc*** and steel seat ring for high temperatures and corrosive service. Available on bolted bonnet globe and angle valves when specified.

***Plug type disc*** integral with stem. Furnished on union bonnet globe and angle valves.

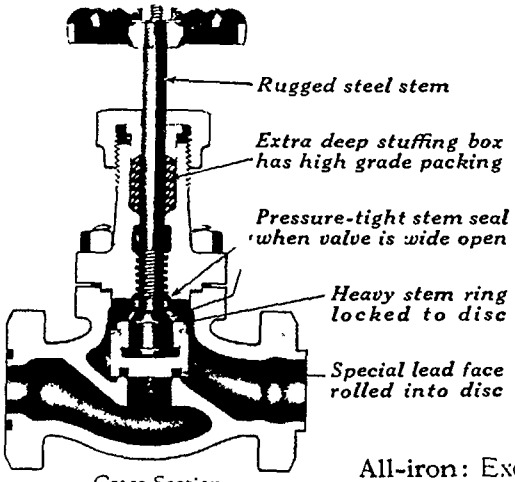
***Needle-point stem*** construction to permit very accurate adjustment. Used on expansion valves.



***Check valve disc*** is cushioned by a dashpot to lengthen service life.

# Ferrosteel Globe and Angle Valves for Ammonia

## Bolted Bonnet—Special Lead-Faced Disc




Cross Section
Globe, Flanged

300 pounds ammonia working pressure
300-pound air-under-water test

**Recommendations:** These valves are designed particularly for high pressure ammonia refrigeration service. The special seating design, extra tight stem seal and bonnet joint, and rugged all-iron construction assure safe, economical handling of hazardous liquid and gas refrigerants.

The valves are also excellent for air, gas, and oil service, as well as for corrosive fluids in special process work and chemical plants where all-iron valves are required.

**All-iron:** Except for the stem and disc, the valves are all-iron. The body and bonnet, made of Crane Ferrosteel, are designed for smooth flow. Unusually massive metal sections provide a high safety factor.

**Disc and seat:** The disc has a special lead face, securely rolled into a machined dovetail in the disc. The face seats upon a crowned face in the body, assuring tightness in service. On sizes ½-inch and smaller, the disc and stem are integral. On larger sizes, the disc is held to the stem by a threaded stem ring; the stem ring is locked to the disc, preventing the disc from becoming detached in service.

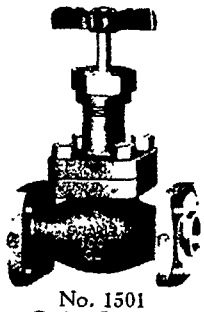
**Stem and stuffing box:** The stem is steel, nickel-plated and has a tapered, machined shoulder. When the valve is wide open, the shoulder seats against a machined chamfer in the bonnet. This seals pressure from the packing, assures tightness at the stuffing box, and permits repacking the valve when it is wide open and under pressure.

The stuffing box, unusually deep, is filled with high grade packing. Valves 1½-inch and smaller have a screwed packing nut; larger sizes have a bolted gland.

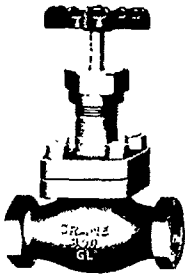
### Steel Disc and Seat For High Temperatures And Corrosive Service

Where high temperatures or corrosive action prohibit the use of lead, order the valves with a case-hardened steel disc and a steel seat; extra prices are listed in the table below.

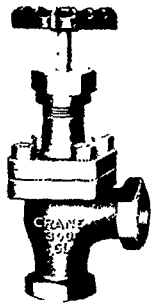
Such valves, when suitable stuffing box packing is used, are recommended for air or gas pressures up to 250 pounds at 500° F.



No. 1501
Globe, Flanged
Tongue and Groove



No. 1504
Globe, Screwed



No. 1505
Angle, Screwed

35

### List Prices and Dimensions

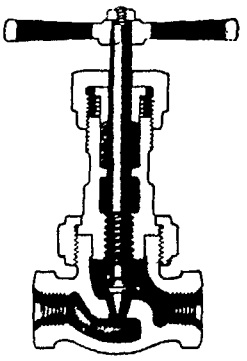
| Size | List Prices, per Valve | | | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | With Lead-Faced Disc | | | Extra Charge for Steel Disc and Seat Ring | No. 1501 | | | No. 1504 | | No. 1505 | | Diameter of wheel |
| Inches | *No. 1501 Globe Flanged F. & D. | No. 1504 Globe Screwed | No. 1505 Angle Screwed | Specify | Style of flanges | Groove bottom to face of tongue | Center to top, open | End to end | Center to top, open | Center to end | Center to top, open | All Valves |
| ¼ | | 16.00 | 16.00 | 7.50 | | | | 4½ | 7¼ | 2¼ | 6¾ | 3⅝ |
| ⅜ | | 16.00 | 16.00 | 7.50 | | | | 4¾ | 7¼ | 2⅜ | 6¾ | 3⅝ |
| ½ | 19.00 | 17.50 | 17.50 | 8.00 | Oval | 5 13/16 | 7¼ | 5 | 7¼ | 2½ | 6¾ | 3⅝ |
| ¾ | 21.50 | 19.50 | 19.50 | 9.00 | | 6 5/16 | 9¼ | 5½ | 9¼ | 2¾ | 8½ | 4 1/16 |
| 1 | 24.00 | 21.50 | 21.50 | 10.00 | Square | 6 11/16 | 9¼ | 6¼ | 9¼ | 3⅛ | 8½ | 4 1/16 |
| 1¼ | 29.50 | 25.00 | 25.00 | 11.50 | | 7⅜ | 11¼ | 6¾ | 11¼ | 3⅜ | 10¼ | 4¾ |
| 1½ | 35.00 | 29.50 | 29.50 | 13.00 | | 8⅛ | 11½ | 7½ | 11½ | 3¾ | 10¼ | 6 |
| 2 | 44.50 | 37.50 | 37.50 | 15.00 | | 9⅛ | 12¼ | 8½ | 12¼ | 4¼ | 11 | 8 |
| 2½ | 56.50 | 48.50 | 48.50 | 20.00 | | 10 5/16 | 12¾ | 9½ | 12¾ | 4¾ | 11¼ | 8 |
| 3 | 80.50 | 70.00 | 70.00 | 23.00 | Round | 12 13/16 | 14¼ | 12 | 14¼ | 6 | 12¾ | 9 |
| 4 | 121.00 | | | 27.00 | | 14 9/16 | 16¼ | | | | | 10 |

*List prices of No. 1501 Flanged Valves include facing and drilling but not companion flanges, bolts, or gaskets.

*General description . . .page 410 Dimensions of end flanges and facing . . page 416 Companion flanges . . page 415*

# Ferrosteel Globe and Angle Valves for Ammonia

## Union Bonnet — Plug Type Disc



Cross Section
Union Bonnet Globe
With Plug Type Disc

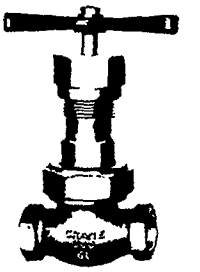
**All-iron:** Except for the steel stem with integral disc, the valves are all-iron. Copper and brass, unsuited for corrosive services, are not used in their construction.

**Regrinding:** The valves may be reground without removing them from the line.

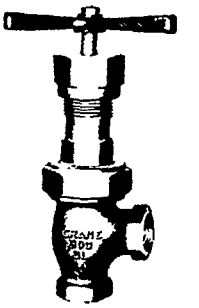
300 pounds ammonia working pressure
300-pound air-under-water test

**Recommendations:** These valves have a wide application in services where plug type disc valves can be utilized. Recommended primarily for high pressure ammonia refrigeration use, the valves are equally suitable for air, oil, or gas, for corrosive fluids in special process work, and for chemical plants where rugged, all-iron construction is needed.

**Construction:** The valves are of the inside screw, rising stem type. Their plug type disc is integral with a nickel-plated, steel stem. The union bonnet construction provides a strong, tight joint between the Crane Ferrosteel body and the malleable iron bonnet. The unusually deep stuffing box is filled with high grade packing and equipped with a gland. The valves, when wide open, can be repacked while under pressure.



No. 1504½
Globe
Screwed



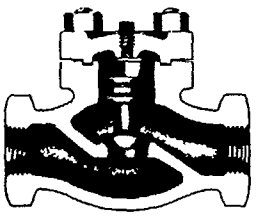
No. 1505½
Angle
Screwed

### List Prices and Dimensions

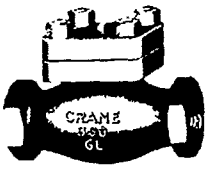
| Size | List Prices, Each | | Dimensions, in Inches | | | |
|---|---|---|---|---|---|---|
| Inches | No. 1504½ Globe Screwed | No. 1505½ Angle Screwed | End to end Globe | Center to end Angle | Center to top, open | Length of tee handle |
| ¼ | 15.50 | 15.50 | 3 | 1½ | 6 9/16 | 4½ |
| ⅜ | 15.50 | 15.50 | 3¼ | 1⅝ | 6⅝ | 4½ |
| ½ | 16.00 | 16.00 | 3½ | 1¾ | 6⅞ | 4½ |
| ¾ | 17.50 | 17.50 | 4 | 2 | 8¼ | 6 |
| 1 | 19.00 | 19.00 | 4½ | 2¼ | 8½ | 6 |

# Ferrosteel Lift Check Valves for Ammonia

300 pounds ammonia working pressure
300-pound air-under-water test



Cross Section
No. 1507½



No. 1507½
Horizontal Lift Check
Screwed

**Recommendations:** No. 1507½ Lift Check Valves, like all valves in the Crane Ammonia line, are ideal for high pressure ammonia service, for air, gas, or oil, or for corrosive services and special process work requiring heavy duty, all-iron construction.

### List Prices and Dimensions

| Size | No. 1507½, Lift Check Screwed | | |
|---|---|---|---|
| Inches | List Prices Each | End to end Inches | Center to top Inches |
| ½ | 27.00 | 5 | 2⅝ |
| ¾ | 28.00 | 5½ | 3½ |
| 1 | 30.00 | 6¼ | 3⅝ |
| 1¼ | 35.50 | 6¾ | 4⅛ |
| 1½ | 41.50 | 7½ | 4⅜ |
| 2 | 51.00 | 8½ | 5⅛ |

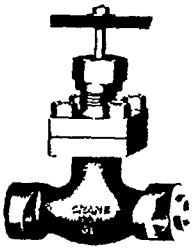
**Construction:** Unusually heavy, massive metal sections provide a high safety factor. The valve cap is bolted on by means of four steel bolt-studs. The cap joint is tongue and groove, assuring positive retention of the 1/16-inch thick Crane gasket.

The upper end of the disc is piston-shaped and fits snugly in the body. This dash-pot type of construction cushions the disc in service and increases the life of the valve. The disc is guided at both ends in sizes 1¼-inch and larger and, in sizes 1½ and 2-inch, is regularly equipped with a piston ring.

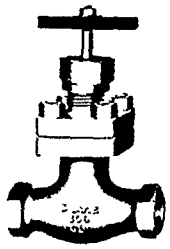
**Materials:** The body and cap are made of Crane Ferrosteel, a high grade iron about 35 per cent stronger than cast iron. The disc in sizes 1-inch and smaller is steel; in larger sizes, it is Ferrosteel.

*General description . . . . page 410*

# Ferrosteel Expansion Valves for Ammonia



No. 1513
Globe, Flanged
Tongue and Groove

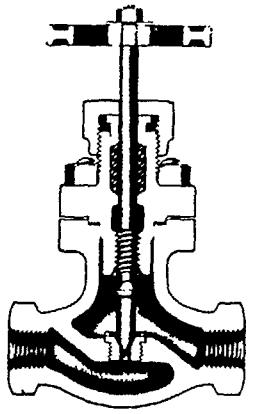


No. 1519½
Globe, Screwed

300 pounds ammonia working pressure
300-pound air-under-water test

**Recommendations:** These high grade expansion valves are recommended for high pressure ammonia refrigeration service, and for air or gas lines. They are particularly suited for use on short lines.

**Construction and materials:** The valves are of the rising stem, bolted bonnet type. They have a needle point stem with fine, close fitting threads to permit very accurate adjustment. The stem is steel and is nickel-plated above the threads. The body and bonnet are made of Crane Ferrosteel. The stuffing box is unusually deep and is fitted with a gland. The wheel is especially made for these valves. When wide open, the valves may be repacked while under pressure.



Cross Section
Globe, Screwed

No. 1519¾
Angle, Screwed

* List prices of flanged valves include facing and drilling but not companion flanges, bolts, or gaskets.

### List Prices and Dimensions

| Size | List Prices, Each | | | Dimensions, in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *No. 1513 Globe | No. 1519½ Globe | No. 1519¾ Angle | No. 1513 | | | No. 1519½ | | No. 1519¾ | | Diameter of wheel |
| Inches | Flanged F. & D. | Screwed | Screwed | Style of flanges | Groove bottom to face of tongue | Center to top, open | End to end | Center to top, open | Center to end | Center to top, open | All Valves |
| ¼ | 19.00 | 18.00 | 18.00 | Oval | 5 5/16 | 7½ | 4½ | 7½ | 2¼ | 7 | 3½ |
| ⅜ | 19.00 | 18.00 | 18.00 | | 5 9/16 | 7½ | 4¾ | 7½ | 2⅜ | 7 | 3½ |
| ½ | 20.00 | 18.50 | 18.50 | | 5 13/16 | 7½ | 5 | 7½ | 2½ | 7 | 3½ |
| ¾ | 21.50 | 19.50 | 19.50 | | 6 5/16 | 7½ | 5½ | 7½ | 2¾ | 7 | 3½ |
| 1 | 24.00 | 21.50 | 21.50 | Square | 6 11/16 | 7½ | 6¼ | 7½ | 3⅛ | 7 | 3½ |

*Companion Flanges.... page 415* *Dimensions of end flanges and facing.... page 416*

# All-Iron Liquid Gauges for Ammonia

## With Special Lead Seat

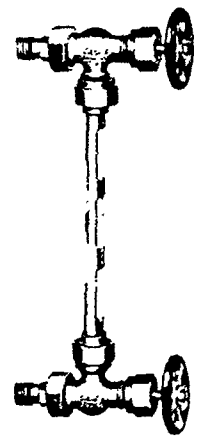
35

300 pounds ammonia working pressure
300-pound air-under-water test

Crane Liquid Gauges are recommended for ammonia, air, gas, or oil service. The gauge valves have a ball check valve in their inlet end. Should a glass tube be broken, the check valves close instantly and automatically, preventing the escape of fluid or gas. Unless otherwise ordered, gauges are furnished with 15-inch centers. Centers up to 24-inch are available at an extra charge; see price table.

### List Prices

| Size | No. 1586½ Liquid Gauge | | Parts for No. 1586½ | | | | | |
|---|---|---|---|---|---|---|---|---|
| | With 15-inch centers | For each inch over 15 inches up to 24 inches | Upper or Lower Valve Only *Specify which is wanted* | Gauge Glass only, ⅝" O.D., for 15" centers | Guard only, for 15" centers | Rubber Gauge Glass Gasket only | Flat Steel Gauge Glass Washer only | Steel Stuffing Box Washer only |
| Inches | Each Complete | Add Per Inch | Each | Each | Each | Each | Each | Each |
| ½ | 37.00 | .55 | 17.00 | .50 | 2.40 | .05 | .08 | .08 |
| ¾ | 37.00 | .55 | 17.00 | .50 | 2.40 | .05 | .08 | .08 |

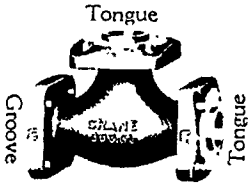


No. 1586½
Liquid Gauge
With Special
Lead Seat

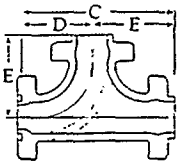
*Ammonia Relief Valves....page 331* *Ammonia Pressure Gauges....pages 366 and 367*

# Fittings for Ammonia

No. 1521, 90° Elbow
Tongue & Groove
Flanged—Ferrosteel




No. 1523, Tee
Tongue & Groove
Flanged—Ferrosteel




No. 1521 or No. 1523

300 pounds ammonia working pressure
300-pound air-under-water test

**Flanges used:** All flanged ammonia fittings, with the exception of the No. 1563 Return Bend, require the No. 1547 Tongue and No. 1545 Groove Flanges shown on the opposite page. The No. 1563 Return Bend requires the No. 1556 Groove Flange shown below.

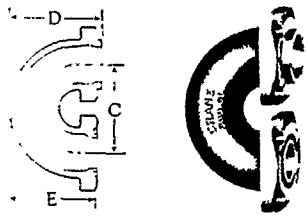
Fittings ordered with flanges are furnished with bolts, nuts, and Cranite gaskets.

**Return bends:** The No. 1563 Return Bends are extremely compact. They are ideal for close coupled coil assemblies such as are used in processing coke oven gas.

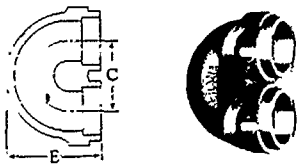
The No. 1570 Return Bend consists of a gasket, bolts, and two 90° elbows. One elbow has a screwed end and a flanged tongue end; the other, a screwed end and a flanged groove end. The No. 1570 can be divided and used as two screwed and flanged end elbows, or, by using all parts of a No. 1589 Flange Union (page 182), as two complete combination elbows with flanges, bolts, and gaskets.

***List prices of flanged fittings do not include companion flanges, bolts, or gaskets. Prices of companion flanges do not include bolts or gaskets.***

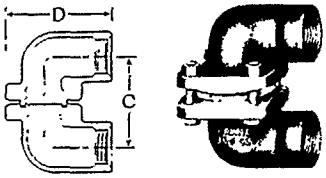
### *Return Bends for Atmospheric Ammonia Condensers or Pipe Coils*




No. 1559, Return Bend
Tongue & Groove-Flanged-Ferrosteel




No. 1563, Return Bend
Tongue—Flanged—Malleable Iron

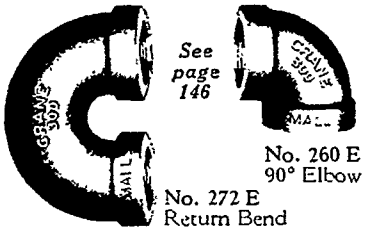



No. 1570, Divided Return Bend
Screwed—Malleable Iron
Tongue & Groove with Cranite gasket.
Lead gasket furnished when specified.

### *Companion Flanges for No. 1563 Return Bends*

No. 1556, Groove No. 1556½, Tongue
Screwed—Malleable Iron
The No. 1556½ is used with the No. 1556 in or at the ends of coils having No. 1563 Bends.

### *Malleable Iron Screwed Fittings for Ammonia*



*See page 146*

No. 260 E
90° Elbow

No. 272 E
Return Bend

## List Prices and Dimensions

| Description of Product and Catalog Number | | Style of Flanges | Size Inches | List Prices, Each Black | List Prices, Each Galv. | Dimensions, in Inches C | D | E |
|---|---|---|---|---|---|---|---|---|
| Flanged 90° Elbows | No. 1521 | Oval | ½ | 5.50 | | | 2 11/16 | 3⅛ |
| | | | ¾ | 6.00 | | | 2 15/16 | 3⅜ |
| | | Square | 1 | 7.00 | | | 3⅛ | 3 9/16 |
| | | | 1¼ | 8.00 | | | 3⅜ | 4 |
| | | | 1½ | 9.50 | | | 3¾ | 4⅜ |
| | | | 2 | 11.25 | | | 4¼ | 4⅞ |
| | | | 2½ | 13.50 | | | 4¾ | 5 9/16 |
| | | Round | 3 | 20.00 | | | 6 | 6 13/16 |
| | | | 4 | 33.50 | | | 6⅞ | 7 11/16 |
| Flanged Tees | No. 1523 | Oval | ½ | 8.25 | | 5 13/16 | 2 11/16 | 3⅛ |
| | | | ¾ | 9.00 | | 6 5/16 | 2 15/16 | 3⅜ |
| | | Square | 1 | 10.50 | | 6 11/16 | 3⅛ | 3 9/16 |
| | | | 1¼ | 11.25 | | 7⅜ | 3⅜ | 4 |
| | | | 1½ | 13.50 | | 8⅛ | 3¾ | 4⅜ |
| | | | 2 | 16.00 | | 9⅛ | 4¼ | 4⅞ |
| | | | 2½ | 19.00 | | 10 5/16 | 4¾ | 5 9/16 |
| | | Round | 3 | 28.00 | | 12 13/16 | 6 | 6 13/16 |
| | | | 4 | 47.00 | | 14 9/16 | 6⅞ | 7 11/16 |
| Flanged Return Bends | No. 1559 | Square | 1¼ × 4 | 7.50 | | 4 | 4⅝ | 4⅛ |
| | | | 1¼ × 6 | 8.50 | | 6 | 5⅝ | 5⅛ |
| | | | 2 × 6 | 11.00 | | 6 | 6 5/16 | 5 13/16 |
| | | | 2 × 8 | 12.00 | | 8 | 7 5/16 | 6 13/16 |
| | No. 1563 | Oval | 2 × 3½ | 11.50 | 14.00 | 3½ | | 4 11/16 |
| Screwed Return Bends | No. 1570 | – | 1¼ × 4 | 13.00 | | 4 | 5⅜ | |
| | | – | 1¼ × 6 | 13.50 | | 6 | 5⅜ | |
| | | – | 2 × 3½ | 16.50 | | 3½ | 7 1/16 | |
| | | – | 2 × 4 | 17.00 | | 4 | 7 1/16 | |
| | | – | 2 × 6 | 18.50 | | 6 | 7 1/16 | |
| Companion Flanges | No. 1556 | Oval | 2 | 1.70 | 2.80 | | | |
| | No. 1556½ | Oval | 2 | 2.60 | 3.70 | | | |

*General description.....page 410*
*Other Companion Flanges.....page 415*
*Dimensions of end flanges and facing...page 416*

# Flanges for Ammonia

### Special Forged Steel Screwed Flanges

No. 1582½, Tongue

No. 1583½, Groove

The special flanges above have smaller dimensions than the regular type shown at the right. They are used on:

No. 1591½ Flange Union (see page 182)

No. 1529 Combination Elbow (see page 266)

For dimensions, refer to the No. 1591½.

300 pounds ammonia working pressure

These flanges have a wide application in high pressure ammonia refrigeration service. They are equally suitable for use on air, gas, and oil lines. Sizes 3-inch and smaller are made of forged steel; the 4-inch size is malleable iron.

List Prices

| Cat. Nos. | Style of Flange | Size Inches | Prices, Each With Bolts and Gasket | Prices, Each Without Bolts or Gasket |
|---|---|---|---|---|
| Nos. 1545 1547 1555 1557 | Oval | ¼ | 1.20 | .95 |
| | | ⅜ | 1.45 | 1.15 |
| | | ½ | 1.60 | 1.30 |
| | | ¾ | 1.95 | 1.50 |
| | Square | 1 | 2.45 | 1.90 |
| | | 1¼ | 2.80 | 2.25 |
| | | 1½ | 3.35 | 2.50 |
| | | 2 | 4.00 | 3.15 |
| | | 2½ | 6.00 | 4.85 |
| | Round | 3 | 10.25 | 8.00 |
| | | 4 | 13.50 | 11.25 |
| Nos. 1582½ 1583½ | Oval | 1 | 2.20 | 1.80 |
| | | 1¼ | 2.35 | 1.95 |
| | Square | 2 | 4.00 | 3.15 |

*Unless otherwise ordered, flanges are furnished without bolts or gaskets.*

***Reducing flanges*** can be made to order by drilling and tapping blind flanges; prices on request.

***Bolting on companion flanges*** requires an extra charge; see the Crane Discount Sheet.

***For tongue and groove flange, unions*** suitable for 300 pounds ammonia, use the No. 1529 or 1591½ shown on page 182. The latter, made by bolting together the Special Screwed Flanges at the left, is ideal for making up pipe coils with close centers.

### Screwed Flanges

No. 1547 Tongue

No. 1545 Groove

### Blind Flanges

No. 1555 Tongue

No. 1557 Groove

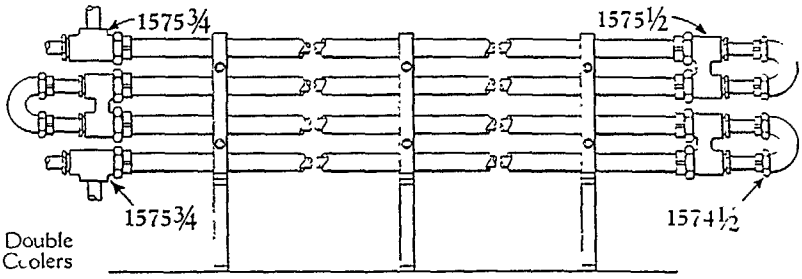
***For dimensions of regular screwed and blind flanges, see page 416.***

# Ferrosteel Double Pipe Fittings

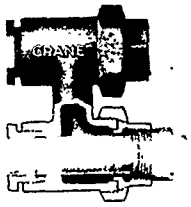
## For Water Coolers

No. 1574½ Return Bend With Union Ends

**WORKING PRESSURES**
125 pounds saturated steam
175 pounds cold water




Fittings for Double Pipe Water Coolers



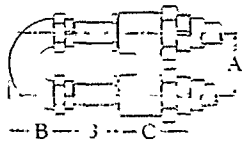
No. 1575½ Double Pipe Return Bend With Union Ends

No. 1575¾ Double Pipe Tee With Union End

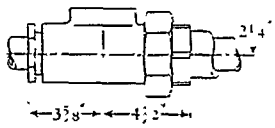
With Crane Double Pipe fittings, the inside and outside pipes are entirely independent of each other, and are free to expand or contract independently without danger of straining the joints. The fittings can be demounted easily and quickly for cleaning or repairs. No. 1574½ Return Bends are cast iron with malleable iron union ends and rubber gaskets. The No. 1575½ Double Pipe Return Bend and No. 1575¾ Tee have Ferrosteel bodies and glands with malleable iron union rings and tailpieces, and rubber gaskets.

List Prices and Dimensions

| Catalog No. | Size Inches | Prices, Each Black | Prices, Each Galv. | Dimensions, in Inches A | B | C |
|---|---|---|---|---|---|---|
| No. 1574½ | 1¼ | 4.50 | | 4⅝ | 5 3/16 | |
| | 2 | 8.00 | | 6 | 6 11/16 | |
| No. 1575½ | 2 · 1¼ | 17.00 | 23.50 | 4⅝ | | 6⅜ |
| No. 1575¾ | 2 · 1¼ · 2 | 11.00 | 15.50 | See illustration at right. | | |




No. 1574½ and No 1575½

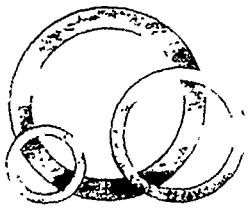



No. 1575¾

***Fabricated Double Pipe Heat Exchangers....page 522***

35

# Gaskets for Ammonia



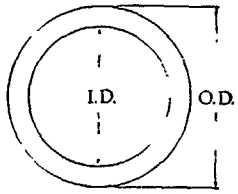
Cranite Gaskets for Tongue and Groove Joints

Rubber Gaskets for Boyle Joints

**List Prices and Dimensions**

| Size | Tongue and Groove Gaskets | | | |
|---|---|---|---|---|
| | Prices, Each | | Inches | |
| Inches | Cranite | Lead | I.D. | O.D. |
| 1/4 | .04 | .06 | 19/32 | 31/32 |
| 3/8 | .05 | .07 | 23/32 | 13/32 |
| 1/2 | .05 | .07 | 7/8 | 17/32 |
| 3/4 | .07 | .10 | 1 1/8 | 1 15/32 |
| 1 | .07 | .13 | 1 3/8 | 1 25/32 |
| 1 1/4 | .09 | .18 | 1 11/16 | 2 7/32 |
| 1 1/2 | .09 | .18 | 1 15/16 | 2 15/32 |
| 2 | .10 | .21 | 2 7/16 | 3 3/32 |
| 2 1/2 | .11 | .24 | 2 15/16 | 3 21/32 |
| 3 | .12 | .26 | 3 9/16 | 4 9/32 |
| 4 | .17 | .34 | 4 9/16 | 5 15/32 |

| Size | Canvas Wrapped Boyle Gaskets | | |
|---|---|---|---|
| | Prices, Each | Inches | |
| Inches | Rubber | I.D. | O.D. |
| 1 1/4 | .20 | 1 11/16 | 2 1/4 |

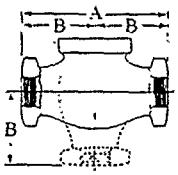



Except for No. 1563 Return Bends and Nos. 1550 and 1556½ Flanges (page 414), all Crane flanged ammonia products listed in this section, as well as flange unions and combination elbows shown on pages 182 and 266 respectively, have the same tongue and groove dimensions for corresponding pipe sizes. Gaskets, are interchangeable, size for size; all are 1/16-inch thick.

Gaskets for the No. 1563 Return Bend and applicable flanges are special; prices and dimensions will be furnished on application.

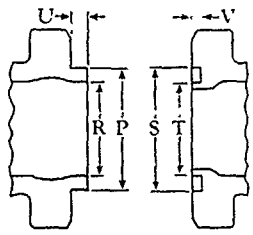
**Boyle gaskets:** Gaskets (3/8-inch thick) for Boyle joints are rubber and are canvas wrapped; they are used in the double pipe return bends and tees described on the preceding page.

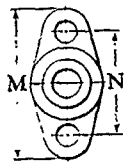
# Dimensions of Ammonia Valves, Fittings, Flanges, and Flange Facings



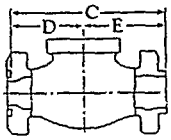

Globe, Angle, or Check Valve Screwed

Dimensions of Crane valves and fittings for ammonia service are indicated on individual pages listing the products (411 to 414). Dimensions repeated below point out the wide degree of interchangeability in the Crane line. For example, note flanged valves and tees have the same face to face dimensions; and all screwed valves, with the exception of the union bonnet globe and angle shown on page 412, have the same end to end or center to end.

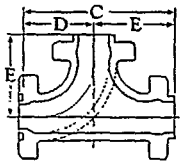



35

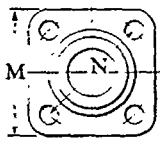


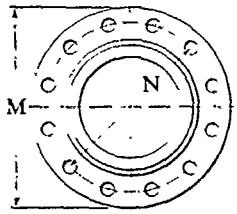

Globe Valve Flanged




90° Elbow or Tee Flanged

The dimensions shown for end flanges apply to all flanged ammonia valves, elbows, and tees. In addition, they apply to the No. 1559 Return Bend (page 414), regular screwed and blind flanges (page 415), and No. 1589 Flange Unions (page 182).



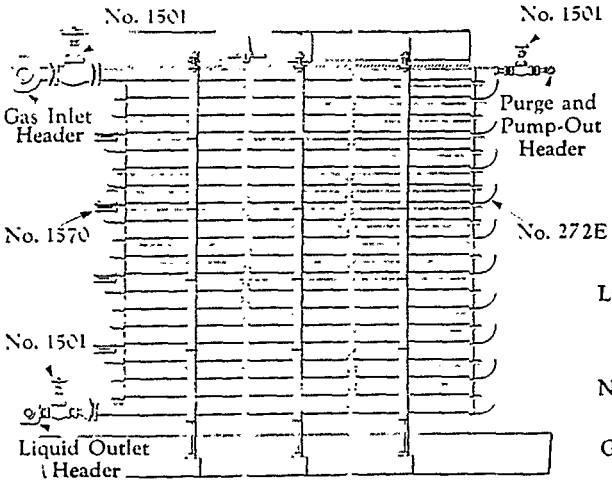




| Style of Flanges | Size | A | B | C | D | E | M | N | P | R | S | T | U | V | Bolts No. | Bolts Dia. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oval | 1/4 | 4 1/2 | 2 1/4 | 5 5/16 | 2 7/16 | 2 7/8 | 3 5/8 | 2 3/8 | 31/32 | 19/32 | 1 | 9/16 | 3/16 | 1/8 | 2 | 1/2 |
| | 3/8 | 4 3/4 | 2 3/8 | 5 9/16 | 2 9/16 | 3 | 3 13/16 | 2 9/16 | 13/32 | 23/32 | 1 1/8 | 11/16 | 3/16 | 1/8 | 2 | 1/2 |
| | 1/2 | 5 | 2 1/2 | 5 13/16 | 2 11/16 | 3 1/8 | 4 | 2 3/4 | 17/32 | 7/8 | 1 1/4 | 27/32 | 3/16 | 1/8 | 2 | 1/2 |
| | 3/4 | 5 1/2 | 2 3/4 | 6 5/16 | 2 15/16 | 3 3/8 | 4 3/4 | 3 1/4 | 1 15/32 | 1 1/8 | 1 1/2 | 1 3/32 | 3/16 | 1/8 | 2 | 5/8 |
| Square | 1 | 6 1/4 | 3 1/8 | 6 11/16 | 3 1/8 | 3 9/16 | 3 9/16 | 3 1/4 | 1 25/32 | 1 3/8 | 1 13/16 | 1 11/32 | 3/16 | 1/8 | 4 | 1/2 |
| | 1 1/4 | 6 3/4 | 3 3/8 | 7 3/8 | 3 3/8 | 4 | 3 15/16 | 3 3/4 | 2 7/32 | 1 11/16 | 2 1/4 | 1 21/32 | 1/4 | 3/16 | 4 | 1/2 |
| | 1 1/2 | 7 1/2 | 3 3/4 | 8 1/8 | 3 3/4 | 4 3/8 | 4 11/16 | 4 1/2 | 2 15/32 | 1 15/16 | 2 1/2 | 1 29/32 | 1/4 | 3/16 | 4 | 5/8 |
| | 2 | 8 1/2 | 4 1/4 | 9 1/8 | 4 1/4 | 4 7/8 | 5 1/16 | 5 | 3 3/32 | 2 7/16 | 3 1/8 | 2 13/32 | 1/4 | 3/16 | 4 | 5/8 |
| | 2 1/2 | 9 1/2 | 4 3/4 | 10 5/16 | 4 3/4 | 5 9/16 | 5 15/16 | 5 7/8 | 3 21/32 | 2 15/16 | 3 11/16 | 2 29/32 | 5/16 | 1/4 | 4 | 3/4 |
| Round | 3 | 12 | 6 | 12 13/16 | 6 | 6 13/16 | 8 1/4 | 6 5/8 | 4 9/32 | 3 9/16 | 4 5/16 | 3 17/32 | 5/16 | 1/4 | 8 | 3/4 |
| | 4 | | | 14 9/16 | 6 7/8 | 7 11/16 | 10 | 7 7/8 | 5 15/32 | 4 9/16 | 5 1/2 | 4 17/32 | 7/16 | 1/4 | 8 | 3/4 |

All dimensions in inches. *On valves, the tongue face is on the end flange next to the upper side of the disc.*

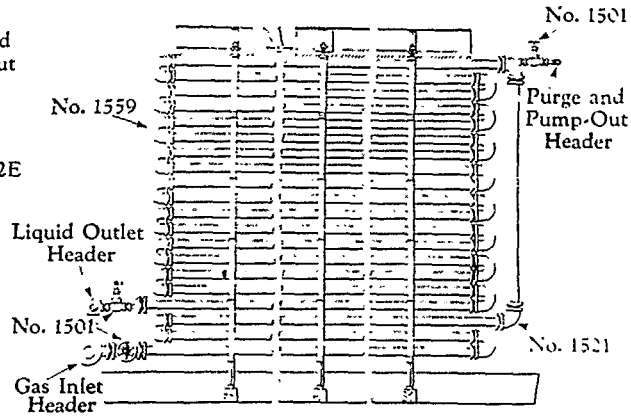
# Atmospheric Ammonia Condensers

The illustrations below show two common types of atmospheric condensers, and indicate the application of the return bends and fittings shown on page 412. Either type, or any other type, can be made with flanged, screwed, or divided return bends, or combinations of all three; if welded joints are preferred, welding fittings (see pages 275 to 280) and flanges (see pages 201 to 208) can be used.




**Atmospheric Condenser**

The atmospheric ammonia condenser above is the simplest type. The hot gas from the compressor enters at the top and the condensed liquid ammonia leaves at the bottom. These condensers are usually made of 2-inch Standard weight pipe, 20 feet long, and 18 or 20 pipes high. However, they can be built of any weight or length of pipe, and any number of pipes high. Each stand of condensers should have a galvanized water trough made in two sections, with adjustable trough supports for leveling.




**Atmospheric Condenser With Three Preliminary Pipes**

The ammonia condenser illustrated above is of the atmospheric type with a three-pipe preliminary cooler at the lower part of the coil. The hot gas enters at the bottom, where it is partly cooled by the water which has already passed over the main condenser. The partially cooled gas then passes to the top of the coil and meets the coldest condensing surface where the actual process of condensation begins.

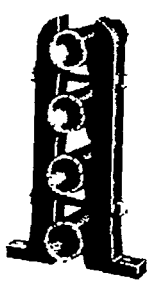
# Cast Iron Pipe Stands

35

## For Condensers, Brine Coolers, Water Coolers, or Heat Exchangers

***Made to order only—Prices on application***

A complete stand consists of a base, an intermediate section or sections, and a top section. However, an intermediate section may be used at the top; it is always required with water troughs and trough supports.



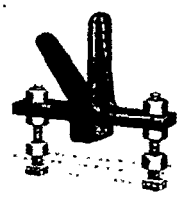
Top Section

Intermediate Section

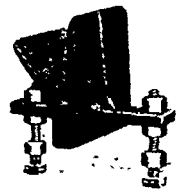
***Malleable iron or galvanized sections are made to order; prices on application.***

**Bases:** The 9-inch and 15-inch bases are designed for 2-inch atmospheric and 2-inch double pipe condensers.

Base



Face 2 Inches Wide



Face 6 Inches Wide

Trough Supports

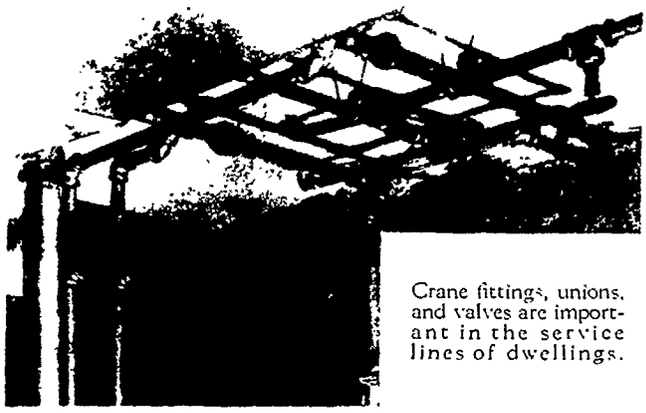
**Trough supports:** The trough support with a 2-inch wide face is for use on each end of a condenser coil; the support with a 6-inch wide face is for the middle of the coil where two troughs meet.

Each trough support has two long bolts, with three hexagon nuts each, for adjusting and leveling the trough.

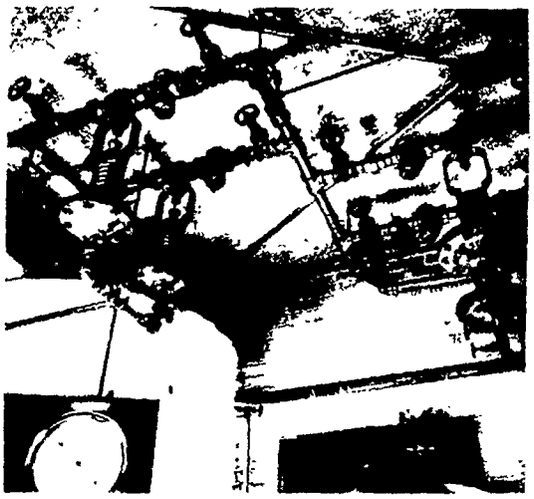
| List of Sizes. All for Use with 2-inch Pipe | | |
|---|---|---|
| Top Sections | 4 or 6 pipes high | *4⅝" |
| Intermediate Sections | 4, 6, or 8 pipes high | *3½" |
| | 4 or 6 pipes high | *4⅝" |
| Bases | 9 or 15 inches high | |
| Trough Supports | 2 or 6-inch face | |

*Indicates center to center dimension for pipes.

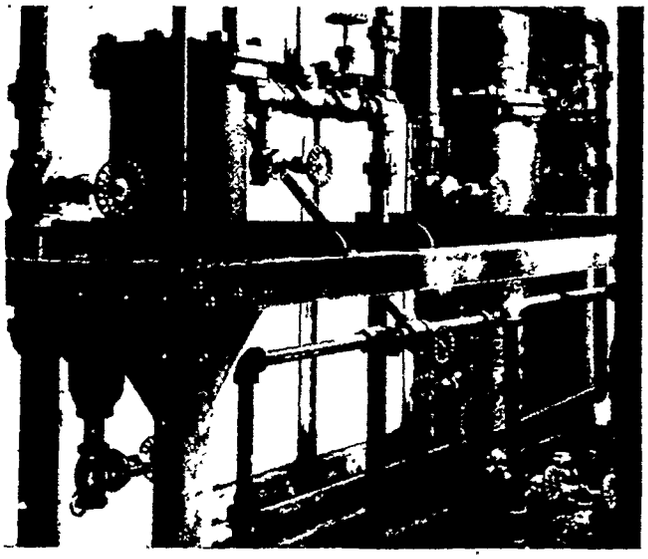
## —From Crane—
## Products to Fit the Service



Crane fittings, unions, and valves are important in the service lines of dwellings.



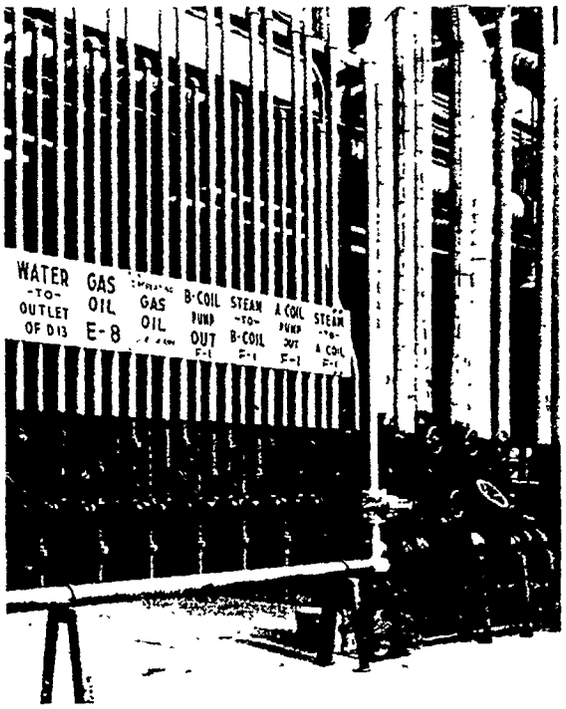
Housing project piping where Crane fittings, unions, and valves are installed.



Piping system in the boiler room of a candy manufacturer

35

A portion of the ventilating system of a large gymnasium utilizing Crane fittings and unions.




Crane fittings, unions, and valves used in piping for controlling air operated valves in a large refinery.

# Solder-Joint Valves, Fittings, and Accessories

**Solder-Joint Valves**
Gate . . . . . page 420
Globe . . . . . page 421
Angle . . . . . page 421
Swing Check . . . . . page 420

**Solder-Joint Fittings**
Couplings, Reducers, and Adapters . . . . . page 422
Elbows . . . . . page 423
Tees, Plugs, Caps, and Bushings . . . . . page 424
Return Bends and Unions . . . . . page 424

**Accessories**
Torches and Soldering Sets . . . . . page 426
Tools and Brushes . . . . . page 427
Soldering Materials . . . . . page 427

**Copper Water Tube**
Standard Specifications . . . . . page 428
Linear Expansion Table . . . . . page 425

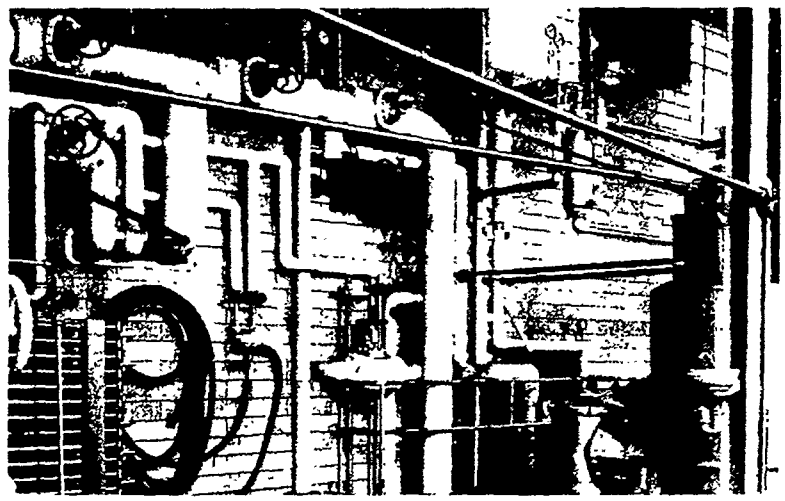
**Making a Solder Joint** . . . . . page 425

***Square End Sawing Vise for Copper Tube . . . see page 444***

The user of copper tubing for plumbing, heating, and industrial installations will appreciate the complete line of solder-joint material offered by Crane. All of the requirements for a modern, dependable installation—valves, fittings, tubing, and accessories—are obtainable from one source—Crane.

The list of Crane Solder-Joint Valves includes globe, angle, gate, and check valves. In addition, a wide selection of Crane screwed end valves, through the use of adaptors, is available for copper tubing piping systems.



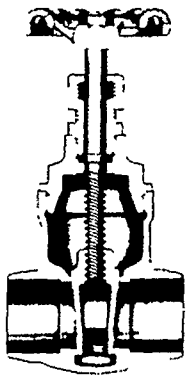


A Crane installation in an evaporator room of a milk drying plant.

# Brass Solder-Joint Gate Valves

## Wedge Disc—Non-Rising Stem

WORKING PRESSURES
100 pounds saturated steam
150 pounds water 200° F.



Cross Section

**Service recommendations:** Crane No. 1320 Brass Solder-Joint Gate Valves are recommended for general shut-off valve service on low pressure steam lines and on hot and cold water lines.

The valves are well suited for use in plumbing and heating systems, on circulating water lines, on low pressure condensation return lines, and for similar low pressure services.

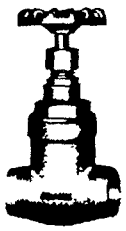
***Important***—When Solder-Joint Valves and Fittings are installed on steam lines, the solder used to make the joints must have a melting point high enough to withstand the temperature of the steam.

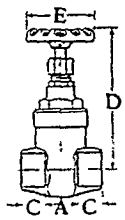
**Construction:** No. 1320 Gate Valves have a non-rising stem and a one-piece wedge disc. They are sturdily constructed and are amply reinforced at points subject to greatest stress, to withstand piping and operating strains. All parts are made of good quality materials.

**Repacking:** The valves, when wide open, can be repacked while under pressure.

**Larger sizes and higher pressure valves:** When larger size or higher pressure valves are wanted, Crane screwed end valves with solder-joint adaptors can be used.

**Instruction tag:** These valves are furnished with a tag giving special instructions for soldering.






No. 1320, Gate
Wedge Disc, Non-Rising Stem

### List Prices and Dimensions

| Size | | Inches | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|
| No. 1320, Gate | | Each | 4.30 | 5.00 | 5.90 | 7.00 | 9.40 | 12.00 | 17.00 |
| Dimensions, in Inches | A | | 13/16 | 13/16 | 7/8 | 11/16 | 15/16 | 17/16 | 19/16 |
| | C | | 13/32 | 17/32 | 25/32 | 29/32 | 31/32 | 13/32 | 111/32 |
| | D | | 3 1/4 | 3 3/4 | 4 3/8 | 5 1/8 | 5 3/4 | 6 3/8 | 7 3/8 |
| | E | | 1 1/2 | 1 3/4 | 2 1/16 | 2 9/16 | 2 3/4 | 3 1/16 | 3 5/8 |

# Brass Solder-Joint Swing Check Valves

WORKING PRESSURES
100 pounds saturated steam
150 pounds water, 200° F.

36

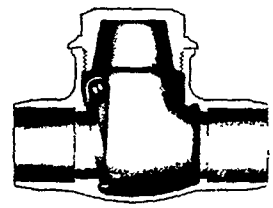
**Service recommendations:** Crane No. 1303 Brass Solder-Joint Swing Check Valves are recommended for service on steam, hot water, and cold water. They are particularly suited for plumbing and heating systems and for low pressure steam and water lines in industrial and process plants.

***Important***—When Solder-Joint Valves and Fittings are installed on steam lines, the solder used to make the joints must have a melting point high enough to withstand the temperature of the steam.

**Construction:** The valves are strong and well proportioned; they will easily withstand normal operating strains. All parts are made of good quality materials.

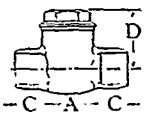
**Larger sizes and higher pressure valves:** When larger size valves or valves suitable for higher pressures are wanted, Crane screwed end valves with solder-joint adaptors can be used.

**Instruction tag:** The valves are furnished with a tag giving special instructions for soldering.



Cross Section

No. 1303
Swing Check




Swing Check

### List Prices and Dimensions

| Size | | Inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 1303, Swing Check | | Each | 4.30 | 4.90 | 6.50 | 8.00 | 9.70 | 14.70 |
| Dimensions, in Inches | A | | 1 3/8 | 1 11/16 | 2 1/16 | 2 7/16 | 2 7/8 | 3 1/2 |
| | C | | 13/16 | 1 | 1 1/16 | 1 1/8 | 1 3/16 | 1 3/8 |
| | D | | 19/16 | 1 13/16 | 2 3/16 | 2 9/16 | 2 13/16 | 3 1/4 |

***Swing Check Valves may be used either in a horizontal position, or in a vertical position for upward flow.***

# Brass Solder-Joint Globe and Angle Valves

## Composition Disc

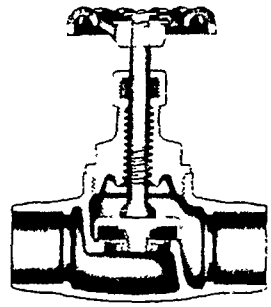
WORKING PRESSURES
100 pounds saturated steam
150 pounds water, 200° F.

No. 1310
Globe

No. 1310½
Globe
With Drain

No. 1311
Angle

***No. 1310½ Globe Valves are regularly furnished with a right hand drain unless a left hand drain is specified.***


Cross Section
No. 1310, Globe

### List Prices

| Size | Inches | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 1310, Globe | Each | 3.20 | 3.90 | 5.40 | 7.40 | 10.00 | 13.00 | 20.00 |
| No. 1310½, Globe with drain | Each | | 4.30 | 6.00 | | | | |
| No. 1311, Angle | Each | 3.20 | 3.90 | 5.40 | 7.40 | 10.00 | 13.00 | 20.00 |

*For composition discs see page 133*

**Service recommendations:** Solder-Joint Globe and Angle Valves are recommended for steam or water lines. They are well suited for plumbing and heating systems, for low pressure steam and water piping in industrial plants, and for similar service.

***Important***—When valves are installed on steam lines, the solder used to make the joints must have a melting point that is high enough to remain unaffected by the temperature of the steam.

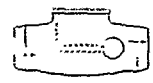
**Construction:** The valves, although light in weight, are sturdily constructed. They are well proportioned and are amply reinforced to withstand piping and operating strains. All parts are made of good quality materials.

The disc holder is spun onto the end of the stem. The stuffing box is amply deep to prevent leakage around the stem.

**Discs:** Unless otherwise ordered these valves are furnished with a No. 12 Composition Disc, suitable for 150 pounds cold water or for hot water, 200° F. maximum temperature.

When so ordered, the valves will be furnished with a No. 10 Composition Disc suitable for 100 pounds saturated steam. For description and dimensions of discs, see page 133.

**Drain on No. 1310½ Valve:** The No. 1310½ Solder-Joint Globe Valve is regularly furnished with a right hand drain; orders must specify "with left hand drain" if left hand is wanted.


Right Hand

Left Hand

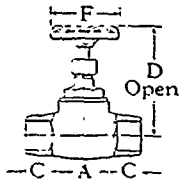
The adjacent illustrations indicate the position of a right hand and a left hand drain.

**Repacking:** These valves, when wide open, can be repacked while under pressure.

**Larger sizes and higher pressure valves:** When larger size valves or valves suitable for higher pressures are wanted, Crane screwed end valves with solder-joint adaptors are recommended.

**Instruction tag:** These valves are furnished with a tag giving special instructions for soldering.

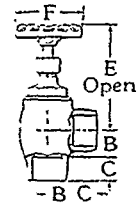




Globe

### Dimensions, in Inches

| Size | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|
| A | 1½ | 1¾ | 1 15/16 | 2⅜ | 2¾ | 3 3/16 | 3⅞ |
| B | 9/16 | ⅝ | ¾ | ⅞ | 1 1/16 | 1¼ | 1 9/16 |
| C | 7/16 | 9/16 | 13/16 | 15/16 | 1 | 1⅛ | 1⅜ |
| D | 2⅞ | 3½ | 4 | 4½ | 4⅞ | 5½ | 6 |
| E | 2⅝ | 3⅛ | 3¾ | 4¼ | 4⅝ | 5¼ | 5⅞ |
| F | 1½ | 1¾ | 2 1/16 | 2 9/16 | 2¾ | 3 1/16 | 3⅝ |



Angle

# Wrought Copper Solder-Joint Fittings

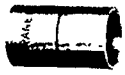
The Crane line of Wrought Copper Solder-Joint Fittings is shown on this and the two pages following. Hints for planning a successful installation are shown on page 425.

**Larger sizes; dimensions:** Larger sizes than listed are available. List prices of larger sizes and dimensions for all sizes, will be furnished on application.

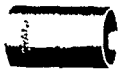
**Other fittings:** Wrought Copper Solder-Joint Fittings for refrigeration, and Cast Brass Fittings, including a complete line for drainage service are also available; prices and information on application.

**Tubing:** The outside diameter of tubing used with solder-joint fittings is 1/8-inch greater than the nominal size; see page 428.

## Couplings and Reducers



**No. 600 Coupling With Stop**
Copper to Copper



**No. 601 Coupling Without Stop**
Copper to Copper

**No. 600-2 Fitting Reducer**
Fitting to Copper

List Prices, Each

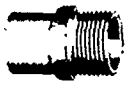
| Nominal Size Inches | No. 600 Coupling with Stop | No. 601 Coupling without Stop | No. 600-2 Fitting Reducer |
|---|---|---|---|
| 1/8 | .08 | .08 | — |
| 1/4 | .09 | .09 | — |
| 3/8 | .09 | .09 | — |
| 1/2 | .12 | .12 | — |
| 3/4 | .18 | .18 | — |
| 1 | .24 | .24 | — |
| 1 1/4 | .30 | .30 | — |
| 1 1/2 | .38 | .38 | — |
| 2 | .68 | .68 | — |
| 2 1/2 | 1.00 | 1.00 | — |
| 1/4 × 1/8 | .09 | — | .09 |
| 3/8 × 1/4 × 1/8 | .09 | — | .09 |
| 1/2 × 3/8 × 1/4 | .12 | — | .12 |
| 3/4 × 1/2 × 3/8 × 1/4 | .18 | — | .18 |
| 1 × 3/4 × 1/2 × 3/8 | .24 | — | .24 |
| 1 1/4 × 1 × 3/4 × 1/2 | .30 | — | .30 |
| 1 1/2 × 1 1/4 × 1 × 3/4 × 1/2 | .38 | — | .38 |
| 2 × 1 1/2 × 1 1/4 × 1 × 3/4 × 1/2 | .68 | — | .68 |
| 2 1/2 × 2 × 1 1/2 × 1 1/4 × 1 | 1.00 | — | 1.00 |

NPTI = Internal Standard Pipe Thread (Female)
NPTE = External Standard Pipe Thread (Male)

## Adapters

**No. 603 Female Adapter**
Copper to NPTI

**No. 603-2 Female Fitting Adapter**
Fitting to NPTI



**No. 604 Male Adapter**
Copper to NPTE

**No. 604-2 Male Fitting Adapter**
Fitting to NPTE

List Prices, Each

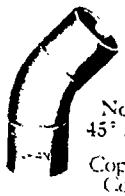
| Nominal Size Inches Copper or Fitting to NPT | No. 603 Female Adapter | No. 603-2 Female Fitting Adapter | No. 604 Male Adapter | No. 604-2 Male Fitting Adapter |
|---|---|---|---|---|
| 1/8 | .18 | .18 | .18 | .18 |
| 1/4 | .18 | .18 | .18 | .18 |
| 3/8 | .18 | .18 | .18 | .18 |
| 1/2 | .20 | .20 | .20 | .20 |
| 3/4 | .30 | .30 | .30 | .30 |
| 1 | .55 | .55 | .55 | .55 |
| 1 1/4 | .76 | .76 | .76 | .76 |
| 1 1/2 | 1.05 | 1.05 | 1.05 | 1.05 |
| 2 | 1.50 | 1.50 | 1.50 | 1.50 |
| 2 1/2 | 2.60* | 2.60* | 2.60* | 2.60* |
| 1/4 × 3/8 | .18 | — | .18 | — |
| 3/8 × 1 | — | — | .55* | — |
| × 3/4 | .30 | — | .30 | — |
| × 1/2 | .20 | .20 | .20 | .20 |
| 1/2 × 1 | — | — | .55 | — |
| × 3/4 | .30 | .30 | .30 | .30 |
| × 3/8 | .20 | .20 | .20 | .20 |
| × 1/4 | .20 | — | — | — |
| 3/4 × 2 | — | — | 1.50* | — |
| × 1 1/2 | — | — | 1.05* | — |
| × 1 1/4 | — | — | .76* | — |
| × 1 | .55 | — | .55 | — |
| × 1/2 | .30 | .30 | .30 | .30 |
| 1 × 2 | — | — | 1.50* | — |
| × 1 1/2 | — | — | 1.05* | — |
| × 1 1/4 | .76 | — | .76 | — |
| × 3/4 | .55 | — | .55 | — |
| × 1/2 | — | — | .55* | — |
| 1 1/4 × 2 | — | — | 1.50* | — |
| × 1 1/2 | 1.05 | — | 1.05 | — |
| × 1 | .76 | — | .76 | .76 |
| × 3/4 | — | — | .76* | — |
| 1 1/2 × 2 | 1.50 | — | 1.50 | |
| × 1 1/4 | 1.05 | — | 1.05 | |
| × 1 | 1.05* | — | 1.05* | |
| × 3/4 | — | — | 1.05* | |
| 2 × 1 1/2 | 1.50 | — | 1.50 | |
| × 1 1/4 | — | — | 1.50* | |
| × 1 | — | — | 1.50* | |
| × 3/4 | — | — | 1.50* | |

*Asterisk indicates sizes made of cast brass.

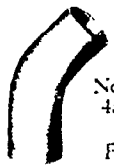
36

# Wrought Copper Solder-Joint Fittings

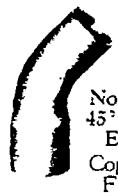
## Elbows



No. 606
45° Elbow
Copper to Copper



No. 606-2-2
45° Street Elbow
Fitting to Fitting



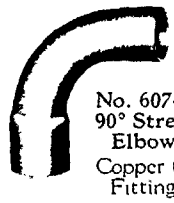
No. 606-2
45° Street Elbow
Copper to Fitting

No. 706-3†
45° Elbow
Copper to NPTI

No. 706-4†
45° Elbow
Copper to NPTE

No. 607
90° Elbow
Copper to Copper

No. 607-2-2
90° Street Elbow
Fitting to Fitting



No. 607-2
90° Street Elbow
Copper to Fitting

No. 707-3†
90° Elbow
Copper to NPTI

No. 707-4†
90° Elbow
Copper to NPTE

List Prices, Each

| Nominal Size | Copper to Copper | | Fitting to Fitting | |
|---|---|---|---|---|
| | No. 606 | No. 607 | No. 606-2-2 | No. 607-2-2 |
| Inches | 45° Elbow | 90° Elbow | 45° Street Elbow | 90° Street Elbow |
| 1/8 | .15 | .15 | — | .20 |
| 1/4 | .15 | .15 | .20 | .20 |
| 3/8 | .15 | .15 | .20 | .20 |
| 1/2 | .18 | .18 | .28 | .28 |
| 3/4 | .30 | .30 | .40 | .40 |
| 1 | .55 | .55 | .70 | .70 |
| 1 1/4 | .84 | .84 | — | .84 |
| 1 1/2 | 1.15 | 1.15 | — | 1.15 |
| 2 | 1.65 | 1.65 | — | 1.65 |
| 2 1/2 | 3.05 | 3.05 | — | 3.05 |
| 1/4×1/8 | — | .15 | — | — |
| 3/8×1/4 | .15 | .15 | — | — |
| 1/2×3/8 | .18 | .18 | — | — |
| ×1/4 | — | .18 | — | — |
| 3/4×1/2 | .30 | .30 | — | — |
| ×3/8 | — | .30 | — | — |
| 1×3/4 | .55 | .55 | — | — |
| ×1/2 | — | .55 | — | — |
| 1 1/4×1 | .84 | .84 | — | — |
| ×3/4 | — | .84 | — | — |
| ×1/2 | — | .84* | — | — |
| 1 1/2×1 1/4 | — | 1.15 | — | — |
| 1 | — | 1.15 | — | — |
| ×3/4 | — | 1.15* | — | — |
| 2 1 1/2 | — | 1.65 | — | — |
| 1 1/4 | — | 1.65 | — | — |
| 1 | — | 1.65* | — | — |
| 2 1/2×2 | — | 3.05* | | |
| 1 1/2 | — | 3.05* | | |
| ×1 1/4 | — | 3.05* | | |
| 1 | — | 3.05* | | |

*Asterisk indicates sizes made of cast brass.

Notes: The outside diameter of the tubing is 1/8-inch greater than the nominal size, see page 428.
NPTI = Internal Standard Pipe Thread (Female)
NPTE = External Standard Pipe Thread (Male)

***Larger sizes are available; prices, and dimensions of all sizes, on application.***

List Prices, Each

| Nominal Size | Copper to Fitting | | Copper to NPT | | | |
|---|---|---|---|---|---|---|
| | No. 606-2 | No. 607-2 | No. 706-3† | No. 707-3† | No. 706-4† | No. 707-4† |
| Inches | 45° Street Elbow | 90° Street Elbow | 45° Elbow | 90° Elbow | 45° Elbow | 90° Elbow |
| 1/8 | .20 | .20 | — | — | — | .20 |
| 1/4 | .20 | .20 | — | .20 | — | .20 |
| 3/8 | .20 | .20 | .20 | .20 | .20 | .20 |
| 1/2 | .28 | .28 | .28 | .28 | .28 | .28 |
| 3/4 | .40 | .40 | .40 | .40 | .40 | .40 |
| 1 | .70 | .70 | .70 | .70 | .70 | .70 |
| 1 1/4 | .84 | .84 | .84 | .84 | .84 | .84 |
| 1 1/2 | 1.15 | 1.15 | 1.15 | 1.15 | 1.15 | 1.15 |
| 2 | 1.65 | 1.65 | 1.65 | 1.65 | 1.65 | 1.65 |
| 2 1/2 | — | 3.05 | — | 3.05 | — | 3.05 |
| 1/4×1/2 | — | .28 | — | — | — | — |
| 3/8×3/4 | — | — | — | .40 | — | — |
| ×1/2 | — | .28 | — | .28 | — | .28 |
| 1/2×1 | — | — | — | .70 | — | .70 |
| ×3/4 | — | — | — | .40 | — | .40 |
| ×3/8 | — | .28 | — | .28 | — | .28 |
| 3/4×1 1/4 | — | — | — | .84 | — | — |
| ×1 | — | .70 | — | .70 | — | .70 |
| ×1/2 | — | — | — | .40 | — | .40 |
| ×3/8 | — | — | — | .40 | — | — |
| 1×1 1/4 | — | — | — | .84 | — | .84 |
| ×3/4 | — | .70 | — | .70 | — | .70 |
| ×1/2 | — | — | — | .70 | — | .70 |
| 1 1/4×2 | — | — | — | 1.65 | — | — |
| ×1 1/2 | — | — | — | 1.15 | — | 1.15 |
| ×1 | — | — | — | .84 | — | .84 |
| ×3/4 | — | — | — | .84 | — | .84 |
| ×1/2 | — | — | — | .84 | — | .84 |
| 1 1/2×2 | — | — | — | 1.65 | — | 1.65 |
| ×1 1/4 | — | — | — | — | — | 1.15 |
| ×1 | — | — | — | 1.15 | — | 1.15 |
| ×3/4 | — | — | — | 1.15 | — | — |
| 2×1 1/2 | — | — | — | 1.65 | — | 1.65 |
| ×1 1/4 | — | — | — | 1.65 | — | 1.65 |
| ×1 | — | — | — | 1.65 | — | 1.65 |

The list of reducing sizes above indicates the copper end size first

†Elbows with NPT ends are made of cast brass.

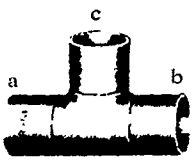
36

# Wrought Copper Solder-Joint Fittings

## Tees

List Prices, Each

| Nominal Size Inches | No. 611 Tee |
|---|---|
| 1/8 | .23 |
| 1/4 | .23 |
| 3/8 | .23 |
| 1/2 | .27 |
| 3/4 | .49 |
| 1 | .76 |
| 1 1/4 | 1.15 |
| 1 1/2 | 1.65 |
| 2 | 2.30 |
| 2 1/2 | 4.85 |




No 611, Tee
Copper to Copper
to Copper

For reducing tees, specify the size of openings in the sequence of lower case letters shown on illustration

Reducing Sizes

| Nominal Size Inches a | b | c | No. 611 Tee |
|---|---|---|---|
| 1/4 | 1/4 | 1/8 | .23 |
| | 1/8 | 1/4 | |
| | 1/8 | 1/8 | |
| 1/8 | 1/8 | 1/4 | |
| 3/8 | 3/8 | 1/4 | .23 |
| | | 1/8 | |
| 3/8 | 1/4 | 3/8 | |
| | | 1/4 | |
| | | 1/8 | |
| 3/8 | 1/8 | 3/8 | |
| | | 1/4 | |
| | | 1/8 | |
| 1/4 | 1/4 | 3/8 | |
| 1/2 | 1/2 | 3/8 | .27 |
| | | 1/4 | |
| 1/2 | 3/8 | 1/2 | |
| | | 3/8 | |
| | | 1/4 | |
| 1/2 | 1/4 | 1/2 | |
| | | 3/8 | |
| | | 1/4 | |
| 3/8 | 3/8 | 1/2 | |
| 3/4 | 3/4 | 1/2 | .49 |
| | | 3/8 | |
| 3/4 | 1/2 | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 3/4 | 3/8 | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 1/2 | 1/2 | 3/4 | |
| 1 | 1 | 3/4 | .76 |
| | | 1/2 | |
| | | 3/8 | |
| 1 | 3/4 | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 1 | 1/2 | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 3/4 | 3/4 | 1 | |
| 1/2 | 1/2 | 1 | |
| 1 1/4 | 1 1/4 | 1 | 1.15 |
| | | 3/4 | |
| | | 1/2 | |
| | | 3/8* | |
| 1 1/4 | 1 | 1 1/4 | |
| | | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 1/4 | 1/4 | 1 1/8 | |
| 1/2 | 1/2 | 3/8 | 1.65 |
| | | 1/4 | |
| 1/2 | 3/8 | 1/2 | |
| | | 3/8 | |
| | | 1/4 | |
| 1/2 | 1/4 | 1/2 | |
| | | 3/8 | |
| | | 1/4 | |
| 3/8 | 3/8 | 1/2 | |
| 3/4 | 3/4 | 1/2 | 2.30 |
| | | 3/8 | |
| 3/4 | 1/2 | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 3/4 | 3/8 | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 1/2 | 1/2 | 3/4 | |
| 1 | 1 | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 1 | 3/4 | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| | | 3/8 | |
| 1 | 1/2 | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 3/4 | 3/4 | 1 | |
| 1/2 | 1/2 | 1 | |
| 1 1/4 | 1 1/4 | 1 | 1.15 |
| | | 3/4 | |
| | | 1/2 | |
| | | 3/8* | |
| 1 1/4 | 1 | 1 1/4 | |
| | | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 1/4 | 3/4 | 1 1/4 | 1.65 |
| | | 1 | |
| | | 3/4 | |
| 1 1/4 | 1/2 | 1 1/4* | |
| | | 1* | |
| | | 3/4* | |
| 1 | 1 | 1 1/4 | |
| 3/4 | 3/4 | 1 1/4* | |
| 1 1/2 | 1 1/2 | 1 1/4 | 2.30 |
| | | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 1 1/2 | 1 1/4 | 1 1/2 | |
| | | 1 1/4 | |
| | | 1 | |
| | | 3/4 | |
| | | 1/2* | |
| 1 1/2 | 1 | 1 1/2 | |
| | | 1 1/4 | |
| | | 1 | |
| 1 1/2 | 3/4 | 1 1/2 | |
| | | 1 1/4* | |
| 1 1/2 | 1/2 | 1 1/2* | |
| 1 1/4 | 1 1/4 | 1 1/2 | |
| 1 | 1 | 1 1/2 | |
| 2 | 2 | 1 1/2 | |
| | | 1 1/4 | |
| | | 1 | |
| | | 3/4 | |
| | | 1/2 | |
| 2 | 1 1/2 | 2 | |
| | | 1 1/2 | |
| | | 1 1/4 | |
| | | 1 | |
| | | 3/4 | |
| | | 1/2* | |
| 2 | 1 1/4 | 2 | |
| | | 1 1/2 | |
| | | 1 1/4 | |
| 2 | 1 | 2* | |
| | | 1 1/2* | |
| 2 | 3/4 | 2* | |
| | | 1 1/2* | |
| 2 | 1/2 | 2* | |
| 1 1/2 | 1 1/2 | 2 | |
| 1 1/4 | 1 1/4 | 2 | |

Tees are manufactured under U. S. Patent No. 2,111,095.

Note: The outside diameter of the tubing is 1/32-inch greater than the nominal size, see page 428.

*Asterisk indicates sizes made of cast brass.

## Plugs

No. 616
Fitting End
Plug

## Caps

No. 617
Tube
Cap

## Unions

No. 633, Union
Copper to Copper

List Prices, Each

| Nominal Size Inches | No. 616 Fitting End Plug | No. 617 Tube Cap | No. 633 Union |
|---|---|---|---|
| 1/8 | ... | .08 | .76 |
| 1/4 | .09 | .09 | .76 |
| 3/8 | .09 | .09 | .76 |
| 1/2 | .12 | .12 | .91 |
| 3/4 | .18 | .18 | 1.30 |
| 1 | .24 | .24 | 1.65 |
| 1 1/4 | .76 | .30 | 2.30 |
| 1 1/2 | 1.05 | .38 | 3.35 |
| 2 | 1.50 | .68 | 4.20 |
| 2 1/2 | 2.60 | 1.00 | 8.35 |

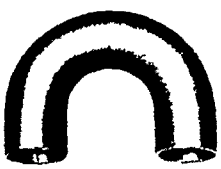
## Bushings

No. 618
Flush
Bushing
Fitting to
Copper

List Prices, Each

| Nominal Size Inches Fitting to Copper | No. 618 Flush Bushing |
|---|---|
| 1/4 × 1/8 | .09 |
| 3/8 × 1/4 | .09 |
| 1/2 × 3/8 | .12 |
| 3/4 × 1/2 | .18 |
| 1 × 3/4 | .24 |
| 1 1/4 × 1 | .30 |
| 1 1/2 × 1 1/4 | .38 |

## Return Bends



No. 638
Return Bend
Copper to Copper

List Prices, Each

| Nominal Size Inches | Center to Center Inches | No. 638 Return Bend |
|---|---|---|
| 1/8 | 1 | .24 |
| 1/4 | 1 1/4 | .24 |
| 3/8 | 1 1/2 | .30 |
| 1/2 | 2 | .38 |
| 3/4 | 2 1/2 | .53 |
| | 3 3/8 | .53 |
| 1 | 3 | .76 |
| 1 1/4 | 4 | 1.20 |
| 1 1/2 | 4 1/2 | 1.65 |
| 2 | 5 1/2 | 2.65 |

## Other Solder-Joint Fittings

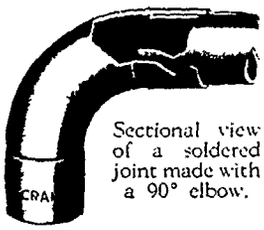
In addition to the Solder-Joint Fittings shown on this and the preceding two pages, Wrought Copper Solder-Joint Fittings for refrigeration, and Cast Brass Solder-Joint Fittings, including a complete line for drainage service, are available. Prices and data on request.

***Larger sizes are available; prices, and dimensions of all sizes, on application.***

36

# Wrought Copper Solder-Joint Fittings

## Making a Solder Joint



Sectional view of a soldered joint made with a 90° elbow.

Under proper conditions of cleanliness and temperature, solder will make a perfect adhesion between adjoining surfaces of copper and copper alloys. The strength of the joint is equal to, or even greater than, the strength of the tube alone. This is due to the great affinity of tin and copper—the tin of the solder and the copper of the tube and product. Surface tension seals the joint; capillary attraction draws the solder into, through, and all about the joint.

***Six simple steps*** lead to a perfect joint. Both valves and fittings are joined to copper tubing in the same fashion.

***Cut the tubing*** to length, making certain the end is square; use a fine hacksaw blade. Ream and remove all burrs with a file or scraper.

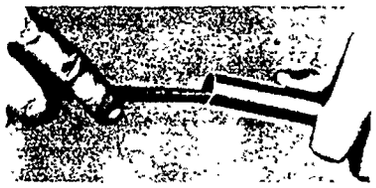
***Clean*** the outside end of the tubing and the cup end of the fitting with steel wool, sand cloth, or a steel wire brush.

***Apply flux*** at the outside end of the tubing and inside the cup end of the product. Apply the flux evenly, but sparingly, until surfaces to be joined are completely covered. Slip the tube into the product and revolve a couple of times to assure even distribution of the flux.

***Use solder wire*** according to the nature of the job, bending over an end as long as the diameter of the fitting—½" solder for ½" fittings, etc.

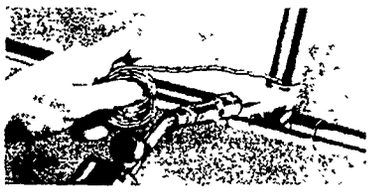
***Apply flame*** at the end of the fitting until the solder melts; than pass the flame toward the center of the fitting until the solder is absorbed and the joint completed.

***Remove excess solder,*** while it is still plastic, with a small brush. Leave a fillet around the cup of the fitting as it cools.



Removing burrs from the tube end after it has been cut to the proper length.

Both the tube and cup of the fitting should be cleaned to a bright finish.



Applying flame to the fitting until the solder is completely absorbed.

## Solder and Solder Flux Requirements

| Nominal Size of Joint Inches | Quantity of Solder Required, in Pounds | |
|---|---|---|
| | For General Use | For Drainage Use |
| ¼ | ½ | — |
| ⅜ | ½ | — |
| ½ | ¾ | — |
| ¾ | 1 | — |
| 1 | 1½ | — |
| 1¼ | 1¾ | 1¼ |
| 1½ | 2 | 1⅜ |
| 2 | 2½ | 1½ |
| 2½ | 3½ | — |
| 3 | 4½ | 2¾ |
| 3½ | 5 | — |
| 4 | 6½ | 4¼ |

Basis for values: The solder requirements in the table shown above are an estimate based on the weight of solder necessary to prepare 100 joints of the sizes listed.

Solder flux: Two ounces of solder flux are required for each pound of solder.

*Solders and fluxes..... .page 427*

## Expansion of Copper Tubing

To plan a solder-joint piping installation successfully, it is necessary, as in any other piping assembly, to make suitable provisions for the expansion of the pipe lines under actual service conditions. Expansion bends can be designed only when the amount of expansion is known.

To find the expansion in inches of any length of copper tubing, proceed as follows:

***First,*** obtain from the adjacent table the expansion at the minimum line temperature and at the maximum line temperature.

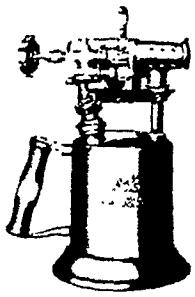
***Second,*** subtract the value for the minimum temperature from the value for the maximum temperature to find the expansion per foot through that temperature range.

***Third,*** multiply the expansion per foot by the number of feet of tubing for total expansion.

| Temperature Deg. F. | Linear Expansion in Inches Per foot of Copper Tubing |
|---|---|
| 0 | .0000 |
| 20 | .0025 |
| 40 | .0045 |
| 60 | .0065 |
| 80 | .0087 |
| 100 | .0110 |
| 120 | .0135 |
| 140 | .0157 |
| 160 | .0177 |
| 180 | .0200 |
| 200 | .0225 |
| 220 | .0252 |
| 240 | .0274 |
| 260 | .0295 |
| 280 | .0317 |
| 300 | .0342 |
| 320 | .0370 |
| 340 | .0395 |
| 360 | .0415 |
| 380 | .0440 |
| 400 | .0464 |
| 420 | .0489 |
| 440 | .0515 |
| 460 | .0537 |
| 480 | .0564 |
| 500 | .0588 |

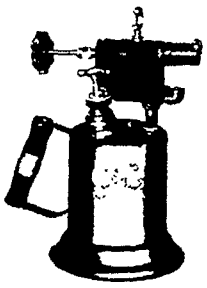
# Torches and Soldering Sets

## Clayton & Lambert Torches



No. 32A
Mechanics Standard
For gasoline or kerosene

***No. 32A*** is recommended for all types of industrial use, either indoors or outdoors. It generates a large, powerful, steady blue flame seven inches long which can be reduced to a small flame for light work. The burner has a blunt control needle which prevents the orifice from enlarging, a removable jet block, and a detachable cleaner pin. A full-skirted, heavy windshield protects the generator veins. Regularly furnished for gasoline, the torch will be equipped for use with kerosene, when orders specify.



No. 158A
General Purpose
For gasoline only

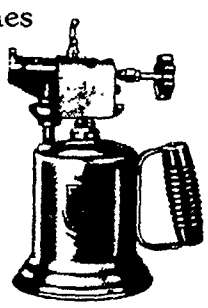
***No. 158A*** a general purpose torch, can be used indoors or outdoors. A back-flow, superheating vein in the burner generates an intensely hot, well controlled blue flame 6½ inches long. A blunt control needle prevents enlargement of the self-cleaning gas orifice. The orifice is removable; the cleaner pin is detachable. The unit has a windshield, an automatic pump with lock-down plunger, and is bottom filled.

No. 327
Heavy Duty
For gasoline only

***No. 327*** for heavy duty service generates a powerful blast flame ten inches long or a small flame for ordinary use. The burner has a blunt control needle to prevent orifice enlargement, a removable jet block, and a detachable cleaner pin. A full-skirted, heavy windshield is securely fastened in place. The unit, bottom filled, has an automatic pump with a lock-down plunger.

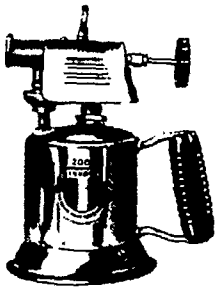
## Turner Torches

***No. 150*** is a moderately priced torch, highly efficient on both light and heavy jobs. The burner, made of cast bronze, is equipped with a windshield for outdoor use. An improved type valve prevents orifice enlargement. The pressure pump is blow-proof. The tank, made of terne plate steel, is sprayed with a bronze finish.



No. 150
For gasoline only

***No. 206A*** is an exceptionally fine torch recommended for general indoor or outdoor use. It features an exclusive type "carburetor control", an automatic cleaning needle, and a replaceable jet block. The torch is equipped with a full-skirted, protective windshield. The tank is made of a high polished brass. The No. 206A is regularly furnished for use with gasoline; when orders so specify, it will be equipped for use with kerosene.

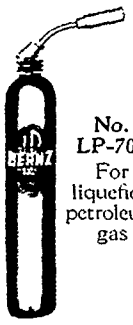


No. 206A
For gasoline or kerosene

## Bernz LP-Gas Torch

***No. LP-700*** is a portable, "cartridge refill" torch using liquefied petroleum gas. The fuel cartridge lasts for many hours and is quickly replaceable when necessary. The torch operates in any position, lights instantly, and heats to approximately 3660° F.

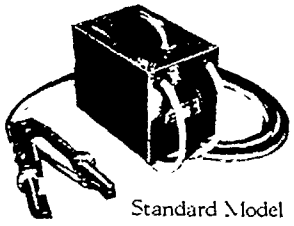
The No. LP-700 Torch features both a pencil-flame burner adjustable for fine, close work and a utility burner for general work requiring a large flame. The flame is protected by a shield.



No. LP-700
For liquefied petroleum gas

***Gasoline and Kerosene Torches shown above have a one quart capacity.***

## Ideal Thermo-Grip Soldering Set



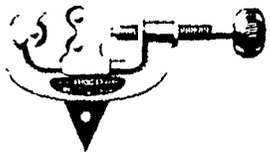
Standard Model

Thermo-Grip Soldering Sets, recommended for the sweating and unsweating of copper tube and fittings, are extremely safe. All parts are fully insulated; current is reduced to a harmless low voltage; there is no open flame. Instant heat is provided simply by touching the work with the tool. Each set includes a 115 volt, 50 60 cycle power unit, 12-foot secondary leads, and a plier attachment; furnished without a thumb switch unless specified. A Fork Attachment for soldering in restricted places where straight tools cannot be used and a Pencil Attachment for spot or seam soldering are also available.

***Prices on application***

# Copper Tube Accessories

## Ridgid Tubing Cutters



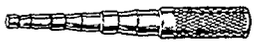
No. 000..... for 1/8 to 1-inch O. D.
No. 00.....for 3/16 to 1 1/8-inch O. D.
No. 0.....for 1/2 to 2 1/8-inch O. D.

## Papco Cut-Off Tool

No. 500

A compact cut-off tool made of aluminum alloy and equipped with a burring attachment; handles copper tubing 1/8 to 1-inch O.D.

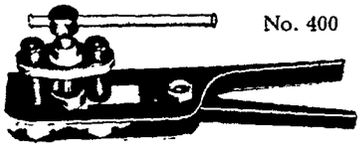
## Swedge Tool



No. 3713-CS

A hardened steel, chrome-plated precision tool used for swedging 3/8, 1/2, and 3/4-inch copper tubing.

## Papco Flaring Tool



No. 400

The No. 400 Flaring Tool features "Form-a-Gage", the exclusive design that means better double flares. Close flares of short tubes are easy, too. The tool quickly selects the right tubing size (3/16 to 5/8-inch) for all hand flaring jobs.

## Sawing Vises

Beaver Square-End Sawing Vises facilitate quick, clean, square-end cutting of copper tubing. The vises are illustrated and described on page 444.

## Allen Soldering Fluxes

Soldering Oil — Soldering Paste — Soldering Salt

Allen Soldering Paste, safe and easy to use, triples the strength of solder. Available in 2, 4, and 8-ounce, or 1 and 5-pound cans.

Allen Soldering Oil gets into the tiniest crevice and takes the solder along. Excellent for sweat soldering copper joint fittings. Available in 1, 3, and 12-pound bottles.

Allen Soldering Salt, a powdered flux, solders all metals except aluminum. Non-acid; to use, simply mix with water. Available in 1/2, 1, and 5-pound bottles.

## Eagle Bar Solders

| Type | Tin-Lead Content | Melt Range Deg. Fahr. |
|---|---|---|
| One-Star | 60-40% | 362-370° |
| Two-Star | 50-50% | 362-419° |
| Three-Star | 48-52% | 362-424° |
| Four-Star | 45-55% | 362-441° |
| Five-Star | 42-58% | 362-450° |

## Fluxolder

*An Active Solder Paint*

A flux and solder combined in paint form. No tinning or cleaning of parts is required.

Fluxolder solders hard-to-reach parts, capillary joints, tubes, etc. It flows with a minimum of heat and produces a perfect joint quickly. Available in 1/2, 1, and 3-pound cans.

Flux-Stik requires no liquid, paste, or preliminary preparation. Simply rub the stick over the surface and apply the solder. Use on hot or cold metal.

## Eagle Wire Solders

Only new, clean metals are used in Eagle Wire Solder. Available in any alloy. Furnished in 1, 5, 10, 25, and 50-pound spools.

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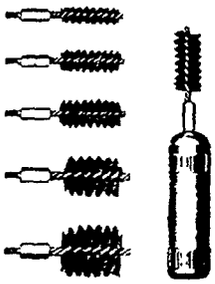
## Mill-Rose Clean-Fit Wire Brushes

*For quick, easy cleaning of copper tubing products*

No. 6200 Tube Brush

This handy assortment simplifies cleaning the cup ends of fittings and the ends of copper water tubing. Individual brushes are available for each tubing size from 1/8 to 2-inch. The No. 6001 Handle, made of aluminum, fits comfortably into the hand and accommodates any size brush.

The No. 6200 Tube Brushes (individual brushes for 3/8, 1/2, 3/4, and 1-inch tubing sizes) are designed to clean the right amount of surface area necessary for perfect solder-joints.



No. 6000 Brushes and No. 6001 Handle

*Prices on application*

# Copper Water Tube

## Standard Specifications

These seamless copper tubes are especially designed for plumbing purposes, underground water services, etc., but are also suitable for copper coil water heaters, fuel oil lines, gas lines, certain industrial piping, etc. They are furnished in three weights: Types K and L, in hard and soft temper, and Type M, in hard temper only.

### Dimensions and Weights

| Nominal Size of Tube | Actual Outside Diameter of Tube | Type K Tube | | Type L Tube | | Type M Tube | |
|---|---|---|---|---|---|---|---|
| | | Wall Thickness | Weight per Foot | Wall Thickness | Weight per Foot | Wall Thickness | Weight per Foot |
| Inches | Inches | Inches | Pounds | Inches | Pounds | Inches | Pounds |
| 1/4 | 3/8 | .035 | .145 | .030 | .126 | .025 | .106 |
| 3/8 | 1/2 | .049 | .269 | .035 | .198 | .025 | .144 |
| 1/2 | 5/8 | .049 | .344 | .040 | .285 | .028 | .203 |
| 5/8 | 3/4 | .049 | .418 | .042 | .362 | — | — |
| 3/4 | 7/8 | .065 | .641 | .045 | .455 | .032 | .328 |
| 1 | 1 1/8 | .065 | .839 | .050 | .655 | .035 | .464 |
| 1 1/4 | 1 3/8 | .065 | 1.04 | .055 | .884 | .042 | .681 |
| 1 1/2 | 1 5/8 | .072 | 1.36 | .060 | 1.14 | .049 | .940 |
| 2 | 2 1/8 | .083 | 2.06 | .070 | 1.75 | .058 | 1.46 |
| 2 1/2 | 2 5/8 | .095 | 2.93 | .080 | 2.48 | .065 | 2.03 |
| 3 | 3 1/8 | .109 | 4.00 | .090 | 3.33 | .072 | 2.68 |
| 3 1/2 | 3 5/8 | .120 | 5.12 | .100 | 4.29 | .083 | 3.58 |
| 4 | 4 1/8 | .134 | 6.51 | .110 | 5.38 | .095 | 4.66 |
| 5 | 5 1/8 | .160 | 9.67 | .125 | 7.61 | .109 | 6.66 |
| 6 | 6 1/8 | .192 | 13.9 | .140 | 10.2 | .122 | 8.92 |
| 8 | 8 1/8 | .271 | 25.9 | .200 | 19.3 | .170 | 16.5 |
| 10 | 10 1/8 | .338 | 40.3 | .250 | 30.1 | .212 | 25.6 |
| 12 | 12 1/8 | .405 | 57.8 | .280 | 40.4 | .254 | 36.7 |

**Service recommendations:** Copper water tube is used for many services, such as for steam, water, air, oil, gas, or similar fluids.

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Type K Tube is recommended for general plumbing and heating systems, and especially for underground use and where conditions are severe; the tube is also used for gas, oil, and steam.

Type L Tube is recommended for interior use in general plumbing and heating work.

Type M Tube is for use with soldered fittings only, for waste, vent, interior drainage, and other non-pressure applications.

On steam installations, the successful application of copper tubes depends not only upon the weight of the tube but also upon the solder used when making joints. The solder must have a melting point high enough to remain unaffected by the temperature of the steam.

**Hard copper tube:** Hard copper tube is intended primarily for use in straight lengths. It is recommended for field bending only when proper bending equipment is used.

**Soft copper tube:** Soft copper tube can be bent without special bending equipment; it is recommended for service where bends must be made in the field, as on concealed replacement work.

Soft copper tube while in transit or when being handled may become flattened or distorted. Before being used, the ends of the tube should be sized to assure a tight soldered joint.

**Standard lengths:** 20-foot straight lengths for both hard and soft copper tube and 60-foot coiled lengths for soft copper tube are generally considered standard. Other lengths can be furnished.

**Tinning:** Copper tube can be furnished tinned on the outside, on the inside, or on both the outside and the inside.

**American Standard:** Type K (hard and soft) and Type L (hard and soft) in sizes 3/8 to 12-inch, and Type M (hard) in sizes 2 1/2 to 12-inch conform to the American Standard for Copper Water Tube, A.S.A. No. H23.1-1947 (A.S.T.M. B88-49).

*Prices on application*

Pipe Hangers
& Supports

# Pipe Hangers and Supports

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Split Pipe Ring Hangers....page 431
Adjustable Split Swivel Hangers....page 431
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Constant-Support Hangers....page 433
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No piping system is better than the means provided for its suspension and support.

The support, suspension, and regulation of motion are important factors to be considered when installing a piping system since the stresses and thrusts occasioned by dead weight and expansive movement may exceed safe working values for the piping materials, the connected equipment, or the building structure.

The purpose of pipe hangers and supports is to carry the weight of the piping safely. Safety requires that supporting equipment, except springs, should be designed to include the weight of the pipe, valves, fittings, fluid transported or that used in testing (whichever is the heavier), and insulation, if used.

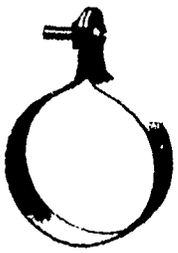
Each pipe hanger or support should carry its portion of the load. Hangers, in particular, should be adjustable so that proper pitch and support of the pipe line can be maintained. The basic difference between pipe hangers and pipe supports is that with hangers, the piping load is supported from above; with supports, the piping load is supported from below.

**The following pages illustrate many of the various pipe hangers, pipe supports, and accessories furnished by Crane to meet the needs of nearly every piping installation.**

***For deflection of horizontal pipe lines and spacing of pipe supports, see pages 550 and 551.***

# Pipe Hangers

## Standard Ring and Bolt Hangers



No. 2-C

The No. 2-C Hangers are made of light weight, good quality soft steel. They can also be furnished galvanized.

The hangers can be used with perforated extension bars, or with malleable iron sockets for use with pipe or rod extensions.

Sizes and Dimensions

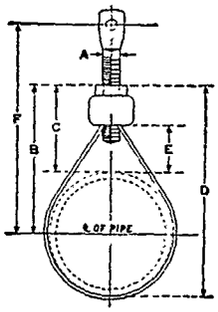
| Pipe size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stock Size | Inches | ¾ | ¾ | ⅞ | ⅞ | 1 | 1 | 1⅛ | 1⅛ | 1⅛ | 1¼ | 1¼ | 1¼ |
| Stock No. of Gauge | | 16 | 16 | 16 | 16 | 15 | 15 | 12 | 12 | 12 | 12 | 12 | 12 |
| Size of bolt | Inches | ¼ | ¼ | ¼ | ¼ | ¼ | ¼ | ¼ | ¼ | ¼ | ¼ | 5/16 | 5/16 |

## Adjustable Ring Hangers

No. 95-G, Steel
No. 95 CP-G, Copper Plated

For ¾ to 1½-inch copper tubing, use rings one size smaller than for steel pipe.

For extra heavy cast iron soil pipe, use same size rings as for steel pipe.




These hangers consist of a steel ring supported by a malleable adjusting nut threaded for hanger rod. They may be used directly with an I-Beam Clamp or with a perforated extension bar.

Dimensions, in Inches

| Pipe Size | A | B | C | D | E (Max.) | F (Max.) | Max. Load Lbs. |
|---|---|---|---|---|---|---|---|
| ½ | ⅜ | 2½ | 2 1/16 | 2⅞ | 1⅛ | 4 7/16 | 75 |
| ¾ | ⅜ | 2⅝ | 2 1/16 | 3⅛ | 1⅛ | 4 9/16 | 80 |
| 1 | ⅜ | 2 11/16 | 2 1/16 | 3⅜ | 1⅛ | 4 11/16 | 85 |
| 1¼ | ⅜ | 2 15/16 | 2 1/16 | 3¾ | 1⅛ | 4⅞ | 95 |
| 1½ | ⅜ | 3 | 2⅛ | 4 | 1 3/16 | 5 1/16 | 105 |
| 2 | ⅜ | 3¼ | 2 1/16 | 4 7/16 | 1⅛ | 5 3/16 | 150 |
| 2½ | ½ | 3 13/16 | 2⅜ | 5¼ | 1¼ | 6 1/16 | 225 |
| 3 | ½ | 4 3/16 | 2 7/16 | 5 15/16 | 1 5/16 | 6 7/16 | 310 |
| 3½ | ½ | 4 7/16 | 2 7/16 | 6 7/16 | 1 5/16 | 6 11/16 | 390 |
| 4 | ⅝ | 5⅜ | 3⅛ | 7⅝ | 1 11/16 | 8 3/16 | 475 |
| 5 | ⅝ | 5 15/16 | 3⅛ | 8 11/16 | 1 11/16 | 8¾ | 685 |
| 6 | ¾ | 7⅛ | 3 13/16 | 10 7/16 | 2 3/16 | 10½ | 950 |
| 8 | ⅞ | 8 13/16 | 4½ | 13⅛ | 2⅝ | 12 15/16 | 1510 |

## Adjustable Clevis and Band Hangers

These wrought steel Adjustable Clevis and Band Hangers provide for vertical adjustment either before or after the pipe is in place. Hanger rods and supporting nuts may be locked into position after adjustment by use of the upper load nut. Hanger rods and nuts must be ordered separately. The hangers are regularly furnished black; the No. 239-F is available cadmium plated at extra cost.

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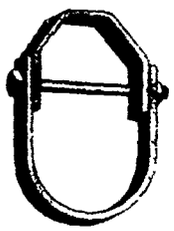
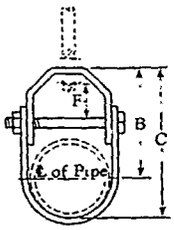
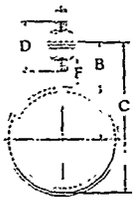





No. 239-F
Clevis Hanger

Dimensions, in Inches

| Pipe Size | Rod Dia. | No. 239-F B | No. 239-F C | No. 239-F F Max. | No. 269-G B | No. 269-G C | No. 269-G D | No. 269-G F Max. | Max. Load Lbs. |
|---|---|---|---|---|---|---|---|---|---|
| ½ | ⅜ | 2 15/16 | 3⅜ | 1⅛ | | | | | |
| ¾ | ⅜ | 2 15/16 | 3½ | 1⅛ | 2 1/16 | 2⅝ | 2½ | 1 | 80 |
| 1 | ⅜ | 3 3/16 | 3⅞ | 1 3/16 | 2 3/16 | 2⅞ | 2½ | 1 | 85 |
| 1¼ | ⅜ | 3½ | 4⅜ | 1 9/16 | 2 9/16 | 3 7/16 | 2½ | 1¼ | 95 |
| 1½ | ⅜ | 3½ | 4⅜ | 1½ | 2¾ | 3 11/16 | 2½ | 1¼ | 105 |
| 2 | ⅜ | 4⅜ | 5⅝ | 1 15/16 | 3 | 4 3/16 | 2½ | 1¼ | 150 |
| 2½ | ½ | 4⅜ | 5⅝ | 1 3/16 | 3⅞ | 5 5/16 | 3½ | 1¾ | 225 |
| 3 | ½ | 4⅝ | 6½ | 1 3/16 | 4¼ | 6 | 3½ | 1¾ | 310 |
| 3½ | ½ | 4⅝ | 6½ | 1 3/16 | 4½ | 6½ | 3½ | 1¾ | 390 |
| 4 | ⅝ | 5¼ | 7½ | 1 5/16 | 4⅞ | 7⅛ | 3½ | 1¾ | 475 |
| 5 | ⅝ | 6 5/16 | 9⅛ | 2 | 5 11/16 | 8 7/16 | 4 | 2 | 685 |
| 6 | ¾ | 6 15/16 | 10¼ | 2 | 6⅜ | 9 11/16 | 4½ | 2 | 950 |
| 8 | ⅞ | 9 9/16 | 13⅞ | 2⅝ | 7 9/16 | 11⅞ | 4½ | 2 | 1510 |
| 10 | ⅞ | 11⅝ | 17 | 3½ | | | | | |
| 12 | ⅞ | 13⅜ | 19¾ | 3 7/16 | | | | | |




No. 269-G
Band Hanger

*Prices on application*

# Pipe Hangers

## Adjustable Clips

Clip Base
No. 116-G

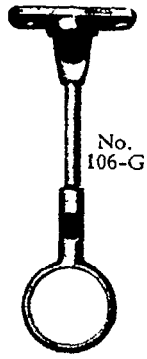
Clip Ring
No. 105-G

All of these clips are Underwriters' listed. The No. 100-G is made of malleable iron and consists of the No. 105-G Clip Ring, the No. 116-G Clip Base, and a hanger rod. The No. 100-G Clips allow a 1½-inch adjustment which can be made easily after the pipe is installed. The adjustment is made by raising the pipe until the head of the rod is close to the ceiling and the turning rod.

This Clip is regularly furnished black; galvanized to order.

Dimensions, in Inches

| Pipe Size | Square Head Hanger Rod | | Ceiling to Center of Pipe | | Inside Diameter of Ring |
|---|---|---|---|---|---|
| | Length | Diam. | Min. | Max. | |
| ¾ | 6¼ | ⅜ | 8 | 9⅝ | 1 3/16 |
| 1 | 6¾ | ⅜ | 8½ | 10⅛ | 1 7/16 |
| 1¼ | 6¾ | ⅜ | 8¾ | 10⅜ | 1 13/16 |
| 1½ | 7 | ⅜ | 9 | 10⅝ | 2 1/16 |
| 2 | 7¼ | ⅜ | 9½ | 11⅛ | 2 9/16 |



No.
106-G

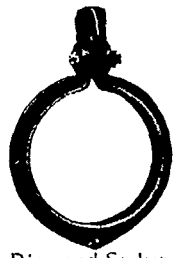
## Split Pipe Ring Hangers

Socket
No. 110-G
No. 110R-G

Dimensions, in Inches

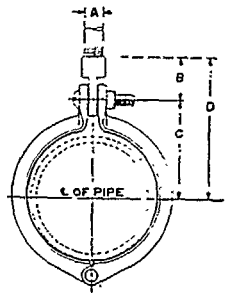
| No. 110-G, Pipe Threaded | | | | No. 110 R-G, Rod Threaded | | | |
|---|---|---|---|---|---|---|---|
| Pipe Size | A | B | Max. Load Lbs. | Pipe Size | A | B | Max. Load Lbs. |
| ½-1 | ⅛ | 1⅛ | 150 | ½-2 | ⅜ | 1⅛ | 150 |
| 1¼-3 | ¼ | 1 5/16 | 390 | 2½-3½ | ½ | 1 5/16 | 390 |
| 3½-4 | ⅜ | 1 9/16 | 685 | 4-5 | ⅝ | 1 9/16 | 685 |
| 5-6 | ½ | 1⅞ | 950 | 6 | ¾ | 1 13/16 | 950 |
| 8 | ¾ | 2⅛ | 1510 | 8 | ⅞ | 2 1/16 | 1510 |

Pipe Ring
No. 108-G



Ring and Socket
No. 107-G
No. 107R-G

| Pipe Size | Ring and Socket | | | | | | | | Maximum Load Pounds |
|---|---|---|---|---|---|---|---|---|---|
| | No. 107-G, Pipe Threaded | | | | No. 107R-G, Rod Threaded | | | | |
| | A | B | C | D | A | B | C | D | |
| ½ | ⅛ | 1⅛ | 15/16 | 2⅛ | ⅜ | 1⅛ | 15/16 | 2⅛ | 75 |
| ¾ | ⅛ | 1⅛ | 1⅛ | 2 5/16 | ⅜ | 1⅛ | 1⅛ | 2 5/16 | 80 |
| 1 | ⅛ | 1⅛ | 1¼ | 2 7/16 | ⅜ | 1⅛ | 1¼ | 2 7/16 | 85 |
| 1¼ | ¼ | 1 5/16 | 1 9/16 | 2 15/16 | ⅜ | 1⅛ | 1 9/16 | 2¾ | 95 |
| 1½ | ¼ | 1 5/16 | 1 11/16 | 3 1/16 | ⅜ | 1⅛ | 1 11/16 | 2⅞ | 105 |
| 2 | ¼ | 1 5/16 | 2 1/16 | 3 7/16 | ⅜ | 1⅛ | 2 1/16 | 3¼ | 150 |
| 2½ | ¼ | 1 5/16 | 2¼ | 3⅝ | ½ | 1 5/16 | 2¼ | 3⅝ | 225 |
| 3 | ¼ | 1 5/16 | 2¾ | 4⅛ | ½ | 1 5/16 | 2¾ | 4⅛ | 310 |
| 3½ | ⅜ | 1 9/16 | 3⅛ | 4¾ | ½ | 1 5/16 | 3⅛ | 4½ | 390 |
| 4 | ⅜ | 1 9/16 | 3⅝ | 5¼ | ⅝ | 1 9/16 | 3⅝ | 5¼ | 475 |
| 5 | ½ | 1⅞ | 4½ | 6 7/16 | ⅝ | 1 9/16 | 4½ | 6⅛ | 865 |
| 6 | ½ | 1⅞ | 5 7/16 | 7⅜ | ¾ | 1 13/16 | 5 7/16 | 7 5/16 | 950 |
| 8 | ¾ | 2⅛ | 6⅜ | 8 9/16 | ⅞ | 2 1/16 | 6⅜ | 8½ | 1510 |




*Black unless cadmium plating is specified.*

## Adjustable Split Swivel Hangers

Dimensions, in Inches

| Pipe Size | Ring to Bolt Hole (Centers) | Center of Bolt Hole to Top | Adjustment | Adjuster No. | Pipe Thread | Bolt Thread |
|---|---|---|---|---|---|---|
| ½ | 1 | 3⅜ | 1⅝ | 1 | ⅛ | ⅜ |
| ¾ | 1⅛ | 3⅜ | 1⅝ | 1 | ⅛ | ⅜ |
| 1 | 1⅛ | 3⅜ | 1⅝ | 1 | ⅛ | ⅜ |
| 1¼ | 1⅝ | 3⅜ | 1⅝ | 1 | ¼ | ½ |
| 1½ | 1¾ | 3⅜ | 1⅝ | 1 | ¼ | ½ |
| 2 | 2¼ | 3⅜ | 1⅝ | 1 | ¼ | ½ |
| 2½ | 2½ | 3⅜ | 1⅝ | 1 | ¼ | ½ |
| 3 | 3 | 3⅜ | 1⅝ | 1 | ¼ | ½ |
| 3½ | 3⅜ | 4⅛ | 2⅛ | 2 | ⅜ | ⅝ |
| 4 | 3⅝ | 4⅛ | 2⅛ | 2 | ⅜ | ⅝ |
| 5 | 4⅛ | 4⅛ | 2⅛ | 2 | ½ | ¾ |
| 6 | 4¾ | 4⅛ | 2⅛ | 2 | ½ | ¾ |
| 8 | 7¼ | 5⅝ | 2⅝ | 3 | ½ | ¾ |
| 10 | 9⅛ | 5⅝ | 2⅝ | 3 | ½ | ⅞ |

*Prices on application*

The No. 215-F Adjustable Hanger is made of malleable iron. By its use, the supporting rod or pipe may be cut approximately to size and placed in position; the unit may then be adjusted to the proper position without removing the hanger from the pipe.

The lower portion of the adjuster is cast within the top section, forming an integral swivel which allows the top section to rotate, thus raising or lowering the entire unit to the desired position. The top section is formed in the shape of a hexagon nut to allow the use of a wrench when needed.

This hanger is regularly furnished black. Galvanized finish can be furnished, when so specified.

No. 215-F

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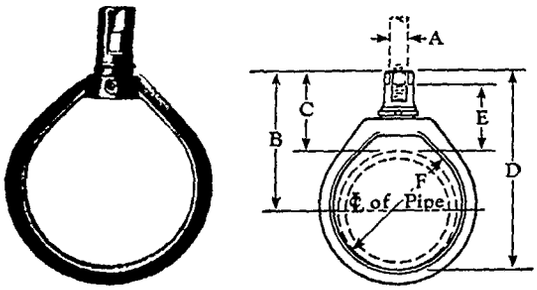
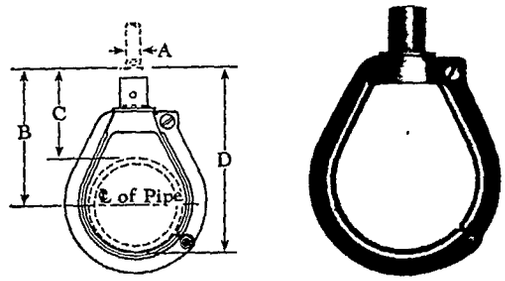
# Pipe Hangers

## Adjustable Swivel Ring Hangers




No. 101-G
Solid Ring Type




No. 199-F
Split Ring Type

The No. 101-G Solid Ring Type Swivel Ring is made of malleable iron and is Underwriters' listed. The swivel shank allows adjustment by turning the shank nut to left or right. No temporary support of the pipe line is necessary while making adjustments. The swivel shank automatically locks when the pipe is in the desired position.

The No. 199-F, made of malleable iron and Underwriters' listed, is suitable for all general piping and sprinkler service. The off-center hinge design provides support for the piping while the ring is open and permits removing the pipe after the hanger is erected. The integral swivel allows vertical adjustment without the use of temporary supports.

Dimensions, in Inches

| Pipe Size | No. 101-G, Solid Ring Type | | | | | | | No. 199-F, Split Ring Type | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. Load | A | B | C | D | E | F | A | B | C | D |
| 3/4 | 80 lbs. | 3/8 | 2 15/16 | 2 7/16 | 3 1/2 | 2 | 1 3/16 | 3/8 | 2 3/8 | 1 13/16 | 2 7/8 |
| 1 | 85 lbs. | 3/8 | 2 3/4 | 2 1/8 | 3 7/16 | 1 11/16 | 1 7/16 | 3/8 | 2 5/8 | 1 15/16 | 3 1/4 |
| 1 1/4 | 95 lbs. | 3/8 | 3 1/16 | 2 3/16 | 3 7/8 | 1 3/4 | 1 13/16 | 3/8 | 2 13/16 | 1 15/16 | 3 5/8 |
| 1 1/2 | 105 lbs. | 3/8 | 3 1/16 | 2 1/8 | 4 | 1 11/16 | 2 | 3/8 | 2 7/8 | 1 15/16 | 3 7/8 |
| 2 | 150 lbs. | 3/8 | 3 7/16 | 2 1/4 | 4 3/8 | 1 13/16 | 2 9/16 | 3/8 | 3 3/16 | 2 | 4 3/8 |
| 2 1/2 | 225 lbs. | 1/2 | 4 | 2 9/16 | 5 7/16 | 2 1/16 | 3 1/16 | 1/2 | 3 3/8 | 2 | 4 13/16 |
| 3 | 310 lbs. | 1/2 | 4 3/8 | 2 5/8 | 6 1/8 | 2 1/8 | 3 11/16 | 1/2 | 3 7/8 | 2 1/8 | 5 5/8 |
| 3 1/2 | 390 lbs. | 1/2 | 4 9/16 | 2 9/16 | 6 9/16 | 2 1/16 | 4 3/16 | 1/2 | 4 1/16 | 2 1/8 | 6 1/16 |
| 4 | 475 lbs. | 5/8 | 5 7/16 | 3 3/16 | 7 11/16 | 2 9/16 | 4 3/4 | 5/8 | 4 3/8 | 2 1/8 | 6 5/8 |
| 5 | 685 lbs. | 5/8 | 6 | 3 1/4 | 8 13/16 | 2 5/8 | 5 13/16 | 5/8 | 5 5/8 | 2 13/16 | 8 3/8 |
| 6 | 950 lbs. | 3/4 | 7 1/8 | 3 13/16 | 10 7/16 | 3 1/16 | 6 7/8 | 3/4 | 6 3/16 | 2 7/8 | 9 1/2 |
| 8 | 1510 lbs. | 7/8 | 8 13/16 | 4 1/2 | 13 1/8 | 3 5/8 | 8 15/16 | 7/8 | 8 1/8 | 3 13/16 | 12 7/16 |

These rings, regularly furnished black, will be cadmium plated at extra cost; orders must specify.

## Adjustable Swivel Pipe Rolls

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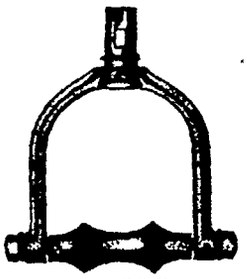
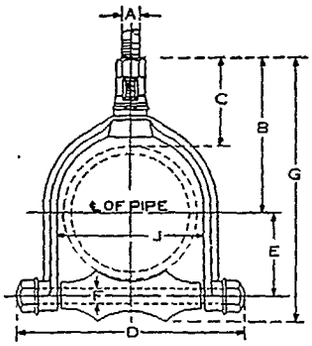


No. 174-G
Adjustable Swivel
Pipe Roll

Dimensions, in Inches

| Pipe Size | A | B | C | D | E | F | G | J | Max. Load Lbs. |
|---|---|---|---|---|---|---|---|---|---|
| 2 1/2 | 1/2 | 4 | 2 9/16 | 5 1/2 | 1 15/16 | 7/16 | 6 5/8 | 3 1/4 | 225 |
| 3 | 1/2 | 4 5/16 | 2 9/16 | 6 1/8 | 2 1/4 | 7/16 | 7 5/16 | 3 7/8 | 310 |
| 3 1/2 | 1/2 | 4 5/8 | 2 5/8 | 6 7/8 | 2 9/16 | 1/2 | 8 | 4 3/8 | 390 |
| 4 | 5/8 | 5 3/8 | 3 1/8 | 7 7/16 | 2 13/16 | 1/2 | 9 1/16 | 4 15/16 | 475 |
| 5 | 5/8 | 5 15/16 | 3 1/8 | 8 3/4 | 3 7/16 | 5/8 | 10 3/8 | 6 | 685 |
| 6 | 3/4 | 7 1/16 | 3 3/4 | 10 7/8 | 4 | 3/4 | 12 1/4 | 7 1/8 | 950 |
| 8 | 7/8 | 8 13/16 | 4 1/2 | 13 1/4 | 5 1/8 | 7/8 | 15 3/8 | 9 1/4 | 1510 |
| 10 | 7/8 | 10 | 4 5/8 | 15 1/2 | 6 3/8 | 7/8 | 18 1/16 | 11 1/4 | 2100 |
| 12 | 7/8 | 11 1/8 | 4 3/4 | 17 3/4 | 7 7/16 | 1 | 20 1/2 | 13 1/4 | 2300 |




These Adjustable Swivel Pipe Rolls have a malleable iron yoke and a cast iron roll. Vertical adjustment is made by use of the swivel shank which automatically locks, preventing loosening due to vibration.

This type of hanger is primarily designed for use with uncovered pipe but can also be used with covered pipe having Pipe Covering Protection Saddles if the proper size pipe rolls are installed.

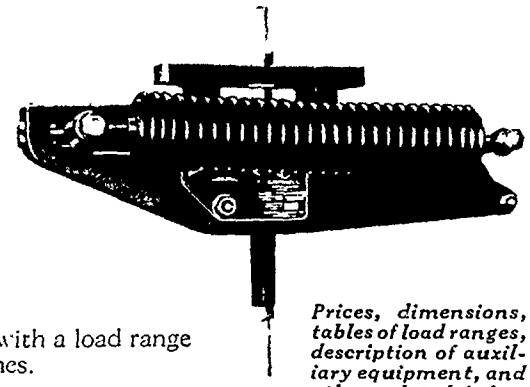
*Prices on application*

# Grinnell Constant-Support Hangers

## For High Temperature Piping Installations

Grinnell Constant-Support Hangers are designed to compensate for the normal variation in the supporting force of helical coil springs. The total supporting force of these highly developed hangers is equal in all positions to the constant weight of the vertically shifting pipe.

The Hangers are recommended for high temperature piping in power plant, oil refinery, and marine installations. The following types are available:



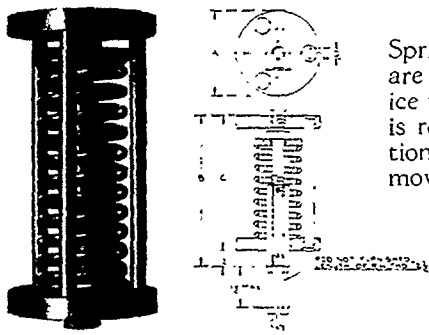
*Prices, dimensions, tables of load ranges, description of auxiliary equipment, and other related information will be furnished on request.*

**No. 242, Model L:** This Constant-Support Hanger is made in six sizes for an over-all load range of 141 to 2110 pounds and a total travel range of 1¼ to 2½ inches.

**No. 243, Model L:** The No. 243 Hanger is made in six sizes with a load range of 210 to 7875 pounds and a total travel range of 2 to 5 inches.

**No. 244, Model L:** The No. 244 Hanger is made in four sizes with a load range of 1270 to 19,530 pounds and a total travel range of 4 to 10 inches.

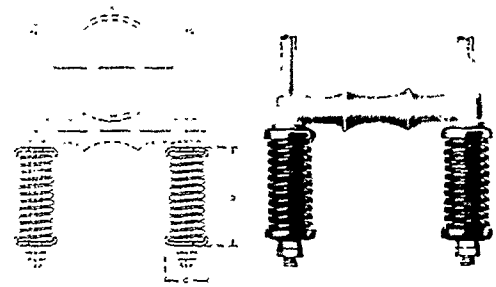
# Spring Cushion Hangers



No. 247-G

Spring Cushion Hangers are recommended for service where constant support is required and compensation must be made for movement of the piping.

The use of springs is an efficient means of absorbing vibration.



No. 178-G

(Illustrations show complete assembly of No. 178-G Spring Cushion and a Single Pipe Roll.)

**No. 247-G:** The No. 247-G Light Duty Spring Hanger is a flexible support with a relatively small variation in supporting force.

It is used on small sized piping where the piping weight is in its range of load carrying capacity.

This hanger is recommended to the plumbing and heating trade for use on steam mains in municipal and commercial buildings and also for small piping in power and industrial plants.

**No. 178-G:** The No. 178-G Spring Cushion Hanger is usually used with a single pipe roll hanger as illustrated above.

The Spring Cushion consists of a set of two springs and four retainers. Size No. 1 retainer is cored with a 7/16-inch hole suitable for a 3/8-inch hanger rod, Size No. 2 is cored with a 9/16-inch hole for a 1/2-inch rod, and Size No. 3 is cored with a 15/16-inch hole for a 7/8-inch rod. These holes may be drilled or reamed larger to satisfy the hanger roll rod diameter.



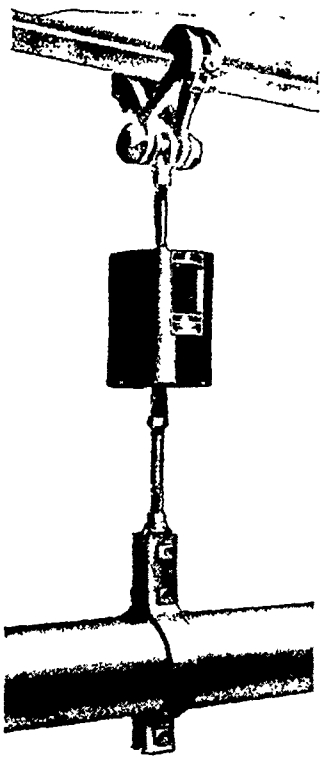
Dimensions, in Inches

| Size No. | No. 247-G | | | | | | | No. 178-G | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | *Maximum Deflection | Load Pounds at Maximum Deflection | Rod Size | C | D | †Capacity of Hanger Pounds | Deflection Rate per Spring Pounds per Inch |
| 1 | 2⅝ | 4⅝ | 4⅛ | 5/16 | 1¼ | 47.5 | ⅜ | 22 1/32 | 6⅛ | 535 | 214 |
| 2 | 2⅝ | 5 19/32 | 5 3/32 | 5/16 | 1¼ | 85.0 | ⅜ | 4⅛ | 6 1/16 | 1500 | 600 |
| 3 | 3⅜ | 5 11/16 | 5 3/16 | ⅜ | 1¼ | 150.0 | ½ | 4⅛ | 9 1/16 | 3000 | 1200 |
| 4 | 3½ | 7¾ | 7¼ | ⅜ | 1¼ | 267.5 | ½ | | | | |

*At maximum deflection, spring can be compressed an additional ¼-inch before becoming solid.
†Maximum capacity of double spring assembly.

*Prices on application*

# Grinnell Pre-Engineered Spring Hangers



No. B-268-G

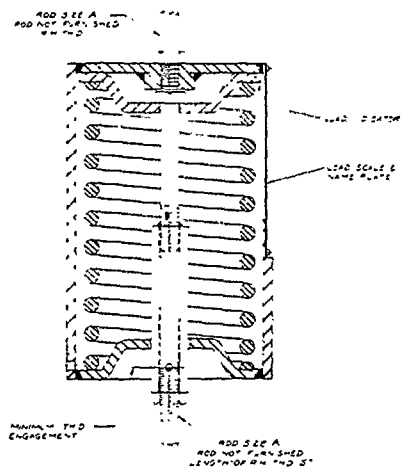
The Grinnell Pre-Engineered Spring Hanger was developed after years of experience in analyzing the problems of flexible pipe suspension systems. Spring design for the expanded line of No. B-268 Spring Hangers has been carefully calculated in all sizes and types to minimize the inherent changes in the supporting force with deflection of the spring. The feature of pre-compression assures operation of the spring within its proper working range, where variation in supporting force is at a minimum. Maximum variation in supporting force per ½-inch deflection of the spring is 10½ per cent of the rated capacity.

The design embodies pre-compressing the spring into the casing, within ½-inch of the working range, thereby reducing the over-all height of the hanger assembly.

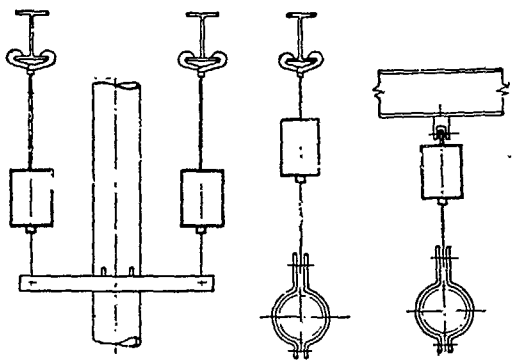
Erection of the hanger system has been simplified by incorporating a scale plate on the side of each hanger.

A unique load coupling eliminates the necessity for a turnbuckle to adjust the hanger load. Shortening or lengthening the rod until the scale pointer indicates the correct load assures proper installation of the equipment.

This Spring Hanger is offered in seven types and makes available a wide choice of carefully engineered spring hangers. It is made in sixteen sizes with load ranges from 74 to 9000 pounds capacity.



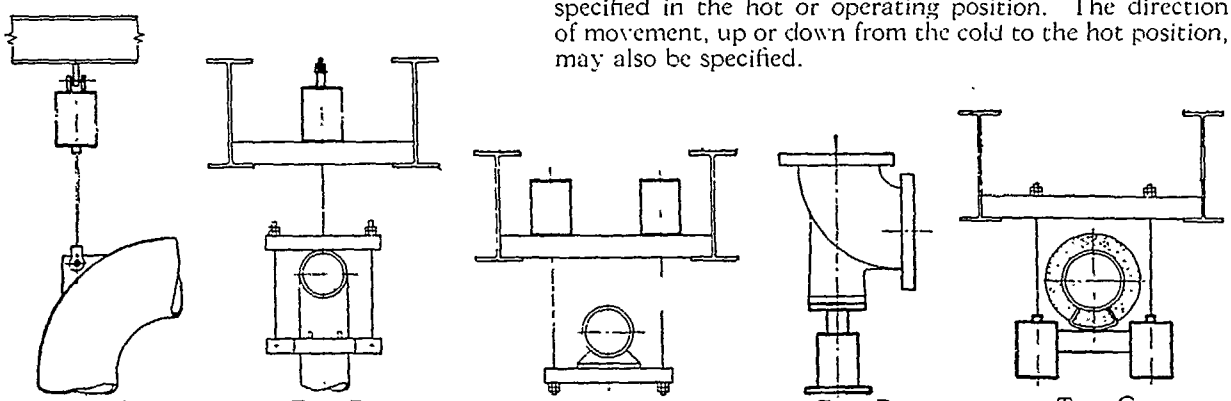
Type A Cross Section



Type A Type A Type B

**Specifications:** Grinnell Pre-Engineered Spring Hangers are designed to meet the requirements of the American Standard Code for Pressure Piping. Standard weight steel piping is used for the casing and serves to protect the spring from damage as well as weather conditions. The top and bottom spring cap serves as a centering device or guide and prevents the spring from coming in contact with the sides of the casing. All welding is done in strict accordance with the American Standard Code.

**When ordering:** When ordering, specify catalog number, type, and hanger size. These hangers provide a space for die-stamping the hanger mark number, the operating load per spring unit in pounds, and also for indicating the actual hot and cold position when the necessary data is furnished on the order. The desired supporting force should be specified in the hot or operating position. The direction of movement, up or down from the cold to the hot position, may also be specified.



Type C Type D Type E Type F Type G

*Prices on application*

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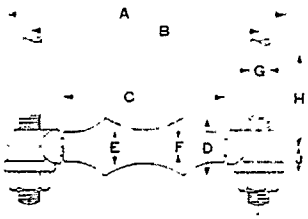
# Single Pipe Rolls and Sockets

The No. 171-G Pipe Roll and Socket assembly is designed for use with uncovered or covered pipe. The single pipe roll takes care of horizontal expansion and contraction. The adjustable socket permits vertical adjustment at the roll. Order hanger rods and nuts separately. Special long rolls and special sockets are available; information on request.



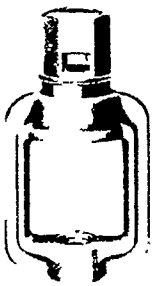

No. 171-G Complete

For Pipe Roll only, specify No. 173-G. For Adjustable Socket only, specify No. 171-G.

Dimensions, in Inches

| Pipe Size | Socket No. | A (Max.) | B | C | D | E | F | G Min | G Max | H | J (Max.) | Max. Load Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 4 1/8 | 3 | 1 1/2 | 1 | 3/4 | 3/8 | 3/8 | 3/8 | 1 11/16 | 9/16 | 85 |
| 1 1/4 | 1 | 4 1/2 | 3 3/8 | 1 7/8 | 1 1/16 | 3/4 | 3/8 | 3/8 | 3/8 | 1 1/4 | 9/16 | 95 |
| 1 1/2 | 1 | 4 3/4 | 3 5/8 | 2 1/8 | 1 1/8 | 3/4 | 3/8 | 3/8 | 3/8 | 1 3/8 | 9/16 | 105 |
| 2 | 1 | 5 1/4 | 4 1/8 | 2 5/8 | 1 3/16 | 3/4 | 3/8 | 3/8 | 3/8 | 1 5/8 | 9/16 | 150 |
| 2 1/2 | 2 | 6 1/4 | 4 7/8 | 3 1/8 | 1 3/8 | 7/8 | 7/16 | 1/2 | 1/2 | 1 15/16 | 11/16 | 225 |
| 3 | 2 | 6 7/8 | 5 1/2 | 3 3/4 | 1 7/16 | 7/8 | 7/16 | 1/2 | 1/2 | 2 1/4 | 11/16 | 310 |
| 3 1/2 | 2, 3 | 7 3/4 | 6 1/4 | 4 1/4 | 1 5/8 | 1 | 1/2 | 1/2 | 5/8 | 2 9/16 | 3/4 | 390 |
| 4 | 2, 3 | 8 1/4 | 6 3/4 | 4 3/4 | 1 3/4 | 1 | 1/2 | 1/2 | 5/8 | 2 13/16 | 3/4 | 475 |
| 5 | 2, 3 | 9 11/16 | 8 1/16 | 5 13/16 | 2 | 1 1/8 | 5/8 | 1/2 | 5/8 | 3 7/16 | 7/8 | 685 |
| 6 | 2, 3, 4 | 11 7/16 | 9 9/16 | 6 7/8 | 2 5/16 | 1 1/4 | 3/4 | 1/2 | 3/4 | 4 | 1 | 950 |
| 8 | 2, 3, 4, 5 | 14 1/16 | 11 15/16 | 8 7/8 | 2 13/16 | 1 1/2 | 7/8 | 1/2 | 7/8 | 5 1/8 | 1 3/16 | 1510 |
| 10 | 2, 3, 4, 5 | 16 3/16 | 14 1/16 | 11 | 3 3/8 | 1 3/4 | 7/8 | 1/2 | 7/8 | 6 3/8 | 1 3/16 | 2100 |
| 12 | 3, 4, 5 | 18 7/16 | 16 5/16 | 13 | 3 7/8 | 2 | 1 | 5/8 | 7/8 | 7 7/16 | 1 1/4 | 2300 |
| 14 | 5, 6 | 20 1/8 | 17 3/4 | 14 1/4 | 4 5/8 | 2 1/2 | 1 1/8 | 7/8 | 1 | 8 3/8 | 1 7/16 | 3075 |
| 16 | 5, 6, 7 | 22 3/8 | 19 3/4 | 16 1/4 | 5 | 2 5/8 | 1 1/4 | 7/8 | 1 1/8 | 9 7/16 | 1 1/2 | 3075 |
| 18 | 5, 6, 7 | 24 1/2 | 21 7/8 | 18 1/4 | 5 7/16 | 2 3/4 | 1 1/4 | 7/8 | 1 1/8 | 10 1/2 | 1 1/2 | 3875 |
| 20 | 8 | 27 1/4 | 24 1/4 | 20 1/4 | 6 | 3 | 1 3/8 | 1 1/4 | 1 1/4 | 11 5/8 | 1 5/8 | 4980 |
| 24 | 6, 7, 8, 9 | 32 1/8 | 28 5/8 | 24 1/4 | 7 3/16 | 3 5/8 | 1 1/2 | 1 | 1 1/2 | 14 | 2 1/16 | 4980 |
| 30 | 8, 9, 10 | 39 7/8 | 35 1/2 | 30 1/4 | 8 15/16 | 4 1/2 | 1 7/8 | 1 1/4 | 1 7/8 | 17 7/16 | 2 7/16 | 4980 |

# Hanger Couplings and Toggle Bolts



No. 134-G Adjustable Swivel Coupling

No. 136-G Rod Coupling

Dimensions, in Inches

| Size No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| No. 134-G | Rod tappings | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
| | Length | 3 1/16 | 3 5/8 | 4 5/8 | 5 3/16 | 6 3/8 |
| No. 136-G | Rod tappings | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
| | Length | 1 15/16 | 2 1/4 | 2 1/2 | 2 13/16 | 3 1/8 |

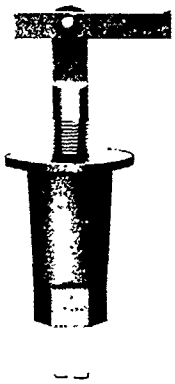
**No. 134-G:** The No. 134-G has a swivel nut to raise or lower the pipe. It is self-locking.

**No. 136-G:** The No. 136-G is furnished with right hand threads unless otherwise specified.

**Nos. 209-G, 208-G:** Nos. 209-G and 208-G are used under tile and cinder concrete construction.

No. 209-G → Toggle Bolt

No. 208-G → Hanger Rod Coupling



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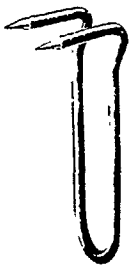
# Pipe Straps

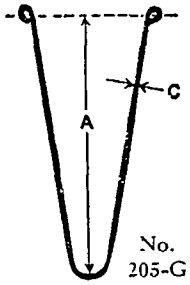
These Galvanized Tin Pipe Straps are furnished for pipe sizes 1/4 to 3-inch inclusive.

# Wire Hooks



These Wire Pipe Hooks have long diamond points and are humped for easy driving. Made in lengths of 4 to 12-inch for pipe sizes 3/8 to 2-inch: coppered finish at extra cost.

# U-Hooks

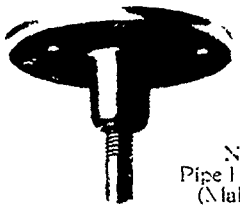


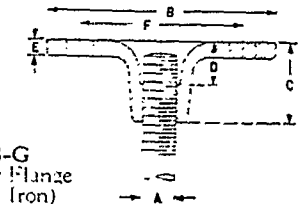

No. 205-G

U-Hooks are available in lengths of 6 to 36-inch for pipe sizes 3/4 to 8-inch. Rod sizes (C) are 5/16, 3/8, 7/16, 9/16, 5/8, and 3/4-inch.

***Prices on application***

# Hanger Flanges





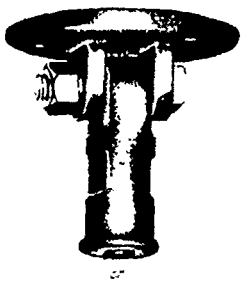

No. 153-G
Pipe Hanger Flange
(Malleable Iron)

Dimensions, in Inches

| Size No. | Pipe Size | A | B | C | D | E | F | Size Screw |
|---|---|---|---|---|---|---|---|---|
| 1 | 3/4–2 | 3/8 | 2 7/8 | 1 3/8 | 7/8 | 3/16 | 2 | 1 1/2 No. 18 |
| 2 | 2 1/2–3 1/2 | 1/2 | 4 | 1 1/2 | 15/16 | 1/4 | 2 7/8 | 3/8 × 2 |
| 3 | 4–5 | 5/8 | 4 3/4 | 1 5/8 | 1 | 5/16 | 3 3/8 | 1/2 × 2 |
| 4 | 6 | 3/4 | 5 1/4 | 1 7/8 | 1 1/16 | 3/8 | 3 5/8 | 9/16 × 2 |
| 5 | 8–12 | 7/8 | 6 | 2 1/8 | 1 1/8 | 7/16 | 4 1/4 | 5/8 × 2 |

The No. 153-G Hanger Flange size No. 1 has two holes for wood screws; size Nos. 2, 3, 4, and 5 have three holes for coach screws. Underwriters' listed for pipe sizes up to 8-inch, the Flange is used primarily on level ceilings. A 1-inch adjustment is provided where the rod enters the flange.

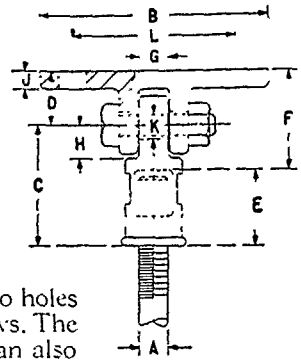
# Adjustable Swinging Hanger Flanges



No. 155-G
Adjustable Swinging
Hanger Flange, Complete

No. 156-G
Flange
With Bolt,
Nut, and
Spring Washer

No. 157-G
Extension
Piece
Rod
Threaded



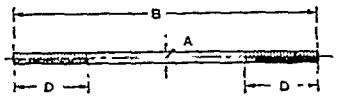

***Made of Malleable Iron***
***Underwriters' listed***
***for pipe sizes 8-inch and smaller***

The No. 155-G Hanger Flange, a combination of Nos. 156-G and 157-G, provides a means of hanging pipe where a swing through a 180 radius is desired. Size No. 1 has two holes for wood screws; other sizes have three holes for coach screws. The No. 157-G Extension Piece has a 1-inch adjustment; it can also be used with beam clamps and channel clamps.

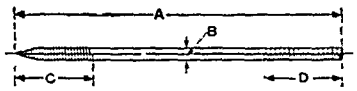
Dimensions, in Inches

| Size No. | Pipe Size | A | B | C | D | E | F | G | H | J | K | L | Size Screws | Size Bolt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3/4–2 | 3/8 | 3 1/4 | 2 1/8 | 3/4 | 1 1/4 | 1 5/8 | 1/2 | 9/16 | 3/16 | 1/2 | 2 1/2 | 1 1/2 No. 18 | 3/8 × 1 1/2 |
| 2 | 2 1/2–3 1/2 | 1/2 | 4 | 2 3/8 | 15/16 | 1 3/8 | 1 15/16 | 5/8 | 11/16 | 1/4 | 1/2 | 2 7/8 | 3/8 × 2 | 3/8 × 1 3/4 |
| 3 | 4–5 | 5/8 | 4 3/4 | 2 9/16 | 1 1/8 | 1 9/16 | 2 1/8 | 5/8 | 11/16 | 3/8 | 1/2 | 3 3/8 | 1/2 × 2 | 7/16 × 2 |
| 4 | 6 | 3/4 | 5 1/4 | 2 7/8 | 1 5/16 | 1 3/4 | 2 7/16 | 5/8 | 13/16 | 7/16 | 1/2 | 3 5/8 | 9/16 × 2 | 7/16 × 2 1/8 |
| 5 | 8–12 | 7/8 | 6 | 3 1/16 | 1 7/16 | 1 7/8 | 2 5/8 | 3/4 | 7/8 | 1/2 | 9/16 | 4 1/4 | 5/8 × 2 | 1/2 × 2 3/8 |

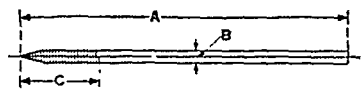
# Hanger Rods



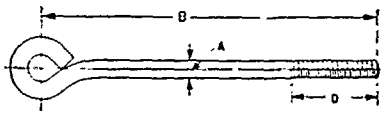

No. 140-G
Hanger Rod
Both Ends Machine Threaded
with Right Hand Threads




No. 142-G
Coach Screw Rod
Machine Threaded
on Opposite End




No. 143-G
Coach Screw Rod
Not Threaded
on Opposite End




No. 248-G
Eye Rod
Machine Threaded

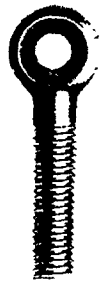
Dimensions, in Inches

| Length Inches | | No. 142-G and No. 143-G Rod Size B, Inches | | | | No. 140-G and No. 248-G Rod Size A, Inches | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3/8 | 1/2 | 5/8 | 3/4 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | 1 1/8 | 1 1/4 | 1 1/2 |
| Available in lengths of 8, 10, 12, 14, 18, 24, 30, 36, 42, 48, 54, 60, 66, and 72-inch | | Specify length on orders. | | | | Specify length on orders. | | | | | | | | |
| Thread Length | C | 2 | 27/16 | 29/16 | 29/16 | | | | | | | | | |
| | D | 2 1/2 | 2 1/2 | 2 1/2 | 3 | 2 1/2 | 2 1/2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 6 |

Other rods can be furnished. Information and data on request.

***Prices on application***

# Extension Eye Bolts

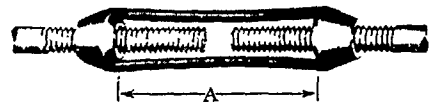


No. 220-G Eye Bolt Forged Steel

Dimensions, in Inches

| Dia. of Eye Bolt | Length | Length of Thread | Dia. of Hole | Thickness of Metal at Eye |
|---|---|---|---|---|
| 3/8 | 2 1/2 | 2 | 13/32 | 1/2 |
| | 4 | 2 1/4 | 13/32 | 1/2 |
| | 5 1/2 | 2 1/4 | 13/32 | 1/2 |
| 1/2 | 2 3/4 | 2 | 15/32 | 5/8 |
| | 4 1/4 | 2 1/2 | 15/32 | 5/8 |
| | 5 3/4 | 2 1/2 | 15/32 | 5/8 |
| 5/8 | 3 | 2 1/8 | 15/32 | 5/8 |
| | 4 1/2 | 3 1/4 | 15/32 | 5/8 |
| | 6 | 3 1/4 | 15/32 | 5/8 |
| 3/4 | 3 | 2 1/8 | 15/32 | 5/8 |
| | 4 1/2 | 3 1/2 | 15/32 | 5/8 |
| | 6 | 3 3/4 | 15/32 | 5/8 |
| 7/8 | 3 1/4 | 2 1/4 | 17/32 | 3/4 |
| | 4 3/4 | 3 3/4 | 17/32 | 3/4 |
| | 6 1/4 | 4 1/2 | 17/32 | 3/4 |

# Turnbuckles



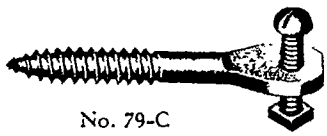

No. 230-G

The No. 230-G Turnbuckle is made of drop forged steel and can be furnished galvanized at additional cost. It is available in the following screw diameters: 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4 and 1 1/2-inch. When ordering, specify whether turnbuckles are wanted with or without stub ends.

Standard length Turnbuckles have a 6-inch opening (dimension "A" on illustration). Opening lengths of 9, 12, 18, and 24 inches are also available.

# Flattened Lag Screws

With Bolt



No. 79-C

Dimensions, in Inches

| Number of Screw | 1 | 2 | 3 |
|---|---|---|---|
| Size | 5/16 | 3/8 | 1/2 |
| Length | 3 1/2 | 3 1/2 | 5 |

# Flattened End Bolts

The No. 96-G End Bolt is forged steel. It is also available heavily copper plated for use with copper pipe and fittings; it is then designated No. 96 CP-G.

Dimensions, in Inches

| Bolt No. | Pipe Size | Bolt Size | Thread Length | Length Center of Hole to End | Size Hole |
|---|---|---|---|---|---|
| 1 | 1/2 to 2 | 3/8 | 2 | 2 7/8 | 9/32 |
| 2 | 2 1/2 to 3 1/2 | 1/2 | 2 1/2 | 3 3/8 | 11/32 |
| 3 | 4 to 5 | 5/8 | 3 | 4 1/4 | 13/32 |
| 4 | 6 | 3/4 | 3 3/4 | 5 | 13/32 |
| 5 | 8 | 7/8 | 4 1/2 | 6 | 17/32 |

No. 96-G

# Extension Bars

Dimensions, in Inches

| Size Number | Width | Thickness | Std. Length Feet | Size Holes | Ctr. to Ctr. of Holes |
|---|---|---|---|---|---|
| 00 | 3/4 | 18 ga. | 10 | 9/32 | 5/8 |
| 0 | 3/4 | 16 ga. | 10 | 9/32 | 5/8 |
| 1 | 7/8 | 16 ga. | 10 | 9/32 | 5/8 |
| 2 | 1 | 15 ga. | 10 | 9/32 | 5/8 |
| 3 | 1 1/8 | 12 ga. | 10 | 11/32 | 3/4 |
| 4 | 1 1/4 | 12 ga. | 10 | 11/32 | 3/4 |

No. 1-C

The No. 1-C Perforated Extension Bar is made of soft steel and can be cut with a cold chisel. When specified, lengths of 5 feet can be furnished. The bars will be galvanized at additional cost.

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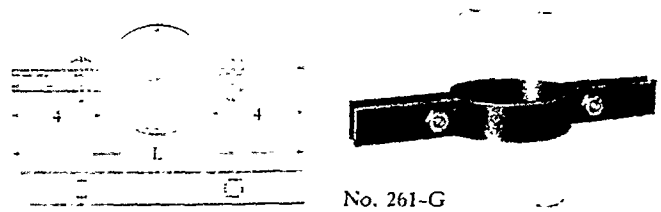
# Extension Pipe or Riser Clamps

Dimensions, in Inches

| Pipe Size | Length L | Size Stock | Pipe Size | Length L | Size Stock |
|---|---|---|---|---|---|
| 3/4 | 9 3/8 | 3/16 · 1 1/4 | 5 | 14 1/2 | 1/4 · 2 |
| 1 | 9 5/8 | 3/16 · 1 1/4 | 6 | 15 1/2 | 1/4 · 2 |
| 1 1/4 | 10 | 1/4 · 1 1/4 | 8 | 18 1/2 | 3/8 · 2 |
| 1 1/2 | 10 3/8 | 1/4 · 1 1/4 | 10 | 20 3/4 | 3/8 · 2 |
| 2 | 10 3/4 | 1/4 · 1 1/4 | 12 | 22 3/4 | 1/2 · 2 |
| 2 1/2 | 11 1/4 | 1/4 · 1 1/4 | 14 OD | 24 | 1/2 · 2 |
| 3 | 12 | 1/4 · 1 1/4 | 16 OD | 26 | 5/8 · 2 1/2 |
| 3 1/2 | 13 | 1/4 · 1 1/2 | 18 OD | 28 | 5/8 · 2 1/2 |
| 4 | 13 1/2 | 1/4 · 1 1/2 | 20 OD | 30 | 5/8 · 2 1/2 |

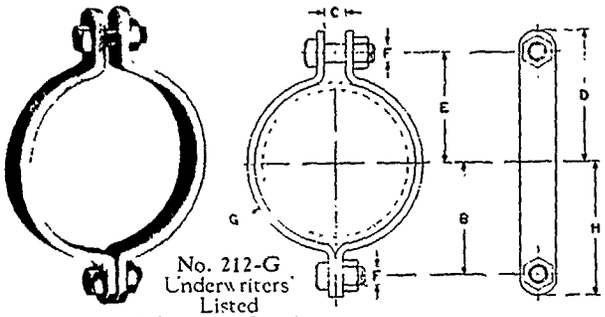



No. 261-G

The No. 261-G Clamp is made of wrought steel and is used as a riser clamp for supporting steel or cast iron pipe risers; also asbestos and other types of pipe covering.

*Prices on application*

# Wrought Pipe Clamps



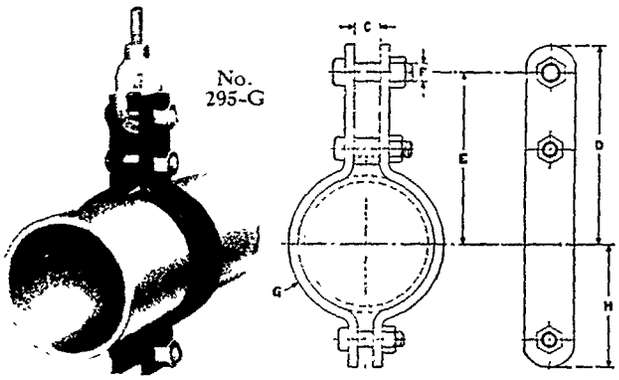

No. 212-G
Underwriters' Listed
8-Inch and Smaller

This clamp is made of wrought steel and is used for hanging power piping and for anchoring pipe on steam and hot water mains. For heavier load ratings the No. 216-G Clamp is available; data on request.

Dimensions, in Inches

| Pipe Size | B | C | D | E | F | G | H | Max. Load Pounds 450°F. | Max. Load Pounds 750°F. |
|---|---|---|---|---|---|---|---|---|---|
| 1½ | 1 13/16 | ½ | 2½ | 1⅞ | ⅜ | ¼×1 | 2 7/16 | 850 | 650 |
| 2 | 2⅛ | ½ | 2¾ | 2⅛ | ½ | ¼×1 | 2¾ | 850 | 650 |
| 2½ | 2½ | ⅝ | 3¼ | 2⅝ | ½ | ¼×1 | 3⅛ | 850 | 650 |
| 3 | 2 13/16 | ⅝ | 3 9/16 | 2 15/16 | ½ | ¼×1 | 3 7/16 | 850 | 650 |
| 3½ | 3⅛ | ⅝ | 3 13/16 | 3 3/16 | ½ | ¼×1 | 3¾ | 850 | 650 |
| 4 | 3 7/16 | ¾ | 4⅜ | 3⅝ | ⅝ | ¼×1¼ | 4 3/16 | 865 | 660 |
| 5 | 4 | ¾ | 4 15/16 | 4 3/16 | ⅝ | ¼×1¼ | 4¾ | 865 | 660 |
| 6 | 4⅞ | ⅞ | 5⅞ | 5 | ¾ | ⅜×1½ | 5¾ | 1550 | 1200 |
| 8 | 6 | 1 | 7 | 6⅛ | ¾ | ⅜×1½ | 6⅞ | 1550 | 1200 |
| 10 | 7 5/16 | 1 | 8 9/16 | 7 7/16 | ⅞ | ½×2 | 8 7/16 | 2200 | 1700 |
| 12 | 8¼ | 1 | 9 9/16 | 8 7/16 | ⅞ | ½×2 | 9⅜ | 2200 | 1700 |
| 14 OD | 9 | 1⅛ | 10⅝ | 9¼ | ⅞ | ½×2½ | 10⅜ | 2380 | 1820 |
| 16 OD | 10 | 1⅛ | 11⅝ | 10¼ | ⅞ | ½×2½ | 11⅜ | 2380 | 1820 |
| 18 OD | 11½ | 1¼ | 13 | 11⅝ | 1 | ⅝×2½ | 12⅞ | 2380 | 1820 |
| 20 OD | 12½ | 1⅜ | 14⅛ | 12¾ | 1⅛ | ⅝×2½ | 13⅞ | 3120 | 2400 |
| 24 OD | 15 | 1⅝ | 16⅞ | 15¼ | 1¼ | ⅝×3 | 16⅝ | 3120 | 2400 |

# Double Bolt Wrought Pipe Clamps




No. 295-G

A clamp for power station and industrial service for use where the top bolt is outside a 4-inch pipe covering; a heavy material is available for above normal loads.

Dimensions, in Inches

| Pipe Size | C | D | E | F | G | H | Max. Load Pounds 750° F. |
|---|---|---|---|---|---|---|---|
| 1½ | 1 1/16 | 4⅞ | 4⅛ | ⅝ | ¼×1¼ | 2⅜ | 725 |
| 2 | 1 1/16 | 5⅞ | 5⅛ | ⅝ | ¼×1¼ | 2 11/16 | 725 |
| 2½ | 1 1/16 | 6⅛ | 5⅜ | ⅝ | ¼×1¼ | 2 15/16 | 725 |
| 3 | 1 1/16 | 6 11/16 | 5 15/16 | ⅝ | ¼×1¼ | 3½ | 725 |
| 3½ | 1 1/16 | 6 15/16 | 6 3/16 | ⅝ | ¼×1¼ | 3¾ | 725 |
| 4 | 1 1/16 | 7⅝ | 6½ | ¾ | ⅜×2 | 4½ | 1300 |
| 5 | 1 1/16 | 8⅛ | 7 | ¾ | ⅜×2 | 5 | 1300 |
| 6 | 1 7/16 | 9 15/16 | 8 9/16 | 1 | ⅜×2½ | 6⅛ | 1900 |
| 8 | 1 7/16 | 10 15/16 | 9 9/16 | 1 | ⅜×2½ | 7⅛ | 1900 |
| 10 | 1 7/16 | 12 | 10⅝ | 1 | ½×2½ | 8¼ | 2200 |
| 12 | 1 7/16 | 13 | 11⅝ | 1 | ½×2½ | 9¼ | 2200 |
| 14 OD | 2 | 14⅝ | 12 11/16 | 1¼ | ⅝×3 | 10 11/16 | 3200 |
| 16 OD | 2 | 15 5/16 | 13 11/16 | 1¼ | ⅝×3 | 11 11/16 | 3200 |
| 18 OD | 2 | 16 5/16 | 14 11/16 | 1¼ | ⅝×3 | 12 11/16 | 3200 |
| 20 OD | 2 | 17½ | 15⅞ | 1⅜ | ¾×3 | 14 | 4200 |
| 24 OD | 2 | 19½ | 17⅞ | 1½ | ¾×3 | 16 | 3500 |

# I-Beam and Channel Clamps

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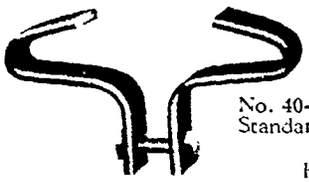
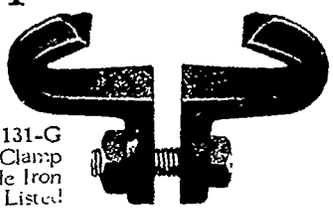


Made of strap steel

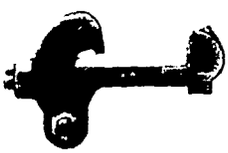
No. 40-C
Standard I-Beam Clamp

No. 41-C
Heavy I-Beam Clamp



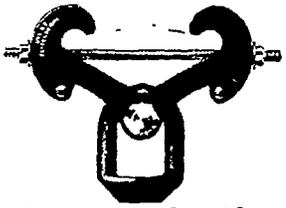
No. 131-G
I-Beam Clamp
Malleable Iron
Underwriters' Listed

No. 225-G
Universal Side I-Beam Clamp
Malleable Iron
Underwriters' Listed



No. 226-G
Universal Channel Clamp
Malleable Iron
Underwriters' Listed

I-Beam Clamps
Forged Steel
No. 228-G
(R. H. Thread)
No. 228L-G
(L. H. Thread)



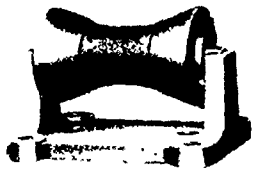
I-Beam Clamps, Forged Steel
No. 292-G (R. H. Thread)
No. 292L-G (L. H. Thread)

*Prices on application*

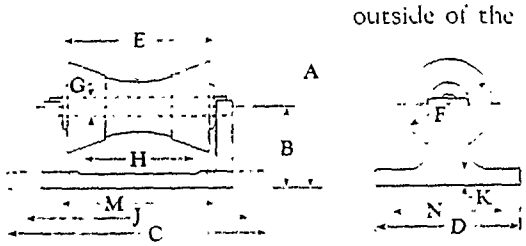
# Pipe Roll Stands

These Cast Iron Pipe Roll Stands are designed for supporting piping in cases where vertical adjustment is not necessary, but where provision must be made for expansion and contraction of the pipe line.

There are two 1-inch cored holes located on the outside of the stands (at dimension "J") for 2 to 6-inch pipe; the stands for 8-inch pipe and larger have two 1-inch cored holes located inside of the uprights (at dimension "H").



No. 271-G
Pipe Roll Stand, Complete
No. 272-G
Pipe Roll and Rod Only
No. 273-G
Pipe Roll Only

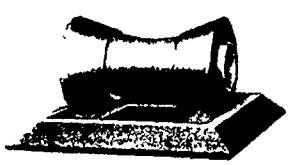



There are four cored holes located at the four corners of the stand to provide additional anchorage. Dimensions "M" and "N" show the location of these holes.

Dimensions, in Inches

| Pipe Size | A | B | C Length | D | E | F | G | H | J | K | M | N | Max. Load Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2<br>2½<br>3<br>3½ | 3½<br>3⅞<br>4⅛<br>4⅜ | 1¾ | 8⅜ | 5⅜ | 2¾ | 1⅞ | ½ | | 6⅜ | 9/16 | 3 7/16 | 4 | 390 |
| 4<br>5<br>6 | 4 13/16<br>5 7/16<br>6 1/16 | 2 1/16 | 9⅞ | 5⅝ | 3¾ | 2 1/16 | ½ | | 7⅞ | ¾ | 4 11/16 | 4¼ | 950 |
| 8<br>10 | 8 11/16<br>9 13/16 | 3 7/16 | 8⅝ | 6⅝ | 6 | 3¼ | ¾ | 4 | | ¾ | 7 | 5 | 2100 |
| 12<br>14 OD | 11⅜<br>12 | 3⅞ | 10 15/16 | 7⅞ | 8 | 4 | ⅞ | 5¾ | | ¾ | 9 1/16 | 6 | 3075 |
| 16 OD<br>18 OD<br>20 OD | 13⅝<br>14⅝<br>15⅝ | 4¼ | 12⅜ | 8⅝ | 9 | 4½ | 1⅛ | 6¾ | | ⅞ | 10¼ | 6½ | 4980 |
| 24 OD<br>30 OD | 17¾<br>21⅞ | 4⅜<br>5⅛ | 13½<br>17 | 8⅝<br>10¾ | 10<br>12½ | 4 7/16<br>5½ | 1⅜<br>1¾ | 7½<br>10 | | 1<br>1¼ | 11⅜<br>14¼ | 6½<br>8 | 7940<br>7500 |

# Pipe Roll and Plate

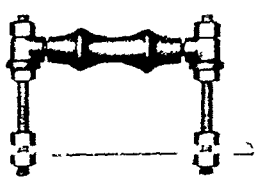


No. 277-G
Pipe Roll and Plate
No. 277 P-G
Base Plate Only

This Cast Iron Pipe Roll and Plate is used to support piping where vertical adjustment is not necessary, but where provision must be made for expansion and contraction. The supports can be raised or lowered by blocking or shimming up the base plate. They use pipe roll No. 273-G.

# Pipe Roller Supports

No. 17-C Cast Iron Adjustable Roller is used on welded steel brackets or almost any type of steel construction. It is adjustable while the pipe is in place; the nuts lock the roller in position. All sizes provide a vertical adjustment of 6 inches, and include a roll with sockets, roll rod, two vertical threaded rods, and eight nuts.

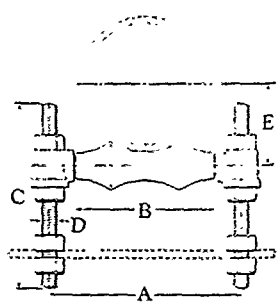


No. 17-C
Pipe Roller Support

Dimensions, in Inches

| Pipe Size | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 3 | 1½ | 9½ | ⅜ | 1 1/16 |
| 1¼ | 3⅜ | 1⅞ | 9½ | ⅜ | 1¼ |
| 1½ | 3⅝ | 2⅛ | 9½ | ⅜ | 1⅜ |
| 2 | 4⅛ | 2⅝ | 9½ | ⅜ | 1⅝ |
| 2½ | 4⅞ | 3⅛ | 9½ | ½ | 1 15/16 |
| 3 | 5½ | 3¾ | 9½ | ½ | 2¼ |
| 3½ | 6¼ | 4¼ | 10 | ⅝ | 2 9/16 |
| 4 | 6¾ | 4¾ | 10 | ⅝ | 2 13/16 |
| 5 | 8 1/16 | 5 13/16 | 10 | ⅝ | 3 7/16 |
| 6 | 9 9/16 | 6⅞ | 11 | ¾ | 4 |
| 8 | 11 15/16 | 8⅞ | 11¾ | ⅞ | 5⅛ |
| 10 | 14 1/16 | 11 | 11¾ | ⅞ | 6⅜ |
| 12 | 16 5/16 | 13 | 11¾ | ⅞ | 7 7/16 |
| 14 OD | 17¾ | 14¼ | 11¾ | ⅞ | 8⅜ |
| 16 OD | 19¾ | 16¼ | 18 | 1¼ | 9 7/16 |
| 18 OD | 21⅞ | 18¼ | 18 | 1¼ | 10½ |
| 20 OD | 24¼ | 20¼ | 18 | 1¼ | 11⅝ |
| 24 OD | 28⅝ | 24¼ | 24 | 1½ | 14 |
| 30 OD | 35½ | 30¼ | 24 | 1⅞ | 17 7/16 |

*Prices on application*

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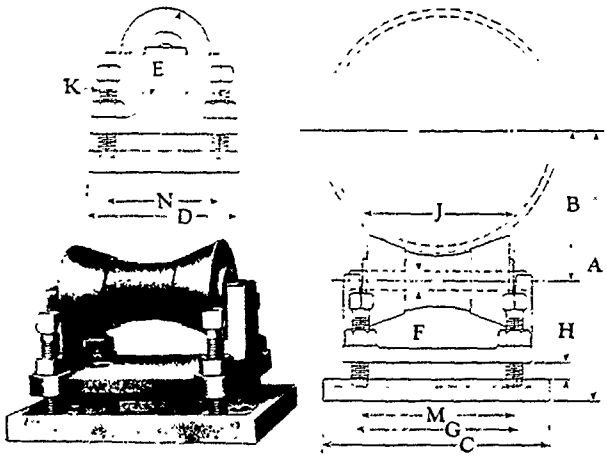
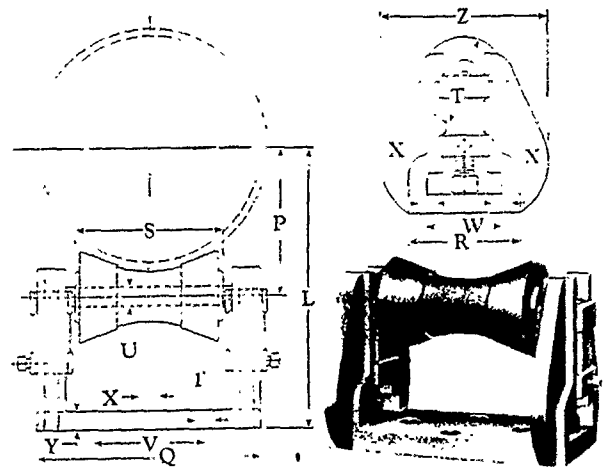
# Adjustable Pipe Roll Stands




No. 274-G, Adjustable Pipe Roll Stand with Base Plate
No. 275-G, Adjustable Pipe Roll Stand Only
No. 274 P-G, Base Plate Only




No. 276-G
Adjustable Pipe Roll Stand

**No. 274-G:** These Cast Iron Stands are designed to support piping where there must be provision for vertical adjustment and lateral movement, as well as for expansion and contraction. Vertical adjustment is obtained by the four adjusting screws. Lateral movement of 1 inch on smaller sizes, and up to 1⅜ inches on larger sizes, is accomplished by sliding the stand on the ends of the adjusting screws.

**No. 276-G:** These Cast Iron Stands are for supporting piping where vertical adjustment is needed as well as allowance for expansion and contraction. Vertical adjustment is accomplished by turning the two adjustment screws which raise and lower adjusting slides located at either end of the stand. When proper alignment is obtained, the adjusting screws may be locked by tightening the small set screws.

Dimensions, in Inches, for No. 274-G, No. 275-G, and No. 274 P-G

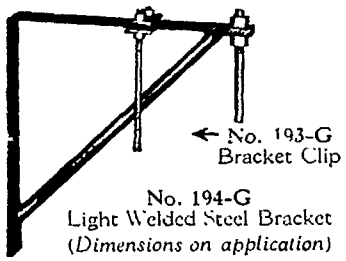
| Pipe Size | A Min. | A Max. | B | C | D | E | F | G | H (Max.) | J | K | M | N | Max. Load Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5⅛ | 5⅜ | 1¾ | 6⅞ | 5½ | 1⅞ | ½ | 3⅞ | ⅞ | 2¾ | ⅝ | 3 7/16 | 4 | 390 |
| 2½ | 5⅜ | 5⅝ | 2⅛ | | | | | | | | | | | |
| 3 | 5¾ | 6 | 2⅜ | | | | | | | | | | | |
| 3½ | 6 | 6¼ | 2⅝ | | | | | | | | | | | |
| 4 | 6½ | 7 | 2¾ | 8⅛ | 5¾ | 2 1/16 | ½ | 5⅛ | 1⅛ | 3¾ | ⅝ | 4 11/16 | 4¼ | 950 |
| 5 | 7 | 7½ | 3⅜ | | | | | | | | | | | |
| 6 | 7⅝ | 8⅛ | 4 | | | | | | | | | | | |
| 8 | 10⅜ | 11⅝ | 5¼ | 10⅝ | 6¾ | 3¼ | ¾ | 7⅜ | 1¾ | 6 | ¾ | 7 | 5 | 2100 |
| 10 | 11½ | 12¾ | 6⅜ | | | | | | | | | | | |
| 12 | 13 | 14¼ | 7½ | 13 | 8 | 4 | ⅞ | 9½ | 1¾ | 8 | ⅞ | 9 1/16 | 6 | 3075 |
| 14 OD | 13⅝ | 14⅞ | 8⅛ | | | | | | | | | | | |
| 16 OD | 15¼ | 16⅝ | 9⅜ | 14⅝ | 8⅝ | 4½ | 1⅛ | 11⅛ | 1⅞ | 9 | 1 | 10¼ | 6½ | 4980 |
| 18 OD | 16⅜ | 17¾ | 10⅜ | | | | | | | | | | | |
| 20 OD | 17⅜ | 18¾ | 11⅜ | | | | | | | | | | | |
| 24 OD | 19⅝ | 21 | 13⅜ | 15¾ | 8⅝ | 4 7/16 | 1⅜ | 12¼ | 1⅞ | 10 | 1 | 11⅜ | 6½ | 6100 |
| 30 OD | 24 | 26¾ | 16¾ | 19¼ | 10½ | 5½ | 1¾ | 15¾ | 3¼ | 12½ | 1¼ | 14¼ | 8 | 7500 |

Dimensions, in Inches, for No. 276-G

| Pipe Size | L Min. | L Max. | P | Q | R | S | T | U | V | W | X | Y | Z | Max. Load Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 7⅛ | 8⅜ | 2¾ | 7 | 6 | 3¾ | 2⅛ | ½ | 2½ | 4 | ⅞ | ¾ | 7⅛ | 950 |
| 5 | 7¾ | 9 | 3⅜ | | | | | | | | | | | |
| 6 | 8⅜ | 9⅝ | 4 | | | | | | | | | | | |
| 8 | 10⅞ | 12⅜ | 5¼ | 9½ | 6 | 6 | 3¼ | ¾ | 4½ | 4 | 1 | ⅞ | 8½ | 2100 |
| 10 | 12 | 13½ | 6⅜ | | | | | | | | | | | |
| 12 | 13½ | 15¼ | 7½ | 12 | 6 | 8 | 4 | ⅞ | 6 | 4 | 1 | 1 | 9 | 3075 |
| 14 OD | 14⅛ | 15⅞ | 8⅛ | | | | | | | | | | | |
| 16 OD | 15½ | 17⅛ | 9⅜ | 13 | 6½ | 9 | 4½ | 1⅛ | 7 | 4½ | 1 | 1 | 9⅛ | 4980 |
| 18 OD | 16½ | 18⅛ | 10⅜ | | | | | | | | | | | |
| 20 OD | 17½ | 19⅛ | 11⅜ | | | | | | | | | | | |
| 24 OD | 19⅝ | 21½ | 13⅜ | 14⅛ | 6½ | 10 | 4½ | 1⅜ | 8 | 4½ | 1 | 1 | 9⅛ | 6100 |
| 30 OD | 24¾ | 27 | 16¾ | 17¼ | 8 | 12½ | 5½ | 1¾ | 10¼ | 6 | 1 | 1¼ | 11½ | 7500 |

*Prices on application*

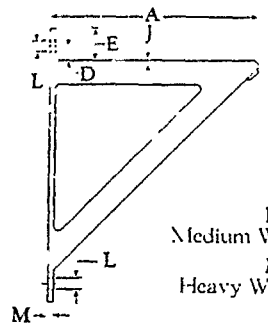
# Welded Steel Brackets

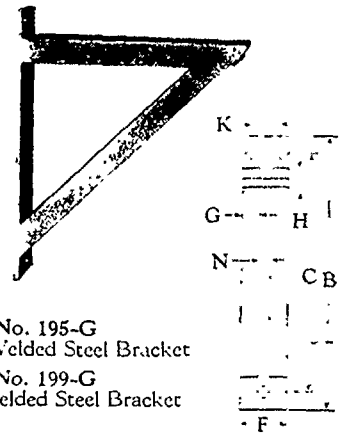



No. 194-G
Light Welded Steel Bracket
*(Dimensions on application)*

MAXIMUM LOADS
Light Weight Brackets — 750 pounds
Medium Weight Brackets—1500 pounds
Heavy Weight Brackets —3000 pounds

No. 193-G Bracket Clips will support 3½-inch pipe and smaller from any position along the arm of the bracket.




No. 195-G
Medium Welded Steel Bracket

No. 199-G
Heavy Welded Steel Bracket

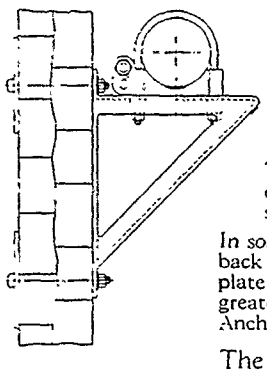
Welded steel brackets in all of the weights shown can be furnished in practically any size or type. The brackets are coated with a protective paint to prevent rusting during shipment.

Dimensions of Medium and Heavy Brackets, in Inches

| Figure No. | Bracket No. | A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 195-G | 0 | 12 | 18 | 15½ | 1¼ | 2½ | 4 | 1½ | 1½ | 3/16 | * | 13/16 | 3/8 | 1 |
| | 1 | 18 | 24 | 21½ | 1¼ | 2½ | 4½ | 1¾ | 1¾ | 3/16 | * | 13/16 | 3/8 | 1 |
| | 2 | 24 | 30 | 27½ | 1¼ | 2½ | 5 | 2 | 2 | ¼ | * | 13/16 | 3/8 | 1 |
| No. 199-G | 0 | 12 | 18 | 15¼ | 1¼ | 2¾ | 4 | 1½ | 2 | ¼ | * | 13/16 | ½ | 1 |
| | 1 | 18 | 24 | 21⅜ | 1⅜ | 2¾ | 5 | 2 | 2 | ⅜ | 2¾ | 15/16 | ½ | 1 |
| | 2 | 24 | 30 | 27½ | 1½ | 2¾ | 5 | 2 | 2½ | 5/16 | 2½ | 1 1/16 | ½ | 1 |
| | 3 | 30 | 36 | 33¼ | 1½ | 3 | 5 | 2 | 2½ | 5/16 | 2½ | 1 1/16 | ½ | 1 |
| | 4 | 36 | 42 | 39 | 1½ | 3 | 6 | 2½ | 3½ | ⅜ | 3½ | 1 1/16 | ½ | 1 |
| | 5 | 42 | 50 | 46 | 1½ | 3½ | 6 | 2½ | 3½ | ⅜ | 3½ | 1 1/16 | ½ | 1 |

*Medium Weight Brackets and No. 0 Heavy Weight Brackets have only one bolt hole at the top.

# Application of Welded Steel Brackets



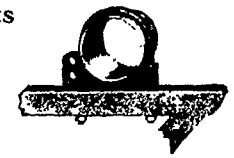
### Used with Pipe Rolls and Supports

Left: When a bracket is bolted to a wall, back plates must be ordered of such size and thickness to properly distribute the weight over the wall section.

The size and thickness of the plate will be governed by the load to be carried and the construction and condition of the wall.

In some installations, it is advisable to reinforce the back plates with additional steel in the form of a plate or angle to distribute the load over an even greater wall area. This is especially desirable when Anchor Chairs are mounted on a bracket.

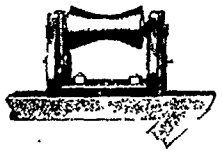
The illustrations at the right show various types of pipe supports mounted on welded steel brackets. Pipe supports and welded steel brackets must be ordered separately.



No. 197-G
Anchor Chair

No. 271-G
Pipe Roll Stand

No. 274-G
Pipe Roll Stand
with Base Plate



No. 276-G
Adjustable Pipe
Roll Stand

37

# Single Hooks

Dimensions

| Pipe Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|
| Center to center of holes | Inches | 1 27/32 | 2⅛ | 2 7/16 | 3 | 3 5/16 | 3⅞ | 4 13/16 | 5½ |
| Size of screws | | No. 14 | | | No. 18 | | | ⅜-inch | |

No. 168-G
Single Hook

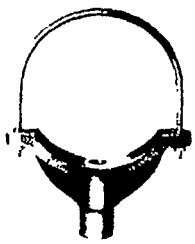
**Application:** No. 108-G Single Hooks are used mainly from sides of beams where no adjustment is necessary, and in cases where there is no movement due to expansion and contraction. Single hooks are often used in conjunction with hook plates to carry wall coil.

*Prices on application*

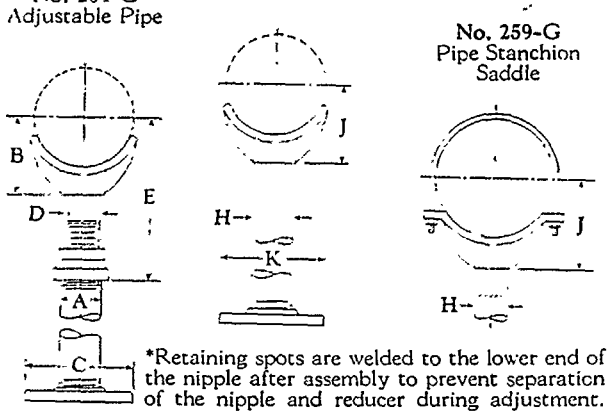
# Cast Iron Pipe Supports

*No. 264-G
Adjustable Pipe

No. 258-G
Pipe Saddle Support



No. 259-G
Pipe Stanchion
Saddle

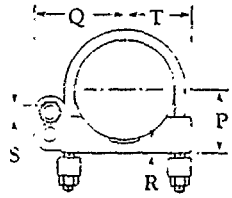



*Retaining spots are welded to the lower end of the nipple after assembly to prevent separation of the nipple and reducer during adjustment.

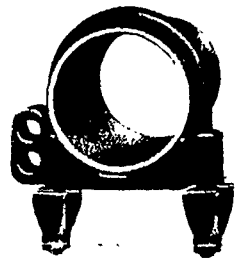
Dimensions, in Inches

| Pipe Size | No. 264-G A | B | C | D | E Min. | E Max. | No. 258-G and No. 259-G H | J | K |
|---|---|---|---|---|---|---|---|---|---|
| 2½ | 2½ | 3½ | 9 | 1½ | 8 | 13 | | | |
| 3 | 2½ | 3¾ | 9 | 1½ | 8¼ | 13¼ | | | |
| 3½ | 2½ | 4 | 9 | 1½ | 8½ | 13½ | | | |
| 4 | 3 | 4¼ | 9 | 2½ | 9¼ | 14 | 3 | 4¼ | 9 |
| 5 | 3 | 4⅞ | 9 | 2½ | 10 | 14¾ | 3 | 4⅞ | 9 |
| 6 | 3 | 5½ | 9 | 2½ | 10½ | 15¼ | 3 | 5½ | 9 |
| 8 | 3 | 6⅞ | 9 | 2½ | 11¾ | 16½ | 3 | 6⅞ | 9 |
| 10 | 3 | 8½ | 9 | 2½ | 13½ | 18¼ | 3 | 8½ | 9 |
| 12 | 3 | 10 | 9 | 2½ | 15 | 19¾ | 3 | 10 | 9 |
| 14 OD | 4 | 11 | 11 | 3 | 16¼ | 20¾ | 4 | 11 | 11 |
| 16 OD | 4 | 12½ | 11 | 3 | 17¾ | 22¼ | 4 | 12½ | 11 |
| 18 OD | 6 | 14 | 13½ | 3½ | 19½ | 24 | 4 | 14 | 11 |
| 20 OD | 6 | 15½ | 13½ | 3½ | 21 | 25½ | 6 | 15½ | 13½ |
| 24 OD | 6 | 18 | 13½ | 4 | 23¾ | 28¼ | 6 | 18 | 13½ |
| 26 OD | | | | | | | 6 | 19¼ | 13½ |
| 30 OD | 6 | 21½ | 13½ | 4 | 27 | 31½ | 6 | 21½ | 13½ |
| 32 OD | 6 | 22¾ | 13½ | 4 | 28¼ | 32¾ | 6 | 22¾ | 13½ |
| 36 OD | 6 | 24¾ | 13½ | 4 | 30¼ | 34¾ | 8 | 24¾ | 16 |

# Anchor Chairs




No. 197-G Anchor Chair



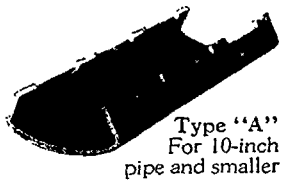
Dimensions, in Inches

| Pipe Size | P | Q | R | S | T |
|---|---|---|---|---|---|
| 4 | 3 | 4⅛ | ¾ | ⅝ | 3 3/16 |
| 5 | 3 9/16 | 5 | ¾ | ¾ | 3⅞ |
| 6 | 4 1/16 | 5¾ | ¾ | ⅞ | 4 9/16 |
| 8 | 5 5/16 | 7⅛ | 1 | 1 | 5¾ |
| 10 | 6½ | 8⅜ | 1⅛ | 1⅛ | 6 13/16 |
| 12 | 7⅝ | 9½ | 1¼ | 1¼ | 7 13/16 |
| 14 OD | 8½ | 10⅛ | 1½ | 1¼ | 8 7/16 |
| 16 OD | 9⅝ | 11½ | 1⅝ | 1½ | 9 7/16 |
| 18 OD | 10⅞ | 12½ | 1⅞ | 1½ | 10 7/16 |
| 20 OD | 12 | 13½ | 2 | 1½ | 11 7/16 |
| 24 OD | 14 | 15½ | 2 | 1½ | 13 7/16 |

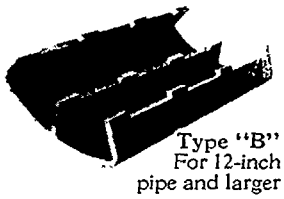
These supports consist of a cast iron chair, a round iron yoke, two special cast iron washers, and two hexagonal nuts.

These anchor chairs are well adapted for use with welded steel brackets.

# Protection Saddles



Type "A"
For 10-inch
pipe and smaller



Type "B"
For 12-inch
pipe and larger

The No. 186-G, for Standard covering, the No. 186A-G for 2-inch covering, and the No. 187-G for Double Standard covering are available in the ¾, 1, 1¼, 1½, 2, 2½, 3, 3½, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, and 24-inch sizes.

The No. 188-G for Double 1½-inch covering is made in sizes 2, 2½, 3, 3½, 4, 5, 6, 8, and 10-inch.

All saddles are 12 inches long and are made of curved steel plates with the edges turned up.

# B & C Floor and Ceiling Plates

No. 1-BC
Made in copper tube
sizes ⅜ to 3-inch.

No. 10-BC
Made in standard pipe
sizes ¼ to 6-inch.

***When ordering, specify the catalog number, the size, and the type of finish desired.***

No. 13-BC
Made in standard pipe
sizes ¼ to 6-inch.

No. 20-BC
Made in standard pipe
sizes ⅜ to 4-inch

These plates, made of pressed steel, are available with a plain or chromium-plated finish. Nos. 1-BC, 10-BC, and 20-BC hold their position on the pipe by means of springs; the No. 13-BC is equipped with a set screw. If the No. 1-BC style is desired with a set screw instead of springs, specify No. 2-BC.

***Prices on application***

Pipe Tools;
Insulating Material

# Pipe Tools and Insulating Materials

Pipe and Square-End Sawing Vises.....page 444
Pipe Wrenches and Pipe Tongs.....page 445
Pipe Cutters and Cutter Wheels.....page 446
Pipe End Reamers.....page 447
Pipe Taps.....page 447

Pipe and Bolt Threading Devices.....pages 447 to 450
Pipe Threading Machines.....pages 450 and 451
Power Vise Stand.....page 451
Thread Cutting Oil.....page 452

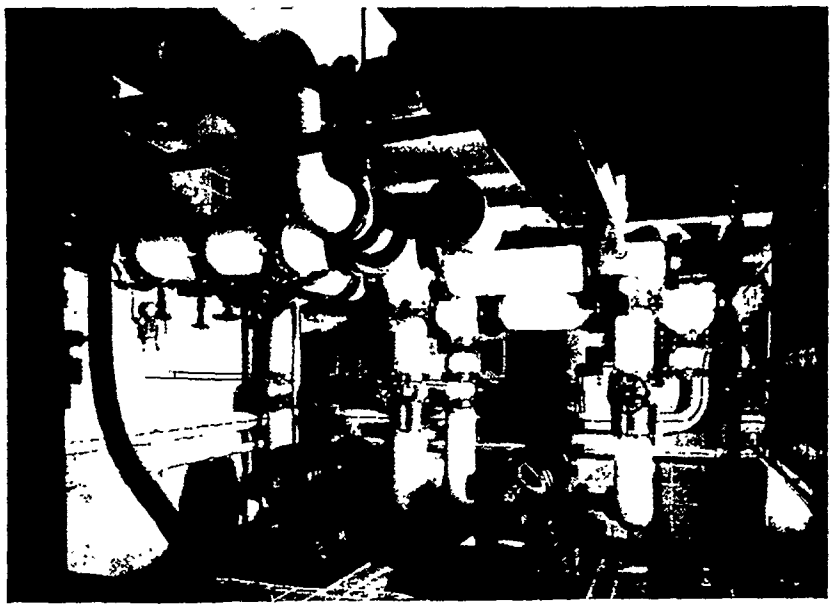
Flange-Jacks.....page 445
Fire Pots.....page 452
Flue Brushes and Scrapers.....page 452
Valve Reseating Equipment.....page 453

Insulating Materials and Cements.....pages 454 and 455
NoDrip Coating and Tape.....page 452
Air Filters.....page 456

In addition to the tools and supplies shown on pages 444 to 456, the following are shown in other sections of this catalog, in order to group them with allied products:

Body Seat Ring Wrenches.....page 137
Thread Lubricant and Compound.....page 464
Machine Bolts.....page 465
Gaskets.....pages 472 to 476, and 416
Sheet Packings.....page 473

***For Solder-Joint Accessories, see pages 426 and 427.***



Crane valves and fittings can be found in all industries, on all services, wherever fluids are conveyed in pipe lines. Illustrated is a portion of the basement piping in a large office building—Crane products were used throughout.

# Pipe Vises

## Reed Long Jaw and Extra Heavy Pipe Vises

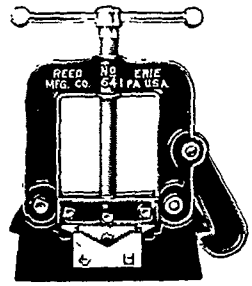
Long Jaw Vise
For 1/8 to 4½-Inch Pipe

Long Jaw Vises have long bearing alloy tool steel jaws which grip firmly without crushing, marring, or bending the pipe. The lower jaw is reversible; an automatic take-up keeps the vise tight.

Extra Heavy Vises are ruggedly built and have interlocking pipe jaws with heat-treated high carbon steel screws. The base has a flat bottom, without an apron, and can be mounted on any flat surface.

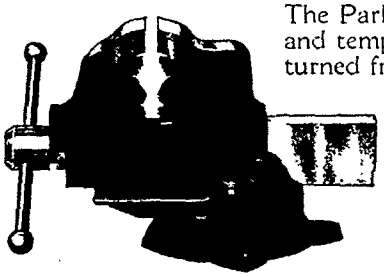
Sizes and Capacities

| No. of Vise | | Long Jaw | | | | Extra Heavy | | |
|---|---|---|---|---|---|---|---|---|
| | | No. 00 | No. 0 | No. 1 | No. 2 | No. 3 | No. 64 | No. 65 | No. 66 |
| For Pipe | Inches | 1/8 to 1½ | 1/8 to 2 | 1/8 to 2½ | 1/8 to 3½ | 1/8 to 4½ | 1/8 to 6 | 1 to 8 | 1½ to 12 |



Extra Heavy Vise
For 1/8 to 12-Inch Pipe

## Parker Combination Pipe Vises



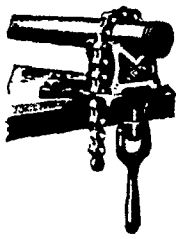
The Parker Combination Pipe Vises have pipe jaws of highest grade steel, milled and tempered in oil. They are furnished with a reversible front jaw which can be turned from end to end when worn, making the vise suitable for general use.

The Parker Vise bolts to a bench, and the split swivel base construction assures ample gripping power. A tension spring holds the handle wherever it is placed.

Sizes and Capacities

| Number of Vise | | No. 433½ | No. 434½ | No. 435 | No. 436 |
|---|---|---|---|---|---|
| Size of jaw | Inches | 3½ | 4½ | 5 | 6 |
| Maximum pipe size | Inches | 2 | 3 | 4 | 6 |

## Williams Drop-Forged Chain Pipe Vises



Vulcan
For 1/8 to 8-Inch Pipe

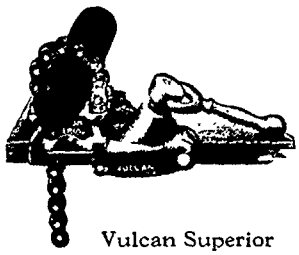
Vulcan wrought steel chain pipe vises can be used on bench or post. The jaws are tempered for file sharpening.

Vulcan Superior chain vises are made from wrought steel. They are quickly set up. The overhead adjustment feature simplifies operation. Reversible jaws provide long life.

Sizes and Capacities

| Number of Vise | | Vulcan | | | | Vulcan Superior | |
|---|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 11 | No. 12 |
| For Pipe | Inches | *1/8 to 2 | 1/4 to 4 | 1/4 to 6 | 1/4 to 8 | 1/8 to 2½ | 1/4 to 4½ |

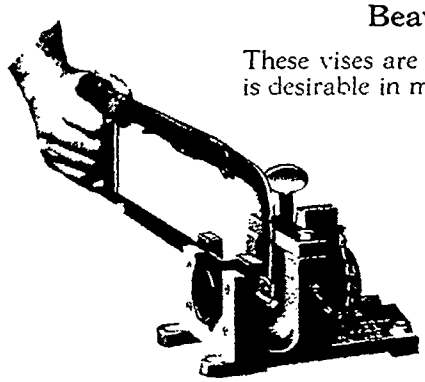
*Will grip pipe fittings not larger in diameter than Standard 2½-inch pipe (2⅞ inches O.D.).



Vulcan Superior
For 1/8 to 4½-Inch Pipe

38

## Beaver Square-End Sawing Vises



These vises are particularly well suited for copper tubing, on which a square-cut end is desirable in making a good joint. The hacksaw is not furnished with the vise.

**No. 2:** The No. 2 Square-End Vise is for pipe sizes 1/8 to 2 inches, and is made of aluminum, with renewable hardened steel inserts in the saw guides. It is self-contained, light in weight, and can be used with any kind of a hacksaw. A strip of cotton webbing and a piece of rosin are included for use when cutting polished nickel tubing. The vise is equipped with a long "V" trough for accurate centering of tubing.

**No. 4:** The No. 4 is similar to the No. 2 except that it is for tube sizes 1½ to 4 inches, and is made of air-furnace malleable iron and uses a different type clamping device.

*Prices on application*

# Pipe Wrenches

Ridgid Straight Pattern

Ridgid End Pattern—Style E

Trimo-Alloy

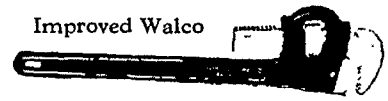
Ridgid pipe wrenches have an all-alloy housing guaranteed never to break or warp. Handles are made of steel. End pattern wrenches are designed particularly for use in close quarters.

Trimo wrenches are made of drop-forged heat-treated alloy steels. All sizes are equipped with a steel handle.

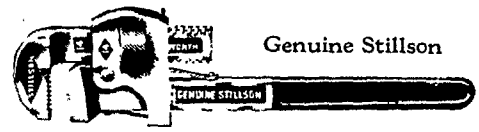
Wrench Sizes and Capacities

| Size | Pipe Capacities, in Inches | | | | |
|---|---|---|---|---|---|
| | Ridgid | | Trimo-Alloy | Genuine Stillson | Improved Walco |
| Inches | Straight Pattern | End Pattern | | | |
| 6 | 3/4 | 3/4 | 1/8-1/2 | 1/8-1/2 | 1/8-1/2 |
| 8 | 1 | 1 | 1/8-3/4 | 1/8-3/4 | 1/8-3/4 |
| 10 | 1 1/2 | 1 1/2 | 1/8-1 | 1/8-1 | 1/8-1 |
| 12 | 2 | 2 | | | |
| 14 | 2 | 2 | 1/4-1 1/2 | 1/4-1 1/2 | 1/4-1 1/2 |
| 18 | 2 1/2 | 2 1/2 | 1/4-2 | 1/4-2 | 1/4-2 |
| 24 | 3 | 3 | 1/4-2 1/2 | 1/4-2 1/2 | 1/4-2 1/2 |
| 36 | 4 1/2 | 4 1/2 | 1/2-3 1/2 | 1/4-3 1/2 | 1/4-4 |
| 48 | 6 | | 1-5 | 1-5 | 1-6 |
| 60 | 8 | | | | |

Improved Walco



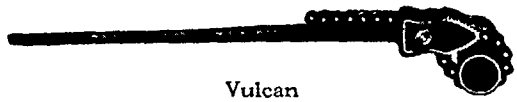
Improved Walco wrenches are designed for heavy duty work. All parts are made of forged steel. A new type spring provides reliable ratchet action.



Genuine Stillson

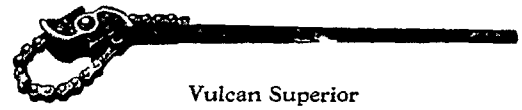
Genuine Stillson Wrenches have a forged steel handle and jaw. They are light in weight and easy to use.

# Williams Drop-Forged Chain Pipe Tongs



Vulcan

These Chain Pipe Tongs are furnished with either flat link or cable chain (flat link chain illustrated). Each flat chain is individually tested to two-thirds of the breaking strain listed in the table below.



Vulcan Superior

Vulcan Superior Pipe Tongs have reversible jaws. The chain locks easily and positively. A greater number of grips or bites on pipe and fittings is attained by a "V" recess in the jaws.

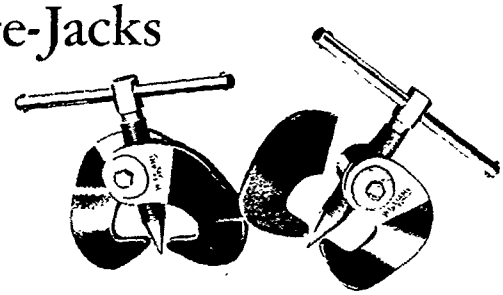
Sizes, Dimensions, and Capacities

| Vulcan No. | | | 10 | 11 | 12 | 13 | 13 1/2 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vulcan Superior No. | | | 0 | 1 | 2 | 3 | 3 1/2 | 4 | 5 | — |
| For pipe sizes | | Inches | 1/8 to 3/4 | 1/8 to 1 1/2 | 1/4 to 2 1/2 | 3/4 to 4 | 1 to 6 | 1 1/2 to 8 | 2 to 12 | 4 to 18 |
| Dimensions, in Inches | Over-all length | | 13 3/4 | 20 | 27 | 37 | 44 1/2 | 50 1/2 | 64 1/2 | 87 |
| | Length of flat chain | | 9 1/2 | 13 1/2 | 17 1/2 | 22 1/2 | 32 | 40 1/2 | 55 1/2 | 74 1/2 |
| | Length of cable chain | | | 14 1/2 | 18 | 27 | 33 1/2 | 42 | 57 | 76 |
| Breaking strain | Flat chain | Pounds | 3600 | 6700 | 9800 | 12500 | 14300 | 15700 | 21800 | 40000 |
| | Cable chain | Pounds | | 6000 | 9000 | 12500 | 14300 | 15700 | 21800 | 40000 |



# Williams Flange-Jacks

Williams Flange-Jacks are exceptionally well suited for flange gasket replacement work. Available in pairs only.



Capacities, in Inches
(Standard Raised Face Flanges)

| No. | 125-Pound Cast Iron | 150-Pound Steel | 250-Pound Cast Iron | 300-Pound Steel |
|---|---|---|---|---|
| 20 | 2 to 20 | 2 to 20 | 1 to 12 | 3/4 to 12 |
| 30 | 16 to 48 | 18 to 24 | 12 to 30 | 12 to 24 |

*Prices on application*

# Pipe Cutters and Cutter Wheels

## Nye No. 2N Pipe Cutter

For 1/8 to 2-Inch Pipe

The Nye No. 2N is a heavy duty pipe cutter of solid malleable construction. The handle is steel.

## Nye Barnes Type Pipe Cutters

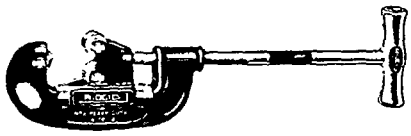
The Nye Barnes Type Pipe Cutter is furnished with three, plain edge wheels.

| No. | | 2 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| For pipe sizes | Inches | 1/8—2 | 2½—4 | 4—6 | 6—8 |

## Trimo Pipe Cutters

| No. | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| For pipe sizes | Inches | 1/8—1¼ | 1/8—2 | 1—3 | 2—4 |

## Ridgid Pipe Cutters

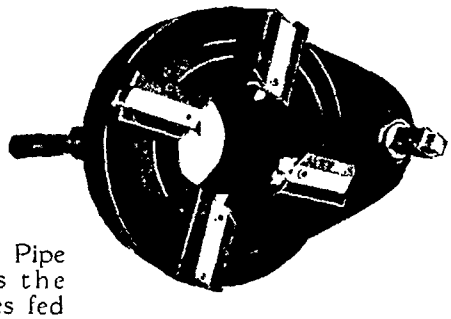


| No. | | 1 | 2 | 3 | 4 | 6 |
|---|---|---|---|---|---|---|
| For pipe sizes | Inches | 1/8—1¼ | 1/8—2 | 1—3 | 2—4 | 4—6 |

## Tubing Cutters

The Crane line of accessories for use with solder-joint valves and fittings includes tubing cutters; refer to page 427 for complete information.

## Toledo Automatic Pipe Cutter



No. 40
For 2 to 4-Inch Pipe

The No. 40 Pipe Cutter has the cutter knives fed automatically, cuts rapidly, gives a square-end cut, and can be converted into a power cutter.

## Nye Cutter Wheels

Nye cutter wheels fit all standard type pipe cutters. The wheels, of hardened and tempered alloy steel, are made with a smooth edge. When ordering, specify the number and type of cutter.

Make of Cutters Wheels Will Fit

| Wheel No. | Type | Cutter Size Number |
|---|---|---|
| 1 & 2-R | Ridgid | No. 1 or No. 2 |
| | Nye | No. 2N |
| | Oster | [1]No. 502 Power Machine |
| 3 & 4-R | Ridgid | [1]No. 3 or No. 4 |
| 1 & 2-T | Trimo | No. 1 or No. 2 |
| | Nye | Nos. 1T or 2T (Former Nos. 1A, 2A) |
| | Reed | Nos. 1R or 2R, Roller Block only |
| | Beaver | No. 102, Model A or B Machine |
| 3-T | Trimo | No. 3 |
| | Nye | No. 3T (Former No. 3A) |
| | Reed | No. 3R Roller Block only |
| 1-U | Universal | Nye No. 1 |
| 2-U | Universal | Nye No. 2 |
| 4-U | Universal | Nye No. 4 |
| 1-B[2] | Barnes | No. 1, all makes |
| | Reed | No. 1W, hook end only on No. 1R |
| 2-B[2] | Barnes | No. 2, all makes |
| | Reed | Nos. 2W, 2F, hook end only on No. 2R |
| 3-B[2] | Barnes | No. 3, all makes |
| | Reed | No. 3W, hook end only on No. 3R |
| 4-B | Barnes | No. 4, all makes |
| 5-7B | Barnes | Nos. 5, 6, 6½, or 7, all makes |
| 1-S | Saunders | [3]No. 1, all makes |
| 2-S | Saunders | [3]No. 2, all makes |
| 3 & 4-S | Saunders | [3]Nos. 3 or 4, all makes |
| 5-S | Saunders | [3]No. 5, all makes |
| N10CW | Nye | [3]No. 10 Tube Cutter |
| N20CW | Nye | [3]Nos. 20 or 30 Tube Cutters |

[1]Heavy duty wheels are available, if specified, at extra cost.
[2]When ordering pins for Reed cutters, add "H" to number.
[3]For pins, specify whether for wheel or roller.

*Prices on application*

# Pipe Taps and Reamers

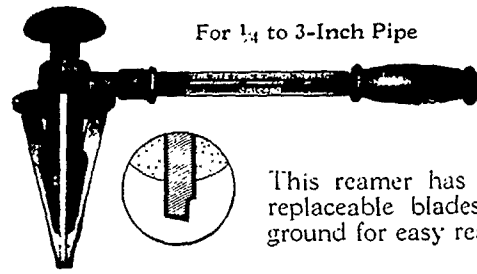
## Nye Taper Pipe Taps

For 1/8 to 2-Inch Pipe

Nye Taper Pipe Taps are made of carbon steel for pipe sizes 1/8 to 2 inches.

## Nye Ratchet Reamer

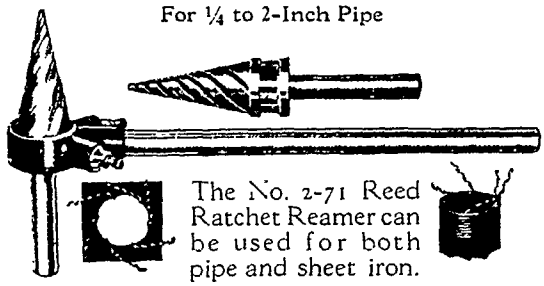
For 1/4 to 3-Inch Pipe



This reamer has alloy steel replaceable blades, specially ground for easy reaming.

## Reed Self-Feeding Ratchet Reamer

For 1/4 to 2-Inch Pipe

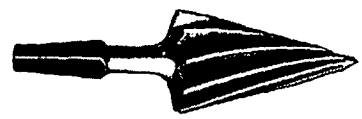


The No. 2-71 Reed Ratchet Reamer can be used for both pipe and sheet iron.

## Nye Bit Brace Reamers

Spiral Flute

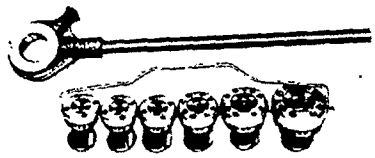
Made with taper shank to fit any standard bit brace.



| No. | | 42 | 42½ | 44 |
|---|---|---|---|---|
| For pipe sizes | Inches | 1/8 to 1 | 1/8 to 1 1/4 | 1/4 to 2 |

# Beaver Threading Devices

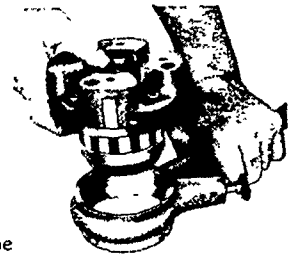
## Ratchet Pipe and Bolt Threader



No. 3
For 1/8 to 1-Inch Pipe

The No. 3 Threader is furnished with a fully enclosed ratchet. The dies can be inverted for close work.

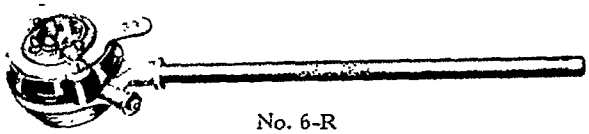
## Ratchet Pipe Threader



No. 17
For 1/8 to 2-Inch Pipe

This threader has square removable die segments which can be resharpened. Non-adjustable.

## Beaverette Ratchet Threader

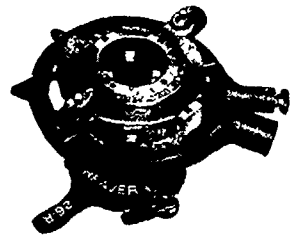


No. 6-R
For 1/4 to 3/4-Inch Pipe

The No. 6-R Threader consists of two sets of dies (1/4, 3/8-inch and 1/2, 3/4-inch) in tool, being moved in and out of working position by a simple cam arrangement. The 1/8-inch die is extra.

This threader is furnished with a smooth working chuck, right or left dies, and will cut standard, oversize, or undersize threads.

## Adjustable Ratchet Threader



No. 26-R
For 1 to 2-Inch Pipe

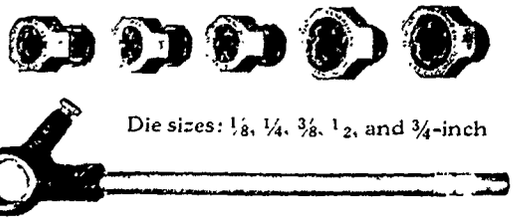
The No. 26-R Threader is fully adjustable and has the ratchet drive ring located in the head, providing straight line pull. The threader is self-contained and well balanced.

38

*Prices on application*

# Nye Threading Devices

## No. 50 Triad Ratchet Stock

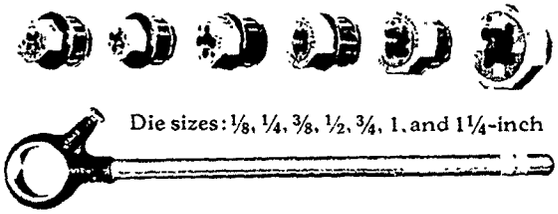



One-piece dies, locked in place by a threaded screw cap, are easy to remove when necessary.

## Triplex Solid Die Stock

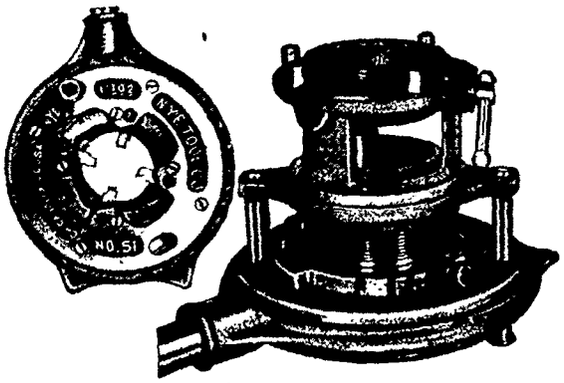
This stock is a one-piece combination stock with three dies and permanently fixed steel guides. To thread short nipples, the dies can be reversed and a nipple bushing or guide inserted between die and tap plate. Furnished in two combinations: 3/8 to 3/4-inch and 1/2 to 1-inch.

## No. 60 Triad Ratchet Stock



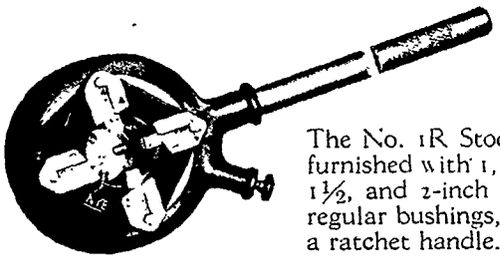

The No. 60 Stock uses the same type dies as the No. 50 above but the die heads are different.

## No. 51 Ratchet Pipe Threader




The No. 51 Ratchet Pipe Threader uses a single set of high speed dies to thread 1, 1 1/4, 1 1/2, and 2-inch pipe. A reversible guide post permits cutting taper or straight pipe threads. The spin back knob feature, (see upper left of smaller illustration) provides a rapid means of screwing the leader nut out to the starting position, at the completion of the threading operation. The unit is self-opening. It will not jam.

## No. 1R Ratchet Stock



The No. 1R Stock is furnished with 1, 1 1/4, 1 1/2, and 2-inch dies, regular bushings, and a ratchet handle.

# Ridgid Threading Devices

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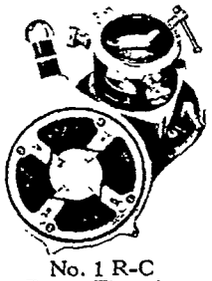
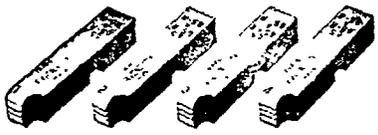


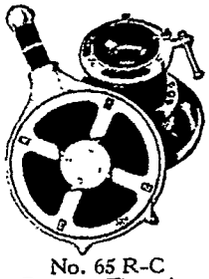
No. 1 R-C
Poster Threader
For 1, 1 1/4, 1 1/2, and 2-Inch Pipe



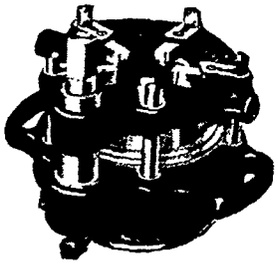
Nos. 65 and 85 Series
Chaser Dies

These Chaser Dies are made of high speed steel.

Chaser Dies (Nos. 1 and 1-R Series) are available for any Ridgid Poster Threaders.



No. 65 R-C
Ratchet Threader
For 1, 1 1/4, 1 1/2, and 2-Inch Pipe



No. 4-P
Ratchet Threader
For 2 1/2 to 4-Inch Pipe

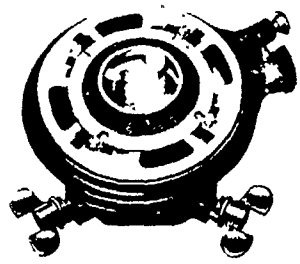
*Prices on application*

# Toledo Threading Devices

## Simpact Threader

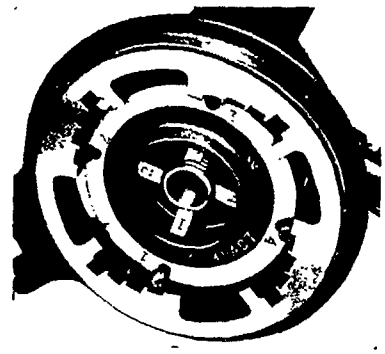
### For 1 to 2-Inch Pipe

*Quick, easy changes. Simply push in the dies—then slip them in the proper steps.*



Simpact Ratchet Threader

***A compact, all-in-one tool, adjustable for over, under, or standard size threads.***

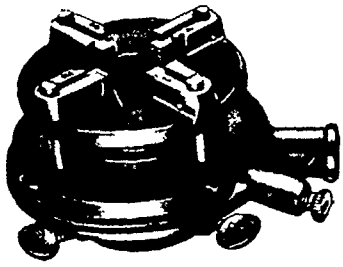


*No waste. Oil collects in the pockets; drips on the dies as the tool revolves.*

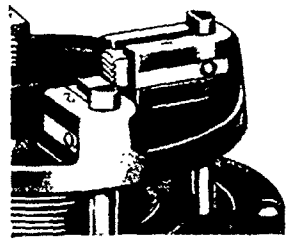
The Simpact Threader is a self-contained tool with one set of fine grade, high speed steel dies, which, through a simple adjustment, threads all four sizes. The dies can be reground when necessary. Three large winghead thumb screws, graduated guide posts, and broad-face chuck jaws simplify centering of pipe.

## Adjustable Threaders

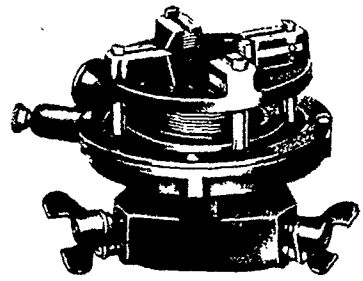
### For 1 to 2-Inch Pipe



No. 1R
Ratchet Tool



*Toledo Taper-Pin principle assures smooth, perfectly tapered threads.*



No. 1 BR
Ratchet Tool

Adjustable Threaders feature the "taper-pin" principle of operation. Adjustments are easy and quick. Dies cut smoothly assuring perfectly tapered threads.

No. 1R, light in weight, uses bushings to center the tool on the pipe. The unit includes separate right hand dies for each size pipe, and one handle.

No. 1BR uses three broad-face chuck jaws and graduated guide posts to center the tool. Separate right hand dies for each size pipe, and one handle, are included.

## Geared Adjustable Threaders

### For 2½ to 4-Inch Pipe

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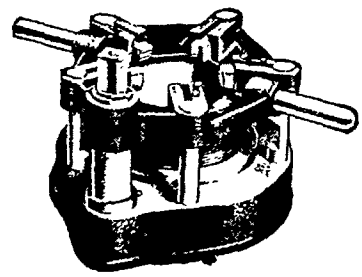
These Geared Adjustable Threaders are sturdy and strong, yet easily handled by one man, to provide smooth, perfectly tapered threads.

These tools can be converted into power threaders with installation of a Toledo Power Drive.

No. 2 Threader, illustrated at the right, uses bushings to center the pipe and threads 2½ to 4-inch pipe.

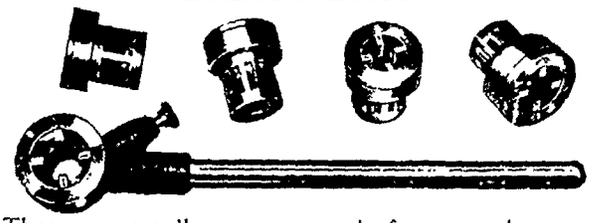
No. 2BR Threader is of the same design as the No. 2 except that it has three broad-face chuck jaws and graduated guide posts in place of bushings. Both the No. 2 and No. 2 BR use a separate set of dies for each size pipe.



***Prices on application***

# Toledo Threading Devices

## Ratchet Threaders

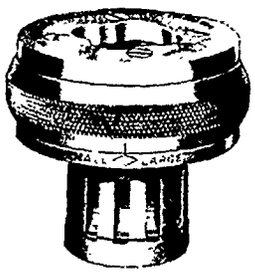


These are small, compact tools for general use or where space is restricted. Quick changes from one size to another are effected simply by pulling out the ratchet pawl, dropping out the head, and setting in another. A separate die head and set of dies are furnished for each pipe size.

No. 00: Capacity, 1/8 to 3/4-inch pipe.
No. 11: Capacity, 1/8 to 1 1/4-inch pipe.
No. 12: Capacity, 1/8 to 2-inch pipe.

## Adjustable Die Heads
### For Bolts and Pipe

These adjustable die heads may be used in the No. co ratchet handle die stock. They have standard bolt threads with an over or under adjustment of 1/64 of an inch.



The die heads have ample chip clearance.

No. 101R: Capacity, 1/4 to 5/8-inch bolts.

No. 102R: Capacity, 3/4, 7/8, and 1-inch bolts.

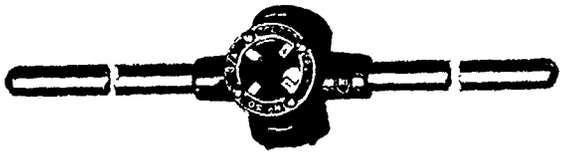
## Adjustable Bolt Stocks and Dies

Segmental dies move in and out by a turn of the knurled sizing ring, allowing quick setting for deep, shallow, or standard threads. Each die takes a proportional share of the work and may be reground.

No. 101: Available as a single unit consisting of a stock, one size die, and guide, or as a set consisting of seven full-mounted stocks and dies (1/4, 5/16, 3/8, 7/16, 1/2, 9/16, and 5/8-inch) in a metal box.

No. 102: Similar to the No. 101 except it is larger (3/4, 7/8, and 1-inch). Can be furnished either full mounted for instant use or with one stock and necessary dies and guides in sizes desired.

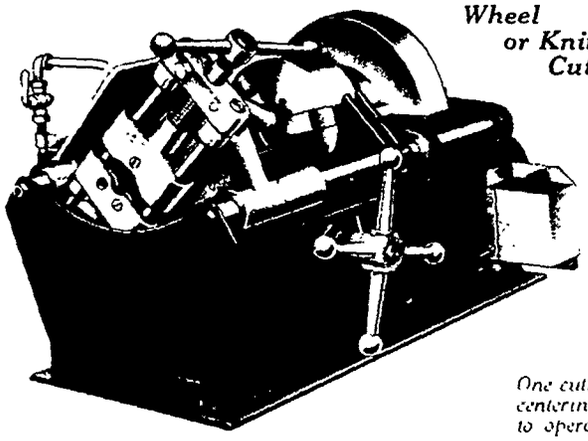
## Three-Way Threaders



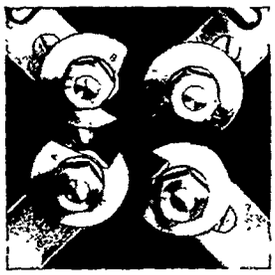
Toledo Three-Way Threaders are small and compact, with dies that can be reground when dull.

No. 30: This threader is used on 3/8 to 3/4-inch pipe.
No. 31: This threader is used on 1/2 to 1-inch pipe.

# Toledo No. 999 Power Pipe Machine



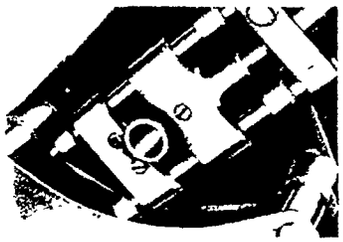
*Wheel or Knife Cut-Off*



*Four cutting knives perform simultaneously and smoothly.*

*Quick-acting, all-steel, hinged type die heads.*

*One cutter wheel and two rollers. Self-centering. Fed by one hand wheel. Easy to operate. All parts are replaceable.*



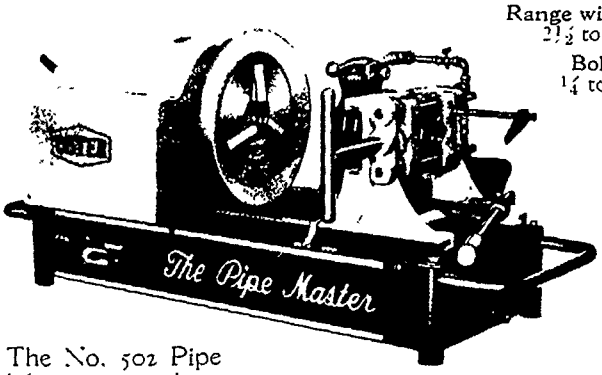
**Toledo No. 999 Super Model** cuts, threads, and reams 1/2 to 2-inch pipe and will thread 3/8 to 1 1/2-inch bolts. The die heads are the quick-opening, hinged type; mounted vertically on the cutter head, they permit instant change of sizes. The reversible type motor automatically adjusts its speed to the load. All controls are in the forward and reversing switch.

***Prices on application***

# Oster Portable Power Pipe Machines

## No. 502 Pipe Master

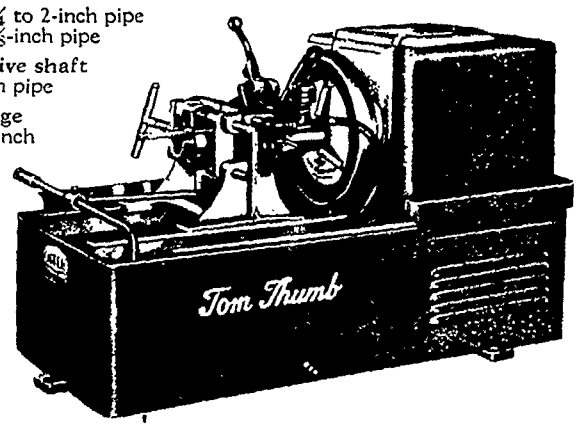
Standard range....¼ to 2-inch pipe
Extra range.....⅛-inch pipe
Range with drive shaft
2½ to 8-inch pipe
Bolt range
¼ to 1½-inch




The No. 502 Pipe Master, a low priced, ruggedly constructed, attractively designed portable pipe machine, saves production time and production costs. The Pipe Master reams, threads, and cuts off pipe in one chucking operation. Its quick-opening, adjustable die-head is the stationary type; an opening at the top of the machine permits viewing the thread as it is cut. A new, patented "Auto-Grip" front chuck speeds up operation and eliminates the use of a chuck bar or wrench. The roller type, self-centering cutter, detachable reamer, and Universal centering rear chuck all contribute to maximum efficiency.

Standard equipment also includes: a Universal motor, geared head type, 110 volts, either A.C. single phase or D.C.; four sets of carbon steel dies to cover the standard pipe range; reversing switch; reversible oil pump with relief valve; gauge for thread length; and five gallons of Oster oil.

## No. 582 Tom Thumb




The No. 582 Tom Thumb Portable features a ball-bearing mounted spindle and a worm drive rendering it capable of production speeds suitable for almost any requirement. Types N and W stationary die-heads accommodate pipe sizes up to ¾-inch and 1 to 2-inch respectively. The patented "Auto-Grip" chuck eliminates the use of a chuck bar or wrench. The roller type, self-centering cutter, detachable reamer, and Universal centering rear chuck simplify operation and assure long, dependable service.

Standard equipment also includes: a Universal variable speed motor, 110 volts, either A.C. single phase or D.C.; four sets of carbon steel and high speed steel dies to cover the standard pipe range; reversing switch; reversible oil pump with relief valve; gauge for thread length; and five gallons of Oster oil.

# Oster Power Vise Stand

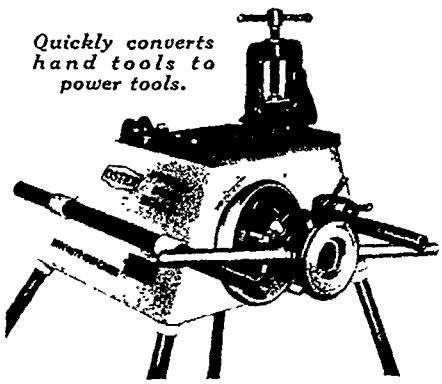
The No. 422 Power Vise Stand with new "Auto-Grip" chuck outmodes old style vise stands. It quickly converts regular die-stocks, cutters, and reamers to more efficient, easy-to-use power tools.

The universal, quick-acting "Auto-Grip" front chuck provides a positive gripping action; no bar or T-wrench is necessary. The chuck is revolved by a reversible power unit mounted and protected from damage within a welded steel case. The universal centering rear chuck instantly lines up all pipe sizes within the range of the machine.

Motor gears are ball-bearing mounted. The spindle gear is hardened steel; the spindle, semi-steel. Two carrying arms, one on each side of the machine, provide easy portability and assure absolute centering of the die-stock during threading operations.

Standard equipment includes: the Universal, geared head, 110 volt motor, either A.C. single phase or D.C.; reversing switch; "Auto-Grip" front chuck; universal centering rear chuck; two carrying arms; two feet for the front legs; universal plate for mounting the pipe vise; and one quart of Oster oil. Legs, vise, and pipe tools, not included, are available at extra cost.

*Quickly converts hand tools to power tools.*

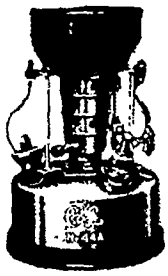


No. 422
Power Vise Stand
With "Auto-Grip" Chuck

Standard range.....⅛ to 2-inch pipe
Range with drive shaft...2½ to 8-inch pipe

*Prices on application*

# Clayton & Lambert Coiltrol Fire Pot



No. 44A
Fire Pot

The No. 44 A Fire Pot is easy to start and simple to operate.

The detachable coil unit has a flame control device which allows the powerful flame to be varied in size and volume.

A pot of metal can be rapidly melted, and then, by adjusting the flame control valve, be held at the desired temperature, thus saving gasoline and metal.

The No. 44 A is designed to handle a full 6-inch metal pot; its capacity is one gallon. If the fire pot is to be used to burn kerosene, orders should so specify; a different type burner jet will be furnished.

*For torches, see page 426.*

# Stuart's Thred-Kut Oil

Thred-Kut, a high grade cutting oil, flows freely at low temperatures. Makes dies last longer. Available in 1 gallon cans, 5 gallon pails, or in 15, 30, and 55 gallon drums.

Also available are Stuart's Plumbers' and Extra Winter Strain Lard Oil Compounds.

# Mortell NoDrip Coating and Tape

NoDrip Coating
Prevents dripping caused by sweating and condensation. Apply to almost any surface

NoDrip Tape
Forms a tight fitting, sealed jacket. Quickly stops condensation drip from cold water pipes, valves, or fittings.

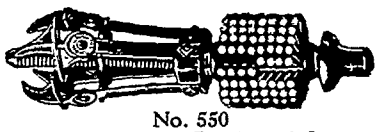
***NoDrip Coating,*** an easy flowing plastic, effectively prevents condensation dripping and corrosion. It eliminates sweating on industrial equipment, blower pipes, air ducts, and cyclones as well as on pipes and tanks. Vermin-proof, moisture-proof, and odorless, it is widely used in industrial plants, warehouses, railroads, etc.

Apply the coating to practically any clean surface, painted or unpainted. No primer is needed unless the coating is used on severely rusted or pitted metal, or on concrete, wood, and other absorbent-like material. In such cases, the primer prevents suction and rapid drying.

Available in 1, 5, and 55 gallon containers.

***NoDrip Tape*** is used on valves, fittings, and small diameter pipe. Quickly stops condensation drip. Prevents rust and corrosion. Simply wrap the tape around the pipes and joints. Available in rolls; one roll covers approximately ten feet of ½-inch pipe.

# Pilley Flue Brushes and Scrapers

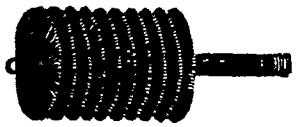


No. 550
Combination Flue Brush and Scraper

Adjustable claws scrape off hard dirt; brush sweeps out remaining deposit. For 2 to 4-inch flues.

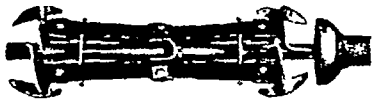
No. 585
Flat Steel Wire, Single Spiral Brush

A sturdy type brush that fits all size flues from 1 to 6-inch.



No. 589
Round Steel Wire, Single Spiral Brush

A highly efficient brush. Fits all size flues from 1 to 6-inch.

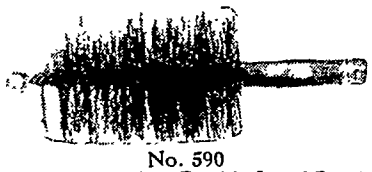


No. 570
Engineers' Favorite Flue Scraper

Malleable iron claws mounted on spring steel arms. Ajustable scrapers clean 2 to 4-inch flues.

No. 555
Expansion Flue Brush

For hard deposits. Made of flat steel wire for 1½ to 9-inch flues.



No. 590
Round Steel Wire, Double Spiral Brush

A well built brush designed to fit any size flue, 1 to 6-inch.

***Prices on application***

# Drilling Templates; Bolts; Lubricants; Flange Facings; Gaskets

# Templates for Drilling, Bolts, Thread Lubricants, Flange Facings, Gaskets, and Galvanizing

Templates for Drilling
Brass and Bronze....page 458
Iron....pages 459 and 460
Steel....pages 461 to 463

Thread Lubricant and Thread Compound....page 464
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Machine Bolts....page 465
Triplex and Templex Steel Bolt-Studs....pages 466 and 467

Bolting on Companion Flanges....page 457
Wooden Flange Protectors....page 457

Special Facings for Flanges, Valves, and Fittings....pages 468 to 471
Gaskets for Iron, Brass, Bronze, and Steel Flanged Joints...pages 472 to 476
Ring Gaskets for Unions....page 476

Sheet Packing; Cranite and C. C. Rubber....page 473
Galvanizing Steel Flanged Fittings and Flanges....page 476

This section is devoted to a variety of subjects, not wholly related, but having in common the fact that they apply to nearly all Crane products and are referred to frequently. In addition, other sections of this catalog include data on subjects of a somewhat similar nature, but more specialized or technical in character. Among these are found the following:

Normal Engagement Between Male and Female Threads....page 494
Threaded Pipe Joints....page 495
Flange Finishes....pages 510 and 511

Crane Bolting, Engineering Data on....pages 524 and 525
Assembly and Maintenance of Flanged Joints....page 526
Taps and Drains for Flanged Fittings....page 578
Taps and Drains for Flanged Valves....page 579

Pipe and Fabricated Piping....pages 477 to 522
Engineering Data....pages 523 to 580
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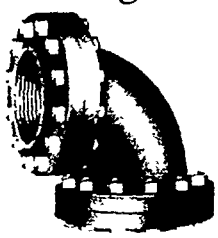
## Bolting on Companion Flanges



Orders for valves, fittings, or other products with companion flanges bolted on should indicate: the catalog number of the flange; if necessary, style of facing on flanges; kind of bolts or bolt studs; and kind of gasket, if gaskets are required. *Unless otherwise ordered, female faced companion flanges will be used when male faced valves and fittings are desired.* The labor involved in bolting on flanges entails an added charge: refer to the Crane Discount Sheet.

## Wooden Flange Protectors

Damaged flange faces may make it difficult or impossible to make up tight joints. Wooden protectors are a worthwhile investment, offering ample protection to flange faces while in transit and prior to installation. In addition, in the case of valves, they keep out foreign matter that might otherwise injure the seating surfaces. For complete information on protectors for the ends of valves and fittings, refer to the Crane Discount Sheet.

# Templates for Drilling

## Brass and Bronze Flanged Valves and Flanges

### 150-Pound MSS Standard

Dimensions agree with MSS 150-Pound Corrosion-Resistant Flange Standard, No. SP-42-1951

This Standard is known as MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). It was developed and adopted as "Standard Practice" by the Manufacturers' Standardization Society of the Valve and Fittings Industry.

The flange diameter, bolt circle, and number and diameter of bolts are the same as for the Class 125 Cast Iron and 150-Pound Steel American Standards, but the thickness and facing of the flanges are different.

| Size | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|
| Inches | Diameter of Flange | Thickness of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts | Length of Bolts | Length of Bolt-Studs with 2 Nuts |
| 1/2 | 3 1/2 | 5/16 | 2 3/8 | 4 | 1/2 | 1 1/4 | 1 7/8 |
| 3/4 | 3 7/8 | 11/32 | 2 3/4 | 4 | 1/2 | 1 1/2 | 1 7/8 |
| 1 | 4 1/4 | 3/8 | 3 1/8 | 4 | 1/2 | 1 1/2 | 2 |
| 1 1/4 | 4 5/8 | 13/32 | 3 1/2 | 4 | 1/2 | 1 1/2 | 2 |
| 1 1/2 | 5 | 7/16 | 3 7/8 | 4 | 1/2 | 1 1/2 | 2 1/8 |
| 2 | 6 | 1/2 | 4 3/4 | 4 | 5/8 | 1 3/4 | 2 1/2 |
| 2 1/2 | 7 | 9/16 | 5 1/2 | 4 | 5/8 | 2 | 2 5/8 |
| 3 | 7 1/2 | 5/8 | 6 | 4 | 5/8 | 2 | 2 3/4 |
| 3 1/2 | 8 1/2 | 11/16 | 7 | 8 | 5/8 | 2 1/4 | 2 7/8 |
| 4 | 9 | 11/16 | 7 1/2 | 8 | 5/8 | 2 1/4 | 2 7/8 |
| 5 | 10 | 3/4 | 8 1/2 | 8 | 3/4 | 2 1/2 | 3 1/4 |
| 6 | 11 | 13/16 | 9 1/2 | 8 | 3/4 | 2 1/2 | 3 3/8 |
| 8 | 13 1/2 | 15/16 | 11 3/4 | 8 | 3/4 | 2 3/4 | 3 5/8 |
| 10 | 16 | 1 | 14 1/4 | 12 | 7/8 | 3 1/4 | 4 1/8 |
| 12 | 19 | 1 1/16 | 17 | 12 | 7/8 | 3 1/4 | 4 1/4 |

### 300-Pound MSS Standard

This Standard is known as MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1946). It was developed and adopted as "Standard Practice" by the Manufacturers' Standardization Society of the Valve and Fittings Industry.

The flange diameter, bolt circle, and number and diameter of bolts are the same as for the Class 250 Cast Iron and 300-Pound Steel American Standards, but the thickness and facing of the flanges are different.

| Size | Dimensions, in Inches | | | | | | |
|---|---|---|---|---|---|---|---|
| Inches | Diameter of Flange | Thickness of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts | Length of Bolts | Length of Bolt-Studs with 2 Nuts |
| 1/2 | 3 3/4 | 1/2 | 2 5/8 | 4 | 1/2 | 1 3/4 | 2 1/4 |
| 3/4 | 4 5/8 | 17/32 | 3 1/4 | 4 | 5/8 | 2 | 2 1/2 |
| 1 | 4 7/8 | 19/32 | 3 1/2 | 4 | 5/8 | 2 | 2 5/8 |
| 1 1/4 | 5 1/4 | 5/8 | 3 7/8 | 4 | 5/8 | 2 | 2 3/4 |
| 1 1/2 | 6 1/8 | 11/16 | 4 1/2 | 4 | 3/4 | 2 1/4 | 3 1/8 |
| 2 | 6 1/2 | 3/4 | 5 | 8 | 5/8 | 2 1/4 | 3 |
| 2 1/2 | 7 1/2 | 13/16 | 5 7/8 | 8 | 3/4 | 2 1/2 | 3 3/8 |
| 3 | 8 1/4 | 29/32 | 6 5/8 | 8 | 3/4 | 2 3/4 | 3 1/2 |
| 3 1/2 | 9 | 31/32 | 7 1/4 | 8 | 3/4 | 3 | 3 5/8 |
| 4 | 10 | 1 1/16 | 7 7/8 | 8 | 3/4 | 3 | 3 7/8 |
| 5 | 11 | 1 1/8 | 9 1/4 | 8 | 3/4 | 3 1/4 | 4 |
| 6 | 12 1/2 | 1 3/16 | 10 5/8 | 12 | 3/4 | 3 1/4 | 4 1/8 |
| 8 | 15 | 1 3/8 | 13 | 12 | 7/8 | 3 3/4 | 4 3/4 |

* * * * *

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**Facing:** All 150 and 300-Pound flange faces are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

**Diameter of port:** The diameter of the port on 150 and 300-Pound Flanged Valves is the same as the pipe size (nominal).

**Bolt holes:** Bolt holes are drilled 1/8-inch larger than the diameter of the bolt.

The bolt holes are in multiples of four, so that valves or fittings can be turned to face in any quarter when being installed. They are drilled to straddle the center line unless otherwise ordered.

**Spot facing:** The bolt holes in Crane brass and bronze flanged valves and flanges are not regularly spot faced.

**Gaskets:** Full face gaskets should be used. For list prices, dimensions, and description of gaskets, see page 472.

When brass or bronze flanged material is bolted to iron or steel flanges that normally have a raised face, the raised face should be removed to provide a full face bearing for the gasket.

Brass or bronze flanged material should not be bolted to Cranelap flanged pipe joints.

# Templates for Drilling

## 25-Pound and 125-Pound Cast Iron

Dimensions, in Inches

| Size | 25-Pound Cast Iron: Diameter of Flange | Thickness of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts | Length of Bolts X | Length of Bolts Y | 125-Pound Cast Iron: Diameter of Flange | Thickness of Flange | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolts | Length of Bolts | Length of Bolt-Studs with 2 Nuts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | 4¼ | 7/16 | 3⅛ | 4 | ½ | 1¾ | |
| 1¼ | | | | | | | | 4⅝ | ½ | 3½ | 4 | ½ | 2 | |
| 1½ | | | | | | | | 5 | 9/16 | 3⅞ | 4 | ½ | 2 | |
| 2 | 6 | ½ | 4¾ | 4 | ⅝ | 1¾ | 2 | 6 | ⅝ | 4¾ | 4 | ⅝ | 2¼ | |
| 2½ | 7 | 9/16 | 5½ | 4 | ⅝ | 2 | 2 | 7 | 11/16 | 5½ | 4 | ⅝ | 2½ | |
| 3 | 7½ | ⅝ | 6 | 4 | ⅝ | 2 | 2¼ | 7½ | ¾ | 6 | 4 | ⅝ | 2½ | |
| 3½ | 8½ | 11/16 | 7 | 8 | ⅝ | 2¼ | 2¼ | 8½ | 13/16 | 7 | 8 | ⅝ | 2¾ | |
| 4 | 9 | ¾ | 7½ | 8 | ⅝ | 2¼ | 2½ | 9 | 15/16 | 7½ | 8 | ⅝ | 3 | |
| 5 | 10 | ¾ | 8½ | 8 | ⅝ | 2¼ | 2½ | 10 | 15/16 | 8½ | 8 | ¾ | 3 | |
| 6 | 11 | ¾ | 9½ | 8 | ⅝ | 2¼ | 2½ | 11 | 1 | 9½ | 8 | ¾ | 3¼ | |
| 8 | 13½ | ¾ | 11¾ | 8 | ⅝ | 2¼ | 2¾ | 13½ | 1⅛ | 11¾ | 8 | ¾ | 3½ | |
| 10 | 16 | ⅞ | 14¼ | 12 | ⅝ | 2½ | 3 | 16 | 1 3/16 | 14¼ | 12 | ⅞ | 3¾ | |
| 12 | 19 | 1 | 17 | 12 | ⅝ | 2¾ | 3 | 19 | 1¼ | 17 | 12 | ⅞ | 3¾ | |
| 14 | 21 | 1⅛ | 18¾ | 12 | ¾ | 3¼ | 3½ | 21 | 1⅜ | 18¾ | 12 | 1 | 4¼ | |
| 16 | 23½ | 1⅛ | 21¼ | 16 | ¾ | 3¼ | 3½ | 23½ | 1 7/16 | 21¼ | 16 | 1 | 4½ | |
| 18 | 25 | 1¼ | 22¾ | 16 | ¾ | 3½ | 3¾ | 25 | 1 9/16 | 22¾ | 16 | 1⅛ | 4¾ | |
| 20 | 27½ | 1¼ | 25 | 20 | ¾ | 3½ | 4 | 27½ | 1 11/16 | 25 | 20 | 1⅛ | 5 | |
| 24 | 32 | 1⅜ | 29½ | 20 | ¾ | 3¾ | 4¼ | 32 | 1⅞ | 29½ | 20 | 1¼ | 5½ | |
| 30 | 38¾ | 1½ | 36 | 28 | ⅞ | 4¼ | | 38¾ | 2⅛ | 36 | 28 | 1¼ | 6¼ | |
| 36 | 46 | 1⅝ | 42¾ | 32 | ⅞ | 5 | | 46 | 2⅜ | 42¾ | 32 | 1½ | 7 | |
| 42 | 53 | 1¾ | 49½ | 36 | 1 | 5¼ | | 53 | 2⅝ | 49½ | 36 | 1½ | 7½ | |
| 48 | 59½ | 2 | 56 | 44 | 1 | 5½ | | 59½ | 2¾ | 56 | 44 | 1½ | 7¾ | |
| 54 | 66¼ | 2¼ | 62¾ | 44 | 1 | 5¾ | | 66¼ | 3 | 62¾ | 44 | 1¾ | | 10½ |
| 60 | 73 | 2¼ | 69¼ | 52 | 1⅛ | 6 | | 73 | 3⅛ | 69¼ | 52 | 1¾ | | 10¾ |
| 72 | 86½ | 2½ | 82½ | 60 | 1⅛ | 6¼ | | 86½ | 3½ | 82½ | 60 | 1¾ | | 11½ |
| 84 | 99¾ | 2¾ | 95½ | 64 | 1¼ | 7¼ | | 99¾ | 3⅞ | 95½ | 64 | 2 | | 12¾ |
| 96 | 113¼ | 3 | 108½ | 68 | 1¼ | 7¾ | | 113¼ | 4¼ | 108½ | 68 | 2¼ | | 14 |

**Length of Bolts**

*X*— Valve to valve.

*Y*— Valve to screwed companion flange, or
Valve to special 125-pound fitting with 25-pound drilling.

**25-Pound Cast Iron:** In sizes 4-inch and larger, the 25-Pound templates for drilling conform to the American Tentative Standard for Cast Iron Pipe Flanges and Flanged Fittings for 25 pounds steam working pressure (B16b2-1031). In sizes 3½-inch and smaller, they are Crane Standard, proportioned from the American Tentative Standard.

**125-Pound Cast Iron:** The 125-Pound templates for drilling conform to the American Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125 (B16.1-1048).

**Facing:** 25-Pound Flanges and 125-Pound Flanges are plain faced with a smooth finish.

**Diameter of port:** The diameter of the port on 25-Pound and 125-Pound Flanged Valves and Fittings is the same as the pipe size (nominal).

**Bolt holes:** For bolts smaller than 1¾-inch diameter, bolt holes are drilled ⅛-inch larger than the diameter of the bolt.

For bolts 1¾-inch diameter and larger, the bolt holes are drilled ¼-inch larger than the diameter of the bolt.

Drilling templates are in multiples of four, so that valves or fittings may be turned to face in any quarter when being installed.

Bolt holes are drilled to straddle the center line unless otherwise ordered.

**Spot facing:** Bolt holes are not spot faced except on 125-Pound Cast Iron Flanged Fittings sizes 18 to 22-inch inclusive unless so ordered. An extra charge is made for spot facing.

# Templates for Drilling

## 250-Pound and 800-Pound Hydraulic Cast Iron

**250-Pound Cast Iron:** The 250-Pound templates for drilling conform to the American Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 250 (B16b-1944).

These templates apply also to 500-Pound W.O.G. Ferrosteel Double Disc Gate Valves.

The flanges have a 1/16-inch raised face. The thickness of flange dimension (dimension "C") includes the 1/16-inch raised face.

In sizes 24-inch and smaller, except for the diameter of the raised face (dimension "D"), these templates are the same as for the 300-Pound Steel American Standard.

**800-Pound Hydraulic Cast Iron:** The 800-Pound Hydraulic templates for drilling conform to the American Standard for Cast Iron Pipe Flanges and Flanged Fittings for a maximum non-shock hydraulic working pressure of 800 pounds at ordinary air temperatures (B16b1-1931).

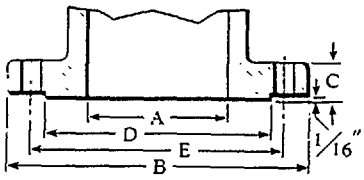
800-Pound W.O.G. Valves are regularly furnished with a 1/4-inch high large male facing on the flanges. The thickness of flange dimension (dimension "C") does not include the 1/4-inch male facing.

Except for flange thickness and length of bolts, these templates are the same as for the 600-Pound Steel American Standard.

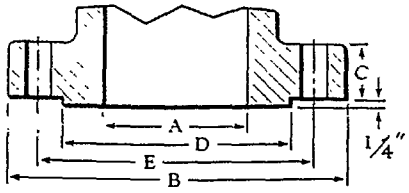
**Bolt holes:** For bolts smaller than 1 3/4-inch diameter, bolt holes are drilled 1/8-inch larger than the diameter of the bolt. For bolts 1 3/4-inch diameter and larger, bolt holes are drilled 1/4-inch larger than the diameter of the bolt.

Drilling templates are in multiples of four, so that valves or fittings may be turned to face in any quarter when being installed. Bolt holes straddle the center line unless otherwise ordered.

**Spot facing:** Bolt holes are not spot faced unless so ordered; an extra charge is made.




250-Pound Cast Iron




800-Pound Hydraulic Cast Iron

### Dimensions, in Inches

| | Size | A For valve or fitting | B | C | D | E | No. of bolts | Dia. of bolts | Length of bolts See Note X | Length of bolt-studs with 2 nuts See Note X |
|---|---|---|---|---|---|---|---|---|---|---|
| 250 Pound Cast Iron | 1 | 1 | 4 7/8 | 11/16 | 2 11/16 | 3 1/2 | 4 | 5/8 | 2 1/2 | |
| | 1 1/4 | 1 1/4 | 5 1/4 | 3/4 | 3 1/16 | 3 7/8 | 4 | 5/8 | 2 1/2 | |
| | 1 1/2 | 1 1/2 | 6 1/8 | 13/16 | 3 9/16 | 4 1/2 | 4 | 3/4 | 2 3/4 | |
| | 2 | 2 | 6 1/2 | 7/8 | 4 3/16 | 5 | 8 | 5/8 | 2 3/4 | |
| | 2 1/2 | 2 1/2 | 7 1/2 | 1 | 4 15/16 | 5 7/8 | 8 | 3/4 | 3 1/4 | |
| | 3 | 3 | 8 1/4 | 1 1/8 | 5 11/16 | 6 5/8 | 8 | 3/4 | 3 1/2 | |
| | 3 1/2 | 3 1/2 | 9 | 1 3/16 | 6 5/16 | 7 1/4 | 8 | 3/4 | 3 1/2 | |
| | 4 | 4 | 10 | 1 1/4 | 6 15/16 | 7 7/8 | 8 | 3/4 | 3 3/4 | |
| | 5 | 5 | 11 | 1 3/8 | 8 5/16 | 9 1/4 | 8 | 3/4 | 4 | |
| | 6 | 6 | 12 1/2 | 1 7/16 | 9 11/16 | 10 5/8 | 12 | 3/4 | 4 | |
| | 8 | 8 | 15 | 1 5/8 | 11 15/16 | 13 | 12 | 7/8 | 4 1/2 | |
| | 10 | 10 | 17 1/2 | 1 7/8 | 14 1/16 | 15 1/4 | 16 | 1 | 5 1/4 | |
| | 12 | 12 | 20 1/2 | 2 | 16 7/16 | 17 3/4 | 16 | 1 1/8 | 5 1/2 | |
| | 14 | 13 1/4 | 23 | 2 1/8 | 18 15/16 | 20 1/4 | 20 | 1 1/8 | 6 | |
| | 16 | 15 1/4 | 25 1/2 | 2 1/4 | 21 1/16 | 22 1/2 | 20 | 1 1/4 | 6 1/4 | |
| | 18 | 17 | 28 | 2 3/8 | 23 5/16 | 24 3/4 | 24 | 1 1/4 | 6 1/2 | |
| | 20 | 19 | 30 1/2 | 2 1/2 | 25 9/16 | 27 | 24 | 1 1/4 | 6 3/4 | |
| | 24 | 23 | 36 | 2 3/4 | 30 1/4 | 32 | 24 | 1 1/2 | 7 3/4 | 9 1/2 |
| | 30 | 29 | 43 | 3 | 37 3/16 | 39 1/4 | 28 | 1 3/4 | 8 1/2 | 10 1/2 |
| | 36 | 34 1/2 | 50 | 3 3/8 | 43 11/16 | 46 | 32 | 2 | 9 1/2 | 11 3/4 |
| | 42 | 40 1/4 | 57 | 3 11/16 | 50 7/16 | 52 3/4 | 36 | 2 | 10 1/4 | 12 1/2 |
| | 48 | 46 | 65 | 4 | 58 7/16 | 60 3/4 | 40 | 2 | 10 3/4 | 13 |

| | Size | A For valve or fitting | B | C | D | E | No. of bolts | Dia. of bolts | Length of Bolts See Note Y | Length of Bolts See Note Z |
|---|---|---|---|---|---|---|---|---|---|---|
| | For sizes smaller than 2-inch, use 600-Pound Steel material. | | | | | | | | | |
| 800 Pound Hydraulic Cast Iron | 2 | 2 | 6 1/2 | 1 1/4 | 3 5/8 | 5 | 8 | 5/8 | 3 3/4 | 3 1/2 |
| | 2 1/2 | 2 1/2 | 7 1/2 | 1 3/8 | 4 1/8 | 5 7/8 | 8 | 3/4 | 4 1/4 | 4 |
| | 3 | 3 | 8 1/4 | 1 1/2 | 5 | 6 5/8 | 8 | 3/4 | 4 1/2 | 4 1/4 |
| | 3 1/2 | 3 1/2 | 9 | 1 5/8 | 5 1/2 | 7 1/4 | 8 | 7/8 | 5 | 4 3/4 |
| | 4 | 4 | 10 3/4 | 1 7/8 | 6 3/16 | 8 1/2 | 8 | 7/8 | 5 1/2 | 5 1/4 |
| | 5 | 5 | 13 | 2 1/8 | 7 5/16 | 10 1/2 | 8 | 1 | 6 | 5 3/4 |
| | 6 | 6 | 14 | 2 1/4 | 8 1/2 | 11 1/2 | 12 | 1 | 6 1/4 | 6 |
| | 8 | 7 7/8 | 16 1/2 | 2 1/2 | 10 5/8 | 13 3/4 | 12 | 1 1/8 | 7 | 6 3/4 |
| | 10 | 9 3/4 | 20 | 2 7/8 | 12 3/4 | 17 | 16 | 1 1/4 | 7 3/4 | 7 1/2 |
| | 12 | 11 3/4 | 22 | 3 | 15 | 19 1/4 | 20 | 1 1/4 | 8 | 7 3/4 |
| | For sizes larger than 12-inch, use 600-Pound Steel material. | | | | | | | | | |

**Length of Bolts or Bolt-Studs**

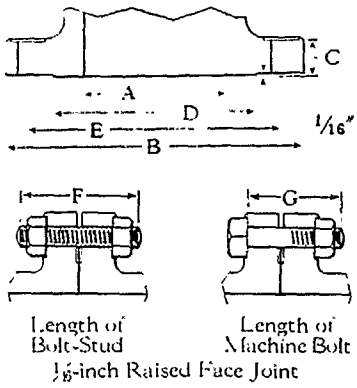
*Note X* — 1/16" raised face to 1/16" raised face valve, fitting, or companion flange.

*Note Y* — 1/4" male to 1/4" male valve, fitting, or companion flange.

*Note Z* — 1/4" large male to 3/16" large female valve, fitting, or companion flange. 1/4" tongue to 3/16" groove valve, fitting, or companion flange.

# Templates for Drilling

## 150 and 300-Pound Steel Standards




1/16-inch Raised Face Joint

**American Standard:** The 150 and 300-Pound flange dimensions, drilling templates, and bolt-stud lengths shown in the table at the right conform, respectively, to the American Standard for 150 and 300-Pound Steel Pipe Flanges and Flanged Fittings, B16e-1930.

**Facing:** Unless otherwise ordered, 150 and 300-Pound Steel Flanged Valves, Fittings, and Companion Flanges are regularly furnished with a 1/16-inch high raised face.

The thickness of flange dimension (dimension "C") includes the 1/16-inch high raised face.

**Bolt holes:** Bolt holes are drilled 1/8-inch larger than the diameter of the bolt.

Drilling templates are in multiples of four, so that valves or fittings may be turned to face in any quarter when installed. Bolt holes are drilled to straddle the center line unless otherwise ordered.

The bolt holes are spot faced.

Dimensions, in Inches

| Class | Size | A For valve or fitting | B | C For companion flange | C For valve or fitting | D | E | No. of bolts or bolt-studs | Dia. of bolts or bolt-studs | F | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 Pound Steel | 1/2 | 1/2 | 3 1/2 | 7/16 | | 1 3/8 | 2 3/8 | 4 | 1/2 | 2 1/4 | 1 3/4 |
| | 3/4 | 3/4 | 3 7/8 | 1/2 | | 1 11/16 | 2 3/4 | 4 | 1/2 | 2 1/4 | 2 |
| | 1 | 1 | 4 1/4 | 9/16 | 7/16 | 2 | 3 1/8 | 4 | 1/2 | 2 1/2 | 2 |
| | 1 1/4 | 1 1/4 | 4 5/8 | 5/8 | 1/2 | 2 1/2 | 3 1/2 | 4 | 1/2 | 2 1/2 | 2 1/4 |
| | 1 1/2 | 1 1/2 | 5 | 11/16 | 9/16 | 2 7/8 | 3 7/8 | 4 | 1/2 | 2 3/4 | 2 1/4 |
| | 2 | 2 | 6 | 3/4 | 5/8 | 3 5/8 | 4 3/4 | 4 | 5/8 | 3 1/4 | 2 1/2 |
| | 2 1/2 | 2 1/2 | 7 | 7/8 | 11/16 | 4 1/8 | 5 1/2 | 4 | 5/8 | 3 1/2 | 2 3/4 |
| | 3 | 3 | 7 1/2 | 15/16 | 3/4 | 5 | 6 | 4 | 5/8 | 3 1/2 | 3 |
| | 3 1/2 | 3 1/2 | 8 1/2 | 15/16 | 13/16 | 5 1/2 | 7 | 8 | 5/8 | 3 1/2 | 3 |
| | 4 | 4 | 9 | 15/16 | | 6 3/16 | 7 1/2 | 8 | 5/8 | 3 1/2 | 3 |
| | 5 | 5 | 10 | 15/16 | | 7 5/16 | 8 1/2 | 8 | 3/4 | 3 3/4 | 3 |
| | 6 | 6 | 11 | 1 | | 8 1/2 | 9 1/2 | 8 | 3/4 | 4 | 3 1/4 |
| | 8 | 8 | 13 1/2 | 1 1/8 | | 10 5/8 | 11 3/4 | 8 | 3/4 | 4 1/4 | 3 1/2 |
| | 10 | 10 | 16 | 1 3/16 | | 12 3/4 | 14 1/4 | 12 | 7/8 | 4 3/4 | 3 3/4 |
| | 12 | 12 | 19 | 1 1/4 | | 15 | 17 | 12 | 7/8 | 4 3/4 | 3 3/4 |
| | 14 | 13 1/4 | 21 | 1 3/8 | | 16 1/4 | 18 3/4 | 12 | 1 | 5 1/4 | 4 1/4 |
| | 16 | 15 1/4 | 23 1/2 | 1 7/16 | | 18 1/2 | 21 1/4 | 16 | 1 | 5 1/2 | 4 1/2 |
| | 18 | 17 1/4 | 25 | 1 9/16 | | 21 | 22 3/4 | 16 | 1 1/8 | 6 | 4 3/4 |
| | 20 | 19 1/4 | 27 1/2 | 1 11/16 | | 23 | 25 | 20 | 1 1/8 | 6 1/4 | 5 |
| | 24 | 23 1/4 | 32 | 1 7/8 | | 27 1/4 | 29 1/2 | 20 | 1 1/4 | 7 | 5 1/2 |
| 300 Pound Steel | 1/2 | 1/2 | 3 3/4 | 9/16 | | 1 3/8 | 2 5/8 | 4 | 1/2 | 2 1/2 | 2 |
| | 3/4 | 3/4 | 4 5/8 | 5/8 | | 1 11/16 | 3 1/4 | 4 | 5/8 | 3 | 2 1/4 |
| | 1 | 1 | 4 7/8 | 11/16 | | 2 | 3 1/2 | 4 | 5/8 | 3 | 2 1/2 |
| | 1 1/4 | 1 1/4 | 5 1/4 | 3/4 | | 2 1/2 | 3 7/8 | 4 | 5/8 | 3 1/4 | 2 1/2 |
| | 1 1/2 | 1 1/2 | 6 1/8 | 13/16 | | 2 7/8 | 4 1/2 | 4 | 3/4 | 3 1/2 | 2 3/4 |
| | 2 | 2 | 6 1/2 | 7/8 | | 3 5/8 | 5 | 8 | 5/8 | 3 1/2 | 2 3/4 |
| | 2 1/2 | 2 1/2 | 7 1/2 | 1 | | 4 1/8 | 5 7/8 | 8 | 3/4 | 4 | 3 1/4 |
| | 3 | 3 | 8 1/4 | 1 1/8 | | 5 | 6 5/8 | 8 | 3/4 | 4 1/4 | 3 1/2 |
| | 3 1/2 | 3 1/2 | 9 | 1 3/16 | | 5 1/2 | 7 1/4 | 8 | 3/4 | 4 1/4 | 3 1/2 |
| | 4 | 4 | 10 | 1 1/4 | | 6 3/16 | 7 7/8 | 8 | 3/4 | 4 1/2 | 3 3/4 |
| | 5 | 5 | 11 | 1 3/8 | | 7 5/16 | 9 1/4 | 8 | 3/4 | 4 3/4 | 4 |
| | 6 | 6 | 12 1/2 | 1 7/16 | | 8 1/2 | 10 5/8 | 12 | 3/4 | 4 3/4 | 4 |
| | 8 | 8 | 15 | 1 5/8 | | 10 5/8 | 13 | 12 | 7/8 | 5 1/2 | 4 1/2 |
| | 10 | 10 | 17 1/2 | 1 7/8 | | 12 3/4 | 15 1/4 | 16 | 1 | 6 1/4 | 5 1/4 |
| | 12 | 12 | 20 1/2 | 2 | | 15 | 17 3/4 | 16 | 1 1/8 | 6 3/4 | 5 1/2 |
| | 14 | 13 1/4 | 23 | 2 1/8 | | 16 1/4 | 20 1/4 | 20 | 1 1/8 | 7 | 6 |
| | 16 | 15 1/4 | 25 1/2 | 2 1/4 | | 18 1/2 | 22 1/2 | 20 | 1 1/4 | 7 1/2 | 6 1/4 |
| | 18 | 17 | 28 | 2 3/8 | | 21 | 24 3/4 | 24 | 1 1/4 | 7 3/4 | 6 1/2 |
| | 20 | 19 | 30 1/2 | 2 1/2 | | 23 | 27 | 24 | 1 1/4 | 8 1/4 | 6 3/4 |
| | 24 | 23 | 36 | 2 3/4 | | 27 1/4 | 32 | 24 | 1 1/2 | 9 1/4 | 7 3/4 |

**Bolt and bolt-stud lengths:** The lengths indicated as dimensions F and G in the above table apply for flanged joints other than Cranelap, made up of combinations of 150-Pound or of 300-Pound valves, fittings, or companion flanges with 1/16-inch high raised faces.

For flanged joints made up of Cranelaps, or for Cranelaps in combination with valves, fittings, or companion flanges having 1/16-inch raised faces, add to dimension F or G the thickness of the lap for each Cranelap used.

***150-Pound Class:*** The bolt-stud lengths established by the American Standard are adequate for all 150-Pound joints, made up of any combination of valves, fittings, or flanges having the regular 1/16-inch raised face.

***300-Pound Class:*** For male to female or tongue to groove flanged joints, add the height of the male or tongue (1/4-inch) to dimension F or G.

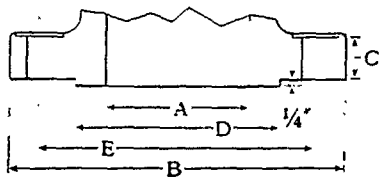
When Cranelaps are used in combinations of male to female flanged joints, add the thickness of the lap for each Cranelap. *Caution:* the male Cranelap must have a minimum lap thickness of 1/4-inch.

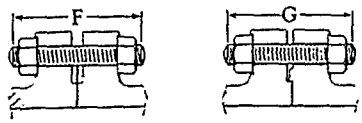
For Cranelaps of tongue to groove flanged joints, add to dimension F or G the thickness of each lap, plus 1/4-inch.

*List prices of machine bolts . . . page 465*
*List prices of bolt-studs. . . . . pages 466 and 467*
*Special facings . . . pages 468 and 470*
*Length of bolt-studs for ring joints . . . page 470*

# Templates for Drilling

## 400, 600, and 900-Pound Steel Standards




Male to Male Flanged Joint — Male to Female Flanged Joint

Bolt-Stud Length "G" also applies for Tongue to Groove Flanged Joint.

**American Standard:** The 400, 600, and 900-Pound flange dimensions, drilling templates, and bolt-stud lengths shown in the table at the right conform, respectively, to the American Standard for 400, 600, and 900-Pound Steel Pipe Flanges and Flanged Fittings, B16e-1939.

**Facing:** Unless otherwise ordered, 400, 600, and 900-Pound Steel Flanged Valves and Fittings are regularly furnished with a 1/4-inch high large male face. Companion Flanges are regularly furnished with 1/4-inch high large male or, if specified, 3/16-inch deep large female facing.

The thickness of flange dimension (dimension "C") does not include the 1/4-inch high large male face.

**Bolt holes:** Bolt holes are drilled 1/8-inch larger than the diameter of the bolt. Drilling templates are in multiples of four, so that valves or fittings may be turned to face in any quarter when being installed. Bolt holes are drilled to straddle the center line unless otherwise ordered.

**Spot facing:** The bolt holes are spot faced.

**Bolt-stud lengths:** The bolt-stud lengths shown in the table at the right apply for flanged joints other than Cranelap, made up of combinations of valves, fittings, or companion flanges with male, female, tongue, or groove faces. Male or tongue faces are 1/4-inch high; female or groove faces are 3/16-inch deep.

Dimensions, in Inches

| Class | Size | A† | B | C | D | E | No. of bolt-studs | Dia. of bolt-studs | F | G |
|---|---|---|---|---|---|---|---|---|---|---|
| 400 Pound Steel | 4 | 4 | 10 | 1 3/8 | 6 3/16 | 7 7/8 | 8 | 7/8 | 5 1/2 | 5 1/4 |
| | 5 | 5 | 11 | 1 1/2 | 7 5/16 | 9 1/4 | 8 | 7/8 | 5 3/4 | 5 1/2 |
| | 6 | 6 | 12 1/2 | 1 5/8 | 8 1/2 | 10 5/8 | 12 | 7/8 | 6 | 5 3/4 |
| | 8 | 8 | 15 | 1 7/8 | 10 5/8 | 13 | 12 | 1 | 6 3/4 | 6 1/2 |
| | 10 | 10 | 17 1/2 | 2 1/8 | 12 3/4 | 15 1/4 | 16 | 1 1/8 | 7 1/2 | 7 1/4 |
| | 12 | 12 | 20 1/2 | 2 1/4 | 15 | 17 3/4 | 16 | 1 1/4 | 8 | 7 3/4 |
| | 14 | 13 1/8 | 23 | 2 3/8 | 16 1/4 | 20 1/4 | 20 | 1 1/4 | 8 1/4 | 8 |
| | 16 | 15 | 25 1/2 | 2 1/2 | 18 1/2 | 22 1/2 | 20 | 1 3/8 | 8 3/4 | 8 1/2 |
| | 18 | 17 | 28 | 2 5/8 | 21 | 24 3/4 | 24 | 1 3/8 | 9 | 8 3/4 |
| | 20 | 18 7/8 | 30 1/2 | 2 3/4 | 23 | 27 | 24 | 1 1/2 | 9 3/4 | 9 1/2 |
| | 24 | 22 5/8 | 36 | 3 | 27 1/4 | 32 | 24 | 1 3/4 | 10 3/4 | 10 1/2 |
| 600 Pound Steel | 1/2 | 1/2 | 3 3/4 | 9/16 | 1 3/8 | 2 5/8 | 4 | 1/2 | 3 | 2 3/4 |
| | 3/4 | 3/4 | 4 5/8 | 5/8 | 1 11/16 | 3 1/4 | 4 | 5/8 | 3 1/2 | 3 1/4 |
| | 1 | 1 | 4 7/8 | 11/16 | 2 | 3 1/2 | 4 | 5/8 | 3 1/2 | 3 1/4 |
| | 1 1/4 | 1 1/4 | 5 1/4 | 13/16 | 2 1/2 | 3 7/8 | 4 | 5/8 | 3 3/4 | 3 1/2 |
| | 1 1/2 | 1 1/2 | 6 1/8 | 7/8 | 2 7/8 | 4 1/2 | 4 | 3/4 | 4 1/4 | 4 |
| | 2 | 2 | 6 1/2 | 1 | 3 5/8 | 5 | 8 | 5/8 | 4 1/4 | 4 |
| | 2 1/2 | 2 1/2 | 7 1/2 | 1 1/8 | 4 1/8 | 5 7/8 | 8 | 3/4 | 4 3/4 | 4 1/2 |
| | 3 | 3 | 8 1/4 | 1 1/4 | 5 | 6 5/8 | 8 | 3/4 | 5 | 4 3/4 |
| | 3 1/2 | 3 1/2 | 9 | 1 3/8 | 5 1/2 | 7 1/4 | 8 | 7/8 | 5 1/2 | 5 1/4 |
| | 4 | 4 | 10 3/4 | 1 1/2 | 6 3/16 | 8 1/2 | 8 | 7/8 | 5 3/4 | 5 1/2 |
| | 5 | 5 | 13 | 1 3/4 | 7 5/16 | 10 1/2 | 8 | 1 | 6 1/2 | 6 1/4 |
| | 6 | 6 | 14 | 1 7/8 | 8 1/2 | 11 1/2 | 12 | 1 | 6 3/4 | 6 1/2 |
| | 8 | 7 7/8 | 16 1/2 | 2 3/16 | 10 5/8 | 13 3/4 | 12 | 1 1/8 | 7 3/4 | 7 1/2 |
| | 10 | 9 3/4 | 20 | 2 1/2 | 12 3/4 | 17 | 16 | 1 1/4 | 8 1/2 | 8 1/4 |
| | 12 | 11 3/4 | 22 | 2 5/8 | 15 | 19 1/4 | 20 | 1 1/4 | 8 3/4 | 8 1/2 |
| | 14 | 12 7/8 | 23 3/4 | 2 3/4 | 16 1/4 | 20 3/4 | 20 | 1 3/8 | 9 1/4 | 9 |
| | 16 | 14 3/4 | 27 | 3 | 18 1/2 | 23 3/4 | 20 | 1 1/2 | 10 | 9 3/4 |
| | 18 | 16 1/2 | 29 1/4 | 3 1/4 | 21 | 25 3/4 | 20 | 1 5/8 | 10 3/4 | 10 1/2 |
| | 20 | 18 1/4 | 32 | 3 1/2 | 23 | 28 1/2 | 24 | 1 5/8 | 11 1/2 | 11 1/4 |
| | 24 | 22 | 37 | 4 | 27 1/4 | 33 | 24 | 1 7/8 | 13 | 12 3/4 |
| 900 Pound Steel | 3 | 2 7/8 | 9 1/2 | 1 1/2 | 5 | 7 1/2 | 8 | 7/8 | 5 3/4 | 5 1/2 |
| | 4 | 3 7/8 | 11 1/2 | 1 3/4 | 6 3/16 | 9 1/4 | 8 | 1 1/8 | 6 3/4 | 6 1/2 |
| | 5 | 4 3/4 | 13 3/4 | 2 | 7 5/16 | 11 | 8 | 1 1/4 | 7 1/2 | 7 1/4 |
| | 6 | 5 3/4 | 15 | 2 3/16 | 8 1/2 | 12 1/2 | 12 | 1 1/8 | 7 3/4 | 7 1/2 |
| | 8 | 7 1/2 | 18 1/2 | 2 1/2 | 10 5/8 | 15 1/2 | 12 | 1 3/8 | 8 3/4 | 8 1/2 |
| | 10 | 9 3/8 | 21 1/2 | 2 3/4 | 12 3/4 | 18 1/2 | 16 | 1 3/8 | 9 1/4 | 9 |
| | 12 | 11 1/8 | 24 | 3 1/8 | 15 | 21 | 20 | 1 3/8 | 10 | 9 3/4 |
| | 14 | 12 1/4 | 25 1/4 | 3 3/8 | 16 1/4 | 22 | 20 | 1 1/2 | 10 3/4 | 10 1/2 |
| | 16 | 14 | 27 3/4 | 3 1/2 | 18 1/2 | 24 1/4 | 20 | 1 5/8 | 11 1/4 | 11 |
| | 18 | 15 3/4 | 31 | 4 | 21 | 27 | 20 | 1 7/8 | 13 | 12 3/4 |
| | 20 | 17 1/2 | 33 3/4 | 4 1/4 | 23 | 29 1/2 | 20 | 2 | 13 3/4 | 13 1/2 |
| | 24 | 21 | 41 | 5 1/2 | 27 1/4 | 35 1/2 | 20 | 2 1/2 | 17 1/4 | 17 |

†Dimension "A" applies to valves or fittings.

For flanged joints made up of Cranelaps or for Cranelaps in combination with valves, fittings, or companion flanges, new bolt-stud lengths must be established in the following manner:

**Bolt-Stud Lengths for Cranelap Joints (Based on length "G" for bolt-studs).**

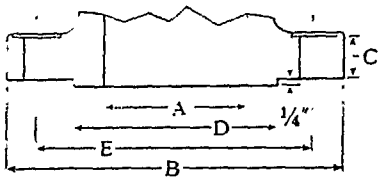
Cranelap to Cranelap . . . . . Deduct 1/4-inch and add thickness of both laps
Cranelap to 1/4-inch male . . . . . Add thickness of one lap
Cranelap to female . . . . . Deduct 1/4-inch and add thickness of one lap*
Cranelap to female Cranelap . . . . . Deduct 1/4-inch and add thickness of both laps*
Tongue or groove Cranelaps . . . . . Add thickness of each lap

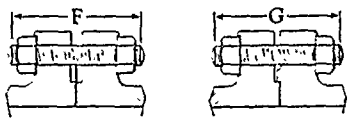
*The Cranelap serving as the male must have a minimum lap thickness of 1/4-inch.

*Bolting on companion flanges* page 457
*List prices of bolt-studs* . . pages 466 and 467
*Special facings* pages 469 to 471
*Length of bolt-studs for ring joints* . . . pages 470 and 471

# Templates for Drilling

## 1500 and 2500-Pound Steel Standards




Male to Male Flanged Joint — Male to Female Flanged Joint

Bolt-Stud Length "G" also applies - Tongue to Groove Flanged Joint.

Dimensions, in Inches

| Class | Size | A† | B | C | D | E | No. of bolt-studs | Dia. of bolt-studs | F | G |
|---|---|---|---|---|---|---|---|---|---|---|
| 1500 Pound Steel | 1/2 | 1/2 | 4 3/4 | 7/8 | 1 3/8 | 3 1/4 | 4 | 3/4 | 4 1/4 | 4 |
| | 3/4 | 11/16 | 5 1/8 | 1 | 1 11/16 | 3 1/2 | 4 | 3/4 | 4 1/2 | 4 1/4 |
| | 1 | 7/8 | 5 7/8 | 1 1/8 | 2 | 4 | 4 | 7/8 | 5 | 4 3/4 |
| | 1 1/4 | 1 1/8 | 6 1/4 | 1 1/8 | 2 1/2 | 4 3/8 | 4 | 7/8 | 5 | 4 3/4 |
| | 1 1/2 | 1 3/8 | 7 | 1 1/4 | 2 7/8 | 4 7/8 | 4 | 1 | 5 1/2 | 5 1/4 |
| | 2 | 1 7/8 | 8 1/2 | 1 1/2 | 3 5/8 | 6 1/2 | 8 | 7/8 | 5 3/4 | 5 1/2 |
| | 2 1/2 | 2 1/4 | 9 5/8 | 1 5/8 | 4 1/8 | 7 1/2 | 8 | 1 | 6 1/4 | 6 |
| | 3 | 2 3/4 | 10 1/2 | 1 7/8 | 5 | 8 | 8 | 1 1/8 | 7 | 6 3/4 |
| | 4 | 3 5/8 | 12 1/4 | 2 1/8 | 6 3/16 | 9 1/2 | 8 | 1 1/4 | 7 3/4 | 7 1/2 |
| | 5 | 4 3/8 | 14 3/4 | 2 7/8 | 7 5/16 | 11 1/2 | 8 | 1 1/2 | 9 3/4 | 9 1/2 |
| | 6 | 5 3/8 | 15 1/2 | 3 1/4 | 8 1/2 | 12 1/2 | 12 | 1 3/8 | 10 1/4 | 10 |
| | 8 | 7 | 19 | 3 5/8 | 10 5/8 | 15 1/2 | 12 | 1 5/8 | 11 1/2 | 11 1/4 |
| | 10 | 8 3/4 | 23 | 4 1/4 | 12 3/4 | 19 | 12 | 1 7/8 | 13 1/2 | 13 1/4 |
| | 12 | 10 3/8 | 26 1/2 | 4 7/8 | 15 | 22 1/2 | 16 | 2 | 15 | 14 3/4 |
| | 14 | 11 3/8 | 29 1/2 | 5 1/4 | 16 1/4 | 25 | 16 | 2 1/4 | 16 1/4 | 16 |
| | 16 | 13 | 32 1/2 | 5 3/4 | 18 1/2 | 27 3/4 | 16 | 2 1/2 | 17 3/4 | 17 1/2 |
| | 18 | 14 5/8 | 36 | 6 3/8 | 21 | 30 1/2 | 16 | 2 3/4 | 19 1/2 | 19 1/4 |
| | 20 | 16 3/8 | 38 3/4 | 7 | 23 | 32 3/4 | 16 | 3 | 21 1/2 | 21 1/4 |
| | 24 | 19 5/8 | 46 | 8 | 27 1/4 | 39 | 16 | 3 1/2 | 24 1/4 | 24 |
| 2500 Pound Steel | 1/2 | 7/16 | 5 1/4 | 1 3/16 | 1 3/8 | 3 1/2 | 4 | 3/4 | 4 3/4 | 4 1/2 |
| | 3/4 | 9/16 | 5 1/2 | 1 1/4 | 1 11/16 | 3 3/4 | 4 | 3/4 | 5 | 4 3/4 |
| | 1 | 3/4 | 6 1/4 | 1 3/8 | 2 | 4 1/4 | 4 | 7/8 | 5 1/2 | 5 1/4 |
| | 1 1/4 | 1 | 7 1/4 | 1 1/2 | 2 1/2 | 5 1/8 | 4 | 1 | 6 | 5 3/4 |
| | 1 1/2 | 1 1/8 | 8 | 1 3/4 | 2 7/8 | 5 3/4 | 4 | 1 1/8 | 6 3/4 | 6 1/2 |
| | 2 | 1 1/2 | 9 1/4 | 2 | 3 5/8 | 6 3/4 | 8 | 1 | 7 | 6 3/4 |
| | 2 1/2 | 1 7/8 | 10 1/2 | 2 1/4 | 4 1/8 | 7 3/4 | 8 | 1 1/8 | 7 3/4 | 7 1/2 |
| | 3 | 2 1/4 | 12 | 2 5/8 | 5 | 9 | 8 | 1 1/4 | 8 3/4 | 8 1/2 |
| | 4 | 2 7/8 | 14 | 3 | 6 3/16 | 10 3/4 | 8 | 1 1/2 | 10 | 9 3/4 |
| | 5 | 3 5/8 | 16 1/2 | 3 5/8 | 7 5/16 | 12 3/4 | 8 | 1 3/4 | 12 | 11 3/4 |
| | 6 | 4 3/8 | 19 | 4 1/4 | 8 1/2 | 14 1/2 | 8 | 2 | 13 3/4 | 13 1/2 |
| | 8 | 5 3/4 | 21 3/4 | 5 | 10 5/8 | 17 1/4 | 12 | 2 | 15 1/4 | 15 |
| | 10 | 7 1/4 | 26 1/2 | 6 1/2 | 12 3/4 | 21 1/4 | 12 | 2 1/2 | 19 1/4 | 19 |
| | 12 | 8 5/8 | 30 | 7 1/4 | 15 | 24 3/8 | 12 | 2 3/4 | 21 1/4 | 21 |

†Dimension "A" applies to valves or fittings.

**American Standard:** The 1500 and 2500-Pound flange dimensions, drilling templates, and bolt-stud lengths shown in the table at the right conform, respectively, to the American Standard for 1500 and 2500-Pound Steel Pipe Flanges and Flanged Fittings, B16e-1939.

**Facing:** Unless otherwise ordered, 1500 and 2500-Pound Steel Flanged Valves and Fittings are regularly furnished with 1/4-inch high large male facing. Companion Flanges are regularly furnished with 1/4-inch high large male or, if specified, 3/16-inch deep large female facing.

The thickness of flange dimension (dimension "C") does not include the 1/4-inch high large male face.

**Bolt holes:** The bolt holes are drilled 1/8-inch larger than the diameter of the bolt.

Drilling templates are in multiples of four, so that valves or fittings may be turned to face in any quarter when installed. Bolt holes are drilled to straddle the center line unless otherwise ordered.

**Spot facing:** The bolt holes are spot faced.

* * * * *

**Bolt-stud lengths:** The bolt-stud lengths shown in the above table apply for flanged joints other than Cranelap, made up of combinations of valves, fittings, or companion flanges with male, female, tongue, or groove faces. Male or tongue faces are 1/4-inch high; female or groove faces are 3/16-inch deep.

For flanged joints made up of Cranelaps or for Cranelaps in combination with valves, fittings, or companion flanges, new bolt-stud lengths must be established in the following manner:

39

**Bolt-Stud Lengths for Cranelap Joints (Based on length "G" for bolt-studs).**

Cranelap to Cranelap.....Deduct 1/4-inch and add thickness of both laps
Cranelap to 1/4-inch male.....Add thickness of one lap
Cranelap to female.....Deduct 1/4-inch and add thickness of one lap*
Cranelap to female Cranelap.....Deduct 1/4-inch and add thickness of both laps*
Tongue or groove Cranelaps.....Add thickness of each lap

*The Cranelap serving as the male must have a minimum lap thickness of 1/4-inch.

*Bolting on companion flanges* . *page 457*
*List prices of bolt-studs* ..... *pages 466 and 467*
*Special facings* *pages 469 and 471*
*Length of bolt-studs for ring joints* *page 471*

# Crane Thread Lubricant

## For Threaded Pipe Joints, Bolt Threads, and Gasket Coating

For temperatures up to 500° F.

Crane Thread Lubricant is available in a choice of four container sizes, as follows:

Quart can ..2¾ lbs. compound
Pint can.....1¼ lbs. compound
Half-pint can..10 oz. compound
Tube..... 4 oz. compound

***Prices on application***

Crane Thread Lubricant is used to make better threaded and flanged joints on steam, water, and gas piping. Pipe joints are made tighter; easy "breaking" is assured. The lubricant has been developed to replace ordinary pipe dope or pipe cement.

**Recommended use:** Unusual lubricating qualities make Crane Thread Lubricant ideal for all threaded metal connections except those on lines carrying liquids such as gasoline, kerosene, naphthas, fuel oil, etc. It is effectively used on Cranite or corrugated metal gaskets in flanged joints.

The lubricant is particularly suited to the requirements of alloys such as stainless steel, Monel, and nickel, as well as copper, brass, iron, and steel. It can be used on chrome or nickel finished fittings without smearing or discoloring the trim. Being non-poisonous, it is safely used on pipe lines handling food products as well as for all domestic and industrial uses.

Crane Thread Lubricant reduces the friction common to making a metal-to-metal joint and prevents the galling or seizing which occurs when a good lubricant is not used.

When threads are clean and properly cut, the use of Crane Thread Lubricant permits pulling them up to a tight joint with greater ease. The lubricant will neither separate nor harden, regardless of age. It spreads easily over threaded surfaces, always providing a high degree of lubrication.

**Application:** The lubricant is usually applied with a brush. Its consistency is such that application can be made from either the can or tube, whichever is more convenient.

# Crane High Temperature Thread Compound

For temperatures up to 1000° F.

Crane High Temperature Thread Compound is regularly furnished in 3¾-pound cans

**Price, per pound.....$1.35**

Crane High Temperature Thread Compound is the result of years of development and research to find a compound combining low frictional qualities with particular suitability for high temperature service.

The tendency of metal to seize or gall is more pronounced under high temperatures and high loading. Only a proper compound can avoid these damaging effects.

Threaded pipe joints, made up with Crane High Temperature Thread Compound, after having been in service under temperatures as high as 1000° F., can be taken apart readily and re-used; threads are kept smooth and a pressure tight, metal-to-metal contact is maintained.

On bolt-studs used in flanged joints for high pressure-temperature installations, the tendency of seizing or galling of the threads is a common failing because of the high bolt loads and increased friction. Crane High Temperature Thread Compound is ideal for use on bolt-studs; it enables the maximum stress to be obtained with a minimum of power applied to the nut. Bolted joints are more easily assembled to tightness under high pressures, and damage of threads incidental to high loading is avoided

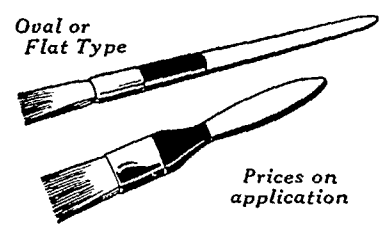


## Thread Lubricant Brushes

Thread lubricant can be applied in any convenient way. It is common practice, however, to apply the compound with a brush.

These brushes are specifically made for easy application of thread lubricant to bolts, flanges, gaskets, studs, valves, fittings, etc.

The brushes are well constructed to withstand heavy usage. The bristles are well set in the handle to minimize the usual loss of bristles in hard service. These brushes are available in two types, either oval or flat. Specify the type of brush desired, when ordering.



# Machine Bolts

For a variety of services and for temperatures up to a maximum of 500° F., Machine Bolts with square heads and hexagon nuts are the standard practice of the Pipe and Fitting Industry

| Length Inches | List Prices, Per 100 | | | | | | | List Prices, Per 100. Quantities of 500 or more of one diameter | |
|---|---|---|---|---|---|---|---|---|---|
| | 1/2" Dia. | 5/8" Dia. | 3/4" Dia. | 7/8" Dia. | 1" Dia. | 1 1/8" Dia. | 1 1/4" Dia. | 1 3/8" Dia. | 1 1/2" Dia. |
| 1 1/4 | 5.90 | 9.55 | | | | | | | |
| 1 1/2 | 6.10 | 9.80 | 12.65 | 19.45 | | | | | |
| 2 | 6.45 | 10.30 | 13.30 | 20.35 | 28.20 | | | | |
| 2 1/2 | 6.85 | 10.80 | 13.95 | 21.25 | 29.35 | | | | |
| 3 | 7.25 | 11.30 | 14.60 | 22.15 | 30.50 | | | 72.80 | 88.45 |
| 3 1/2 | 7.60 | 11.80 | 15.25 | 23.05 | 31.65 | | | 74.80 | 90.85 |
| 4 | 7.95 | 12.30 | 15.90 | 23.95 | 32.80 | 52.50 | 63.05 | 76.80 | 93.20 |
| 4 1/2 | 8.35 | 12.80 | 16.55 | 24.85 | 33.95 | 53.80 | 64.70 | 78.80 | 95.60 |
| 5 | 8.75 | 13.30 | 17.20 | 25.75 | 35.10 | 55.10 | 66.35 | 80.80 | 97.95 |
| 5 1/2 | 9.15 | 13.80 | 17.85 | 26.65 | 36.25 | 56.40 | 68.00 | 82.80 | 100.35 |
| 6 | 9.55 | 14.30 | 18.50 | 27.55 | 37.40 | 57.70 | 69.65 | 84.80 | 102.70 |
| 6 1/2 | 11.25 | 14.80 | 19.15 | 28.45 | 38.55 | | | 86.80 | 105.10 |
| 7 | 11.70 | 15.30 | 19.80 | 29.35 | 39.70 | 60.30 | 72.95 | 88.80 | 107.45 |
| 7 1/2 | 12.15 | 15.80 | 20.45 | 30.25 | 40.85 | | | 90.80 | 109.85 |
| 8 | 12.60 | 16.30 | 21.10 | 31.15 | 42.00 | 62.90 | 76.25 | 92.80 | 112.20 |
| 8 1/2 | 13.05 | 16.80 | 21.75 | 32.05 | | | | 94.80 | 114.55 |
| 9 | 13.50 | 17.30 | 22.40 | 32.95 | 44.30 | 65.50 | 79.55 | 96.80 | 116.95 |
| 9 1/2 | 13.95 | 17.80 | 23.05 | | | | | 98.80 | 119.35 |
| 10 | 14.40 | 18.30 | 23.70 | 34.75 | 46.60 | 68.10 | 82.85 | 100.80 | 121.70 |
| 11 | 15.80 | 19.30 | 25.00 | 36.55 | 48.90 | 70.70 | 86.15 | 104.80 | 126.45 |
| 12 | 16.70 | 20.30 | 26.30 | 38.35 | 51.20 | 73.30 | 89.45 | 108.80 | 131.20 |
| 13 | 17.60 | 21.30 | 27.60 | 40.15 | 53.50 | | | 112.80 | 135.95 |
| 14 | 18.50 | 22.30 | 28.90 | 41.95 | 55.80 | 78.50 | 96.05 | 116.80 | 140.70 |
| 15 | 19.40 | 23.30 | 30.20 | 43.75 | 58.10 | 81.10 | 99.35 | 120.80 | 145.45 |

*For intermediate lengths, use the list price for the next longer length.*

**List Prices:** The list prices shown in the table above cover Machine Bolts having a Regular Unfinished Square Head and equipped with a Heavy Unfinished Hot Pressed Hexagon Nut. Unless otherwise specified on the order, Machine Bolts and Nuts of this description will be regularly furnished.

When so specified, Machine Bolts can be supplied without nuts, with various other type of nuts, or with other types of bolt heads; list prices are based on the prices shown in the table above with appropriate additions or deductions, as specified in the table below.

**Deductions from or Additions to the List Prices in the above table, Per 100**

| | | | 1/2" Dia. | 5/8" Dia. | 3/4" Dia. | 7/8" Dia. | 1" Dia. | 1 1/8" Dia. | 1 1/4" Dia. | 1 3/8" Dia. | 1 1/2" Dia. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bolts | Regular Unfin. Sq. Head, Without Nuts | Deduct | 2.05 | 3.10 | 4.10 | 6.65 | 9.10 | 12.75 | 16.90 | 20.20 | 27.85 |
| Bolts | Regular Hexagon Head, Unfinished | Add | .65 | 1.00 | 1.40 | 2.20 | 3.00 | | | | |
| Nuts | Heavy Hexagon, Unfinished, C.P. | Add | .20 | .45 | .90 | 1.35 | 2.00 | 2.00 | 4.00 | | |
| Nuts | Heavy Hexagon, Semi-finished, C.P. | Add | .50 | 1.00 | 1.60 | 2.05 | 2.90 | 3.10 | 5.40 | | |
| Nuts | Regular Hexagon, Unfinished, C.P. | Deduct | .60 | .25 | .05 | | | | | | |
| Nuts | Regular Hexagon, Unfinished, C.P. | Add | | | | .50 | .70 | 1.25 | 1.20 | 5.00 | 6.10 |
| Nuts | Regular Square, Unfinished, H.P. | Deduct | 1.10 | 1.20 | 1.70 | 2.75 | 3.80 | 4.00 | 5.30 | 2.80 | 4.45 |

**Standards:** Machine Bolts and Nuts are made from open-hearth steel conforming to the ASTM Specification A-107—47.

The dimensions of bolt heads and nuts conform to the American Standard ASA-B18.2—1941.

Bolt and nut threads conform to the American Standard ASA-B1.1—1935 Standard on Screw Threads, Coarse Thread Series, Class 2 Fit.

Extra List Prices, Per 100
For less than 500 of one diameter

| Quantities | 1 3/8" Dia. | 1 1/2" Dia. |
|---|---|---|
| 400 to 499 | 2.00 | 2.25 |
| 300 to 399 | 3.20 | 3.50 |
| 200 to 299 | 7.20 | 7.50 |
| 100 to 199 | 19.20 | 19.60 |
| 50 to 99 | 44.00 | 44.50 |
| 25 to 49 | 92.00 | 92.50 |
| 10 to 24 | 240.00 | 241.00 |

*For engineering data on machine bolts, see pages 524 and 525.*

# Crane Triplex and Templex Alloy Steel Bolt-Studs

Bolt-Stud
Threaded Entire Length
With Two Nuts

***The list prices apply to Triplex Steel Bolt-Studs equipped with two nuts, each. Prices of Templex Steel Bolt-Studs will be furnished on application.***

***The lengths shown below do not include the crowned ends.***

***Each Triplex or Templex Steel Bolt-Stud is equipped with two medium carbon, oil-quenched, semi-finished, heavy, steel hexagon nuts.***

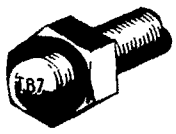
**Triplex Steel Bolt-Studs:** The merits of Crane Triplex Steel are well known. Triplex Steel Bolt-Studs have been used with uniformly satisfactory results in thousands of steel valve and fitting installations, many of which—particularly in oil refineries—have been operating under extreme pressures and temperatures.

Made to rigid manufacturing tolerances of a high quality chrome-molybdenum steel, they provide liberal strength for the bolting of steel flanged joints.

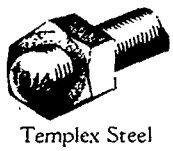
**Templex Steel Bolt-Studs:** Templex Steel, a Crane development in bolting materials, is superior to Triplex Steel in creep resistance. On temperatures over 850° F., especially where joints are made up for permanent, long-time service, as in steam power plants, Crane Templex Steel will be found ideal.

A specially heat treated chrome-molybdenum-vanadium steel, Templex offers unusual resistance to creep.

**Marking:** On one end of each bolt-stud is stamped the identification of the material; Crane Triplex is marked with the symbol "T B7", and Crane Templex is marked with the symbol "T B14". These markings are shown in the accompanying illustrations.




Triplex Steel




Templex Steel

**Standard lengths:** The lengths of bolt-studs are standardized in increments of ¼-inch in accordance with the American Standard, ASA B16e-1939.

When ordering bolt-studs for Cranelap requirements, lengths should be selected as follows:

A. If calculated length is 1/16-inch or more longer than a standardized length, use the next longer standard ¼-inch length.

B. If calculated length is less than 1/16-inch longer than a standardized length, use the next shorter standard ¼-inch length.

Bolt-stud lengths in ⅛-inch increments are made to order only, at a special price; prices on request.

**Threads:** Crane Alloy Steel Bolt-Studs are threaded their entire length. Threading, including threading on the accompanying nuts, is in accordance with the American Standard for Screw Threads for High Strength Bolting (ASA B1.4), sizes 1-inch and smaller in diameter with the Coarse-Thread Series, and sizes 1⅛-inch and larger in diameter with the 8-Pitch-Thread Series.

| Length Inches | List Prices, Each 7/16" Dia. | 1/2" Dia. | 5/8" Dia. | 3/4" Dia. | 7/8" Dia. |
|---|---|---|---|---|---|
| 2 | .39 | .39 | .43 | | |
| 2¼ | .40 | .40 | .44 | | |
| 2½ | .41 | .41 | .45 | .53 | |
| 2¾ | | .42 | .46 | .55 | |
| 3 | | .43 | .47 | .57 | .72 |
| 3¼ | | .44 | .48 | .59 | .74 |
| 3½ | | .45 | .49 | .61 | .76 |
| 3¾ | | | .50 | .63 | .78 |
| 4 | | | .51 | .65 | .80 |
| 4¼ | | | .52 | .67 | .82 |
| 4½ | | | .53 | .69 | .84 |
| 4¾ | | | .54 | .71 | .86 |
| 5 | | | .55 | .73 | .88 |
| 5¼ | | | | .75 | .90 |
| 5½ | | | .57 | .77 | .92 |
| 5¾ | | | | .79 | .94 |
| 6 | | | .59 | .81 | .96 |
| 6¼ | | | | .83 | .98 |
| 6½ | | | | .85 | 1.00 |
| 6¾ | | | | .87 | 1.02 |
| 7 | | | | .89 | 1.04 |
| 7¼ | | | | .91 | 1.06 |
| 7½ | | | | .93 | 1.08 |
| 7¾ | | | | .95 | 1.10 |
| 8 | | | | .97 | 1.12 |
| 8¼ | | | | | 1.14 |
| 8½ | | | | | 1.16 |
| 8¾ | | | | | 1.18 |
| 9 | | | | | 1.20 |
| 9¼ | | | | | 1.22 |
| 9½ | | | | | 1.24 |

**Standards:** Crane Triplex and Templex Steel Bolt-Studs and Nuts conform to the American Standard B16e-1939 and to various A.S.T.M. Specifications. Triplex Steel conforms to A.S.T.M. A 193, Grade B7 bolting. Templex Steel conforms to A.S.T.M. A 193, Grade B14 bolting.

The nuts conform to A.S.T.M. Specification A 194, Class 2H; they are made to American Standard "Heavy" Hexagon Nut dimensions, ASA B18.2.

*Description of materials page 9*

*Engineering data on bolting ...pages 524 to 526*

# Crane Triplex and Templex Alloy Steel Bolt-Studs

*(continued)*

***The list prices apply to Triplex Steel Bolt-Studs equipped with two nuts, each. Prices of Templex Steel Bolt-Studs will be furnished on application.***

***The lengths shown below do not include the crowned ends.***

***Each Triplex or Templex Steel Bolt-Stud is equipped with two medium carbon, oil-quenched, semi-finished, heavy, steel hexagon nuts.***

Bolt-Stud
Threaded Entire Length
With Two Nuts

| Length Inches | List Prices, Each 1" Dia. | 1⅛" Dia. | 1¼" Dia. | 1⅜" Dia. | 1½" Dia. |
|---|---|---|---|---|---|
| 5 | 1.21 | | | | |
| 5¼ | 1.24 | | | | |
| 5½ | 1.27 | 1.74 | | | |
| 5¾ | 1.30 | 1.78 | | | |
| 6 | 1.33 | 1.82 | | | |
| 6¼ | 1.36 | 1.86 | | | |
| 6½ | 1.39 | 1.90 | 2.45 | | |
| 6¾ | 1.42 | 1.94 | 2.50 | | |
| 7 | 1.45 | 1.98 | 2.55 | | |
| 7¼ | 1.48 | 2.02 | 2.60 | | |
| 7½ | 1.51 | 2.06 | 2.65 | | |
| 7¾ | 1.54 | 2.10 | 2.70 | | |
| 8 | 1.57 | 2.14 | 2.75 | 3.31 | |
| 8¼ | 1.60 | 2.18 | 2.80 | 3.39 | |
| 8½ | 1.63 | 2.22 | 2.85 | 3.47 | 4.35 |
| 8¾ | 1.66 | 2.26 | 2.90 | 3.55 | 4.45 |
| 9 | 1.69 | 2.30 | 2.95 | 3.63 | 4.55 |
| 9¼ | 1.72 | 2.34 | 3.00 | 3.71 | 4.65 |
| 9½ | 1.75 | 2.38 | 3.05 | 3.79 | 4.75 |
| 9¾ | 1.78 | 2.42 | 3.10 | 3.87 | 4.85 |
| 10 | 1.81 | 2.46 | 3.15 | 3.95 | 4.95 |
| 10¼ | 1.84 | 2.50 | 3.20 | 4.03 | 5.05 |
| 10½ | 1.87 | 2.54 | 3.25 | 4.11 | 5.15 |
| 10¾ | | 2.58 | 3.30 | 4.19 | 5.25 |
| 11 | | 2.62 | 3.35 | 4.27 | 5.35 |
| 11¼ | | 2.66 | 3.40 | 4.35 | 5.45 |
| 11½ | | 2.70 | 3.45 | 4.43 | 5.55 |
| 11¾ | | 2.74 | 3.50 | 4.51 | 5.65 |
| 12 | | 2.78 | 3.55 | 4.59 | 5.75 |
| 12¼ | | | 3.60 | 4.67 | 5.85 |
| 12½ | | | 3.65 | 4.75 | 5.95 |
| 12¾ | | | 3.70 | 4.83 | 6.05 |
| 13 | | | 3.75 | 4.91 | 6.15 |
| 13¼ | | | 3.80 | 4.99 | 6.25 |
| 13½ | | | 3.85 | 5.07 | 6.35 |
| 13¾ | | | | 5.15 | 6.45 |
| 14 | | | | 5.23 | 6.55 |
| 14¼ | | | | 5.31 | 6.65 |
| 14½ | | | | 5.39 | 6.75 |
| 14¾ | | | | 5.47 | 6.85 |
| 15 | | | | 5.55 | 6.95 |

| Length Inches | List Prices, Each 1⅝" Dia. | 1¾" Dia. | 1⅞" Dia. |
|---|---|---|---|
| 9½ | 6.46 | | |
| 9¾ | 6.59 | | |
| 10 | 6.72 | 8.55 | |
| 10¼ | 6.85 | 8.70 | |
| 10½ | 6.98 | 8.85 | |
| 10¾ | 7.11 | 9.00 | |
| 11 | 7.24 | 9.15 | |
| 11¼ | 7.37 | 9.30 | 11.30 |
| 11½ | 7.50 | 9.45 | 11.45 |
| 11¾ | 7.63 | 9.60 | 11.60 |
| 12 | 7.76 | 9.75 | 11.75 |
| 12¼ | 7.89 | 9.90 | 11.90 |
| 12½ | 8.02 | 10.05 | 12.05 |
| 12¾ | 8.15 | 10.20 | 12.20 |
| 13 | 8.28 | 10.35 | 12.35 |
| 13¼ | 8.41 | 10.50 | 12.50 |
| 13½ | 8.54 | 10.65 | 12.65 |
| 13¾ | 8.67 | 10.80 | 12.80 |
| 14 | 8.80 | 10.95 | 12.95 |
| 14¼ | 8.93 | 11.10 | 13.10 |
| 14½ | 9.06 | 11.25 | 13.25 |
| 14¾ | | 11.40 | 13.40 |
| 15 | 9.32 | 11.55 | 13.55 |
| 15¼ | | | 13.70 |
| 15½ | 9.58 | 11.85 | 13.85 |
| 15¾ | | | 14.00 |
| 16 | 9.84 | 12.15 | 14.15 |
| 16¼ | | | 14.30 |
| 16½ | | 12.30 | 14.45 |
| 16¾ | | | |
| 17 | | | 14.75 |
| 17¼ | | | |
| 17½ | | | 15.05 |
| 17¾ | | | |
| 18 | | | 15.35 |
| 18¼ | | | |
| 18½ | | | |
| 18¾ | | | |
| 19 | | | |
| 19¼ | | | |
| 19½ | | | |

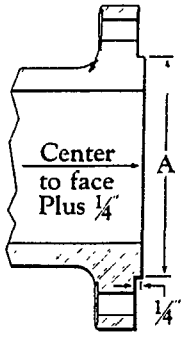
| Length Inches | List Prices, Each 2" Dia. | 2¼" Dia. | 2½" Dia. |
|---|---|---|---|
| 12 | 14.00 | | |
| 12¼ | 14.20 | | |
| 12½ | 14.40 | | |
| 12¾ | 14.60 | | |
| 13 | 14.80 | | |
| 13¼ | 15.00 | | |
| 13½ | 15.20 | | |
| 13¾ | 15.40 | | |
| 14 | 15.60 | | |
| 14¼ | 15.80 | | |
| 14½ | 16.00 | | |
| 14¾ | 16.20 | | |
| 15 | 16.40 | 21.40 | |
| 15¼ | 16.60 | 21.60 | |
| 15½ | 16.80 | 21.80 | |
| 15¾ | 17.00 | 22.00 | |
| 16 | 17.20 | 22.20 | |
| 16¼ | | 22.40 | |
| 16½ | 17.60 | 22.60 | 27.60 |
| 16¾ | | | 27.80 |
| 17 | 18.00 | 23.00 | 28.00 |
| 17¼ | | | 28.20 |
| 17½ | 18.40 | 23.40 | 28.40 |
| 17¾ | | | 28.60 |
| 18 | 18.80 | 23.80 | 28.80 |
| 18¼ | | | 29.00 |
| 18½ | 19.20 | 24.20 | 29.20 |
| 18¾ | | | 29.40 |
| 19 | 19.60 | 24.60 | 29.60 |
| 19¼ | | | 29.80 |
| 19½ | | 25.00 | 30.00 |
| 19¾ | | | 30.20 |
| 20 | | 25.40 | 30.40 |
| 20¼ | | | 30.60 |
| 20½ | | 25.80 | 30.80 |
| 21 | | 26.20 | 31.20 |
| 21¼ | | | 31.40 |
| 21½ | | | 31.60 |
| 22 | | | 32.00 |
| 22½ | | | 32.40 |
| 23 | | | 32.80 |

## Thread Compound

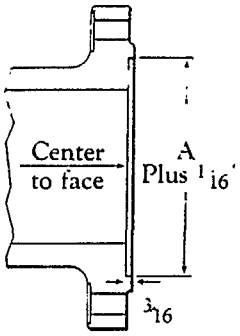
Crane High Temperature Thread Compound is recommended for use with alloy steel bolt-studs. On bolting subjected to high temperatures, this compound is unsurpassed. Because it reduces friction, maximum stress can be obtained in the bolt-stud with a minimum amount of power applied to the nut. In addition, since it minimizes the tendency of metals to gall or seize, joints can be more readily assembled and taken apart without injuring the bolting. The compound is described in detail on page 404.

# Male, Female, Tongue, and Groove Flange Facings

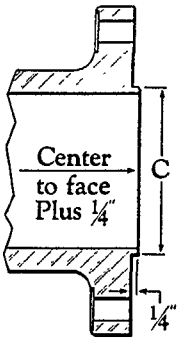
## For 300-Pound Steel



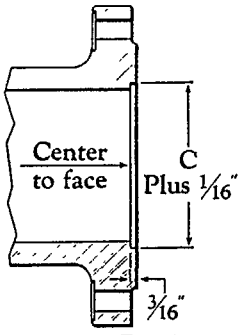
Large Male



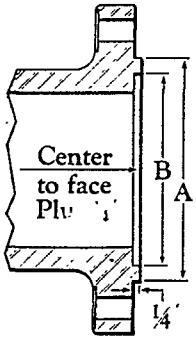
Large Female



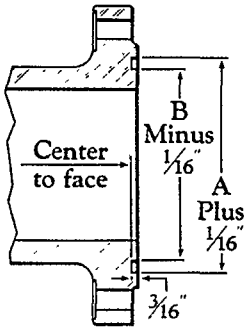
*Small Male



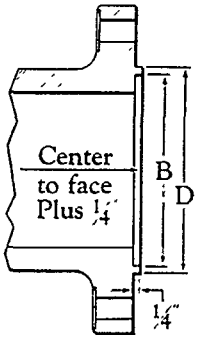
*Small Female



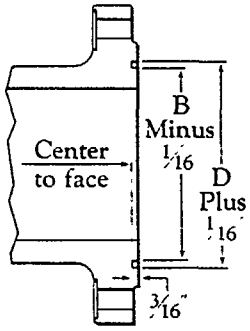
Large Tongue



Large Groove



Small Tongue



Small Groove

Dimensions, in Inches

| Class | Size | A | B | C | D |
|---|---|---|---|---|---|
| 300-Pound Steel | ½ | 1 3/8 | 1 | 23/32 | 1 3/8 |
| | ¾ | 1 11/16 | 1 5/16 | 15/16 | 1 11/16 |
| | 1 | 2 | 1 1/2 | 1 3/16 | 1 7/8 |
| | 1¼ | 2 1/2 | 1 7/8 | 1 1/2 | 2¼ |
| | 1½ | 2 7/8 | 2 1/8 | 1¾ | 2½ |
| | 2 | 3 5/8 | 2 7/8 | 2¼ | 3¼ |
| | 2½ | 4 1/8 | 3 3/8 | 2 11/16 | 3¾ |
| | 3 | 5 | 4¼ | 3 5/16 | 4 5/8 |
| | 3½ | 5½ | 4¾ | 3 13/16 | 5⅛ |
| | 4 | 6 3/16 | 5 3/16 | 4 5/16 | 5 11/16 |
| | 5 | 7 5/16 | 6 5/16 | 5⅜ | 6 13/16 |
| | 6 | 8½ | 7½ | 6⅜ | 8 |
| | 8 | 10⅝ | 9⅜ | 8⅜ | 10 |
| | 10 | 12¾ | 11¼ | 10½ | 12 |
| | 12 | 15 | 13½ | 12½ | 14¼ |
| | 14 | 16¼ | 14¾ | 13¾ | 15½ |
| | 16 | 18½ | 16¾ | 15¾ | 17⅝ |
| | 18 | 21 | 19¼ | 17¾ | 20⅛ |
| | 20 | 23 | 21 | 19¾ | 22 |
| | 24 | 27¼ | 25¼ | 23¾ | 26¼ |

***Refer to the Crane Discount Sheet for prices.***

The dimensions shown above conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939.

All of the types of facings can be applied to flanged products in the 300-Pound steel class, conforming to the American Steel Flange Standard B16e-1939.

**Center to face:** The illustrations show how regular valve or fitting center to face dimensions are affected by these special facings. Notice: the male or tongue facing increases the regular center to face ¼-inch; the female or groove facing does not alter the regular center to face.

**Regular facing and finish:** 300-Pound Steel flanged valves, flanged fittings, and flanges are regularly furnished with a 1/16-inch raised face.

1/16-inch raised faces and ¼-inch male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish. Female, tongue, and groove faces are regularly furnished with a smooth finish.

***Small male and female:** Small male and female facing, when used with steel screwed flanges, makes the joint directly on the end of the pipe. In these cases the pipe must be thick enough to provide a bearing surface of ample width to prevent crushing of the gasket. If a pipe end is to be used as a mating member in a joint, orders should specify the inside diameter of the pipe. In some instances, it may be necessary to lag up the port diameter of valves and fittings to match the I.D. of the pipe, in which case special prices will apply.

**Gaskets:** Gaskets for male and female and for tongue and groove joints should cover the bottom of the recess with minimum clearances, allowing for the plus or minus tolerance of 0.016 inch (1/64") which is permitted by the American Standard on the inside and outside diameters of facings.

*Dimensions of ring joint facing pages 470 and 471*
*Facings on Cranelap Joints . pages 507 and 508*
*Templates for drilling . . . page 461*

# Male, Female, Tongue, and Groove Flange Facings

## For 400 to 2500-Pound Steel

Dimensions, in Inches

| Class | Size | A | B | C | D |
|---|---|---|---|---|---|
| 400, 600, 900, 1500, or 2500-Pound Steel | 1/2 | 1 3/8 | 1 | 23/32 | 1 3/8 |
| | 3/4 | 1 11/16 | 15/16 | 15/16 | 1 11/16 |
| | 1 | 2 | 1 1/2 | 1 3/16 | 1 7/8 |
| | 1 1/4 | 2 1/2 | 1 7/8 | 1 1/2 | 2 1/4 |
| | 1 1/2 | 2 7/8 | 2 1/8 | 1 3/4 | 2 1/2 |
| | 2 | 3 5/8 | 2 7/8 | 2 1/4 | 3 1/4 |
| | 2 1/2 | 4 1/8 | 3 3/8 | 2 11/16 | 3 3/4 |
| | 3 | 5 | 4 1/4 | 3 5/16 | 4 5/8 |
| | 3 1/2 | 5 1/2 | 4 3/4 | 3 13/16 | 5 1/8 |
| | 4 | 6 3/16 | 5 3/16 | 4 5/16 | 5 11/16 |
| | 5 | 7 5/16 | 6 5/16 | 5 3/8 | 6 13/16 |
| | 6 | 8 1/2 | 7 1/2 | 6 3/8 | 8 |
| | 8 | 10 5/8 | 9 3/8 | 8 3/8 | 10 |
| | 10 | 12 3/4 | 11 1/4 | 10 1/2 | 12 |
| | 12 | 15 | 13 1/2 | 12 1/2 | 14 1/4 |
| | 14 | 16 1/4 | 14 3/4 | 13 3/4 | 15 1/2 |
| | 16 | 18 1/2 | 16 3/4 | 15 3/4 | 17 5/8 |
| | 18 | 21 | 19 1/4 | 17 3/4 | 20 1/8 |
| | 20 | 23 | 21 | 19 3/4 | 22 |
| | 24 | 27 1/4 | 25 1/4 | 23 3/4 | 26 1/4 |

***Refer to the Crane Discount Sheet for prices.***

The dimensions shown above conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1930.

All of the types of facings can be applied to flanged products in the 400, 600, 900, 1500, and 2500-Pound steel classes, conforming to the American Standard, B 16e-1930.

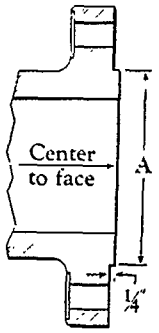
**Center to face:** The illustrations show how regular valve or fitting center to face dimensions are affected by these special facings. Notice particularly: the male and tongue facings are included in the regular center to face; the female and groove facings require a deduction of 1/4-inch from the regular center to face.

**Regular facing and finish:** Flanged valves and flanged fittings of the classes indicated are regularly furnished with a 1/4-inch male face. Companion flanges have a 1/4-inch male face or, if specified, a 3/16-inch female face.

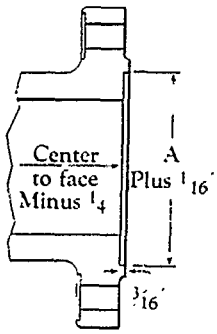
The male faces are finished with concentric grooves, approximately 32 grooves per inch, known as a "serrated" finish. Female, tongue, and groove faces regularly have a smooth finish.

***Small male and female:** Small male and female facing, when used with steel screwed flanges, makes the joint directly on the end of the pipe. In these cases the pipe must be thick enough to provide a bearing surface of ample width to prevent crushing of the gasket. If a pipe end is to be used as a mating member in a joint, orders should specify the inside diameter of the pipe. In some instances, it may be necessary to lag up the port diameter of valves and fittings to match the I.D. of the pipe, in which case special prices will apply.

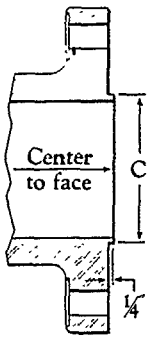
**Gaskets:** Gaskets for male and female and for tongue and groove joints should cover the bottom of the recess with minimum clearances, allowing for the plus or minus tolerance of 0.010 inch (1/64") which is permitted by the American Standard on the inside and outside diameters of facings.



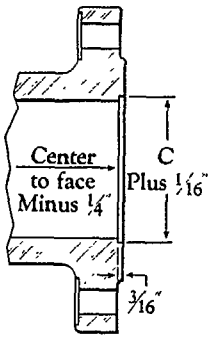
Large Male



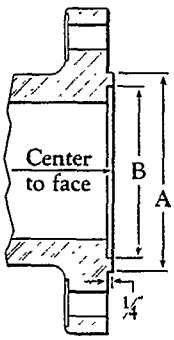
Large Female



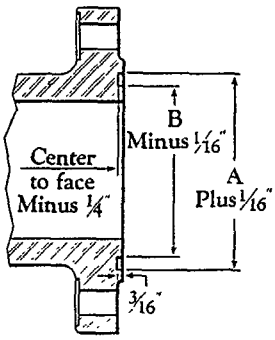
*Small Male



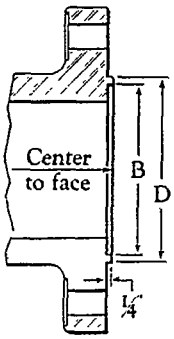
*Small Female



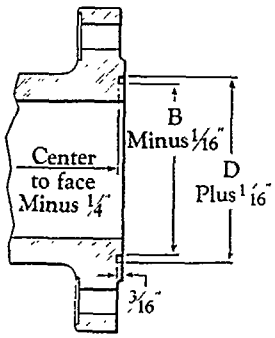
Large Tongue



Large Groove



Small Tongue

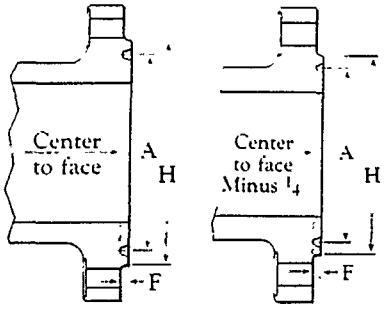


Small Groove

*Dimensions of ring joint facing . pages 470 and 471*
*Facings on Cranelap Joints.....pages 507 and 508*
*Bolting on companion flanges. . . . . page 457*
*Templates for drilling.... . . pages 462 and 463*

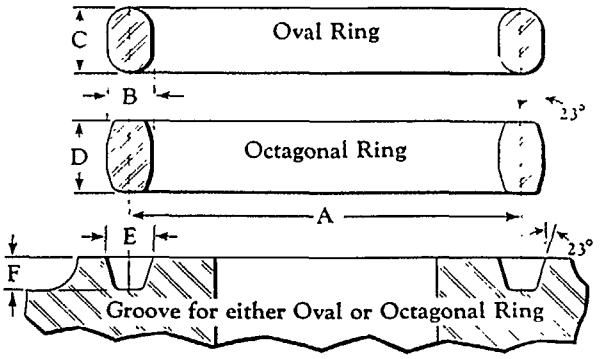
# Ring Joint Facing and Rings

## API and American Standard—Dimensions, in Inches

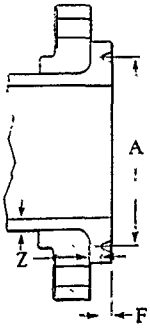



150 and 300-Pound — 400, 600, 900, 1500, and 2500-Pound

For Valves, Fittings, and Flanges

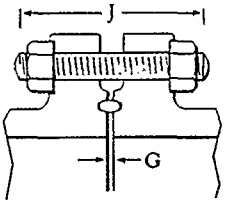



(Oval rings fit grooves having either a flat or round bottom; octagonal rings only fit grooves having a flat bottom.)




("Z" represents pipe thickness.)

Cranelap Joints




"G" is approximate clearance with bolt-studs tight.

Assembled Ring Joint

*Dimension "J" does not apply to Cranelap Joints; see "Bolt-stud lengths" on next page.

†***Caution:*** The 3-inch 300 and 600-Pound Cranelap Ring Joints use Ring No. R 30, having a pitch diameter of 4⅝ inches. When 3-inch 300 or 600-Pound ring joint valves, fittings, or flanges are to be bolted to Cranelap joints, orders must so specify; they will be machined special.

‡See explanation of "center to face" on next page.

| Class | Size | Ring Number | A | B | C | D | E | F | G | H | *J | No. of Bolt-Studs | Dia. of Bolt-Studs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 Pound | 1 | R 15 | 1⅞ | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | 2½ | 3 | 4 | ½ |
| | 1¼ | R 17 | 2¼ | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | 2⅞ | 3¼ | 4 | ½ |
| | 1½ | R 19 | 2 9/16 | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | 3¼ | 3¼ | 4 | ½ |
| | 2 | R 22 | 3¼ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 4 | 3¾ | 4 | ⅝ |
| | 2½ | R 25 | 4 | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 4¾ | 4 | 4 | ⅝ |
| | 3 | R 29 | 4½ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 5¼ | 4¼ | 4 | ⅝ |
| | 3½ | R 33 | 5 3/16 | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 6 1/16 | 4¼ | 8 | ⅝ |
| | 4 | R 36 | 5⅞ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 6¾ | 4¼ | 8 | ⅝ |
| | 5 | R 40 | 6¾ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 7⅝ | 4½ | 8 | ¾ |
| | 6 | R 43 | 7⅝ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 8⅝ | 4½ | 8 | ¾ |
| | 8 | R 48 | 9¾ | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 10¾ | 4¾ | 8 | ¾ |
| | 10 | R 52 | 12 | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 13 | 5¼ | 12 | ⅞ |
| | 12 | R 56 | 15 | 5/16 | 9/16 | ½ | 11/32 | ¼ | 5/32 | 16 | 5½ | 12 | ⅞ |
| | 14 | R 59 | 15⅝ | 5/16 | 9/16 | ½ | 11/32 | ¼ | ⅛ | 16¾ | 6 | 12 | 1 |
| | 16 | R 64 | 17⅞ | 5/16 | 9/16 | ½ | 11/32 | ¼ | ⅛ | 19 | 6 | 16 | 1 |
| | 18 | R 68 | 20⅜ | 5/16 | 9/16 | ½ | 11/32 | ¼ | ⅛ | 21½ | 6½ | 16 | 1⅛ |
| | 20 | R 72 | 22 | 5/16 | 9/16 | ½ | 11/32 | ¼ | ⅛ | 23½ | 7 | 20 | 1⅛ |
| | 24 | R 76 | 26½ | 5/16 | 9/16 | ½ | 11/32 | ¼ | ⅛ | 28 | 7¾ | 20 | 1¼ |

| Class | Size | Ring Number | A | B | C | D | E | F | G 300 Lb. | G 400 Lb. | G 600 Lb. | H | *J 300 Lb. | *J 400 Lb. | *J 600 Lb. | No. of Bolt-Studs 300 Lb. | No. of Bolt-Studs 400 Lb. | No. of Bolt-Studs 600 Lb. | Dia. of Bolt-Studs 300 Lb. | Dia. of Bolt-Studs 400 Lb. | Dia. of Bolt-Studs 600 Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | ½ | R 11 | 1 11/32 | ¼ | 7/16 | ⅜ | 9/32 | ‡7/32 | ⅛ | | ⅛ | 2 | 3 | | 3 | 4 | | 4 | ½ | | ½ |
| | ¾ | R 13 | 1 11/16 | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | | 5/32 | 2½ | 3½ | | 3½ | 4 | | 4 | ⅝ | | ⅝ |
| | 1 | R 16 | 2 | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | | 5/32 | 2¾ | 3½ | | 3½ | 4 | | 4 | ⅝ | | ⅝ |
| | 1¼ | R 18 | 2⅜ | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | | 5/32 | 3⅛ | 3¾ | | 3¾ | 4 | | 4 | ⅝ | | ⅝ |
| | 1½ | R 20 | 2 11/16 | 5/16 | 9/16 | ½ | 11/32 | ‡¼ | 5/32 | | 5/32 | 3 9/16 | 4 | | 4¼ | 4 | | 4 | ¾ | | ¾ |
| | 2 | R 23 | 3¼ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | | 3/16 | 4¼ | 4¼ | | 4½ | 8 | | 8 | ⅝ | | ⅝ |
| | 2½ | R 26 | 4 | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | | 3/16 | 5 | 4¾ | | 5 | 8 | | 8 | ¾ | | ¾ |
| | †3 | †R 31 | †4⅞ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | | 3/16 | 5¾ | 5 | | 5¼ | 8 | | 8 | ¾ | | ¾ |
| | 3½ | R 34 | 5 3/16 | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | | 3/16 | 6¼ | 5¼ | | 5¾ | 8 | | 8 | ¾ | | ⅞ |
| | 4 | R 37 | 5⅞ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 6⅞ | 5¼ | 5¾ | 6 | 8 | 8 | 8 | ¾ | ⅞ | ⅞ |
| | 5 | R 41 | 7⅛ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 8¼ | 5½ | 6 | 6¾ | 8 | 8 | 8 | ¾ | ⅞ | 1 |
| | 6 | R 45 | 8 5/16 | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 9½ | 5¾ | 6¼ | 7 | 12 | 12 | 12 | ¾ | ⅞ | 1 |
| | 8 | R 49 | 10⅝ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 11⅞ | 6¼ | 7 | 8 | 12 | 12 | 12 | ⅞ | 1 | 1⅛ |
| | 10 | R 53 | 12¾ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 14 | 7¼ | 7¾ | 8¾ | 16 | 16 | 16 | 1 | 1⅛ | 1¼ |
| | 12 | R 57 | 15 | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 16¼ | 7½ | 8½ | 9 | 16 | 16 | 20 | 1⅛ | 1¼ | 1¼ |
| | 14 | R 61 | 16½ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 18 | 7¾ | 8¾ | 9½ | 20 | 20 | 20 | 1⅛ | 1¼ | 1⅜ |
| | 16 | R 65 | 18½ | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 20 | 8½ | 9¼ | 10¼ | 20 | 20 | 20 | 1¼ | 1⅜ | 1½ |
| | 18 | R 69 | 21 | 7/16 | 11/16 | ⅝ | 15/32 | 5/16 | 7/32 | 7/32 | 3/16 | 22⅝ | 8¾ | 9½ | 11 | 24 | 24 | 20 | 1¼ | 1⅜ | 1⅝ |
| | 20 | R 73 | 23 | ½ | ¾ | 11/16 | 17/32 | ⅜ | 7/32 | 7/32 | 3/16 | 25 | 9¼ | 10¼ | 11¾ | 24 | 24 | 24 | 1¼ | 1½ | 1⅝ |
| | 24 | R 77 | 27¼ | ⅝ | ⅞ | 13/16 | 21/32 | 7/16 | ¼ | ¼ | 7/32 | 29½ | 10¼ | 11¼ | 13½ | 24 | 24 | 24 | 1½ | 1¾ | 1⅞ |

†, ‡, 4 and †600 Pound

# Dimensions, in Inches (Cont.)

| Class | Size | Ring Numbers | A | B | C | D | E | F | G | H | *J | No. of Bolt-Studs | Dia. of Bolt-Studs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 900 Pound | 3 | R 31 | 4 7/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 6 1/8 | 6 | 8 | 7/8 |
| | 4 | R 37 | 5 7/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 7 1/8 | 7 | 8 | 1 1/8 |
| | 5 | R 41 | 7 1/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 8 1/2 | 7 3/4 | 8 | 1 1/4 |
| | 6 | R 45 | 8 5/16 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 9 1/2 | 8 | 12 | 1 1/8 |
| | 8 | R 49 | 10 5/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 12 1/8 | 9 | 12 | 1 3/8 |
| | 10 | R 53 | 12 3/4 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 14 1/4 | 9 1/2 | 16 | 1 3/8 |
| | 12 | R 57 | 15 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 5/32 | 16 1/2 | 10 1/4 | 20 | 1 3/8 |
| | 14 | R 62 | 16 1/2 | 5/8 | 7/8 | 13/16 | 21/32 | 7/16 | 5/32 | 18 3/8 | 11 1/4 | 20 | 1 1/2 |
| | 16 | R 66 | 18 1/2 | 5/8 | 7/8 | 13/16 | 21/32 | 7/16 | 5/32 | 20 5/8 | 11 3/4 | 20 | 1 5/8 |
| | 18 | R 70 | 21 | 3/4 | 1 | 15/16 | 25/32 | 1/2 | 3/16 | 23 3/8 | 13 1/2 | 20 | 1 7/8 |
| | 20 | R 74 | 23 | 3/4 | 1 | 15/16 | 25/32 | 1/2 | 3/16 | 25 1/2 | 14 1/2 | 20 | 2 |
| | 24 | R 78 | 27 1/4 | 1 | 1 5/16 | 1 1/4 | 1 1/16 | 5/8 | 7/32 | 30 3/8 | 18 1/4 | 20 | 2 1/2 |
| 1500 Pound | 1/2 | R 12 | 1 9/16 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 2 3/8 | 4 1/4 | 4 | 3/4 |
| | 3/4 | R 14 | 1 3/4 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 2 5/8 | 4 1/2 | 4 | 3/4 |
| | 1 | R 16 | 2 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 2 13/16 | 5 | 4 | 7/8 |
| | 1 1/4 | R 18 | 2 3/8 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 3 3/16 | 5 | 4 | 7/8 |
| | 1 1/2 | R 20 | 2 11/16 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 3 5/8 | 5 1/2 | 4 | 1 |
| | 2 | R 24 | 3 3/4 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 4 7/8 | 6 | 8 | 7/8 |
| | 2 1/2 | R 27 | 4 1/4 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 5 3/8 | 6 1/2 | 8 | 1 |
| | 3 | R 35 | 5 3/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 6 5/8 | 7 1/4 | 8 | 1 1/8 |
| | 4 | R 39 | 6 3/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 7 5/8 | 8 | 8 | 1 1/4 |
| | 5 | R 44 | 7 5/8 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 9 | 10 | 8 | 1 1/2 |
| | 6 | R 46 | 8 5/16 | 1/2 | 3/4 | 11/16 | 17/32 | 3/8 | 1/8 | 9 3/4 | 10 3/4 | 12 | 1 3/8 |
| | 8 | R 50 | 10 5/8 | 5/8 | 7/8 | 13/16 | 21/32 | 7/16 | 5/32 | 12 1/2 | 12 | 12 | 1 5/8 |
| | 10 | R 54 | 12 3/4 | 5/8 | 7/8 | 13/16 | 21/32 | 7/16 | 5/32 | 14 5/8 | 13 3/4 | 12 | 1 7/8 |
| | 12 | R 58 | 15 | 7/8 | 1 1/8 | 11/16 | 29/32 | 9/16 | 3/16 | 17 1/4 | 15 3/4 | 16 | 2 |
| | 14 | R 63 | 16 1/2 | 1 | 1 5/16 | 1 1/4 | 1 1/16 | 5/8 | 7/32 | 19 1/4 | 17 1/4 | 16 | 2 1/4 |
| | 16 | R 67 | 18 1/2 | 1 1/8 | 1 7/16 | 1 3/8 | 1 3/16 | 11/16 | 5/16 | 21 1/2 | 19 | 16 | 2 1/2 |
| | 18 | R 71 | 21 | 1 1/8 | 1 7/16 | 1 5/8 | 1 3/16 | 11/16 | 5/16 | 24 1/8 | 20 3/4 | 16 | 2 3/4 |
| | 20 | R 75 | 23 | 1 1/4 | 1 9/16 | 1 1/2 | 1 5/16 | 11/16 | 3/8 | 26 1/2 | 22 3/4 | 16 | 3 |
| | 24 | R 79 | 27 1/4 | 1 3/8 | 1 3/4 | 1 5/8 | 1 7/16 | 13/16 | 7/16 | 31 1/4 | 26 | 16 | 3 1/2 |
| 2500 Pound | 1/2 | R 13 | 1 11/16 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 2 9/16 | 4 3/4 | 4 | 3/4 |
| | 3/4 | R 16 | 2 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 2 7/8 | 5 | 4 | 3/4 |
| | 1 | R 18 | 2 3/8 | 5/16 | 9/16 | 1/2 | 11/32 | ‡1/4 | 5/32 | 3 1/4 | 5 1/2 | 4 | 7/8 |
| | 1 1/4 | R 21 | 2 27/32 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 4 | 6 1/4 | 4 | 1 |
| | 1 1/2 | R 23 | 3 1/4 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 4 1/2 | 7 | 4 | 1 1/8 |
| | 2 | R 26 | 4 | 7/16 | 11/16 | 5/8 | 15/32 | 5/16 | 1/8 | 5 1/4 | 7 1/4 | 8 | 1 |
| | 2 1/2 | R 28 | 4 3/8 | 1/2 | 3/4 | 11/16 | 17/32 | 3/8 | 1/8 | 5 7/8 | 8 | 8 | 1 1/8 |
| | 3 | R 32 | 5 | 1/2 | 3/4 | 11/16 | 17/32 | 3/8 | 1/8 | 6 5/8 | 9 1/4 | 8 | 1 1/4 |
| | 4 | R 38 | 6 3/16 | 5/8 | 7/8 | 13/16 | 21/32 | 7/16 | 5/32 | 8 | 10 1/2 | 8 | 1 1/2 |
| | 5 | R 42 | 7 1/2 | 3/4 | 1 | 15/16 | 25/32 | 1/2 | 5/32 | 9 1/2 | 12 1/2 | 8 | 1 3/4 |
| | 6 | R 47 | 9 | 3/4 | 1 | 15/16 | 25/32 | 1/2 | 5/32 | 11 | 14 1/4 | 8 | 2 |
| | 8 | R 51 | 11 | 7/8 | 1 1/8 | 1 1/16 | 29/32 | 9/16 | 3/16 | 13 3/8 | 16 | 12 | 2 |
| | 10 | R 55 | 13 1/2 | 1 1/8 | 1 7/16 | 1 3/8 | 1 3/16 | 11/16 | 1/4 | 16 3/4 | 20 1/4 | 12 | 2 1/2 |
| | 12 | R 60 | 16 | 1 1/4 | 1 9/16 | 1 1/2 | 1 5/16 | 11/16 | 5/16 | 19 1/2 | 22 1/4 | 12 | 2 3/4 |

**Rings:** See page 472. Type "A" or "B" Rings 1/4, 5/16, or 7/16-inch wide are regularly furnished oval shape; 1/2-inch wide or wider Type "A" or Type "B" Rings are octagonal shape.

**Standards:** The dimensions of the rings and ring joint grooves conform to American Standard B16.20-1952. The flange facing dimensions conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1939 and Addendum B16e4-1940.

Flange facing and ring dimensions also conform to the American Petroleum Institute Standard 6-B, Fourth Edition, May, 1949 (Tentative), except that this Standard does not include 1/2 and 3/4-inch 600-Pound Flanges or 16-inch and larger 1500-Pound Flanges.

The dimensions shown on this and the preceding page apply to ring joint facing and rings for the end flanges of steel valves and flanged fittings, and for steel flanges. The groove (smooth finish) for the ring is cut in a raised face as illustrated on the preceding page.

**‡Center to face:** When ring joint facing is applied to 150 and 300-Pound valves and fittings, the center to the raised face is equal to the regular center to face dimension (which includes the 1/16-inch raised face) plus the depth of the groove on sizes 6-inch and larger, or plus the depth of the groove minus 1/32-inch on smaller sizes.

On higher pressure ring joint valves and fittings, the center to the raised face is equal to the regular center to face dimension minus 1/4-inch (the height of the large male), plus the depth of the groove on 400, 600, 900, and 1500-Pound sizes 2-inch and larger and on 2500-Pound sizes 1 1/4-inch and larger, or plus the depth of the groove minus 1/32-inch on the smaller sizes.

This practice also applies to loose flanges; that is, the raised face which is equal to the depth of the groove is added to the flange thickness (dimension "B" on pages 296 and 297) except that on the smaller sizes the groove cuts 1/32-inch into the flange thickness.

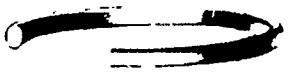
On Cranelap joints with ring joint facing the depth of the groove is added to the minimum thickness of the lap. See pages 505 to 508 for Cranelap joints.

***Bolt-stud lengths:** The length of bolt-studs indicated as dimension "J" in the tables applies for all combinations of ring joint valves, fittings, and flanges other than Cranelap.

For ring joint combinations made up of valves, fittings, or flanges bolted to Cranelaps, add the pipe thickness to dimension "J". For Cranelap to Cranelap ring joints, add twice the pipe thickness to dimension "J".

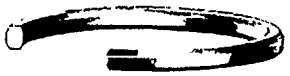
*Rings for ring joints . page 472*
*Dimensions of Cranelap Joints . . page 508*
*List prices of bolt-studs . . pages 466 and 467*
*Templates for drilling and flange dimensions . . pages 461 to 463*

# Rings for Ring Joints



Oval Ring
Types A and B

***Prices on application***



Octagonal Ring
Types A and B

Crane Oval and Octagonal Rings, illustrated above, are available in two grades of material suitable for use in 150, 300, 400, 600, 900, 1500, and 2500-Pound ring joints.

The shape of the ring regularly furnished for various sizes and pressure classes of joints is indicated in the table at the right.

**Ordering:** Orders for rings should specify the Ring Number and whether Type A or Type B is wanted. When the Type is not specified, Type A Rings will regularly be supplied in the shape shown in the table at the right.

***Type A Rings*** are made of Soft Steel (90 Brinell maximum hardness), either oval or octagonal, as shown in the table at the right; they are recommended for use with Carbon Steel, No. 4 Carbon-Molybdenum Steel, or No. 3 Nickel Steel products.

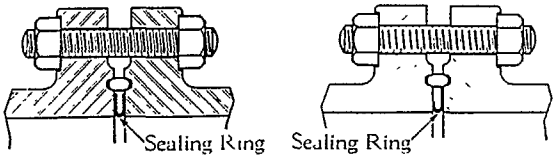
***Type B Rings*** made of 5% Chrome with ½% Molybdenum (130 Brinell maximum hardness), are recommended for corrosive services, as in oil refinery work, and for use with No. 5 Chrome-Molybdenum Steel products. They have the same shape as Type A Rings, being distinguished by a square bead on the outer periphery.

***Dimensions of Rings and Ring Joints . pages 470 and 471***
***Flanged joint assembly and maintenance . . . . . page 526***

**Shape of Ring Regularly Furnished For Various Size Ring Joints**

| Pressure Class | Oval Rings | Octagonal Rings |
|---|---|---|
| 150-Pound | All sizes | |
| 300-Pound | | |
| 400-Pound | 18" and smaller | 20 and 24" |
| 600-Pound | | |
| 900-Pound | 12" and smaller | 14" and larger |
| 1500-Pound | 5" and smaller | 6" and larger |
| 2500-Pound | 2" and smaller | 2½" and larger |

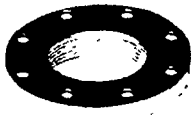
## Corrosion Sealing Rings




For unusually corrosive fluids, ***Corrosion Sealing Rings,*** illustrated above, are recommended for protection of rings. Prices on application.

# Gaskets

## For Brass and Bronze Flanged Joints



Full Face Gaskets are furnished without bolt holes unless otherwise ordered; an extra charge is made for punching bolt holes.

| Size of Joint Inches | 150-Pound MSS Standard Full Face Gaskets — List Prices, Each: 1/16-inch Cloth Inserted Rubber | 1/16-inch "CC" Rubber | 1/16-inch Cranite | Inside and Outside Diameters Inches | 300-Pound MSS Standard Full Face Gaskets — List Prices, Each: 1/16-inch "CC" Rubber | 1/16-inch Cranite | Inside and Outside Diameters Inches |
|---|---|---|---|---|---|---|---|
| 1 | .15 | .18 | .18 | 1 × 4¼ | .39 | .22 | 1 × 4⅞ |
| 1¼ | .21 | .26 | .19 | 1¼ × 4⅝ | .39 | .26 | 1¼ × 5¼ |
| 1½ | .21 | .26 | .22 | 1½ × 5 | .39 | .34 | 1½ × 6⅛ |
| 2 | .27 | .35 | .31 | 2 × 6 | .46 | .38 | 2 × 6½ |
| 2½ | .34 | .43 | .44 | 2½ × 7 | .56 | .53 | 2½ × 7½ |
| 3 | .41 | .51 | .49 | 3 × 7½ | .69 | .61 | 3 × 8¼ |
| 3½ | .44 | .69 | .61 | 3½ × 8½ | | | |
| 4 | .52 | .77 | .66 | 4 × 9 | | | |
| 5 | .62 | 1.05 | .72 | 5 × 10 | | | |
| 6 | .69 | 1.25 | .81 | 6 × 11 | | | |
| 8 | .96 | 1.50 | 1.20 | 8 × 13½ | | | |
| 10 | 1.30 | 2.05 | 1.70 | 10 × 16 | | | |

**Important:** Full face gaskets should always be used for brass or bronze flanged joints. Metallic gaskets are not recommended.

When brass or bronze flanged material is bolted to iron or steel material which normally has a raised face, the raised face should be removed to provide a full face bearing for the gasket. Brass or bronze flanged material should not be bolted to Cranelap flanged pipe joints.

**Cranite Gaskets:** When installing Cranite Gaskets, they should be coated with Crane Thread Lubricant in order to facilitate making tight joints; see page 464. Cranite Gaskets are satisfactory for use in oil lines where asbestos gaskets are permitted.



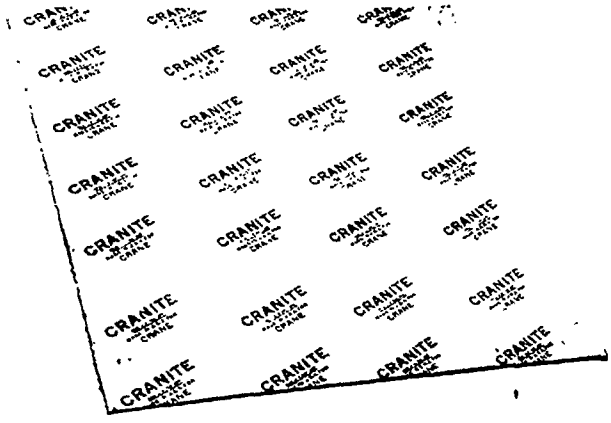
***Sheet Packings . . page 473*** ***For Gaskets for Iron and Steel Flanged Joints, see pages 474 to 476.***

# Cranite Sheet Packing

CRANITE——*the highest grade sheet packing obtainable.*

*Cranite Packing has been approved by the Underwriters' Laboratories, Inc., for use on hazardous liquids.*

*The name "CRANITE" is registered in the United States Patent Office.*




*The list price of Cranite Sheet Packing, for widths and thicknesses regularly furnished, is $1.60 per pound.*

*The 1/16-inch thickness averages .62 pound to the square foot.*

*An Asbestos Composition manufactured solely for Crane*

**Cranite Sheet Packing:** Cranite Sheet Packing is made of an asbestos composition, using only selected long fiber asbestos, cross laminated to provide unusual tensile strength. It offers a very uniform and high resistance to compression, is exceptionally strong and rugged, and will not deteriorate with age.

This packing is unhesitatingly recommended for a multitude of services, such as steam, water, oil, dry air, acids, ammonia, alkali, gases, etc., and for temperatures up to 750° F.

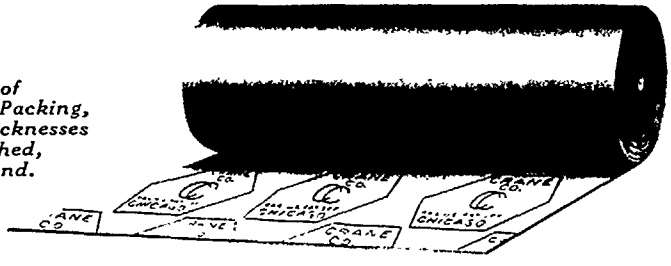
Because of the great number of services for which Cranite Sheet Packing can be used, its unusually high quality, and its ability to withstand deterioration, users will find it economical to purchase the packing in quantities and to carry it in stock.

For best results, gaskets cut from Cranite Sheet Packing should be coated with Crane Thread Lubricant when being installed. See page 464 for Crane Thread Lubricants.

**Sizes:** Cranite Sheet Packing is regularly furnished 1/16-inch thick in sheets 30 or 48 inches square. Other thicknesses from 1/64 to 1/4-inch, or other sizes up to 120 inches square can be made to order; prices and additional data on request.

# "CC" Rubber Sheet Packing

*The list price of "CC" Rubber Sheet Packing, for widths and thicknesses regularly furnished, is $1.05 per pound.*



*Average weights per square yard:*
*1/16-inch thick... 5 1/4 pounds*
*3/32-inch thick... 8 pounds*
*1/8-inch thick...10 1/2 pounds*

*Manufactured Solely for Crane*

"CC" Rubber Sheet Packing, manufactured solely for Crane, is especially well adapted for high or low pressure service on saturated steam, hot and cold water, air, gases, etc.

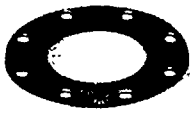
"CC" Rubber Sheet Packing is regularly furnished in rolls 36 inches wide and in thicknesses of 1/16-inch 3/32-inch, or 1/8-inch; each of these rolls weighs approximately 200 pounds.

Other widths, up to 72 inches, are available on special order; prices and data furnished on request.

# Gaskets

## For Cast Iron Flanged Joints

Ring Gaskets cover the face of the flange to the inside edge of the bolts and will always be furnished unless otherwise ordered.



Full Face Gaskets are furnished without bolt holes unless otherwise ordered; an extra charge is made for punching bolt holes.

| Flanged Joint | | Ring Gaskets | | | | | | Full Face Gaskets | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | List Prices, Each | | | | Diameter, in Inches | | List Prices, Each | | | | Diameter, in Inches | |
| Pressure Class | Size Inches | 1/16-inch Cloth Inserted Rubber | 1/16-inch "CC" Rubber | 4-ounce Canvas | 1/16-inch Cranite | In-side | Out-side | 1/16-inch Cloth Inserted Rubber | 1/16-inch "CC" Rubber | 4-ounce Canvas | 1/16-inch Cranite | In-side | Out-side |
| For 25-Pound Cast Iron Flanged Joints | 10 | .63 | 1.05 | .37 | | 10 | 13⅝ | 1.30 | 2.05 | .81 | | 10 | 16 |
| | 12 | .86 | 1.30 | .52 | | 12 | 16⅜ | 1.70 | 2.55 | 1.05 | | 12 | 19 |
| | 14 | 1.05 | 1.60 | .62 | .... | 14 | 18 | 1.90 | 2.90 | 1.20 | | 14 | 21 |
| | 16 | 1.20 | 2.05 | .72 | ... | 16 | 20½ | 2.45 | 3.65 | 1.45 | | 16 | 23½ |
| | 18 | 1.30 | 2.35 | .77 | | 18 | 22 | 2.75 | 4.10 | 1.65 | | 18 | 25 |
| | 20 | 1.50 | 2.55 | .90 | ... | 20 | 24¼ | 2.95 | 4.50 | 1.75 | .... | 20 | 27½ |
| | 24 | 2.10 | 3.00 | 1.25 | .... | 24 | 28¾ | 3.75 | 5.40 | 2.30 | .... | 24 | 32 |
| | 30 | 3.10 | 4.50 | 1.90 | .... | 30 | 35⅛ | 5.60 | 9.10 | 3.40 | .... | 30 | 38¾ |
| | 36 | 4.30 | 7.00 | 2.60 | .... | 36 | 41⅞ | 7.50 | 13.90 | 4.55 | ... | 36 | 46 |
| | 42 | 5.15 | 8.25 | 3.10 | .... | 42 | 48½ | ... | 16.55 | 5.55 | .... | 42 | 53 |
| | 48 | .... | 9.65 | 4.10 | ... | 48 | 55 | .... | 19.25 | 7.15 | .... | 48 | 59½ |
| For 125-Pound Cast Iron Flanged Joints | 1 | .07 | .09 | .06 | .08 | 1 | 2⅝ | .15 | .18 | .13 | .18 | 1 | 4¼ |
| | 1¼ | .10 | .13 | .09 | .09 | 1¼ | 3 | .21 | .26 | .18 | .19 | 1¼ | 4⅝ |
| | 1½ | .10 | .13 | .09 | .12 | 1½ | 3⅜ | .21 | .26 | .18 | .22 | 1½ | 5 |
| | 2 | .10 | .18 | .09 | .14 | 2 | 4⅛ | .27 | .35 | .21 | .31 | 2 | 6 |
| | 2½ | .13 | .22 | .10 | .17 | 2½ | 4⅞ | .34 | .43 | .27 | .44 | 2½ | 7 |
| | 3 | .18 | .26 | .13 | .20 | 3 | 5⅜ | .41 | .51 | .31 | .49 | 3 | 7½ |
| | 3½ | .21 | .36 | .15 | .29 | 3½ | 6⅜ | .44 | .69 | .33 | .61 | 3½ | 8½ |
| | 4 | .24 | .40 | .16 | .31 | 4 | 6⅞ | .52 | .77 | .35 | .66 | 4 | 9 |
| | 5 | .28 | .51 | .19 | .36 | 5 | 7¾ | .62 | 1.05 | .41 | .72 | 5 | 10 |
| | 6 | .34 | .60 | .22 | .41 | 6 | 8¾ | .69 | 1.25 | .44 | .81 | 6 | 11 |
| | 8 | .44 | .77 | .27 | .56 | 8 | 11 | .96 | 1.50 | .59 | 1.20 | 8 | 13½ |
| | 10 | .62 | 1.05 | .37 | .75 | 10 | 13⅜ | 1.30 | 2.05 | .81 | 1.70 | 10 | 16 |
| | 12 | .86 | 1.30 | .52 | 1.15 | 12 | 16⅛ | 1.70 | 2.55 | 1.05 | 2.30 | 12 | 19 |
| | 14 | 1.05 | 1.60 | .62 | 1.20 | 14 | 17¾ | 1.90 | 2.85 | 1.20 | 2.60 | 14 | 21 |
| | 16 | 1.20 | 2.05 | .72 | 1.40 | 16 | 20¼ | 2.45 | 3.65 | 1.50 | 3.10 | 16 | 23½ |
| | 18 | 1.25 | 2.35 | .77 | 1.20 | 18 | 21⅝ | 2.75 | 4.10 | 1.65 | 3.20 | 18 | 25 |
| | 20 | 1.50 | 2.55 | .90 | 1.45 | 20 | 23⅞ | 2.95 | 4.50 | 1.75 | 3.50 | 20 | 27½ |
| | 24 | 2.05 | 2.95 | 1.25 | 2.50 | 24 | 28¼ | 3.75 | 5.40 | 2.30 | 4.25 | 24 | 32 |
| | 30 | 3.10 | 4.50 | 1.85 | .... | 30 | 34¾ | 5.60 | 9.10 | 3.40 | .... | 30 | 38¾ |
| | 36 | 4.30 | 6.95 | 2.60 | .... | 36 | 41¼ | 7.50 | 13.90 | 4.55 | .... | 36 | 46 |
| | 42 | 5.15 | 8.25 | 3.10 | .... | 42 | 48 | .... | 16.55 | 5.55 | .... | 42 | 53 |
| | 48 | | 9.65 | 4.05 | .... | 48 | 54½ | .... | 19.20 | 7.15 | | 48 | 59½ |
| For 250-Pound Cast Iron Flanged Joints | 1½ | | .18 | .... | .14 | 1½ | 3¾ | | | | | | |
| | 2 | .... | .20 | .... | .15 | 2 | 4⅜ | | | | | | |
| | 2½ | ... | .26 | .... | .19 | 2½ | 5⅛ | | | | | | |
| | 3 | | .33 | .... | .26 | 3 | 5⅞ | | | | | | |
| | 3½ | ... | .36 | .... | .30 | 3½ | 6½ | | | | | | |
| | 4 | | .39 | .... | .36 | 4 | 7⅛ | | | | | | |
| | 5 | | .53 | .... | .47 | 5 | 8½ | | | | | | |
| | 6 | | .64 | .... | .61 | 6 | 9⅞ | | | | | | |
| | 8 | | .92 | .... | .81 | 8 | 12⅛ | | | | | | |
| | 10 | | 1.20 | ... | 1.05 | 10 | 14¼ | | | | | | |
| | 12 | | 1.55 | ... | 1.25 | 12 | 16⅝ | | | | | | |
| | 14 | | 2.15 | ... | 2.10 | 13¼ | 19⅛ | | | | | | |
| | 16 | | 2.55 | ... | 2.30 | 15¼ | 21¼ | | | | | | |
| | 18 | | 2.95 | | 2.60 | 17 | 23½ | | | | | | |
| | 20 | | 3.10 | ... | 3.05 | 19 | 25¾ | | | | | | |
| | 24 | | 4.10 | ... | 3.95 | 23 | 30½ | | | | | | |

**Canvas Gaskets:** Canvas Gaskets are furnished uncoated. They should be coated with Crane Thread Lubricant or with red lead and oil when installed.

**Cranite Gaskets:** When Cranite Gaskets are installed, they should be coated with Crane Thread Lubricant to facilitate making tight joints. Cranite Gaskets are satisfactory for use in oil lines where asbestos gaskets are permitted.

**Other materials:** Other commercial sheet packing gaskets are made to order; prices on application.

*Thread lubricant . . . page 464*
*Gaskets for brass flanged joints . page 472*
*Sheet packings . . . page 473*

**800-Pound Hydraulic Cast Iron Joints:** Gaskets for 800-Pound Hydraulic Cast Iron Flanged Joints are the same as for 800-Pound Steel Flanged Joints; use the list prices and dimensions shown on page 475.

# Gaskets

## For Steel Flanged Joints

**Cranite Gaskets:** Cranite Gaskets are recommended for steam, water, air, gas, and many other similar services, including oil lines on which asbestos gaskets are permitted. Their use is limited to a maximum of 750° F. When being installed, they should be coated with Crane Thread Lubricant to facilitate the making of tight joints; see page 464.

**Corrugated Metallic Gaskets:** Corrugated Metallic Gaskets (Copper or Soft Iron) can be furnished when ordered; prices and dimensions on application. They should have a large inside diameter to assure a high unit compressive load; this requirement is mandatory in the case of piping materials used at the higher pressures and temperatures for which they are recommended. The gaskets should be coated with Crane High Temperature Thread Compound when being installed; see page 464.

Ring Gaskets extend to the inside edge of the bolts

Corrugated Metallic Gasket

**800-Pound Hydraulic Cast Iron Joints:** 800-Pound Hydraulic Cast Iron Flanged Joints use the same gaskets as the 600-Pound Steel; see list prices and dimensions in the table below.

### Ring Gaskets—1/16-Inch Thick Cranite

| Size of Joint Inches | 150-Pound List Price Each | 150-Pound I.D. × O.D. Inches | 300-Pound List Price Each | 300-Pound I.D. × O.D. Inches | 400-Pound List Price Each | 400-Pound I.D. × O.D. Inches | 600-Pound List Price Each | 600-Pound I.D. × O.D. Inches | 900-Pound List Price Each | 900-Pound I.D. × O.D. Inches | 1500-Pound List Price Each | 1500-Pound I.D. × O.D. Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/2 | .06 | 1/2 × 1 7/8 | .08 | 1/2 × 2 1/8 | .... | ..... | .08 | 1/2 × 2 1/8 | .... | ..... | .08 | 1/2 × 2 1/2 |
| 3/4 | .07 | 3/4 × 2 1/4 | .08 | 3/4 × 2 5/8 | .... | ..... | .08 | 3/4 × 2 5/8 | .... | ..... | .09 | 11/16 × 2 3/4 |
| 1 | .08 | 1 × 2 5/8 | .09 | 1 × 2 7/8 | .... | ..... | .09 | 1 × 2 7/8 | .... | ..... | .11 | 7/8 × 3 1/8 |
| 1 1/4 | .09 | 1 1/4 × 3 | .11 | 1 1/4 × 3 1/4 | .... | ..... | .11 | 1 1/4 × 3 1/4 | .... | ..... | .13 | 1 1/8 × 3 1/2 |
| 1 1/2 | .12 | 1 1/2 × 3 3/8 | .14 | 1 1/2 × 3 3/4 | .... | ..... | .14 | 1 1/2 × 3 3/4 | .... | ..... | .15 | 1 3/8 × 3 7/8 |
| 2 | .14 | 2 × 4 1/8 | .15 | 2 × 4 3/8 | .... | ..... | .15 | 2 × 4 3/8 | .... | ..... | .27 | 1 7/8 × 5 5/8 |
| 2 1/2 | .17 | 2 1/2 × 4 7/8 | .19 | 2 1/2 × 5 1/8 | .... | ..... | .19 | 2 1/2 × 5 1/8 | .... | ..... | .36 | 2 1/4 × 6 1/2 |
| 3 | .20 | 3 × 5 3/8 | .26 | 3 × 5 7/8 | .... | ..... | .26 | 3 × 5 7/8 | .36 | 2 7/8 × 6 5/8 | .40 | 2 3/4 × 6 7/8 |
| 3 1/2 | .29 | 3 1/2 × 6 3/8 | .30 | 3 1/2 × 6 1/2 | .... | ..... | .29 | 3 1/2 × 6 3/8 | .... | ..... | .... | ..... |
| 4 | .31 | 4 × 6 7/8 | .36 | 4 × 7 1/8 | .34 | 4 × 7 | .44 | 4 × 7 5/8 | .54 | 3 7/8 × 8 1/8 | .58 | 3 5/8 × 8 1/4 |
| 5 | .36 | 5 × 7 3/4 | .47 | 5 × 8 1/2 | .45 | 5 × 8 3/8 | .66 | 5 × 9 1/2 | .72 | 4 3/4 × 9 3/4 | .81 | 4 3/8 × 10 |
| 6 | .41 | 6 × 8 3/4 | .61 | 6 × 9 7/8 | .59 | 6 × 9 3/4 | .69 | 6 × 10 1/2 | 1.00 | 5 3/4 × 11 7/8 | 1.00 | 5 3/8 × 11 1/8 |
| 8 | .56 | 8 × 11 | .81 | 8 × 12 1/8 | .78 | 8 × 12 | 1.00 | 7 7/8 × 12 5/8 | 1.40 | 7 1/2 × 14 1/8 | 1.40 | 7 × 13 7/8 |
| 10 | .75 | 10 × 13 3/8 | 1.05 | 10 × 14 1/4 | 1.00 | 10 × 14 1/8 | 1.65 | 9 3/4 × 15 3/4 | 2.10 | 9 3/8 × 17 1/8 | 2.15 | 8 3/4 × 17 1/8 |
| 12 | 1.15 | 12 × 16 1/8 | 1.25 | 12 × 16 5/8 | 1.25 | 12 × 16 1/2 | 2.00 | 11 3/4 × 18 | 2.60 | 11 1/8 × 19 5/8 | 3.05 | 10 3/8 × 20 1/2 |
| 14 | 1.35 | 13 1/4 × 17 3/4 | 2.10 | 13 1/4 × 19 1/8 | 2.05 | 13 1/8 × 19 | 2.25 | 12 7/8 × 19 3/8 | 2.70 | 12 1/4 × 20 1/2 | 3.80 | 11 3/8 × 22 3/4 |
| 16 | 1.75 | 15 1/4 × 20 1/4 | 2.30 | 15 1/4 × 21 1/4 | 2.35 | 15 × 21 1/8 | 2.90 | 14 3/4 × 22 1/4 | 3.30 | 14 × 22 5/8 | .... | ..... |
| 18 | 1.55 | 17 1/4 × 21 5/8 | 2.60 | 17 × 23 1/2 | 2.55 | 17 × 23 3/8 | 3.20 | 16 1/2 × 24 1/8 | 3.75 | 15 3/4 × 25 1/8 | .... | ..... |
| 20 | 1.80 | 19 1/4 × 23 7/8 | 3.05 | 19 × 25 3/4 | 3.05 | 18 7/8 × 25 1/2 | 3.80 | 18 1/4 × 26 7/8 | 4.40 | 17 1/2 × 27 1/2 | .... | ..... |
| 24 | 2.95 | 23 1/4 × 28 1/4 | 3.95 | 23 × 30 1/2 | 4.00 | 22 5/8 × 30 1/4 | 4.75 | 22 × 31 1/8 | 6.40 | 21 × 33 | .... | ..... |

### Large Male and Female Gaskets—1/16-Inch Thick Cranite

| Size of Joint Inches | 300-Pound List Price Each | 300-Pound I.D. × O.D. Inches | 400-Pound List Price Each | 400-Pound I.D. × O.D. Inches | 600-Pound List Price Each | 600-Pound I.D. × O.D. Inches | 900-Pound List Price Each | 900-Pound I.D. × O.D. Inches | 1500-Pound List Price Each | 1500-Pound I.D. × O.D. Inches |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/2 | .04 | 1/2 × 1 3/8 | .... | ..... | .04 | 1/2 × 1 3/8 | .... | ..... | .04 | 1/2 × 1 3/8 |
| 3/4 | .05 | 3/4 × 1 11/16 | .... | ..... | .05 | 3/4 × 1 11/16 | .... | ..... | .05 | 11/16 × 1 11/16 |
| 1 | .05 | 1 × 2 | .... | ..... | .05 | 1 × 2 | .... | ..... | .06 | 7/8 × 2 |
| 1 1/4 | .06 | 1 1/4 × 2 1/2 | .... | ..... | .06 | 1 1/4 × 2 1/2 | .... | ..... | .07 | 1 1/8 × 2 1/2 |
| 1 1/2 | .07 | 1 1/2 × 2 7/8 | .... | ..... | .07 | 1 1/2 × 2 7/8 | .... | ..... | .08 | 1 3/8 × 2 7/8 |
| 2 | .11 | 2 × 3 5/8 | .... | ..... | .11 | 2 × 3 5/8 | .... | ..... | .12 | 1 7/8 × 3 5/8 |
| 2 1/2 | .12 | 2 1/2 × 4 1/8 | .... | ..... | .12 | 2 1/2 × 4 1/8 | .... | ..... | .13 | 2 1/4 × 4 1/8 |
| 3 | .15 | 3 × 5 | .... | ..... | .15 | 3 × 5 | .15 | 2 7/8 × 5 | .16 | 2 3/4 × 5 |
| 3 1/2 | .16 | 3 1/2 × 5 1/2 | .... | ..... | .16 | 3 1/2 × 5 1/2 | .... | ..... | .... | ..... |
| 4 | .24 | 4 × 6 3/16 | .24 | 4 × 6 3/16 | .24 | 4 × 6 3/16 | .25 | 3 7/8 × 6 3/16 | .27 | 3 5/8 × 6 3/16 |
| 5 | .29 | 5 × 7 5/16 | .29 | 5 × 7 5/16 | .29 | 5 × 7 5/16 | .31 | 4 3/4 × 7 5/16 | .36 | 4 3/8 × 7 5/16 |
| 6 | .36 | 6 × 8 1/2 | .36 | 6 × 8 1/2 | .36 | 6 × 8 1/2 | .39 | 5 3/4 × 8 1/2 | .44 | 5 3/8 × 8 1/2 |
| 8 | .47 | 8 × 10 5/8 | .47 | 8 × 10 5/8 | .50 | 7 7/8 × 10 5/8 | .56 | 7 1/2 × 10 5/8 | .63 | 7 × 10 5/8 |
| 10 | .61 | 10 × 12 3/4 | .61 | 10 × 12 3/4 | .66 | 9 3/4 × 12 3/4 | .72 | 9 3/8 × 12 3/4 | .88 | 8 3/4 × 12 3/4 |
| 12 | .81 | 12 × 15 | .81 | 12 × 15 | .88 | 11 3/4 × 15 | 1.00 | 11 1/8 × 15 | 1.15 | 10 3/8 × 15 |
| 14 | .88 | 13 1/4 × 16 1/4 | .91 | 13 1/8 × 16 1/4 | .97 | 12 7/8 × 16 1/4 | 1.15 | 12 1/4 × 16 1/4 | 1.25 | 11 3/8 × 16 1/4 |
| 16 | 1.05 | 15 1/4 × 18 1/2 | 1.15 | 15 × 18 1/2 | 1.20 | 14 3/4 × 18 1/2 | 1.40 | 14 × 18 1/2 | .... | ..... |
| 18 | 1.35 | 17 × 21 | 1.35 | 17 × 21 | 1.55 | 16 1/2 × 21 | 1.95 | 15 3/4 × 21 | .... | ..... |
| 20 | 1.45 | 19 × 23 | 1.50 | 18 7/8 × 23 | 1.80 | 18 1/4 × 23 | 2.20 | 17 1/2 × 23 | .... | ..... |
| 24 | 2.35 | 23 × 27 1/4 | 2.50 | 22 5/8 × 27 1/4 | 2.85 | 22 × 27 1/4 | 3.20 | 21 × 27 1/4 | .... | ..... |

*Sheet packings page 473* *Large tongue and groove gaskets page 476*

# Gaskets for All Large Tongue and Groove Flanged Joints

Cranite Gaskets are not recommended for temperatures higher than 752° F. They are satisfactory for use in oil lines where asbestos gaskets are permitted. Corrugated Metallic Gaskets (Copper or Soft Iron) are available; prices on application.

Coating Cranite Gaskets with Crane Thread Lubricant and Corrugated Metallic Gaskets with Crane High Temperature Thread Compound, before installing, will facilitate making tight joints.

Cranite Gaskets are not recommended for use in small male and female or small tongue and groove joints. Cranite offers uniform and high resistance to compression but the gasket contact area in such joints is so narrow, crushing the gasket is possible.

List Prices and Dimensions of Gaskets

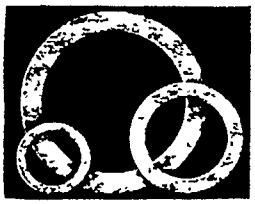
For 800-Pound Hydraulic and 800-Pound W.O.G. Cast Iron, and 300, 400, 600, 900, and 1500-Pound Steel Large Tongue and Groove Flanged Joints

| Size of Joint | 1/16-inch Cranite List Price | Inside and Outside Diameters | Size of Joint | 1/16-inch Cranite List Price | Inside and Outside Diameters |
|---|---|---|---|---|---|
| Inches | Each | Inches | Inches | Each | Inches |
| 1/2 | .03 | 1 ×1 3/8 | 5 | .13 | 6 5/16 ×7 5/16 |
| 3/4 | .03 | 1 5/16 ×1 11/16 | 6 | .16 | 7 1/2 ×8 1/2 |
| 1 | .03 | 1 1/2 ×2 | 8 | .25 | 9 3/8 ×10 5/8 |
| 1 1/4 | .04 | 1 7/8 ×2 1/2 | 10 | .36 | 11 1/4 ×12 3/4 |
| 1 1/2 | .04 | 2 1/8 ×2 7/8 | 12 | .42 | 13 1/2 ×15 |
| 2 | .05 | 2 7/8 ×3 5/8 | 14 | .46 | 14 3/4 ×16 1/4 |
| 2 1/2 | .06 | 3 3/8 ×4 1/8 | 16 | .61 | 16 3/4 ×18 1/2 |
| 3 | .09 | 4 1/4 ×5 | 18 | .69 | 19 1/4 ×21 |
| 3 1/2 | .10 | 4 3/4 ×5 1/2 | 20 | .88 | 21 ×23 |
| 4 | .12 | 5 3/16 ×6 3/16 | 24 | 1.05 | 25 1/4 ×27 1/4 |

*Thread lubricant and compound* *page 464*
*Sheet packings* *page 473*

# Ring Gaskets For Unions or Union Fittings

When ordering ring gaskets, specify the gasket material and the size and kind of union or union fitting.



*For ring gaskets for Tongue and Groove Flange Unions, see page 416.*

List Prices and Dimensions of Ring Gaskets

| Size of Union or Union Fitting | For 150-Pound Malleable Iron Screwed Unions and Union Fittings *Circulating Boiler Fittings: Rubber | Cranite | Inside and Outside Diameters | For 125-Pound Cast Iron Flange Unions: 1/16-inch Cloth Inserted Rubber | Inside and Outside Diameters |
|---|---|---|---|---|---|
| Inches | Price per 100 | Price per 100 | Inches | Price Each | Inches |
| 1/4 | .56 | 1.00 | 1/2 ×29/32 | .... | .... |
| 3/8 | .89 | 1.25 | 5/8 ×13/32 | .... | .. |
| 1/2 | 1.05 | 1.50 | 3/4 ×1 1/4 | .11 | 13/16 ×1 3/8 |
| 3/4 | 1.30 | 1.80 | 31/32 ×1 17/32 | .12 | 1 1/16 ×1 7/8 |
| 1 | 1.60 | 2.25 | 1 7/32 ×1 13/16 | .13 | 1 5/16 ×2 1/8 |
| 1 1/4 | 1.95 | 2.70 | 1 9/16 ×2 5/32 | .13 | 1 11/16 ×2 5/8 |
| 1 1/2 | 2.40 | 3.35 | 1 13/16 ×2 7/16 | .14 | 1 15/16 ×2 7/8 |
| 2 | 3.20 | 4.50 | 2 5/16 ×3 3/32 | .14 | 2 3/8 ×3 1/2 |
| 2 1/2 | 4.20 | 5.90 | 2 3/4 ×3 9/16 | .15 | 2 7/8 ×3 7/8 |
| 3 | 5.40 | 7.60 | 3 3/8 ×4 1/4 | .17 | 3 1/2 ×4 5/8 |
| 3 1/2 | .... | .... | .... | .19 | 4 ×5 1/4 |
| 4 | .... | .... | .... | .20 | 4 1/2 ×5 3/4 |
| 5 | .... | .... | .... | .30 | 5 9/16 ×7 |
| 6 | .... | .... | .... | .35 | 6 5/8 ×8 1/4 |
| 8 | .... | .... | .... | .85 | 8 5/8 ×10 1/2 |

*Circulating Boiler Fittings (No. 586 and No. 589) use the gaskets shown for the 3/4-inch size.

# Galvanized Steel Flanged Fittings and Flanges

Extra List Prices for Galvanizing

| Size | 150-Pound Cast Steel Fittings and Forged Steel Flanges: Elbows No. 525 D, No. 527 D, No. 545 D | Elbows No. 550 D, No. 551 D | Crosses No. 537 D, No. 539 D | Flanges No. 556 Screwed, No. 554 Slip-On Welding | Flanges No. 554 1/2, No. 556 1/2, No. 558 1/2, No. 568 | | 300-Pound Cast Steel Fittings and Forged Steel Flanges: Elbows No. 401 D, No. 403 D, No. 421 D | Elbows No. 425 1/2 D, No. 427 D | Crosses No. 413 D, No. 415 D | Flanges No. 291 E Screwed, No. 294 E Slip-On Welding | Flanges No. 290 E, No. 292 E, No. 296 E, No. 297 E | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reducers No. 547 D, No. 548 D | Tees No. 531 D, No. 534 D | Laterals No. 541 D, No. 543 D | | | | Reducers No. 423 D, No. 423 1/2 D | Tees No. 407 D, No. 412 D | Laterals No. 417 D, No. 419 D | | | |
| Inches | Extra Each | Extra Each | Extra Each | Extra Each | O.D. In. | Extra Each | Extra Each | Extra Each | Extra Each | Extra Each | O.D. In. | Extra Each |
| 1 | 3.50 | 5.20 | 7.00 | .90 | 4 1/4 | 1.30 | 4.40 | 6.50 | 8.70 | 1.20 | 4 7/8 | 1.80 |
| 1 1/4 | 3.50 | 5.20 | 7.00 | .90 | 4 5/8 | 1.30 | 4.40 | 6.50 | 8.70 | 1.20 | 5 1/4 | 1.80 |
| 1 1/2 | 3.50 | 5.20 | 7.00 | .90 | 5 | 1.30 | 4.40 | 6.50 | 8.70 | 1.20 | 6 1/8 | 1.80 |
| 2 | 3.50 | 5.20 | 7.00 | 1.00 | 6 | 1.50 | 4.40 | 6.50 | 8.70 | 1.50 | 6 1/2 | 2.20 |
| 2 1/2 | 3.60 | 5.40 | 7.30 | 1.10 | 7 | 1.60 | 4.50 | 6.70 | 9.00 | 1.50 | 7 1/2 | 2.30 |
| 3 | 4.00 | 6.00 | 8.00 | 1.30 | 7 1/2 | 1.80 | 5.00 | 7.60 | 10.00 | 1.70 | 8 1/4 | 2.50 |
| 3 1/2 | 4.70 | 7.00 | 9.40 | 1.50 | 8 1/2 | 2.20 | 6.00 | 9.00 | 12.00 | 2.00 | 9 | 3.00 |
| 4 | 5.30 | 8.00 | 10.50 | 1.80 | 9 | 2.60 | 6.50 | 10.00 | 13.00 | 2.40 | 10 | 3.60 |
| 5 | 7.00 | 10.50 | 14.00 | 2.00 | 10 | 2.90 | 8.70 | 13.00 | 17.50 | 2.80 | 11 | 4.00 |
| 6 | 8.70 | 13.00 | 17.50 | 2.40 | 11 | 3.60 | 11.00 | 16.50 | 22.00 | 3.30 | 12 1/2 | 5.00 |
| 8 | 13.00 | 19.50 | 26.00 | 3.60 | 13 1/2 | 5.40 | 16.50 | 24.50 | 32.50 | 5.00 | 15 | 7.60 |
| 10 | 21.00 | 32.00 | 42.00 | 5.40 | 16 | 8.30 | 26.00 | 39.00 | 52.00 | 7.60 | 17 1/2 | 11.50 |
| 12 | 30.50 | 45.00 | 61.00 | 7.30 | 19 | 11.00 | 37.50 | 56.50 | 75.50 | 10.00 | 20 1/2 | 15.00 |
| 14 | 43.50 | 65.50 | 87.00 | 10.00 | 21 | 15.00 | 54.50 | 81.00 | 109.00 | 14.50 | 23 | 22.00 |
| 16 | 58.00 | 87.00 | 116.00 | 15.00 | 23 1/2 | 23.00 | 72.50 | 109.00 | 145.00 | 22.00 | 25 1/2 | 32.50 |

*Cast Steel Flanged Fittings* *pages 267 to 274* *Forged Steel Flanges* *pages 291 to 298*

# Pipe, Pipe Data, and Thread Information

**Tubular Products**—Wrought Steel and Wrought Iron
General Notes, Pipe Trade Practice.....page 478
Lengths Normally Carried in Stock.....page 478

**Pipe**
Standard Pipe.....page 479
Extra Strong Pipe.....page 480
Double Extra Strong Pipe.....page 481
Reamed and Drifted Pipe.....page 481
API Standard Threaded Line Pipe.....page 482
Large O.D. Pipe.....page 483
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**Fittings**—for Cast Iron Water Pipe.....page 496

**Tubes and Casings**
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**Pipe Standard and Data**
American Standard for Pipe.....pages 486 to 489
Commercial Wrought Steel Pipe Data.....pages 490 and 491
Bundling Schedule for Pipe.....page 480

**Thread Information**
American Standard Taper Pipe Threads.....page 492
American Standard Straight Pipe Threads.....page 493
British Standard Taper Pipe Threads.....page 494
Normal Thread Engagement Between Pipe Threads...page 494
Discussion of Threaded Pipe Joints.....page 495

Pages 478 to 496 constitute the section devoted to Pipe, Pipe Data, and Thread Information. In addition, this catalog contains useful engineering data on pipe and lists of sizes and weights of copper tubing; see the pages referred to below:

Calculating Working Pressure, Stress, or Wall Thickness of Pipe.....pages 543 to 545
Thermal Expansion and Modulus of Elasticity of Pipe.....page 549
Deflection of Horizontal Pipe Lines.....page 551
Calculation of Pipe Bends.....pages 546 and 547
Length of Pipe in Bends.....page 548

Expansion in Pipe Lines.....page 349
Expansion of Copper Tubing.....page 425
Types K, L, and M Copper Tube for Solder-Joints.....page 428

*Threads for Railing Fittings....page 192*

*Fabricated Piping....pages 497 to 522*

# Wrought Steel and Genuine Wrought Iron

# Tubular Products

## Butt-Welded, Lap-Welded, and Seamless Pipe
## Casing, Boiler Tubes, and Tubing

## General Notes

### Pipe Trade Practice

All weights for steel are figured on the basis of one cubic inch of steel weighing .2833 pound. All weights for wrought iron pipe are figured on the basis of one cubic inch of iron weighing .2777 pound.

All material will be cut to length when so ordered, with extreme variation not exceeding one-eighth of an inch over or under, unless otherwise arranged.

All threads, unless otherwise indicated, are in accordance with American (Briggs') Standard.

The outside diameter of any size of pipe is the same for all weights. Variations in weight and wall thickness affect only the inside diameter.

Pipe 12-inch and smaller is known by its nominal inside diameter; pipe 14-inch and larger is known by its outside diameter. Boiler Tubes and Tubing are known by their outside diameters.

When ordering pipe 12-inch and smaller, designate the weight desired—that is, Standard, Extra Strong, or Double Extra Strong. When ordering pipe having an outside diameter of 14-inch or larger, designate the wall thickness desired.

On orders calling for commercial sizes of pipe which are finished with threads and couplings, in sizes 1/8-inch to 12-inch, inclusive, and where orders specify quantity in lineal feet, it is understood that random lengths fitted with threads both ends and coupling one end will be shipped; and the measurement is charged from end to end; that is, over-all including the coupling.

If cut lengths of any sizes are ordered, instructions must appear on the face of the order whether plain ends, beveled ends, threads only, or threads and couplings are required. The pipe is then cut to the length specified for plain end and threads only, but if cut lengths with threads and couplings are specified the practice is the same with the exception that the couplings are charged separately, whether they are shipped loose or screwed on the pipe.

All data given on the following pages, 479 to 483, inclusive, apply to Wrought Steel Tubular Products. Because of difference in basic weight of steel and wrought iron, inside diameter and thickness dimensions of genuine wrought iron pipe will vary slightly from steel dimensions; that is, smaller inside diameters with correspondingly heavier wall thicknesses. Weights per foot are the same as weights shown for steel pipe.

### Pipe Normally Carried in Stock

A distinguishing feature of Crane policy has always been to maintain widely distributed and adequate stocks of all staple lines for the convenience of customers. These include not only valves, fittings, flanges, and accessories, but also large stocks of the various classes of pipe.

Stocks of pipe are carried by each Crane branch in sufficient sizes, classes, and quantities to meet all normal local requirements. Prompt shipment can be made of random lengths or of cut pipe, plain end or threaded. Butt-welded pipe in sizes 1/8 to 3-inch inclusive, both Standard and Extra Strong weights, is normally stocked in 21-foot uniform lengths.

At the Chicago Works, in addition to large stocks of regular pipe, double random lengths of seamless pipe are regularly carried in stock. Averaging 38 feet to 43 feet in length, depending on the size, they are stocked in sizes 4-inch to 24-inch inclusive, both in Standard and Extra Strong weights.

In addition to regular pipe sizes, many wall thicknesses corresponding to ASA Schedule Numbers are stocked. This diversity of sizes together with the many sizes and grades of seamless alloy pipe and tubing regularly stocked, make it possible for Crane to give prompt service on all pipe requirements.

# Standard Pipe

## Black and Galvanized

### Dimensions, Weights, and Test Pressures

| Nominal Size | List Prices | Diameters | | Wall Thickness | Nominal Weight Pounds per Foot | | Number of Threads per Inch | Test Pressure Pounds per Square Inch | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Outside | Inside | | Plain End | Threads and Couplings | | Butt-Weld | Grade A Seamless | Grade B Seamless |
| Inches | Per Foot Base | Inches | Inches | Inches | | | | | | |
| 1/8 | .05½ | .405 | .269 | .068 | .24 | .24 | 27 | 700 | | |
| 1/4 | .06 | .540 | .364 | .088 | .42 | .42 | 18 | 700 | | |
| 3/8 | .06 | .675 | .493 | .091 | .57 | .57 | 18 | 700 | | |
| 1/2 | .08½ | .840 | .622 | .109 | .85 | .85 | 14 | 700 | | |
| 3/4 | .11½ | 1.050 | .824 | .113 | 1.13 | 1.13 | 14 | 700 | | |
| 1 | .17 | 1.315 | 1.049 | .133 | 1.68 | 1.68 | 11½ | 700 | | |
| 1¼ | .23 | 1.660 | 1.380 | .140 | 2.27 | 2.28 | 11½ | 800 | | |
| 1½ | .27½ | 1.900 | 1.610 | .145 | 2.72 | 2.73 | 11½ | 800 | | |
| 2 | .37 | 2.375 | 2.067 | .154 | 3.65 | 3.68 | 11½ | 800 | 1000 | 1100 |
| 2½ | .58½ | 2.875 | 2.469 | .203 | 5.79 | 5.82 | 8 | 800 | 1000 | 1100 |
| 3 | .76½ | 3.500 | 3.068 | .216 | 7.58 | 7.62 | 8 | 800 | 1000 | 1100 |
| 3½ | .92 | 4.000 | 3.548 | .226 | 9.11 | 9.20 | 8 | | 1200 | 1300 |
| 4 | 1.09 | 4.500 | 4.026 | .237 | 10.79 | 10.89 | 8 | | 1200 | 1300 |
| 5 | 1.48 | 5.563 | 5.047 | .258 | 14.62 | 14.81 | 8 | | 1200 | 1300 |
| 6 | 1.92 | 6.625 | 6.065 | .280 | 18.97 | 19.18 | 8 | | 1200 | 1300 |
| †8 | 2.50 | 8.625 | 8.071 | .277 | 24.70 | | 8 | | 1200 | 1300 |
| | 2.88 | | 7.981 | .322 | 28.55 | | | | 1200 | 1300 |
| †10 | 3.20 | 10.750 | 10.192 | .279 | 31.20 | | 8 | | 1000 | 1200 |
| | 3.50 | | 10.136 | .307 | 34.24 | | | | 1000 | 1200 |
| | 4.12 | | 10.020 | .365 | 40.48 | | | | 1000 | 1200 |
| †12 | 4.50 | 12.750 | 12.090 | .330 | 43.77 | | 8 | | 1000 | 1200 |
| | 5.07 | | 12.000 | .375 | 49.56 | | | | 1000 | 1200 |

***Standard Steel Pipe with threads and couplings in sizes larger than 6-inch is designated as Line Pipe; see page 482.***

**List prices:** List prices shown for 1/8 to 6-inch sizes apply to plain end, threaded only, or threaded and coupled pipe.

List prices shown for 8, 10, and 12-inch sizes apply to plain end or threaded only pipe; for prices of threaded and coupled pipe in sizes 8 to 12-inch, see page 482.

**Unless otherwise ordered:** Unless otherwise ordered, Standard Pipe is furnished with threads and couplings and in random lengths.

On sizes 3-inch and smaller, butt-weld pipe will be furnished unless otherwise specified.

**Cut lengths:** For cut lengths, an extra charge will be made above random lengths.

**Galvanized:** For galvanized pipe, an extra charge will be made above Black.

**Threads:** The taper of threads is 3/4-inch per foot, measured on the diameter for all sizes.

**Weights:** The permissible variation in weight is 5 per cent above and 5 per cent below. The weight per foot of pipe with threads and couplings is based on a length of 20 feet, including the coupling.

**†8, 10, and 12-inch sizes:** On sizes made in more than one weight, specify the weight desired.



*General notes . page 478*

*Standard Bundling Schedule page 480*

# Extra Strong Pipe

## Black and Galvanized

### Dimensions, Weights, and Test Pressures

| Nominal Size Inches | List Prices Per Foot Base | Diameters Outside Inches | Diameters Inside Inches | Wall Thickness Inches | Nominal Weight per Foot Plain End Pounds | Test Pressure Pounds per Square Inch: Butt-Weld | Grade A Seamless | Grade B Seamless |
|---|---|---|---|---|---|---|---|---|
| 1/8 | .12 | .405 | .215 | .095 | .31 | 850 | | |
| 1/4 | .07 1/2 | .540 | .302 | .119 | .54 | 850 | | |
| 3/8 | .07 1/2 | .675 | .423 | .126 | .74 | 850 | | |
| 1/2 | .11 | .840 | .546 | .147 | 1.09 | 850 | | |
| 3/4 | .15 | 1.050 | .742 | .154 | 1.47 | 850 | | |
| 1 | .22 | 1.315 | .957 | .179 | 2.17 | 850 | | |
| 1 1/4 | .30 | 1.660 | 1.278 | .191 | 3.00 | 1100 | | |
| 1 1/2 | .36 1/2 | 1.900 | 1.500 | .200 | 3.63 | 1100 | | |
| 2 | .50 1/2 | 2.375 | 1.939 | .218 | 5.02 | 1100 | 1500 | 1600 |
| 2 1/2 | .77 | 2.875 | 2.323 | .276 | 7.66 | 1100 | 1500 | 1600 |
| 3 | 1.03 | 3.500 | 2.900 | .300 | 10.25 | 1100 | 1500 | 1600 |
| 3 1/2 | 1.25 | 4.000 | 3.364 | .318 | 12.51 | | 1700 | 1800 |
| 4 | 1.50 | 4.500 | 3.826 | .337 | 14.98 | | 1700 | 1800 |
| 5 | 2.08 | 5.563 | 4.813 | .375 | 20.78 | | 1700 | 1800 |
| 6 | 2.86 | 6.625 | 5.761 | .432 | 28.57 | | 1700 | 1800 |
| 8 | 4.34 | 8.625 | 7.625 | .500 | 43.39 | | 1700 | 2400 |
| 10 | 5.48 | 10.750 | 9.750 | .500 | 54.74 | | 1600 | 1900 |
| 12 | 6.55 | 12.750 | 11.750 | .500 | 65.42 | | 1600 | 1900 |

**Unless otherwise ordered:** Unless otherwise ordered, Extra Strong Pipe is furnished with plain ends and in random lengths.

On sizes 3-inch and smaller, butt-weld pipe will be furnished unless otherwise specified.

**Random lengths:** Random lengths of Extra Strong Pipe are considered to be 12 feet to 22 feet, we to have the privilege, however, of supplying not exceeding 5 per cent of total order in lengths 6 feet to 12 feet.

**Cut lengths:** For cut lengths, an extra charge will be made above random lengths.

**Threads, couplings:** For pipe fitted with threads only or with threads and couplings, an extra charge will be made above plain ends.

**Galvanized:** For galvanized pipe, an extra charge will be made above Black.

**Weights:** The permissible variation in weight is 5 per cent above and 5 per cent below.

# Standard Bundling Schedule

### Based on 21-Foot Uniform Lengths

| Number of Pieces, Number of Feet, and Weight of Pipe, per Bundle | Size Inches | Standard Pipe: Number of Pieces Per Bundle | Standard Pipe: Average per Bundle: Number of Feet | Standard Pipe: Average per Bundle: Weight Pounds | Extra Strong Pipe: Number of Pieces Per Bundle | Extra Strong Pipe: Average per Bundle: Number of Feet | Extra Strong Pipe: Average per Bundle: Weight Pounds |
|---|---|---|---|---|---|---|---|
| | 1/8 | 30 | 630 | 151 | 30 | 630 | 195 |
| | 1/4 | 24 | 504 | 212 | 24 | 504 | 272 |
| | 3/8 | 18 | 378 | 215 | 18 | 378 | 280 |
| | 1/2 | 12 | 252 | 214 | 12 | 252 | 275 |
| | 3/4 | 7 | 147 | 166 | 7 | 147 | 216 |
| | 1 | 5 | 105 | 176 | 5 | 105 | 228 |
| | 1 1/4 | 3 | 63 | 144 | 3 | 63 | 189 |
| | 1 1/2 | 3 | 63 | 172 | 3 | 63 | 229 |

Order sizes 1/8 to 1 1/2-inch by the bundle. Order sizes 2 to 3-inch by lengths, using 21 feet as average length, and larger sizes by lengths, using 20 feet as average length.



*General notes . page 478*

# Double Extra Strong Pipe

## Black and Galvanized

### Dimensions, Weights, and Test Pressures

| Nominal Size Inches | List Prices Per Foot Base | Diameters Outside Inches | Diameters Inside Inches | Wall Thickness Inches | Nominal Weight per Foot Plain End Pounds | Test Pressure Pounds per Square Inch Grade A Seamless | Test Pressure Pounds per Square Inch Grade B Seamless |
|---|---|---|---|---|---|---|---|
| ½ | * | .840 | .252 | .294 | 1.714 | 1000 | 1000 |
| ¾ | * | 1.050 | .434 | .308 | 2.441 | 1000 | 1000 |
| 1 | * | 1.315 | .599 | .358 | 3.659 | 1000 | 1000 |
| 1¼ | * | 1.660 | .896 | .382 | 5.214 | 1000 | 1000 |
| 1½ | * | 1.900 | 1.100 | .400 | 6.408 | 1000 | 1000 |
| 2 | .91 | 2.375 | 1.503 | .436 | 9.03 | 1800 | 1900 |
| 2½ | 1.37 | 2.875 | 1.771 | .552 | 13.70 | 1800 | 1900 |
| 3 | 1.86 | 3.500 | 2.300 | .600 | 18.58 | 1800 | 1900 |
| 4 | 2.76 | 4.500 | 3.152 | .674 | 27.54 | 2000 | 2100 |
| 5 | 3.86 | 5.563 | 4.063 | .750 | 38.55 | 2000 | 2100 |
| 6 | 5.32 | 6.625 | 4.897 | .864 | 53.16 | 2000 | 2100 |
| 8 | 7.25 | 8.625 | 6.875 | .875 | 72.42 | 2800 | 2800 |

*Sizes ½ to 1½-inch are available only as seamless pressure tubing: prices on application.

**Unless otherwise ordered:** Unless otherwise ordered, Double Extra Strong Pipe is furnished with plain ends and in random lengths.

**Random lengths:** Random lengths of Double Extra Strong Pipe are considered to be 12 feet to 22 feet, we to have the privilege, however, of supplying not exceeding 5 per cent of total order in lengths 6 feet to 12 feet.

**Cut lengths:** For cut lengths, an extra charge will be made above the price listed for random lengths.

**Threads, couplings:** For pipe fitted with threads only or with threads and couplings, an extra charge will be made above plain ends.

**Galvanized:** For galvanized pipe, an extra charge will be made above Black.

**Weights:** The permissible variation in weight is 10 per cent above and 10 per cent below.

# Reamed and Drifted Pipe

### Dimensions, Weights, and Test Pressures

| Nominal Size Inches | List Prices Per Foot Base | Diameters Outside Inches | Diameters Inside Inches | Wall Thickness Inches | Nominal Weight Pounds per Foot Plain End | Nominal Weight Pounds per Foot Threads and Couplings | Number of Threads per Inch | Test Pressure Pounds per Square Inch Butt-Weld | Test Pressure Pounds per Square Inch Grade A Seamless |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .17 | 1.315 | 1.049 | .133 | 1.68 | 1.70 | 11½ | 700 | |
| 1¼ | .23 | 1.660 | 1.380 | .140 | 2.27 | 2.30 | 11½ | 800 | |
| 1½ | .27½ | 1.900 | 1.610 | .145 | 2.72 | 2.75 | 11½ | 800 | |
| †2 | .37 | 2.375 | 2.067 | .154 | 3.65 | 3.75 | 11½ | 800 | 1000 |
| | .40 | | 2.041 | .167 | 3.94 | 4.00 | | | 1000 |
| 2½ | .58½ | 2.875 | 2.469 | .203 | 5.79 | 5.90 | 8 | 800 | 1000 |
| 3 | .76½ | 3.500 | 3.068 | .216 | 7.58 | 7.70 | 8 | 800 | 1000 |
| 3½ | .92 | 4.000 | 3.548 | .226 | 9.11 | 9.25 | 8 | | 1200 |
| 4 | 1.09 | 4.500 | 4.026 | .237 | 10.79 | 11.00 | 8 | | 1200 |
| 5 | 1.48 | 5.563 | 5.047 | .258 | 14.62 | 15.00 | 8 | | 1200 |
| 6 | 1.92 | 6.625 | 6.065 | .280 | 18.97 | 19.45 | 8 | | 1200 |
| 8 | 2.88 | 8.625 | 7.981 | .322 | 28.55 | 29.35 | 8 | | 1200 |
| 10 | 4.12 | 10.750 | 10.020 | .365 | 40.48 | 41.85 | 8 | | 1000 |
| 12 | 5.07 | 12.750 | 12.000 | .375 | 49.56 | 51.15 | 8 | | 1000 |

**Unless otherwise ordered:** Unless otherwise ordered, Reamed and Drifted Pipe is furnished with threads and couplings and in random lengths, 16 feet to 22 feet.

**Threads:** The taper of threads is ¾-inch per foot, measured on the diameter for all sizes.

**Weights:** The permissible variation in weight is 5 per cent above and 5 per cent below.

The weight per foot of pipe with threads and couplings is based on a length of 20 feet, including the coupling, but shipping lengths of small sizes will usually average less than 20 feet.

**†2-inch size:** The 2-inch size is made in two weights; weight desired must be specified.



*General notes....page 478*

# API Standard Threaded Line Pipe

Dimensions, Weights, and Test Pressures

| Nominal Size Inches | List Prices Per Foot Base | Diameters Outside Inches | Diameters Inside Inches | Wall Thickness Inches | Nominal Weight Pounds per Foot Plain End | Nominal Weight Pounds per Foot Threads and Couplings | Number of Threads per Inch | Test Pressure Pounds per Square Inch Butt-Weld | Test Pressure Pounds per Square Inch Grade A Seamless | Test Pressure Pounds per Square Inch Grade B Seamless |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | .06 | .405 | .269 | .068 | .24 | .25 | 27 | 700 | 1000 | 1000 |
| 1/4 | .06½ | .540 | .364 | .088 | .42 | .43 | 18 | 700 | 1000 | 1000 |
| 3/8 | .06½ | .675 | .493 | .091 | .57 | .57 | 18 | 700 | 1000 | 1000 |
| 1/2 | .09 | .840 | .622 | .109 | .85 | .86 | 14 | 700 | 1000 | 1000 |
| 3/4 | .12 | 1.050 | .824 | .113 | 1.13 | 1.14 | 14 | 700 | 1000 | 1000 |
| 1 | .17½ | 1.315 | 1.049 | .133 | 1.68 | 1.70 | 11½ | 700 | 1000 | 1000 |
| 1¼ | .23½ | 1.660 | 1.380 | .140 | 2.27 | 2.30 | 11½ | 800 | 2500 | 2500 |
| 1½ | .28 | 1.900 | 1.610 | .145 | 2.72 | 2.75 | 11½ | 800 | 2300 | 2500 |
| 2 | .37½ | 2.375 | 2.067 | .154 | 3.65 | 3.75 | 11½ | 800 | 1000 | 1100 |
| 2½ | .59 | 2.875 | 2.469 | .203 | 5.79 | 5.90 | 8 | 800 | 1000 | 1100 |
| 3 | .77 | 3.500 | 3.068 | .216 | 7.58 | 7.70 | 8 | 800 | 1000 | 1100 |
| 3½ | .93 | 4.000 | 3.548 | .226 | 9.11 | 9.25 | 8 | | 1200 | 1300 |
| 4 | 1.10 | 4.500 | 4.026 | .237 | 10.79 | 11.00 | 8 | | 1200 | 1300 |
| 5 | 1.50 | 5.563 | 5.047 | .258 | 14.62 | 15.00 | 8 | | 1200 | 1300 |
| 6 | 1.94 | 6.625 | 6.065 | .280 | 18.97 | 19.45 | 8 | | 1200 | 1300 |
| †8 | 2.54 | 8.625 | 8.071 | .277 | 24.70 | 25.55 | 8 | | 1200 | 1300 |
| | 2.92 | | 7.981 | .322 | 28.55 | 29.35 | | | 1200 | 1300 |
| †10 | 3.25 | 10.750 | 10.192 | .279 | 31.20 | 32.75 | 8 | | 1000 | 1200 |
| | 3.55 | | 10.136 | .307 | 34.24 | 35.75 | | | 1000 | 1200 |
| | 4.17 | | 10.020 | .365 | 40.48 | 41.85 | | | 1000 | 1200 |
| †12 | 4.55 | 12.750 | 12.090 | .330 | 43.77 | 45.45 | 8 | | 1000 | 1200 |
| | 5.12 | | 12.000 | .375 | 49.56 | 51.15 | | | 1000 | 1200 |

**Unless otherwise ordered:** Unless otherwise ordered, API Line Pipe is furnished with threads and couplings and in random lengths.

**Cut lengths:** For cut lengths, an extra charge will be made above random lengths.

**Galvanized:** For galvanized pipe, an extra charge will be made above Black.

**Threads:** The taper of threads is ¾-inch per foot, measured on the diameter for all sizes.

**Weights:** The permissible variation in weight for any length of pipe is 10 per cent above and 3½ per cent below, but the carload weight shall not be more than 1¾ per cent under the calculated weight.

The weight per foot of pipe with threads and couplings is based on a length of 20 feet, including the coupling.

**†8, 10, and 12-inch sizes:** On sizes made in more than one weight, weight desired must be specified.

# Boiler Tubes

Dimensions and Manufacturing Weights

| Outside Diameter Inches | Wall Thickness, Minimum B.W.G. | Wall Thickness, Minimum Inches | Manufacturing Weights Pounds per Foot | Outside Diameter Inches | Wall Thickness, Minimum B.W.G. | Wall Thickness, Minimum Inches | Manufacturing Weights Pounds per Foot |
|---|---|---|---|---|---|---|---|
| 1 | 13 | .095 | 1.037 | 3¼ | 11 | .120 | 4.555 |
| 1¼ | 13 | .095 | 1.328 | 3½ | 11 | .120 | 4.921 |
| 1½ | 13 | .095 | 1.619 | | 10 | .134 | 5.469 |
| 1¾ | 13 | .095 | 1.910 | | 9 | .148 | 6.012 |
| 2 | 13 | .095 | 2.201 | 4 | 10 | .134 | 6.286 |
| | 11 | .120 | 2.726 | | 9 | .148 | 6.915 |
| 2¼ | 13 | .095 | 2.492 | 4½ | 10 | .134 | 7.103 |
| 2½ | 12 | .109 | 3.171 | | 9 | .148 | 7.817 |
| 2¾ | 12 | .109 | 3.504 | 5 | 9 | .148 | 8.720 |
| 3 | 12 | .109 | 3.838 | 6 | 7 | .180 | 12.750 |
| | 10 | .134 | 4.652 | *Prices on application* | | | |

Under the permissible variations allowed in the A.S.T.M. Standard Specification A-83 and the A.S.M.E. Boiler Code, the tubing furnished on an order cannot be lighter in weight than that of the gauge thickness specified.

Since manufacturing to exact specifications is impossible, the variations are represented by heavier wall thicknesses and overweight. Prices are based on manufacturing weights.

*Dimensions and weights for boiler tube sizes not listed will be furnished on application.*



*General notes page 478*

# Large O.D. Plain End Pipe

Dimensions, Weights, and Test Pressures

| Outside Diameter Inches | Wall Thickness Inches | List Prices Per Foot Base | Nominal Weight Plain End Pounds per Foot | Test Pressure Pounds per Square Inch Grade A Seamless | Test Pressure Pounds per Square Inch Grade B Seamless |
|---|---|---|---|---|---|
| 14 | 1/4 | 3.67 | 36.71 | 650 | 750 |
| | 5/16 | 4.56 | 45.68 | 800 | 950 |
| | 3/8 | 5.45 | 54.57 | 950 | 1100 |
| | 7/16 | 6.33 | 63.37 | 1100 | 1300 |
| | 1/2 | 7.20 | 72.09 | 1300 | 1500 |
| 16 | 1/4 | 4.20 | 42.05 | 550 | 650 |
| | 5/16 | 5.23 | 52.36 | 700 | 800 |
| | 3/8 | 6.25 | 62.58 | 850 | 1000 |
| | 7/16 | 7.27 | 72.72 | 1000 | 1100 |
| | 1/2 | 8.27 | 82.77 | 1100 | 1300 |
| 18 | 1/4 | 4.73 | 47.39 | 500 | 600 |
| | 5/16 | 5.90 | 59.03 | 600 | 750 |
| | 3/8 | 7.05 | 70.59 | 750 | 900 |
| | 7/16 | 8.20 | 82.06 | 900 | 1000 |
| | 1/2 | 9.34 | 93.45 | 1000 | 1200 |
| 20 | 1/4 | 5.27 | 52.73 | 450 | 500 |
| | 5/16 | 6.57 | 65.71 | 550 | 650 |
| | 3/8 | 7.86 | 78.60 | 700 | 800 |
| | 7/16 | 9.14 | 91.41 | 800 | 900 |
| | 1/2 | 10.41 | 104.13 | 900 | 1000 |
| 24 | 5/16 | 7.90 | 79.06 | 450 | 550 |
| | 3/8 | 9.46 | 94.62 | 550 | 650 |
| | 7/16 | 11.01 | 110.10 | 650 | 750 |
| | 1/2 | 12.54 | 125.49 | 750 | 850 |
| 26 | 5/16 | Prices on request | 85.73 | 450 | 500 |
| | 3/8 | | 102.63 | 500 | 600 |
| | 7/16 | | 119.44 | 600 | 700 |
| | 1/2 | | 136.17 | 700 | 800 |

Prices and data on larger sizes or heavier walls will be furnished on application.

**Unless otherwise ordered:** Unless otherwise ordered, Large O.D. Pipe is furnished with plain ends and in random lengths.

**Cut lengths:** For cut lengths, an extra charge will be made above random lengths.

**Weights:** The permissible variation in weight is 10 per cent above and 10 per cent below.

# Water Well Casing

Dimensions, Weights, and Test Pressures

| Outside Diameter Inches | List Prices Per Foot Base | Diameter Outside Inches | Diameter Inside Inches | Wall Thickness Inches | Nominal Weight Pounds per Foot Plain End | Nominal Weight Pounds per Foot Threads and Couplings | Number of Threads per Inch | Test Pressure Pounds per Square Inch Grade A Seamless |
|---|---|---|---|---|---|---|---|---|
| 3 1/2 | .46 | 3.500 | 3.250 | .125 | 4.51 | 4.60 | 14 | 1100 |
| 4 | .56 1/2 | 4.000 | 3.732 | .134 | 5.53 | 5.65 | 14 | 1000 |
| 4 1/2 | .68 1/2 | 4.500 | 4.216 | .142 | 6.61 | 6.75 | 14 | 950 |
| 5 1/2 | .90 | 5.500 | 5.192 | .154 | 8.79 | 9.00 | 14 | 850 |
| 6 | 1.05 | 6.000 | 5.672 | .164 | 10.22 | 10.50 | 14 | 850 |
| 6 5/8 | 1.30 | 6.625 | 6.255 | .185 | 12.72 | 13.00 | 11 1/2 | 850 |
| 8 5/8 | 1.75 | 8.625 | 8.249 | .188 | 16.94 | 17.50 | 11 1/2 | 650 |

**Unless otherwise ordered:** Unless otherwise ordered, Water Well Casing is furnished with threads and couplings, and in random lengths.

**Cut lengths:** For cut lengths, an extra charge will be made above random lengths.

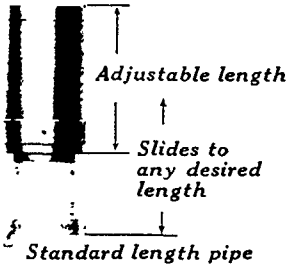
**Galvanized:** For galvanized casing, an extra charge will be made above Black.

**Threads:** The taper of threads is 3/8-inch per foot, measured on the diameter for all sizes. The thickness of walls makes it impracticable to cut threads of coarser pitch than shown in the table.

**Weights:** The permissible variation in weight is 5 per cent above and 5 per cent below. The weight per foot of casing with threads and couplings is based on a length of 20 feet, including the coupling.

# Metalbestos Gas Vent

*Two sections fitted together. Note the built-in air space between the double walls.*




*New double wall telescopic extension eliminates cutting, speeds installation, and provides a neat finish.*

***Safer Venting***
***Top Efficiency***
***Easier Installation***
***Underwriters' Approved***

The pipe-within-a-pipe construction of the Metalbestos Gas Vent (illustrated at the left) provides quick-heating inner pipe for a strong draft and air-insulated outer pipe for maximum safety.

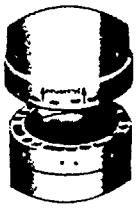
The use of Metalbestos units eliminates condensation and keeps the surrounding walls cool. It is fully approved by the Underwriters' Laboratories, Inc.

Low cost installation is assured through the use of exclusive type Metalbestos couplings. The couplings join pipe sections together quickly and easily without crimping, cementing, or banding. Special adjustable lengths and elbows permit exact installation without costly cutting and fitting.

Durably constructed Metalbestos is made entirely of aluminum and is highly resistant to corrosion. It will not crack, shatter, or break.

Adjustable 45° Elbow

Swivels to any angle from zero to 45 degrees. Allows for slight changes of direction and simplifies fitting of vent pipe into available space.



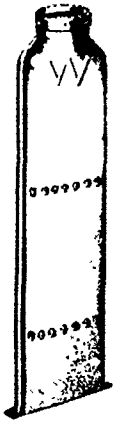
Coupling

Special die-formed couplings are permanently attached to each Metalbestos section. They insure perfect alignment of the vent pipe and form a completely gas-tight joint for both inner and outer pipes.

## Metalbestos Wall Vent

Metalbestos Wall Vent employs, a rectangular design with the same double wall construction found in round Metalbestos.

Specially designed for wall heater venting, this vent will fit inside a standard 2 by 4-inch wall. It is approved by the Underwriters' Laboratories, Inc., for use within 3/8-inch of combustible material.



***Prices and additional information furnished on application.***

# Red Brass and Copper Pipe

### Standard Pipe Sizes—Dimensions and Weights

| Nominal Size (Iron Pipe Size) Inches | Regular: Diameters Outside Inches | Regular: Diameters Inside Inches | Regular: Wall Thickness Inches | Regular: Weight, Pounds Per Linear Foot Red Brass | Regular: Weight, Pounds Per Linear Foot Copper |
|---|---|---|---|---|---|
| 1/8 | .405 | .281 | .062 | .253 | .259 |
| 1/4 | .540 | .375 | .082 | .447 | .457 |
| 3/8 | .675 | .494 | .090 | .627 | .641 |
| 1/2 | .840 | .625 | .107 | .934 | .955 |
| 3/4 | 1.050 | .822 | .114 | 1.27 | 1.30 |
| 1 | 1.315 | 1.062 | .126 | 1.78 | 1.82 |
| 1 1/4 | 1.660 | 1.368 | .146 | 2.63 | 2.69 |
| 1 1/2 | 1.900 | 1.600 | .150 | 3.13 | 3.20 |
| 2 | 2.375 | 2.062 | .156 | 4.12 | 4.22 |
| 2 1/2 | 2.875 | 2.500 | .187 | 5.99 | 6.12 |
| 3 | 3.500 | 3.062 | .219 | 8.56 | 8.75 |
| 3 1/2 | 4.000 | 3.500 | .250 | 11.2 | 11.4 |
| 4 | 4.500 | 4.000 | .250 | 12.7 | 12.9 |
| 5 | 5.563 | 5.063 | .250 | 15.8 | 16.2 |
| 6 | 6.625 | 6.125 | .250 | 19.0 | 19.4 |
| 8 | 8.625 | 8.000 | .312 | 30.9 | 31.6 |
| 10 | 10.750 | 10.019 | .365 | 45.2 | 46.2 |
| 12 | 12.750 | 12.000 | .375 | 55.3 | 56.5 |

**Ordering:** Unless otherwise ordered, red brass or copper pipe is furnished with plain ends.

When brass pipe is ordered, regular weight red brass pipe will be furnished unless another type is specified.

**Lengths:** Commercial length regularly available is 12 feet.

**Weights:** Actual weights of red brass and copper pipe will vary slightly from the theoretical weights shown in the accompanying table.

**Gauge tubing:** Seamless brass or copper tubing in nominal or outside diameters, sizes 1/8 to 10-inch, can be supplied in any gauge. Prices are furnished on application.

**Extra strong pipe:** Red brass and copper pipe, made to the extra strong thicknesses and regular outside diameter up to 10-inch nominal pipe size can be furnished on special order, when so specified. Complete information will be furnished on application.

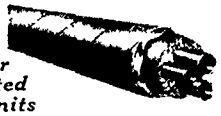
For Types K, L, and M Copper Tube for Solder-Joint Valves and Fittings, see page 428.

***Prices on application***

# Ric-wil Insulated Piping Systems

## For Steam, Hot Water, Oil, or Refrigerated Process Liquids

### Pre-Fabricated Piping

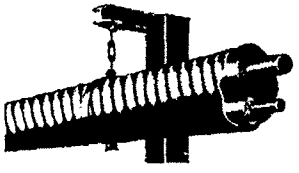


***Hel-Cor Insulated Pipe Units***

For underground lines. Single or multiple pipe combinations, insulated as required. Housing for pipe and insulation is 10-gauge spirally-corrugated ingot iron conduit, hot-dip zinc galvanized. Outside is coated with asphalt and wrapped with asbestos felt; inside is coated with phenolic resin, baked-on. 21-foot length with required accessories and joint materials is standard.

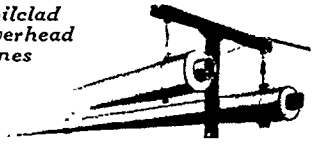
Full-welded conduit closure may be used for field joints. Air tested for tightness.

Type "B" Mechanical Coupler for tight joint without welding; rubber gaskets are used. Can be air tested.

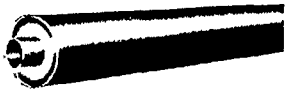


***Hel-Cor Overhead Lines*** employ the same basic system as above except the conduit is neither coated nor wrapped. Simple joint closure consists of a split metal connector band held tight with wedge clamps.

***Foilclad Overhead Lines***



Pipe and insulation are protected by a double coat of high temperature asphalt. A wrapping of asbestos felt and a final spiral wrapping of copper or aluminum foil provide added protection. 21-foot length is standard with accessories as required.



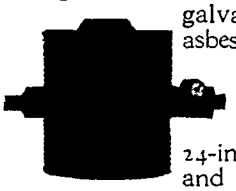
***Cast Iron Insulated Pipe Units,*** for underground systems have a heavy, corrosion-resistant, cast iron protective housing. Standard units are 18½-feet long with all accessories furnished. Joint connections are shown below.

*Mechanical Joint:* Gland is drawn tight against a rubber gasket with cast iron bolts and nuts.

*Solid Sleeve Joint:* Like above except both ends of conduit are plain with separate connector sleeve.

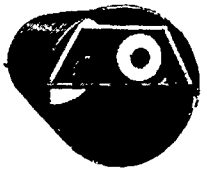
*Flanged Joint:* The bolts draw the flanges up tight against the asbestos gasket.

***Prefabricated Manholes*** are made to job requirements of 10-gauge corrugated Armco ingot iron, galvanized and asbestos bonded; outside is coated with asphalt.



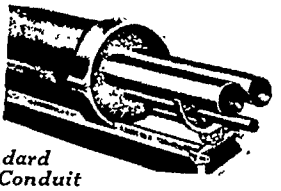
24-inch manway and cover; expansion devices optional. Standard unit is 6 feet in diameter and height; other sizes available.

***Utilidor-Type Conduit*** is used for all types of utility service (steam, return, trap discharge, hot water, fire or sewer lines, communication cable, electrical ducts, etc.).



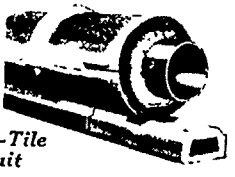
Insulated as required, with walk or crawl through space. Made of Armco corrugated ingot iron, galvanized and asbestos-bonded; outside is asphalt coated. 21-foot length in 30 to 84-inch diameters is standard.

### Sectional Conduits



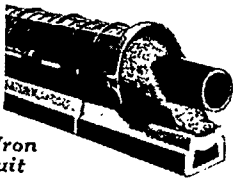
***Standard Tile Conduit***

For ordinary ground loads. Salt-glazed vitrified tile conduit and base drain foundation in 2-foot lengths. Conduit is scored for splitting and resealing. Loc-lip joint provides a positive seal. Single or multiple pipe systems, with insulation as required.



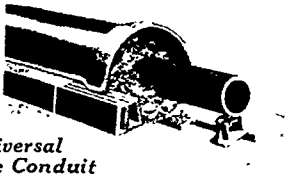
***Super-Tile Conduit***

For use under highways and heavy ground loads. Similar to "Standard" except reinforced walls are double-thick. Base drain is extra heavy tile.



***Cast Iron Conduit***

For protection of insulated piping under or near railroad tracks. Heavy ribbed cast iron withstands vibration and load impacts. 4-foot sections with extra heavy tile base drain.



***Universal Tile Conduit***

For swamp areas or unstable ground conditions. Consists of a tile arch, trapezoidal blocks, and a continuous concrete foundation laid on the job. Internal drainage. Arch may be Standard Tile, Super-Tile, or Cast Iron.

***Use durable, corrosion-resistant Ricwilite Phenolic Resin Coatings to prolong life of piping and equipment. Prices and additional data concerning coatings and other products shown above furnished on request.***

# American Standard for Wrought-Steel and Wrought-Iron Pipe

ASA B36.10-1950

*Introductory Notes*

**1 Scope.** These standards shall be known as the "American Standard for Wrought-Steel and Wrought-Iron Pipe". The word *pipe* is used as distinguished from *tubing*, restricting the term *pipe* and therefore the scope of these standards, to apply to tubular products of dimensions and materials commonly used for pipe lines and connections.

**2 Size.** The size of all pipe in these standards is identified by the *nominal pipe size*. For 14 inches and larger, *nominal pipe size* corresponds with the outside diameter of the pipe.

**3 Materials.** The dimensional standards for pipe described herein are based on products such as are covered by the ASTM and API specifications outlined in Table 1.

**4 Wall Thickness.** The nominal wall thicknesses are given in Tables 2 and 4 for steel pipe, and in Table 6 for wrought-iron pipe.

**5 Weights.** The nominal weights of steel pipe are listed in Tables 3 and 5, and correspond with the respective wall thicknesses given in Tables 2 and 4. The nominal weights of wrought-iron pipe are listed in Table 7, and correspond with the respective wall thicknesses given in Table 6.

**6 Permissible Variations.** Unless otherwise provided by the specification, the actual wall thickness at any point shall not be more than 12.5 per cent under the nominal wall thickness shown in the tables. Permissible variations for other dimensions are indicated in each specification.

**7 Screw Threads.** Unless otherwise specified, the screw threads of threaded pipe shall conform to American Standard for Pipe Threads (taper threads) (ASA B2).

**8 Schedule Wall Pipe.** The schedule numbers under Tables 2 and 3 indicate for subjoined wall thickness, for the pressure stress ratios designated, pipe of approximately uniform strength to resist internal pressure.

When the selection of wall thickness depends primarily upon capacity to resist internal pressure under given conditions, the designer shall compute the exact value of wall thickness suitable for conditions for which the pipe is required as prescribed in detail in the ASME Boiler Code, American Standard Code for Pressure Piping (ASA B31.1), etc., whichever governs the construction. A thickness will be selected from the schedules of nominal thickness contained herein to suit the value computed to fulfill the conditions for which the pipe is desired.

**9 Standard Wall, Extra Strong Wall, and Double Extra Strong Wall Pipe.** The wall thicknesses shown under Table 4 are those which have been traditional in commercial lists for *standard*, *extra strong*, and *double extra strong* pipe. Up to 10-inch, inclusive, standard wall and Schedule 40 pipe are the same dimensionally. The same is true of extra strong wall and Schedule 80 up to 8-inch inclusive. Double extra strong wall has no corresponding schedule number. Above these limiting sizes to and including 24-inch, wall thicknesses are uniformly ⅜-inch for standard wall and ½-inch for extra strong wall.

**10 Wrought-Iron Pipe.** The wall thicknesses for wrought-iron pipe shown in Table 6, and the weights per foot in Table 7 are those which have always been customary for this commodity. The weights in Table 7, being basically those for all wrought ferrous pipe, correspond with those for welded and seamless steel pipe in Table 5, but because of the difference in weight per cubic foot of the two materials the wall thicknesses for wrought-iron pipe in Table 6 are slightly greater than those for wrought-steel pipe in Table 4.

## Table 1
**Specifications for Pipe with ASA Designations and Titles of Standard Specifications**

| ASA Designation | ASTM or API Designation | Title |
|---|---|---|
| B36.1 | ASTM A53 | Welded and Seamless Steel Pipe |
| B36.2 | ASTM A72 | Welded Wrought-Iron Pipe |
| B36.3 | ASTM A106 | Seamless Carbon-Steel Pipe for High-Temperature Service |
| B36.4 | ASTM A134 | Electric-Fusion-Welded Steel Pipe, Sizes 30" and Over |
| B36.5 | ASTM A135 | Electric-Resistance-Welded Steel Pipe |
| B36.9 | ASTM A139 | Electric-Fusion-Welded Steel Pipe, Sizes 4" to but not including 30" |
| B36.11 | ASTM A155 | Electric-Fusion-Welded Steel Pipe for High-Temperature and High-Pressure Service |
| G8.7 | ASTM A120 | Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses |
| — | API 5L | Line Pipe |
| — | API 5LX | High-Test Line Pipe |
| — | ASTM A158 | Seamless Alloy-Steel Pipe for High-Temperature Service |
| — | ASTM A206 | Seamless Carbon-Molybdenum Alloy-Steel Pipe for High-Temperature Service |
| B36.16 | ASTM A211 | Spiral-Welded Steel or Iron Pipe |
| — | ASTM A253 | Welded Alloyed Open-Hearth Iron Pipe |
| — | ASTM A280 | Seamless Chromium-Molybdenum Alloy-Steel Pipe for Service at High Temperatures |
| — | ASTM A312 | Seamless Steel and Welded Austenitic Stainless Steel Pipe |
| — | ASTM A315 | Seamless 1 Per Cent Chromium, 0.5 Per Cent Molybdenum Alloy-Steel Pipe for Service at High Temperatures |

## Table 2
### Dimensions of Welded and Seamless Steel Pipe
(Listed by Schedule Numbers)

| Nominal Pipe Size | Outside Diam. | Nominal Wall Thickness | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sched 10 | Sched 20 | Sched 30 | Sched 40 | Sched 60 | Sched 80 | Sched 100 | Sched 120 | Sched 140 | Sched 160 |
| 1/8 | 0.405 | ..... | ..... | ..... | 0.068 | ..... | 0.095 | ..... | ..... | ..... | ..... |
| 1/4 | 0.540 | ..... | ..... | ..... | 0.088 | ..... | 0.119 | ..... | ..... | ..... | ..... |
| 3/8 | 0.675 | ..... | ..... | ..... | 0.091 | ..... | 0.126 | ..... | ..... | ..... | ..... |
| 1/2 | 0.840 | ..... | ..... | ..... | 0.109 | ..... | 0.147 | ..... | ..... | ..... | 0.187 |
| 3/4 | 1.050 | ..... | ..... | ..... | 0.113 | ..... | 0.154 | ..... | ..... | ..... | 0.218 |
| 1 | 1.315 | ..... | ..... | ..... | 0.133 | ..... | 0.179 | ..... | ..... | ..... | 0.250 |
| 1 1/4 | 1.660 | ..... | ..... | ..... | 0.140 | ..... | 0.191 | ..... | ..... | ..... | 0.250 |
| 1 1/2 | 1.900 | ..... | ..... | ..... | 0.145 | ..... | 0.200 | ..... | ..... | ..... | 0.281 |
| 2 | 2.375 | ..... | ..... | ..... | 0.154 | ..... | 0.218 | ..... | ..... | ..... | 0.343 |
| 2 1/2 | 2.875 | ..... | ..... | ..... | 0.203 | ..... | 0.276 | ..... | ..... | ..... | 0.375 |
| 3 | 3.500 | ..... | ..... | ..... | 0.216 | ..... | 0.300 | ..... | ..... | ..... | 0.438 |
| 3 1/2 | 4.000 | ..... | ..... | ..... | 0.226 | ..... | 0.318 | ..... | ..... | ..... | ..... |
| 4 | 4.500 | ..... | ..... | ..... | 0.237 | ..... | 0.337 | ..... | 0.438 | ..... | 0.531 |
| 5 | 5.563 | ..... | ..... | ..... | 0.258 | ..... | 0.375 | ..... | 0.500 | ..... | 0.625 |
| 6 | 6.625 | ..... | ..... | ..... | 0.280 | ..... | 0.432 | ..... | 0.562 | ..... | 0.718 |
| 8 | 8.625 | ..... | 0.250 | 0.277 | 0.322 | 0.406 | 0.500 | 0.593 | 0.718 | 0.812 | 0.906 |
| 10 | 10.750 | ..... | 0.250 | 0.307 | 0.365 | 0.500 | 0.593 | 0.718 | 0.843 | 1.000 | 1.125 |
| 12 | 12.750 | ..... | 0.250 | 0.330 | 0.406 | 0.562 | 0.687 | 0.843 | 1.000 | 1.125 | 1.312 |
| 14 | 14.000 | 0.250 | 0.312 | 0.375 | 0.438 | 0.593 | 0.750 | 0.937 | 1.093 | 1.250 | 1.406 |
| 16 | 16.000 | 0.250 | 0.312 | 0.375 | 0.500 | 0.656 | 0.843 | 1.031 | 1.218 | 1.438 | 1.593 |
| 18 | 18.000 | 0.250 | 0.312 | 0.438 | 0.562 | 0.750 | 0.937 | 1.156 | 1.375 | 1.562 | 1.781 |
| 20 | 20.000 | 0.250 | 0.375 | 0.500 | 0.593 | 0.812 | 1.031 | 1.281 | 1.500 | 1.750 | 1.968 |
| 24 | 24.000 | 0.250 | 0.375 | 0.562 | 0.687 | 0.968 | 1.218 | 1.531 | 1.812 | 2.062 | 2.343 |
| 30 | 30.000 | 0.312 | 0.500 | 0.625 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

All dimensions are given in inches.

The decimal thicknesses listed for the respective pipe sizes represent their nominal or average wall dimensions. For tolerances on wall thicknesses, see appropriate material specifications.

Thicknesses shown in bold face type for Schedule 40 are identical with thicknesses shown in bold face type for *Standard Wall* pipe in Table 4. Those in bold face type in Schedules 60 and 80 are identical with thicknesses in bold face type for *Extra Strong Wall* pipe in Table 4.

Some of the larger, heavier wall sections are beyond the capabilities of seamless mill production and must be obtained from turned-and-bored billets or other sources.

## Table 3
### Nominal Weights of Welded and Seamless Steel Pipe[1]
(Listed by Schedule Numbers)

| Nominal Pipe Size (Inches) | Sched 10 Plain Ends | Sched 20 Plain Ends | Schedule 30 | | Schedule 40 | | Sched 60 Plain Ends | Sched 80 Plain Ends | Sched 100 Plain Ends | Sched 120 Plain Ends | Sched 140 Plain Ends | Sched 160 Plain Ends |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plain Ends | Threads[2] and Couplings | Plain Ends | Threads[2] and Couplings | | | | | | |
| 1/8 | ..... | ..... | ..... | ..... | 0.24 | 0.24 | ..... | 0.31 | ..... | ..... | ..... | ..... |
| 1/4 | ..... | ..... | ..... | ..... | 0.42 | 0.42 | ..... | 0.54 | ..... | ..... | ..... | ..... |
| 3/8 | ..... | ..... | ..... | ..... | 0.57 | 0.57 | ..... | 0.74 | ..... | ..... | ..... | ..... |
| 1/2 | ..... | ..... | ..... | ..... | 0.85 | 0.85 | ..... | 1.09 | ..... | ..... | ..... | 1.30 |
| 3/4 | ..... | ..... | ..... | ..... | 1.13 | 1.13 | ..... | 1.47 | ..... | ..... | ..... | 1.94 |
| 1 | ..... | ..... | ..... | ..... | 1.68 | 1.68 | ..... | 2.17 | ..... | ..... | ..... | 2.84 |
| 1 1/4 | ..... | ..... | ..... | ..... | 2.27 | 2.28 | ..... | 3.00 | ..... | ..... | ..... | 3.76 |
| 1 1/2 | ..... | ..... | ..... | ..... | 2.72 | 2.73 | ..... | 3.63 | ..... | ..... | ..... | 4.86 |
| 2 | ..... | ..... | ..... | ..... | 3.65 | 3.68 | ..... | 5.02 | ..... | ..... | ..... | 7.44 |
| 2 1/2 | ..... | ..... | ..... | ..... | 5.79 | 5.82 | ..... | 7.66 | ..... | ..... | ..... | 10.01 |
| 3 | ..... | ..... | ..... | ..... | 7.58 | 7.62 | ..... | 10.25 | ..... | ..... | ..... | 14.32 |
| 3 1/2 | ..... | ..... | ..... | ..... | 9.11 | 9.20 | ..... | 12.51 | ..... | ..... | ..... | ..... |
| 4 | ..... | ..... | ..... | ..... | 10.79 | 10.89 | ..... | 14.98 | ..... | 19.01 | ..... | 22.51 |
| 5 | ..... | ..... | ..... | ..... | 14.62 | 14.81 | ..... | 20.78 | ..... | 27.04 | ..... | 32.96 |
| 6 | ..... | ..... | ..... | ..... | 18.97 | 19.18 | ..... | 28.57 | ..... | 36.39 | ..... | 45.30 |
| 8 | ..... | 22.36 | 24.70 | 25.55 | 28.55 | 29.35 | 35.64 | 43.39 | 50.87 | 60.63 | 67.76 | 74.69 |
| 10 | ..... | 28.04 | 34.24 | 35.75 | 40.48 | 41.85 | 54.74 | 64.33 | 76.93 | 89.20 | 104.13 | 115.65 |
| 12 | ..... | 33.38 | 43.77 | 45.45 | 53.53 | ..... | 73.16 | 88.51 | 107.20 | 125.49 | 139.68 | 160.27 |
| 14 | 36.71 | 45.98 | 54.57 | ..... | 63.37 | ..... | 84.91 | 106.13 | 130.73 | 150.67 | 170.22 | 189.12 |
| 16 | 42.05 | 52.36 | 62.58 | ..... | 82.77 | ..... | 107.50 | 136.46 | 164.83 | 192.29 | 223.50 | 245.11 |
| 18 | 47.39 | 59.03 | 82.06 | ..... | 104.75 | ..... | 138.17 | 170.75 | 207.96 | 244.14 | 274.23 | 308.51 |
| 20 | 52.73 | 78.60 | 104.13 | ..... | 122.91 | ..... | 166.40 | 208.87 | 256.10 | 296.37 | 341.10 | 379.01 |
| 24 | 63.41 | 94.62 | 140.80 | ..... | 171.17 | ..... | 238.11 | 296.36 | 367.40 | 429.39 | 483.13 | 541.94 |
| 30 | 98.93 | 157.53 | 196.08 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

[1]Weights are given in pounds per linear foot and are for pipe with plain ends except for sizes which are commercially available with threads and couplings for which both weights are listed. Weights are calculated on the basis of 1 cu. in. of steel = 0.2833 pounds.

Weights shown in bold face type for Schedule 40 are identical with weights shown in bold face type for *Standard Wall* pipe in Table 5. Those shown in bold face type in Schedules 60 and 80 are identical with weights shown in bold face type for *Extra Strong Wall* pipe in Table 5.

[2]The weights of line pipe with couplings are slightly greater than shown in Schedules 30 and 40 and may be found in API Specification 5-L.

## Table 4
### Dimensions of Welded and Seamless Steel Pipe
(Listed as Standard Wall, Extra Strong Wall, and Double Extra Strong Wall)

| Nominal Pipe Size | Outside Diam. | Nominal Wall Thickness | | |
|---|---|---|---|---|
| | | Standard Wall | Extra Strong Wall | Double Extra Strong Wall |
| 1/8 | 0.405 | 0.068 | 0.095 | ..... |
| 1/4 | 0.540 | 0.088 | 0.119 | ..... |
| 3/8 | 0.675 | 0.091 | 0.126 | ..... |
| 1/2 | 0.840 | 0.109 | 0.147 | 0.294 |
| 3/4 | 1.050 | 0.113 | 0.154 | 0.308 |
| 1 | 1.315 | 0.133 | 0.179 | 0.358 |
| 1 1/4 | 1.660 | 0.140 | 0.191 | 0.382 |
| 1 1/2 | 1.900 | 0.145 | 0.200 | 0.400 |
| 2 | 2.375 | 0.154 | 0.218 | 0.436 |
| 2 1/2 | 2.875 | 0.203 | 0.276 | 0.552 |
| 3 | 3.500 | 0.216 | 0.300 | 0.600 |
| 3 1/2 | 4.000 | 0.226 | 0.318 | ..... |
| 4 | 4.500 | 0.237 | 0.337 | 0.674 |
| 5 | 5.563 | 0.258 | 0.375 | 0.750 |
| 6 | 6.625 | 0.280 | 0.432 | 0.864 |
| 8 | 8.625 | 0.322 | 0.500 | 0.875 |
| 10 | 10.750 | 0.365 | 0.500 | ..... |
| 12 | 12.750 | 0.375 | 0.500 | ..... |
| 14 | 14.000 | 0.375 | 0.500 | ..... |
| 16 | 16.000 | 0.375 | 0.500 | ..... |
| 18 | 18.000 | 0.375 | 0.500 | ..... |
| 20 | 20.000 | 0.375 | 0.500 | ..... |
| 24 | 24.000 | 0.375 | 0.500 | ..... |

All dimensions are given in inches.

The decimal thicknesses listed for the respective pipe sizes represent their nominal or average wall dimensions. For tolerances on wall thicknesses, see appropriate material specifications.

Thicknesses shown in bold face type for *Standard Wall* are identical with corresponding thicknesses shown in bold face type for Schedule 40 in Table 2. Those shown in bold face type for *Extra Strong Wall* are identical with corresponding thicknesses shown in bold face type in Schedules 60 and 80 in Table 2.

*Double Extra Strong Wall* has no corresponding schedule numbers. (See Introductory Notes, Paragraph 9). Dimensions are identical with *Double Extra Strong Pipe* shown as an Appendix to B36.10-1939.

## Table 5
### Nominal Weights of Welded and Seamless Steel Pipe[1]
(Listed as Standard Wall, Extra Strong Wall, and Double Extra Strong Wall)

[1] Weights are given in pounds per linear foot and are for pipe with plain ends except for sizes which are commercially available with threads and couplings for which both weights are listed.

Weights are calculated on the basis of 1 cu. in. of steel = 0.2833 pounds.

Weights shown in bold face type for *Standard Wall* are identical with weights shown in bold face type for Schedule 40 in Table 3. Those shown in bold face type for *Extra Strong Wall* are identical with weights shown in bold face type for Schedules 60 and 80 in Table 3.

All weights in Table 5 are identical with those in Table 7 for Wrought-Iron Pipe.

| Nominal Pipe Size | Standard Wall | | Extra Strong Wall | Double Extra Strong Wall |
|---|---|---|---|---|
| Inches | Plain Ends | Threads and Couplings | Plain Ends | Plain Ends |
| 1/8 | 0.24 | 0.24 | 0.31 | ..... |
| 1/4 | 0.42 | 0.42 | 0.54 | ..... |
| 3/8 | 0.57 | 0.57 | 0.74 | ..... |
| 1/2 | 0.85 | 0.85 | 1.09 | 1.71 |
| 3/4 | 1.13 | 1.13 | 1.47 | 2.44 |
| 1 | 1.68 | 1.68 | 2.17 | 3.66 |
| 1 1/4 | 2.27 | 2.28 | 3.00 | 5.21 |
| 1 1/2 | 2.72 | 2.73 | 3.63 | 6.41 |
| 2 | 3.65 | 3.68 | 5.02 | 9.03 |
| 2 1/2 | 5.79 | 5.82 | 7.66 | 13.70 |
| 3 | 7.58 | 7.62 | 10.25 | 18.58 |
| 3 1/2 | 9.11 | 9.20 | 12.51 | .... |
| 4 | 10.79 | 10.89 | 14.98 | 27.54 |
| 5 | 14.62 | 14.81 | 20.78 | 38.55 |
| 6 | 18.97 | 19.18 | 28.57 | 53.16 |
| 8 | 28.55 | 29.35 | 43.39 | 72.42 |
| 10 | 40.48 | 41.85 | 54.74 | .. .. |
| 12 | 49.56 | 51.15 | 65.42 | .. .. |
| 14 | 54.57 | ..... | 72.09 | ..... |
| 16 | 62.58 | ..... | 82.77 | ..... |
| 18 | 70.59 | ..... | 93.45 | ..... |
| 20 | 78.60 | ..... | 104.13 | ..... |
| 24 | 94.62 | .. .. | 125.49 | ..... |

## Table 6
### Dimensions of Welded Wrought-Iron Pipe
(Listed as Standard Wall, Extra Strong Wall, and Double Extra Strong Wall)

All dimensions are given in inches.

The decimal thicknesses listed for the respective pipe sizes represent their nominal or average wall dimensions. For tolerances on wall thicknesses, see appropriate material specifications.

Thicknesses of all of the sizes shown are slightly greater than those of corresponding sizes for steel pipe shown in Tables 2 and 4 to compensate for the difference in weights per cubic foot of wrought-steel and wrought-iron. See Introductory Notes, Paragraph 10.

| Nominal Pipe Size | Outside Diam. | Nominal Wall Thickness: Standard Wall | Extra Strong Wall | Double Extra Strong Wall |
|---|---|---|---|---|
| 1/8 | 0.405 | 0.069 | 0.099 | ..... |
| 1/4 | 0.540 | 0.090 | 0.122 | ..... |
| 3/8 | 0.675 | 0.093 | 0.129 | ..... |
| 1/2 | 0.840 | 0.111 | 0.151 | 0.307 |
| 3/4 | 1.050 | 0.115 | 0.157 | 0.318 |
| 1 | 1.315 | 0.136 | 0.183 | 0.369 |
| 1 1/4 | 1.660 | 0.143 | 0.195 | 0.393 |
| 1 1/2 | 1.900 | 0.148 | 0.204 | 0.411 |
| 2 | 2.375 | 0.158 | 0.223 | 0.447 |
| 2 1/2 | 2.875 | 0.208 | 0.282 | 0.567 |
| 3 | 3.500 | 0.221 | 0.306 | 0.615 |
| 3 1/2 | 4.000 | 0.231 | 0.325 | ..... |
| 4 | 4.500 | 0.242 | 0.344 | 0.690 |
| 5 | 5.563 | 0.263 | 0.383 | 0.768 |
| 6 | 6.625 | 0.286 | 0.441 | 0.884 |
| 8 | 8.625 | 0.329 | 0.510 | 0.895 |
| 10 | 10.750 | 0.372 | 0.510 | ..... |
| 12 | 12.750 | 0.383 | 0.510 | ..... |
| 14 | 14.000 | 0.383 | 0.510 | ..... |
| 16 | 16.000 | 0.383 | 0.510 | ..... |
| 18 | 18.000 | 0.383 | 0.510 | ..... |
| 20 | 20.000 | 0.383 | 0.510 | ..... |
| 24 | 24.000 | 0.383 | 0.510 | ..... |

## Table 7
### Nominal Weights of Welded Wrought-Iron Pipe[1]
(Listed as Standard Wall, Extra Strong Wall, and Double Extra Strong Wall)

| Nominal Pipe Size, Inches | Standard Wall: Plain Ends | Standard Wall: Threads and Couplings | Extra Strong Wall: Plain Ends | Double Extra Strong Wall: Plain Ends |
|---|---|---|---|---|
| 1/8 | 0.24 | 0.24 | 0.31 | ..... |
| 1/4 | 0.42 | 0.42 | 0.54 | ..... |
| 3/8 | 0.57 | 0.57 | 0.74 | ..... |
| 1/2 | 0.85 | 0.85 | 1.09 | 1.71 |
| 3/4 | 1.13 | 1.13 | 1.47 | 2.44 |
| 1 | 1.68 | 1.68 | 2.17 | 3.66 |
| 1 1/4 | 2.27 | 2.28 | 3.00 | 5.21 |
| 1 1/2 | 2.72 | 2.73 | 3.63 | 6.41 |
| 2 | 3.65 | 3.68 | 5.02 | 9.03 |
| 2 1/2 | 5.79 | 5.82 | 7.66 | 13.70 |
| 3 | 7.58 | 7.62 | 10.25 | 18.58 |
| 3 1/2 | 9.11 | 9.20 | 12.51 | ..... |
| 4 | 10.79 | 10.89 | 14.98 | 27.54 |
| 5 | 14.62 | 14.81 | 20.78 | 38.55 |
| 6 | 18.97 | 19.18 | 28.57 | 53.16 |
| 8 | 28.55 | 29.35 | 43.39 | 72.42 |
| 10 | 40.48 | 41.85 | 54.74 | ..... |
| 12 | 49.56 | 51.15 | 65.42 | ..... |
| 14 | 54.57 | ..... | 72.09 | ..... |
| 16 | 62.58 | ..... | 82.77 | ..... |
| 18 | 70.59 | ..... | 93.45 | ..... |
| 20 | 78.60 | ..... | 104.13 | ..... |
| 24 | 94.62 | ..... | 125.49 | ..... |

[1] Weights are given in pounds per linear foot and are for pipe with plain ends except for sizes which are commercially available with threads and couplings for which both weights are given.

Weights shown in bold face type for *Standard Wall* are identical with weights shown in bold face type in Table 3. Those shown in bold face type for *Extra Strong Wall* are identical with weights shown in bold face type for Schedules 60 and 80 in Table 3. All weights in Table 7 are identical with those shown in Table 5 for Wrought-Steel Pipe.

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# Commercial Wrought Steel Pipe Data

Note 1: The letters "s", "x", and "xx" in the column of Schedule Numbers indicate Standard, Extra Strong, and Double Extra Strong Pipe, respectively.

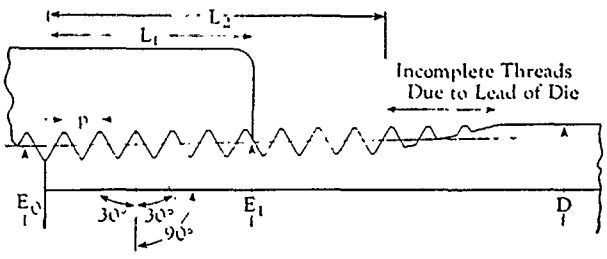
Note 2: The values shown in square feet for the Transverse Internal Area also represent the volume in cubic feet per foot of pipe length.

| Nominal Pipe Size Inches | Outside Diameter (D) Inches | Schedule No. *See Note 1* | Wall Thickness (t) Inches | Inside Diameter (d) Inches | Area of Metal (a) Square Inches | Transverse Internal Area Square Inches | Transverse Internal Area *See Note 2* Square Feet | Moment of Inertia (I) Inches to 4th Power | Weight of Pipe Pounds per foot | Weight of Water Pounds per foot of pipe | External Surface Sq. Ft. per foot of pipe | Section Modulus $\left(\frac{I}{D}\right)$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 0.405 | 40s | .068 | .269 | .0720 | .0568 | .00040 | .00106 | .244 | .025 | .106 | .00523 |
| | | 80x | .095 | .215 | .0925 | .0364 | .00025 | .00122 | .314 | .016 | .106 | .00602 |
| 1/4 | 0.540 | 40s | .088 | .364 | .1250 | .1041 | .00072 | .00331 | .424 | .045 | .141 | .01227 |
| | | 80x | .119 | .302 | .1574 | .0716 | .00050 | .00377 | .535 | .031 | .141 | .01395 |
| 3/8 | 0.675 | 40s | .091 | .493 | .1670 | .1910 | .00133 | .00729 | .567 | .083 | .178 | .02160 |
| | | 80x | .126 | .423 | .2173 | .1405 | .00098 | .00862 | .738 | .061 | .178 | .02554 |
| 1/2 | 0.840 | 40s | .109 | .622 | .2503 | .3040 | .00211 | .01709 | .850 | .132 | .220 | .04069 |
| | | 80x | .147 | .546 | .3200 | .2340 | .00163 | .02008 | 1.087 | .102 | .220 | .04780 |
| | | 160 | .187 | .466 | .3836 | .1706 | .00118 | .02212 | 1.300 | .074 | .220 | .05267 |
| | | ...xx | .294 | .252 | .5043 | .050 | .00035 | .0242 | 1.714 | .022 | .220 | .05762 |
| 3/4 | 1.050 | 40s | .113 | .824 | .3326 | .5330 | .00371 | .03704 | 1.130 | .231 | .275 | .07055 |
| | | 80x | .154 | .742 | .4335 | .4330 | .00300 | .04479 | 1.473 | .188 | .275 | .08531 |
| | | 160 | .218 | .614 | .5698 | .2961 | .00206 | .05269 | 1.940 | .128 | .275 | .10036 |
| | | ...xx | .308 | .434 | .7180 | .148 | .00103 | .05792 | 2.440 | .064 | .275 | .11032 |
| 1 | 1.315 | 40s | .133 | 1.049 | .4939 | .8640 | .00600 | .08734 | 1.678 | .375 | .344 | .1328 |
| | | 80x | .179 | .957 | .6388 | .7190 | .00499 | .1056 | 2.171 | .312 | .344 | .1606 |
| | | 160 | .250 | .815 | .8365 | .5217 | .00362 | .1251 | 2.840 | .230 | .344 | .1903 |
| | | ...xx | .358 | .599 | 1.0760 | .282 | .00196 | .1405 | 3.659 | .122 | .344 | .2136 |
| 1 1/4 | 1.660 | 40s | .140 | 1.380 | .6685 | 1.495 | .01040 | .1947 | 2.272 | .649 | .435 | .2346 |
| | | 80x | .191 | 1.278 | .8815 | 1.283 | .00891 | .2418 | 2.996 | .555 | .435 | .2913 |
| | | 160 | .250 | 1.160 | 1.1070 | 1.057 | .00734 | .2839 | 3.764 | .458 | .435 | .3421 |
| | | ...xx | .382 | .896 | 1.534 | .630 | .00438 | .3411 | 5.214 | .273 | .435 | .4110 |
| 1 1/2 | 1.900 | 40s | .145 | 1.610 | .7995 | 2.036 | .01414 | .3099 | 2.717 | .882 | .497 | .3262 |
| | | 80x | .200 | 1.500 | 1.068 | 1.767 | .01225 | .3912 | 3.631 | .765 | .497 | .4118 |
| | | 160 | .281 | 1.338 | 1.429 | 1.406 | .00976 | .4824 | 4.862 | .608 | .497 | .5078 |
| | | ...xx | .400 | 1.100 | 1.885 | .950 | .00660 | .5678 | 6.408 | .42 | .497 | .5977 |
| 2 | 2.375 | 40s | .154 | 2.067 | 1.075 | 3.355 | .02330 | .6657 | 3.652 | 1.45 | .622 | .5606 |
| | | 80x | .218 | 1.939 | 1.477 | 2.953 | .02050 | .8679 | 5.022 | 1.28 | .622 | .7309 |
| | | 160 | .343 | 1.689 | 2.190 | 2.241 | .01556 | 1.162 | 7.440 | .97 | .622 | .979 |
| | | ...xx | .436 | 1.503 | 2.656 | 1.774 | .01232 | 1.311 | 9.029 | .77 | .622 | 1.104 |
| 2 1/2 | 2.875 | 40s | .203 | 2.469 | 1.704 | 4.788 | .03322 | 1.530 | 5.79 | 2.07 | .753 | 1.064 |
| | | 80x | .276 | 2.323 | 2.254 | 4.238 | .02942 | 1.924 | 7.66 | 1.87 | .753 | 1.339 |
| | | 160 | .375 | 2.125 | 2.945 | 3.546 | .02463 | 2.353 | 10.01 | 1.54 | .753 | 1.638 |
| | | ...xx | .552 | 1.771 | 4.028 | 2.464 | .01710 | 2.871 | 13.70 | 1.07 | .753 | 1.997 |
| 3 | 3.500 | 40s | .216 | 3.068 | 2.228 | 7.393 | .05130 | 3.017 | 7.58 | 3.20 | .916 | 1.724 |
| | | 80x | .300 | 2.900 | 3.016 | 6.605 | .04587 | 3.894 | 10.25 | 2.86 | .916 | 2.225 |
| | | 160 | .437 | 2.626 | 4.205 | 5.416 | .03761 | 5.032 | 14.32 | 2.35 | .916 | 2.876 |
| | | ...xx | .600 | 2.300 | 5.466 | 4.155 | .02885 | 5.993 | 18.58 | 1.80 | .916 | 3.424 |
| 3 1/2 | 4.000 | 40s | .226 | 3.548 | 2.680 | 9.886 | .06870 | 4.788 | 9.11 | 4.29 | 1.047 | 2.394 |
| | | 80x | .318 | 3.364 | 3.678 | 8.888 | .06170 | 6.280 | 12.51 | 3.84 | 1.047 | 3.140 |
| 4 | 4.500 | 40s | .237 | 4.026 | 3.174 | 12.73 | .08840 | 7.233 | 10.79 | 5.50 | 1.178 | 3.214 |
| | | 80x | .337 | 3.826 | 4.407 | 11.50 | .07986 | 9.610 | 14.98 | 4.98 | 1.178 | 4.271 |
| | | 120 | .437 | 3.626 | 5.578 | 10.33 | .0717 | 11.65 | 19.00 | 4.47 | 1.178 | 5.178 |
| | | 160 | .531 | 3.438 | 6.621 | 9.28 | .0645 | 13.27 | 22.51 | 4.02 | 1.178 | 5.898 |
| | | ...xx | .674 | 3.152 | 8.101 | 7.80 | .0542 | 15.28 | 27.54 | 3.38 | 1.178 | 6.791 |
| 5 | 5.563 | 40s | .258 | 5.047 | 4.300 | 20.01 | .1390 | 15.16 | 14.62 | 8.67 | 1.456 | 5.451 |
| | | 80x | .375 | 4.813 | 6.112 | 18.19 | .1263 | 20.67 | 20.78 | 7.88 | 1.456 | 7.431 |
| | | 120 | .500 | 4.563 | 7.953 | 16.35 | .1136 | 25.73 | 27.10 | 7.09 | 1.456 | 9.250 |
| | | 160 | .625 | 4.313 | 9.696 | 14.61 | .1015 | 30.03 | 32.96 | 6.33 | 1.456 | 10.796 |
| | | ...xx | .750 | 4.063 | 11.340 | 12.97 | .0901 | 33.63 | 38.55 | 5.61 | 1.456 | 12.090 |
| 6 | 6.625 | 40s | .280 | 6.065 | 5.581 | 28.89 | .2006 | 28.14 | 18.97 | 12.51 | 1.734 | 8.50 |
| | | 80x | .432 | 5.761 | 8.405 | 26.07 | .1810 | 40.49 | 28.57 | 11.29 | 1.734 | 12.22 |
| | | 120 | .562 | 5.501 | 10.70 | 23.77 | .1650 | 49.61 | 36.40 | 10.30 | 1.734 | 14.98 |
| | | 160 | .718 | 5.189 | 13.32 | 21.15 | .1469 | 58.97 | 45.30 | 9.16 | 1.734 | 17.81 |
| | | ...xx | .864 | 4.897 | 15.64 | 18.84 | .1308 | 66.33 | 53.16 | 8.16 | 1.734 | 20.02 |
| 8 | 8.625 | 20 | .250 | 8.125 | 6.57 | 51.85 | .3601 | 57.72 | 22.36 | 22.47 | 2.258 | 13.39 |
| | | 30 | .277 | 8.071 | 7.26 | 51.16 | .3553 | 63.35 | 24.70 | 22.17 | 2.258 | 14.69 |
| | | 40s | .322 | 7.981 | 8.40 | 50.03 | .3474 | 72.49 | 28.55 | 21.70 | 2.258 | 16.81 |
| | | 60 | .406 | 7.813 | 10.48 | 47.94 | .3329 | 88.73 | 35.64 | 20.77 | 2.258 | 20.58 |
| | | 80x | .500 | 7.625 | 12.76 | 45.66 | .3171 | 105.7 | 43.39 | 19.78 | 2.258 | 24.51 |
| | | 100 | .593 | 7.439 | 14.96 | 43.46 | .3018 | 121.3 | 50.87 | 18.83 | 2.258 | 28.14 |
| | | 120 | .718 | 7.189 | 17.84 | 40.59 | .2819 | 140.5 | 60.63 | 17.59 | 2.258 | 32.58 |
| | | 140 | .812 | 7.001 | 19.93 | 38.50 | .2673 | 153.7 | 67.76 | 16.68 | 2.258 | 35.65 |
| | | ...xx | .875 | 6.875 | 21.30 | 37.12 | .2578 | 162.0 | 72.42 | 16.10 | 2.258 | 37.56 |
| | | 160 | .906 | 6.813 | 21.97 | 36.46 | .2532 | 165.9 | 74.69 | 15.80 | 2.258 | 38.48 |

## Commercial Wrought Steel Pipe Data (*continued*)

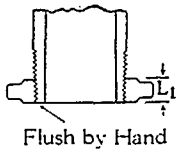
| Nominal Pipe Size Inches | Outside Diameter D Inches | Schedule No. *See Note 1* | Wall Thickness (t) Inches | Inside Diameter (d) Inches | Area of Metal (a) Square Inches | Transverse Internal Area: Square Inches | Transverse Internal Area: *See Note 2* Square Feet | Moment of Inertia (I) Inches to 4th Power | Weight of Pipe Pounds per foot | Weight of Water Pounds per foot of pipe | External Surface Sq. Ft. per foot of pipe | Section Modulus $\left(2\frac{I}{D}\right)$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 10.750 | 20 | .250 | 10.250 | 8.24 | 82.52 | .5731 | 113.7 | 28.04 | 35.76 | 2.814 | 21.15 |
| | | 30 | .307 | 10.136 | 10.07 | 80.69 | .5603 | 137.4 | 34.24 | 34.96 | 2.814 | 25.57 |
| | | 40s | .365 | 10.020 | 11.90 | 78.86 | .5475 | 160.7 | 40.48 | 34.20 | 2.814 | 29.90 |
| | | 60x | .500 | 9.750 | 16.10 | 74.66 | .5185 | 212.0 | 54.74 | 32.35 | 2.814 | 39.43 |
| | | 80 | .593 | 9.564 | 18.92 | 71.84 | .4989 | 244.8 | 64.33 | 31.13 | 2.814 | 45.54 |
| | | 100 | .718 | 9.314 | 22.63 | 68.13 | .4732 | 286.1 | 76.93 | 29.53 | 2.814 | 53.22 |
| | | 120 | .843 | 9.064 | 26.24 | 64.53 | .4481 | 324.2 | 89.20 | 27.96 | 2.814 | 60.32 |
| | | 140 | 1.000 | 8.750 | 30.63 | 60.13 | .4176 | 367.8 | 104.13 | 26.06 | 2.814 | 68.43 |
| | | 160 | 1.125 | 8.500 | 34.02 | 56.75 | .3941 | 399.3 | 115.65 | 24.59 | 2.814 | 74.29 |
| 12 | 12.75 | 20 | .250 | 12.250 | 9.82 | 117.86 | .8185 | 191.8 | 33.38 | 51.07 | 3.338 | 30.2 |
| | | 30 | .330 | 12.090 | 12.87 | 114.80 | .7972 | 248.4 | 43.77 | 49.74 | 3.338 | 38.1 |
| | | ..s | .375 | 12.000 | 14.58 | 113.10 | .7854 | 279.3 | 49.56 | 49.00 | 3.338 | 43.8 |
| | | 40 | .406 | 11.938 | 15.77 | 111.93 | .7773 | 300.3 | 53.53 | 48.50 | 3.338 | 47.1 |
| | | ..x | .500 | 11.750 | 19.24 | 108.43 | .7528 | 361.5 | 65.42 | 46.92 | 3.338 | 56.7 |
| | | 60 | .562 | 11.626 | 21.52 | 106.16 | .7372 | 400.4 | 73.16 | 46.00 | 3.338 | 62.8 |
| | | 80 | .687 | 11.376 | 26.03 | 101.64 | .7058 | 475.1 | 88.51 | 44.04 | 3.338 | 74.6 |
| | | 100 | .843 | 11.064 | 31.53 | 96.14 | .6677 | 561.6 | 107.20 | 41.66 | 3.338 | 88.1 |
| | | 120 | 1.000 | 10.750 | 36.91 | 90.76 | .6303 | 641.6 | 125.49 | 39.33 | 3.338 | 100.7 |
| | | 140 | 1.125 | 10.500 | 41.08 | 86.59 | .6013 | 700.5 | 133.68 | 37.52 | 3.338 | 109.9 |
| | | 160 | 1.312 | 10.126 | 47.14 | 80.53 | .5592 | 781.1 | 160.27 | 34.89 | 3.338 | 122.6 |
| 14 | 14.00 | 10 | .250 | 13.500 | 10.80 | 143.14 | .9940 | 255.3 | 36.71 | 62.03 | 3.665 | 36.6 |
| | | 20 | .312 | 13.376 | 13.42 | 140.52 | .9758 | 314.4 | 45.68 | 60.89 | 3.665 | 45.0 |
| | | 30s | .375 | 13.250 | 16.05 | 137.88 | .9575 | 372.8 | 54.57 | 59.75 | 3.665 | 53.2 |
| | | 40 | .437 | 13.126 | 18.61 | 135.32 | .9397 | 429.1 | 63.37 | 58.64 | 3.665 | 61.3 |
| | | ..x | .500 | 13.000 | 21.21 | 132.73 | .9217 | 483.8 | 72.09 | 57.46 | 3.665 | 69.1 |
| | | 60 | .593 | 12.814 | 24.98 | 128.96 | .8956 | 562.3 | 84.91 | 55.86 | 3.665 | 80.3 |
| | | 80 | .750 | 12.500 | 31.22 | 122.72 | .8522 | 687.3 | 106.13 | 53.18 | 3.665 | 98.2 |
| | | 100 | .937 | 12.126 | 38.45 | 115.49 | .8020 | 824.4 | 130.73 | 50.04 | 3.665 | 117.8 |
| | | 120 | 1.093 | 11.814 | 44.32 | 109.62 | .7612 | 929.6 | 150.67 | 47.45 | 3.665 | 132.8 |
| | | 140 | 1.250 | 11.500 | 50.07 | 103.87 | .7213 | 1027.0 | 170.22 | 45.01 | 3.665 | 146.8 |
| | | 160 | 1.406 | 11.188 | 55.63 | 98.31 | .6827 | 1117.0 | 189.12 | 42.60 | 3.665 | 159.6 |
| 16 | 16.00 | 10 | .250 | 15.500 | 12.37 | 188.69 | 1.3103 | 383.7 | 42.05 | 81.74 | 4.189 | 48.0 |
| | | 20 | .312 | 15.376 | 15.38 | 185.69 | 1.2895 | 473.2 | 52.36 | 80.50 | 4.189 | 59.2 |
| | | 30s | .375 | 15.250 | 18.41 | 182.65 | 1.2684 | 562.1 | 62.58 | 79.12 | 4.189 | 70.3 |
| | | 40x | .500 | 15.000 | 24.35 | 176.72 | 1.2272 | 731.9 | 82.77 | 76.58 | 4.189 | 91.5 |
| | | 60 | .656 | 14.688 | 31.62 | 169.44 | 1.1766 | 932.4 | 107.50 | 73.42 | 4.189 | 116.6 |
| | | 80 | .843 | 14.314 | 40.14 | 160.92 | 1.1175 | 1155.8 | 136.46 | 69.73 | 4.189 | 144.5 |
| | | 100 | 1.031 | 13.938 | 48.48 | 152.58 | 1.0596 | 1364.5 | 164.83 | 66.12 | 4.189 | 170.5 |
| | | 120 | 1.218 | 13.564 | 56.56 | 144.50 | 1.0035 | 1555.8 | 192.29 | 62.62 | 4.189 | 194.5 |
| | | 140 | 1.437 | 13.126 | 65.74 | 135.32 | .9397 | 1760.3 | 223.64 | 58.64 | 4.189 | 220.0 |
| | | 160 | 1.593 | 12.814 | 72.10 | 128.96 | .8956 | 1893.5 | 245.11 | 55.83 | 4.189 | 236.7 |
| 18 | 18.00 | 10 | .250 | 17.500 | 13.94 | 240.53 | 1.6703 | 549.1 | 47.39 | 104.21 | 4.712 | 61.1 |
| | | 20 | .312 | 17.376 | 17.34 | 237.13 | 1.6467 | 678.2 | 59.03 | 102.77 | 4.712 | 75.5 |
| | | ..s | .375 | 17.250 | 20.76 | 233.71 | 1.6230 | 806.7 | 70.59 | 101.18 | 4.712 | 89.6 |
| | | 30 | .437 | 17.126 | 24.11 | 230.36 | 1.5997 | 930.3 | 82.06 | 99.84 | 4.712 | 103.4 |
| | | ..x | .500 | 17.000 | 27.49 | 226.98 | 1.5763 | 1053.2 | 92.45 | 98.27 | 4.712 | 117.0 |
| | | 40 | .562 | 16.876 | 30.79 | 223.68 | 1.5533 | 1171.5 | 104.75 | 96.93 | 4.712 | 130.1 |
| | | 60 | .750 | 16.500 | 40.64 | 213.83 | 1.4849 | 1514.7 | 138.17 | 92.57 | 4.712 | 168.3 |
| | | 80 | .937 | 16.126 | 50.23 | 204.24 | 1.4183 | 1833.0 | 170.75 | 88.50 | 4.712 | 203.8 |
| | | 100 | 1.156 | 15.688 | 61.17 | 193.30 | 1.3423 | 2180.0 | 207.96 | 83.76 | 4.712 | 242.3 |
| | | 120 | 1.375 | 15.250 | 71.81 | 182.66 | 1.2684 | 2498.1 | 244.14 | 79.07 | 4.712 | 277.6 |
| | | 140 | 1.562 | 14.876 | 80.66 | 173.80 | 1.2070 | 2749.0 | 274.23 | 75.32 | 4.712 | 305.5 |
| | | 160 | 1.781 | 14.438 | 90.75 | 163.72 | 1.1369 | 3020.0 | 308.51 | 70.88 | 4.712 | 335.6 |
| 20 | 20.00 | 10 | .250 | 19.500 | 15.51 | 298.65 | 2.0740 | 756.4 | 52.73 | 129.42 | 5.236 | 75.6 |
| | | 20 | .375 | 19.250 | 23.12 | 290.04 | 2.0142 | 1113.0 | 78.60 | 125.67 | 5.236 | 111.3 |
| | | 30x | .500 | 19.000 | 30.63 | 283.53 | 1.9690 | 1457.0 | 104.13 | 122.87 | 5.236 | 145.7 |
| | | 40 | .593 | 18.814 | 36.15 | 278.00 | 1.9305 | 1703.0 | 122.91 | 120.46 | 5.236 | 170.4 |
| | | 60 | .812 | 18.376 | 48.95 | 265.21 | 1.8417 | 2257.0 | 166.40 | 114.92 | 5.236 | 225.7 |
| | | 80 | 1.031 | 17.938 | 61.44 | 252.72 | 1.7550 | 2772.0 | 208.87 | 109.51 | 5.236 | 277.1 |
| | | 100 | 1.281 | 17.438 | 75.33 | 238.83 | 1.6585 | 3315.2 | 256.10 | 103.39 | 5.236 | 331.5 |
| | | 120 | 1.500 | 17.000 | 87.18 | 226.98 | 1.5762 | 3754.0 | 296.37 | 98.35 | 5.236 | 375.5 |
| | | 140 | 1.750 | 16.500 | 100.33 | 213.82 | 1.4849 | 4216.0 | 341.10 | 92.66 | 5.236 | 421.7 |
| | | 160 | 1.968 | 16.064 | 111.49 | 202.67 | 1.4074 | 4585.5 | 379.01 | 87.74 | 5.236 | 458.5 |
| 24 | 24.00 | 10 | .250 | 23.500 | 18.65 | 433.74 | 3.0121 | 1315.4 | 63.41 | 187.95 | 6.283 | 109.6 |
| | | 20s | .375 | 23.250 | 27.83 | 424.56 | 2.9483 | 1942.0 | 94.62 | 183.95 | 6.283 | 161.9 |
| | | ..x | .500 | 23.000 | 36.91 | 415.48 | 2.8853 | 2549.5 | 125.49 | 179.87 | 6.283 | 212.5 |
| | | 30 | .562 | 22.876 | 41.39 | 411.00 | 2.8542 | 2843.0 | 140.80 | 178.09 | 6.283 | 237.0 |
| | | 40 | .687 | 22.626 | 50.31 | 402.07 | 2.7921 | 3421.3 | 171.17 | 174.23 | 6.283 | 285.1 |
| | | 60 | .968 | 22.064 | 70.04 | 382.35 | 2.6552 | 4652.8 | 238.11 | 165.52 | 6.283 | 387.7 |
| | | 80 | 1.218 | 21.564 | 87.17 | 365.22 | 2.5362 | 5672.0 | 296.36 | 158.26 | 6.283 | 472.8 |
| | | 100 | 1.531 | 20.938 | 108.07 | 344.32 | 2.3911 | 6849.9 | 367.40 | 149.06 | 6.283 | 570.8 |
| | | 120 | 1.812 | 20.376 | 126.31 | 326.08 | 2.2645 | 7825.0 | 429.39 | 141.17 | 6.283 | 652.1 |
| | | 140 | 2.062 | 19.876 | 142.11 | 310.28 | 2.1547 | 8625.0 | 483.13 | 134.45 | 6.283 | 718.9 |
| | | 160 | 2.343 | 19.314 | 159.41 | 292.98 | 2.0346 | 9455.9 | 541.94 | 126.84 | 6.283 | 787.9 |

# American Standard Taper Pipe Threads (NPT)

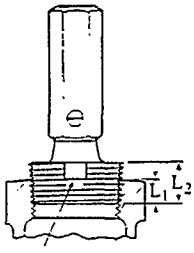



$E_0 = D - (0.050D + 1.1)p$
$E_1 = E_0 + 0.0625\ L_1$
$L_2 = (0.80D + 6.8)p$

$p$ = Pitch
Depth of thread = $0.80p$
Total Taper ¾-inch per Foot




**Tolerance on Product:**
One turn large or small from notch on plug gauge or face of ring gauge.




Notch flush with face of fitting If chamfered, notch flush with bottom of chamfer.

## Dimensions, in Inches

| Nominal Pipe Size | D Outside Diameter of Pipe | $E_0$ Pitch Diameter at End of External Thread | $E_1$† Pitch Diameter at End of Internal Thread | $L_1$¶ Normal Engagement by Hand between External and Internal Threads | $L_2$§ Length of Effective Thread | p Pitch of Thread | Depth of Thread | Number of Threads Per Inch |
|---|---|---|---|---|---|---|---|---|
| ⅛ | 0.405 | 0.36351 | 0.37476 | 0.180 | 0.2639 | 0.03704 | 0.02963 | 27 |
| ¼ | 0.540 | 0.47739 | 0.48989 | 0.200 | 0.4018 | 0.05556 | 0.04444 | 18 |
| ⅜ | 0.675 | 0.61201 | 0.62701 | 0.240 | 0.4078 | 0.05556 | 0.04444 | 18 |
| ½ | 0.840 | 0.75843 | 0.77843 | 0.320 | 0.5337 | 0.07143 | 0.05714 | 14 |
| ¾ | 1.050 | 0.96768 | 0.98887 | 0.339 | 0.5457 | 0.07143 | 0.05714 | 14 |
| 1 | 1.315 | 1.21363 | 1.23863 | 0.400 | 0.6828 | 0.08696 | 0.06957 | 11½ |
| 1¼ | 1.660 | 1.55713 | 1.58338 | 0.420 | 0.7068 | 0.08696 | 0.06957 | 11½ |
| 1½ | 1.900 | 1.79609 | 1.82234 | 0.420 | 0.7235 | 0.08696 | 0.06957 | 11½ |
| 2 | 2.375 | 2.26902 | 2.29627 | 0.436 | 0.7565 | 0.08696 | 0.06957 | 11½ |
| 2½ | 2.875 | 2.71953 | 2.76216 | 0.682 | 1.1375 | 0.12500 | 0.10000 | 8 |
| 3 | 3.500 | 3.34062 | 3.38850 | 0.766 | 1.2000 | 0.12500 | 0.10000 | 8 |
| 3½ | 4.000 | 3.83750 | 3.88881 | 0.821 | 1.2500 | 0.12500 | 0.10000 | 8 |
| 4 | 4.500 | 4.33438 | 4.38712 | 0.844 | 1.3000 | 0.12500 | 0.10000 | 8 |
| 5 | 5.563 | 5.39073 | 5.44929 | 0.937 | 1.4063 | 0.12500 | 0.10000 | 8 |
| 6 | 6.625 | 6.44609 | 6.50597 | 0.958 | 1.5125 | 0.12500 | 0.10000 | 8 |
| 8 | 8.625 | 8.43359 | 8.50003 | 1.063 | 1.7125 | 0.12500 | 0.10000 | 8 |
| 10 | 10.750 | 10.54531 | 10.62094 | 1.210 | 1.9250 | 0.12500 | 0.10000 | 8 |
| 12 | 12.750 | 12.53281 | 12.61781 | 1.360 | 2.1250 | 0.12500 | 0.10000 | 8 |
| 14 O.D. | 14.000 | 13.77500 | 13.87262 | 1.562 | 2.2500 | 0.12500 | 0.10000 | 8 |
| 16 O.D. | 16.000 | 15.76250 | 15.87575 | 1.812 | 2.4500 | 0.12500 | 0.10000 | 8 |
| 18 O.D. | 18.000 | 17.75000 | 17.87500 | 2.000 | 2.6500 | 0.12500 | 0.10000 | 8 |
| 20 O.D. | 20.000 | 19.73750 | 19.87031 | 2.125 | 2.8500 | 0.12500 | 0.10000 | 8 |
| 24 O.D. | 24.000 | 23.71250 | 23.86094 | 2.375 | 3.2500 | 0.12500 | 0.10000 | 8 |

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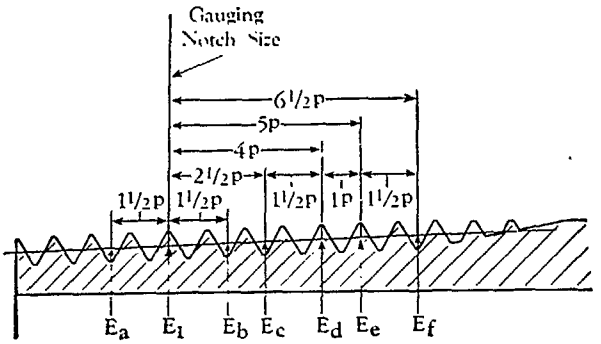
†Also pitch diameter at gauging notch.
§Also length of plug gauge.
¶Also length of ring gauge, and length from gauging notch to small end of plug gauge.

*The above information taken from the American Standard for Pipe Threads, ASA—B2.1-1945.*

*Crane Railing Pipe Threads....page 192*

# American Standard Straight Pipe Threads




Dimensions, in Inches

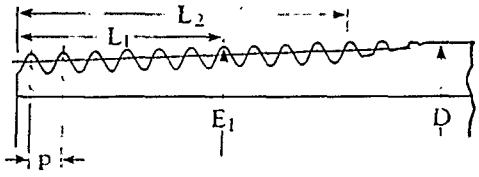
| Nominal Pipe Size | Number of Threads per Inch | Pitch of Thread p | Increase in Pitch Diameter per Turn | Pitch Diameter: Straight Thread Couplings* (Internal Thread) for use with Taper Thread Pipe for Pressure Tight Joints (NPSC) Min. $E_a$ | Max. $E_b$ | Straight Thread (Free Fitting) Mechanical Joints† (NPSM) External Min. $E_a$ | Max. $E_1$ | Internal Min. $E_1$ | Max. $E_b$ | Straight Thread (Loose Fitting) Mechanical Joints† Locknut Connections (NPSL) External Min. $E_c$ | Max. $E_d$ | Internal Min. $E_e$ | Max. $E_f$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 27 | 0.03704 | 0.00231 | 0.3713 | 0.3782 | 0.3713 | 0.3748 | 0.3748 | 0.3782 | 0.3805 | 0.3840 | 0.3863 | 0.3898 |
| 1/4 | 18 | 0.05556 | 0.00347 | 0.4847 | 0.4951 | 0.4847 | 0.4899 | 0.4899 | 0.4951 | 0.4986 | 0.5038 | 0.5073 | 0.5125 |
| 3/8 | 18 | 0.05556 | 0.00347 | 0.6218 | 0.6322 | 0.6218 | 0.6270 | 0.6270 | 0.6322 | 0.6357 | 0.6409 | 0.6444 | 0.6496 |
| 1/2 | 14 | 0.07143 | 0.00446 | 0.7717 | 0.7851 | 0.7717 | 0.7784 | 0.7784 | 0.7851 | 0.7896 | 0.7963 | 0.8008 | 0.8075 |
| 3/4 | 14 | 0.07143 | 0.00446 | 0.9822 | 0.9956 | 0.9822 | 0.9889 | 0.9889 | 0.9956 | 1.0000 | 1.0067 | 1.0112 | 1.0179 |
| 1 | 11½ | 0.08696 | 0.00543 | 1.2305 | 1.2468 | 1.2305 | 1.2386 | 1.2386 | 1.2468 | 1.2523 | 1.2604 | 1.2658 | 1.2739 |
| 1¼ | 11½ | 0.08696 | 0.00543 | 1.5752 | 1.5915 | 1.5752 | 1.5834 | 1.5834 | 1.5915 | 1.5970 | 1.6051 | 1.6106 | 1.6187 |
| 1½ | 11½ | 0.08696 | 0.00543 | 1.8142 | 1.8305 | 1.8142 | 1.8223 | 1.8223 | 1.8305 | 1.8360 | 1.8441 | 1.8495 | 1.8576 |
| 2 | 11½ | 0.08696 | 0.00543 | 2.2881 | 2.3044 | 2.2881 | 2.2963 | 2.2963 | 2.3044 | 2.3099 | 2.3180 | 2.3234 | 2.3315 |
| 2½ | 8 | 0.12500 | 0.00781 | 2.7505 | 2.7739 | 2.7505 | 2.7622 | 2.7622 | 2.7739 | 2.7817 | 2.7934 | 2.8012 | 2.8129 |
| 3 | 8 | 0.12500 | 0.00781 | 3.3768 | 3.4002 | 3.3768 | 3.3885 | 3.3885 | 3.4002 | 3.4081 | 3.4198 | 3.4276 | 3.4393 |
| 3½ | 8 | 0.12500 | 0.00781 | 3.8771 | 3.9005 | 3.8771 | 3.8888 | 3.8888 | 3.9005 | 3.9084 | 3.9201 | 3.9279 | 3.9396 |
| 4 | 8 | 0.12500 | 0.00781 | 4.3754 | 4.3988 | 4.3754 | 4.3871 | 4.3871 | 4.3988 | 4.4067 | 4.4184 | 4.4262 | 4.4379 |
| 5 | 8 | 0.12500 | 0.00781 | | | 5.4376 | 5.4493 | 5.4493 | 5.4610 | 5.4688 | 5.4805 | 5.4884 | 5.5001 |
| 6 | 8 | 0.12500 | 0.00781 | | | 6.4943 | 6.5060 | 6.5060 | 6.5177 | 6.5255 | 6.5372 | 6.5450 | 6.5567 |
| 8 | 8 | 0.12500 | 0.00781 | | | | | | | 8.5196 | 8.5313 | 8.5391 | 8.5508 |
| 10 | 8 | 0.12500 | 0.00781 | | | | | | | 10.6405 | 10.6522 | 10.6600 | 10.6717 |
| 12 | 8 | 0.12500 | 0.00781 | | | | | | | 12.6374 | 12.6491 | 12.6569 | 12.6686 |

*Straight pipe threads in couplings are gauged with American Standard Taper Pipe Thread plug gauges, the notch (P.D. = $E_1$) to come flush at bottom of chamfer with gauging tolerance of one and one-half turns large or small. While this theoretically provides maximum and minimum pitch diameters as shown, the actual pitch diameters of the tapped hole will be slightly smaller than the values given.

†Mechanical joint straight pipe threads are gauged with straight thread gauges.

*Crane Railing Pipe Threads....page 192*

# British Standard Taper Pipe Threads




Whitworth 55° Form of Thread

Total Taper ¾-inch per Foot

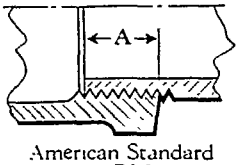
*This information is taken from the British Engineering Standards Association Report No. 21-1938.*

Dimensions, in Inches

| Pipe Size (Nominal Bore) | D Approximate Outside Diameter of Pipe | $E_1$ Pitch Diameter at End of Internal Thread | $L_1$ Normal Engagement by Hand between External and Internal Threads | $L_2$ Length of Effective Thread | p Pitch of Threads | Depth of Threads | Number of Threads Per Inch |
|---|---|---|---|---|---|---|---|
| 1/8 | 13/32 | 0.3601 | 0.1563 | 0.2545 | 0.03571 | 0.0229 | 28 |
| 1/4 | 17/32 | 0.4843 | 0.2367 | 0.3814 | 0.05263 | 0.0337 | 19 |
| 3/8 | 11/16 | 0.6223 | 0.2500 | 0.3947 | 0.05263 | 0.0337 | 19 |
| 1/2 | 27/32 | 0.7793 | 0.3214 | 0.5178 | 0.07143 | 0.0457 | 14 |
| 3/4 | 1 1/16 | 0.9953 | 0.3750 | 0.5714 | 0.07143 | 0.0457 | 14 |
| 1 | 1 11/32 | 1.2508 | 0.4091 | 0.6591 | 0.09091 | 0.0582 | 11 |
| 1 1/4 | 1 11/16 | 1.5918 | 0.5000 | 0.7500 | 0.09091 | 0.0582 | 11 |
| 1 1/2 | 1 29/32 | 1.8238 | 0.5000 | 0.7500 | 0.09091 | 0.0582 | 11 |
| 2 | 2 3/8 | 2.2888 | 0.6250 | 0.9204 | 0.09091 | 0.0582 | 11 |
| 2 1/2 | 3 | 2.9018 | 0.6875 | 1.0511 | 0.09091 | 0.0582 | 11 |
| 3 | 3 1/2 | 3.4018 | 0.8125 | 1.1761 | 0.09091 | 0.0582 | 11 |
| 3 1/2 | 4 | 3.8918 | 0.8750 | 1.2386 | 0.09091 | 0.0582 | 11 |
| 4 | 4 1/2 | 4.3918 | 1.0000 | 1.4091 | 0.09091 | 0.0582 | 11 |
| 5 | 5 1/2 | 5.3918 | 1.1250 | 1.5795 | 0.09091 | 0.0582 | 11 |
| 6 | 6 1/2 | 6.3918 | 1.1250 | 1.5795 | 0.09091 | 0.0582 | 11 |
| 7 | 7 1/2 | 7.3860 | 1.3750 | 1.9250 | 0.10000 | 0.0640 | 10 |
| 8 | 8 1/2 | 8.3860 | 1.5000 | 2.0500 | 0.10000 | 0.0640 | 10 |
| 9 | 9 1/2 | 9.3860 | 1.5000 | 2.0500 | 0.10000 | 0.0640 | 10 |
| 10 | 10 1/2 | 10.3860 | 1.6250 | 2.1750 | 0.10000 | 0.0640 | 10 |
| 11 | 11 1/2 | 11.3700 | 1.6250 | 2.3125 | 0.1250 | 0.0800 | 8 |
| 12 | 12 1/2 | 12.3700 | 1.6250 | 2.3125 | 0.1250 | 0.0800 | 8 |

# Normal Engagement

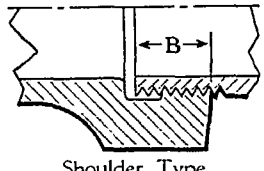
## Between Male and Female Threads to Make Tight Joints




American Standard and API Line Pipe Threads

Dimensions given do not allow for variations in tapping or threading.

*For normal engagement on Crane Railing Pipe Threads, see page 192.*




Shoulder Type Drainage Fitting Threads

40

Dimensions, in Inches

| Size | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 5 | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1/4 | 3/8 | 3/8 | 1/2 | 9/16 | 11/16 | 11/16 | 11/16 | 3/4 | 15/16 | 1 | 1 1/16 | 1 1/8 | 1 1/4 | 1 5/16 | 1 7/16 | 1 5/8 | 1 3/4 | |
| B* | | | | | | 9/16 | 5/8 | 5/8 | 5/8 | 7/8 | 15/16 | 1 | 1 1/16 | 1 3/16 | 1 1/4 | 1 3/8 | 1 9/16 | 1 11/16 | 1 7/8 |

*Using American Standard Taper Male Thread with Crane shoulder type Drainage Fittings. The external thread, however, should not be threaded small to gauge nor more than one turn large.

*Information on threaded pipe joints page 495*

# Threaded Pipe Joints

## Threads

In screwed joints having strength, tightness, and durability it is necessary to have clean-cut and uniform threads.

The threads should be tapered and smooth, cut with the correct taper lead thread angle, and diameters. Reasonable manufacturing tolerances are allowed on all of the thread elements to take care of variations in threading. The diameters should be such as to allow sufficient hand engagement and yet allow enough threads for wrench or power make-up.

The thread lengths should be long enough to compensate for pipe strains usually present in the various types of thread joint services. A short thread is satisfactory for joints where little or no pipe strains exist, but longer threads are required where extreme pipe strains are encountered, such as in Oil Field Casing Thread joints.

## Standardized Threads

Several Standards have been established covering pipe threads for various purposes. The oldest and probably most commonly used is the American Standard for Pipe Threads, known as ASA Standard B-2.1. There are also the American Petroleum Institute Standards No. 5A, 6A, and 5L covering Oil Field Tubular Goods, such as Line Pipe and Casing Threads.

## Thread Assembling

In making up screwed pipe joints it is very important that the threads in both parts be thoroughly cleaned. Any threads which may have become burred or bent should be straightened or removed and afterward a good grade of lubricant should be applied to the threads. The lubricant reduces the friction which allows the two parts to be pulled up further, resulting in a more effective pipe joint. Pipe joints should not be screwed together too rapidly and thereby avoid objectionably raising the temperature of the two parts. For Crane thread lubricant and compound, see page 464.

## Normal Engagement

The normal amount of engagement to make a tight joint for various types of screwed material is given in the table on page 494. These dimensions have been established from tests made under practical working conditions.

The normal engagement specified for American Standard Pipe Thread and API Line Pipe Thread joints is based on parts being threaded to the American Standard for Pipe Threads or the API Standard for Line Pipe Threads. The shoulder type Drainage Fitting Thread engagement is based on using Crane Fittings and American Standard Pipe Thread dimensions on the external thread but holding the external thread to a special tolerance as covered in the footnote of the table.

In order to obtain the thread engagements listed in the table it is necessary to vary the torque or power applied according to the size, metal and weight of material used. For example, it requires considerably less power to make up a screwed joint using a light brass valve than a high pressure steel valve.

## Screwed Companion Flanges

The normal length of thread engagement listed in the table on page 494 does not apply to Screwed Companion Flanges. The length of thread engagement for Screwed Companion Flanges depends upon the weight of the flange, considering pressure, and the type of thread joint employed.

There are two types of threaded flange joints in general use; namely, where the pipe and flange are refaced after assembly, as distinguished from the other, in which the pipe and the flange are not refaced. Pipe threaded for a refaced job should have a thread sufficiently long to extend slightly beyond the face of the flange when assembled, to allow for refacing. For the joint which is not to be refaced the thread on the pipe should be slightly shorter so that the end of the threaded pipe will be about one thread from the face of the flange when assembled.

## Leaky Joints

Leaky joints can usually be traced either to faulty threading or an improper lubricant. Frequently the trouble lies in the thread on the pipe which may have been cut with dull or improperly adjusted threading tools resulting in wavy, shaved, rough or chewed threads.

Wavy threads are noticeable both to the eye and touch, due to circumferential waves or longitudinal flats of slightly helical form rather than the desired true circular form. Shaved threads appear to have been threaded with two dies, one not matching the other, giving a double thread appearance at the start of the thread. Rough or chewed threads are noticeably rough and torn.

Should the threads have any of these defects it is possible that leaky joints might result.

## Crane Threaded Products

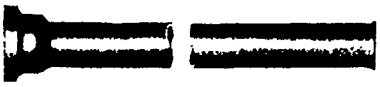
Crane threaded materials have smooth, accurately cut threads properly gauged and carefully inspected for taper, lead, thread angle, height, out-of-roundness, and alignment.

They are threaded in compliance with established Standards as the requirements may be, and the start of each thread is properly chamfered for ease in assembling.

Crane has taken extraordinary precautions to insure satisfactory thread joints by maintaining constantly careful inspection of not only the product itself but the threading equipment as well, which is the best available.

A complete gauging system has also been established which includes Master Gauges approved by the National Bureau of Standards, Reference Gauges, and Working Gauges. These gauges are checked periodically and frequently so as to keep them well within the allowable tolerances. In fact, Crane threading is held to much closer tolerances than actually required to make a tight joint.

# Cast Iron Water Pipe



All pipe sizes listed use A.W.W.A. Class D fittings. When specified, sizes 14 to 24-inch are available (with smaller O.D.) for use with Class B fittings.

A.W.W.A. Class A-B body pattern covers pipe sizes 4 to 12-inch (also available, if specified, for 14 to 24-inch sizes); Class C-D body pattern covers sizes 14 to 24-inch.

Class 150 and Class 250 Cast Iron Water Pipe in sizes 4 to 24-inch comply with Federal Specification WW-P-421.

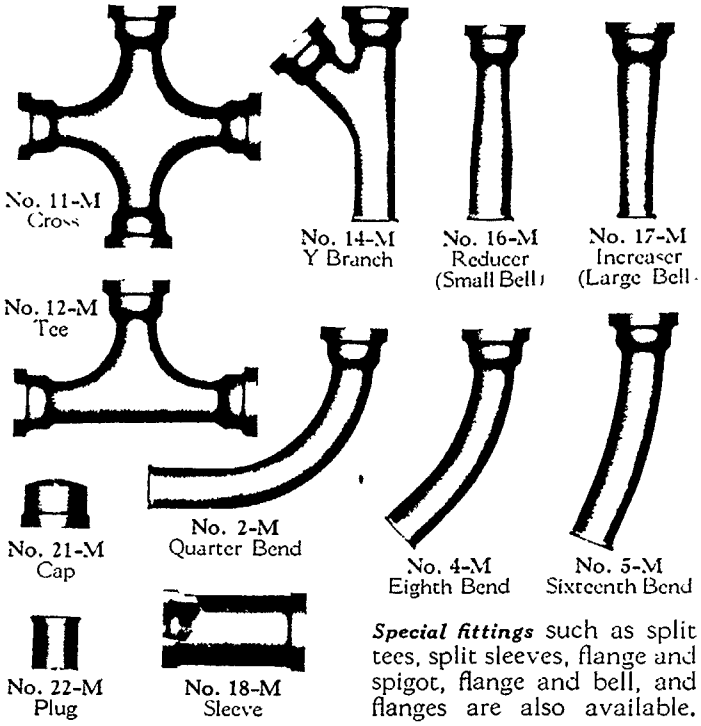
In the table below, weight of pipe is taken to the nearest five pounds. Weight of pipe per foot including bell is based on the weight of pipe to the nearest pound

**Pipe Sizes, Dimensions, and Weights**

| Nominal Size I.D. Inches | Actual Size O.D. Inches | Thickness Inches | Weight, Pounds: Plain End per Foot | With Bell per Foot | 16-Foot Length |
|---|---|---|---|---|---|
| **CLASS 150** — 150 Pounds Working Pressure, 346-Foot Head | | | | | |
| 3* | 3.96 | .33 | 12 | 13.1 | 210 |
| 4 | 4.80 | .34 | 15 | 16.1 | 255 |
| 6 | 6.90 | .37 | 24 | 25.7 | 410 |
| 8 | 9.05 | .42 | 36 | 38.6 | 615 |
| 10 | 11.10 | .47 | 49 | 52.2 | 835 |
| 12 | 13.20 | .50 | 62 | 66.1 | 1055 |
| 14 | 15.65 | .55 | 82 | 86.9 | 1390 |
| 16 | 17.80 | .60 | 102 | 108.1 | 1730 |
| 18 | 19.92 | .65 | 123 | 130.4 | 2085 |
| 20 | 22.06 | .68 | 143 | 152.0 | 2430 |
| 24 | 26.32 | .76 | 191 | 202.9 | 3245 |
| **CLASS 200** — 200 Pounds Working Pressure, 462-Foot Head | | | | | |
| 8 | 9.05 | .46 | 39 | 41.6 | 665 |
| 10 | 11.10 | .52 | 54 | 57.2 | 915 |
| 12 | 13.20 | .57 | 70 | 74.1 | 1185 |
| 14 | 15.65 | .62 | 91 | 97.0 | 1550 |
| 16 | 17.80 | .68 | 114 | 121.6 | 1945 |
| 18 | 19.92 | .74 | 139 | 147.9 | 2365 |
| 20 | 22.06 | .78 | 163 | 173.6 | 2775 |
| 24 | 26.32 | .88 | 219 | 233.1 | 3730 |
| **CLASS 250** — 250 Pounds Working Pressure, 576-Foot Head | | | | | |
| 3* | 3.96 | .36 | 13 | 13.8 | 220 |
| 4 | 4.80 | .38 | 17 | 18.1 | 290 |
| 6 | 6.90 | .43 | 27 | 28.7 | 460 |
| 8 | 9.05 | .50 | 42 | 44.6 | 715 |
| 10 | 11.10 | .57 | 59 | 62.3 | 995 |
| 12 | 13.20 | .62 | 77 | 81.1 | 1300 |
| 14 | 15.65 | .69 | 102 | 108.0 | 1730 |
| 16 | 17.80 | .75 | 126 | 133.6 | 2135 |
| 18 | 19.92 | .83 | 156 | 164.9 | 2640 |
| 20 | 22.06 | .88 | 183 | 193.6 | 3095 |
| 24 | 26.32 | 1.00 | 248 | 262.1 | 4195 |

*3-inch inside diameter is Manufacturer's Standard

# Fittings for Cast Iron Water Pipe




***Special fittings*** such as split tees, split sleeves, flange and spigot, flange and bell, and flanges are also available.

**Fitting Sizes and Weights**

| Sizes Inches | Weight per Fitting, in Pounds: No. 2-M | No. 4-M | No. 5-M | No. 11-M | No. 12-M | No. 14-M | No. 16-M | No. 17-M | No. 18-M | No. 21-M | No. 22-M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 65 | 53 | 53 | 125 | 94 | 78 | .. | .. | 36 | 20 | 7 |
| 4 | 82 | 66 | 66 | 166 | 128 | 103 | ... | ... | 47 | 27 | 8 |
| 6 | 130 | 105 | 105 | 257 | 200 | 181 | ... | .. | 68 | 40 | 14 |
| 8 | 200 | 150 | 150 | 372 | 294 | 291 | ... | ... | 104 | 59 | 25 |
| 10 | 278 | 202 | 202 | 493 | 395 | 434 | .. | ... | 123 | 84 | 38 |
| 12 | 366 | 265 | 265 | 623 | 512 | 632 | .. | ... | 174 | 142 | 50 |
| 3×2 | ... | .. | .. | .. | ... | ... | 35 | 39 | .. | ... | .. |
| 4×3 | . | .. | .. | 153 | 120 | . | 45 | 50 | . | .. | .. |
| ×2 | .. | .. | .. | ... | .. | .. | 40 | 44 | .. | .. | .. |
| 6×4 | .. | ... | .. | 221 | 183 | 167 | 97 | 104 | .. | ... | ... |
| ×3 | ... | ... | ... | 204 | 170 | ... | 88 | 100 | ... | ... | ... |
| 8×6 | ... | ... | .. | 325 | 270 | 268 | 143 | 150 | ... | ... | .. |
| ×4 | .. | ... | ... | 294 | 255 | 234 | 119 | 132 | ... | .. | .. |
| 10×8 | .. | . | ... | 443 | 371 | 398 | 198 | 201 | .. | .. | .. |
| ×6 | .. | .. | .. | 406 | 351 | 366 | 169 | 180 | .. | .. | .. |
| ×4 | .. | ... | ... | 377 | 338 | ... | 146 | 162 | ... | ... | .. |
| 12×10 | .. | .. | ... | 577 | 491 | 588 | 261 | 267 | .. | .. | ... |
| ×8 | ... | . | .. | 545 | 474 | 553 | 231 | 240 | ... | ... | .. |
| ×6 | .. | .. | .. | 512 | 458 | 520 | 202 | 218 | .. | .. | .. |
| ×4 | . | | | 486 | 445 | ... | 179 | 201 | .. | .. | ... |

## Weight of Lead and Hemp Required per Joint

(Based on Lead 2 Inches Thick)

| Pipe Size | Inches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | Pounds | 6 | 7½ | 10¼ | 13¼ | 16 | 19 | 22 | 30 | 33¾ | 37 | 44 |
| Hemp | Pounds | .18 | .21 | .31 | .44 | .53 | .61 | .81 | .94 | 1 | 1¼ | 1½ |

***Prices and additional data furnished on application.***

Fabricated Piping

# Crane Fabricated Piping

Crane Shop Fabricating Facilities.....pages 498 to 501
Crane Pipe Bends.....pages 502 to 504

Crane Flanging Processes:
Screwed Flanged Joints.....page 505
The Cranelap Joint.....pages 505 to 508
Welded Flanged Joints.....page 509

Flange Facings and Finishes.....pages 510 and 511
Crane Welded Piping.....pages 512 and 513
Unit Fabrication of Piping and Valves.....pages 514 and 515
Dimensions of Crane Welded Headers.....pages 516 and 517

Crane Pipe Coils:
Comments.....page 518
Cylindrical and Flat Spiral Types.....page 519
Flat and Oval Types.....page 520
Box Type.....page 521
Minimum Dimensions.....page 521

Welded Double Pipe Heat Exchangers.....page 522

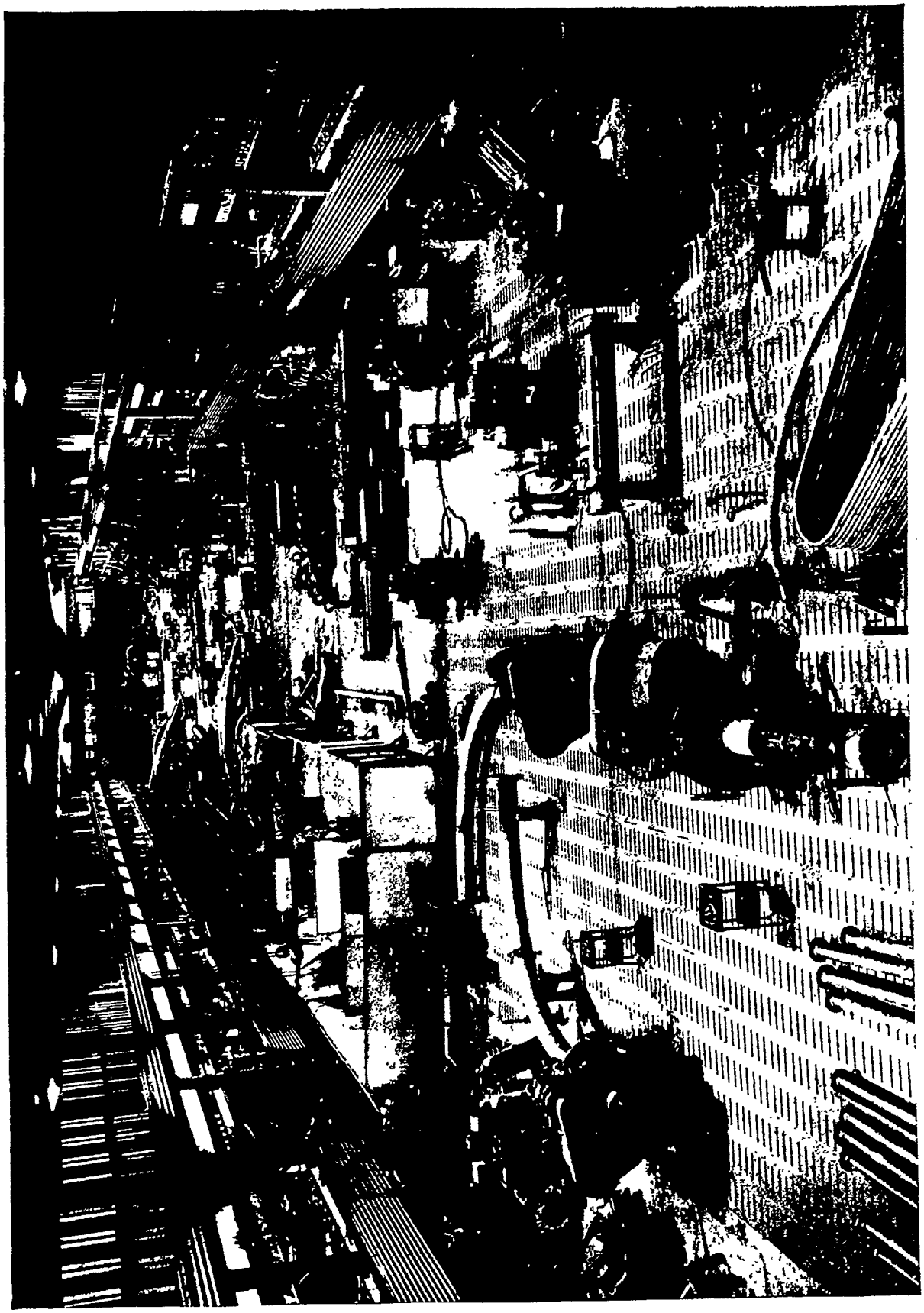
The increasing use of higher pressures and temperatures has elevated the art of designing, erecting, and purchasing fabricated piping to its rightful position of importance. Discriminating buyers now realize that the purchase of piping requires the same careful thought and attention to details as does the selection of steam generators, prime movers, refinery cracking stills, valves, and other major items of modern plants.

Years ago, Crane realized the desirability of having the production and development of fabricated piping go hand in hand with the constant improvement in valves, fittings, and allied articles. In this manner, materials of uniform design, workmanship, and performance have been developed.

The nature of fabricated piping precludes any attempt to list completely the variety of materials and operations available in a modern fabricating shop. The special and peculiar requirements of industry and its processes daily present problems which must be solved. Attention is invited to the following pages which tell a brief story about Crane Fabricated Piping; additional information will be furnished on request.



*Integrated piping systems from a single manufacturing source — one responsibility for proper and complete fabrication*



A portion of the Crane Pipe Fabricating Shop in Chicago

# One Source of Supply

Exacting users of materials for piping installations will recognize the advantages of purchasing the fabricated piping from a manufacturer who also produces a complete line of valves, fittings, bolts, gaskets, and accessories.

**One responsibility:** When the task of furnishing all of the material rests with Crane there is but one responsibility—one uniform standard of materials, workmanship and service. Whether the joints used are threaded, flanged, or beveled for welding, the same standards and gauging systems are used uniformly on all of the products.

This assures the user that the component parts of the piping system will fit accurately provide reliability and safety, and will be easily installed, with a minimum of erection and of maintenance costs.

**Simplicity of ordering:** An order for the complete piping job is handled as an integral unit; there is not the division of responsibility regarding the dimensions and related details of the various items that occurs when the component parts of a piping system are ordered from several sources of supply.

**Time saving:** There is a saving in time and expense when orders and detailed drawings are prepared for only one source of supply. The delays caused by shipments from several sources are eliminated.

**Ease of maintenance:** When repairs or replacements are necessary because of the demands of service, they are effected easily when all of the original material was secured from one source of supply.

# Advantages of Crane Shop Fabrication

**Accuracy:** A piping system, when placed in service, should develop the predetermined results and fulfill all of the expectations of a proper design. This should be accomplished expeditiously and at a minimum of final erected cost consistent with the use of good materials and workmanship. Obviously, this purpose will be defeated unless each piece, large or small, of both simple and complex piping systems, receives the attention necessary to assure accuracy and a high quality of workmanship. Crane shop fabrication accomplishes this desirable end.

**Proficiency:** In the Crane fabricating shops the mechanics are employed solely on the production of fabricated piping. Such continuity of practice means that they do not lose their proficiency, particularly desirable for welding and other complex operations.

**Safety:** Safety is a prime requisite of every piping installation. Crane shop fabrication assures purchasers that every necessary precaution has been employed to eliminate hidden hazards of piping.

A weld may appear excellent on the exterior, yet under the surface it may contain gas pockets or have faulty penetration. A threaded flange joint gives no indication in its external appearance, of improper threading. These are but two of the many hidden hazards of piping.

**Shop appliances:** Shop fabrication requires the use of special machinery, clamps, jigs, and other convenient appliances which are impractical for field service. This equipment permits the alignment and squaring-up of all flanged faces or ends of piping, also accuracy of dimensions and angles—all within the closest practical limits. Such characteristics assure the final fitting of every piece into position without alteration or improper strain, resulting in increased safety and a saving of time and labor.

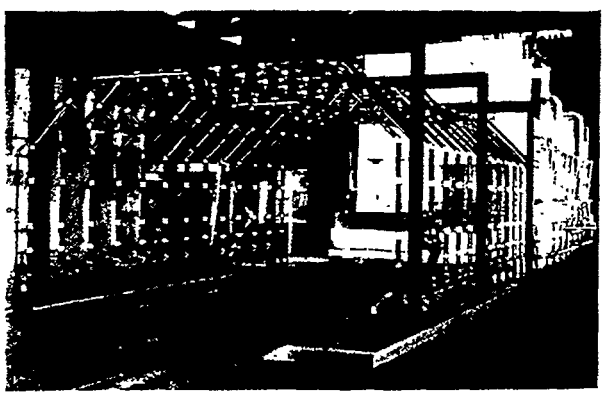
Stress relieving, annealing, or heat treating, when necessary, are readily performed in the shop. All of these advantages are almost impossible of accomplishment in the field.

**Working conditions:** Working conditions, almost invariably, are better in the shop than in the field. The shop has facilities for handling heavy or bulky pieces, therefore each mechanic is working at all times in a comfortable position and is not concerned about his safety.

**Testing:** Crane shop fabrication assures dependability because the product is tested and proved sound before shipment. Piping which is fabricated in the field usually must be installed in its final position before it can be tested, and, in the event of failure, the removal for replacement or repair proves expensive and causes delay.

**Simplified assembly:** The erecting force in the field should only be called upon to assemble a piping system. It should neither be expected to design and fabricate piping, nor to manufacture economically under adverse field conditions, a product comparable with that of the modern fabricating shop.

**Unit fabrication:** For further information on unit fabrication, see pages 514 and 515.



Heat treating furnace with spray equipment for quick quenching of product.

# Scope of Crane Shop Facilities

Crane can advantageously supply piping for any industry.

**Shops at strategic points:** Many shops are maintained for supplying the piping needs of industry. A goodly number of the Crane branch houses are equipped for the simpler jobs—the larger branch houses for more elaborate jobs—and fabricating shops embracing the full line of pipe fabrication are located at strategic centers throughout the country.

**All types of joints:** Any type of joint can be furnished—screwed, flanged, welded, or special. The selection of any type of joint presents a basic engineering or mechanical problem. Crane makes its recommendations accordingly—having an all-inclusive line, it can exercise a degree of impartiality conducive to best serving the interests of the purchaser.

**Large stocks:** Large stocks of the various kinds of pipe, flanges, valves, fittings and accessories are carried at all fabricating shops and branches.

Crane is prepared for the job, whether it calls for a single piece of pipe cut to length, or the complete piping equipment of an industry.

# Metallurgical and Engineering Control

**Laboratories:** In the year 1888, Crane established a chemical laboratory with full control over the raw materials used in its products. Constantly expanded, this service has grown into complete research, metallurgical, and testing laboratories. Long a dominant factor in the development of Crane products, all of the accumulated data held by these departments—the applied experience of Crane engineers and research men—are utilized in the production of Crane Fabricated Piping.

**Engineering:** All fabrication of piping in the Crane shops is under a system of constant procedure control. A thorough gauging system is employed in all operations.

Trained engineers are responsible at all times for the design, superintendence during manufacture, and constant checking of the product.

The services outlined eliminate guesswork in the production of Crane Fabricated Piping.

Studying design through photoelasticity in Crane Research Laboratory.

Constant checking and gauging of Crane Fabricated Piping assures perfect alignment.

# Estimating and Ordering

**Estimates:** A reliable estimate of the cost of any piping system will be furnished promptly upon receipt of an inquiry accompanied by blueprints and specifications.

No matter how complex the layout or how involved the specification, a complete and accurate quotation is assured.

**Orders:** Crane has specialized for many years in the handling of orders for fabricated piping. Men, well trained and experienced in this work, enter the shop orders direct from complete blueprints, detail sketches, or bills of material, constantly checking all dimensions and details.

Submit inquiries to the nearest Crane representative.

# Crane Shop Fabricating Facilities

## Equipment

The Crane shops are fully equipped with machinery and facilities for the various operations required in the production of a complete line of fabricated piping.

Much of the shop equipment is special—designed and built to develop the manufacturing technique necessary for the fabrication of piping of uniform accuracy and quality of workmanship.

Many forms of special jigs and appliances are employed constantly to supplement the effectiveness of the machines and other facilities.

## Pipe Bending

In Crane shops, the art of bending pipe has been developed to a high degree—pipe bends of many sizes and shapes are in constant production.

Pipe bends have a wide range of usefulness. No two general piping installations are alike, hence pipe bends are especially adapted to solve the many problems of space requirements. The proper proportions of a pipe bend usually are essentially a matter of bending pipe to the dimensions necessary to fit into the available space.

To meet these needs of industry, Crane pipe bending facilities are available: shops are equipped to fabricate pipe bends from a large range of sizes, weights, and kinds of pipe. See pages 502 to 504.

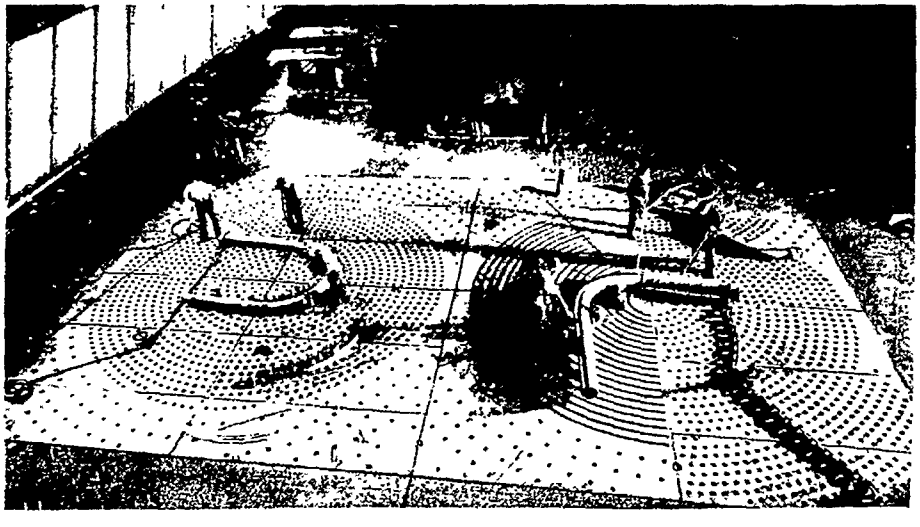
## Flanging

Crane shop facilities include equipment for producing the many types of flanged joints in current use. These can be furnished not only in their regular forms but also in the various modifications and special adaptations required. Precision gauges govern every operation, assuring the utmost accuracy. For details, see pages 505 to 509.

## Finishing

Special finishing machines enable Crane shops to furnish fabricated piping with a variety of finishes —regular and special. See pages 510 and 511.

Cutting, beveling, threading, making-on screwed flanges, facing all types of flanges machining Cranclap joints, and various other operations for finishing the ends of Crane Fabricated Piping are performed on these machines with precision and a close adherence to accurate gauging standards.



Pipe bending plate in a Crane Pipe Fabricating Shop.

## Welding

Crane pioneered in the welding of fabricated piping. For more than forty years, welding has been used in the fabrication of Crane headers and other products. Untiring research and experiment in the shops and laboratories during this long period are responsible for the constant refinement in the technique of Crane welding.

Crane welders use all modern methods of welding with equal facility and are subjected periodically to qualification tests.

Crane Fabricated Piping includes an almost infinite variety of shop-welded product. For detailed information on welding, see pages 512 to 517.

## Swedging

Swedging facilities are available for all sizes of pipe. The facilities include furnaces for heating, powerful forging hammers, and dies to assure accurate fabrication.

## Cutting and Threading Pipe

Crane shops are equipped to cut and thread pipe for all commercial services; regular and special threads can be furnished. Accurate threading to gauge, so characteristic of Crane screwed products, is similarly found in pipe cut and threaded in Crane shops.

## Testing

Crane shop facilities include equipment for testing fabricated piping as specified in the various codes, or in accordance with the provisions of a specification. The usual hydrostatic tests are supplemented by air-under-water and other special tests if required.

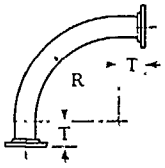
## Cleaning Fabricated Piping

All fabricated piping is regularly cleaned internally by a mechanically driven rotary cleaning tool, or with a wire brush, or blown out with compressed air to remove loose foreign material resulting from fabrication. When specified on orders, special cleaning by pickling or sand-blasting, or both, will be performed at an extra charge.

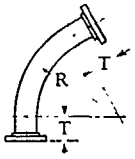
# Standard Types of Pipe Bends

Crane Pipe Bends are made from pipe which is filled with sand, heated carefully until the entire sand core produces a uniform temperature, then clamped on the bending floor to forms which have been accurately laid out. Power winches are applied to draw the pipe around the forms and the point of power application is repeatedly shifted to prevent the formation of wrinkles on the inside wall. A new heat is made for each bend.

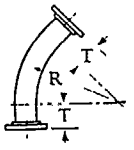
*All bends are completed in the pipe before beveling, threading, or flanging, to assure dimensional accuracy.* A system of repeated checking assures that every dimension and angle of the completed pipe bend will be accurate, and that the ends or flanges will be square with the axis of the pipe. Crane Pipe Bends are full area, free from wrinkles, buckles, and thin spots; they are cleaned of all scale, chips, and oil. They are easy to erect, fitting into place exactly.



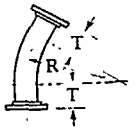

No. 1
Quarter Bend, 90°



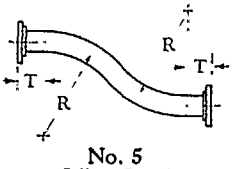

No. 1½
Angle Bend, 46° to 89°



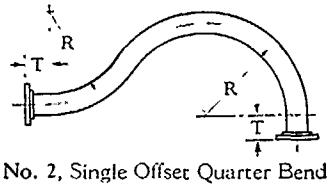

No. 3
45° Bend



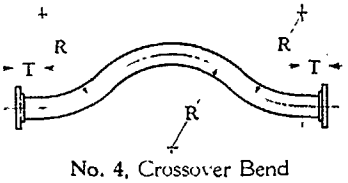

No. 3½
Angle Bend, Under 45°



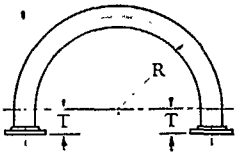

No. 5
Offset Bend



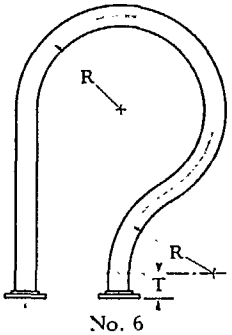

No. 2, Single Offset Quarter Bend



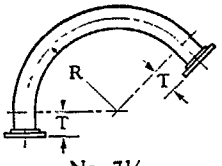

No. 4, Crossover Bend



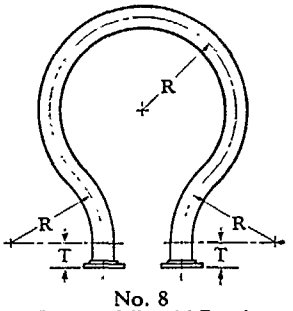

No. 7, U-Bend — 180°



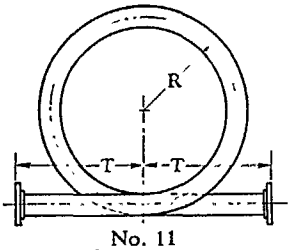

No. 6
Single Offset U-Bend



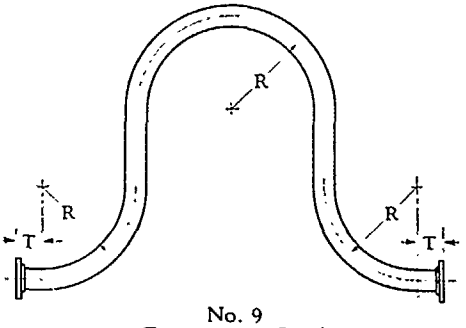

No. 7½
Angle Bend
91° to 179°




No. 8
Double Offset U-Bend




No. 11
Circle Bend

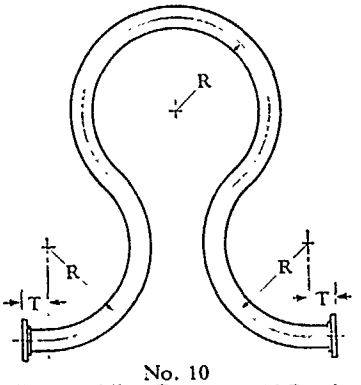



No. 9
Expansion U-Bend

***For table of radii and tangents, see page 503.***

***For notes on pipe bends, see pages 503 and 504.***

***To calculate working pressure, stress, or wall thickness of pipe, see pages 541 to 545.***




No. 10
Double Offset Expansion U-Bend

## *Cautionary note regarding the use of minimum radii and tangents:*

The table and notes on page 503 outline the minimum radii and tangents which can be furnished for various conditions. *The use of such minimum dimensions is not desirable, nor is it recommended except when absolutely necessary.*

The radii of pipe bends preferably should equal or exceed the dimensions shown in column "A", defining "Minimum Recommended Radius".

When possible, the tangents of pipe bends should be greater than the dimensions shown in column "C", defining "Minimum Length of Tangent".

The tangents can be of any dimensions up to the limits imposed by the length of pipe available or the shipping facilities. See paragraphs on "Long Lengths of Pipe", page 504.

# Standard Types of Pipe Bends (Cont.)

Radii and Tangents of Pipe Bends, in Inches

| Size of Pipe | Column "A" R Minimum Recommended Radius Steel or Genuine Wrought Iron Pipe Standard or Extra Strong Weight | Column "B" R Shortest Radii to which pipe can be bent (*See Note below*) Steel Pipe Only: Threaded Ends, Screwed, or Welded Flanges: Standard Weight Pipe | Steel Pipe Only: Threaded Ends, Screwed, or Welded Flanges: Extra Strong Weight Pipe | Steel Pipe Only: Cranelap Joints: Standard Weight Pipe | Steel Pipe Only: Cranelap Joints: Extra Strong Weight Pipe | Genuine Wrought Iron Pipe: Threaded Ends, Screwed, or Welded Flanges: Standard Weight Pipe | Genuine Wrought Iron Pipe: Threaded Ends, Screwed, or Welded Flanges: Extra Strong Weight Pipe | Genuine Wrought Iron Pipe: Cranelap Joints: Standard Weight Pipe | Genuine Wrought Iron Pipe: Cranelap Joints: Extra Strong Weight Pipe | Column "C" T Minimum Length of Tangent (*See Note below*) Steel or Genuine Wrought Iron Pipe Standard or Extra Strong Weight: Threaded Ends or Screwed Flanges | Cranelap Joints |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1 1/4 | 1 | 5/8 | | | 1 1/4 | 1 | | | 1 | |
| 3/8 | 1 7/8 | 1 1/4 | 3/4 | | | 1 7/8 | 1 1/2 | | | 1 1/4 | |
| 1/2 | 2 1/2 | 1 1/2 | 1 | 2 | 2 | 2 1/2 | 2 | 2 1/2 | 2 | 1 1/2 | 2 |
| 3/4 | 3 3/4 | 1 3/4 | 1 1/4 | 3 | 3 | 3 | 2 1/2 | 3 | 3 | 1 3/4 | 2 |
| 1 | 5 | 2 | 1 1/2 | 4 | 4 | 4 | 3 | 4 | 4 | 2 | 2 |
| 1 1/4 | 6 1/4 | 2 1/4 | 1 3/4 | 4 | 4 | 5 | 4 | 5 | 4 | 2 | 2 1/2 |
| 1 1/2 | 7 1/2 | 2 1/2 | 2 | 5 | 5 | 6 | 5 | 6 | 5 | 2 1/2 | 3 |
| 2 | 10 | 3 | 2 1/2 | 6 | 6 | 8 | 5 | 8 | 6 | 3 | 4 |
| 2 1/2 | 12 1/2 | 5 | 4 1/4 | 10 | 10 | 10 | 8 | 10 | 10 | 4 | 5 |
| 3 | 15 | 8 | 6 | 12 | 12 | 12 | 10 | 12 | 12 | 4 | 6 |
| 3 1/2 | 17 1/2 | 10 | 8 | 12 | 12 | 14 | 12 | 14 | 12 | 5 | 6 |
| 4 | 20 | 12 | 10 | 14 | 14 | 16 | 12 | 16 | 14 | 5 | 6 |
| 5 | 25 | 18 | 14 | 18 | 14 | 20 | 15 | 20 | 15 | 6 | 7 |
| 6 | 30 | 22 | 15 | 22 | 15 | 26 | 18 | 26 | 18 | 7 | 7 |
| 8 | 40 | 30 | 23 | 30 | 23 | 30 | 28 | 30 | 28 | 9 | 8 |
| 10 | 50 | 36 | 30 | 36 | 30 | 36 | 32 | 36 | 32 | 12 | 10 |
| 12 | 60 | 46 | 36 | 46 | 36 | 46 | 42 | 46 | 42 | 14 | 10 |
| *14 OD | 70 | 60 | 48 | 60 | 48 | 60 | 54 | 60 | 54 | 16 | 14 |
| *16 OD | 96 | 80 | 60 | 80 | 60 | 80 | 70 | 80 | 70 | 18 | 16 |
| *18 OD | 108 | 90 | 66 | 90 | 66 | 90 | 80 | 90 | 80 | 18 | 18 |
| *20 OD | 120 | 100 | 72 | 100 | 72 | 100 | 90 | 100 | 90 | 18 | 18 |
| *24 OD | 144 | 144 | 108 | 144 | 108 | 144 | 122 | 144 | 122 | 18 | 20 |

*For sizes 14-inch O.D. and larger, the radii shown are based upon pipe with a wall thickness of 3/8-inch or lighter under the "Standard Weight Pipe" column, and a wall thickness of 1/2-inch or heavier under the "Extra Strong Weight Pipe" column.

***Length of Pipe in Bends and Calculation of Pipe Bends ...pages 546 to 548***

# Notes on Standard Types of Pipe Bends

**Minimum recommended radius:** The figures shown in column "A" represent a schedule of dimensions that is consistent with good practice for determining ordinary minimum radii of pipe bends.

**Shortest radius:** The dimensions shown in column "B" are based upon actual manufacturing conditions and should not be lowered. *Refer to the cautionary note on page 502.*

**Minimum length of tangent:** The dimensions shown in column "C" are based upon actual manufacturing conditions for tangents with a threaded end, screwed flange, or Cranelap joint. These dimensions must be maintained without deviation for minimum lengths. *Refer to the cautionary note on page 502.*

**Tangents for pipe bends with plain or beveled ends:** Pipe bends with the ends plain or beveled for welding can be furnished without tangents. However, for convenience in erection, it is recommended that pipe bends with beveled ends have tangents at least equal to the minimum lengths given in the table for threaded ends in column "C". Such tangents will provide space for applying jigs or clamps to line up and fasten the piping before welding.

**Tangents for pipe bends with welding flanges:** Pipe bends fitted with slip-on welding flanges can be furnished with a minimum length of tangent equal to the length through the hub of the slip-on welding flange being used.

Pipe bends fitted with welding neck flanges can be furnished without tangents, since these flanges may be butt-welded directly at the end of the arc of pipe bends with beveled ends.

This is only recommended when minimum dimensions must be maintained. When possible, the use of a tangent is desirable for the same reasons as outlined in the paragraph pertaining to pipe bends with beveled ends.

For dimensions of flanges, see pages 296 and 297.

***Continued on page 504***

# Comments on Pipe Bends

**Compound and unusual bends:** Crane facilities are not limited to the production of common types of pipe bends such as shown on page 5[illegible]2. Compound and unusual bends can be supplied in any practical shape. Some of the photographs in this section of the catalog illustrate a few of the uncommon types made in Crane shops. Compound bends or bends in more than one plane do not require any tangent or straight portion between the arcs.

**Long lengths of pipe:** When designing or ordering pipe bends, the maximum available lengths of welded or seamless pipe should be considered.

Steel pipe is carried in stock in extra long or double random lengths for the fabrication of bends requiring long lengths of pipe, and for eliminating an intermediate joint when practical and desirable; refer to page 478.

Genuine wrought iron pipe is available only in average mill lengths of approximately 19 feet. When the required lengths are not available, two or more pieces of pipe can either be welded together or provided with intermediate flanged joints to produce a desired bend. The intermediate joint should be definitely located if it is an important factor in erection.

Shipping facilities present the only practical limit to the shape or length of pipe bends. Care must be used, when ordering large or complicated pipe bends, to keep the over-all dimensions within the maximum shipping facilities and clearances between the factory and destination.

**Ends of pipe bends:** Ends of pipe bends can be furnished plain, beveled for welding, threaded, or flanged. A list of all types of flanged joints will be found on pages 505 to 509.

**Special materials:** Pipe bends can be made from special piping materials such as brass, aluminum, nickel, Monel, silicon bronze, stainless steels and other alloy steels, as well as rubber-lined pipe. Facilities are available for heat-treating alloy steels after fabrication if required.

**Commercial pipe bends:** *Pipe bends when made to approximate dimensions only*, for down-spouts, ash handling, railings, and other non-fluid and non-pressure mechanical purposes, can be furnished at prices lower than those of regular pipe bends.

**Galvanizing:** Pipe bends can be furnished either galvanized on the inside and outside, or galvanized on the outside only.

**Painting:** Pipe bends are painted on the outside as a protection against rust in transit.

**Protectors:** The flanged ends of all pipe bends are provided with flange protectors before shipment; threaded ends have thread protectors.

**Pipe:** For information on pipe, see pages 477 to 491.

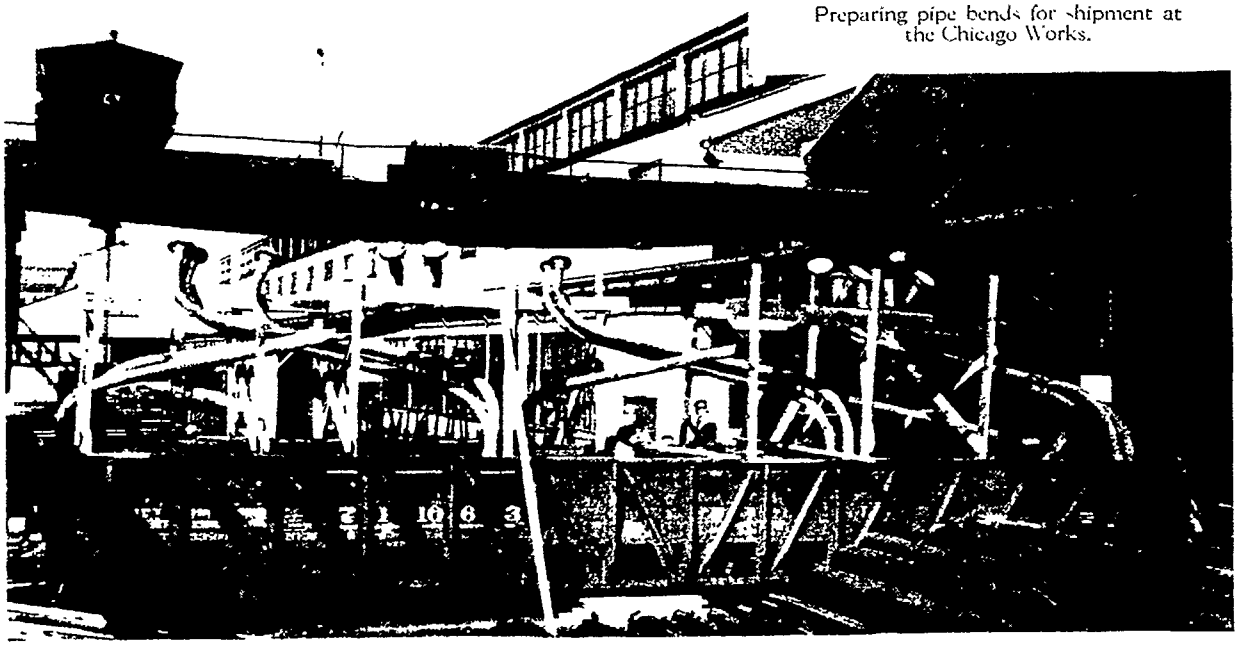
**Engineering data:** Additional information and engineering data will be found on the following pages:

Calculating working pressure, stress, or wall thickness..... pages 541 to 545
Calculation of pipe bends..... pages 546 and 547
Length of pipe in bends..... page 548
Thermal expansion and modulus of elasticity of pipe..... page 549

**Prices:** Prices on all pipe bends are on application.

**Inquiries and orders:** Inquiries and orders should specify: quantity; size, weight, and kind of pipe and whether black or galvanized; complete dimensions; kind of end connections (plain, beveled, threaded, or flanged.) If flanged ends are wanted, specify the kind of flanges, facings, and type of joints.

Preparing pipe bends for shipment at the Chicago Works.



# Flanging Processes

## Screwed Flanged Joints

Screwed Flange
Made On and Refaced

*Brass Flanges* .. *page 188*
*Iron Flanges* .. *pages 202 to 204*
*Steel Flanges* ... *pages 291 to 298*
*18-8 Mo Flanges* *page 383*
*Drilling Templates* . *pages 458 to 463*
*Facings* .. *pages 510 and 511*
*Thread Lubricants* . *page 464*

The screwed flanged joint has proved its general utility and satisfactory performance, primarily for the low and moderate pressure and temperature services — especially when fabricated in the Crane shops, using proper threading and pull-up machines.

Screwed Flange
Made On, Not Refaced

**Application:** The screwed flanged joint can be applied to straight pipe, pipe bends, the ends and nozzles of welded headers, and to the flanged ends of welded assemblies. It can be applied to butt-welded, lap-welded, and seamless steel pipe, or genuine wrought iron pipe, of practically all commercial weights and thicknesses.

**Flanges:** Any of the screwed flanges listed in this catalog can be used — cast iron, forged steel, and brass, straight or reducing sizes.

**Special piping materials:** The screwed flanged joint can be furnished on special piping materials such as brass, copper, aluminum, nickel, stainless steels, and Monel. Flanges of the same material can be furnished. Full information on application.

**Threading:** The threading of both the pipe and the flange is to accurate gauge. The flange is secure on the pipe after the joint is made up.

**Alignment of bolt holes:** Crane shop fabrication assures proper alignment of the bolt holes in all flanges. When specified special alignment of the bolt holes can be furnished.

**Screwed flange, made on and refaced:** After the flange and the pipe have been properly threaded, the flange is made up tight by a powerful machine until the end of the pipe projects slightly beyond the face of the flange. A light refacing cut is then taken across both the flange face and the pipe end.

The refacing assures that the end of the pipe will be flush with the face of the flange, thus providing a proper gasket-bearing surface to the inside of the pipe. It also assures perfect alignment of the pipe.

**Screwed flange, made on, not refaced:** After the flange and the pipe have been properly threaded, the flange is made up tight by a powerful machine until the end of the pipe is within one-half to one thread from the face of the flange.

## The Cranelap Joint

The Cranelap joint approaches more closely than any other type the function of an all-purpose flanged pipe joint. It eliminates the individual, inherent disadvantages of the other types of joints

The Cranelap joint is predominantly the most effective and practical joint. With either plain facing or the numerous modifications, it has given such universal satisfaction over a long period of time that it is recommended for intermediate and moderately high pressure steam and water lines, and for many other difficult services. The wide range of utility and service applications makes the Cranelap joint a modern flanged joint with very few limitations.

Cranelap joints are well suited for low pressure service particularly in those sizes where large flange diameters are employed.

In the Cranelap joint the end of the pipe is lapped to produce a square corner at the junction of the inside periphery of the pipe and the face of the lap. When bolted up, the joint is made directly on the pipe itself; there is no thread in the flange to leak under distortion due to bolting load pressure and temperature, or expansion and contraction strains.

These laps are made by a process which is a combination of upsetting and forging, the operation being performed while the metal is at a proper forging heat.

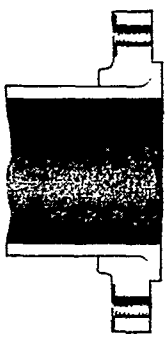
CRANELAP JOINTS

| | |
|---|---|
| 150-Pound | 600-Pound |
| 300-Pound | 900-Pound |
| 400-Pound | 1500-Pound |

*Additional description* *pages 506 and 507*
*Dimensions* ... .. .. *page 508*
*Facings* ..... ..*pages 510 and 511*

***Regular Cranelap joints are made on both steel and genuine wrought iron pipe. See note on page 506.***

***Prices on application***



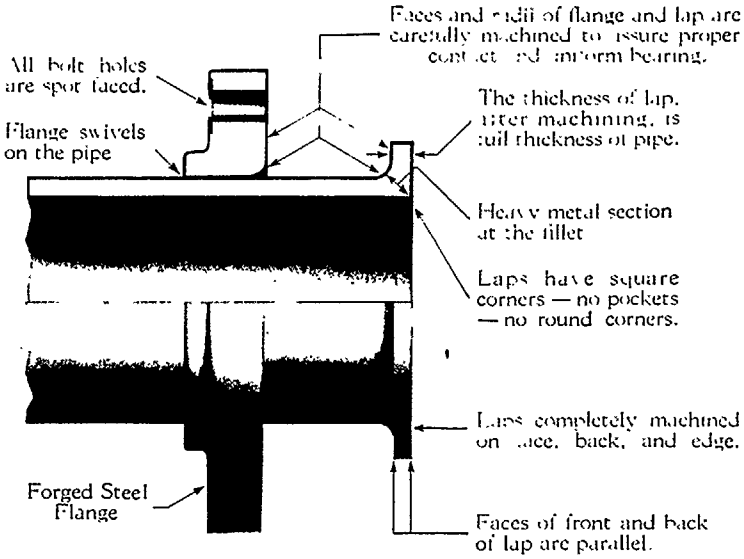
Regular
Cranelap Joint
with plain face,
serrated finish.

(*Continued on next page*)

# Flanging Processes

## The Cranelap Joint (Cont.)

### Features and Advantages




**Square corner laps:** The Cranelap joint has a square corner lap—it should not be confused or compared with a joint having a round corner lap. The square corner lap assures a smooth joint on the inside of the pipe, without a pocket or depression; it provides a metal thickness at the turn, or fillet, which is much heavier in section than the round corner lap; consequently much greater strength is developed.

**Full thickness laps:** The rough laps of all plain Cranelap joints are of sufficient thickness to produce, after machining both the front and the back, a finished thickness of lap equal to or greater than the wall thickness of the pipe on which the lap is made.

Male and female, tongue and groove, double thickness, ring joint, and radial back Cranelap joints have the laps of sufficient thickness to permit machining without reducing the thickness of the lap at any point to less than that of the pipe wall.

**Machining of the laps and flanges:** All laps are completely machined on the front, back, and edge. The back of the lap is machined to provide a face which is parallel to the front or contact face. The face and the radius of the flange are carefully machined to match the corresponding face and radius of the lap on the pipe. The bolt holes of the flanges are spot faced.

The features of the machining outlined above are important. The spot facing of the bolt holes of the flange provides a uniform bearing surface for the nuts of the bolts or studs. In addition, the facing of the flange and the parallel facing of the back and front of the lap assure an even bearing throughout the joint, and a uniform pressure on the gasket.

**Swivel flanges of forged steel:** Flanges on Cranelap joints swivel on the pipe, facilitating alignment of the piping. This makes erection easier, because the swivel flange accommodates itself readily to any variations in the position of adjacent bolt holes.

All flanges used on Cranelap joints are of forged steel—unbreakable, and of high strength.

**Marine service:** Cranelap joints comply with the regulations of the following bureaus: U. S. Coast Guard, Marine Engineering Regulations and Material Specifications—Lloyds Register of Shipping, Ships Registered in U.S.A.—American Bureau of Shipping, Special Inspection Required.

### Notes on Cranelap Joints

**Pipe:** Cranelap joints with plain face are regularly made from lapwelded steel or lapwelded genuine wrought iron pipe, using standard, extra strong, or double extra strong weights—or from seamless steel pipe in any of the regular thicknesses.

Cranelap joints with radial back, double thickness or [illegible] lap, ring joint male and female, or tongue and groove facing require the use of lap-welded or seamless steel pipe only; the pipe should have a wall thickness equal to that of extra strong or heavier weight pipe.

In sizes smaller than are obtainable in lapwelded steel pipe, all Cranelap joints are made only on seamless steel pipe. For pipe, see pages 477 to 491.

***Van Stone joints: Whenever Van Stone joints are specified, Cranelap joints will be furnished.***

***Plain face: Cranelap joints with plain face, serrated finish, as illustrated on page 511, will always be furnished unless otherwise specified.***

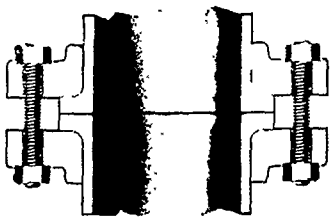
**Application of Cranelap joints:** Cranelap joints can be applied to straight pipe, pipe bends, the ends and nozzles of welded headers, and the flanged ends of welded assemblies.

**Cranelap joints on special piping materials:** Cranelap joints can be fabricated on many special piping materials—brass, aluminum, nickel, Monel, stainless steels, and numerous other alloy steels. Facilities are available for heat-treating when required. Information and prices furnished on request.

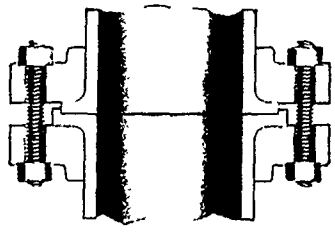
**Reducing Cranelap flanges:** Reducing Cranelap flanges are not furnished or recommended; another type of flanged joint or connection should be used.

# Flanging Processes

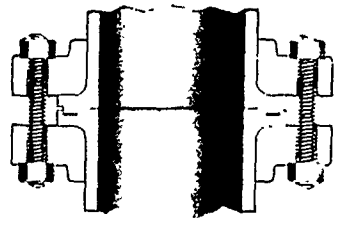
## Modifications of the Cranelap Joint and Facings



Double Thickness or 200% Lap, Cranelap Joint



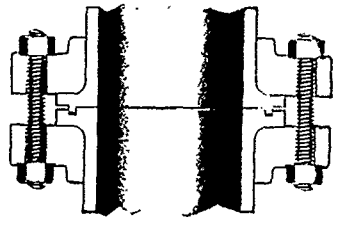
Large Male and Female Cranelap Joint (female in the lap)



Large Tongue and Groove Cranelap Joint

In addition to the plain face Cranelap joint shown on the preceding page, various modifications can be furnished, as shown on this page. Modified Cranelap joints require the use of lapwelded or seamless steel pipe only, and of a wall thickness equal to or heavier than extra strong weight. They are applicable to primary service pressures of 300 pounds or higher.

Modified Cranelap joints have the laps completely machined — on the face, back, and edge. All except the radial back have a straight face on the back.



Small Tongue and Groove Cranelap Joint

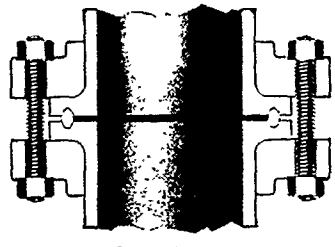
### Double Thickness or 200% Lap Cranelap Joints

Double thickness Cranelap joints are exactly the same as the regular Cranelap joint with plain face, except that the thickness of the lap, after machining, is twice the wall thickness of the pipe used.

For dimensions of double thickness Cranelap joints, use the dimensions of plain Cranelap flanges on page 508. A dimension of twice the wall thickness of the pipe should be used in establishing the thickness of the lap for obtaining dimension "L".

### Large Male and Female Cranelap Joints

In the lapped end with male face, the thickness of the lap, after machining, will be the wall thickness of the pipe used, except that the minimum thickness of lap will be ¼-inch when the wall thickness of the pipe is less than ¼-inch, such as on 2-inch and smaller extra strong pipe. In the lapped end with female face, the thickness of the lap, after machining, will be the wall thickness of the pipe used, plus the depth of the female facing.



Ring Joint Cranelap Joint

### Large or Small Tongue and Groove Cranelap Joints

In either the large tongue and groove or the small tongue and groove Cranelap joint the thickness of the lap, after machining, will be the wall thickness of the pipe used, plus the height of the tongue or the depth of the groove.

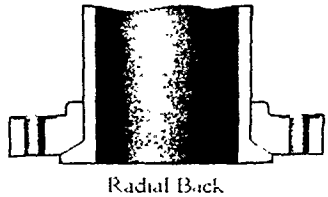
### Ring Joint Cranelap Joints

The ring joint Cranelap joint is furnished with a specially designed groove which employs a steel ring, this combination making a pressure-tight joint. The joint has a thickness of lap, after machining, equal to the wall thickness of the pipe used plus the depth of the groove. For dimensions of ring joints, see pages 470 and 471.

### Radial Back Cranelap Joints

Radial back Cranelap joints derive their name from the shape of the back — they have a radial back instead of the straight back as furnished on other Cranelap joints. Regular 300, 400, 600, 900 or 1500-Pound Forged Steel Cranelap Flanges are used, except that the faces have a radius machined to fit the radius on the back of the lap on the pipe.

Dimensions of radial back Cranelap joints are furnished on application.



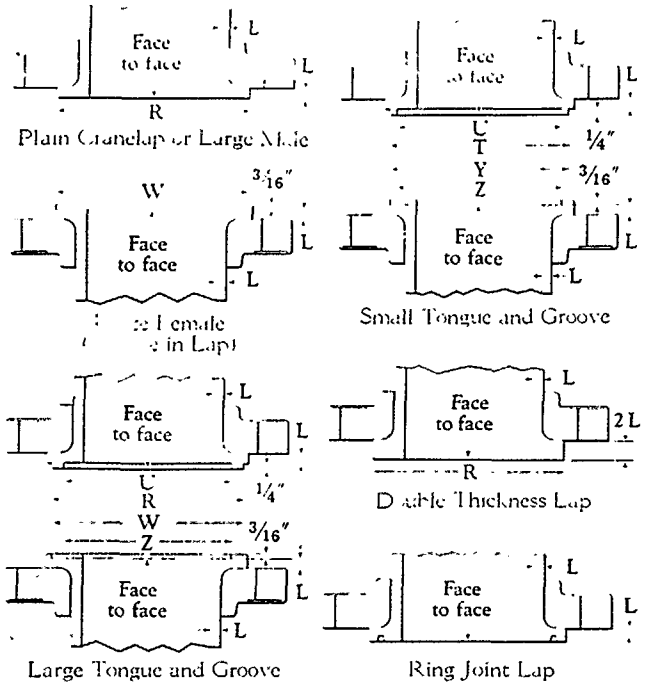
Radial Back Cranelap Joint

41

*Prices on application* *Dimensions . page 508*

# Flanging Processes

## Dimensions of Cranelap Joints




Dimensions, in Inches

| Size of pipe | R | T | L | W | Y | Z |
|---|---|---|---|---|---|---|
| 1/2 | 1 3/8 | 1 3/8 | 1 | 1 7/16 | 1 7/16 | 15/16 |
| 3/4 | 1 11/16 | 1 11/16 | 15/16 | 1 3/4 | 1 3/4 | 1 1/4 |
| 1 | 2 | 1 7/8 | 1 1/2 | 2 1/16 | 1 15/16 | 1 7/16 |
| 1 1/4 | 2 1/2 | 2 1/4 | 1 7/8 | 2 9/16 | 2 5/16 | 1 13/16 |
| 1 1/2 | 2 7/8 | 2 1/2 | 2 1/8 | 2 13/16 | 2 9/16 | 2 1/16 |
| 2 | 3 5/8 | 3 1/4 | 2 7/8 | 3 11/16 | 3 5/16 | 2 13/16 |
| 2 1/2 | 4 1/8 | 3 3/4 | 3 3/8 | 4 3/16 | 3 13/16 | 3 5/16 |
| 3 | 5 | 4 5/8 | 4 1/4 | 5 1/16 | 4 11/16 | 4 3/16 |
| 3 1/2 | 5 1/2 | 5 1/8 | 4 3/4 | 5 9/16 | 5 3/16 | 4 11/16 |
| 4 | 6 3/16 | 5 11/16 | 5 3/16 | 6 1/4 | 5 3/4 | 5 1/8 |
| 5 | 7 5/16 | 6 13/16 | 6 5/16 | 7 3/8 | 6 7/8 | 6 1/4 |
| 6 | 8 1/2 | 8 | 7 1/2 | 8 9/16 | 8 1/16 | 7 7/16 |
| 8 | 10 5/8 | 10 | 9 3/8 | 10 11/16 | 10 1/16 | 9 5/16 |
| 10 | 12 3/4 | 12 | 11 1/4 | 12 13/16 | 12 1/16 | 11 3/16 |
| 12 | 15 | 14 1/4 | 13 1/2 | 15 1/16 | 14 5/16 | 13 7/16 |
| 14 OD | 16 1/4 | 15 1/2 | 14 3/4 | 16 5/16 | 15 9/16 | 14 11/16 |
| 16 OD | 18 1/2 | 17 5/8 | 16 3/4 | 18 9/16 | 17 11/16 | 16 11/16 |
| 18 OD | 21 | 20 1/8 | 19 1/4 | 21 1/16 | 20 3/16 | 19 3/16 |
| 20 OD | 23 | 22 | 21 | 23 1/16 | 22 1/16 | 20 15/16 |
| 24 OD | 27 1/4 | 26 1/4 | 25 1/4 | 27 5/16 | 26 5/16 | 25 3/16 |

This schedule of dimensions conforms to the American Steel Flange Standard (B16e-1930).

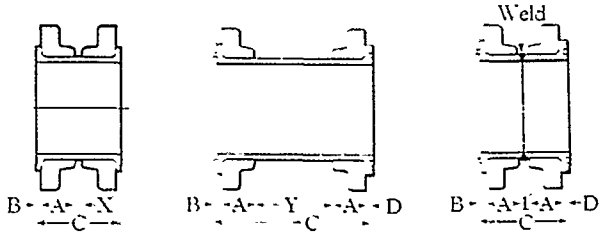
Plain Cranelaps are regularly made on lapwelded steel or genuine wrought iron pipe, using standard, extra strong, or double extra strong weights — or on seamless steel pipe, using any regular thickness. Plain Cranelaps are applicable to all pressure classes, i.e. 150-Pound and higher; the thickness of the lap is the same as the thickness of the pipe wall.

Male and female, tongue and groove, double thickness or 200% lap, and ring joint Cranelaps require the use of lapwelded or seamless steel pipe only, and of a wall thickness equal to or heavier than extra strong weight, except that the minimum lap thickness on the male for large male and female joints will be 1/4-inch where the pipe wall thickness is less than 1/4-inch (i.e. extra strong weight pipe, sizes 2-inch and smaller). These Cranelaps, called "modified Cranelaps", are applicable to the 300-Pound and higher pressure classes only.

Dimensions of radial back Cranelaps are furnished on application. For dimensions of grooves on ring joint Cranelaps, refer to pages 470 and 471.

***Description... pages 505 to 507*** ***Cranelap Flanges... pages 291 to 297*** ***Ring Joints... pages 470 and 471***

## Minimum Face to Face of Piping with Cranelap Joints




The minimum face to face dimensions of straight pipe with Cranelap joints are obtained as follows:

**Sketch "A":** Formula for straight pipe with plain face Cranelap joints:

$C = X - 2(A) - B$ Where X = 16 1/2" on 1 to 1 1/2" pipe
X = 19" on 2" pipe
X = 17" on 2 1/2" and larger pipe

**Sketch "B":** Formula for straight pipe with the modified Cranelap joints—male and female, tongue and groove, ring joint, radial back, and double thickness lap:

$C = Y - (2A) - B - D$ Where Y = 16 1/2" on 1 to 1 1/2" pipe
Y = 20" on 2 and 2 1/2" pipe
Y = 19" on 3" and larger pipe

**Sketch "C":** The minimum face to face outlined for sketch "B" can be reduced if a butt weld is located between the flanges, as illustrated in "C".

If the procedure of sketch "C" is followed, the minimum face to face of straight pipe with the modified Cranelap joints is in accordance with the formula:

$C = 1'' + (2A) + B + D$

41

# Flanging Processes

## Welded Flanged Joints

Welded flanged joints can be furnished in the types illustrated here.

The Crane [illegible] with Cranelap flange also illustrated [illegible] an auxiliary flanged connection for welding.

**Application:** Any of the welded flanged joints shown at the right can be applied to straight pipe, pipe bends, the ends and nozzles of welded headers, and the flanged ends of welded assemblies. Special shop equipment assures the perfect alignment of flange faces on all Crane Welded Flanged Joints.

**Welding:** The shop welding of these flanged joints is performed by Crane welders working under approved procedure control.

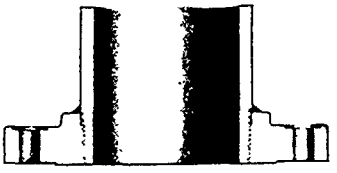
**Special piping materials:** These types of welded flanged joints can be furnished on many special piping materials, including numerous alloy steels, with facilities for heat-treating after fabrication.

Information and prices furnished on application.

### Forged Steel Screwed Flange, Seal-Welded

A Crane Forged Steel Screwed Flange is used in this joint. The pipe and the flange are accurately threaded: the flange is made up tight on the pipe, seal-welded, and then refaced. The joint is sealed by fillet-welding the back of the flange to the pipe, thus assuring no leakage through the threads.

The refacing assures perfect alignment of the flange faces, and that the end of the pipe is flush with the face of the flange for a proper gasket-bearing surface to the inside of the pipe. The threads retain the function of holding the flange securely on the pipe, hence there is no shearing action.



Screwed Flange
Seal-Welded and Refaced

### Forged Steel Welding Neck Flange

Crane Welding Neck Flanges are of forged steel. They are machined with a beveled end and bored to match the inside diameter of the pipe to which they are applied. A butt-weld is used to attach the welding neck flange to the pipe, which is also machine beveled.

Welding Neck Flange
Butt-Welded to Pipe

### Forged Steel Slip-On Welding Flange

Crane Forged Steel Slip-On Welding Flanges are bored for a snug fit on the pipe and, when applied to fabricated piping, are welded at the front and back through the two methods defined below and illustrated at the right.

**Type No. 1:** Type No. 1 is Crane standard for welded flanged joints on carbon steel and genuine wrought iron piping with 150 and 300-Pound Forged Steel Slip-On Welding Flanges. Regular flanges are utilized with the end of the pipe set back from the face of the flange and the flange welded to the pipe both in front and back. Type No. 2 for this class of piping is furnished on special order only.

Type No. 1
Slip-On Welding Flange
Welded Front and Back

**Type No. 2:** Type No. 2 is Crane standard for welded flanged joints on carbon steel and genuine wrought iron piping with 400-Pound or higher pressure class forged carbon steel flanges, and for all iron-pipe-size alloy piping where alloy flanges of all pressure-classes are used. Slip-on flanges with a special front groove for welding are used. The pipe is flush with the flange face; this is accomplished by refacing after both the front and back of the flange are welded to the pipe.

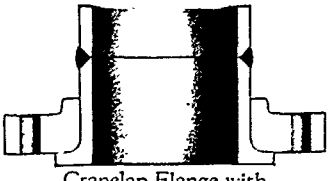
Type No. 2
Slip-On Welding Flange
Welded Front and Back
and Refaced

**Code limitation:** When piping must comply with either the Pressure Piping Code or the A.S.M.E. Unfired Pressure Vessel Code, the use of the slip-on welding flange joint is limited to a primary service pressure rating of 300 pounds per square inch.

### Cranelap Stub Ends and Cranelap Flange

The Cranelap stub end with Cranelap flange can be applied to fabricated piping. Both the stub end and the pipe are machine beveled. A butt-weld is used to complete the joint.

This type of joint has all of the advantages of the regular Cranelap joint, as described on pages 505 to 507. In most cases, piping can be fabricated with Cranelap joints applied directly, which eliminates the weld necessary for the application of the Cranelap stub end with Cranelap flange.



Cranelap Flange with
Cranelap Stub End
Butt-Welded to Pipe

*Facings pages 510 and 511*
*Flanges pages 291 to 298* *Cranelap Stub Ends pages 280 to 283* *Welding Fittings pages 275 to 290*

# Flange Facings and Finishes

Crane Fabricated Piping includes a variety of facings and finishes for flanged joints. Shown and described on these pages are details of those regularly furnished on flanged joints in the many pressure classes. Also shown and described are other facings and finishes available on special orders.

The word "facing" refers to the type of face that is machined on flanges or lap joints. It should not be confused with the word "finish", which refers to the kind of finish that is applied to the actual contact surface of the face. For example, the "facing" on a flange machined with a ¼-inch high projection is commonly known as a "¼-inch high male face", but the "finish" on the contact surface of the male projection can be either "serrated" or "smooth".

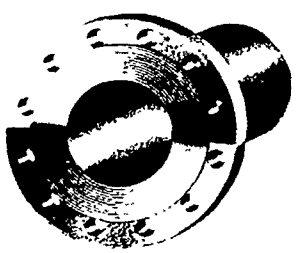
There are many finishes in general use for flange and lap joint facings. Crane, in regular practice, employs either the serrated or smooth finish.

**Serrated finish:** The machining of faces with this finish is accomplished with a round nose or form tool which cuts concentric grooves. On cast iron and ferrosteel flange facings there are approximately 10 serrations to the inch, and on steel flange facings, approximately 32 serrations to the inch.

**Smooth finish:** The machining of faces with this finish is accomplished with tools which leave an even, uniform surface, designated as "smooth".

***Caution:*** Although not used by Crane, the term "plane face" is sometimes encountered. It usually means "smooth finish". As it is not a "facing" and is often confused with plain (or flat) face, the use of the term is misleading and should be avoided.

Plain Face
Smooth Finish



1/16-inch High Raised Face
Serrated Finish

¼-inch High Male Face
Serrated Finish

Plain Face
Smooth Finish—"V" Grooved

**Iron and steel flanged joints—regular practice:** Flanged joints when using 125-Pound Cast Iron or Ferrosteel Screwed Flanges are regularly furnished plain faced with smooth finish. Serrated or special finishes can be furnished but at an extra charge.

Flanged joints when using 250-Pound Cast Iron or Ferrosteel Screwed Flanges, and 150-Pound or 300-Pound Forged Steel Screwed, Welding Neck, or Slip-On Welding Flanges are regularly furnished with a 1/16-inch high raised face having a serrated finish. Smooth or special finishes and special facings can be furnished but at an extra charge.

*Raised faces should be removed from 150-Pound Steel Flanges before bolting against 125-Pound Iron Flanges, and only a full face gasket should be used.*

Flanged joints utilizing steel valves and fittings with 400, 600, 900, 1500, or 2500-Pound Forged Steel Screwed, Welding Neck, or Slip-On Welding Flanges bolted on are regularly furnished with a ¼-inch high large male face with serrated finish on the end flanges and a 3/16-inch deep large female face with smooth finish on the companion flanges.

Special facings, and smooth or special finishes on male faces can be furnished but at an extra charge.

**Brass and bronze flanged joints:** Flanged joints when using brass or bronze flanges are regularly plain faced with smooth finish and "V" grooved. Full face gaskets should always be used when assembling all brass or bronze joints. Metallic gaskets are not recommended.

*Raised faces should be removed from iron and steel flanges before bolting against brass or bronze flanges.*


| | |
|---|---|
| *Brass Flanges* | *page 188* |
| *Iron Flanges* | *pages 202 to 204* |
| *Steel Flanges* | *pages 291 to 298* |
| *Templates for drilling* | *pages 458 to 463* |
| *Dimensions of special facings* | *pages 468 to 471* |

# Flange Facings and Finishes (Cont.)

**¼-inch High Double Male**
**Large Male and Female**
**Small Male and Female**

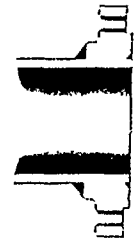
**Ring Joint**
**Large Tongue and Groove**
**Small Tongue and Groove**

Flanged joints, when using 300, 400, 600, 900, 1500, and 2500-Pound Forged Steel Screwed, Welding Neck, or Slip-On Welding Flanges, can be furnished with ¼-inch high double male, large male and female, small male and female, large tongue and groove, small tongue and groove, and ring joint facing.

¼-inch High Double Male

Ring Joint on Screwed Flange

Ring Joint on Welding Neck Flange



Ring Joint on Slip-On Welding Flange

Flanged joints, when using 150-Pound Forged Steel Screwed, Welding Neck, or Slip-on Welding Flanges, can be furnished with ring joint facing. The ring joint face is also furnished on Cranelap joints; see page 507.

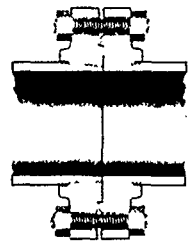
***The ring joint facing should not be used with or against iron, brass, or bronze valves, flanges, or fittings.***

**Finish:** Male faces are regularly furnished with serrated finish. Female faces, tongue faces, and groove faces are regularly furnished with smooth finish.

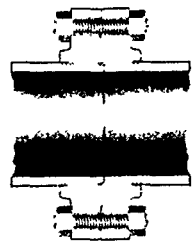
Smooth finish can be furnished on the male faces when ordered; special prices will apply.

***Caution:*** Care should be taken in the use of small male and female joints to insure that the pipe is thick enough to permit sufficient bearing surface to prevent crushing the gasket.

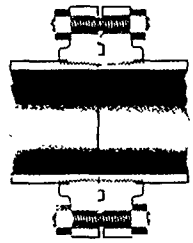
**Gaskets:** For best results, when corrugated copper and corrugated soft iron gaskets are used, they should be coated with Crane High Temperature Thread Compound. See pages 474 to 476 for gaskets and page 464 for thread compound.



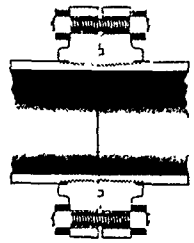
Large Male and Female



Small Male and Female



Large Tongue and Groove



Small Tongue and Groove

## Cranelap Joint Facing Finishes

**Regular Cranelap joint:** The regular Cranelap joint with raised face is regularly furnished with a serrated finish, approximately 32 serrations per inch. Smooth finish can be furnished when specified.

Cranelap Joint — Plain Face Serrated Finish

**Modified Cranelap joints:** The modified Cranelap joint facings are finished as follows:

Radial back and double thickness lap Cranelap joints with raised face are regularly furnished with a serrated finish, approximately 32 serrations per inch. A smooth finish can be furnished when so specified on orders.

On large male and female, large tongue and groove, and small tongue and groove Cranelap joints, the male faces are regularly furnished with a serrated finish (approximately 32 serrations per inch), and the female, tongue, and groove faces are regularly furnished with a smooth finish. Smooth finish can be furnished on the male faces when specified.

**Gaskets:** For best results, when corrugated copper and corrugated soft iron gaskets are used, they should be coated with Crane High Temperature Thread Compound. See pages 474 to 476 for gaskets and page 464 for thread compound.

*Dimensions of Cranelap Joints . . . page 508*

# Crane Welded Piping

Crane Fabricated Piping includes a wide variety of shop welded product — headers, welded assemblies receiver separators — vessels, etc. — for all current operating pressure and temperature services.

The welding of shop fabricated piping probably finds its greatest usefulness in the production of welded headers from pipe.

A few of the advantages of welded headers are: the elimination of joints; a saving in weight; a conservation of space when necessary; the location of branches or nozzles at any required practical intervals; continuity of insulation and the freedom to apply any type of joint to the nozzles or connections.

Shop fabrication of welded headers is recommended. See page 499 for the "Advantages of Crane Shop Fabrication".

For information on the dimensions and design of Crane Welded Headers, see pages 510 and 517.

**Welding processes:** All modern methods of fusion welding are employed in the fabrication of Crane welded piping.

***When orders do not specify which process should be used, Crane employs the method best adapted to the character of the work and which will produce the best results.***

**Codes; qualification of welders:** Crane welded piping can be fabricated to conform to the requirements of the various codes. Crane welders must pass tests in accordance with the A.S.M.E. Unfired Pressure Vessel Code and the A.S.A. Code for Pressure Piping. The qualifications are for various methods of welding.

**Stress relieving:** Crane welded piping will be stress relieved in accordance with the codes. Welded nozzles, in both the unreinforced and reinforced types, and other welds are stress relieved when it is considered necessary, even though the codes do not stipulate that stress relief is required.

***The practice of stress relief as outlined above will be followed unless orders or inquiries specify otherwise.***

# Notes on Crane Welded Piping

**Ends of welded piping:** Welded headers and piping can be supplied with the ends plain, beveled for welding, threaded, or flanged, utilizing any of the types of flanged joints which are listed; see pages 505 to 511.

**Long lengths of pipe:** When designing or ordering welded headers and piping, consideration should be given to the maximum lengths of welded or seamless pipe available: see page 478.

When the necessary lengths are not available, two or more pieces of pipe can be welded together or provided with intermediate flanged joints to produce the desired header or welded assembly. Any intermediate joint should be definitely located if its location is an important factor in erection.

Shipping facilities present the only practical limit to the shape or length of welded headers and assemblies. Care must be used to keep the over-all dimensions within the maximum shipping facilities and clearances between factory and destination.

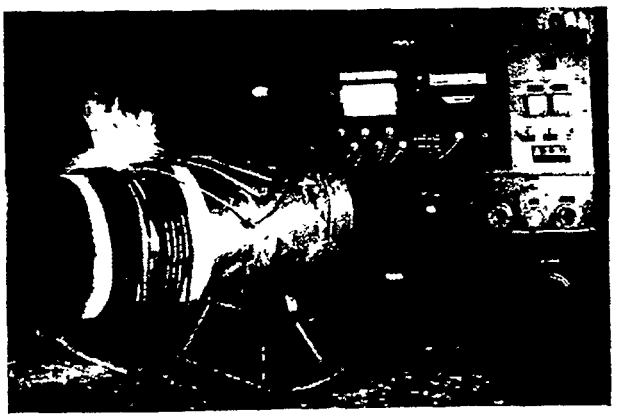
**Special materials:** Facilities are available for welding or brazing into various types of fabricated assemblies piping materials such as brass, copper, aluminum, and Monel.

Numerous alloy steels, including stainless steels, also can be welded. Facilities for heat-treating alloy steels after fabrication are available when required. Crane shops have welding rods and electrodes for welding alloy steels which give the deposited metals approximately the same characteristics as the parent metals.

Details on special materials will be furnished on application.

**Galvanizing:** Welded headers and welded piping can be furnished galvanized on the inside and outside, or galvanized on the outside only. The galvanizing is done after fabrication. Information on application.

**Inquiries and orders:** Inquiries or orders for welded products should specify the quantity; the dimensions; size, weight, and kind of pipe; also if the ends are to be plain, beveled for welding, threaded, or flanged. If flanged, the kind of flange, facing, and type of joint should be specified. It is advisable to have a sketch accompany all orders or inquiries.



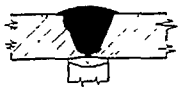
Preheating by induction during welding. Piping is stress relieved by the same method.

# Crane Welded Piping (Cont.)

## Types of Welds

Butt Weld
For metal thickness of ¾-inch or less

Butt Weld
For metal thickness greater than ¾-inch



Butt Weld
With machined backing ring for any metal thickness

Welded Coupling
Threaded

Welded Coupling
Bored for Socket Welding

Welded Pad
Threaded
(Also made Socket-Welding)

There are numerous types of welds for various connections and purposes. Those in general use are as follows:

**Butt welds:** Two types of butt welds furnished are shown at the upper left—one is for light sections, and one for heavy sections. All piping is machine-beveled before butt welds are applied.

Butt welds with machined (illustrated at the left) or plain backing rings, can also be furnished.

**Welded couplings and welded pads:** Smaller sizes of screwed and socket-weld connections are furnished in two types—welded couplings and welded pads, as illustrated at the lower left.

For welded couplings, the regular practice is to use a half coupling of either the extra heavy seamless, the 3000-Pound W.O.G., or 6000-Pound W.O.G. Steel pattern. One end is beveled and the weld is made as illustrated. For welded pads, the regular practice is to use a section of steel bar stock or a forged steel pad. One end is beveled, the weld is made, and the opening is drilled and tapped, or bored for socket-welding, as the final operation. WeldOlets can also be supplied; see page 287. Orders and inquiries should specify type wanted.

**Welded nozzles:** Crane Fabricated Piping utilizes two types of welded 90° or angular nozzles — the "standard type" which is not reinforced, and the "reinforced type" which provides reinforcement of the nozzle weld. One of two types of welds is used; see illustrations at the right.

Reinforcing of welded nozzles will be done as required by the customer and in accordance with the A.S.M.E. Unfired Pressure Vessel Code or the A.S.A. Pressure Piping Code, when compliance with these Codes is mandatory.

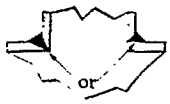
***The ring type of reinforcement will be furnished in the absence of definite specifications on orders for fabricated piping with reinforced welded nozzles.***

Other types of reinforcement can be furnished according to individual specifications, when so stipulated.

**Mitre weld:** The mitre weld, illustrated at the right, may be used for fabricated piping, especially in the larger sizes, or for unusual conditions.

*The use of pipe bends or welding elbows is recommended in preference to mitre welds.* However, where space or design limitations require, or when suitable welding elbows are not available, mitre welding can be used. Mitre welds are made up of various combinations of segments, angles, etc., and must be designed for each condition encountered.

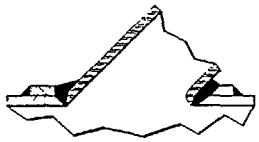
**Welded end closure:** The welded end closure regularly furnished is illustrated above. Crane Welding Caps (ellipsoidal shape) are used unless otherwise specified. For welding caps, see pages 281 and 283. Other types, such as flat head, dished head, etc., can be furnished when ordered.



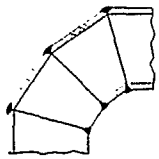

90° Nozzle Weld
Standard Type

90° Nozzle Weld
Reinforced Type

Angular Nozzle Weld
Standard Type

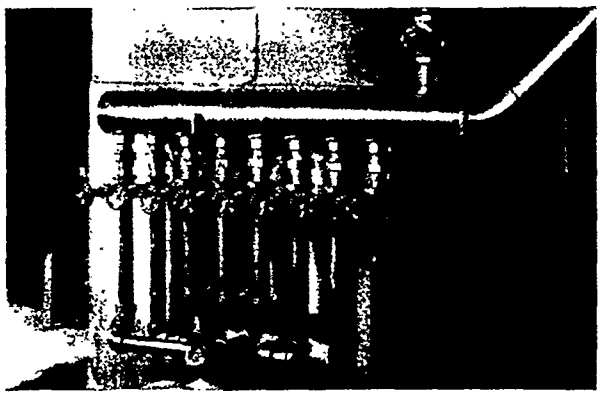


Angular Nozzle Weld
Reinforced Type



Mitre Weld

Welded End Closure



A welded header with threaded outlets.

# Unit Fabrication

## Piping and Valves

Piping specifications for central stations and industrial power plants have undergone many changes in recent years, especially since piping materials have been developed to meet the demands of the extremely high pressures and temperatures prevalent today.

Long, patient, and intelligent engineering research and experiment have developed new equipment and alloys capable of handling pressures and temperatures which would have seemed fantastic but little more than a decade ago. It follows that as service demands become more severe, piping materials themselves must and do meet the challenge of more exacting design, materials, and construction.

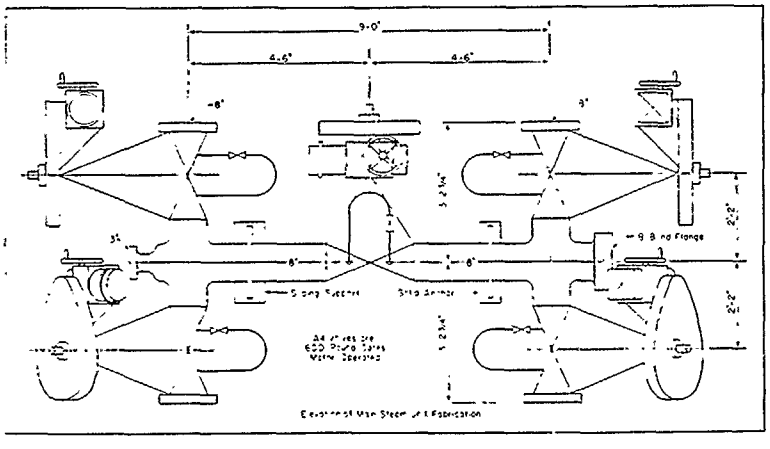
The present trend in power plant design is to make the main steam headers large in diameter and relatively short in length. Stop valves for boiler, turbine, and auxiliary leads can be grouped closely on such a header. Feed water headers and auxiliary or service assemblies follow this trend.

Among the many innovations contributing to the efficiency of modern piping materials welding has played an important part. That, in turn, has pointed the way to shop fabrication of headers, assemblies, and even complex piping units. These can be delivered complete to the job, thereby saving considerable time in installation costs, as well as assuring compliance with the strictest intent of the design and dependable performance when placed in operation.

Where installations suggest that welding end valves and headers are preferred, it is becoming common practice to have the header with its valves and other piping welded into convenient assemblies. Suitable flanged or beveled end connections can be provided so the assemblies may be connected to adjacent flanged or welded piping lines.

There are many advantages in having piping units fabricated in the shop, as portrayed on pages 400 to 501, 512 and 513.

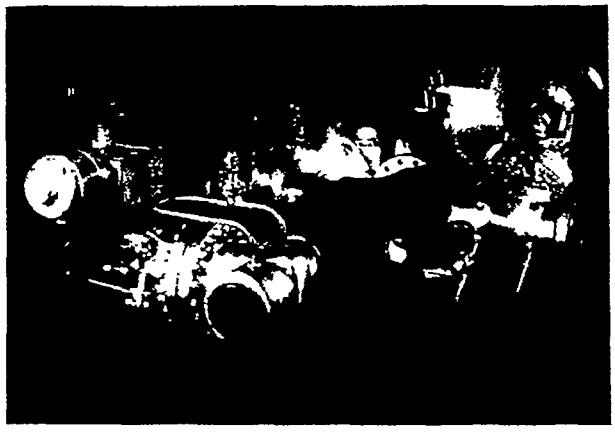
A secondary but important consideration is that a modern fabricating shop has the facilities needed to care for all possible emergencies and unusual requirements. Unavoidable last minute changes or additions, the replacement of a component part of an assembly which occasionally fails under test, and realignment after fabrication are but a few of the contingencies encountered and overcome daily in the shop fabrication of complete assemblies.



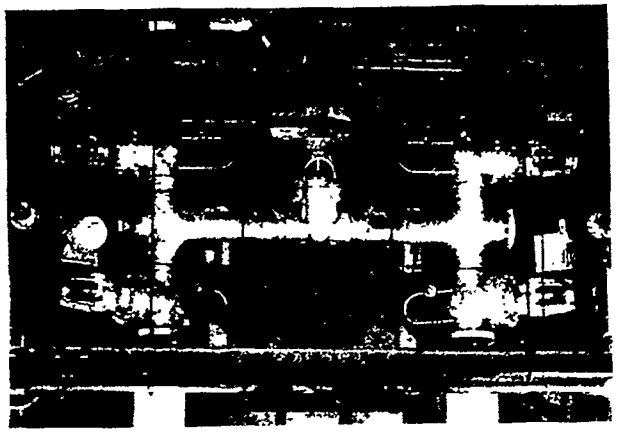
*Unit fabrication in the blueprint stage.*

***The illustrations are an example of Crane Unit Fabrication—from the drawing board—through manufacture—and finally, installed in the piping system.***

***This 8-inch assembly for the steam distribution system of a central station is operating at 550 pounds pressure and 850 °F. temperature. The total weight is 12,500 pounds.***



*Welding operation in Crane Shop.*



*The completed installation.*

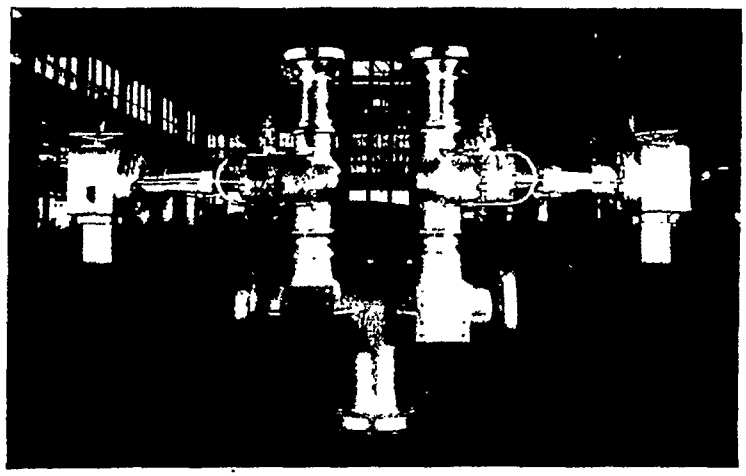
# Unit Fabrication
## Piping and Valves (Cont.)

It is generally agreed among engineers that headers and major piping assemblies, such as those illustrated, are the heart of the main steam, boiler feed, and auxiliary lines in high-pressure high-temperature power plants.

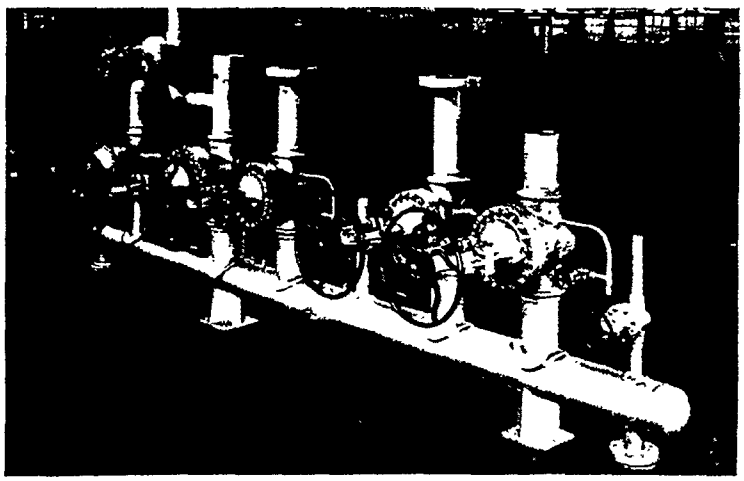
Some of the illustrations on these pages show cast carbon-moly steel headers. These are gaining in favor where the required length permits their use. This design permits the application of liberal radii for nozzle outlets, thus providing better flow characteristics. Velocities have been speeded up to a point where the effect of cavitation at the outlet nozzles of a header may reach serious proportions. This is minimized through the careful nozzle design possible in a cast header.

In large header structures involving many outlets, the problem of reinforcing is overcome through the exacting design of a casting, and uniform results can be predicted from the final annealing operation.

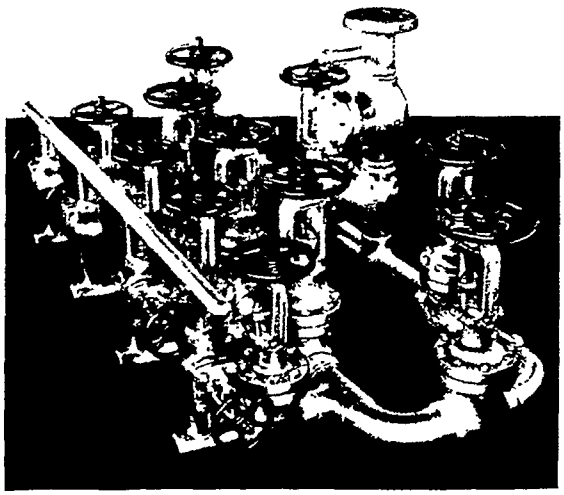
While most of the illustrations show assemblies for higher pressures and temperatures, the plan of pre-fabricated assemblies is also applicable to lower pressure jobs.



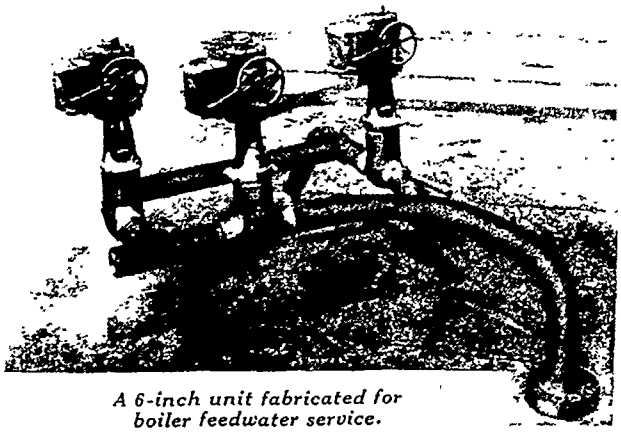
*A 900-Pound cast header complete with valves.*



*A 10-inch main steam header for central station installation.*

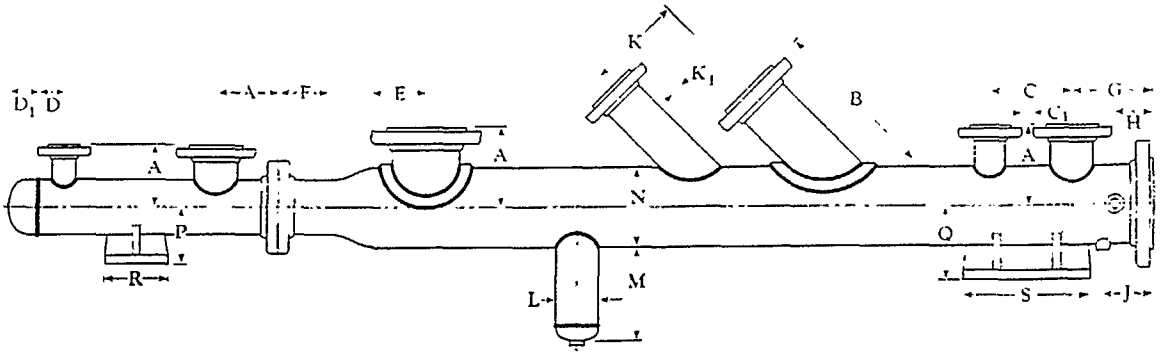


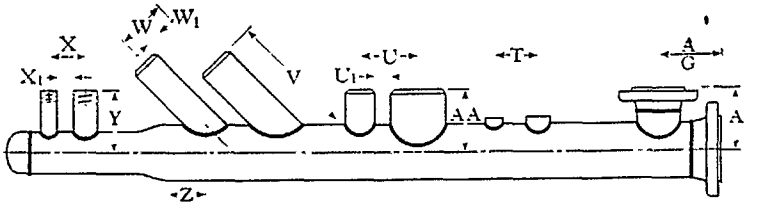
*A steel loop header for boiler feedwater service.*



*A 6-inch unit fabricated for boiler feedwater service.*

# Dimensions of Crane Welded Headers




**Design recommendations:** It is impossible to outline in complete detail fixed recommendations for the dimensions of welded headers, because the specific requirements often necessitate the use of special or unusual dimensional design. However, for the major portion of ordinary requirements, it is possible to keep within the limitations of standard practice.

To this end, the composite header sketches shown above and the data following are presented as a guide for designing and for determining the dimensions of welded headers.

*Caution:* In the data following, reference is made, in many cases, to recommended minimum dimensions. The principles of good header design preclude the use of these minimum dimensions, and consequent close clearances, except when necessary.

As an example, refer to dimension "C" (center to center of adjacent flanged end nozzles) in the sketch above and in the data section following, and note that the recommended minimum should be used only when close nesting of the branch outlet piping is required, or when the space for the header length is limited. Obviously, the use of the minimum dimension "C" is not desirable when greater spacing of adjacent nozzles can be effected.

*Recommended minima:* While the recommended minimum dimensions appearing in the following data are accurate for general purposes, slight variations are possible. For specific problems of this nature, full information will be furnished upon receipt of inquiries, which preferably should be accompanied by a sketch.

41

**Dimensions "A" and "B":** The center to face dimension of flanged end welded nozzles should be the same as the corresponding dimension of flanged fittings of similar pressure rating and of similar type.

**Dimensions "C"-"$C_1$" and "K"-"$K_1$":** The recommended minimum center to center dimension of adjacent flanged end welded nozzles should be one-half the diameter of one outlet flange, plus one-half the diameter of the other outlet flange, plus one inch (1″). This will provide sufficient clearance for welding the nozzles to the header and also for bolting up the adjacent flanged joints.

If the nozzle welds are reinforced, certain types of reinforcement may require more than one inch of clearance between adjacent flanges of nozzles. However, if ring reinforcement is used, this qualification does not apply, as the one inch clearance between adjacent flanges (dimensions "$C_1$" and "$K_1$") provides sufficient clearance for the application of welded reinforcing rings.

**Dimensions "D" and "E":** The dimension "D" (center of welded nozzle to center of the butt weld of an end closure) and the dimension "E" (center of welded nozzle to the beginning of a swedged reduction in the diameter of the header) should not be less than one-half the diameter of the flange on the welded nozzle.

**Dimension "$D_1$"** For dimensions of the welding caps used for end closures, see page 286. See pages 280 to 283 for description of caps.

Dimensions of welding caps used for end closures for pipe heavier than extra strong will be furnished on application.

**Dimension "F":** The minimum lengths of tangents on swedged or reduced ends should be the same as the minimum tangents used on pipe bends. See column "C" in the table on page 503 and the notes relating to tangents on page 502.

# Dimensions of Crane Welded Headers (Cont.)

**Dimension "G":** When the diameter of the welded nozzle is smaller than the diameter of the header, it is possible in some instances, to make the dimension from center of nozzle to face of header flange less than the normal dimension ("A"), which is the corresponding flanged fitting dimension.

Dimension "G" should not be less than one-half the diameter of the outlet flange, plus the length through the hub of the header flange (including welding neck type), plus any additional space, if necessary, for the insertion of bolts.

**Dimension "H":** The pipe connection for flow meter purposes should be located according to the requirement of the flow meter manufacturer. However, clearance for the hub of the flange is necessary.

**Dimension "J":** Welded coupling nozzles or welded pads for a drain or other purposes should be so located that dimension "J" provides ample clearance for the hub of the header flange, and also for the insertion or removal of the bolts for the header flange when piping is connected to the welded coupling nozzle or pad.

**Dimensions "L" and "M":** The diameter of welded drip pockets ("L") should be approximately one-half to two-thirds of the diameter of the header ("N"). The length of welded drip pockets ("M") should be, as a recommended minimum, approximately two to three times the diameter ("L"). It is recommended that the drain connection be not less than 1-inch, also that the size should be based on the service requirement.

For low pressure saturated steam lines, drip pockets should be larger than those used on high pressure superheated steam lines, because more condensate will be present in the low pressure saturated steam lines than in the high pressure superheated steam. Drip pockets should not be located immediately opposite and below a vertical branch outlet of a header, because the flow from the header through the vertical branch will produce a syphonic action and render the drip pocket partially or even entirely ineffective, especially when a high velocity of flow is employed.

**Dimensions "P" and "Q":** The fabrication of headers by welding readily permits variations in the location, design, and dimensions of supports and anchorage bases.

In the absence of any special requirement, it is recommended that the dimension "P" (center of header to face of base support) and the dimension "Q" (center of header to face of anchorage base) be the same as the corresponding dimensions of base fittings of similar pressure rating and of similar type.

These recommended dimensions provide clearance for insulation.

**Dimensions "R" and "S":** The dimensions of the support bases ("R") should be the same as the corresponding dimensions of base fittings of similar pressure rating and type.

The dimensions of anchorage bases ("S") should be larger than those of support bases and should be developed to suit the conditions

When bases are to be drilled for bolts, the size and the location of the holes should be specified. When an anchorage base is used, it should be bolted securely; however, the supporting base should then be free, in order not to interfere with the longitudinal movement of the header when expanding or contracting.

**Dimension "T":** The minimum center to center dimension of adjacent welded coupling nozzles or welded pads ("T") is governed by the pipe sizes of these connections. Adequate space should be provided for the installation of any valves, unions, etc., in the connected piping.

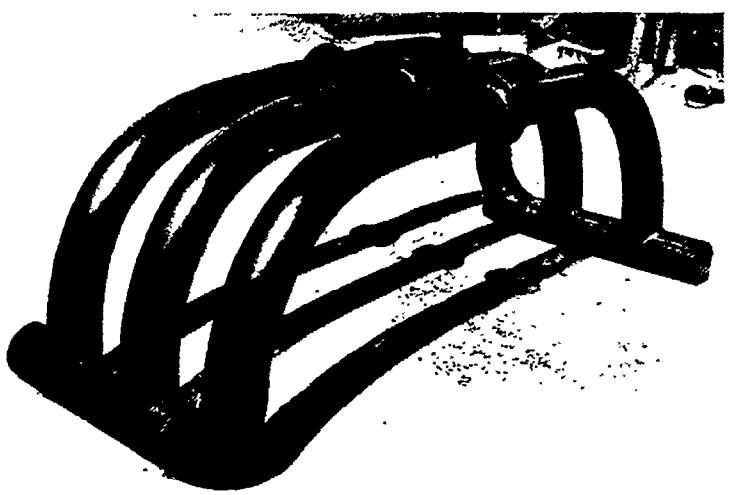
**Dimensions "AA", "V", and "Y":** It is recommended that the center to end dimension of beveled end welded nozzles ("AA" and "V") and threaded end welded nozzles ("Y") be the same as the center to face dimensions of corresponding flanged fittings of similar pressure rating and type.

When necessary, it is possible to reduce dimensions "AA", "V", and "Y" below the standard recommended above, but in such a case care should be used to have these dimensions of adequate length for proper butt-welding or screwing-up of the branch piping to the ends of the nozzles in the header.

**Dimensions "U"-"$U_1$", "W"-"$W_1$", and "X"-"$X_1$":** The minimum center to center dimension of adjacent beveled end or threaded end welded nozzles is governed by the pipe sizes of these nozzles. Adequate space should be provided for the installation of any valves, unions, flanges, etc. in the piping connected to the nozzles.

It is also necessary that the dimensions "$U_1$", "$W_1$", and "$X_1$" be of sufficient length to provide adequate space for the welding of the nozzles to the header.

**Dimension "Z":** The dimension "Z" can be determined by the same formula used for dimension "E", i. e., the same as one-half the flange diameter on a 90° welded nozzle.



A Crane fabricated header, welded and flanged.

# Pipe Coils

Pipe coils can be obtained in varied designs and sizes, dependent upon the space available for installing and other factors. They provide a practical, efficient, and economical means for the transfer of heat from one fluid to another.

Crane fabricating shops, located for nation-wide service, are equipped to produce the complicated types of pipe coils as well as the simple or standardized types.

**Materials:** Carbon steel pipe, seamless or welded, of standard or extra strong weights, predominate the pipe coil field, although other tubular materials are available. Seamless pipe rather than butt-welded or lap-welded, is recommended, to overcome any possible leakage in service.

**Testing, stress-relieving, and heat-treating:** Crane regularly tests all pipe coils either hydrostatically, or on air, before shipment. Special tests will be made if indicated in the order. Facilities for stress-relieving or heat-treating coils made from carbon, or alloy steels, or other materials, are available. Details will be furnished on application.

**Dimensional tolerances:** Commercial pipe coils are subject to certain manufacturing tolerances in dimensions. Additional information on this subject will be furnished on request.

**Galvanizing:** Pipe coils can be furnished galvanized on the outside only. It is possible, however, in limited instances, to galvanize on the inside as well.

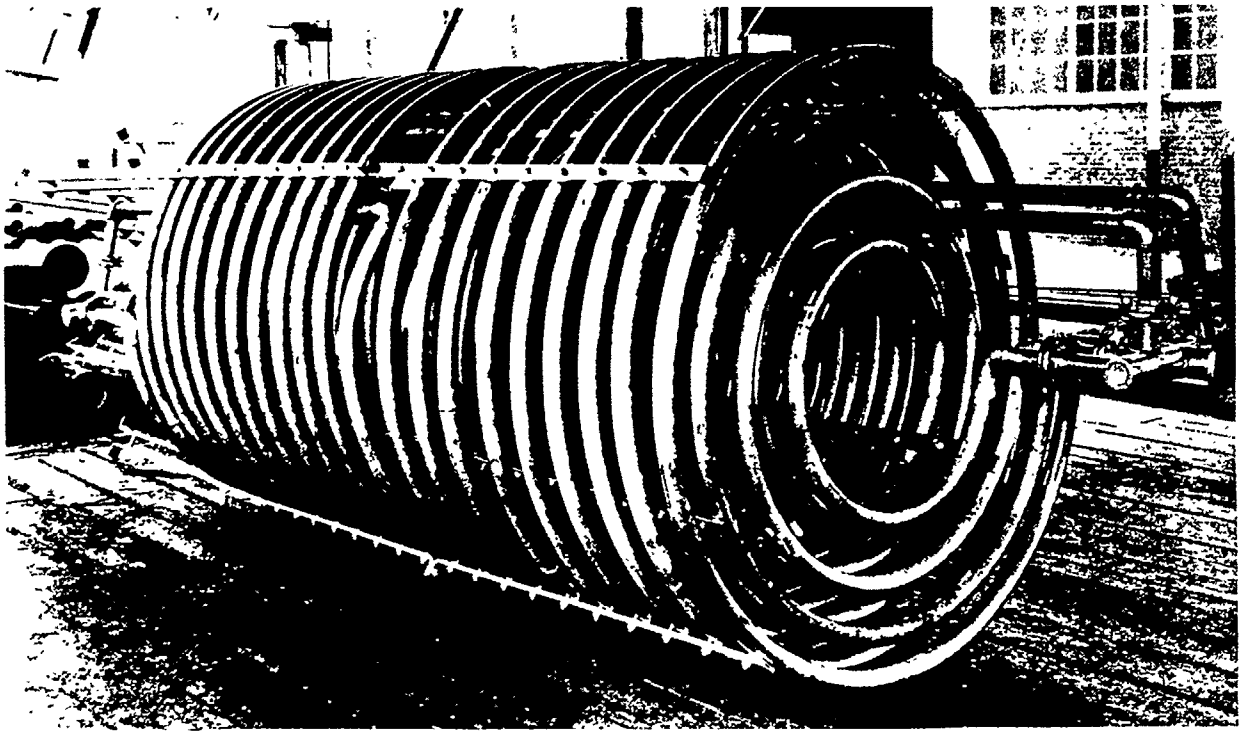
**Painting:** Unless specified in detail on the order, all pipe coils are shipped unpainted.

**Straps and supports:** Straps will be furnished for all types of pipe coils if the over-all size is large enough to warrant support for maintaining their shape in shipment. These straps can be used as supports in installation.

**Welded headers:** To conserve space, save weight, and eliminate many joints, welded headers are recommended for connecting the inlets and outlets of two or more pipe coils used in a battery. For further information on Crane Welded Headers, refer to pages 516 and 517.

On the following pages are illustrations of pipe coils more commonly used.

For additional information on common types available, dimensional tolerances, straps, supports, and engineering data, request a copy of Circular No. 318 from the nearest Crane branch.



Unusual assembly of multiple cylindrical pipe coils. Coils 3 feet, 4 feet, 5 feet, and 6 feet in diameter. Notice the fabricated header on this coil specially designed to provide flanged connections. Fabricated in the Birmingham Shop.

# Pipe Coils (Cont.)

## Cylindrical

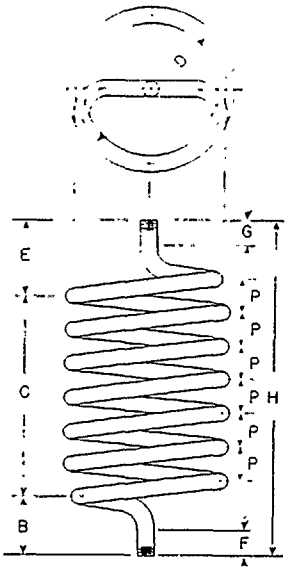



Figure No. C-1

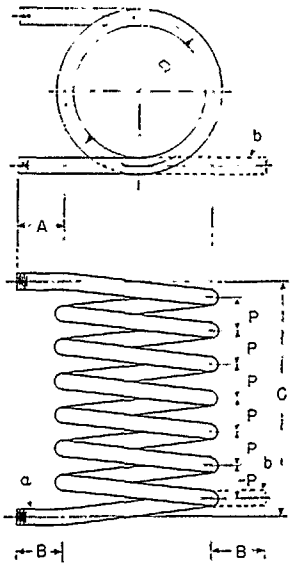



Figure No. C-6
Shown by solid lines.

Figure No. C-7
Outlet shown by dotted lines.

## Double Cylindrical

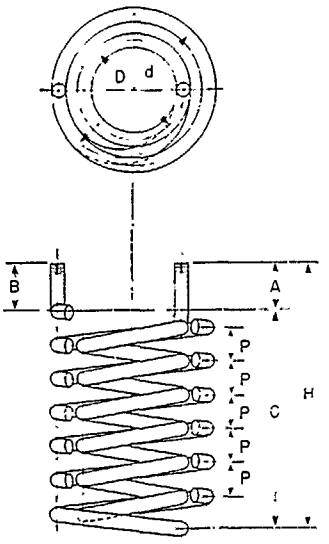



Figure No. DC-1
As shown

***Triple Cylindrical Pipe Coils can also be furnished***

**Inlets and outlets:** Inlets and outlets are identified by markings "a" and "b."

The inlet or outlet locations may be in positions other than shown in these illustrations. If required in other positions, provide those details in a sketch.

**Tangents:** The illustration of Figure No. C-1 shows how required lengths of tangents may be specified by inserting dimensions "F" and "G." If a specific length of tangent must be maintained, include that information in detail.

## Flat Spiral

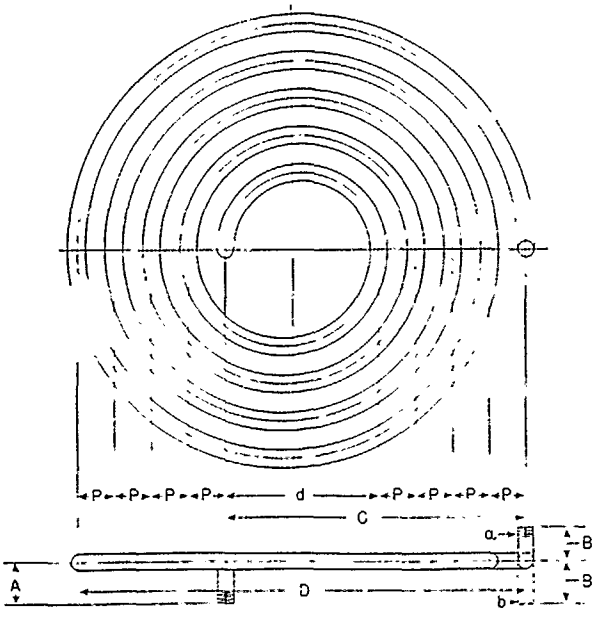



Figure No. FS-1
Shown by solid lines

Figure No. FS-2
Outlet shown by dotted lines

*Minimum dimensions..... page 521*

# Pipe Coils (Cont.)

## Flat Type

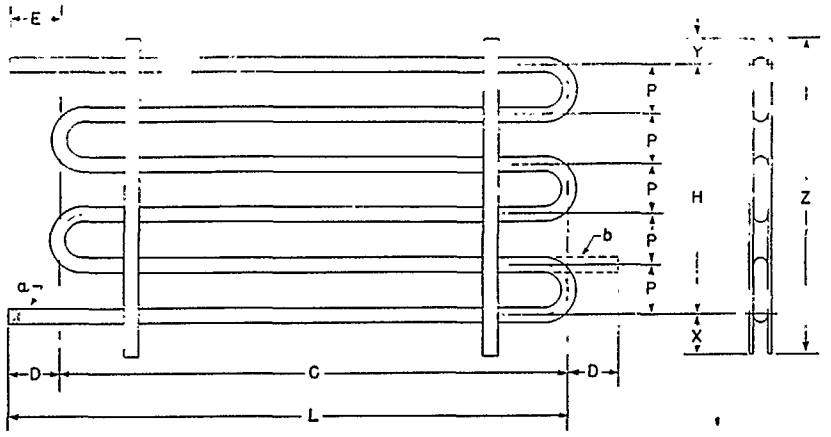



Figure No. F-3
Shown by solid lines

Figure No. F-4
Outlet shown by dotted lines

## Oval Type

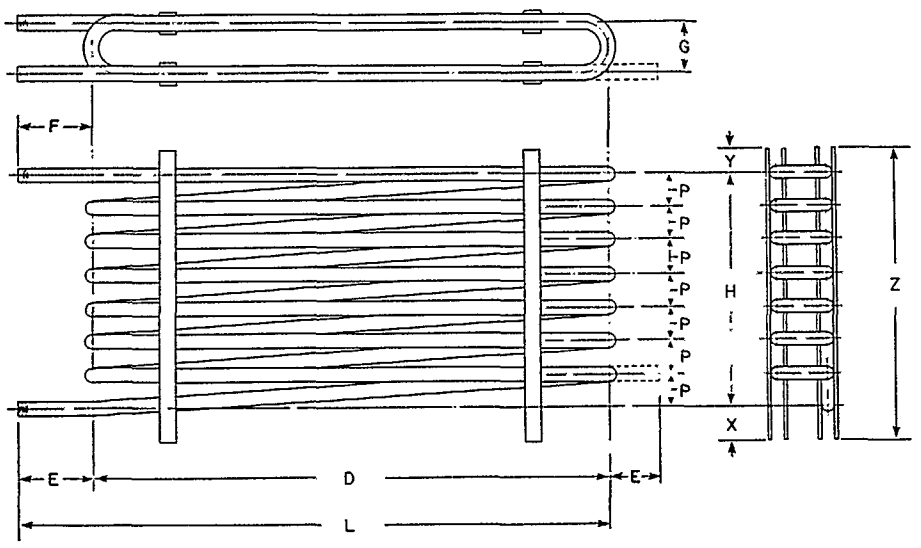



Figure No. O-3
Shown by solid lines

Figure No. O-4
Outlet shown by dotted lines

**Inlets and outlets:** Inlets and outlets are identified by markings "a" and "b."

The inlet or outlet locations may be in positions other than shown in the illustrations above. If locations are required in other positions, provide the complete details in a sketch.

**Tangents:** If a specific length of tangent must be maintained for the inlet and outlet of the pipe coils shown above, include that information in detail.

Welding return bends can be used in the fabrication of flat or oval pipe coils. For sizes and centers of welding return bends, refer to pages 280 to 283.

# Pipe Coils (Cont.)

## Box Type

The inlet or outlet locations may be in positions other than shown in the illustration. If required in other positions, provide those details in a sketch.

Welding return bends can be used in the fabrication of these box pipe coils. For sizes and centers of welding return bends, refer to pages 280 to 283, inclusive.

Minimum dimensions are shown below.

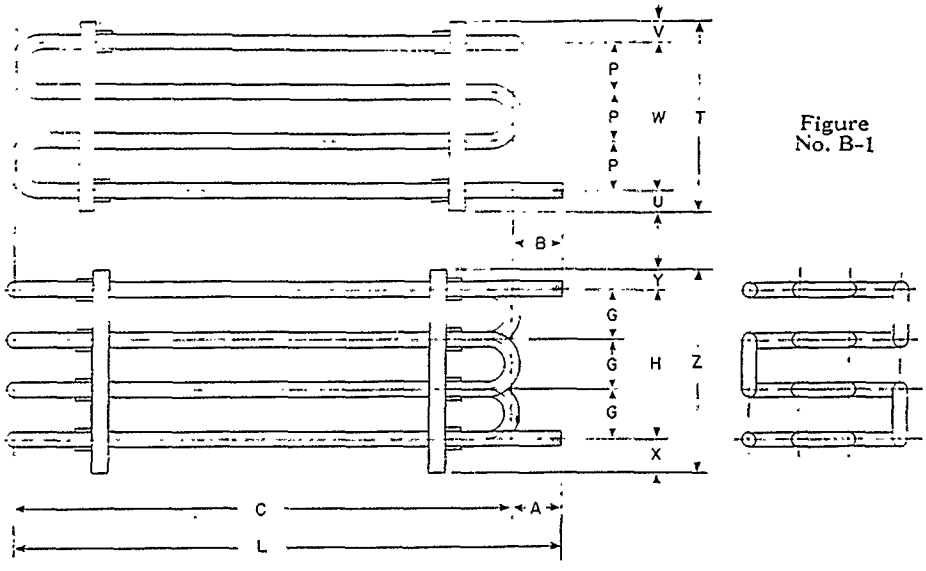



Figure No. B-1

### Minimum Dimensions of Pipe Coils

The following table shows two sets of dimensions which can be used in the fabrication of pipe coils. Both are classed as minimum schedules of dimensions.

When it is necessary to resort to a compact design, the "Recommended Minimum Center to Center" dimensions are suggested. For unusually compact designs, the "Shortest Center to Center" dimensions can be used. Both should be avoided whenever greater centers can be employed; refer to the cautionary note below.

*For pipe coils bent on short center to center dimensions, the use of seamless pipe is recommended.*

"Center to Center" has reference to dimension "D" (diameter) for cylindrical pipe coils, to dimension "P" for flat pipe coils, dimension "G" for oval pipe coils, and dimensions "P" and "G" for box pipe coils.

| Type of Pipe Coils | Size of Pipe Inches | Steel Pipe | | | | | | Genuine Wrought Iron Pipe | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Recommended Minimum Center to Center Dimensions—Inches | | | Shortest Center to Center Dimensions—Inches | | | Recommended Minimum Center to Center Dimensions—Inches | | | Shortest Center to Center Dimensions—Inches | | |
| | | Standard | Extra | Strong | Standard | Extra | Strong | Standard | Extra | Strong | Standard | Extra | Strong |
| For Cylindrical Pipe Coils | ½ | 5 | 5 | | 3½ | 3 | | 8 | 6 | | 6 | 4 | |
| | ¾ | 7½ | 7 | | 5 | 4½ | | 10 | 9 | | 8 | 6 | |
| | 1 | 10 | 9 | | 7 | 6 | | 14 | 12 | | 10 | 8 | |
| | 1¼ | 13 | 12 | | 9 | 8 | | 18 | 16 | | 12 | 10 | |
| | 1½ | 18 | 15 | | 10 | 9 | | 24 | 20 | | 15 | 12 | |
| | 2 | 24 | 20 | | 14 | 12 | | 30 | 26 | | 20 | 16 | |
| For Flat, Oval, and Box Pipe Coils | ½ | 3 | 2½ | | 3 | 2 | | 5 | 4 | | 5 | 4 | |
| | ¾ | 3½ | 3 | | 3½ | 2½ | | 6 | 6 | | 6 | 5 | |
| | 1 | 4 | 3½ | | 4 | 3 | | 10 | 8 | | 8 | 6 | |
| | 1¼ | 5 | 4 | | 4½ | 3½ | | 12 | 10 | | 10 | 8 | |
| | 1½ | 6 | 5 | | 5 | 4 | | 15 | 12 | | 12 | 10 | |
| | 2 | 8 | 7 | | 6 | 6 | | 20 | 16 | | 16 | 12 | |

Information on smaller and larger sizes of pipe, and on other piping materials, will be furnished on application.

### Cautionary Note Regarding the Use of Recommended Minimum or Shortest Center to Center Dimensions

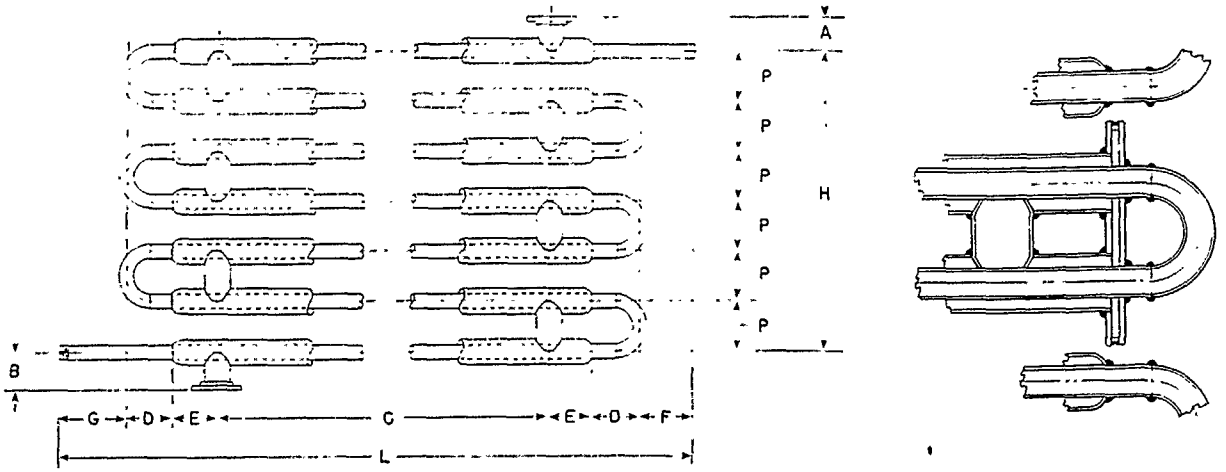
*The center to center dimensions and bending radii of pipe coils preferably should exceed the recommended minimum shown above.*

By bending to close centers the outside pipe walls are subject to some flattening and thinning, both of which increase as the bending centers are reduced. This is particularly true of the larger sizes, 1½-inch and 2-inch.

In some instances it is possible to obtain shorter center to center dimensions than listed. Detailed information will be furnished upon receipt of specific inquiry.

*Theory of Heat Transfer Through Pipe Walls . page 536* *Design of Pipe Coils .pages 537 and 538*

# Welded Double Pipe Heat Exchangers




Crane shops can fabricate heat exchangers of the type illustrated above. They are formed of two sets of piping, one placed inside of the other, utilizing swedging and welding to complete the assembly.

**Application:** This type of heat exchanger has a wide range of application in various installations, to serve as a medium for heat transfer between liquids, gases, etc. The usual arrangement is to provide counter flows or directions of travel in the inside of the smaller or inner piping and the annular space between the inner and outer piping.

**Pipe sizes:** The sizes commonly used are 2 x 1¼, 2½ x 1¼, 3 x 2, and 4 x 3-inch. Other sizes can be made; information will be furnished upon receipt of specific inquiries.

**Length and height:** These double pipe heat exchangers are regularly made in any length up to 20 feet. Lengths over 20 feet can be fabricated on special orders.

The usual practice limits the height to 12 pipes; however, these heat exchangers can be any number of pipes high, the only limitation being shipping facilities.

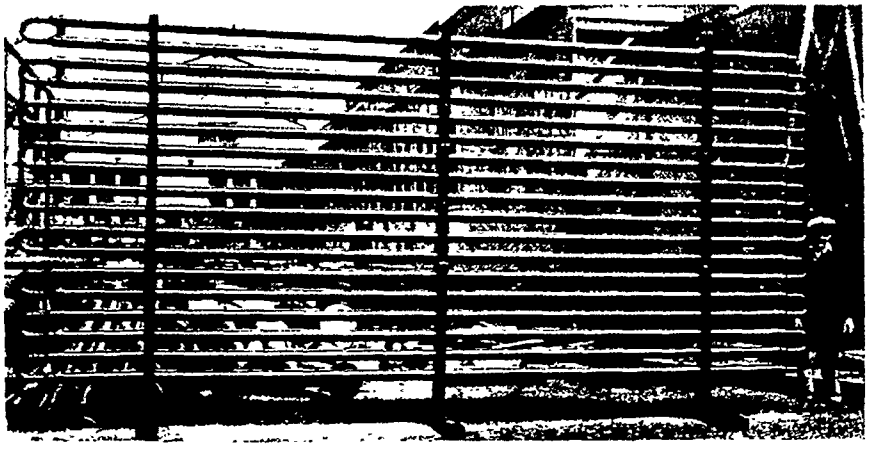
**Headers for multiple stands:** When two or more stands of double pipe heat exchangers are used in a battery, welded piping headers for connecting the inlets and outlets are recommended.

**Note:** For information about sizes and centers of welding return bends, see pages 282 to 283.

**Special expansion joint:** The enlarged detail above shows a design of welded expansion joint which can be adapted to double pipe heat exchangers as an alternate construction. It is suggested for installations involving unusual temperature differentials, when provision for taking care of moderate expansive movement of the connected piping appears desirable.

**Inquiries and orders:** Inquiries or orders should specify the quantity; sizes, weight, and kind of pipe; service, pressures, and temperatures; over-all length; number of pipes; number of stands; center to center dimensions of stands when headers are wanted; and whether or not valves and any additional connections are wanted on the inlets and outlets.

**Prices:** Prices will be quoted on application.



Double Pipe Heat Exchanger fabricated by welding—made in the Chicago Shop of Crane

***Double Pipe Heat Exchangers can also be made with the Crane Double Pipe Fittings shown on page 415.***

# Engineering Data

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Years of research, experimenting, and testing have endowed Crane with a wealth of engineering data pertinent to piping systems. A portion of that data is indexed above. Additional data of an engineering nature are included elsewhere in this catalog with products to which they definitely pertain; see pages below. Customers confronted with unusual piping problems or desiring further information are invited to refer to various Crane technical publications or to submit their query direct to Crane.

Selecting Size of Crane Pressure-Seal Bonnet Stop-Check Valves... pages 216 and 217
Selecting Size of Crane Bolted Bonnet Stop-Check Valves... pages 306 and 307
Formula for Determining Size of Steam or Oil Separators.....page 354
Normal Engagement Between Male and Female Threads.....page 494
American and British Standard Pipe Threads.....pages 492 to 494
Railing Pipe Threads.....page 192
Expansion of Wrought Iron, Steel, Brass, or Copper Pipe.....page 349
Commercial Wrought Steel Pipe Data.....pages 490 and 491

# Crane Bolting

Machine Bolt
Square Head
With Hexagon Nut

Stud
Threaded Oversize on One End
Other End Threaded for Nut

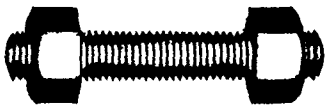
## Definitions

***A bolt*** is threaded on one end only, the other end being upset into the form of a head.

***A stud*** is threaded on both ends, one end being oversize in diameter to fit tightly (wrench fit) in a tapped hole, the other being to the standard diameter for a nut assembly.

***A bolt-stud*** is threaded to the standard diameter, either on both ends or full length, for nut assembly on each end.

Bolt-Stud
Threaded on Both Ends
With Two Hexagon Nuts



Bolt-Stud
Threaded Entire Length
With Two Hexagon Nuts

## Materials

Crane furnishes bolts, studs, and bolt-studs of the following materials:

***Machine Bolts*** for use at temperatures up to 500° F. are made from steel complying with A.S.T.M. Specification A 107, open-hearth, free-cutting grade, having the following physical properties:

| | Minimum |
|---|---|
| Tensile Strength, lbs. per sq. in. | 60,000 |
| Yield Point, lbs. per sq. in. | 35,000 |
| Elongation in 2", per cent | 25 |
| Reduction of Area, per cent | 50 |

These bolts are furnished with "Regular" unfinished square heads in accordance with A.S.A. B18.2.

All machine bolts are threaded in accordance with A.S.A. B1.1 Coarse Thread Series, Class 2 fit.

Nuts regularly furnished with machine bolts are made of free-cutting or resulfurized nut stock conforming to A.S.T.M. Specification A 107.

Nuts are made to American Standard Unfinished "Heavy" Hexagon Dimensions, A.S.A. B18.2.

All nuts are tapped in accordance with A.S.A. B1.1 Coarse Thread Series, Class 2 fit.

***Studs and Bolt-Studs*** for use at temperatures up to 500° F. are made from cold rolled steel complying with A.S.T.M. Spec. A 108, open-hearth free-cutting grade, having the following physical properties:

| | Minimum |
|---|---|
| Tensile Strength, lbs. per sq. in. | 70,000 |
| Yield Point, lbs. per sq. in. | 60,000 |
| Elongation in 2", per cent | 18 |
| Reduction of Area, per cent | 45 |

Cold roll steel studs and bolt-studs are threaded in accordance with A.S.A. B1.1 Coarse Thread Series, Class 2 fit (nut ends only).

Nuts regularly furnished are cold made of material in accordance with A.S.T.M. Spec. A 107.

Nuts are semi-finished in accordance with the American Standard "Heavy" Hexagon Dimensions, A.S.A. B18.2.

All nuts are tapped in accordance with A.S.A. B1.1 Coarse Thread Series, Class 2 fit.

***Alloy Steel Studs and Bolt-Studs*** are made of Crane Triplex or Templex Steel. Crane Triplex Steel has been used with uniformly satisfactory results in thousands of steel valve and fitting installations, many of which—particularly in oil refineries—have been operating under extreme pressures and temperatures. Templex Steel, a recent Crane development in bolting materials, is superior to Triplex Steel in creep resistance; on temperatures over 850° F., especially where joints are made up for permanent, long-time service, as in steam power plants, Crane Templex Steel will be found ideal.

Crane Triplex Steel complies with the requirements of A.S.T.M. Specification A 193, Grades BC and B 7 bolting.

Crane Templex Steel complies with the requirements of A.S.T.M. Specification A 193, Grades BC and B 14 bolting.

Both steels have the following physical properties:

| | Minimum |
|---|---|
| Tensile Strength, lbs. per sq. in. | 125,000 |
| Yield Point, lbs. per sq. in. | 105,000 |
| Elongation in 2", per cent | 16 |
| Reduction of Area, per cent | 50 |

Crane Alloy Steel Bolt-Studs, threaded their entire length, and accompanying nuts are threaded in accordance with the American Standard for Screw Threads for High Strength Bolting (ASA B1.4), sizes 1-inch and smaller in diameter with the Coarse-Thread Series, and 1⅛-inch and larger in diameter with the 8-Pitch-Thread Series.

Nuts regularly furnished with alloy steel bolt-studs are medium carbon, oil-quenched, semi-finished, made to the American Standard "Heavy" Hexagon Nut Dimensions, A.S.A. B18.2.

Nuts for alloy steel bolt-studs comply with the requirements of A.S.T.M. Specification A 194, Class 2 H.

## Torque Required to Produce Bolt Stress

The torque or turning effort required to produce a certain stress in bolting is dependent upon a number of conditions, some of which are:

1. Diameter of bolt.
2. Type and number of threads on bolt.
3. Material of bolt.
4. Condition of nut bearing surfaces.
5. Lubrication of bolt threads and nut bearing surfaces.

The tables below reflect the results of many Crane tests to determine the relation between torque and bolt stress. Values are based on steel bolting well lubricated with a heavy graphite and oil mixture.

It was found that a non-lubricated bolt has an efficiency of about 50 per cent of a well lubricated bolt and also that different lubricants produce results varying between the limits of 50 and 100 per cent of the tabulated stress figures.

## Crane High Temperature Thread Compound

The graphite and oil mixture mentioned above will give satisfactory results; however, for high temperature service, Crane High Temperature Thread Compound should be used; see page 464. Through its use, bolt-studs can be more readily followed up or disassembled after being subject to heat.

### Data for Use with Machine Bolts and Cold Rolled Steel Bolt-Studs

Load in Pounds on Bolts and Bolt-Studs when Torque Loads Are Applied

| Nominal Diameter of Bolt | No. of Threads | Diameter at Root of Thread | Area at Root of Thread | Stress | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 7,500 Lbs. per Sq. In. | | 15,000 Lbs. per Sq. In. | | 30,000 Lbs. per Sq. In. | |
| Inches | Per Inch | Inches | Sq. Inch | Torque Ft. Lbs. | Compression, Lbs. | Torque, Ft. Lbs. | Compression, Lbs. | Torque Ft. Lbs. | Compression, Lbs. |
| 1/4 | 20 | .185 | .027 | 1 | 203 | 2 | 405 | 4 | 810 |
| 5/16 | 18 | .240 | .045 | 2 | 388 | 4 | 675 | 8 | 1350 |
| 3/8 | 16 | .294 | .068 | 3 | 510 | 6 | 1020 | 12 | 2040 |
| 7/16 | 14 | .345 | .093 | 5 | 698 | 10 | 1395 | 20 | 2790 |
| 1/2 | 13 | .400 | .126 | 8 | 945 | 15 | 1890 | 30 | 3780 |
| 9/16 | 12 | .454 | .162 | 12 | 1215 | 23 | 2430 | 45 | 4860 |
| 5/8 | 11 | .507 | .202 | 15 | 1515 | 30 | 3030 | 60 | 6060 |
| 3/4 | 10 | .620 | .302 | 25 | 2265 | 50 | 4530 | 100 | 9060 |
| 7/8 | 9 | .731 | .419 | 40 | 3143 | 80 | 6285 | 160 | 12570 |
| 1 | 8 | .838 | .551 | 62 | 4133 | 123 | 8265 | 245 | 16530 |
| 1 1/8 | 7 | .939 | .693 | 98 | 5190 | 195 | 10380 | 390 | 20760 |
| 1 1/4 | 7 | 1.064 | .890 | 137 | 6675 | 273 | 13350 | 545 | 26700 |
| 1 3/8 | 6 | 1.158 | 1.054 | 183 | 7905 | 365 | 15810 | 730 | 31620 |
| 1 1/2 | 6 | 1.283 | 1.294 | 219 | 9705 | 437 | 19410 | 875 | 38820 |
| 1 5/8 | 5 1/2 | 1.389 | 1.515 | 300 | 11363 | 600 | 22725 | 1200 | 45450 |
| 1 3/4 | 5 | 1.490 | 1.744 | 390 | 13080 | 775 | 26160 | 1550 | 52320 |
| 1 7/8 | 5 | 1.615 | 2.049 | 525 | 15368 | 1050 | 30735 | 2100 | 61470 |
| 2 | 4 1/2 | 1.711 | 2.300 | 563 | 17250 | 1125 | 34500 | 2250 | 69000 |

### Data for Use with Alloy Steel Bolt-Studs

Load in Pounds on Bolt-Studs when Torque Loads Are Applied

| Nominal Diameter of Stud | No. of Threads | Diameter at Root of Thread | Area at Root of Thread | Stress | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 30,000 Lbs. per Sq. In. | | 45,000 Lbs. per Sq. In. | | 60,000 Lbs. per Sq. In. | |
| Inches | Per Inch | Inches | Sq. Inch | Torque Ft. Lbs. | Compression, Lbs. | Torque Ft. Lbs. | Compression, Lbs. | Torque Ft. Lbs. | Compression, Lbs. |
| 1/4 | 20 | .185 | .027 | 4 | 810 | 6 | 1215 | 8 | 1620 |
| 5/16 | 18 | .240 | .045 | 8 | 1350 | 12 | 2025 | 16 | 2700 |
| 3/8 | 16 | .294 | .068 | 12 | 2040 | 18 | 3060 | 24 | 4080 |
| 7/16 | 14 | .345 | .093 | 20 | 2790 | 30 | 4185 | 40 | 5580 |
| 1/2 | 13 | .400 | .126 | 30 | 3780 | 45 | 5670 | 60 | 7560 |
| 9/16 | 12 | .454 | .162 | 45 | 4860 | 68 | 7290 | 90 | 9720 |
| 5/8 | 11 | .507 | .202 | 60 | 6060 | 90 | 9090 | 120 | 12120 |
| 3/4 | 10 | .620 | .302 | 100 | 9060 | 150 | 13590 | 200 | 18120 |
| 7/8 | 9 | .731 | .419 | 160 | 12570 | 240 | 18855 | 320 | 25140 |
| 1 | 8 | .838 | .551 | 245 | 16530 | 368 | 24795 | 490 | 33060 |
| 1 1/8 | 8 | .963 | .728 | 355 | 21840 | 533 | 32760 | 710 | 43680 |
| 1 1/4 | 8 | 1.088 | .929 | 500 | 27870 | 750 | 41805 | 1000 | 55740 |
| 1 3/8 | 8 | 1.213 | 1.155 | 680 | 34650 | 1020 | 51975 | 1360 | 69300 |
| 1 1/2 | 8 | 1.338 | 1.405 | 800 | 42150 | 1200 | 63225 | 1600 | 84300 |
| 1 5/8 | 8 | 1.463 | 1.680 | 1100 | 50400 | 1650 | 75600 | 2200 | 100800 |
| 1 3/4 | 8 | 1.588 | 1.980 | 1500 | 59400 | 2250 | 89100 | 3000 | 118800 |
| 1 7/8 | 8 | 1.713 | 2.304 | 2000 | 69120 | 3000 | 103680 | 4000 | 138240 |
| 2 | 8 | 1.838 | 2.652 | 2200 | 79560 | 3300 | 119340 | 4400 | 159120 |
| 2 1/4 | 8 | 2.088 | 3.423 | 3180 | 102690 | 4770 | 154035 | 6360 | 205380 |
| 2 1/2 | 8 | 2.338 | 4.292 | 4400 | 128760 | 6600 | 193140 | 8800 | 257520 |
| 2 3/4 | 8 | 2.588 | 5.259 | 5920 | 157770 | 8880 | 236655 | 11840 | 315540 |
| 3 | 8 | 2.838 | 6.324 | 7720 | 189720 | 11580 | 284580 | 15440 | 379440 |

# Assembly and Maintenance of Flanged Joints

As the temperatures and pressures used in the piping industry have increased the problem of maintaining tight flanged joints has progressively become more severe. Many types of joints have been used; various types of gaskets have been installed in these joints; and different kinds of bolting materials have been recommended — all with a varying amount of success, depending upon the operating conditions. Even with all of these variations in design, certain precautions must be taken to maintain tight flanged joints.

When a flanged joint is assembled, each of the component parts is subjected to tensile or compressive stresses of varying magnitude. Under service conditions, especially where high temperatures are involved, a change in the magnitude of these stresses occurs and a lowering of the bolt stress results.

To compensate for this reduction in bolt stress, the following recommendations are made with regard to the assembly and maintenance of flanged joints.

**Assembly:** Initial bolt stresses to be applied in the assembly of flanged joints should afford a reasonable factor of safety with reference to the yield point of the bolting material. And yet the initial bolt stress must be high enough to insure a tight joint.

An extensive survey of field erected flanged joints has indicated that the following initial stresses are usually applied when alloy steel bolt-studs are pulled up manually. Experience has shown that these stresses are satisfactory for American Standard Steel Flanges and will comply with the requirements as set forth in the preceding paragraph.

**Table I**

| Size of Alloy Steel Bolt-Stud (Note 1) | Average Stress Applied Manually Lbs. per Sq Inch (Note 2) | Approximate Torque to Obtain Stress, Ft. Lbs. (Note 3) | Elongation in Inches, per Inch of Effective Length (Note 4) |
|---|---|---|---|
| 3/4 | 52,000 | 175 | .00173 |
| 7/8 | 48,000 | 255 | .00160 |
| 1 | 45,000 | 370 | .00150 |
| 1 1/8 | 42,500 | 500 | .00142 |
| 1 1/4 | 40,000 | 665 | .00133 |
| 1 3/8 | 38,000 | 860 | .00127 |
| 1 1/2 | 36,500 | 975 | .00122 |
| 1 5/8 | 35,000 | 1285 | .00117 |
| 1 3/4 | 34,000 | 1700 | .00113 |
| 1 7/8 | 33,000 | 2200 | .00110 |
| 2 | 32,000 | 2350 | .00107 |

Notes: (1) Coarse thread series, 1" and smaller; 8 pitch thread series, 1 1/8" and larger. (2) Average stress applied by maintenance men in assembly, using a lever and wrench or by sledging. (3) Based upon well-lubricated* threads. (4) Based on a modulus of elasticity of 30,000,000. The effective length of bolt-stud equals the distance from center of one nut to center of the other.

The values given in Table I have been graduated according to size — however, if it is possible to apply higher torques, it is recommended that the initial bolt stress be approximately 45,000 pounds per square inch.

The initial bolt stress can be applied by either of two methods: (1) By pulling up the well-lubricated* bolt-studs with the proper torque, or (2) by pulling up the bolt-studs to produce the elongation necessary for the desired bolt stress. When the second method is used the total desired elongation of the bolt-stud should be ascertained by multiplying the value given in the table for elongation in inches per inch by the effective length (distance from center of one nut to center of the other). Figures 1 and 2, respectively, show the design of an instrument which can be used in measuring bolt-stud elongation and the preparation of the ends of a bolt-stud for accurate measurement.

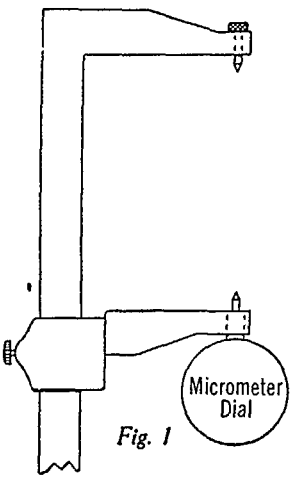



*Fig. 1*

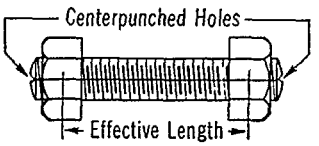



*Fig. 2*

**Maintenance:** ***When should bolt-studs be pulled up after being in service?*** It is recommended that the bolting in all flanged joints installed on temperatures above 500° F. be pulled up after the first shutdown. On high temperature service where creep may be expected to occur, it is recommended that the bolting be pulled up at least once during the first 200 hours of service, regardless of whether the line has been shut down or not. Bolt stress should be checked periodically during the life of the installation.

***How should the bolt elongation be checked and the bolt-studs pulled up?*** As a general rule, it is only necessary to check the elongation in two or three diametrically opposite bolt-studs, using the average of the values obtained as the elongation for the remainder. If the bolt elongation is to be determined while the joint is in service, one bolt should be checked and pulled up before another is loosened. Measurements should be taken immediately after releasing the load before the bolt temperature decreases. The following procedure should be used in checking bolt elongation:

(a) Determine the length of the bolt in the assembled joint.
(b) Release the load on the bolt by loosening the nut and re-measure the length.
(c) Subtract second reading from first.
(d) Divide this value by the effective length of the bolt. (Effective length equals distance from center of one nut to center of the other.)

If the residual elongation is less than 70% of the values given in Table I, the bolts should be pulled up so that the final elongation approximates the figures shown.

*Crane High-Temperature Thread Compound or equal; see page 464.

*For Pressure-Seal Bonnet and Lip-Seal Bonnet Valves, see pages 205 to 220.*

# Discharge of Water

## Through Pipes, Orifices, and Valves

### Table of Nomenclature

$A$ = Area of opening, square feet.
$C$ = Experimental coefficient.
$D$ = Inside diameter of pipe, feet.
$f$ = Coefficient of friction.
$g$ = 32.2 feet per second per second.
$h_1, h_2, h_3$ = Individual head losses, feet of water.
$H$ = Effective head pressure, feet of water.
$L$ = Length of pipe line, feet.
$Q$ = Flow of water, gallons per minute.
$V$ = Velocity of water, feet per second.

Frequently it is necessary to determine the quantity of water which will be discharged through a valve or orifice, or through a certain length of pipe. This problem is one which occurs often in hydraulic work, particularly with reference to the flow of water through long pipe lines from a high level to a lower one.

The quantity of water which is discharged into the atmosphere through a pipe, orifice, or valve is dependent upon several variable factors which include flow pressure, size of pipe, type of valve or orifice, condition of pipe wall surface, length of pipe line, etc. The discharge of water into the atmosphere in terms of head loss follows the general formula:

$$H = C\frac{V^2}{2g} \qquad \textit{Formula No. 1.}$$

Where the value of "$C$" is usually determined by experiment.

### Discharge of Water Through Pipes

In the case of water flowing through pipes, the quantity discharged is dependent upon three major resistance factors:

A. Entrance loss
B. Loss of head due to friction
C. Loss of head due to velocity

The loss of head at entrance depends upon the condition of the pipe end. A well rounded connection will cause the entrance loss to be decreased appreciably, while a square non-projecting pipe will give a "$C$" value of approximately .5 in Formula No. 1. This latter condition is realized in the majority of installations and therefore, the formula for entrance effect is as follows:

$$h_1 = .5\frac{V^2}{2g} \qquad \textit{Formula No. 2.}$$

The loss of head due to friction is mainly dependent upon the length and condition of the pipe line and may be expressed as

$$h_2 = \frac{f \times L}{D} \times \frac{V^2}{2g} \qquad \textit{Formula No. 3.}$$

In this equation, the friction factor, "$f$", must be determined from experimental results. For rough approximations, the value of "$f$" may be assumed as .015 for brass tubes, .02 for steel pipe, and .04 for cast iron pipe.

The third factor, the loss of head due to velocity, may be expressed by the following formula:

$$h_3 = \frac{V^2}{2g} \qquad \textit{Formula No. 4.}$$

The total loss of head is the sum of the individual losses and may be expressed as follows:

$$H = h_1 + h_2 + h_3 = \left(1.5 + \frac{f \times L}{D}\right)\frac{V^2}{2g}$$

As $Q = VA \times 450$

It follows that $Q = 450A\sqrt{\dfrac{2gH}{1.5 + \dfrac{f \times L}{D}}}$ *Formula No. 5.*

**Example:** How much water will an 8" steel pipe line (7.981 inside diameter) 3000 feet long discharge per minute at a point which is 300 feet below the inlet?

Given: $D = \dfrac{7.981}{12} = .665$ feet
$A = .3474$ square feet
$H = 300$ feet
$2g = 64.4$ feet per second per second.
$f = .02$ (assumed)
$L = 3000$ feet

Then: $Q = 450 \times .3474\sqrt{\dfrac{64.4 \times 300}{1.5 + \dfrac{.02 \times 3000}{.665}}}$

$Q = 2268$ gallons per minute

### Discharge of Water Through Orifices

The coefficient "$C$" for orifices is dependent upon the condition of the orifice edges, i.e., an orifice having well rounded edges has a "$C$" value of approximately 1.23, while one having sharp edges gives a "$C$" value of approximately 2.69.

### Discharge of Water Through Globe Valves

The discharge of water through globe valves under a given flow pressure depends primarily upon the type of valve considered. Crane has conducted tests on various types of globe valves in sizes up to and including 2½" and has determined that the flow through a globe valve is, roughly, one-half of the flow through a short pipe of the same size.

*For additional data, see pages 528 and 529.*

# Discharge of Water (Cont.)

## Through Pipes, Orifices, and Valves

The chart on the opposite page gives the discharge of water through pipe sizes from ¾" to 10", in lengths from 1 foot to 200 feet; through orifices in sizes up to 10": and through valves in sizes up to 2½" based upon the formulas or tests described previously. For sizes, lengths, or pressures not given on the chart, the respective formulas or ratios may be used.

***Note:*** In all cases, the pressure used to determine the flow through pipes, orifices, or valves, should be the effective head pressure under flow conditions, not the static pressure in the line before flow commences. This statement applies particularly to lines supplied by pumps, etc.

## Application of Chart

### Example No. 1

What quantity of water will be discharged through 75 feet of 5" standard pipe under a discharge gauge pressure of 50 pounds per square inch?

Enter the upper portion of the chart (page 529) at the intersection of the horizontal line for 75 feet of pipe and the line for the 5" pipe size. Proceed downward to the intersection with the diagonal for 50 pounds gauge pressure and then continue horizontally to the right where the quantity discharged is given as 2600 gallons per minute on the right hand ordinate.

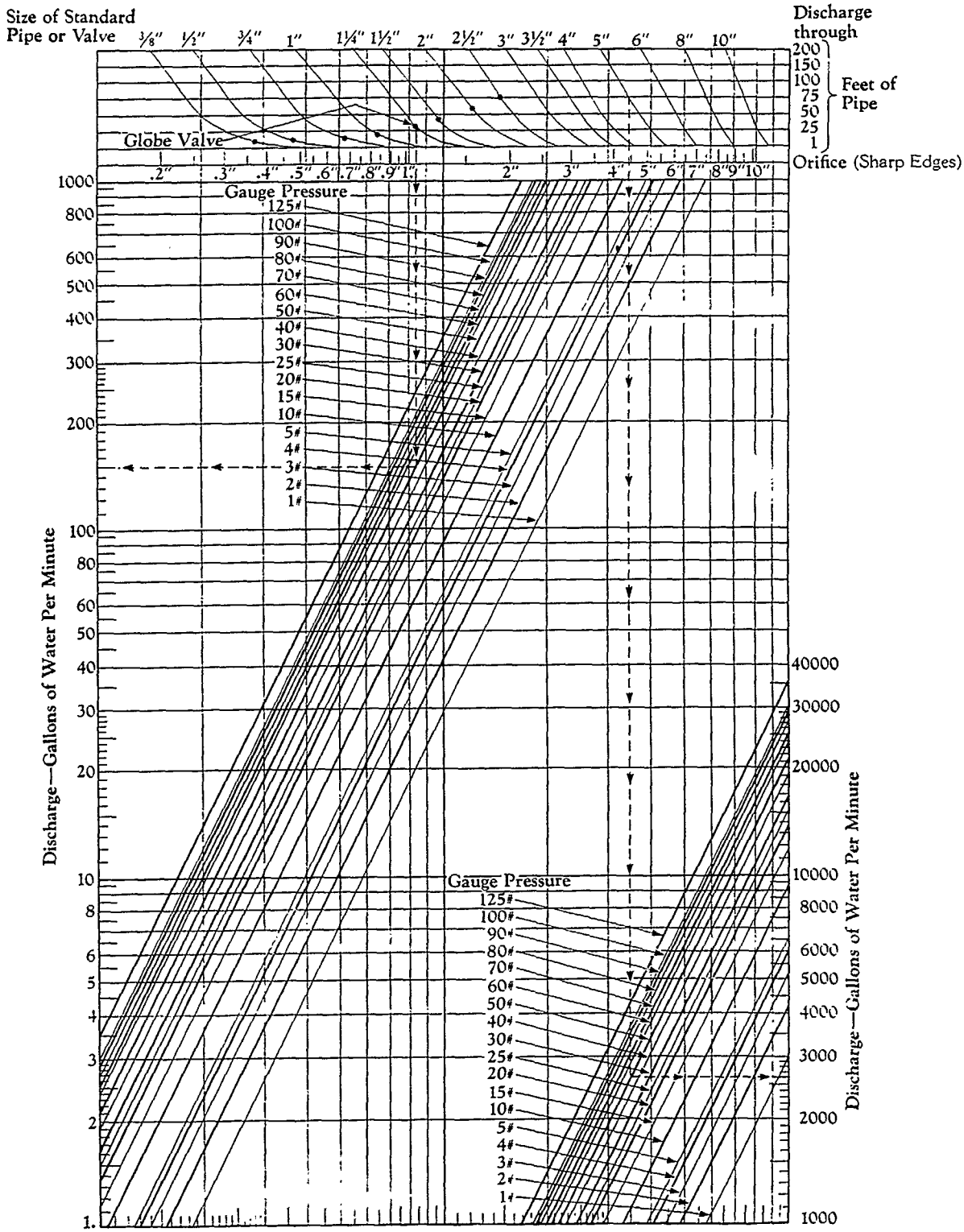
### Example No. 2

A 1¼" globe valve is discharging water into the atmosphere under a discharge gauge pressure of 50 pounds per square inch. What quantity is discharged in gallons per minute?

Enter the upper portion of the chart (opposite page) at the black dot on the line for 1¼" valve size. Proceed downward to the intersection with the diagonal for 50 pounds gauge pressure and then continue horizontally to the left where the quantity discharged is given as 150 gallons per minute on the left hand ordinate.

# Discharge of Water (Cont.)

## Through Smooth Pipes, Orifices, and Valves



# Resistance of Valves and Fittings to Flow of Fluids

When the flow of a fluid in a pipe line is altered by some obstruction such as a valve or fitting the velocity is changed, turbulence is magnified and a drop in pressure results. This pressure drop may be insignificant in long lines where it is very small in comparison to the total drop, but when the line is short, the pressure drop through valves and fittings becomes a major item in the total pressure drop value.

The most widely used data on the subject of the resistance of valves and fittings to the flow of water and steam is the information given in Dean Foster's paper on "Effect of Fittings on Flow of Fluids Through Pipe Lines" (published in Vol. 42, 1920, of the *Transactions of the American Society of Mechanical Engineers*). Later tests conducted by others have indicated that the values given by Foster are low for globe valves, angle valves, etc., and that data are needed to establish the correct information to use.

It has been the tendency, and probably is the most practical way, to present the friction values in terms of an equivalent length of the same size of pipe: i. e., the pressure drop caused by a 2-inch elbow is equivalent to approximately the pressure drop caused by five or six feet of 2-inch pipe under the same conditions of flow.

Realizing the need for definite data covering this subject, Crane has conducted pressure drop tests on valves and fittings on both water and steam. These tests were made on 2-inch and 6-inch sizes and conducted under conditions which were thoroughly investigated previous to the tests.

## Resistance in Terms of Equivalent Pipe Length

From data given in the tests conducted by Crane and also from information gathered from authentic sources, the chart shown on the opposite page has been prepared.

The chart gives the equivalent length of pipe to produce the same pressure drop as a valve or fitting. This additional pipe length should be added to the length of the line in order to determine the total pressure drop.

It has been shown by previous investigators that the drop in pressure through valves, fittings, etc., is some constant multiplied by the velocity head,

$$\frac{V^2}{2g}.$$

Therefore: $H_1 = K\frac{V^2}{2g}$ where

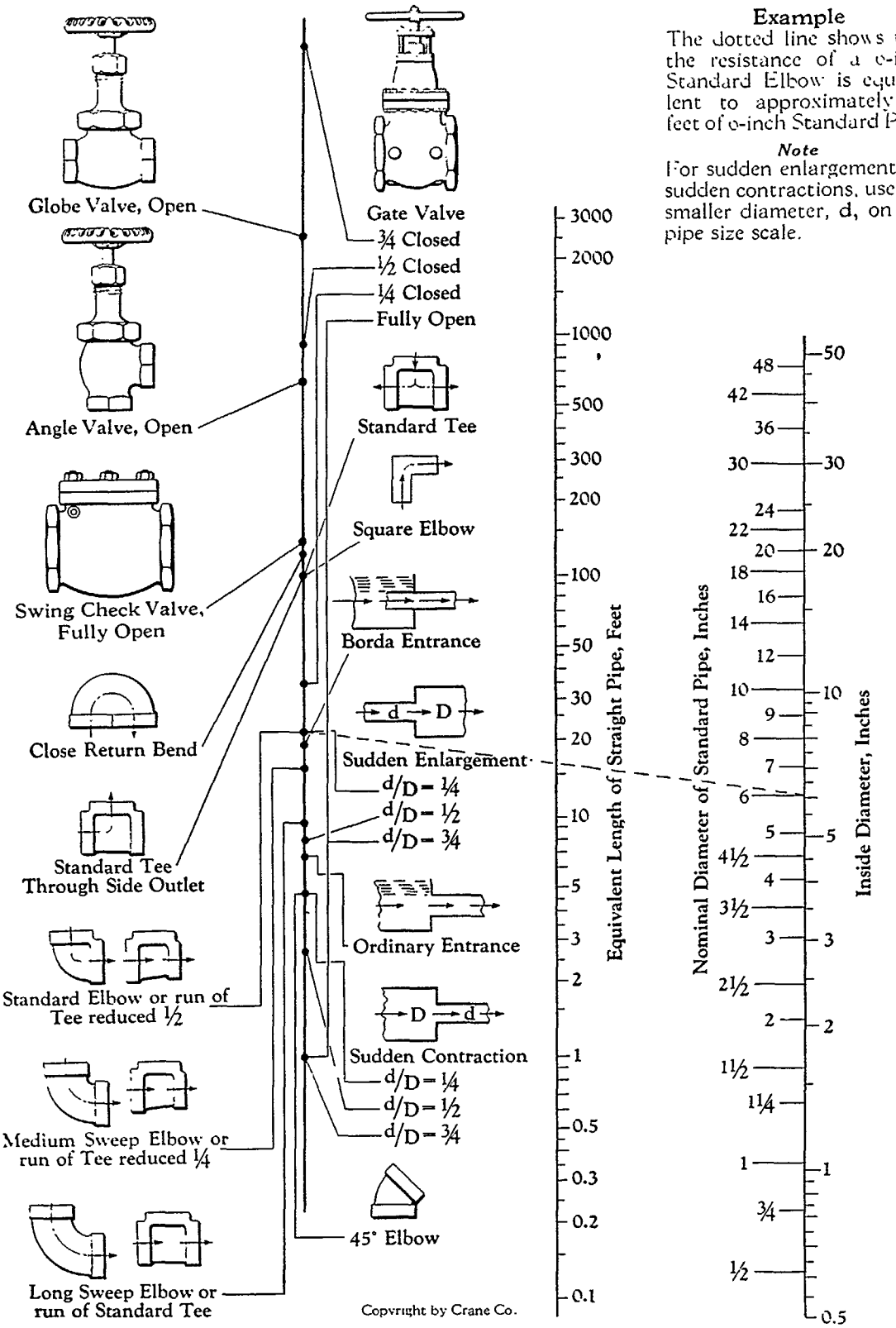
$H_1$ = Loss of head in feet
$K$ = Coefficient (values given in table below)
$V$ = Velocity of water, feet per second
$2g$ = 64.4

### Representative "K" Values for Various Valves and Fittings

| Type | "K" | Authority |
|---|---|---|
| Globe valve (fully open) | 10.0 | Crane tests |
| Angle valve (fully open) | 5.0 | Crane tests |
| Swing check valve (fully open) | 2.5 | Crane tests |
| Close return bend | 2.2 | |
| Standard tee | 1.8 | Giesecke & Badgett |
| Standard elbow | .9 | Giesecke & Badgett |
| Medium sweep elbow | .75 | Crane tests |
| Long sweep elbow | .60 | Bulletin No. 2712—University of Texas |
| 45° elbow | .42 | Bulletin No. 2712—University of Texas |
| Gate valve (fully open) | .19 | University of Wisconsin tests* and Crane tests |
| 1/4 closed | 1.15 | |
| 1/2 closed | 5.6 | |
| 3/4 closed | 24.0 | |
| Borda entrance | .83 | "Hydraulics" Daugherty |
| Sudden enlargement: | | |
| $d_1/d_2$ = 1/4 | .92 | "Hydraulics" Daugherty |
| $d_1/d_2$ = 1/2 | .56 | "Hydraulics" Daugherty |
| $d_1/d_2$ = 3/4 | .19 | "Hydraulics" Daugherty |
| Ordinary entrance | .5 | "Hydraulics" Daugherty |
| Sudden contraction: | | |
| $d_2/d_1$ = 1/4 | .42 | "Hydraulics" Daugherty |
| $d_2/d_1$ = 1/2 | .33 | "Hydraulics" Daugherty |
| $d_2/d_1$ = 3/4 | .19 | "Hydraulics" Daugherty |

*University of Wisconsin Experimental Station Bulletin Vol. 9, No. 1, 1922

# Resistance of Valves and Fittings to Flow of Fluids

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**Example**

The dotted line shows that the resistance of a 6-inch Standard Elbow is equivalent to approximately 10 feet of 6-inch Standard Pipe.

***Note***

For sudden enlargements or sudden contractions, use the smaller diameter, d, on the pipe size scale.

# Pressure Drop of Water Through Schedule 40 Steel Pipe

| Discharge | Pressure Drop of Water per 100 Feet of Schedule 40 Steel Pipe | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop | Velocity | Pressure Drop |
| Gallons per Minute | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. | Feet per Second | Pounds per Sq. In. |
| | 1/8" | | 1/4" | | 3/8" | | 1/2" | | 3/4" | | | | | | | |
| .2 | 1.13 | 1.52 | .62 | .420 | | | | | | | | | | | | |
| .3 | 1.69 | 4.20 | .92 | .925 | .50 | .199 | .32 | .065 | | | | | | | | |
| .4 | 2.26 | 7.70 | 1.23 | 1.61 | .67 | .346 | .42 | .111 | | | | | | | | |
| .5 | 2.82 | 11.20 | 1.54 | 2.41 | .84 | .527 | .53 | .169 | .30 | .045 | 1" | | 1¼" | | 1½" | |
| .6 | 3.38 | 15.75 | 1.85 | 3.32 | 1.01 | .747 | .63 | .238 | .36 | .064 | | | | | | |
| .8 | 4.52 | 27.40 | 2.46 | 5.77 | 1.34 | 1.30 | .84 | .407 | .48 | .102 | | | | | | |
| 1 | | | 3.08 | 8.80 | 1.68 | 1.98 | 1.06 | .605 | .60 | .152 | .37 | .049 | | | | |
| 2 | | | 6.16 | 33.60 | 3.37 | 7.17 | 2.11 | 2.18 | 1.20 | .552 | .74 | .170 | .43 | .045 | | |
| 3 | | | | | 5.05 | 15.30 | 3.16 | 4.67 | 1.80 | 1.18 | 1.12 | .353 | .64 | .094 | .47 | .044 |
| 4 | 2" | | | | 6.73 | 25.70 | 4.22 | 7.60 | 2.40 | 1.97 | 1.49 | .594 | .86 | .155 | .63 | .074 |
| 5 | | | | | | | 5.27 | 11.15 | 3.60 | 2.90 | 1.86 | .902 | 1.07 | .236 | .79 | .112 |
| 6 | .57 | .046 | 2½" | | | | 6.33 | 16.10 | 4.20 | 4.05 | 2.24 | 1.23 | 1.28 | .330 | .95 | .153 |
| 8 | .76 | .075 | | | | | 8.42 | 27.60 | 4.80 | 6.97 | 2.98 | 2.11 | 1.72 | .552 | 1.26 | .263 |
| 10 | .96 | .114 | .67 | .048 | 3" | | | | 6.01 | 10.52 | 3.72 | 3.08 | 2.14 | .834 | 1.57 | .386 |
| 15 | 1.43 | .233 | 1.00 | .099 | | | | | 9.02 | 22.00 | 5.60 | 6.46 | 3.21 | 1.76 | 2.36 | .813 |
| 20 | 1.91 | .386 | 1.34 | .164 | .87 | .059 | 3½" | | | | 7.44 | 11.05 | 4.29 | 2.91 | 3.15 | 1.35 |
| 25 | 2.39 | .581 | 1.68 | .248 | 1.08 | .087 | .81 | .042 | 4" | | | | 5.36 | 4.37 | 3.94 | 2.02 |
| 30 | 2.87 | .804 | 2.01 | .343 | 1.30 | .121 | .97 | .060 | | | | | 6.43 | 6.29 | 4.72 | 2.91 |
| 35 | 3.35 | 1.10 | 2.35 | .449 | 1.52 | .158 | 1.14 | .079 | .88 | .042 | | | 7.51 | 8.25 | 5.51 | 3.82 |
| 40 | 3.82 | 1.37 | 2.68 | .588 | 1.74 | .206 | 1.30 | .100 | 1.01 | .053 | | | | | 6.30 | 4.78 |
| 45 | 4.30 | 1.74 | 3.00 | .714 | 1.95 | .251 | 1.46 | .121 | 1.13 | .067 | | | | | 7.08 | 6.06 |
| 50 | 4.78 | 2.06 | 3.35 | .882 | 2.17 | .310 | 1.62 | .144 | 1.26 | .080 | 5" | | | | 7.87 | 7.47 |
| 60 | 5.74 | 2.96 | 4.02 | 1.22 | 2.60 | .429 | 1.95 | .207 | 1.51 | .110 | | | | | | |
| 70 | 6.69 | 3.86 | 4.69 | 1.53 | 3.04 | .584 | 2.27 | .271 | 1.76 | .150 | 1.12 | .048 | | | | |
| 80 | 7.65 | 5.03 | 5.37 | 2.17 | 3.48 | .762 | 2.59 | .353 | 2.01 | .187 | 1.28 | .063 | 6" | | | |
| 90 | 8.60 | 6.36 | 6.04 | 2.61 | 3.91 | .922 | 2.92 | .446 | 2.26 | .237 | 1.44 | .080 | | | | |
| 100 | 9.56 | 7.51 | 6.71 | 3.23 | 4.34 | 1.14 | 3.24 | .527 | 2.52 | .281 | 1.60 | .095 | 1.11 | .039 | | |
| 125 | | | 8.38 | 4.82 | 5.42 | 1.71 | 4.05 | .786 | 3.15 | .438 | 2.00 | .148 | 1.39 | .056 | | |
| 150 | | | 10.06 | 6.04 | 6.51 | 2.35 | 4.86 | 1.13 | 3.78 | .602 | 2.41 | .204 | 1.67 | .078 | | |
| 175 | | | 11.73 | 9.00 | 7.59 | 3.20 | 5.67 | 1.47 | 4.41 | .820 | 2.81 | .278 | 1.94 | .106 | 8" | |
| 200 | | | | | 8.68 | 3.97 | 6.48 | 1.92 | 5.04 | 1.02 | 3.21 | .346 | 2.22 | .132 | | |
| 225 | | | | | 9.77 | 5.02 | 7.29 | 2.31 | 5.67 | 1.29 | 3.61 | .437 | 2.50 | .166 | 1.44 | .044 |
| 250 | | | | | 10.85 | 6.19 | 8.10 | 2.85 | 6.30 | 1.59 | 4.01 | .514 | 2.78 | .205 | 1.60 | .055 |
| 275 | | | | | 11.94 | 7.50 | 8.91 | 3.44 | 6.93 | 1.83 | 4.41 | .622 | 3.06 | .236 | 1.76 | .063 |
| 300 | | | | | 13.02 | 8.47 | 9.72 | 4.09 | 7.56 | 2.18 | 4.81 | .741 | 3.33 | .280 | 1.92 | .075 |
| 325 | | | | | | | 10.53 | 4.55 | 8.18 | 2.55 | 5.21 | .825 | 3.61 | .329 | 2.08 | .088 |
| 350 | | | | | | | 11.35 | 5.27 | 8.82 | 2.97 | 5.61 | .957 | 3.89 | .362 | 2.24 | .097 |
| 375 | | | | | | | 12.17 | 6.07 | 9.45 | 3.23 | 6.01 | 1.10 | 4.16 | .416 | 2.40 | .111 |
| 400 | | | | | | | 12.97 | 6.89 | 10.08 | 3.67 | 6.41 | 1.25 | 4.44 | .472 | 2.56 | .127 |
| 425 | 10" | | | | | | 13.78 | 7.78 | 10.70 | 4.15 | 6.82 | 1.41 | 4.72 | .534 | 2.72 | .143 |
| 450 | | | | | | | 14.59 | 8.73 | 11.33 | 4.65 | 7.22 | 1.50 | 5.00 | .596 | 2.88 | .160 |
| 475 | 1.93 | .030 | | | | | | | 11.96 | 5.17 | 7.62 | 1.67 | 5.27 | .666 | 3.04 | .169 |
| 500 | 2.04 | .063 | | | | | | | 12.59 | 5.73 | 8.02 | 1.85 | 5.55 | .739 | 3.20 | .187 |
| 550 | 2.24 | .070 | | | | | | | 13.84 | 6.93 | 8.82 | 2.24 | 6.11 | .894 | 3.53 | .226 |
| 600 | 2.44 | .086 | 12" | | | | | | 15.10 | 8.25 | 9.62 | 2.67 | 6.66 | 1.06 | 3.85 | .270 |
| 650 | 2.65 | .101 | | | | | | | | | 10.42 | 3.13 | 7.21 | 1.18 | 4.17 | .316 |
| 700 | 2.85 | .118 | 2.01 | .048 | | | | | | | 11.22 | 3.63 | 7.77 | 1.37 | 4.49 | .369 |
| 750 | 3.05 | .135 | 2.15 | .055 | 14" | | | | | | 12.02 | 4.16 | 8.32 | 1.57 | 4.81 | .421 |
| 800 | 3.26 | .154 | 2.29 | .062 | | | | | | | 12.82 | 4.47 | 8.88 | 1.78 | 5.13 | .479 |
| 850 | 3.46 | .174 | 2.44 | .070 | 2.02 | .043 | | | | | 13.62 | 5.05 | 9.44 | 2.02 | 5.45 | .511 |
| 900 | 3.66 | .194 | 2.58 | .079 | 2.14 | .048 | | | | | 14.42 | 5.66 | 10.00 | 2.26 | 5.77 | .573 |
| 950 | 3.87 | .223 | 2.72 | .088 | 2.25 | .053 | | | | | 15.22 | 6.31 | 10.55 | 2.37 | 6.09 | .638 |
| 1,000 | 4.07 | .240 | 2.87 | .098 | 2.38 | .059 | 16" | | | | 16.02 | 7.00 | 11.10 | 2.63 | 6.41 | .708 |
| 1,100 | 4.48 | .274 | 3.16 | .118 | 2.61 | .068 | | | | | 17.63 | 8.46 | 12.22 | 3.18 | 7.05 | .856 |
| 1,200 | 4.88 | .327 | 3.45 | .140 | 2.85 | .081 | 2.18 | .040 | | | | | 13.32 | 3.78 | 7.69 | 1.02 |
| 1,300 | 5.29 | .383 | 3.73 | .156 | 3.09 | .095 | 2.36 | .047 | | | | | 14.43 | 4.44 | 8.33 | 1.13 |
| 1,400 | 5.70 | .444 | 4.02 | .180 | 3.32 | .110 | 2.54 | .054 | | | | | 15.54 | 5.15 | 8.97 | 1.30 |
| 1,500 | 6.10 | .511 | 4.30 | .207 | 3.55 | .119 | 2.73 | .062 | 18" | | | | 16.65 | 5.55 | 9.62 | 1.50 |
| 1,600 | 6.51 | .546 | 4.59 | .236 | 3.80 | .135 | 2.91 | .071 | | | | | 17.76 | 6.31 | 10.26 | 1.70 |
| 1,800 | 7.32 | .691 | 5.16 | .298 | 4.27 | .171 | 3.27 | .085 | 2.58 | .048 | | | 19.98 | 7.98 | 11.54 | 2.16 |
| 2,000 | 8.13 | .854 | 5.73 | .347 | 4.74 | .211 | 3.63 | .105 | 2.88 | .056 | 20" | | 22.20 | 9.85 | 12.83 | 2.50 |
| 2,500 | 10.18 | 1.25 | 7.17 | .541 | 5.92 | .309 | 4.54 | .163 | 3.59 | .088 | | | | | 16.03 | 3.90 |
| 3,000 | 12.21 | 1.80 | 8.60 | .731 | 7.12 | .445 | 5.45 | .221 | 4.31 | .127 | 3.45 | .073 | 24" | | 19.24 | 5.24 |
| 3,500 | 14.25 | 2.29 | 10.03 | .995 | 8.32 | .618 | 6.35 | .300 | 5.03 | .152 | 4.03 | .094 | | | 22.43 | 7.14 |
| 4,000 | 16.28 | 2.99 | 11.48 | 1.30 | 9.49 | .792 | 7.25 | .392 | 5.74 | .212 | 4.61 | .122 | 3.19 | .051 | 25.65 | 9.33 |
| 4,500 | 18.31 | 3.78 | 12.90 | 1.54 | 10.67 | .936 | 8.17 | .497 | 6.47 | .250 | 5.19 | .155 | 3.59 | .060 | | |
| 5,000 | 20.35 | 4.67 | 14.34 | 1.89 | 11.84 | 1.16 | 9.08 | .572 | 7.17 | .308 | 5.76 | .178 | 3.99 | .074 | | |
| 6,000 | 24.42 | 6.72 | 17.21 | 2.73 | 14.22 | 1.54 | 10.88 | .824 | 8.62 | .445 | 6.92 | .257 | 4.80 | .100 | | |
| 7,000 | 28.50 | 8.51 | 20.08 | 3.72 | 16.60 | 2.10 | 12.69 | 1.22 | 10.04 | .606 | 8.06 | .350 | 5.68 | .136 | | |
| 8,000 | | | 22.95 | 4.51 | 18.98 | 2.74 | 14.52 | 1.36 | 11.43 | .734 | 9.23 | .457 | 6.38 | .178 | | |
| 9,000 | | | 25.80 | 5.70 | 21.35 | 3.47 | 16.32 | 1.72 | 12.92 | .920 | 10.37 | .536 | 7.18 | .225 | | |
| 10,000 | | | 28.63 | 7.04 | 23.75 | 4.29 | 18.16 | 2.12 | 14.37 | 1.15 | 11.53 | .663 | 7.96 | .278 | | |
| 12,000 | | | 34.38 | 9.36 | 28.50 | 6.18 | 21.80 | 3.09 | 17.23 | 1.65 | 13.83 | .954 | 9.57 | .371 | | |
| 14,000 | | | | | 33.20 | 8.40 | 25.42 | 4.16 | 20.10 | 2.07 | 16.14 | 1.20 | 11.18 | .505 | | |
| 16,000 | | | | | | | 29.05 | 5.44 | 22.96 | 2.71 | 18.43 | 1.57 | 12.77 | .660 | | |

# Pressure Drop of Air Through Schedule 40 Steel Pipe

| Cubic Feet per Minute of Free Air At Atmospheric Pressure and Temperature 60° F. | Equivalent Cubic Feet per Minute of Compressed Air At 100 Pounds Gauge Pressure and Temperature 60° F. | Pressure Drop of Air Per 100 Feet of Schedule 40 Steel Pipe In Pounds per Square Inch at 100 Pounds Gauge Air Inlet Pressure | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/8" | 1/4" | 3/8" | 1/2" | | | | | |
| 1 | .128 | .394 | .087 | .019 | | | | | | |
| 2 | .256 | 1.51 | .311 | .068 | .021 | | | | | |
| 3 | .384 | 3.16 | .675 | .148 | .046 | 3/4" | | | | |
| 4 | .513 | 5.47 | 1.19 | .256 | .078 | | | | | |
| 5 | .641 | 8.60 | 1.80 | .396 | .118 | .030 | 1" | | | |
| 6 | .769 | | 2.56 | .556 | .165 | .042 | | | | |
| 8 | 1.025 | | 4.50 | .962 | .276 | .070 | .020 | | | |
| 10 | 1.282 | | 6.85 | 1.42 | .407 | .100 | .031 | 1 1/4" | | |
| 15 | 1.922 | | | 2.93 | .890 | .211 | .063 | | 1 1/2" | |
| 20 | 2.563 | | | 5.03 | 1.53 | .361 | .105 | .028 | | |
| 25 | 3.204 | | | 7.85 | 2.31 | .546 | .158 | .043 | .020 | |
| 30 | 3.845 | | | | 3.22 | .785 | .227 | .060 | .027 | |
| 35 | 4.486 | | | | 4.21 | 1.03 | .297 | .075 | .035 | |
| 40 | 5.126 | | | | 5.52 | 1.35 | .388 | .105 | .046 | 2" |
| 45 | 5.767 | | | | 6.72 | 1.64 | .492 | .129 | .056 | |
| 50 | 6.408 | | | | 8.27 | 2.02 | .580 | .154 | .069 | .020 |
| 60 | 7.690 | 2 1/2" | | | | 2.92 | .835 | .221 | .099 | .028 |
| 70 | 8.971 | | | | | 3.82 | 1.14 | .290 | .134 | .037 |
| 80 | 10.25 | .020 | | | | 4.98 | 1.43 | .375 | .168 | .048 |
| 90 | 11.53 | .025 | | | | 6.07 | 1.81 | .476 | .213 | .058 |
| 100 | 12.82 | .031 | 3" | | | 7.47 | 2.14 | .587 | .253 | .068 |
| 125 | 16.02 | .046 | | | | | 3.34 | .887 | .397 | .108 |
| 150 | 19.22 | .067 | .023 | | | | 4.82 | 1.22 | .542 | .155 |
| 175 | 22.43 | .088 | .031 | 3 1/2" | | | 6.28 | 1.66 | .738 | .201 |
| 200 | 25.36 | .110 | .038 | | | | 8.02 | 2.03 | .900 | .257 |
| 225 | 28.84 | .137 | .049 | .023 | | | | 2.63 | 1.17 | .333 |
| 250 | 32.04 | .169 | .057 | .029 | | | | 3.24 | 1.44 | .392 |
| 275 | 35.24 | .204 | .069 | .033 | | | | 3.76 | 1.66 | .475 |
| 300 | 38.45 | .243 | .082 | .040 | 4" | | | 4.47 | 1.98 | .565 |
| 325 | 41.65 | .272 | .096 | .047 | | | | 5.27 | 2.31 | .662 |
| 350 | 44.86 | .316 | .112 | .052 | .027 | | | 5.77 | 2.68 | .767 |
| 375 | 48.06 | .362 | .128 | .059 | .032 | | | 6.65 | 3.08 | .840 |
| 400 | 51.26 | .413 | .140 | .068 | .036 | | | 7.55 | 3.51 | .955 |
| 425 | 54.47 | .466 | .157 | .076 | .041 | | | 8.55 | 3.76 | 1.08 |
| 450 | 57.67 | .507 | .176 | .086 | .045 | | | | 4.22 | 1.14 |
| 475 | 60.88 | .552 | .197 | .095 | .051 | | | | 4.70 | 1.28 |
| 500 | 64.08 | .611 | .218 | .100 | .056 | | | | 5.20 | 1.41 |
| 550 | 70.49 | .740 | .263 | .122 | .064 | | | | 5.95 | 1.71 |
| 600 | 76.90 | .880 | .298 | .144 | .077 | 5" | | | 7.10 | 2.03 |
| 650 | 83.30 | .980 | .350 | .169 | .090 | | | | | 2.38 |
| 700 | 89.71 | 1.04 | .405 | .185 | .099 | .034 | | | | 2.77 |
| 750 | 96.12 | 1.31 | .441 | .213 | .113 | .039 | | | | 3.18 |
| 800 | 102.5 | 1.49 | .500 | .242 | .129 | .044 | | | | 3.42 |
| 850 | 108.9 | 1.68 | .565 | .273 | .146 | .047 | 6" | | | 3.87 |
| 900 | 115.3 | 1.88 | .633 | .306 | .154 | .053 | | | | 4.32 |
| 950 | 121.8 | 1.98 | .707 | .341 | .172 | .059 | .023 | | | 4.82 |
| 1000 | 128.2 | 2.19 | .782 | .357 | .190 | .065 | .026 | | | 5.33 |
| 1100 | 141.0 | 2.65 | .895 | .432 | .231 | .079 | .031 | | | 6.10 |
| 1200 | 153.8 | 3.16 | 1.07 | .515 | .275 | .094 | .035 | | | 7.27 |
| 1300 | 166.6 | 3.70 | 1.25 | .603 | .322 | .110 | .042 | | | 8.52 |
| 1400 | 179.4 | 4.30 | 1.45 | .700 | .376 | .127 | .048 | | | |
| 1500 | 192.2 | 4.65 | 1.66 | .803 | .428 | .139 | .055 | 8" | | |
| 1600 | 205.1 | 5.27 | 1.92 | .915 | .487 | .158 | .063 | | | |
| 1800 | 230.7 | 6.67 | 2.40 | 1.11 | .580 | .199 | .080 | .021 | | |
| 2000 | 256.3 | 8.25 | 2.79 | 1.35 | .717 | .246 | .093 | .025 | 10" | |
| 2500 | 320.4 | | 4.35 | 2.11 | 1.12 | .385 | .145 | .037 | | |
| 3000 | 384.5 | | 6.27 | 3.02 | 1.51 | .522 | .208 | .053 | .017 | |
| 3500 | 448.6 | | 8.52 | 4.11 | 2.06 | .710 | .265 | .071 | .023 | |
| 4000 | 512.6 | | | 5.37 | 2.69 | .927 | .347 | .088 | .030 | 12" |
| 4500 | 576.7 | | | 6.40 | 3.41 | 1.10 | .438 | .111 | .036 | |
| 5000 | 640.8 | | | 7.90 | 4.20 | 1.36 | .540 | .137 | .044 | .020 |
| 6000 | 769.0 | | | | 5.63 | 1.94 | .726 | .197 | .063 | .026 |
| 7000 | 897.1 | | | | 7.70 | 2.48 | .990 | .268 | .086 | .036 |
| 8000 | 1025 | | | | | 3.24 | 1.29 | .324 | .113 | .047 |
| 9000 | 1153 | | | | | 4.10 | 1.52 | .410 | .142 | .059 |
| 10000 | 1282 | | | | | 5.05 | 1.87 | .505 | .164 | .074 |
| 11000 | 1410 | | | | | 6.13 | 2.27 | .574 | .199 | .089 |
| 12000 | 1538 | | | | | 6.77 | 2.70 | .683 | .237 | .099 |
| 13000 | 1666 | | | | | 7.95 | 3.17 | .802 | .278 | .115 |
| 14000 | 1794 | | | | | 9.20 | 3.67 | .928 | .299 | .134 |
| 15000 | 1922 | | | | | | 4.22 | 1.07 | .343 | .154 |
| 16000 | 2051 | | | | | | 4.78 | 1.21 | .390 | .162 |
| 18000 | 2307 | | | | | | 5.60 | 1.53 | .493 | .205 |
| 20000 | 2563 | | | | | | 6.92 | 1.89 | .610 | .253 |
| 22000 | 2820 | | | | | | 8.37 | 2.29 | .737 | .307 |
| 24000 | 3076 | | | | | | | 2.52 | .827 | .365 |
| 26000 | 3332 | | | | | | | 2.96 | 1.03 | .428 |
| 28000 | 3588 | | | | | | | 3.44 | 1.11 | .498 |
| 30000 | 3845 | | | | | | | 3.61 | 1.27 | .572 |

***For lengths of pipe other than 100 feet,*** the pressure drop is proportional to the length. Thus, for 50 feet of pipe, the pressure drop is approximately one-half the value given in the table; for 300 feet, three times the given value, etc.

***For inlet pressures other than 100 pounds gauge,*** the pressure drop is inversely proportional to the absolute pressure. Thus, for 100 feet of Schedule 40 steel pipe, multiply the values given in the table by the ratio:

$$\frac{100 + 14.7}{P_1 + 14.7}$$

*Where $P_1$ is the gauge pressure under consideration.*

***The equivalent cubic feet per minute*** of compressed air at any pressure is inversely proportional to the absolute pressure. To determine, multiply the value of the cubic feet per minute of free air at atmospheric pressure by the ratio:

$$\frac{14.7}{14.7 + P_1}$$

*Where $P_1$ is the gauge pressure under consideration.*

# Simplified Steam Flow Formula for Pressure Drop, Rate of Flow, and Pipe Size

The Fanning formula for the flow of steam can be written in the form:

$$\Delta P_{100} = C_1 C_2 C_3 \bar{V}$$

$C_1$ = discharge factor—obtain from chart below
$C_2$ = size factor—obtain from table on opposite page.
$C_3$ = viscosity factor—obtain from chart on opposite page.
$\Delta P_{100}$ = pressure drop per 100 feet of pipe, in pounds per square inch.
$\bar{V}$ = average specific volume of steam—obtain from steam tables, pages 570 to 576.

**Example 1:** Find the pressure drop in 100 feet of 8-inch Standard (Schedule 40) pipe if the steam pressure and temperature are 360 pounds per square inch absolute and 500° Fahrenheit, respectively. The discharge is 240,000 pounds per hour.

***Solution:*** From the tables and figures, the following values are found: $C_1 = 26.7$, $C_2 = 0.263$, $C_3 = 0.996$, and $\bar{V} = 1.45$. If we put these values in the steam flow formula and solve for $\Delta P_{100}$, we find: $\Delta P_{100} = 10.14$ pounds per square inch per 100 feet.

**Example 2:** Find the rate of flow, in pounds per hour, in a 4-inch Schedule 40 pipe if the pressure drop is 8 pounds per square inch per 100 feet. Saturated steam at 150 pounds absolute pressure is flowing in the pipe.

***Solution:*** From the given conditions and the tables and figures we find $\Delta P_{100} = 8.0$, $C_2 = 7.73$, $C_3 = 0.972$, and $\bar{V} = 3.0$. If we substitute these values into the steam flow formula and solve for $C_1$, we get $C_1 = 0.355$. By referring to the chart at the right, the discharge for this value of $C_1$ is found to be 23,000 pounds per hour.

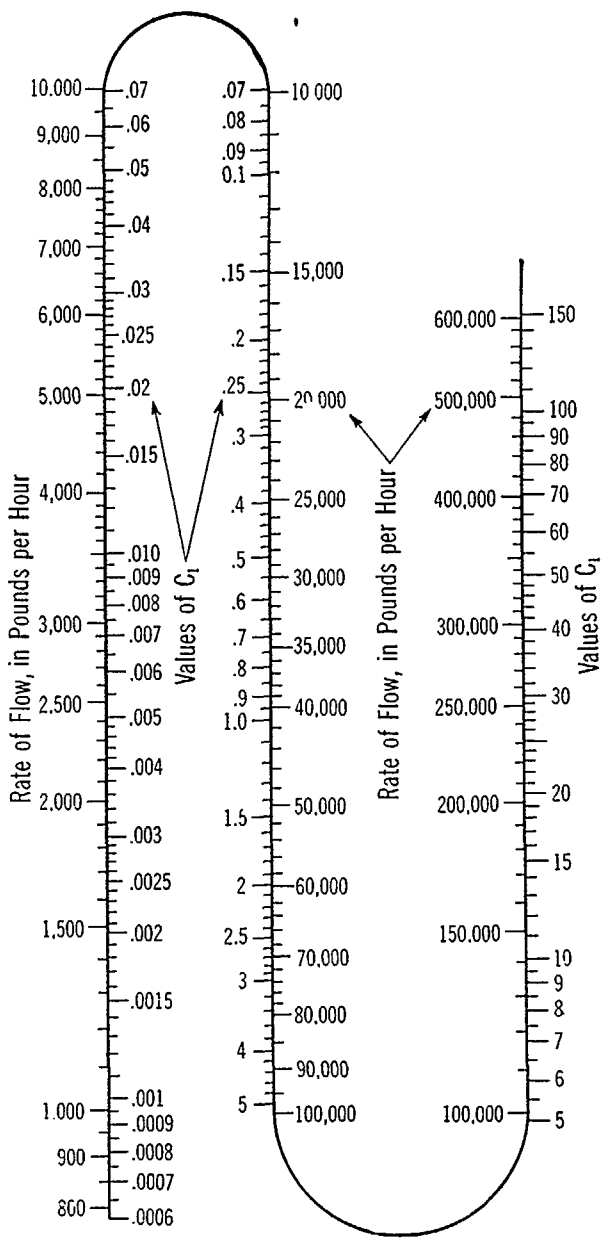
**Example 3:** Find the smallest size of Schedule 40 (Standard) pipe that can be used for a process requiring 20,000 pounds of saturated steam per hour, if the initial steam pressure is 100 psi absolute and the maximum allowable pressure drop is 10 pounds per square inch per 100 feet of pipe.

***Solution:*** From the given conditions and the tables and figures:

$\Delta P_{100} = 10$, $C_1 = 0.257$, $C_3 = 0.96$, and $\bar{V} = 4.432$.

Substituting these values in the steam flow formula, and solving for $C_2$, it is found that $C_2 = 9.2$. From the table, 4-inch Schedule 40 pipe is the smallest size that will provide a value of $C_2$ less than the calculated value. The actual pressure drop per 100 feet of 4-inch Schedule 40 pipe may now be calculated as 8.5 psi by solving the steam flow formula using the table value of 7.73 for $C_2$.

Values of $C_1$



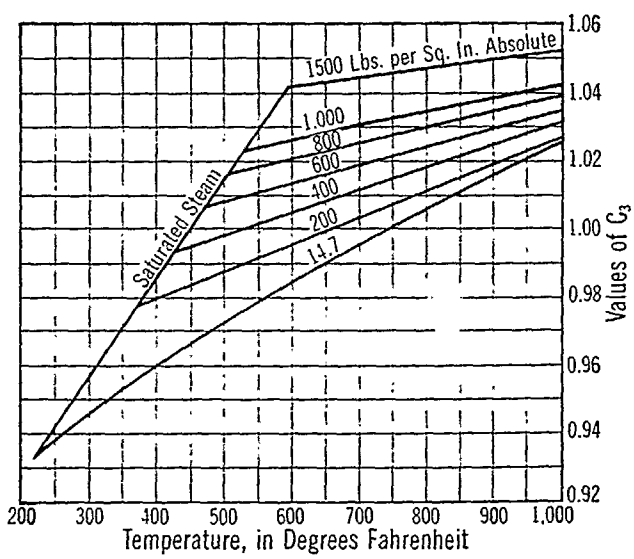
# Simplified Steam Flow Formula for Pressure Drop, Rate of Flow, and Pipe Size

*(Continued)*

## Values of $C_2$

| Nominal Pipe Size Inches | Schedule Number of Pipe | Internal Diameter of Pipe Inches | Value of $C_2$ |
|---|---|---|---|
| 1 | 40 | 1.049 | 6420. |
| | 80 | 0.957 | 10050. |
| | 160 | 0.815 | 21950. |
| 1¼ | 40 | 1.380 | 1687. |
| | 80 | 1.278 | 2455. |
| | 160 | 1.160 | 3935. |
| 1½ | 40 | 1.610 | 755. |
| | 80 | 1.500 | 1067. |
| | 160 | 1.338 | 1860. |
| 2 | 40 | 2.067 | 213. |
| | 80 | 1.939 | 291. |
| | 160 | 1.689 | 570. |
| 2½ | 40 | 2.469 | 80.1 |
| | 80 | 2.323 | 121. |
| | 160 | 2.125 | 188. |
| 3 | 40 | 3.068 | 31.2 |
| | 80 | 2.900 | 40.9 |
| | 160 | 2.626 | 66.7 |
| 3½ | 40 | 3.548 | 15.0 |
| | 80 | 3.364 | 19.5 |
| 4 | 40 | 4.026 | 7.73 |
| | 80 | 3.826 | 9.91 |
| | 120 | 3.626 | 12.8 |
| | 160 | 3.438 | 17.5 |
| 5 | 40 | 5.047 | 2.57 |
| | 80 | 4.813 | 3.18 |
| | 120 | 4.563 | 4.22 |
| | 160 | 4.313 | 5.52 |
| 6 | 40 | 6.065 | 1.00 |
| | 80 | 5.761 | 1.28 |
| | 120 | 5.501 | 1.62 |
| | 160 | 5.189 | 2.16 |
| 8 | 30 | 8.071 | 0.249 |
| | 40 | 7.981 | 0.263 |
| | 60 | 7.813 | 0.291 |
| | 80 | 7.625 | 0.328 |
| | 100 | 7.439 | 0.369 |
| | 120 | 7.189 | 0.435 |
| | 160 | 6.813 | 0.568 |
| 10 | 30 | 10.136 | 0.0819 |
| | 40 | 10.020 | 0.0866 |
| | 60 | 9.750 | 0.0980 |
| | 80 | 9.564 | 0.109 |
| | 100 | 9.314 | 0.1235 |
| | 120 | 9.064 | 0.141 |
| | 140 | 8.750 | 0.168 |
| | 160 | 8.500 | 0.193 |
| 12 | 30 | 12.090 | 0.0344 |
| | 40 | 11.938 | 0.0366 |
| | 60 | 11.626 | 0.0420 |
| | 80 | 11.376 | 0.0467 |
| | 100 | 11.064 | 0.0534 |
| | 120 | 10.750 | 0.0615 |
| | 140 | 10.500 | 0.0690 |
| | 160 | 10.126 | 0.0823 |

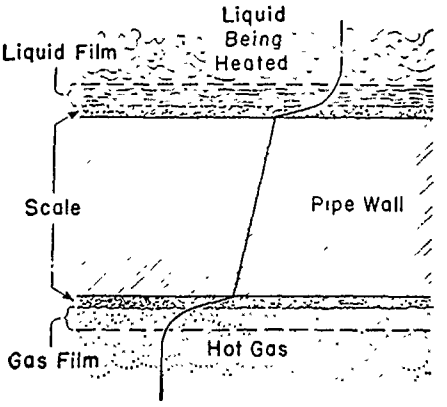
## Values of $C_3$



# Theory of Heat Transfer Through Pipe Walls

The conduction of heat through a pipe wall is shown diagrammatically in the illustration at the right. It shows the transfer of heat from a hot gas (such as steam) to a liquid (such as water).

The heat is conducted first from the hot gas through the gas film, then through the corrosion scale on the pipe wall due to the gas, through the pipe wall itself, then through the corrosion scale on the pipe wall due to the liquid, and finally through the liquid film to the liquid.




The general formula for the transfer of heat through pipes is given as

$$Q = U\,A\,T \qquad \textit{Formula 1}$$

Where: $Q$ = Total heat to be transmitted in Btu per hour.
$U$ = Over-all coefficient of heat transfer in Btu per hour per square feet per degree F.
$A$ = Amount of heating surface in the pipe coil expressed in square feet.
$T$ = The logarithmic mean temperature difference between the hot and cold fluids in degrees F.

### Determination of Q

The total heat to be transmitted "$Q$" is determined by multiplying the weight of the fluid per unit of time (pounds per hour), the specific heat of the fluid at the average fluid temperature, and the fluid change in temperature in degrees F. If the fluid alters its phase, that is, if the fluid changes from a liquid to a gas or from a gas to a liquid, then the heat of vaporization must be considered in this calculation. If the fluid is to give up heat through radiation, emission, or surface convection, such heat losses also must be considered.

### Determination of A

Since "$A$" is the unknown to be solved, Formula 1 becomes $A = \frac{Q}{UT}$. The number of square feet of heating surface, "$A$", can be converted readily into the number of feet of pipe of any particular size and wall thickness by dividing the value of "A" by the external surface area in square feet per foot as given in the table of Pipe Data, pages 490 and 491.

### Determination of T

A true average temperature difference between the hot and cold fluids "$T$" is called the logarithmic mean temperature difference and is determined by the following formula:

$$T = \frac{GTD - LTD}{2.3 \text{ Log } \frac{GTD}{LTD}} \qquad \textit{Formula 2}$$

Where:
$GTD$ = Greatest temperature difference between the fluids.
$LTD$ = Least temperature difference between the fluids.

(*See pages 566 and 567 for table of Common Logarithms*).

### Determination of U

The over-all coefficient of heat transfer "$U$" is dependent upon a large number of variables, including the conductivity and thickness of the metal in the pipe wall, the fluid velocity, specific heat, conductivity, density and viscosity, and the oxidation or scaling effect of the fluid on the pipe wall, as well as other physical characteristics such as the quantity of entrapped gases in the fluid, etc. The value of "$U$" may, therefore, be determined accurately only by experiment.

Generally accepted approximations of over-all heat transfer coefficients are listed in the table on the opposite page.

If a scale of rust or oxide builds up on either the inner or outer pipe walls, the value of "$U$" will be greatly reduced. In some cases, therefore, the substitution of a copper or alloy pipe coil for steel pipe will greatly improve the over-all rate of heat transfer, not because of the change in conductivity of the metal but because the pipe surface stays bright and practically rust free.

Selection of a value for "$U$" should be based upon a consideration of the conditions under which the coil will be operated. The maximum values should be used only when the velocity of the cooling and the cooled fluids is high and when corrosion or scaling of the pipe is negligible. The coefficients given in the column headed "Free Convections" are those obtained with pipe coils and pipe immersed in liquids under normally static conditions. The column headed "Forced Convections" covers pipe coils and pipe immersed in liquids that are agitated either by mechanical means or by a continuous flow of the fluid through the vessel.

# Design of Pipe Coils for Heat Transfer

The following practical hints and recommendations are presented to aid the designer of pipe coils for heat transfer.

1. "Overdesign" rather than "underdesign". It is a simple matter to cut down the conductivity of a pipe coil but more difficult to increase it.

2. Have adequate means for removal of condensate.

3. Remove entrapped gases from liquids.

4. It is important that pressure drop be considered in designing a pipe coil, to determine the limitations on length of a given pipe size. If excessively long lines are used, they may not be capable of transmitting the required quantity of fluid at the available initial pressure. Keeping this limitation in mind, it is desirable to use fluid velocities as high as possible, so that the resistance to heat transfer due to the film is lowered.

Data for calculating the pressure drop in steam lines is given on page 534, water lines on page 532, and air lines on page 533. In a coil using smooth pipe bends, the actual pipe length should be converted to an equivalent pipe length, for purposes of calculating pressure drop on the basis of the chart on page 540 showing the resistance of 90° bends. If other fittings such as return bends or elbows are used, equivalent length may be based on data shown on page 531.

For steam condensing in a pipe coil, the quantity of steam passing through the coil varies from total input at the inlet to zero pounds per hour at the outlet, and the amount of condensate varies from zero pounds per hour at the inlet to total weight per hour at the outlet. Obviously, the total pressure drop in the coil will be equal to the sum of the losses due to the flow of the steam and the water. However, due to the high ratio of the specific volumes of the two fluids, the percentage of pipe cross-section that is occupied by the water is negligible and the pressure drop due to the flow of condensate may therefore be neglected in the calculation of practical problems. The pressure drop due to the flow of steam will be high near the inlet, and will decrease approximately as the square of the velocity as the steam passes through the coil. From this relationship, combined with the effect of increased specific volume of the steam due to pressure drop, it can be shown that the average velocity of the steam in the coil is approximately three-fourths of the maximum or initial velocity, and for the purpose of calculating pressure drop, the same ratio may be used to determine the average quantity of steam flowing within the coil.

5. Give careful consideration to the installation of those accessories which are necessary adjuncts for the successful use of pipe coils, such as pressure and temperature indicators and regulators, safety and relief valves, traps, vent valves, and sediment separators.

6. The shape and dimensions of the vessel determine the dimensional limits and design of the pipe coil which is to be installed. The illustrations of pipe coils given on pages 518 to 521 will aid in the selection of the most applicable design.

The sample problem on the page following shows the procedure for determining the pipe size and lineal feet of pipe required in a pipe coil containing steam at a given pressure and specified allowable pressure drop, to raise the temperature of a given quantity of water per unit of time a specified amount.

(*Continued on the next page*)

## Ordinary Ranges of U*[1]

**Over-all Coefficients "U" Expressed in Btu per Hour per Square Foot per Degree F.**
(See preceding page for explanation—"Determination of U")

| Fluid Giving Up Heat | Fluid Receiving Heat | State of Controlling Resistance: Free Convections *U* | State of Controlling Resistance: Forced Convections *U* | Typical Fluid | Typical Apparatus |
|---|---|---|---|---|---|
| Liquid | Liquid | 25-60 | 150-300 | Water | Liquid Heat Exchangers, etc. |
| | | 5-10 | 20-50 | Oil | |
| | Gas | 1-3 | 2-10 | Water to Air | Hot Water Radiators, Cooling Tower Surfaces |
| | Boiling Liquid | 20-60 | 50-150 | Water | Brine Coolers |
| | | 5-20 | 25-60 | Oil | |
| Gas | Liquid | 1-3 | 2-10 | Air to Water | Air Coolers, Economizers |
| | Gas | 0.6-2 | 2-6 | Gas to Steam | Steam Superheaters |
| | Boiling Liquid | 1-3 | 2-10 | Gas to Boiling Water | Steam Boilers |
| Condensing Vapor | Liquid | 50-200 | 150-800 | Steam to Water | Condensers, Feed Water Heaters |
| | | 10-30 | 20-60 | Steam to Oil | |
| | Gas | 1-2 | 2-10 | Steam to Air | Steam Pipes in Air, Air Heaters |
| | Boiling Liquid | 300-800 | | Steam to Water | Vacuum Evaporators |
| | | 50-150 | | Steam to Oil | |

*Under special conditions higher or lower values may be realized.

[1] W. H. McAdams, "Heat Transmission" (McGraw-Hill Book Co., Inc.) from data given by A. P. Colburn (Copyright 1942).

# Design of Pipe Coils for Heat Transfer (Cont.)

### *Sample Problem*

1000 gallons of hot water per hour is required. The water is to be heated from 50° to 180° F. with 25 lb. gauge steam in a single cylindrical steel pipe coil (Standard or Schedule 40 pipe) immersed in water. The coil is to be 3'-0" center to center in diameter. The pressure drop through the coil shall not exceed 5 psi. *Determine the size of pipe from which the coil should be made and the number of turns required in the coil.*

### *Solution*

Refer to the steam tables, pages 570 to 573, and determine the properties of the steam, as follows:

$$\text{Average pressure} = \frac{25 + (25 - 5)}{2} = 22.5 \text{ psi}$$

Average specific volume = 11.29 cu. ft./lb.

Latent Heat of Steam at avg. press. = 936 BTU/lb.

Temp. of 25 lb. steam = 267° F.

Temp. of 20 lb. steam = 259° F. (minimum allowable downstream pressure)

Fluid change in temp. = 180° F. − 50° F. = 130° F.

Refer to table of thermal properties of water, page 530 and determine the weight per gallon of 180° F. water equals 8.098 pounds.

### Determination of Q

$$Q = 8.098 \times 1000 \times 130$$
$$= 1{,}053{,}000 \text{ BTU/hr. required.}$$

### Determination of U

From the conditions given, water flows through the heat exchanger at the rate of 1000 GPH, giving continuous flow. Therefore, a value of "U" will be selected from the column headed "Forced Convections." The velocity of the water as it passes the coil will obviously be low, and since steel pipe is used, some rusting may be expected. The minimum value of "U" for forced convections, i. e., $U = 150$, is therefore used.

### Determination of T (*Use Formula 2*)

$$GTD = 267 - 50 = 217° \text{ F.}$$
$$LTD = 259 - 180 = 79° \text{ F.}$$
$$T = \frac{217 - 79}{2.3 \log \frac{217}{79}} = \frac{138}{2.3 \log 2.75} =$$
$$\frac{138}{2.3 \times .4393} = 136° \text{ F.}$$

### Determination of A (*Use Formula 1*)

$$A = \frac{1{,}053{,}000}{150 \times 136} = 51.5 \text{ sq. ft.}$$

### Determination of Pipe Size and Length of Pipe

Refer to the table of Pipe Data, pages 400 and 401, to determine the inside diameter and external area per foot of the probable pipe sizes.

| Size | Inside Diameter | External Surface Square Feet per Foot |
|---|---|---|
| 1¼ | 1.380 | .435 |
| 1½ | 1.610 | .497 |
| 2 | 2.067 | .622 |

Calculate the length of pipe required to give the required area of heating surface:

$$(1\tfrac{1}{4}'') = \frac{51.5}{.435} = 118 \text{ feet}$$

$$(1\tfrac{1}{2}'') = \frac{51.5}{.497} = 104 \text{ feet}$$

$$(2'') = \frac{51.5}{.622} = 83 \text{ feet}$$

To determine the equivalent length of the coil for purposes of calculating pressure drop, calculate the relative radius R/D by dividing the radius of the coil by the ID of the pipe, and refer to the Chart for resistance of 90° bends to determine the total resistance and resistance due to the length of the bends.

| Size | R/D | Pipe Diameter | |
|---|---|---|---|
| | | Total Resistance | Resistance Due to Length |
| 1¼ | 13.0 | 37 | 21 |
| 1½ | 11.2 | 32 | 18 |
| 2 | 8.7 | 26 | 14 |

The equivalent length of the circular coil, then, is equal to the lineal length of the pipe times the ratio of the total resistance to the resistance due to length.

Equivalent Length:

$$(1\tfrac{1}{4}'') = \frac{37}{21} \times 118 = 208 \text{ feet of straight pipe}$$

$$(1\tfrac{1}{2}'') = \frac{32}{18} \times 104 = 185 \text{ feet of straight pipe}$$

$$(2'') = \frac{26}{14} \times 83 = 154 \text{ feet of straight pipe}$$

Amount of steam that must be condensed to provide

$$1{,}053{,}000 \text{ BTU} = \frac{1{,}053{,}000}{936} = 1130 \text{ lbs./hr.}$$

For the purpose of calculating pressure drop, the average quantity of steam flowing within the coil may be assumed as, = .75 × 1130 = 850 pounds per hour. Refer to pages 534 and 535 to determine pressure drops as follows:

| Size | $C_1$ | $C_2$ | $C_3$ | $\Delta P_{10}$ |
|---|---|---|---|---|
| 1¼ | .0007 | 1087 | .95 | 12.07 |
| 1½ | .0007 | 755 | .95 | 5.07 |
| 2 | .0007 | 213 | .95 | 1.6 |

By inspection, the conditions of the problem i. e., 5 psi maximum pressure drop, cannot be met with either 1¼" or 1½" pipe, and 2" pipe must be used. Total pressure drop in the 2" coil will be:

$$\frac{154}{100} \times 1.6, \text{ or } 2.46 \text{ psi}$$

Number of coils required will be:

$$\frac{S3}{\pi D} = 8.8. \text{ or } 9 \text{ coils.}$$

# Thermal Properties of Water

| Temperature of Water Degrees Fahr. | Saturation Pressure Pounds per Square Inch Absolute | Specific Volume Cubic Feet per Pound | Density Pounds per Cubic Foot | Weight Pounds per Gallon | Specific Heat | Specific Gravity |
|---|---|---|---|---|---|---|
| 32 | .08854 | .01602 | 62.42 | 8.345 | 1.0093 | 1.001 |
| 40 | .12170 | .01602 | 62.42 | 8.345 | 1.0048 | 1.001 |
| 50 | .17811 | .01603 | 62.38 | 8.340 | 1.0015 | 1.000 |
| 60 | .2563 | .01604 | 62.34 | 8.334 | .9995 | 1.000 |
| 70 | .3631 | .01606 | 62.27 | 8.325 | .9982 | .998 |
| 80 | .5069 | .01608 | 62.19 | 8.314 | .9975 | .997 |
| 90 | .6982 | .01610 | 62.11 | 8.303 | .9971 | .996 |
| 100 | .9492 | .01613 | 62.00 | 8.289 | .9970 | .994 |
| 110 | 1.2748 | .01617 | 61.84 | 8.267 | .9971 | .991 |
| 120 | 1.6924 | .01620 | 61.73 | 8.253 | .9974 | .990 |
| 130 | 2.2225 | .01625 | 61.54 | 8.227 | .9978 | .987 |
| 140 | 2.8886 | .01629 | 61.39 | 8.207 | .9984 | .984 |
| 150 | 3.718 | .01634 | 61.20 | 8.182 | .9990 | .981 |
| 160 | 4.741 | .01639 | 61.01 | 8.156 | .9998 | .978 |
| 170 | 5.992 | .01645 | 60.79 | 8.127 | 1.0007 | .975 |
| 180 | 7.510 | .01651 | 60.57 | 8.098 | 1.0017 | .971 |
| 190 | 9.339 | .01657 | 60.35 | 8.068 | 1.0028 | .968 |
| 200 | 11.526 | .01663 | 60.13 | 8.039 | 1.0039 | .964 |
| 210 | 14.123 | .01670 | 59.88 | 8.005 | 1.0052 | .960 |
| 212 | 14.696 | .01672 | 59.81 | 7.996 | 1.0055 | .959 |
| 220 | 17.186 | .01677 | 59.63 | 7.972 | 1.0068 | .956 |
| 240 | 24.969 | .01692 | 59.10 | 7.901 | 1.0104 | .947 |
| 260 | 35.429 | .01709 | 58.51 | 7.822 | 1.0148 | .938 |
| 280 | 49.203 | .01726 | 57.94 | 7.746 | 1.020 | .929 |
| 300 | 67.013 | .01745 | 57.31 | 7.662 | 1.026 | .919 |
| 350 | 134.63 | .01799 | 55.59 | 7.432 | 1.044 | .891 |
| 400 | 247.31 | .01864 | 53.65 | 7.172 | 1.067 | .860 |
| 450 | 422.6 | .0194 | 51.55 | 6.892 | 1.095 | .826 |
| 500 | 680.8 | .0204 | 49.02 | 6.553 | 1.130 | .786 |
| 550 | 1045.2 | .0218 | 45.87 | 6.132 | 1.200 | .735 |
| 600 | 1542.9 | .0236 | 42.37 | 5.664 | 1.362 | .679 |
| 700 | 3093.7 | .0369 | 27.10 | 3.623 | | .434 |

Weight per Gallon based on 7.48 Gallons per Cubic Foot.

# Weight of Air at Various Pressures and Temperatures[1]

| Temp. of Air Deg. Fahr. | Gauge Pressure, in Pounds per Square Inch (Based on an Atmospheric Pressure of 14.7 Pounds per Square Inch Absolute at Sea Level) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 175 | 200 | 225 | 250 | 300 |
| | Weight (Density), in Pounds per Cubic Foot | | | | | | | | | | | | | | | | | | | | | |
| −20 | .0900 | .1205 | .1515 | .2125 | .2744 | .3360 | .3970 | .4580 | .5190 | .5800 | .6410 | .702 | .7635 | .825 | .886 | .948 | 1.010 | 1.165 | 1.318 | 1.465 | 1.625 | 1.930 |
| −10 | .0882 | .1184 | .1485 | .2090 | .2685 | .3283 | .3880 | .4478 | .5076 | .5674 | .6272 | .687 | .747 | .807 | .868 | .928 | .989 | 1.139 | 1.288 | 1.438 | 1.588 | 1.890 |
| 0 | .0864 | .1160 | .1455 | .2040 | .2630 | .3215 | .3800 | .4385 | .4970 | .5555 | .6140 | .672 | .731 | .790 | .849 | .908 | .968 | 1.114 | 1.260 | 1.406 | 1.553 | 1.850 |
| 10 | .0846 | .1136 | .1425 | .1995 | .2568 | .3145 | .3720 | .4292 | .4863 | .5433 | .6006 | .658 | .716 | .774 | .832 | .889 | .947 | 1.090 | 1.233 | 1.376 | 1.520 | 1.810 |
| 20 | .0828 | .1112 | .1395 | .1955 | .2516 | .3071 | .3645 | .4205 | .4770 | .5330 | .5890 | .645 | .701 | .757 | .813 | .869 | .927 | 1.067 | 1.208 | 1.348 | 1.489 | 1.770 |
| 30 | .0811 | .1088 | .1366 | .1916 | .2465 | .3015 | .3570 | .4121 | .4672 | .5221 | .5771 | .632 | .687 | .742 | .797 | .852 | .908 | 1.046 | 1.184 | 1.322 | 1.460 | 1.735 |
| 40 | .0795 | .1067 | .1338 | .1876 | .2415 | .2954 | .3503 | .4038 | .4576 | .5114 | .5652 | .619 | .673 | .727 | .781 | .835 | .890 | 1.025 | 1.161 | 1.296 | 1.431 | 1.701 |
| 50 | .0780 | .1045 | .1310 | .1839 | .2367 | .2905 | .3432 | .3960 | .4487 | .5014 | .5541 | .607 | .660 | .713 | .766 | .819 | .873 | 1.006 | 1.139 | 1.271 | 1.403 | 1.668 |
| 60 | .0764 | .1025 | .1283 | .1803 | .2323 | .2840 | .3362 | .3882 | .4402 | .4927 | .5447 | .596 | .649 | .700 | .752 | .804 | .856 | .988 | 1.116 | 1.245 | 1.376 | 1.636 |
| 70 | .0750 | .1005 | .1260 | .1770 | .2280 | .2791 | .3302 | .3808 | .4316 | .4824 | .5332 | .584 | .635 | .686 | .737 | .788 | .839 | .967 | 1.095 | 1.223 | 1.350 | 1.604 |
| 80 | .0736 | .0988 | .1239 | .1738 | .2237 | .2739 | .3242 | .3738 | .4234 | .4729 | .5224 | .572 | .622 | .673 | .723 | .774 | .824 | .949 | 1.074 | 1.199 | 1.325 | 1.573 |
| 90 | .0723 | .0970 | .1218 | .1707 | .2195 | .2688 | .3182 | .3670 | .4154 | .4639 | .5122 | .561 | .611 | .660 | .709 | .759 | .809 | .932 | 1.054 | 1.177 | 1.300 | 1.544 |
| 100 | .0710 | .0954 | .1197 | .1676 | .2155 | .2638 | .3122 | .3602 | .4079 | .4555 | .5033 | .551 | .599 | .648 | .696 | .745 | .794 | .914 | 1.035 | 1.155 | 1.276 | 1.517 |
| 110 | .0698 | .0937 | .1176 | .1645 | .2115 | .2593 | .3070 | .3542 | .4011 | .4481 | .4950 | .542 | .589 | .637 | .685 | .732 | .780 | .899 | 1.017 | 1.135 | 1.254 | 1.491 |
| 120 | .0686 | .0921 | .1155 | .1618 | .2080 | .2549 | .3018 | .3481 | .3944 | .4403 | .4866 | .533 | .579 | .626 | .673 | .720 | .767 | .884 | 1.001 | 1.118 | 1.234 | 1.465 |
| 130 | .0674 | .0905 | .1135 | .1590 | .2045 | .2505 | .2966 | .3446 | .3924 | .4296 | .4770 | .524 | .570 | .616 | .662 | .708 | .754 | .869 | .984 | 1.099 | 1.214 | 1.440 |
| 140 | .0663 | .0889 | .1115 | .1565 | .2015 | .2465 | .2915 | .3364 | .3813 | .4262 | .4711 | .516 | .561 | .606 | .651 | .696 | .742 | .855 | .968 | 1.081 | 1.194 | 1.416 |
| 150 | .0652 | .0874 | .1096 | .1541 | .1985 | .2425 | .2865 | .3308 | .3751 | .4193 | .4636 | .508 | .552 | .596 | .640 | .685 | .730 | .841 | .953 | 1.064 | 1.175 | 1.392 |
| 175 | .0626 | .0840 | .1054 | .1482 | .1910 | .2335 | .2755 | .3181 | .3607 | .4033 | .4450 | .488 | .531 | .573 | .616 | .658 | .701 | .808 | .914 | 1.021 | 1.128 | 1.337 |
| 200 | .0603 | .0809 | .1014 | .1427 | .1840 | .2248 | .2655 | .3054 | .3473 | .3882 | .4291 | .470 | .511 | .552 | .592 | .633 | .674 | .776 | .879 | .982 | 1.084 | 1.287 |
| 225 | .0581 | .0779 | .0976 | .1373 | .1770 | .2163 | .2555 | .2949 | .3344 | .3738 | .4129 | .452 | .491 | .531 | .570 | .609 | .649 | .747 | .846 | .944 | 1.043 | 1.240 |
| 250 | .0560 | .0751 | .0941 | .1323 | .1705 | .2085 | .2466 | .2845 | .3223 | .3602 | .3981 | .436 | .474 | .513 | .551 | .589 | .627 | .722 | .817 | .912 | 1.007 | 1.197 |
| 275 | .0541 | .0726 | .0910 | .1278 | .1645 | .2011 | .2378 | .2745 | .3111 | .3478 | .3844 | .421 | .458 | .494 | .531 | .568 | .605 | .697 | .789 | .881 | .972 | 1.155 |
| 300 | .0523 | .0707 | .0881 | .1237 | .1592 | .1945 | .2300 | .2654 | .3008 | .3362 | .3716 | .407 | .442 | .478 | .513 | .549 | .585 | .673 | .762 | .852 | .940 | 1.118 |
| 350 | .0491 | .0658 | .0825 | .1160 | .1495 | .1828 | .2160 | .2492 | .2824 | .3156 | .3488 | .382 | .415 | .449 | .482 | .516 | .549 | .632 | .715 | .799 | .883 | 1.048 |
| 400 | .0463 | .0621 | .0779 | .1090 | .1405 | .1720 | .2035 | .2348 | .2661 | .2974 | .3287 | .360 | .391 | .423 | .454 | .486 | .517 | .596 | .674 | .753 | .831 | .987 |
| 450 | .0437 | .0586 | .0735 | .1033 | .1330 | .1628 | .1925 | .2220 | .2515 | .2810 | .3105 | .340 | .369 | .399 | .429 | .458 | .488 | .562 | .637 | .711 | .786 | .934 |
| 500 | .0414 | .0555 | .0696 | .0978 | .1260 | .1540 | .1820 | .2100 | .2380 | .2660 | .2940 | .322 | .351 | .379 | .407 | .435 | .463 | .534 | .604 | .675 | .746 | .885 |
| 550 | .0394 | .0528 | .0661 | .0930 | .1198 | .1464 | .1730 | .1996 | .2262 | .2528 | .2794 | .306 | .333 | .359 | .386 | .413 | .440 | .507 | .573 | .641 | .709 | .841 |
| 600 | .0376 | .0504 | .0631 | .0885 | .1140 | .1395 | .1650 | .1904 | .2158 | .2412 | .2668 | .292 | .317 | .343 | .368 | .393 | .419 | .483 | .547 | .611 | .675 | .801 |

[1]Reprinted from "Compressed Air Data" Fifth Edition. Courtesy of Ingersoll-Rand Company.

# Pressure Drop in Bends and Elbows

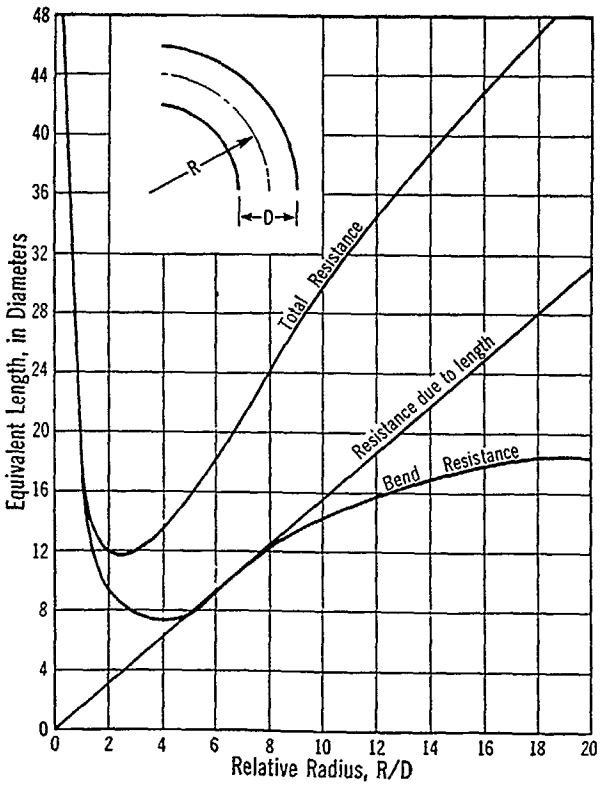
### Resistance of Bends to Flow

The relationship between the equivalent length of pipe bends and the ratio of the radius of the bend axis to the internal diameter, i.e. R/D, is not well defined and considerable variation is found in the results based on the work of various investigators. The chart below, showing the resistance of 90° bends in terms of equivalent length of straight pipe, represents average flow conditions and is based on the work of K. H. Biej, in his paper on "Pressure Losses for Fluid Flow in 90° Pipe Bends," Journal of Research of the National Bureau of Standards, Vol. 21, July, 1938.

The chart showing the Resistance of Miter Bends to the Flow of Fluids represents average flow conditions and is based on resistance coefficients for Miter Bends determined by H. Kirchbach, "Loss of Energy in Miter Bends," Transactions of the Munich Hydraulic Institute, Bulletin No. 3, American Society of Mechanical Engineers, New York, 1935.

### Resistance of Elbows to Flow

For the common 90° cast or malleable iron screwed elbow, the total resistance is roughly equivalent to 30 diameters of straight pipe. Flanged elbows offer approximately 25% less resistance than screwed elbows.




Resistance of 90° Bends
(Biej)

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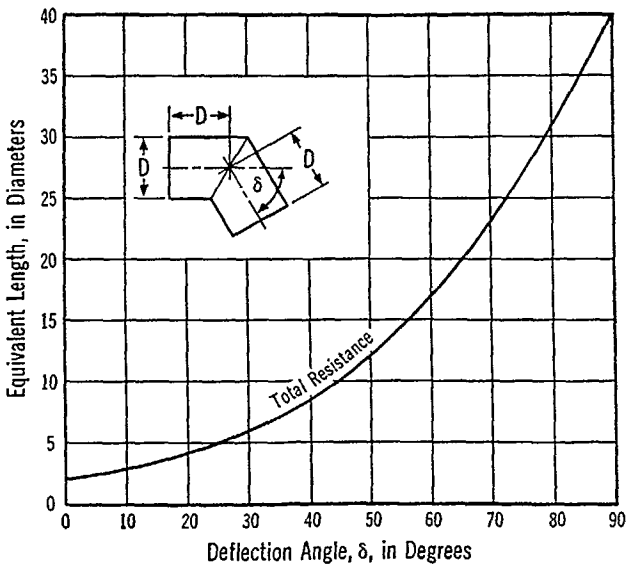



Resistance of Miter Bends
to the Flow of Fluids (Kirchbach)

# *Excerpts from the Code for Pressure Piping*

Shown on this and the following page are excerpts from the Code for Pressure Piping, American Standard B31. 1-1942, with 1944 Supplement No. 1 and 1947 Supplement No. 2. The excerpts cover the Scope and Classification of the five piping sections and set forth limitations of threaded end pipe.

## Section 1, Power Piping Systems

"**101 Scope.** Section 1 of this Code covers the design, manufacture, test and installation of power piping systems, as defined below, for steam generating plants, central heating plants, and industrial plants.

**102 Classification.** (a) Power piping systems and the component parts of such piping including, for example, the pipe, flanges, bolting, gaskets, valves, and fittings, shall be understood to embrace all steam, water, and oil piping (not including oil piping covered by Section 3 of this code) within or forming a part of the above-mentioned plants. Gas, air, refrigerating piping, central and district heating steam or hot water distribution piping away from the plant, building heating piping when the pressure does not exceed 15 p.s.i. gage, roof and floor drains, plumbing, sprinkler systems, piping for hydraulic pressure tools or equipment, sewers, and industrial process piping for fluids not mentioned above, are excluded.

(b) Valves, fittings, and piping for boilers, as prescribed in the A.S.M.E. Code for Power Boilers are within the scope of this code except that provisions of the A.S.M.E. Code for Power Boilers shall govern insofar as they exceed corresponding requirements of this code.

(c) Economizers, heaters, tanks, and other pressure vessels are outside the scope of this code, but connecting piping shall conform to the requirements herein specified.

**122 Thickness of Pipe.** (f) Steel.....pipe lighter than Schedule 40.....shall not be threaded. The value of P in formula 1 (pipe design formula)..... shall not be taken at less than 100 psi gage for any conditions or material.

(g) (1) While the thickness given by ..... (the pipe design formula).....is theoretically ample to take care of both bursting pressure and material removed in the threading, it is mandatory that where steel pipe is threaded and used for steam pressures of 250 psi and over, or for piping under pressure in excess of 100 psi with water temperature of 220° F and over, it shall be seamless of a quality at least equal to A.S.T.M. Specifications A-106 or A-53 and of a weight at least equal to Schedule 80..... in order to furnish added mechanical strength."

## Section 2, Gas and Air Piping Systems

"**201 Scope.** This section covers the design, manufacture, installation, and tests of piping systems and the component parts of such piping including, for example, the pipe, flanges, bolting, gaskets, valves, and fittings, intended for conveying air, fuel gas, illuminating gas, and other substantially non-corrosive gases.

**202 Classification.** (a) This section includes city gas distribution systems, cross-country transportation systems, piping in gas manufacturing plants, in gas or air compressing stations, and in processive plants.

(b) This section does not contemplate gas or air temperatures above 450°F. The requirements of Section 3 of this code for temperatures above 450°F. shall apply to all gas or air piping systems where the temperature exceeds 450°F.

(c) This section *does not* apply to:

(1) Air piping under pressures 30 psi and below,
(2) Equipment or apparatus, or pipe connections which are a part of apparatus,
(3) Piping lined with fire brick or other refractory material used for conveying hot gases,
(4) Piping used for conveying refinery process gas in oil refineries or gasoline recovery plants, and for sewer gas; or ducts for waste gases and ventilation.
(5) Casing, tubing, and pipe when used in gas or oil wells, and material gas and oil field producing and gathering systems outside the boundaries of city or villages. The gathering system is defined as a piping system which carries gas from wells to a common point in the producing field where the transportation systems begin,
(6) Residential and commercial building gas piping systems.

**220 Thickness of Pipe. Div. 1.** (d)..... The value of P allowed.....shall not exceed two-thirds of the mill test pressure for service temperatures not in excess of 100°F and five-ninths of the mill test pressure for a service temperature of 450°F, P values for intermediate temperatures to be obtained by interpolation.

(e) Threaded pipe thinner than listed in any of the specifications for threaded pipe enumerated..... (in the code) shall not be used.

(f) The value of P shall not be taken at less than 180 psi for pipe diameters up to and including 24 in., and 100 psi for pipe diameters greater than 24 in....."

## Section 3, Oil Piping Systems
## Including Oil Vapor, Refinery Gas, and Gasoline Recovery Plants

"**301 Scope.** Section 3 of this Code covers mandatory requirements and recommended practices for the design, manufacture, test, and installation of oil piping systems and the component parts of such piping including, for example, the pipe, flanges, bolting, gaskets, valves, and fittings, used in the production, transmission, and refining of petroleum. It is not intended to include casing, tubing or pipe used in gas or oil wells."

*(continued on the next page)*

# *Excerpts from the Code for Pressure Piping*

(Section 3—*continued from the preceding page*)

"302 Classification. (a) The requirements specified herein shall apply particularly to oil piping, refinery gas piping, and piping for gasoline recovery plants. They may also be used for corresponding pressure and temperature conditions for all piping other than oil; such as steam, air, water, gas, etc., used in the distribution systems and process areas of the plants devoted principally to the processing and handling of oils, but they shall not be used for steam piping in such plants within the limits of the boiler house or boiler plant areas, nor for boiler feed water piping between feed pumps and boilers; piping for these services and in these locations shall conform to the requirements of Section 1.

The requirements do not apply to heater coils, economizers, or pipe exchangers except surface coolers or exchangers ordinarily known as condenser box coils; nor to the design of piping for conveying fluids such as acids or caustics (or solutions thereof), or other special fluids of a dangerous nature.

(b) This section of the code includes piping, valves, and fittings up to the connections of drums, pressure vessels, and apparatus, and up to the tube sheets of furnaces, interstage piping between compressors or duplex pumping equipment, etc., but does not include (1) The connections themselves, which are ordinarily furnished with and as a part of the equipment; (2) piping exposed to flame in furnaces; (3) internal piping or its parts integral with the equipment or apparatus.

(c) Oil lines are classified according to pressure and temperature. Oil vapor lines shall follow the same classifications and specifications as oil lines. (Refinery gas lines are dealt with specifically.)

325 Thickness of Pipe. (e) For pipes both inside and outside of refinery limits it is recommended that no pipe lighter than A.P.I. standard threaded line pipe (see A.P.I. Standard 5 L) shall be threaded (where two or more standard weights of pipe are obtainable the heavier or heaviest is referred to in this case).

(f) Regardless of the actual pressure, the minimum thickness of the pipe used shall not be less than that determined by.....(the pipe design formula)....., and in addition shall not be less than the thickness required for mechanical strength as determined by the best engineering data available. For temperatures above 750°F, only seamless steel pipe or a high temperature resisting seamless alloy pipe is permitted where....."

## Section 4, District Heating Piping Systems

"401 Scope. (a) This section covers the design, manufacture, test, and installation of district heating and central heating piping systems and the component parts of such piping including, for example, the pipe, flanges, bolting, gaskets, valves, and fittings (away from the plant) for the distribution of steam or hot water, for pressures not exceeding 600 psi or temperatures in excess of 750°F.

(b) Piping in the district heating and central heating generating plants is covered by Section 1 of this Code. Piping for pressures in excess of 600 psi, or temperatures in excess of 750°F, shall conform to requirements of Section 1.

402 Classification. (a) District and central heating piping systems shall include all distributing piping for steam or hot water produced in district heating and central heating plants whether the piping is installed underground or elsewhere and distributed at pressures in excess of 15 p.s.i. gage.

(b) This section shall not apply to equipment, apparatus, or pipe connections which are a part of apparatus, nor does it apply to low pressure heating piping within buildings, roof, and floor drains, or plumbing and sewers. This section shall not apply to heating systems aboard ship.

(c) Outdoor steam or hot water distribution piping on the premises of an industrial establishment shall conform to the requirements of this section. Such distribution piping constructed within the buildings of such establishment shall conform to Section 1 of this code.

423 Thickness of Pipe. (f) Steel.....pipe lighter than Schedule 40.....shall not be threaded. In .....(the pipe design formula).....the value P shall be taken at not less than 100 psi gage for any conditions or material.

(g) (1) While the thickness given by ..... (the pipe design formula).....is theoretically ample to take care of both bursting pressure and material removed in the threading, it is mandatory that where steel pipe is threaded and used for steam pressures of 250 psi and over, or for piping under pressure in excess of 100 psi with water temperature of 220° F and over, it shall be seamless of a quality at least equal to A.S.T.M. Specifications A-106 or A-53 and of a weight at least equal to Schedule 80..... in order to furnish added mechanical strength."

## Section 5, Refrigeration Piping Systems

"501 Scope. Section 5 of this Code covers the design, manufacture, installation, and tests of piping systems and the component parts of such piping including, for example, the pipe, flanges, bolting, gaskets, valves, and fittings for refrigerants and brines, as defined below.

503 Classification. (a) Refrigeration piping shall be understood to comprise all refrigerant and brine piping, wheresoever used and whether erected on the premises or factory assembled. It does not include shell apparatus, compressors, nor pumps, but does include all connecting refrigerant or brine piping, starting at the first joint adjacent to such apparatus. Requirements apply to both refrigerant and brine piping unless specifically restricted by the wording to one or the other class.

(b) Water piping in connection with refrigerating systems shall be designed in accordance with the provisions for Service Water and Condensing Water Systems in Section 1 of this code,.....

519 Specific Minimum Thickness Requirements for Refrigerant Pipe and Tubing. (a) Standard weight (Schedule 40) steel.....pipe may be used for design working pressures not exceeding 250 psi, provided lap welded or seamless pipe is used for sizes larger than 2" (iron pipe size) and extra heavy (Schedule 80) pipe is used for liquid lines for 1½" (iron pipe size) and smaller."

## Welded and Seamless Steel Pipe

# Calculating Working Pressure, Stress, or Wall Thickness

## Based on the Code for Pressure Piping

It is the generally accepted practice among designers today, when computing thickness of pipe for a given service condition to use formulas provided by the Code for Pressure Piping, the A.S.M.E. Boiler Construction Code, or other applicable codes.

Of these codes, the Code for Pressure Piping, American Standard B31.1-1942, with 1944 Supplement No. 1 and 1947 Supplement No. 2, serves the widest general purpose. It presents minimum safety requirements for the design, manufacture, and erection of pressure piping systems, and is divided into five major sections, as follows:

**Section 1 ..... covering Power Piping**
**Section 2 ..... covering Gas and Air Piping**
**Section 3 ..... covering Oil Piping**
**Section 4 ..... covering District Heating Piping**
**Section 5 ..... covering Refrigeration Piping**

## Pipe Design Formula

The Code for Pressure Piping includes the following formulas for determining pipe wall thickness:

$$t = \frac{PD}{2S + .8P} + c, \text{ for Sections 1, 4, and 5}$$

$$\text{and: } t = \frac{PD}{2S} + c, \text{ for Sections 2 and 3.}$$

**Where: *t = minimum pipe wall thickness for inspection, in inches**
**P = maximum internal working pressure, in lbs. per sq. in. (gauge)**
**D = outside diameter of pipe, in inches**
**S = allowable stress in material, in lbs. per sq. in.**
**c = allowance for threading, mechanical strength, and for corrosion, in inches**

*Since all pipe furnished by the mill is subject to a 12½% variation in wall thickness, the thickness calculated by the above formula should be multiplied by 8/7 to obtain the nominal wall thickness.

The value of P shall not be taken at less than allowed by the various Sections of the Code.

Table 1
"c" Values for Steel Pipe, Code for Pressure Piping

| Nominal Pipe Size Inches | Plain End | | **Threaded | |
|---|---|---|---|---|
| | Sections 1, 4, & 5 | Section 3 | Section 2 | Sections 1, 3, 4, & 5 |
| ⅛ | 0.05" | 0.00" | Depend | 0.05" |
| ¼ and ⅜ | 0.05 | 0.00 | on | 0.05 |
| ½ and ¾ | 0.05 | 0.05 | corrosive | 0.0571 |
| 1 | 0.05 | 0.05 | condi- | 0.0696 |
| 1¼ to 2 | 0.065 | 0.05 | tions. | 0.0696 |
| Larger than 2 | 0.065 | 0.05 | See Code. | 0.1000 |

**Values are for American Standard Pipe Threads for nominal pipe sizes of ½-inch and larger.

## Simplified Method for Calculating Working Pressure, Stress, or Wall Thickness

Although the formulas given above enable the determination of pipe wall thicknesses, their extensive use for practical purposes involves many laborious calculations. By establishing the ratio of the working pressure to the allowable stress as a coefficient, Crane engineers have developed an exceedingly easy, simple, and accurate method for figuring not only the pipe wall thickness but also the stress in the pipe or the working pressure of the pipe, based on the Code for Pressure Piping. Three typical problems and complete data for making calculations are shown on the following two pages.

* * * * * * * * * * * * * * * * *

**Coefficients for calculating; P/S values:** The coefficients for calculating, which are the values of the ratio of the working pressure to allowable stress (P/S) are shown in Table 3, page 545. This table covers various thicknesses and sizes of steel pipe, including not only all scheduled pipe shown in the American Standard for Wrought-Iron and Wrought-Steel Pipe (A. B36.10) but also other thicknesses which are at present commercially available.

The table has been based upon the design formulas given in the Code for Pressure Piping, the formulas being rearranged in the following manner in order to calculate these values:

$$P/S = \frac{2(.875T - c)}{D - .8(.875T - c)} \text{ for Sections 1, 4, and 5.}$$

$$\text{and: } P/S = \frac{2(.875T - c)}{D} \text{ for Section 3}$$

**Where: T = nominal wall thickness, in inches**

The P/S values vary for the different sections of the Code due to the fact that the formulas and the value of "c" are not the same in all sections. The use of any particular value, therefore, depends upon the service for which the pipe is to be used.

**Allowable stress for pipe:** Each section of the Code for Pressure Piping tabulates the allowable stress, "S", for piping materials at various temperatures. Table 2, page 544, shows these allowable stresses for steel pipe made in accordance with A.S.T.M. Specifications A 53 and A 106, and for carbon molybdenum steel pipe made in accordance with A.S.T.M. Specification A 206.

The allowable stresses for Section 2 of the Code for Pressure Piping have not been included in Table 2, because information for solution of the pipe design formula must be obtained from the Code since "c" values for Section 2 depend upon corrosive conditions.

**Calculated pressure-temperature ratings:** For the convenience of users, Crane engineers have also calculated the actual pressure-temperature ratings for Standard and Extra Strong Grade A Seamless Steel Pipe for the Power Piping and the Oil Piping (Within Refinery Limits) Sections of the Code for Pressure Piping. See pages 288 and 289. As explained above, other ratings, stresses, or pipe wall thicknesses can be easily calculated from the data shown on the following two pages.

# *Working Pressure, Stress, or Thickness Calculated Quickly and Accurately*

## Determining Working Pressure

***Multiply P/S value by allowable stress.*** Determination of maximum allowable working pressure when material, thickness, and temperature are known.

What is the maximum allowable working pressure at 100° F. for 1" Schedule 40 Grade A seamless steel plain end pipe per A.S.T.M. Specification A 106 to comply with Section 1 of the Code for Pressure Piping?

The P/S value for 1" Schedule 40 pipe for Section 1 is .105; see Table 3. The allowable stress for Grade A pipe at 100° F. for Section 1 is 12,240 pounds; see Table 2. Multiply these values to obtain the maximum working pressure, thus:

Working pressure = .105 x 12240 = 1285 lbs. per sq. in

## Determining Stress

***Divide working pressure by P/S value.*** Determination of stress in pipe when the material, the working pressure, and the thickness are known.

What is the stress in 4" Schedule 80, Grade A seamless steel plain end pipe per A.S.T.M. Spec. A 106 when the working pressure is 1000 pounds per square inch and the temperature is 550° F.? The stress should not exceed that allowed at 550° F. by Section 1 of the Code for Pressure Piping.

The P/S value for 4" Schedule 80 pipe for Section 1 is .107; see Table 3. Divide the known working pressure by the P/S value, thus:

$$\text{Stress} = \frac{1000}{.107} = 9346 \text{ lbs. per sq. in.}$$

The allowable stress for this Grade A seamless steel pipe at 550° F. per Section 1 is 10,080 pounds per square inch; see Table 2. Since the calculated stress is less than the allowable, the pipe is satisfactory for the service conditions.

## Determining Pipe Wall Thickness

***Divide working pressure by allowable stress to get P/S value.***

***Refer to Table 3 for equivalent.***

Determination of pipe wall thickness when the material, working pressure, and temperature are known.

What thickness of 12" Grade B seamless steel plain end pipe per A.S.T.M. Specification A 106 can be used for 950 pounds per square inch oil working pressure at 450° F.? This pipe is to comply with Section 3 (Within Refinery Limits) of the Code for Pressure Piping.

The allowable stress for 12" Grade B pipe at 450° F. for Section 3 is 17,200 pounds; see Table 2. Divide the known working pressure by the allowable stress, thus:

$$\text{P/S value} = \frac{950}{17200} = .055$$

Compare this P/S value with those of the established thicknesses of 12" pipe to find its equivalent or the next heavier weight; see Table 3. In the column for Section 3, it will be found that 12" pipe with a .500" thickness has a P/S value of .061. Since the calculated value is .055 and the next lighter weight pipe (.406" thickness) has a lower P/S value (.048), pipe .500" thick should be used.

### Table 2—Allowable Stresses for Steel Pipe (psi) From Code for Pressure Piping

| Temperature Degrees Fahr. | Seamless: Grade A * † ‡ ASTM A 106 | Seamless: Grade B † ‡ ASTM A 106 | Seamless: Carbon Molybdenum ASTM A 206 | Lap-Weld ‡ ASTM A 53 or A 106 | Butt-Weld ‡ ASTM A 53 |
|---|---|---|---|---|---|
| **Section 1, Power Piping or Section 4, District Heating** | | | | | |
| 100 | 12240 | 15300 | | 9600 | 6875 |
| 150 | 12000 | 15000 | | 9400 | 6750 |
| 200 | 11760 | 14700 | | 9200 | 6625 |
| 250 | 11520 | 14400 | | 9000 | 6500 |
| 300 | 11280 | 14100 | | 8775 | 6350 |
| 350 | 11040 | 13800 | | 8550 | 6200 |
| 400 | 10800 | 13400 | | 8350 | 6050 |
| 450 | 10560 | 13200 | | 8150 | 5950 |
| 500 | 10320 | 12900 | | 7950 | 5800 |
| 550 | 10080 | 12600 | | 7750 | 5650 |
| 600 | 9840 | 12300 | | 7550 | 5550 |
| 650 | 9600 | 12000 | 11000 | 7300 | 5400 |
| 700 | 9250 | 11400 | 11000 | 6800 | 5100 |
| 750 | 8700 | 10400 | 11000 | 6250 | 4700 |
| 800 | 8000 | 9100 | 10750 | | |
| 850 | 6850 | 7400 | 10500 | | |
| 900 | 5600 | 5600 | 10000 | | |
| 950 | 3800 | 3800 | 8000 | | |
| 1000 | 2000 | 2000 | 5000 | | |
| **Section 3, Oil Piping** | | | | | |
| Outside of Refinery Limits | | | | | |
| 100 | 25500 | 29750 | | 15950 | 15300 |
| Within Refinery Limits | | | | | |
| 100 | 18000 | 21000 | 18000 | 11250 | 10800 |
| 150 | 17450 | 20450 | 17650 | 11000 | 10500 |
| 200 | 16900 | 19900 | 17350 | 10750 | 10200 |
| 250 | 16350 | 19350 | 17000 | 10500 | 9900 |
| 300 | 15800 | 18800 | 16700 | 10250 | 9600 |
| 350 | 15300 | 18250 | 16350 | 10000 | 9300 |
| 400 | 14700 | 17700 | 16050 | 9700 | 9000 |
| 450 | 14150 | 17200 | 15700 | 9450 | 8700 |
| 500 | 13600 | 16600 | 15400 | 9200 | 8400 |
| 550 | 13100 | 16100 | 15050 | 8950 | 8100 |
| 600 | 12550 | 15550 | 14750 | 8700 | 7800 |
| 650 | 12000 | 15000 | 14400 | 8450 | 7500 |
| 700 | 11550 | 14250 | 14100 | 8200 | 7200 |
| 750 | 10900 | 13000 | 13800 | 7850 | 6700 |
| 800 | 10000 | 11400 | 13500 | | |
| 850 | 8550 | 9250 | 13150 | | |
| 900 | 7000 | 7000 | 12250 | | |
| 950 | 4750 | 4750 | 10000 | | |
| 1000 | 2500 | 2500 | 6250 | | |
| 1050 | | | 3000 | | |
| 1100 | | | 1500 | | |
| **Section 5, Refrigeration Piping** | | | | | |
| .... | 12000 | 15000 | | 9000 | 6800 |

*Silicon killed, 0.10 to 0.25 per cent silicon.

†Within the following temperature limitations, the values are also applicable to Seamless Pipe per ASTM Specification A 53:

For Section 1 or 4, Grade A Pipe not exceeding 650° F.
Grade B Pipe not exceeding 700° F.

For Section 3, Grade A or B Pipe not exceeding 750° F.

‡For Section 3 only, values are also applicable to A.P.I. 5L.

*For allowable stresses for steel pipe for Section 2, Division 1, Gas and Air Piping, see Code for Pressure Piping.*

## Table 3—P S Values for Steel Pipe; Coefficients, Based on Code for Pressure Piping

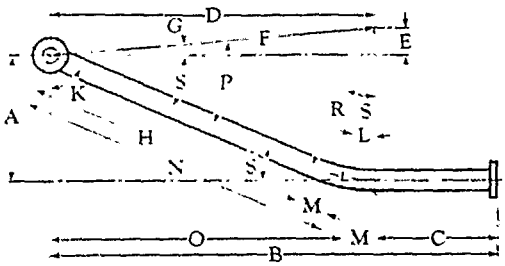
| Nominal Pipe Size | O.D. of Pipe Inches | [1]Nominal Wall Thickness Inches | [2]Values for P S: Plain End Pipe Sec. 1, 4, or 5 | Plain End Pipe Sec. 3 | [3]Thd'd. Pipe Sec. 1, 4, or 5 | Thd'd. Pipe Sec. 3 |
|---|---|---|---|---|---|---|
| 1/8 | .405 | .068 (40) s | .048 | .294 | .048 | .047 |
| | | .095 (80) x | .175 | .410 | .175 | .164 |
| 1/4 | .540 | .088 (40) s | .104 | .285 | .104 | .100 |
| | | .119 (80) x | .218 | .386 | .218 | .200 |
| 3/8 | .675 | .091 (40) s | .091 | .236 | .091 | .088 |
| | | .126 (80) x | .192 | .327 | .192 | .179 |
| 1/2 | .840 | .109 (40) s | .113 | .108 | .095 | .091 |
| | | .147 (80) x | .202 | .187 | .183 | .170 |
| | | .187 (160) | .303 | .271 | .282 | .254 |
| | | .294 xx | .615 | .493 | .589 | .477 |
| 3/4 | 1.050 | .113 (40) s | .097 | .093 | .082 | .080 |
| | | .154 (80) x | .173 | .161 | .157 | .148 |
| | | .218 (160) | .300 | .268 | .283 | .255 |
| | | .308 xx | .502 | .418 | .482 | .405 |
| 1 | 1.315 | .133 (40) s | .105 | .101 | .073 | .071 |
| | | .179 (80) x | .173 | .162 | .140 | .132 |
| | | .250 (160) | .286 | .257 | .249 | .227 |
| | | .358 xx | .477 | .400 | .435 | .371 |
| 1 1/4 | 1.660 | .140 (40) s | .071 | .087 | .065 | .064 |
| | | .191 (80) x | .129 | .141 | .123 | .118 |
| | | .250 (160) | .200 | .203 | .194 | .180 |
| | | .382 xx | .373 | .342 | .365 | .319 |
| 1 1/2 | 1.900 | .145 (40) s | .067 | .081 | .062 | .060 |
| | | .200 (80) x | .121 | .132 | .116 | .111 |
| | | .281 (160) | .206 | .206 | .200 | .186 |
| | | .400 xx | .341 | .316 | .335 | .295 |
| 2 | 2.375 | .154 (40) s | .060 | .071 | .056 | .055 |
| | | .218 (80) x | .111 | .119 | .106 | .102 |
| | | .343 (160) | .215 | .211 | .210 | .194 |
| | | .436 xx | .298 | .279 | .293 | .263 |
| 2 1/2 | 2.875 | .203 (40) s | .081 | .089 | .055 | .054 |
| | | .276 (80) x | .129 | .133 | .102 | .098 |
| | | .375 (160) | .198 | .193 | .169 | .159 |
| | | .552 xx | .329 | .301 | .298 | .266 |
| 3 | 3.500 | .216 (40) s | .073 | .079 | .052 | .051 |
| | | .300 (80) x | .118 | .121 | .096 | .093 |
| | | .437 (160) | .196 | .190 | .172 | .161 |
| | | .600 xx | .294 | .271 | .269 | .243 |
| 3 1/2 | 4.000 | .226 (40) s | .068 | .074 | .050 | .049 |
| | | .318 (80) x | .111 | .114 | .092 | .089 |
| 4 | 4.500 | .237 (40) s | .065 | .070 | .049 | .048 |
| | | .337 (80) x | .107 | .109 | .090 | .087 |
| | | .437 (120) | .149 | .148 | .132 | .126 |
| | | .531 (160) | .191 | .184 | .173 | .162 |
| | | .674 xx | .257 | .240 | .238 | .218 |
| 5 | 5.563 | .258 (40) s | .059 | .063 | .046 | .045 |
| | | .375 (80) x | .098 | .100 | .085 | .082 |
| | | .500 (120) | .142 | .139 | .128 | .121 |
| | | .625 (160) | .186 | .179 | .172 | .161 |
| | | .750 xx | .232 | .218 | .217 | .200 |
| 6 | 6.625 | .280 (40) s | .056 | .059 | .045 | .044 |
| | | .432 (80) x | .098 | .099 | .087 | .084 |
| | | .562 (120) | .136 | .133 | .124 | .118 |
| | | .718 (160) | .182 | .175 | .170 | .159 |
| | | .864 xx | .228 | .213 | .215 | .198 |
| 8 | 8.625 | .250 (20) | .036 | .039 | .028 | .028 |
| | | .277 (30) | .042 | .045 | .033 | .033 |
| | | .322 (40) s | .051 | .054 | .043 | .042 |
| | | .406 (60) | .069 | .071 | .061 | .059 |
| | | .500 (80) x | .089 | .090 | .081 | .078 |
| | | .593 (100) | .110 | .109 | .101 | .097 |
| | | .718 (120) | .138 | .134 | .129 | .122 |
| | | .812 (140) | .159 | .153 | .150 | .142 |
| | | .875 xx | .174 | .166 | .165 | .154 |
| | | .906 (160) | .181 | .172 | .172 | .161 |
| 10" | 10.75 | .250 (20) | .029 | .031 | .022 | .022 |
| | | .307 (30) | .038 | .041 | .032 | .031 |
| | | .365 (40) s | .048 | .050 | .041 | .041 |
| | | .500 (60) x | .071 | .072 | .064 | .063 |
| | | .593 (80) | .087 | .087 | .080 | .078 |
| | | .718 (100) | .109 | .108 | .102 | .098 |
| | | .843 (120) | .132 | .128 | .125 | .119 |
| | | 1.000 (140) | .160 | .153 | .153 | .144 |
| | | 1.125 (160) | .184 | .174 | .176 | .165 |
| 12 | 12.75 | .250 (20) | .024 | .026 | .019 | .019 |
| | | .330 (30) | .036 | .037 | .030 | .030 |
| | | .375 s | .042 | .044 | .036 | .036 |
| | | .406 (40) | .046 | .048 | .041 | .040 |
| | | .500 x | .060 | .061 | .054 | .053 |
| | | .562 (60) | .069 | .069 | .063 | .061 |
| | | .687 (80) | .087 | .086 | .081 | .079 |
| | | .843 (100) | .110 | .108 | .104 | .100 |
| | | 1.000 (120) | .134 | .129 | .128 | .122 |
| | | 1.125 (140) | .153 | .147 | .147 | .139 |
| | | 1.312 (160) | .182 | .172 | .176 | .164 |
| 14 OD | 14.00 | .250 (10) | .022 | .024 | .017 | .017 |
| | | .312 (20) | .030 | .032 | .025 | .025 |
| | | .375 (30) s | .038 | .040 | .033 | .033 |
| | | .437 (40) | .046 | .047 | .041 | .040 |
| | | .500 x | .054 | .055 | .049 | .048 |
| | | .593 (60) | .067 | .067 | .061 | .060 |
| | | .750 (80) | .087 | .087 | .082 | .079 |
| | | .937 (100) | .113 | .110 | .107 | .103 |
| | | 1.093 (120) | .134 | .129 | .129 | .122 |
| | | 1.250 (140) | .156 | .149 | .151 | .142 |
| | | 1.406 (160) | .178 | .169 | .173 | .161 |
| 16 OD | 16.00 | .250 (10) | .019 | .021 | .015 | .015 |
| | | .312 (20) | .026 | .028 | .022 | .022 |
| | | .375 (30) s | .033 | .035 | .029 | .029 |
| | | .500 (40) x | .047 | .048 | .043 | .042 |
| | | .656 (60) | .065 | .066 | .061 | .059 |
| | | .843 (80) | .087 | .086 | .082 | .080 |
| | | 1.031 (100) | .109 | .107 | .104 | .100 |
| | | 1.218 (120) | .132 | .127 | .127 | .121 |
| | | 1.437 (140) | .158 | .151 | .154 | .145 |
| | | 1.593 (160) | .178 | .168 | .173 | .162 |
| 18 OD | 18.00 | .250 (10) | .017 | .019 | .013 | .013 |
| | | .312 (20) | .023 | .025 | .019 | .019 |
| | | .375 s | .030 | .031 | .026 | .025 |
| | | .437 (30) | .036 | .037 | .032 | .031 |
| | | .500 x | .042 | .043 | .038 | .038 |
| | | .562 (40) | .048 | .049 | .044 | .044 |
| | | .750 (60) | .067 | .067 | .063 | .062 |
| | | .937 (80) | .087 | .086 | .083 | .080 |
| | | 1.156 (100) | .110 | .107 | .106 | .101 |
| | | 1.375 (120) | .133 | .128 | .129 | .123 |
| | | 1.562 (140) | .154 | .146 | .149 | .141 |
| | | 1.781 (160) | .178 | .168 | .173 | .162 |
| 20 OD | 20.00 | .250 (10) | .015 | .017 | .012 | .012 |
| | | .375 (20) s | .027 | .028 | .023 | .023 |
| | | .500 (30) x | .038 | .038 | .034 | .034 |
| | | .593 (40) | .046 | .047 | .043 | .042 |
| | | .812 (60) | .066 | .066 | .063 | .061 |
| | | 1.031 (80) | .087 | .085 | .083 | .080 |
| | | 1.281 (100) | .110 | .107 | .106 | .102 |
| | | 1.500 (120) | .131 | .126 | .127 | .121 |
| | | 1.750 (140) | .156 | .148 | .152 | .143 |
| | | 1.968 (160) | .177 | .167 | .173 | .162 |
| 24 OD | 24.00 | .250 (10) | .013 | .014 | .010 | [illegible] |
| | | .375 (20) s | .022 | .023 | .019 | .019 |
| | | .500 x | .031 | .032 | .028 | .028 |
| | | .562 (30) | .036 | .037 | .033 | .033 |
| | | .687 (40) | .045 | .046 | .042 | .042 |
| | | .968 (60) | .067 | .066 | .064 | .062 |
| | | 1.218 (80) | .086 | .085 | .083 | .080 |
| | | 1.531 (100) | .111 | .107 | .108 | .103 |
| | | 1.812 (120) | .133 | .128 | .130 | .124 |
| | | 2.062 (140) | .154 | .146 | .151 | .142 |
| | | 2.343 (160) | .177 | .166 | .174 | .162 |

[1] Figures in parentheses indicate A.S.A. B-36 Schedule Numbers. Letters "s", "x", and "xx" indicate Standard, Extra Strong, and Double Extra Strong Pipe.

[2] P. S Values for Section 2 are not listed because the "c" values page 543) vary, depending upon corrosive conditions.

[3] See pages 541 and 542 for limitations of threaded ends.

# Calculation of Pipe Bends




Example No. 1 - Given A, B, C, R

$D = B - C$

$E = R - A$

$F = \sqrt{D^2 + E^2}$

$\frac{E}{F} = \sin \angle G$

$H = \sqrt{F^2 - R^2}$

$\frac{R}{F} = \sin \angle P$

$\angle S = \angle P - \angle G$

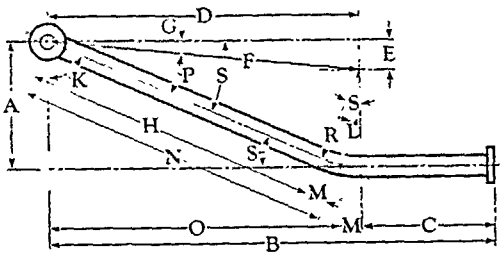
$\angle K = 90° - \angle S$

$\angle L = \frac{1}{2} \angle S$

$M = \tan \angle L \times R$

$N = H + M$

$O = B - C - M$




Example No. 2 - Given A, B, C, R

$D = B - C$

$E = A - R$

$F = \sqrt{D^2 + E^2}$

$\frac{E}{F} = \sin \angle G$

$H = \sqrt{F^2 - R^2}$

$\frac{R}{F} = \sin \angle P$

$\angle S = \angle P + \angle G$

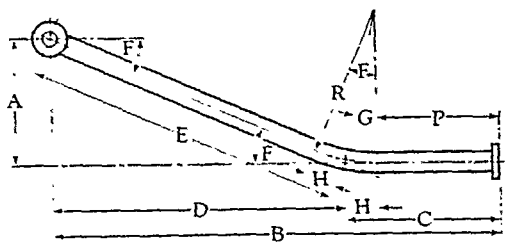
$\angle K = 90° - \angle S$

$\angle L = \frac{1}{2} \angle S$

$M = \tan \angle L \times R$

$N = H + M$

$O = B - C - M$




Example No. 3 - Given A, B, C, R

$D = B - C$

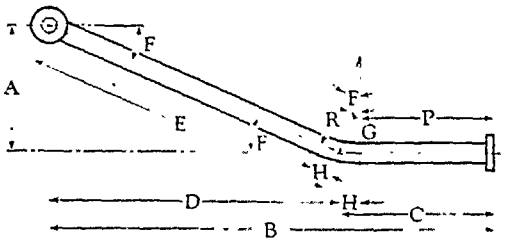
$E = \sqrt{A^2 - D^2}$

$\frac{A}{E} = \sin \angle F$

$\angle G = \frac{1}{2} \angle F$

$H = \tan \angle G \times R$

$P = C - H$




Example No. 4 - Given A, B, C, R

$D = B - C$

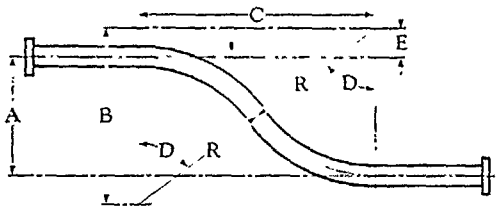
$E = \sqrt{A^2 + D^2}$

$\frac{A}{E} = \sin \angle F$

$\angle G = \frac{1}{2} \angle F$

$H = \tan \angle G \times R$

$P = C - H$

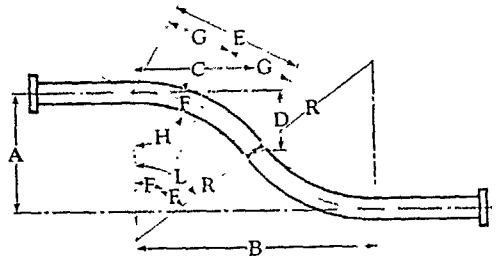



Example No. 5 - Given A, R

$B = 2R - A$

$C = \sqrt{(2R)^2 - B^2}$

$\frac{C}{2R} = \sin \angle D$




Example No. 6 - Given A, B

$C = \frac{1}{2} B$

$D = \frac{1}{2} A$

$E = \sqrt{C^2 + D^2}$

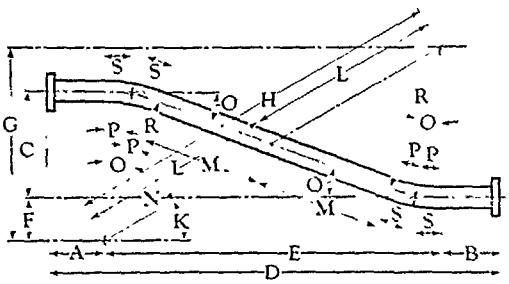
$\frac{D}{E} = \sin \angle F$

$G = \frac{1}{2} E$

$\angle H = 90° - \angle F$

$R = \frac{A^2 + B^2}{4A}$

$L = 2F$




Example No. 7 - Given A, B, C, D, R

$E = D - A - B$

$F = R - C$

$G = R + F$

$H = \sqrt{E^2 + G^2}$

$H = \sin \angle K$

$L = \frac{1}{2} H$

$M = \sqrt{L^2 - R^2}$

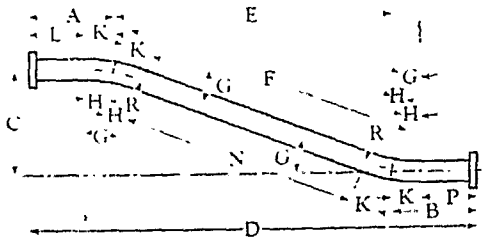
$L = \sin \angle N$

$\angle O = 90° - \angle K - \angle N$

$\angle P = \frac{1}{2} \angle O$

$S = \tan \angle P \times R$

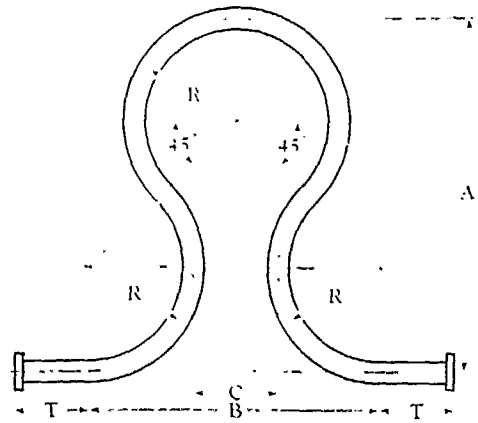
# Calculation of Pipe Bends (Cont.)




Example No. 8 - Given A, B, C, D, R

$E = D - A - B$
$F = \sqrt{E^2 - C^2}$
$\frac{C}{F} = \sin \angle G$

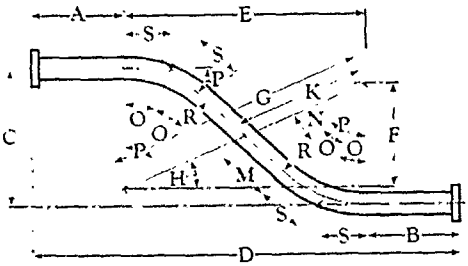
$\angle H = \frac{1}{2} \angle G$
$K = \tan \angle H \times R$
$L = A - K$
$P = B - K$
$N = F - 2K$




Example No. 11 - Given R and 45° Angles

$A = 3.414 \times R$
$B = 2.828 \times R$
$C = 0.828 \times R$

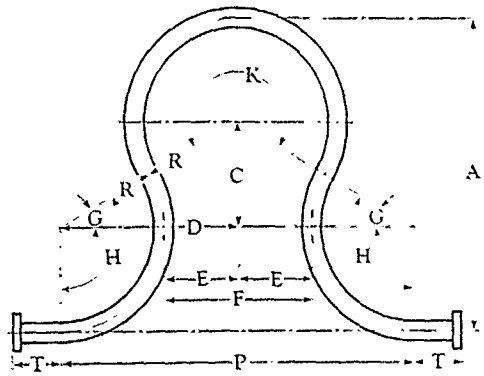
$T$ = Tangent
Length of Pipe in Bend = $9.425 \times R + 2T$




Example No. 9 - Given A, B, C, D, R

$E = D - A - B$
$F = 2R - C$
$G = \sqrt{E^2 + F^2}$
$\frac{F}{E} = \tan \angle H$
$K = \frac{1}{2} G$

$M = \sqrt{K^2 - R^2}$
$\frac{M}{K} = \sin \angle N$
$\angle P = 90° - \angle H - \angle N$
$\angle O = \frac{1}{2} \angle P$
$S = \tan \angle O \times R$

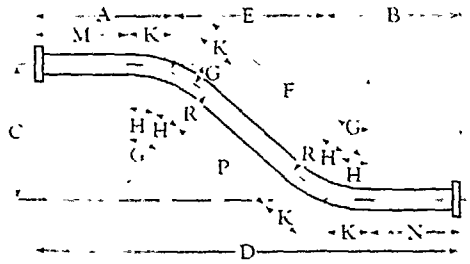



Example No. 12 - Given A, R

$C = A - 2R$
$D = \sqrt{(2R)^2 - C^2}$

$P = 2D$
$E = D - R$
$F = 2E$

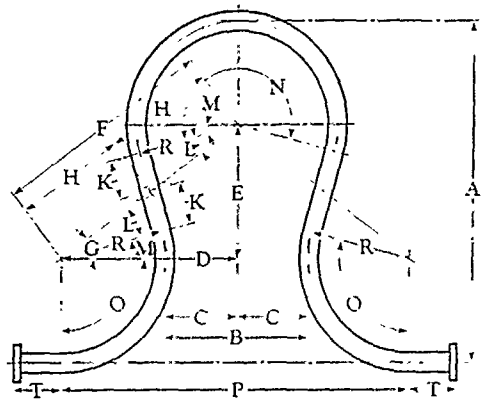
$C/2R = \sin \angle G$
$\angle H = 90° \div \angle G$
$\angle K = 180° \div 2 \angle G$




Example No. 10 - Given A, B, C, D, R

$E = D - A - B$
$F = \sqrt{C^2 + E^2}$
$\frac{C}{F} = \sin \angle G$

$\angle H = \frac{1}{2} \angle G$
$K = \tan \angle H \times R$
$M = A - K$
$N = B - K$
$P = F - 2K$



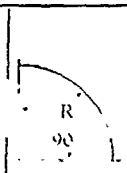
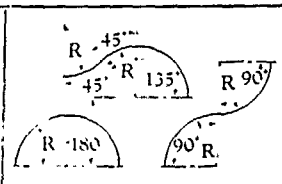
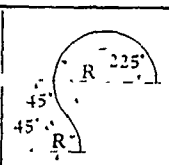
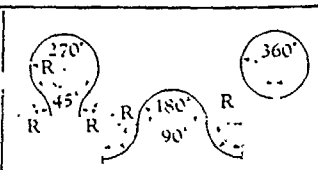
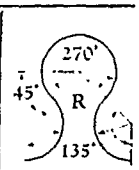

Example No. 13 - Given A, B, C

$C = \frac{1}{2} B$
$D = R - C$
$E = A - 2R$
$F = \sqrt{D^2 + E^2}$

$E\ F = \sin \angle G$
$H = \frac{1}{2} F$
$K = \sqrt{H^2 - R^2}$
$K\ H = \sin \angle L$

$\angle M = \angle G - \angle L$
$\angle N = 180° \div 2 \angle M$
$\angle O = 90° \div \angle M$
$P = 2D$

# Length of Pipe in Bends

| Radius of Pipe Bends | |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Inches | Feet | 90° Bends | 180° Bends | 270° Bends | 360° Bends | 540° Bends |
| 1 | | 1½" | 3" | 4¾" | 6¼" | 9½" |
| 2 | | 3 | 6¼ | 9½ | 12½ | 18¾ |
| 3 | ¼ | 4¾ | 9½ | 14¼ | 18¾ | 28¼ |
| 4 | | 6¼ | 12½ | 18¾ | 25¼ | 37¾ |
| 5 | | 7¾ | 15¾ | 23½ | 31½ | 47¼ |
| 6 | ½ | 9½ | 18¾ | 28¼ | 37¾ | 56½ |
| 7 | | 11 | 22 | 33 | 44 | 66 |
| 8 | | 12½ | 25¼ | 37¾ | 50¼ | 75½ |
| 9 | ¾ | 14¼ | 28¼ | 42½ | 56½ | 84¾ |
| 10 | | 15¾ | 31½ | 47¼ | 62¾ | 94¼ |
| 11 | | 17¼ | 34½ | 51¾ | 69 | 103¾ |
| 12 | 1 | 18¾ | 37¾ | 56½ | 75½ | 113 |
| 12.5 | | 19¾ | 39¼ | 59 | 78½ | 117¾ |
| 14 | | 22 | 44 | 66 | 88 | 132 |
| 15 | 1¼ | 23½ | 47 | 70¾ | 94¼ | 141¼ |
| 16 | | 25¼ | 50¼ | 75½ | 100½ | 150¾ |
| 17.5 | | 27½ | 55 | 82½ | 110 | 165 |
| 18 | 1½ | 28¼ | 56½ | 84¾ | 113 | 169¾ |
| 20 | | 31½ | 62¾ | 94¼ | 125¾ | 188½ |
| 21 | 1¾ | 33 | 66 | 99 | 132 | 198 |
| 24 | 2 | 37¾ | 75½ | 113 | 150¾ | 226¼ |
| 25 | | 39¼ | 78½ | 117¾ | 157 | 235½ |
| 30 | 2½ | 47¼ | 94¼ | 141¼ | 188½ | 282¾ |
| 32 | | 50¼ | 100½ | 150¾ | 201 | 301½ |
| 36 | 3 | 56½ | 113 | 169½ | 226¼ | 339¼ |
| 40 | | 62¾ | 125¾ | 188½ | 251¼ | 377 |
| 48 | 4 | 75½ | 150¾ | 226¼ | 301½ | 452½ |
| 50 | | 78½ | 157 | 235½ | 314¼ | 471¼ |
| 56 | | 88 | 176 | 264 | 351¾ | 527¾ |
| 60 | 5 | 94¼ | 188½ | 282¾ | 377 | 565½ |
| 64 | | 100½ | 201 | 301½ | 402 | 603¼ |
| 70 | | 110 | 220 | 329¾ | 439¾ | 659¾ |
| 72 | 6 | 113 | 226¼ | 339¼ | 452½ | 678½ |
| 80 | | 125¾ | 251¼ | 377 | 502¾ | 754 |
| 84 | 7 | 132 | 263¾ | 395¾ | 527¾ | 791½ |
| 90 | 7½ | 141¼ | 282¾ | 424 | 565½ | 848¼ |
| 96 | 8 | 150¾ | 301½ | 452½ | 603 | 904¾ |
| 100 | | 157 | 314¼ | 471¼ | 628¼ | 942½ |
| 108 | 9 | 169½ | 339¼ | 509 | 678½ | 1017¾ |
| 120 | 10 | 188½ | 377 | 565½ | 754 | 1131 |
| 132 | 11 | 207¼ | 414¾ | 622 | 829½ | 1244 |
| 144 | 12 | 226¼ | 452½ | 678½ | 904¾ | 1357¼ |
| 156 | 13 | 245 | 490 | 735¼ | 980¼ | 1470¼ |
| 168 | 14 | 263¾ | 527¾ | 791½ | 1055½ | 1583½ |
| 180 | 15 | 282¾ | 565½ | 848¼ | 1131 | 1696½ |
| 192 | 16 | 301½ | 603 | 904¾ | 1206¼ | 1809½ |
| 204 | 17 | 320½ | 640¾ | 961¼ | 1281¾ | 1922½ |
| 216 | 18 | 339¼ | 678½ | 1017¾ | 1357¼ | 2035¾ |
| 228 | 19 | 358 | 716¼ | 1074½ | 1432½ | 2148¾ |
| 240 | 20 | 377 | 754 | 1131 | 1508 | 2262 |

***To find*** the length of pipe in a bend having a radius not given above, add together the length of pipe in bends whose combined radii equal the required radius.

***Example:*** Find length of pipe in 90° bend of 5′ 9″ radius.
Length of pipe in 90° bend of 5′ radius = 94¼″
Length of pipe in 90° bend of 9″ radius = 14¼″

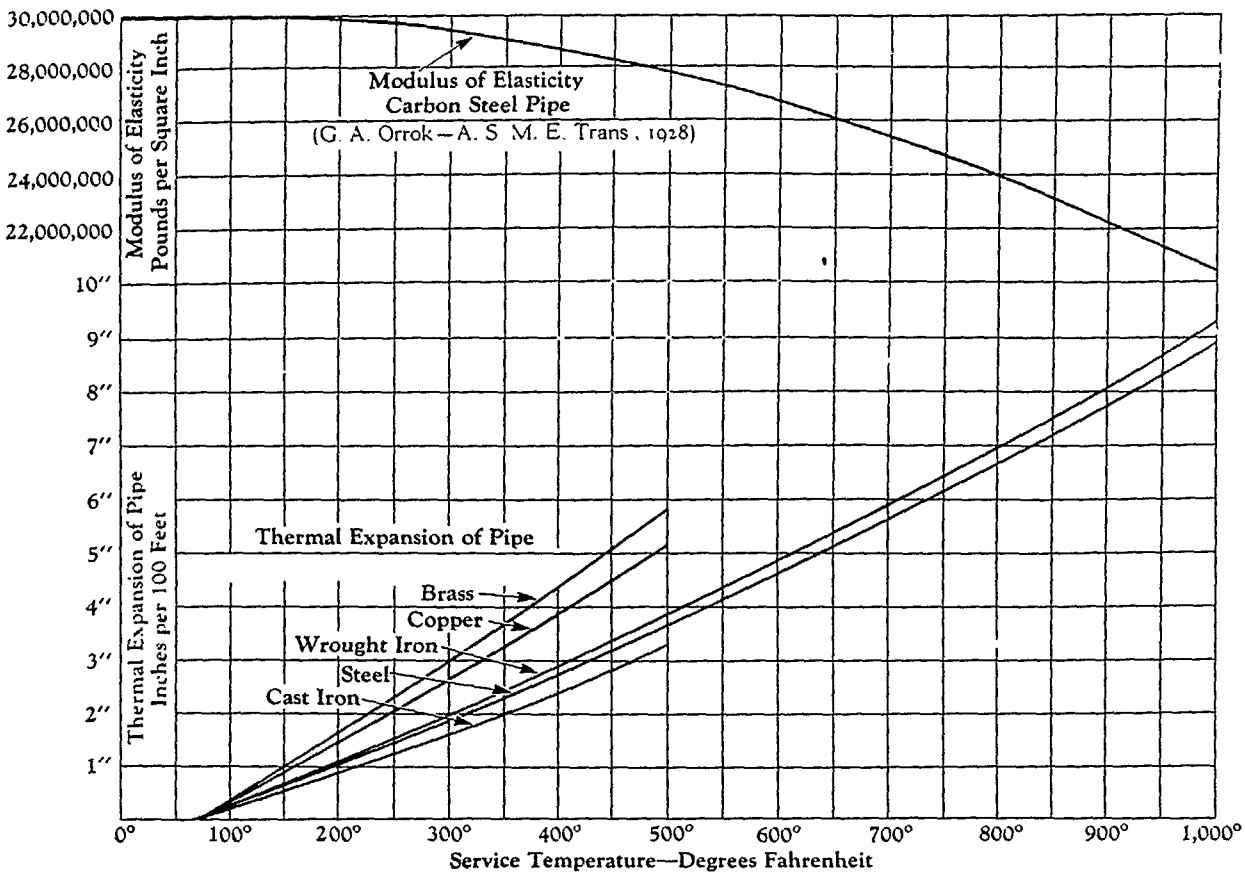
Then, length of pipe in 90° bend of 5′ 9″ radius = 108½″



*Standard Types of Pipe Bends....pages 502 and 503*

*Minimum permissible radii of pipe bends....page 503*

# Thermal Expansion and Modulus of Elasticity of Pipe




References

Pipe.....pages 477 to 484
American Standard for Pipe.....pages 486 to 489
Commercial Wrought Steel Pipe Data.....pages 490 and 491

Calculating Working Pressures,
Stress, or Wall Thickness of Pipe.....pages 543 to 545

Calculations of Pipe Bends.....pages 546 and 547
Length of Pipe in Bends.....page 548

# Spacing of Pipe Supports

When a horizontal pipe line is supported at intermediate points, sagging of the pipe occurs between these supports, the amount of sag being dependent upon the weight of the pipe, fluid, insulation, and valves or fittings which may be included in the line. If the pipe line is installed with no downward pitch, pockets will be formed in each span in which case condensation may collect if the line is transporting steam. In order to eliminate these pockets, the line must be pitched downward so that the outlet of each span is lower than the maximum sag.

Crane has conducted tests to determine the deflection of horizontal standard pipe lines filled with water, in pipe sizes ¾″ to 4″ inclusive, the results of which have indicated that for pipes larger than 2″ and with supports having center to center dimensions greater than 10 feet, the resultant deflection is less than that determined by the use of the formula for a uniformly loaded pipe fixed at both ends. For pipe sizes 2″ and smaller, the test deflection was in excess of that determined by the formula for pipe having fixed ends and approached, for the shorter spans, the deflection as determined by the use of the formula for pipe lines having unrestrained ends.

Page 551 gives the deflection of horizontal standard pipe lines filled with water, for varying spans, based upon the results obtained from tests for sizes 2″ and smaller, and upon the formula for fixed ends for the larger sizes of pipe. The deflection values given on the chart are twice those obtained from test or calculated, to compensate for any variables including weight of insulation, etc.

The formula given below indicates the vertical distance that the span must be pitched so that the outlet is lower than the maximum sag of the pipe.

$$h = \frac{144\, S^2 y}{36\, S^2 - y^2}$$

where:

$h$ = Difference in elevation of span ends, inches
$S$ = Length of one span, feet
$y$ = Deflection of one span, inches

By eliminating the unconsequential term "$-y^2$" from the denominator, the formula reduces to:

$$h = 4\, y$$

The pitch of pipe spans, called the Average Gradient, is a ratio between the drop in elevation and the length of the span. This is expressed as so many inches in a certain number of feet.

$$\text{Average Gradient} = \frac{4\, y}{S}$$

The dotted lines as shown on the chart on the opposite page are plotted from the above formula and indicate average gradients of 1″ in 10′, 1″ in 15′, 1″ in 20′, 1″ in 30′, and 1″ in 40′.

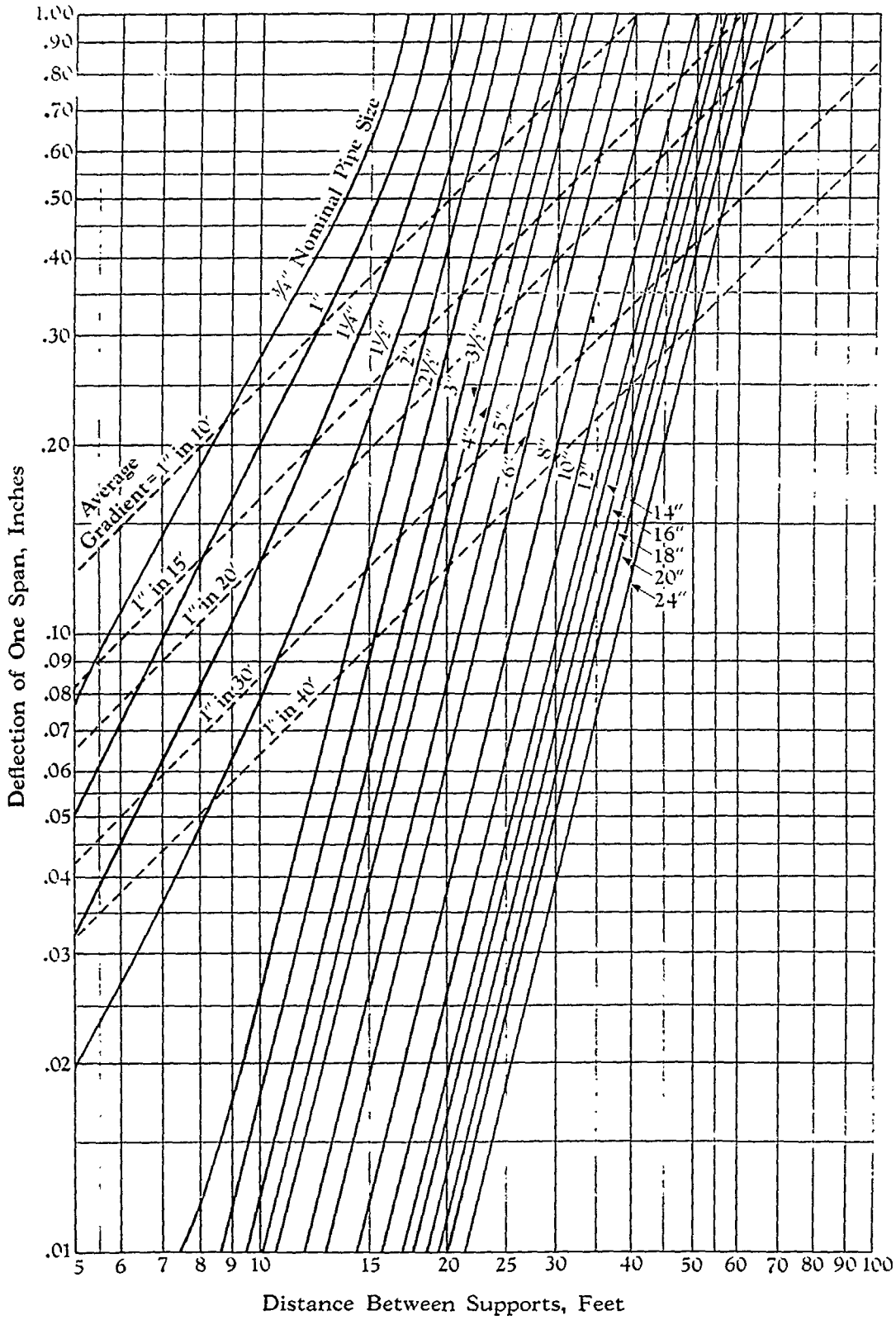
## EXAMPLE

What is the maximum distance between supports for a 4″ Standard pipe line assuming a pitch or average gradient of 1″ in 30 feet?

Proceed downward from the intersection of the diagonal dotted line for an average gradient of 1″ in 30 feet and the diagonal solid line for 4″ pipe to the bottom line where it is noted that the maximum span is approximately 22 feet.

# Deflection of Horizontal Pipe Lines

(Based on Standard Pipe Filled with Water)



# Conversion Table

## Measure

1 in. = 25.4 mm.
1 mm. = .03937 in.
1 mm. = .00328 ft.
1 ft. = 304.8 mm.
1 ft. = 30.48 cm.

1 sq. in. = 6.4516 sq. cm.
1 sq. cm. = 0.155 sq. in.
1 sq. cm. = .00108 sq. ft.
1 sq. ft. = 929.03 sq. cm.

1 cu. in. = 16.39 cu. cm.
1 cu. ft. = 1728 cu. in.
1 cu. ft. = 28,316.83 cu. cm.
1 cu. ft. = 7.4805 U. S. gals.
1 cu. ft. = 6.23 imp. gals.
1 cu. ft. = 28.375 liters

1 U. S. gal. = 0.1337 cu. ft.
1 imp. gal. = 277.27 cu. in.
1 imp. gal. = 0.16 cu. ft.
1 imp. gal. = 1.2 U. S. gals.
1 imp. gal. = 4.537 liters

1 liter = 61 cu. in.
1 liter = .0353 cu. ft.
1 liter = .22 imp. gal.

## Weight

1 cu. in. of water = .0361 lb. (15° C)
1 cu. ft. of water = 62.4 lbs. (15° C)
1 U. S. gal. of water = 8.33 lbs. (15° C)
1 imp. gal. of water = 10 lbs. (15° C)
1 liter of water = 2.2 lbs. (15° C)

1 kg. = 2.2 lbs.
1 cu. in. of water = .0735 cu. in. of mercury
1 cu. in. of mercury = 13.6 cu. in. of water
1 cu. in. of mercury = .491 lb.

## Velocity

1 ft. per sec. = .3048 m. per sec.
1 m. per sec. = 3.2808 ft. per sec.

## Density

1 lb. per cu. in. = 27.68 gram. per cu. cm.
1 gr. per cu. cm. = .03613 lb. per cu. in.
1 lb. per cu. ft. = 16.0184 kg. per cu. m.
1 kg. per cu. m. = .06243 lb. per cu. ft.

## Pressure

1 in. of water = .0361 lb. per sq. in.
1 in. of water = .0735 in. of mercury
1 ft. of water = .4332 lb. per sq. in.
1 ft. of water = .8824 in. of mercury

1 in. of mercury = .4912 lb. per sq. in.
1 in. of mercury = 13.6 in. of water
1 in. of mercury = 1.133 ft. of water
1 cm. of mercury = .1934 lb. per sq. in.

1 atmosphere = 14.696 lbs. per sq. in.
1 atmosphere = 34 ft. of water
1 atmosphere = 760 mm. of mercury

1 lb. per sq. in. = 27.71 in. of water
1 lb. per sq. in. = 2.312 ft. of water
1 lb. per sq. in. = 2.04 in. of mercury
1 lb. per sq. in. = .06804 atmosphere
1 lb. per sq. in. = .0703 kg. per sq. cm.
1 lb. per sq. in. = 703.08 kg. per sq. m.

1 kg. per sq. cm. = 14.223 lbs. per sq. in.
1 kg. per sq. m. = .00142 lb. per sq. in.

## Heat Transfer

1 B.t.u. per sq. ft. = .2712 gram. calorie per sq. cm.
1 gram. cal. per sq. cm. = 3.687 B.t.u. per sq. ft.
1 B.t.u. per hr. per sq. ft. per F° = 4.88 kg. cal. per hr. per sq. m. per C°.
1 kg. cal. per hr. per sq. m. per C° = .205 B.t.u. per hr. per sq. ft. per F°.
1 B.t.u. per hr. per sq. ft. per F° = .0001355 gram. cal. per sec. per sq. cm. per C°.
1 gram. cal. per sec. per sq. cm. per C° = 7380 B.t.u. per hr. per sq. ft. per F°.

## Thermal Conductivity

1 B.t.u. per sq. ft. per in. = .6892 gram. calories per sq. cm. per cm.
1 gram. cal. per sq. cm. per cm. = 1.451 B.t.u. per sq. ft. per in.
1 B.t.u. per hr. per sq. ft. per F° per in. = .0003445 gram. cal. per sec. per sq. cm. per C° per cm.
1 gram. cal. per sec. per sq. cm. per C° per cm. = 2903 B.t.u. per hr. per sq. ft. per F° per in.
1 B.t.u. per hr. per sq. ft. per F° per ft. = .00413 gram. cal. per sec. per sq. cm. per C° per cm.
1 gram. cal. per sec. per sq. cm. per C° per cm. = 242.13 B.t.u. per hr. per sq. ft. per F° per ft.

# Linear Conversion

## Fractions of an Inch To Decimals of an Inch and to Millimeters

| Fraction | Decimal | Millimeter |
|---|---|---|
| 1/64 | .015625 | 0.39688 |
| 1/32 | .03125 | 0.79375 |
| 3/64 | .046875 | 1.19063 |
| 1/16 | .0625 | 1.58750 |
| 5/64 | .078125 | 1.98438 |
| 3/32 | .09375 | 2.38125 |
| 7/64 | .109375 | 2.77813 |
| 1/8 | .125 | 3.17501 |
| 9/64 | .140625 | 3.57188 |
| 5/32 | .15625 | 3.96876 |
| 11/64 | .171875 | 4.36563 |
| 3/16 | .1875 | 4.76251 |
| 13/64 | .203125 | 5.15939 |
| 7/32 | .21875 | 5.55626 |
| 15/64 | .234375 | 5.95314 |
| 1/4 | .25 | 6.35001 |
| 17/64 | .265625 | 6.74689 |
| 9/32 | .28125 | 7.14376 |
| 19/64 | .296875 | 7.54064 |
| 5/16 | .3125 | 7.93752 |
| 21/64 | .328125 | 8.33439 |
| 11/32 | .34375 | 8.73127 |
| 23/64 | .359375 | 9.12814 |
| 3/8 | .375 | 9.52502 |
| 25/64 | .390625 | 9.92189 |
| 13/32 | .40625 | 10.31877 |
| 27/64 | .421875 | 10.71565 |
| 7/16 | .4375 | 11.11252 |
| 29/64 | .453125 | 11.50940 |
| 15/32 | .46875 | 11.90627 |
| 31/64 | .484375 | 12.30315 |
| 1/2 | .5 | 12.70002 |
| 33/64 | .515625 | 13.09690 |
| 17/32 | .53125 | 13.49378 |
| 35/64 | .546875 | 13.89065 |
| 9/16 | .5625 | 14.28753 |
| 37/64 | .578125 | 14.68440 |
| 19/32 | .59375 | 15.08128 |
| 39/64 | .609375 | 15.47816 |
| 5/8 | .625 | 15.87503 |
| 41/64 | .640625 | 16.27191 |
| 21/32 | .65625 | 16.66878 |
| 43/64 | .671875 | 17.06566 |
| 11/16 | .6875 | 17.46253 |
| 45/64 | .703125 | 17.85941 |
| 23/32 | .71875 | 18.25629 |
| 47/64 | .734375 | 18.65316 |
| 3/4 | .75 | 19.05004 |
| 49/64 | .765625 | 19.44691 |
| 25/32 | .78125 | 19.84379 |
| 51/64 | .796875 | 20.24066 |
| 13/16 | .8125 | 20.63754 |
| 53/64 | .828125 | 21.03442 |
| 27/32 | .84375 | 21.43129 |
| 55/64 | .859375 | 21.82817 |
| 7/8 | .875 | 22.22504 |
| 57/64 | .890625 | 22.62192 |
| 29/32 | .90625 | 23.01880 |
| 59/64 | .921875 | 23.41567 |
| 15/16 | .9375 | 23.81255 |
| 61/64 | .953125 | 24.20942 |
| 31/32 | .96875 | 24.60630 |
| 63/64 | .984375 | 25.00317 |
| 1 | 1.0 | 25.40005 |

# Linear Conversion

## Decimals of an Inch to Millimeters

(0.10 inch = 2.54 millimeters)

| Inches | 0.00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 | Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.25 | 0.51 | 0.76 | 1.02 | 1.27 | 1.52 | 1.78 | 2.03 | 2.29 | 0.00 |
| .10 | 2.54 | 2.79 | 3.05 | 3.30 | 3.56 | 3.81 | 4.06 | 4.32 | 4.57 | 4.83 | .10 |
| .20 | 5.08 | 5.33 | 5.59 | 5.84 | 6.10 | 6.35 | 6.60 | 6.86 | 7.11 | 7.37 | .20 |
| .30 | 7.62 | 7.87 | 8.13 | 8.38 | 8.64 | 8.89 | 9.14 | 9.40 | 9.65 | 9.91 | .30 |
| .40 | 10.16 | 10.41 | 10.67 | 10.92 | 11.18 | 11.43 | 11.68 | 11.94 | 12.19 | 12.45 | .40 |
| .50 | 12.70 | 12.95 | 13.21 | 13.46 | 13.72 | 13.97 | 14.22 | 14.48 | 14.73 | 14.99 | .50 |
| .60 | 15.24 | 15.49 | 15.75 | 16.00 | 16.26 | 16.51 | 16.76 | 17.02 | 17.27 | 17.53 | .60 |
| .70 | 17.78 | 18.03 | 18.29 | 18.54 | 18.80 | 19.05 | 19.30 | 19.56 | 19.81 | 20.07 | .70 |
| .80 | 20.32 | 20.57 | 20.83 | 21.08 | 21.34 | 21.59 | 21.84 | 22.10 | 22.35 | 22.61 | .80 |
| .90 | 22.86 | 23.11 | 23.37 | 23.62 | 23.88 | 24.13 | 24.38 | 24.64 | 24.89 | 25.15 | .90 |

## Millimeters to Inches

(1 millimeter = .03937 inch)

| Millimeters | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Millimeters |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.00 | 0.039 | 0.079 | 0.118 | 0.157 | 0.197 | 0.236 | 0.276 | 0.315 | 0.354 | 0 |
| 10 | 0.39 | 0.43 | 0.47 | 0.51 | 0.55 | 0.59 | 0.63 | 0.67 | 0.71 | 0.75 | 10 |
| 20 | 0.79 | 0.83 | 0.87 | 0.91 | 0.94 | 0.98 | 1.02 | 1.06 | 1.10 | 1.14 | 20 |
| 30 | 1.18 | 1.22 | 1.26 | 1.30 | 1.34 | 1.38 | 1.42 | 1.46 | 1.50 | 1.54 | 30 |
| 40 | 1.57 | 1.61 | 1.65 | 1.69 | 1.73 | 1.77 | 1.81 | 1.85 | 1.89 | 1.93 | 40 |
| 50 | 1.97 | 2.01 | 2.05 | 2.09 | 2.13 | 2.17 | 2.20 | 2.24 | 2.28 | 2.32 | 50 |
| 60 | 2.36 | 2.40 | 2.44 | 2.48 | 2.52 | 2.56 | 2.60 | 2.64 | 2.68 | 2.72 | 60 |
| 70 | 2.76 | 2.80 | 2.83 | 2.87 | 2.91 | 2.95 | 2.99 | 3.03 | 3.07 | 3.11 | 70 |
| 80 | 3.15 | 3.19 | 3.23 | 3.27 | 3.31 | 3.35 | 3.39 | 3.43 | 3.46 | 3.50 | 80 |
| 90 | 3.54 | 3.58 | 3.62 | 3.66 | 3.70 | 3.74 | 3.78 | 3.82 | 3.86 | 3.90 | 90 |
| 100 | 3.94 | 3.98 | 4.02 | 4.06 | 4.09 | 4.13 | 4.17 | 4.21 | 4.25 | 4.29 | 100 |
| 110 | 4.33 | 4.37 | 4.41 | 4.45 | 4.49 | 4.53 | 4.57 | 4.61 | 4.65 | 4.69 | 110 |
| 120 | 4.72 | 4.76 | 4.80 | 4.84 | 4.88 | 4.92 | 4.96 | 5.00 | 5.04 | 5.08 | 120 |
| 130 | 5.12 | 5.16 | 5.20 | 5.24 | 5.28 | 5.31 | 5.35 | 5.39 | 5.43 | 5.47 | 130 |
| 140 | 5.51 | 5.55 | 5.59 | 5.63 | 5.67 | 5.71 | 5.75 | 5.79 | 5.83 | 5.87 | 140 |
| 150 | 5.91 | 5.94 | 5.98 | 6.02 | 6.06 | 6.10 | 6.14 | 6.18 | 6.22 | 6.26 | 150 |
| 160 | 6.30 | 6.34 | 6.38 | 6.42 | 6.46 | 6.50 | 6.54 | 6.57 | 6.61 | 6.65 | 160 |
| 170 | 6.69 | 6.73 | 6.77 | 6.81 | 6.85 | 6.89 | 6.93 | 6.97 | 7.01 | 7.05 | 170 |
| 180 | 7.09 | 7.13 | 7.17 | 7.20 | 7.24 | 7.28 | 7.32 | 7.36 | 7.40 | 7.44 | 180 |
| 190 | 7.48 | 7.52 | 7.56 | 7.60 | 7.64 | 7.68 | 7.72 | 7.76 | 7.80 | 7.83 | 190 |
| 200 | 7.87 | 7.91 | 7.95 | 7.99 | 8.03 | 8.07 | 8.11 | 8.15 | 8.19 | 8.23 | 200 |
| 210 | 8.27 | 8.31 | 8.35 | 8.39 | 8.43 | 8.46 | 8.50 | 8.54 | 8.58 | 8.62 | 210 |
| 220 | 8.66 | 8.70 | 8.74 | 8.78 | 8.82 | 8.86 | 8.90 | 8.94 | 8.98 | 9.02 | 220 |
| 230 | 9.06 | 9.09 | 9.13 | 9.17 | 9.21 | 9.25 | 9.29 | 9.33 | 9.37 | 9.41 | 230 |
| 240 | 9.45 | 9.49 | 9.53 | 9.57 | 9.61 | 9.65 | 9.69 | 9.72 | 9.76 | 9.80 | 240 |
| 250 | 9.84 | 9.88 | 9.92 | 9.96 | 10.00 | 10.04 | 10.08 | 10.12 | 10.16 | 10.20 | 250 |
| 260 | 10.24 | 10.28 | 10.31 | 10.35 | 10.39 | 10.43 | 10.47 | 10.51 | 10.55 | 10.59 | 260 |
| 270 | 10.63 | 10.67 | 10.71 | 10.75 | 10.79 | 10.83 | 10.87 | 10.91 | 10.94 | 10.98 | 270 |
| 280 | 11.02 | 11.06 | 11.10 | 11.14 | 11.18 | 11.22 | 11.26 | 11.30 | 11.34 | 11.38 | 280 |
| 290 | 11.42 | 11.46 | 11.50 | 11.54 | 11.57 | 11.61 | 11.65 | 11.69 | 11.73 | 11.77 | 290 |
| 300 | 11.81 | 11.85 | 11.89 | 11.93 | 11.97 | 12.01 | 12.05 | 12.09 | 12.13 | 12.17 | 300 |
| 310 | 12.20 | 12.24 | 12.28 | 12.32 | 12.36 | 12.40 | 12.44 | 12.48 | 12.52 | 12.56 | 310 |
| 320 | 12.60 | 12.64 | 12.68 | 12.72 | 12.76 | 12.80 | 12.83 | 12.87 | 12.91 | 12.95 | 320 |
| 330 | 12.99 | 13.03 | 13.07 | 13.11 | 13.15 | 13.19 | 13.23 | 13.27 | 13.31 | 13.35 | 330 |
| 340 | 13.39 | 13.43 | 13.46 | 13.50 | 13.54 | 13.58 | 13.62 | 13.66 | 13.70 | 13.74 | 340 |
| 350 | 13.78 | 13.82 | 13.86 | 13.90 | 13.94 | 13.98 | 14.02 | 14.06 | 14.09 | 14.13 | 350 |
| 360 | 14.17 | 14.21 | 14.25 | 14.29 | 14.33 | 14.37 | 14.41 | 14.45 | 14.49 | 14.53 | 360 |
| 370 | 14.57 | 14.61 | 14.65 | 14.69 | 14.72 | 14.76 | 14.80 | 14.84 | 14.88 | 14.92 | 370 |
| 380 | 14.96 | 15.00 | 15.04 | 15.08 | 15.12 | 15.16 | 15.20 | 15.24 | 15.28 | 15.31 | 380 |
| 390 | 15.35 | 15.39 | 15.43 | 15.47 | 15.51 | 15.55 | 15.59 | 15.63 | 15.67 | 15.71 | 390 |

(Continued on next page)

# Millimeters to Inches (Cont.)

| Millimeters | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Millimeters |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 400 | 15.75 | 15.79 | 15.83 | 15.87 | 15.91 | 15.94 | 15.98 | 16.02 | 16.06 | 16.10 | 400 |
| 410 | 16.14 | 16.18 | 16.22 | 16.26 | 16.30 | 16.34 | 16.38 | 16.42 | 16.46 | 16.50 | 410 |
| 420 | 16.54 | 16.57 | 16.61 | 16.65 | 16.69 | 16.73 | 16.77 | 16.81 | 16.85 | 16.89 | 420 |
| 430 | 16.93 | 16.97 | 17.01 | 17.05 | 17.09 | 17.13 | 17.17 | 17.20 | 17.24 | 17.28 | 430 |
| 440 | 17.32 | 17.36 | 17.40 | 17.44 | 17.48 | 17.52 | 17.56 | 17.60 | 17.64 | 17.68 | 440 |
| 450 | 17.72 | 17.76 | 17.80 | 17.83 | 17.87 | 17.91 | 17.95 | 17.99 | 18.03 | 18.07 | 450 |
| 460 | 18.11 | 18.15 | 18.19 | 18.23 | 18.27 | 18.31 | 18.35 | 18.39 | 18.43 | 18.46 | 460 |
| 470 | 18.50 | 18.54 | 18.58 | 18.62 | 18.66 | 18.70 | 18.74 | 18.78 | 18.82 | 18.86 | 470 |
| 480 | 18.90 | 18.94 | 18.98 | 19.02 | 19.06 | 19.09 | 19.13 | 19.17 | 19.21 | 19.25 | 480 |
| 490 | 19.29 | 19.33 | 19.37 | 19.41 | 19.45 | 19.49 | 19.53 | 19.57 | 19.61 | 19.65 | 490 |
| 500 | 19.69 | 19.72 | 19.76 | 19.80 | 19.84 | 19.88 | 19.92 | 19.96 | 20.00 | 20.04 | 500 |
| 510 | 20.08 | 20.12 | 20.16 | 20.20 | 20.24 | 20.28 | 20.31 | 20.35 | 20.39 | 20.43 | 510 |
| 520 | 20.47 | 20.51 | 20.55 | 20.59 | 20.63 | 20.67 | 20.71 | 20.75 | 20.79 | 20.83 | 520 |
| 530 | 20.87 | 20.91 | 20.94 | 20.98 | 21.02 | 21.06 | 21.10 | 21.14 | 21.18 | 21.22 | 530 |
| 540 | 21.26 | 21.30 | 21.34 | 21.38 | 21.42 | 21.46 | 21.50 | 21.54 | 21.58 | 21.61 | 540 |
| 550 | 21.65 | 21.69 | 21.73 | 21.77 | 21.81 | 21.85 | 21.89 | 21.93 | 21.97 | 22.01 | 550 |
| 560 | 22.05 | 22.09 | 22.13 | 22.17 | 22.20 | 22.24 | 22.28 | 22.32 | 22.36 | 22.40 | 560 |
| 570 | 22.44 | 22.48 | 22.52 | 22.56 | 22.60 | 22.64 | 22.68 | 22.72 | 22.76 | 22.80 | 570 |
| 580 | 22.83 | 22.87 | 22.91 | 22.95 | 22.99 | 23.03 | 23.07 | 23.11 | 23.15 | 23.19 | 580 |
| 590 | 23.23 | 23.27 | 23.31 | 23.35 | 23.39 | 23.43 | 23.46 | 23.50 | 23.54 | 23.58 | 590 |
| 600 | 23.62 | 23.66 | 23.70 | 23.74 | 23.78 | 23.82 | 23.86 | 23.90 | 23.94 | 23.98 | 600 |
| 610 | 24.02 | 24.06 | 24.09 | 24.13 | 24.17 | 24.21 | 24.25 | 24.29 | 24.33 | 24.37 | 610 |
| 620 | 24.41 | 24.45 | 24.49 | 24.53 | 24.57 | 24.61 | 24.65 | 24.68 | 24.72 | 24.76 | 620 |
| 630 | 24.80 | 24.84 | 24.88 | 24.92 | 24.96 | 25.00 | 25.04 | 25.08 | 25.12 | 25.16 | 630 |
| 640 | 25.20 | 25.24 | 25.28 | 25.31 | 25.35 | 25.39 | 25.43 | 25.47 | 25.51 | 25.55 | 640 |
| 650 | 25.59 | 25.63 | 25.67 | 25.71 | 25.75 | 25.79 | 25.83 | 25.87 | 25.91 | 25.94 | 650 |
| 660 | 25.98 | 26.02 | 26.06 | 26.10 | 26.14 | 26.18 | 26.22 | 26.26 | 26.30 | 26.34 | 660 |
| 670 | 26.38 | 26.42 | 26.46 | 26.50 | 26.54 | 26.57 | 26.61 | 26.65 | 26.69 | 26.73 | 670 |
| 680 | 26.77 | 26.81 | 26.85 | 26.89 | 26.93 | 26.97 | 27.01 | 27.05 | 27.09 | 27.13 | 680 |
| 690 | 27.17 | 27.20 | 27.24 | 27.28 | 27.32 | 27.36 | 27.40 | 27.44 | 27.48 | 27.52 | 690 |
| 700 | 27.56 | 27.60 | 27.64 | 27.68 | 27.72 | 27.76 | 27.80 | 27.83 | 27.87 | 27.91 | 700 |
| 710 | 27.95 | 27.99 | 28.03 | 28.07 | 28.11 | 28.15 | 28.19 | 28.23 | 28.27 | 28.31 | 710 |
| 720 | 28.35 | 28.39 | 28.43 | 28.46 | 28.50 | 28.54 | 28.58 | 28.62 | 28.66 | 28.70 | 720 |
| 730 | 28.74 | 28.78 | 28.82 | 28.86 | 28.90 | 28.94 | 28.98 | 29.02 | 29.06 | 29.09 | 730 |
| 740 | 29.13 | 29.17 | 29.21 | 29.25 | 29.29 | 29.33 | 29.37 | 29.41 | 29.45 | 29.49 | 740 |
| 750 | 29.53 | 29.57 | 29.61 | 29.65 | 29.68 | 29.72 | 29.76 | 29.80 | 29.84 | 29.88 | 750 |
| 760 | 29.92 | 29.96 | 30.00 | 30.04 | 30.08 | 30.12 | 30.16 | 30.20 | 30.24 | 30.28 | 760 |
| 770 | 30.31 | 30.35 | 30.39 | 30.43 | 30.47 | 30.51 | 30.55 | 30.59 | 30.63 | 30.67 | 770 |
| 780 | 30.71 | 30.75 | 30.79 | 30.83 | 30.87 | 30.91 | 30.94 | 30.98 | 31.02 | 31.06 | 780 |
| 790 | 31.10 | 31.14 | 31.18 | 31.22 | 31.26 | 31.30 | 31.34 | 31.38 | 31.42 | 31.46 | 790 |
| 800 | 31.50 | 31.54 | 31.57 | 31.61 | 31.65 | 31.69 | 31.73 | 31.77 | 31.81 | 31.85 | 800 |
| 810 | 31.89 | 31.93 | 31.97 | 32.01 | 32.05 | 32.09 | 32.13 | 32.17 | 32.20 | 32.24 | 810 |
| 820 | 32.28 | 32.32 | 32.36 | 32.40 | 32.44 | 32.48 | 32.52 | 32.56 | 32.60 | 32.64 | 820 |
| 830 | 32.68 | 32.72 | 32.76 | 32.80 | 32.83 | 32.87 | 32.91 | 32.95 | 32.99 | 33.03 | 830 |
| 840 | 33.07 | 33.11 | 33.15 | 33.19 | 33.23 | 33.27 | 33.31 | 33.35 | 33.39 | 33.43 | 840 |
| 850 | 33.46 | 33.50 | 33.54 | 33.58 | 33.62 | 33.66 | 33.70 | 33.74 | 33.78 | 33.82 | 850 |
| 860 | 33.86 | 33.90 | 33.94 | 33.98 | 34.02 | 34.06 | 34.09 | 34.13 | 34.17 | 34.21 | 860 |
| 870 | 34.25 | 34.29 | 34.33 | 34.37 | 34.41 | 34.45 | 34.49 | 34.53 | 34.57 | 34.61 | 870 |
| 880 | 34.65 | 34.68 | 34.72 | 34.76 | 34.80 | 34.84 | 34.88 | 34.92 | 34.96 | 35.00 | 880 |
| 890 | 35.04 | 35.08 | 35.12 | 35.16 | 35.20 | 35.24 | 35.28 | 35.31 | 35.35 | 35.39 | 890 |
| 900 | 35.43 | 35.47 | 35.51 | 35.55 | 35.59 | 35.63 | 35.67 | 35.71 | 35.75 | 35.79 | 900 |
| 910 | 35.83 | 35.87 | 35.91 | 35.94 | 35.98 | 36.02 | 36.06 | 36.10 | 36.14 | 36.18 | 910 |
| 920 | 36.22 | 36.26 | 36.30 | 36.34 | 36.38 | 36.42 | 36.46 | 36.50 | 36.54 | 36.57 | 920 |
| 930 | 36.61 | 36.65 | 36.69 | 36.73 | 36.77 | 36.81 | 36.85 | 36.89 | 36.93 | 36.97 | 930 |
| 940 | 37.01 | 37.05 | 37.09 | 37.13 | 37.17 | 37.20 | 37.24 | 37.28 | 37.32 | 37.36 | 940 |
| 950 | 37.40 | 37.44 | 37.48 | 37.52 | 37.56 | 37.60 | 37.64 | 37.68 | 37.72 | 37.76 | 950 |
| 960 | 37.80 | 37.83 | 37.87 | 37.91 | 37.95 | 37.99 | 38.03 | 38.07 | 38.11 | 38.15 | 960 |
| 970 | 38.19 | 38.23 | 38.27 | 38.31 | 38.35 | 38.39 | 38.43 | 38.46 | 38.50 | 38.54 | 970 |
| 980 | 38.58 | 38.62 | 38.66 | 38.70 | 38.74 | 38.78 | 38.82 | 38.86 | 38.90 | 38.94 | 980 |
| 990 | 38.98 | 39.02 | 39.06 | 39.09 | 39.13 | 39.17 | 39.21 | 39.25 | 39.29 | 39.33 | 990 |
| 1000 | 39.37 | 39.41 | 39.45 | 39.49 | 39.53 | 39.57 | 39.61 | 39.65 | 39.68 | 39.72 | 1000 |

# Linear Conversion

## Inches to Millimeters

(1 inch = 25.4 millimeters)

| In. | 0 | 1/16 | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 | 11/16 | 3/4 | 13/16 | 7/8 | 15/16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.0 | 1.6 | 3.2 | 4.8 | 6.4 | 7.9 | 9.5 | 11.1 | 12.7 | 14.3 | 15.9 | 17.5 | 19.1 | 20.6 | 22.2 | 23.8 |
| 1 | 25.4 | 27.0 | 28.6 | 30.2 | 31.8 | 33.3 | 34.9 | 36.5 | 38.1 | 39.7 | 41.3 | 42.9 | 44.5 | 46.0 | 47.6 | 49.2 |
| 2 | 50.8 | 52.4 | 54.0 | 55.6 | 57.2 | 58.7 | 60.3 | 61.9 | 63.5 | 65.1 | 66.7 | 68.3 | 69.9 | 71.4 | 73.0 | 74.6 |
| 3 | 76.2 | 77.8 | 79.4 | 81.0 | 82.6 | 84.1 | 85.7 | 87.3 | 88.9 | 90.5 | 92.1 | 93.7 | 95.3 | 96.8 | 98.4 | 100.0 |
| 4 | 101.6 | 103.2 | 104.8 | 106.4 | 108.0 | 109.5 | 111.1 | 112.7 | 114.3 | 115.9 | 117.5 | 119.1 | 120.7 | 122.2 | 123.8 | 125.4 |
| 5 | 127.0 | 128.6 | 130.2 | 131.8 | 133.4 | 134.9 | 136.5 | 138.1 | 139.7 | 141.3 | 142.9 | 144.5 | 146.1 | 147.6 | 149.2 | 150.8 |
| 6 | 152.4 | 154.0 | 155.6 | 157.2 | 158.8 | 160.3 | 161.9 | 163.5 | 165.1 | 166.7 | 168.3 | 169.9 | 171.5 | 173.0 | 174.6 | 176.2 |
| 7 | 177.8 | 179.4 | 181.0 | 182.6 | 184.2 | 185.7 | 187.3 | 188.9 | 190.5 | 192.1 | 193.7 | 195.3 | 196.9 | 198.4 | 200.0 | 201.6 |
| 8 | 203.2 | 204.8 | 206.4 | 208.0 | 209.6 | 211.1 | 212.7 | 214.3 | 215.9 | 217.5 | 219.1 | 220.7 | 222.3 | 223.8 | 225.4 | 227.0 |
| 9 | 228.6 | 230.2 | 231.8 | 233.4 | 235.0 | 236.5 | 238.1 | 239.7 | 241.3 | 242.9 | 244.5 | 246.1 | 247.7 | 249.2 | 250.8 | 252.4 |
| 10 | 254.0 | 255.6 | 257.2 | 258.8 | 260.4 | 261.9 | 263.5 | 265.1 | 266.7 | 268.3 | 269.9 | 271.5 | 273.1 | 274.6 | 276.2 | 277.8 |
| 11 | 279.4 | 281.0 | 282.6 | 284.2 | 285.8 | 287.3 | 288.9 | 290.5 | 292.1 | 293.7 | 295.3 | 296.9 | 298.5 | 300.0 | 301.6 | 303.2 |
| 12 | 304.8 | 306.4 | 308.0 | 309.6 | 311.2 | 312.7 | 314.3 | 315.9 | 317.5 | 319.1 | 320.7 | 322.3 | 323.9 | 325.4 | 327.0 | 328.6 |
| 13 | 330.2 | 331.8 | 333.4 | 335.0 | 336.6 | 338.1 | 339.7 | 341.3 | 342.9 | 344.5 | 346.1 | 347.7 | 349.3 | 350.8 | 352.4 | 354.0 |
| 14 | 355.6 | 357.2 | 358.8 | 360.4 | 362.0 | 363.5 | 365.1 | 366.7 | 368.3 | 369.9 | 371.5 | 373.1 | 374.7 | 376.2 | 377.8 | 379.4 |
| 15 | 381.0 | 382.6 | 384.2 | 385.8 | 387.4 | 388.9 | 390.5 | 392.1 | 393.7 | 395.3 | 396.9 | 398.5 | 400.1 | 401.6 | 403.2 | 404.8 |
| 16 | 406.4 | 408.0 | 409.6 | 411.2 | 412.8 | 414.3 | 415.9 | 417.5 | 419.1 | 420.7 | 422.3 | 423.9 | 425.5 | 427.0 | 428.6 | 430.2 |
| 17 | 431.8 | 433.4 | 435.0 | 436.6 | 438.2 | 439.7 | 441.3 | 442.9 | 444.5 | 446.1 | 447.7 | 449.3 | 450.9 | 452.4 | 454.0 | 455.6 |
| 18 | 457.2 | 458.8 | 460.4 | 462.0 | 463.6 | 465.1 | 466.7 | 468.3 | 469.9 | 471.5 | 473.1 | 474.7 | 476.3 | 477.8 | 479.4 | 481.0 |
| 19 | 482.6 | 484.2 | 485.8 | 487.4 | 489.0 | 490.5 | 492.1 | 493.7 | 495.3 | 496.9 | 498.5 | 500.1 | 501.7 | 503.2 | 504.8 | 506.4 |
| 20 | 508.0 | 509.6 | 511.2 | 512.8 | 514.4 | 515.9 | 517.5 | 519.1 | 520.7 | 522.3 | 523.9 | 525.5 | 527.1 | 528.6 | 530.2 | 531.8 |
| 21 | 533.4 | 535.0 | 536.6 | 538.2 | 539.8 | 541.3 | 542.9 | 544.5 | 546.1 | 547.7 | 549.3 | 550.9 | 552.5 | 554.0 | 555.6 | 557.2 |
| 22 | 558.8 | 560.4 | 562.0 | 563.6 | 565.2 | 566.7 | 568.3 | 569.9 | 571.5 | 573.1 | 574.7 | 576.3 | 577.9 | 579.4 | 581.0 | 582.6 |
| 23 | 584.2 | 585.8 | 587.4 | 589.0 | 590.6 | 592.1 | 593.7 | 595.3 | 596.9 | 598.5 | 600.1 | 601.7 | 603.3 | 604.8 | 606.4 | 608.0 |
| 24 | 609.6 | 611.2 | 612.8 | 614.4 | 616.0 | 617.5 | 619.1 | 620.7 | 622.3 | 623.9 | 625.5 | 627.1 | 628.7 | 630.2 | 631.8 | 633.4 |
| 25 | 635.0 | 636.6 | 638.2 | 639.8 | 641.4 | 642.9 | 644.5 | 646.1 | 647.7 | 649.3 | 650.9 | 652.5 | 654.1 | 655.6 | 657.2 | 658.8 |
| 26 | 660.4 | 662.0 | 663.6 | 665.2 | 666.8 | 668.3 | 669.9 | 671.5 | 673.1 | 674.7 | 676.3 | 677.9 | 679.5 | 681.0 | 682.6 | 684.2 |
| 27 | 685.8 | 687.4 | 689.0 | 690.6 | 692.2 | 693.7 | 695.3 | 696.9 | 698.5 | 700.1 | 701.7 | 703.3 | 704.9 | 706.4 | 708.0 | 709.6 |
| 28 | 711.2 | 712.8 | 714.4 | 716.0 | 717.6 | 719.1 | 720.7 | 722.3 | 723.9 | 725.5 | 727.1 | 728.7 | 730.3 | 731.8 | 733.4 | 735.0 |
| 29 | 736.6 | 738.2 | 739.8 | 714.4 | 743.0 | 744.5 | 746.1 | 747.7 | 749.3 | 750.9 | 752.5 | 754.1 | 755.7 | 757.2 | 758.8 | 760.4 |
| 30 | 762.0 | 763.6 | 765.2 | 766.8 | 768.4 | 769.9 | 771.5 | 773.1 | 774.7 | 776.3 | 777.9 | 779.5 | 781.1 | 782.6 | 784.2 | 785.8 |
| 31 | 787.4 | 789.0 | 790.6 | 792.2 | 793.8 | 795.3 | 796.9 | 798.5 | 800.1 | 801.7 | 803.3 | 804.9 | 806.5 | 808.0 | 809.6 | 811.2 |
| 32 | 812.8 | 814.4 | 816.0 | 817.6 | 819.2 | 820.7 | 822.3 | 823.9 | 825.5 | 827.1 | 828.7 | 830.3 | 831.9 | 833.4 | 835.0 | 836.6 |
| 33 | 838.2 | 839.8 | 841.4 | 843.0 | 844.6 | 846.1 | 847.7 | 849.3 | 850.9 | 852.5 | 854.1 | 855.7 | 857.3 | 858.8 | 860.4 | 862.0 |
| 34 | 863.6 | 865.2 | 866.8 | 868.4 | 870.0 | 871.5 | 873.1 | 874.7 | 876.3 | 877.9 | 879.5 | 881.1 | 882.7 | 884.2 | 885.8 | 887.4 |
| 35 | 889.0 | 890.6 | 892.2 | 893.8 | 895.4 | 896.9 | 898.5 | 900.1 | 901.7 | 903.3 | 904.9 | 906.5 | 908.1 | 909.6 | 911.2 | 912.8 |
| 36 | 914.4 | 916.0 | 917.6 | 919.2 | 920.8 | 922.3 | 923.9 | 925.5 | 927.1 | 928.7 | 930.3 | 931.9 | 933.5 | 935.0 | 936.6 | 938.2 |
| 37 | 939.8 | 941.4 | 943.0 | 944.6 | 946.2 | 947.7 | 949.3 | 950.9 | 952.5 | 954.1 | 955.7 | 957.3 | 958.9 | 960.4 | 962.0 | 963.6 |
| 38 | 965.2 | 966.8 | 968.4 | 970.0 | 971.6 | 973.1 | 974.7 | 976.3 | 977.9 | 979.5 | 981.1 | 982.7 | 984.3 | 985.8 | 987.4 | 989.0 |
| 39 | 990.6 | 992.2 | 993.8 | 995.4 | 997.0 | 998.5 | 1000.1 | 1001.7 | 1003.3 | 1004.9 | 1006.5 | 1008.1 | 1009.7 | 1011.2 | 1012.8 | 1014.4 |
| 40 | 1016.0 | 1017.6 | 1019.2 | 1020.8 | 1022.4 | 1023.9 | 1025.5 | 1027.1 | 1028.7 | 1030.3 | 1031.9 | 1033.5 | 1035.1 | 1036.6 | 1038.2 | 1039.8 |
| 41 | 1041.4 | 1043.0 | 1044.6 | 1046.2 | 1047.8 | 1049.3 | 1050.9 | 1052.5 | 1054.1 | 1055.7 | 1057.3 | 1058.9 | 1060.5 | 1062.0 | 1063.6 | 1065.2 |
| 42 | 1066.8 | 1068.4 | 1070.0 | 1071.6 | 1073.2 | 1074.7 | 1076.3 | 1077.9 | 1079.5 | 1081.1 | 1082.7 | 1084.3 | 1085.9 | 1087.4 | 1089.0 | 1090.6 |
| 43 | 1092.2 | 1093.8 | 1095.4 | 1097.0 | 1098.6 | 1100.1 | 1101.7 | 1103.3 | 1104.9 | 1106.5 | 1108.1 | 1109.7 | 1111.3 | 1112.8 | 1114.4 | 1116.0 |
| 44 | 1117.6 | 1119.2 | 1120.8 | 1122.4 | 1124.0 | 1125.5 | 1127.1 | 1128.7 | 1130.3 | 1131.9 | 1133.5 | 1135.1 | 1136.7 | 1138.2 | 1139.8 | 1141.4 |
| 45 | 1143.0 | 1144.6 | 1146.2 | 1147.8 | 1149.4 | 1150.9 | 1152.5 | 1154.1 | 1155.7 | 1157.3 | 1158.9 | 1160.5 | 1162.1 | 1163.6 | 1165.2 | 1166.8 |
| 46 | 1168.4 | 1170.0 | 1171.6 | 1173.2 | 1174.8 | 1176.3 | 1177.9 | 1179.5 | 1181.1 | 1182.7 | 1184.3 | 1185.9 | 1187.5 | 1189.0 | 1190.6 | 1192.2 |
| 47 | 1193.8 | 1195.4 | 1197.0 | 1198.6 | 1200.2 | 1201.7 | 1203.3 | 1204.9 | 1206.5 | 1208.1 | 1209.7 | 1211.3 | 1212.9 | 1214.4 | 1216.0 | 1217.6 |
| 48 | 1219.2 | 1220.8 | 1222.4 | 1224.0 | 1225.6 | 1227.1 | 1228.7 | 1230.3 | 1231.9 | 1233.5 | 1235.1 | 1236.7 | 1238.3 | 1239.8 | 1241.4 | 1243.0 |
| 49 | 1244.6 | 1246.2 | 1247.8 | 1249.4 | 1251.0 | 1252.5 | 1254.1 | 1255.7 | 1257.3 | 1258.9 | 1260.5 | 1262.1 | 1263.7 | 1265.2 | 1266.8 | 1268.4 |
| 50 | 1270.0 | 1271.6 | 1273.2 | 1274.8 | 1276.4 | 1277.9 | 1279.5 | 1281.1 | 1282.7 | 1284.3 | 1285.9 | 1287.5 | 1289.1 | 1290.6 | 1292.2 | 1293.8 |

# Temperature Conversion

| —459.4° to 0° | | | 1° to 60° | | | 61° to 290° | | | 300° to 890° | | | 900° to 3000° | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C / F | F | C | C / F | F | C | C / F | F | C | C / F | F | C | C / F | F |
| −273 | −459.4 | | −17.2 | 1 | 33.8 | 16.1 | 61 | 141.8 | 149 | 300 | 572 | 482 | 900 | 1652 |
| −268 | −450 | | −16.7 | 2 | 35.6 | 16.7 | 62 | 143.6 | 154 | 310 | 590 | 488 | 910 | 1670 |
| −262 | −440 | | −16.1 | 3 | 37.4 | 17.2 | 63 | 145.4 | 160 | 320 | 608 | 493 | 920 | 1688 |
| −257 | −430 | | −15.6 | 4 | 39.2 | 17.8 | 64 | 147.2 | 166 | 330 | 626 | 499 | 930 | 1706 |
| −251 | −420 | | −15.0 | 5 | 41.0 | 18.3 | 65 | 149.0 | 171 | 340 | 644 | 504 | 940 | 1724 |
| −246 | −410 | | −14.4 | 6 | 42.8 | 18.9 | 66 | 150.8 | 177 | 350 | 662 | 510 | 950 | 1742 |
| −240 | −400 | | −13.9 | 7 | 44.6 | 19.4 | 67 | 152.6 | 182 | 360 | 680 | 516 | 960 | 1760 |
| −234 | −390 | | −13.3 | 8 | 46.4 | 20.0 | 68 | 154.4 | 188 | 370 | 698 | 521 | 970 | 1778 |
| −229 | −380 | | −12.8 | 9 | 48.2 | 20.6 | 69 | 156.2 | 193 | 380 | 716 | 527 | 980 | 1796 |
| −223 | −370 | | −12.2 | 10 | 50.0 | 21.1 | 70 | 158.0 | 199 | 390 | 734 | 532 | 990 | 1814 |
| −218 | −360 | | −11.7 | 11 | 51.8 | 21.7 | 71 | 159.8 | 204 | 400 | 752 | 538 | 1000 | 1832 |
| −212 | −350 | | −11.1 | 12 | 53.6 | 22.2 | 72 | 161.6 | 210 | 410 | 770 | 549 | 1020 | 1868 |
| −207 | −340 | | −10.6 | 13 | 55.4 | 22.8 | 73 | 163.4 | 216 | 420 | 788 | 560 | 1040 | 1904 |
| −201 | −330 | | −10.0 | 14 | 57.2 | 23.3 | 74 | 165.2 | 221 | 430 | 806 | 571 | 1060 | 1940 |
| −196 | −320 | | − 9.4 | 15 | 59.0 | 23.9 | 75 | 167.0 | 227 | 440 | 824 | 582 | 1080 | 1976 |
| −190 | −310 | | − 8.9 | 16 | 60.8 | 24.4 | 76 | 168.8 | [illegible] | 450 | 842 | 593 | 1100 | 2012 |
| −184 | −300 | | − 8.3 | 17 | 62.6 | 25.0 | 77 | 170.6 | 238 | 460 | 860 | 604 | 1120 | 2048 |
| −179 | −290 | | − 7.8 | 18 | 64.4 | 25.6 | 78 | 172.4 | 243 | 470 | 878 | 616 | 1140 | 2084 |
| −173 | −280 | | − 7.2 | 19 | 66.2 | 26.1 | 79 | 174.2 | 249 | 480 | 896 | 627 | 1160 | 2120 |
| −169 | −273 | −459.4 | − 6.7 | 20 | 68.0 | 26.7 | 80 | 176.0 | 254 | 490 | 914 | 638 | 1180 | 2156 |
| −168 | −270 | −454 | − 6.1 | 21 | 69.8 | 27.2 | 81 | 177.8 | 260 | 500 | 932 | 649 | 1200 | 2192 |
| −162 | −260 | −436 | − 5.6 | 22 | 71.6 | 27.8 | 82 | 179.6 | 266 | 510 | 950 | 660 | 1220 | 2228 |
| −157 | −250 | −418 | − 5.0 | 23 | 73.4 | 28.3 | 83 | 181.4 | 271 | 520 | 968 | 671 | 1240 | 2264 |
| −151 | −240 | −400 | − 4.4 | 24 | 75.2 | 28.9 | 84 | 183.2 | 277 | 530 | 986 | 682 | 1260 | 2300 |
| −146 | −230 | −382 | − 3.9 | 25 | 77.0 | 29.4 | 85 | 185.0 | 282 | 540 | 1004 | 693 | 1280 | 2336 |
| −140 | −220 | −364 | − 3.3 | 26 | 78.8 | 30.0 | 86 | 186.8 | 288 | 550 | 1022 | 704 | 1300 | 2372 |
| −134 | −210 | −346 | − 2.8 | 27 | 80.6 | 30.6 | 87 | 188.6 | 293 | 560 | 1040 | 732 | 1350 | 2462 |
| −129 | −200 | −328 | − 2.2 | 28 | 82.4 | 31.1 | 88 | 190.4 | 299 | 570 | 1058 | 760 | 1400 | 2552 |
| −123 | −190 | −310 | − 1.7 | 29 | 84.2 | 31.7 | 89 | 192.2 | 304 | 580 | 1076 | 788 | 1450 | 2642 |
| −118 | −180 | −292 | − 1.1 | 30 | 86.0 | 32.2 | 90 | 194.0 | 310 | 590 | 1094 | 816 | 1500 | 2732 |
| −112 | −170 | −274 | − 0.6 | 31 | 87.8 | 32.8 | 91 | 195.8 | 316 | 600 | 1112 | 843 | 1550 | 2822 |
| −107 | −160 | −256 | 0.0 | 32 | 89.6 | 33.3 | 92 | 197.6 | 321 | 610 | 1130 | 871 | 1600 | 2912 |
| −101 | −150 | −238 | 0.6 | 33 | 91.4 | 33.9 | 93 | 199.4 | 327 | 620 | 1148 | 899 | 1650 | 3002 |
| − 96 | −140 | −220 | 1.1 | 34 | 93.2 | 34.4 | 94 | 201.2 | 332 | 630 | 1166 | 927 | 1700 | 3092 |
| − 90 | −130 | −202 | 1.7 | 35 | 95.0 | 35.0 | 95 | 203.0 | 338 | 640 | 1184 | 954 | 1750 | 3182 |
| − 84 | −120 | −184 | 2.2 | 36 | 96.8 | 35.6 | 96 | 204.8 | 343 | 650 | 1202 | 982 | 1800 | 3272 |
| − 79 | −110 | −166 | 2.8 | 37 | 98.6 | 36.1 | 97 | 206.6 | 349 | 660 | 1220 | 1010 | 1850 | 3362 |
| − 73 | −100 | −148 | 3.3 | 38 | 100.4 | 36.7 | 98 | 208.4 | 354 | 670 | 1238 | 1038 | 1900 | 3452 |
| − 68 | − 90 | −130 | 3.9 | 39 | 102.2 | 37.2 | 99 | 210.2 | 360 | 680 | 1256 | 1066 | 1950 | 3542 |
| − 62 | − 80 | −112 | 4.4 | 40 | 104.0 | 37.8 | 100 | 212.0 | 366 | 690 | 1274 | 1093 | 2000 | 3632 |
| − 57 | − 70 | − 94 | 5.0 | 41 | 105.8 | 43 | 110 | 230 | 371 | 700 | 1292 | 1121 | 2050 | 3722 |
| − 51 | − 60 | − 76 | 5.6 | 42 | 107.6 | 49 | 120 | 248 | 377 | 710 | 1310 | 1149 | 2100 | 3812 |
| − 46 | − 50 | − 58 | 6.1 | 43 | 109.4 | 54 | 130 | 266 | 382 | 720 | 1328 | 1177 | 2150 | 3902 |
| − 40 | − 40 | − 40 | 6.7 | 44 | 111.2 | 60 | 140 | 284 | 388 | 730 | 1346 | 1204 | 2200 | 3992 |
| − 34 | − 30 | − 22 | 7.2 | 45 | 113.0 | 66 | 150 | 302 | 393 | 740 | 1364 | 1232 | 2250 | 4082 |
| − 29 | − 20 | − 4 | 7.8 | 46 | 114.8 | 71 | 160 | 320 | 399 | 750 | 1382 | 1260 | 2300 | 4172 |
| − 23 | − 10 | 14 | 8.3 | 47 | 116.6 | 77 | 170 | 338 | 404 | 760 | 1400 | 1288 | 2350 | 4262 |
| − 17.8 | 0 | 32 | 8.9 | 48 | 118.4 | 82 | 180 | 356 | 410 | 770 | 1418 | 1316 | 2400 | 4352 |
| | | | 9.4 | 49 | 120.2 | 88 | 190 | 374 | 416 | 780 | 1436 | 1343 | 2450 | 4442 |
| | | | 10.0 | 50 | 122.0 | 93 | 200 | 392 | 421 | 790 | 1454 | 1371 | 2500 | 4532 |
| | | | 10.6 | 51 | 123.8 | 99 | 210 | 410 | 427 | 800 | 1472 | 1399 | 2550 | 4622 |
| | | | 11.1 | 52 | 125.6 | 100 | 212 | 413.6 | 432 | 810 | 1490 | 1427 | 2600 | 4712 |
| | | | 11.7 | 53 | 127.4 | 104 | 220 | 428 | 438 | 820 | 1508 | 1454 | 2650 | 4802 |
| | | | 12.2 | 54 | 129.2 | 110 | 230 | 446 | 443 | 830 | 1526 | 1482 | 2700 | 4892 |
| | | | 12.8 | 55 | 131.0 | 116 | 240 | 464 | 449 | 840 | 1544 | 1510 | 2750 | 4982 |
| | | | 13.3 | 56 | 132.8 | 121 | 250 | 482 | 454 | 850 | 1562 | 1538 | 2800 | 5072 |
| | | | 13.9 | 57 | 134.6 | 127 | 260 | 500 | 460 | 860 | 1580 | 1566 | 2850 | 5162 |
| | | | 14.4 | 58 | 136.4 | 132 | 270 | 518 | 466 | 870 | 1598 | 1593 | 2900 | 5252 |
| | | | 15.0 | 59 | 138.2 | 138 | 280 | 536 | 471 | 880 | 1616 | 1621 | 2950 | 5342 |
| | | | 15.6 | 60 | 140.0 | 143 | 290 | 554 | 477 | 890 | 1634 | 1649 | 3000 | 5432 |

Locate temperature in middle column. If in degrees Centigrade, read Fahrenheit equivalent in right hand column; if in degrees Fahrenheit, read Centigrade equivalent in left hand column.

Abstracted from "Bethlehem Alloy Steels". (Albert Sauveur type of table. Values revised.) Courtesy Bethlehem Steel Company.

# Weight Conversion

## Pounds to Kilograms

(1 pound = 0.4536 kilogram)

| Pounds | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.00 | 0.45 | 0.91 | 1.36 | 1.81 | 2.27 | 2.72 | 3.18 | 3.63 | 4.08 |
| 10 | 4.54 | 4.99 | 5.44 | 5.90 | 6.35 | 6.80 | 7.26 | 7.71 | 8.16 | 8.62 |
| 20 | 9.07 | 9.53 | 9.98 | 10.43 | 10.89 | 11.34 | 11.79 | 12.25 | 12.70 | 13.15 |
| 30 | 13.61 | 14.06 | 14.52 | 14.97 | 15.42 | 15.88 | 16.33 | 16.78 | 17.24 | 17.69 |
| 40 | 18.14 | 18.60 | 19.05 | 19.50 | 19.96 | 20.41 | 20.87 | 21.32 | 21.77 | 22.23 |
| 50 | 22.68 | 23.13 | 23.59 | 24.04 | 24.49 | 24.95 | 25.40 | 25.86 | 26.31 | 26.76 |
| 60 | 27.22 | 27.67 | 28.12 | 28.58 | 29.03 | 29.48 | 29.94 | 30.39 | 30.84 | 31.30 |
| 70 | 31.75 | 32.21 | 32.66 | 33.11 | 33.57 | 34.02 | 34.47 | 34.93 | 35.38 | 35.83 |
| 80 | 36.29 | 36.74 | 37.20 | 37.65 | 38.10 | 38.56 | 39.01 | 39.46 | 39.92 | 40.37 |
| 90 | 40.82 | 41.28 | 41.73 | 42.18 | 42.64 | 43.09 | 43.55 | 44.00 | 44.45 | 44.91 |

## Kilograms to Pounds

(1 kilogram = 2.2046 pounds)

| Kilograms | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.00 | 2.20 | 4.41 | 6.61 | 8.82 | 11.02 | 13.23 | 15.43 | 17.64 | 19.84 |
| 10 | 22.05 | 24.25 | 26.46 | 28.66 | 30.86 | 33.07 | 35.27 | 37.48 | 39.68 | 41.89 |
| 20 | 44.09 | 46.30 | 48.50 | 50.71 | 52.91 | 55.12 | 57.32 | 59.52 | 61.73 | 63.93 |
| 30 | 66.14 | 68.34 | 70.55 | 72.75 | 74.96 | 77.16 | 79.37 | 81.57 | 83.77 | 85.98 |
| 40 | 88.18 | 90.39 | 92.59 | 94.80 | 97.00 | 99.21 | 101.41 | 103.62 | 105.82 | 108.03 |
| 50 | 110.23 | 112.43 | 114.64 | 116.84 | 119.05 | 121.25 | 123.46 | 125.66 | 127.87 | 130.07 |
| 60 | 132.28 | 134.48 | 136.69 | 138.89 | 141.09 | 143.30 | 145.50 | 147.71 | 149.91 | 152.12 |
| 70 | 154.32 | 156.53 | 158.73 | 160.94 | 163.14 | 165.35 | 167.55 | 169.75 | 171.96 | 174.16 |
| 80 | 176.37 | 178.57 | 180.78 | 182.98 | 185.19 | 187.39 | 189.60 | 191.80 | 194.00 | 196.21 |
| 90 | 198.41 | 200.62 | 202.82 | 205.03 | 207.23 | 209.44 | 211.64 | 213.85 | 216.05 | 218.26 |

# Pressure Conversion

## Pounds per Square Inch to Kilograms per Square Centimeter

(1 pound per square inch = .0703066 kilogram per square centimeter)

| 1 to 30 | | 31 to 60 | | 61 to 90 | | 91 to 200 | | 205 to 400 | | 410 to 700 | | 710 to 1000 | | 1010 to 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. | Lbs. per Sq. Inch | Kg. per Sq. Cm. |
| 1 | .07 | 31 | 2.18 | 61 | 4.29 | 91 | 6.40 | 205 | 14.41 | 410 | 28.83 | 710 | 49.92 | 1010 | 71.01 |
| 2 | .14 | 32 | 2.25 | 62 | 4.36 | 92 | 6.47 | 210 | 14.76 | 420 | 29.53 | 720 | 50.62 | 1020 | 71.71 |
| 3 | .21 | 33 | 2.32 | 63 | 4.43 | 93 | 6.54 | 215 | 15.12 | 430 | 30.23 | 730 | 51.32 | 1030 | 72.42 |
| 4 | .28 | 34 | 2.39 | 64 | 4.50 | 94 | 6.61 | 220 | 15.47 | 440 | 30.93 | 740 | 52.03 | 1040 | 73.12 |
| 5 | .35 | 35 | 2.46 | 65 | 4.57 | 95 | 6.68 | 225 | 15.82 | 450 | 31.64 | 750 | 52.73 | 1050 | 73.82 |
| 6 | .42 | 36 | 2.53 | 66 | 4.64 | 96 | 6.75 | 230 | 16.17 | 460 | 32.34 | 760 | 53.43 | 1060 | 74.52 |
| 7 | .49 | 37 | 2.60 | 67 | 4.71 | 97 | 6.82 | 235 | 16.52 | 470 | 33.04 | 770 | 54.14 | 1070 | 75.23 |
| 8 | .56 | 38 | 2.67 | 68 | 4.78 | 98 | 6.89 | 240 | 16.87 | 480 | 33.75 | 780 | 54.84 | 1080 | 75.93 |
| 9 | .63 | 39 | 2.74 | 69 | 4.85 | 99 | 6.96 | 245 | 17.23 | 490 | 34.45 | 790 | 55.54 | 1090 | 76.63 |
| 10 | .70 | 40 | 2.81 | 70 | 4.92 | 100 | 7.03 | 250 | 17.58 | 500 | 35.15 | 800 | 56.25 | 1100 | 77.34 |
| 11 | .77 | 41 | 2.88 | 71 | 4.99 | 105 | 7.38 | 255 | 17.93 | 510 | 35.86 | 810 | 56.95 | 1120 | 78.74 |
| 12 | .84 | 42 | 2.95 | 72 | 5.06 | 110 | 7.73 | 260 | 18.28 | 520 | 36.56 | 820 | 57.65 | 1140 | 80.15 |
| 13 | .91 | 43 | 3.02 | 73 | 5.13 | 115 | 8.09 | 265 | 18.63 | 530 | 37.26 | 830 | 58.35 | 1160 | 81.56 |
| 14 | .98 | 44 | 3.09 | 74 | 5.20 | 120 | 8.44 | 270 | 18.98 | 540 | 37.97 | 840 | 59.06 | 1180 | 82.96 |
| 15 | 1.05 | 45 | 3.16 | 75 | 5.27 | 125 | 8.79 | 275 | 19.33 | 550 | 38.67 | 850 | 59.76 | 1200 | 84.37 |
| 16 | 1.12 | 46 | 3.23 | 76 | 5.34 | 130 | 9.14 | 280 | 19.69 | 560 | 39.37 | 860 | 60.46 | 1220 | 85.77 |
| 17 | 1.20 | 47 | 3.30 | 77 | 5.41 | 135 | 9.49 | 285 | 20.04 | 570 | 40.07 | 870 | 61.17 | 1240 | 87.18 |
| 18 | 1.27 | 48 | 3.37 | 78 | 5.48 | 140 | 9.84 | 290 | 20.39 | 580 | 40.78 | 880 | 61.87 | 1260 | 88.59 |
| 19 | 1.34 | 49 | 3.45 | 79 | 5.55 | 145 | 10.19 | 295 | 20.74 | 590 | 41.48 | 890 | 62.57 | 1280 | 89.99 |
| 20 | 1.41 | 50 | 3.52 | 80 | 5.62 | 150 | 10.55 | 300 | 21.09 | 600 | 42.18 | 900 | 63.28 | 1300 | 91.40 |
| 21 | 1.48 | 51 | 3.59 | 81 | 5.69 | 155 | 10.90 | 310 | 21.80 | 610 | 42.89 | 910 | 63.98 | 1320 | 92.80 |
| 22 | 1.55 | 52 | 3.66 | 82 | 5.77 | 160 | 11.25 | 320 | 22.50 | 620 | 43.59 | 920 | 64.68 | 1340 | 94.21 |
| 23 | 1.62 | 53 | 3.73 | 83 | 5.84 | 165 | 11.60 | 330 | 23.20 | 630 | 44.29 | 930 | 65.39 | 1360 | 95.62 |
| 24 | 1.69 | 54 | 3.80 | 84 | 5.91 | 170 | 11.95 | 340 | 23.90 | 640 | 45.00 | 940 | 66.09 | 1380 | 97.02 |
| 25 | 1.76 | 55 | 3.87 | 85 | 5.98 | 175 | 12.30 | 350 | 24.61 | 650 | 45.70 | 950 | 66.79 | 1400 | 98.43 |
| 26 | 1.83 | 56 | 3.94 | 86 | 6.05 | 180 | 12.66 | 360 | 25.31 | 660 | 46.40 | 960 | 67.49 | 1420 | 99.84 |
| 27 | 1.90 | 57 | 4.01 | 87 | 6.12 | 185 | 13.01 | 370 | 26.01 | 670 | 47.11 | 970 | 68.20 | 1440 | 101.24 |
| 28 | 1.97 | 58 | 4.08 | 88 | 6.19 | 190 | 13.36 | 380 | 26.72 | 680 | 47.81 | 980 | 68.90 | 1460 | 102.65 |
| 29 | 2.04 | 59 | 4.15 | 89 | 6.26 | 195 | 13.71 | 390 | 27.42 | 690 | 48.51 | 990 | 69.60 | 1480 | 104.05 |
| 30 | 2.11 | 60 | 4.22 | 90 | 6.33 | 200 | 14.06 | 400 | 28.12 | 700 | 49.21 | 1000 | 70.31 | 1500 | 105.46 |

# Circumferences and Areas of Circles

| Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/64 | .04909 | .00019 | 2 | 6.2832 | 3.1416 | 6 | 18.850 | 28.274 | 14 | 43.982 | 153.94 | 22 | 69.115 | 380.13 |
| 1/32 | .09818 | .00077 | 1/16 | 6.4795 | 3.3410 | 1/8 | 19.242 | 29.465 | 1/8 | 44.375 | 156.70 | 1/8 | 69.508 | 384.46 |
| 3/64 | .14726 | .00173 | 1/8 | 6.6759 | 3.5466 | 1/4 | 19.635 | 30.680 | 1/4 | 44.768 | 159.48 | 1/4 | 69.900 | 388.82 |
| 1/16 | .19635 | .00307 | 3/16 | 6.8722 | 3.7583 | 3/8 | 20.028 | 31.919 | 3/8 | 45.160 | 162.30 | 3/8 | 70.293 | 393.20 |
| 3/32 | .29452 | .00690 | 1/4 | 7.0686 | 3.9761 | 1/2 | 20.420 | 33.183 | 1/2 | 45.553 | 165.13 | 1/2 | 70.686 | 397.61 |
| | | | 5/16 | 7.2649 | 4.2000 | 5/8 | 20.813 | 34.472 | 5/8 | 45.946 | 167.99 | 5/8 | 71.079 | 402.04 |
| 1/8 | .39270 | .01227 | 3/8 | 7.4613 | 4.4301 | 3/4 | 21.206 | 35.785 | 3/4 | 46.338 | 170.87 | 3/4 | 71.471 | 406.49 |
| 5/32 | .49087 | .01917 | 7/16 | 7.6576 | 4.6664 | 7/8 | 21.598 | 37.122 | 7/8 | 46.731 | 173.78 | 7/8 | 71.864 | 410.97 |
| 3/16 | .58905 | .02761 | | | | | | | | | | | | |
| 7/32 | .68722 | .03758 | 1/2 | 7.8540 | 4.9087 | 7 | 21.991 | 38.485 | 15 | 47.124 | 176.71 | 23 | 72.257 | 415.48 |
| | | | 9/16 | 8.0503 | 5.1572 | 1/8 | 22.384 | 39.871 | 1/8 | 47.517 | 179.67 | 1/8 | 72.649 | 420.00 |
| 1/4 | .78540 | .04909 | 5/8 | 8.2467 | 5.4119 | 1/4 | 22.776 | 41.282 | 1/4 | 47.909 | 182.65 | 1/4 | 73.042 | 424.56 |
| 9/32 | .88357 | .06213 | 11/16 | 8.4430 | 5.6727 | 3/8 | 23.169 | 42.718 | 3/8 | 48.302 | 185.66 | 3/8 | 73.435 | 429.13 |
| 5/16 | .98175 | .07670 | 3/4 | 8.6394 | 5.9396 | 1/2 | 23.562 | 44.179 | 1/2 | 48.695 | 188.69 | 1/2 | 73.827 | 433.74 |
| 11/32 | 1.0799 | .09281 | 13/16 | 8.8357 | 6.2126 | 5/8 | 23.955 | 45.664 | 5/8 | 49.087 | 191.75 | 5/8 | 74.220 | 438.36 |
| | | | 7/8 | 9.0321 | 6.4918 | 3/4 | 24.347 | 47.173 | 3/4 | 49.480 | 194.83 | 3/4 | 74.613 | 443.01 |
| 3/8 | 1.1781 | .11045 | 15/16 | 9.2284 | 6.7771 | 7/8 | 24.740 | 48.707 | 7/8 | 49.873 | 197.93 | 7/8 | 75.006 | 447.69 |
| 13/32 | 1.2763 | .12962 | | | | | | | | | | | | |
| 7/16 | 1.3744 | .15033 | 3 | 9.4248 | 7.0686 | 8 | 25.133 | 50.265 | 16 | 50.265 | 201.06 | 24 | 75.398 | 452.39 |
| 15/32 | 1.4726 | .17257 | 1/16 | 9.6211 | 7.3662 | 1/8 | 25.525 | 51.849 | 1/8 | 50.658 | 204.22 | 1/8 | 75.791 | 457.11 |
| | | | 1/8 | 9.8175 | 7.6699 | 1/4 | 25.918 | 53.456 | 1/4 | 51.051 | 207.39 | 1/4 | 76.184 | 461.86 |
| 1/2 | 1.5708 | .19635 | 3/16 | 10.014 | 7.9798 | 3/8 | 26.311 | 55.088 | 3/8 | 51.444 | 210.60 | 3/8 | 76.576 | 466.64 |
| 17/32 | 1.6690 | .22166 | 1/4 | 10.210 | 8.2958 | 1/2 | 26.704 | 56.745 | 1/2 | 51.836 | 213.82 | 1/2 | 76.969 | 471.44 |
| 9/16 | 1.7671 | .24850 | 5/16 | 10.407 | 8.6179 | 5/8 | 27.096 | 58.426 | 5/8 | 52.229 | 217.08 | 5/8 | 77.362 | 476.26 |
| 19/32 | 1.8653 | .27688 | 3/8 | 10.603 | 8.9462 | 3/4 | 27.489 | 60.132 | 3/4 | 52.622 | 220.35 | 3/4 | 77.754 | 481.11 |
| | | | 7/16 | 10.799 | 9.2806 | 7/8 | 27.882 | 61.862 | 7/8 | 53.014 | 223.65 | 7/8 | 78.147 | 485.98 |
| 5/8 | 1.9635 | .30680 | | | | | | | | | | | | |
| 21/32 | 2.0617 | .33824 | 1/2 | 10.996 | 9.6211 | 9 | 28.274 | 63.617 | 17 | 53.407 | 226.98 | 25 | 78.540 | 490.87 |
| 11/16 | 2.1598 | .37122 | 9/16 | 11.192 | 9.9678 | 1/8 | 28.667 | 65.397 | 1/8 | 53.800 | 230.33 | 1/8 | 78.933 | 495.79 |
| 23/32 | 2.2580 | .40574 | 5/8 | 11.388 | 10.321 | 1/4 | 29.060 | 67.201 | 1/4 | 54.192 | 233.71 | 1/4 | 79.325 | 500.74 |
| | | | 11/16 | 11.585 | 10.680 | 3/8 | 29.452 | 69.029 | 3/8 | 54.585 | 237.10 | 3/8 | 79.718 | 505.71 |
| 3/4 | 2.3562 | .44179 | 3/4 | 11.781 | 11.045 | 1/2 | 29.845 | 70.882 | 1/2 | 54.978 | 240.53 | 1/2 | 80.111 | 510.71 |
| 25/32 | 2.4544 | .47937 | 13/16 | 11.977 | 11.416 | 5/8 | 30.238 | 72.760 | 5/8 | 55.371 | 243.98 | 5/8 | 80.503 | 515.72 |
| 13/16 | 2.5525 | .51849 | 7/8 | 12.174 | 11.793 | 3/4 | 30.631 | 74.662 | 3/4 | 55.763 | 247.45 | 3/4 | 80.896 | 520.77 |
| 27/32 | 2.6507 | .55914 | 15/16 | 12.370 | 12.177 | 7/8 | 31.023 | 76.589 | 7/8 | 56.156 | 250.95 | 7/8 | 81.289 | 525.84 |
| 7/8 | 2.7489 | .60132 | 4 | 12.566 | 12.566 | 10 | 31.416 | 78.540 | 18 | 56.549 | 254.47 | 26 | 81.681 | 530.93 |
| 29/32 | 2.8471 | .64504 | 1/16 | 12.763 | 12.962 | 1/8 | 31.809 | 80.516 | 1/8 | 56.941 | 258.02 | 1/8 | 82.074 | 536.05 |
| 15/16 | 2.9452 | .69029 | 1/8 | 12.959 | 13.364 | 1/4 | 32.201 | 82.516 | 1/4 | 57.334 | 261.59 | 1/4 | 82.467 | 541.19 |
| 31/32 | 3.0434 | .73708 | 3/16 | 13.155 | 13.772 | 3/8 | 32.594 | 84.541 | 3/8 | 57.727 | 265.18 | 3/8 | 82.860 | 546.35 |
| | | | 1/4 | 13.352 | 14.186 | 1/2 | 32.987 | 86.590 | 1/2 | 58.119 | 268.80 | 1/2 | 83.252 | 551.55 |
| | | | 5/16 | 13.548 | 14.607 | 5/8 | 33.379 | 88.664 | 5/8 | 58.512 | 272.45 | 5/8 | 83.645 | 556.76 |
| | | | 3/8 | 13.744 | 15.033 | 3/4 | 33.772 | 90.763 | 3/4 | 58.905 | 276.12 | 3/4 | 84.038 | 562.00 |
| | | | 7/16 | 13.941 | 15.466 | 7/8 | 34.165 | 92.886 | 7/8 | 59.298 | 279.81 | 7/8 | 84.430 | 567.27 |
| 1 | 3.1416 | .7854 | 1/2 | 14.137 | 15.904 | 11 | 34.558 | 95.033 | 19 | 59.690 | 283.53 | 27 | 84.823 | 572.56 |
| 1/16 | 3.3379 | .8866 | 9/16 | 14.334 | 16.349 | 1/8 | 34.950 | 97.205 | 1/8 | 60.083 | 287.27 | 1/8 | 85.216 | 577.87 |
| 1/8 | 3.5343 | .9940 | 5/8 | 14.530 | 16.800 | 1/4 | 35.343 | 99.402 | 1/4 | 60.476 | 291.04 | 1/4 | 85.608 | 583.21 |
| 3/16 | 3.7306 | 1.1075 | 11/16 | 14.726 | 17.257 | 3/8 | 35.736 | 101.62 | 3/8 | 60.868 | 294.83 | 3/8 | 86.001 | 588.57 |
| 1/4 | 3.9270 | 1.2272 | 3/4 | 14.923 | 17.721 | 1/2 | 36.128 | 103.87 | 1/2 | 61.261 | 298.65 | 1/2 | 86.394 | 593.96 |
| 5/16 | 4.1233 | 1.3530 | 13/16 | 15.119 | 18.190 | 5/8 | 36.521 | 106.14 | 5/8 | 61.654 | 302.49 | 5/8 | 86.786 | 599.37 |
| 3/8 | 4.3197 | 1.4849 | 7/8 | 15.315 | 18.665 | 3/4 | 36.914 | 108.43 | 3/4 | 62.046 | 306.35 | 3/4 | 87.179 | 604.81 |
| 7/16 | 4.5160 | 1.6230 | 15/16 | 15.512 | 19.147 | 7/8 | 37.306 | 110.75 | 7/8 | 62.439 | 310.24 | 7/8 | 87.572 | 610.27 |
| 1/2 | 4.7124 | 1.7671 | 5 | 15.708 | 19.635 | 12 | 37.699 | 113.10 | 20 | 62.832 | 314.16 | 28 | 87.965 | 615.75 |
| 9/16 | 4.9087 | 1.9175 | 1/16 | 15.904 | 20.129 | 1/8 | 38.092 | 115.47 | 1/8 | 63.225 | 318.10 | 1/8 | 88.357 | 621.26 |
| 5/8 | 5.1051 | 2.0739 | 1/8 | 16.101 | 20.629 | 1/4 | 38.485 | 117.86 | 1/4 | 63.617 | 322.06 | 1/4 | 88.750 | 626.80 |
| 11/16 | 5.3014 | 2.2365 | 3/16 | 16.297 | 21.135 | 3/8 | 38.877 | 120.28 | 3/8 | 64.010 | 326.05 | 3/8 | 89.143 | 632.36 |
| 3/4 | 5.4978 | 2.4053 | 1/4 | 16.493 | 21.648 | 1/2 | 39.270 | 122.72 | 1/2 | 64.403 | 330.06 | 1/2 | 89.535 | 637.94 |
| 13/16 | 5.6941 | 2.5802 | 5/16 | 16.690 | 22.166 | 5/8 | 39.663 | 125.19 | 5/8 | 64.795 | 334.10 | 5/8 | 89.928 | 643.55 |
| 7/8 | 5.8905 | 2.7612 | 3/8 | 16.886 | 22.691 | 3/4 | 40.055 | 127.68 | 3/4 | 65.188 | 338.16 | 3/4 | 90.321 | 649.18 |
| 15/16 | 6.0868 | 2.9483 | 7/16 | 17.082 | 23.221 | 7/8 | 40.448 | 130.19 | 7/8 | 65.581 | 342.25 | 7/8 | 90.713 | 654.84 |
| | | | 1/2 | 17.279 | 23.758 | 13 | 40.841 | 132.73 | 21 | 65.973 | 346.36 | 29 | 91.106 | 660.52 |
| | | | 9/16 | 17.475 | 24.301 | 1/8 | 41.233 | 135.30 | 1/8 | 66.366 | 350.50 | 1/8 | 91.499 | 666.23 |
| | | | 5/8 | 17.671 | 24.850 | 1/4 | 41.626 | 137.89 | 1/4 | 66.759 | 354.66 | 1/4 | 91.892 | 671.96 |
| | | | 11/16 | 17.868 | 25.406 | 3/8 | 42.019 | 140.50 | 3/8 | 67.152 | 358.84 | 3/8 | 92.284 | 677.71 |
| | | | 3/4 | 18.064 | 25.967 | 1/2 | 42.412 | 143.14 | 1/2 | 67.544 | 363.05 | 1/2 | 92.677 | 683.49 |
| | | | 13/16 | 18.261 | 26.535 | 5/8 | 42.804 | 145.80 | 5/8 | 67.937 | 367.28 | 5/8 | 93.070 | 689.30 |
| | | | 7/8 | 18.457 | 27.109 | 3/4 | 43.197 | 148.49 | 3/4 | 68.330 | 371.54 | 3/4 | 93.462 | 695.13 |
| | | | 15/16 | 18.653 | 27.688 | 7/8 | 43.590 | 151.20 | 7/8 | 68.722 | 375.83 | 7/8 | 93.855 | 700.98 |

# Circumferences and Areas of Circles

(continued)

| Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 94.248 | 706.86 | 37 | 116.239 | 1075.2 | 44 | 138.230 | 1520.5 | 51 | 160.221 | 2042.8 | 58 | 182.212 | 2642.1 |
| ⅛ | 94.640 | 712.76 | ⅛ | 116.632 | 1082.5 | ⅛ | 138.623 | 1529.2 | ⅛ | 160.614 | 2052.8 | ⅛ | 182.605 | 2653.5 |
| ¼ | 95.033 | 718.69 | ¼ | 117.024 | 1089.8 | ¼ | 139.015 | 1537.9 | ¼ | 161.007 | 2062.9 | ¼ | 182.998 | 2664.9 |
| ⅜ | 95.426 | 724.64 | ⅜ | 117.417 | 1097.1 | ⅜ | 139.408 | 1546.6 | ⅜ | 161.399 | 2073.0 | ⅜ | 183.390 | 2676.4 |
| ½ | 95.819 | 730.62 | ½ | 117.810 | 1104.5 | ½ | 139.801 | 1555.3 | ½ | 161.792 | 2083.1 | ½ | 183.783 | 2687.8 |
| ⅝ | 96.211 | 736.62 | ⅝ | 118.202 | 1111.8 | ⅝ | 140.194 | 1564.0 | ⅝ | 162.185 | 2093.2 | ⅝ | 184.176 | 2699.3 |
| ¾ | 96.604 | 742.64 | ¾ | 118.596 | 1119.2 | ¾ | 140.586 | 1572.8 | ¾ | 162.577 | 2103.3 | ¾ | 184.569 | 2710.9 |
| ⅞ | 96.997 | 748.69 | ⅞ | 118.988 | 1126.7 | ⅞ | 140.979 | 1581.6 | ⅞ | 162.970 | 2113.5 | ⅞ | 184.961 | 2722.4 |
| 31 | 97.389 | 754.77 | 38 | 119.381 | 1134.1 | 45 | 141.372 | 1590.4 | 52 | 163.363 | 2123.7 | 59 | 185.354 | 2734.0 |
| ⅛ | 97.782 | 760.87 | ⅛ | 119.773 | 1141.6 | ⅛ | 141.764 | 1599.3 | ⅛ | 163.756 | 2133.9 | ⅛ | 185.747 | 2745.6 |
| ¼ | 98.175 | 766.99 | ¼ | 120.166 | 1149.1 | ¼ | 142.157 | 1608.2 | ¼ | 164.148 | 2144.2 | ¼ | 186.139 | 2757.2 |
| ⅜ | 98.567 | 773.14 | ⅜ | 120.559 | 1156.6 | ⅜ | 142.550 | 1617.0 | ⅜ | 164.541 | 2154.5 | ⅜ | 186.532 | 2768.8 |
| ½ | 98.960 | 779.31 | ½ | 120.951 | 1164.2 | ½ | 142.942 | 1626.0 | ½ | 164.934 | 2164.8 | ½ | 186.925 | 2780.5 |
| ⅝ | 99.353 | 785.51 | ⅝ | 121.344 | 1171.7 | ⅝ | 143.335 | 1634.9 | ⅝ | 165.326 | 2175.1 | ⅝ | 187.317 | 2792.2 |
| ¾ | 99.746 | 791.73 | ¾ | 121.737 | 1179.3 | ¾ | 143.728 | 1643.9 | ¾ | 165.719 | 2185.4 | ¾ | 187.710 | 2803.9 |
| ⅞ | 100.138 | 797.98 | ⅞ | 122.129 | 1186.9 | ⅞ | 144.121 | 1652.9 | ⅞ | 166.112 | 2195.8 | ⅞ | 188.103 | 2815.7 |
| 32 | 100.531 | 804.25 | 39 | 122.522 | 1194.6 | 46 | 144.513 | 1661.9 | 53 | 166.504 | 2206.2 | 60 | 188.496 | 2827.4 |
| ⅛ | 100.924 | 810.54 | ⅛ | 122.915 | 1202.3 | ⅛ | 144.906 | 1670.9 | ⅛ | 166.897 | 2216.6 | ⅛ | 188.888 | 2839.2 |
| ¼ | 101.316 | 816.86 | ¼ | 123.308 | 1210.0 | ¼ | 145.299 | 1680.0 | ¼ | 167.290 | 2227.0 | ¼ | 189.281 | 2851.0 |
| ⅜ | 101.709 | 823.21 | ⅜ | 123.700 | 1217.7 | ⅜ | 145.691 | 1689.1 | ⅜ | 167.683 | 2237.5 | ⅜ | 189.674 | 2862.9 |
| ½ | 102.102 | 829.58 | ½ | 124.093 | 1225.4 | ½ | 146.084 | 1698.2 | ½ | 168.075 | 2248.0 | ½ | 190.066 | 2874.8 |
| ⅝ | 102.494 | 835.97 | ⅝ | 124.486 | 1233.2 | ⅝ | 146.477 | 1707.4 | ⅝ | 168.468 | 2258.5 | ⅝ | 190.459 | 2886.6 |
| ¾ | 102.887 | 842.39 | ¾ | 124.878 | 1241.0 | ¾ | 146.869 | 1716.5 | ¾ | 168.861 | 2269.1 | ¾ | 190.852 | 2898.6 |
| ⅞ | 103.280 | 848.83 | ⅞ | 125.271 | 1248.8 | ⅞ | 147.262 | 1725.7 | ⅞ | 169.253 | 2279.6 | ⅞ | 191.244 | 2910.5 |
| 33 | 103.673 | 855.30 | 40 | 125.664 | 1256.6 | 47 | 147.655 | 1734.9 | 54 | 169.646 | 2290.2 | 61 | 191.637 | 2922.5 |
| ⅛ | 104.065 | 861.79 | ⅛ | 126.056 | 1264.5 | ⅛ | 148.048 | 1744.2 | ⅛ | 170.039 | 2300.8 | ⅛ | 192.030 | 2934.5 |
| ¼ | 104.458 | 868.31 | ¼ | 126.449 | 1272.4 | ¼ | 148.440 | 1753.5 | ¼ | 170.431 | 2311.5 | ¼ | 192.423 | 2946.5 |
| ⅜ | 104.851 | 874.85 | ⅜ | 126.842 | 1280.3 | ⅜ | 148.833 | 1762.7 | ⅜ | 170.824 | 2322.1 | ⅜ | 192.815 | 2958.5 |
| ½ | 105.243 | 881.41 | ½ | 127.235 | 1288.2 | ½ | 149.226 | 1772.1 | ½ | 171.217 | 2332.8 | ½ | 193.208 | 2970.6 |
| ⅝ | 105.636 | 888.00 | ⅝ | 127.627 | 1296.2 | ⅝ | 149.618 | 1781.4 | ⅝ | 171.609 | 2343.5 | ⅝ | 193.601 | 2982.7 |
| ¾ | 106.029 | 894.62 | ¾ | 128.020 | 1304.2 | ¾ | 150.011 | 1790.8 | ¾ | 172.002 | 2354.3 | ¾ | 193.993 | 2994.8 |
| ⅞ | 106.421 | 901.26 | ⅞ | 128.413 | 1312.2 | ⅞ | 150.404 | 1800.1 | ⅞ | 172.395 | 2365.0 | ⅞ | 194.386 | 3006.9 |
| 34 | 106.814 | 907.92 | 41 | 128.805 | 1320.3 | 48 | 150.796 | 1809.6 | 55 | 172.788 | 2375.8 | 62 | 194.779 | 3019.1 |
| ⅛ | 107.207 | 914.61 | ⅛ | 129.198 | 1328.3 | ⅛ | 151.189 | 1819.0 | ⅛ | 173.180 | 2386.6 | ⅛ | 195.171 | 3031.3 |
| ¼ | 107.600 | 921.32 | ¼ | 129.591 | 1336.4 | ¼ | 151.582 | 1828.5 | ¼ | 173.573 | 2397.5 | ¼ | 195.564 | 3043.5 |
| ⅜ | 107.992 | 928.06 | ⅜ | 129.983 | 1344.5 | ⅜ | 151.975 | 1837.9 | ⅜ | 173.966 | 2408.3 | ⅜ | 195.957 | 3055.7 |
| ½ | 108.385 | 934.82 | ½ | 130.376 | 1352.7 | ½ | 152.367 | 1847.5 | ½ | 174.358 | 2419.2 | ½ | 196.350 | 3068.0 |
| ⅝ | 108.778 | 941.61 | ⅝ | 130.769 | 1360.8 | ⅝ | 152.760 | 1857.0 | ⅝ | 174.751 | 2430.1 | ⅝ | 196.742 | 3080.3 |
| ¾ | 109.170 | 948.42 | ¾ | 131.161 | 1369.0 | ¾ | 153.153 | 1866.5 | ¾ | 175.144 | 2441.1 | ¾ | 197.135 | 3092.6 |
| ⅞ | 109.563 | 955.25 | ⅞ | 131.554 | 1377.2 | ⅞ | 153.545 | 1876.1 | ⅞ | 175.536 | 2452.0 | ⅞ | 197.528 | 3104.9 |
| 35 | 109.956 | 962.11 | 42 | 131.947 | 1385.4 | 49 | 153.938 | 1885.7 | 56 | 175.929 | 2463.0 | 63 | 197.920 | 3117.2 |
| ⅛ | 110.348 | 969.00 | ⅛ | 132.340 | 1393.7 | ⅛ | 154.331 | 1895.4 | ⅛ | 176.322 | 2474.0 | ⅛ | 198.313 | 3129.6 |
| ¼ | 110.741 | 975.91 | ¼ | 132.732 | 1402.0 | ¼ | 154.723 | 1905.0 | ¼ | 176.715 | 2485.0 | ¼ | 198.706 | 3142.0 |
| ⅜ | 111.134 | 982.84 | ⅜ | 133.125 | 1410.3 | ⅜ | 155.116 | 1914.7 | ⅜ | 177.107 | 2496.1 | ⅜ | 199.098 | 3154.5 |
| ½ | 111.527 | 989.80 | ½ | 133.518 | 1418.6 | ½ | 155.509 | 1924.4 | ½ | 177.500 | 2507.2 | ½ | 199.491 | 3166.9 |
| ⅝ | 111.919 | 996.78 | ⅝ | 133.910 | 1427.0 | ⅝ | 155.902 | 1934.2 | ⅝ | 177.893 | 2518.3 | ⅝ | 199.884 | 3179.4 |
| ¾ | 112.312 | 1003.8 | ¾ | 134.303 | 1435.4 | ¾ | 156.294 | 1943.9 | ¾ | 178.285 | 2529.4 | ¾ | 200.277 | 3191.9 |
| ⅞ | 112.705 | 1010.8 | ⅞ | 134.696 | 1443.8 | ⅞ | 156.687 | 1953.7 | ⅞ | 178.678 | 2540.6 | ⅞ | 200.669 | 3204.4 |
| 36 | 113.097 | 1017.9 | 43 | 135.088 | 1452.2 | 50 | 157.080 | 1963.5 | 57 | 179.071 | 2551.8 | 64 | 201.062 | 3217.0 |
| ⅛ | 113.490 | 1025.0 | ⅛ | 135.481 | 1460.7 | ⅛ | 157.472 | 1973.3 | ⅛ | 179.463 | 2563.0 | ⅛ | 201.455 | 3229.6 |
| ¼ | 113.883 | 1032.1 | ¼ | 135.874 | 1469.1 | ¼ | 157.865 | 1983.2 | ¼ | 179.856 | 2574.2 | ¼ | 201.847 | 3242.2 |
| ⅜ | 114.275 | 1039.2 | ⅜ | 136.267 | 1477.6 | ⅜ | 158.258 | 1993.1 | ⅜ | 180.249 | 2585.4 | ⅜ | 202.240 | 3254.8 |
| ½ | 114.668 | 1046.3 | ½ | 136.659 | 1486.2 | ½ | 158.650 | 2003.0 | ½ | 180.642 | 2596.7 | ½ | 202.633 | 3267.5 |
| ⅝ | 115.061 | 1053.5 | ⅝ | 137.052 | 1494.7 | ⅝ | 159.043 | 2012.9 | ⅝ | 181.034 | 2608.0 | ⅝ | 203.025 | 3280.1 |
| ¾ | 115.454 | 1060.7 | ¾ | 137.445 | 1503.3 | ¾ | 159.436 | 2022.8 | ¾ | 181.427 | 2619.4 | ¾ | 203.418 | 3292.8 |
| ⅞ | 115.846 | 1068.0 | ⅞ | 137.837 | 1511.9 | ⅞ | 159.829 | 2032.8 | ⅞ | 181.820 | 2630.7 | ⅞ | 203.811 | 3305.6 |

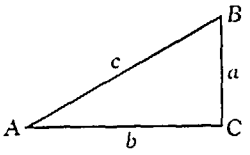
# Circumferences and Areas of Circles

(continued)

| Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area | Dia. | Circum. | Area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 204.204 | 3318.3 | 72 | 226.195 | 4071.5 | 79 | 248.186 | 4901.7 | 86 | 270.177 | 5808.8 | 93 | 292.168 | 6792.9 |
| ⅛ | 204.596 | 3331.1 | ⅛ | 226.587 | 4085.7 | ⅛ | 248.579 | 4917.2 | ⅛ | 270.570 | 5825.7 | ⅛ | 292.561 | 6811.2 |
| ¼ | 204.989 | 3343.9 | ¼ | 226.980 | 4099.8 | ¼ | 248.971 | 4932.7 | ¼ | 270.962 | 5842.6 | ¼ | 292.954 | 6829.5 |
| ⅜ | 205.382 | 3356.7 | ⅜ | 227.373 | 4114.0 | ⅜ | 249.364 | 4948.3 | ⅜ | 271.355 | 5859.6 | ⅜ | 293.346 | 6847.8 |
| ½ | 205.774 | 3369.6 | ½ | 227.765 | 4128.2 | ½ | 249.757 | 4963.9 | ½ | 271.748 | 5876.5 | ½ | 293.739 | 6866.1 |
| ⅝ | 206.167 | 3382.4 | ⅝ | 228.158 | 4142.5 | ⅝ | 250.149 | 4979.5 | ⅝ | 272.140 | 5893.5 | ⅝ | 294.132 | 6884.5 |
| ¾ | 206.560 | 3395.3 | ¾ | 228.551 | 4156.8 | ¾ | 250.542 | 4995.2 | ¾ | 272.533 | 5910.6 | ¾ | 294.524 | 6902.9 |
| ⅞ | 206.952 | 3408.2 | ⅞ | 228.944 | 4171.1 | ⅞ | 250.935 | 5010.9 | ⅞ | 272.926 | 5927.6 | ⅞ | 294.917 | 6921.3 |
| 66 | 207.345 | 3421.2 | 73 | 229.336 | 4185.4 | 80 | 251.327 | 5026.5 | 87 | 273.319 | 5944.7 | 94 | 295.310 | 6939.8 |
| ⅛ | 207.738 | 3434.2 | ⅛ | 229.729 | 4199.7 | ⅛ | 251.720 | 5042.3 | ⅛ | 273.711 | 5961.8 | ⅛ | 295.702 | 6958.2 |
| ¼ | 208.131 | 3447.2 | ¼ | 230.122 | 4214.1 | ¼ | 252.113 | 5058.0 | ¼ | 274.104 | 5978.9 | ¼ | 296.095 | 6976.7 |
| ⅜ | 208.523 | 3460.2 | ⅜ | 230.514 | 4228.5 | ⅜ | 252.506 | 5073.8 | ⅜ | 274.497 | 5996.0 | ⅜ | 296.488 | 6995.3 |
| ½ | 208.916 | 3473.2 | ½ | 230.907 | 4242.9 | ½ | 252.898 | 5089.6 | ½ | 274.889 | 6013.2 | ½ | 296.881 | 7013.8 |
| ⅝ | 209.309 | 3486.3 | ⅝ | 231.300 | 4257.4 | ⅝ | 253.291 | 5105.4 | ⅝ | 275.282 | 6030.4 | ⅝ | 297.273 | 7032.4 |
| ¾ | 209.701 | 3499.4 | ¾ | 231.692 | 4271.8 | ¾ | 253.684 | 5121.2 | ¾ | 275.675 | 6047.6 | ¾ | 297.666 | 7051.0 |
| ⅞ | 210.094 | 3512.5 | ⅞ | 232.085 | 4286.3 | ⅞ | 254.076 | 5137.1 | ⅞ | 276.067 | 6064.9 | ⅞ | 298.059 | 7069.6 |
| 67 | 210.487 | 3525.7 | 74 | 232.478 | 4300.8 | 81 | 254.469 | 5153.0 | 88 | 276.460 | 6082.1 | 95 | 298.451 | 7088.2 |
| ⅛ | 210.879 | 3538.8 | ⅛ | 232.871 | 4315.4 | ⅛ | 254.862 | 5168.9 | ⅛ | 276.853 | 6099.4 | ⅛ | 298.844 | 7106.9 |
| ¼ | 211.272 | 3552.0 | ¼ | 233.263 | 4329.9 | ¼ | 255.254 | 5184.9 | ¼ | 277.246 | 6116.7 | ¼ | 299.237 | 7125.6 |
| ⅜ | 211.665 | 3565.2 | ⅜ | 233.656 | 4344.5 | ⅜ | 255.647 | 5200.8 | ⅜ | 277.638 | 6134.1 | ⅜ | 299.629 | 7144.3 |
| ½ | 212.058 | 3578.5 | ½ | 234.049 | 4359.2 | ½ | 256.040 | 5216.8 | ½ | 278.031 | 6151.4 | ½ | 300.022 | 7163.0 |
| ⅝ | 212.450 | 3591.7 | ⅝ | 234.441 | 4373.8 | ⅝ | 256.433 | 5232.8 | ⅝ | 278.424 | 6168.8 | ⅝ | 300.415 | 7181.8 |
| ¾ | 212.843 | 3605.0 | ¾ | 234.834 | 4388.5 | ¾ | 256.825 | 5248.9 | ¾ | 278.816 | 6186.2 | ¾ | 300.807 | 7200.6 |
| ⅞ | 213.236 | 3618.3 | ⅞ | 235.227 | 4403.1 | ⅞ | 257.218 | 5264.9 | ⅞ | 279.209 | 6203.7 | ⅞ | 301.200 | 7219.4 |
| 68 | 213.628 | 3631.7 | 75 | 235.619 | 4417.9 | 82 | 257.611 | 5281.0 | 89 | 279.602 | 6221.1 | 96 | 301.59[illegible] | 7238.2 |
| ⅛ | 214.021 | 3645.0 | ⅛ | 236.012 | 4432.6 | ⅛ | 258.003 | 5297.1 | ⅛ | 279.994 | 6238.6 | ⅛ | 301.986 | 7257.1 |
| ¼ | 214.414 | 3658.4 | ¼ | 236.405 | 4447.4 | ¼ | 258.396 | 5313.3 | ¼ | 280.387 | 6256.1 | ¼ | 302.378 | 7276.0 |
| ⅜ | 214.806 | 3671.8 | ⅜ | 236.798 | 4462.2 | ⅜ | 258.789 | 5329.4 | ⅜ | 280.780 | 6273.7 | ⅜ | 302.771 | 7294.9 |
| ½ | 215.199 | 3685.3 | ½ | 237.190 | 4477.0 | ½ | 259.181 | 5345.6 | ½ | 281.173 | 6291.2 | ½ | 303.164 | 7313.8 |
| ⅝ | 215.592 | 3698.7 | ⅝ | 237.583 | 4491.8 | ⅝ | 259.574 | 5361.8 | ⅝ | 281.565 | 6308.8 | ⅝ | 303.556 | 7332.8 |
| ¾ | 215.984 | 3712.2 | ¾ | 237.976 | 4506.7 | ¾ | 259.967 | 5378.1 | ¾ | 281.958 | 6326.4 | ¾ | 303.949 | 7351.8 |
| ⅞ | 216.377 | 3725.7 | ⅞ | 238.368 | 4521.5 | ⅞ | 260.359 | 5394.3 | ⅞ | 282.351 | 6344.1 | ⅞ | 304.342 | 7370.8 |
| 69 | 216.770 | 3739.3 | 76 | 238.761 | 4536.5 | 83 | 260.752 | 5410.6 | 90 | 282.743 | 6361.7 | 97 | 304.734 | 7389.8 |
| ⅛ | 217.163 | 3752.8 | ⅛ | 239.154 | 4551.4 | ⅛ | 261.145 | 5426.9 | ⅛ | 283.136 | 6379.4 | ⅛ | 305.127 | 7408.9 |
| ¼ | 217.555 | 3766.4 | ¼ | 239.546 | 4566.4 | ¼ | 261.538 | 5443.3 | ¼ | 283.529 | 6397.1 | ¼ | 305.520 | 7428.0 |
| ⅜ | 217.948 | 3780.0 | ⅜ | 239.939 | 4581.3 | ⅜ | 261.930 | 5459.6 | ⅜ | 283.921 | 6414.9 | ⅜ | 305.913 | 7447.1 |
| ½ | 218.341 | 3793.7 | ½ | 240.332 | 4596.3 | ½ | 262.323 | 5476.0 | ½ | 284.314 | 6432.6 | ½ | 306.305 | 7466.2 |
| ⅝ | 218.733 | 3807.3 | ⅝ | 240.725 | 4611.4 | ⅝ | 262.716 | 5492.4 | ⅝ | 284.707 | 6450.4 | ⅝ | 306.698 | 7485.3 |
| ¾ | 219.126 | 3821.0 | ¾ | 241.117 | 4626.4 | ¾ | 263.108 | 5508.8 | ¾ | 285.100 | 6468.2 | ¾ | 307.091 | 7504.5 |
| ⅞ | 219.519 | 3834.7 | ⅞ | 241.510 | 4641.5 | ⅞ | 263.501 | 5525.3 | ⅞ | 285.492 | 6486.0 | ⅞ | 307.483 | 7523.7 |
| 70 | 219.911 | 3848.5 | 77 | 241.903 | 4656.6 | 84 | 263.894 | 5541.8 | 91 | 285.885 | 65[illegible].9 | 98 | 307.876 | 7543.0 |
| ⅛ | 220.304 | 3862.2 | ⅛ | 242.295 | 4671.8 | ⅛ | 264.286 | 5558.3 | ⅛ | 286.278 | 6521.8 | ⅛ | 308.269 | 7562.2 |
| ¼ | 220.697 | 3876.0 | ¼ | 242.688 | 4686.9 | ¼ | 264.679 | 5574.8 | ¼ | 286.670 | 6539.7 | ¼ | 308.661 | 7581.5 |
| ⅜ | 221.090 | 3889.8 | ⅜ | 243.081 | 4702.1 | ⅜ | 265.072 | 5591.4 | ⅜ | 287.063 | 6557.6 | ⅜ | 309.054 | 7600.8 |
| ½ | 221.482 | 3903.6 | ½ | 243.473 | 4717.3 | ½ | 265.465 | 5607.9 | ½ | 287.456 | 6575.5 | ½ | 309.447 | 7620.1 |
| ⅝ | 221.875 | 3917.5 | ⅝ | 243.866 | 4732.5 | ⅝ | 265.857 | 5624.5 | ⅝ | 287.848 | 6593.5 | ⅝ | 309.840 | 7639.5 |
| ¾ | 222.268 | 3931.4 | ¾ | 244.259 | 4747.8 | ¾ | 266.250 | 5641.2 | ¾ | 288.241 | 6611.5 | ¾ | 310.232 | 7658.9 |
| ⅞ | 222.660 | 3945.3 | ⅞ | 244.652 | 4763.1 | ⅞ | 266.643 | 5657.8 | ⅞ | 288.634 | 6629.6 | ⅞ | 310.625 | 7678.3 |
| | | | | | | | | | | | | 99 | 311.018 | 7697.7 |
| 71 | 223.053 | 3959.2 | 78 | 245.044 | 4778.4 | 85 | 267.035 | 5674.5 | 92 | 289.027 | 6647.6 | ⅛ | 311.410 | 7717.1 |
| ⅛ | 223.446 | 3973.1 | ⅛ | 245.437 | 4793.7 | ⅛ | 267.428 | 5691.2 | ⅛ | 289.419 | 6665.7 | ¼ | 311.803 | 7736.6 |
| ¼ | 223.838 | 3987.1 | ¼ | 245.830 | 4809.0 | ¼ | 267.821 | 5707.9 | ¼ | 289.812 | 6683.8 | ⅜ | 312.196 | 7756.1 |
| ⅜ | 224.231 | 4001.1 | ⅜ | 246.222 | 4824.4 | ⅜ | 268.213 | 5724.7 | ⅜ | 290.205 | 6701.9 | ½ | 312.588 | 7775.6 |
| ½ | 224.624 | 4015.2 | ½ | 246.615 | 4839.8 | ½ | 268.606 | 5741.5 | ½ | 290.597 | 6720.1 | ⅝ | 312.981 | 7795.2 |
| ⅝ | 225.017 | 4029.2 | ⅝ | 247.008 | 4855.2 | ⅝ | 268.999 | 5758.3 | ⅝ | 290.990 | 6738.2 | ¾ | 313.374 | 7814.8 |
| ¾ | 225.409 | 4043.3 | ¾ | 247.400 | 4870.7 | ¾ | 269.392 | 5775.1 | ¾ | 291.383 | 6756.4 | ⅞ | 313.767 | 7834.4 |
| ⅞ | 225.802 | 4057.4 | ⅞ | 247.793 | 4886.2 | ⅞ | 269.784 | 5791.9 | ⅞ | 291.775 | 6774.7 | 100 | 314.159 | 7854.0 |

# Mensuration of Plane Figures

## Right Triangle




Angles $A - B = 90°$

$\sin A = \frac{a}{c}$

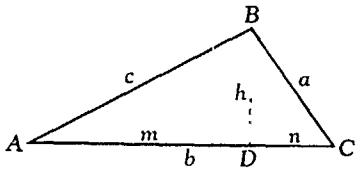
$\cos A = \frac{b}{c}$

$\tan A = \frac{a}{b}$

$a^2 + b^2 = c^2$

Area $= \frac{1}{2}ab$

## Oblique Triangle




$\overline{AB} = c$ $\quad \overline{BC} = a$

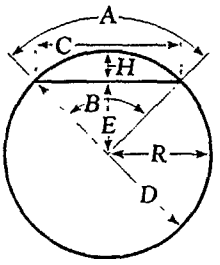
$\overline{AC} = b$ $\quad \overline{BD} = h$

$\overline{AD} = m$ $\quad \overline{DC} = n$

$A$, $B$ and $C$ are angles

| Given | Required | Formulas |
|---|---|---|
| $A, B, a$ | $C, b, c$ | $C = 180° - A - B$; $b = \frac{a \sin B}{\sin A}$; $c = \frac{a \sin C}{\sin A}$ |
| $b, c, A$ | $B, C, a$ | $\cos B = \frac{c^2 + a^2 - b^2}{2ac}$; $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$<br>$a^2 = b^2 + c^2 - 2bc \cos A$; $h = c \sin A$<br>$m = c \cos A$; $n = b - m$; $a^2 = h^2 + n^2$ |
| $a, c, A$ | $B, C, b$ | $\sin C = \sin A \times \frac{c}{a}$; $B = 180° - A - C$<br>$b = a \frac{\sin B}{\sin A}$<br>Note: In some cases two values for $B$, $C$ and $b$ are possible |
| $a, b, c$ | $A$ | $\sin \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{b \times c}}$<br>$\cos \frac{A}{2} = \sqrt{\frac{s(s-a)}{b \times c}}$ $\quad s = \frac{1}{2}(a + b + c)$<br>$\tan \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ |
| $a, b, c$ | $m, n$ | $m = \frac{c^2 + b^2 - a^2}{2b}$; $n = \frac{a^2 + b^2 - c^2}{2b}$ |

## Circle




$B$ = Angle in Degrees
$A$ = Length of Arc

Circumference $= \pi D = 2\pi R$

Area $= \pi R^2$

$A = \frac{\pi R B}{180}$

$C = 2\sqrt{2HR - H^2} = 2R \sin \frac{B}{2}$

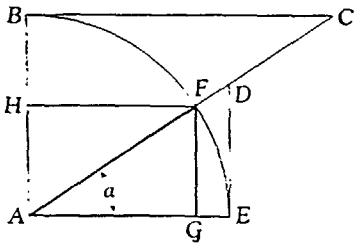
$H = R - \frac{1}{2}\sqrt{4R^2 - C^2} = 2R \sin^2 \frac{B}{4}$

$E = R - H$

Area of Sector $= \frac{1}{2}RA$

Area of Segment $= \frac{1}{2}RA - \frac{1}{2}EC$

## Trigonometric Formulae




Radius $AE = 1$

$FG = \sin a$ $\quad BC = \cot a$

$AG = \cos a$ $\quad AD = \sec a$

$DE = \tan a$ $\quad AC = \csc a$

$\sin^2 a + \cos^2 a = 1$

$\tan a = \frac{\sin a}{\cos a}$

$\sec^2 a - \tan^2 a = 1$

| | | | | |
|---|---|---|---|---|
| $\sin a$ | | $\sqrt{1 - \cos^2 a}$ | $\frac{\tan a}{\sqrt{1 + \tan^2 a}}$ | $\frac{1}{\sqrt{1 + \cot^2 a}}$ |
| $\cos a$ | $\sqrt{1 - \sin^2 a}$ | | $\frac{1}{\sqrt{1 + \tan^2 a}}$ | $\frac{\cot a}{\sqrt{1 + \cot^2 a}}$ |
| $\tan a$ | $\frac{\sin a}{\sqrt{1 - \sin^2 a}}$ | $\frac{\sqrt{1 - \cos^2 a}}{\cos a}$ | | $\frac{1}{\cot a}$ |
| $\cot a$ | $\frac{\sqrt{1 - \sin^2 a}}{\sin a}$ | $\frac{\cos a}{\sqrt{1 - \cos^2 a}}$ | $\frac{1}{\tan a}$ | |

# Natural Trigonometric Functions

| Degrees | Sines 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | 60′ | Cosines |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.00000 | 0.00291 | 0.00582 | 0.00873 | 0.01164 | 0.01454 | 0.01745 | 89 |
| 1 | 0.01745 | 0.02036 | 0.02327 | 0.02618 | 0.02908 | 0.03199 | 0.03490 | 88 |
| 2 | 0.03490 | 0.03781 | 0.04071 | 0.04362 | 0.04653 | 0.04943 | 0.05234 | 87 |
| 3 | 0.05234 | 0.05524 | 0.05814 | 0.06105 | 0.06395 | 0.06685 | 0.06976 | 86 |
| 4 | 0.06976 | 0.07266 | 0.07556 | 0.07846 | 0.08136 | 0.08426 | 0.08716 | 85 |
| 5 | 0.08716 | 0.09005 | 0.09295 | 0.09585 | 0.09874 | 0.10164 | 0.10453 | 84 |
| 6 | 0.10453 | 0.10742 | 0.11031 | 0.11320 | 0.11609 | 0.11898 | 0.12187 | 83 |
| 7 | 0.12187 | 0.12476 | 0.12764 | 0.13053 | 0.13341 | 0.13629 | 0.13917 | 82 |
| 8 | 0.13917 | 0.14205 | 0.14493 | 0.14781 | 0.15069 | 0.15356 | 0.15643 | 81 |
| 9 | 0.15643 | 0.15931 | 0.16218 | 0.16505 | 0.16792 | 0.17078 | 0.17365 | 80 |
| 10 | 0.17365 | 0.17651 | 0.17937 | 0.18224 | 0.18509 | 0.18795 | 0.19081 | 79 |
| 11 | 0.19081 | 0.19366 | 0.19652 | 0.19937 | 0.20222 | 0.20507 | 0.20791 | 78 |
| 12 | 0.20791 | 0.21076 | 0.21360 | 0.21644 | 0.21928 | 0.22212 | 0.22495 | 77 |
| 13 | 0.22495 | 0.22778 | 0.23062 | 0.23345 | 0.23627 | 0.23910 | 0.24192 | 76 |
| 14 | 0.24192 | 0.24474 | 0.24756 | 0.25038 | 0.25320 | 0.25601 | 0.25882 | 75 |
| 15 | 0.25882 | 0.26163 | 0.26443 | 0.26724 | 0.27004 | 0.27284 | 0.27564 | 74 |
| 16 | 0.27564 | 0.27843 | 0.28123 | 0.28402 | 0.28680 | 0.28959 | 0.29237 | 73 |
| 17 | 0.29237 | 0.29515 | 0.29793 | 0.30071 | 0.30348 | 0.30625 | 0.30902 | 72 |
| 18 | 0.30902 | 0.31178 | 0.31454 | 0.31730 | 0.32006 | 0.32282 | 0.32557 | 71 |
| 19 | 0.32557 | 0.32832 | 0.33106 | 0.33381 | 0.33655 | 0.33929 | 0.34202 | 70 |
| 20 | 0.34202 | 0.34475 | 0.34748 | 0.35021 | 0.35293 | 0.35565 | 0.35837 | 69 |
| 21 | 0.35837 | 0.36108 | 0.36379 | 0.36650 | 0.36921 | 0.37191 | 0.37461 | 68 |
| 22 | 0.37461 | 0.37730 | 0.37999 | 0.38268 | 0.38537 | 0.38805 | 0.39073 | 67 |
| 23 | 0.39073 | 0.39341 | 0.39608 | 0.39875 | 0.40141 | 0.40408 | 0.40674 | 66 |
| 24 | 0.40674 | 0.40939 | 0.41204 | 0.41469 | 0.41734 | 0.41998 | 0.42262 | 65 |
| 25 | 0.42262 | 0.42525 | 0.42788 | 0.43051 | 0.43313 | 0.43575 | 0.43837 | 64 |
| 26 | 0.43837 | 0.44098 | 0.44359 | 0.44620 | 0.44880 | 0.45140 | 0.45399 | 63 |
| 27 | 0.45399 | 0.45658 | 0.45917 | 0.46175 | 0.46433 | 0.46690 | 0.46947 | 62 |
| 28 | 0.46947 | 0.47204 | 0.47460 | 0.47716 | 0.47971 | 0.48226 | 0.48481 | 61 |
| 29 | 0.48481 | 0.48735 | 0.48989 | 0.49242 | 0.49495 | 0.49748 | 0.50000 | 60 |
| 30 | 0.50000 | 0.50252 | 0.50503 | 0.50754 | 0.51004 | 0.51254 | 0.51504 | 59 |
| 31 | 0.51504 | 0.51753 | 0.52002 | 0.52250 | 0.52498 | 0.52745 | 0.52992 | 58 |
| 32 | 0.52992 | 0.53238 | 0.53484 | 0.53730 | 0.53975 | 0.54220 | 0.54464 | 57 |
| 33 | 0.54464 | 0.54708 | 0.54951 | 0.55194 | 0.55436 | 0.55678 | 0.55919 | 56 |
| 34 | 0.55919 | 0.56160 | 0.56401 | 0.56641 | 0.56880 | 0.57119 | 0.57358 | 55 |
| 35 | 0.57358 | 0.57596 | 0.57833 | 0.58070 | 0.58307 | 0.58543 | 0.58779 | 54 |
| 36 | 0.58779 | 0.59014 | 0.59248 | 0.59482 | 0.59716 | 0.59949 | 0.60182 | 53 |
| 37 | 0.60182 | 0.60414 | 0.60645 | 0.60876 | 0.61107 | 0.61337 | 0.61566 | 52 |
| 38 | 0.61566 | 0.61795 | 0.62024 | 0.62251 | 0.62479 | 0.62706 | 0.62932 | 51 |
| 39 | 0.62932 | 0.63158 | 0.63383 | 0.63608 | 0.63832 | 0.64056 | 0.64279 | 50 |
| 40 | 0.64279 | 0.64501 | 0.64723 | 0.64945 | 0.65166 | 0.65386 | 0.65606 | 49 |
| 41 | 0.65606 | 0.65825 | 0.66044 | 0.66262 | 0.66480 | 0.66697 | 0.66913 | 48 |
| 42 | 0.66913 | 0.67129 | 0.67344 | 0.67559 | 0.67773 | 0.67987 | 0.68200 | 47 |
| 43 | 0.68200 | 0.68412 | 0.68624 | 0.68835 | 0.69046 | 0.69256 | 0.69466 | 46 |
| 44 | 0.69466 | 0.69675 | 0.69883 | 0.70091 | 0.70298 | 0.70505 | 0.70711 | 45 |
| Sines | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | 0′ | Degrees |
| | Cosines | | | | | | | |

# Natural Trigonometric Functions

(continued)

| Degrees | Cosines 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | 60′ | Sines |
|---|---|---|---|---|---|---|---|---|
| 0 | 1.00000 | 1.00000 | 0.99998 | 0.99996 | 0.99993 | 0.99989 | 0.99985 | 89 |
| 1 | 0.99985 | 0.99979 | 0.99973 | 0.99966 | 0.99958 | 0.99949 | 0.99939 | 88 |
| 2 | 0.99939 | 0.99929 | 0.99917 | 0.99905 | 0.99892 | 0.99878 | 0.99863 | 87 |
| 3 | 0.99863 | 0.99847 | 0.99831 | 0.99813 | 0.99795 | 0.99776 | 0.99756 | 86 |
| 4 | 0.99756 | 0.99736 | 0.99714 | 0.99692 | 0.99668 | 0.99644 | 0.99619 | 85 |
| 5 | 0.99619 | 0.99594 | 0.99567 | 0.99540 | 0.99511 | 0.99482 | 0.99452 | 84 |
| 6 | 0.99452 | 0.99421 | 0.99390 | 0.99357 | 0.99324 | 0.99290 | 0.99255 | 83 |
| 7 | 0.99255 | 0.99219 | 0.99182 | 0.99144 | 0.99106 | 0.99067 | 0.99027 | 82 |
| 8 | 0.99027 | 0.98986 | 0.98944 | 0.98902 | 0.98858 | 0.98814 | 0.98769 | 81 |
| 9 | 0.98769 | 0.98723 | 0.98676 | 0.98629 | 0.98580 | 0.98531 | 0.98481 | 80 |
| 10 | 0.98481 | 0.98430 | 0.98378 | 0.98325 | 0.98272 | 0.98218 | 0.98163 | 79 |
| 11 | 0.98163 | 0.98107 | 0.98050 | 0.97992 | 0.97934 | 0.97875 | 0.97815 | 78 |
| 12 | 0.97815 | 0.97754 | 0.97692 | 0.97630 | 0.97566 | 0.97502 | 0.97437 | 77 |
| 13 | 0.97437 | 0.97371 | 0.97304 | 0.97237 | 0.97169 | 0.97100 | 0.97030 | 76 |
| 14 | 0.97030 | 0.96959 | 0.96887 | 0.96815 | 0.96742 | 0.96667 | 0.96593 | 75 |
| 15 | 0.96593 | 0.96517 | 0.96440 | 0.96363 | 0.96285 | 0.96206 | 0.96126 | 74 |
| 16 | 0.96126 | 0.96046 | 0.95964 | 0.95882 | 0.95799 | 0.95715 | 0.95630 | 73 |
| 17 | 0.95630 | 0.95545 | 0.95459 | 0.95372 | 0.95284 | 0.95195 | 0.95106 | 72 |
| 18 | 0.95106 | 0.95015 | 0.94924 | 0.94832 | 0.94740 | 0.94646 | 0.94552 | 71 |
| 19 | 0.94552 | 0.94457 | 0.94361 | 0.94264 | 0.94167 | 0.94068 | 0.93969 | 70 |
| 20 | 0.93969 | 0.93869 | 0.93769 | 0.93667 | 0.93565 | 0.93462 | 0.93358 | 69 |
| 21 | 0.93358 | 0.93253 | 0.93148 | 0.93042 | 0.92935 | 0.92827 | 0.92718 | 68 |
| 22 | 0.92718 | 0.92609 | 0.92499 | 0.92388 | 0.92276 | 0.92164 | 0.92050 | 67 |
| 23 | 0.92050 | 0.91936 | 0.91822 | 0.91706 | 0.91590 | 0.91472 | 0.91355 | 66 |
| 24 | 0.91355 | 0.91236 | 0.91116 | 0.90996 | 0.90875 | 0.90753 | 0.90631 | 65 |
| 25 | 0.90631 | 0.90507 | 0.90383 | 0.90259 | 0.90133 | 0.90007 | 0.89879 | 64 |
| 26 | 0.89879 | 0.89752 | 0.89623 | 0.89493 | 0.89363 | 0.89232 | 0.89101 | 63 |
| 27 | 0.89101 | 0.88968 | 0.88835 | 0.88701 | 0.88566 | 0.88431 | 0.88295 | 62 |
| 28 | 0.88295 | 0.88158 | 0.88020 | 0.87882 | 0.87743 | 0.87603 | 0.87462 | 61 |
| 29 | 0.87462 | 0.87321 | 0.87178 | 0.87036 | 0.86892 | 0.86748 | 0.86603 | 60 |
| 30 | 0.86603 | 0.86457 | 0.86310 | 0.86163 | 0.86015 | 0.85866 | 0.85717 | 59 |
| 31 | 0.85717 | 0.85567 | 0.85416 | 0.85264 | 0.85112 | 0.84959 | 0.84805 | 58 |
| 32 | 0.84805 | 0.84650 | 0.84495 | 0.84339 | 0.84182 | 0.84025 | 0.83867 | 57 |
| 33 | 0.83867 | 0.83708 | 0.83549 | 0.83389 | 0.83228 | 0.83066 | 0.82904 | 56 |
| 34 | 0.82904 | 0.82741 | 0.82577 | 0.82413 | 0.82248 | 0.82082 | 0.81915 | 55 |
| 35 | 0.81915 | 0.81748 | 0.81580 | 0.81412 | 0.81242 | 0.81072 | 0.80902 | 54 |
| 36 | 0.80902 | 0.80730 | 0.80558 | 0.80386 | 0.80212 | 0.80038 | 0.79864 | 53 |
| 37 | 0.79864 | 0.79688 | 0.79512 | 0.79335 | 0.79158 | 0.78980 | 0.78801 | 52 |
| 38 | 0.78801 | 0.78622 | 0.78442 | 0.78261 | 0.78079 | 0.77897 | 0.77715 | 51 |
| 39 | 0.77715 | 0.77531 | 0.77347 | 0.77162 | 0.76977 | 0.76791 | 0.76604 | 50 |
| 40 | 0.76604 | 0.76417 | 0.76229 | 0.76041 | 0.75851 | 0.75661 | 0.75471 | 49 |
| 41 | 0.75471 | 0.75280 | 0.75088 | 0.74896 | 0.74703 | 0.74509 | 0.74314 | 48 |
| 42 | 0.74314 | 0.74120 | 0.73924 | 0.73728 | 0.73531 | 0.73333 | 0.73135 | 47 |
| 43 | 0.73135 | 0.72937 | 0.72737 | 0.72537 | 0.72337 | 0.72136 | 0.71934 | 46 |
| 44 | 0.71934 | 0.71732 | 0.71529 | 0.71325 | 0.71121 | 0.70916 | 0.70711 | 45 |
| Cosines | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | 0′ | Degrees |
| | Sines | | | | | | | |

# Natural Trigonometric Functions

(continued)

| Degrees | Tangents 0′ | 10′ | 20′ | 30′ | 40′ | 50′ | 60′ | Cotangents |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.00000 | 0.00291 | 0.00582 | 0.00873 | 0.01164 | 0.01455 | 0.01746 | 89 |
| 1 | 0.01746 | 0.02036 | 0.02328 | 0.02619 | 0.02910 | 0.03201 | 0.03492 | 88 |
| 2 | 0.03492 | 0.03783 | 0.04075 | 0.04366 | 0.04658 | 0.04949 | 0.05241 | 87 |
| 3 | 0.05241 | 0.05533 | 0.05824 | 0.06116 | 0.06408 | 0.06700 | 0.06993 | 86 |
| 4 | 0.06993 | 0.07285 | 0.07578 | 0.07870 | 0.08163 | 0.08456 | 0.08749 | 85 |
| 5 | 0.08749 | 0.09042 | 0.09335 | 0.09629 | 0.09923 | 0.10216 | 0.10510 | 84 |
| 6 | 0.10510 | 0.10805 | 0.11099 | 0.11394 | 0.11688 | 0.11983 | 0.12278 | 83 |
| 7 | 0.12278 | 0.12574 | 0.12869 | 0.13165 | 0.13461 | 0.13758 | 0.14054 | 82 |
| 8 | 0.14054 | 0.14351 | 0.14648 | 0.14945 | 0.15243 | 0.15540 | 0.15838 | 81 |
| 9 | 0.15838 | 0.16137 | 0.16435 | 0.16734 | 0.17033 | 0.17333 | 0.17633 | 80 |
| 10 | 0.17633 | 0.17933 | 0.18233 | 0.18534 | 0.18835 | 0.19136 | 0.19438 | 79 |
| 11 | 0.19438 | 0.19740 | 0.20042 | 0.20345 | 0.20648 | 0.20952 | 0.21256 | 78 |
| 12 | 0.21256 | 0.21560 | 0.21864 | 0.22169 | 0.22475 | 0.22781 | 0.23087 | 77 |
| 13 | 0.23087 | 0.23393 | 0.23700 | 0.24008 | 0.24316 | 0.24624 | 0.24933 | 76 |
| 14 | 0.24933 | 0.25242 | 0.25552 | 0.25862 | 0.26172 | 0.26483 | 0.26795 | 75 |
| 15 | 0.26795 | 0.27107 | 0.27419 | 0.27732 | 0.28046 | 0.28360 | 0.28675 | 74 |
| 16 | 0.28675 | 0.28990 | 0.29305 | 0.29621 | 0.29938 | 0.30255 | 0.30573 | 73 |
| 17 | 0.30573 | 0.30891 | 0.31210 | 0.31530 | 0.31850 | 0.32171 | 0.32492 | 72 |
| 18 | 0.32492 | 0.32814 | 0.33136 | 0.33460 | 0.33783 | 0.34108 | 0.34433 | 71 |
| 19 | 0.34433 | 0.34758 | 0.35085 | 0.35412 | 0.35740 | 0.36068 | 0.36397 | 70 |
| 20 | 0.36397 | 0.36727 | 0.37057 | 0.37388 | 0.37720 | 0.38053 | 0.38386 | 69 |
| 21 | 0.38386 | 0.38721 | 0.39055 | 0.39391 | 0.39727 | 0.40065 | 0.40403 | 68 |
| 22 | 0.40403 | 0.40741 | 0.41081 | 0.41421 | 0.41763 | 0.42105 | 0.42447 | 67 |
| 23 | 0.42447 | 0.42791 | 0.43136 | 0.43481 | 0.43828 | 0.44175 | 0.44523 | 66 |
| 24 | 0.44523 | 0.44872 | 0.45222 | 0.45573 | 0.45924 | 0.46277 | 0.46631 | 65 |
| 25 | 0.46631 | 0.46985 | 0.47341 | 0.47698 | 0.48055 | 0.48414 | 0.48773 | 64 |
| 26 | 0.48773 | 0.49134 | 0.49495 | 0.49858 | 0.50222 | 0.50587 | 0.50953 | 63 |
| 27 | 0.50953 | 0.51319 | 0.51688 | 0.52057 | 0.52427 | 0.52798 | 0.53171 | 62 |
| 28 | 0.53171 | 0.53545 | 0.53920 | 0.54296 | 0.54673 | 0.55051 | 0.55431 | 61 |
| 29 | 0.55431 | 0.55812 | 0.56194 | 0.56577 | 0.56962 | 0.57348 | 0.57735 | 60 |
| 30 | 0.57735 | 0.58124 | 0.58513 | 0.58905 | 0.59297 | 0.59691 | 0.60086 | 59 |
| 31 | 0.60086 | 0.60483 | 0.60881 | 0.61280 | 0.61681 | 0.62083 | 0.62487 | 58 |
| 32 | 0.62487 | 0.62892 | 0.63299 | 0.63707 | 0.64117 | 0.64528 | 0.64941 | 57 |
| 33 | 0.64941 | 0.65355 | 0.65771 | 0.66189 | 0.66608 | 0.67028 | 0.67451 | 56 |
| 34 | 0.67451 | 0.67875 | 0.68301 | 0.68728 | 0.69157 | 0.69588 | 0.70021 | 55 |
| 35 | 0.70021 | 0.70455 | 0.70891 | 0.71329 | 0.71769 | 0.72211 | 0.72654 | 54 |
| 36 | 0.72654 | 0.73100 | 0.73547 | 0.73996 | 0.74447 | 0.74900 | 0.75355 | 53 |
| 37 | 0.75355 | 0.75812 | 0.76272 | 0.76733 | 0.77196 | 0.77661 | 0.78129 | 52 |
| 38 | 0.78129 | 0.78598 | 0.79070 | 0.79544 | 0.80020 | 0.80498 | 0.80978 | 51 |
| 39 | 0.80978 | 0.81461 | 0.81946 | 0.82434 | 0.82923 | 0.83415 | 0.83910 | 50 |
| 40 | 0.83910 | 0.84407 | 0.84906 | 0.85408 | 0.85912 | 0.86419 | 0.86929 | 49 |
| 41 | 0.86929 | 0.87441 | 0.87955 | 0.88473 | 0.88992 | 0.89515 | 0.90040 | 48 |
| 42 | 0.90040 | 0.90569 | 0.91099 | 0.91633 | 0.92170 | 0.92709 | 0.93252 | 47 |
| 43 | 0.93252 | 0.93797 | 0.94345 | 0.94896 | 0.95451 | 0.96008 | 0.96569 | 46 |
| 44 | 0.96569 | 0.97133 | 0.97700 | 0.98270 | 0.98843 | 0.99420 | 1.00000 | 45 |
| Tangents | 60′ | 50′ | 40′ | 30′ | 20′ | 10′ | 0′ | Degrees |
| | Cotangents | | | | | | | |

# Four-Place Table of Common Logarithms

The common logarithms of numbers between 1 and 10, correct to four places, are given in the table shown on this and the following page.

If the decimal point in the number is moved $n$ places to the right (or left), the value of $n$ (or $-n$) is added to the logarithm, thus:

log 3.14 = 0.4969
log 314. = 0.4969 + 2 or 2.4969
log .0314 = 0.4969 − 2, which may be written, 2.4969 or 8.4969 − 10

If the given number has more than four significant figures, it should be reduced to four figures, since those beyond four figures will not affect the result in four-place computations.

The logarithm of a number having four significant figures must be interpolated by adding to the logarithm of the three figure number, the amount under the fourth figure, as read in the proportional parts section of the table.

Thus, the logarithm of 3.1416 is found as follows:

a. Reduce the number to four significant figures: 3.142
b. The log of 3.14 is .4969
c. The value of the proportional part under 2 (the fourth figure) is 3
d. Then, the log 3.142 = 0.4969 + .0003 or 0.4972

$$\log ab = \log a + \log b \qquad \log a^n = n \log a$$

$$\log \frac{a}{b} = \log a - \log b \qquad \log \sqrt[n]{a} = \frac{\log a}{n}$$

| N | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Proportional Parts 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.0** | 0000 | 0043 | 0086 | 0128 | 0170 | 0212 | 0253 | 0294 | 0334 | 0374 | 4 | 8 | 12 | 17 | 21 | 25 | 29 | 33 | 37 |
| 1.1 | 0414 | 0453 | 0492 | 0531 | 0569 | 0607 | 0645 | 0682 | 0719 | 0755 | 4 | 8 | 11 | 15 | 19 | 23 | 26 | 30 | 34 |
| 1.2 | 0792 | 0828 | 0864 | 0899 | 0934 | 0969 | 1004 | 1038 | 1072 | 1106 | 3 | 7 | 10 | 14 | 17 | 21 | 24 | 28 | 31 |
| 1.3 | 1139 | 1173 | 1206 | 1239 | 1271 | 1303 | 1335 | 1367 | 1399 | 1430 | 3 | 6 | 10 | 13 | 16 | 19 | 23 | 26 | 29 |
| 1.4 | 1461 | 1492 | 1523 | 1553 | 1584 | 1614 | 1644 | 1673 | 1703 | 1732 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
| 1.5 | 1761 | 1790 | 1818 | 1847 | 1875 | 1903 | 1931 | 1959 | 1987 | 2014 | 3 | 6 | 8 | 11 | 14 | 17 | 20 | 22 | 25 |
| 1.6 | 2041 | 2068 | 2095 | 2122 | 2148 | 2175 | 2201 | 2227 | 2253 | 2279 | 3 | 5 | 8 | 11 | 13 | 16 | 18 | 21 | 24 |
| 1.7 | 2304 | 2330 | 2355 | 2380 | 2405 | 2430 | 2455 | 2480 | 2504 | 2529 | 2 | 5 | 7 | 10 | 12 | 15 | 17 | 20 | 22 |
| 1.8 | 2553 | 2577 | 2601 | 2625 | 2648 | 2672 | 2695 | 2718 | 2742 | 2765 | 2 | 5 | 7 | 9 | 12 | 14 | 16 | 19 | 21 |
| 1.9 | 2788 | 2810 | 2833 | 2856 | 2878 | 2900 | 2923 | 2945 | 2967 | 2989 | 2 | 4 | 7 | 9 | 11 | 13 | 16 | 18 | 20 |
| **2.0** | 3010 | 3032 | 3054 | 3075 | 3096 | 3118 | 3139 | 3160 | 3181 | 3201 | 2 | 4 | 6 | 8 | 11 | 13 | 15 | 17 | 19 |
| 2.1 | 3222 | 3243 | 3263 | 3284 | 3304 | 3324 | 3345 | 3365 | 3385 | 3404 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| 2.2 | 3424 | 3444 | 3464 | 3483 | 3502 | 3522 | 3541 | 3560 | 3579 | 3598 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 15 | 17 |
| 2.3 | 3617 | 3636 | 3655 | 3674 | 3692 | 3711 | 3729 | 3747 | 3766 | 3784 | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 |
| 2.4 | 3802 | 3820 | 3838 | 3856 | 3874 | 3892 | 3909 | 3927 | 3945 | 3962 | 2 | 4 | 5 | 7 | 9 | 11 | 12 | 14 | 16 |
| 2.5 | 3979 | 3997 | 4014 | 4031 | 4048 | 4065 | 4082 | 4099 | 4116 | 4133 | 2 | 3 | 5 | 7 | 9 | 10 | 12 | 14 | 15 |
| 2.6 | 4150 | 4166 | 4183 | 4200 | 4216 | 4232 | 4249 | 4265 | 4281 | 4298 | 2 | 3 | 5 | 7 | 8 | 10 | 11 | 13 | 15 |
| 2.7 | 4314 | 4330 | 4346 | 4362 | 4378 | 4393 | 4409 | 4425 | 4440 | 4456 | 2 | 3 | 5 | 6 | 8 | 9 | 11 | 13 | 14 |
| 2.8 | 4472 | 4487 | 4502 | 4518 | 4533 | 4548 | 4564 | 4579 | 4594 | 4609 | 2 | 3 | 5 | 6 | 8 | 9 | 11 | 12 | 14 |
| 2.9 | 4624 | 4639 | 4654 | 4669 | 4683 | 4698 | 4713 | 4728 | 4742 | 4757 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 12 | 13 |
| **3.0** | 4771 | 4786 | 4800 | 4814 | 4829 | 4843 | 4857 | 4871 | 4886 | 4900 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 11 | 13 |
| 3.1 | 4914 | 4928 | 4942 | 4955 | 4969 | 4983 | 4997 | 5011 | 5024 | 5038 | 1 | 3 | 4 | 6 | 7 | 8 | 10 | 11 | 12 |
| 3.2 | 5051 | 5065 | 5079 | 5092 | 5105 | 5119 | 5132 | 5145 | 5159 | 5172 | 1 | 3 | 4 | 5 | 7 | 8 | 9 | 11 | 12 |
| 3.3 | 5185 | 5198 | 5211 | 5224 | 5237 | 5250 | 5263 | 5276 | 5289 | 5302 | 1 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 12 |
| 3.4 | 5315 | 5328 | 5340 | 5353 | 5366 | 5378 | 5391 | 5403 | 5416 | 5428 | 1 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 |
| 3.5 | 5441 | 5453 | 5465 | 5478 | 5490 | 5502 | 5514 | 5527 | 5539 | 5551 | 1 | 2 | 4 | 5 | 6 | 7 | 9 | 10 | 11 |
| 3.6 | 5563 | 5575 | 5587 | 5599 | 5611 | 5623 | 5635 | 5647 | 5658 | 5670 | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 10 | 11 |
| 3.7 | 5682 | 5694 | 5705 | 5717 | 5729 | 5740 | 5752 | 5763 | 5775 | 5786 | 1 | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3.8 | 5798 | 5809 | 5821 | 5832 | 5843 | 5855 | 5866 | 5877 | 5888 | 5899 | 1 | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3.9 | 5911 | 5922 | 5933 | 5944 | 5955 | 5966 | 5977 | 5988 | 5999 | 6010 | 1 | 2 | 3 | 4 | 5 | 7 | 8 | 9 | 10 |
| N | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

# Four-Place Table of Common Logarithms (Cont.)

| N | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Proportional Parts 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4.0** | 6021 | 6031 | 6042 | 6053 | 6064 | 6075 | 6085 | 6096 | 6107 | 6117 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 |
| 4.1 | 6128 | 6138 | 6149 | 6160 | 6170 | 6180 | 6191 | 6201 | 6212 | 6222 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4.2 | 6232 | 6243 | 6253 | 6263 | 6274 | 6284 | 6294 | 6304 | 6314 | 6325 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4.3 | 6335 | 6345 | 6355 | 6365 | 6375 | 6385 | 6395 | 6405 | 6415 | 6425 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4.4 | 6435 | 6444 | 6454 | 6464 | 6474 | 6484 | 6493 | 6503 | 6513 | 6522 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4.5 | 6532 | 6542 | 6551 | 6561 | 6571 | 6580 | 6590 | 6599 | 6609 | 6618 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4.6 | 6628 | 6637 | 6646 | 6656 | 6665 | 6675 | 6684 | 6693 | 6702 | 6712 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 7 | 8 |
| 4.7 | 6721 | 6730 | 6739 | 6749 | 6758 | 6767 | 6776 | 6785 | 6794 | 6803 | 1 | 2 | 3 | 4 | 5 | 5 | 6 | 7 | 8 |
| 4.8 | 6812 | 6821 | 6830 | 6839 | 6848 | 6857 | 6866 | 6875 | 6884 | 6893 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 8 |
| 4.9 | 6902 | 6911 | 6920 | 6928 | 6937 | 6946 | 6955 | 6964 | 6972 | 6981 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 8 |
| **5.0** | 6990 | 6998 | 7007 | 7016 | 7024 | 7033 | 7042 | 7050 | 7059 | 7067 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 |
| 5.1 | 7076 | 7084 | 7093 | 7101 | 7110 | 7118 | 7126 | 7135 | 7143 | 7152 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 |
| 5.2 | 7160 | 7168 | 7177 | 7185 | 7193 | 7202 | 7210 | 7218 | 7226 | 7235 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 7 | 7 |
| 5.3 | 7243 | 7251 | 7259 | 7267 | 7275 | 7284 | 7292 | 7300 | 7308 | 7316 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 6 | 7 |
| 5.4 | 7324 | 7332 | 7340 | 7348 | 7356 | 7364 | 7372 | 7380 | 7388 | 7396 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 6 | 7 |
| 5.5 | 7404 | 7412 | 7419 | 7427 | 7435 | 7443 | 7451 | 7459 | 7466 | 7474 | 1 | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 7 |
| 5.6 | 7482 | 7490 | 7497 | 7505 | 7513 | 7520 | 7528 | 7536 | 7543 | 7551 | 1 | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 7 |
| 5.7 | 7559 | 7566 | 7574 | 7582 | 7589 | 7597 | 7604 | 7612 | 7619 | 7627 | 1 | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 7 |
| 5.8 | 7634 | 7642 | 7649 | 7657 | 7664 | 7672 | 7679 | 7686 | 7694 | 7701 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 |
| 5.9 | 7709 | 7716 | 7723 | 7731 | 7738 | 7745 | 7752 | 7760 | 7767 | 7774 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 |
| **6.0** | 7782 | 7789 | 7796 | 7803 | 7810 | 7818 | 7825 | 7832 | 7839 | 7846 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 6 |
| 6.1 | 7853 | 7860 | 7868 | 7875 | 7882 | 7889 | 7896 | 7903 | 7910 | 7917 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 6 |
| 6.2 | 7924 | 7931 | 7938 | 7945 | 7952 | 7959 | 7966 | 7973 | 7980 | 7987 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 6 |
| 6.3 | 7993 | 8000 | 8007 | 8014 | 8021 | 8028 | 8035 | 8041 | 8048 | 8055 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 6.4 | 8062 | 8069 | 8075 | 8082 | 8089 | 8096 | 8102 | 8109 | 8116 | 8122 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 6.5 | 8129 | 8136 | 8142 | 8149 | 8156 | 8162 | 8169 | 8176 | 8182 | 8189 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 6.6 | 8195 | 8202 | 8209 | 8215 | 8222 | 8228 | 8235 | 8241 | 8248 | 8254 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 6.7 | 8261 | 8267 | 8274 | 8280 | 8287 | 8293 | 8299 | 8306 | 8312 | 8319 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 6.8 | 8325 | 8331 | 8338 | 8344 | 8351 | 8357 | 8363 | 8370 | 8376 | 8382 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 6 |
| 6.9 | 8388 | 8395 | 8401 | 8407 | 8414 | 8420 | 8426 | 8432 | 8439 | 8445 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 6 |
| **7.0** | 8451 | 8457 | 8463 | 8470 | 8476 | 8482 | 8488 | 8494 | 8500 | 8506 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 6 |
| 7.1 | 8513 | 8519 | 8525 | 8531 | 8537 | 8543 | 8549 | 8555 | 8561 | 8567 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 7.2 | 8573 | 8579 | 8585 | 8591 | 8597 | 8603 | 8609 | 8615 | 8621 | 8627 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 7.3 | 8633 | 8639 | 8645 | 8651 | 8657 | 8663 | 8669 | 8675 | 8681 | 8686 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 7.4 | 8692 | 8698 | 8704 | 8710 | 8716 | 8722 | 8727 | 8733 | 8739 | 8745 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 7.5 | 8751 | 8756 | 8762 | 8768 | 8774 | 8779 | 8785 | 8791 | 8797 | 8802 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 5 | 5 |
| 7.6 | 8808 | 8814 | 8820 | 8825 | 8831 | 8837 | 8842 | 8848 | 8854 | 8859 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 5 | 5 |
| 7.7 | 8865 | 8871 | 8876 | 8882 | 8887 | 8893 | 8899 | 8904 | 8910 | 8915 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 7.8 | 8921 | 8927 | 8932 | 8938 | 8943 | 8949 | 8954 | 8960 | 8965 | 8971 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 7.9 | 8976 | 8982 | 8987 | 8993 | 8998 | 9004 | 9009 | 9015 | 9020 | 9025 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| **8.0** | 9031 | 9036 | 9042 | 9047 | 9053 | 9058 | 9063 | 9069 | 9074 | 9079 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.1 | 9085 | 9090 | 9096 | 9101 | 9106 | 9112 | 9117 | 9122 | 9128 | 9133 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.2 | 9138 | 9143 | 9149 | 9154 | 9159 | 9165 | 9170 | 9175 | 9180 | 9186 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.3 | 9191 | 9196 | 9201 | 9206 | 9212 | 9217 | 9222 | 9227 | 9232 | 9238 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.4 | 9243 | 9248 | 9253 | 9258 | 9263 | 9269 | 9274 | 9279 | 9284 | 9289 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.5 | 9294 | 9299 | 9304 | 9309 | 9315 | 9320 | 9325 | 9330 | 9335 | 9340 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.6 | 9345 | 9350 | 9355 | 9360 | 9365 | 9370 | 9375 | 9380 | 9385 | 9390 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 8.7 | 9395 | 9400 | 9405 | 9410 | 9415 | 9420 | 9425 | 9430 | 9435 | 9440 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 8.8 | 9445 | 9450 | 9455 | 9460 | 9465 | 9469 | 9474 | 9479 | 9484 | 9489 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 8.9 | 9494 | 9499 | 9504 | 9509 | 9513 | 9518 | 9523 | 9528 | 9533 | 9538 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| **9.0** | 9542 | 9547 | 9552 | 9557 | 9562 | 9566 | 9571 | 9576 | 9581 | 9586 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.1 | 9590 | 9595 | 9600 | 9605 | 9609 | 9614 | 9619 | 9624 | 9628 | 9633 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.2 | 9638 | 9643 | 9647 | 9652 | 9657 | 9661 | 9666 | 9671 | 9675 | 9680 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.3 | 9685 | 9689 | 9694 | 9699 | 9703 | 9708 | 9713 | 9717 | 9722 | 9727 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.4 | 9731 | 9736 | 9741 | 9745 | 9750 | 9754 | 9759 | 9763 | 9768 | 9773 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.5 | 9777 | 9782 | 9786 | 9791 | 9795 | 9800 | 9805 | 9809 | 9814 | 9818 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.6 | 9823 | 9827 | 9832 | 9836 | 9841 | 9845 | 9850 | 9854 | 9859 | 9863 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.7 | 9868 | 9872 | 9877 | 9881 | 9886 | 9890 | 9894 | 9899 | 9903 | 9908 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.8 | 9912 | 9917 | 9921 | 9926 | 9930 | 9934 | 9939 | 9943 | 9948 | 9952 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 9.9 | 9956 | 9961 | 9965 | 9969 | 9974 | 9978 | 9983 | 9987 | 9991 | 9996 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 |
| N | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

# Steam

There are three states of matter: solid, liquid, and gas. Under normal atmospheric conditions, substances exist in any one of these three states, and when the outside conditions are varied, they change from one state to another.

Water under average conditions exists in the form of a liquid. When a body of water is heated by means of some external medium, the temperature of the water rises, and soon small bubbles are noted on the surface which break and form continuously. This phenomenon is described as "boiling".

The amount of heat necessary to cause the temperature of the water to rise is expressed in British Thermal Units (B.t.u.), where one B.t.u. is the quantity of heat required to raise the temperature of 1 pound of water from 60 to 61° F. or, as is generally stated, 1/180 part of the heat necessary to raise the temperature of 1 pound of water from 32° F. (freezing point) to 212° F. (boiling point).

After the temperature of 212° F. is reached, each pound of water contains 180 B.t.u. (above 32° F.). This quantity of heat is called "*heat of the liquid*" or "*sensible heat*". In order to change the liquid into a vapor at atmospheric pressure (14.7 pounds per square inch absolute), 970.2 B.t.u. must be added to each pound of water after the temperature of 212° F. is reached. During this transition period the temperature remains constant. The added quantity of heat is called the "*latent heat of evaporation*". Consequently, the "*total heat*" of the vapor, formed when water boils at atmospheric pressure, is the sum of the two quantities 180 B.t.u. and 970.2 B.t.u., or 1150.2 B.t.u. per pound.

If water is heated in a closed vessel not completely filled, the pressure will rise after steam begins to form accompanied by an increase in temperature.

**Saturated Steam:** Saturated steam is steam in contact with the liquid water from which it was generated, at a temperature which is the boiling point of the water and the condensing point of the steam. It may be either "dry" or "wet", depending upon the generating conditions. "Dry" saturated steam is steam free from mechanically mixed water particles. "Wet" saturated steam, on the other hand, contains water particles in suspension. Saturated steam at any pressure has a definite temperature.

**Superheated Steam:** Superheated steam is steam at any given pressure which is heated to a temperature higher than the temperature of saturated steam at that pressure.

*Steam Data* ..... *page 569*
*Properties of Saturated Steam* .. *pages 570 to 573*
*Properties of Superheated Steam* *pages 574 to 576*
*Temperature Conversion table* ..... *page 557*

# Steam Data

## Boiler Horse Power

The accepted rule for figuring boiler horse power is as follows

One Horse Power equals the evaporation of 34½ pounds of water per hour from an initial temperature of 100° F. into steam at 70 pounds gauge pressure, or its equivalent; that is, 34½ pounds of water evaporated per hour from a temperature of 212° F. into steam at 212° F.

## Horse Power of an Engine

$P$ = Mean effective pressure per square inch of the steam on the piston.

$L$ = Length of stroke in feet.

$A$ = Area of piston in square inches.

$N$ = Number of strokes per minute.

Then Horse Power $= \frac{PLAN}{33000}$

The approximate mean effective pressure in the cylinder when the valve cuts off at:

¼ stroke equals steam pressure × .507
⅓ stroke equals steam pressure × .675
⅜ stroke equals steam pressure × .743
½ stroke equals steam pressure × .847
⅝ stroke equals steam pressure × .919
⅔ stroke equals steam pressure × .937
¾ stroke equals steam pressure × .966
⅞ stroke equals steam pressure × .992

## Ranges in Steam Consumption by Prime Movers

*(For Estimating Purposes)*

| | |
|---|---|
| Simple Non-Condensing Engines | 20 — 45 pounds per H. P. hour |
| Simple Non-Condensing Automatic Engines | 26 — 40 pounds per H. P. hour |
| Simple Non-Condensing Corliss Engines | 26 — 35 pounds per H. P. hour |
| Compound Non-Condensing Engines | 19 — 28 pounds per H. P. hour |
| Compound Condensing Engines | 12 — 22 pounds per H. P. hour |
| Simple Duplex Steam Pumps | 120 — 200 pounds per H. P. hour |
| Turbines, Non-Condensing | 21 — 45 pounds per H. P. hour |
| Turbines, Condensing | 9 — 32 pounds per H. P. hour |

## Flow of Steam in Pipes

To determine the velocity of steam in feet per minute through a pipe, the quantity, pressure and area being known.

$V$ = Velocity in feet per minute.
$W$ = Pounds of steam per hour.
$v$ = Specific volume in cubic feet per pound. (See steam tables, pages 570 to 576.)
$a$ = Area of pipe in square inches. (See steel pipe data, pages 490 and 491.)
1728 = Cubic inches in a cubic foot.
60 = Minutes in an hour.
12 = Inches in a foot.

$$\text{Then } V = \frac{W \times v \times 1728}{60 \times a \times 12} = \frac{W \times v \times 2.4}{a}$$

$$W = \frac{a \times V}{v \times 2.4}$$

$$v = \frac{a \times V}{W \times 2.4}$$

$$a = \frac{W \times v \times 2.4}{V}$$

## Loss of Pressure

The above formula does not consider the probable drop, or loss of pressure which is dependent upon the velocity of flow, length of line, number of turns in fittings or valves, and the covering of the pipe. In every steam line there must be a difference in pressure between the inlet and outlet or there could be no flow, and this difference is increased by friction and radiation.

## Reasonable Velocities for Flow of Steam in Pipes

The table below giving reasonable velocities, based on average practice, can be used to advantage in steam lines. It must be realized that the lower velocities should be used for smaller pipes and the higher velocities for pipes larger than 12 inches.

| Condition of Steam | Pressure Pounds per Square Inch | Use | Reasonable Velocity Feet per Minute |
|---|---|---|---|
| Saturated | 0 pounds — 15 pounds | Heating (Short lines) | 4,000 to 6,000 |
| Saturated | 50 pounds and up | Miscellaneous | 6,000 to 10,000 |
| Superheated | 200 pounds and up | High Pressure Steam Piping | 7,000 to 20,000 |

# Properties of Saturated Steam[1]

| Absolute Pressure Lbs. per Sq. In. $P$ | Absolute Pressure Inches of Hg | Vacuum Inches of Hg | Temperature Degrees F. $t$ | Heat of the Liquid Btu lb. $h_f$ | Latent Heat of Evaporation Btu lb. $h_{fg}$ | Total Heat of Steam Btu lb. $h_g$ | Specific Volume Cu. ft. per lb. $v_g$ |
|---|---|---|---|---|---|---|---|
| 0.20 | 0.41 | 29.51 | 53.14 | 21.21 | 1063.8 | 1085.0 | 1526.0 |
| 0.25 | 0.51 | 29.41 | 59.30 | 27.36 | 1060.3 | 1087.7 | 1235.3 |
| 0.30 | 0.61 | 29.31 | 64.47 | 32.52 | 1057.4 | 1090.0 | 1039.5 |
| 0.35 | 0.71 | 29.21 | 68.93 | 36.97 | 1054.9 | 1091.9 | 898.5 |
| 0.40 | 0.81 | 29.11 | 72.86 | 40.89 | 1052.7 | 1093.6 | 791.9 |
| 0.45 | 0.92 | 29.00 | 76.38 | 44.41 | 1050.7 | 1095.1 | 708.5 |
| 0.50 | 1.02 | 28.90 | 79.58 | 47.60 | 1048.8 | 1096.4 | 641.4 |
| 0.60 | 1.22 | 28.70 | 85.21 | 53.21 | 1045.7 | 1098.9 | 540.0 |
| 0.70 | 1.43 | 28.49 | 90.08 | 58.07 | 1042.9 | 1101.0 | 466.9 |
| 0.80 | 1.63 | 28.29 | 94.38 | 62.36 | 1040.4 | 1102.8 | 411.7 |
| 0.90 | 1.83 | 28.09 | 98.24 | 66.21 | 1038.3 | 1104.5 | 368.4 |
| 1.0 | 2.04 | 27.88 | 101.74 | 69.70 | 1036.3 | 1106.0 | 333.6 |
| 1.2 | 2.44 | 27.48 | 107.92 | 75.87 | 1032.7 | 1108.6 | 280.9 |
| 1.4 | 2.85 | 27.07 | 113.26 | 81.20 | 1029.6 | 1110.8 | 243.0 |
| 1.6 | 3.26 | 26.66 | 117.99 | 85.91 | 1026.9 | 1112.8 | 214.3 |
| 1.8 | 3.66 | 26.26 | 122.23 | 90.14 | 1024.5 | 1114.6 | 191.8 |
| 2.0 | 4.07 | 25.85 | 126.08 | 93.99 | 1022.2 | 1116.2 | 173.73 |
| 2.2 | 4.48 | 25.44 | 129.62 | 97.52 | 1020.2 | 1117.7 | 158.85 |
| 2.4 | 4.89 | 25.03 | 132.89 | 100.79 | 1018.3 | 1119.1 | 146.38 |
| 2.6 | 5.29 | 24.63 | 135.94 | 103.83 | 1016.5 | 1120.3 | 135.78 |
| 2.8 | 5.70 | 24.22 | 138.79 | 106.68 | 1014.8 | 1121.5 | 126.65 |
| 3.0 | 6.11 | 23.81 | 141.48 | 109.37 | 1013.2 | 1122.6 | 118.71 |
| 3.5 | 7.13 | 22.79 | 147.57 | 115.46 | 1009.6 | 1125.1 | 102.72 |
| 4.0 | 8.14 | 21.78 | 152.97 | 120.86 | 1006.4 | 1127.3 | 90.63 |
| 4.5 | 9.16 | 20.76 | 157.83 | 125.71 | 1003.6 | 1129.3 | 81.16 |
| 5.0 | 10.18 | 19.74 | 162.24 | 130.13 | 1001.0 | 1131.1 | 73.52 |
| 5.5 | 11.20 | 18.72 | 166.30 | 134.19 | 998.5 | 1132.7 | 67.24 |
| 6.0 | 12.22 | 17.70 | 170.06 | 137.96 | 996.2 | 1134.2 | 61.98 |
| 6.5 | 13.23 | 16.69 | 173.56 | 141.47 | 994.1 | 1135.6 | 57.50 |
| 7.0 | 14.25 | 15.67 | 176.85 | 144.76 | 992.1 | 1136.9 | 53.64 |
| 7.5 | 15.27 | 14.65 | 179.94 | 147.86 | 990.2 | 1138.1 | 50.29 |
| 8.0 | 16.29 | 13.63 | 182.86 | 150.79 | 988.5 | 1139.3 | 47.34 |
| 8.5 | 17.31 | 12.61 | 185.64 | 153.57 | 986.8 | 1140.4 | 44.73 |
| 9.0 | 18.32 | 11.60 | 188.28 | 156.22 | 985.2 | 1141.4 | 42.40 |
| 9.5 | 19.34 | 10.58 | 190.80 | 158.75 | 983.6 | 1142.3 | 40.31 |
| 10.0 | 20.36 | 9.56 | 193.21 | 161.17 | 982.1 | 1143.3 | 38.42 |
| 11.0 | 22.40 | 7.52 | 197.75 | 165.73 | 979.3 | 1145.0 | 35.14 |
| 12.0 | 24.43 | 5.49 | 201.96 | 169.96 | 976.6 | 1146.6 | 32.40 |
| 13.0 | 26.47 | 3.45 | 205.88 | 173.91 | 974.2 | 1148.1 | 30.06 |
| 14.0 | 28.50 | 1.42 | 209.56 | 177.61 | 971.9 | 1149.5 | 28.04 |

| Pressure Lbs. per Sq. In. Absolute $P$ | Pressure Lbs. per Sq. In. Gage $p$ | Temperature Degrees F. $t$ | Heat of the Liquid Btu/lb. $h_f$ | Latent Heat of Evaporation Btu/lb. $h_{fg}$ | Total Heat of Steam Btu/lb. $h_g$ | Specific Volume Cu. ft. per lb. $v_g$ |
|---|---|---|---|---|---|---|
| 14.696 | 0.0 | 212.00 | 180.07 | 970.3 | 1150.4 | 26.80 |
| 15.0 | 0.3 | 213.03 | 181.11 | 969.7 | 1150.8 | 26.29 |
| 16.0 | 1.3 | 216.32 | 184.42 | 967.6 | 1152.0 | 24.75 |
| 17.0 | 2.3 | 219.44 | 187.56 | 965.5 | 1153.1 | 23.39 |
| 18.0 | 3.3 | 222.41 | 190.56 | 963.6 | 1154.2 | 22.17 |
| 19.0 | 4.3 | 225.24 | 193.42 | 961.9 | 1155.3 | 21.08 |
| 20.0 | 5.3 | 227.96 | 196.16 | 960.1 | 1156.3 | 20.089 |
| 21.0 | 6.3 | 230.57 | 198.79 | 958.4 | 1157.2 | 19.192 |
| 22.0 | 7.3 | 233.07 | 201.33 | 956.8 | 1158.1 | 18.375 |
| 23.0 | 8.3 | 235.49 | 203.78 | 955.2 | 1159.0 | 17.627 |
| 24.0 | 9.3 | 237.82 | 206.14 | 953.7 | 1159.8 | 16.938 |
| 25.0 | 10.3 | 240.07 | 208.42 | 952.1 | 1160.6 | 16.303 |
| 26.0 | 11.3 | 242.25 | 210.62 | 950.7 | 1161.3 | 15.715 |
| 27.0 | 12.3 | 244.36 | 212.75 | 949.3 | 1162.0 | 15.170 |
| 28.0 | 13.3 | 246.41 | 214.83 | 947.9 | 1162.7 | 14.663 |
| 29.0 | 14.3 | 248.40 | 216.86 | 946.5 | 1163.4 | 14.189 |
| 30.0 | 15.3 | 250.33 | 218.82 | 945.3 | 1164.1 | 13.746 |
| 31.0 | 16.3 | 252.22 | 220.73 | 944.0 | 1164.7 | 13.330 |
| 32.0 | 17.3 | 254.05 | 222.59 | 942.8 | 1165.4 | 12.940 |
| 33.0 | 18.3 | 255.84 | 224.41 | 941.6 | 1166.0 | 12.572 |
| 34.0 | 19.3 | 257.58 | 226.18 | 940.3 | 1166.5 | 12.226 |

[1] Abstracted from Thermodynamic Properties of Steam by J. H. Keenan and F. G. Keyes, 1936 Edition, by permission of the publishers, John Wiley & Sons, Inc.

| Pressure Lbs. per Sq. In. Absolute $P$ | Gage $p$ | Temperature Degrees F. $t$ | Heat of the Liquid Btu lb. $h_f$ | Latent Heat of Evaporation Btu lb. $h_{fg}$ | Total Heat of Steam Btu lb. $h_g$ | Specific Volume Cu. ft. per lb. $v_g$ |
|---|---|---|---|---|---|---|
| 35.0 | 20.3 | 259.28 | 227.91 | 939.2 | 1167.1 | 11.898 |
| 36.0 | 21.3 | 260.95 | 229.60 | 938.0 | 1167.6 | 11.588 |
| 37.0 | 22.3 | 262.57 | 231.26 | 936.9 | 1168.2 | 11.294 |
| 38.0 | 23.3 | 264.16 | 232.89 | 935.8 | 1168.7 | 11.015 |
| 39.0 | 24.3 | 265.72 | 234.48 | 934.7 | 1169.2 | 10.750 |
| 40.0 | 25.3 | 267.25 | 236.03 | 933.7 | 1169.7 | 10.498 |
| 41.0 | 26.3 | 268.74 | 237.55 | 932.6 | 1170.2 | 10.258 |
| 42.0 | 27.3 | 270.21 | 239.04 | 931.6 | 1170.7 | 10.029 |
| 43.0 | 28.3 | 271.64 | 240.51 | 930.6 | 1171.1 | 9.810 |
| 44.0 | 29.3 | 273.05 | 241.95 | 929.6 | 1171.6 | 9.601 |
| 45.0 | 30.3 | 274.44 | 243.36 | 928.6 | 1172.0 | 9.401 |
| 46.0 | 31.3 | 275.80 | 244.75 | 927.7 | 1172.4 | 9.209 |
| 47.0 | 32.3 | 277.13 | 246.12 | 926.7 | 1172.9 | 9.025 |
| 48.0 | 33.3 | 278.45 | 247.47 | 925.8 | 1173.3 | 8.848 |
| 49.0 | 34.3 | 279.74 | 248.79 | 924.9 | 1173.7 | 8.678 |
| 50.0 | 35.3 | 281.01 | 250.09 | 924.0 | 1174.1 | 8.515 |
| 51.0 | 36.3 | 282.26 | 251.37 | 923.0 | 1174.4 | 8.359 |
| 52.0 | 37.3 | 283.49 | 252.63 | 922.2 | 1174.8 | 8.208 |
| 53.0 | 38.3 | 284.70 | 253.87 | 921.3 | 1175.2 | 8.062 |
| 54.0 | 39.3 | 285.90 | 255.09 | 920.5 | 1175.6 | 7.922 |
| 55.0 | 40.3 | 287.07 | 256.30 | 919.6 | 1175.9 | 7.787 |
| 56.0 | 41.3 | 288.23 | 257.50 | 918.8 | 1176.3 | 7.656 |
| 57.0 | 42.3 | 289.37 | 258.67 | 917.9 | 1176.6 | 7.529 |
| 58.0 | 43.3 | 290.50 | 259.82 | 917.1 | 1176.9 | 7.407 |
| 59.0 | 44.3 | 291.61 | 260.96 | 916.3 | 1177.3 | 7.289 |
| 60.0 | 45.3 | 292.71 | 262.09 | 915.5 | 1177.6 | 7.175 |
| 61.0 | 46.3 | 293.79 | 263.20 | 914.7 | 1177.9 | 7.064 |
| 62.0 | 47.3 | 294.85 | 264.30 | 913.9 | 1178.2 | 6.957 |
| 63.0 | 48.3 | 295.90 | 265.38 | 913.1 | 1178.5 | 6.853 |
| 64.0 | 49.3 | 296.94 | 266.45 | 912.3 | 1178.8 | 6.752 |
| 65.0 | 50.3 | 297.97 | 267.50 | 911.6 | 1179.1 | 6.655 |
| 66.0 | 51.3 | 298.99 | 268.55 | 910.8 | 1179.4 | 6.560 |
| 67.0 | 52.3 | 299.99 | 269.58 | 910.1 | 1179.7 | 6.468 |
| 68.0 | 53.3 | 300.98 | 270.60 | 909.4 | 1180.0 | 6.378 |
| 69.0 | 54.3 | 301.96 | 271.61 | 908.7 | 1180.3 | 6.291 |
| 70.0 | 55.3 | 302.92 | 272.61 | 907.9 | 1180.6 | 6.206 |
| 71.0 | 56.3 | 303.88 | 273.60 | 907.2 | 1180.8 | 6.124 |
| 72.0 | 57.3 | 304.83 | 274.57 | 906.5 | 1181.1 | 6.044 |
| 73.0 | 58.3 | 305.76 | 275.54 | 905.8 | 1181.3 | 5.966 |
| 74.0 | 59.3 | 306.68 | 276.49 | 905.1 | 1181.6 | 5.890 |
| 75.0 | 60.3 | 307.60 | 277.43 | 904.5 | 1181.9 | 5.816 |
| 76.0 | 61.3 | 308.50 | 278.37 | 903.7 | 1182.1 | 5.743 |
| 77.0 | 62.3 | 309.40 | 279.30 | 903.1 | 1182.4 | 5.673 |
| 78.0 | 63.3 | 310.29 | 280.21 | 902.4 | 1182.6 | 5.604 |
| 79.0 | 64.3 | 311.16 | 281.12 | 901.7 | 1182.8 | 5.537 |
| 80.0 | 65.3 | 312.03 | 282.02 | 901.1 | 1183.1 | 5.472 |
| 81.0 | 66.3 | 312.89 | 282.91 | 900.4 | 1183.3 | 5.408 |
| 82.0 | 67.3 | 313.74 | 283.79 | 899.7 | 1183.5 | 5.346 |
| 83.0 | 68.3 | 314.59 | 284.66 | 899.1 | 1183.8 | 5.285 |
| 84.0 | 69.3 | 315.42 | 285.53 | 898.5 | 1184.0 | 5.226 |
| 85.0 | 70.3 | 316.25 | 286.39 | 897.8 | 1184.2 | 5.168 |
| 86.0 | 71.3 | 317.07 | 287.24 | 897.2 | 1184.4 | 5.111 |
| 87.0 | 72.3 | 317.88 | 288.08 | 896.5 | 1184.6 | 5.055 |
| 88.0 | 73.3 | 318.68 | 288.91 | 895.9 | 1184.8 | 5.001 |
| 89.0 | 74.3 | 319.48 | 289.74 | 895.3 | 1185.1 | 4.948 |
| 90.0 | 75.3 | 320.27 | 290.56 | 894.7 | 1185.3 | 4.896 |
| 91.0 | 76.3 | 321.06 | 291.38 | 894.1 | 1185.5 | 4.845 |
| 92.0 | 77.3 | 321.83 | 292.18 | 893.5 | 1185.7 | 4.796 |
| 93.0 | 78.3 | 322.60 | 292.98 | 892.9 | 1185.9 | 4.747 |
| 94.0 | 79.3 | 323.36 | 293.78 | 892.3 | 1186.1 | 4.699 |
| 95.0 | 80.3 | 324.12 | 294.56 | 891.7 | 1186.2 | 4.652 |
| 96.0 | 81.3 | 324.87 | 295.34 | 891.1 | 1186.4 | 4.606 |
| 97.0 | 82.3 | 325.61 | 296.12 | 890.5 | 1186.6 | 4.561 |
| 98.0 | 83.3 | 326.35 | 296.89 | 889.9 | 1186.8 | 4.517 |
| 99.0 | 84.3 | 327.08 | 297.65 | 889.4 | 1187.0 | 4.474 |
| 100.0 | 85.3 | 327.81 | 298.40 | 888.8 | 1187.2 | 4.432 |
| 101.0 | 86.3 | 328.53 | 299.15 | 888.2 | 1187.4 | 4.391 |
| 102.0 | 87.3 | 329.25 | 299.90 | 887.6 | 1187.5 | 4.350 |
| 103.0 | 88.3 | 329.96 | 300.64 | 887.1 | 1187.7 | 4.310 |
| 104.0 | 89.3 | 330.66 | 301.37 | 886.5 | 1187.9 | 4.271 |
| 105.0 | 90.3 | 331.36 | 302.10 | 886.0 | 1188.1 | 4.232 |
| 106.0 | 91.3 | 332.05 | 302.82 | 885.4 | 1188.2 | 4.194 |
| 107.0 | 92.3 | 332.74 | 303.54 | 884.9 | 1188.4 | 4.157 |
| 108.0 | 93.3 | 333.42 | 304.26 | 884.3 | 1188.6 | 4.120 |
| 109.0 | 94.3 | 334.10 | 304.97 | 883.7 | 1188.7 | 4.084 |

| Pressure Lbs. per Sq. In. Absolute $P$ | Gage $p$ | Temperature Degrees F. $t$ | Heat of the Liquid Btu lb. $h_f$ | Latent Heat of Evaporation Btu lb. $h_{fg}$ | Total Heat of Steam Btu lb. $h_g$ | Specific Volume Cu. ft. per lb. $v_g$ |
|---|---|---|---|---|---|---|
| 110.0 | 95.3 | 334.77 | 305.66 | 883.2 | 1188.9 | 4.049 |
| 111.0 | 96.3 | 335.44 | 306.37 | 882.6 | 1189.0 | 4.015 |
| 112.0 | 97.3 | 336.11 | 307.06 | 882.1 | 1189.2 | 3.981 |
| 113.0 | 98.3 | 336.77 | 307.75 | 881.6 | 1189.4 | 3.947 |
| 114.0 | 99.3 | 337.42 | 308.43 | 881.1 | 1189.5 | 3.914 |
| 115.0 | 100.3 | 338.07 | 309.11 | 880.6 | 1189.7 | 3.882 |
| 116.0 | 101.3 | 338.72 | 309.79 | 880.0 | 1189.8 | 3.850 |
| 117.0 | 102.3 | 339.36 | 310.46 | 879.5 | 1190.0 | 3.819 |
| 118.0 | 103.3 | 339.99 | 311.12 | 879.0 | 1190.1 | 3.788 |
| 119.0 | 104.3 | 340.62 | 311.78 | 878.4 | 1190.2 | 3.758 |
| 120.0 | 105.3 | 341.25 | 312.44 | 877.9 | 1190.4 | 3.728 |
| 121.0 | 106.3 | 341.88 | 313.10 | 877.4 | 1190.5 | 3.699 |
| 122.0 | 107.3 | 342.50 | 313.75 | 876.9 | 1190.7 | 3.670 |
| 123.0 | 108.3 | 343.11 | 314.40 | 876.4 | 1190.8 | 3.642 |
| 124.0 | 109.3 | 343.72 | 315.04 | 875.9 | 1190.9 | 3.614 |
| 125.0 | 110.3 | 344.33 | 315.68 | 875.4 | 1191.1 | 3.587 |
| 126.0 | 111.3 | 344.94 | 316.31 | 874.9 | 1191.2 | 3.560 |
| 127.0 | 112.3 | 345.54 | 316.94 | 874.4 | 1191.3 | 3.533 |
| 128.0 | 113.3 | 346.13 | 317.57 | 873.9 | 1191.5 | 3.507 |
| 129.0 | 114.3 | 346.73 | 318.19 | 873.4 | 1191.6 | 3.481 |
| 130.0 | 115.3 | 347.32 | 318.81 | 872.9 | 1191.7 | 3.455 |
| 131.0 | 116.3 | 347.90 | 319.43 | 872.5 | 1191.9 | 3.430 |
| 132.0 | 117.3 | 348.48 | 320.04 | 872.0 | 1192.0 | 3.405 |
| 133.0 | 118.3 | 349.06 | 320.65 | 871.5 | 1192.1 | 3.381 |
| 134.0 | 119.3 | 349.64 | 321.25 | 871.0 | 1192.2 | 3.357 |
| 135.0 | 120.3 | 350.21 | 321.85 | 870.6 | 1192.4 | 3.333 |
| 136.0 | 121.3 | 350.78 | 322.45 | 870.1 | 1192.5 | 3.310 |
| 137.0 | 122.3 | 351.35 | 323.05 | 869.6 | 1192.6 | 3.287 |
| 138.0 | 123.3 | 351.91 | 323.64 | 869.1 | 1192.7 | 3.264 |
| 139.0 | 124.3 | 352.47 | 324.23 | 868.7 | 1192.9 | 3.242 |
| 140.0 | 125.3 | 353.02 | 324.82 | 868.2 | 1193.0 | 3.220 |
| 141.0 | 126.3 | 353.57 | 325.40 | 867.7 | 1193.1 | 3.198 |
| 142.0 | 127.3 | 354.12 | 325.98 | 867.2 | 1193.2 | 3.177 |
| 143.0 | 128.3 | 354.67 | 326.56 | 866.7 | 1193.3 | 3.155 |
| 144.0 | 129.3 | 355.21 | 327.13 | 866.3 | 1193.4 | 3.134 |
| 145.0 | 130.3 | 355.76 | 327.70 | 865.8 | 1193.5 | 3.114 |
| 146.0 | 131.3 | 356.29 | 328.27 | 865.3 | 1193.6 | 3.094 |
| 147.0 | 132.3 | 356.83 | 328.83 | 864.9 | 1193.8 | 3.074 |
| 148.0 | 133.3 | 357.36 | 329.39 | 864.5 | 1193.9 | 3.054 |
| 149.0 | 134.3 | 357.89 | 329.95 | 864.0 | 1194.0 | 3.034 |
| 150.0 | 135.3 | 358.42 | 330.51 | 863.6 | 1194.1 | 3.015 |
| 152.0 | 137.3 | 359.46 | 331.61 | 862.7 | 1194.3 | 2.977 |
| 154.0 | 139.3 | 360.49 | 332.70 | 861.8 | 1194.5 | 2.940 |
| 156.0 | 141.3 | 361.52 | 333.79 | 860.9 | 1194.7 | 2.904 |
| 158.0 | 143.3 | 362.53 | 334.86 | 860.0 | 1194.9 | 2.869 |
| 160.0 | 145.3 | 363.53 | 335.93 | 859.2 | 1195.1 | 2.834 |
| 162.0 | 147.3 | 364.53 | 336.98 | 858.3 | 1195.3 | 2.801 |
| 164.0 | 149.3 | 365.51 | 338.02 | 857.5 | 1195.5 | 2.768 |
| 166.0 | 151.3 | 366.48 | 339.05 | 856.6 | 1195.7 | 2.736 |
| 168.0 | 153.3 | 367.45 | 340.07 | 855.7 | 1195.8 | 2.705 |
| 170.0 | 155.3 | 368.41 | 341.09 | 854.9 | 1196.0 | 2.675 |
| 172.0 | 157.3 | 369.35 | 342.10 | 854.1 | 1196.2 | 2.645 |
| 174.0 | 159.3 | 370.29 | 343.10 | 853.3 | 1196.4 | 2.616 |
| 176.0 | 161.3 | 371.22 | 344.09 | 852.4 | 1196.5 | 2.587 |
| 178.0 | 163.3 | 372.14 | 345.06 | 851.6 | 1196.7 | 2.559 |
| 180.0 | 165.3 | 373.06 | 346.03 | 850.8 | 1196.9 | 2.532 |
| 182.0 | 167.3 | 373.96 | 347.00 | 850.0 | 1197.0 | 2.505 |
| 184.0 | 169.3 | 374.86 | 347.96 | 849.2 | 1197.2 | 2.479 |
| 186.0 | 171.3 | 375.75 | 348.92 | 848.4 | 1197.3 | 2.454 |
| 188.0 | 173.3 | 376.64 | 349.86 | 847.6 | 1197.5 | 2.429 |
| 190.0 | 175.3 | 377.51 | 350.79 | 846.8 | 1197.6 | 2.404 |
| 192.0 | 177.3 | 378.38 | 351.72 | 846.1 | 1197.8 | 2.380 |
| 194.0 | 179.3 | 379.24 | 352.64 | 845.3 | 1197.9 | 2.356 |
| 196.0 | 181.3 | 380.10 | 353.55 | 844.5 | 1198.1 | 2.333 |
| 198.0 | 183.3 | 380.95 | 354.46 | 843.7 | 1198.2 | 2.310 |
| 200.0 | 185.3 | 381.79 | 355.36 | 843.0 | 1198.4 | 2.288 |
| 205.0 | 190.3 | 383.86 | 357.58 | 841.1 | 1198.7 | 2.234 |
| 210.0 | 195.3 | 385.90 | 359.77 | 839.2 | 1199.0 | 2.183 |
| 215.0 | 200.3 | 387.89 | 361.91 | 837.4 | 1199.3 | 2.134 |
| 220.0 | 205.3 | 389.86 | 364.02 | 835.6 | 1199.6 | 2.087 |
| 225.0 | 210.3 | 391.79 | 366.09 | 833.8 | 1199.9 | 2.0422 |
| 230.0 | 215.3 | 393.68 | 368.13 | 832.0 | 1200.1 | 1.9992 |
| 235.0 | 220.3 | 395.54 | 370.14 | 830.3 | 1200.4 | 1.9579 |
| 240.0 | 225.3 | 397.37 | 372.12 | 828.5 | 1200.6 | 1.9183 |
| 245.0 | 230.3 | 399.18 | 374.08 | 826.8 | 1200.9 | 1.8803 |

| Pressure Lbs. per Sq. In. Absolute $P$ | Gage $p$ | Temperature Degrees F. $t$ | Heat of the Liquid Btu lb. $h_f$ | Latent Heat of Evaporation Btu lb. $h_{fg}$ | Total Heat of Steam Btu lb. $h_g$ | Specific Volume Cu. ft. per lb. $v_g$ |
|---|---|---|---|---|---|---|
| 250.0 | 235.3 | 400.95 | 376.00 | 825.1 | 1201.1 | 1.8438 |
| 255.0 | 240.3 | 402.70 | 377.89 | 823.4 | 1201.3 | 1.8086 |
| 260.0 | 245.3 | 404.42 | 379.76 | 821.8 | 1201.5 | 1.7748 |
| 265.0 | 250.3 | 406.11 | 381.60 | 820.1 | 1201.7 | 1.7422 |
| 270.0 | 255.3 | 407.78 | 383.42 | 818.5 | 1201.9 | 1.7107 |
| 275.0 | 260.3 | 409.43 | 385.21 | 816.9 | 1202.1 | 1.6804 |
| 280.0 | 265.3 | 411.05 | 386.98 | 815.3 | 1202.3 | 1.6511 |
| 285.0 | 270.3 | 412.65 | 388.73 | 813.7 | 1202.4 | 1.6228 |
| 290.0 | 275.3 | 414.23 | 390.46 | 812.1 | 1202.6 | 1.5954 |
| 295.0 | 280.3 | 415.79 | 392.16 | 810.5 | 1202.7 | 1.5689 |
| 300.0 | 285.3 | 417.33 | 393.84 | 809.0 | 1202.8 | 1.5433 |
| 320.0 | 305.3 | 423.29 | 400.39 | 803.0 | 1203.4 | 1.4485 |
| 340.0 | 325.3 | 428.97 | 406.66 | 797.1 | 1203.7 | 1.3645 |
| 360.0 | 345.3 | 434.40 | 412.67 | 791.4 | 1204.1 | 1.2895 |
| 380.0 | 365.3 | 439.60 | 418.45 | 785.8 | 1204.3 | 1.2222 |
| 400.0 | 385.3 | 444.59 | 424.0 | 780.5 | 1204.5 | 1.1613 |
| 420.0 | 405.3 | 449.39 | 429.4 | 775.2 | 1204.6 | 1.1061 |
| 440.0 | 425.3 | 454.02 | 434.6 | 770.0 | 1204.6 | 1.0556 |
| 460.0 | 445.3 | 458.50 | 439.7 | 764.9 | 1204.6 | 1.0094 |
| 480.0 | 465.3 | 462.82 | 444.6 | 759.9 | 1204.5 | 0.9670 |
| 500.0 | 485.3 | 467.01 | 449.4 | 755.0 | 1204.4 | 0.9278 |
| 520.0 | 505.3 | 471.07 | 454.1 | 750.1 | 1204.2 | 0.8915 |
| 540.0 | 525.3 | 475.01 | 458.6 | 745.4 | 1204.0 | 0.8578 |
| 560.0 | 545.3 | 478.85 | 463.0 | 740.8 | 1203.8 | 0.8265 |
| 580.0 | 565.3 | 482.58 | 467.4 | 736.1 | 1203.5 | 0.7973 |
| 600.0 | 585.3 | 486.21 | 471.6 | 731.6 | 1203.2 | 0.7698 |
| 620.0 | 605.3 | 489.75 | 475 | 727.2 | 1202.9 | 0.7440 |
| 640.0 | 625.3 | 493.21 | 479.5 | 722.7 | 1202.5 | 0.7198 |
| 660.0 | 645.3 | 496.58 | 483.8 | 718.3 | 1202.1 | 0.6971 |
| 680.0 | 665.3 | 499.88 | 487.7 | 714.0 | 1201.7 | 0.6757 |
| 700.0 | 685.3 | 503.10 | 491.5 | 709.7 | 1201.2 | 0.6554 |
| 720.0 | 705.3 | 506.25 | 495.3 | 705.4 | 1200.7 | 0.6362 |
| 740.0 | 725.3 | 509.34 | 499.0 | 701.2 | 1200.2 | 0.6180 |
| 760.0 | 745.3 | 512.36 | 502.6 | 697.1 | 1199.7 | 0.6007 |
| 780.0 | 765.3 | 515.33 | 506.2 | 692.9 | 1199.1 | 0.5843 |
| 800.0 | 785.3 | 518.23 | 509.7 | 688.9 | 1198.6 | 0.5687 |
| 820.0 | 805.3 | 521.08 | 513.2 | 684.8 | 1198.0 | 0.5538 |
| 840.0 | 825.3 | 523.88 | 516.6 | 680.8 | 1197.4 | 0.5396 |
| 860.0 | 845.3 | 526.63 | 520.0 | 676.8 | 1196.8 | 0.5260 |
| 880.0 | 865.3 | 529.33 | 523.3 | 672.8 | 1196.1 | 0.5130 |
| 900.0 | 885.3 | 531.98 | 526.6 | 668.8 | 1195.4 | 0.5006 |
| 920.0 | 905.3 | 534.59 | 529.8 | 664.9 | 1194.7 | 0.4886 |
| 940.0 | 925.3 | 537.16 | 533.0 | 661.0 | 1194.0 | 0.4772 |
| 960.0 | 945.3 | 539.68 | 536.2 | 657.1 | 1193.3 | 0.4663 |
| 980.0 | 965.3 | 542.17 | 539.3 | 653.3 | 1192.6 | 0.4557 |
| 1000.0 | 985.3 | 544.61 | 542.4 | 649.4 | 1191.8 | 0.4456 |
| 1050.0 | 1035.3 | 550.57 | 550.0 | 639.9 | 1189.9 | 0.4218 |
| 1100.0 | 1085.3 | 556.31 | 557.4 | 630.4 | 1187.8 | 0.4001 |
| 1150.0 | 1135.3 | 561.86 | 564.6 | 621.0 | 1185.6 | 0.3802 |
| 1200.0 | 1185.3 | 567.22 | 571.7 | 611.7 | 1183.4 | 0.3619 |
| 1250.0 | 1235.3 | 572.42 | 578.6 | 602.4 | 1181.0 | 0.3450 |
| 1300.0 | 1285.3 | 577.46 | 585.4 | 593.2 | 1178.6 | 0.3293 |
| 1350.0 | 1335.3 | 582.35 | 592.1 | 584.0 | 1176.1 | 0.3148 |
| 1400.0 | 1385.3 | 587.10 | 598.7 | 574.7 | 1173.4 | 0.3012 |
| 1450.0 | 1435.3 | 591.73 | 605.2 | 565.5 | 1170.7 | 0.2884 |
| 1500.0 | 1485.3 | 596.23 | 611.6 | 556.3 | 1167.9 | 0.2765 |
| 1600.0 | 1585.3 | 604.90 | 624.1 | 538.0 | 1162.1 | 0.2548 |
| 1700.0 | 1685.3 | 613.15 | 636.3 | 519.6 | 1155.9 | 0.2354 |
| 1800.0 | 1785.3 | 621.03 | 648.3 | 501.1 | 1149.4 | 0.2179 |
| 1900.0 | 1885.3 | 628.58 | 660.1 | 482.4 | 1142.4 | 0.2021 |
| 2000.0 | 1985.3 | 635.82 | 671.7 | 463.4 | 1135.1 | 0.1878 |
| 2100.0 | 2085.3 | 642.77 | 683.3 | 444.1 | 1127.4 | 0.1746 |
| 2200.0 | 2185.3 | 649.46 | 694.8 | 424.4 | 1119.2 | 0.1625 |
| 2300.0 | 2285.3 | 655.91 | 706.5 | 403.9 | 1110.4 | 0.1513 |
| 2400.0 | 2385.3 | 662.12 | 718.4 | 382.7 | 1101.1 | 0.1407 |
| 2500.0 | 2485.3 | 668.13 | 730.6 | 360.5 | 1091.1 | 0.1307 |
| 2600.0 | 2585.3 | 673.94 | 743.0 | 337.2 | 1080.2 | 0.1213 |
| 2700.0 | 2685.3 | 679.55 | 756.2 | 312.1 | 1068.3 | 0.1123 |
| 2800.0 | 2785.3 | 684.99 | 770.1 | 284.7 | 1054.8 | 0.1035 |
| 2900.0 | 2885.3 | 690.26 | 785.4 | 253.6 | 1039.0 | 0.0947 |
| 3000.0 | 2985.3 | 695.36 | 802.5 | 217.8 | 1020.3 | 0.0858 |
| 3100.0 | 3085.3 | 700.31 | 825.0 | 168.1 | 993.1 | 0.0753 |
| 3200.0 | 3185.3 | 705.11 | 872.4 | 62.0 | 934.4 | 0.0580 |
| 3206.2 | 3191.5 | 705.40 | 902.7 | 0.0 | 902.7 | 0.0503 |

# Properties of Superheated Steam[1]

v = specific volume, cubic feet per pound
h = total heat of steam, Btu per pound

| Pressure Lbs. per Sq. In. Abs. $P$ | Gage $p$ | Sat. Temp. $t$ | | Total Temperature — Degrees Fahrenheit 360 | 400° | 440° | 480° | 500° | 600° | 700° | 800° | 900° | 1000° | 1200° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.696 | 0.0 | 212.00 | v | 33.03 | 34.68 | 36.32 | 37.96 | 38.78 | 42.86 | 46.94 | 51.00 | 55.07 | 59.13 | 67.25 |
| | | | h | 1221.1 | 1239.9 | 1258.8 | 1277.6 | 1287.1 | 1334.8 | 1383.2 | 1432.3 | 1482.3 | 1533.1 | 1637.5 |
| 20.0 | 5.3 | 227.96 | v | 24.21 | 25.43 | 26.65 | 27.86 | 28.46 | 31.47 | 34.47 | 37.46 | 40.45 | 43.44 | 49.41 |
| | | | h | 1220.3 | 1239.2 | 1258.2 | 1277.1 | 1286.6 | 1334.4 | 1382.9 | 1432.1 | 1482.1 | 1533.0 | 1637.4 |
| 30.0 | 15.3 | 250.33 | v | 16.072 | 16.897 | 17.714 | 18.528 | 18.933 | 20.95 | 22.96 | 24.96 | 26.95 | 28.95 | 32.93 |
| | | | h | 1218.6 | 1237.9 | 1257.0 | 1276.2 | 1285.7 | 1333.8 | 1382.4 | 1431.7 | 1481.8 | 1532.7 | 1637.2 |
| 40.0 | 25.3 | 267.25 | v | 12.001 | 12.628 | 13.247 | 13.862 | 14.168 | 15.688 | 17.198 | 18.702 | 20.20 | 21.70 | 24.69 |
| | | | h | 1216.9 | 1236.5 | 1255.9 | 1275.2 | 1284.8 | 1333.1 | 1381.9 | 1431.3 | 1481.4 | 1532.4 | 1637.0 |
| 50.0 | 35.3 | 281.01 | v | 9.557 | 10.065 | 10.567 | 11.062 | 11.309 | 12.532 | 13.744 | 14.950 | 16.152 | 17.352 | 19.747 |
| | | | h | 1215.2 | 1235.1 | 1254.7 | 1274.2 | 1283.9 | 1332.5 | 1381.4 | 1430.9 | 1481.1 | 1532.1 | 1636.8 |
| 60.0 | 45.3 | 292.71 | v | 7.927 | 8.357 | 8.779 | 9.196 | 9.403 | 10.427 | 11.441 | 12.449 | 13.452 | 14.454 | 16.451 |
| | | | h | 1213.4 | 1233.6 | 1253.5 | 1273.2 | 1283.0 | 1331.8 | 1380.9 | 1430.5 | 1480.8 | 1531.9 | 1636.6 |
| 70.0 | 55.3 | 302.92 | v | 6.762 | 7.136 | 7.502 | 7.863 | 8.041 | 8.924 | 9.796 | 10.662 | 11.524 | 12.383 | 14.097 |
| | | | h | 1211.5 | 1232.1 | 1252.3 | 1272.2 | 1282.0 | 1331.1 | 1380.4 | 1430.1 | 1480.5 | 1531.6 | 1636.3 |
| 80.0 | 65.3 | 312.03 | v | 5.888 | 6.220 | 6.544 | 6.862 | 7.020 | 7.797 | 8.562 | 9.322 | 10.077 | 10.830 | 12.332 |
| | | | h | 1209.7 | 1230.7 | 1251.1 | 1271.1 | 1281.1 | 1330.5 | 1379.9 | 1429.7 | 1480.1 | 1531.3 | 1636.2 |
| 90.0 | 75.3 | 320.27 | v | 5.208 | 5.508 | 5.799 | 6.084 | 6.225 | 6.920 | 7.603 | 8.279 | 8.952 | 9.623 | 10.959 |
| | | | h | 1207.7 | 1229.1 | 1249.8 | 1270.1 | 1280.1 | 1329.8 | 1379.4 | 1429.3 | 1479.8 | 1531.0 | 1635.9 |
| 100.0 | 85.3 | 327.81 | v | 4.663 | 4.937 | 5.202 | 5.462 | 5.589 | 6.218 | 6.835 | 7.446 | 8.052 | 8.656 | 9.860 |
| | | | h | 1205.7 | 1227.6 | 1248.6 | 1269.0 | 1279.1 | 1329.1 | 1378.9 | 1428.9 | 1479.5 | 1530.8 | 1635.7 |
| 120.0 | 105.3 | 341.25 | v | 3.844 | 4.081 | 4.307 | 4.527 | 4.636 | 5.165 | 5.683 | 6.195 | 6.702 | 7.207 | 8.212 |
| | | | h | 1201.6 | 1224.4 | 1246.0 | 1266.9 | 1277.2 | 1327.7 | 1377.8 | 1428.1 | 1478.8 | 1530.2 | 1635.3 |
| 140.0 | 125.3 | 353.02 | v | 3.258 | 3.468 | 3.667 | 3.860 | 3.954 | 4.413 | 4.861 | 5.301 | 5.738 | 6.172 | 7.035 |
| | | | h | 1197.3 | 1221.1 | 1243.3 | 1264.7 | 1275.2 | 1326.4 | 1376.8 | 1427.3 | 1478.2 | 1529.7 | 1634.9 |
| 160.0 | 145.3 | 363.53 | v | | 3.008 | 3.187 | 3.359 | 3.443 | 3.849 | 4.244 | 4.631 | 5.015 | 5.396 | 6.152 |
| | | | h | | 1217.6 | 1240.6 | 1262.4 | 1273.1 | 1325.0 | 1375.7 | 1426.4 | 1477.5 | 1529.1 | 1634.5 |
| 180.0 | 165.3 | 373.06 | v | | 2.649 | 2.813 | 2.969 | 3.044 | 3.411 | 3.764 | 4.110 | 4.452 | 4.792 | 5.466 |
| | | | h | | 1214.0 | 1237.8 | 1260.2 | 1271.0 | 1323.5 | 1374.7 | 1425.6 | 1476.8 | 1528.6 | 1634.1 |
| 200.0 | 185.3 | 381.79 | v | | 2.361 | 2.513 | 2.656 | 2.726 | 3.060 | 3.380 | 3.693 | 4.002 | 4.309 | 4.917 |
| | | | h | | 1210.3 | 1234.9 | 1257.8 | 1268.9 | 1322.1 | 1373.6 | 1424.8 | 1476.2 | 1528.0 | 1633.7 |
| 220.0 | 205.3 | 389.86 | v | | 2.125 | 2.267 | 2.400 | 2.465 | 2.772 | 3.066 | 3.352 | 3.634 | 3.913 | 4.467 |
| | | | h | | 1206.5 | 1231.9 | 1255.4 | 1266.7 | 1320.7 | 1372.6 | 1424.0 | 1475.5 | 1527.5 | 1633.3 |
| 240.0 | 225.3 | 397.37 | v | | 1.9276 | 2.062 | 2.187 | 2.247 | 2.533 | 2.804 | 3.068 | 3.327 | 3.584 | 4.093 |
| | | | h | | 1202.5 | 1228.8 | 1253.0 | 1264.5 | 1319.2 | 1371.5 | 1423.2 | 1474.8 | 1526.9 | 1632.9 |
| 260.0 | 245.3 | 404.42 | v | | | 1.8882 | 2.006 | 2.063 | 2.330 | 2.582 | 2.827 | 3.067 | 3.305 | 3.776 |
| | | | h | | | 1225.7 | 1250.5 | 1262.3 | 1317.7 | 1370.4 | 1422.3 | 1474.2 | 1526.3 | 1632.5 |
| 280.0 | 265.3 | 411.05 | v | | | 1.7388 | 1.8512 | 1.9047 | 2.156 | 2.392 | 2.621 | 2.845 | 3.066 | 3.504 |
| | | | h | | | 1222.4 | 1247.9 | 1260.0 | 1316.2 | 1369.4 | 1421.5 | 1473.5 | 1525.8 | 1632.1 |
| 300.0 | 285.3 | 417.33 | v | | | 1.6090 | 1.7165 | 1.7675 | 2.005 | 2.227 | 2.442 | 2.652 | 2.859 | 3.269 |
| | | | h | | | 1219.1 | 1245.3 | 1257.6 | 1314.7 | 1368.3 | 1420.6 | 1472.8 | 1525.2 | 1631.7 |
| 320.0 | 305.3 | 423.29 | v | | | 1.4950 | 1.5985 | 1.6472 | 1.8734 | 2.083 | 2.285 | 2.483 | 2.678 | 3.063 |
| | | | h | | | 1215.6 | 1242.6 | 1255.2 | 1313.2 | 1367.2 | 1419.8 | 1472.1 | 1524.7 | 1631.3 |
| 340.0 | 325.3 | 428.97 | v | | | 1.3941 | 1.4941 | 1.5410 | 1.7569 | 1.9562 | 2.147 | 2.334 | 2.518 | 2.881 |
| | | | h | | | 1212.1 | 1239.9 | 1252.8 | 1311.6 | 1366.1 | 1419.0 | 1471.5 | 1524.1 | 1630.9 |
| 360.0 | 345.3 | 434.40 | v | | | 1.3041 | 1.4012 | 1.4464 | 1.6533 | 1.8431 | 2.025 | 2.202 | 2.376 | 2.719 |
| | | | h | | | 1208.4 | 1237.1 | 1250.3 | 1310.1 | 1365.0 | 1418.1 | 1470.8 | 1523.5 | 1630.5 |

[1]Abstracted from Thermodynamic Properties of Steam by J. H. Keenan and F. G. Keyes, 1936 Edition, by permission of the publishers, John Wiley & Sons, Inc.

# Properties of Superheated Steam (Cont.)

v = specific volume, cubic feet per pound
h = total heat of steam, Btu per pound

| Pressure Lbs. per Sq. In. Abs. $P$ | Gage $p$ | Sat. Temp. $t$ | | Total Temperature — Degrees Fahrenheit 500° | 540° | 600° | 640° | 660° | 700° | 740° | 800° | 900° | 1000° | 1200° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 380.0 | 365.3 | 439.60 | v | 1.3616 | 1.4444 | 1.5605 | 1.6345 | 1.6707 | 1.7419 | 1.8118 | 1.9149 | 2.083 | 2.249 | 2.575 |
| | | | h | 1247.7 | 1273.1 | 1308.5 | 1331.0 | 1342.0 | 1363.8 | 1385.3 | 1417.3 | 1470.1 | 1523.0 | 1630.0 |
| 400.0 | 385.3 | 444.59 | v | 1.2851 | 1.3652 | 1.4770 | 1.5480 | 1.5827 | 1.6508 | 1.7177 | 1.8161 | 1.9767 | 2.134 | 2.445 |
| | | | h | 1245.1 | 1271.0 | 1306.9 | 1329.6 | 1340.8 | 1362.7 | 1384.3 | 1416.4 | 1469.4 | 1522.4 | 1629.6 |
| 420.0 | 405.3 | 449.39 | v | 1.2158 | 1.2935 | 1.4014 | 1.4697 | 1.5030 | 1.5684 | 1.6324 | 1.7267 | 1.8802 | 2.031 | 2.327 |
| | | | h | 1242.5 | 1268.9 | 1305.3 | 1328.3 | 1339.5 | 1361.6 | 1383.3 | 1415.5 | 1468.7 | 1521.9 | 1629.2 |
| 440.0 | 425.3 | 454.02 | v | 1.1526 | 1.2282 | 1.3327 | 1.3984 | 1.4306 | 1.4934 | 1.5549 | 1.6454 | 1.7925 | 1.9368 | 2.220 |
| | | | h | 1239.8 | 1266.7 | 1303.6 | 1326.9 | 1338.2 | 1360.4 | 1382.3 | 1414.7 | 1468.1 | 1521.3 | 1628.8 |
| 460.0 | 445.3 | 458.50 | v | 1.0948 | 1.1685 | 1.2698 | 1.3334 | 1.3644 | 1.4250 | 1.4842 | 1.5711 | 1.7124 | 1.8508 | 2.122 |
| | | | h | 1237.0 | 1264.5 | 1302.0 | 1325.4 | 1336.9 | 1359.3 | 1381.3 | 1413.8 | 1467.4 | 1520.7 | 1628.4 |
| 480.0 | 465.3 | 462.82 | v | 1.0417 | 1.1138 | 1.2122 | 1.2737 | 1.3038 | 1.3622 | 1.4193 | 1.5031 | 1.6390 | 1.7720 | 2.033 |
| | | | h | 1234.2 | 1262.3 | 1300.3 | 1324.0 | 1335.6 | 1358.2 | 1380.3 | 1412.9 | 1466.7 | 1520.2 | 1628.0 |
| 500.0 | 485.3 | 467.01 | v | 0.9927 | 1.0633 | 1.1591 | 1.2188 | 1.2478 | 1.3044 | 1.3596 | 1.4405 | 1.5715 | 1.6996 | 1.9504 |
| | | | h | 1231.3 | 1260.0 | 1298.6 | 1322.6 | 1334.2 | 1357.0 | 1379.3 | 1412.1 | 1466.0 | 1519.6 | 1627.6 |
| 520.0 | 505.3 | 471.07 | v | 0.9473 | 1.0166 | 1.1101 | 1.1681 | 1.1962 | 1.2511 | 1.3045 | 1.3826 | 1.5091 | 1.6326 | 1.8743 |
| | | | h | 1228.3 | 1257.7 | 1296.9 | 1321.1 | 1332.9 | 1355.8 | 1378.2 | 1411.2 | 1465.3 | 1519.0 | 1627.2 |
| 540.0 | 525.3 | 475.01 | v | 0.9052 | 0.9733 | 1.0646 | 1.1211 | 1.1485 | 1.2017 | 1.2535 | 1.3291 | 1.4514 | 1.5707 | 1.8039 |
| | | | h | 1225.3 | 1255.4 | 1295.2 | 1319.7 | 1331.5 | 1354.6 | 1377.2 | 1410.3 | 1464.6 | 1518.5 | 1626.8 |
| 560.0 | 545.3 | 478.85 | v | 0.8659 | 0.9330 | 1.0224 | 1.0775 | 1.1041 | 1.1558 | 1.2060 | 1.2794 | 1.3978 | 1.5132 | 1.7385 |
| | | | h | 1222.2 | 1253.0 | 1293.4 | 1318.2 | 1330.2 | 1353.5 | 1376.1 | 1409.4 | 1463.9 | 1517.9 | 1626.4 |
| 580.0 | 565.3 | 482.58 | v | 0.8291 | 0.8954 | 0.9830 | 1.0368 | 1.0627 | 1.1131 | 1.1619 | 1.2331 | 1.3479 | 1.4596 | 1.6776 |
| | | | h | 1219.0 | 1250.5 | 1291.7 | 1316.7 | 1328.8 | 1352.3 | 1375.1 | 1408.6 | 1463.2 | 1517.3 | 1626.0 |
| 600.0 | 585.3 | 486.21 | v | 0.7947 | 0.8602 | 0.9463 | 0.9988 | 1.0241 | 1.0732 | 1.1207 | 1.1899 | 1.3013 | 1.4096 | 1.6208 |
| | | | h | 1215.7 | 1248.1 | 1289.9 | 1315.2 | 1327.4 | 1351.1 | 1374.0 | 1407.7 | 1462.5 | 1516.7 | 1625.5 |
| 620.0 | 605.3 | 489.75 | v | 0.7624 | 0.8272 | 0.9118 | 0.9633 | 0.9880 | 1.0358 | 1.0821 | 1.1494 | 1.2577 | 1.3628 | 1.5676 |
| | | | h | 1212.4 | 1245.5 | 1288.1 | 1313.7 | 1326.0 | 1349.9 | 1373.0 | 1406.8 | 1461.8 | 1516.2 | 1625.1 |
| 640.0 | 625.3 | 493.21 | v | 0.7319 | 0.7962 | 0.8795 | 0.9299 | 0.9541 | 1.0008 | 1.0459 | 1.1115 | 1.2168 | 1.3190 | 1.5178 |
| | | | h | 1209.0 | 1243.0 | 1286.2 | 1312.2 | 1324.6 | 1348.6 | 1371.9 | 1405.9 | 1461.1 | 1515.6 | 1624.7 |
| 660.0 | 645.3 | 496.58 | v | 0.7032 | 0.7670 | 0.8491 | 0.8985 | 0.9222 | 0.9679 | 1.0119 | 1.0759 | 1.1784 | 1.2778 | 1.4709 |
| | | | h | 1205.4 | 1240.4 | 1284.4 | 1310.6 | 1323.2 | 1347.4 | 1370.8 | 1405.0 | 1460.4 | 1515.0 | 1624.3 |
| 680.0 | 665.3 | 499.88 | v | 0.6759 | 0.7395 | 0.8205 | 0.8690 | 0.8922 | 0.9369 | 0.9800 | 1.0424 | 1.1423 | 1.2390 | 1.4269 |
| | | | h | 1201.8 | 1237.7 | 1282.5 | 1309.1 | 1321.7 | 1346.2 | 1369.8 | 1404.1 | 1459.7 | 1514.5 | 1623.9 |
| 700.0 | 685.3 | 503.10 | v | | 0.7134 | 0.7934 | 0.8411 | 0.8639 | 0.9077 | 0.9498 | 1.0108 | 1.1082 | 1.2024 | 1.3853 |
| | | | h | | 1235.0 | 1280.6 | 1307.5 | 1320.3 | 1345.0 | 1368.7 | 1403.2 | 1459.0 | 1513.9 | 1623.5 |
| 750.0 | 735.3 | 510.86 | v | | 0.6540 | 0.7319 | 0.7778 | 0.7996 | 0.8414 | 0.8813 | 0.9391 | 1.0310 | 1.1196 | 1.2912 |
| | | | h | | 1227.9 | 1275.7 | 1303.5 | 1316.6 | 1341.8 | 1366.0 | 1400.9 | 1457.2 | 1512.4 | 1622.4 |
| 800.0 | 785.3 | 518.23 | v | | 0.6015 | 0.6779 | 0.7223 | 0.7433 | 0.7833 | 0.8215 | 0.8763 | 0.9633 | 1.0470 | 1.2088 |
| | | | h | | 1220.5 | 1270.7 | 1299.4 | 1312.9 | 1338.6 | 1363.2 | 1398.6 | 1455.4 | 1511.0 | 1621.4 |
| 850.0 | 835.3 | 525.26 | v | | 0.5546 | 0.6301 | 0.6732 | 0.6934 | 0.7320 | 0.7685 | 0.8209 | 0.9037 | 0.9830 | 1.1360 |
| | | | h | | 1212.7 | 1265.5 | 1295.2 | 1309.0 | 1335.4 | 1360.4 | 1396.3 | 1453.6 | 1509.5 | 1620.4 |
| 900.0 | 885.3 | 531.98 | v | | 0.5124 | 0.5873 | 0.6294 | 0.6491 | 0.6863 | 0.7215 | 0.7716 | 0.8506 | 0.9262 | 1.0714 |
| | | | h | | 1204.4 | 1260.1 | 1290.9 | 1305.1 | 1332.1 | 1357.5 | 1393.9 | 1451.8 | 1508.1 | 1619.3 |
| 950.0 | 935.3 | 538.42 | v | | 0.4740 | 0.5489 | 0.5901 | 0.6092 | 0.6453 | 0.6793 | 0.7275 | 0.8031 | 0.8753 | 1.0136 |
| | | | h | | 1195.5 | 1254.6 | 1286.4 | 1301.1 | 1328.7 | 1354.7 | 1391.6 | 1450.0 | 1506.6 | 1618.3 |
| 1000.0 | 985.3 | 544.61 | v | | | 0.5140 | 0.5546 | 0.5733 | 0.6084 | 0.6413 | 0.6878 | 0.7604 | 0.8294 | 0.9615 |
| | | | h | | | 1248.8 | 1281.9 | 1297.0 | 1325.3 | 1351.7 | 1389.2 | 1448.2 | 1505.1 | 1617.3 |

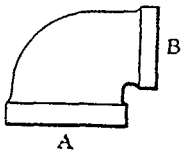
# Properties of Superheated Steam (Cont.)

v = specific volume, cubic feet per pound
h = total heat of steam, Btu per pound

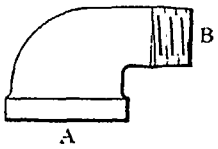
| Pressure Lbs. per Sq. In. Abs. P | Gage p | Sat. Temp. t | | Total Temperature — Degrees Fahrenheit 660° | 700° | 740° | 760° | 780° | 800° | 860° | 900° | 1000° | 1100° | 1200° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1100.0 | 1085.3 | 556.31 | v | 0.5110 | 0.5445 | 0.5755 | 0.5904 | 0.6049 | 0.6191 | 0.6601 | 0.6866 | 0.7503 | 0.8117 | 0.8716 |
| | | | h | 1288.5 | 1318.3 | 1345.8 | 1358.9 | 1371.7 | 1384.3 | 1420.8 | 1444.5 | 1502.2 | 1558.8 | 1615.2 |
| 1200.0 | 1185.3 | 567.22 | v | 0.4586 | 0.4909 | 0.5206 | 0.5347 | 0.5484 | 0.5617 | 0.6003 | 0.6250 | 0.6843 | 0.7412 | 0.7967 |
| | | | h | 1279.6 | 1311.0 | 1339.6 | 1353.2 | 1366.4 | 1379.3 | 1416.7 | 1440.7 | 1499.2 | 1556.4 | 1613.1 |
| 1300.0 | 1285.3 | 577.46 | v | 0.4139 | 0.4454 | 0.4739 | 0.4874 | 0.5004 | 0.5131 | 0.5496 | 0.5728 | 0.6284 | 0.6816 | 0.7333 |
| | | | h | 1270.2 | 1303.4 | 1333.3 | 1347.3 | 1361.0 | 1374.3 | 1412.5 | 1437.0 | 1496.2 | 1553.9 | 1611.0 |
| 1400.0 | 1385.3 | 587.10 | v | 0.3753 | 0.4062 | 0.4338 | 0.4468 | 0.4593 | 0.4714 | 0.5061 | 0.5281 | 0.5805 | 0.6305 | 0.6789 |
| | | | h | 1260.3 | 1295.5 | 1326.7 | 1341.3 | 1355.4 | 1369.1 | 1408.2 | 1433.1 | 1493.2 | 1551.4 | 1608.9 |
| 1500.0 | 1485.3 | 596.23 | v | 0.3413 | 0.3719 | 0.3989 | 0.4114 | 0.4235 | 0.4352 | 0.4684 | 0.4893 | 0.5390 | 0.5862 | 0.6318 |
| | | | h | 1249.8 | 1287.2 | 1320.0 | 1335.2 | 1349.7 | 1363.8 | 1403.9 | 1429.3 | 1490.1 | 1548.9 | 1606.8 |
| 1600.0 | 1585.3 | 604.90 | v | 0.3112 | 0.3417 | 0.3682 | 0.3804 | 0.3921 | 0.4034 | 0.4353 | 0.4553 | 0.5027 | 0.5474 | 0.5906 |
| | | | h | 1238.7 | 1278.7 | 1313.0 | 1328.8 | 1343.9 | 1358.4 | 1399.5 | 1425.3 | 1487.0 | 1546.4 | 1604.6 |
| 1700.0 | 1685.3 | 613.15 | v | 0.2842 | 0.3148 | 0.3410 | 0.3529 | 0.3643 | 0.3753 | 0.4061 | 0.4253 | 0.4706 | 0.5132 | 0.5542 |
| | | | h | 1226.8 | 1269.7 | 1305.8 | 1322.3 | 1337.9 | 1352.9 | 1395.0 | 1421.4 | 1484.0 | 1543.8 | 1602.5 |
| 1800.0 | 1785.3 | 621.03 | v | 0.2597 | 0.2907 | 0.3166 | 0.3284 | 0.3395 | 0.3502 | 0.3801 | 0.3986 | 0.4421 | 0.4828 | 0.5218 |
| | | | h | 1214.0 | 1260.3 | 1298.4 | 1315.5 | 1331.8 | 1347.2 | 1390.4 | 1417.4 | 1480.8 | 1541.3 | 1600.4 |
| 1900.0 | 1885.3 | 628.58 | v | 0.2371 | 0.2688 | 0.2947 | 0.3063 | 0.3173 | 0.3277 | 0.3568 | 0.3747 | 0.4165 | 0.4556 | 0.4929 |
| | | | h | 1200.2 | 1250.4 | 1290.6 | 1308.6 | 1325.4 | 1341.5 | 1385.8 | 1413.3 | 1477.7 | 1538.8 | 1598.2 |
| 2000.0 | 1985.3 | 635.82 | v | 0.2161 | 0.2489 | 0.2748 | 0.2863 | 0.2972 | 0.3074 | 0.3358 | 0.3532 | 0.3935 | 0.4311 | 0.4668 |
| | | | h | 1184.9 | 1240.0 | 1282.6 | 1301.4 | 1319.0 | 1335.5 | 1381.2 | 1409.2 | 1474.5 | 1536.2 | 1596.1 |
| 2100.0 | 2085.3 | 642.77 | v | 0.1962 | 0.2306 | 0.2567 | 0.2682 | 0.2789 | 0.2890 | 0.3167 | 0.3337 | 0.3727 | 0.4089 | 0.4433 |
| | | | h | 1167.7 | 1229.0 | 1274.3 | 1294.0 | 1312.3 | 1329.5 | 1376.4 | 1405.0 | 1471.4 | 1533.6 | 1593.9 |
| 2200.0 | 2185.3 | 649.46 | v | 0.1768 | 0.2135 | 0.2400 | 0.2514 | 0.2621 | 0.2721 | 0.2994 | 0.3159 | 0.3538 | 0.3887 | 0.4218 |
| | | | h | 1147.8 | 1217.4 | 1265.7 | 1286.3 | 1305.4 | 1323.3 | 1371.5 | 1400.8 | 1468.2 | 1531.1 | 1591.8 |
| 2300.0 | 2285.3 | 655.91 | v | 0.1575 | 0.1978 | 0.2247 | 0.2362 | 0.2468 | 0.2567 | 0.2835 | 0.2997 | 0.3365 | 0.3703 | 0.4023 |
| | | | h | 1123.8 | 1204.9 | 1256.7 | 1278.4 | 1298.4 | 1316.9 | 1366.6 | 1396.5 | 1464.9 | 1528.5 | 1589.6 |
| 2400.0 | 2385.3 | 662.12 | v | | 0.1828 | 0.2105 | 0.2221 | 0.2327 | 0.2425 | 0.2689 | 0.2848 | 0.3207 | 0.3534 | 0.3843 |
| | | | h | | 1191.5 | 1247.3 | 1270.2 | 1291.1 | 1310.3 | 1361.6 | 1392.2 | 1461.7 | 1525.9 | 1587.4 |
| 2500.0 | 2485.3 | 668.13 | v | | 0.1686 | 0.1973 | 0.2090 | 0.2196 | 0.2294 | 0.2555 | 0.2710 | 0.3061 | 0.3379 | 0.3678 |
| | | | h | | 1176.8 | 1237.6 | 1261.8 | 1283.6 | 1303.6 | 1356.5 | 1387.8 | 1458.4 | 1523.2 | 1585.3 |
| 2600.0 | 2585.3 | 673.94 | v | | 0.1549 | 0.1849 | 0.1967 | 0.2074 | 0.2172 | 0.2431 | 0.2584 | 0.2926 | 0.3236 | 0.3526 |
| | | | h | | 1160.6 | 1227.3 | 1252.9 | 1275.8 | 1296.8 | 1351.4 | 1383.4 | 1455.1 | 1520.6 | 1583.1 |
| 2700.0 | 2685.3 | 679.55 | v | | 0.1415 | 0.1732 | 0.1853 | 0.1960 | 0.2059 | 0.2315 | 0.2466 | 0.2801 | 0.3103 | 0.3385 |
| | | | h | | 1142.5 | 1216.5 | 1243.8 | 1267.9 | 1289.7 | 1346.1 | 1378.9 | 1451.8 | 1518.0 | 1580.9 |
| 2800.0 | 2785.3 | 684.99 | v | | 0.1281 | 0.1622 | 0.1745 | 0.1854 | 0.1953 | 0.2208 | 0.2356 | 0.2685 | 0.2979 | 0.3254 |
| | | | h | | 1121.4 | 1205.1 | 1234.2 | 1259.6 | 1282.4 | 1340.8 | 1374.3 | 1448.5 | 1515.4 | 1578.7 |
| 2900.0 | 2885.3 | 690.26 | v | | 0.1143 | 0.1517 | 0.1644 | 0.1754 | 0.1853 | 0.2108 | 0.2254 | 0.2577 | 0.2864 | 0.3132 |
| | | | h | | 1095.9 | 1193.0 | 1224.3 | 1251.1 | 1274.9 | 1335.3 | 1369.7 | 1445.1 | 1512.7 | 1576.5 |
| 3000.0 | 2985.3 | 695.36 | v | | 0.0984 | 0.1416 | 0.1548 | 0.1660 | 0.1760 | 0.2014 | 0.2159 | 0.2476 | 0.2757 | 0.3018 |
| | | | h | | 1060.7 | 1180.1 | 1213.8 | 1242.2 | 1267.2 | 1329.7 | 1365.0 | 1441.8 | 1510.0 | 1574.3 |
| 3100.0 | 3085.3 | 700.31 | v | | | 0.1320 | 0.1456 | 0.1571 | 0.1672 | 0.1926 | 0.2070 | 0.2382 | 0.2657 | 0.2911 |
| | | | h | | | 1166.2 | 1202.9 | 1233.0 | 1259.3 | 1324.1 | 1360.3 | 1438.4 | 1507.4 | 1572.1 |
| 3200.0 | 3185.3 | 705.11 | v | | | 0.1226 | 0.1369 | 0.1486 | 0.1589 | 0.1843 | 0.1986 | 0.2293 | 0.2563 | 0.2811 |
| | | | h | | | 1151.1 | 1191.4 | 1223.5 | 1251.1 | 1318.3 | 1355.5 | 1434.9 | 1504.7 | 1569.9 |
| 3206.2 | 3191.5 | 705.40 | v | | | 0.1220 | 0.1363 | 0.1480 | 0.1583 | 0.1838 | 0.1981 | 0.2288 | 0.2557 | 0.2806 |
| | | | h | | | 1150.2 | 1190.6 | 1222.9 | 1250.5 | 1317.9 | 1355.2 | 1434.7 | 1504.5 | 1569.8 |

# How to Read Reducing Fittings

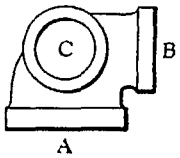
## Elbows



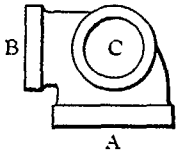

90° Elbow
Reducing




90° Street Elbow
Reducing on male end

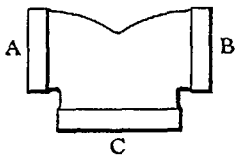



Right Hand



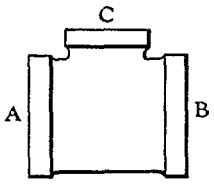

Left Hand

Side Outlet 90° Elbows
Reducing on two Outlets

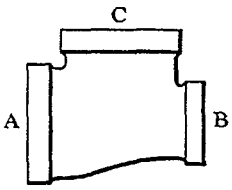



Double Branch Elbow
Reducing on both ends of Run

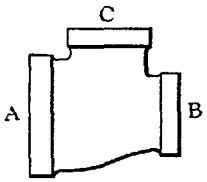
## Tees



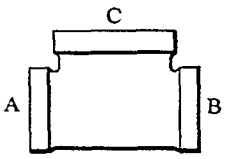

Tee
With Outlet
reduced



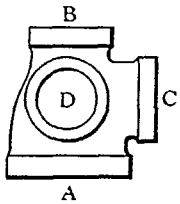

Tee
With one end
of Run reduced



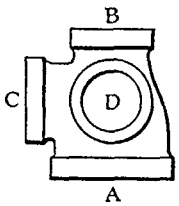

Tee
With one end of Run
and Outlet reduced




Tee
Bull head type—Both
ends of Run reduced




Right Hand




Left Hand

Side Outlet Tees
With one end of Run and Outlets reduced

To assist the user in "reading" reducing fittings, a variety of types most commonly required for piping systems are illustrated on this page. In these illustrations, each opening of the fitting is identified with a letter which indicates the sequence to be followed in reading the size of the fitting.

In designating the outlets of reducing fittings, the openings should be read in the order indicated by the sequence of the letters "A", "B", "C", and "D". On side outlet reducing fittings, the size of the side outlet is named last.

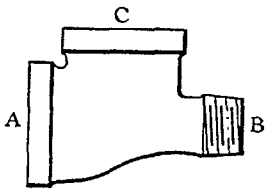
***For example:*** A Cross having one end of the run and one outlet reduced is designated as:

A B C D
2½ x 1¼ x 2½ x 1½

Simply name the largest opening first and then name the other openings in the order indicated.

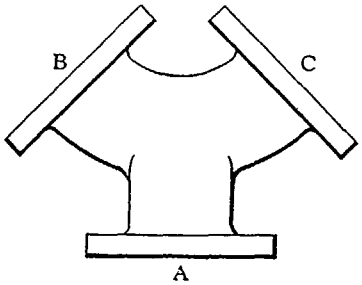
***Flanged fittings:*** Although all but one of the illustrations are of screwed fittings, the same rules apply to the "reading" of reducing flanged fittings.

## Service Tee



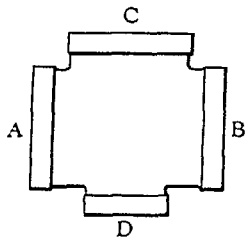

Service Tee
Reducing on male end only

## True "Y"

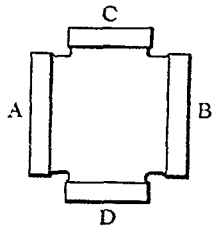



True "Y"

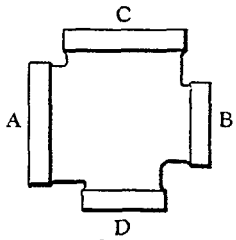
## Crosses



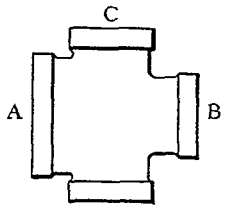

Cross
Reducing on
one Outlet only




Cross
Reducing on
both Outlets

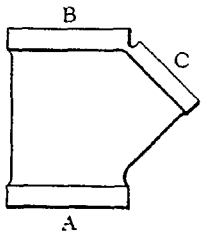



Cross
Reducing on one end of
Run and on one Outlet




Cross
Reducing on one end of
Run and on both Outlets

## 45° Y-Bend




45° Y-Bend (Lateral)
Reducing on Outlet only

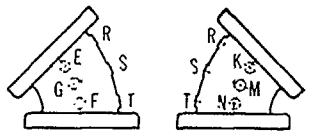
# Taps and Drains for Flanged Fittings

## Designating Location of Tapped Holes

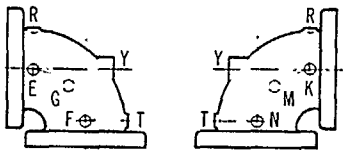
90° Elbow

The illustrations on this page indicate a standard method used for designating the location of tapped holes on ferrous flanged fittings in all pressure classes.

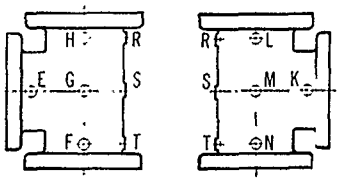
When a tapped connection is required at the heel of an elbow without a boss (at location S), the tapping should be done at right angles to the point of tangency of the radius or sweep of the fitting. This shall be standard practice, and where the tapping is required parallel to the run (at locations V and Y), the fitting shall be furnished with a boss.



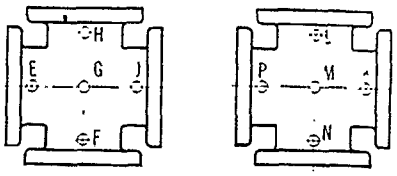

45° Elbow



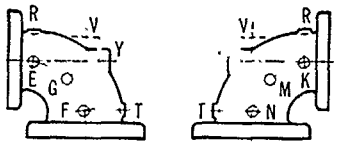

90° Elbow
Straight Size



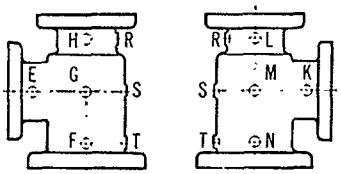

Tee
Straight Size



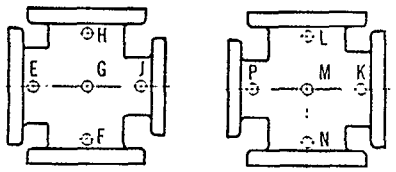

Cross
Straight Size



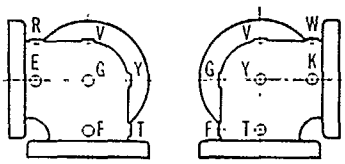

90° Elbow
Reducing Size



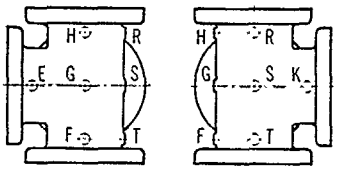

Tee
Reducing Size



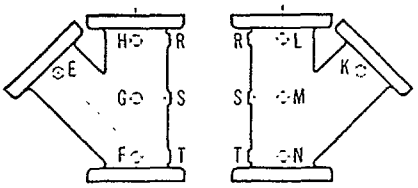

Cross
Reducing Size



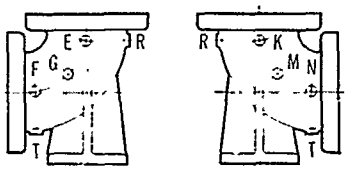

Side Outlet Elbow
Straight Size



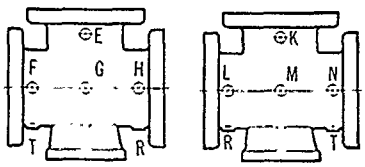

Side Outlet Tee
Straight Size



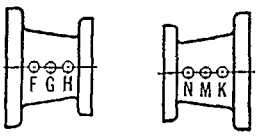

45° Lateral
Straight Size




90° Base Elbow



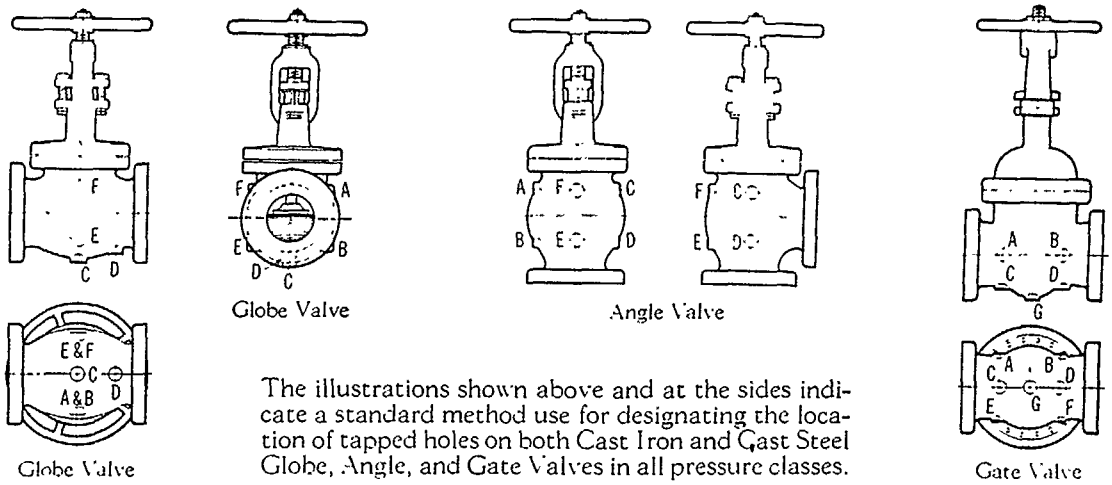

Base Tee
Straight Size




Reducer

# Taps and Drains for Flanged Valves

## Designating Location of Tapped Holes




Globe Valve

The illustrations shown above and at the sides indicate a standard method use for designating the location of tapped holes on both Cast Iron and Cast Steel Globe, Angle, and Gate Valves in all pressure classes.

Valve bodies can be tapped without a boss for a very small drain hole; the maximum size of the hole, however, depends entirely upon the location of the tapped hole and the pressure class of the valve.

Gate valves are regularly made with bosses (except at location "G"). Globe and angle valves are not regularly made with bosses but can be so furnished when orders specify.

# Location of By-Passes on Flanged Valves

**Gate valves:** When gate valves are ordered with by-pass attached, it shall be regular practice to attach said by-pass at the side of the main valve with the stems of both valves parallel, pointing vertically upward.

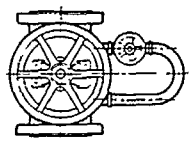
The more common of the "special" attached-locations is on the center of the flow line, at the bottom of the main valve, with the stem of the by-pass valve at right angles to the main valve stem. This is designated as the bottom "attachment", or defined as "by-pass at bottom". When any other "special" attached-location or other position of the by-pass valve stem is desired, a sketch should be submitted.

**Globe valves:** When globe valves are ordered with by-pass attached, it shall be regular practice to attach said by-pass at the right-hand side of the main valve, with the stems of both valves parallel, pointing vertically upward. When by-pass is "specially" required attached at the left-hand side, the designation shall be "left-hand attachment".

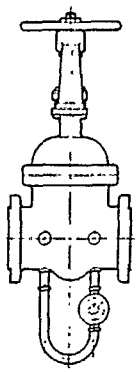
Right-hand side of a globe valve is the side at the right, when facing the flow-port which leads to the under side of the disc.

**Angle valves:** When angle valves are ordered with by-pass attached, it shall be regular practice to attach said by-pass at the back of the main valve, with the stems of both valves parallel, pointing vertically upward. When by-pass is "specially" required attached at the right or left-hand side, the designations shall be "right-hand attachment" or "left-hand attachment". Right-hand side of an angle valve is at the right, when facing the back of the valve.

These illustrations are representative of steel valves.



Gate Valve with By-Pass on Side



Gate Valve with By-Pass at Bottom

*For by-passes, see the following pages:*

*Iron Wedge Gate Valves* ..... *page 84*
*Iron Double Disc Gate Valves* ..... *page 102*
*Steel Wedge Gate Valves* ..... *page 231*

# Abbreviations Used in This Catalog

AAR.....Association of American Railroads

A.G.A.....American Gas Association

A.I.S.I.....American Iron and Steel Institute

API.....American Petroleum Institute

ASA.....American Standards Association

A.S.M.E.....American Society of Mechanical Engineers

A.S.T.M.....American Society for Testing Materials

A.W.W.A....American Water Works Association

B&S.....Brown & Sharp (used herein to indicate thickness of copper gaskets)

Btu.....British Thermal Unit

BWG.....Birmingham Wire Gauge (used herein to indicate thickness of boiler tubes)

cfm.....Cubic feet per minute

F.&D.....Faced and drilled

F.D.&S.F....Faced, drilled, and spot faced

gpm.....Gallons per minute

H.P.....Horsepower

MSS.....Manufacturers Standardization Society of the Valve and Fittings Industry

NEMA.....National Electrical Manufacturers Association

N.F.P.A.....National Fire Protection Association

NPSC.....Symbol indicating American Standard Straight Pipe Thread in pipe couplings

NPSL.....Symbol indicating American Standard Straight Pipe Thread for locknuts and locknut pipe threads

NPSM.....Symbol indicating American Standard Straight Pipe Thread for mechanical joints

NPT.....Symbol indicating American Standard Taper Pipe Thread

NPTE.....Symbol indicating external American Standard Taper Pipe Thread (Male)

NPTI.....Symbol indicating internal American Standard Taper Pipe Thread (Female)

P.D.....Used in conjunction with threads to indicate "Pitch Diameter"

psi.....Pounds per square inch

rpm.....Revolutions per minute

S.A.E.....Society of Automotive Engineers

SP.....When used in conjunction with references to "MSS", is the abbreviation for "Standard Practice", thus: MSS Bronze Flange and Flange Fitting Standard, No. SP-2-1946.

SWP.....When used in conjunction with working pressure ratings, indicates "steam working pressure"

Symbols used to designate type of service for which product is recommended; these are frequently combined, like "WOG", and also appear as part of the marking on products:

G signifies Gas
L signifies Liquid
O signifies Oil
S signifies Steam
W signifies Water

# CRANE DEALER PRICE SERVICE

March 7, 1955

TO THE DEALER

Enclosed are new and replacement pages for your **PRICE SERVICE CATALOG.** These bring most pages of the catalog up-to-date with pricing data previously supplied to you. Important product changes are as follows:

| | |
|---|---|
| Page 1-14a | - Countess cabinet ensembles are added. |
| 1-21 | - Oxlee lavatories are discontinued and have been deleted. |
| 5-1 to 5-30 and 5-33 | - All of Section 5, except pages 5-31 and 5-32, is completely revised and should be removed. Changes include new Crane undersink cabinets; base, wall and utility cabinets; new types of stainless steel sinks; In-Sink-Erators; and gas fired incinerators. |
| 8-5 and 8-6 | - New Repcal trim for laundry tubs. |
| 18-3 | - Crane Glass-Lined and Crane-Monel water heaters are added. |
| 19-3, 19-5 | - Crane No. 130, No. 131 and No. 132 valves for L.P. gases are added. |
| 19-6 | - Crane No. 422 and No. 423 valves are included. |

Other pages have price revisions. Pages included are as follows:

For Section 1
Pages 1-9 and 1-10
1-13 1-14
1-14a 1-14b
1-21 1-22
1-23 1-24

For Section 4
Pages 4-17 and 4-18

For Section 5
Pages 5-1 and Blank
5-3 5-4
5-5 5-6
5-7 5-8
5-9 5-10
5-11 5-12
5-13 5-14
5-15 5-16
5-17 5-18
5-19 5-20
5-21 5-22
5-23 5-24
5-25 5-26

For Section 5 Cont.
Pages 5-27 and 5-28
5-29 5-30
5-33 Blank

For Section 6
Pages 6-5 6-6

For Section 8
Pages 8-5 and 8-6

For Section 14
Pages 14-5 and 14-6
14-9 14-10
14-11 14-12
14-17 14-18

For Section 17
Pages 17-3 and 17-4

For Section 18
Pages 18-1 and 18-2
18-3 18-4
18-5 18-6
18-7 18-8
18-9 18-10

For Section 19
Pages 19-3 and 19-4
19-5 19-6

For Section 20
Pages 20-1 and Blank
20-13 20-14
20-29 20-30

For Section 21
Pages 21-37 and 21-38

For Section 22
Pages 22-7 and 22-8
22-9 22-10
22-11 22-12

For Section 24
Pages 24-5 and 24-6
24-13 24-14
24-15 24-16
24-25 24-26
24-29 24-30

**IMPORTANT:** No change has been made in the pricing procedure. List prices shown on the above pages are subject to your regular discount of 50%.

If any of the above pages are not received, make notations, sign and return this notice to your Crane Branch or Crane Wholesaler. If all pages are received, a return notice is not necessary.

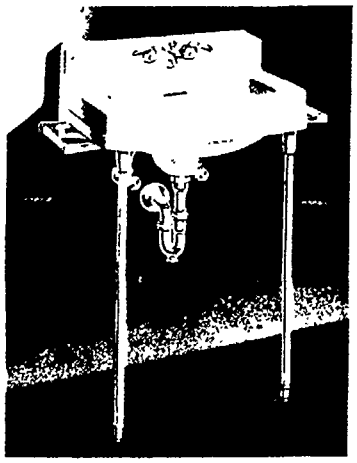
C R A N E C O.

Name_____ City_____

Address_____ State_____

# OXFORD VITREOUS CHINA LAVATORIES

**With Repcal Trim**



1-125-ERS, On Metal Legs

**1-125-ERS, On Metal Legs**
**Sizes: 19x17" and 20x14"**
**1-130-ERS, On Metal Legs—Size: 26x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

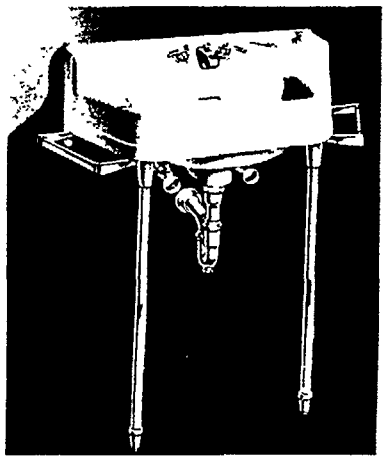
Supports: 8-710 **Crestmont** round metal legs, concealed hangers and wall screws.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

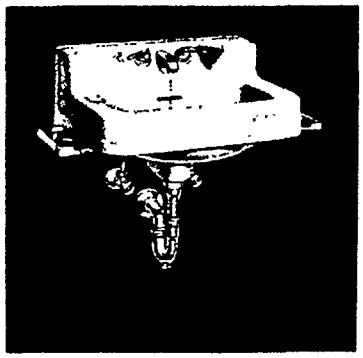
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***



1-130-ERS, On Metal Legs



1-125-ERS, Wall Hung

**1-125-ERS, Wall Hung—Sizes: 19x17" and 20x14"**

Lavatory: **Oxford** vitreous china lavatory with beveled panel shelf back, rectangular basin with splash lip and soap depression.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

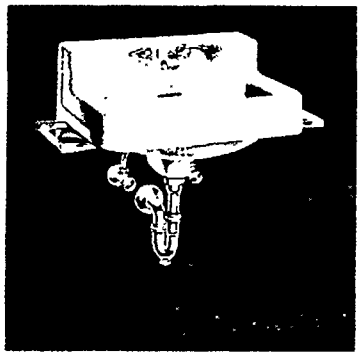
Towel Bars: 8-697 **Crestmont** towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

**1-125-FRS, Wall Hung—Sizes: 19x17" and 20x14"**

Same, except with 8-135 **Repcal** supply fitting with renewable seats, chain, stopper and 8-350 1¼" P. O. plug.



1-125-FRS, Wall Hung

**ALTERNATE REPCAL TRIM FOR OXFORD LAVATORIES**

**When ordering an Oxford lavatory with Repcal trim other than illustrated, merely change SUFFIX DESIGNATION and TRIM DESCRIPTION.**

**ERS Trim**
8-132 **Repcal** supply and direct lift waste fitting with renewable seats.

**ER Trim**
8-131 **Repcal** supply and direct lift waste fitting with integral seats.

**FRS Trim**
8-135 **Repcal** supply fitting with renewable seats, chain and stopper; 8-350 1¼" P.O. plug.

**FR Trim**
8-134 **Repcal** supply fitting with integral seats, chain and stopper; 8-350 1¼" P.O. plug.

The above fittings are regularly furnished with 45° elbows, coupling nuts, friction rings and washers for slip joint connection. When required for use with iron pipe supplies, specify the No. 20-19 ¼" male tailpieces.

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Size... | 19x17" | Basin.... | 14x11" |
| | 20x14" | | 15x9" |
| | 26x14" | | 17¼x9" |

Height of shelf back.....3⅜"
Height, floor to top of rim..... 31"

**PRICES COMPLETE, less traps**

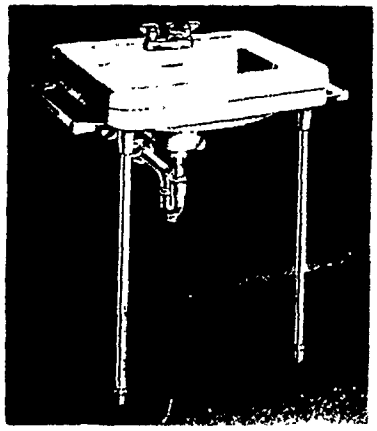
| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **1-125-ER, On Metal Legs** | 19x17 | **$89.20** | **$95.70** | 60 |
| | 20x14 | **94.90** | **114.30** | 70 |
| **1-125-ERS, On Metal Legs** | 19x17 | **89.90** | **96.40** | 60 |
| | 20x14 | **95.70** | **115.00** | 70 |
| **1-125-FR, On Metal Legs** | 19x17 | **86.80** | **93.30** | 60 |
| | 20x14 | **92.60** | **111.90** | 70 |
| **1-125-FRS, On Metal Legs** | 19x17 | **87.50** | **94.00** | 60 |
| | 20x14 | **93.30** | **112.60** | 70 |
| **1-125-ER, Wall Hung** | 19x17 | **73.40** | **79.90** | 55 |
| | 20x14 | **79.10** | **98.50** | 65 |
| **1-125-ERS, Wall Hung** | 19x17 | **74.10** | **80.60** | 55 |
| | 20x14 | **79.90** | **99.20** | 65 |
| **1-125-FR, Wall Hung** | 19x17 | **71.00** | **77.50** | 55 |
| | 20x14 | **76.80** | **96.10** | 65 |
| **1-125-FRS, Wall Hung** | 19x17 | **71.70** | **78.20** | 55 |
| | 20x14 | **77.50** | **96.80** | 65 |
| **1-130-ER, On Metal Legs** | 26x14 | **114.30** | **143.20** | 80 |
| **1-130-ERS, On Metal Legs** | 26x14 | **115.10** | **143.90** | 80 |
| **1-130-FR, On Metal Legs** | 26x14 | **112.00** | **140.80** | 80 |
| **1-130-FRS, On Metal Legs** | 26x14 | **112.70** | **141.50** | 80 |

| | |
|---|---|
| **8-304** flexible supplies, | Per Pair **$9.40** |
| **8-697 Crestmont** towel bars | Per Pair **11.00** |
| **8-710 Crestmont** legs | Per Pair **15.80** |
| **20-19** ¼" male tailpieces | Per Pair **.38** |
| For aerator on spout | Add **1.60** |

**All exposed metal trim is chromium plated.**

# NORWICH VITREOUS CHINA LAVATORIES

## On Metal Legs or On Porcelain Enameled Brackets



1-150-C, On Metal Legs

### 1-150-C, On Metal Legs
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

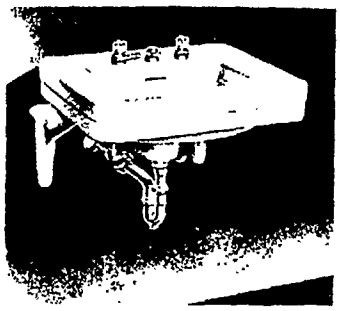
Supports: 8-710 Crestmont round metal legs; 8-765 wall brackets.

"C" Trim: 8-560 Olympia *Dial-ese* supply and direct lift waste fitting with coupling nuts, less ¼" tailpieces.

Towel Bars: 8-697 Crestmont towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



### 1-150-R, On Enameled Brackets
Sizes: 20x18" and 24x21"

Lavatory: Norwich vitreous china lavatory with rectangular basin, splash lip and soap depression.

Supports: 8-763 white enameled cast iron brackets.

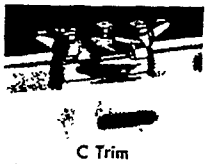
"R" Trim: 8-31 Vantage *Dial-ese* faucets (with coupling nuts, less ¼" tailpieces); 8-41 Lever Action Securo waste.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### ALTERNATE TRIM FOR NORWICH LAVATORIES

For Norwich lavatories with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.



C Trim
8-560 Olympia *Dial-ese* supply and direct lift waste fitting.

D Trim
8-569 Neu-Rainier *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

L Trim
8-10 Temple *Dial-ese* supply and Lever Action Securo waste fitting with three rib handles.
8-5, same except with lever handles.

P Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

R Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-41 Lever Action Securo waste.

S Trim
8-140 Embassy *Dial-ese* supply and indirect lift waste fitting.

V Trim
8-564 Neu-Rainier *Dial-ese* supply and indirect lift waste fitting.

W Trim
*8-31 Vantage *Dial-ese* faucets with four-arm handles; 8-46 Crestmont direct lift waste fitting.

*Alternate faucets for "P", "R" and "W" trimmings
8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

All exposed metal trim is chromium plated.

**Overall Dimensions**

| Size | Basin |
|---|---|
| 20x18" | 14x11" |
| 24x21" | 16x11" |
| Floor to rim 31" | |

### PRICES COMPLETE, less traps

| Catalog Number | Size Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 1-150, Norwich Ware Only | 20x18 | $33.70 | $50.50 | 55 |
| | 24x21 | 49.60 | 74.30 | 72 |
| 1-150-C, On Metal Legs | 20x18 | 99.00 | 115.80 | 75 |
| | 24x21 | 114.90 | 139.66 | 95 |
| 1-150-D, On Metal Legs | 20x18 | 96.22 | 113.02 | 75 |
| | 24x21 | 112.12 | 136.88 | 95 |
| 1-150-L, On Metal Legs | 24x21 | 142.42 | 167.18 | 100 |
| 1-150-P, On Metal Legs | 20x18 | 93.30 | 110.10 | 75 |
| | 24x21 | 109.20 | 133.96 | 95 |
| 1-150-R, On Metal Legs | 20x18 | 107.32 | 124.12 | 75 |
| | 24x21 | 123.22 | 147.98 | 95 |
| 1-150-S, On Metal Legs | 20x18 | 104.56 | 121.36 | 75 |
| | 24x21 | 120.46 | 145.20 | 95 |
| 1-150-V, On Metal Legs | 20x18 | 99.46 | 116.26 | 75 |
| | 24x21 | 115.36 | 140.10 | 95 |
| 1-150-W, On Metal Legs | 20x18 | 97.96 | 114.76 | 75 |
| | 24x21 | 113.86 | 138.60 | 95 |
| 1-150-C, On Brackets | 20x18 | 83.40 | — | 90 |
| | 24x21 | 99.30 | — | 110 |
| 1-150-D, On Brackets | 20x18 | 80.62 | — | 90 |
| | 24x21 | 96.52 | — | 110 |
| 1-150-L, On Brackets | 24x21 | 126.82 | — | 115 |
| 1-150-P, On Brackets | 20x18 | 77.70 | — | 90 |
| | 24x21 | 93.60 | — | 110 |
| 1-150-R, On Brackets | 20x18 | 91.72 | — | 90 |
| | 24x21 | 107.62 | — | 110 |
| 1-150-S, On Brackets | 20x18 | 88.96 | — | 90 |
| | 24x21 | 104.86 | — | 110 |
| 1-150-V, On Brackets | 20x18 | 83.86 | — | 90 |
| | 24x21 | 99.76 | — | 110 |
| 1-150-W, On Brackets | 20x18 | 82.36 | — | 90 |
| | 24x21 | 98.26 | — | 110 |

| | |
|---|---|
| 8-31 or 8-39 Vantage faucets | Per Pair $13.40 |
| 8-36 Victor Magiclose faucets | Per Pair 17.60 |
| 8-304 flexible supplies | Per Pair 9.40 |
| 8-324 ¼" male tailpieces | Per Pair .44 |
| 8-697 Crestmont towel bars | Per Pair 11.00 |
| 8-710 Crestmont legs | Per Pair 15.80 |
| For aerators (C, D, S and V trim only) | Add each $2.00 |

*Prices are subject to change without notice.*

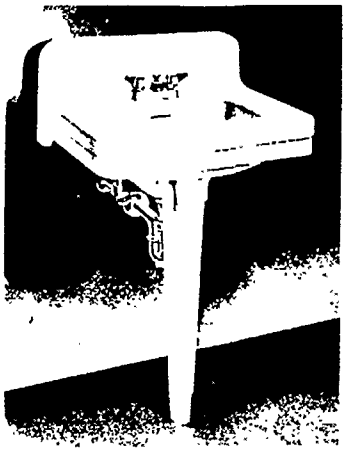


LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# NORWICH VITREOUS CHINA LAVATORIES

## With 6" High Back—Wall Hung or On China Leg



1-220-C, On China Leg

1-220 Norwich lavatories can be furnished with china leg to set lavatories 24" or 27" high, rim to floor.

### 1-220-C, On China Leg—Sizes: 20x18" and 24x21"

Lavatory: **Norwich** vitreous china lavatory with back, rectangular basin with splash lip and soap depression.

Supports: Vitreous china leg; concealed hangers and wall screws.

"C" Trim: 8-560 **Olympia** *Dial-ese* supply and direct lift waste fitting with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-240-C, Wall Hung—Sizes: 18x15", 20x18" and 24x21"

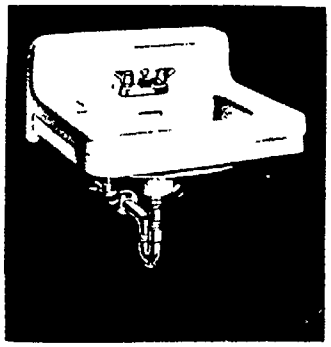
Lavatory: **Norwich** vitreous china lavatory with back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

"C" Trim: 8-560 **Olympia** *Dial-ese* supply and direct lift waste fitting with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-240-C, Wall Hung

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Size... | 18x15" | Basin... | 14x9" |
| | 20x18" | | 14x11" |
| | 24x21" | | 16x11" |
| Floor to top of rim..... | | | ...31" |

## ALTERNATE TRIM FOR NORWICH LAVATORIES

**When ordering a Norwich lavatory with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.**

**C Trim**

8-560 **Olympia** *Dial-ese* supply and direct lift waste fitting.

**D Trim**

8-569 **Neu-Rainier** *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

**L Trim**

8-10 **Temple** *Dial-ese* supply and Lever Action **Securo** waste fitting with three rib handles.

8-5, same except with lever handles.

**P Trim**

*8-31 **Vantage** *Dial-ese* faucets with four-arm handles; 8-655 chainstay on slab with chain and stopper; 8-350 1¼" P.O. plug.

**R Trim**

*8-31 **Vantage** *Dial-ese* faucets with four-arm handles; 8-41 Lever Action **Securo** waste fitting.

**S Trim**

8-140 **Embassy** *Dial-ese* supply and indirect lift waste fitting.

**V Trim**

8-564 **Neu-Rainier** *Dial-ese* supply and indirect lift waste fitting.

**W Trim**

*8-31 **Vantage** *Dial-ese* faucets with four-arm handles; 8-46 **Crestmont** direct lift waste fitting.

*Alternate faucets for "P", "R" and "W" trimmings

8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.

All exposed metal trim is chromium plated. *For other supply pipes and traps, refer to Section 8.*

## PRICES COMPLETE, less traps

| Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|
| **On China Leg** | | | | |
| **1-220 Ware Only** | 20x18" | $43.30 | $65.00 | 80 lbs. |
| | 24x21" | 68.80 | 103.10 | 100 |
| **1-220-C** | 20x18" | 76.60 | 98.30 | 90 |
| | 24x21" | 102.10 | 136.40 | 110 |
| **1-220-D** | 20x18" | 73.90 | 95.60 | 90 |
| | 24x21" | 99.40 | 133.70 | 110 |
| **1-220-L** | 24x21" | 129.60 | 164.00 | 115 |
| **1-220-P** | 20x18" | 71.00 | 92.70 | 90 |
| | 24x21" | 96.50 | 130.80 | 110 |
| **1-220-R** | 20x18" | 90.70 | 115.20 | 90 |
| | 24x21" | 110.50 | 144.80 | 110 |
| **1-220-S** | 20x18" | 82.20 | 103.90 | 90 |
| | 24x21" | 107.70 | 142.00 | 110 |
| **1-220-V** | 20x18" | 77.10 | 98.80 | 90 |
| | 24x21" | 102.60 | 136.90 | 110 |
| **1-220-W** | 20x18" | 75.60 | 97.30 | 90 |
| | 24x21" | 101.10 | 135.40 | 110 |
| **Wall Hung** | | | | |
| **1-240 Ware Only** | 18x15" | $31.50 | $47.30 | 40 lbs. |
| | 20x18" | 31.60 | 47.40 | 48 |
| | 24x21" | 57.10 | 85.70 | 92 |
| **1-240-C** | 18x15" | 64.80 | 80.60 | 50 |
| | 20x18" | 64.90 | 80.70 | 60 |
| | 24x21" | 90.40 | 119.00 | 100 |
| **1-240-D** | 18x15" | 62.10 | 77.90 | 50 |
| | 20x18" | 62.20 | 78.00 | 60 |
| | 24x21" | 87.70 | 116.30 | 100 |
| **1-240-L** | 24x21" | 118.00 | 146.50 | 105 |
| **1-240-P** | 18x15" | 59.20 | 75.00 | 50 |
| | 20x18" | 59.30 | 75.10 | 60 |
| | 24x21" | 84.80 | 113.40 | 100 |
| **1-240-R** | 20x18" | 79.10 | 97.80 | 60 |
| | 24x21" | 98.80 | 127.40 | 100 |
| **1-240-S** | 18x15" | 70.40 | 86.20 | 50 |
| | 20x18" | 70.50 | 86.30 | 60 |
| | 24x21" | 96.00 | 124.60 | 100 |
| **1-240-V** | 18x15" | 65.30 | 81.10 | 50 |
| | 20x18" | 65.40 | 81.20 | 60 |
| | 24x21" | 90.90 | 119.50 | 100 |
| **1-240-W** | 18x15" | 63.80 | 79.60 | 50 |
| | 20x18" | 63.90 | 79.70 | 60 |
| | 24x21" | 89.40 | 118.00 | 100 |

| | | |
|---|---|---|
| **8-31** or **8-39 Vantage** faucets | Per Pair | $13.40 |
| **8-36 Victor Magiclose** faucets | Per Pair | 17.60 |
| **8-304** flexible supplies | Per Pair | 9.40 |
| **8-324** ¼" male tailpieces | Per Pair | .44 |
| For **Spring-Flo** aerators | **Add each** | 2.00 |
| | (C, D, S and V trim only) | |

*Prices are subject to change without notice.*

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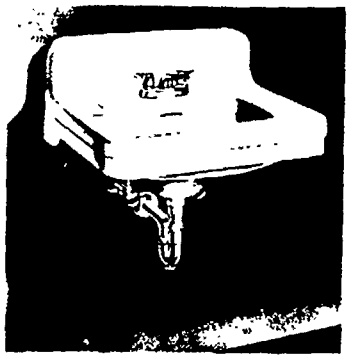
## NORWICH LAVATORIES
### With Neu-Spray *Dial-ese* Trim



8-572
Neu-Spray Fitting

View of Spray Face

**1-240-V, Wall Hung, with Neu-Spray Trim**
**Sizes: 18x15", 20x18" and 24x21"**

Lavatory: **Norwich** vitreous china lavatory with 6" high back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

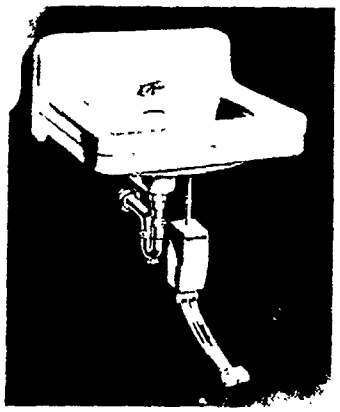
Trim: 8-572 **Neu-Spray** *Dial-ese* supply fitting with raised spout and 1¾" diameter perforated spray face (with coupling nuts, less ¼" tailpieces).

Waste: 8-353 1¼" P.O. plug with perforated open strainer.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

## NORWICH LAVATORIES
### With Pedal Operated Supply Valve



1-243, Wall Hung

**1-243, Wall Hung**
**Sizes: 20x18" and 24x21"**

Lavatory: **Norwich** vitreous china lavatory with 6" high back, rectangular basin, splash lip and soap depression.

Supports: Concealed hangers and wall screws.

Trim: 8H-500 wall mounted self-closing mixing valve with integral stops and polished aluminum hinged pedals; raised spout and supply to spout with volume control.

Waste: 8-353 1¼" P.O. plug with perforated open strainer.

***Note: Lavatory trap is not included.***

**PRICES COMPLETE, less traps**

| Catalog Number | Size, Inches | Price, Each | | Shpg. Wt. Pounds |
|---|---|---|---|---|
| | | White | Color | |
| **Norwich, Ware Only** | 18x15" | $31.50 | $47.30 | 40 |
| | 20x18" | 31.60 | 47.40 | 48 |
| | 24x21" | 57.10 | 85.70 | 92 |
| **1-240-V, with Neu-Spray Trim** | 18x15" | 72.60 | 88.40 | 50 |
| | 20x18" | 72.70 | 88.50 | 60 |
| | 24x21" | 98.20 | 126.80 | 100 |
| **1-243, Wall Hung** | 20x18" | 135.40 | 151.20 | 65 |
| | 24x21" | 160.90 | 189.50 | 105 |

**8-304** supplies Per Pair **$9.40**
**8-324** ¼" male tailpieces Per Pair **.44**



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# COUNTESS LAVATORY ENSEMBLES

## SALES FEATURES

### Cabinet

One-piece wood construction—exterior surfaces are faced with colorful laminated plastics, interior of cabinet, edges, toe base and knee space back panel are painted in harmonizing colors.

Two storage compartments, one stationary shelf and one medicine drawer with check stop, easily removed for cleaning.

Doors have semi-concealed hinges, chromium plated knobs and roller type spring latches.

Available in 3 color patterns—Planked Maple (Parkwood), Walnut (Parkwood) and Gray Limba (Parkwood).

Shipped assembled in one carton.

All exposed metal trim is chromium plated

### Countertop

Wood core—exposed surfaces and edges faced with laminated plastic, no metal trim.

Back coved into counter, rounded front corners.

Available in 3 color patterns—Brown Marble (Formica), Charcoal Medley (Textolite) and Blue Skylark (Formica).

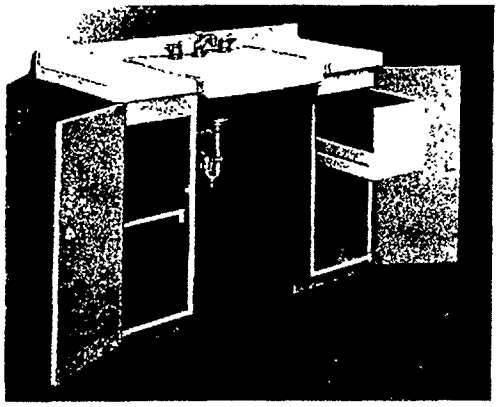
Hudee lavatory frame is included.

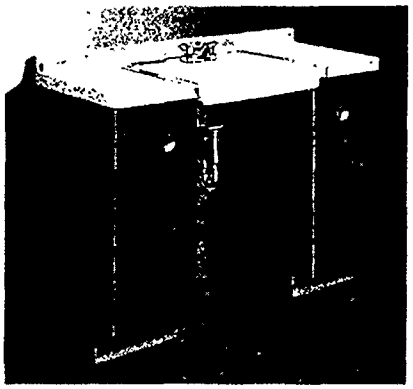
Countertop is packed in separate carton.

### Lavatories

Available with 2 types of trim—1-284-S Countess with 8-575-A Embassy trim or 1-284-V Countess with 8-562-A Neu-Rainier trim.

Countess lavatories are furnished in white or any of the seven regular Crane colors.





### 1-260-S COUNTESS LAVATORY ENSEMBLE (Open View)

Countertop: Type 1-C-5 1½" thick, laminated plastic faced countertop with 2" high back, square front rim with rounded corners and finished ends; **Hudee** lavatory frame. (Specify color.)

Cabinet: Laminated plastic faced wood cabinet with two end compartments and full length flush back, utility shelf, medicine drawer and chromium knobs. (Specify color.)

Lavatory: 1-284-S **Countess** vitreous china lavatory with modified rectangular basin, splash lip, twin front overflow and two soap depressions. (Specify if white or Crane color.)

"S" Trim: 8-575-A **Embassy *Dial-ese*** supply and indirect lift waste with aerator. (Specify 8-575 if less aerator.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### 1-260-V COUNTESS LAVATORY ENSEMBLE

Countertop: Type 1-C-5 1½" thick, laminated plastic faced countertop with 2" high back, square front rim with rounded corners and finished ends; **Hudee** lavatory frame. (Specify color.)

Cabinet: Laminated plastic faced wood cabinet with two end compartments and full length flush back, utility shelf, medicine drawer and chromium knobs. (Specify color.)

Lavatory: 1-284-V **Countess** vitreous china lavatory with modified rectangular basin, splash lip, twin front overflow and two soap depressions. (Specify if white or Crane color.)

"V" Trim: 8-562-A **Neu-Rainier *Dail-ese*** supply and indirect lift waste with aerator. (Specify 8-562 if less aerator.)

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

### COLOR SELECTION

In selecting color combinations for **Countess** lavatory ensembles it is essential first to determine the color of the lavatory, then the color pattern for the countertop and next the color pattern for the cabinet. The color chart below is arranged accordingly. When ordering be sure to specify lavatory, countertop and cabinet colors desired.

| Lavatory | Countertop | Cabinet |
|---|---|---|
| White or Sky Blue | Blue Skylark | Walnut, Gray Limba or Planked Maple |
| Shell Pink | Charcoal Medley | Gray Limba |
| Citrus Yellow or Sun Tan | Brown Marble | Walnut, Gray Limba or Planked Maple |
| Pale Jade or Persian Red | Brown Marble | Walnut or Planked Maple |
| French Grey | Charcoal Medley | Gray Limba, Planked Maple or Walnut |

**Overall Dimensions**

| | | | |
|---|---|---|---|
| Top Size | 42x18½" | Lavatory Size | 20x17" |
| Rim to Floor | 31" | Basin Size | †15½x11¾" |

†Width at back is 14"

### ENSEMBLE PRICES COMPLETE, less trap

| Catalog Number | Price, Each: With White Lavatory | Price, Each: With Colored Lavatory | Shipping Weight, Pounds: Lavatory and Trim | Shipping Weight, Pounds: Counter-top Only | Shipping Weight, Pounds: Cabinet Only |
|---|---|---|---|---|---|
| 1-260-S | $306.60 | $324.00 | 56 | 15 | 85 |
| 1-260-V | 301.50 | 318.90 | 55 | 15 | 85 |

| | |
|---|---|
| If less aerator | Deduct $2.00 |
| If less 8-304 supplies | Per Pair, Deduct 9.40 |
| For 8-324 ¼" male tailpieces | Per Pair, Add .44 |

*For other supply pipes and traps, refer to Section 8*

*Prices are subject to change without notice.*

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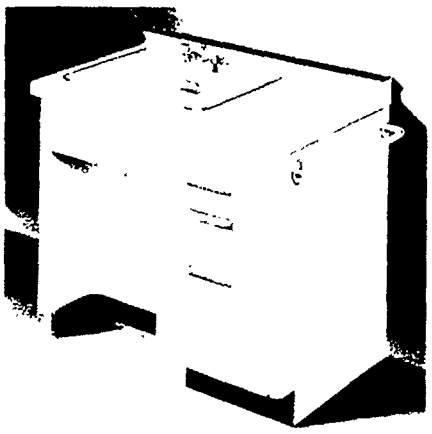
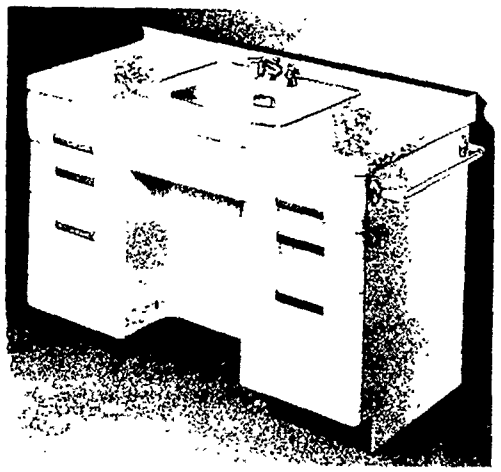
# LAVANETTE AND VANETTE

*For Bath or Powder Room — A Lavatory, Vanity and Powder Bar — All in One*

Cabinet is baked enamel finish, all-steel with two drawers and one cupboard compartment. Enclosed recess provides ample knee space and conceals plumbing. Drawers are one-piece with curved corners top drawer has lift out tray for toilet accessories. Middle drawer has tiltproof slanting shelves for convenient storage of medical supplies. It is fitted with a lock. Cupboard compartment provides a spacious area for bath towel storage a lift out receptacle for convenient disposal of used tissues, etc., is attached to door. Top is one-piece, stain-resisting **Formica** with integral back—available in white or a choice of attractive colors, as shown in the table below.





## No. 3500 LAVANETTE

Cabinet with Top: All-steel baked enamel finish cabinet with one-piece single surface stain-resisting **Formica** top.
Lavatory: 21x17" **Vanity** acid-resisting, formed metal lavatory with soap depression.
Frame: One-piece stainless steel frame.
Trim: B-419-SF **Repcal** supply and pop-up waste fitting with aerator.
Towel Bars: Clear **Lucite** towel bars with metal brackets.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

Length . . . . . 36" Width . . . . . 23 3/8"
Height, floor to rim . . . . . 31 3/8" Height of back . . . . . 2 1/8"

## No. 5748 VANETTE

Cabinet with Top: All-steel baked enamel finish cabinet with one-piece double surface stain-resisting **Formica** top.
Lavatory: 21x17" **Vanity** acid-resisting, formed metal lavatory with soap depression.
Frame: One-piece stainless steel frame.
Trim: B-419-SF **Repcal** supply and pop-up waste fitting with aerator.
Towel Bars: Clear **Lucite** towel bars with metal brackets.
Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*

**Overall Dimensions**

Length . . . . . 48" Width . . . . . 23 3/8"
Height, floor to rim . . . . . 31 3/8" Height of back . . . . . 2 1/8"

## TRANSPORTATION CHARGES ON LAVANETTE AND VANETTE COMBINATIONS

**NOTE: Lavanette and Vanette combinations shown below are F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the prices shown. Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.**

### CABINET DISTRIBUTION POINTS BY ZONES

| ZONE 1 | ZONE 1 | ZONE 1 | ZONE 1 | ZONE 2 |
|---|---|---|---|---|
| Atlanta, Ga. | Charlotte, N. C. | Denver, Colo. | Philadelphia, Pa. | Los Angeles, Cal. |
| Bayonne, N. J. | Chicago, Ill. | Des Moines, Ia. | Pittsburgh, Pa. | San Francisco, Cal. |
| Brighton, Mass. | Cincinnati, O. | Maumee, O. | St. Louis, Mo. | Seattle, Wash. |
| Buffalo, N. Y. | Dallas, Tex. | New Orleans, La. | | |

### PRICES COMPLETE, less trap

| LAVANETTE | | | | Lavatory Bowl and Cabinet Color | Formica Top Color | VANETTE | | | |
|---|---|---|---|---|---|---|---|---|---|
| Catalog Numbers | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds | | | Catalog Number | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
| 3500-1 or *3500-1DL | | | | White | Gray | 5748-1 | | | |
| 3500-2 or *3500-2DL | | | | Blue | Blue | 5748-2 | | | |
| 3500-3 or *3500-3DL | | | | Green | Gray | 5748-3 | | | |
| 3500-4 or *3500-4DL | | | | Tan | Red | 5748-4 | | | |
| 3500-5 or *3500-5DL | $251.30 | $266.24 | 145 | Pink | Gray | 5748-5 | $326.14 | $346.56 | 191 |
| 3500-6 or *3500-6DL | | | | Blue | Coral Skylark | 5748-6 | | | |
| 3500-7 or *3500-7DL | | | | Blue | Pink Frost | 5748-7 | | | |
| 3500-8 or *3500-8DL | | | | Coral | Pink Frost | 5748-8 | | | |

If less 8-304 flexible supplies . Per Pair, Deduct $9.40 For 20-19 1/4" male tailpieces . Per Pair, Add $.38

*Units with suffix "DL" have drawers on left side and basin on right side instead of as illustrated.

*Prices are subject to change without notice.*



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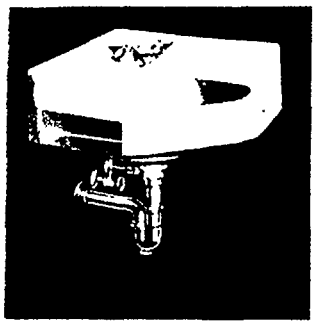
## CORNATE VITREOUS CHINA CORNER LAVATORIES

With 3¼" High Back



**1-370-F, Wall Hung—Size: 17x17"**

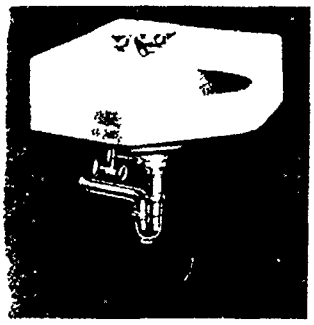
Lavatory: **Cornate** vitreous china corner lavatory with 3¼" high back, beveled panel, splash lip and soap depression.

Supports: Concealed hangers and wall bracket.

"F" Trim: 8-133 **Whitney** *Dial-ese* supply fitting with chain and stopper, with coupling nuts, less ¼" tailpieces; 8-350 1¼" P.O. plug.

Supplies: 8-304 ⅜" supplies with stops and flexible risers.

**Note: Lavatory trap is not included.**



**1-370-E, Wall Hung—Size: 17x17"**

Lavatory: **Cornate** vitreous china corner lavatory with 3¼" high back, beveled panel, splash lip and soap depression.

Supports: Concealed hangers and wall bracket.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

**Note: Lavatory trap is not included.**

**Overall Dimensions** Size....17x17" Basin... 15½x10"

## ORAL HYGIENE VITREOUS CHINA DENTAL LAVATORY

**1-398, Wall Hung—Size: 9¼x9"**

Lavatory: **Oral Hygiene** vitreous china dental lavatory with 3¼" high beveled panel back and integral flushing rim.

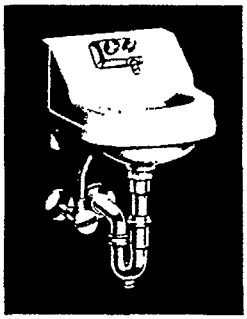
Supports: Concealed hanger and wall brackets.

Trim: Push button self-closing cold water supply and flushing rim fitting with back flow preventer.

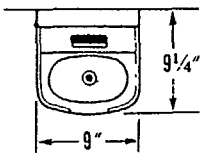
Waste: Perforated open strainer with 1¼" O.D. tailpiece.

Supply: 8-304 ⅜" angle supply with stop and flexible riser.

**Note: Lavatory trap is not included.**



**1-398, Wall Hung**




**Overall Dimensions**
Size 9¼x9"
Basin 6¾x4⅛"

PRICES COMPLETE, less traps

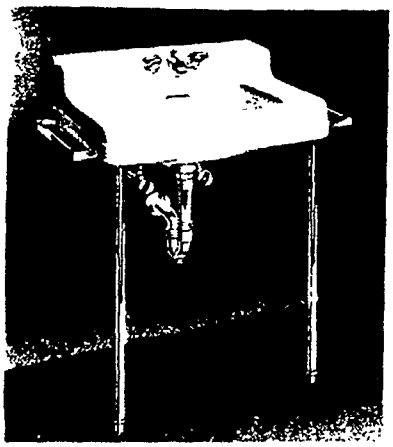
| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **1-370-E, Wall Hung** | 17x17 | **89.40** | **115.50** | 55 |
| **1-370-F, Wall Hung** | 17x17 | **85.70** | **111.80** | 55 |
| **1-398, Wall Hung** | 9¼x9 | **73.00** | **83.30** | 30 |

***8-304** flexible supplies Per Pair **$9.40**
*One supply pipe only (for cold water line) is included in price of 1-398 lavatory.
**8-324** ¼" male tailpieces Per Pair .44

***For other supply pipes and traps, refer to Section 8.***

# NEUDAY PORCELAIN ENAMELED CAST IRON LAVATORIES

With Whitney *Dial-ese* Trim



1-455-E, On Metal Legs—24x18"
Soap depression is on rim.

### 1-455-E, On Metal Legs
Sizes: 19x17" and 24x18"

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

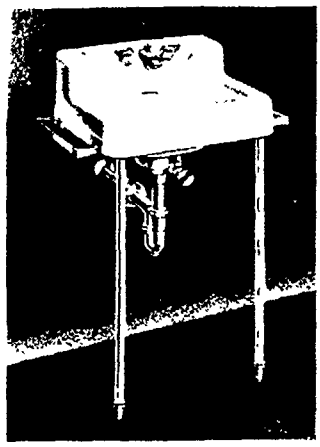
Supports: 8-714 **Crestmont** round metal legs and concealed wall hanger.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

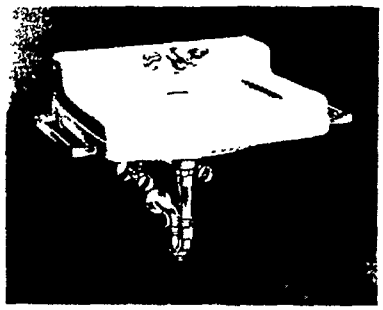
Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-455-E, On Metal Legs—19x17"
Soap depression is on shelf.



1-455-E, Wall Hung—24x18"

### 1-455-E, Wall Hung
Sizes: 19x17" and 24x18"

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Support: Concealed wall hanger.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

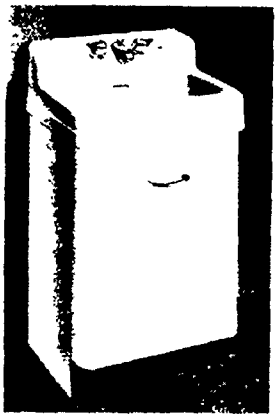
*Note: Lavatory trap is not included.*

Whitney supply fitting with chain and stopper (F Trim) can also be furnished on Neuday lavatories. When so desired merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.

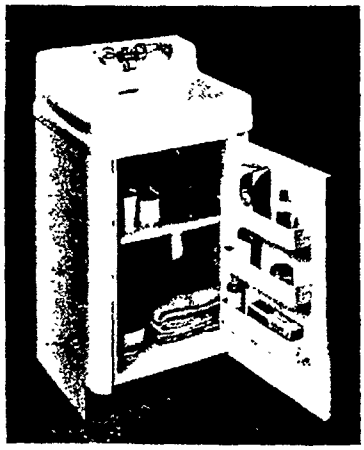
F Trim
8-133 Whitney *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P. O. plug.

**Overall Dimensions**

Size....19x17" Basin...15½x10½"
24x18" 16x11"
Height, floor to top of rim.....31"
Height of shelf back..... .....3¼"



1-455-E, On Steel Cabinet
19x17" size only



*Open View of Cabinet*

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Support: Concealed wall hanger.

"E" Trim: 8-130 **Whitney** *Dial-ese* supply and direct lift waste fitting, with coupling nuts, less ¼" tailpieces.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

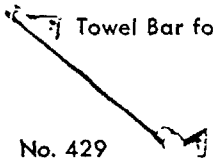
Cabinet: **Neuday** white baked enamel steel cabinet with single inside shelf, three shelf compartments on inside of door, and black enameled toe base; door is hinged on right hand side.

*Note: Lavatory trap is not included.*

*When ordering, specify if regular or acid-resisting enamel is required.*

All exposed metal trim is chromium plated.

### Towel Bar for Neuday Lavatory Cabinet



No. 429

Round tubing towel bar with metal brackets for attaching to sides of Neuday lavatory cabinet.

PRICES COMPLETE, less traps

| Catalog Number | Size Inches | White Regular | White A.R. | Color A.R. | Shpg.Wt. Pounds |
|---|---|---|---|---|---|
| **1-455-E, On Metal Legs** | 19x17 | **$91.70** | **$95.50** | **$99.20** | 95 |
| | 24x18 | **100.30** | **105.20** | **110.00** | 115 |
| **1-455-F, On Metal Legs** | 19x17 | **90.40** | **94.20** | **97.90** | 95 |
| | 24x18 | **99.00** | **103.90** | **108.70** | 115 |
| **1-455-E, Wall Hung** | 19x17 | **75.90** | **79.70** | **83.40** | 90 |
| | 24x18 | **84.50** | **89.40** | **94.20** | 110 |
| **1-455-F, Wall Hung** | 19x17 | **74.60** | **78.40** | **82.10** | 90 |
| | 24x18 | **83.20** | **88.10** | **92.90** | 110 |
| **1-455-E, On Cabinet** | 19x17 | **123.66** | **127.46** | **131.16** | 130 |

*Price is for colored lavatory with white cabinet.

| | |
|---|---|
| **8-304** flexible supplies | Per Pair **$9.40** |
| **8-324** ¼" male tailpieces | Per Pair **.44** |
| **8-698 Crestmont** towel bars | Per Pair **11.00** |
| **8-714 Crestmont** legs | Per Pair **15.80** |
| **429** Cabinet towel bars | Per Pair **10.00** |

*For other supply pipes and traps, refer to Section 8*



*Prices are subject to change without notice.*

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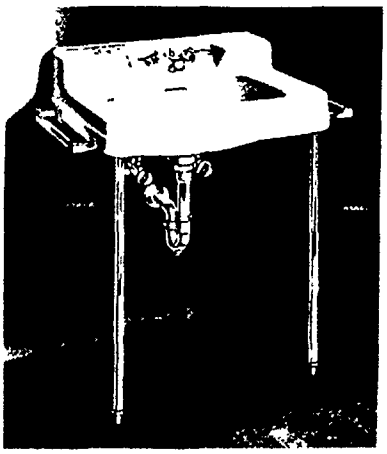
# NEUDAY PORCELAIN ENAMELED CAST IRON LAVATORIES

**With Repcal Trim**



1-455-ERS, On Metal Legs
24x18" size
Soap depression is on rim.

### 1-455-ERS, On Metal Legs
**Sizes: 19x17" and 24x18"**

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

Supports: 8-714 **Crestmont** round metal legs and concealed wall hanger.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

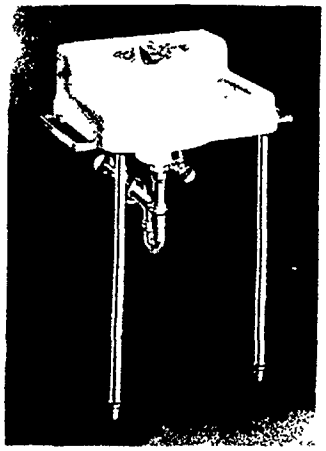
Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

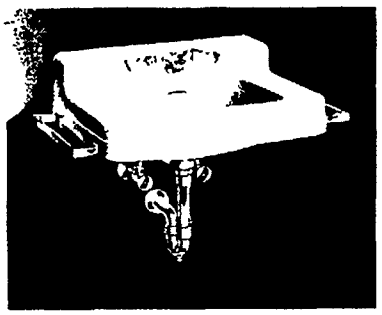
*Note: Lavatory trap is not included.*

**Overall Dimensions**

Size...19x17" Basin...15½x10½"
24x18" 16x11"
Height, floor to top of rim.....31"
Height of shelf back.....31¼"



1-455-ERS, On Metal Legs
19x17" size
Soap depression is on shelf.



1-455-ERS, Wall Hung
24x18" size
Soap depression is on rim.

### 1-455-ERS, Wall Hung
**Sizes: 19x17" and 24x18"**

Lavatory: **Neuday** porcelain enameled cast iron lavatory with beveled panel shelf back, rectangular basin and soap depression.

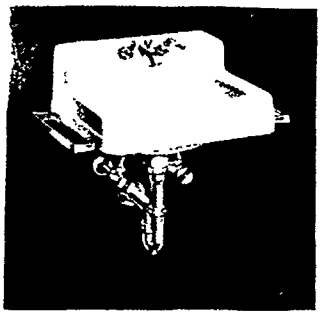
Support: Concealed wall hanger.

"ERS" Trim: 8-132 **Repcal** supply and direct lift waste fitting with renewable seats and 45° elbows with coupling nuts, less tailpieces.

Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 3/8" angle supplies with stops and flexible risers.

*Note: Lavatory trap is not included.*



1-455-ERS, Wall Hung
19x17" size
Soap depression is on shelf.

**All exposed metal trim is chromium plated.**

***When ordering, specify if regular or acid-resisting enamel is required.***

## ALTERNATE REPCAL TRIM FOR NEUDAY LAVATORIES

**When ordering a Neuday lavatory with Repcal trim other than illustrated, merely change SUFFIX DESIGNATION and TRIM DESCRIPTION.**

**ERS Trim**
8-132 **Repcal** supply and direct lift waste fitting with renewable seats.

**ER Trim**
8-131 **Repcal** supply and direct lift waste fitting with integral seats.

**FRS Trim**
8-135 **Repcal** supply fitting with renewable seats, chain and stopper; 8-350 1¼" P.O. plug.

**FR Trim**
8-134 **Repcal** supply fitting with integral seats, chain and stopper; 8-350 1¼" P.O. plug.

The above fittings are regularly furnished with 45° elbows, coupling nuts, friction rings and washers for slip joint connection. When required for use with iron pipe supplies, specify the No. 20-19 ¼" male tailpieces.

**PRICES COMPLETE, less traps**

| Catalog Number | Size Inches | White Regular | White A. R. | Color A. R. | Shpg.Wt. Pounds |
|---|---|---|---|---|---|
| **1-455-ER, On Metal Legs** | 19x17 | **$85.90** | **$89.60** | **$93.40** | 95 |
| | 24x18 | **94.50** | **99.40** | **104.20** | 115 |
| **1-455-ERS, On Metal Legs** | 19x17 | **86.60** | **90.40** | **94.10** | 95 |
| | 24x18 | **95.20** | **100.10** | **104.90** | 115 |
| **1-455-FR, On Metal Legs** | 19x17 | **84.30** | **88.10** | **91.80** | 95 |
| | 24x18 | **92.90** | **97.80** | **102.60** | 115 |
| **1-455-FRS, On Metal Legs** | 19x17 | **85.00** | **88.80** | **92.50** | 95 |
| | 24x18 | **93.60** | **98.50** | **103.30** | 115 |
| **1-455-ER, Wall Hung** | 19x17 | **70.10** | **73.80** | **77.60** | [illegible] |
| | 24x18 | **78.70** | **83.60** | **88.40** | 110 |
| **1-455-ERS, Wall Hung** | 19x17 | **70.80** | **74.60** | **78.30** | 90 |
| | 24x18 | **79.40** | **84.30** | **89.10** | 110 |
| **1-455-FR, Wall Hung** | 19x17 | **68.50** | **72.30** | **76.00** | 90 |
| | 24x18 | **77.10** | **82.00** | **86.80** | 110 |
| **1-455-FRS, Wall Hung** | 19x17 | **69.20** | **73.00** | **76.70** | 90 |
| | 24x18 | **77.80** | **82.70** | **87.50** | 110 |

| | |
|---|---|
| **8-304** flexible supplies | Per Pair **$9.40** |
| **8-698 Crestmont** towel bars | Per Pair **11.00** |
| **8-714 Crestmont** legs | Per Pair **15.80** |
| **20-19** ¼" male tailpieces | Per Pair **.38** |
| For aerator on spout | Add **1.60** |

**For other supply pipes and traps, refer to Section 8**

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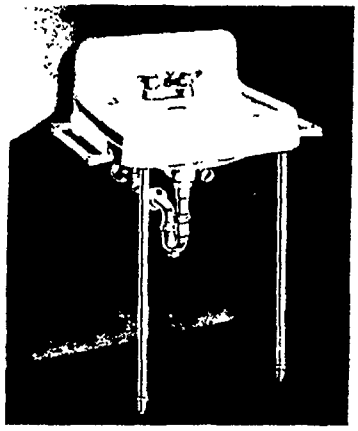
# RHODILE AND CAROLINA PORCELAIN ENAMELED CAST IRON LAVATORIES

With 6" High Back



**1-495-C, On Metal Legs**
**Size: 20x18"**

Lavatory: **Rhodile** porcelain enameled cast iron lavatory with back, rectangular basin and soap depression.

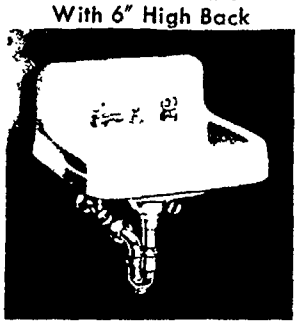
Supports: 8-714 **Crestmont** round metal legs and concealed wall hanger.

"C" Trim: 8-560 **Olympia** *Dial-ese* supply and direct lift waste fitting with coupling nuts, less ¼" tailpieces.

Towel Bars: 8-698 **Crestmont** clamp-on towel bars.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***



**1-495-W, Wall Hung**
**Size: 20x18"**

Lavatory: **Rhodile** porcelain enameled cast iron lavatory with back, rectangular basin and soap depression.

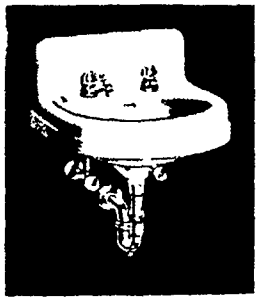
Support: Concealed wall hanger.

"W" Trim: 8-31 **Vantage** *Dial-ese* faucets with coupling nuts, less ¼" tailpieces; 8-46 **Crestmont** direct lift waste.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

**Overall Dimensions**
Size...20x18" Basin...15½x10"
Height, floor to top of rim.....31"



**1-531-P, Wall Hung**
**Size: 19x17"**

Lavatory: **Carolina** porcelain enameled cast iron lavatory with back, oval basin and soap depression.

Support: Concealed wall hanger.

"P" Trim: 8-31 **Vantage** *Dial-ese* faucets with coupling nuts, less ¼" tailpieces; 8-350 1¼" P.O. plug; and chainstay with chain and rubber stopper.

Supplies: 8-304 ⅜" angle supplies with stops and flexible risers.

***Note: Lavatory trap is not included.***

**Overall Dimensions**
Size...19x17" Basin...15¼x9¾"
Height, floor to top of rim.....31"

## PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | White Regular | White A.R. | Color A.R. | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| **Rhodile, Ware Only** | 20x18 | **$34.50** | **$38.80** | **$43.10** | 82 |
| On Metal Legs | | | | | |
| **1-495-C** | 20x18 | **$94.60** | **$98.90** | **$103.20** | 100 |
| **1-495-D** | 20x18 | **91.90** | **96.20** | **100.50** | 100 |
| **1-495-P** | 20x18 | **88.30** | **92.60** | **96.90** | 100 |
| **1-495-S** | 20x18 | **100.20** | **104.50** | **108.80** | 100 |
| **1-495-V** | 20x18 | **95.10** | **99.40** | **103.70** | 95 |
| **1-495-W** | 20x18 | **93.60** | **97.90** | **102.20** | 95 |
| Wall Hung | | | | | |
| **1-495-C** | 20x18 | **$67.80** | **$72.10** | **$76.40** | 93 |
| **1-495-D** | 20x18 | **65.10** | **69.40** | **73.70** | 93 |
| **1-495-P** | 20x18 | **61.50** | **65.80** | **70.10** | 93 |
| **1-495-S** | 20x18 | **73.40** | **77.70** | **82.00** | 93 |
| **1-495-V** | 20x18 | **68.30** | **72.60** | **76.90** | 88 |
| **1-495-W** | 20x18 | **66.80** | **71.10** | **75.40** | 88 |
| **Carolina Ware Only** | 19x17 | **31.30** | **35.20** | **39.10** | 65 |
| **1-531-C** | 19x17 | **$64.60** | **$68.50** | **$72.40** | 83 |
| **1-531-D** | 19x17 | **61.90** | **65.80** | **69.70** | 83 |
| **1-531-P** | 19x17 | **58.30** | **62.20** | **66.10** | 83 |
| **1-531-S** | 19x17 | **70.20** | **74.10** | **78.00** | 83 |
| **1-531-V** | 19x17 | **65.10** | **69.00** | **72.90** | 78 |
| **1-531-W** | 19x17 | **63.50** | **67.50** | **71.40** | 78 |

| | | |
|---|---|---|
| **8-31** or **8-39 Vantage** faucets | Per Pair | **$13.40** |
| **8-36 Victor Magiclose** faucets | Per Pair | **17.60** |
| **8-304** flexible supplies | Per Pair | **9.40** |
| **8-324** ¼" male tailpieces | Per Pair | **.44** |
| **8-698 Crestmont** towel bars | Per Pair | **11.00** |
| **8-714 Crestmont** legs | Per Pair | **15.80** |
| For aerators (**C, D, S** and **V** trim only) | | **Add each $2.00** |

**All exposed metal trim is chromium plated.**

***When ordering, specify if regular or acid-resisting enamel is required.***

## ALTERNATE TRIM FOR RHODILE AND CAROLINA LAVATORIES

**When ordering a Rhodile or Carolina lavatory with trim other than illustrated, merely change SUFFIX DESIGNATION and use TRIM DESCRIPTION below.**

**C Trim**
8-560 **Olympia** *Dial-ese* supply and direct lift waste fitting.

**D Trim**
8-569 **Neu-Rainier** *Dial-ese* supply fitting with chain and stopper; 8-350 1¼" P.O. plug.

**V Trim**
8-564 **Neu-Rainier** *Dial-ese* supply and indirect lift waste fitting.

**S Trim**
8-140 **Embassy** *Dial-ese* supply and indirect lift waste fitting.

**P Trim**
*8-31 **Vantage** *Dial-ese* faucets with four-arm handles; chainstay through back with chain and stopper; 8-350 1¼" P.O. plug.

**W Trim**
*8-31 **Vantage** *Dial-ese* faucets with four-arm handles; 8-46 Crestmont direct lift waste fitting.

*Alternate faucets for "P" and "W" trimmings
8-36 Victor *Magiclose* faucets with four-arm handles or 8-39 Vantage *Dial-ese* faucets with lever handles can be furnished when specified.



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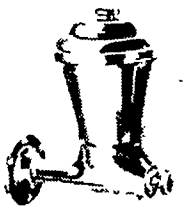
## BOBRICK SOAP DISPENSERS AND TANK-TYPE GRAVITY SOAP SYSTEMS

**For Liquid, Lather or Powdered Soap and Lotions**

Delivers measured quantities of Soap or Lotion.
With Clear Glass, Translucent or Metal Containers as Indicated

All wall-mounted Dispensers are top filled; have Integral Wall Bracket or separate Wall Plate. WallPlad (wall plate with special adhesive) for attaching to any smooth surface without use of screws, available as indicated.

For Liquid Soap — Lather Type



**B-7MG**
Chr. Pl. Brass Container

**B-41**
Clear Glass Container

**B-7**
Same, except with Glass Container

**B-41MG**
Same, except with C.P. Brass Container

For Powdered Soap

**B-31CP**
Chrome Plated Steel
Capacity 32 oz. Uses any free flowing powdered soap.
B-31, same except with white enameled finish.

For Liquid Soap — Lather Type

**B-12CP** — **B-47CP**
Chrome Plated Steel Container, Stainless Steel and C.P. Brass Valve
Push-in Type — Capacity 40 fl. oz.
Lucite window provides visible soap supply.

For adhesive mounting of Models B-12CP, B-31, B-31CP and B-47CP, specify, WallPlad No. 250.....Price Each $2.00

### LAVATORY SOAP DISPENSERS

For Liquid Soap — Lather Type

Stainless Steel Push Button and Spout

**B-829MG**
N.P. Steel Container
Fits lavatory slab up to 1" thick

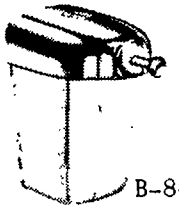
**B-899**
Glass Container
Fits lavatory slab up to 2½" thick

**B-829**
Same, except with Glass Container

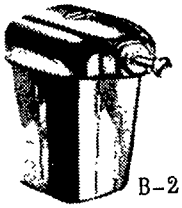
**B-899MG**
Same, except with N.P. Steel Container

Made for thicker lavatory slabs at extra cost. Add "Spl." to Model No. and specify thickness.

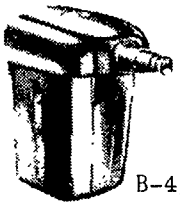
For Lotions — For Liquid Soap — Lather Type



**B-84**
Stainless steel hood and valve. Translucent shatterproof Styron container. Capacity 18 fl. oz.



**B-25**



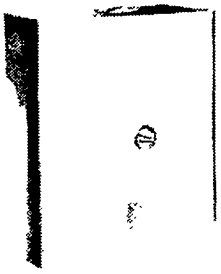
**B-45**

Push-in Types. Stainless steel and chrome plated brass exterior and valve. Visible soap supply. Capacity 18 fl. oz.

**B-24** — **B-44**
Same, except with translucent Styron containers.

For adhesive mounting of Models B-24, B-25, B-44, B-45 and B-84
Specify, Adhesive Kit 24-43.....Each $ .66

### LIQUID SOAP TANK



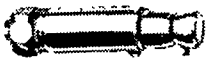
**B-924, B-925, B-926**
All Stainless Steel
Rotary magnetic gauge
Furnished with concealed wall bracket mounting.
3/8" I.P.S. female outlet

| Tank No. | Cap. Gals. | Size In. ht. x w | Depth In. |
|---|---|---|---|
| 924 | 1 | 9x8 | 4½ |
| 925 | 2½ | 12½x10 | 4¾ |
| 926 | 5 | 15x12 | 7¼ |

All soap valves have 3/8" I.P.S. female inlet.

### LIQUID AND LATHER SOAP VALVES
For Gravity Systems

For Liquid Soap — Lather Type



**B-860** — **B-861**
C.P. Brass Horizontal, Push-in Types

**B-861W**
Same, except all Stainless Steel

### COMBINATION UNION & SHUT-OFF VALVE
For use with Tanks

**B-870**
3/8" I.P.S. male inlet connection.

**B-863**

For Liquid Soap C.P. Brass Vertical Push-up Types

**B-862**

*F.O.B. Brooklyn, N.Y. or Los Angeles, California

| Number | Wt. Lbs | *Price |
|---|---|---|
| B-7 | 2½ | $14.66 |
| B-7MG | 2½ | 18.54 |
| B-12CP | 3 | 21.46 |
| B-24 | 1½ | 12.00 |
| B-25 | 2 | 14.66 |
| B-31 | 2½ | 10.54 |
| B-31CP | 2½ | 15.60 |
| B-41 | 1½ | 17.34 |
| B-41MG | 2½ | 21.20 |
| B-44 | 1½ | 13.20 |
| B-45 | 2 | 15.86 |
| B-47CP | 3 | 22.80 |
| B-84 | 1½ | 14.00 |
| B-829 | 3 | 16.00 |
| B-829MG | 3½ | 18.66 |
| B-860 | 1½ | 6.00 |
| B-861 | 1½ | 8.54 |
| B-861W | 1½ | 10.54 |
| B-862 | 1½ | 7.06 |
| B-863 | 1½ | 10.54 |
| B-870 | 1½ | 10.26 |
| B-899 | 3 | 18.00 |
| B-899MG | 3½ | 20.66 |
| B-924 | 2 | 44.00 |
| B-925 | 5 | 50.40 |
| B-926 | 7 | 66.66 |

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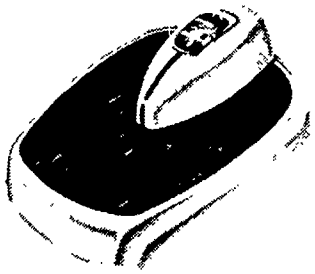
## HEALTH-O-METER BATHROOM SCALES

**AIRPLANE DIAL MODEL 134**

White baked enamel finish with inlaid rubber mat on platform. Has airplane dial with wide space graduations to 99 pounds and smaller dial to register 100 pound readings. Capacity 300 pounds. Hardened steel pivots and bearings.



**MODEL 187**

Baked enamel finish with crystal clear magnifying lens and chromium dial cap. Has hardened steel pivots and bearings, rotating dial, 1 to 250 pounds capacity, and inlaid rubber mat on platform.

Colors – White, Green, Blue, Yellow, or Black.

**MODEL 189**

Same, except all chromium.

## COUNSELOR BATHROOM SCALES

**No. 239**

Low, slim design, has Line-O-Site lens encased in chromium plated headplate and center strip. Lite-O-Matic dial, operated by replaceable flashlight battery. Available in the following colors with matching marbleized rubber mats – Blue, Burgundy, Green, Pink and Yellow; also Black or White with Black marbleized mat.

**No. 279**

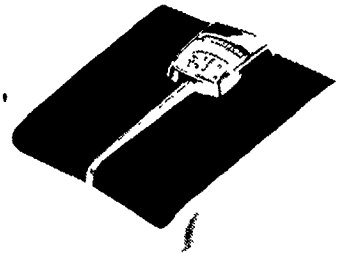
Deluxe model, same, except chromium plated body with Black marbleized mat.

**No. 227**

Deluxe flat top model, large platform, only 2¼" high. Magnifying Line-O-Site lens encased in chromium plated headplate. Has chromium plated body with Black marbleized mat.

**No. 222**

Same, except body is finished in Blue, Burgundy, Green, Pink or Yellow with matching marbleized rubber mats; also Black or White with Black marbleized mat.

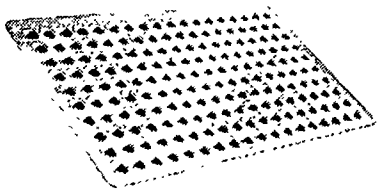


**No. 400**

The Coronet model has a large scuff-resistant rubber mat. Line-O-Site indicator with large magnifying lens. Low tip-proof design with overall height of 1[illegible] inches. Trim is chromium plated.

Available in black or white with a black marbleized mat. Also burgundy, green, blue, yellow and pink with mats in matching marbleized colors.

## RUBBERMAID BATHTUB MATS



*No. 7015 14x23" No. 7011 16½x28½"
No. 7010 14x26" No. 7022 18x30"

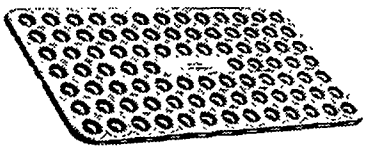
*Rubbermaid Safti-Cup* ribbed design with non-slip molded vacuum cups – colorfast and odorless – resists hot water and soap.

Colors – White, Light Blue, Peach, Dubonnet, Yellow, or Light Green.

*No. 7015 not available in Yellow or Dubonnet.

**Prices are subject to change without notice.**

## PRETTY WARE BATH AND SHOWER MAT



**No. 1426 14x26" Size**

Heavy gauge soft rubber – provides safe footing because of air-entrapping dome construction. Has 91 vacuum cups that grip tight on wet or soapy surfaces.

Colors – Rose, Blue, Green, Yellow and White.

**PRICES**

| Number | Price | Shpg. Wt. | Number | Price | Shpg. Wt. |
|---|---|---|---|---|---|
| 134 | $31.50 | 24 Lbs. | 400 | $13.20 | 3 Lbs. |
| 187 | 11.40 | 10 | 1426 | 4.46 | 2 |
| 189 | 15.90 | 10 | 7010 | 2.52 | 2 |
| 222 | 10.20 | 8 | 7011 | 3.18 | 2 |
| 227 | 13.20 | 8 | 7015 | 1.34 | ½ |
| 239 | 11.70 | 9 | 7022 | 3.98 | 2½ |
| 279 | 14.70 | 9 | | | |



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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# KITCHEN SINKS — KITCHEN CABINETS — DISPOSERS GREASE INTERCEPTORS — SCULLERY SINKS — APPLIANCES

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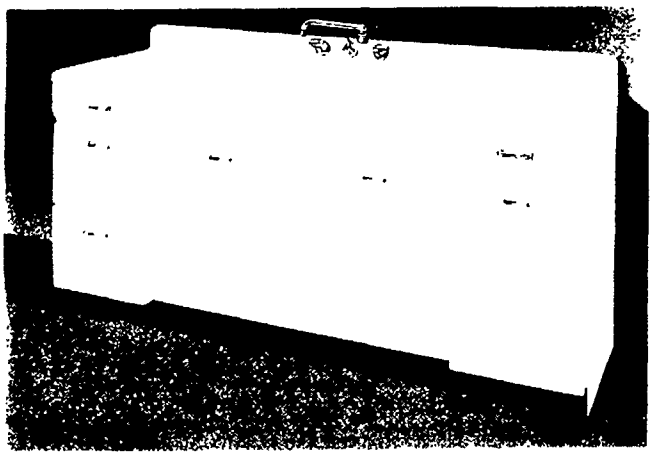
## KITCHEN QUEEN PORCELAIN ENAMELED CAST IRON CABINET SINK



### 5-40-S KITCHEN QUEEN

Sink: Kitchen Queen acid-resisting porcelain enameled cast iron two-compartment sink with back, depressed drainboards, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 **Temple *Dial-ese*** swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and traps are not included.*

| | Overall Dimensions | | |
|---|---|---|---|
| Sink.... | 72x25¼" | Each Basin.... 18x16x8" | Height of back 4" |
| Cabinet... | 72x24 5/16" | Height..34½" (sets sink 36" floor to top of rim) | |

No. 7240 **Kitchen Queen** cabinet is arranged to accommodate the following accessories, when specified.

| | |
|---|---|
| **SB** Utility Basket | **CB** Hardwood Cutting Board |
| **CT** Plastic Cutlery Tray | **STR** Sliding Towel Rack |

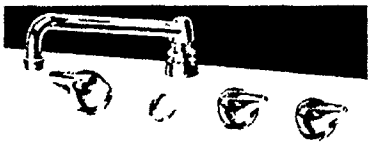
*Refer to Page 5-16 for illustrations and descriptions.*

**Alternate Supply Fittings for Beveled Panel Back Sinks**

The **Kitchen Queen, Kitchen Pride, Sunnyday** and **All-American** sinks with beveled panel backs can be furnished with the following alternate **Temple** supply fittings with ***Dial-ese*** controls when specified:

**8-62**—**Temple *Dial-ese*** swinging spout, two-valve supply fitting, less spray, with cover plate. (Specify **8-62-A** if with aerator.)

**8-66**—**Temple *Dial-ese*** swinging spout, three-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify **8-66-A** if with aerator.)



**8-68**—**Temple *Dial-ese*** swinging spout, three-valve supply fitting, less spray, with cover plate. (Specify **8-68-A** if with aerator.)

To order **Kitchen Queen** sinks with alternate supply fittings as illustrated above, use the following catalog numbers:

**5-40**, with 8-62 or 8-62-A fitting.
**5-40-T**, with 8-68 or 8-68-A fitting.
**5-40-TS**, with 8-66 or 8-66-A fitting.

All exposed metal trim is chromium plated.

## TRANSPORTATION CHARGES ON SINK AND KITCHEN CABINETS

Note: Undersink cabinets and base and wall cabinets shown on this page and on the pages following are F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the cabinet prices shown. Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.

### CABINET DISTRIBUTION POINTS BY ZONES

| ZONE 1 | ZONE 1 | ZONE 1 | ZONE 1 | ZONE 2 |
|---|---|---|---|---|
| Atlanta, Ga. | Charlotte, N. C. | Denver, Colo. | Philadelphia, Pa. | Los Angeles, Cal. |
| Bayonne, N. J. | Chicago, Ill. | Des Moines, Ia. | Pittsburgh, Pa. | San Francisco, Cal. |
| Brighton, Mass. | Cincinnati, O. | Maumee, O. | St. Louis, Mo. | Seattle, Wash. |
| Buffalo, N. Y. | Dallas, Tex. | New Orleans, La. | | |

### PRICES COMPLETE, less supplies and traps

*†Color Price includes colored sink and white cabinet.*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | Pounds |
| 5-40, with Cabinet | $413.40 | $436.12 | $438.76 | $461.48 | 520 |
| 5-40-S, with Cabinet | 420.16 | 442.88 | 445.50 | 468.22 | 522 |
| 5-40-T, with Cabinet | 422.26 | 444.98 | 447.60 | 470.32 | 522 |
| 5-40-TS, with Cabinet | 428.92 | 451.66 | 454.28 | 477.00 | 524 |
| No. 7240 Cabinet Only | 168.46 | — | 193.72 | — | 182 |

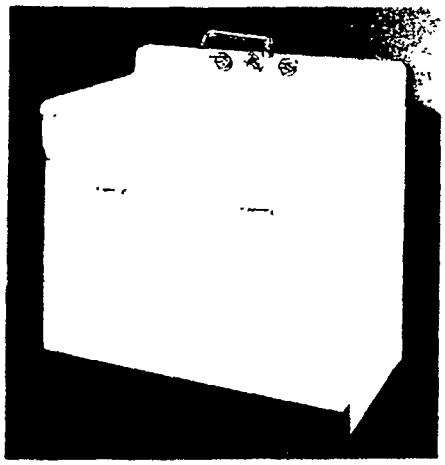
| | | |
|---|---|---|
| For aerator on spout | Add | $1.80 |
| For **8-324** ¼" male tailpieces | Per Pair, Add | .44 |
| For **SB** Utility Basket | Add | 3.52 |
| For **CT** Plastic Cutlery Tray | Add | 3.22 |
| For **STR** Sliding Towel Rack | Add | 12.00 |
| For **CB** Hardwood Cutting Board | Add | 5.02 |
| If less **8-361** wastes | Each, Deduct | 6.38 |

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal unit, refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## KITCHEN PRIDE AND SUNNYDAY PORCELAIN ENAMELED CAST IRON CABINET SINKS



### 5-44-S KITCHEN PRIDE

Sink: **Kitchen Pride** acid-resisting porcelain enameled cast iron two-compartment sink with back, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 **Temple** *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 3800 **CRANE** baked white enamel steel cabinet with sink clamps.

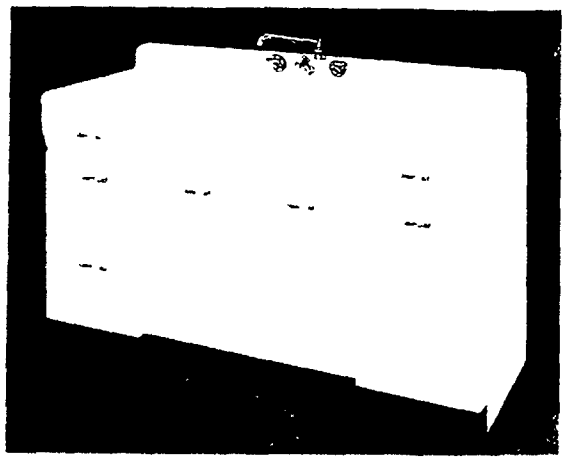
***Note: Sink supplies and traps are not included.***

**Overall Dimensions**

| | | |
|---|---|---|
| Sink.....38x25¼" | Each basin....18x16x8" | Height of back 4" |
| Cabinet....38x24 5/16" | Height..34½" (sets sink 36" floor to top of rim) | |

To order **Kitchen Pride** or **Sunnyday** sinks with alternate **Temple** supply fittings described on Page 5-3, use the catalog numbers shown below:

| Kitchen Pride | | Sunnyday |
|---|---|---|
| 5-44 | —with 8-62 or 8-62-A fitting— | 5-50 |
| 5-44-T | —with 8-68 or 8-68-A fitting— | 5-50-T |
| 5-44-TS | —with 8-66 or 8-66-A fitting— | 5-50-TS |



### 5-50-S SUNNYDAY

Sink: **Sunnyday** acid-resisting porcelain enameled cast iron single compartment sink with back, depressed drainboards, beveled fixture panel, two soap depressions and concealed wall attachment plates.

Trim: 8-60 **Temple** *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and trap are not included.***

**Overall Dimensions**

| Sink Size | Basin Size | Back Height | Cabinet Size | Cabinet Height | Sink rim to floor |
|---|---|---|---|---|---|
| 54x25¼" | 20x18x8" | 4" | 54x24 5/16" | 34½" | 36" |
| 60x25¼" | 22x18x8" | 4" | 60x24 5/16" | 34½" | 36" |

Cabinets are arranged to accommodate the following accessories, when specified:

No. 3800 **Kitchen Pride** Cabinet—**SB** Utility Basket.
Nos. 5440 or 6040 **Sunnyday** Cabinet—**SB** Utility Basket, **STR** Sliding Towel Rack, **CB** Hardwood Cutting Board and **CT** Plastic Cutlery Tray.

***Refer to Page 5-16 for illustrations and descriptions.***

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

*†Color Price includes colored sinks and white cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 †Color | ZONE 2 White | ZONE 2 †Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| 5-44, with Cabinet | 38x25¼ | $213.00 | $224.56 | $221.86 | $233.48 | 305 |
| 5-44-S, with Cabinet | 38x25¼ | 219.68 | 231.30 | 228.60 | 240.16 | 306 |
| 5-44-T, with Cabinet | 38x25¼ | 221.78 | 233.40 | 230.70 | 242.26 | 307 |
| 5-44-TS, with Cabinet | 38x25¼ | 228.46 | 240.08 | 237.38 | 249.00 | 308 |
| No. 3800 Cabinet Only | 38x24 5/16 | 68.70 | — | 77.56 | — | 95 |
| 5-50, with Cabinet | 54x25¼ | 288.30 | 301.72 | 308.48 | 321.90 | 421 |
| 5-50-S, with Cabinet | 54x25¼ | 295.06 | 308.40 | 315.16 | 328.58 | 422 |
| 5-50-T, with Cabinet | 54x25¼ | 297.16 | 310.50 | 317.26 | 330.68 | 424 |
| 5-50-TS, with Cabinet | 54x25¼ | 303.82 | 317.26 | 324.00 | 337.36 | 425 |
| No. 5440 Cabinet Only | 54x24 5/16 | 132.60 | — | 152.78 | — | 163 |
| 5-50, with Cabinet | 60x25¼ | 299.86 | 313.96 | 320.56 | 334.66 | 442 |
| 5-50-S, with Cabinet | 60x25¼ | 306.60 | 320.70 | 327.22 | 341.32 | 443 |
| 5-50-T, with Cabinet | 60x25¼ | 308.70 | 322.80 | 329.32 | 343.42 | 444 |
| 5-50-TS, with Cabinet | 60x25¼ | 315.38 | 329.48 | 336.08 | 350.18 | 445 |
| No. 6040 Cabinet Only | 60x24 5/16 | 137.78 | — | 158.48 | — | 169 |

| | |
|---|---|
| For aerator on spout | Add $1.80 |
| For 8-324 ¼" male tailpieces | Per Pair, Add .44 |
| For SB Utility Basket | Add 3.52 |
| For CT Plastic Cutlery Tray | Add 3.22 |
| For STR Sliding Towel Rack | Add 12.00 |
| For CB Hardwood Cutting Board | Add 5.02 |
| If less 8-361 wastes | Each, Deduct 6.38 |

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*

All exposed metal trim is chromium plated.

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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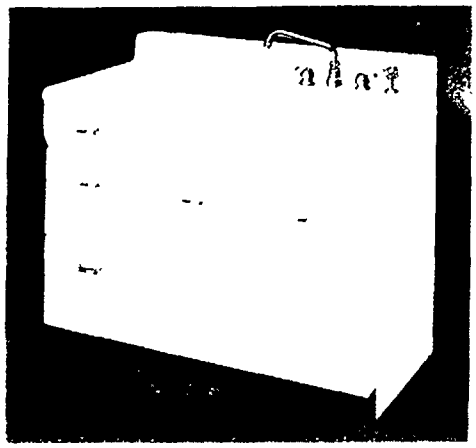
## HOMEMAKER PORCELAIN ENAMELED CAST IRON CABINET SINKS



**HOMEMAKER**
**5-81-S, with Left Hand Drainboard**
**5-82-S, with Right Hand Drainboard**

Sink: **Homemaker** acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboard, soap depression and concealed wall attachment plates.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and trap are not included.***

**Overall Dimensions**

| | | |
|---|---|---|
| Sink.....42x25¼" | Basin.....20x18x8" | Height of back.....4" |
| Cabinet....42x24 5/16" | Height..34½" (sets sink 36" floor to top of rim) | |

No. 4240 **Homemaker** cabinets are arranged to accommodate the following accessories, when specified:

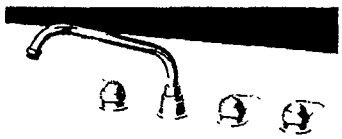
**SB** Utility Basket — **STR** Sliding Towel Rack
**CT** Plastic Cutlery Tray — **CB** Hardwood Cutting Board

***Refer to Page 5-16 for illustrations and descriptions.***

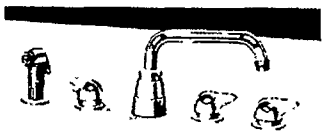
### Alternate Supply Fittings for Deck Type Kitchen Sinks

The **Homemaker, Sunnycrest, Stewardess, AllianceWare** and all flat rim ledge type sinks can be furnished with the following alternate **Embassy** supply fittings with ***Dial-ese*** controls when specified:

8-84 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting, less spray. (Specify 8-84-A if with aerator.



8-85 **Embassy** ***Dial-ese*** ledge type, swinging spout three-valve supply fitting, less spray. (Specify 8-85-A if with aerator.)



8-89 **Embassy** ***Dial-ese*** ledge type, swinging spout three-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-89-A if with aerator.)

To order **Homemaker** sinks with alternate supply fittings as illustrated above, use the following catalog numbers:

**With 8-84 or 8-84-A Embassy Fitting**
**5-81**, L. H. Drainboard — **5-82**, R. H. Drainboard

**With 8-85 or 8-85-A Embassy Fitting**
**5-81-T**, L. H. Drainboard — **5-82-T**, R. H. Drainboard

**With 8-89 or 8-89-A Embassy Fitting**
**5-81-TS**, L. H. Drainboard — **5-82-TS**, R. H. Drainboard

**All exposed metal trim is chrome plated.**

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

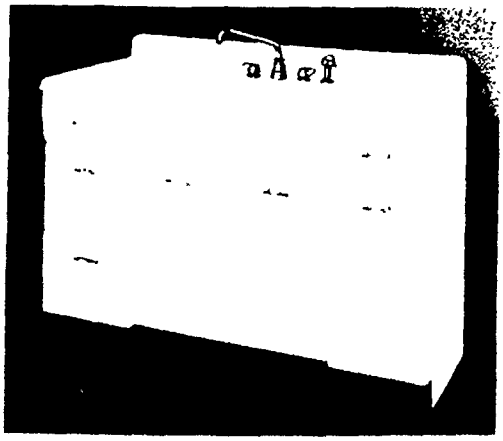
**PRICES COMPLETE, less supplies and traps**
*†Color Price includes colored sink and white cabinet*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| **5-81 or 5-82, with Cabinet** | $209.92 | $219.68 | $224.18 | $233.86 | 323 |
| **5-81-S or 5-82-S, with Cabinet** | 217.42 | 227.18 | 231.68 | 241.36 | 324 |
| **5-81-T or 5-82-T, with Cabinet** | 217.36 | 227.02 | 231.52 | 241.28 | 325 |
| **5-81-TS or 5-82-TS, with Cabinet** | 225.22 | 234.98 | 239.48 | 249.16 | 326 |
| **5-81 or 5-82, Sinks Only, less all trim** | 87.70 | 97.40 | 87.70 | 97.40 | 195 |
| **No. 4240-L or No. 4240-R Cabinet Only** | 97.58 | — | 111.76 | — | 120 |

| | |
|---|---|
| For aerator on spout..... | Add $1.72 |
| For **8-324** ¼" tailpieces.. ... | Per Pair, Add .44 |
| For **SB** Utility Basket..... | Add 3.52 |
| For **CT** Cutlery Tray..... | Add 3.22 |
| For **STR** Towel Rack..... | Add 12.00 |
| For **CB** Cutting Board . .. | Add 5.02 |
| Is less **8-361** waste..... | Each, Deduct 6.38 |

*For sink traps and supply pipes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*

## SUNNYCREST AND STEWARDESS PORCELAIN ENAMELED CAST IRON CABINET SINKS



### 5-100-S SUNNYCREST

Sink: **Sunnycrest** acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboards, two soap depressions and concealed wall attachment plates.

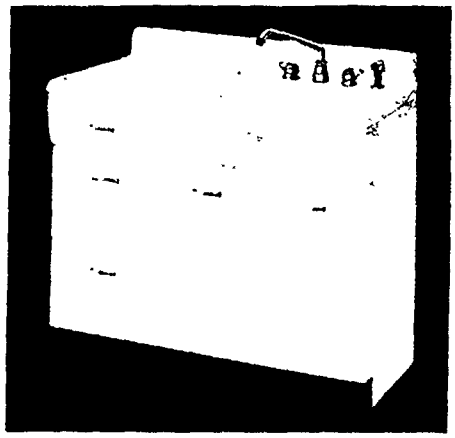
Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5422 (for 54" sink) or No. 6022 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included*

| Sink Size | Basin Size | Overall Dimensions Back Height | Cabinet Size | Cabinet Height | Sink rim to floor |
|---|---|---|---|---|---|
| 54x22½" | 20x15x8" | 4" | 54x21¾" | 34½" | 36" |
| 60x22½" | 22½x15x8" | 4" | 60x21¾" | 34½" | 36" |



### STEWARDESS

**5-103-S, with Left Hand Drainboard**
**5-106-S, with Right Hand Drainboard**

Sink: **Stewardess** acid-resisting porcelain enameled cast iron single compartment ledge sink with back, depressed drainboard, soap depression and concealed wall attachment plates.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4222-L (for left hand drainboard) or No. 4222-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink supplies and trap are not included.*

**Overall Dimensions**

Sink.....42x22½" Basin.....20x15x8" Height of back.. ..4"
Cabinet....42x21¾" Height..34½" (sets sink 36" floor to top of rim)

To order **Sunnycrest** or **Stewardess** sinks with alternate **Embassy** supply fittings described on Page 5–5, use the catalog numbers shown below.

**With 8-84 or 8-84-A Embassy Fitting**
5-100 Sunnycrest
5-103 Stewardess L. H. Drainboard
5-106 Stewardess R. H. Drainboard

**With 8-85 or 8-85-A Embassy Fitting**
5-100-T Sunnycrest
5-103-T Stewardess L. H. Drainboard
5-106-T Stewardess R. H. Drainboard

**With 8-89 or 8-89-A Embassy Fitting**
5-100-TS Sunnycrest
5-103-TS Stewardess L. H. Drainboard
5-106-TS Stewardess R. H. Drainboard

No. 5422 and No. 6022 **Sunnycrest** cabinets and No. 4222 **Stewardess** cabinets are arranged to accommodate the following accessories, when specified:

SB Utility Basket
CT Plastic Cutlery Tray
STR Sliding Towel Rack
CB Hardwood Cutting Board

Refer to Page 5–16 for illustrations and descriptions.

**All exposed metal trim is chromium plated.**

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

**PRICES COMPLETE, less supplies and traps**

*†Color Price includes colored sink and white cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 †Color | ZONE 2 White | ZONE 2 †Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| **5-100, with Cabinet** | 54x22½ | $276.12 | $288.52 | $296.88 | $309.28 | 366 |
| **5-100-S, with Cabinet** | 54x22½ | 283.62 | 296.02 | 304.38 | 316.78 | 367 |
| **5-100-T, with Cabinet** | 54x22½ | 283.52 | 295.92 | 304.28 | 316.68 | 368 |
| **5-100-TS, with Cabinet** | 54x22½ | 291.42 | 303.82 | 312.18 | 324.58 | 369 |
| **5-100, Sink Only, less all trim** | 54x22½ | 111.30 | 123.70 | 111.30 | 123.70 | 230 |
| **No. 5422 Cabinet Only** | 54x21¾ | 140.12 | — | 160.88 | — | 128 |
| **5-100, with Cabinet** | 60x22½ | 289.36 | 302.66 | 310.78 | 324.08 | 383 |
| **5-100-S, with Cabinet** | 60x22½ | 296.86 | 310.16 | 318.28 | 331.58 | 384 |
| **5-100-T, with Cabinet** | 60x22½ | 296.76 | 310.06 | 318.18 | 331.48 | 385 |
| **5-100-TS, with Cabinet** | 60x22½ | 304.66 | 317.96 | 326.08 | 339.38 | 386 |
| **5-100, Sink Only, less all trim** | 60x22½ | 118.60 | 131.90 | 118.60 | 131.90 | 240 |
| **No. 6022 Cabinet Only** | 60x21¾ | 146.06 | — | 167.48 | — | 135 |
| **5-103 or 5-106, with Cabinet** | 42x22½ | 215.60 | 224.90 | 231.20 | 240.50 | 262 |
| **5-103-S or 5-106-S, with Cabinet** | 42x22½ | 223.10 | 232.40 | 238.70 | 248.00 | 263 |
| **5-103-T or 5-106-T, with Cabinet** | 42x22½ | 223.00 | 232.30 | 238.60 | 247.90 | 264 |
| **5-103-TS or 5-106-TS, with Cabinet** | 42x22½ | 230.90 | 240.20 | 246.50 | 255.80 | 265 |
| **5-103 or 5-106, Sink Only, less all trim** | 42x22½ | 83.00 | 92.30 | 83.00 | 92.30 | 160 |
| **No. 4222-L or No. 4222-R Cabinet Only** | 42x21¾ | 107.90 | — | 123.50 | — | 96 |

For aerator on spout..... **Add $1.72**
For 8-324 ¼" tailpieces.... ...**Per Pair. Add .44**
For SB Utility Basket ..... **Add 3.52**
For CT Cutlery Tray.... .... **Add 3.22**
For STR Towel Rack..... **Add $12.00**
For CB Cutting Board..... ..... **Add 5.02**
If less 8-361 waste.. ..... **Each, Deduct 6.38**

*For sink traps and supply pipes, refer to Section 8. For waste disposal units, refer to Pages 5-24 to 5-27.*

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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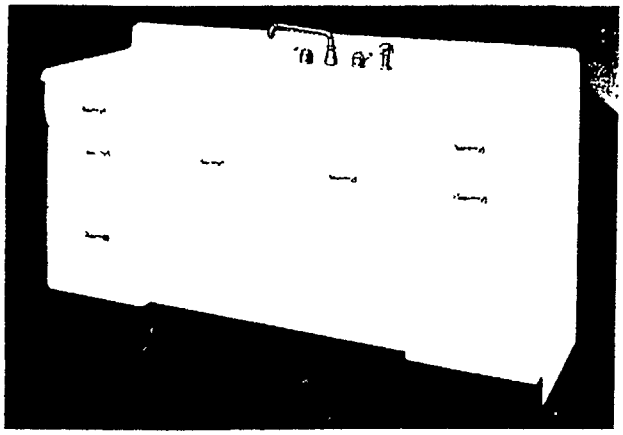
# ALLIANCEWARE PORCELAIN ENAMELED FORMED METAL CABINET SINKS



## 5-117-S ALLIANCEWARE

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal two-compartment ledge sink with back, depressed drainboards and two soap depressions.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 6640 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

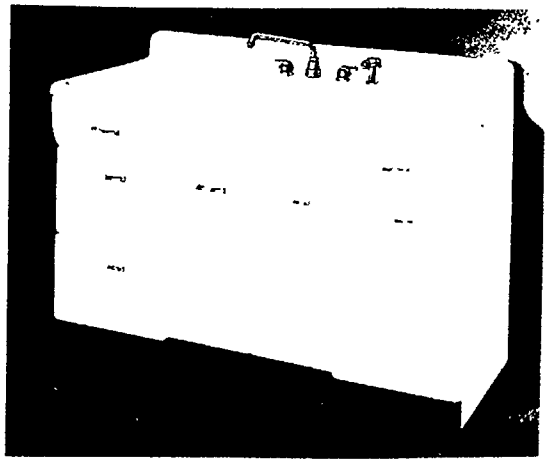
## 5-117 ALLIANCEWARE

Same, except with 8-84 **Embassy** supply fitting, less hose and spray, with 8-650 faucet hole cover. (Specify 8-84-A if with aerator.)

***Note: Sink supplies and traps are not included.***

**Overall Dimensions**

Sink.....66x25" Each basin...15x17½x8" Height of back...4"
Cabinet...66x24⅝" Height....34½" (sets sink 36" floor to top of rim)



## 5-118-S ALLIANCEWARE

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal single compartment ledge sink with back, depressed drainboards and soap depression.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

## 5-118 ALLIANCEWARE

Same, except with 8-84 **Embassy** supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

***Note: Sink supplies and traps are not included.***

**Overall Dimensions**

Sink.....54x25" Basin.....20x17½x7" Height of back...4"
Cabinet..54x24⅝" Height....34½" (sets sink 36" floor to top of rim)

No. 5440 and 6640 **CRANE** cabinets for **AllianceWare** sinks are arranged to accommodate the following accessories, when specified:

**SB** Utility Basket — **STR** Sliding Towel Rack
**CT** Plastic Cutlery Tray — **CB** Hardwood Cutting Board

***Refer to Page 5-16 for illustrations and descriptions.***

**All exposed metal trim is chromium plated**

## TRANSPORTATION CHARGES ON SINK CABINETS

(*See Page 5-3 for details*)

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|
| **5-117, with Cabinet** | **$268.72** | **$290.10** | 286 |
| **5-117-S, with Cabinet** | **275.78** | **297.16** | 286 |
| **5-117, Sink Only, less all trim** | **94.00** | **94.00** | 101 |
| **No. 6640 Cabinet Only** | **143.18** | **164.56** | 176 |
| **5-118, with Cabinet** | **216.22** | **236.40** | 257 |
| **5-118-S, with Cabinet** | **223.72** | **243.90** | 257 |
| **5-118, Sink Only, less all trim** | **58.90** | **58.90** | 80 |
| **No. 5440 Cabinet Only** | **132.60** | **152.78** | 163 |

For aerator on spout.....Add $1.72
For **8-324** ¼" male tailpieces.....Per Pair, Add .44
For **SB** Utility Basket.....Add 3.52
For **CT** Plastic Cutlery Tray.....Add 3.22
For **STR** Sliding Towel Rack.....Add 12.00
For **CB** Hardwood Cutting Board.....Add 5.02
If less **8-361** waste.....Each, Deduct 6.38

***For sink traps, supply pipes and continuous wastes, refer to Section 8. For waste disposal units, refer to Pages 5-24 to 5-27.***

*Prices are subject to change without notice.*

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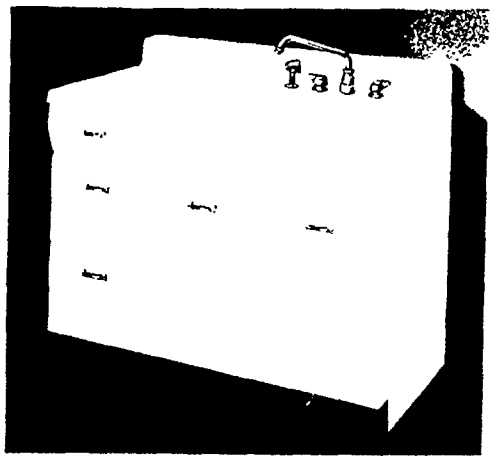
## ALLIANCEWARE FORMED METAL CABINET SINKS



**5-121-S, with Left Hand Drainboard**
**5-122-S, with Right Hand Drainboard**

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal single compartment ledge sink with back, depressed drainboard and soap depression.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

**5-121, with Left Hand Drainboard**
**5-122, with Right Hand Drainboard**

Same, except with 8-84 **Embassy** supply fitting less hose and spray. (Specify 8-84-A if with aerator.)

*Refer to Page 5-16 for illustrations and descriptions.*

**Overall Dimensions**

Sink..... 42x25" Basin....20x17½x7" Height of back....4"
Cabinet....42x24 5/16" Height..34½" (sets sink 36" floor to top of rim)

No. 4240 **CRANE** cabinet for **AllianceWare** sink is arranged to accommodate the following accessories, when specified:

**SB** Utility Basket — **STR** Sliding Towel Rack
**CT** Plastic Cutlery Tray — **CB** Hardwood Cutting Board

*Refer to Page 5-16 for illustrations and descriptions.*

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|
| **5-121 or 5-122, with Cabinet** | $180.52 | $194.78 | 190 |
| **5-121-S or 5-122-S, with Cabinet** | 188.02 | 202.28 | 190 |
| **5-121 or 5-122 Sink Only, less all trim** | 58.30 | 58.30 | 63 |
| **No. 4240-L or No. 4240-R Cabinet Only** | 97.58 | 111.76 | 120 |

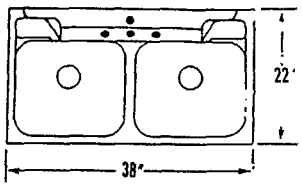
For aerator on spout..... **Add $1.72**
For **8-324** ¼" male tailpieces..... **Per Pair, Add .44**
For **SB** Utility Basket..... **Add 3.52**
For **CT** Plastic Cutlery Tray..... **Add 3.22**
For **STR** Sliding Towel Rack..... **Add 12.00**
For **CB** Hardwood Cutting Board..... **Add 5.02**
If less **8-361** waste..... **Deduct 6.38**

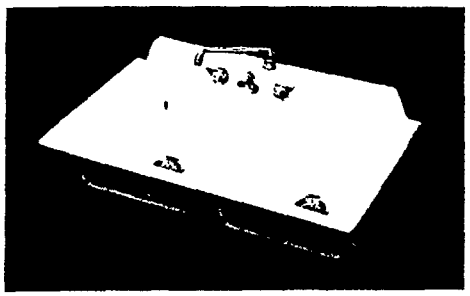
*For sink traps, supply pipes and continuous wastes, refer to Section 8.*

## ALL AMERICAN CAST IRON SINKS

*For Building into Fabricated Tops*

The overall size, large and deep twin basins, low height integral back, and wide flat rims of the **All American** are features that make it a most desirable style for building into fabricated sink tops. In addition, the beveled fixture panel is a feature found only in the most modern styles of **CRANE** sinks. The sink ends are offset to provide a more attractive and water tight in-installation. It is a practical design for use with Formica, Textolite, Micarta, linoleum or other covering materials for fabricated countertop installations.



**5-124-S ALL AMERICAN**

Sink: **All American** acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back, beveled fixture panel and two soap depressions, for counter top installation.

Trim: 8-60 **Temple** *Dial-ese* swinging spout, two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

*Note: Sink supplies and traps are not included.*

**Overall Dimensions**

Size....38x22" Each Basin....17x15½x8" Height of back.. 4"

**All American** sinks are available with alternate **Temple** supply fittings as described on Page 5-3. To order, specify catalog numbers as follows:

5-124 —with 8-62 or 8-62-A fitting.
5-124-T —with 8-68 or 8-68-A fitting.
5-124-TS—with 8-66 or 8-66-A fitting.

**HUDEE stainless steel sink frames, for use with All American sinks, are illustrated on Page 5-21.**

PRICES COMPLETE, less supplies and traps

| Catalog Number | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|
| **5-124** | $134.92 | $145.28 | 160 |
| **5-124-S** | 141.60 | 152.02 | 161 |
| **5-124-T** | 143.70 | 154.12 | 162 |
| **5-124-TS** | 150.38 | 160.80 | 163 |

For aerator on spout..... **Add $1.80**
For **8-324** ¼" male tailpieces..... **Per Pair, Add .44**
If less **8-361** wastes..... **Each, Deduct 6.38**

*For waste disposal units, refer to Pages 5-24 to 5-27.*



*Prices are subject to change without notice.*
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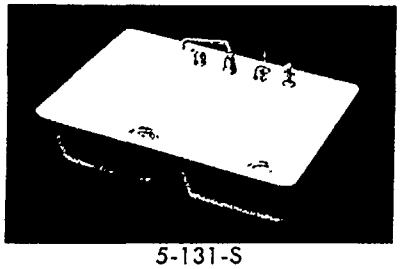
## CAST IRON FLAT RIM SINKS



5-131-S

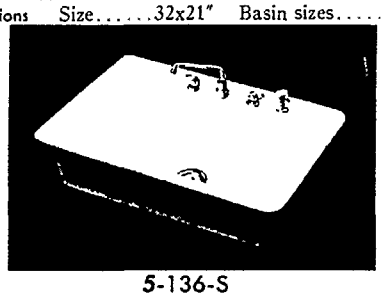
Sink: Acid-resisting porcelain enameled cast iron two-compartment flat rim sink with extended back ledge and two soap depressions.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

***Note: Sink supplies, traps and continuous wastes are not included.***

**Overall Dimensions** Size.....32x21" Basin sizes.....14½x15½x8"



5-136-S

Sink: Acid-resisting porcelain enameled cast iron flat rim sink with extended back ledge and *two soap depressions.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

***Note: Sink supplies and trap are not included.***

**Overall Dimensions:** Size.....24x21" Basin size.....21½x15½x8"
Size.....30x21" Basin size.....27½x15½x8"
*24x21" size does not have soap depressions.

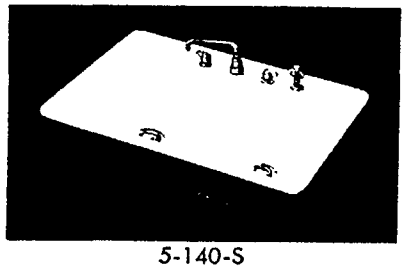
Cast iron flat rim sinks are available with alternate **Embassy** supply fittings as illustrated on Page 5–5; to order (specify catalog number as follows):

| Two Basin | | Single Basin |
|---|---|---|
| 5-131 | —with 8-84 or 8-84-A fitting— | 5-136 |
| 5-131-T | —with 8-85 or 8-85-A fitting— | 5-136-T |
| 5-131-TS | —with 8-89 or 8-89-A fitting— | 5-136-TS |

PRICES COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 5-131 | 32x21 | $107.32 | $115.72 | 113 |
| 5-131-S | 32x21 | 114.82 | 123.22 | 114 |
| 5-131-T | 32x21 | 114.68 | 123.08 | 114 |
| 5-131-TS | 32x21 | 122.62 | 131.02 | 115 |
| 5-131, Ware Only | 32x21 | 76.20 | 84.60 | 105 |
| 5-136 | 24x21 | 70.12 | 75.08 | 81 |
| | 30x21 | 78.08 | 84.00 | 101 |
| 5-136-S | 24x21 | 77.62 | 82.58 | 82 |
| | 30x21 | 85.58 | 91.50 | 102 |
| 5-136-T | 24x21 | 77.48 | 82.50 | 82 |
| | 30x21 | 85.50 | 91.42 | 102 |
| 5-136-TS | 24x21 | 85.42 | 90.38 | 83 |
| | 30x21 | 93.38 | 99.30 | 103 |
| 5-136, Ware Only | 24x21 | 45.38 | 50.40 | 75 |
| | 30x21 | 53.40 | 59.32 | 95 |

## FORMED METAL FLAT RIM SINKS



5-140-S

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal two-compartment flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

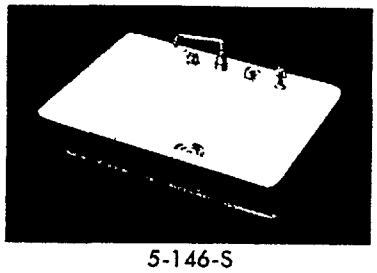
Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

***Note: Sink supplies, traps, and continuous wastes are not included.***

5-140

Same except with 8-84 **Embassy** supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

**Overall Dimensions:** Size .....32x21" Basin Sizes 14½x14x8"



5-146-S

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

***Note: Sink supplies and trap are not included.***

5-146

Same except with 8-84 **Embassy** supply fitting, less hose and spray. (Specify 8-84-A if with aerator.)

**Overall Dimensions:** Size.....24x21" Basin Size.....20⅞x14⅞x8"
Size.....30x21" Basin Size.....26⅞x14⅞x8"

PRICE COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | Price, Each White | Shpg. Wt. Pounds |
|---|---|---|---|
| 5-140 | 32x21 | $76.50 | 47 |
| 5-140-S | 32x21 | 84.00 | 48 |
| 5-140, Ware Only | 32x21 | 45.38 | 39 |
| 5-146 | 24x21 | 48.22 | 37 |
| | 30x21 | 51.52 | 43 |
| 5-146-S | 24x21 | 55.72 | 38 |
| | 30x21 | 59.02 | 44 |
| 5-146, Ware Only | 24x21 | 23.48 | 29 |
| | 30x21 | 26.78 | 35 |

For aerator on spout..... Add $1.72
For 8-324 ¼" male tailpieces..... Per Pair, Add .44
If less 8-361 waste.....Each, Deduct 6.38

*For sink traps and continuous wastes, refer to Section 8.*
*For waste disposal units, refer to Pages 5-24 to 5-27.*
*For HUDEE stainless steel sink frames, refer to Page 5-23.*

*Prices are subject to change without notice.*

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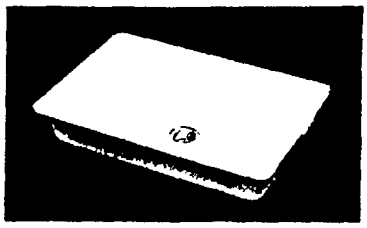
## PORCELAIN ENAMELED CAST IRON



5-150

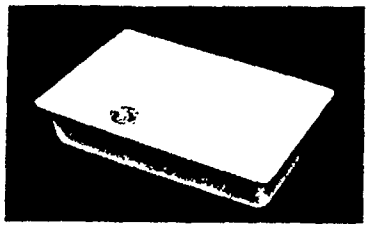
Sink: Acid-resisting porcelain enameled cast iron flat rim center outlet sink.

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

**Overall Dimensions**

| | |
|---|---|
| Sizes...24x20" | Basin Sizes...21½x17½x6" |
| 30x20" | 27½x17½x6" |



5-155

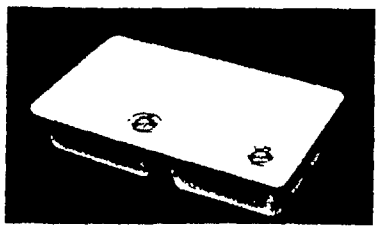
Sink: Acid-resisting porcelain enameled cast iron flat rim end outlet sink.

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

**Overall Dimensions**

| | |
|---|---|
| Sizes...24x18" | Basin Sizes...21½x15½x6" |
| 24x20" | 21½x17½x6" |
| 30x18" | 27½x15½x6" |
| 30x20" | 27½x17½x6" |



5-160

Sink: Acid-resisting porcelain enameled cast iron two-compartment flat rim sink with center outlets.

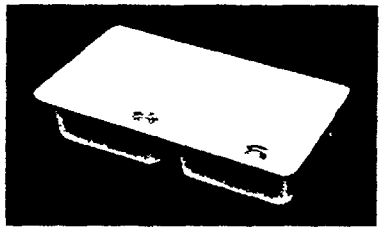
Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

*Note: Sink traps are not included.*

**Overall Dimensions**

| | |
|---|---|
| Sizes....32x20" | Basin Sizes....14x17½x8" |
| 42x20" | 19x17½x8" |

## PORCELAIN ENAMELED FORMED METAL



5-165

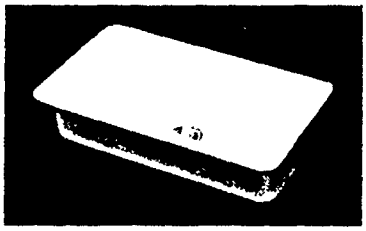
Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal two-compartment flat rim sink with center outlets.

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

*Note: Sink traps are not included.*

**Overall Dimensions**

Size.....32x18" Basin Sizes.....13 7/16x14x8"



5-168

Sink: **AllianceWare** white acid-resisting porcelain enameled formed metal center outlet sink.

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

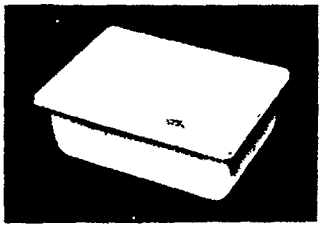
*Note: Sink trap is not included.*

**Overall Dimensions**

| | |
|---|---|
| Sizes...24x18" | Basin Sizes...20⅞x14⅞x8" |
| 30x18" | 26⅞x14⅞x8" |

## DURACLAY

*Earthenware, Vitreous Glazed*



5-180

Sink: **Duraclay**, earthenware vitreous glazed, flat rim center outlet sink.

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

*Note: Sink trap is not included.*

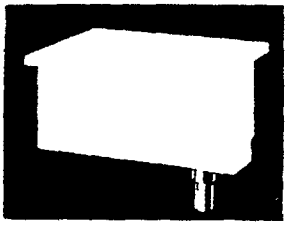
**Overall Dimensions**

| | |
|---|---|
| Sizes..20x18" | Basin Sizes 16⅛x14x6½" |
| 24x18" | 21x15x8" |

**HUDEE stainless steel sink frames are available for porcelain enameled cast iron and formed metal sinks—refer to Page 5-23 for details.**

## VITREOUS CHINA

For Installation Under Countertops



5-186

Sink: Vitreous china end outlet flat rim sink with integral overflow. (Top of rim is unglazed, for installation under countertop.)

Waste: 8-353 P.O. plug with perforated open strainer and 1½" tailpiece.

*Note: Sink trap is not included.*

**Overall Dimensions**

| | |
|---|---|
| Sink Sizes.....12x8" | Basin Sizes..... 9x5x5" |
| 15x12" | 12¼x9¼x6" |
| 20x14" | 17x11x8" |

**All exposed metal trim is chromium plated.**

### PRICES COMPLETE, less traps

| Catalog Number | Size, Inches | Price, Each White | Price, Each Color | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 5-150 | 24x20 | $35.26 | $38.40 | 57 |
| | 30x20 | 41.26 | 45.08 | 82 |
| 5-155 | 24x18 | 33.90 | 36.90 | 52 |
| | 24x20 | 35.26 | 38.40 | 57 |
| | 30x18 | 37.28 | 40.66 | 72 |
| | 30x20 | 40.20 | 43.88 | 80 |
| 5-160 | 32x20 | 70.72 | 77.18 | 120 |
| | 42x20 | 88.28 | 96.76 | 145 |
| 5-165 | 32x18 | 52.88 | — | 39 |
| 5-168 | 24x18 | 24.90 | — | 30 |
| | 30x18 | 29.56 | — | 34 |
| 5-180 | 20x18 | 38.70 | 54.82 | 62 |
| | 24x18 | 47.40 | 67.88 | 82 |
| 5-186 | 12x8 | 33.68 | — | 30 |
| | 15x12 | 42.08 | — | 36 |
| | 20x14 | 60.38 | — | 47 |

If less **8-361** waste. .....Each, Deduct $6.38
If less **8-353** waste. .....Each, Deduct 4.50

*For sink traps and continuous wastes, refer to Section 8.*

*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

# CRANE BASE AND WALL CABINETS

Crane base and wall cabinets are made of high quality, welded steel construction. Proper bracing and extra heavy gussets at strategic points provide strength and sturdiness.

A new baked on white enamel finish, conforming to the N.E.M.A. standard for white color on kitchen appliances, matches the new white color now being furnished on Crane porcelain enameled cast iron sinks. This new color also matches the white color on AllianceWare porcelain enameled formed metal sinks.

Cabinet drawers are of maximum capacity, operate smoothly and quietly and can be removed easily for cleaning. Drawer fronts are double faced, die formed with rounded edges—have internal bracing for strength and rigidity and are fitted with sound deadening pads and rubber bumpers for quietness. Bottoms are also die formed, with roll rims and embossed paneling for sturdiness.

Drawer wheels are self-lubricating and have Neoprene tires that roll easily and quietly on die formed interlocking rails. Built-in stops hold drawers in a firm, closed position.

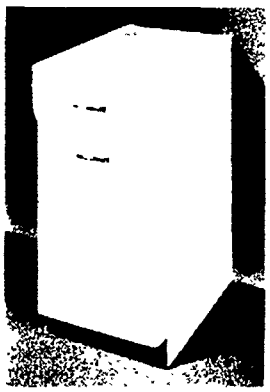
Doors are die-formed, double faced with rounded edges. Concealed sound deadening pads and rubber bumpers assure quietness. Toggle spring hinges hold doors firmly in fully opened or fully closed positions.

Base cabinets have fully enclosed, flat backs and recessed toe base with black finish.

Wall cabinets have fully enclosed, flat backs and are installed flush against the wall. A recessed hanger pocket near the top at back, fits over a bar type hanger, to hold cabinet securely against the wall. Holes, for wall screws, are also provided and may be used when conditions will not permit the use of the regular bar type hangers. Bottoms are recessed from below and can be furnished with snap-in bottoms when flush bottom cabinets are specified. Shelves are adjustable.

Exposed hardware is modern design, chromium plated. Wall cabinets have a concealed finger recess at the bottom of doors.

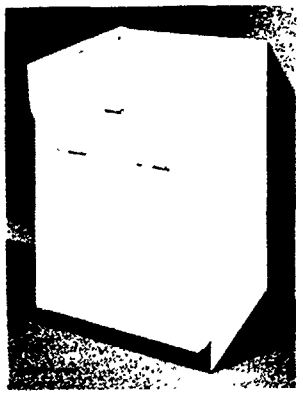
## CRANE BASE CABINETS



### No. 15C-L or No. 15C-R

CRANE baked white enamel steel base cabinet, 34½" high, with one shallow roller drawer, and cupboard with one stationary shelf; door hinged at left or right.

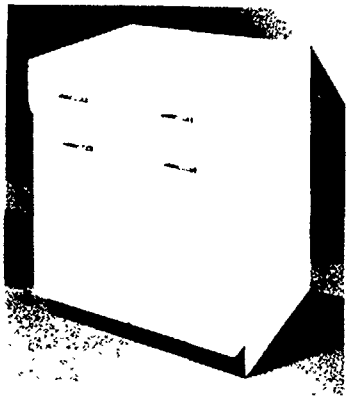
| Catalog Number | Size, Inches Width | Size, Inches Depth | Door Hinge |
|---|---|---|---|
| 15C-L | 15 | 24 5/16 | L.H. |
| 15C-R | 15 | 24 5/16 | R.H. |
| 18C-L | 18 | 24 5/16 | L.H. |
| 18C-R | 18 | 24 5/16 | R.H. |
| 1522-L | 15 | 21¾ | L.H. |
| 1522-R | 15 | 21¾ | R.H. |
| 1822-L | 18 | 21¾ | L.H. |
| 1822-R | 18 | 21¾ | R.H. |



### No. 21C

CRANE baked white enamel steel base cabinet, 34½" high, with one shallow roller drawer and cupboard with one stationary shelf; double doors hinged at outside ends.

| Cat. No. | Size, Inches Width | Size, Inches Depth | Cat. No. | Size, Inches Width | Size, Inches Depth |
|---|---|---|---|---|---|
| 21C | 21 | 24 5/16 | 2122 | 21 | 21¾ |
| 24C | 24 | 24 5/16 | 2422 | 24 | 21¾ |
| 27C | 27 | 24 5/16 | | | |



### No. 30C

CRANE baked white enamel steel base cabinet, 34½" high, with two shallow roller drawers, and cupboard with one stationary shelf; double doors hinged at outside ends.

| Catalog Number | Size, Inches Width | Size, Inches Depth |
|---|---|---|
| 30C | 30 | 24 5/16 |
| 36C | 36 | 24 5/16 |

The drawers in 15" and 30" wide cabinets will accommodate the CT Plastic Cutlery Tray and CB Hardwood Cutting Board.

## TRANSPORTATION CHARGES ON KITCHEN CABINETS

(See Page 5-3 for details)

PRICE, EACH

| Catalog Number | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds | Catalog Number | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds | Catalog Number | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15C-L or 15C-R | $49.50 | $56.62 | 58 | 21-C | $61.20 | $67.12 | 68 | 2122 | $63.16 | $72.30 | 63 |
| 18C-L or 18C-R | 52.12 | 59.40 | 62 | 24-C | 63.82 | 72.68 | 74 | 2422 | 66.82 | 76.66 | 69 |
| 1522-L or 1522-R | 52.12 | 59.56 | 52 | 27-C | 67.12 | 76.72 | 82 | 30C | 71.86 | 82.66 | 93 |
| 1822-L or 1822-R | 55.66 | 63.60 | 55 | — | — | — | — | 36C | 81.08 | 91.50 | 105 |

For CT Plastic Cutlery Tray . . . . . Add $3.22 For CB Hardwood Cutting Board. . . . . Add $5.02

*Prices are subject to change without notice.*

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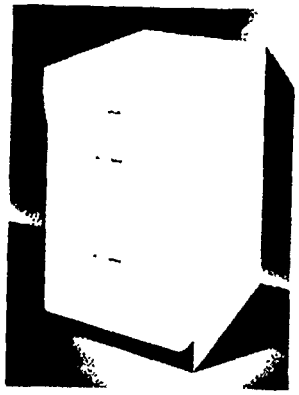
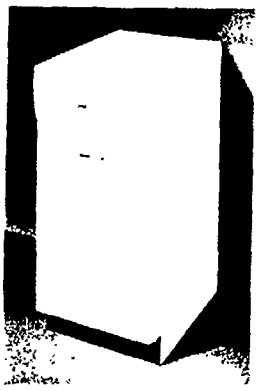
## CRANE BASE CABINETS



18D

CRANE baked white enamel steel base cabinet, 34½" high, with one shallow roller drawer and two deep roller drawers.

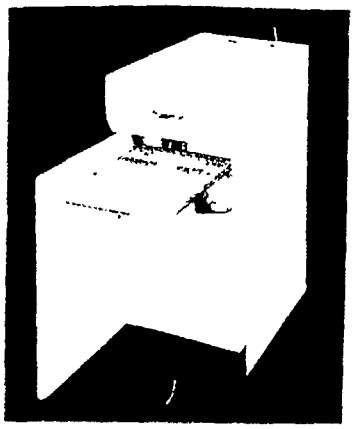
| Catalog Number | Size, Inches Width | Depth | Catalog Number | Size, Inches Width | Depth |
|---|---|---|---|---|---|
| 15D | 15 | 24 5/16 | 1522D | 15 | 21¾ |
| 18D | 18 | 24 5/16 | 1822D | 18 | 21¾ |



15M Mixer Cabinet

CRANE baked white enamel steel mixer base cabinet, 34½" high, with one shallow roller drawer and cupboard with 11x14" spring actuated lift-up mixer platform; door hinged at left.

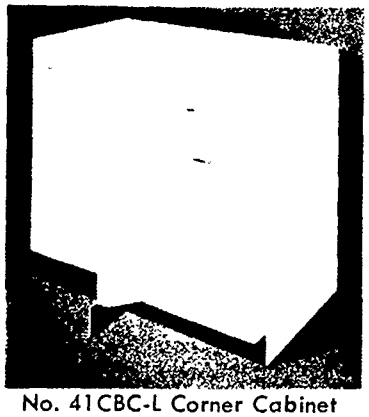
| Catalog Number | Size, Inches Width | Depth |
|---|---|---|
| 15M | 15 | 24 5/16" |



15M Mixer Cabinet, Open View

Mixer platform, in open position, extends 39" from wall and 25¼" above floor. Spring tension counter balance is adjustable to three positions.

## CRANE EXTENDED CORNER BASE CABINETS



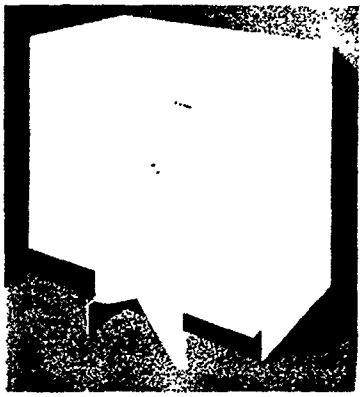
No. 41CBC-L Corner Cabinet

No. 41CBC-L, Left Hand Corner
No. 41CBC-R, Right Hand Corner

CRANE baked white enamel steel extended corner base cabinet, 34½" high, with one shallow roller drawer and cupboard with full length stationary shelf, one door hinged at inside edge, and one CBF corner filler piece.

| Catalog Number | Corner | Size, Inches Width | Depth |
|---|---|---|---|
| 41CBC-L | L.H. | 36 | 21¾ |
| 41CBC-R | R.H. | 36 | 21¾ |

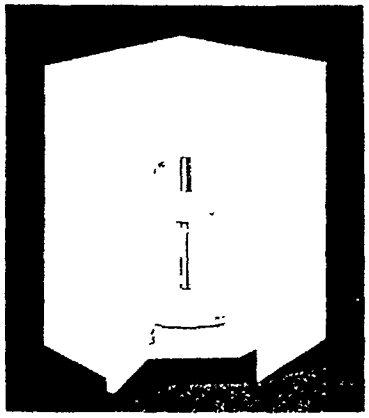
Note: The CBF corner base filler is always furnished with corner cabinets—this filler is needed to provide clearance for hardware, doors and drawers when additional base cabinets are to be installed at right angles to the corner cabinet.



No. 41CBC-L, Open View

## CRANE CORNER BASE CABINET

With Revolving Shelves



No. 31RCB

No. 31RCB

CRANE baked white enamel steel corner base cabinet, 34½" high, with two adjustable revolving shelves; door hinged at left side.

| Catalog Number | Width of Sides | Width of Backs |
|---|---|---|
| 31RCB | 17 1/16" | 23¾" |

Note. Shelves have turned up edges with roll rims and revolve on a ball bearing shaft.

The drawers in 15" wide cabinets and extended corner base cabinets will accommodate the CT Plastic Cutlery Tray and the CB Hardwood Cutting Board.

### TRANSPORTATION CHARGES ON KITCHEN CABINETS

(See Page 5-3 for details)

PRICE EACH

| Catalog Number | Size, Inches | Price, Each ZONE 1 | ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| 15D | 15x24 5/16 | $65.78 | $71.86 | 71 |
| 18D | 18x24 5/16 | 72.00 | 81.60 | 77 |
| 1522D | 15x21¾ | 71.70 | 81.68 | 67 |
| 1822D | 18x21¾ | 76.36 | 86.86 | 73 |
| 15M | 15x24 5/16 | 83.56 | 94.20 | 70 |
| 41CBC-L | 36x21¾ | 85.96 | 99.82 | 99 |
| 41CBC-R | 36x21¾ | 85.96 | 99.82 | 99 |
| 31RCB | 17 1/16x23¾ | 84.22 | 92.62 | 67 |

For CT Plastic Cutlery Tray... Add $3.22
For CB Hardwood Cutting Board....Add 5.02



Prices are subject to change without notice.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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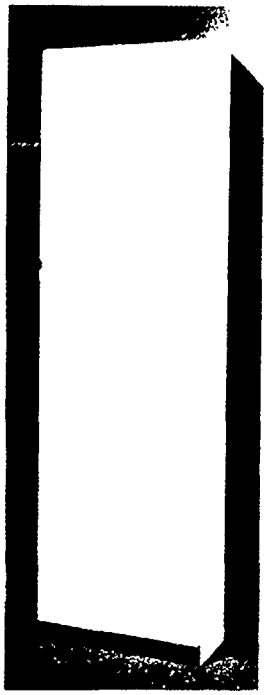
## CRANE BROOM AND UTILITY CABINETS



No. 2181B
Broom Cabinet

### No. 2181B Broom Cabinet

CRANE baked white enamel steel broom cabinet, 81″ high, with two adjustable shelves, broom clamps and hooks.

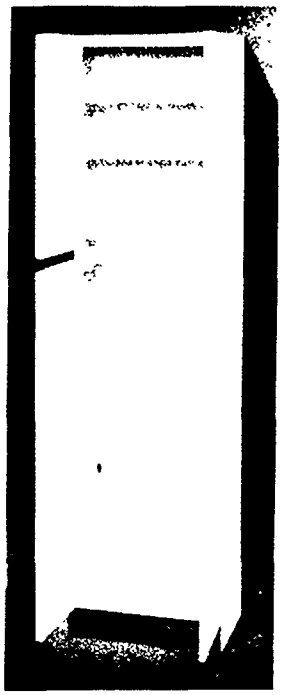
| Catalog Number | Size, Inches Width | Depth | Height |
|---|---|---|---|
| 2181B | 21 | 13 | 81 |

Broom cabinets conform to the general design and dimensions of wall cabinets. They are 13″ deep and the upper doors match the height of 30″ high wall cabinets. Toe base is flush with cabinet frame and is directly behind the doors.

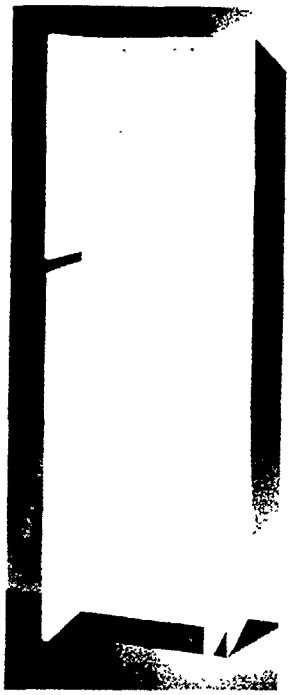
Two shelves, adjustable on 2″ centers, are furnished. The lower compartment is fitted with clamps and hooks for broom and mop storage.

### Converts to Utility Cabinet with UTIPAC Conversion Kit

Each No. 2181B broom cabinet can be converted to a Utility Cabinet by ordering UTIPAC conversion kits. These kits consist of four additional baked white enamel steel shelves which are to be installed in the lower compartment. All shelves are adjustable on 2″ spacings.

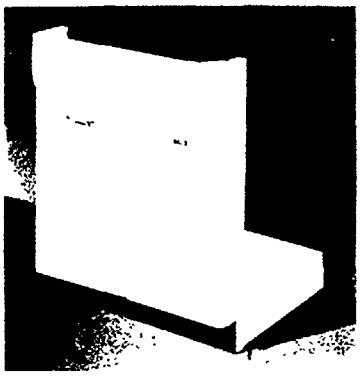


Broom Cabinet
Open View



Open View
after Conversion
to Utility Cabinet

## CRANE SINK FRONTS AND SINK FRONT RETURNS



No. 24SF Sink Front

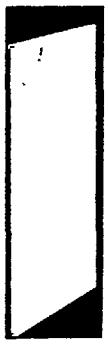
### SINK FRONTS

CRANE baked white enamel steel sink front, 34½″ high, with separate extended bottom and recessed toe base.

| Catalog Number | Size, Inches Width | Depth |
|---|---|---|
| 24SF | 24 | 24 5/16 |
| 27SF | 27 | 24 5/16 |
| 30SF | 30 | 24 5/16 |
| 36SF | 36 | 24 5/16 |

Note: No. 36SF Sink front has a two-piece divided upper panel. All other sizes have a continuous single panel.

Sink fronts conform to the design and dimensions of base cabinets and have side returns for attaching to adjoining cabinet. They are used to enclose built-in countertop sinks; may be used singly or in pairs for enclosing built-in surface cooking units.



SFR Return

### SFR Sink Front Returns

CRANE baked white enamel steel sink front return.

**Size:** 18 5/16″ wide x 34½″ high

Sink front returns are flanged on four sides and can be attached to sink front, countertop, wall and floor. They are reversible and may be used at left or right side of sink front. They enclose the exposed side opening of a sink front at the end of a base cabinet ensemble.

## TRANSPORTATION CHARGES ON KITCHEN CABINETS

*(See Page 5-3 for details)*

PRICE, EACH

| Catalog Number | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds | Catalog Number | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|
| 2181B | 21x81x13 | $92.26 | $98.26 | 112 | 24SF | 24x24 5/16 | $41.92 | $46.80 | 42 |
| 2181B, complete with UTIPAC | 21x81x13 | 105.22 | 116.10 | 115 | 27SF | 27x24 5/16 | 43.66 | 49.66 | 46 |
| | | | | | 30SF | 30x24 5/16 | 45.68 | 52.20 | 51 |
| | | | | | 36SF | 36x24 5/16 | 47.56 | 54.82 | 56 |
| UTIPAC only | — | 12.98 | 17.86 | 3 | SFR | 18 5/16 wide | 9.46 | 11.40 | 10 |

*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

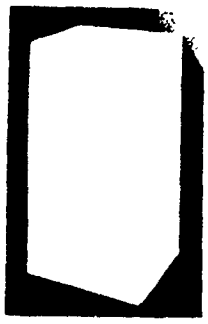
February 28, 1955
*Superseding August 17, 1953*

# CRANE WALL CABINETS

Crane wall cabinets are made with recessed bottoms and have protruding buttons for holding snap-in bottoms. Snap-in bottoms are furnished when flush bottom cabinets are desired.

All wall cabinets (except 12⅛" and 15⅛" high) have adjustable shelves.

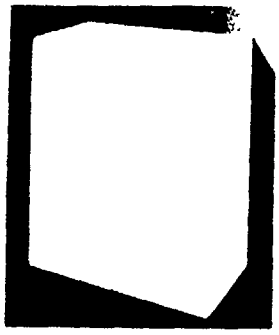
The recommended installed height is 81" from floor to top of cabinet. This height conforms to F.H.A. requirements for effective height of shelving. It also conforms with the overall height of the No. 2181B Broom Cabinet.



No. 1530-L or R

CRANE baked white enamel steel wall cabinet, 13" deep, with two adjustable shelves and concealed hanger; door hinged at left or right end.

| Catalog Number | Size, Inches Width | Height | Hinged at End |
|---|---|---|---|
| 1530-L | 15 | 30⅛ | L.H. |
| 1530-R | 15 | 30⅛ | R.H. |
| 1830-L | 18 | 30⅛ | L.H. |
| 1830-R | 18 | 30⅛ | R.H. |

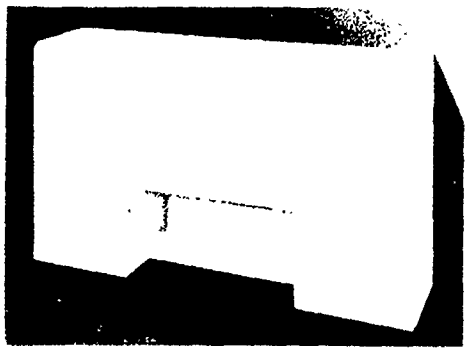


No. 2130

CRANE baked white enamel steel wall cabinet, 13" deep, with two adjustable shelves and concealed hanger; double doors hinged at outside ends.

| Catalog Number | Size, Inches Width | Height |
|---|---|---|
| 2130 | 21 | 30⅛ |
| 2430 | 24 | 30⅛ |
| 2730 | 27 | 30⅛ |
| 3030 | 30 | 30⅛ |
| 3630 | 36 | 30⅛ |

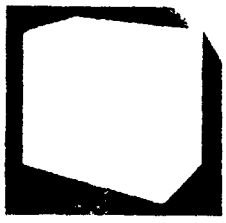
Combination Wall Cabinet



No. 5430W

CRANE baked white enamel steel combination wall cabinet, consisting of two 15x30⅛" and one 24x18⅛" cabinets with adjustable shelves; open shelf, backing plate and concealed hangers.

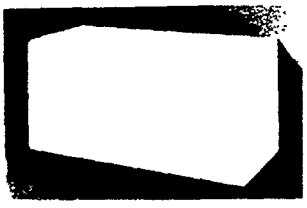
| Catalog Number | Overall Size, Inches Width | Depth | Height |
|---|---|---|---|
| 5430W | 54 | 13. | 30⅛ |



No. 2118

CRANE baked white enamel steel wall cabinet, 13" deep, with one adjustable shelf and concealed hanger; double doors hinged at outside ends.

| Catalog Number | Size, Inches Width | Height |
|---|---|---|
| 2118 | 21 | 18⅛ |
| 2418 | 24 | 18⅛ |
| 3018 | 30 | 18⅛ |
| 3618 | 36 | 18⅛ |

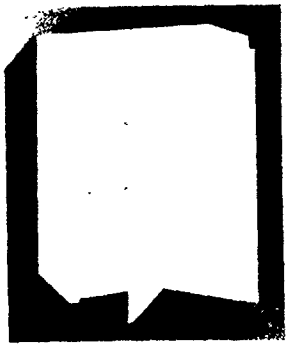


No. 3612

CRANE baked white enamel steel wall cabinet, 13" deep, with concealed hanger; double doors hinged at outside ends.

| Catalog Number | Size, Inches Width | Height |
|---|---|---|
| 3612 | 36 | 12⅛ |
| 3615 | 36 | 15⅛ |

Blank Corner Wall Cabinet



No. 24BCW, Open View

CRANE baked white enamel steel blank corner wall cabinet, 13" deep, with two adjustable shelves and concealed hanger; double doors are hinged at center of cabinet.

Catalog Number..... **24BCW** Width.....24" Height.....30⅛"

## TRANSPORTATION CHARGES ON KITCHEN CABINETS

*(Refer to Page 5-3 for details)*

PRICE, EACH

| Catalog Number | Sizes, Inches | Price, Each ZONE 1 | ZONE 2 | Shpg. Wt. Pounds | Catalog Number | Sizes, Inches | Price, Each ZONE 1 | ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|
| 1530-L or R | 15x30⅛ | $31.72 | $36.52 | 38 | 2118 | 21x18⅛ | $32.10 | $36.38 | 31 |
| 1830-L or R | 18x30⅛ | 35.56 | 40.80 | 41 | 2418 | 24x18⅛ | 34.36 | 39.30 | 36 |
| 2130 | 21x30⅛ | 39.46 | 45.90 | 48 | 3018 | 30x18⅛ | 37.12 | 42.76 | 41 |
| 2430 | 24x30⅛ | 42.00 | 48.52 | 52 | 3618 | 36x18⅛ | 43.42 | 49.36 | 48 |
| 2730 | 27x30⅛ | 45.38 | 52.66 | 57 | 3612 | 36x12⅛ | 43.42 | 49.36 | 36 |
| 3030 | 30x30⅛ | 47.62 | 55.42 | 61 | 3615 | 36x15⅛ | 43.42 | 49.36 | 46 |
| 3630 | 36x30⅛ | 54.22 | 63.52 | 69 | 5430W | 54x30⅛ | 88.42 | 101.40 | 99 |
| | | | | | 24BCW | 24x30⅛ | 42.00 | 48.52 | 53 |



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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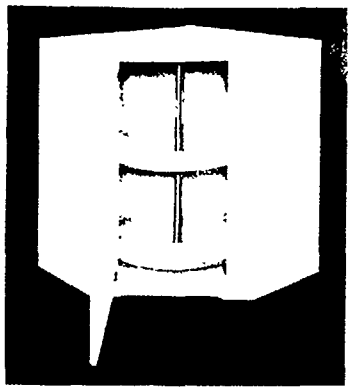
## CRANE CORNER WALL CABINETS



No. R30CW, Open View

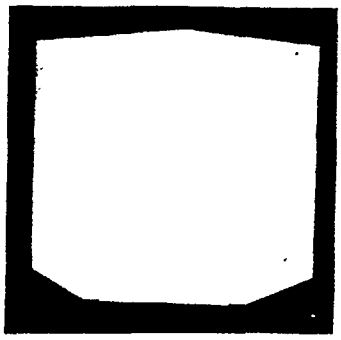
**No. R30CW, *With Revolving Shelves***
CRANE baked white enamel steel corner wall cabinet, 30⅛" high, with two adjustable, revolving shelves and concealed hangers; door hinged at left.

| Catalog Number | Width of backs | Depth at sides |
|---|---|---|
| R30CW | 25" | 13" |

Shelves have turned up edges with roll rims—they revolve on a ball bearing shaft.

**No. 30CW, *with Adjustable Shelves***
CRANE baked white enamel steel corner wall cabinet, 30⅛" high, with two adjustable shelves and concealed hangers; door hinged at left.

| Catalog Number | Width of backs | Depth at sides |
|---|---|---|
| 30CW | 25" | 13" |



No. 30CW

### TRANSPORTATION CHARGES ON SINK CABINETS

*(See Page 5-3 for details)*

PRICE EACH

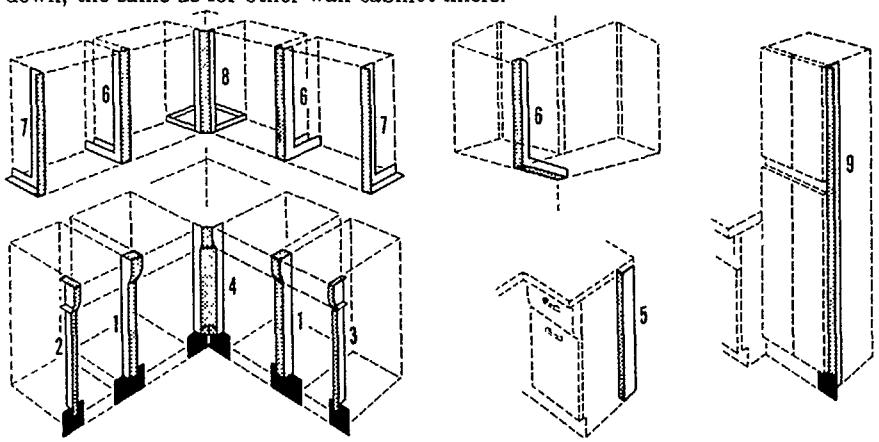
| Catalog Number | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| R30CW | 25x30⅛ | $87.76 | $95.92 | 70 |
| 30CW | 25x30⅛ | 58.12 | 66.46 | 73 |

## FILLER PIECES FOR CRANE KITCHEN CABINETS

Filler pieces are die formed with curved contours and rounded edges to match the contours of Crane cabinets. They are installed flush with the front of doors and drawers.

Base cabinet filler pieces have a white baked enamel vertical piece and black toe plate.

Vertical and horizontal pieces for wall cabinets have a white baked enamel finish. Corner filler pieces for wall cabinets are installed with the flat bottom piece face down, the same as for other wall cabinet fillers.

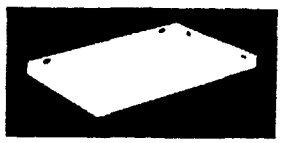



FILLERS—Sizes and Applications

| Symbol | Catalog Number | Type of Filler | Size, Inches Width | Size, Inches Height |
|---|---|---|---|---|
| FOR BASE CABINETS | | | | |
| 1 | IBF-1 | Inside | 1 | 34½ |
| 1 | IBF-2 | Inside | 2 | 34½ |
| 2 | SBF-L | Scribe | 3 | 34½ |
| 3 | SBF-R | Scribe | 3 | 34½ |
| 4 | CBF | Corner | 11/16x11/16 | 34½ |
| 5 | 7½RCB | Scribe | 7½ | 34½ |
| FOR WALL CABINETS | | | | |
| 6 | IWF-18-1 | Inside | 1 | 18⅛ |
| 6 | IWF-18-2 | Inside | 2 | 18⅛ |
| 6 | IWF-30-1 | Inside | 1 | 30⅛ |
| 6 | IWF-30-2 | Inside | 2 | 30⅛ |
| 7 | SWF-12 | Scribe | 3 | 12⅛ |
| 7 | SWF-18 | Scribe | 3 | 18⅛ |
| 7 | SWF-30 | Scribe | 3 | 30⅛ |
| 8 | CWF-18 | Corner | 14x14 | 18⅛ |
| 8 | CWF-30 | Corner | 14x14 | 30⅛ |
| FOR BROOM CABINETS | | | | |
| 9 | SF81 | Scribe | 3 | 81 |

## SNAP-IN BOTTOMS

Snap in bottoms have elongated holes to match the protruding buttons in the recessed bottoms of cabinets.



CRANE baked white enamel steel snap-in bottom.

| Catalog Number | Size, Inches | For Cabinets Numbered |
|---|---|---|
| B-15 | 15x13 | 1530-L or R; 5430W-2 |
| B-18 | 18x13 | 1830-L or R |
| B-21 | 21x13 | 2118; 2130 |
| B-24 | 24x13 | 2418; 2430; 24BCW; 5430W-1 |
| B-27 | 27x13 | 2730 |
| B-30 | 30x13 | 3018; 3030 |
| B-36 | 36x13 | 3612; 3615; 3618; 3630 |
| B-CW | 25x25 | 30CW; R30CW |

PRICE, EACH

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds | Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|
| B-15 | 15x13 | $5.62 | 3 | CBF | 11/16x11/16x34½ | $11.48 | 4 |
| B-18 | 18x13 | 5.78 | 3½ | 7½RCB | 7½x34½ | 7.36 | 3 |
| B-21 | 21x13 | 6.60 | 3½ | IWF-18-1 | 1x18⅛ | 5.70 | [illegible] |
| B-24 | 24x13 | 6.90 | 4 | IWF-18-2 | 2x18⅛ | 5.70 | [illegible] |
| B-27 | 27x13 | 7.66 | 4½ | IWF-30-1 | 1x30⅛ | 5.70 | [illegible] |
| B-30 | 30x13 | 8.26 | 5 | IWF-30-2 | 2x30⅛ | 5.70 | [illegible] |
| B-36 | 36x13 | 8.48 | 7½ | SWF-12 | 3x12⅛ | 5.70 | 1 |
| B-CW | 25x25 | 11.26 | 8½ | SWF-18 | 3x18⅛ | 5.70 | [illegible] |
| IBF-1 | 1x34½ | 5.70 | 2½ | SWF-30 | 3x30⅛ | 5.70 | 3 |
| IBF-2 | 2x34½ | 5.70 | 3 | CWF-18 | 14x14x18⅛ | 11.48 | 4½ |
| SBF-L | 3x34½ | 5.70 | 2½ | CWF-30 | 14x14x30⅛ | 11.48 | [illegible] |
| SBF-R | 3x34½ | 5.70 | 2½ | SF-81 | 3x81 | 17.26 | 6½ |

*Prices are subject to change without notice.*

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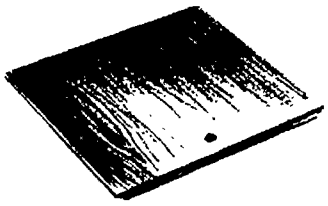
# ACCESSORIES FOR CRANE KITCHEN CABINETS

**CT Cutlery Tray**
White plastic cutlery tray.

Can be used in drawers of 15" and 30" wide base cabinets.

Size, Inches.....11 5/8x12 5/8x1 5/16



**CB Cutting Board**
Hardwood cutting board.

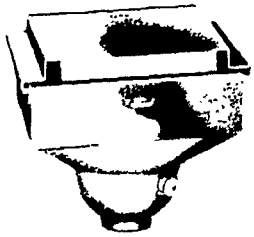
Can be used in drawers of 15" and 30" wide base cabinets.

Size, Inches.....11 3/4x11 3/4x 1/2

**BBC Bread Drawer Cover**
Sheet tin bread drawer sliding cover.

Can be used in drawers of 15" and 30" wide base cabinets.

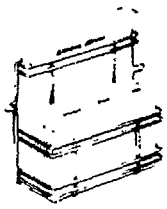
Size, Inches.....11 15/16x19 1/2



**SFB Flour Dispenser**
Sheet tin flour dispenser with crank handle sifter and screws.

Attaches to underside of shelf in wall cabinets; slides in and out of cabinet.

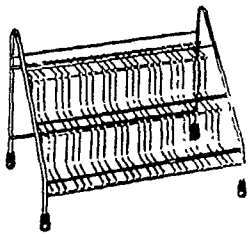
Size, Inches.....11x10 1/8x9 1/2



**RF Recipe Card Rack**
Bright zinc plated recipe card rack, with screws, 100 3x5" ruled cards with guides and two memo pads.

Attaches to inside of wall cabinet doors.

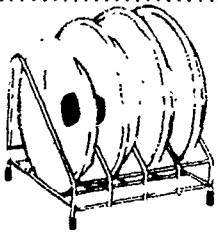
Size, Inches.....6 3/4x2 1/4x4 1/4



**WCR Step Shelf**
Bright zinc plated condiment step shelf, with rubber tipped feet.

Stored on shelf in wall cabinet.

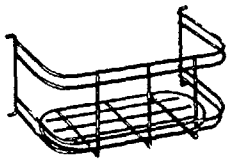
Size, Inches.....10 1/4x8 1/4x7 3/4



**LF Pan Rack**
Bright zinc plated cake pan and lid rack, with rubber tipped feet.

Stored on shelf in wall cabinet or base cabinet.

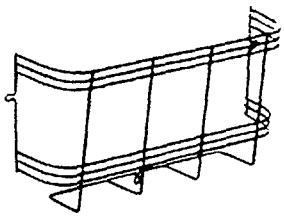
Size, Inches.....8 3/4x8 1/4x7 3/4



**SB Utility Basket**
Bright zinc plated utility basket, snap-in attachment prongs.

Attaches to inside of base cabinet doors.

Size, Inches.....8 1/8x3 3/8x3 7/8



**LR-12 Lid Rack**
Bright zinc plated lid rack, with screws.

Attaches to inside of base cabinet doors.

LR-12 Size, Inches.....12 3/8x3x7
LR-16 Size, Inches.....16 1/4x3x7

**STR Sliding Towel Rack**
Cadmium plated sliding towel rack, with clip-on attachment prongs.

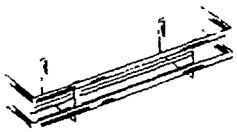
Attaches to inside partition of undersink cabinets.

Size, Inches.....16x4 1/2x2

**CH-17 Cup Hook Rack**
Cadmium plated cup hook rack, with attachment adhesive.

Attaches to underside of shelf in wall cabinets.

CH-17 Length, Inches...17 No. of Hooks..6
CH-20 Length, Inches...20 No. of Hooks..6
CH-23 Length, Inches...23 No. of Hooks..8



**CR Condiment Rack**
Cadmium plated condiment rack, with screws.

Attaches to inside of door on wall cabinets.

Size, Inches.....9 1/2x3x2

## PRICE, EACH

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds |
|---|---|---|---|
| BBC | 11 15/16x19 1/2 | $3.76 | 1/4 |
| CB | 11 3/4x11 3/4x1/2 | 5.02 | 1 3/8 |
| CH17 | 17 | 3.16 | 1/4 |
| CH20 | 20 | 3.38 | 1/3 |
| CH23 | 23 | 3.52 | 1/3 |
| CR | 9 1/2x3x2 | 3.52 | 3/4 |
| CT | 11 5/8x12 5/8x1 5/16 | 3.22 | 1 1/2 |
| LF | 8 3/4x8 1/4x7 3/4 | 5.40 | 2 1/4 |
| LR12 | 12 3/8x3x7 | 3.22 | 3/4 |
| LR16 | 16 1/4x3x7 | 3.38 | 3/4 |
| RF | 6 3/4x2 1/4x4 1/4 | 4.88 | 1 1/2 |
| SB | 8 1/8x3 3/4x3 7/8 | 3.52 | 1/2 |
| SFB | 11x10 1/8x9 1/2 | 12.38 | 1 1/4 |
| STR | 16x4 1/2x2 | 12.00 | 5 1/2 |
| WCR | 10 1/4x8 1/4x7 3/4 | 5.62 | - |

*Prices are subject to change without notice.*



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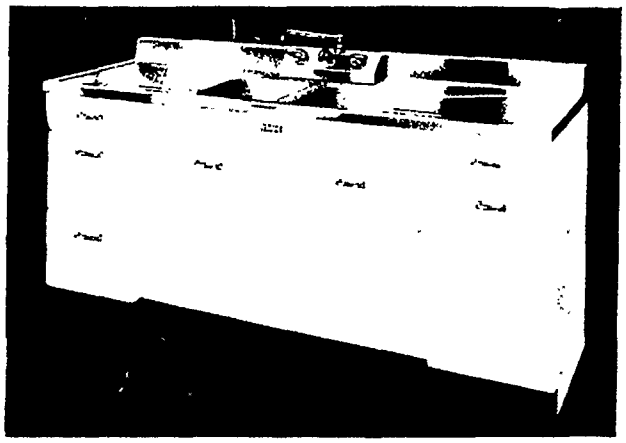
# LUSTERTONE STAINLESS STEEL CABINET SINKS



## 5-221-S KITCHEN QUEEN, Stainless Steel

Sink: **Kitchen Queen** Lustertone stainless steel two-compartment sink with back, drainboards, beveled fixture panel and concealed wall clips.
Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with stoppers and 1½" tailpieces.
Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

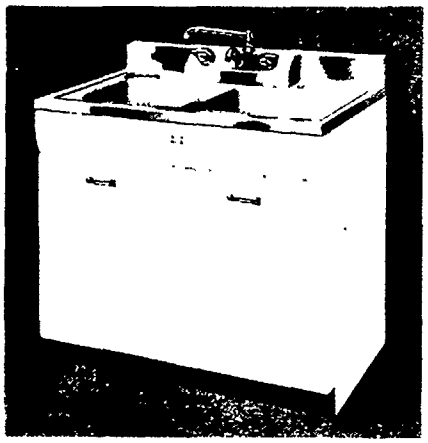
***Note: Sink traps are not included.***

## 5-221 KITCHEN QUEEN, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator.)

**Overall Dimensions**

Sink.....72x25" Each Basin...16x13½x7½" Height of back...4"
Cabinet...72x24 5/16" Height...34½" (sets sink 36" floor to top of rim)



## 5-223-S KITCHEN PRIDE, Stainless Steel

Sink: **Kitchen Pride** Lustertone stainless steel two-compartment sink with back, beveled fixture panel and concealed wall clips.
Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with stoppers and 1½" tailpieces.
Cabinet: No. 3800 **CRANE** baked white enamel steel cabinet with sink clamps.

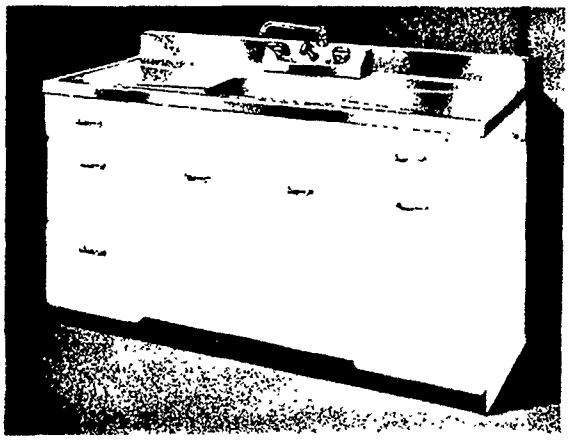
***Note: Sink traps are not included.***

## 5-223 KITCHEN PRIDE, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator.)

**Overall Dimensions**

Sink 38x25" Each Basin...16x13½x7½" Height of back .4"
Cabinet. 38x24 5/16" Height...34½" (sets sink 36" floor to top of rim)



## 5-225-S SUNNYDAY, Stainless Steel

Sink: **Sunnyday** Lustertone stainless steel single compartment sink with back, drainboards, beveled fixture panel and concealed wall clips.
Trim: 8-60 **Temple** *Dial-ese* swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A if with aerator.)
Waste: LK-35 **Duo** basket strainer with stopper and 1½" tailpiece.
Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink trap is not included.***

## 5-225 SUNNYDAY, Stainless Steel

Same, except with 8-62 **Temple** supply fitting, less spray, with cover plate. (Specify 8-62-A if with aerator.)

**Overall Dimensions**

| Sink | Basin | Back | Cabinet | Cabinet Height | Sink, floor to rim |
|---|---|---|---|---|---|
| 54x25" | 16x18x7½" | 4" | 54x24 5/16" | 34½" | 36" |
| 60x25" | 16x18x7½" | 4" | 60x24 5/16" | 34½" | 36" |

Cabinets are arranged to accommodate the following accessories, when specified:
Nos. 7240, 5440 or 6040—**SB** Utility Basket; **CT** Cutlery Tray; **CB** Hardwood Cutting Board and **STR** Sliding Towel Rack.
No. 3800—**SB** Utility Basket.

***Refer to Page 5-16 for illustrations and descriptions.***

## TRANSPORTATION CHARGES ON SINK CABINETS

(*See Page 5-3 for details*)

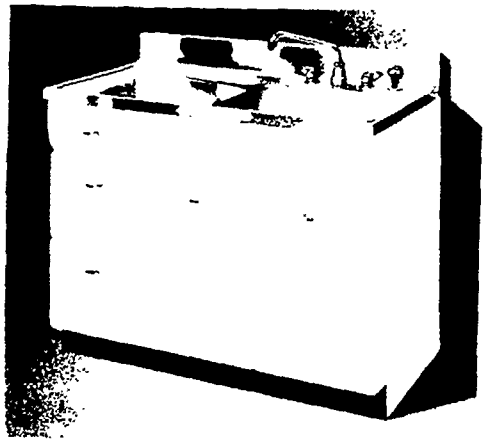
### PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| **5-221, with Cabinet** | 72x25 | **$545.26** | **$570.52** | 300 |
| **5-221-S, with Cabinet** | 72x25 | **551.96** | **577.22** | 301 |
| **No. 7240 Cabinet Only** | 72x24 5/16 | **168.46** | **193.72** | 182 |
| **5-223, with Cabinet** | 38x25 | **487.26** | **496.12** | 148 |
| **5-223-S, with Cabinet** | 38x25 | **493.96** | **502.82** | 149 |
| **No. 3800 Cabinet Only** | 38x24 5/16 | **68.70** | **77.56** | 95 |
| **5-225, with Cabinet** | 54x25 | **431.88** | **452.06** | 241 |
| | 60x25 | **446.26** | **466.96** | 264 |
| **5-225-S, with Cabinet** | 54x25 | **438.58** | **458.76** | 242 |
| | 60x25 | **452.96** | **473.66** | 265 |
| **No. 5440 Cabinet Only** | 54x24 5/16 | **132.60** | **152.78** | 163 |
| **No. 6040 Cabinet Only** | 60x24 5/16 | **137.78** | **158.48** | 169 |

For aerator on spout.....**Add $1.80**
For **8-324** ¼" male tailpieces.....**Per Pair, Add .44**
For **SB** Utility Basket.....**Add 3.52**
For **CT** Plastic Cutlery Tray.....**Add 3.22**
For **STR** Sliding Towel Rack.....**Add 12.00**
For **CB** Hardwood Cutting Board.....**Add 5.02**
If less **LK-35** strainers.....**Each, Deduct 4.88**

***For traps and supply pipes, refer to Section 8.***

# LUSTERTONE STAINLESS STEEL CABINET SINKS



**5-229-S, with Left Hand Drainboard**
**5-230-S, with Right Hand Drainboard**

Sink: **Lustertone** stainless steel single compartment ledge sink with back, drainboard and wall clips.

Trim: 8-88 **Embassy** *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

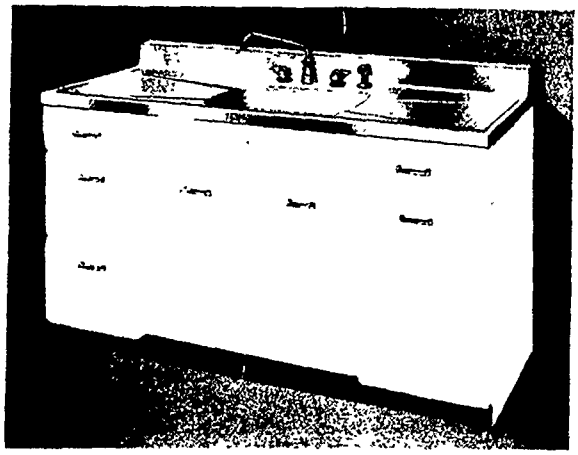
***Note: Sink trap is not included.***

**5-229, with Left Hand Drainboard**
**5-230, with Right Hand Drainboard**

Same, except with 8-84 **Embassy** supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

**Overall Dimensions**

Sink.....42x25" Basin...13½x16x7½" Height of back...4"
Cabinet....42x24 5/16" Height...34½" (sets sink 36" floor to top of rim)



**5-231-S**

Sink: **Lustertone** stainless steel single compartment ledge sink with back, drainboards and wall clips.

Trim: 8-88 **Embassy** *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink), No. 6040 (for 60" sink), No. 6640 (for 66" sink) or No. 7240 (for 72" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink trap is not included.***

**5-231**

Same, except with 8-84 **Embassy** supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

**Overall Dimensions**

| Sink Size | Basin Size | Sink Back | Cabinet Size | Cabinet Height, |
|---|---|---|---|---|
| *54x25" | 18x16" or 20x18" | 4" | 54x24 5/16" | 34½" (sets sink rim 36" from floor) |
| *60x25" | 18x16" or 20x18" | 4" | 60x24 5/16" | |
| 66x25" | 18x16" | 4" | 66x24 5/16" | |
| *72x25" | 18x16" or 20x18" | 4" | 72x24 5/16" | |

Depth of basins 7½" *When ordering specify sink size and basin size.

Cabinets are arranged to accommodate the following accessories, when specified:
SB Utility Basket CB Hardwood Cutting Board CT Plastic Cutlery Tray STR Sliding Towel Rack

**TRANSPORTATION CHARGES ON SINK CABINETS** (*See Page 5-3 for details*)

**PRICES COMPLETE, less supplies and traps**

| Catalog Number and Description | Size, Inches | Basin Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| **5-229 or 5-230, with Cabinet** | 42x25 | 13½x16x7½ | $265.14 | $279.32 | 170 |
| **5-229-S or 5-230-S, with Cabinet** | 42x25 | 13½x16x7½ | 272.64 | 286.82 | 171 |
| **5-231, with Cabinet** | 54x25 | 18x16x7½ | 334.20 | 354.38 | 234 |
| | 54x25 | 20x18x7½ | 349.36 | 369.54 | 234 |
| | 60x25 | 18x16x7½ | 349.80 | 370.50 | 245 |
| | 60x25 | 20x18x7½ | 364.96 | 385.66 | 245 |
| | 66x25 | 18x16x7½ | 369.60 | 390.98 | 257 |
| | 72x25 | 18x16x7½ | 397.66 | 422.92 | 268 |
| | 72x25 | 20x18x7½ | 412.82 | 438.08 | 268 |
| **5-231-S, with Cabinet** | 54x25 | 18x16x7½ | 341.70 | 361.88 | 235 |
| | 54x25 | 20x18x7½ | 356.86 | 377.04 | 235 |
| | 60x25 | 18x16x7½ | 357.30 | 378.00 | 246 |
| | 60x25 | 20x18x7½ | 372.46 | 393.16 | 246 |
| | 66x25 | 18x16x7½ | 377.10 | 398.48 | 258 |
| | 72x25 | 18x16x7½ | 405.16 | 430.42 | 269 |
| | 72x25 | 20x18x7½ | 420.32 | 445.58 | 269 |

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg.Wt. Pounds |
|---|---|---|---|---|
| **No. 4240-L Cabinet Only** | 42x24 5/16 | $97.58 | $111.76 | 120 |
| **No. 4240-R Cabinet Only** | 42x24 5/16 | 97.58 | 111.76 | 120 |
| **No. 5440 Cabinet Only** | 54x24 5/16 | 132.60 | 152.78 | 163 |
| **No. 6040 Cabinet Only** | 60x24 5/16 | 137.78 | 158.48 | 169 |
| **No. 6640 Cabinet Only** | 66x24 5/16 | 143.18 | 164.56 | 176 |
| **No. 7240 Cabinet Only** | 72x24 5/16 | 168.46 | 193.72 | 182 |

For aerator on spout..... **Add $1.72**
For **8-324** ¼" male tailpieces.....**Per Pair, Add .44**
For **SB** Utility Basket..... **Add 3.52**
For **CT** Plastic Cutlery Tray..... **Add 3.22**
For **STR** Sliding Towel Rack.....**Add 12.00**
For **CB** Hardwood Cutting Board.....**Add 5.02**
If less **LK-35** Strainers.....**Deduct 4.88**
If less 8-84 **Embassy** Trim (where described).....**Deduct 18.30**
If less 8-88 **Embassy** Trim (where described).**Deduct 25.80**

For sink traps and supplies, refer to Section 8. For cabinet accessories, refer to Page 5-16.



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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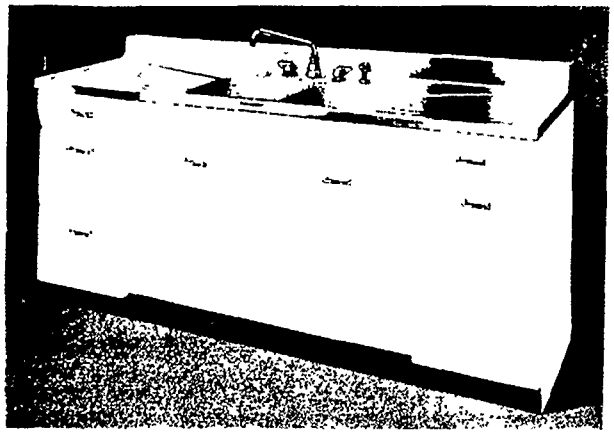
## LUSTERTONE STAINLESS STEEL CABINET SINKS



5-232-S

**5-232-S**

Sink: **Lustertone** stainless steel two-compartment ledge sink with back, drainboards and wall clips.
Trim: 8-88 **Embassy** *Dial-ese* ledge type swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpiece.
Cabinet: No. 6040 (for 60" sink), No. 6640 (for 66" sink) or No. 7240 for 72" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

*Note: Sink traps are not included.*

**5-232**

Same, except with 8-84 **Embassy** supply fitting less spray, and with snap-in faucet hole cover. (Specify 8-84-A if with aerator.)

**Overall Dimensions**

| Sink Size | Basin Sizes | Sink Back | Cabinet Size | Cabinet Height |
|---|---|---|---|---|
| 60x25" | 13½x16" | 4" | 60x24 5/16" | 34½" (sets |
| *66x25" | 13½x16" or 16x18" | 4" | 66x24 5/16" | sink rim 36" |
| *72x25" | 13½x16" or 16x18" | 4" | 72x24 5/16" | from floor |

Depth of basins....7½" *When ordering specify sink size and basin size.

### TRANSPORTATION CHARGES ON SINK CABINETS *(See Page 5-3 for details)*

PRICES COMPLETE, less supplies and traps

| Catalog Number and Description | Size, Inches | Basin Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 5-232, with Cabinet | 60x25 | 13½x16x7½ | $400.14 | $420.84 | 247 |
| | 66x25 | 13½x16x7½ | 414.76 | 436.14 | 259 |
| | 66x25 | 16x18x7½ | 452.64 | 474.02 | 259 |
| | 72x25 | 13½x16x7½ | 451.58 | 476.84 | 270 |
| | 72x25 | 16x18x7½ | 489.46 | 514.72 | 270 |
| 5-232-S, with Cabinet | 60x25 | 13½x16x7½ | 407.64 | 428.34 | 248 |
| | 66x25 | 13½x16x7½ | 422.26 | 443.64 | 260 |
| | 66x25 | 16x18x7½ | 460.14 | 481.52 | 260 |
| | 72x25 | 13½x16x7½ | 459.08 | 484.34 | 271 |
| | 72x25 | 16x18x7½ | 496.96 | 522.22 | 271 |

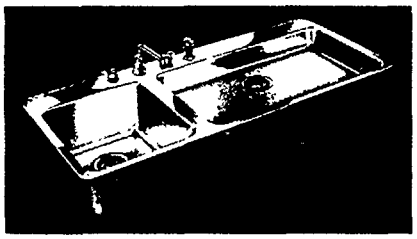
If less **8-84 Embassy** trim (where described).....**Deduct $18.30**

| Catalog Number and Description | Size, Inches | Price, Each ZONE 1 | Price, Each ZONE 2 | Shpg. Wt. Pounds |
|---|---|---|---|---|
| No. 6040 Cabinet Only | 60x24 5/16 | $137.78 | $158.48 | 169 |
| No. 6640 Cabinet Only | 66x24 5/16 | 143.18 | 164.56 | 175 |
| No. 7240 Cabinet Only | 72x24 5/16 | 168.46 | 193.72 | 182 |

For aerator on spout.....**Add $1.72**
For **8-324** ¼" male tailpieces.....**Per Pair, Add .44**
For **SB** Utility Basket.....**Add 3.52**
For **CT** Plastic Cutlery Tray.....**Add 3.22**
For **CB** Hardwood Cutting Board.....**Add 5.02**
For **STR** Sliding Towel Rack.....**Add 12.00**
If less **LK-35** Strainers.....**Each, Deduct 4.88**

If less **8-88 Embassy** trim (where described).....**Deduct $25.80**

## LUSTERTONE STAINLESS STEEL DEEP AND SIT-DOWN BOWL SINKS



**LS-3221-RS,**
**With Shallow Bowl at Right**

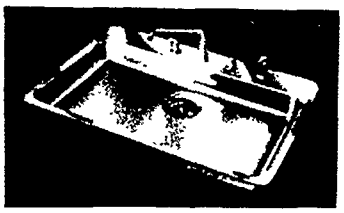
**LS-3221-LS,**
**With Shallow Bowl at Left**

Sink: **Lustertone** stainless steel two-compartment flat rim sink with extended back ledge, deep bowl and shallow "sit-down" bowl.
Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpieces.

*Note: Sink traps are not included.*

**LS-3221-R, with shallow bowl at right**
**LS-3221-L, with shallow bowl at left**

Same, except with 8-84 **Embassy** supply less spray. (Specify 8-84-A if with aerator.)



LS-1621-S

Sink: **Lustertone** stainless steel flat rim "sit-down" sink with extended back ledge.
Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)
Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

*Note: Sink trap is not included.*

**LS-1621**

Same, except with 8-84 **Embassy** supply less spray. (Specify 8-84-A if with aerator.)

PRICES COMPLETE, less supplies and traps

| Catalog Number | Overall Size, Inches | Deep Bowl, Inches | Shallow Bowl, Inches | Price, Each | Shpg. Weight Pounds | Add for Hudee Frame |
|---|---|---|---|---|---|---|
| LS-3221-R or L | 32x21 | 13½x16x7½ | 13½x16x3½ | $144.60 | 31 | $10.88 |
| LS-4021-R or L | 40x21 | 13½x16x7½ | 22x16x3½ | 155.32 | 33 | 20.92 |
| LS-4221-R or L | 42x21 | 18x16x7½ | 18x16x3½ | 153.90 | 35 | 12.16 |
| LS-4621-R or L | 46x21 | 13½x16x7½ | 28x16x3½ | 185.02 | 39 | 20.92 |
| LS-4821-R or L | 48x21 | 22x16x7½ | 22x16x3½ | 165.08 | 42 | 20.92 |
| LS-3221-RS or LS | 32x21 | 13½x16x7½ | 13½x16x3½ | 152.10 | 32 | 10.88 |
| LS-4021-RS or LS | 40x21 | 13½x16x7½ | 22x16x3½ | 162.82 | 34 | 20.92 |
| LS-4221-RS or LS | 42x21 | 18x16x7½ | 18x16x3½ | 161.40 | 36 | 12.16 |
| LS-4621-RS or LS | 46x21 | 13½x16x7½ | 28x16x3½ | 192.52 | 40 | 20.92 |
| LS-4821-RS or LS | 48x21 | 22x16x7½ | 22x16x3½ | 172.58 | 43 | 20.92 |

| Catalog Number | Overall Size, Inches | Bowl Size, Inches | Price, Each | Shpg. Weight Pounds | Add for Hudee Frame |
|---|---|---|---|---|---|
| LS-1621 | 16x21 | 13½x16x3½ | $84.22 | 19 | $10.36 |
| LS-2121 | 21x21 | 18x16x3½ | 89.10 | 21 | 10.58 |
| LS-2421 | 24x21 | 22x16x3½ | 94.96 | 22 | 10.12 |
| LS-3021 | 30x21 | 28x16x3½ | 124.66 | 23 | 10.58 |
| LS-1621-S | 16x21 | 13½x16x3½ | 91.72 | 20 | 10.36 |
| LS-2121-S | 21x21 | 18x16x3½ | 96.60 | 22 | 10.58 |
| LS-2421-S | 24x21 | 22x16x3½ | 102.46 | 23 | 10.12 |
| LS-3021-S | 30x21 | 28x16x3½ | 132.16 | 24 | 10.58 |

For aerator on spout. **Add $1.72** For **8-324** ¼" male tailpieces. **Per Pair, Add $.44** If less **LK-35** strainer.....**Deduct, Each $4.88**

*Prices are subject to change without notice.*

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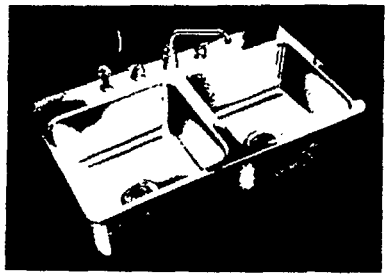
*February 28, 1955*
*Superseding October 8, 1952*

## LUSTERTONE STAINLESS STEEL FLAT RIM SINKS



L-2817-S

Sink: **Lustertone** stainless steel two-compartment flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

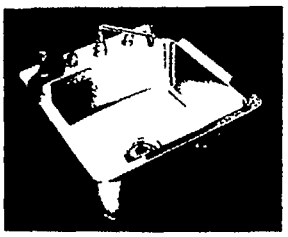
Wastes: Two LK-35 **Duo** basket strainers with 1½" tailpieces.

*Note: Sink traps are not included.*

### L-2817

Same, except with 8-84 **Embassy** supply fitting less spray. (Specify 8-84-A if with aerator.)

| Catalog Numbers | Overall Dimensions Size | Each Basin |
|---|---|---|
| L-2817 or L-2817-S | 28x17" | 12x12x7½" |
| L-3617 or L-3617-S | 36x17" | 16x11½x7½" |
| L-2821 or L-2821-S | 28x21" | 11½x16x7½" |
| L-3221 or L-3221-S | 32x21" | 13½x16x7½" |
| L-4221 or L-4221-S | 42x21" | 18x16x7½" |



L-1817-S

Sink: **Lustertone** stainless steel flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** *Dial-ese* ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A if with aerator.)

Waste: LK-35 **Duo** basket strainer with 1½" tailpiece.

*Note: Sink trap is not included.*

### L-1817

Same, except with 8-84 **Embassy** supply fitting, less spray. (Specify 8-84-A if with aerator.)

| Catalog Numbers | Overall Dimensions Size | Basin Size |
|---|---|---|
| L-1417 | 14x17" | 12x12" |
| L-1817 or L-1817-S | 18x17" | 16x11½" |
| L-1421 | 14x21" | 11½x16" |
| L-1621 | 16x21" | 13½x16" |
| L-2121 or L-2121-S | 21x21" | 18x16" |
| L-2421 or L-2421-S | 24x21" | 22x16" |
| L-3021 or L-3021-S | 30x21" | 28x16" |

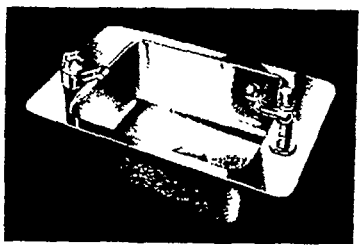
**Note:** L-1417, L-1421 and L-1621 are available only with 8-84 **Embassy** supply fitting less spray.

PRICES COMPLETE, less supplies and traps

| Catalog Number | Size, Inches | Price, Each | Shpg. Wt. Pounds | Add for Hudee Frame |
|---|---|---|---|---|
| L-2817 | 28x17 | $145.66 | 28 | $10.88 |
| L-3617 | 36x17 | 150.60 | 32 | 12.16 |
| L-2821 | 28x21 | 153.00 | 32 | 10.88 |
| L-3221 | 32x21 | 130.28 | 32 | 10.88 |
| L-4221 | 42x21 | 143.38 | 38 | 12.16 |
| L-2817-S | 28x17 | 153.16 | 29 | 10.88 |
| L-3617-S | 36x17 | 158.10 | 33 | 12.16 |
| L-2821-S | 28x21 | 160.50 | 33 | 10.88 |
| L-3221-S | 32x21 | 137.78 | 33 | 10.88 |
| L-4221-S | 42x21 | 150.88 | 39 | 12.16 |
| L-1417 | 14x17 | 81.98 | 21 | 10.36 |
| L-1817 | 18x17 | 84.46 | 22 | 10.36 |
| L-1421 | 14x21 | 85.66 | 23 | 10.36 |
| L-1621 | 16x21 | $78.68 | 20 | $10.36 |
| L-2121 | 21x21 | 83.10 | 23 | 10.58 |
| L-2421 | 24x21 | 88.42 | 24 | 10.12 |
| L-3021 | 30x21 | 115.42 | 26 | 10.88 |
| L-1817-S | 18x17 | 91.96 | 23 | 10.36 |
| L-2121-S | 21x21 | 90.60 | 24 | 10.58 |
| L-2421-S | 24x21 | 95.92 | 25 | 10.12 |
| L-3021-S | 30x21 | 122.92 | 27 | 10.88 |

For aerator on spout.....Add $1.72
For 8-324 ¼" male tailpieces.....Per Pair, Add .44
If less LK-35 strainer.....Each, Deduct 4.88
If less 8-88 Embassy trim (where described).....Deduct 25.80
If less 8-84 Embassy trim (where described).....Deduct 18.30

## LUSTERTONE STAINLESS STEEL DRINKING FOUNTAIN AND SINK COMBINATIONS



Stainless steel, one-piece Hudee sink frames are regularly furnished with corner clips and fastening lugs for ⅝" to ¾" thick countertops; specify if lugs are required for ⅞" to 1" thick countertops.

### DRK-2416

Fountain and Sink: **Lustertone** stainless steel flat rim drinking fountain and sink combination with wide ledge at right and left ends, each ledge drilled for single faucet.

Trim: 8-31 **Vantage** *Dial-ese* faucet; 748 **Naiad** push button self-closing, angle stream drinking fountain bubbler.

Waste: LK-35 **Duo** basket strainer with stopper and 1½" tailpiece.

*Note: Supplies and trap are not included.*

PRICES COMPLETE, less supplies and traps

| Catalog Number | Size, Inches Length | Size, Inches Width | Basin Size, Inches Length | Basin Size, Inches Width | Basin Size, Inches Depth | Shpg. Wt. Pounds | Price, Complete | Add for Hudee Frame |
|---|---|---|---|---|---|---|---|---|
| DRK-2416 | 24 | 16 | 16 | 13½ | 7½ | 21 | $114.18 | $10.12 |
| DRK-2421 | 24 | 21 | 16 | 18 | 7½ | 23 | 119.06 | 10.12 |
| DRK-2118 | 21½ | 18 | 13½ | 16 | 7½ | 20 | 114.18 | 10.58 |
| DRK-3018 | 30 | 18 | 22 | 16 | 7½ | 25 | 131.80 | 10.88 |

If less 8-31 Vantage faucet Deduct $6.70 If less 748 bubbler fitting Deduct $24.00

*Prices are subject to change without notice.*



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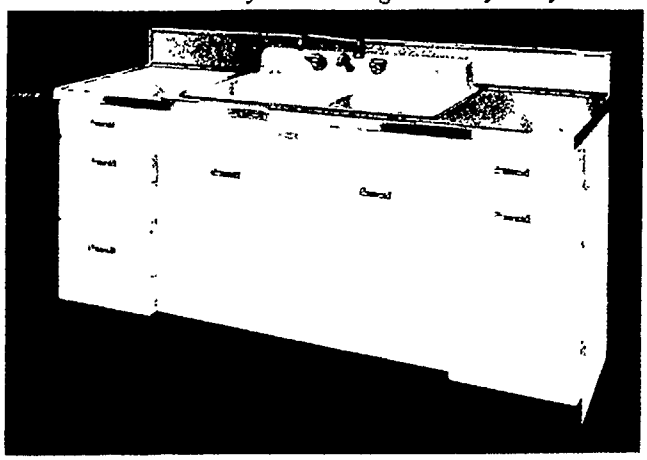
## CRANE FABRICATED SINK TOPS WITH FLAT RIM SINKS AND UNDERSINK CABINETS

All of the flat rim sinks described on preceding pages can be installed in a sink top assembly consisting of a wood core with **Formica** or similar laminated plastic coverings. In order to secure a satisfactory and lasting assembly for your customer, it is essential to have the **All-American** sink bowl assembled to the sink top at the factory. All other types of flat rim sinks are assembled to the sink top by the installing contractor.



**5-250-S**

Sink Top: **Formica** covered wood core fabricated sink top, 1½" thick, with double drainboard and 5" high back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-124-S 38x22" **All American** acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back, beveled fixture panel and two soap depressions.

Trim: 8-60 **Temple *Dial-ese*** swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-60-A, if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and trap are not included.***

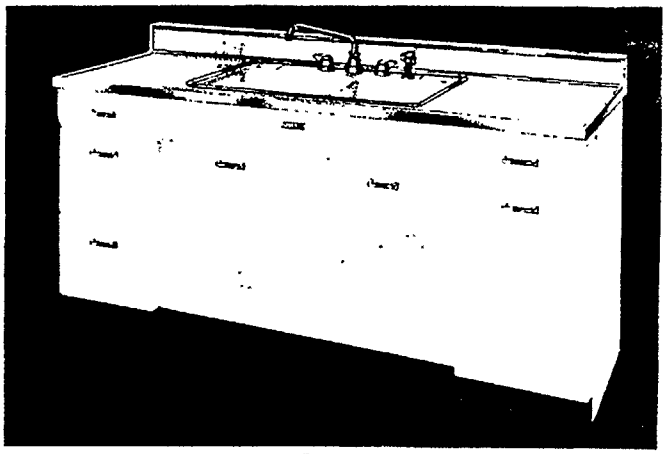
**Overall Dimensions**

Sink Top...72x25¼" Sink Bowl...38x22" Each Basin...17x15½x8"
Cabinet....72x24 5/16" Height...34½" (sets sink 36" floor to top of rim)

**ALTERNATE SINK TRIMMINGS**

| Unit No. | Trim Description |
|---|---|
| 5-250 | With 8-62 or 8-62-A **Temple** 2-valve supply, less spray |
| 5-250-T | With 8-68 or 8-68-A **Temple** 3-valve supply, less spray |
| 5-250-TS | With 8-66 or 8-66-A **Temple** 3-valve supply, with spray |

***Refer to Page 5-3 for illustrations.***



**5-251-S**

Sink Top: **Formica** covered wood core fabricated sink top, 1½" thick, with double drainboard and 4" high back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-131-S 32x21" acid-resisting porcelain enameled cast iron two-compartment flat rim sink with back ledge and two soap depressions.

Trim: 8-88 **Embassy *Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Wastes: Two 8-361 **Receptol** basket strainers with stoppers and 1½" tailpieces.

Cabinet: No. 7240 **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and traps are not included.***

**Overall Dimensions**

Sink Top..72x25¼" Sink Bowl..32x21" Each Basin..14¼x15½x8"
Cabinet...72x24 5/16" Height...34½" (sets sink 36" floor to top or rim)

**ALTERNATE SINK TRIMMINGS**

| Unit No. | Trim Description |
|---|---|
| 5-251 | 8-84 or 8-84-A **Embassy** 2-valve supply, less spray |
| 5-251-T | 8-85 or 8-85-A **Embassy** 3-valve supply, less spray |
| 5-251-TS | 8-89 or 8-89-A **Embassy** 3-valve supply, with spray |

***Refer to Page 5-5 for illustrations***

## TRANSPORTATION CHARGES ON SINK TOPS AND SINK CABINETS

**SINK TOPS—F.O.B. factory at Rensselaer, Indiana. All actual transportation costs from factory to delivery point will be added to prices shown.**

**SINK CABINETS—F.O.B. nearest distribution point. All actual transportation costs from distribution point to delivery point will be added to the cabinet prices shown. Consult your local Crane Branch or Crane Wholesaler for nearest distribution point.**

### PRICES COMPLETE, less supplies and traps

*†Color Prices include Colored Sink and White Cabinet*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| 5-250, with Cabinet | $424.20 | $434.56 | $449.46 | $459.82 | 416 |
| 5-250-S, with Cabinet | 430.88 | 441.28 | 456.14 | 466.54 | 417 |
| 5-250-T, with Cabinet | 432.98 | 443.40 | 458.24 | 468.66 | 417 |
| 5-250-TS, with Cabinet | 439.66 | 450.08 | 464.92 | 475.34 | 418 |
| No. 7240 Cabinet Only | 168.46 | — | 193.72 | — | 182 |

Approx. Shipping Weights—5-250 Top Only, 75 lbs.
5-124 Bowl Only, 150 lbs.

For aerator on spout **(Temple Trim)**.....**Add $1.80**
For **8-324** ¼" male tail pieces .....**Per Pair, Add .44**

*For Cabinet Accessories, Refer to Page 5-16.*

| Catalog Number and Description | ZONE 1 | | ZONE 2 | | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| | White | †Color | White | †Color | |
| 5-251, with Cabinet | $390.30 | $398.70 | $415.56 | $423.96 | 371 |
| 5-251-S, with Cabinet | 397.80 | 406.20 | 423.06 | 431.46 | 372 |
| 5-251-T, with Cabinet | 397.66 | 406.06 | 422.92 | 431.32 | 372 |
| 5-251-TS, with Cabinet | 405.60 | 414.00 | 430.86 | 439.26 | 373 |
| No. 7240 Cabinet Only | 168.46 | — | 193.72 | — | 182 |

Approx. Shipping Weights—5-251 Top Only, 75 lbs.
5-131 Bowl Only, 105 lbs.

For aerator on spout **(Embassy Trim)**.....**Add $1.72**
If less **8-361** wastes.....**Each, Deduct 6.38**

*For Sink Traps and Wastes, Refer to Section 8.*

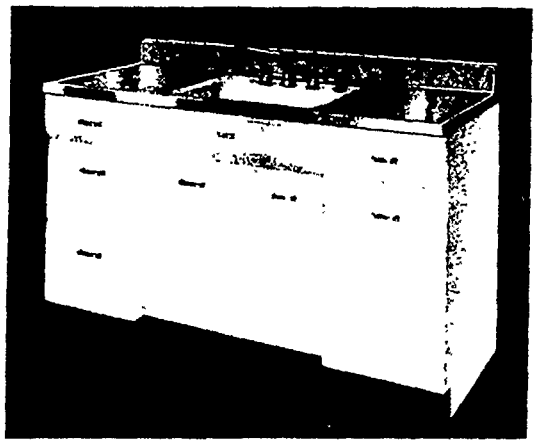
***Prices are subject to change without notice.***

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

*February 28, 1955*
*Superseding February 18, 1954*

## CRANE FABRICATED SINK TOPS WITH FLAT RIM SINKS AND UNDERSINK CABINETS



### 5-252-S

Sink Top: **Formica** covered wood core fabricated sink top, 1½" thick, with double drainboard and 4" high integral back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-146-S 24x21" **AllianceWare** white acid-resisting porcelain enameled formed metal flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 5440 (for 54" sink) or No. 6040 (for 60" sink) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

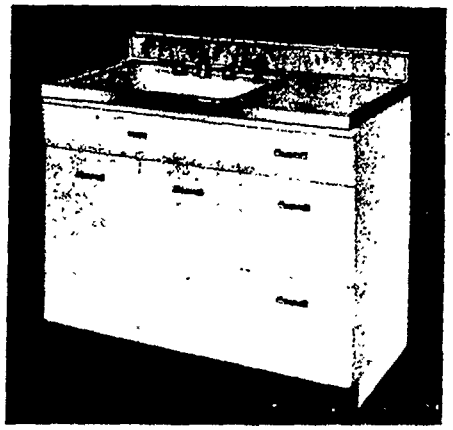
***Note: Sink supplies and trap are not included.***

### 5-252

Same, except with 8-84 **Embassy** supply, less hose and spray. (Specify 8-84-A, if with aerator.)

| Overall Dimensions Sink Top | Sink Bowl | Basin | Cabinet | *Cabinet Height |
|---|---|---|---|---|
| 60x25¼" | 24x21" | 20⅞x14⅞x8" | 60x24 5/16" | 34½" |
| 54x25¼" | 24x21" | 20⅞x14⅞x8" | 54x24 5/16" | 34½" |

*Sets sink 36", floor to top of rim.



### 5-253-S with Left Hand Drainboard
### 5-254-S with Right Hand Drainboard

Sink Top: **Formica** covered wood core fabricated sink top, 1½" thick, with single drainboard and 4" high integral back, exposed edging trimmed with stainless steel; stainless steel sink frame.

Sink: 5-136-S 24x21" acid-resisting porcelain enameled cast iron flat rim sink with extended back ledge.

Trim: 8-88 **Embassy** ***Dial-ese*** ledge type, swinging spout two-valve supply fitting with automatic diverter valve and thumb control spray with retractable rubber hose. (Specify 8-88-A, if with aerator.)

Waste: 8-361 **Receptol** basket strainer with stopper and 1½" tailpiece.

Cabinet: No. 4240-L (for left hand drainboard) or No. 4240-R (for right hand drainboard) **CRANE** baked white enamel steel cabinet with sink clamps and sliding bread drawer cover.

***Note: Sink supplies and trap are not included.***

**Overall Dimensions**

Sink Top..42x25¼" Sink.....24x21" Basin.....21½x15½x8"
Cabinet....42x24 5/16" Height..34½" (sets sink 36" floor to top of rim)

**ALTERNATE SINK TRIMMINGS**

| Unit Number | Trim Description |
|---|---|
| **5-253 or 5-254** | 8-84 or 8-84-A **Embassy** 2-valve supply, less spray |
| **5-253-T or 5-254-T** | 8-85 or 8-85-A **Embassy** 3-valve supply, less spray |
| **5-253-TS or 5-254-TS** | 8-89 or 8-89-A **Embassy** 3-valve supply, with spray |

***Refer to Page 5-5 for illustrations***

### Color Selection

Formica, Micarta, Textolite or similar laminated plastic sink top coverings are furnished in a wide range of colors and patterns—refer to your local Crane Branch or Crane Wholesaler for color selections.

All exposed metal trim is chromium plated.

### TRANSPORTATION CHARGES ON SINK TOPS AND SINK CABINETS

*(See Page 5-21 for details)*

**PRICES COMPLETE, less supplies and traps**

*†Color Prices include Colored Sink and White Cabinet*

| Catalog Number and Description | Size, Inches | ZONE 1 White | ZONE 1 Color | ZONE 2 White | ZONE 2 Color | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|
| **5-252, with Cabinet** | 54x25¼ | **$272.28** | — | **$292.46** | — | 252 |
| | 60x25¼ | **284.76** | — | **305.46** | — | 269 |
| **5-252-S, with Cabinet** | 54x25¼ | **279.78** | — | **299.96** | — | 253 |
| | 60x25¼ | **292.26** | — | **312.96** | — | 270 |
| **No. 5440 Cabinet Only** | 54x24 5/16 | **132.60** | — | **152.78** | — | 163 |
| **No. 6040 Cabinet Only** | 60x24 5/16 | **137.78** | — | **158.48** | — | 169 |
| **5-253 or 5-254, with Cabinet** | 42x25¼ | **243.38** | **$248.34** | **257.56** | **$262.52** | 244 |
| **5-253-S or 5-254-S, with Cabinet** | 42x25¼ | **250.88** | **255.84** | **265.06** | **270.02** | 245 |
| **5-253-T or 5-254-T, with Cabinet** | 42x25¼ | **250.74** | **255.76** | **264.92** | **269.94** | 245 |
| **5-253-TS or 5-254-TS, with Cabinet** | 42x25¼ | **258.68** | **263.64** | **272.86** | **277.82** | 246 |
| **No. 4240 Cabinet Only** | 42x24 5/16 | **85.42** | — | **90.38** | — | 120 |

Approx. Shipping Weights—5-252 Top only, 54x25¼".....55 lbs; 60x25¼".....60 lbs.
5-253 or 5-254, Top Only....45 lbs.
5-146 Sink Only....30 lbs. 5-136 Sink Only....75 lbs.

For aerator on spout.....**Add $1.72** If less **8-361** waste.....**Deduct $6.38**
For **8-324** ¼" male tailpieces....**Per Pair, Add .44**

*For sink traps and continuous wastes, Refer to Section 8.*

*For waste disposal units, Refer to Pages 5-24 to 5-27.*

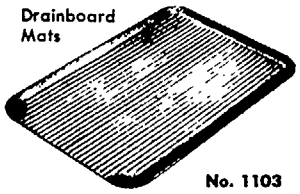
*Prices are subject to change without notice.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price. Printed in U.S.A.

# RUBBERMAID SINK MATS, DRAINBOARD MATS AND DISHDRAINERS

Drainboard Mats

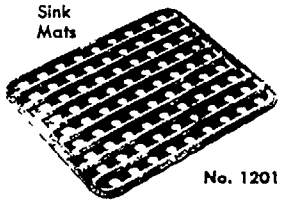


No. 1103

| Number | Size | Price |
|---|---|---|
| 1104 | 16x17 | $2.38 |
| 1106 | 16x14 | 2.26 |

Rubbermaid products are made from a new synthetic rubber that is superior to natural and ordinary synthetic rubber with proven longer life and greater household utility. They prevent scratching, marring and smudging of enameled surfaces; deaden noise and reduce kitchen clatter. They are flexible, colorfast and odorless. Only a minimum of attention is required for long service; wiping with a damp cloth or rinsing with hot water and drying is all the attention that is ordinarily required.

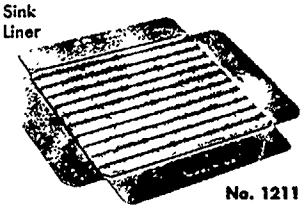
Sink Mats



No. 1201

| Number | Size | Price |
|---|---|---|
| 1201 | $10\frac{3}{4}$x$12\frac{3}{4}$" | $1.30 |
| 1202 | $12\frac{3}{4}$x16 | 1.72 |

Sink Liner

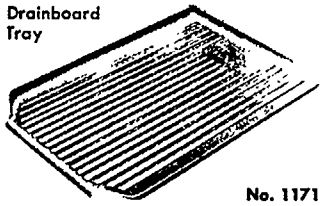


No. 1211

Fits snugly in sink basin; all four sides have 3" flaps.

| Number | Size | Price |
|---|---|---|
| 1211 | 10x12" | $2.26 |
| 1212 | 12x14 | 2.64 |
| 1213 | 13x16 | 3.06 |

Drainboard Tray

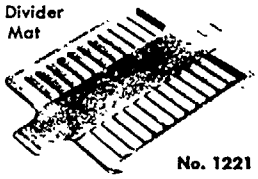


No. 1171

Non-skid tray with curved rims; also handy for thawing frozen foods.

| Number | Size | Price |
|---|---|---|
| 1170 | $15\frac{1}{2}$x$15\frac{1}{2}$" | $3.06 |
| 1171 | 20 x$15\frac{1}{2}$ | 3.98 |

Divider Mat



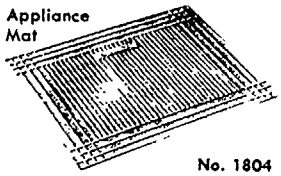
No. 1221

Fits over center partition of two-basin sink.

| Number | Size | Price |
|---|---|---|
| 1221 | 14x$10\frac{1}{2}$" | $1.98 |

*Sink and Drainboard mats are available in all the following colors: Red, white, marbleized black, yellow, green, coralpink and chartreuse.*

Appliance Mat



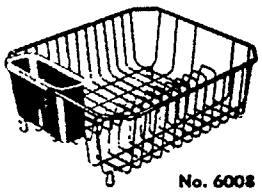
No. 1804

| Number | Size | Price |
|---|---|---|
| 1804 | 21x28" | $3.98 |

## Dish Drainers

*With removable Silverware Cup*

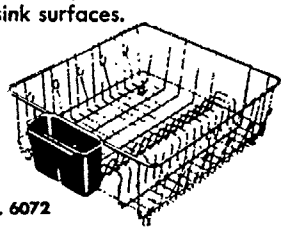
**Cushion covering will not chip, crack, peel or soften.**
**Rubber feet protect sink surfaces.**



No. 6008

Fits 2-basin sink bowls.

| Number | Size | Price |
|---|---|---|
| 6008 | $12\frac{1}{4}$x$14\frac{1}{4}$" $5\frac{1}{4}$" deep | $2.64 |



No. 6072

Has stand up glassware holders.

| Number | Size | Price |
|---|---|---|
| 6072 | 15x$18\frac{1}{2}$" 6" deep | $5.30 |

*Colors: Red, white, yellow, green, coralpink and chartreuse.*

**Drainboard and Sink Mats for use with Crane Sinks**

**Drainboard Mats**

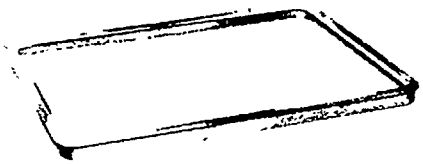
No. 1104—Kitchen Queen, Kitchen Pride, Stewardess, 60" Sunnyday and 60" Sunnycrest.
No. 1106—54" Sunnyday and 54" Sunnycrest.

**Sink Basin Mats**

No. 1201—All American
No. 1202—Kitchen Queen, Kitchen Pride, Stewardess and 54" Sunnycrest.
No. 1212—Homemaker, 54" Sunnyday, and 54" Sunnycrest.
No. 1213—60" Sunnyday and 60" Sunnycrest.

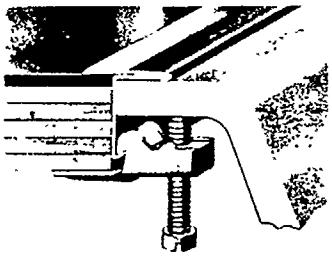
## HUDEE IDEAL SINK FRAMES

*One-piece stainless steel, for flat rim sinks*



The Hudee sink frame is a one-piece unit with invisible weld made from heavy gauge stainless steel, in satin finish.

It provides a sanitary and permanent watertight seal. Regularly furnished with $1\frac{1}{2}$" radius corners for use with porcelain enameled cast iron or formed metal flat rim sinks.



All frames are furnished complete with corner clips and fastening lugs, and can be used with $\frac{3}{4}$" or 1" thick tops with covering materials up to $\frac{1}{8}$" thick.

Lugs are regularly furnished for tops $\frac{5}{8}$" to $\frac{3}{4}$" thick; specify if lugs are required for $\frac{7}{8}$" to 1" thick tops.

The cross section illustration at the left shows the frame, sink bowl, plywood top, lug and screw assembled.

For frames individually packaged.....**Add Each $.50**

**PRICES**

| Bowl Size | Lugs per frame | Price, Each |
|---|---|---|
| 12x12" | 12 | $8.60 |
| 16x16" | 12 | 8.80 |
| 20x16" | 12 | 8.80 |
| 24x16" | 12 | 8.80 |
| 32x16" | 15 | 9.20 |
| 20x18" | 12 | 8.80 |
| 24x18" | 12 | 9.00 |
| 30x18" | 15 | 9.20 |
| 32x18" | 15 | 9.20 |
| 24x20" | 12 | 9.00 |
| 30x20" | 15 | 9.20 |
| 32x20" | 15 | 9.40 |
| 42x20" | 19 | 10.60 |
| 24x21" | 12 | 9.00 |
| 30x21" | 15 | 9.40 |
| 32x21" | 15 | 9.40 |
| 36x21" | 19 | 10.10 |
| 42x21" | 19 | 10.60 |
| *38x22" | 10 | 9.20 |

*3 sided, for All American

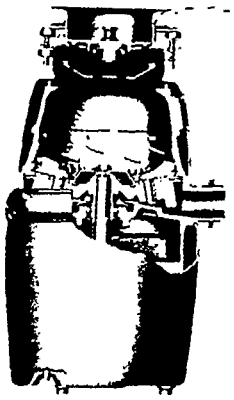
*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# *Waste King* PULVERATORS

## *"The Quiet One"—With Super "Hush-Cushions"*
## *No Sorting of Food Waste—Lifetime Grind Control*



Smooth and quiet.

Cushioned rubber mountings at sink and trap connections act as shock absorbers and noise mufflers.

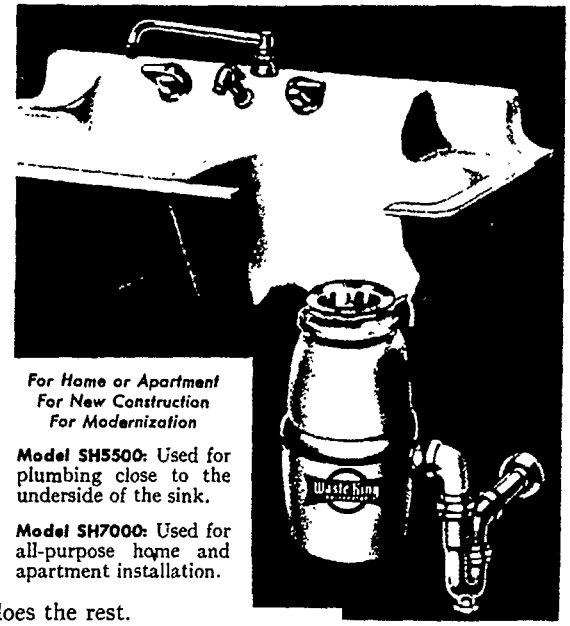
No shaking motion to loosen tile or to cause cracks in porcelain sinks.

No metal-to-metal contact.

No vibration to penetrate through house plumbing.

The Waste King Pulverator, all new "Super Hush" models do the complete job of eliminating all garbage at the "point of origin." Will provide years of safe, efficient, economical and trouble-free operation.

**Eliminates all food waste:** The Waste King with new specially designed shredding ring, cuts, shreds, and pulverizes all garbage and bulky food wastes. Carrot tops, vegetable and fruit peelings, corn husks, celery, and hard brittle food wastes, such as bones, fruit pits, and even paper napkins and cigarette butts are quickly pulverized and flushed away down the drain. Continuous-feed operation allows all garbage to be fed into Pulverator at one time. No bothersome sorting of garbage. No stopping unit to reload.




*For Home or Apartment*
*For New Construction*
*For Modernization*

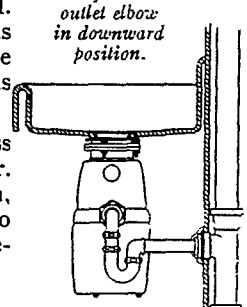
**Model SH5500:** Used for plumbing close to the underside of the sink.

**Model SH7000:** Used for all-purpose home and apartment installation.

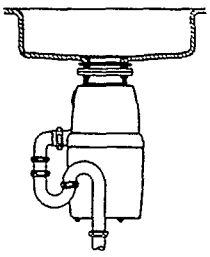
**Fast, sanitary operation:** To operate, simply turn on the cold water, flip on the switch, and scrape all food waste down the drain. The Waste King does the rest. Newly designed turntable whirls the food waste against the improved shredding sleeve. Bulky waste is shredded, hard and brittle waste is pulverized. Fibrous waste is passed through horizontal slots and cut into short lengths by secondary cutters. Exclusive drain-away action flushes all waste down the drain in a swirling, scouring stream of water. There is no after odor, the unit is self-cleaning.

**Lifetime Grind Control:** Exclusive with Waste King. The waste particles pass through stationary control slots that do not cut or shred, therefore do not wear. The constant flow of water keeps the waste particles in full-floating suspension, thereby protecting the household plumbing lines. There is no jamming, no clogging. Anti-jam control prevents food particles from binding or wedging between the turntable and shredding sleeve wall.

*Always install outlet elbow in downward position.*



"P" trap used for waste to wall.



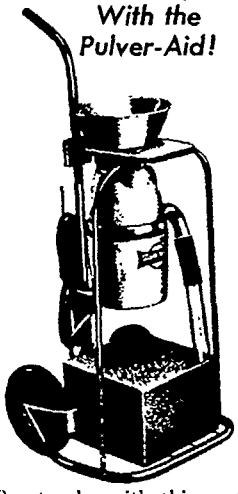
"S" trap used for waste to floor.

**Durable construction:** A precision made mechanical product made with the highest quality abrasion and corrosion resistant cast steel alloy cutting and shredding parts. Inner and outer housings are high quality metal alloy. All joints are sealed with tough, resilient gaskets, graphite shaft seal and seal plate protect motor from moisture and dirt. Ball type bearings are permanently lubricated and sealed.

**Easy to install:** Choice of two models makes installation fast and inexpensive—no need to lower the wall waste line. Both models fit any sink having a 3½-inch drain opening, are adaptable to right or left hand installation without disassembly, and provide a drain outlet with proper clearance for a slip joint connection to a conventional 1½-inch trap (see trap illustrations at right). A toggle switch may be located on the wall or inside the sink cabinet, as preferred.

**The complete unit includes:** A sink flange assembly with 3-way drain closure, 90° elbow tailpiece, removable blue splash guard, easy-to-locate overload protector button, shredding element and a ¼ H.P., 115-volt, 50-60 cycle motor. Body is white baked enamel finish. Model SH7000 has built-in dishwasher inlet.

### *Demonstrate On-the-Spot With the Pulver-Aid!*



Boost sales with this portable demonstrator. No sink, running water, or drain is required. Use it in your store or in prospect's home.

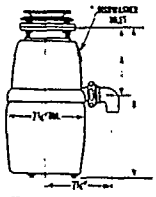
A transparent plastic drain permits the prospect to actually see the pulverizing action on food waste. Offered FREE, with the purchase of a Model SH7000 Waste King.

### *Speed Up Sales With Eye-Catching Display Stand!*

Here is the silent salesman that will constantly remind your customers of the advantages of the Waste King.

This sturdy display stand is constructed of masonite and is designed to hold the Waste King firmly in place. For use in a store window, on floor, sink or counter.

**Display Stand....** Each **$8.50**



Dimensions

*Model SH7000 only.

**†All Prices are F. O. B. Chicago, Detroit, Los Angeles or Philadelphia.**

| Model Number | †Price Each | Shpg. Wt. Pounds | Dimensions A | Dimensions B |
|---|---|---|---|---|
| **SH5500** | **$133.54** | 35 | 5½" | 12½" |
| **SH7000** | **133.54** | 36 | 7" | 14" |

Above prices include Federal Excise Tax.
Use 110-volt, AC Underwriters' Approved wire.

*Prices are subject to change without notice.*

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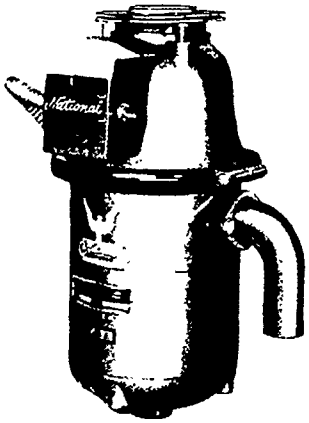
# The NATIONAL Disposer

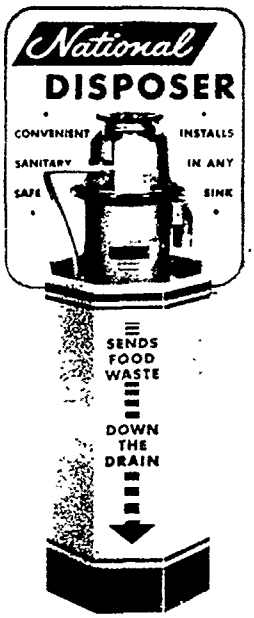
**"the unit designed with the plumber in mind"**



Model 535
*Outside View*

**Patented One-Piece LOK-TOP Cover Control**

**Safety cover control "locks" in the sink drain while unit is in operation. There are no moving parts to jam or stick.**




**Here is the simple, compact National Disposer Display Stand. Displays mean sales—order one from your Crane Branch or Crane Wholesaler. Price, less disposer $3.50**

The National Disposer is designed for quick, easy installation. The complete unit weighs only 36 pounds, installation is a one man job; it is made extra easy by the self-adjusting sink flange and a drain spout which can be rotated. Also, it is unnecessary to provide or install a separate operating switch, the unit comes complete with switch.

### FEATURES

Patended one-piece LOK-TOP safety cover control—no moving parts. Stainless steel sink flange automatically compensates for differences in sink bowl thickness.

New Micro-Size grinding elements perform a triple function —they grind, shred, and micro-size food wastes to minute particles. Grinding elements never need attention.

One-piece, extra hard impeller is attached directly to the drive motor. There are no cams or gears to wear.

Demountable power section makes possible easier, faster, inexpensive installation and quick service if required.

Positive triple water seal insures against leakage into motor.

Has built-in electrical cut-off switch.

Powerful ⅓ h.p. motor with surplus power for shredding bones, gristle and fibrous materials.

### *Simple to Operate*

First, remove disposer cover and drop waste into sink opening. Then turn disposer cover to GRIND position, shown on lip of metal flange in the sink opening. Turn cold water on; within seconds a powerful electric motor shreds food waste to a liquid pulp and flushes it out of disposer and into the drain.

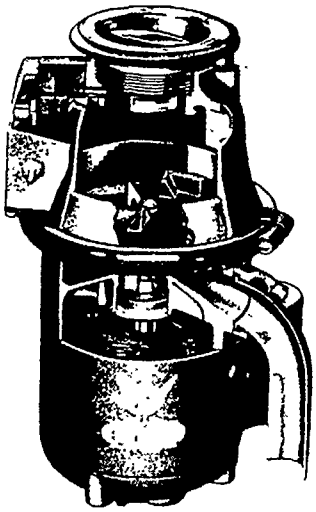
### "Power-Pak" Replacement

Should service be required, it involves merely the "package" replacement of the power unit. No involved repair work is done in the housewife's kitchen. Actual rebuilding is done at the factory by specialists.

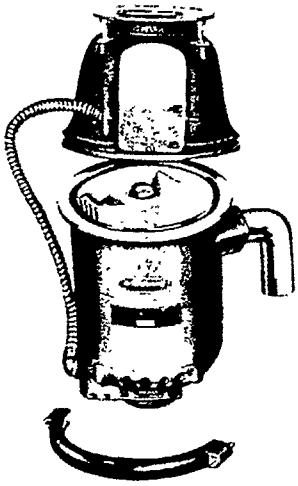
### Water Flow Control Switch

Some cities require the installation of water flow switch control on all domestic garbage disposers. Where not required, the switch is usually desired for convenience and maximum efficiency of operation.

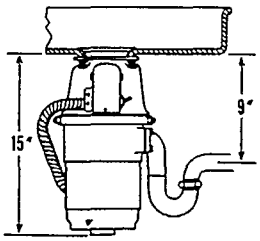
The National water flow switch is simple, rugged, and virtually service-free. It will not plug with small pieces of pipe scale or foreign material. It has no packing gland and does not require a pipe strainer.



*Cut Open View*



"Power-Pak" Replacement




Dimensions

PRICES F.O.B. Akron Ohio or Clifton, N.J.

| Number and Description | Price. Each |
|---|---|
| Model 535, without flow switch control. | $140.70* |
| Water Flow Switch only. | 18.20 |
| Chr. Pl. Brass Adapter Flange, for 4½" or 5" Diameter sink outlets | 13.86 |
| Complete Factory Reconditioned Power Unit (with return of original unit). | 40.00 |

*Price includes Federal Excise Tax

Approximate shipping weight..... ...40 pounds

*Prices are subject to change without notice.*

Printed in U.S.A.

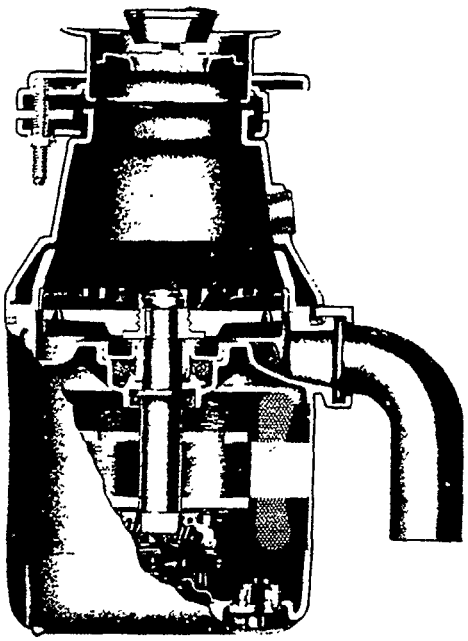
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

*February 28, 1955*
*Superseding May 23, 1951*

# IN-SINK-ERATOR

*Food Waste Disposer with Reversing Action*

## MODEL 77 SPECIAL



Cut Open View

**Easy to Operate**—Turn on the cold water, flip the switch and feed the food waste into the drain opening. Contents immediately come in contact with the shredders where it is reduced to minute particles or pulp and is carried down the drain.

**Automatic Reversing Action**—The motor and shredder of the Model 77 Special automatically reverse direction every-time the switch is flipped, and, whenever the load is extra heavy. Food waste is ground finer and faster; life of shredders is doubled. This 2-way scouring action keeps unit clean and sanitary at all times. In-Sink-Erator is the original food waste disposer with Reversing Action.

**Continuous Feed Method**—This is the method that appeals most to housewives because there is no start-and-stop nuisance, no waiting to reload—its capacity is practically unlimited. Down the drain go table scraps, coffee grounds, egg shells, grease, rinds, seeds, even bones and fibrous foods.

**Simple Self-Service**—Interruptions are minimized and break-downs are prevented with In-Sink-Erator's self-service features. A thermal overload relay protects against accidental over-heating—it is manually reset. A service wrench is included that enables the home owner to easily relieve accidental jams. Saves money as it eliminates unnecessary service calls.

Model 77 Special

## MANY IMPROVED FEATURES

Capacitor start motor means instantaneous full speed in either direction of rotation.

New dishwasher inlet permits automatic dishwasher to drain directly into disposer. Large food particles from dishwasher are ground and shredded before they enter waste line.

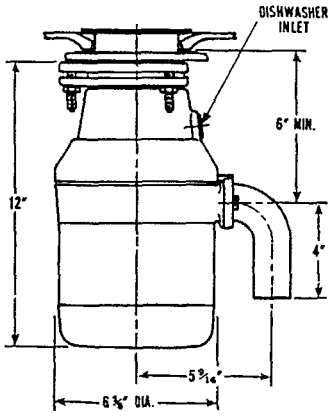
Faster draining facilitated by integral high-speed pump vanes. The resulting "jet-action" provides a scrubbing and flushing operation that keeps unit extra clean and sanitary.

New stainless steel cover stopper and sink flange assembly provides lifetime use. Stopper gives positive water tight seal.

New rotary shredder is made of Damascon #10—a diamond hard corrosion-resistant material that gives extremely long shredder life.

Teeth of new stationary shredding ring are precision-ground on both edges for super-shredding both ways. They are made of Damascon #10.

**Roughing-In Dimensions**




**Specifications**

| | |
|---|---|
| Length, inches | 12 |
| Capacity | Continuous Feed |
| Switch | Automatic Reversing |
| Motor | ½ H.P. Capacitor Start |
| Voltage | 115V., 60 cycle |
| Current | AC., 4.8 amp. |
| Bearings | Permanently Lubricated |
| Overload Protector | Manually Reset |
| Finish | White Enamel |
| Net Weight, pounds | 23½ |

One Year Warranty

## PRICE COMPLETE

*F.O.B. Racine, Wisc. or Los Angeles, Calif.

| Model Number | *Price Complete | Shpg. Wt. Pounds |
|---|---|---|
| 77 Special | $118.00 | 27 |

Above prices include Federal Excise Tax.

For Penn No. 60 Flow Switch (where required)..... .. **Add $20.56**



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Printed in U.S.A.

# IN-SINK-ERATORS

## *Food Waste Disposers with Reversing Action*

### MODEL 20 COMMERCIAL TYPE

The Model 20 food waste disposer is available in six types and is adaptable to any commercial installation, wherever food is served—restaurants, hotels, hospitals, clubs and diet kitchens.

**Continuous Feed**—There is no start and stop nuisance—no waiting to reload—its capacity is practically unlimited.

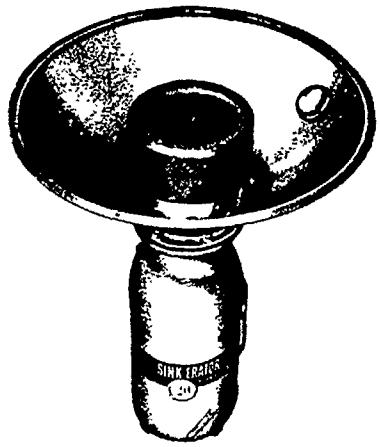
**High Speed Shredding Element**—The new design rotary shredding element is made of Damascon #10—a diamond hard corrosion-resistant material capable of shredding the toughest food waste.

**Automatic Reversing Action**—Equipped with a powerful ½ H.P. automatically reversing motor. The motor and shredder automatically reverses direction every time the unit is started or whenever the load is unusually heavy.

**Cleansing Action**—Faster draining is facilitated by integral high-speed pump vanes. The resulting "jet-action" provides a thorough self-cleaning, flushing action, which scours the unit clean throughout thus preventing odors.

**Self-Service**—The motor is equipped with a built-in overload protector. An easy to use manual reset button and service wrench are furnished for relief of accidental jams. This assures continuous operation and saves costly service calls.

**Easy Operation**—A light pull on the water-proof switch instantly starts the complete disposer operation.



**Model A-20-U**
with 15" stainless cone
(illustrated)

**Model A-20-X**
with 18" stainless cone

**All models include waterproof switch, solenoid valve, vacuum relief valve and line strainer. (Plumbing fittings, piping and electrical wiring are not included.)**

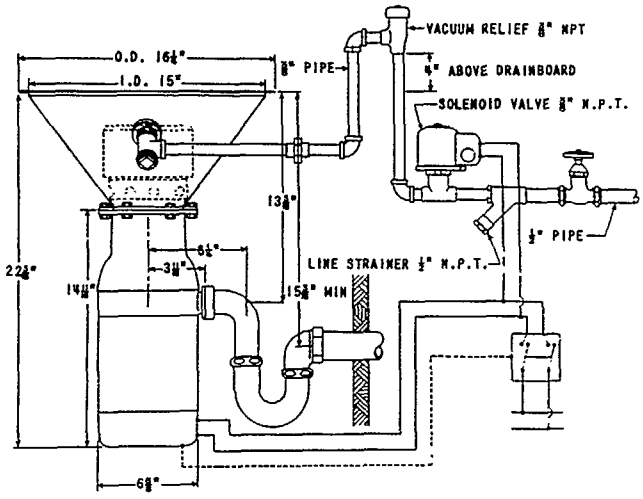
Vacuum Relief Valve

Solenoid Valve

Line Strainer

Waterproof Switch

**Installation Diagram**




**Model A-20-W**, with 15" stainless cone

**Model A-20-Z**, with 18" stainless cone

Above models are furnished with stainless cone, silverware saver, spray nozzle and cone cover as illustrated.

**Specifications**

| | |
|---|---|
| Length, inches | 14⅞ |
| Capacity | Continuous Feed |
| Switch | Automatic Reversing |
| Motor | ½ H.P. Capacitor Start |
| Voltage | 115/230V., 60 cycle |
| Current | A.C., Single phase |
| Overload Protector | Manually Reset |
| Finish | White Enamel |
| Shipping Weight, pounds | 59 |

**PRICES COMPLETE—F.O.B. Racine, Wis. or Los Angeles, Calif.**

| Model No. | Description | Price Each |
|---|---|---|
| A-20-T | Fits 3½" to 4" sink opening | $320.00 |
| A-20-O | with 5¾" stainless cone | 320.00 |
| A-20-U | with 15" stainless cone | 383.00 |
| A-20-W | with 15" stainless cone & silver saver | 448.00 |
| A-20-X | with 18" stainless cone | 400.00 |
| A-20-Z | with 18" stainless cone & silver saver | 464.00 |

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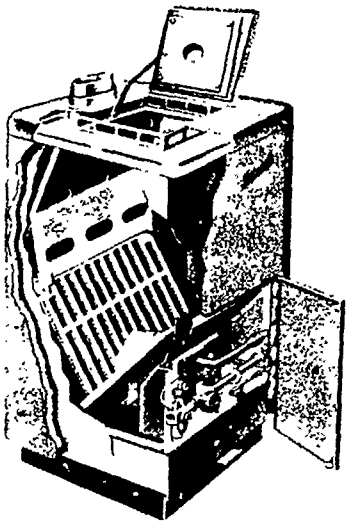
## MAJESTIC GAS FIRED INCINERATORS

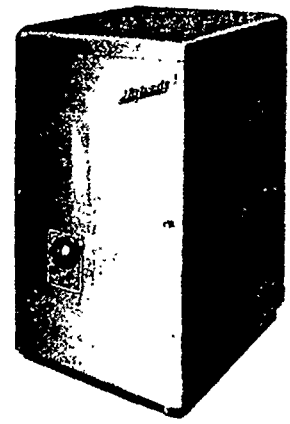


Cut Open View

*The unit can be set in basement, utility room or kitchen. Connections can be made to regular furnace flue without affecting the heating system.*

**Majestic Incinerators** are engineered to make garbage and refuse disposal chores easier, cleaner and safer. Compact construction, 20″ wide, 24″ deep and 36″ high, permits installation in a relatively small space, yet they hold two full bushels of waste. A few of the many features are as follows:

**Attractive Cabinet:** Finished in white silicon-base, high temperature paint with black recessed toe base at front and sides.
**Receiving Door:** Top door has 13x12½″ outer opening, 11″ square opening through inner casing. Handle is heat-resisting plastic. Door closes flush with top of cabinet.
**Insulation:** Bottom protected by 3 inches of rock wool in addition to 1½″ ventilated air chamber. Sides are insulated with ½″ thick spun glass with 1½″ air space. Top is foil-backed with ¼″ thick corrugated asbestos.
**Heavy Inner Casing:** Made of 16 gauge sheet steel.
**Grates:** Cast iron two piece, bar-type "V" grates. Rear section is opened and closed for cleaning by a control rod at the front.
**Burner:** In-shot, mono-port, non-clogging type. Capacity is 18,000 Btu. rating.
**Safety Pilot:** Model 10G is equipped with 100% shut-off, hooded safety pilot, 1500 Btu. rating.
**Adjustable Timer:** Dial set type; can be set for burning periods up to 120 minutes. Burner ignites and shuts off automatically after set time has elapsed.



Model 10G

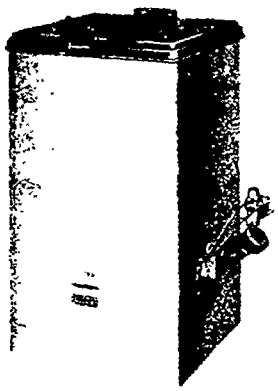
**For use with Natural, Mixed, Manufactured or L.P. gases.**

DIMENSIONS AND PRICES—*All Prices are F.O.B. Huntington, Ind.

| Catalog Number | Btu. Input Pilot | Btu. Input Burner | Gas Conn. | Flue Size | Dimensions, Inches Height | Dimensions, Inches Width | Dimensions, Inches Depth | Shpg. Wt. Pounds | *Price Each |
|---|---|---|---|---|---|---|---|---|---|
| 10G | 1500 | 18,000 | ⅜″ | 7″ | 36¼ | 20 | 24 | 201 | $195.94 |

## ECONOMY GAS FIRED INCINERATORS

*For Use with Natural, Mixed, Manufactured or L.P. Gases*



Model 141ST

*Easy to install. Needs only to be connected to gas line and a 4″ flue connection to the chimney.*

The **Economy** gas fired incinerator offers easy daily disposal—all garbage and waste, except cans and bottles, are reduced to fine ash with the concentrated heat of the whale-fluke gas burner. Heat radiated from the incinerator keeps down moisture in the basement. Sturdily built and attractively finished in light green enamel with black enamel top. Top, grate and burner are cast iron.

Feed door closes into tight seal giving sanitary, smoke-tight and odor-free operation. Products of combustion travel through expanded metal draft chimney so garbage can burn completely.

Extra heavy steel combustion chamber holds a bushel of garbage. Extra large pull-out ash pit is made of heavy gauge enameled steel.

Fitted with Robertshaw safety pilot that automatically shuts off gas supply if the flame is extinguished or the pressure fails.

Model 141ST is furnished with an automatic timer. Timer can be set from 10 minutes (for rubbish) to two hours (for a full load of wet garbage). Will automatically shut off the gas at the end of the time period.

DIMENSIONS AND PRICES—†All Prices are F.O.B. Quincy, Ill.

| Catalog Number | Btu. Input of Burner | Gas Conn. | Flue Size | Dimensions, Inches Height | Dimensions, Inches Width | Dimensions, Inches Depth | Shpg. Wt. Pounds | †Price Each |
|---|---|---|---|---|---|---|---|---|
| 141S | 15,000 | ¾″ | 4″ | 31 | 16¾ | 16¾ | 95 | $87.00 |
| 141ST | 15,000 | ¾″ | 4″ | 31 | 16¾ | 16¾ | 96 | 105.00 |

When ordering Incinerators, specify if for use with Natural, Mixed, Manufactured or Liquefied Petroleum Gas.



*Prices are subject to change without notice.*

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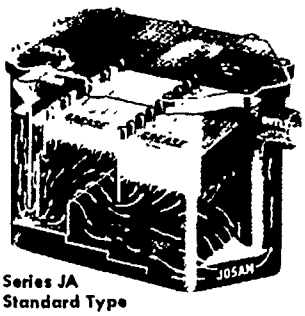
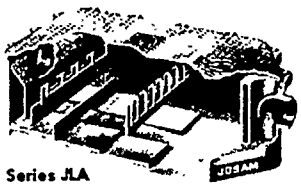
Printed in U.S.A.

# JOSAM CAST IRON GREASE INTERCEPTORS

*With the Plumbing and Drainage Institute Seal of Approval*



Series JA
Standard Type



Series JLA
Low-Boy Type

**Construction:** Interceptor body, heavy cast iron, white lacquered inside and outside, cast iron removable baffles and gasketed, non-slip flush cover with recessed lift rings, cascade bottom with solids-evacuating channel, internal air relief, visible double wall deep seal code trap and female threaded non-submerged inlet and outlet.

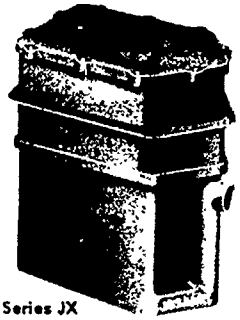
**Flow Control:** A Josam flow control fitting is included at no extra cost. It should be installed to prevent overloading the interceptor and to maintain a rate of at least 90% grease retention efficiency.

**Series JA**—For installation on floor, partially recessed in floor, or fully recessed with cover flush at floor, with shallow roughing.

**Series JLA**—Low height permits installation on floor next to dishwashing machine or with other low outlet fixtures without trapping the inlet or holding water in basin of dishwasher.

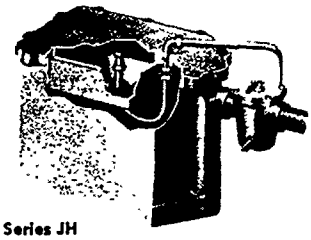
**Series JH**—With semi-automatic grease draw-off feature, is for floor installation. (Also available for use in recess.)

Interceptors in other types and sizes are also available—see Series JX Extension Type and Series PH for Packing House Service illustrated at right. Contact your local Crane Branch or Crane Wholesaler for prices.

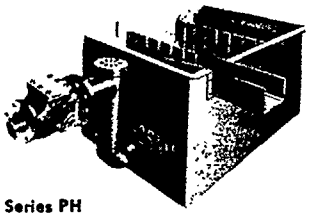


Series JX
Extension Type

**No Cold Water Connections**
Grease accumulates in the receptor regardless of the temperature of the waste water, eliminating the need for a cold water jacket.



Series JH
Semi-Automatic Grease Draw-Off

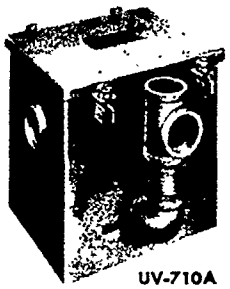


Series PH
For Packing House Service

## PRICES, CAPACITIES AND DIMENSIONS

| Series Number | Type Number | Flow Rate G.P.M. | Grease Capacity, Pounds | Inlet & Outlet, Inches | Overall Dimensions Inches Length | Width | Height | Flow Control Number | Shipping Weight, Pounds | Price, Each |
|---|---|---|---|---|---|---|---|---|---|---|
| JA Standard | JA-00 | 4 | 8 | 2 | 15⅛ | 10⅜ | 10½ | 1041½ | 50 | $ 75.00 |
| | JA-0 | 7 | 14 | 2 | 16¾ | 12 | 11¾ | 1041½ | 76 | 105.00 |
| | JA-1 | 10 | 20 | 2 | 18⅞ | 13½ | 13 | 1041½ | 104 | 180.00 |
| | JA-2 | 15 | 30 | 2 | 21⅝ | 15¼ | 15 | 1062 | 152 | 249.00 |
| | JA-3 | 20 | 40 | 3 | 24¾ | 16⅞ | 17⅜ | 1063 | 200 | 369.00 |
| | JA-4 | 25 | 50 | 3 | 26⅜ | 18 | 18½ | 1063 | 230 | 582.00 |
| | JA-5 | 35 | 70 | 3 | 30 | 19¾ | 20⅜ | 1063 | 300 | 850.00 |
| | JA-6 | 50 | 100 | 3 | 33⅝ | 22 | 23 | 1063 | 395 | 1010.00 |
| JLA Low-Boy | JLA-3 | 20 | 40 | 2 | 35¼ | 23½ | 10½ | 1062 | 245 | 399.00 |
| | JLA-5 | 35 | 70 | 3 | 48⅛ | 29½ | 11½ | 1063 | 452 | 612.00 |
| JH Semi-Automatic | JH-0 | 7 | 14 | 2 | 20½ | 10⅜ | 10½ | 1041½ | 80 | 180.00 |
| | JH-1 | 10 | 20 | 2 | 22⅛ | 12 | 11¾ | 1041½ | 110 | 230.00 |
| | JH-2 | 15 | 30 | 2 | 24¼ | 13½ | 13 | 1062 | 145 | 309.00 |
| | JH-3 | 20 | 40 | 2 | 27 | 15¼ | 15 | 1062H | 200 | 439.00 |
| | JH-4 | 25 | 50 | 3 | 32½ | 16⅞ | 17⅜ | 1063 | 255 | 662.00 |
| | JH-5 | 35 | 70 | 3 | 34⅛ | 18 | 18½ | 1063 | 290 | 940.00 |
| | JH-6 | 50 | 100 | 3 | 37¾ | 19¾ | 20⅜ | 1063 | 365 | 1110.00 |
| | JH-7 | 75 | 150 | 3 | 41⅜ | 22 | 23 | 1063 | 475 | 1340.00 |

# GORDON SEPARATORS

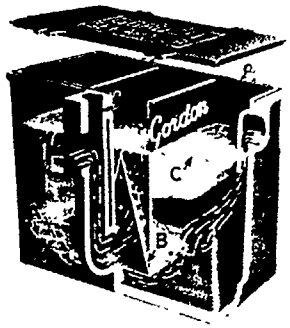


UV-710A

**Construction:** Made of 9-gauge copper-bearing steel and coated with a special waterproof finish. Construction conforms to modern standards for sanitation and cleanliness.

**Performance:** Retains 99% of grease, greasy sludge, and other foreign waste matter, allowing only clear water to enter waste lines. Stops automatically at inlet when holding capacity of grease compartment is reached. Easy to handle, install and clean.

**Low Units:** GSL models are low height to permit installation on floor next to dishwashing machine or other low outlet fixtures.




*Cut Open View*
A—Sludge Compartment
B—Filter System
C—Grease Compartment

## PRICES, CAPACITIES AND DIMENSIONS—*Prices are F.O.B. Chicago, Ill.

| Model Number | Flow Rate G.P.M. | Grease Capacity, Pounds | Inlet and Outlet, Inches | Overall Dimensions Inches Length | Width | Height | Shipping Weight, Pounds | *Price, Each |
|---|---|---|---|---|---|---|---|---|
| UV-710A | 6 | 10 | 1½ | 9¾ | 7 | 9⅛ | 27 | $ 48.00 |
| UV-1012A | 9 | 18 | 1½ | 11 | 9 | 11½ | 38 | 60.00 |
| UV-1412A | 15 | 30 | 2 | 13½ | 10¾ | 13 | 52 | 104.00 |
| UV-1815A | 20 | 60 | 2 | 19 | 11 | 16½ | 82 | 184.00 |
| UV-2420A | 30 | 75 | 3 | 25 | 19 | 21 | 162 | 304.00 |
| UV-2824A | 50 | 180 | 4 | 27 | 20¾ | 29½ | 249 | 608.00 |
| UV-3224A | 80 | 250 | 4 | 33 | 20¾ | 29½ | 285 | 784.00 |
| UV-3628A | 120 | 350 | 6 | 36 | 30 | 30 | 433 | 1088.00 |
| GSL-23A | 24 | 65 | 2 | 22½ | 15 | 11 | 75 | 220.00 |
| GSL-30A | 40 | 90 | 3 | 31 | 21 | 14 | 150 | 312.00 |

Gordon Separators can be made in sizes to meet installed roughing-in or for special requirements of construction or space; they are priced on application.

*All interceptors carry the Seal of Approval plate, indicating conformity with the Plumbing and Drainage Institute Standard PDI-G101.*

*Prices are subject to change without notice.*

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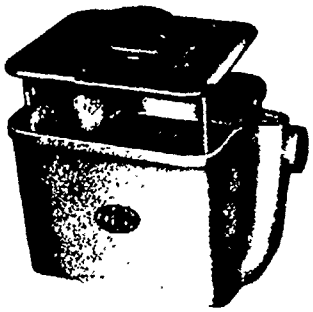
# ZURN GREASEPTORS

*With FLO-TROL, the Automatic Overload Protection*

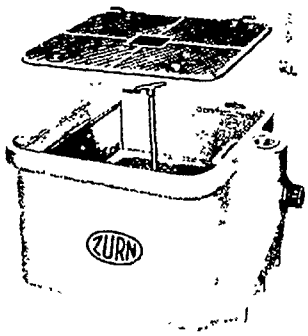


Z-1171 Deluxe, Cast Iron
Z-1170 Standard, Cast Iron
(not illustrated)

**Z-1170 Standard Models, Cast Iron:** Has plain horizontal basket and vertical baffles forming an integral unit which can be readily removed.

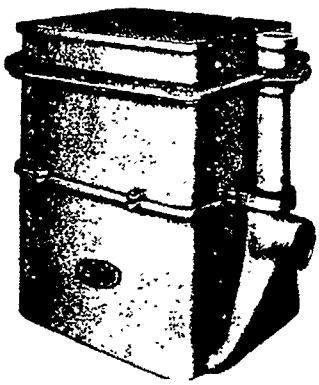
**Z-1171 Deluxe Models, Cast Iron:** Baffle assembly is attached to cover to prevent replacing cover without having interceptor in proper operating condition and to simplify cleaning without touching grease.

**Z-1174 V.G.E. Models, Duraclay (earthenware, vitreous glazed):** Similar in design to the cast iron models but lighter in weight, easier to install, and more sanitary; glazed surfaces make cleaning easier and faster; rapid grease recovery; as durable as cast iron under normal conditions. Made in Deluxe model only.




Z-1174 Duraclay
VGE Models

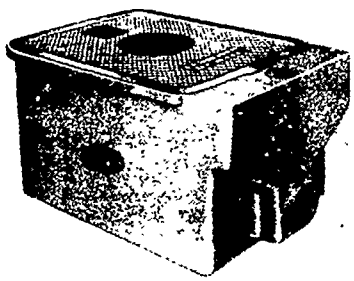
**Z-1170LT Low Type, Models, Cast Iron:** Specifically designed for use with dishwashers having low reservoirs and low drain connections, and for under counter or drainboard installations. Reservoir of most dishwashers can be emptied completely with Low Type Greaseptor installed on floor, thus eliminating the necessity of recessing in the floor.



Z-1170-9 Extension
Cast Iron

**Z-1170-9 Extension Models, Cast Iron:** Provides adjustable floor level installation when outlet is desired below pre-cast concrete slab or where floor construction will not permit waste line within floor. Extension piece is 10" high and is made of cast iron to avoid corrosion. To avoid floor seepage or to anchor securely in floor, the use of integrally cast pan and clamping collar with bolts are recommended—they are included in prices below.

**All Greaseptors are furnished with Flo-Trol, the automatic safeguard that prevents excessive flow rates above the rated capacities, through the interceptors.**



Z-1170LT Low Type
Cast Iron

***All interceptors carry the Seal of Approval plate, indicating conformity with the Plumbing and Drainage Institute Standard PD 1-G 101.***

## PRICES, CAPACITIES AND DIMENSIONS

| Model Type | Size Number | Flow Rate G.P.M. | Grease Capacity Pounds | Connections, Inches: Inlet | Connections, Inches: Outlet | Overall Dimensions, Inches: Length | Overall Dimensions, Inches: Width | Overall Dimensions, Inches: Height | Price Each | Shpg. Weight Pounds |
|---|---|---|---|---|---|---|---|---|---|---|
| Z-1170 Standard | 100 | 4 | 8 | 1½* or 2 | 2* | 17⅞ | 9¾ | 10 | $75.00 | 71 |
| | 200 | 7 | 14 | 1½* or 2 | 2* | 19¼ | 12⅛ | 11⅛ | 105.00 | 91 |
| | 300 | 10 | 20 | 1½* or 2 | 2* | 21¾ | 14¼ | 11¾ | 180.00 | 139 |
| | 400 | 15 | 30 | 1½*, 2 or 3 | 2* or 3 | 23⅞ | 17⅛ | 13¼ | 249.00 | 188 |
| | 500 | 20 | 40 | 1½*, 2, 3 or 4 | 2*, 3 or 4 | 27½ | 17½ | 14¾ | 369.00 | 216 |
| | 600 | 25 | 50 | 1½*, 3 or 4 | 2*, 3 or 4 | 30½ | 20¼ | 16⅝ | 582.00 | 331 |
| | 700 | 35 | 70 | 2*, 3 or 4 | 2, 3* or 4 | 33 | 23 | 18½ | 850.00 | 464 |
| | 800 | 50 | 100 | 2*, 3 or 4 | 2, 3* or 4 | 35¼ | 25 | 21½ | 1010.00 | 590 |
| Z-1171 Deluxe | 100 | 4 | 8 | 1½* or 2 | 2* | 17⅞ | 9¾ | 10 | 120.00 | 67 |
| | 200 | 7 | 14 | 1½* or 2 | 2* | 19¼ | 12⅛ | 11⅛ | 150.00 | 86 |
| | 300 | 10 | 20 | 1½* or 2 | 2* | 21¾ | 14¼ | 11¾ | 240.00 | 132 |
| | 400 | 15 | 30 | 1½*, 2 or 3 | 2* or 3 | 23⅞ | 17⅛ | 13¼ | 315.00 | 178 |
| | 500 | 20 | 40 | 1½*, 2, 3 or 4 | 2*, 3 or 4 | 27½ | 17½ | 14¾ | 450.00 | 205 |
| Z-1170LT Low Type | 500LT | 20 | 40 | 2*, 3 or 4 | 2*, 3 or 4 | 30⅜ | 21⅛ | 9 | 399.00 | 135 |
| | 700LT | 35 | 70 | 2*, 3 or 4 | 2*, 3 or 4 | 42½ | 29⅜ | 9¾ | 612.00 | 230 |
| Z-1170-9 Extension | 300E | 10 | 20 | 1½* or 2 | 2* | 21¾ | 14¼ | 21¾ | 500.00 | 186 |
| | 400E | 15 | 30 | 1½*, 2 or 3 | 2* or 3 | 23⅞ | 17⅛ | 23¼ | 530.00 | 248 |
| | 500E | 20 | 40 | 1½*, 2, 3 or 4 | 2*, 3 or 4 | 27½ | 17½ | 24¾ | 730.00 | 280 |
| | 600E | 25 | 50 | 1½*, 3 or 4 | 2*, 3 or 4 | 30½ | 20¼ | 26⅝ | 1030.00 | 424 |
| | 700E | 35 | 70 | 2*, 3 or 4 | 2, 3* or 4 | 33 | 23 | 28½ | 1420.00 | 580 |
| | 800E | 50 | 100 | 2*, 3 or 4 | 2, 3* or 4 | 35¼ | 25 | 31½ | 1660.00 | 730 |
| Z-1174 Duraclay | 350-VGE | 12 | 24 | 1½ or 2 | 2 | 23 | 16¼ | 12¼ | 300.00 | 76 |
| | 450-VGE | 18 | 36 | 1½ or 2 | 2 | 26⅜ | 19¼ | 15¾ | 440.00 | 128 |
| | 550-VGE | 25 | 50 | 1½ or 2 | 2 | 29⅞ | 22⅛ | 18½ | 680.00 | 171 |

*Recommended sizes. When ordering specify Model Type, Size Number and inlet and outlet sizes.

*Prices are subject to change without notice.*



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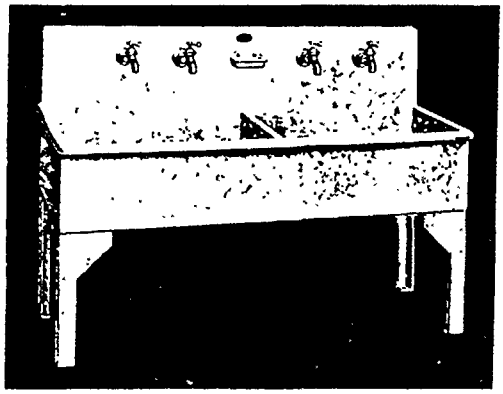
# STURDIBILT GALVANIZED STEEL SCULLERY SINKS

**Sturdibilt** galvanized steel scullery sinks are made of 12-gauge steel, all welded construction, with roll rims. One piece of metal is used to form front, bottom and back; ends and partitions are welded in. Sink compartments are pitched to drain. Legs are 2x2x⅛" angles; they are detachable, and have adjusting bolts for anchoring and leveling sinks. Sink compartments are 12" deep, backs are 12" high; rims are 36" from floor to top. Sinks and legs are hot dip galvanized after fabrication, insuring all edges against rust and corrosion.

## Two Compartment



5-300

Sink: **Sturdibilt** 12-gauge steel, galvanized 12" deep two compartment scullery sink with roll rim, 12" high back, detachable adjustable legs and one galvanized soap dish.

Trim: Four **LK-69** rough brass single faucets with renewable composition discs and ½" female flanged inlets.

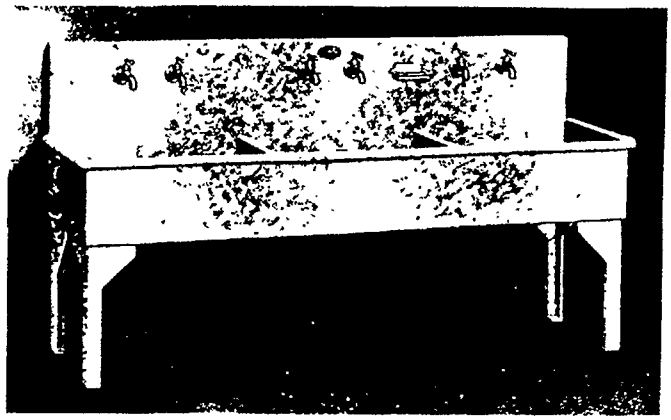
Wastes: Two **LK-4** polished cast brass waste plugs with metal stoppers and 1½" O.D. tailpieces.

*Note: Sink traps and continuous wastes are not included.*

**Overall Dimensions**

Width, front to back.....27¼" Depth inside....12"
Height, floor to top of rim..36" Height of back..12"
Overall length, as specified

## Three Compartment



5-302

Sink: **Sturdibilt** 12-gauge steel, galvanized 12" deep three compartment scullery sink with roll rim, 12" high back, detachable adjustable legs and one galvanized soap dish.

Trim: Six **LK-69** rough brass single faucets with renewable composition discs and ½" female flanged inlets.

Wastes: Three **LK-4** polished cast brass waste plugs with metal stoppers and 1½" O.D. tailpieces.

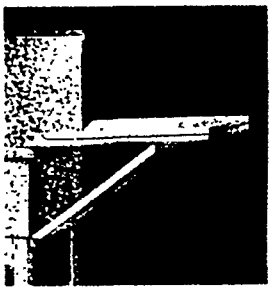
*Note: Sink traps and continuous wastes are not included.*

**Overall Dimensions**

Width, front to back.....27¼" Depth, inside.....12"
Height, floor to top of rim.....36" Height of back.... 12"
Overall length, as specified

# DETACHABLE DRAINBOARDS

**Galvanized Steel — Reversible — 24" Wide**



5-310

Detachable drainboards are made of 14-gauge steel, all welded construction. They are reversible and can be attached to either right or left hand side of the sink without drilling. Drainboards are supported by rigid slip-on angle braces that are bolted to the sink legs; two specially designed clamps secure them to the sink rims. Drainboards are hot dip galvanized after fabrication, insuring all edges against rust and corrosion.

**PRICES, EACH — *F.O.B. CHICAGO, ILLINOIS**

| Length Inches | *Price Each | Shpg. Wt. Pounds | Length Inches | *Price Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|
| 24 | **$19.50** | 30 | 48 | **$41.92** | 70 |
| 30 | **24.16** | 40 | 54 | **48.22** | 80 |
| 36 | **28.72** | 50 | 60 | **54.68** | 90 |
| 42 | **35.56** | 60 | | | |

*Some prices apply for drainboards less than 24" in width.*

**PRICES, EACH (less traps) *F.O.B. CHICAGO, ILLINOIS**

| Number and Type | Overall Dimensions Inches Length | Overall Dimensions Inches Width | Compartment Sizes I.D. Inches | *Price, Complete | *Price, less Faucets | Shipping Weight, Pounds |
|---|---|---|---|---|---|---|
| **5-300 Two Compartment** | 32½ | 27¼ | 15x24x12 | **$129.52** | **$111.82** | 130 |
| | 38½ | 27¼ | 18x24x12 | **134.62** | **116.92** | 142 |
| | 44½ | 27¼ | 21x24x12 | **139.88** | **122.18** | 154 |
| | 50½ | 27¼ | 24x24x12 | **145.12** | **127.42** | 166 |
| | 56½ | 27¼ | 27x24x12 | **150.30** | **132.60** | 178 |
| | 62½ | 27¼ | 30x24x12 | **155.48** | **137.78** | 190 |
| **5-302 Three Compartment** | 47½ | 27¼ | 15x24x12 | **169.28** | **142.72** | 175 |
| | 56½ | 27¼ | 18x24x12 | **177.08** | **150.52** | 193 |
| | 62½ | 27¼ | 20x24x12 | **182.32** | **155.76** | 205 |
| | 74½ | 27¼ | 24x24x12 | **192.76** | **166.20** | 229 |
| | 83½ | 27¼ | 27x24x12 | **203.18** | **176.62** | 238 |
| | 92½ | 27¼ | 30x24x12 | **208.36** | **181.80** | 265 |

*Same prices apply for scullery sinks less than 24" wide inside.*

## For Scullery Sinks Wider than 24" (Inside, Front to Back)

**ADD,** for each extra inch or fraction, up to 36" wide
**5-300....$3.38 5-302....$4.50**

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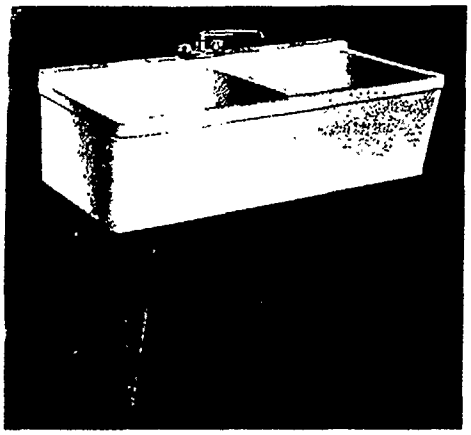
# LAUNDRETTE DURACLAY LAUNDRY TUBS

Earthenware, Vitreous Glazed



6-112

### 6-112

Tub: **Laundrette** Duraclay, earthenware vitreous glazed, two-compartment laundry tub with integral washboard and ledge back with two soap depressions.

Support: 6-248 **Herc-U-Lite** black enameled steel support with leveling screws.

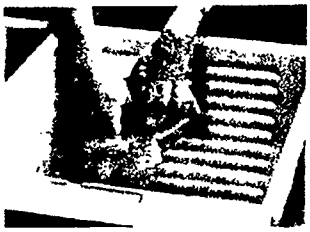
Trim: B36HRR **Repcal** supply fitting with renewable units and seats; 8" long swinging spout with hose end.

Waste: Rough brass twin **Duo** waste connection with rubber stoppers and 1½" O.D. tailpiece.

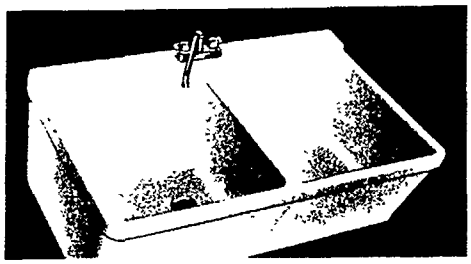
*Note: Trap is not included.*

**Overall Dimensions**

Sizes..36x25x12" deep and 42x25x12" deep.
Rim to floor.....34"



An integral washboard is moulded into the single tub and into the left hand compartment of the two-compartment tub.



Large compartments of the **Laundrette** allow ample room for efficient laundering. Flat ledge back provides wide shelf for laundering materials with two conveniently located integral soap depressions.

### 6-116

Tub: **Laundrette** Duraclay, earthenware vitreous glazed, single compartment laundry tub with integral washboard and ledge back with soap depression.

Support: 6-248 **Herc-U-Lite** black enameled steel support with leveling screws.

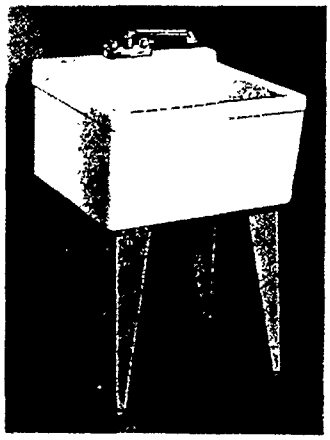
Trim: B36HRR **Repcal** supply fitting with renewable units and seats; 8" long swinging spout with hose end.

Waste: 8-355 brass waste plug with rubber stopper and 1½" O.D. tailpiece.

*Note: Trap is not included.*

**Overall Dimensions**

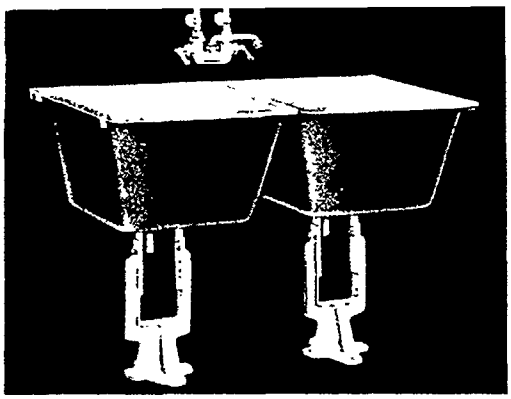
Size..22x25x12" deep  Rim to floor..34"



6-116

*Note: Myrastand support also available for Laundrette laundry tubs—see page 6-6.*

## PORCELAIN ENAMELED CAST IRON LAUNDRY TUBS



6-202

Tubs: Battery of two, porcelain enameled inside, ground coat outside, cast iron flat rim laundry tubs.

Supports: Painted white cast iron adjustable supporting stands; concealed hangers.

Trim: B34CR **Repcal** rough nickel plated laundry tub faucet with hose end swinging spout; ½" union inlets on 3¼" centers for supplies from ceiling.

Wastes: 8-355 brass waste plugs with rubber stoppers and 1½" tailpieces.

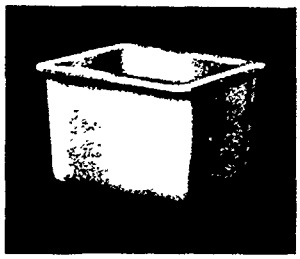
*Note: Traps and supply pipes are not included.*

**Overall Dimensions**

Sizes, each tub.....24x22x13¼" deep.  Height, adjustable from 30" to 33½".

*When ordering, specify if regular or acid-resisting enamel is required.*

## DURACLAY



6-130

Tub: Duraclay, earthenware vitreous glazed, center outlet flat rim laundry tub.

Waste: 8-355 brass waste plug with rubber stopper and 1½" tailpiece.

*Note: Trap is not included.*

Size.....20x18x12" deep

**PRICES COMPLETE, less traps**

| Number | Size | White | Color | Shpg. Wt. |
|---|---|---|---|---|
| 6-112 | 36x25" | $139.46 | $197.16 | 245 lbs. |
| | 42x25" | 168.36 | 240.46 | 270 lbs. |
| 6-116 | 22x25" | 87.14 | 117.54 | 160 lbs. |
| 6-130 | 20x18" | 44.28 | 65.28 | 75 lbs. |
| 6-202 Battery of 2 | 24x22" | White Regular $125.68 | White A.R. $137.28 | 230 lbs. |

If less **B36HRR** supply fitting.....Deduct $15.70
If less **B34CR** laundry faucet.....Deduct 9.92
For **20-19** ¼" male tailpieces....Add Per Pr. .38

Unless otherwise specified, all exposed metal trim is chromium plated.

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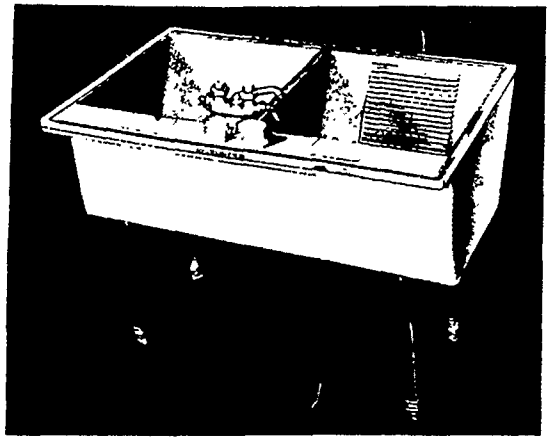
# CEMENT COMPOSITION LAUNDRY TUBS



6-230

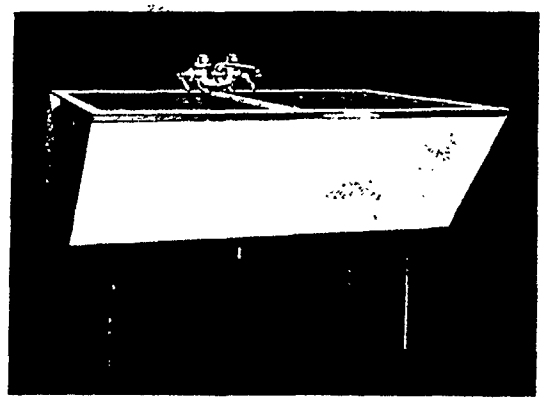
Tub: **Shelfon** one piece cement composition laundry tub with 6" wide integral shelf and self-draining soap depressions; raised metallic rim, built-in rustless metallic washboard and aluminum faucet anchor.

Support: Painted angle iron supporting frame with **Lightning Levelers.**

Trim: B34R **Repcal** Rgh. N.P. laundry tub faucet with swinging hose end spout; ½" union inlets on 3¼" centers, for supplies from ceiling. (3-part tub has two faucets.)

Waste: Cast-in waste connection with nickel plated brass strainers, rubber stoppers and 1½" tailpiece.

| Overall Sizes: | Single | 2-part | 3-part | Tubs |
|---|---|---|---|---|
| | 25x28" | 48x28" | 72x28" | 16" deep |



6-240

Tub: Cast cement composition laundry tub with metallic rim.

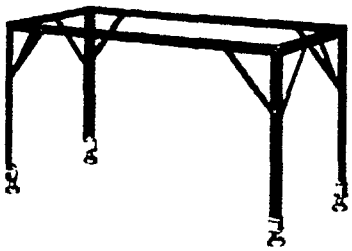
Support: Painted angle iron supporting frame.

Trim: B34R **Repcal** Rgh. N.P. laundry tub faucet with swinging hose end spout; ½" union inlets on 3¼" centers, for supplies from ceiling. (3-part tub has two faucets.)

Waste: Cast-in waste connection with nickel plated brass strainers, rubber stoppers and 1½" tailpiece.

| Sizes: | Single | 2-part | 3-part |
|---|---|---|---|
| | 25x24" | 48x24" | 72x24" |
| All tubs | 27x24" | 54x24" | |
| 16" deep | 31x24" | 60x24" | |

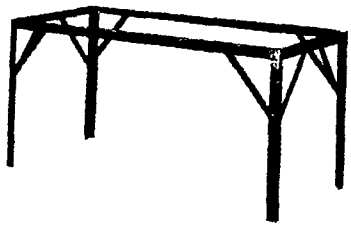
# LAUNDRY TUB SUPPORTING FRAMES



6-245

Dark green enameled angle iron supporting frame for cement composition laundry tubs, with cadmium plated **Lightning Levelers.**

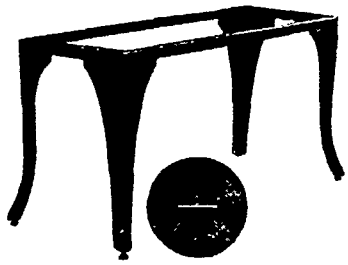
Lengths 24", 40" and 64"
Width 15" Height 18"



6-247

Dark green enameled angle iron supporting frame for cement composition laundry tubs.

Lengths 24",40",46",52" and 64"
Width 15" Height 18"



6-249

**Myrastand** aluminum finish formed steel supporting frame with leveling bolts for **Laundrette** Duraclay laundry tubs.

Lengths 18", 32" and 38"
Width 17½" Height 21"

## LAUNDRY TUBS
### *PRICES COMPLETE, F.O.B., Chicago, Ill.

| Number | Type | Size | *Price | Shpg. Wt. |
|---|---|---|---|---|
| 6-230 | Single | 25x28" | $44.76 | 200 lbs. |
| | 2-part | 48x28" | 58.20 | 400 lbs. |
| | 3-part | 72x28" | 96.76 | 600 lbs. |
| 6-240 | Single | 25x24" | 36.36 | 175 lbs. |
| | Single | 27x24" | 37.88 | 200 lbs. |
| | Single | 31x24" | 39.40 | 225 lbs. |
| | 2-part | 48x24" | 47.00 | 325 lbs. |
| | 2-part | 54x24" | 52.88 | 350 lbs. |
| | 2-part | 60x24" | 58.12 | 375 lbs. |
| | 3-part | 72x24" | 79.16 | 500 lbs. |

If less B34R supply fitting.....**Deduct each $10.06**

*For local prices, contact your Crane Branch or Crane Wholesaler.*

## SUPPORTING FRAMES
### †PRICES COMPLETE, F.O.B. Shipping Point

| Number | Type of Tub | Size | †Price | Shpg. Wt. |
|---|---|---|---|---|
| 6-245 | Single | 24" | $8.54 | 14 lbs. |
| | 2-part | 40" | 8.54 | 15 lbs. |
| | 3-part | 64" | 12.80 | 23 lbs. |
| 6-247 | Single | 24" | 5.34 | 10 lbs. |
| | 2-part | 40" | 5.34 | 12 lbs. |
| | 2-part | 46" | 6.66 | 14 lbs. |
| | 2-part | 52" | 7.34 | 16 lbs. |
| | 3-part | 64" | 8.00 | 18 lbs. |
| 6-249 for Laundrette | 22" single | 18" | 8.40 | 14 lbs. |
| | 36" 2-part | 32" | 8.40 | 16 lbs. |
| | 42" 2-part | 38" | 8.40 | 18 lbs. |

†6-245 and 6-247 frames are F.O.B., Chicago, Ill.
6-249 frames are F.O.B. Philadelphia, Pa.



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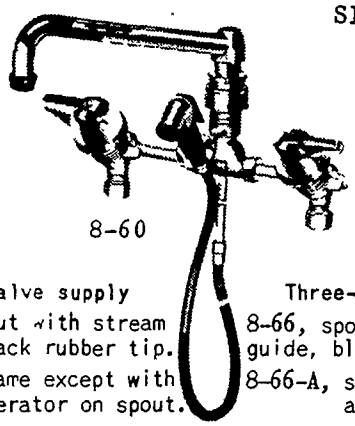
## SINK AND LAUNDRY TUB SUPPLY TRIM



8-60

*Exposed metal trim is chromium plated.*

**Two-valve supply**

8-60, spout with stream guide, black rubber tip.

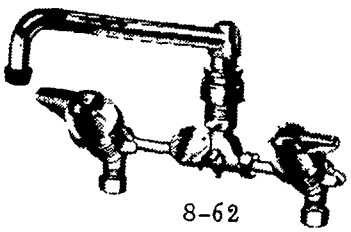
8-60-A, same except with aerator on spout.

**Three-valve supply**

8-66, spout with stream guide, black rubber tip.

8-66-A, same except with aerator on spout.

*Temple Dial-ese* swinging spout supply fitting with automatic diverter valve, thumb control spray with retractable rubber hose, indexed hooded lever handles and inlets on 9" centers with couplings nuts to slip 7/16" or 1/2" O.D. tubing, or 1/4" I.P.S. tailpieces.



8-62

**Two-valve supply**

8-62, spout with stream guide, black rubber tip.

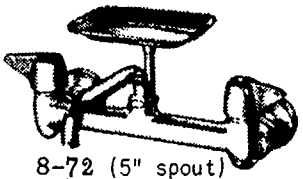
8-62-A, same except with aerator on spout.

**Three-valve supply**

8-68, spout with stream guide, black rubber tip.

8-68-A, same except with aerator on spout.

*Temple Dial-ese* swinging spout supply fitting with indexed hooded lever handles and inlets on 9" centers with coupling nuts to slip 7/16" or 1/2" O.D. tubing, or 1/4" I.P.S. tailpieces.



8-72 (5" spout)
8-72-L (8" spout)

8-73 (5" spout)
8-73-L (8" spout)

8-72 *Embassy Dial-ese* swinging spout sink faucet with removable soap dish and indexed hooded lever handles; ½" eccentric female flange inlets.

8-72-L Same as 8-72 except with 8" long spout.

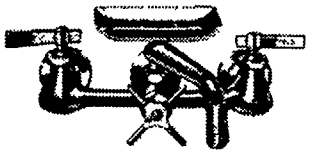
8-74 Same as 8-72 except with ½" male inlets.

8-73 *Embassy Dial-ese* swinging spout sink faucet with indexed hooded lever handles; ½" eccentric female flange inlets.

8-73-L Same as 8-73 except with 8" long spout.

***Inlets are adjustable for supplies 7¾" to 8¼" centers.***

**Note:** For any of the above *Embassy* sink faucets with aerator, add suffix "A" to catalog number.
For example: **8-72-A, 8-73-LA**, etc. **Add $1.70**

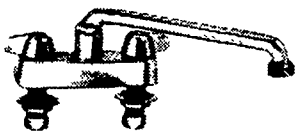


No. 561

Three-water *Classic* swinging spout sink faucet with removable soap dish, indexed metal lever handles, four-arm handle on third water valve, and *Softflo* spout end; *Quaturn* valves with ½" female flange inlets on 4" centers.

## EMBASSY SUPPLY FITTINGS FOR LEDGE TYPE KITCHEN SINKS

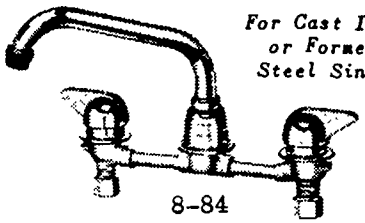
### FOR DURACLAY LAUNDRY TUBS



B36HRR

*Repcal* supply fitting with renewable units and seats; 8" long swinging spout with hose end; inlets on 4" centers.

*For Cast Iron or Formed Steel Sinks*

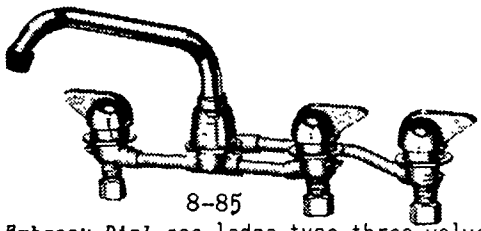


8-84

*Embassy Dial-ese* ledge type supply fitting with rubber tipped swinging spout and indexed hooded lever handles; less ¼" tailpieces.

8-86 Same as 8-84 except for Duraclay sinks or countertops.

8-88 Same as 8-84 except with thumb control spray and retractable rubber hose.



8-85

*Embassy Dial-ese* ledge type three valve supply fitting with rubber tipped swinging spout and indexed hooded lever handles; less ¼" tailpieces.

8-87 Same as 8-85 except for Duraclay sinks or composition countertops.

8-89 Same as 8-85 except with thumb control spray and retractable rubber hose.

**Note:** For any of the above *Embassy* sink supply fittings with aerator, add suffix "A" to catalog number (for example: **8-84-A**) **Add $1.70**

**Aerator with Male Adapter**

For use with Crane sink supply fittings

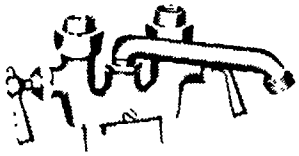
Each **$1.80**

**Note:** Specify catalog number and name of Crane sink faucet with which the aerator is to be used.

| Number | Price | Shpg.Wt | Number | Price | Shpg.Wt | Number | Price | Shpg.Wt |
|---|---|---|---|---|---|---|---|---|
| 8-60 | $34.70 | 6¾ | 8-68-A | $38.60 | 9 | 8-84 | $18.30 | 4½ |
| 8-60-A | 36.50 | 6¾ | 8-72 | 21.00 | 5½ | 8-85 | 25.70 | 5¼ |
| 8-62 | 28.00 | 5¾ | 8-72-L | 21.60 | 5¾ | 8-86 | 20.50 | 5 |
| 8-62-A | 29.80 | 5¾ | 8-73 | 20.00 | 5 | 8-87 | 27.40 | 7 |
| 8-66 | 43.50 | 9 | 8-73-L | 20.60 | 5¼ | 8-88 | 25.80 | 5 |
| 8-66-A | 45.30 | 9 | 8-74 | 21.00 | 5¼ | 8-89 | 33.60 | 6 |
| 8-68 | 36.80 | 9 | B36HRR | 15.70 | 3½ | 561 | 41.92 | 8 |

*Prices are subject to change without notice.*

## SINK AND LAUNDRY TUB SUPPLY TRIM

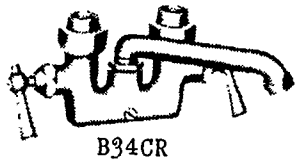


B34R

### B34R

*Repcal* rough nickel plated laundry tub faucet with swinging hose end spout; 1/2" union inlets on 3¾" centers, for supplies from ceiling.

*(For Alberene or composition laundry tubs.)*

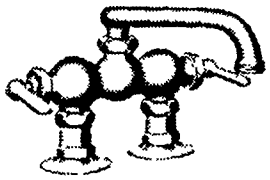


B34CR

### B34CR

*Repcal* rough nickel plated laundry tub faucet with hose end swinging spout, 1/2" union inlets on 3¾" centers, for supplies from ceiling.

*(For flat rim cast iron enameled laundry tubs.)*



8-94

### 8-94

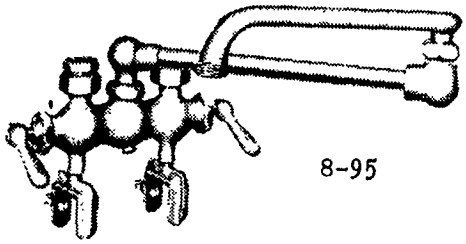
*Quaturn* rough nickel plated laundry tub supply fitting with swinging spout with hose end, indexed lever handles; ½" female flanged union inlets. Inlets on 3⅜" centers.

*(For shelf type laundry tubs.)*

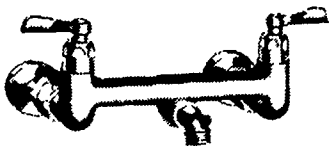
### 8-95

*Quaturn* rough nickel plated laundry tub supply fitting with double jointed swing spout with hose end, indexed lever handles; ½" female iron pipe union inlets for supplies from ceiling. Inlets on 3⅜" centers.

*(For Alberene or composition laundry tubs.)*



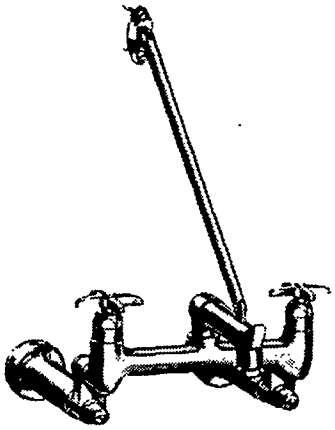
8-95



### 8-101

Rough chromium plated utility sink faucet with *Dial-ese* trimming units, rigid spout with pail hook and hose end; indexed lever handles; 1/2" eccentric female inlets with adjustable set screw flanges.

*Supply inlets adjustable 7¾" to 8¼".*

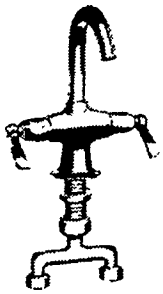


### 8H-103

Exposed sink supply fitting with *Dial-ese* trimming units, rigid spout with pail hook and brace integral stops and adjustable screw flanges. ½" female inlets adjustable 5" to 11" centers. Wall to center of spout outlet 10½".

### 8-114

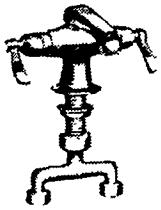
*Quaturn* single pantry faucet with rigid gooseneck spout and metal lever handle; ¼" union tailpiece.



### 8H-180

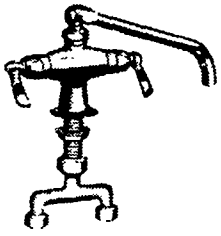
Double lavatory faucet with *Dial-ese* trimming units, gooseneck spout and lever handles with index buttons.

8H-180-A, same with *Spring-Flo* aerator.



### 8H-182

Double lavatory faucet with *Dial-ese* trimming units, low pattern spout, lever handles with index buttons.



### 8H-186

Double lavatory faucet with *Dial-ese* trimming units, and swinging spout, lever handles with index buttons.

| Number | Price | Shpg. Wt. |
|---|---|---|
| B34R | $10.06 | 3¼ Lbs. |
| B34CR | 9.92 | 3¼ |
| 8-94 | 13.18 | 4¾ |
| 8-95 | 18.76 | 4½ |
| 8-101 | 19.00 | 4½ |
| 8H-103 | 47.50 | 8 |
| 8-114 | 10.64 | 2¼ |
| 8H-180 | 25.50 | 6 |
| 8H-180-A | 27.50 | 6 |
| 8H-182 | 25.50 | 6 |
| 8H-186 | 31.90 | 6 |

*Prices are subject to change without notice.*

*Unless otherwise specified all exposed parts are chromium plated.*



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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# CRANE COPPER TUBE BASEBOARD RADIATION—TYPE F

## With Corrugated Aluminum Fin-Type Heating Element

*—Construction Features—*

**Enclosure:** Enclosures are die-formed of 20-gauge furniture steel and consist of three basic parts:

1. Back Panel and Integral Top Molding.
2. Directional Louver Blade.
3. Front Panel.

The combination back panel and top molding eliminates a crack where top molding joins the wall and prevents air leakage. The rounded projecting nose of the top molding and the directional louver blade direct the rising warm air currents away from the wall to minimize the possibility of wall streaking.

**Heating Element:** The non-ferrous heating element consists of corrugated aluminum fins mechanically bonded to ¾" seamless copper tubing. The exclusive corrugated fin design provides maximum fin strength and eliminates the sharp cutting edges normally found with flat fins. The radiator is easier to handle and install. One tube end of each heating element is expanded to receive the unexpanded end of another. This permits sweating the elements together, end to end, without the need of couplings.

**Accessories:** All accessories are constructed of 18-gauge steel, die-formed to continue the clean flowing lines of the enclosure. Enclosures and accessories are designed to eliminate visible fastening devices.

**Supporting Brackets:** Heating elements and enclosure front panels are held in place by supporting brackets. These brackets also have an angle to which dampers may be attached, and are designed to accommodate by-pass piping, if required. An internal spring lock on the bracket locks the front panel in place, yet permits quick removal and snap-on replacement.

**Finish:** Baseboard, enclosures and accessories are finished in a neutral gray, semi-gloss prime coat suitable for refinishing after installation in colors to match the woodwork or walls.

ENCLOSURE WITH HEATING ELEMENT

**Enclosures**—Furnished and packaged separately in 4′, 5′, 6′ and 8′ lengths. Each package contains the back panel, louver blade, front panel, two or more support brackets, one set of upper and lower joint trim and all sheet metal screws necessary for assembling the complete enclosure.

**Heating Elements**—Packaged individually in nominal lengths of 4′, 5′, 6′ and 8′. (The nominal length represents the length of the corresponding enclosure. The overall tube length is slightly longer than the nominal length, the finned length is approximately 2″ shorter than the nominal length.)

END CAP

JOINT TRIM

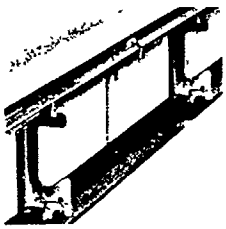
WALL SECTION

**End Cap**—Attractive, rounded end caps give a finished appearance where enclosure terminates at a door or for a similar short-of-corner requirement. Furnished for right or left hand end, as specified.

**Joint Trim**—In rooms where two or more enclosure sections are needed, an attractive, removable joint trim covers the joint where the two enclosures butt together. This trim is also used to conceal the cut edge where enclosures are cut to length. One set is included with each enclosure ordered.

**Wall Section**—For wall-to-wall installation of enclosure, a wall section provides a tight, neat appearing joint between the enclosure and the wall. Wall sections are interchangeable and may be used at either right or left hand ends.

DAMPER



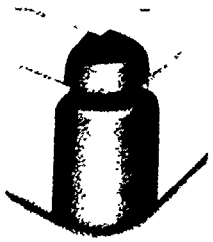
SUPPORT BRACKET

**Damper**—Damper is a hinged blade type operated by a bead chain and keyhole arrangement to close off the convected air flow at the bottom of the enclosure. They are furnished in nominal 4′, 5′, 6′ or 8′ lengths to conform with enclosure lengths.

**Brackets**—Supporting brackets position the three enclosure parts and the heating element. They contain a spring-lock device for supporting the enclosure front panel, and an angle clip for the attachment of the damper.

INSIDE CORNER

OUTSIDE CORNER



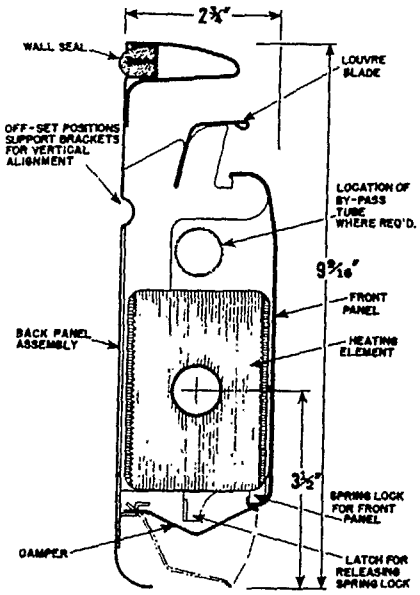
**Inside Corner**—Inside corner pieces are rounded so as to continue the flowing lines of the enclosure around right angle inside wall corners.

**Outside Corner**—Outside corner pieces are attractively designed to continue the finished appearance of the enclosure around outside right angled corners or offsets of the room.

*For capacities, dimensions and prices, refer to page 14-6.*

# CRANE COPPER TUBE BASEBOARD RADIATION—TYPE F

## Capacities, Dimensions and Prices




### HEATING CAPACITIES

Btu/Hr—per Lineal Foot

| Steam 1 psi | Water Rate G.P.M. | Average Temperature, Forced Hot Water | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 150° | 160° | 170° | 180° | 190° | 200° | 210° | 220° |
| 990 | 3 | 460 | 540 | 620 | 690 | 760 | 840 | 910 | 990 |
| | 1 | 440 | 520 | 590 | 660 | 730 | 800 | 870 | 950 |

**NOTE:** All the above I-B-R Ratings include a 15% addition for heating effect. These ratings are based on active length. The total length equals active length plus 2¼".

Heating elements are constructed of ¾" nominal seamless copper tubing type, mechanically expanded within special corrugated aluminum fins. Fin dimensions are 2½" by 3½" by 0.017". Fin spacing, 48 fins per foot.

The use of I-B-R Ratings at 3 GPM (1500 lbs. per hour) is limited to installations where the water flow rate through the baseboard unit is equal to or greater than 3 GPM. Where the water flow rate through the baseboard is not known, the I-B-R Rating at the standard water flow rate of 1 GPM must be used.

The pressure drop through Crane Baseboard Radiation at 1 GPM is 0.04 inches of water per lineal foot. The pressure drop at 3 GPM is 0.32 inches of water per lineal foot.

### PRICES—PER LINEAL FOOT

| Product Description | PRICES—Based on Zones Designated | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| Enclosure with Heating Element | $6.00 | $6.10 | $6.16 | $6.18 | $6.20 | $6.24 | $6.26 | $6.28 |
| Damper Complete | .60 | .60 | .60 | .60 | .60 | .60 | .60 | .60 |
| Enclosure Only | 3.00 | 3.06 | 3.08 | 3.10 | 3.10 | 3.12 | 3.14 | 3.14 |
| Heating Element Only | 3.00 | 3.06 | 3.08 | 3.10 | 3.10 | 3.12 | 3.14 | 3.14 |

| Product Description | PRICES—Based on Zones Designated | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | J | K | L | M | N | O | P | Q |
| Enclosure with Heating Element | $6.30 | $6.34 | $6.48 | $6.52 | $6.54 | $6.56 | $6.58 | $6.60 |
| Damper Complete | .60 | .60 | .60 | .60 | .60 | .60 | .60 | .60 |
| Enclosure Only | 3.16 | 3.18 | 3.24 | 3.26 | 3.28 | 3.28 | 3.30 | 3.30 |
| Heating Element Only | 3.16 | 3.18 | 3.24 | 3.26 | 3.28 | 3.28 | 3.30 | 3.30 |

### ACCESSORY PRICES

*All Prices are F.O.B. Philadelphia, Pa.

| Accessory | *Price, Each | Shipping weight |
|---|---|---|
| End Cap | $1.60 | 1¼ Pounds |
| Wall Section | 1.10 | ¼ |
| Inside Corner | 1.60 | ¼ |
| Outside Corner | 3.20 | ½ |
| Joint Trim | .60 | ¼ |
| Supporting Bracket | 1.00 | ¼ |

Overall Lengths

| | | | | |
|---|---|---|---|---|
| Enclosure Length | 48" | 60" | 72" | 96" |
| Heating Element Length | 48¾" | 60¾" | 72¾" | 96¾" |
| Finned Length | 45¾" | 57¾" | 69¾" | 93¾" |

LIST PRICES shown in the Price Table are zoned according to states as follows:

"A" Alabama, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

"B" Louisiana

"C" Missouri

"D" Iowa

"E" Arkansas

"F" Kansas and Minnesota

"G" Oklahoma

"H" Colorado

"J" Nebraska and South Dakota

"K" Nevada, North Dakota and Texas

"L" California and Washington

"M" Montana

"N" Wyoming

"O" Arizona and Utah

"P" New Mexico and Oregon

"Q" Idaho



Prices are subject to change without notice.

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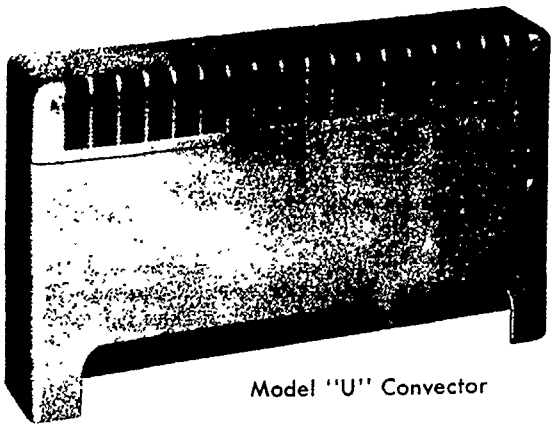
Printed in U.S.A.

# NESBITT MODEL "U" UNIVERSAL CONVECTORS



Model "U" Convector

- All steel cabinet with neutral gray semi-gloss finish
- Same cabinet for free-standing or semi-recessed installations
- Same heating element is used for two-pipe steam, or for forced or gravity hot water systems
- Top, grille front, back and sides of cabinet are welded at factory—lower front section is removable
- Completely assembled unit shipped in one carton
- Damper or air venting system is optional

All Model "U" Convectors are 6 ¼" deep overall and may be installed as free-standing or semi-recessed units. On semi-recessed installations, the maximum depth of recess should not exceed 4¾".

## CAPACITIES AND SIZES

| Catalog Number | Dimensions, Inches | | Steam Capacities | Forced Circulation Hot Water Capacities | | | Approx. Shipping Weight, Pounds |
|---|---|---|---|---|---|---|---|
| | | | | Thousands of Btu/Hr. | | | |
| | Height | Length | Sq. Ft. EDR 215° Steam 65° Ent. Air | 180° Ent. Water 20° Temp. Drop | 200° Ent. Water 20° Temp. Drop | 220° Ent. Water 20° Temp. Drop | |
| U2016 | 20 | 16 | 13.0 | 1.74 | 2.17 | 2.60 | 23 |
| U2020 | 20 | 20 | 17.0 | 2.28 | 2.84 | 3.40 | 27 |
| U2024 | 20 | 24 | 21.0 | 2.81 | 3.51 | 4.20 | 31 |
| U2028 | 20 | 28 | 26.0 | 3.48 | 4.34 | 5.20 | 35 |
| U2032 | 20 | 32 | 29.5 | 3.95 | 4.93 | 5.90 | 39 |
| U2036 | 20 | 36 | 33.5 | 4.48 | 5.59 | 6.70 | 43 |
| U2040 | 20 | 40 | 38.5 | 5.15 | 6.43 | 7.70 | 47 |
| U2044 | 20 | 44 | 43.5 | 5.82 | 7.26 | 8.70 | 51 |
| U2048 | 20 | 48 | 46.5 | 6.22 | 7.76 | 9.30 | 55 |
| U2056 | 20 | 56 | 55.5 | 7.43 | 9.26 | 11.10 | 60 |
| U2064 | 20 | 64 | 63.0 | 8.44 | 10.50 | 12.60 | 67 |
| U2420 | 24 | 20 | 18.5 | 2.48 | 3.09 | 3.70 | 32 |
| U2424 | 24 | 24 | 23.0 | 3.08 | 3.84 | 4.60 | 36 |
| U2428 | 24 | 28 | 28.0 | 3.75 | 4.67 | 5.60 | 40 |
| U2432 | 24 | 32 | 32.5 | 4.35 | 5.42 | 6.50 | 44 |
| U2436 | 24 | 36 | 36.5 | 4.88 | 6.09 | 7.30 | 48 |
| U2440 | 24 | 40 | 42.0 | 5.62 | 7.01 | 8.40 | 52 |
| U2444 | 24 | 44 | 47.5 | 6.36 | 7.93 | 9.50 | 56 |
| U2448 | 24 | 48 | 51.0 | 6.83 | 8.51 | 10.20 | 61 |
| U2456 | 24 | 56 | 60.5 | 8.18 | 10.10 | 12.10 | 68 |
| U2464 | 24 | 64 | 69.0 | 9.24 | 11.52 | 13.80 | 73 |

LIST PRICES shown in the table at the right are zoned according to states as follows:

"A" Alabama, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia and Wisconsin.

"B" Louisiana and Missouri.

"C" Arkansas, Iowa, Kansas and Minnesota.

"D" Colorado, Nebraska, Nevada, North Dakota, Oklahoma, South Dakota and Texas.

"E" California and Washington.

"F" Arizona, Montana, New Mexico, Oregon, Utah and Wyoming.

"G" Idaho.

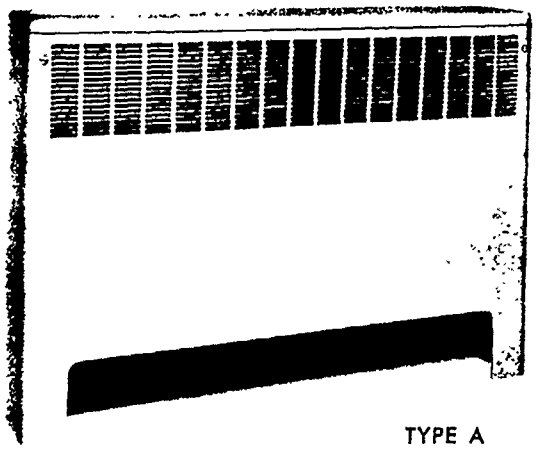
*For Air Valves, refer to Section 17.*

## CONVECTOR PRICES

| Catalog Number | Length Inches | PRICES—BASED ON ZONES DESIGNATED | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| U2016 | 16 | $26.16 | $26.68 | $26.94 | $27.20 | $27.72 | $27.98 | $28.24 |
| U2020 | 20 | 28.76 | 29.44 | 29.78 | 30.12 | 30.80 | 31.14 | 31.48 |
| U2024 | 24 | 31.36 | 32.20 | 32.62 | 33.04 | 33.88 | 34.30 | 34.72 |
| U2028 | 28 | 34.60 | 35.64 | 36.16 | 36.68 | 37.72 | 38.24 | 38.76 |
| U2032 | 32 | 36.88 | 38.06 | 38.66 | 39.24 | 40.42 | 41.02 | 41.60 |
| U2036 | 36 | 39.48 | 40.82 | 41.50 | 42.16 | 43.50 | 44.18 | 44.84 |
| U2040 | 40 | 42.72 | 44.26 | 45.04 | 45.80 | 47.34 | 48.12 | 48.88 |
| U2044 | 44 | 45.98 | 47.72 | 48.60 | 49.46 | 51.20 | 52.08 | 52.94 |
| U2048 | 48 | 47.92 | 49.78 | 50.72 | 51.64 | 53.50 | 54.44 | 55.36 |
| U2056 | 56 | 53.78 | 56.00 | 57.12 | 58.22 | 60.44 | 61.56 | 62.66 |
| U2064 | 64 | 58.66 | 61.18 | 62.44 | 63.70 | 66.22 | 67.48 | 68.74 |
| U2420 | 20 | 29.72 | 30.46 | 30.84 | 31.20 | 31.94 | 32.32 | 32.68 |
| U2424 | 24 | 32.66 | 33.58 | 34.04 | 34.50 | 35.42 | 35.88 | 36.34 |
| U2428 | 28 | 35.90 | 37.02 | 37.58 | 38.14 | 39.26 | 39.82 | 40.38 |
| U2432 | 32 | 38.82 | 40.12 | 40.78 | 41.42 | 42.72 | 43.38 | 44.02 |
| U2436 | 36 | 41.42 | 42.88 | 43.62 | 44.34 | 45.80 | 46.54 | 47.26 |
| U2440 | 40 | 45.00 | 46.68 | 47.52 | 48.36 | 50.04 | 50.88 | 51.72 |
| U2444 | 44 | 48.58 | 50.48 | 51.46 | 52.38 | 54.28 | 55.24 | 56.18 |
| U2448 | 48 | 50.86 | 52.90 | 53.92 | 54.94 | 56.98 | 58.00 | 59.02 |
| U2456 | 56 | 57.02 | 59.44 | 60.66 | 61.86 | 64.28 | 65.50 | 66.70 |
| U2464 | 64 | 62.56 | 65.32 | 66.70 | 68.08 | 70.84 | 72.22 | 73.60 |

For Air Chambers and Accessories, less air valve, Add $3.60 For Dampers, Add $2.50

## TRANE TYPE A CONVECTOR-RADIATORS



TYPE A

All steel cabinet with standard gray primer
Same cabinet for free-standing or semi-recessed installations
Same heating element is used for two-pipe steam, or for forced or gravity hot water systems
Completely welded unit with removable grille front
Completely assembled unit shipped in one carton
Damper or air venting system is optional

Can be installed as free-standing or semi-recessed units. On semi-recessed installations, extension beyond face of finished wall should not be less than 1¼".

### CAPACITIES AND SIZES

| Cabinet Size, Inches | | Steam Capacities | | | Forced Circulation Hot Water Capacities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Square Feet EDR 215° Steam 65° Ent. Air | | | Thousands of Btu/Hr. | | | | | | | | |
| | | | | | 180° Ent. Water 20° Temp. Drop | | | 200° Ent. Water 20° Temp. Drop | | | 220° Ent. Water 20° Temp. Drop | | |
| | | | Height | | Height | | | Height | | | Height | | |
| Depth | †Length | 20" | 24" | 32" | 20" | 24" | 32" | 20" | 24" | 32" | 20" | 24" | 32" |
| 6 | 20 | 15.0 | 17.5 | 19.0 | 2.1 | 2.5 | 2.7 | 2.7 | 3.1 | 3.4 | 3.2 | 3.8 | 4.1 |
| | 24 | 18.5 | 21.5 | 23.5 | 2.6 | 3.1 | 3.3 | 3.3 | 3.8 | 4.2 | 4.0 | 4.7 | 5.1 |
| | 28 | 22.0 | 25.5 | 28.0 | 3.1 | 3.6 | 4.0 | 3.9 | 4.6 | 5.0 | 4.8 | 5.5 | 6.1 |
| | 32 | 25.5 | 29.5 | 32.5 | 3.6 | 4.2 | 4.6 | 4.6 | 5.3 | 5.8 | 5.5 | 6.4 | 7.1 |
| | 36 | 29.0 | 33.5 | 37.0 | 4.1 | 4.8 | 5.3 | 5.2 | 6.0 | 6.6 | 6.3 | 7.3 | 8.0 |
| | 40 | 32.5 | 37.5 | 41.5 | 4.6 | 5.3 | 5.9 | 5.8 | 6.7 | 7.4 | 7.1 | 8.1 | 9.0 |
| | 44 | 36.0 | 41.5 | 46.0 | 5.1 | 5.9 | 6.5 | 6.4 | 7.4 | 8.2 | 7.8 | 9.0 | 10.0 |
| | 48 | 39.5 | 45.5 | 50.5 | 5.6 | 6.5 | 7.2 | 7.1 | 8.1 | 9.0 | 8.6 | 9.9 | 11.0 |
| | 56 | 46.5 | 53.5 | 59.5 | 6.6 | 7.6 | 8.4 | 8.3 | 9.6 | 10.6 | 10.1 | 11.6 | 12.9 |
| | 64 | 53.5 | 61.5 | 68.5 | 7.6 | 8.7 | 9.7 | 9.6 | 11.0 | 12.3 | 11.6 | 13.3 | 14.9 |
| 8 | 32 | 33.5 | 37.5 | 40.0 | 4.8 | 5.3 | 5.7 | 6.0 | 6.7 | 7.2 | 7.3 | 8.1 | 8.7 |
| | 40 | 43.0 | 48.0 | 51.5 | 6.1 | 6.8 | 7.3 | 7.7 | 8.6 | 9.2 | 9.3 | 10.4 | 11.2 |
| | 48 | 52.0 | 58.5 | 62.5 | 7.4 | 8.3 | 8.9 | 9.3 | 10.5 | 11.2 | 11.3 | 12.7 | 13.6 |
| | 56 | 61.5 | 69.0 | 73.5 | 8.7 | 9.8 | 10.4 | 11.0 | 12.4 | 13.2 | 13.3 | 15.0 | 16.0 |
| | 64 | 70.5 | 79.0 | 84.5 | 10.0 | 11.2 | 12.0 | 12.6 | 14.2 | 15.2 | 15.3 | 17.2 | 18.4 |
| 10 | 40 | 50.0 | 56.0 | 62.0 | 7.1 | 8.0 | 8.8 | 9.0 | 10.0 | 11.1 | 10.9 | 12.1 | 13.4 |
| | 48 | 61.0 | 68.0 | 75.0 | 8.7 | 9.6 | 10.6 | 10.9 | 12.2 | 13.5 | 13.2 | 14.8 | 16.3 |
| | 56 | 72.0 | 80.0 | 88.5 | 10.2 | 11.4 | 12.6 | 12.9 | 14.3 | 15.8 | 15.6 | 17.4 | 19.2 |
| | 64 | 82.5 | 92.0 | 101.5 | 11.7 | 13.0 | 14.4 | 14.8 | 16.5 | 18.2 | 17.9 | 20.0 | 22.0 |

†Overall cabinet lengths are ⅜" longer than shown in table.

Approx. Shpg. Wt..... 1.3 lbs. per square foot EDR.

### PRICE EACH—See Freight Terms Below

| Cabinet Size Inches | | Price Each, on Shipments weighing 100 Pounds of more | | |
|---|---|---|---|---|
| | | Height, Inches | | |
| Depth | Length | 20 | 24 | 32 |
| 6 | 20 | $31.80 | $33.60 | $34.68 |
| | 24 | 34.32 | 36.48 | 37.92 |
| | 28 | 36.84 | 39.36 | 41.16 |
| | 32 | 39.36 | 42.24 | 44.40 |
| | 36 | 41.88 | 45.12 | 47.64 |
| | 40 | 44.40 | 48.00 | 50.88 |
| | 44 | 46.92 | 50.88 | 54.12 |
| | 48 | 49.44 | 53.76 | 57.36 |
| | 56 | 54.48 | 59.52 | 63.84 |
| | 64 | 59.52 | 65.28 | 70.32 |
| 8 | 32 | 45.12 | 48.00 | 49.80 |
| | 40 | 51.96 | 55.56 | 58.08 |
| | 48 | 58.44 | 63.12 | 66.00 |
| | 56 | 65.28 | 70.68 | 73.92 |
| | 64 | 71.76 | 77.88 | 81.84 |
| 10 | 40 | 57.00 | 61.32 | 65.64 |
| | 48 | 64.92 | 69.96 | 75.00 |
| | 56 | 72.84 | 78.60 | 84.72 |
| | 64 | 80.40 | 87.24 | 94.08 |

For Damper Add $3.20 For Air Vent Assembly Add $2.40

### ACCESSORIES

**DAMPERS**—Damper assemblies consist of damper plate, bead chain, pendant and hinge pins and are shipped in one package, not assembled. All cabinets are provided with chain guides and catches for dampers.

**AIR VENT ASSEMBLIES**—Air vent assemblies consist of coupling, compression fittings, copper tubing and manual air vent. Nipples are not included.

FREIGHT TERMS—F.O.B. Factories at LaCrosse, Wisc., or Scranton, Pa., with full rail freight rates allowed to jobbers warehouse or to the regular freight station nearest point of destination on shipments of 100 pounds or more. No freight allowance on shipments weighing less than 100 pounds. The manufacturer reserves the right to make shipment from either of the above manufacturing points.



Prices are subject to change without notice.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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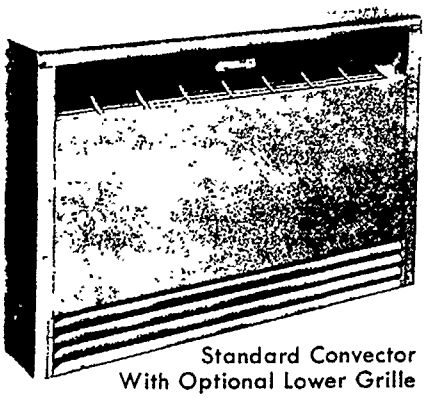
## MODINE CONVECTOR RADIATORS

Cabinets are heavy gauge steel, Bonderized and finished with brown baked-on enamel primer. Cabinet may be installed free-standing (flush against a finished wall), partially recessed, or recessed to full depth. The use of square instead of rounded corners at junction of top and sides simplifies trimming. Self-locking metal trim strips are available for insertion between the recess perimeter and the enclosure. They completely overlap the recess edges by 1¼ inches.

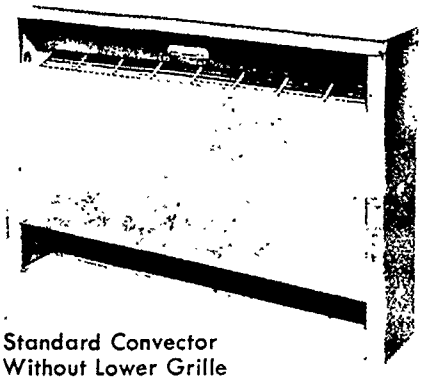
Each enclosure is fitted with a smartly styled damper to provide finger-tip temperature control. Spring tension holds it securely in place or closes it tightly.



Standard Convector With Optional Lower Grille

Heating unit is built for years of trouble-free service. Tubes and fins are entirely non-ferrous for high capacity quick response to automatic controls. The copper tubes are brazed to headers with silver alloy to form a rugged, pressure-resisting unit of steam-carrying passes. Brazing eliminates the need for internal ferrules or orifices which resist rapid elimination of the condensate. Steel side plates rigidly support the tube and fin assembly. Heating units are suitable for 2-pipe steam, forced or gravity hot water systems.

Each convector is completely assembled and shipped individually in cartons.



Standard Convector Without Lower Grille

### CAPACITIES, SIZES AND PRICES—*All Prices are F.O.B. Racine, Wisc.

| Cabinet Size, Inches | | *Price, Complete F.O.B. Racine, Wisc. Standard Convector Without Lower Grille | | | Steam Capacities Square Feet EDR 215° Steam 65° Entering Air | | | Forced Circulation Hot Water Capacities Thousands of Btu/Hr. 180° Ent. Water 20° Temp. Drop | | | 200° Ent. Water 20° Temp. Drop | | | 220° Ent. Water 20° Temp. Drop | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth | Length | Height | | | Height | | | Height | | | Height | | | Height | | |
| | | 20" | 24" | 32" | 20" | 24" | 32" | 20" | 24" | 32" | 20" | 24" | 32" | 20" | 24" | 32" |
| 4 | 20 | $35.60 | $36.36 | $37.12 | 10.0 | 11.0 | 12.0 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 | 2.1 | 2.1 | 2.3 | 2.5 |
| | 24 | 37.50 | 38.64 | 39.78 | 12.5 | 14.0 | 15.5 | 1.7 | 1.9 | 2.1 | 2.2 | 2.4 | 2.7 | 2.6 | 2.9 | 3.2 |
| | 28 | 39.78 | 40.92 | 42.44 | 15.5 | 17.0 | 19.0 | 2.1 | 2.3 | 2.6 | 2.7 | 2.9 | 3.3 | 3.2 | 3.5 | 4.0 |
| | 32 | 41.68 | 43.58 | 45.10 | 18.0 | 20.5 | 22.5 | 2.5 | 2.8 | 3.1 | 3.1 | 3.5 | 3.9 | 3.7 | 4.3 | 4.7 |
| | 36 | 43.96 | 45.86 | 47.38 | 21.0 | 23.5 | 25.5 | 2.9 | 3.2 | 3.5 | 3.6 | 4.0 | 4.4 | 4.4 | 4.9 | 5.3 |
| | 40 | 46.24 | 48.14 | 50.04 | 24.0 | 26.5 | 29.0 | 3.3 | 3.6 | 4.0 | 4.1 | 4.6 | 5.0 | 5.0 | 5.5 | 6.0 |
| | 44 | 48.14 | 50.42 | 52.70 | 26.5 | 29.5 | 32.5 | 3.6 | 4.0 | 4.5 | 4.6 | 5.1 | 5.6 | 5.5 | 6.1 | 6.8 |
| | 48 | 50.42 | 53.08 | 55.36 | 29.5 | 33.0 | 36.0 | 4.0 | 4.5 | 4.9 | 5.1 | 5.7 | 6.2 | 6.1 | 6.9 | 7.5 |
| | 56 | 54.60 | 57.64 | 60.68 | 35.0 | 39.0 | 43.0 | 4.8 | 5.3 | 5.9 | 6.0 | 6.7 | 7.4 | 7.3 | 8.1 | 8.9 |
| | 64 | 58.78 | 62.58 | 65.62 | 40.5 | 45.5 | 49.5 | 5.5 | 6.2 | 6.8 | 7.0 | 7.8 | 8.5 | 8.4 | 9.5 | 10.3 |
| 6 | 20 | 37.02 | 40.54 | 41.68 | 14.5 | 16.5 | 18.0 | 2.0 | 2.3 | 2.5 | 2.5 | 2.8 | 3.1 | 3.0 | 3.4 | 3.7 |
| | 24 | 40.44 | 41.96 | 45.48 | 19.0 | 21.0 | 23.0 | 2.6 | 2.9 | 3.2 | 3.3 | 3.6 | 4.0 | 4.0 | 4.4 | 4.8 |
| | 28 | 43.48 | 45.38 | 49.28 | 23.0 | 25.5 | 28.0 | 3.2 | 3.5 | 3.8 | 4.0 | 4.4 | 4.8 | 4.8 | 5.3 | 5.8 |
| | 32 | 46.52 | 48.80 | 53.08 | 27.0 | 30.0 | 33.0 | 3.7 | 4.1 | 4.5 | 4.6 | 5.2 | 5.7 | 5.6 | 6.2 | 6.9 |
| | 36 | 49.94 | 52.60 | 56.88 | 31.5 | 35.0 | 38.0 | 4.3 | 4.8 | 5.2 | 5.4 | 6.0 | 6.5 | 6.6 | 7.3 | 7.9 |
| | 40 | 52.98 | 56.02 | 60.68 | 35.5 | 39.5 | 43.0 | 4.9 | 5.4 | 5.9 | 6.1 | 6.8 | 7.4 | 7.4 | 8.2 | 8.9 |
| | 44 | 56.02 | 59.44 | 64.86 | 39.5 | 44.0 | 48.5 | 5.4 | 6.0 | 6.6 | 6.8 | 7.6 | 8.3 | 8.2 | 9.2 | 10.1 |
| | 48 | 59.44 | 63.24 | 68.66 | 44.0 | 49.0 | 53.5 | 6.0 | 6.7 | 7.3 | 7.6 | 8.4 | 9.2 | 9.2 | 10.2 | 11.1 |
| | 56 | 65.52 | 70.08 | 76.26 | 52.0 | 58.0 | 63.5 | 7.1 | 7.9 | 8.7 | 8.9 | 10.0 | 10.9 | 10.8 | 12.1 | 13.2 |
| | 64 | 71.98 | 77.30 | 83.86 | 60.5 | 67.5 | 73.5 | 8.3 | 9.2 | 10.1 | 10.4 | 11.6 | 12.6 | 12.6 | 14.0 | 15.3 |
| 8 | 32 | 54.22 | 56.88 | 59.54 | 34.5 | 38.0 | 41.5 | 4.7 | 5.2 | 5.7 | 5.9 | 6.5 | 7.1 | 7.2 | 7.9 | 8.6 |
| | 36 | 56.02 | 59.44 | 64.10 | 39.5 | 44.0 | 47.5 | 5.4 | 6.0 | 6.5 | 6.8 | 7.6 | 8.2 | 8.2 | 9.2 | 9.9 |
| | 40 | 60.20 | 63.62 | 69.04 | 45.0 | 49.5 | 54.0 | 6.2 | 6.8 | 7.4 | 7.7 | 8.5 | 9.3 | 9.4 | 10.3 | 11.2 |
| | 48 | 68.18 | 72.74 | 78.92 | 55.5 | 61.5 | 67.0 | 7.6 | 8.4 | 9.2 | 9.5 | 10.6 | 11.5 | 11.5 | 12.8 | 13.9 |
| | 56 | 76.16 | 81.48 | 88.42 | 66.0 | 73.0 | 79.5 | 9.0 | 10.0 | 10.9 | 11.4 | 12.6 | 13.7 | 13.7 | 15.2 | 16.5 |
| | 64 | 84.52 | 90.60 | 98.30 | 77.0 | 85.0 | 92.5 | 10.5 | 11.6 | 12.7 | 13.2 | 14.6 | 15.9 | 16.0 | 17.7 | 19.2 |
| 10 | 36 | 61.44 | 64.86 | 68.28 | 44.0 | 48.5 | 53.0 | 6.0 | 6.6 | 7.3 | 7.6 | 8.3 | 9.1 | 9.2 | 10.1 | 11.0 |
| | 40 | 65.62 | 69.42 | 73.60 | 49.5 | 54.5 | 60.0 | 6.8 | 7.5 | 8.2 | 8.5 | 9.4 | 10.3 | 10.3 | 11.3 | 12.5 |
| | 48 | 74.74 | 79.30 | 84.24 | 61.5 | 67.5 | 74.0 | 8.4 | 9.2 | 10.1 | 10.6 | 11.6 | 12.7 | 12.8 | 14.0 | 15.4 |
| | 56 | 83.48 | 89.18 | 95.26 | 73.0 | 80.5 | 88.5 | 10.0 | 11.0 | 12.1 | 12.6 | 13.8 | 15.2 | 15.2 | 16.7 | 18.4 |
| | 64 | 92.60 | 99.06 | 103.90 | 85.0 | 93.5 | 102.5 | 11.6 | 12.8 | 14.0 | 14.6 | 16.1 | 17.6 | 17.7 | 19.4 | 21.3 |

**For Package "A" Air Chamber** (consists of non-ferrous air chamber with air storage capacity equivalent to 2½' of ¾" pipe complete with air vent, copper tubing and compression fittings) ..... **ADD $6.00**

**For Metal Trim Strips** (for top and sides) ..... **ADD 3.60**

**For Metal Trim Strips** (for top, bottom and sides) ..... **ADD 5.60**

**For Package "B" Air Chamber** (consists of a ¾" pipe cap with ⅛" vent tapping, air vent, copper tubing and compression fittings) ..... **ADD $2 40**

**For Removable Lower Grille** ..... **ADD 3.60**

Approx. Shipping Wt., 6", 8" or 10" deep convectors. 1.3 lbs. sq. ft.

Approx. Shipping Wt., 4" deep convectors ..... 1.7 lbs. sq. ft.

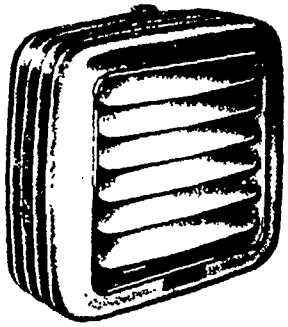
*Prices are subject to change without notice.*

Printed in U.S.A.

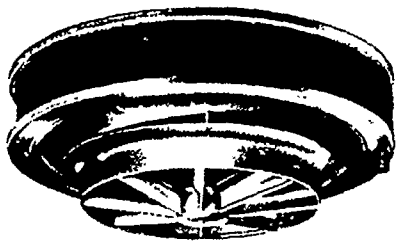
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

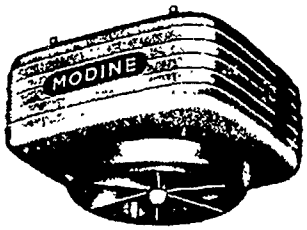
*February 28, 1955*
*Superseding February 18, 1954*

# MODINE UNIT HEATERS



HORIZONTAL TYPE






VERTICAL TYPES
(Illustrated with Cone-Jet Deflectors)

Models V-540 through V-2540 are circular.

Models V-155 through V-385 are square.

The Modine condenser is constructed as an integral unit of steam-carrying passages. There are no screwed or expanded joints—no gaskets or bolts to weaken its structure. Tubes, headers, inlet and outlet connections are brazed into a rugged, pressure-resisting unit. Fins are mechanically bonded to tubes with lead alloy.

The condenser design together with patented center location of supply and return connections permit Horizontal delivery units to be suspended directly from the supply line without the use of hanger rods or other supports.

Built-in velocity generator on Horizontal units distribute air stream evenly over face of condenser—peak velocities are reduced.

Safety fan guard offers constant protection from the hazard of an exposed fan. It is made of steel rod and securely mounted to the casing at four points.

Motors are of the continuous-duty, totally enclosed type designed especially for propeller fan unit heater application. Rubber mounted, they transmit no vibration noises to casings.

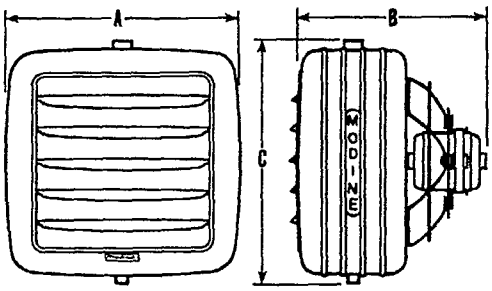
Casings and sheet metal parts are Bonderized and finished in beige-gray baked-on enamel.

Recessed adjustable louvers are correctly curved for control of air delivery—friction device firmly hold louvers in desired position, eliminating rattling.

Vertical units are available with a wide range of deflectors to meet varying heat, air delivery, mounting height and location demands.

## DIMENSIONS

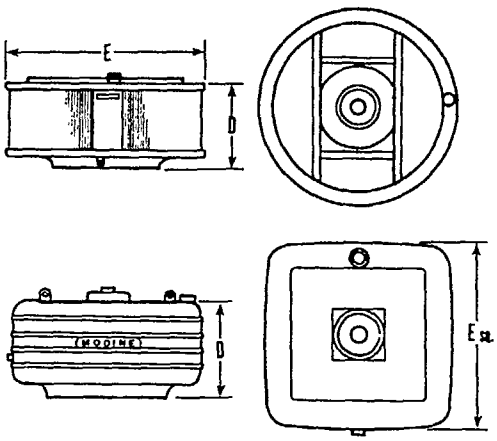
### Horizontal Type




| Model Number | Overall Dimensions, Inches | | |
|---|---|---|---|
| | A (Square) | B | C |
| H-75 | 12¾ | 12 | 14⅝ |
| H-100 | 12¾ | 12 | 14⅝ |
| H-160 | 17½ | 16⅝ | 19 |
| H-245 | 22 | 21 | 24 |
| H-345 | 22 | 21 | 24 |
| H-455 | 27¼ | 22⅞ | 29¼ |
| H-575 | 27¼ | 23⅞ | 29¼ |
| H-720 | 30½ | 23⅞ | 32½ |
| H-860 | 30½ | 24⅞ | 32½ |
| H-1170 | * | 25⅜ | 36¾ |

*Casing Height, 34½"; Casing Width, 29".

### Vertical Types




| Model Number | Overall Dimensions, Inches | | |
|---|---|---|---|
| | D | | E |
| | Without Cone-Jet | With Cone-Jet | |
| †V-155 | 9⅝ | 14¼ | 17½ Sq. |
| †V-320 | 12⅜ | 18 | 27¼ Sq. |
| †V-385 | 12⅜ | 18½ | 27¼ Sq. |
| V-540 | 8¼ | 13⅛ | 34¾ |
| V-605 | 8¼ | 13⅛ | 34¾ |
| V-810 | 11¼ | 16⅛ | 34¾ |
| V-870 | 11¼ | 16⅛ | 34¾ |
| V-1020 | 14¼ | 19⅜ | 34¾ |
| V-1130 | 14¼ | 19⅜ | 34¾ |
| V-1370 | 15⅞ | 21⅛ | 43¼ |
| V-1600 | 15⅞ | 23 | 43¼ |
| V-2060 | 20¾ | 27½ | 43¼ |
| V-2540 | 21 | 27⅝ | 51½ |

†These models have square casings.

*For Capacities and Prices, refer to page 14-13.*



*Prices are subject to change without notice.*

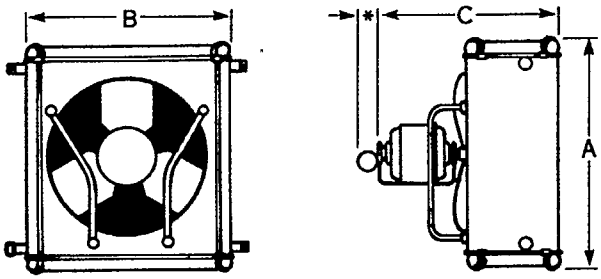
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

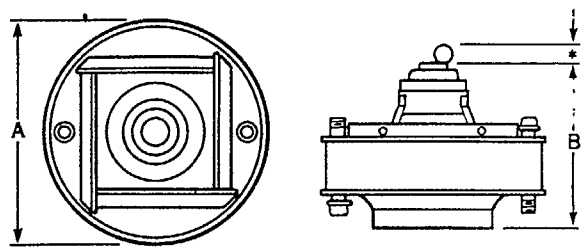
Printed in U.S.A.

# WESTINGHOUSE STURTEVANT SPEEDHEATERS

## DESIGN 14, HORIZONTAL

| Size Number | Motor Data H.P. | Motor Data rpm. | Cfm. at 70° | Outlet Velocity | STEAM CAPACITIES 60° Entering Air 2 Pounds Steam: Btu. per Hr. | E.D.R. Sq. Ft. | Final Air Temp. °F. | HOT WATER CAPACITIES 60° Entering Air 180° Entering Water: Water Rate G.P.M. | Btu. per Hr. | Final Air Temp. °F. | Approx. Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 or 25W | 1/100 | 1000 | 398 | 431 | 25,800 | 109 | 119.7 | 4.5 | 17,800 | 101.2 | 40 |
| 40 or 40W | 1/50 | 1000 | 700 | 526 | 41,500 | 173 | 114.5 | 6.0 | 28,650 | 97.8 | 50 |
| 55 or 55W | 1/20 | 1000 | 979 | 590 | 57,000 | 238 | 113.5 | 6.0 | 37,600 | 95.4 | 70 |
| 75 or 75W | 1/20 | 1140 | 1336 | 638 | 76,000 | 317 | 112.3 | 6.5 | 48,200 | 93.3 | 95 |
| 100 or 100W | 1/12 | 1140 | 1580 | 690 | 100,500 | 419 | 118.5 | 8.5 | 58,300 | 94.0 | 155 |
| 125 or 125W | 1/6 | 1140 | 2050 | 696 | 125,500 | 523 | 116.3 | 9.0 | 74,000 | 93.3 | 175 |
| 150 or 150W | 1/6 | 1140 | 2550 | 772 | 150,700 | 628 | 114.4 | 10.9 | 90,800 | 92.8 | 190 |
| 175 or 175W | 1/4 | 1140 | 3060 | 836 | 176,600 | 736 | 113.0 | 10.9 | 102,400 | 90.9 | 220 |
| 200 or 200W | 1/4 | 1140 | 3620 | 894 | 200,700 | 837 | 111.0 | 12.7 | 119,100 | 90.3 | 260 |
| 250 or 250W | 1/4 | 860 | 4180 | 781 | 251,000 | 1045 | 115.2 | 14.5 | 143,000 | 91.5 | 330 |
| 300 or 300W | 1/3 | 860 | 5200 | 838 | 300,500 | 1252 | 113.2 | 16.3 | 176,000 | 91.2 | 360 |




**Design 14, Horizontal**

| Size Number | Overall Dimensions, Inches A | B | C |
|---|---|---|---|
| 25 or 25W | 20 | 16 | 17 |
| 40 or 40W | 23 | 18 | 18 |
| 55 or 55W | 35 | 20 | 22 |
| 75 or 75W | 26 | 22 | 24 |
| 100 or 100W | 27 | 26 | 25 |
| 125 or 125W | 31 | 26 | 27 |
| 150 or 150W | 33 | 27 | 27 |
| 175 or 175W | 34 | 28 | 28 |
| 200 or 200W | 36 | 29 | 28 |
| 250 or 250W | 39 | 35 | 34 |
| 300 or 300W | 41 | 37 | 35 |

*Allow 2¼" for capacitor extension beyond motor on units from size 75–200 and 3¼" on balance.

**Design 12, Downblast**

| Size Number | Overall Dimensions, Inches A | B |
|---|---|---|
| D40 or D40W | 21 | 16 |
| D55 or D55W | 27 | 16 |
| D75 or D75W | 29 | 16 |
| D100 or D100W | 32 | 17 |
| D125 or D125W | 32 | 17 |
| D150 or D150W | 32 | 18 |
| D175 or D175W | 37 | 18 |
| D200 or D200W | 37 | 20 |
| D250 or D250W | 42 | 20 |
| D300 or D300W | 44 | 22 |
| D350 or D350W | 52 | 19 |
| D400 or D400W | 53 | 20 |

## DESIGN 12, DOWNBLAST

| Size Number | Motor Data H.P. | Motor Data rpm. | Cfm. at 70° | Outlet Velocity | STEAM CAPACITIES 60° Entering Air 2 Pounds Steam: Btu. per Hr. | E.D.R. Sq. Ft. | Final Air Temp. °F. | HOT WATER CAPACITIES 60° Entering Air 180° Entering Water: Water Rate G.P.M. | Btu. per Hr. | Final Air Temp. °F. | Approx. Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D40 or D40W | 1/6 | 1725 | 695 | 1230 | 40,000 | 167 | 113 | 2.72 | 25,000 | 91.0 | 95 |
| D55 or D55W | 1/6 | 1725 | 1010 | 1380 | 55,000 | 229 | 110 | 3.62 | 36,000 | 92.2 | 110 |
| D75 or D75W | 1/6 | 1725 | 1300 | 1650 | 75,000 | 312 | 113 | 5.43 | 48,000 | 91.6 | 125 |
| D100 or D100W | 1/6 | 1725 | 1735 | 1900 | 100,000 | 417 | 113 | 7.24 | 65,000 | 92.0 | 160 |
| D125 or D125W | 1/6 | 1725 | 1740 | 1240 | 125,000 | 520 | 126 | 8.15 | 77,000 | 96.8 | 185 |
| D150 or D150W | 1/4 | 1140 | 2090 | 1304 | 150,000 | 625 | 126 | 10.9 | 93,000 | 97.0 | 205 |
| D175 or D175W | 1/4 | 1140 | 2440 | 1440 | 175,000 | 730 | 126 | 10.9 | 108,000 | 96.8 | 240 |
| D200 or D200W | 1/3 | 1140 | 2830 | 1545 | 200,000 | 833 | 125 | 14.5 | 130,000 | 98.5 | 265 |
| D250 or D250W | 1/2 | 1140 | 3540 | 1605 | 250,000 | 1040 | 125 | 16.3 | 155,000 | 96.5 | 330 |
| D300 or D300W | 1/2 | 1140 | 4250 | 1750 | 300,000 | 1250 | 125 | 21.7 | 180,000 | 95.3 | 360 |
| D350 or D350W | 3/4 | 1140 | 4980 | 1885 | 350,000 | 1460 | 125 | 21.7 | 215,000 | 96.2 | 395 |
| D400 or D400W | 3/4 | 1140 | 5800 | 2040 | 400,000 | 1665 | 123 | 29.0 | 260,000 | 97.4 | 415 |

Low Temperature, Textile Mill and Dairy Types are also available in certain sizes and styles; refer to your local Crane Branch or Crane Wholesaler for data.

# CRANE GAS FIRED UNIT HEATERS

For Natural, Mixed, Manufactured, Liquefied Petroleum or Liquefied Petroleum Air Gases

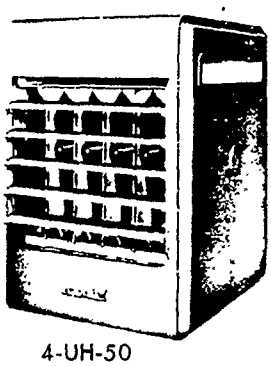
*—Construction Features—*

**Heating Element**—Venturi type for maximum efficiency, continuously welded throughout.

**Burners**—Multi-port, cast iron; permits uniform, efficient combustion over a wide range of gas input fluctuations.

**Manifold**—Rigidly bolted direct to heating element, assuring exact alignment between burners and orifices.

**Draft Hood**—Internal type, integrally welded to heating element; assures dependable, leakproof performance.



4-UH-50

**Fan Motor**—Rubber mounted, provides adequate air flow over wide range of current variations; has extra large bearings with improved lubrication.

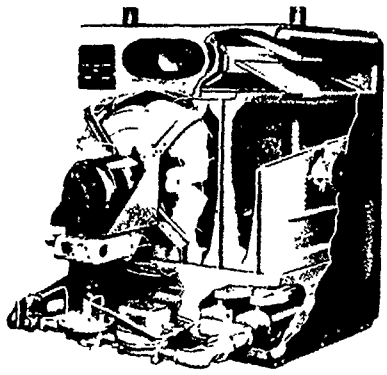
**Fan**—Highly efficient low speed propeller type, dynamically balanced to reduce vibration and minimize noise.

**Fan Switch**—Delays fan cut-in until heating element is up to temperature; prolongs fan operation after main burner shut-down; eliminates cold starts and removes all available heat.

**Limit Switch**—Safety device limits discharge air temperature to safe levels; shuts off main burners in case unit overheats for any reason.

**Hangers**—Standard I.P.S. thread, securely attached to heating element; permits free expansion of all parts on temperature rise.

**Casing**—Grey hammertone finish with rounded corners.



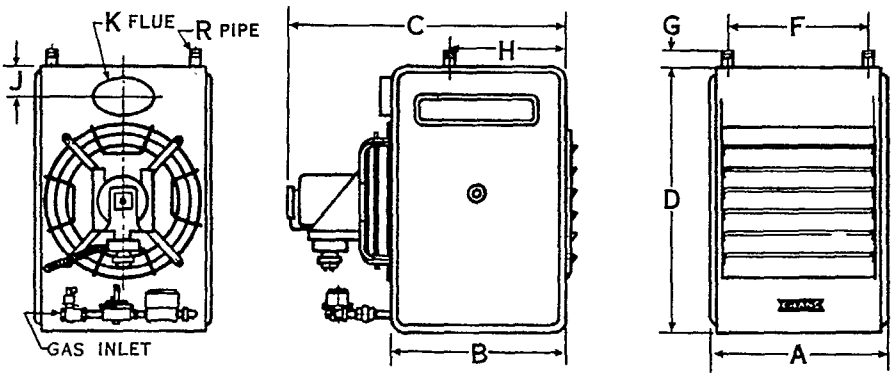
Cut-Open View

When ordering specify: 1. Model number of heater. 2. Type of Controls. 3. Type of gas—Natural, Mixed, Manufactured, Propane, Butane or L.P. air. 4. Btu. value of gas. 5. Specific gravity of gas. 6. Altitude if more than 2,000 feet above sea level.

## RATINGS, CAPACITIES AND PRICES—*All Prices are F.O.B. Tyler, Texas

| Heater Number | Ratings Btu/Hr. Input | Ratings Btu/Hr. Output | E.D.R. Square Feet | Air Delivery cfm. | Motor H.P. | Fan R.P.M. | Heater with Controls Listed: *Price, with D-2 or D-4 Controls | *Price, with D-3 Controls | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|
| 4-UH-50 | 50,000 | 40,000 | 167 | 600 | 1/80 | 1000 | $227.84 | $240.64 | 140 |
| 4-UH-75 | 75,000 | 60,000 | 250 | 900 | 1/40 | 1000 | 268.80 | 281.60 | 205 |
| 4-UH-100 | 100,000 | 80,000 | 333 | 1200 | 1/20 | 1000 | 309.76 | 322.56 | 225 |
| 4-UH-125 | 125,000 | 100,000 | 416 | 1500 | 1/12 | 1140 | 345.60 | 358.40 | 265 |
| 4-UH-150 | 150,000 | 120,000 | 500 | 1800 | 1/8 | 1140 | 381.44 | 394.24 | 285 |
| 4-UH-175 | 175,000 | 140,000 | 580 | 2100 | 1/6 | 1140 | 422.40 | 435.20 | 320 |
| 4-UH-200 | 200,000 | 160,000 | 664 | 2300 | 1/6 | 1140 | 463.36 | 476.16 | 370 |
| 4-UH-225 | 225,000 | 180,000 | 746 | 2500 | 1/6 | 1140 | 504.32 | 517.12 | 405 |

Ratings are approved for altitudes to 2,000 feet; for elevations above 2,000 feet, reduce ratings 4% for each 1,000 feet above sea level.




CRANE Unit Heaters are available with the following controls:

### D-4 Controls

*For Natural, Mixed or Manufactured Gases*

Automatic pilot; magnetic diaphragm valve; gas pressure regulator.

### D-2 Controls

*For Liquefied Petroleum Gas*

Thermocouple type automatic pilot; 100% shut-off valve; magnetic diaphragm valve.

### D-3 Controls

*For Liquefied Petroleum Air Gas*

Thermocouple type automatic pilot; 100% shut-off valve; magnetic diaphragm valve; gas pressure regulator.

## DIMENSIONS, INCHES

| Heater Number | A | B | C | D | F | G | H | J | (Dia.) K | R | Gas Inlet Size, Inches: Natural or Mixed | Manufactured | Liq. Pet. Gas | Liq. Pet. Air |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-UH-50 | 16 3/16 | 15 7/16 | 23 3/4 | 21 13/16 | 12 5/8 | 2 3/8 | 10 5/8 | 2 7/16 | 4 | 3/4 | 1/2 | 1/2 | 1/2 | 1/2 |
| 4-UH-75 | 18 1/8 | 20 13/16 | 31 13/16 | 27 | 14 1/2 | 1 3/4 | 13 1/8 | 2 7/8 | 5 | 3/4 | 1/2 | 1/2 | 1/2 | 1/2 |
| 4-UH-100 | 21 1/8 | 20 13/16 | 30 1/8 | 27 | 17 1/2 | 1 3/4 | 13 1/8 | 2 7/8 | 5 | 3/4 | 1/2 | 3/4 | 1/2 | 3/4 |
| 4-UH-125 | 21 1/8 | 20 13/16 | 32 7/8 | 32 | 17 1/8 | 1 3/4 | 13 15/16 | 3 3/8 | 6 | 1 | 3/4 | 3/4 | 1/2 | 3/4 |
| 4-UH-150 | 24 1/8 | 20 13/16 | 33 | 32 | 20 1/8 | 1 3/4 | 13 15/16 | 3 9/16 | 7 | 1 | 3/4 | 3/4 | 1/2 | 3/4 |
| 4-UH-175 | 27 1/8 | 20 13/16 | 33 7/8 | 32 | 23 1/8 | 1 3/4 | 13 15/16 | 3 9/16 | 7 | 1 | 3/4 | 3/4 | 1/2 | 1 |
| 4-UH-200 | 24 1/8 | 25 13/16 | 38 | 36 | 20 1/8 | 1 3/4 | 17 1/8 | 3 7/8 | 8 | 1 | 3/4 | 1 | 1/2 | 1 |
| 4-UH-225 | 27 1/8 | 25 13/16 | 38 3/16 | 36 | 23 1/8 | 1 3/4 | 16 1/2 | 3 7/8 | 8 | 1 | 3/4 | 1 | 1/2 | 1 |

*Prices are subject to change without notice.*



February 28, 1955
*Superseding September 16, 1954*

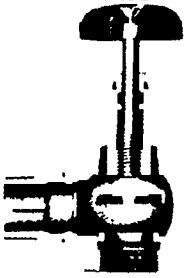
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

## MARSH ROUGH BRASS RADIATOR VALVES

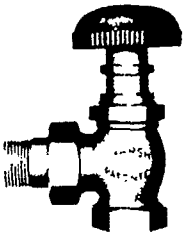
### For Steam

**Flat Disc**



**No. 1126** Angle
**No. 1226** Globe

**Cone Disc**
**Packless Type**



**No. 1141** Angle
**No. 1241** Globe

PRICES, EACH

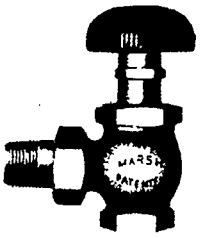
| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|
| Female Inlet and Male Union Outlet | **No. 1126** Angle | $4.66 | $5.42 | $6.42 | $8.06 | $10.58 |
| | **No. 1226** Globe | 7.32 | 8.52 | 10.10 | 12.68 | 16.64 |
| | **No. 1141** Angle | 6.44 | 7.48 | 8.88 | 11.14 | 14.62 |
| | **No. 1241** Globe | 8.20 | 9.50 | 11.20 | 14.10 | 18.50 |
| | **No. 1137** Angle | 4.66 | 5.42 | 6.42 | 8.06 | 10.58 |
| | **No. 1237** Globe | 6.66 | 7.74 | 9.18 | 11.52 | 15.12 |

**No. 1126 and No. 1226:** Heavy globe seat, flat disc valves with rising stem. Swivel type disc holder is equipped with upper seal. The valves may be repacked under pressure.

**No. 1141 and No. 1241:** Re-enforced packless type valves with non-rising stem and bevel cone disc seat. The stem and bonnet construction, and molded packing retained by a stainless steel coil spring combine to prevent leakage around the stem.

### For Hot Water

**Packless Type**



**No. 1137** Angle
**No. 1237** Globe

**No. 1137 and No. 1237:** Neat, compact valves of the re-enforced packless type. Valves are regularly drilled through the diaphragm to prevent freezing.

## HAMMOND ROUGH BRASS RADIATOR VALVES AND UNION ELBOWS

### For Steam

**Composition Disc**

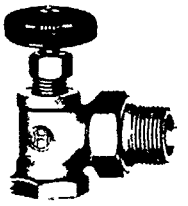
**No. 100** Angle

PRICES, EACH

| Size | Inches | ½ | ¾ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|
| Female Inlet and Male Union Outlet | **No. 100** Angle | $3.22 | $3.66 | $4.54 | $5.58 | $7.04 |
| | **No. 102** Gate | 8.74 | 10.14 | 11.94 | 15.04 | 19.74 |
| | **No. 200** Angle | 2.48 | 2.94 | 3.66 | 4.70 | — |
| | **No. 300** Elbow | 1.30 | 1.60 | 2.18 | 2.94 | 3.94 |
| | *When ordering Gate Valves, specify if for hot water service.* | | | | | |

The No. 100 Valve for steam can also be used for vapor service. The No. 200 Valve is recommended for gravity hot water heating installations only.

### For Hot Water



**No. 200** Angle

**No. 300** Radiator Union Elbow

**No. 102 Gate Valve (not ill.):** Recommended for hot water, steam, or vapor heating systems. Especially suitable for use with unit heaters. Ideal for general shut-off valve service.

## HAMMOND ROUGH BRASS CIRCULATOR VALVES AND BALANCING FITTINGS

### For Forced Hot Water Heating Systems

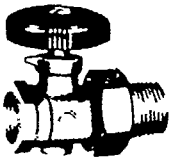
**Angle Valves**
**No. 204,** Female Thread
**No. 201,** Sweat Conn.

PRICES, EACH

| Size | | Inches | ⅜* | ½ | ¾ | 1 |
|---|---|---|---|---|---|---|
| With Male Union Outlet | Angle Valves | **No. 201,** with sweat connection | $2.88 | $2.88 | $3.52 | $5.14 |
| | | **No. 204,** with female thread | 2.88 | 2.88 | 3.52 | 5.14 |
| | Straight Valves | **No. 202,** with sweat connection | 2.88 | 2.88 | 3.52 | 5.14 |
| | | **No. 205,** with female thread | 2.88 | 2.88 | 3.52 | 5.14 |
| | Balancing Elbows | **No. 301,** with female thread | 2.30 | 2.30 | 2.74 | 4.34 |
| | | **No. 303,** with sweat connection | 2.30 | 2.30 | 2.74 | 4.34 |
| | Balancing Straightways | **No. 304,** with sweat connection | 2.30 | 2.30 | 2.74 | 4.34 |
| | | **No. 305,** with female thread | 2.30 | 2.30 | 2.74 | 4.34 |
| | **No. 302,** Union Elbow with sweat connection | | 1.30 | 1.60 | 2.18 | 4.34 |

*⅜-inch sizes have a ½" male union.

**Balancing Elbows**
**No. 301,** Female Thread
**No. 303,** Sweat Conn.

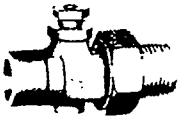


**Straight Valves**
**No. 205,** Female Thread
**No. 202,** Sweat Conn.

**Valves:** A quarter turn of the handle opens these valves smoothly and quietly. The angle valve provides a "nearly tight" shut-off when closed and full flow when opened. The straight type valves are particularly suited for use with concealed or convector type radiators.

**Fittings:** Balancing elbows require no orifices or adaptors; adjustable while system is operating. Straightways are used with concealed or convector type radiators. The union elbow can be used on copper tubing gravity jobs.

**Union Elbow**
**No. 302**

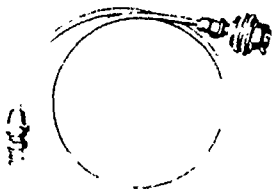


**Balancing Straightways**
**No. 304,** Sweat Conn.
**No. 305,** Female Thread

## HOT WATER AIR VALVES

**17-52**
Loose Key Air Valve

Made from 7/16-inch brass rod stock. Hexagon body.



**17-55**
Convector Radiator Air Valve

For concealed radiators and convectors. Three tubing lengths available.

**17-53**
Wood Wheel Air Valve

Made from 7/16-inch brass rod stock. Hexagon body. Mushroom type handle.

**17-54**
Coin Slot Air Valve

For new type radiators. Sets almost flush with radiator.

PRICES

| Number | | | Prices |
|---|---|---|---|
| **17-52** | | Per dozen | **$2.54*** |
| **17-53** | | Per dozen | **3.06** |
| **17-54** | | Per dozen | **2.40** |
| †**17-55** | 3/16" Tube—15" long | Each | **1.44** |
| | 3/16" Tube—21" long | Each | **1.54** |
| | 3/16" Tube—35" long | Each | **1.68** |
| **Loose Keys** | | Per dozen | **.80** |

*Price of 17-52 Valves includes two Keys with each dozen valves.
†When ordering 17-55 Valves, specify length of tubing desired.

*Above valves have a 1/8" straight shank connection.*

## TACO-VENT AIR VALVE

Taco-Vent Air Valve

An automatic, self-venting hot water valve ideal for use on convectors, radiators, or radiant baseboards. The completely automatic operation eliminates the need for key, coin, or screwdriver adjustments.

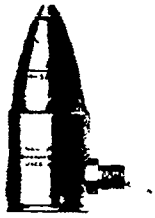
The Taco-Vent keeps radiation free of air at all times. Easy to install. Saves fuel. Provides greater heating comfort. Has 1/8" straight shank connection.

Price, Each..... **$2.20**

## HOFFMAN VENTING VALVES

### Air Valves

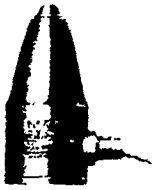
For All Automatic or Hand-Fired Systems



**No. 1A**
Adjustable Port

These valves have a 1/8" straight shank connection.

**No. 40**
Non-Adjustable Single Port



**No. 70A**
Non-Adjustable Single Port

Fast venting action of these valves clears the system of air, even at low pressures. They are not intended for vacuum service.

The No. 1A Valve, of the open vent type, has six adjustable vent ports. Provides proportional venting for various size radiators and for radiators at varied distances from the boiler.

The No. 70A Valve complies with Federal Specifications WW-V-151 for Type 1 Non-Adjustable Valves.

### Main Vent Air Valves

For All Automatic or Hand-Fired Systems

**No. 4A**
For Small Systems

**No. 75**
For Medium Systems

**No. 75A**
For Large Systems

Main Vent Valves have a 3/4" male and 1/2" female straight shank connection.

To relieve air from mains of one or two-pipe steam systems. Float equipped. Nos. 75 and 75A Valves are alike except for venting capacity.

**No. 4 Quick Vent Air Valve** (not illustrated): For venting small steam mains. Does not have a float; install at least 18 inches above boiler water line or at a point where no water is encountered.

### Vacuum Valve

For Hand or Stoker-Fired Systems

**No. 2A**
With 1/8" Angle Connection

PRICES OF HOFFMAN VALVES

| Valves | | Each |
|---|---|---|
| Air Valves | **No. 1A** | **$4.92** |
| | **No. 40** | **1.96** |
| | **No. 70A** | **3.72** |
| Main Vent Air Valves | **No. 4** | **6.88** |
| | **No. 4A** | **5.52** |
| | **No. 75** | **13.40** |
| | **No. 75A** | **13.58** |
| Vacuum Valve | **No. 2A** | **8.64** |
| Main Vent Vacuum Valves | **No. 16A** | **8.76** |
| | **No. 76** | **18.24** |
| | **No. 76A** | **20.22** |

For one-pipe steam systems.
Provides quicker, more sustained heat. Double air-locked; a check in the vent port starts the vacuum, a snap-action diaphragm raises the float to maintain the vacuum. Six adjustable vent ports provide proportional venting.

### Main Vent Vacuum Valves

For Hand or Stoker-Fired Vacuum Steam Systems

**No. 16A**
For Small Systems

**No. 76**
For Medium Systems

**No. 76A**
For Large Systems

These valves have a 3/4" male and 1/2" female straight shank connection.

These valves relieve air from mains of one-pipe vacuum systems and prevent its return. Non-adjustable port and double air-lock feature. A float seals the port when water surges into the valve. Nos. 76 and 76A are alike except for their venting capacity.



*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

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# WATER HEATING EQUIPMENT

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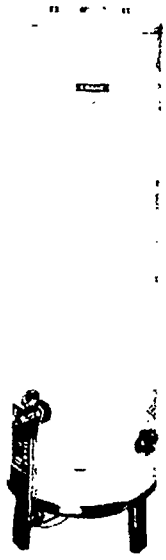
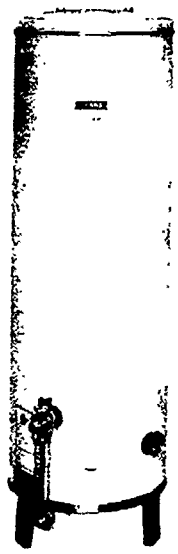
# CRANE AUTOMATIC GAS WATER HEATERS

## With Galvanized Steel Tanks

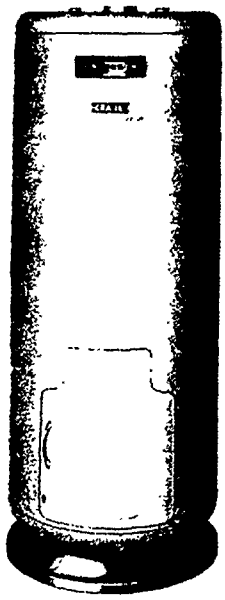


CRANE Marvel
*3 Year Guarantee Plan*



CRANE Champion
*5 Year Guarantee Plan*

CRANE Keystone
*10 Year Guarantee Plan*



CRANE Superior
*10 Year Guarantee Plan*

A.G.A. Approved

*Tank Lifeguard Magnesium Rod can be factory installed on any model Keystone heater at no extra cost. Available on all other heaters at extra charge—see table below for price.*

A fine, high quality line of Automatic Gas Water Heaters, ruggedly constructed. They have a cold rolled steel outer jacket with lustrous white baked enamel finish and a baked black enamel heavy steel footed base or pedestal base, as illustrated.

Thick Fiberglas insulation—non-settling, moisture-proof, and vermin-proof—completely encases the sides, top and combustion chamber walls. A draft hood (not illustrated) is furnished with each heater. Cold water inlet tube is removable (right side for Pacific Coast).

Equipped with a super heat conductor located in the flue way. It efficiently conducts burned gases to side of flue, driving heat into the water.

All heaters have new drilled-port, silent blue flame burner, designed for efficiency and economy.

**Marvel:** A low-priced dependable heater with heavy galvanized steel tank. Equipped with Unitrol "B" thermostat. Carries a 3 year guarantee plan.

**Champion:** A good, quality heater with heavy galvanized steel tank. Priced just above the Marvel. Equipped with Unitrol "B" thermostat. Carries a 5 year guarantee plan.

Marvel and Champion heaters have safe-lighting thermostat with electro-magnetic safety pilot. Shuts off main burner if pilot flame is extinguished. Gas cannot flow to main burner while pilot is being lighted. For liquefied petroleum gas (including LP-Air), Champion and Marvel heaters are equipped with Unitrol "102" thermostat at extra cost.

**Keystone:** A high quality heater at a moderate price. Has extra heavy galvanized steel tank, two full inches of Fiberglas insulation, and the well-known Unitrol "102" control.

**Superior:** An outstanding leader in style and value. Double extra heavy galvanized steel tank, two full inches of Fiberglas insulation, concealed Unitrol A Control, and pedestal base. In addition, Superiors have the patented, fuel-saving **Mini-Miser.** Cold air enters at top and flows only when needed for combustion, preventing chilling flue drafts when burner is off.

Superior with Unitrol A and Keystone with Unitrol "102" have 100% Safety Control. Shuts off ALL gas if pilot flame is extinguished. No extra charge on Superior and Keystone when ordered for LP gas.

*Prices are F.O.B. La Porte, Indiana and include Federal Excise Tax

| Name | Model No. | Capacity Gallons | *Price Each | Btu Input Rating | Recovery Gal. per Hr. 60° Rise | Recovery Gal. per Hr. 100° Rise | Dimensions, Inches: Overall Height | Casing Diameter | Water Connections: Size | C. to C. | To Floor | Gas Conn. | Flue Dia. | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Marvel | M20 | 20 | $102.08 | 21,000 | 29.4 | 17.6 | 50 | 16⅜ | ¾ | 8 | 45½ | ½ | 3 | 125 |
| | M30 | 30 | 118.68 | †30,000 | 42 | 25.2 | 65 | 16⅜ | ¾ | 8 | 60⅜ | ½ | 3 | 155 |
| | M40 | 40 | 143.52 | †30,000 | 42 | 25.2 | 65⅜ | 18⅜ | ¾ | 8½ | 60⅞ | ½ | 3 | 185 |
| Champion | C20 | 20 | 122.96 | 21,000 | 29.4 | 17.6 | 50 | 16⅜ | ¾ | 8 | 45½ | ½ | 3 | 130 |
| | C30 | 30 | 139.52 | †30,000 | 42 | 25.2 | 65 | 16⅜ | ¾ | 8 | 60⅜ | ½ | 3 | 160 |
| | C40 | 40 | 158.88 | †30,000 | 42 | 25.2 | 65⅜ | 18⅜ | ¾ | 8½ | 60⅞ | ½ | 3 | 190 |
| Keystone | K20 | 20 | 168.00 | 21,000 | 29.4 | 17.6 | 64½ | 16⅜ | ¾ | 8 | 62⅝ | ½ | 3 | 156 |
| | K30 | 30 | 182.72 | 28,000 | 39.2 | 23.5 | 58⅛ | 20⅜ | ¾ | 8½ | 56 | ½ | 3 | 206 |
| | K30R | 30 | 188.60 | 32,500 | 45.5 | 27.3 | 58⅛ | 20⅜ | ¾ | 8½ | 56 | ½ | 3 | 206 |
| | K40 | 40 | 201.92 | 28,000 | 39.2 | 23.5 | 59½ | 22⅜ | ¾ | 8½ | 57¾ | ½ | 3 | 237 |
| | K40R | 40 | 207.78 | 32,500 | 45.5 | 27.3 | 59½ | 22⅜ | ¾ | 8½ | 57¾ | ½ | 3 | 237 |
| Superior | S30 | 30 | 210.00 | 30,000 | 42 | 25.2 | 60¼ | 20⅜ | ¾ | 8½ | 57 | ½ | 3 | 224 |
| | S45 | 45 | 254.94 | 40,000 | 56 | 33.6 | 66¾ | 22⅜ | ¾ | 8½ | 63⅝ | ½ | 3 | 296 |

**Note:** Keystone Models K30R and K40R include gas pressure regulator to uprate heaters for higher input rating requirements.

| Extras | | |
|---|---|---|
| | For Unitrol "102" Thermostat 100% shut-off, required on Champion and Marvel Heaters for liquefied petroleum gas | *Add $8.28 |
| | For Pilot Gas Filter on Champion and Marvel Heaters (required by Eastern Utilities on manufactured gas) | *Add 2.08 |
| | For one 2-inch Clean-out available on Superior and Keystone Heaters only | *Add 7.76 |
| | For factory installed Tank Lifeguard Magnesium Rod on any Model. (Keystone, no extra charge) | *Add 7.36 |

For separate magnesium rods (subject to excise tax only when ordered factory installed) and for temperature-pressure relief valves, see page 18-13.

†When the Champion and Marvel Models 30 and 40 are used on L-P gas, the input rating is 28,000 B.T.U. and the recovery is 39.2 gallons per hour at 60° rise and 23.5 gallons per hour at 100° rise.



*Prices are subject to change without notice.*

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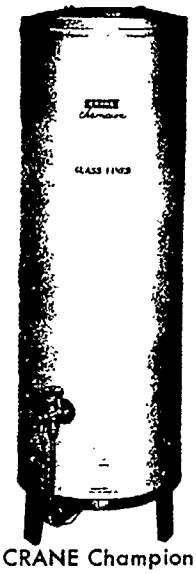
# CRANE AUTOMATIC GAS WATER HEATERS

## With Glass-Lined Tank



CRANE Champion
*10 Year Guarantee Plan*

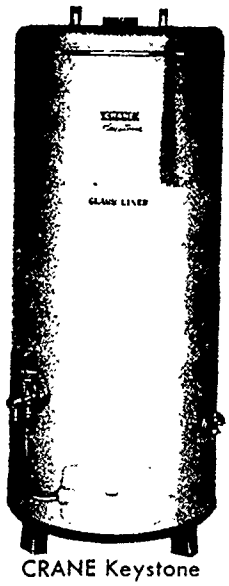
The Crane Champion and Keystone Glass-Lined water heaters have a glass-lined steel tank which resists rust and corrosion and provides lasting service. They are ruggedly constructed and have a cold rolled steel outer jacket with lustrous white baked enamel finish and a baked black enamel heavy steel footed base. Thick Fiberglas insulation—non-settling, moisture-proof and vermin-proof—completely encases the sides, top and combustion chamber walls. A draft hood (not illustrated) is furnished with both heaters. Cold water inlet tube is removable (right side for Pacific Coast).

These heaters have a new drilled-port, silent blue flame burner designed for efficiency and economy. They are equipped with a super heat conductor located in the flue way. This efficiently conducts burned gases to side of flue, driving heat into the water.

The Champion and Keystone Glass-Lined heaters have the Unitrol "102" safe-lighting thermostat. This 100% safety control shuts off ALL gas if pilot flame is extinguished. Easy accessibility for adjustment.

Tank Lifeguard Magnesium Rod is regularly furnished on above heaters.

These heaters can be furnished for use with LP gas when ordered, at no extra charge.



CRANE Keystone
*10 Year Guarantee Plan*

*Prices are F.O.B. La Porte, Indiana and include Federal Excise Tax

| Name | Model No. | Capacity Gallons | *Price Each | Btu Input Rating | Recovery Gal. per Hr. 60° Rise | Recovery Gal. per Hr. 100° Rise | Dimensions, Inches: Overall Height | Casing Diameter | Water Connections: Size | C. to C. | To Floor | Gas Conn. | Flue Dia. | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Champion Glass-Lined | CG20 | 20 | $140.90 | 21,000 | 29.4 | 17.6 | 50 | 16⅜ | ¾ | 8 | 45½ | ½ | 3 | 130 |
| | CG30 | 30 | 163.02 | 30,000 | 42 | 25.2 | 65 | 16⅜ | ¾ | 8 | 60⅜ | ½ | 3 | 160 |
| | CG40 | 40 | 193.40 | 30,000 | 42 | 25.2 | 65⅜ | 18⅜ | ¾ | 8½ | 60⅞ | ½ | 3 | 190 |
| Keystone Glass-Lined | KG20 | 20 | 184.24 | 21,000 | 29.4 | 17.6 | 64½ | 16⅜ | ¾ | 8 | 62⅝ | ½ | 3 | 156 |
| | KG30 | 30 | 206.28 | 28,000 | 39.2 | 23.5 | 58⅛ | 20⅜ | ¾ | 8½ | 56 | ½ | 3 | 206 |
| | KG30R | 30 | 212.20 | 32,500 | 45.5 | 27.3 | 58⅛ | 20⅜ | ¾ | 8½ | 56 | ½ | 3 | 206 |
| | KG40 | 40 | 243.14 | 28,000 | 39.2 | 23.5 | 59½ | 22⅜ | ¾ | 8½ | 57¾ | ½ | 3 | 237 |
| | KG40R | 40 | 249.04 | 32,500 | 45.5 | 27.3 | 59½ | 22⅜ | ¾ | 8½ | 57¾ | ½ | 3 | 237 |

**NOTE:** Keystone Models KG30R and KG40R include gas pressure regulator to operate heaters for higher input rating requirements.

# CRANE-MONEL AUTOMATIC GAS WATER HEATERS

## *with Ten Year Protection Plan*

The Crane-Monel water heaters have a solid Monel tank. Monel is a high-nickel alloy, made of nickel and copper—corrosion and rust resistant—withstands high temperatures—assures life-long trouble-free service.

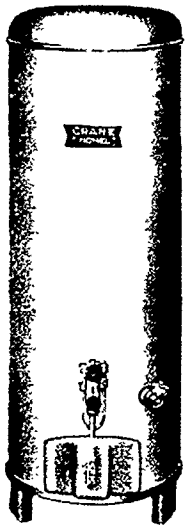
All heaters have safe lighting; thermo-magnetic safety pilot designed to shut off flow of gas to main and pilot burners if pilot flame is extinguished. Thick fiberglas blanket insulation surrounds tank, combustion chamber and heat-way. Outer jacket and main top are of cold-rolled heavy gauge steel with a baked white porcelite finish. Precision-drilled raised port blue flame burner, custom-sized for correct gas specification. Stainless steel pilot burner positively positioned. Fixed gas orifice, factory sized and drilled for rated heat-input. Full-view thermostat control at front of heater—finger tip selection of temperatures up to 180 degrees. Automatic gas pressure regulator is furnished on all heaters except models for LP gas.

**Sanimaster** models have two hot water outlets; one provides 180° water, the other 140°. Two-tone gray porcelite finish. ASME relief valve included.

Sanimaster
CMST60-50
CMST80-80

**Standard and Laundrymaster** can be equipped with Duo°°Temp feature providing both 180° and 125° water at same time, at extra cost.

Standard
CM21-23 CM30-30
Laundrymaster
CM30-36 CM42-42



*All prices include Federal Excise Tax

| Name | Model No. | Capacity Gallons | *Price Each | Btu Input Rating | Recovery Gal. per Hr. 100° Rise | Dimensions, Inches: Overall Height | Casing Diameter | Water Connections: Size | C. to C. | To Floor | Gas Conn. | Flue Dia. | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard | CM21-23 | 21 | $240.00 | 27,500 | 23 | 60¾ | 16¼ | ¾ | 33⅜ | 47⅞ | ½ | 3 | 153 |
| | CM30-30 | 30 | 307.50 | 35,750 | 30 | 65¼ | 18 | ¾ | 36½ | 52 | ½ | 3 | 199 |
| Laundry-master | CM30-36 | 30 | 330.00 | 42,900 | 36 | 64¼ | 20¾ | ¾ | 35¾ | 51¼ | ½ | 3 | 212 |
| | CM42-42 | 42 | 435.00 | 50,000 | 42 | 67⅞ | 22⅝ | ¾ | 37½ | 53¾ | ½ | 4 | 275 |
| Sani-master | CMST60-50 | 60 | 600.00 | 60,000 | 50 | 66⅝ | 26⅝ | 1 | 34⅝ | 51⅝ | ¾ | 4 | 385 |
| | CMST80-80 | 80 | 675.00 | 95,200 | 80 | 73⅝ | 26⅝ | 1 | 37⅜ | 56⅞ | ¾ | 5 | 454 |

*Prices are subject to change without notice.*

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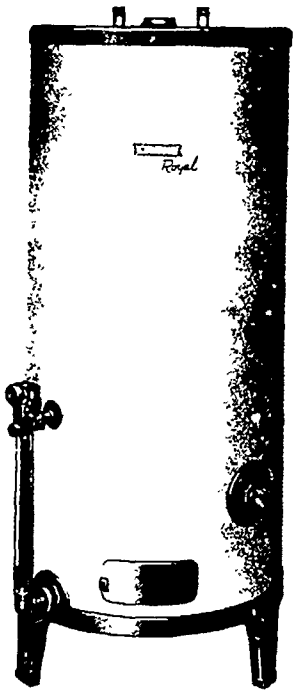


# CRANE ROYAL AUTOMATIC GAS WATER HEATERS

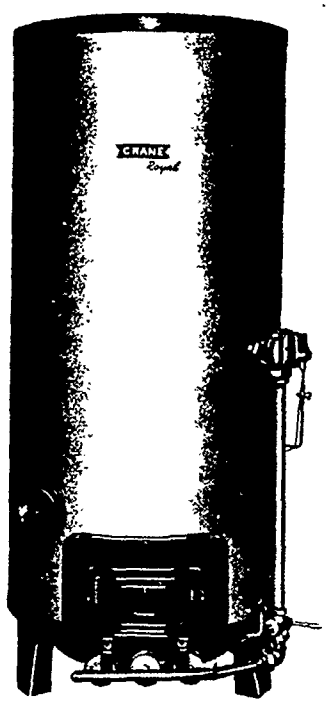
The Crane Royal are rugged, powerful heaters, ideal for restaurants, hospitals, schools, industrial plants, apartment houses, and unusually large homes. Tested and approved by the American Gas Association Inc., Laboratories. One year guarantee plan on commerical installations; five year plan on domestic installations.

They have a heavy duty galvanized steel tank, cast iron drilled-port burner, instant action thermostat, built-in Electro-magnetic safety gas control which shuts off both the pilot and the main burner if pilot is extinguished, heavy Fiberglas insulation, Gas Pressure Regulator, a big cleanout, and (not illustrated) a draft hood including a flue collector on the Models R 75 and R 85. The baked enamel sheet steel outer casing is white with black trim. On the Models R 75 and R 85, the water inlet is on the side with the outlet on top; the draft hood and flue also are on the side and can be turned to face in any quarter.

The use of an auxiliary storage tank is recommended. Royal Heaters are available for use with liquefied petroleum gas when so specified, without extra charge.

CRANE Royal Model R 55†

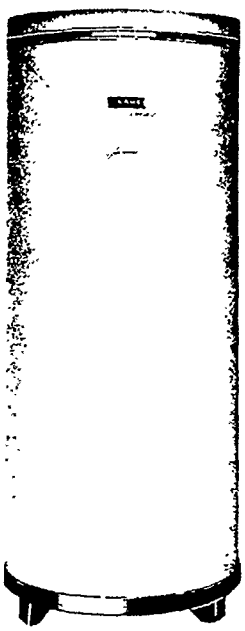
CRANE Royal Models R 75 and R 85



*Prices are F.O.B. LaPorte, Indiana

| Model No. | Gal. Cap. | *Price Each | *Add for Tank Life Guard | Ratings and Recovery: Natural, Mfg. or Mixed Gas: B.T.U. Input | Gallons per Hour 60° Rise | 80° Rise | 100° Rise | 120° Rise | Liquefied Petroleum Gas: B.T.U. Input | Gallons per Hour 60° Rise | 80° Rise | 100° Rise | 120° Rise | Dimensions, in Inches: Over-all Ht. | Dia. of Casing | Size of Connections: Water | Gas | Flue | Shpg. Wt. Lbs. Each |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R 55 | 55 | $384.56 | $12.56 | 50,000 | 70.0 | 52.5 | 42.0 | 35.0 | 46,000 | 64.5 | 48.0 | 38.6 | 32.0 | 72 | 25 | 1 | ½ | 4 | 369 |
| R 75 | 75 | 489.82 | 14.02 | 100,000 | 140.0 | 105.0 | 84.0 | 70.0 | 87,000 | 122.0 | 91.0 | 73.0 | 61.0 | 71½ | 27 | 2 | ¾ | 6 | 549 |
| R 85 | 85 | 560.00 | 15.52 | 150,000 | 210.0 | 157.5 | 126.0 | 105.0 | 125,000 | 175.0 | 131.0 | 105.0 | 87.0 | 78½ | 27 | 2 | ¾ | 6 | 606 |

†Model R55 is furnished with Unitrol A 100% Safety Control. For separate magnesium rods not factory installed and for relief valves, see page 18-13.



CRANE Selectric
Model A
10 Year Guarantee Plan
Model B
5 Year Guarantee Plan

# CRANE SELECTRIC AUTOMATIC ELECTRIC WATER HEATERS

Model A—10 Year Guarantee Plan  Model B—5 Year Guarantee Plan

These water heaters, approved by Underwriters' Laboratories, have double extra heavy galvanized steel tank, white baked enamel steel outer jacket, thick Fiberglas insulation, hot water heat trap, cold water inlet baffle, and drain cock with handy hose connection. All water connections are ¾". The heating elements are completely immersed in water for maximum efficiency and economy. A dependable Selectric Thermostat automatically and accurately maintains any desired water temperature between 100° and 190°.

Both Model A and B heaters are furnished in Type "S" with single element, Type "D" with double elements and single throw thermostats, and Type "T" with double elements and interlocking thermostats (single and double throw). No extra charge for double throw thermostats.

These heaters are standard 230-volt AC. No extra charge if heaters for 115-volt AC are specified. Heaters for DC also are available without extra charge, but these require a relay for each thermostat, and the relays are not furnished. No extra charge for special wattage elements.

*Prices are F.O.B. La Porte, Indiana and include Federal Excise Tax

| Tank Cap. Gals. | Type "S"—Single Element: Model A Size No. | *Price Each | Model B Size No. | *Price Each | Wattage, Lower Element | Types "D" or "T"—Double Element: Model A Size No. | *Price Each | Model B Size No. | *Price Each | Wattages Lower Element | Upper Element | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | E20S | $145.90 | EB20S | $122.30 | 1500 | E20D or T | $160.60 | EB20D or T | $137.04 | 600 | 1000 | 133 |
| 30 | E30S | 152.96 | EB30S | 128.94 | 1500 | E30D or T | 170.66 | EB30D or T | 146.60 | 600 | 1000 | 159 |
| 40 | E40S | 172.50 | EB40S | 145.16 | 2000 | E40D or T | 190.48 | EB40D or T | 158.40 | 750 | 1250 | 183 |
| 52 | E52S | 184.22 | EB52S | 163.58 | 2500 | E52D or T | 201.88 | EB52D or T | 178.30 | 1000 | 1500 | 221 |
| 66 | E66S | 224.96 | EB66S | 198.22 | 3000 | E66D or T | 239.68 | EB66D or T | 212.94 | 1250 | 2000 | 270 |
| 80 | E80S | 245.96 | EB80S | 228.42 | 3000 | E80D or T | 257.74 | EB80D or T | 235.76 | 1500 | 2500 | 371 |
| 100 | E100S | 331.58 | EB100S | 303.58 | 3000 | E100D or T | 349.28 | EB100D or T | 321.24 | 2000 | 3000 | 445 |

For factory installed Magnesium Rod on **Model B** heaters **Add *$11.64;** optional at no extra charge on **Model A.**
For separate tank lifeguard magnesium rods not factory installed and for relief valves, see page 18-13.

*NOTE: Wattages shown above are those generally considered standard. However, local utility wattage specifications should be checked and followed.*

*Prices are subject to change without notice.*



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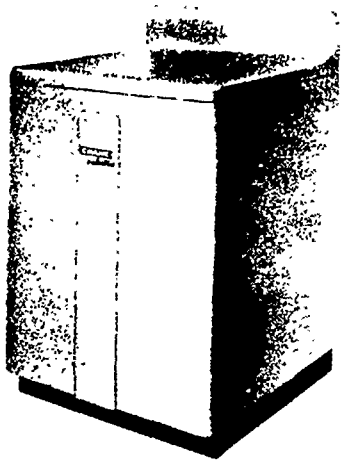
# CRANE SELECTRIC AUTOMATIC ELECTRIC WATER HEATERS



## Table Top Model A—10 Year Guarantee

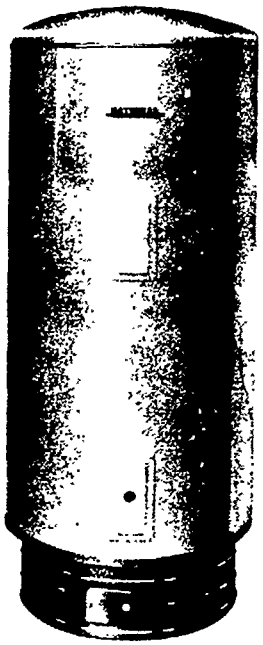
This Table Top Heater has the same high quality features and rugged construction as the Round Model A Crane Selectric Heaters. See page 18-4 for description of elements, thermostats, voltage, optional equipment, features, etc.

These heaters are made in 30 or 40 gallon sizes and are designed for modern kitchens. They are counter height—36″ to top of table, 40″ to top of wall protector back, 25″ deep, and 24″ wide—finished in lustrous white baked enamel jacket with white porcelain enamel table work top. Steel base is enameled black with recessed toe space.

***Prices are F.O.B. LaPorte, Indiana and include Federal Excise Tax**

**Model ET 30S,** with single 1500 W. lower element (shpg. wt. 200 lbs.) ..... *Each **$184.22**
**Model ET 40S,** with single 2000 W. lower element (shpg. wt. 235 lbs.) ..... *Each **198.94**
**Model ET 30D,** with 600 W. lower and 1000 W. upper elements (shpg. wt. 205 lbs.) ..... *Each **198.94**
**Model ET 30T,** with 600 W. lower and 1000 W. upper elements (shpg. wt. 205 lbs.) ..... *Each **198.94**
**Model ET 40D,** with 750 W. lower and 1250 W. upper elements (shpg. wt. 240 lbs.) ..... *Each **213.70**
**Model ET 40T,** with 750 W. lower and 1250 W. upper elements (shpg. wt. 240 lbs.) ..... *Each **213.70**
For factory installed Tank Lifeguard Magnesium Rod ..... **No extra charge.**

*Note: Wattages shown above are those generally considered standard. Local utilities wattage specifications should be checked and followed.*



**Extra Heavy Heater**
Five Year Guarantee

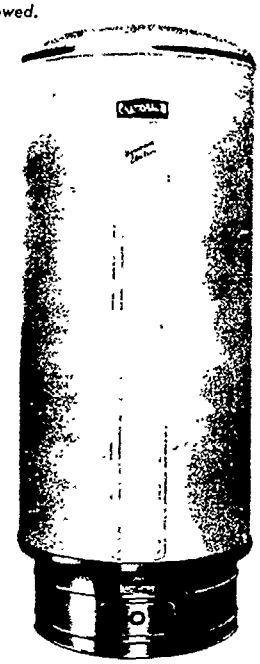
# NATIONAL AUTOMATIC ELECTRIC WATER HEATERS

All National Electric Water Heaters, approved by Underwriters' Laboratories, have identical operating mechanisms. They have patented "snap action" thermostats which are non-corrosive, long lasting, and readily removable; factory set at 150° F., the temperature control dial is adjustable from 100 to 185° F. Fast recovery 100% immersion-type elements are used, consisting of a series of heat conducting ceramic insulators through which is woven high quality chromium-nickel resistance wire; they can be replaced in a few minutes without draining the tank, an exclusive advantage.

Each heater has a steel jacket with white baked enamel finish, a one-piece heat trap, a cold water baffle, and thoroughly packed insulation, averaging 3¼″ in thickness. Tanks in steel tank heaters are galvanized inside and out, and all tanks are tested to 300 pounds hydrostatic pressure—127.5 pounds maximum working pressure.

**Extra Heavy Heaters** have an extra heavy steel tank and a black round apron base. **Doublex Heaters** have a double extra heavy steel tank with a black round apron base. **Puredure Heaters,** also made with the round apron base, have a non-corrosive silicon bronze tank. All heaters have ¾″ inlet and ½″ outlet except the 15 KW models which have 1¼″ inlet and outlet.

The last two numerals of the size number indicate the tank capacity in gallons. The heaters are standard 220-volt AC. When ordering, specify wattage of heating elements for both single and double (upper and lower) element heaters as well as thermostat requirements, single or double throw (interlocking).



**Doublex Heater**
Ten Year Guarantee

| Extra Heavy Heaters | | | | Doublex Heaters | | | | Puredure Heaters | | | | *Heating Elements Maximum | | | Size Over-all Inches | Shpg. Wt. Lbs. Each | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Element | | Double Element | | Single Element | | Double Element | | Single Element | | Double Element | | Single | Double | | | | |
| Size No. | Price Each | Size No. | Price Each | Size No. | Price Each | Size No. | Price Each | Size No. | Price Each | Size No. | Price Each | | Upper | Lower | | Ex. Hy. | XX |
| ER-8 | Prices on application | — | Prices on application | — | Prices on application | — | Prices on application | — | Prices on application | — | Prices on application | 1000W | — | — | 16½x30 | 80 | — |
| ER-20 | | AR-20 | | — | | — | | — | | — | | 2000W | 1500W | 1500W | 22½x36 | 170 | 210 |
| ER-30 | | AR-30 | | ERXX-30 | | ARXX-30 | | — | | — | | 3000W | 1500W | 1500W | 20½x60† | 200 | 256 |
| ER-40 | | AR-40 | | ERXX-40 | | ARXX-40 | | — | | ARP-40 | | 3000W | 2000W | 2000W | 22½x60 | 220 | 295 |
| ER-52 | | AR-52 | | ERXX-52 | | ARXX-52 | | — | | ARP-52 | | 3000W | 2000W | 2000W | 24½x60 | 270 | 300 |
| ER-66 | | AR-66 | | ERXX-66 | | ARXX-66 | | — | | ARP-66 | | 3000W | 2250W | 2250W | 24½x72 | 330 | 337 |
| ER-82 | | AR-82 | | ERXX-82 | | ARXX-82 | | ERP-82 | | ARP-82 | | 4500W | 4500W | 2250W | 26½x72‡ | 400 | 450 |
| ER-100 | | AR-100 | | ERXX-100 | | ARXX-100 | | ERP-100 | | ARP-100 | | 5000W | 5000W | 2500W | 28½x77 | 450 | 500 |
| ER-100 (15KW) | | — | | ERXX-100 (15KW) | | — | | — | | — | | 15000 W | — | — | 28½x77 | 450 | 500 |
| ER-120 | | AR-120 | | ERXX-120 | | ARXX-120 | | ERP-120 | | ARP-120 | | 5000W | 5000W | 2500W | 30½x77 | 500 | 550 |

*Wattages shown are those usually considered standard. Check with electric utilities and specify element wattages according to local rate requirements.
Interlocking type thermostats can be furnished at no extra charge.
Sizes: When shipped from Logansport, Indiana †22½x45″, ‡28½x65½″.
Magnesium Anode furnished when specified in Doublex Heaters without extra charge; nominal extra charge in Extra Heavy Heaters.

*Prices are subject to change without notice.*
Printed in U.S.A. LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

# NATIONAL AUTOMATIC ELECTRIC WATER HEATERS

All National Electric Water Heaters are safe, clean, modern, economical, and automatic. All have identical operating mechanisms, and all have two important, exclusive features: patented "snap action" thermostats and 100% immersion-type heating elements.

Thermostats have extra large, long lasting contacts of special silver alloy; they snap on and off—there is no arcing to burn out points. Thermostats are submerged in the water in thermal-sensitive copper wells and are easily removed without draining the tank.

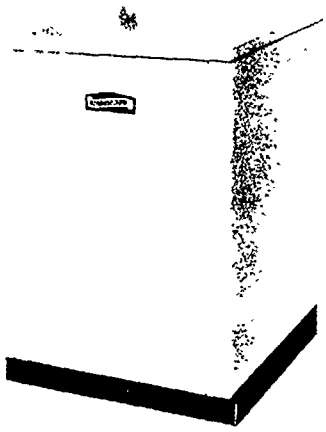
The immersion-type heating elements effect an almost instantaneous transfer of heat, since the element fits snugly into a heavy seamless copper well which is submerged in the water. Heating takes place by convection, conduction, and radiation; and expansion and contraction of the copper keeps the well free of efficiency robbing scale.

## Table Top Models

The Table Top Models provide extra work space and a spotless top for all counter installations. The top is made in one piece with a backsplasher—can also be furnished without top. Heaters are of white Crystal-Cote finish which is impervious to acids and food stains. The finish will not chip or crack, and is easily cleaned with a damp cloth.

The heaters have black base with recessed toe space, white baked enamel steel jacket, a heat trap to prevent circulation when no water is being drawn, a cold water baffle, 3¼" of insulation, and sturdy, durable tanks, tested with 300 pounds hydrostatic pressure and recommended for a maximum of 127.5 pounds working pressure. Steel tanks are galvanized inside and out. The size of the inlet is ¾"; outlet ½".

Table Top Models are made with three kinds of tanks, with single or double heating elements, the same as the Round Models listed on the preceding page. **Extra Heavy Heaters** have an extra heavy steel tank; **Doublex Heaters** have a double extra heavy steel tank; and **Glasteel Heaters** have a rust-proof, glass coating fused onto the inner surface of the steel tank.



| Size | Catalog Number of Heater | | | | | | *Maximum Capacities of Heating Elements | | | Overall Size, Inches | | | Shipping Weight, Pounds | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Extra Heavy | | Doublex | | Glasteel | | | Double Element | | | | | | | |
| Gallons | Single Element | Double Element | Single Element | Double Element | Single Element | Double Element | Single Element | Upper | Lower | Width | Height | Depth | Extra Heavy | Doublex | Glasteel |
| 20 | ET-20 | — | — | — | — | — | 2000W | — | — | 19½ | 36 | 25 | 170 | — | — |
| 30 | ET-30 | AT-30 | ETXX-30 | ATXX-30 | ETGL-30 | ATGL-30 | 3000W | 2000W | 2000W | 21½ | 36 | 25 | 225 | 255 | 230 |
| 43 | ET-43 | AT-43 | ETXX-43 | ATXX-43 | ETGL-43 | ATGL-43 | 3000W | 2000W | 2000W | 23½ | 36 | 25 | 255 | 275 | 260 |
| 52 | ET-52 | AT-52 | ETXX-52 | ATXX-52 | ETGL-52 | ATGL-52 | 4000W | 2500W | 2500W | 26 | 36 | 25 | 300 | 300 | 280 |

*Wattages shown are those usually considered standard. Check with local utilities and specify element wattages according to their requirements.

## Kitchen Booster

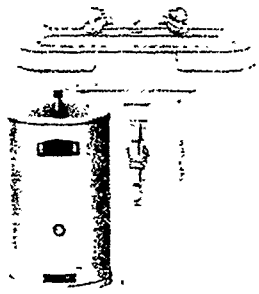
Extremely hot water is necessary for sanitary, efficient operation of an automatic dishwasher. This 8-gallon Kitchen Booster is factory adjusted to provide enough extra hot water for two complete cycles of a dishwasher. The water is piped directly to the dishwasher but not to the hot water faucets, thus eliminating the possibility of scalds.

It is made to build-in alongside a sink or dishwasher; has a handy 11" by 7" soap drawer in the upper half. The heater is 9" wide by 36" high by 25" deep, and has a single 2000 W. heating element*. The inlet and outlet are ½" size, and the approximate shipping weight is 120 pounds.

Size No. **ET-8-KB** ..... **Prices on application.**

## Wash Basin Special

The Wash Basin Special is designed for use in service stations, cabins, offices, barber shops, and other places where the demand for hot water is small but where its availability is desirable. Of 1½-gallon capacity, the over-all size is only 9½" by 16", small enough to mount directly underneath the lavatory or wash basin, as illustrated.



Made for either 110 or 220-volts AC; 110-volt heaters can be plugged into a wall socket, but the 220-volt must be wired to a 220-volt terminal box. The heater has a single 750 watt heating element*, and the shipping weight is 30 pounds; it has ½" inlet and outlet connections.

The tank is extra heavy steel, galvanized inside and out.

Size No. **ER-1½** ..... **Prices on application.**

*Elements furnished as required by the electric utility without extra charge but must not exceed the maximum capacity specified above. Where required by the utility, no extra charge is made for interlocking thermostats.

The last two numerals of the size number indicate the tank capacity in gallons. The heaters are standard 220-volt AC. When ordering, specify wattage of heating elements for both single and double (upper and lower) element heaters as well as thermostat requirements.

Magnesium Anode furnished when specified in Doublex Heaters without extra charge; a nominal extra charge is made when Magnesium Anode is specified in other steel tank heaters.



*Prices are subject to change without notice*

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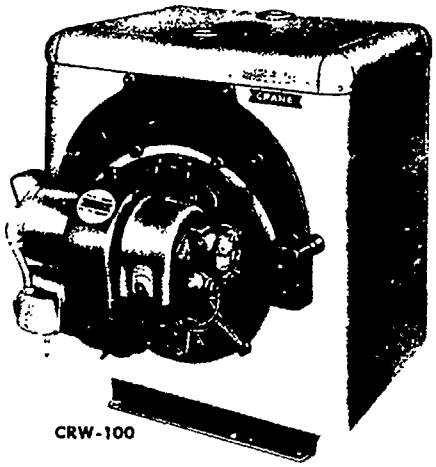
Printed in U.S.A.

# CRANE AUTOMATIC OIL-BURNING WATER HEATERS



CRW-100

A remarkably compact unit, providing plenty of hot water, automatically and economically. For domestic hot water, this Crane heater requires no separate storage tank for the average household's requirements. The 150 unit, for example, carries a reserve of 25 gallons of hot water always ready for use . . . will re-heat another 25 gallons in 10 minutes, or will furnish a continuous flow of 153 gallons an hour at 100° rise.

The adjustable firing head is designed to deliver maximum heat efficiently. Through positive control of primary and secondary air, it provides excellent fuel and air mixture to obtain clean, complete combustion from all types of home heating oils.

This Heater is completely modern in design, is unusually compact to permit installation where space is limited, and is attractive in appearance. The inner shell permits fast heating; it is hot dip galvanized inside and out for long life and freedom from rust.

Water heater shell, insulation, boiler jacket and combustion chamber are completely assembled; burner and controls are packed separately. Standard electrical equipment is for 110 volts 60 cycle A.C. Maximum operating pressure is 90 pounds.

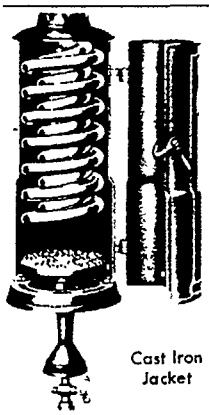
RATINGS, DIMENSIONS AND PRICES—*All Prices are F.O.B. Cedar Rapids, Iowa

| Heater Number | *Price Each | Burner Model | Nozzle Size and Angle | Performance and Capacity: Gallons per Hour 80° Rise | Gallons per Hour 100° Rise | B.T.U. Output | Heating Surface Sq. ft. | Gallons Boiler Storage Capacity | Dimensions, Inches: Over-all Height x Width x Length | Size of Inlets & Outlets 2 Each | Stack Dia. | Shipping Weight Pounds Each |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AW-100 | $814.48 | A | .85-80° | 125 | 104 | 86,000 | 18½ | 16 | 35x28x40½ | 1½ | 8 | 665 |
| AW-150 | 918.24 | | 1.25-80° | 200 | 153 | 127,000 | 28 | 25 | 35x28x50½ | 2 | 8 | 865 |
| AW-200 | 1048.00 | | 1.5 -60° | 250 | 198 | 165,000 | 38 | 33 | 35x28x60½ | 2 | 8 | 1065 |
| CRW-100 | 790.90 | CR | .85-80° | 125 | 104 | 86,000 | 18½ | 16 | 35x28x40⅛ | 1½ | 8 | 670 |
| CRW-150 | 894.64 | | 1.25-80° | 200 | 153 | 127,000 | 28 | 25 | 35x28x50⅛ | 2 | 8 | 870 |
| CRW-200 | 1024.40 | | 1.5 -60° | 250 | 198 | 165,000 | 38 | 33 | 35x28x60⅛ | 2 | 8 | 1070 |

Prices include burner, draft regulator, stackswitch, aquastat, thermometer, nozzle and miscellaneous assembly parts.

For Oil Pressure Gauge..... add $3.70
For No. 2A-700 Fuel Oil Filter..... add 8.42
For 2-stage Fuel Pump on Oil Burner..... add 9.96

## HOTSTREAM GAS FIRED SIDE ARM WATER HEATERS



Cast Iron Jacket

These heaters have a double copper coil; a drilled Bunsen-type blue-flame cast iron burner; a cast iron mixing chamber; and a brass gas valve. They are ruggedly constructed. All flues on the models listed in the table below are 3".

The Model "S" Heater has a steel jacket which is fully insulated with Fiberglas. It has a black baked enamel top and base and an aluminum finished shell.

A Thermo-Couple Automatic Pilot (not illustrated) should always be used on liquefied petroleum gas installations. If the gas supply to the heater is interrupted, or if the pilot flame is extinguished, the Thermo-Couple will automatically cut off the gas supply to the heater.

Triple coil and heavy duty large volume heaters also are available; consult your Crane Branch or Crane Wholesaler.

Model "S" Steel Jacketed

Extra for ⅜" or ½" Thermo-Couple Automatic Pilot for liquefied petroleum gas, *Price Each..... $23.12

†For manufactured gas, input rating is 30,000 B.T.U. and recovery capacity is 42 gallons per hour; in all other cases, the figures in these two columns apply to both natural and manufactured gas.

*Prices are F.O.B. Cleveland, Ohio and include Federal Excise Tax

| Type | With Unions: Model No. | *Price, Each, F.O.B. Cleveland, O. With Galv. Unions | With Brass Unions | Shpg. Wt. Lbs. Each | Without Unions: Model No. | *Price Each F.O.B. Cleveland, Ohio | Shpg. Wt. Lbs. Each | Specifications: Total Height of Jacket Inches | Size Water Connection Union Inches | Direct Inches | Length of Coil Feet | Input Rating 1000 B.T.U. | Capacity Gallons per Hour 60° Rise | Tank Size Gallons Capacity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Insulated Steel Jacket Heaters | S-20U | $35.42 | $36.58 | 22 | S-20 | $32.64 | 21 | 17 | ¾ | 1¼ | 13½ | 22 | 30.8 | 30 |
| | S-24U | 41.44 | 42.62 | 26 | S-24 | 38.72 | 25 | 20 | ¾ | 1¼ | 16 | 23.5 | 32.9 | 30 |
| | S-25U | 45.38 | 46.56 | 29 | S-25 | 42.62 | 28 | 22½ | ¾ | 1¼ | 17 | 25 | 35 | 30–40 |
| | S-30U | 48.32 | 49.50 | 31 | S-30 | 45.54 | 30 | 22½ | ¾ | 1¼ | 20 | 25 | 35 | 30–52 |
| Cast Iron Jacket Heaters | 20U | 35.42 | 36.58 | 31 | 20 | 32.64 | 30 | 17¾ | ¾ | 1¼ | 13½ | 20 | 28 | 30 |
| | 24U | 41.44 | 42.62 | 43 | 24 | 38.72 | 42 | 20⅞ | ¾ | 1¼ | 16 | 25 | 35 | 30–40 |
| | 25U | 45.38 | 46.56 | 45 | | | | 23⅛ | ¾ | 1¼ | 17 | 25† | 35† | 30–40 |
| | 30U | 48.32 | 49.50 | 46 | | | | 23⅛ | ¾ | 1¼ | 20 | 25 | 35 | 40–52 |
| | 50 | — | 49.50 | 47 | | | | 23⅛ | ¾ | 1¼ | 20 | 25 | 35 | 40–52 |
| | 70 | — | 52.58 | 48 | | | | 23⅛ | ¾ | 1¼ | 22 | 25 | 35 | 40–52 |

*Prices are subject to change without notice.*

Printed in U.S.A.

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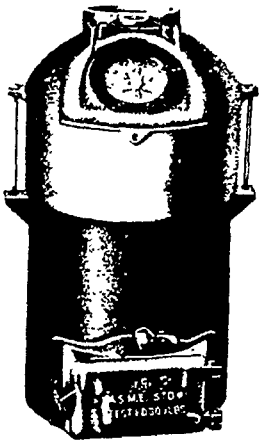
*February 28, 1955*
*Superseding November 27, 1950*

# COAL FIRED HOT WATER SUPPLY HEATERS



Nos. 800 and 1400
10" Boiler

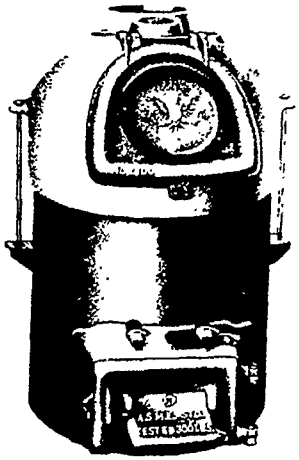
## American Red-Top—Cast Iron with Steel Jacket

These American Red-Top Boilers have ample heating surfaces to furnish a constant supply of domestic hot water at a minimum operating cost.

Boilers are ruggedly constructed and have a heavy steel jacket surrounding the fire pot. The heavy-duty, cast iron fire pots are lined with fire-brick and have single bar grates for all solid fuels.

Boilers are designed and constructed to withstand 300 lbs. pressure in accordance with A.S.M.E. standards.

For most satisfactory operation, use an automatic damper regulator with every installation.

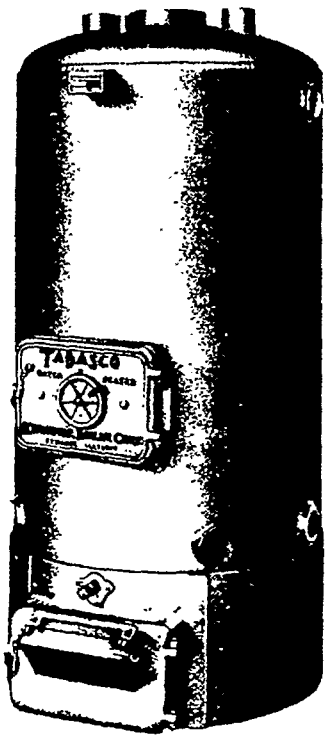


Nos. 2100 and 2750
12" Boiler

CAPACITIES, DIMENSIONS AND PRICES—*All prices are F.O.B. Medina, Ohio

| Heater Number | *Prices, Each F.O.B. Medina, Ohio | Capacities in Gallons per Hour | | | | Total Height | Grate Dia. | Depth of Fire | Inlet & Outlet Tappings | Flue Pipe Size | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100° Rise in 3 Hrs. | Temperature Rise 40° | 85° | 100° | | | | | | |
| 800 | $42.00 | 54 | 45 | 21 | 18 | 22" | 10" | 10" | 1" | 5" | 84 |
| 1400 | 52.00 | 91 | 76 | 36 | 30 | 25" | 10" | 13" | 1" | 5" | 102 |
| 2100 | 82.00 | 129 | 108 | 51 | 43 | 26" | 12" | 11" | 2" | 5" | 140 |
| 2750 | 102.00 | 141 | 118 | 55 | 47 | 30" | 12" | 16" | 2" | 5" | 173 |

All the above boilers have a 6 inch brick lining between the waterpot and grate.



## Tabasco—Welded Steel

Large capacity; economical to operate. Welded steel construction assures liberal strength for high water main pressure. Has improved base and rocking grate, with ample clearance below grates. Large size firedoor opens wide for man-size scoop shovel, making firing easy.

Maximum working pressure is 100 pounds per square inch; tested to 150 pounds hydrostatic pressure. A.S.M.E. Code.

Each heater has two flow connections, two returns, and five washout plugs. Draft opening is fitted with balanced flap, connecting to regulator for automatic draft control.

CAPACITIES, DIMENSIONS AND PRICES—†All prices are F.O.B. Kewanee, Illinois

| Heater | †Price Each F.O.B. Kewanee, Illinois | Capacity 50° Rise Gallons per Hour | Grate Area in Square Feet | Dimensions, in Inches | | | | | Shpg. Wt. Lbs. Each |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Height | Dia. of Base | Size of Flow & Return (2 Each) | Size of Five Washout Plugs | Dia. of Smoke Outlet | |
| No. 018 | $256.00 | 165 | 0.96 | 49½ | 19 | 1½ | 1½ | 6 | 430 |
| No. 022 | 298.00 | 250 | 1.25 | 49½ | 22 | 1½ | 1½ | 6 | 530 |
| No. 027 | 410.00 | 400 | 2.1 | 61½ | 26 | 2 | 2 | 8 | 840 |
| No. 030 | 532.00 | 550 | 3.2 | 59½ | 32 | 2½ | 2 | 8 | 1100 |
| No. 032 | 574.00 | 700 | 3.2 | 67½ | 32 | 2½ | 2 | 8 | 1270 |



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Printed in U.S.A.

## STANDS FOR RANGE BOILERS

### Ring Stands

Made of cast iron. On the two smaller sizes, the height is adjustable; the upright section screws into the base and is secured in position by a lock-nut.

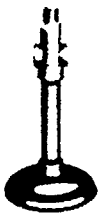
| Size Inches | Dia. of Range Boiler Inches | Height of Stand Inches | Prices, Each Plain | Prices, Each Galv. | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|
| 12¾ | 12 | 13½ to 16½ | $7.40 | $17.74 | 10 |
| 14¾ | 14 | 13½ to 16½ | 8.10 | 19.44 | 12 |
| 18¾ | 18 | 19½ | 15.48 | 37.18 | 26 |
| 20¾ | 20 | 19½ | 17.24 | 41.40 | 27 |
| 24¾ | 24 | 22½ | 23.58 | 56.60 | 49 |

### Reversible Stands

One end supports a 12" diameter range boiler; the other end, a 14" diameter. Available in two heights; made of cast iron.

| Size | Dia. of Range Boiler Inches | Height of Stand Inches | Prices, Each Plain | Prices, Each Galv. | Shpg. Wt. Lbs. |
|---|---|---|---|---|---|
| No. 7 | 12 or 14 | 8 | $2.30 | $5.52 | 3½ |
| No. 8 | 12 or 14 | 12 | 2.92 | 6.98 | 5 |

### ASCO Boiler Stands



No. 103 less Top Plate

No. 104 with Top Plate

The Universal type boiler stands have a ¾ x ¾ I.P.S. malleable iron galvanized tee and painted aluminum finish base. Available with or less top plate as desired.

Height 14 inches

No. 103 ..... Each $8.00 ..... Wt. 6½ lbs.
No. 104 ..... Each 8.60 ..... Wt. 7¼ lbs.

*For Asbestocel Range Boiler Jackets, see page 17-22*

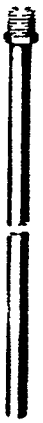
## GALVANIZED WELDED STEEL RANGE BOILERS

Have "universal" tapping—6 openings, for vertical or horizontal installation. All six openings are tapped for 1" pipe except on the 120-gallon 24 x 60" size which has six 1½" tapped openings. Standard weight range boilers are for 85 pounds maximum working pressure; Extra Heavy weight range boilers, for 106¼ pounds.

| Capacity Gallons | Size Inches | *Prices, Each Standard *Zone 1 | Standard *Zone 2 | Extra Heavy *Zone 1 | Extra Heavy *Zone 2 | Approx. Wt. Pounds Std. | Ex. Hy. |
|---|---|---|---|---|---|---|---|
| 15 | 12x30 | $29.86 | $36.80 | $36.00 | $44.48 | 40 | 49 |
| 30 | 12x60 | 35.34 | 44.56 | 38.94 | 50.08 | 71 | 89 |
| 40 | 14x60 | 43.06 | 54.14 | 49.60 | 63.12 | 95 | 105 |
| 66 | 18x60 | 83.34 | 104.40 | 95.34 | 118.82 | 128 | 176 |
| 82 | 20x60 | 92.40 | 115.98 | 107.60 | 134.06 | 163 | 194 |
| 120 | 24x60 | 116.54 | 145.84 | 135.86 | 169.14 | 206 | 236 |

*All prices are F.O.B. factory. Zone 1 prices apply in all States except Washington, Oregon, and California; Zone 2 prices apply in these three Pacific Coast States.

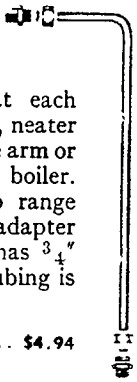
## RANGE BOILER DIP TUBE



Made of ⅝" O.D. brass tubing with ½" I.P.S. bushing; length 54".

Price, Each .....$1.82

## SPEE-DEE CIRCULATOR



An L-shaped piece of copper tubing with a universal type adapter at each end. Makes a better, faster, neater connection between the side arm or tank heater and the range boiler. Adapter for connection to range boiler has 1" male thread; adapter for connection to heater has ¾" male thread. Long leg of tubing is 37".

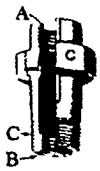
Price, Each..... $4.94

## CRANE CIRCULATING BOILER FITTINGS

Malleable Iron—Galvanized

**Working Pressure: 150 pounds water, 200° F.**

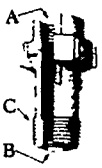
No. 586 90° Elbow




No. 589 Coupling

With Gasket Type Union Fitted with Rubber Gasket

No. 586½ 90° Elbow




No. 589½ Coupling

With Ground Joint Union Having Brass to Iron Seat

No. 587 90° Elbow

No. 588 Coupling

PRICES, EACH

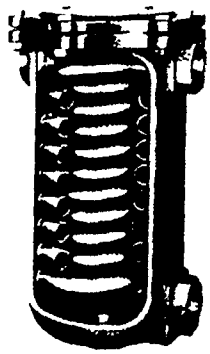
| Type | Size, Inches A B C ½x½x1 | A B C ¾x½x1 | A B C ¾x¾x1 |
|---|---|---|---|
| No. 586 | $3.16 | $3.46 | $3.46 |
| No. 586½ | 3.16 | 3.46 | 3.46 |
| No. 587 | 1.74 | 1.74 | 1.74 |
| No. 588 | 1.54 | 1.54 | 1.54 |
| No. 589 | 2.76 | 3.06 | 3.06 |
| No. 589½ | 2.76 | 3.06 | 3.06 |

*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## INDIRECT HEATERS

Single Coil Heater
(Has Two Brass Unions)



Double Coil Heater

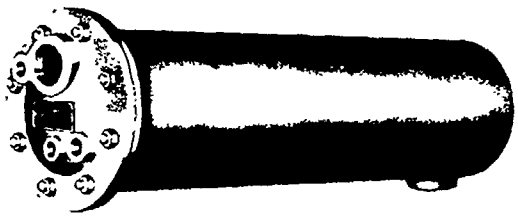
Horizontal Tube Heater

These Indirect Heaters can be installed with any steam, vapor, or hot water heating boiler. Used with a storage tank of suitable capacity and equipped with proper electrical controls, the heater will supply ample hot water winter and summer. All parts in contact with the domestic water are of copper or bronze. Coils can be easily removed. Available in vertical single and double coil units and in horizontal models where larger capacities are required.

*Shell working pressures: 15 pounds steam or 30 pounds water*

| Type | Heater Number and Size | Prices Each | Shipping Weight Pounds | Capacities—Gallons in 3 Hours Heated from 40° to 140° Boiler Water At 212° | 200° | 180° | Steam at 1 Lb. Gauge | Dimensions in Inches Over-all Length | Width | Connections Boiler | Service Water |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Coil Heaters | 90 | $39.22 | 37 | 90 | 74 | 55 | 180 | 19 | 6⅝ | 1½ | 1 |
| | 100 | 44.76 | 38 | 100 | 82 | 61 | 200 | 20⅜ | 6⅝ | 1½ | 1 |
| | 120 | 52.86 | 43 | 120 | 98 | 73 | 240 | 23 | 6⅝ | 1½ | 1 |
| | 150 | 61.44 | 46 | 150 | 123 | 92 | 300 | 25¼ | 6⅝ | 1½ | 1 |
| Double Coil Heaters | 160 | 72.58 | 61 | 160 | 131 | 98 | 320 | 12¾ | 10½ | 2 | 1½ |
| | 200 | 84.46 | 69 | 200 | 164 | 122 | 400 | 15⅜ | 10½ | 2 | 1½ |
| | 300 | 115.82 | 95 | 300 | 246 | 183 | 600 | 20 | 10½ | 2 | 1½ |
| | 400 | 143.14 | 93 | 400 | 328 | 244 | 800 | 24 | 10½ | 2 | 1½ |
| | 500 | 176.54 | 122 | 500 | 410 | 305 | 1000 | 27¼ | 10½ | 2 | 1½ |
| Horizontal Tube Heaters | 600 | 193.20 | 117 | 600 | 492 | 366 | 1200 | 26 | 13¾ | 3 | 2½ |
| | 800 | 232.66 | 141 | 800 | 656 | 488 | 1600 | 29¼ | 13¾ | 3 | 2½ |
| | 1000 | 297.90 | 135 | 1000 | 820 | 610 | 2000 | 32¾ | 13¾ | 3 | 2½ |
| | 1200 | 449.14 | 258 | 1200 | 984 | 732 | 2400 | 47¾ | 18 | 4 | 3 |
| | 1600 | 480.00 | 300 | 1600 | 1312 | 976 | 3200 | 54¾ | 18 | 4 | 3 |
| | 2000 | 551.80 | 341 | 2000 | 1640 | 1220 | 4000 | 62⅞ | 18 5/16 | 6 | 3 |
| | 2500 | 649.68 | 361 | 2500 | 2050 | 1525 | 5000 | 71 | 18 5/16 | 6 | 3 |
| | 3000 | 899.80 | 390 | 3000 | 2460 | 1830 | 6000 | 81⅛ | 18 5/16 | 6 | 3 |

## TANKLESS HEATERS



A small heater with unusual capacity. Use where space does not permit the installation of a storage tank or where water conditions would necessitate an expensive copper or other non-ferrous tank. All parts in contact with domestic water are of copper or bronze.

A Watermixer and a temperature regulating valve are recommended on all tankless heater installations. Where the pressure of the cold water supply exceeds 40 pounds, use a pressure reducing valve.

| Heater No. | Prices Each | Shpg. Wt. Lbs. | Capacities in Gallons Heated from 40° to 140° with Water at 180° Per Hr. | 180° Per Min. | 200° Per Hr. | 200° Per Min. | Heating Surface In Sq. Ft. | Dimensions In Inches Over-all Length | Dia. | Connections Boiler | Service Water |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-12 | $98.18 | 73 | 210 | 3½ | 315 | 5 | 12 | 14⅝ | 11 13/16 | 2½ | ¾ |
| T-14 | 115.58 | 76 | 240 | 4 | 365 | 6 | 14 | 14⅝ | 11 13/16 | 2½ | ¾ |
| T-16 | 124.96 | 80 | 300 | 5 | 450 | 7½ | 16 | 14⅝ | 11 13/16 | 2½ | ¾ |
| T-20 | 173.82 | 106 | 360 | 6 | 540 | 9 | 20 | 31 3/16 | 11 13/16 | 2½ | ¾ |
| T-30 | 183.92 | 141 | 480 | 8 | 750 | 12½ | 30 | 44 1/16 | 11 13/16 | 3 | ¾ |

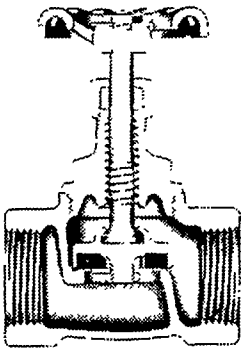
*Prices are subject to change without notice.*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

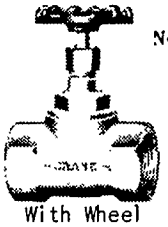
## 100-POUND BRASS GLOBE AND ANGLE VALVES

100 POUNDS STEAM - 150 POUNDS WATER - DOMESTIC GAS SERVICE

*With Composition Disc - Wheel Handle or Lockshield*

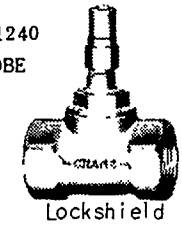


No. 1240 GLOBE
Cross Section



No. 1240
GLOBE

With Wheel



Lockshield

No. 1241
ANGLE

With Wheel

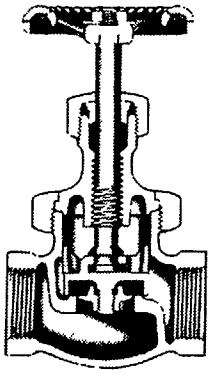
Lockshield

No. 1240 and No. 1241 valves regularly have a No. 12 Disc, suitable for 150 pounds cold or hot water (maximum temperature, 200° F.) and for domestic gas service. When so ordered valves can be furnished with No. 10 Disc suitable for 100 pounds saturated steam.

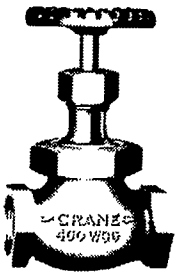
## BRONZE GLOBE AND ANGLE VALVES

For Liquefied Petroleum Gases
400 POUNDS 150° F. LP-gases, light oils, volatile fluids, or air

*With Composition Disc*



No. 130 GLOBE
Cross Section



No. 130
Globe

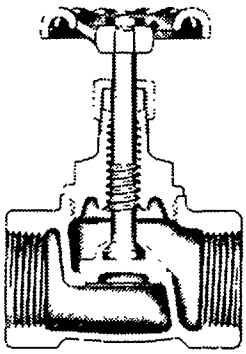
No. 131
Angle

No. 130 and 131 valves have been approved by Underwriters' Laboratories, Inc. for efficient handling of all LP-gases at pressures up to 250 pounds. Sizes 2" and smaller have a union bonnet; sizes 2½" and 3" have a bolted bonnet.

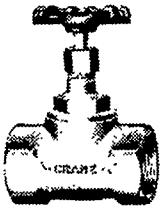
## 100-POUND BRASS GLOBE AND ANGLE VALVES

100 POUNDS STEAM - 150 POUNDS WATER, OIL OR GAS

*With Brass Disc*



No. 1250 GLOBE
Cross Section



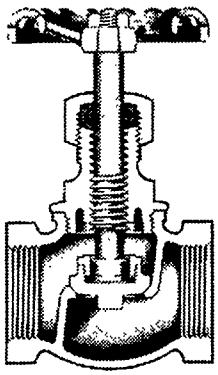
No. 1250
Globe

No. 1251
Angle

## 125-POUND BRASS GLOBE AND ANGLE VALVES

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL OR GAS

*With Brass Disc*



No. 1 GLOBE
Cross Section

No. 1
Globe

No. 2
Angle

PRICES, EACH

| Number | Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1240 GLOBE, With Wheel | | $ 4.36 | $ 4.36 | $ 4.58 | $ 6.04 | $ 8.12 | $11.44 | $14.56 | $19.96 | $31.20 | - | - |
| 1241 ANGLE, With Wheel | | 4.36 | 4.36 | 4.58 | 6.04 | 8.12 | 11.44 | 14.56 | 19.96 | 31.20 | - | - |
| 1240 GLOBE, With Lockshield | | - | 5.40 | 5.62 | 7.48 | 10.20 | 14.36 | 18.10 | - | - | - | - |
| 1241 ANGLE, With Lockshield | | - | 5.40 | 5.62 | 7.48 | 10.20 | 14.36 | 18.10 | - | - | - | - |
| Add for key | | - | 2.76 | 2.76 | 2.76 | 2.76 | 3.32 | 3.32 | - | - | - | - |
| 1250 GLOBE | | - | - | 4.26 | 5.40 | 7.08 | 9.78 | 12.68 | 17.88 | 26.42 | - | - |
| 1251 ANGLE | | - | - | 4.26 | 5.40 | 7.08 | 9.78 | 12.68 | 17.88 | 26.42 | - | - |
| 1 GLOBE | | 4.54 | 4.54 | 5.18 | 7.34 | 9.72 | 13.40 | 17.28 | 24.40 | 37.80 | $55.08 | $ 82.08 |
| 2 ANGLE | | 4.54 | 4.54 | 5.18 | 7.34 | 9.72 | 13.40 | 17.28 | 24.40 | 37.80 | 55.08 | 82.08 |
| 130 GLOBE | | - | 8.10 | 9.94 | 12.96 | 17.28 | 23.76 | 32.40 | 38.88 | 64.80 | 118.80 | 168.48 |
| 131 ANGLE | | - | 8.10 | 9.94 | 12.96 | 17.28 | 23.76 | 32.40 | 38.88 | 64.80 | 118.80 | 168.48 |

*For Composition Discs, refer to Page 19-4.* *Keys for Lockshield Valves, refer to Page 19-9.*



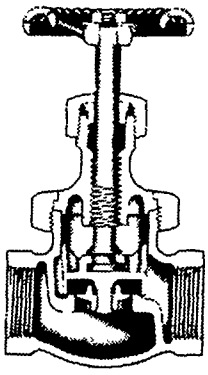
LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## 150-POUND BRASS GLOBE AND ANGLE VALVES

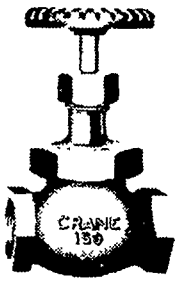
**150 POUNDS STEAM - 300 POUNDS COLD WATER, OIL OR GAS**

Sizes 2" and smaller have union bonnet; Sizes 2-1/2" and 3" have bolted bonnet

*With Composition Disc* *With Plug Type Disc*

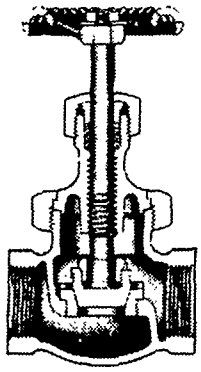


No. 7 GLOBE Cross Section

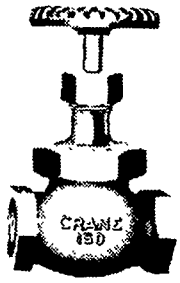



No. 7 Globe

No. 7 Angle



No. 14½ P GLOBE Cross Section




No. 14½ P Globe

No. 16½ P Angle

The **No. 7** valves are regularly equipped with a No. 1 Cranite Disc, suitable for steam or hot water up to 300° F. Valves ordered for cold water, air, gas, oil, or gasoline are furnished with a No. 6 Disc. On hot water under 200° F., especially for frequent operation or easy seating, a No. 6 Disc is preferred to the No. 1.

**PRICE, EACH**

| Number, Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 GLOBE | $ 7.12 | $ 7.12 | $ 8.86 | $11.24 | $15.56 | $ 21.16 | $ 28.94 | $ 36.08 | $ 58.32 | $105.84 | $149.04 |
| 7 ANGLE | 7.12 | 7.12 | 8.86 | 11.24 | 15.56 | 21.16 | 28.94 | 36.08 | 58.32 | 105.84 | 149.04 |
| 14½ P GLOBE | 11.66 | 11.66 | 14.48 | 16.42 | 20.52 | 27.00 | 38.44 | 51.84 | 75.60 | 136.08 | 203.04 |
| 16½ P ANGLE | 11.66 | 11.66 | 14.48 | 16.42 | 20.52 | 27.00 | 38.44 | 51.84 | 75.60 | 136.08 | 203.04 |

## COMPOSITION DISCS

No. 1 CRANITE

No. 4 CRANITE

No. 6 COMPOSITION

No. 10 and 12 COMPOSITION

**No. 1 Cranite Discs** - made of a specially formulated composition consisting of a synthetic base, with asbestos and other ingredients.

*For 150 pounds steam, 366° F. maximum*
**150 pounds hot water, 366° F. maximum*
**300 pounds hot water, 300° F. maximum*

**No. 4 Cranite Discs** - laminated, consisting of a synthetic base with spirally wound fibre asbestos and other ingredients. They are suitably cured to provide a hard disc for high temperature, yet they seat with minimum effort.

*For 300 pounds steam, 450° F. maximum*
**600 pounds hot water, 420° F. maximum*

**The No. 1 and No. 4 Discs are suitable for hot water under 200° F., only when used in globe or angle valves; however, when such valves are operated frequently or must seat easily, and the temperature does not exceed 200° F., the No. 6 Discs are recommended.*

**No. 6 Discs** - made of a specially formulated composition consisting of a synthetic base, with other ingredients. They are soft enough to make a tight seat on air or gas, yet sufficiently stiff and resistant to withstand hot water, and the wear and tear of repeated operation.

*For 300 pounds hot water, 200° F. maximum*
*600 pounds cold water*
*600 pounds air, gas, oil or gasoline, 150° F. maximum. (Also for propane and butane when used in Underwriters' approved valves.)*

**No. 10 and 12 Discs** - made from homogeneous compounds with synthetic bases; they are not interchangeable with No. 1, No. 4, and No. 6 Discs as they are slightly smaller in size.

*No. 10, 100 pounds steam, 338° F. maximum*
*No. 12, 150 pounds water, 200° F. maximum, and domestic gas service.*

**COMPOSITION DISC PRICES, PER 100 PIECES**

| Number Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Cranite | $39.90 | $39.90 | $40.36 | $41.04 | $50.16 | $ 52.44 | $ 71.82 | $ 90.06 | $128.82 | $168.72 | $408.12 |
| 4 Cranite | 114.00 | 114.00 | 129.96 | 129.96 | 148.20 | 186.96 | 271.32 | 376.20 | 579.12 | 761.52 | 1073.88 |
| 6 | 39.90 | 39.90 | 40.36 | 41.04 | 50.16 | 52.44 | 71.82 | 90.06 | 128.82 | 168.72 | 408.12 |
| 10 | 15.96 | 15.96 | 18.24 | 18.24 | 23.94 | 30.78 | 43.32 | 55.86 | 86.64 | - | - |
| 12 | 15.96 | 15.96 | 18.24 | 18.24 | 23.94 | 30.78 | 43.32 | 55.86 | 86.64 | - | - |

**ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.**



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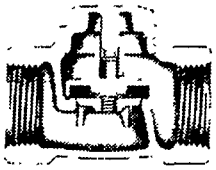
Printed in U. S. A.

## 100-POUND BRASS LIFT CHECK VALVES

100 POUNDS STEAM - 150 POUNDS WATER
DOMESTIC GAS SERVICE
*With Composition Disc*

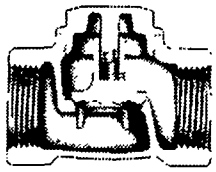


No. 1246
Cross Section

No. 1246
Horizontal

100 POUNDS STEAM - 150 POUNDS WATER, OIL, OR GAS
*With Brass Disc*

No. 1256
Horizontal

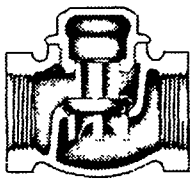


No. 1256
Cross Section

**No. 1246** valves are regularly furnished with a No. 12 Composition Disc, suitable for 150 pounds cold or hot water (maximum temperature, 200° F.) and for domestic gas service. When so ordered, the valves will be furnished with a No. 10 Disc suitable for 100 pounds saturated steam.

## 125-POUND BRASS LIFT CHECK VALVES

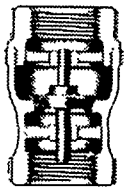
125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL OR GAS



No. 20
Cross Section

No. 20
Horizontal

No. 24
Vertical

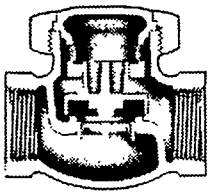


No. 24
Cross Section

*Note: The No. 24 Vertical Check Valves are designed to operate on upward flow only and should always be installed with the inlet end down.*

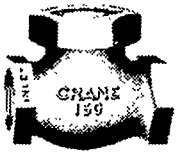
## 150-POUND BRASS LIFT CHECK VALVES

150 POUNDS STEAM - 300 POUNDS COLD WATER, OIL, OR GAS



No. 27
Cross Section

*With Composition Disc*



No. 27
Horizontal

*With Metal Ball Disc*

No. 31
Horizontal

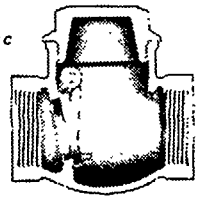
The **No. 27** valves are regularly furnished with a No. 1 Granite Disc suitable for steam or for hot water from 200 to 300° F. When ordered for hot water up to 200° F., cold water, air, gas, gasoline, or oil, they are furnished with a No. 6 Disc.

Where the **No. 31** check valves in sizes smaller than ½-inch are required, the No. 20 Horizontal Lift Check Valves are recommended; they have a ball disc.

## 125-POUND BRASS SWING CHECK VALVES

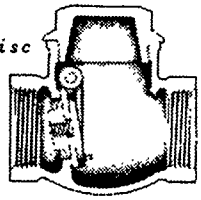
125 POUNDS STEAM - 200 POUNDS COLD WATER

No. 34
*With Brass Disc*



No. 34½
*With Leather Disc*

*Recommended for cold water only.*

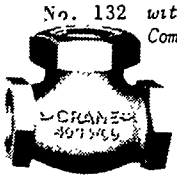


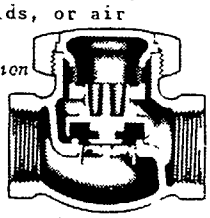
On **No. 34** and **34½** valves, sizes up to 2", the disc is integral with the hinge as shown in the cross sections; on 2½ and 3-inch brass disc valves, the disc swivels on the hinge.

## BRONZE LIFT CHECK VALVES

For Liquefied Petroleum Gases
400 POUNDS 150° F. LP-gases, light oils, volatile fluids, or air

No. 132 *with Composition Disc*





**No. 132** valves have been approved by the Underwriters' Laboratories, Inc. for handling of LP-gases at pressures up to 250 pounds.

PRICE, EACH

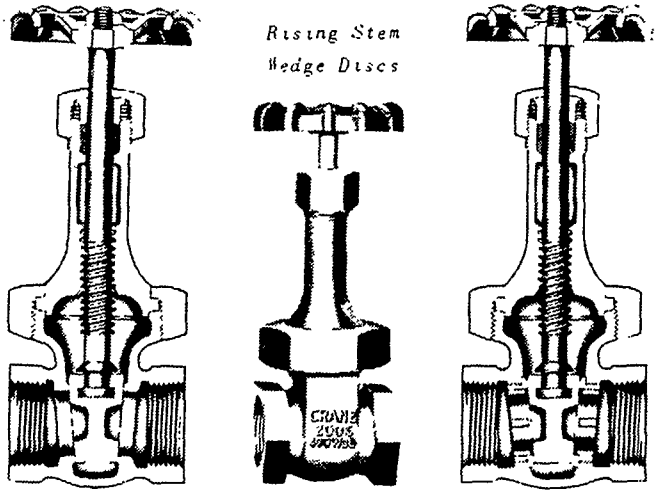
| Number Size, Inches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | $ 4.54 | $ 4.54 | $ 4.96 | $ 6.92 | $ 9.28 | $12.10 | $15.56 | $20.08 | $29.80 | $49.68 | $73.44 |
| 24 | - | 5.62 | 6.04 | 8.42 | 10.16 | 13.40 | 16.20 | 22.24 | 32.84 | 51.84 | 77.76 |
| 27 | - | 6.48 | 7.34 | 8.86 | 12.32 | 17.28 | 24.84 | 31.76 | 47.52 | 90.72 | 129.60 |
| 31 | - | - | - | 9.72 | 13.40 | 18.58 | 28.08 | - | - | - | - |
| 34 | - | - | 8.20 | 9.28 | 10.58 | 14.04 | 17.28 | 20.96 | 31.76 | 51.84 | 77.76 |
| 34½ | - | - | 10.80 | 12.10 | 14.04 | 18.36 | 22.46 | 27.22 | 38.88 | - | - |
| 1246 | 4.36 | 4.36 | 4.58 | 5.82 | 7.70 | 10.20 | 12.68 | 17.48 | 26.00 | - | - |
| 1256 | - | - | 4.26 | 5.40 | 7.08 | 9.36 | 11.86 | 15.60 | 22.88 | - | - |
| 132 | - | 7.12 | 8.10 | 9.72 | 13.50 | 19.00 | 27.22 | 34.56 | 51.84 | - | - |

*Prices are subject to change without notice.*

## 200-POUND BRONZE GATE VALVES

200 POUNDS STEAM, 500°F. 400 POUNDS, NON-SHOCK COLD WATER, OIL, GAS, VOLATILE FLUIDS, OR AIR

*Rising Stem Wedge Discs*



No. 422 Cross Section Integral Seats — No. 422 or No. 423 — No. 423 Cross Section Renewable Seats

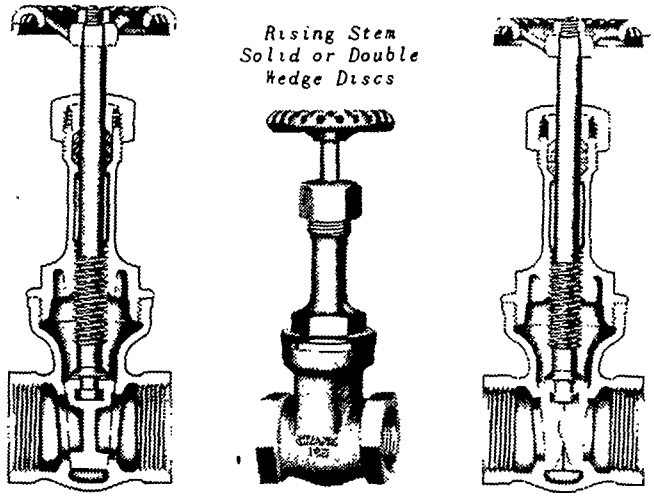
No. 422 valves have been approved by Underwriters' Laboratories, Inc. for efficient handling of all LP-gases at pressures up to 250 pounds.

No. 422 and 423 valves in sizes 2" and smaller have a union bonnet; sizes 2½" and 3" have a bolted bonnet.

## 125-POUND BRASS GATE VALVES

125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

*Rising Stem Solid or Double Wedge Discs*



No. 428 Cross Section Solid Disc — No. 428 or No. 430 — No. 430 Cross Section Double Disc

## 100-POUND BRASS GATE VALVES

100 pounds steam
150 pounds water, oil, or gas

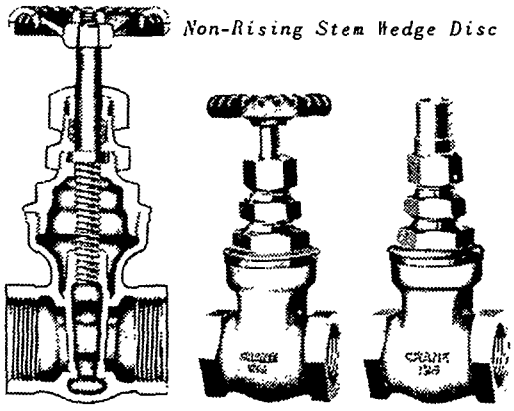
*Non-Rising Stem Wedge Disc*

No. 410

## 125-POUND BRASS GATE VALVES

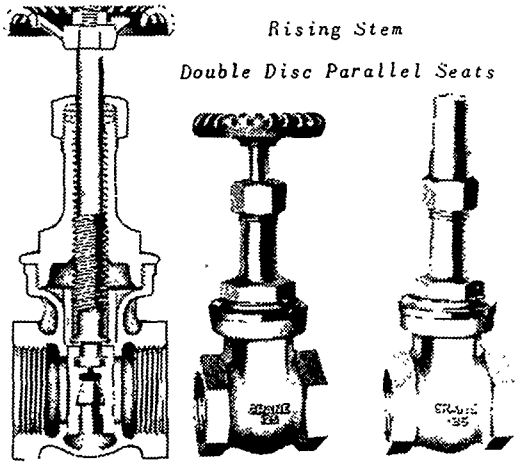
125 POUNDS STEAM - 200 POUNDS COLD WATER, OIL, OR GAS

*Non-Rising Stem Wedge Disc*



No. 438 Cross Section — No. 438 With Wheel — No. 438 Lockshield

*Rising Stem Double Disc Parallel Seats*



No. 440 Cross Section — No. 440 With Wheel — No. 440 Lockshield

### PRICE, EACH

| Number / Size, Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| 410 | $ 6.24 | $ 6.24 | $ 7.28 | $ 8.52 | $10.20 | $13.72 | $17.48 | $24.96 | - | - |
| 428 | 9.28 | 9.28 | 10.80 | 12.74 | 15.12 | 20.30 | 25.92 | 36.72 | $ 59.62 | $ 88.56 |
| 430 | 9.72 | 9.72 | 11.24 | 13.40 | 15.98 | 21.38 | 27.22 | 40.40 | 65.66 | 97.20 |
| 438 With Wheel | 9.28 | 9.28 | 10.80 | 12.74 | 15.12 | 20.30 | 25.92 | 36.72 | 59.62 | 88.56 |
| 438 With Lockshield | - | - | 13.40 | 15.98 | 19.00 | 25.28 | 32.40 | 45.36 | - | - |
| Add for key | - | - | 2.76 | 3.32 | 3.32 | 4.42 | 4.42 | 4.42 | - | - |
| 440 With Wheel | 8.42 | 8.42 | 9.72 | 11.44 | 13.60 | 18.36 | 23.32 | 33.04 | 53.56 | 79.92 |
| 440 With Lockshield | - | - | 12.32 | 14.68 | 17.28 | 23.32 | 29.80 | 41.68 | - | - |
| Add for key | - | - | 3.32 | 3.32 | 3.32 | 4.42 | 4.42 | 4.42 | - | - |
| 422 | 13.18 | 13.18 | 15.76 | 18.80 | 26.14 | 33.48 | 41.90 | 64.80 | 123.12 | 166.32 |
| 423 | 17.28 | 17.28 | 20.08 | 24.40 | 33.48 | 43.20 | 54.00 | 79.92 | 140.40 | 207.36 |

*Keys for Lockshield Valves, refer to Page 19-9.*

Prices are subject to change without notice.



LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U.S.A.

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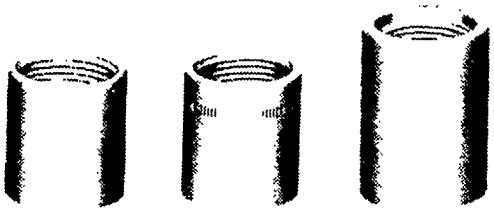
## STEEL PIPE COUPLINGS



STANDARD Right Hand — STANDARD Right & Left — EXTRA HEAVY RECESSED Right Hand

The Threads of Standard Right Hand Couplings in sizes 2-inch and smaller and 1/8-inch Extra Heavy Couplings are straight tapped. All other couplings listed here are taper tapped.

Right and Left Couplings are knurled on the end having the left hand thread.

PRICES, EACH

| Size Inches | Standard | | | | Extra Heavy | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Recessed | | Not Recessed | | | |
| | Right Hand | | Right & Left | | Right Hand | | Right Hand | | Right & Left | |
| | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. | Black | Galv. |
| 1/8 | $ .12 | $ .18 | - | - | $ .48 | $ .60 | $ .48 | $ .60 | - | - |
| 1/4 | .16 | .22 | $ .36 | $ .42 | .68 | .76 | .68 | .76 | - | - |
| 3/8 | .18 | .24 | .38 | .44 | .74 | .80 | .74 | .80 | - | - |
| 1/2 | .26 | .30 | .54 | .64 | .96 | 1.16 | .96 | 1.16 | $ .96 | $1.22 |
| 3/4 | .38 | .46 | .66 | .76 | 1.20 | 1.38 | 1.20 | 1.38 | 1.38 | 1.68 |
| 1 | .54 | .64 | .90 | 1.02 | 1.80 | 1.98 | 1.80 | 1.98 | 2.00 | 2.42 |
| 1¼ | .66 | .80 | 1.04 | 1.18 | 1.86 | 2.14 | 1.86 | 2.14 | 2.18 | 2.66 |
| 1½ | .88 | 1.04 | 1.24 | 1.40 | 2.02 | 2.32 | 2.02 | 2.32 | 2.44 | 2.88 |
| 2 | 1.32 | 1.64 | 2.08 | 2.38 | 3.42 | 4.22 | 3.42 | 4.22 | 3.78 | 4.56 |
| 2½ | 2.48 | 3.00 | - | - | 5.60 | 6.64 | 5.60 | 6.64 | - | - |
| 3 | 3.64 | 4.42 | - | - | 6.66 | 7.76 | 6.66 | 7.76 | - | - |
| 3½ | 5.36 | 6.62 | - | - | 8.88 | 10.50 | 8.88 | 10.50 | - | - |
| 4 | 6.68 | 7.82 | - | - | 10.06 | 11.76 | 10.06 | 11.76 | - | - |

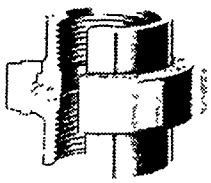
*For Malleable Iron Couplings, refer to Page 20-5.*

## 150-POUND MALLEABLE IRON UNIONS AND UNION FITTINGS

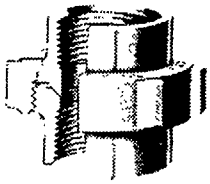
150 POUNDS STEAM - 300 POUNDS COLD WATER, OIL, GAS, OR GASOLINE

*Ground Joint - Air Tested*

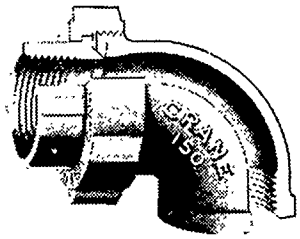
*Brass to Iron Seat or All-Iron Seat*



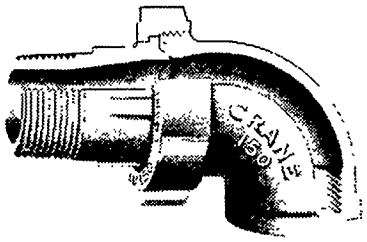
No. 1280 UNION
Female
*Brass to Iron Seat*



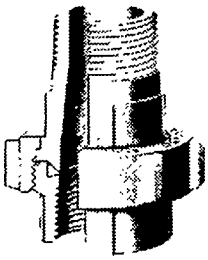
No. 1280½ UNION
Female
*All-Iron Seat*



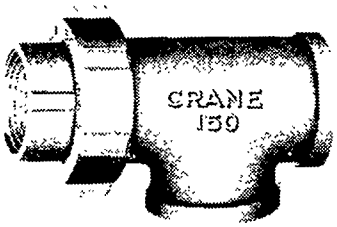

No. 1282 90° ELBOW
Female Union
*Brass to Iron Seat*



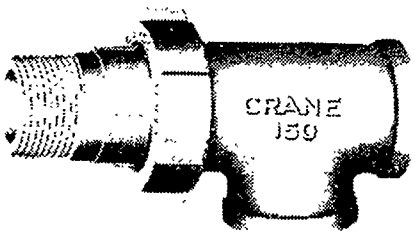

No. 1283 90° ELBOW
Male Union
*Brass to Iron Seat*



No. 1281 UNION
Male and Female
*Brass to Iron Seat*




No. 1284 TEE
Female Union on Run
*Brass to Iron Seat*




No. 1285 TEE
Male Union on Run
*Brass to Iron Seat*

PRICES, EACH

| Size, Inches | | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1280 | Black | $1.06 | $1.06 | $1.10 | $1.24 | $1.64 | $2.26 | $2.74 | $3.46 | $7.06 | $11.52 |
| | Galv. | 1.10 | 1.10 | 1.18 | 1.30 | 1.72 | 2.40 | 2.90 | 3.62 | 7.40 | 12.18 |
| No. 1280½ | Black | 1.30 | 1.30 | 1.36 | 1.54 | 2.00 | 2.78 | 3.36 | 4.24 | 8.68 | 14.16 |
| | Galv. | 1.36 | 1.36 | 1.46 | 1.62 | 2.14 | 2.96 | 3.58 | 4.48 | 9.16 | 15.08 |
| No. 1281 | Black | 1.20 | 1.20 | 1.40 | 1.88 | 2.36 | 3.26 | 3.88 | 5.18 | 9.32 | 14.64 |
| | Galv. | 1.26 | 1.26 | 1.48 | 1.98 | 2.48 | 3.44 | 4.08 | 5.46 | 9.66 | 15.34 |
| No. 1282 | Black | 1.86 | 1.86 | 2.18 | 2.62 | 3.20 | 4.48 | 5.88 | 8.06 | - | - |
| | Galv. | 2.30 | 2.30 | 2.68 | 3.26 | 4.04 | 5.56 | 7.36 | 10.24 | - | - |
| No. 1283 | Black | 2.04 | 2.04 | 2.56 | 3.46 | 4.16 | 5.82 | 7.42 | 10.36 | - | - |
| | Galv. | 2.56 | 2.56 | 3.20 | 4.36 | 5.24 | 7.36 | 9.28 | 12.80 | - | - |
| No. 1284 | Black | 2.44 | 2.44 | 2.82 | 3.32 | 3.84 | 5.24 | 6.66 | 8.96 | - | - |
| | Galv. | 3.08 | 3.08 | 3.52 | 4.16 | 4.80 | 6.52 | 8.32 | 11.20 | - | - |
| No. 1285 | Black | 2.62 | 2.62 | 3.20 | 4.16 | 4.80 | 6.60 | 8.20 | 11.26 | - | - |
| | Galv. | 3.26 | 3.26 | 3.96 | 5.18 | 6.02 | 8.32 | 10.24 | 14.08 | - | - |

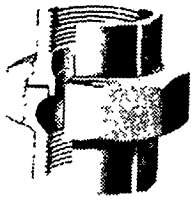
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

## 150-POUND MALLEABLE IRON UNIONS AND UNION ELBOWS

*Gasket Type, with Rubber Gasket*

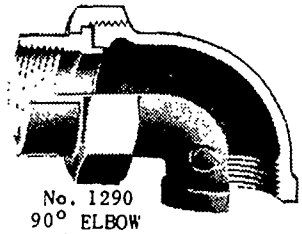
150 POUNDS STEAM - 300 POUNDS COLD WATER

150 POUNDS GAS or WATER (220°F.)

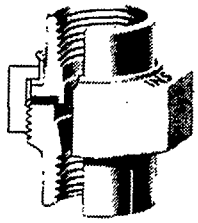


No. 1219
UNION
Female

No. 1218
TWO-THIRD UNION
Female
*(Gasket not furnished)*



No. 1290
90° ELBOW
Female Union



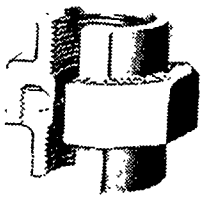
No. 1259
INSULATED UNION
Female

## MALLEABLE IRON RAILROAD UNIONS AND UNION ELBOWS

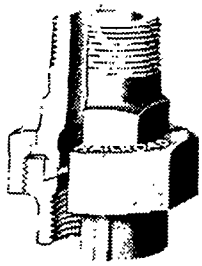
*Brass to Iron Seat - Ground Joint - Air Tested*

250 POUNDS STEAM
500 POUNDS COLD WATER, OIL, GAS, OR GASOLINE

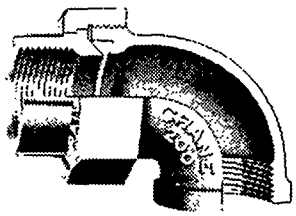
200 POUNDS STEAM
400 POUNDS COLD WATER, OIL, GAS, OR GASOLINE



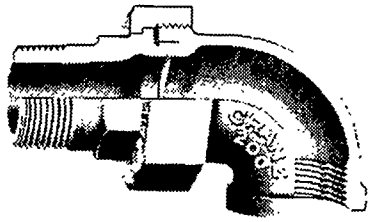
No. 519
UNION
Female



No. 519½
UNION
Male and Female



No. 590
90° ELBOW
Female Union



No. 592
90° ELBOW
Male Union

PRICES, EACH

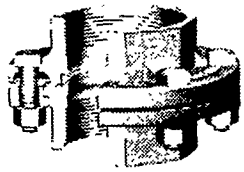
| Size, | Inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 519 | Black | $1.36 | $1.36 | $1.42 | $1.62 | $2.10 | $2.92 | $3.54 | $4.46 | $ 9.12 | $14.88 |
| | Galv. | 1.62 | 1.62 | 1.74 | 1.92 | 2.54 | 3.54 | 4.28 | 5.34 | 10.92 | 17.98 |
| No. 519½ | Black | 1.56 | 1.56 | 1.80 | 2.42 | 3.04 | 4.22 | 5.02 | 6.70 | 12.02 | 18.92 |
| | Galv. | 1.86 | 1.86 | 2.18 | 2.92 | 3.66 | 5.08 | 6.02 | 8.06 | 14.26 | 22.64 |
| No. 590 | Black | 2.04 | 2.04 | 2.38 | 2.88 | 3.50 | 4.90 | 6.44 | 8.82 | - | - |
| | Galv. | 2.52 | 2.52 | 2.94 | 3.58 | 4.42 | 6.10 | 8.06 | 11.20 | - | - |
| No. 592 | Black | 2.24 | 2.24 | 2.80 | 3.78 | 4.56 | 6.38 | 8.12 | 11.34 | - | - |
| | Galv. | 2.80 | 2.80 | 3.50 | 4.76 | 5.74 | 8.06 | 10.16 | 14.00 | - | - |
| No. 1218 | Black | .70 | .70 | .76 | .84 | 1.10 | 1.52 | 1.84 | 2.32 | 4.70 | 7.84 |
| | Galv. | .92 | .92 | .98 | 1.10 | 1.40 | 1.96 | 2.38 | 3.02 | 6.16 | 10.16 |
| No. 1219 | Black | 1.20 | 1.20 | 1.26 | 1.40 | 1.82 | 2.52 | 3.08 | 3.86 | 7.84 | 12.96 |
| | Galv. | 1.54 | 1.54 | 1.68 | 1.82 | 2.38 | 3.30 | 4.00 | 4.98 | 10.22 | 16.80 |
| No. 1259 | Black | - | - | - | 2.94 | 3.78 | 5.12 | 7.08 | 10.64 | - | - |
| | Galv. | - | - | - | 3.44 | 4.42 | 5.88 | 7.98 | 11.76 | - | - |
| No. 1290 | Black | 1.80 | 1.80 | 2.14 | 2.54 | 3.12 | 4.42 | 5.74 | 7.88 | 16.00 | 23.78 |
| | Galv. | 2.22 | 2.22 | 2.62 | 3.20 | 3.94 | 5.58 | 7.14 | 9.84 | 19.68 | 29.52 |

## 125-POUND CAST IRON FLANGE UNIONS

125-POUND
FLANGE UNION

125 POUNDS STEAM
175 POUNDS COLD WATER OR GAS
*Gasket Type,*
*with Rubber Gasket*

## THREE-PART MALLEABLE IRON FLANGE UNIONS



No. 775
FLANGE UNION

600 POUNDS COLD WATER, OIL, OR GAS
4-inch and smaller - 300 POUNDS STEAM
5-inch and larger - 200 POUNDS STEAM
*Brass to Iron Seat - Ground Joint*

PRICES, EACH

| Size, | Inches | 1/2 | 3/4 | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125-Pound | Black | $2.78 | $3.28 | $3.78 | $4.42 | $5.30 | $6.80 | $8.56 | $10.34 | $12.60 | $15.12 | $17.64 | $21.42 | $37.80 | - |
| | Galv. | 5.54 | 6.56 | 7.56 | 8.82 | 10.58 | 13.60 | 17.14 | 20.66 | 25.20 | 30.24 | 35.28 | 42.84 | 75.60 | - |
| No. 775 | Black | - | - | 12.88 | 14.50 | 16.84 | 21.06 | 26.92 | 35.10 | 46.80 | 53.82 | 93.60 | 149.76 | 219.96 | $432.90 |

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



*December 13, 1954*
*Superseding Mar. 22, 1954*

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

Printed in U S A

# COPPER WATER TUBE

These seamless copper tubes are especially designed for plumbing purposes, underground water services, etc., but are also suitable for copper coil water heaters, fuel oil lines, gas lines, certain industrial piping, etc. They are furnished in three weights: Types K and L, in hard and soft temper, and Type M, in hard temper only.

**Soft Copper Tube:** Soft copper tube can be bent without special bending equipment; it is recommended for service where bends must be made in the field, as on concealed replacement work.

**Hard Copper Tube:** Hard copper tube is intended primarily for use in straight lengths. It is not recommended for field bending except when proper bending equipment is used.

### Service Recommendations:

Copper water tube is used for many services, such as for steam, water, air, oil, gas, or similar fluids.

On steam installations, the successful application of copper tubes depends not only upon the weight of the tube but also upon the solder used when making joints. The solder must have a melting point high enough to remain unaffected by the temperature of the steam.

**Type K** is recommended for general plumbing and heating systems, and especially for underground use and where conditions are severe; the tube is also used for gas, oil and steam.

**Type L** is recommended for interior use in general plumbing and heating work.

**Type M** is for use with soldered fittings only, for waste, vent, interior drainage, and other non-pressure applications.

**Standard Stock Lengths**

Types K, L and M, Hard—20-foot straight lengths
Types K and L, Soft —20-foot straight lengths
Types K and L, Soft —1½" and smaller—60-foot coils

### Dimensions and Weights

| Nominal Size Inches | Actual Outside Diameter Inches | Type K Wall Thickness Inches | Type K Weight per Foot Pounds | Type L Wall Thickness Inches | Type L Weight per Foot Pounds | Type M Wall Thickness Inches | Type M Weight per Foot Pounds |
|---|---|---|---|---|---|---|---|
| ¼ | ⅜ | .035 | .145 | .030 | .126 | 025 | 107 |
| ⅜ | ½ | 049 | .269 | .035 | .198 | 025 | .145 |
| ½ | ⅝ | 049 | .344 | .040 | 285 | .028 | 204 |
| ⅝ | ¾ | 049 | .418 | .042 | .362 | .030 | 263 |
| ¾ | ⅞ | 065 | .641 | 045 | 455 | 032 | 328 |
| 1 | 1⅛ | .065 | .839 | 050 | .655 | 035 | 405 |
| 1¼ | 1⅜ | 065 | 1.04 | .055 | 884 | 042 | 682 |
| 1½ | 1⅝ | 072 | 1.36 | 060 | 1 14 | 049 | 940 |
| 2 | 2⅛ | .083 | 2.06 | .070 | 1 75 | 058 | 46 |
| 2½ | 2⅝ | .095 | 2.93 | .080 | 2.48 | .065 | 2 03 |
| 3 | 3⅛ | .109 | 4.00 | .090 | 3.33 | .072 | 2 68 |
| 3½ | 3⅝ | .120 | 5.12 | .100 | 4.29 | 083 | 3.58 |
| 4 | 4⅛ | .134 | 6.51 | .110 | 5.38 | .095 | 4 66 |
| 5 | 5⅛ | .160 | 9.67 | .125 | 7.61 | .109 | 6 56 |
| 6 | 6⅛ | .192 | 13.9 | .140 | 10.2 | .122 | 8 92 |
| 8 | 8⅛ | .271 | 25 [illegible] | .200 | 19.3 | .170 | 16.5 |
| 10 | 10⅛ | .338 | 40.[illegible] | .250 | 30.1 | .212 | 25.6 |
| 12 | 12⅛ | .405 | 57.8 | .280 | 40.4 | .254 | 36 7 |

### PRICES, PER 100 FEET

| Nominal Size Inches | Type K—Hard or Soft *Under 2,000 Feet or Pounds | Type K—Hard or Soft *2,000 to 10,000 Feet or Pounds | Type L—Hard or Soft *Under 2,000 Feet or Pounds | Type L—Hard or Soft *2,000 to 10,000 Feet or Pounds | Type M—Hard only *Under 2,000 Feet or Pounds | Type M—Hard only *2,000 to 10,000 Feet or Pounds |
|---|---|---|---|---|---|---|
| ¼ | $25.76 | $22.66 | $23.70 | $20.84 | $20.88 | $18.36 |
| ⅜ | 44.76 | 39.38 | 34.52 | 30.36 | 27.06 | 23.82 |
| ½ | 56.06 | 49.32 | 48.40 | 42.58 | 36.68 | 32.26 |
| ⅝ | 66.68 | 58.66 | 58.98 | 51.90 | 46.12 | 40.56 |
| ¾ | 95.62 | 84.12 | 71.02 | 62.46 | 54.10 | 47.58 |
| 1 | 119.34 | 104.98 | 97.70 | 85.94 | 73.48 | 64.64 |
| 1¼ | 147.94 | 130.14 | 131.88 | 116.00 | 101.74 | 89.50 |
| 1½ | 193.48 | 170.20 | 166.14 | 146.14 | 140.22 | 123.36 |
| 2 | 285.96 | 251.56 | 255.04 | 224.34 | 217.82 | 191.62 |
| 2½ | 396.60 | 348.88 | 361.40 | 317.92 | 302.86 | 266.42 |
| 3 | 541.46 | 476.32 | 462.28 | 406.66 | 390.56 | 343.58 |
| 3½ | 693.06 | 609.68 | 610.38 | 536.94 | 521.72 | 458.96 |
| 4 | 903.72 | 795.00 | 765.46 | 673.38 | 679.14 | 597.44 |
| 5 | 1409.28 | 1239.74 | 1135.38 | 998.80 | 1016.66 | 894.36 |
| 6 | 2121.92 | 1866.66 | 1592.34 | 1400.78 | 1392.52 | 1225.00 |
| 8 | 3953.82 | 3478.16 | 2946.26 | 2591.82 | 2575.88 | 2266.00 |
| 10 | 6704.14 | 5897.64 | 5007.30 | 4404.92 | 4258.70 | 3746.38 |
| 12 | 10614.74 | 9337.78 | 7419.28 | 6526.74 | 6739.80 | 5928.98 |

*The TOTAL NUMBER OF FEET or the TOTAL NUMBER OF POUNDS on one order (whichever is greater) will determine the basis for pricing.

*For Copper Solder-Joint Fittings, refer to Pages 20-23, 20-24 and 20-25.*

*For Brass Solder-Joint Valves, refer to Page 19-21.*

# RED BRASS AND COPPER PIPE

PRICES, PER 100 FEET (In 12-Foot Straight Lengths, Plain Ends)

| Pipe Size Inches | RED BRASS PIPE | | | | COPPER PIPE | | | |
|---|---|---|---|---|---|---|---|---|
| | Regular | | Extra Strong | | Regular | | Extra Strong | |
| | *Under 2,000 Feet or Pounds | *2,000 to 10,000 Feet or Pounds | *Under 2,000 Feet or Pounds | *2,000 to 10,000 Feet or Pounds | *Under 2,000 Feet or Pounds | *2,000 to 10,000 Feet or Pounds | *Under 2,000 Feet or Pounds | *2,000 to 10,000 Feet or Pounds |
| 1/8 | $43.96 | $38.68 | $58.44 | $51.40 | $43.88 | $38.60 | $58.72 | $51.66 |
| 1/4 | 71.96 | 63.32 | 98.38 | 86.54 | 72.34 | 63.64 | 98.94 | 87.04 |
| 3/8 | 95.62 | 84.12 | 126.44 | 111.24 | 96.68 | 85.04 | 127.78 | 112.40 |
| 1/2 | 134.50 | 118.32 | 192.84 | 169.64 | 136.96 | 120.48 | 193.24 | 170.00 |
| 3/4 | 176.48 | 155.24 | 232.08 | 204.16 | 181.58 | 159.74 | 238.86 | 210.12 |
| 1 | 233.16 | 205.12 | 322.24 | 283.48 | 240.70 | 211.74 | 331.94 | 292.00 |
| 1 1/4 | 334.04 | 293.84 | 430.56 | 378.76 | 345.74 | 304.14 | 444.68 | 391.20 |
| 1 1/2 | 397.52 | 349.70 | 537.10 | 472.48 | 411.28 | 361.80 | 554.12 | 487.46 |
| 2 | 523.30 | 460.34 | 720.16 | 633.52 | 542.40 | 477.14 | 745.46 | 655.78 |
| 2 1/2 | 760.80 | 669.28 | 1099.92 | 967.60 | 786.58 | 691.96 | 1137.48 | 1000.64 |
| 3 | 1087.24 | 956.44 | 1473.36 | 1296.12 | 1124.64 | 989.34 | 1516.64 | 1334.18 |
| 3 1/2 | 1422.56 | 1251.42 | 1790.88 | 1575.44 | 1465.22 | 1288.96 | 1850.82 | 1628.16 |
| 4 | 1663.74 | 1463.58 | 2213.96 | 1947.62 | 1706.06 | 1500.82 | 2287.98 | 2012.74 |
| 5 | 2385.08 | 2098.16 | 3502.14 | 3080.84 | 2444.16 | 2150.12 | 3575.72 | 3145.56 |
| 6 | 2868.14 | 2523.10 | 4860.74 | 4275.98 | 2926.94 | 2574.84 | 4963.76 | 4366.62 |
| 8 | 4664.48 | 4103.34 | 7306.22 | 6427.26 | 4767.64 | 4194.08 | 7468.32 | 6569.86 |
| 10 | 7424.32 | 6531.16 | 10035.96 | 8828.62 | 7658.60 | 6737.28 | 10344.10 | 9099.68 |
| 12 | 10112.96 | 8896.36 | — | — | 10418.10 | 9164.78 | — | — |

*The TOTAL NUMBER OF FEET or the TOTAL NUMBER OF POUNDS on one order (whichever is greater) will determine the basis for pricing.

## Standard Dimensions and Weights

| Pipe Size Inches | Outside Diameter Inches | REGULAR | | | EXTRA STRONG | | |
|---|---|---|---|---|---|---|---|
| | | Wall Thickness Inches | Weight, Pounds per Foot | | Wall Thickness Inches | Weight Pounds per Foot | |
| | | | Brass | Copper | | Brass | Copper |
| 1/8 | .405 | .062 | .253 | .259 | .100 | .363 | .371 |
| 1/4 | .540 | .082 | .447 | .457 | .123 | .611 | .625 |
| 3/8 | .675 | .090 | .627 | .641 | .127 | .829 | .847 |
| 1/2 | .840 | .107 | .934 | .955 | .149 | 1.23 | 1.25 |
| 3/4 | 1.050 | .114 | 1.27 | 1.30 | .157 | 1.67 | 1.71 |
| 1 | 1.315 | .126 | 1.78 | 1.82 | .182 | 2.46 | 2.51 |
| 1 1/4 | 1.660 | .146 | 2.63 | 2.69 | .194 | 3.39 | 3.46 |
| 1 1/2 | 1.900 | .150 | 3.13 | 3.20 | .203 | 4.10 | 4.19 |
| 2 | 2.375 | .156 | 4.12 | 4.22 | .221 | 5.67 | 5.80 |
| 2 1/2 | 2.875 | .187 | 5.99 | 6.12 | .280 | 8.66 | 8.85 |
| 3 | 3.500 | .219 | 8.56 | 8.75 | .304 | 11.6 | 11.8 |
| 3 1/2 | 4.000 | .250 | 11.2 | 11.4 | .321 | 14.1 | 14.4 |
| 4 | 4.500 | .250 | 12.7 | 12.9 | .341 | 16.9 | 17.3 |
| 5 | 5.562 | .250 | 15.8 | 16.2 | .375 | 23.2 | 23.7 |
| 6 | 6.625 | .250 | 19.0 | 19.4 | .437 | 32.2 | 32.9 |
| 8 | 8.625 | .312 | 30.9 | 31.6 | .500 | 48.4 | 49.5 |
| 10 | 10.750 | .365 | 45.2 | 46.2 | .500 | 61.1 | 62.4 |
| 12 | 12.750 | .375 | 55.3 | 56.5 | — | — | — |

Slight variations in the above weights must be expected.

### SPECIAL OPERATIONS

Polishing, nickel or chromium plating.
Tinning inside, outside or both surfaces.
Other special outside surface finishes.
Threading one or both ends.
Beveling ends to 45°.
Cutting to lengths shorter than 1 foot (no extra charge for cutting to lengths of 1 foot or over).

*For Prices of Brass or Copper Pipe with any of the special operations listed above, refer to your local Crane Branch or Crane Wholesaler.*

For Brass Nipples and Fittings, refer to Pages 20-18, 20-19, and 20-20.



*Prices are subject to change without notice.*

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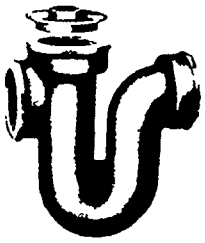
## CAST IRON BATH TRAPS

(Ohio Pattern No. 36 and No. 38)
*Painted or Galvanized*



21-395

1½-inch Tappings

21-396

PRICES, EACH—TRAP ONLY

| | | | |
|---|---|---|---|
| **21-395 or 21-396** | Price, Each | **$2.40** Painted | **$3.84** Galvanized |

For chr. pl. brass flanged cover with female thread ..... **Add $2.40**

## CAST IRON COMBINATION DRAINS WITH TRAP

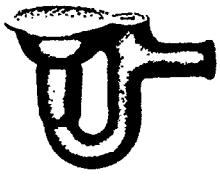
Spigot Outlet for Soil Pipe—Brass Cleanout Plug

*Painted All Iron*
*Iron Body, Polished Brass Top*
*Iron Body, Chromium Plated Brass Top*

21-400

21-402

21-403
With Floor Level Cleanout



21-404
With Floor Level Cleanout

DIMENSIONS, INCHES

| Size | | 2 | 3 | 4 |
|---|---|---|---|---|
| 21-400 | Water Seal | 3 | — | — |
| | Top Diameter | 7¾ | — | — |
| | Depth | 9 | — | — |
| | Length | 13½ | — | — |
| | Cleanout | 1½ | — | — |
| 21-402 | Water Seal | 4 | 4 | 4 |
| | Top Diameter | 8 | 10¼ | 12 |
| | Depth | 11 | 13 | 15 |
| | Length | 14½ | 18 | 21½ |
| | Cleanout | 1½ | 1½ | 1½ |
| 21-403 | Water Seal | 3 | — | — |
| | Top Diameter | 8 | — | — |
| | Depth | 10 | — | — |
| | Length | 14½ | — | — |
| | Cleanout | 2 | — | — |
| 21-404 | Water Seal | 4 | 4 | 4 |
| | Top Diameter | 8 | 10¼ | 12 |
| | Depth | 11 | 13 | 15 |
| | Length | 14½ | 18 | 21½ |
| | Cleanout | 2 | 2½ | 3½ |

PRICES, EACH

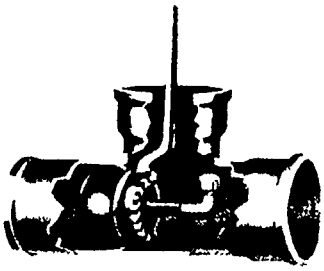
| Number | Size Inches | * Painted All Iron | ** Iron Body Brass Top | ** Iron Body Chr. Pl. Top |
|---|---|---|---|---|
| 21-400 | 2 | $ 6.00 | $23.68 | $30.72 |
| 21-402 | 2 | 9.60 | 25.60 | 32.64 |
| | 3 | 22.40 | 48.64 | 59.20 |
| | 4 | 32.00 | 67.20 | 81.28 |
| 21-403 | 2 | 8.40 | 26.56 | 33.60 |
| 21-404 | 2 | 10.60 | 28.16 | 35.20 |
| | 3 | 24.00 | 53.44 | 64.00 |
| | 4 | 35.20 | 75.20 | 89.28 |

For the above Combination Drains and Trap when ordered with Backwater Valve, *add: 2" $3.40, 3" $8.00, 4" $9.60
**add: 2" 5.44, 3" 8.00, 4" 9.60

For Backwater Valve when ordered separately—not attached to Floor Drains, Price each: 2" $5.44, 3" $8.00, 4" $9.60

## CLIMAX TESTING PLUGS

No. 9, Wing Nut

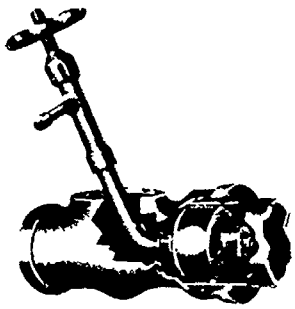


No. 11, Ratchet

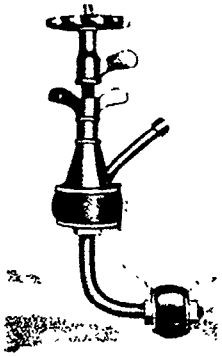
No. 17

No. 17—Double Straight
No. 18—Double Reducing

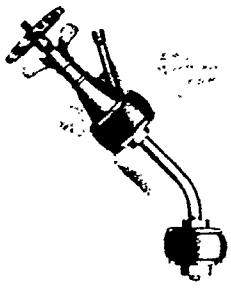
Rubbers on double straight plugs fit bore of soil pipe; on double reducing plugs, top rubber fits hub, lower rubber fits bore. Prices are based on pipe sizes.



No. 41, Tee
With Water Connection



No. 42
Sanitary Tee



No. 43
Y Branch

PRICES, EACH

| Size Inches | No. 9 | No. 11 | No. 17 | No. 18 | No. 41 | No. 42 | No. 43 | Extra Rubbers |
|---|---|---|---|---|---|---|---|---|
| 1 | $2.62 | $2.62 | — | — | — | — | — | $.30 |
| 1¼ | 2.62 | 2.62 | — | — | — | — | — | .30 |
| 1½ | 2.62 | 2.62 | — | — | — | — | — | .30 |
| 2 | 2.62 | 2.62 | $9.24 | $14.02 | $21.26 | $15.70 | $10.32 | .30 |
| 2½ | 3.38 | 3.38 | — | — | — | — | — | .64 |
| 3 | 3.38 | 3.38 | 14.02 | 17.56 | 23.88 | 20.32 | 14.64 | .64 |
| 4 | 4.62 | 4.62 | 17.56 | 23.40 | 27.72 | 26.80 | 20.32 | 1.02 |
| 5 | 5.86 | 5.86 | 23.40 | 29.10 | 29.56 | 33.72 | 24.80 | 1.36 |
| 6 | 6.78 | 6.78 | 29.10 | 45.90 | 48.20 | 40.50 | 31.72 | 1.88 |
| 8 | 12.02 | 12.02 | 45.90 | 58.52 | 60.84 | 63.14 | 48.98 | 3.38 |
| 10 | 20.02 | 20.02 | 58.52 | 72.54 | 77.30 | 89.16 | 63.14 | 6.00 |

Wrench only, for use with No. 11 — 1" thru 2½" Each $.78; 3" " .84; 4" thru 10" " .92

*Prices are subject to change without notice.*

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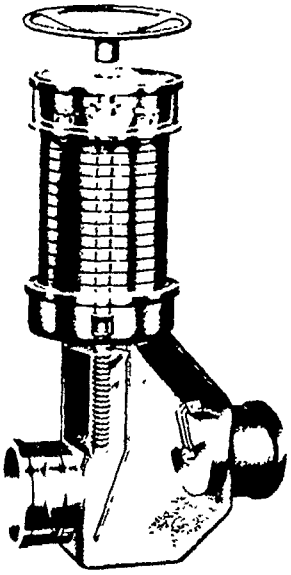
# BOOSEY DRAINAGE CONTROL VALVE

*With Automatic Self Closing Non-Rising Stem Valve and Manually Operated Gate Combined in One Unit*



109-1
Outside View

Valve body is cast iron with removable top, flush with floor.

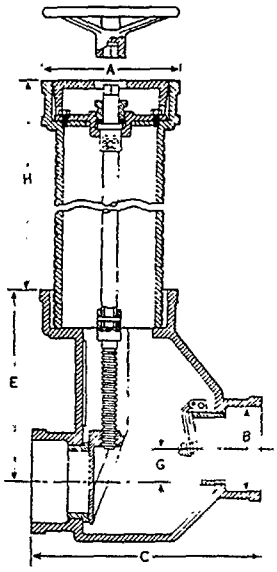
Spade-shaped gate valve will easily cut through sewage. It is operated by a bronze non-rising stem with removable wheel.

Bronze swing check valve operates inwardly with the flow and is a perfectly balanced, rotating disc type valve with iron pipe threaded connection which assures a water tight connection.

The offset in the cast iron body provides 2" lip clearance for the swing check valve and prevents floating particles from interfering with proper seating.

No pit is required regardless of the sewer depth. This is due to the adjustable extension which can be furnished to meet floor line measurements between 18" and 36".

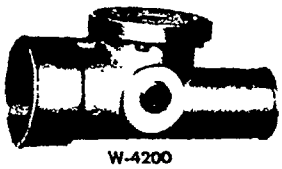
| Size Hub B | Measurement, Inches A | C | E | G | H | Price Each | Shpg. Wt. Pounds |
|---|---|---|---|---|---|---|---|
| 3 | 8 | 14 | 12 | 2 | 12 | $192.00 | 110 |
| 3 | 8 | 14 | 12 | 2 | 24 | 222.00 | 125 |
| 4 | 8 | 14 | 12 | 2 | 12 | 192.00 | 110 |
| 4 | 8 | 14 | 12 | 2 | 24 | 222.00 | 125 |
| 5 | 10½ | 16 | 14½ | 2 | 9 | 285.00 | 155 |
| 5 | 10½ | 16 | 14½ | 2 | 21 | 315.00 | 186 |
| 6 | 10½ | 16 | 14½ | 2 | 9 | 285.00 | 155 |
| 6 | 10½ | 16 | 14½ | 2 | 21 | 315.00 | 186 |




109-1
Measurements

## WADE BACK WATER VALVES

*Brass Check Valve*
*Revolving Disc*
*Hub and Spigot Ends*



W-4200

These valves are extra heavy cast iron with bolted cover and have 1½" tapped bosses, on either side, below the check valve to which downspouts or a hose connection can be attached. This permits flushing out the valve with water.

| Size Inches | Price Each | Shpg. Wt. Pounds |
|---|---|---|
| 2 | $36.00 | 30 |
| 3 | 45.00 | 35 |
| 4 | 63.00 | 55 |
| 6 | 108.00 | 90 |
| 8 | 180.00 | 125 |
| 10 | 432.00 | 240 |
| 12 | 540.00 | 325 |

## PALMER BACK WATER TRAPS

*Cast Iron Body—Non-Ferrous Metal Valve—Hub and Spigot Ends*

21-413
With Clutch Cover

21-414
With Bolted Cover

| Size Inches | 21-413 or 21-414 Price Each | Wt. Lbs | 21-415 Price Each | Wt. Lbs. |
|---|---|---|---|---|
| 2 | $17.34 | 11 | $28.16 | 11 |
| 3 | 20.94 | 17 | 31.68 | 17 |
| 4 | 21.60 | 26 | 35.20 | 26 |
| 5 | 38.80 | 35 | 63.36 | 35 |
| 6 | 43.74 | 46 | 70.40 | 46 |
| 8 | 116.80 | 75 | 140.80 | 75 |
| 10 | 224.00 | 125 | — | — |
| 12 | 304.00 | 180 | — | — |

21-415
With Hub for Pipe Extension

## PIPE EXTENSION

*With Trap Screw*
*For Trap With Hub*

21-416 (24" long)

| Trap Size | Spigot Size | Price Each |
|---|---|---|
| 4" | 6" | $38.40 |
| 6" | 8" | 57.60 |

## SEWER VALVE

21-417
Non-Ferrous Metal

| Size, Inches | Price, Each |
|---|---|
| 4 | $ 8.80 |
| 6 | 13.20 |

## STOLTZ BACK WATER VALVE AND DRAIN

*Manually Operated*
*Cast Iron Body—Brass Plug*
*To caulk into soil pipe hub*

| Size of Soil Pipe Hub Inches | Price Each | Size of Soil Pipe Hub Inches | Price Each |
|---|---|---|---|
| 2 | $4.92 | 5 | $19.36 |
| 3 | 6.68 | 6 | 25.34 |
| 4 | 8.80 | 8 | 58.08 |
| Price of Iron Key . . . each | | | $1.06 |

21-419



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Printed in U.S.A.

# HAYS BRASS CURB STOPS

## Inverted Plug—Round Way—Combination Tee and Cap

A.W.W.A. Thread Standard

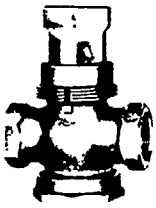
### Regular Pattern

### Minneapolis Pattern

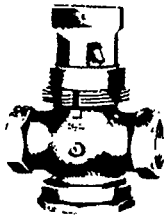
### IRON PIPE

**No. 5000, Stop**

**No. 5001, Stop and Drain**

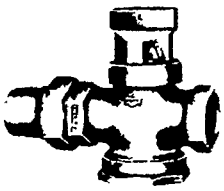


**No. 5140, Stop**

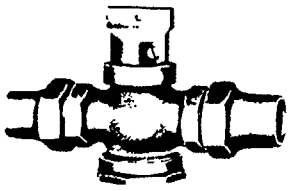


**No. 5141, Stop and Drain**

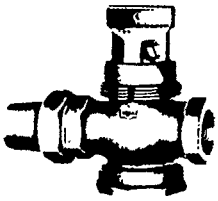
### COPPER SERVICE



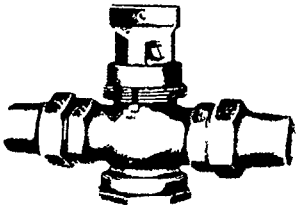
**No. 5040, Stop**
***No. 5041, Stop and Drain**
Copper Inlet
Female I.P. Outlet



**No. 5045, Stop**
***No. 5046, Stop and Drain**
Copper x Copper

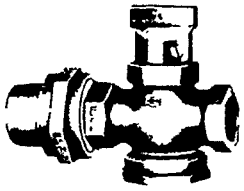


**No. 5150, Stop**
***No. 5151, Stop and Drain**
Copper Inlet
Female I.P. Outlet

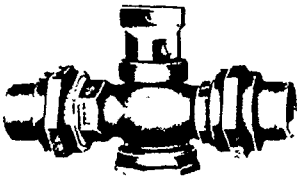


**No. 5155, Stop**
***No. 5156, Stop and Drain**
Copper x Copper

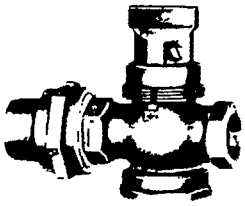
### LEAD FLANGE



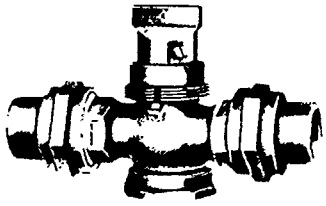
**No. 5090, Stop**
***No. 5091, Stop and Drain**
Lead Flange Inlet
Female I.P. Outlet



**No. 5095, Stop**
***No. 5096, Stop and Drain**
Lead Flange x Lead Flange



**No. 5160, Stop**
***No. 5161, Stop and Drain**
Lead Flange Inlet
Female I.P. Outlet



**No. 5165, Stop**
***No. 5166, Stop and Drain**
Lead Flange x Lead Flange

| Size of Stop | Inches | Prices, Each—F.O.B. Erie, Pa. | | | | | | | Approx. Shipping Weight, Lbs. Each | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 | ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 |
| Regular Pattern | No. 5000 | $5.98 | $6.60 | $7.76 | $11.72 | $16.24 | $24.98 | $42.38 | 1¾ | 2 | 2¾ | 4¼ | 7 | 10¼ | 17 |
| | No. 5001 | 6.18 | 6.80 | 8.08 | 12.16 | 16.78 | 25.50 | 43.02 | 1¾ | 2 | 2¾ | 4¼ | 7 | 10¼ | 17 |
| | No. 5040 | 6.66 | — | 8.68 | 13.08 | 20.12 | 30.14 | 48.10 | 2 | — | 3¼ | 5 | 8¾ | 13¼ | 22½ |
| | No. 5041 | 6.86 | — | 9.00 | 13.50 | 20.66 | 30.66 | 48.74 | 2 | — | 3¼ | 5 | 8¾ | 13¼ | 22½ |
| | No. 5045 | 8.08 | — | 10.58 | 15.86 | 24.68 | 36.06 | 61.50 | 2½ | — | 3¾ | 6 | 10½ | 16½ | 28 |
| | No. 5046 | 8.30 | — | 10.90 | 16.28 | 25.20 | 36.60 | 62.14 | 2½ | — | 3¾ | 6 | 10½ | 16½ | 28 |
| | No. 5090 | 7.46 | 8.70 | 10.44 | 15.68 | 22.12 | 32.44 | 53.42 | 2½ | 3 | 3¾ | 5¼ | 8 | 11¼ | 21½ |
| | No. 5091 | 7.68 | 8.92 | 10.76 | 16.12 | 22.66 | 32.98 | 54.06 | 2½ | 3 | 3¾ | 5¼ | 8 | 11¼ | 21½ |
| | No. 5095 | 9.06 | 10.66 | 12.70 | 19.02 | 26.38 | 39.08 | 63.02 | 3 | 3¾ | 4¾ | 7 | 13 | 20 | 33 |
| | No. 5096 | 9.26 | 10.88 | 13.02 | 19.46 | 26.92 | 39.62 | 63.66 | 3 | 3¾ | 4¾ | 7 | 13 | 20 | 33 |
| Minneapolis Pattern | No. 5140 | 6.66 | 7.36 | 8.56 | 12.76 | 18.08 | 26.90 | 45.58 | 2 | 2¼ | 3 | 4¾ | 7¼ | 10¾ | 17¾ |
| | No. 5141 | 6.86 | 7.58 | 8.88 | 13.08 | 18.62 | 27.44 | 46.22 | 2 | 2¼ | 3 | 4¾ | 7¼ | 10¾ | 17¾ |
| | No. 5150 | 7.38 | — | 9.40 | 13.98 | 21.42 | 33.58 | 51.94 | 2½ | — | 3½ | 5¾ | 10 | 15 | 25 |
| | No. 5151 | 7.60 | — | 9.72 | 14.40 | 21.96 | 34.12 | 52.58 | 2½ | — | 3½ | 5¾ | 10 | 15 | 25 |
| | No. 5155 | 8.80 | — | 11.28 | 16.76 | 25.92 | 39.66 | 61.78 | 2¾ | — | 4 | 6¾ | 11 | 17 | 28¾ |
| | No. 5156 | 9.00 | — | 11.60 | 17.18 | 26.46 | 40.18 | 62.42 | 2¾ | — | 4 | 6¾ | 11 | 17 | 28¾ |
| | No. 5160 | 8.26 | 9.50 | 11.28 | 16.78 | 23.86 | 34.44 | 56.74 | 3 | 3½ | 4 | 7 | 11½ | 18 | 30 |
| | No. 5161 | 8.48 | 9.72 | 11.60 | 17.20 | 24.40 | 34.96 | 57.38 | 3 | 3½ | 4 | 7 | 11½ | 18 | 30 |
| | No. 5165 | 10.68 | 11.44 | 13.52 | 20.12 | 28.50 | 41.06 | 66.34 | 3¼ | 3¾ | 5 | 8 | 13 | 20 | 33 |
| | No. 5166 | 10.90 | 11.66 | 13.84 | 20.54 | 29.04 | 41.60 | 66.98 | 3¼ | 3¾ | 5 | 8 | 13 | 20 | 33 |

Minneapolis Pattern Stops have the following size curb box threads (I.P.):

| Size of Stop Inches | Curb Box Thread Size Inches |
|---|---|
| ½ ..... | 1½ |
| ⅝ ..... | 1½ |
| ¾ ..... | 1½ |
| 1 ..... | 2 |
| 1¼ ..... | 2½ |
| 1½ ..... | 3 |
| 2 ..... | 3½ |

Lead Flange Stops are regularly furnished for Extra Strong Lead Pipe. available for Double Extra Strong Pipe at added cost, when specified.

**Not illustrated.*

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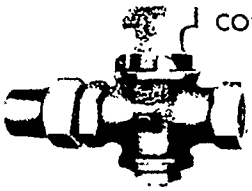
## HAYS BRASS CURB STOPS

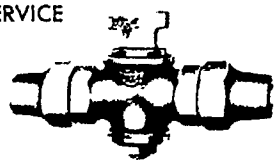
### Round Way—Solid Brass Tee Head

A.W.W.A. Thread Standard

COPPER SERVICE

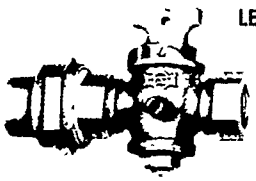


**No. 5051, Stop and Drain**
***No. 5050, Stop**
Copper x Female I.P.

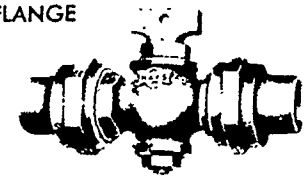


**No. 5055, Stop**
***No. 5056, Stop and Drain**
Copper x Copper

LEAD FLANGE



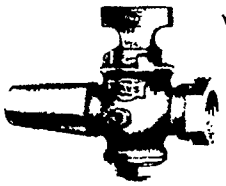
**No. 5101, Stop and Drain**
***No. 5100, Stop**
Lead Flange Inlet
Female I.P. Outlet



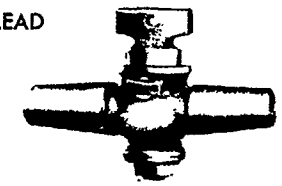
**No. 5105, Stop**
***No. 5106, Stop and Drain**
Lead Flange x Lead Flange

Regularly furnished for Extra Strong Lead Pipe; available for Double Extra Strong at added cost, when specified.

WIPED LEAD



**No. 5121, Stop and Drain**
***No. 5120, Stop**
Lead Pipe Inlet
Female I.P. Outlet



**No. 5125, Stop**
***No. 5126, Stop and Drain**
Lead Pipe x Lead Pipe

**Not Illustrated.*

## HAYS BRASS CORPORATION STOPS

COPPER SERVICE

A.W.W.A. Standard Copper Outlet
Complete with Straight Coupling Nuts

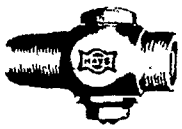
A.W.W.A. Standard Thread Inlet

Iron Pipe Thread Inlet

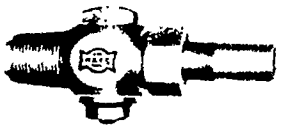
**No. 5200**—For Female Screw Plug—**No. 5204**
**No. 5202**—For Male Screw Plug—**No. 5206**

WIPED LEAD

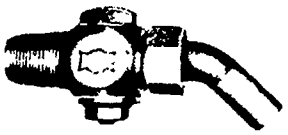
A.W.W.A. Standard Thread Inlet
Tapped for Male Screw Plug



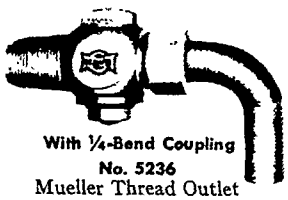
**Less Coupling**
**No. 5230**
Mueller Thread Outlet
**No. 5240**
†A.W.W.A. Standard
Increased Iron Pipe Outlet



**With Straight Coupling**
**No. 5232**
Mueller Thread Outlet
**No. 5242**
†A.W.W.A. Standard
Increased Iron Pipe Outlet



**With ⅛-Bend Coupling**
**No. 5234**
Mueller Thread Outlet
**No. 5244**
†A.W.W.A. Standard
Increased Iron Pipe Outlet



**With ¼-Bend Coupling**
**No. 5236**
Mueller Thread Outlet
**No. 5246**
†A.W.W.A. Standard
Increased Iron Pipe Outlet

*†The A.W.W.A. Standard increased iron pipe outlet on Wiped Lead Corporation Stops is one size larger than the listed pipe size. Iron pipe threads on the ⅝-inch size are ¾ inches.*

| Size of Stop | Inches | Prices, Each—F.O.B. Erie, Pa. ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 | Approximate Shipping Weight, Lbs. Each ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Round Way Curb Stops and Stops and Drains | No. 5050 | $4.50 | — | $6.46 | $10.12 | $15.30 | $21.04 | $35.16 | 1⅝ | — | 2½ | 4 | 6½ | 9½ | 16½ |
| | No. 5051 | 4.70 | — | 6.78 | 10.56 | 15.84 | 21.58 | 35.80 | 1⅝ | — | 2½ | 4 | 6½ | 9½ | 16½ |
| | No. 5055 | 5.72 | — | 8.14 | 12.60 | 19.26 | 25.96 | 42.30 | 1¾ | — | 3 | 5 | 9¾ | 13¼ | 22 |
| | No. 5056 | 5.90 | — | 8.46 | 13.04 | 19.80 | 26.50 | 42.94 | 1¾ | — | 3 | 5 | 9¾ | 13¼ | 22 |
| | No. 5100 | 5.42 | $6.24 | 7.44 | 11.68 | 17.62 | 25.70 | 42.84 | 1¾ | 2¼ | 2¾ | 4 | 7 | 10 | 17 |
| | No. 5101 | 5.74 | 6.46 | 7.76 | 12.12 | 18.14 | 26.24 | 43.48 | 1¾ | 2¼ | 2¾ | 4 | 7 | 10 | 17 |
| | No. 5105 | 6.16 | 7.92 | 9.28 | 14.42 | 18.66 | 29.04 | 47.20 | 2 | 3 | 3½ | 5 | 10 | 14 | 22 |
| | No. 5106 | 6.38 | 8.14 | 9.60 | 14.86 | 19.20 | 29.58 | 47.86 | 2 | 3 | 3½ | 5 | 10 | 14 | 22 |
| | No. 5120 | 4.40 | 5.00 | 6.10 | 9.68 | 13.56 | 21.50 | 37.16 | 1⅛ | 1⅝ | 1¾ | 2¾ | 4½ | 6½ | 10½ |
| | No. 5121 | 4.62 | 5.22 | 6.42 | 10.10 | 14.10 | 22.04 | 37.80 | 1⅛ | 1⅝ | 1¾ | 2¾ | 4½ | 6½ | 10½ |
| | No. 5125 | 4.40 | 5.00 | 6.10 | 9.68 | 13.12 | 21.50 | 37.16 | 1⅛ | 1⅝ | 1¾ | 2¾ | 4½ | 6½ | 10½ |
| | No. 5126 | 4.62 | 5.22 | 6.42 | 10.10 | 13.66 | 22.04 | 37.80 | 1⅛ | 1⅝ | 1¾ | 2¾ | 4½ | 6½ | 10½ |
| Corporation Stops | No. 5200 or 5202 | 3.74 | 4.92 | 5.02 | 7.82 | 13.88 | 21.50 | 35.84 | 1 | 1⅝ | 1¾ | 2¾ | 5¾ | 9½ | 16¾ |
| | No. 5204 or 5206 | 3.74 | — | 5.02 | 7.82 | 13.88 | 21.50 | 35.84 | 1 | — | 1¾ | 2¾ | 5¾ | 9½ | 16¾ |
| | No. 5230 | 3.02 | 3.56 | 4.14 | 6.16 | 11.72 | 18.94 | 31.56 | ¾ | 1 | 1¼ | 2 | 4½ | 7½ | 12½ |
| | No. 5232 | 4.16 | 5.06 | 5.68 | 8.48 | 14.56 | 23.28 | 38.56 | 1⅛ | 1⅜ | 2 | 2¾ | 5¼ | 9 | 14½ |
| | No. 5234 | 4.16 | 5.06 | 5.74 | 8.48 | 14.86 | 23.28 | 38.56 | 1⅛ | 1⅜ | 2 | 2¾ | 5¼ | 9 | 14½ |
| | No. 5236 | 4.38 | 5.06 | 6.00 | 8.48 | 15.42 | 23.28 | 38.56 | 1⅛ | 1⅜ | 2 | 2¾ | 5¼ | 9 | 14½ |
| | No. 5240 | 3.02 | 3.56 | 4.32 | 6.16 | 11.72 | 18.94 | 31.56 | ¾ | 1 | 1½ | 2¼ | 4½ | 7½ | 12½ |
| | No. 5242 | 4.16 | 5.06 | 5.84 | 8.48 | 14.56 | 23.28 | 38.56 | 1 | 1⅛ | 2 | 3 | 5½ | 9 | 14½ |
| | No. 5244 | 4.24 | 5.06 | 6.02 | 8.48 | 14.86 | 23.28 | 38.56 | 1 | 1⅛ | 2 | 3 | 5½ | 9 | 14½ |
| | No. 5246 | 4.52 | 5.36 | 6.30 | 8.48 | 15.20 | 23.28 | 38.56 | 1 | 1⅛ | 2 | 3 | 5½ | 9 | 14½ |



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Printed in U.S.A.

# HAYS BRASS CORPORATION STOPS

## LEAD FLANGE

With Coupling—Tapped for Male Plug
A.W.W.A. Standard Lead Flange Outlet

**No. 5270**
A.W.W.A. Standard Thread Inlet

**No. 5275**
Iron Pipe Thread Inlet

Regularly furnished for Extra Strong Lead Pipe; available for Double Extra Strong at added cost, when specified.

| Cat. No. | Sizes, Inches | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1/2 | *5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| | Prices, Each—F.O.B. Erie, Pa. | | | | | | |
| 5270 | $4.38 | $5.74 | $6.42 | $10.02 | $17.74 | $27.82 | $44.86 |
| 5275 | 4.38 | 5.74 | 6.42 | 10.02 | 17.74 | 27.82 | 44.86 |
| 5282 | 3.44 | 4.00 | 4.68 | 6.94 | 11.68 | 18.94 | 31.56 |
| | Approximate Shipping Weight, Pounds, Each | | | | | | |
| 5270 | 1 1/4 | 1 3/4 | 2 1/4 | 3 1/4 | 6 | 9 1/2 | 15 3/4 |
| 5275 | 1 1/4 | 1 3/4 | 2 1/4 | 3 1/4 | 6 | 9 1/2 | 15 3/4 |
| 5282 | 7/8 | 1 | 1 1/2 | 2 1/4 | 4 1/2 | 7 1/2 | 12 1/2 |

*5/8-inch No. 5282 Stops have 3/4-inch iron pipe threads.

## BORED FULL WAY

Used in Service Clamps With Drilling Machines

**No. 5282**
Male iron pipe thread on both ends. Hexagon on inlet end.

# HAYS BRASS COUPLINGS AND UNIONS

## Couplings for Corporation Stops

Complete with Gasket

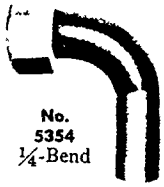
**No. 5310**—Straight —**No. 5340**
**No. 5312**—†1/8-Bend—**No. 5342**
**No. 5314**—†1/4-Bend—**No. 5344**

Mueller Thread Outlet to Copper — Lead Flange Outlet to Copper

Couplings at left used for all Corporation Stops having Mueller thread outlets; Couplings at right for all Corporation Stops having A.W.W.A. Thread Standard lead flange outlets—also, to adopt lead flange Curb Stops to copper service.
†Not Illustrated

**No. 5350**
Straight

**No. 5352**
1/8-Bend



**No. 5354**
1/4-Bend

For Mueller Thread Outlet to Wiped Lead.

Used for all Corporation Stops having Mueller thread outlets. Tail-piece is machined for wiped lead pipe.

## Copper Service Couplings and Unions

A.W.W.A. Thread Standard

**No. 5600 Coupling**
Copper x Female I.P.

**No. 5605 Coupling**
Copper x Male I.P.

**Unions** (not shown): The following copper service unions, listed in the price table, are available:

**No. 5610 Two-Part Union**—Copper to Copper
**No. 5615 Three-Part Union**—Copper to Copper

## Lead Service Couplings

A.W.W.A. Thread Standard

**No. 5640**
Lead Flange x Female I.P.

**No. 5642**
Lead Flange x Lead Flange

**No. 5644**
Lead Flange x Male I.P.

Regularly furnished for Extra Strong Lead Pipe; available for Double Extra Strong at added cost, when specified.

| Size | Inches | Prices—F.O.B. Erie, Pa. | | | | | | | | Approx. Shipping Weight, Lbs. Each | | | | | | | For Extra Gaskets, Specify |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/2 | 5/8 | ‡5/8x3/4 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | |
| Corporation Stop Couplings, Each | No. 5310 | $1.90 | — | $2.28 | $2.28 | $3.72 | $7.30 | $9.96 | $16.94 | 5/8 | — | 1 1/4 | 1 1/2 | 2 3/4 | 5 1/2 | 9 1/2 | No. 5316 Copper |
| | No. 5312 | 2.12 | — | 2.44 | 2.58 | 4.26 | 9.12 | 11.32 | 19.30 | 3/4 | — | 1 1/2 | 2 | 3 1/4 | 6 1/2 | 11 | |
| | No. 5314 | 2.32 | — | 2.82 | 2.82 | 4.48 | 9.54 | 12.36 | 20.28 | 1 | — | 2 | 2 3/4 | 4 | 7 1/2 | 12 | |
| | No. 5340 | 2.72 | — | 3.22 | 3.22 | 5.24 | 10.20 | 15.84 | 23.74 | 5/8 | — | 1 | 1 1/2 | 2 3/4 | 5 1/2 | 9 | No. 5346 Copper |
| | No. 5342 | 3.12 | — | 3.70 | 3.70 | 5.92 | 11.80 | 17.72 | 27.26 | 3/4 | — | 1 1/4 | 1 3/4 | 3 | 6 | 10 1/2 | |
| | No. 5344 | 3.90 | — | 3.70 | 3.70 | 6.52 | 12.40 | 17.72 | 27.26 | 1 | — | 1 3/4 | 2 1/2 | 3 3/4 | 7 | 11 1/2 | |
| | No. 5350 | 1.24 | $1.44 | — | 1.86 | 2.48 | 3.72 | 4.94 | 7.88 | 1/4 | 1/4 | — | 5/8 | 1 | 1 1/2 | 2 3/4 | No. 5356 Leather or 5358 Fibre |
| | No. 5352 | 1.24 | 1.44 | — | 1.86 | 2.48 | 3.72 | 4.94 | 7.88 | 1/4 | 3/8 | — | 3/4 | 1 | 1 1/2 | 2 3/4 | |
| | No. 5354 | 1.24 | 1.44 | — | 1.86 | 2.48 | 3.72 | 4.94 | 7.88 | 3/8 | 1/2 | — | 1 | 1 1/4 | 2 | 3 1/2 | |
| Copper Service Couplings, Each | No. 5600 | 1.46 | — | — | 1.82 | 2.84 | 5.86 | 7.96 | 13.62 | 1/2 | — | 3/4 | 1 3/8 | 2 1/4 | 4 | 6 1/2 | *Prices of gaskets per 100 are listed at bottom of table.* |
| | No. 5605 | 1.46 | — | — | 1.82 | 2.84 | 5.86 | 7.96 | 13.62 | 1/2 | — | 7/8 | 1 1/2 | 2 3/8 | 4 | 6 3/4 | |
| Copper Service Unions, Each | No. 5610 | 1.46 | — | — | 1.82 | 2.84 | 6.12 | 8.60 | 14.26 | 3/4 | — | 1 | 2 | 3 1/2 | 5 | 8 | |
| | No. 5615 | 2.22 | — | — | 2.66 | 4.18 | 9.24 | 13.02 | 22.26 | 1 | — | 1 1/2 | 2 3/4 | 4 1/2 | 7 | 12 | |
| Lead Service Couplings, Each | No. 5640 | 1.72 | 2.48 | — | 2.74 | 3.64 | 6.92 | 9.10 | 13.76 | 3/4 | 1 | — | 1 1/2 | 2 | 3 | 4 1/4 | |
| | No. 5642 | 3.40 | 4.56 | — | 5.38 | 7.10 | 13.66 | 16.82 | 25.92 | 1 | 1 1/2 | — | 2 1/4 | 3 | 4 | 5 3/4 | |
| | No. 5644 | 2.12 | 3.10 | — | 3.46 | 4.56 | 8.28 | 11.36 | 17.30 | 3/4 | 1 | — | 1 5/8 | 2 1/4 | 4 1/4 | 5 | |
| Extra Gaskets, Per 100 | No. 5316 | 10.00 | 10.00 | — | 10.00 | 10.00 | 26.00 | 31.00 | 94.00 | | | | | | | | |
| | No. 5346 | 22.00 | 22.00 | — | 22.00 | 22.00 | 68.00 | 68.00 | 68.00 | | | | | | | | |
| | No. 5356 | 4.00 | 5.50 | — | 6.00 | 6.00 | 25.00 | 31.00 | 44.00 | | | | | | | | |
| | No. 5358 | 2.00 | 2.00 | — | 3.00 | 4.50 | 6.00 | 8.50 | 15.00 | | | | | | | | |

‡5/8x3/4-inch Couplings connect 3/4" pipe to 5/8" Stops. Order according to Corporation Stop size.

*Prices are subject to change without notice.*

Printed in U.S.A. LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

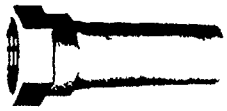
# HAYS BRASS SOLDERING NIPPLES

## Extra Heavy—Long Pattern

No. 5650
Male

PRICES—F. O. B. ERIE, PA.

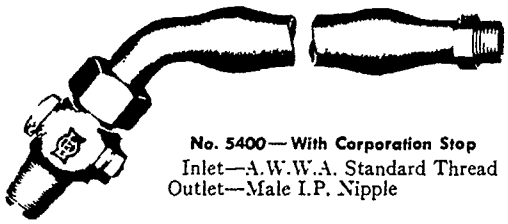
| Size | | Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|
| No. 5650, Male | Price | Each | $ .80 | $1.12 | $1.52 | $2.04 | $2.82 | $3.96 |
| | Approx. Shpg. Wt. | Lbs. | ¼ | ⅜ | ½ | ¾ | 1⅛ | 1¾ |
| No. 5652, Female | Price | Each | $ .80 | $1.12 | $1.52 | $2.04 | $2.82 | $3.96 |
| | Approx. Shpg. Wt. | Lbs. | ¼ | ⅜ | ⅝ | ⅞ | 1 | 1½ |



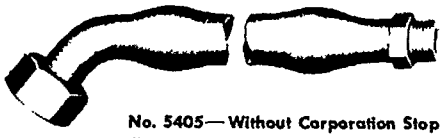
No. 5652
Female

# HAYS LEAD GOOSENECKS

## WIPED LEAD



**No. 5400—With Corporation Stop**
Inlet—A.W.W.A. Standard Thread
Outlet—Male I.P. Nipple



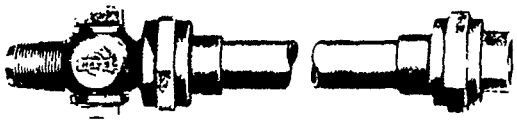
**No. 5405—Without Corporation Stop**
Inlet Coupling—Mueller Thread
Outlet—Male I.P. Nipple

Pipe Length and Weight Regularly Furnished

| Size | Lead Pipe | |
|---|---|---|
| | Length | Weight |
| Inches | Inches | |
| ½ | 18 | |
| ⅝ | 18 | Extra |
| ¾ | 18 | Strong |
| 1 | 18 | |
| 1¼ | 24 | Double |
| 1½ | 30 | Extra |
| 2 | 36 | Strong |

*For pipe threads and pipe weights other than listed, orders must specify.*

## FLANGED LEAD



**No. 5410—With Corporation Stop**
Inlet—A.W.W.A. Standard Thread
Outlet—Female I.P. Coupling

**No. 5415—Without Corporation Stop**
Inlet Coupling—Lead Flange Thread
Outlet—Female I.P. Coupling

PRICES OF GOOSENECKS

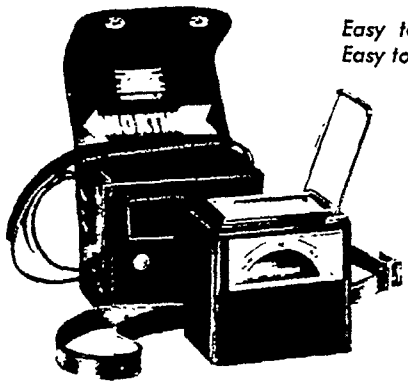
| Size | Inches | Prices, Each—F.O.B. Erie, Pa. ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 | Approx. Shpg. Wt., Lbs. Each ½ | ⅝ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wiped Lead | No. 5400 With Stop | $15.44 | $16.72 | $17.84 | $25.44 | $44.08 | $70.00 | $109.76 | 5 | 6¼ | 7½ | 10½ | 18½ | 29 | 44 |
| | No. 5405 Without Stop | 13.12 | 14.16 | 14.64 | 21.04 | 36.32 | 57.36 | 86.48 | 4½ | 5½ | 6½ | 8½ | 14 | 21½ | 31½ |
| Flanged Lead | No. 5410 With Stop | 13.20 | 14.00 | 15.60 | 21.36 | 39.90 | 63.36 | 94.16 | 5½ | 7¼ | 8½ | 12 | 20½ | 32 | 48½ |
| | No. 5415 Without Stop | 10.64 | 10.80 | 12.16 | 15.68 | 27.44 | 43.28 | 61.28 | 4¾ | 6¼ | 7½ | 10½ | 16 | 24½ | 36 |

# AQUA VALVE BOX LOCATOR

*Easy to Use*
*Easy to Read*

*For Quick Location of Concealed Boxes, Sewer Lids, and Iron Stakes*

*Highly Sensitive Needle*
*Built-In Compass Feature*



PRICE—F.O.B. CINCINNATI, OHIO

| Aqua Locator With Leather Case and Shoulder Strap | Approx. Shpg. Wt. | Price Complete |
|---|---|---|
| | 1 lb. | $59.00 |

Price includes name on case, if desired.

The Aqua Locator eliminates trial-and-error methods in determining location of concealed valve boxes, sewer lids, iron stakes, etc. One Locator will save valuable personnel time and costly searches. Results are assured through snow, ice, and any type of paving. Accuracy and simplified operation are unexcelled.

For general use, the encased instrument is suspended by the strap to a point just above the ground. The upper part of the strap is held by the user and the suspected area is covered by merely walking about. There is no need to squat or stoop. The top mirror dial is easily read from a standing position.

For difficult locations, such as under shrubbery, the chrome-nickel handle permits easy manipulation.

When the needle points to the largest reading on the dial, the user is alerted to the exact position of the valve box. The needle, made of 35% cobalt steel for extra sensitivity and long magnetic life, is guaranteed for ten years. Rubber mountings protect it against sudden jars.

Held face up, the Aqua becomes a dependable and accurate compass.

**Important:** The Aqua Locator is a precision instrument and must be factory adjusted for specific territories.



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Printed in U.S.A.

## BRASS FERRULES

### Standard or Extra Heavy

Wiping Ends Machined

STRAIGHT

**22-750** Standard
**22-760** Extra Heavy

REDUCING

**22-751** Standard
**22-761** Extra Heavy

BENDS

**⅛-Bends**
**22-752** Standard
**22-762** Extra Heavy

**¼-Bends**
**22-753** Standard
**22-763** Extra Heavy

PRICES

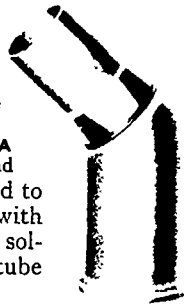
| Catalog No. | Size Inches | Length Inches | Approx. Shpg. Wt. Pounds | Prices Each |
|---|---|---|---|---|
| **Standard** | | | | |
| **22-750 Straight** | 2 | 3 | ½ | $ .82 |
| | | 3½ | ½ | .90 |
| | | 4 | ¾ | 1.10 |
| | 3 | 4 | 1¼ | 1.72 |
| | 4 | 3½ | 1¼ | 1.98 |
| | | 4 | 2 | 2.38 |
| | | 4½ | 1¾ | 2.40 |
| | | 4¾ | 2 | 2.92 |
| | | 5 | 2 | 3.32 |
| | | 6 | 3 | 4.74 |
| | 5 | 4¾ | 3 | 6.58 |
| | 6 | 4¾ | 3½ | 7.14 |
| **22-751 Reducing** | 2x1½ | 3½ | ¾ | .98 |
| | 2x1½ | 4 | ¾ | 1.10 |
| | 2x1¼ | 4 | ¾ | .98 |
| **22-752 ⅛-Bends** | 2 | — | 1¼ | 2.16 |
| | 3 | — | 2½ | 5.42 |
| | 4 | — | 3½ | 5.64 |
| **22-753 ¼-Bends** | 2 | — | 2 | 5.42 |
| | 4 | — | 6 | 10.90 |
| **Extra Heavy** | | | | |
| **22-760 Straight** | 2 | 4 | 1 | $1.38 |
| | 4 | 4½ | 2½ | 2.90 |
| | | 4⅝ | 2¼ | 3.02 |
| | | 5 | 2½ | 3.32 |
| **22-761 Reducing** | 2x1½ | 4 | 1 | 1.50 |
| | 2x1½ | 4½ | 1 | 1.54 |
| | 2x1¼ | 4 | 1 | 1.48 |
| | 4x3 | 4½ | 4 | 4.94 |
| **22-762 ⅛-Bends** | 2 | — | 1 | 2.18 |
| | 3 | — | 3 | 5.78 |
| | 4 | — | 4 | 6.22 |
| **22-763 ¼-Bends** | 2 | — | 2½ | 5.78 |
| | 4 | — | 5¾ | 11.52 |

*When ordering, specify the Catalog No. and the size. If more than one length is listed, include the length desired.*

## ATHOL UNION FERRULES AND UNIONS

### Iron Body with Brass Union or All-Brass

With Ground Joint



UNION FERRULES

For Connecting Soil Pipe with Lead Pipe

**No. 32** Straight — **No. 32A** ⅛-Bend

These union ferrules are used to connect 2-inch soil pipe with lead pipe. The lead pipe is soldered or wiped to the brass tube or tail-piece.

The ferrules have a ground joint and require no packing. They also serve as cleanouts.

UNIONS

For Connecting Iron Pipe with Lead Pipe

**No. 34**

The No. 34 Union is used to connect iron pipe with lead pipe. The lead pipe is soldered or wiped to the brass tube or tail-piece. The union has a ground joint; no packing is needed. It has female threads for iron pipe.

PRICES—F.O.B. ORANGE, MASS.

| Catalog No. | Sizes, Inches: Soil Pipe x Lead Pipe | Sizes, Inches: Iron Pipe x Lead Pipe | Approx. Shpg. Wt. Lbs. | Prices, Each: Iron Body with Brass Union | Prices, Each: All-Brass |
|---|---|---|---|---|---|
| **No. 32** | 2x1½ | — | 1½ | $3.58 | $5.00 |
| | 2x1¼ | — | 1½ | 2.94 | 4.60 |
| **No. 32A** | 2x1½ | — | 2 | 4.88 | 6.22 |
| | 2x1¼ | — | 2 | 4.14 | 5.64 |
| **No. 34** | — | 1¼x1¼ | ⅞ | 2.70 | 4.60 |
| | — | 1½x1½ | 2 | 3.28 | 5.00 |
| | — | 1½x1¼ | 1¼ | 3.42 | 5.00 |
| | — | 2x1½ | 2⅛ | 4.22 | 5.64 |
| | — | 2x1¼ | 1½ | 4.06 | 5.28 |

*When ordering, specify the Catalog No. and size. Iron Body with Brass Union is furnished, unless "All-Brass" is specified.*

## ALL-BRASS TRAP SCREW FERRULES

### With Flanged Plug

For Standard Soil Pipe
Small Opening

**22-754** With Raised Head Brass Plug

**22-755** With Countersunk Brass Plug

PRICES

| Size Inches | For Standard Soil Pipe: Approx. Shpg. Wt. Lbs. | Prices, Each: 22-754 With Raised Head Plug | Prices, Each: 22-755 With Countersunk Plug | For Extra Heavy Soil Pipe: Approx. Shpg. Wt. Lbs. | Prices, Each: 22-764 With Raised Head Plug | Prices, Each: 22-765 With Countersunk Plug |
|---|---|---|---|---|---|---|
| 2 | 1¼ | $3.20 | $3.42 | 2¼ | $4.34 | $4.56 |
| 3 | 1¾ | 4.52 | 4.78 | 3¼ | 6.26 | 6.52 |
| 4 | 3 | 5.34 | 5.66 | 4 | 7.80 | 8.12 |
| 5 | 5 | 14.28 | 14.86 | 6½ | 19.92 | 20.50 |
| 6 | 5½ | 18.72 | 19.52 | 8¾ | 25.48 | 26.28 |
| 8 | 15 | 41.44 | 42.72 | 15½ | 47.50 | 48.78 |
| 10 | 21 | 74.48 | 76.83 | 22 | 83.76 | 86.10 |
| 12 | 28 | 137.42 | 140.36 | 29 | 156.02 | 158.94 |

For Extra Heavy Soil Pipe
Full Opening

**22-764** With Raised Head Brass Plug

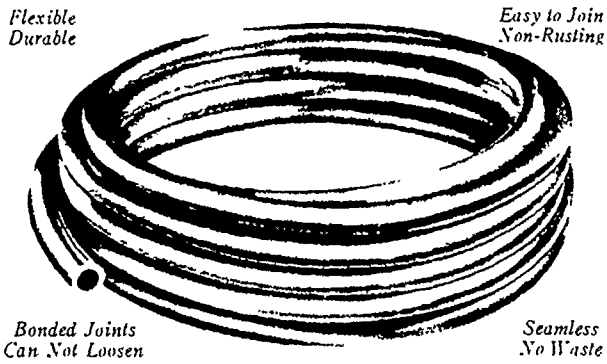
**22-765** With Countersunk Brass Plug

*Prices are subject to change without notice.*

Printed in U.S.A.

LIST PRICES are shown for the Dealer's convenience in determining his net cost. They are not intended to establish the retail price.

## LEAD PIPE




Carefully extruded from primary metal. The pipe is absolutely true to caliber with uniform metal thickness.

**Increased wall thickness:** The wall thickness and outside diameter of pipe in the Strong (A or S), Extra Strong (AA or XS), and Double Extra Strong (AAA or XXS) classifications have been increased so that all sizes in those classes safely carry constant cold water pressures, as follows:

Strong. . . . . 50 lbs. per sq. in.
Extra Strong. . . . . 75 lbs. per sq. in.
Double Extra Strong. . . . . 100 lbs. per sq. in.

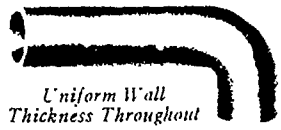
LEAD PIPE CALIBER LIST
LEAD INDUSTRIES ASSOCIATION STANDARD
(Table Includes Average Number of Feet in Coils of Pipe)

| Diameters Inches Inside (I.D.) | Outside (O.D.) | Weight per Foot Lbs.–Oz. | Avg. Feet per Coil | Classification East | Classification West | Diameters Inches Inside (I.D.) | Outside (O.D.) | Weight per Foot Lbs.–Oz. | Avg. Feet per Coil |
|---|---|---|---|---|---|---|---|---|---|
| | .520 | 0 – 8 | 220 | E | AQ | | 1.192 | 1 – 10 | 83 |
| | .549 | 0 – 10 | 176 | D | XL | | 1.232 | 2 – 0 | 67 |
| | .577 | 0 – 12 | 147 | C | L | | 1.284 | 2 – 8 | 54 |
| ⅜ | .631 | 1 – 0 | 110 | B | M | 1 | 1.356 | 3 – 4 | 55 |
| | .725 | 1 – 8 | 133 | A | S | | 1.428 | 4 – 0 | 46 |
| | .811 | 2 – 0 | 100 | AA | XS | | 1.492 | 4 – 12 | 39 |
| | .888 | 2 – 8 | 80 | AAA | XXS | | 1.596 | 6 – 0 | 30 |
| | .628 | 0 – 9 | 205 | E | AQ | | 1.442 | 2 – 0 | 63 |
| | .666 | 0 – 12 | 153 | D | XL | | 1.486 | 2 – 8 | 50 |
| | .712 | 1 – 0 | 115 | C | L | | 1.528 | 3 – 0 | 42 |
| ½ | .756 | 1 – 4 | 92 | B | M | 1¼ | 1.592 | 3 – 12 | 49 |
| | .798 | 1 – 8 | 133 | A | S | | 1.670 | 4 – 12 | 79 |
| | .876 | 2 – 0 | 100 | AA | XS | | 1.765 | 6 – 0 | 60 |
| | 1.012 | 3 – 0 | 67 | AAA | XXS | | 1.889 | 7 – 12 | 47 |
| | .765 | 0 – 12 | 153 | E | AQ | | 1.740 | 3 – 0 | 42 |
| | .803 | 1 – 0 | 115 | D | XL | | 1.776 | 3 – 8 | 36 |
| | .881 | 1 – 8 | 77 | C | L | | 1.830 | 4 – 4 | 29 |
| ⅝ | .953 | 2 – 0 | 57 | B | M | 1½ | 1.882 | 5 – 0 | 37 |
| | 1.019 | 2 – 8 | 80 | A | S | | 1.984 | 6 – 8 | 58 |
| | 1.082 | 3 – 0 | 67 | AA | XS | | 2.076 | 8 – 0 | 45 |
| | 1.137 | 3 – 8 | 57 | AAA | XXS | | 2.272 | 11 – 4 | 32 |
| | .906 | 1 – 0 | 100 | E | AQ | | — | — | |
| | .940 | 1 – 4 | 80 | D | XL | | 2.024 | 4 – 0 | |
| | 1.006 | 1 – 12 | 80 | C | L | | 2.086 | 5 – 0 | |
| ¾ | 1.068 | 2 – 4 | 62 | B | M | 1¾ | 2.146 | 6 – 0 | |
| | 1.156 | 3 – 0 | 65 | A | S | | 2.193 | 6 – 12 | |
| | 1.212 | 3 – 8 | 56 | AA | XS | | 2.404 | 10 – 8 | |
| | 1.336 | 4 – 12 | 41 | AAA | XXS | | 2.624 | 14 – 12 | |
| | | | | E | AQ | | 2.185 | 3 – 0 | * |
| | | | | D | XL | | 2.284 | 4 – 12 | * |
| | | | | C | L | | 2.354 | 6 – 0 | * |
| | | | | B | M | 2 | 2.410 | 7 – 0 | * |
| | | | | A | S | | 2.503 | 8 – 12 | 39* |
| | | | | AA | XS | | 2.751 | 13 – 12 | 25* |
| | | | | AAA | XXS | | 3.008 | 19 – 8 | 14* |
| | | | | — | — | 4 | 4.25 | 7 – 14 | * |
| | | | | — | — | | 4.50 | 16 – 6 | * |

*Ordering: Sizes 2 and 4" furnished in 10' boxed lengths; smaller sizes in coils or on reels, as specified. Include I.D. and O.D. sizes on orders.

## LEAD BENDS

Flexible and durable bends available in a variety of types, sizes, and weights. The bends are free of seams or internal obstructions.




**Types available:** Lead bends are available in Short Pattern or Long Pattern in sizes 1¼, 1½, 2, 3, and 4-inch sizes. They are furnished in Standard Weight, Medium Weight, or Extra Heavy Weight.

Short Pattern Bends and Long Pattern Bends are also available with extra long outlet ends measuring 12", 15", 18" or 20" center to end, as specified.

**Ordering:** Specify the Type of Bend, Size, and Weight Pattern. If Short or Long Pattern with extra long ends are desired, include the center to end dimension.

WEIGHTS AND DIMENSIONS

| Sizes | | | Inches | 1¼ | 1½ | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| Weight of Lead Per Running Foot | Standard Weight | | Lbs. | 1½ | 2¼ | 3¼ | 5 | 6 |
| | Medium Weight | | Lbs. | 2 | 3 | 4 | 6 | 7 |
| | Extra Heavy Weight | | Lbs. | 2½ | 3½ | 4½ | 6 | 8 |
| Center To End Dimensions | Short Bends | Inlet | Inches | 3½ | 4 | 3¾ | 4¼ | 5½ |
| | | Outlet | Inches | 6 | 7 | 7¾ | 8¼ | 10 |
| | Long Bends | Inlet | Inches | 6 | 7 | 7¾ | 8¼ | 10 |
| | | Outlet | Inches | 6 | 7 | 7¾ | 8¼ | 10 |

## LEAD DRUM TRAPS

*With Round or Flat Bottoms*
*Rough Brass or Chromium Plated Covers*

Triple metal thickness at the bottom provides maximum strength where needed.

**Ordering:** Specify the Catalog Number, Size, and Weight Pattern. Rough brass cover and round bottom are furnished unless otherwise ordered.

TYPES AVAILABLE AND DIMENSIONS

| Catalog Nos. of Drum Traps and Covers | | | Dimensions, Inches O.D. of Cap Face | Flange Overlaps Body | O.D. of Cap Threads |
|---|---|---|---|---|---|
| Flush Cover | No. 0 | Countersunk Hd. | 4⅛ | — | 3¾ |
| | No. 1 | Square Head | 4⅛ | — | |
| | No. 2 | Straight Vent | 4⅛ | — | I.D. of Ring Threads |
| | No. 3 | 90° Vent | 4⅛ | — | |
| | No. 4 | 45° Vent | 4⅛ | — | |
| Wide Cover | No. 4½ | Countersunk Hd. | 4½ | 3/16 | 3 11/16 |
| | No. 5 | Square Head | 4½ | 3/16 | |
| | No. 5½ | Sq. Hd. (Spec.) | 5 | 7/16 | No. of threads to inch 16 |
| | No. 6 | Straight Vent | 4½ | 3/16 | |
| | No. 7 | 90° Vent | 4½ | 3/16 | |
| | No. 8 | 45° Vent | 4½ | 3/16 | |

Drum Traps without Covers are also available.

SIZES AND WEIGHT PATTERNS AVAILABLE

| Standard Weight | | | | Medium Weight | | Extra Heavy Weight |
|---|---|---|---|---|---|---|
| 4x8" x9 x10 | 4x11" x12 x14 | 5x10" x11 x12 | 6x10" x11 x12 | 4x8" x9 x10 | 4x11" x12 x14 | Same as Standard |

*For prices of lead products, refer to your local Crane Branch or Crane Wholesaler.*

*Prices are subject to change without notice.*



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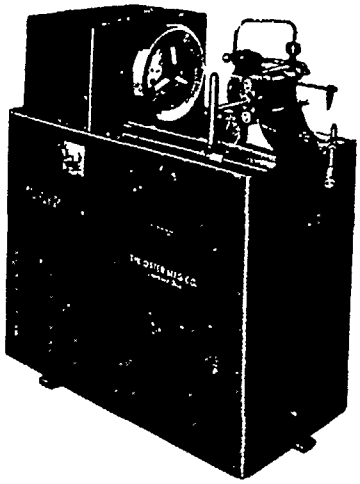
Printed in U.S.A.

## Oster Power Pipe Threading Machines

### No. 782 "Rapiduction Jr."

Standard Range ¼ to 2" Pipe
Extra Range ⅛" Pipe — Bolt Range ¼ to 1½"



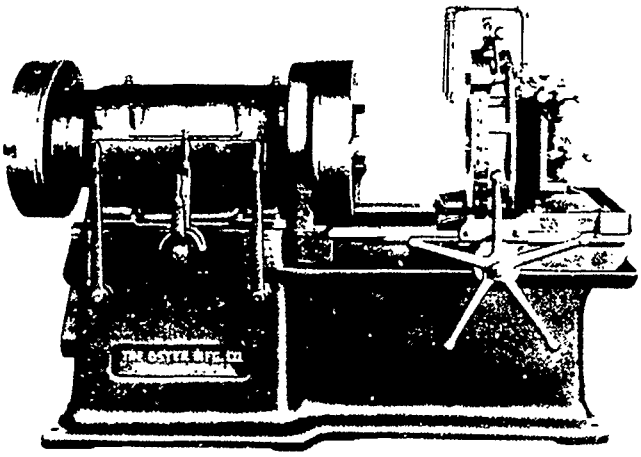
A high quality, durable, versatile, production machine for faster threading with minimum handling. Has two-speed motor, worm gear drive with ball bearing mounted spindle. "Auto-Grip" wrenchless front chuck, quick-opening adjustable die-heads, and completely modern design for convenient right hand operation.

**Equipment furnished with No. 782:** Two stationary die-heads, Type N for pipe up to ¾" and Type W for 1 to 2" pipe; three sets of high speed dies to cover standard pipe range; detachable reamer; roller type cut off device with length gauge and self-centering guide; "Auto-Grip" wrenchless front chuck; universal centering rear chuck; 2-speed (2 H.P., 900-1800 rpm) single voltage, 3 phase, 60 cycle motor; magnetic non-reversing motor control with start-stop switch and speed selector switch; thread length gauge; internal gear type oil pump, driven by the motor, and 10 gallons of Oster oil.

**No. 782** (shpg. wt. 1200 lbs.).....*Price, Each **$2650.00**

### No. 8 8" "Rapiduction"

Standard Range 2½ to 8" Pipe



A high production, quality machine, ideally suited for service where large quantities of the larger sizes of pipe must be threaded and cut. A wide selection of spindle speeds permits each size to be threaded at maximum speed for profitable production.

**Equipment furnished with No. 8:** One die-head, adjustable to handle all sizes; one set of high speed steel dies to cover entire range of 2½ to 8" pipe; one set of die holders for entire range; blade type cut off device with V-block steady rest; reaming and chamfering tool; three-jaw universal gripping front chuck; three flange jaw rear chuck, universal, gripping; 3 phase, 60 cycle, 7½ hp motor, 1200 rpm (spindle speeds 10, 14, 19, 25, 36, and 51 rpm); magnetic reversing motor control; thread length gauge; internal gear type oil pump, automatic reversing; and 20 gallons of Oster oil.

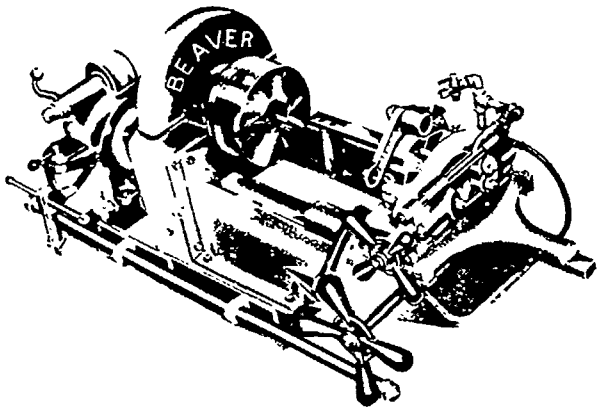
**No. 8** (shpg. wt. 8100 lbs.).....*Price, Each **$12500.00**

***All Prices are F.O.B. Cleveland, Ohio**

**Extra parts, motors for other voltages, and other types and sizes of machines are available; prices on application.**

## Beaver Model A Heavy-Duty Portable Pipe and Bolt Machine

A heavy-duty portable pipe and bolt machine having many convenient and unusually high quality features. Cuts, threads, and reams pipe ⅛ to 2"—range can be increased to cover 2½ to 12" pipe through the use of geared tools and a drive shaft; threads ¼ to 2" bolts and rods. Choice of 110 or 220 universal reversible motor for AC, 25 to 60 cycle, or DC current; specify type desired.




**†Prices are F.O.B. Warren, Ohio**

**Model A-1,** complete with motor, reversing controller-type switch, reversible oil pump, ⅛ to 2" hinged cone-type reamer, ball-bearing self-centering wheel and roller cutoff suitable for pipe or bolts, one-gallon Beaver threading oil, and 3 quick-opening adjustable Duo-type dieheads with dies (each threads two sizes) to thread ½ to 2" pipe; wt. 500#.

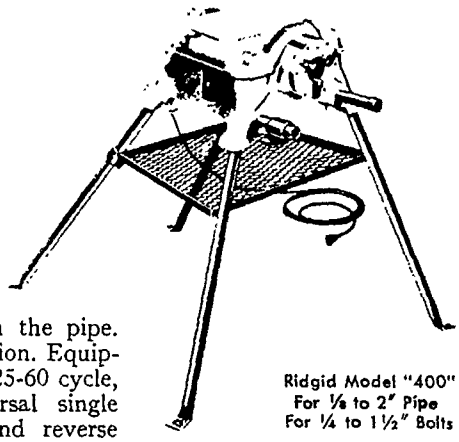
**A-1,** with wrench type chuck.....Price, Each **$1220.00†**
**A-1,** with power grip wrenchless chuck.....Price, Each **1240.00†**

**Model A-11,** same as above except with 6 quick-opening adjustable Mono-type dieheads with dies (one diehead with dies for each size) to thread ½ to 2" pipe; shpg. wt. 530#.

**A-11,** with wrench type chuck.....Price, Each **$1400.00†**
**A-11,** with power grip wrenchless chuck.....Price, Each **1420.00†**

| | | |
|---|---|---|
| Automatic knife-cutoff (for pipe only)..... | Each | 30.00 |
| Bolt Dieheads, for ¼ to 1 or 1⅛ to 2" dies; wt. 10#... | Each | 55.00 |
| Bolt Dies, RH, any std. size ¼ to 2", USS thrd..... | Set | 24.00 |
| Bolt Dies, RH, any std. size ¼ to 2", SAE thrd..... | Set | 27.00 |
| Portable Stand, enclosed, steel rimmed wheels; wt. 105# | Each | 80.00 |
| Drive Shaft, heavy duty, for geared tools; wt. 38#... | Each | 64.00 |
| Nipple Chuck, wedge-type, ½ to 2" pipe; wt. 25#... | Each | 60.50 |

## Ridgid Model "400" Portable Power Drive

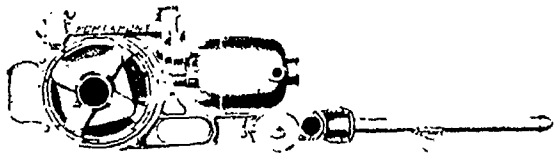


Ridgid Model "400"
For ⅛ to 2" Pipe
For ¼ to 1½" Bolts

Turns the pipe for your hand pipe tools. Easily portable, weighing only slightly over 100 pounds. Case is of rugged alloy. Has 3-jaw lathe-type chuck in front with self-centering work-holder in rear which turns with the pipe. Sealed-in lubrication. Equipped with ½ hp, 25-60 cycle, 110 volt, Universal single phase forward and reverse motor. Capacity ⅛ to 2" pipe. When used with Ridgid Universal Drive Shaft, it will turn pipe for geared die stocks and cutters, increasing the capacity to 12".

| | Price Each |
|---|---|
| **Ridgid No. 400** (Lathe-type chuck) less legs, tray and fittings (shpg. wt. 152 lbs.) | **$480.00** |
| **Ridgid No. 400A** (Speed-grip chuck) less legs, tray and fittings (shpg. wt. 152 lbs.) | **500.00** |
| Set of 4 legs (shpg. wt. 21½ lbs.) | **15.40** |
| Tool tray with 4 fittings (12 lbs.) | **18.00** |
| Tool tray with fittings and 4 legs (shpg. wt. 31 lbs.) | **28.90** |
| **Kit A**—Front legs with handles, rear legs with wheels, and tool tray with fittings (shpg. wt. 59 lbs.) | **70.40** |
| **Kit B**—Rear legs with wheels, and front handles (shpg. wt. 42 lbs.) | **55.00** |

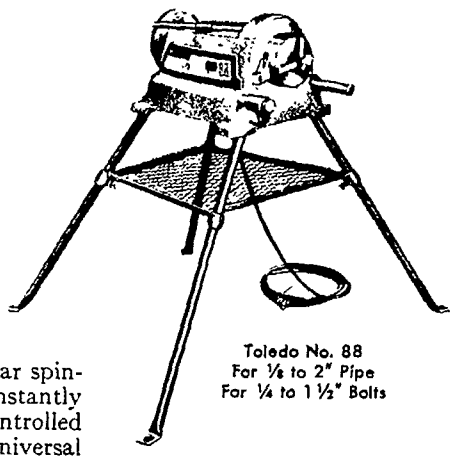
## Port-A-Pony Power Pipe Threader



A precision-built portable power device designed for use with Ridgid, Oster, Nye, Toledo, and Beaver die stocks. Made of magnesium alloy and weighing only 26 pounds, it can be easily carried and operated by one man. With proper adaptors and die stocks, it threads ¼" to 4" pipe. Has worm driven ring gear which easily turns high-speed cutting dies on stationary pipe. It can be used in any position in a working area of 12" and within 5" of walls. One-half horse power; the motor is reversible, 110 volts, A.C. single phase, or D.C.

| | Price Each |
|---|---|
| **No. 200 Port-A-Pony Assembly,** including casing, motor, gears, control and gear switches, and 8 ft. of cord | **$339.00** |
| **Adaptors for Die Stocks** | |
| **No. 200-1** for Ridgid No. 65 RC and 65RP, 1 to 2" pipe | **$29.00** |
| **No. 200-2** for Nye Nos. 1, 1A, & 1R and Toledo Nos. 1 and 1A, 1 to 2" pipe | **20.00** |
| **No. 200-3** for Oster No. 112R, ¼ to 1¼" pipe | **20.00** |
| **No. 200-4** for Beaver No. 7, 1 to 2" pipe | **20.00** |
| **No. 200-5** for Ridgid Nos. 1 and 1C, 1 to 2" pipe | **20.00** |
| **No. 200-6** for Gear Driven Stock, 2½ to 4" pipe | **29.00** |

## Toledo No. 88 Portable Power Drive



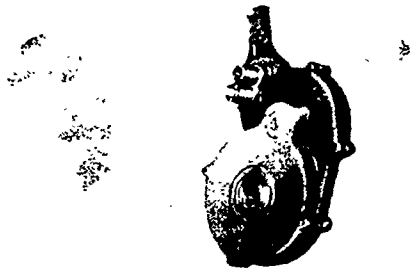
Toledo No. 88
For ⅛ to 2" Pipe
For ¼ to 1½" Bolts

The No. 88 high speed power drive unit is rugged yet light in weight. Motor is concealed in the aluminum housing and protected from damage by a metal plate. Has 3-jaw scroll chuck on front with six positions for the wrench. Pipe in rear spindle is centered instantly by cam wheel controlled centering jaws. Universal forward and reverse motor, 25-60 cycle, 110 volt, AC or DC. Capacity ⅛" to 2" pipe. When used with universal drive shaft will turn geared die stocks and cutters up to 12".

The No. 88 (less legs) can be mounted on a bench or service truck. Can also be furnished with set of four legs and expanded metal tool tray as illustrated.

| | | |
|---|---|---|
| **Toledo No. 88** Power Drive, less legs, tool tray and fittings, (shpg. wt. 140 lbs.) | Price, Each | **$490.00** |
| Set of 4 legs (shpg. wt. 25 lbs.) | Price, Per Set | **18.40** |
| Tool tray (shpg. wt. 12 lbs.) | Price, Each | **27.60** |

## Porta-Drive Reversible Power Unit



A small, compact, portable 20 to 1 gear reduction unit designed to operate standard thread cutting die heads.

Quickly threads pipe up to 8" standard pipe size in any position—horizontal, vertical, or on any angle. Power is supplied by the worker's own ½ H.P. electric or air drill through a drive key which fits into the chuck of the drill and the drive socket of the Porta-Drive. The powerful Meehanite bull gear and cold rolled steel spur gears are sealed in grease and housed in a light, durable aluminum casting. The reversible feature of the unit permits quick removal of the die

Furnished with each unit is a sturdy aluminum combination adaptor yoke, which firmly attaches the Porta-Drive to Toledo 1 and 1A, and Ridgid 65R, 65RC, 65RP, 1R, 1RC, and 1RP die heads. Adaptors are also available for other die heads; prices and information on request.

Price, Each, Complete with one combination adaptor as described (weight 14 pounds) **F.O.B. Muncie, Indiana** ..... **$152.80**



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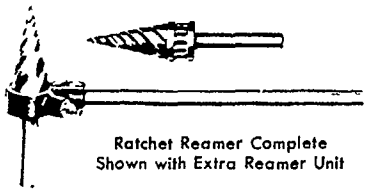
## Reed Self-Feeding Ratchet Reamers



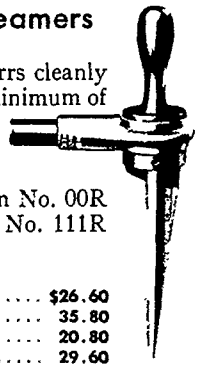
Ratchet Reamer Complete
Shown with Extra Reamer Unit

Self-feeding design resulting from spiral flutes provides good cutting (not scraping) action, with minimum effort required for clean, smooth reamed surface. Intended for pipe ¼ to 2" sizes but also well suited for enlarging outlets in conduit boxes, reaming sheet metal 12 gauge or thinner, and reaming out holes in soil pipe, etc., where metal is not thicker than ⅛".

These Reamers are made with two sizes of ratchet rings, which are the same as those used on Reed Ratchet Threaders, and are frequently ordered as matching sets, that is: the No. 2-71 Reamer with the Series No. 71 Threaders or the No. 2-72 Reamer with the Series No. 72 Threaders.

**No. 2-71** Ratchet Reamer, complete, for ¼ to 2" pipe..... **$29.70**
**No. 2-72** Ratchet Reamer, complete, for ¼ to 2" pipe..... **32.80**
Extra Reamer Unit for No. 2-71..... **20.00**
Extra Reamer Unit for No. 2-72..... **21.60**
Extra Cone only for No. 2-71 or No. 2-72..... **15.00**

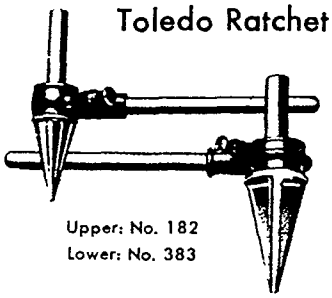
## Ridgid LonGrip Pipe Reamers



Extra long taper on reamer cone cuts burrs cleanly from the inside of pipe or conduit with a minimum of effort; does not reduce wall thickness of threading end nor flare or split pipe. Furnished complete with ratchet handle, which on the No. 2 is the same as used on No. 00R Threaders and on No. 3, the same as on No. 111R Threaders.

**No. 2** Reamer, complete, for ⅛ to 2" pipe..... **$26.60**
**No. 3** Reamer, complete, for ⅜ to 3" pipe..... **35.80**
Extra Reamer unit only for No. 2..... **20.80**
Extra Reamer unit only for No. 3..... **29.60**

## Toledo Ratchet Pipe Reamers

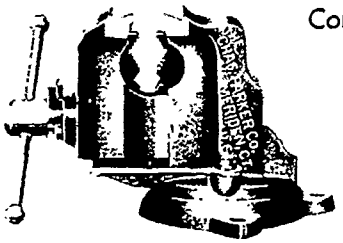


Upper: No. 182
Lower: No. 383

The No. 182 is small and compact with a one-piece heat-treated alloy steel head. The No. 383 has high speed steel cutter blades cast solidly in the head. Both cut cleanly and smoothly.

**No. 182,** ⅛ to 2"..... **$26.40**
**No. 383,** ⅜ to 3"..... **33.00**

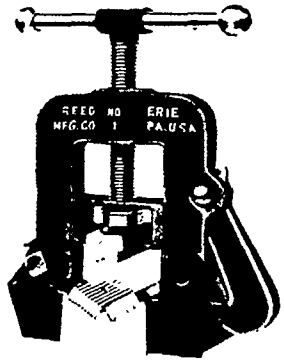
## Parker's Combination Pipe Vises



### With Swivel Base

| No. of Vise | Width of Jaw | For Pipe to | Price Each |
|---|---|---|---|
| **433½** | 3½" | 2" | **$70.00** |
| **434½** | 4½" | 3" | **96.00** |
| **435** | 5" | 4" | **152.00** |
| **436** | 6" | 6" | **240.00** |

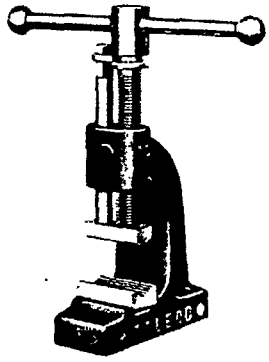
## Reed Long Jaw Pipe Vises



Lower jaws are reversible. Threaded locknut on end of screw allows take up for wear. Closes and holds automatically; equipped with effective pipe bender.

| Vise No. | Pipe Size Capacity | Price Each | Wt. Lbs. |
|---|---|---|---|
| **00** | ⅛ to 1½" | **$16.40** | 6 |
| **0** | ⅛ to 2" | **19.30** | 8 |
| **1** | ⅛ to 2½" | **22.80** | 11 |
| **2** | ⅛ to 3½" | **34.20** | 18 |
| **3** | ⅛ to 4½" | **47.60** | 27 |

## Toledo Malleable Open-Side Pipe Vises

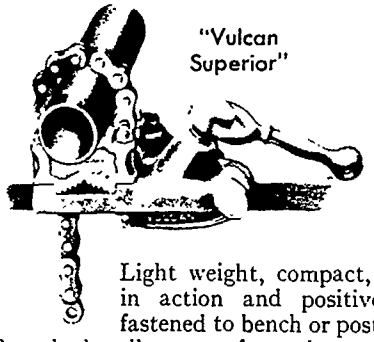


Practical, convenient pipe vises that eliminate the need for unlatching and tipping back a yoke; the pipe slips into the open side.

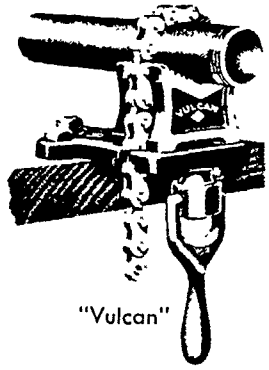
The frame is extra heavy malleable iron; the jaws are heat treated steel and are replaceable.

| | Shpg. Wt. | Price Each |
|---|---|---|
| **No. 00,** ⅛ to 1½"..... | 6¾# | **$19.80** |
| **No. 0,** ⅛ to 2½"..... | 12# | **26.40** |
| **No. 3,** ⅛ to 4½"..... | 27# | **52.80** |

## Williams' Drop-Forged Chain Pipe Vises



"Vulcan Superior"



"Vulcan"

Light weight, compact, and unbreakable; rapid in action and positive in gripping. Readily fastened to bench or post. The "Vulcan Superior" has the handle on top for easier operation and has reversible jaws for longer life.

| Vise | | Price Each | Pipe Capacity | Weight Each |
|---|---|---|---|---|
| Vulcan | **No. 1** | **$15.98** | ⅛ to 2" | 4 lbs. |
| | **No. 2** | **32.46** | ¼ to 4" | 10 lbs. |
| | **No. 3** | **51.92** | ½ to 6" | 18 lbs. |
| | **No. 4** | **69.22** | ½ to 8" | 30 lbs. |
| Vulcan Superior | **No. 11** | **23.36** | ⅛ to 2½" | 7 lbs. |
| | **No. 12** | **44.40** | ¼ to 4½" | 15 lbs. |

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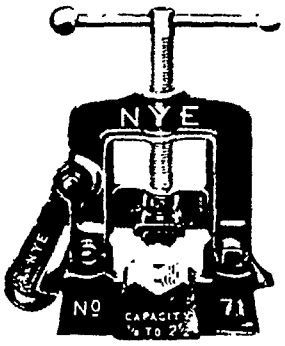
## Nye Improved Self-Locking Vises



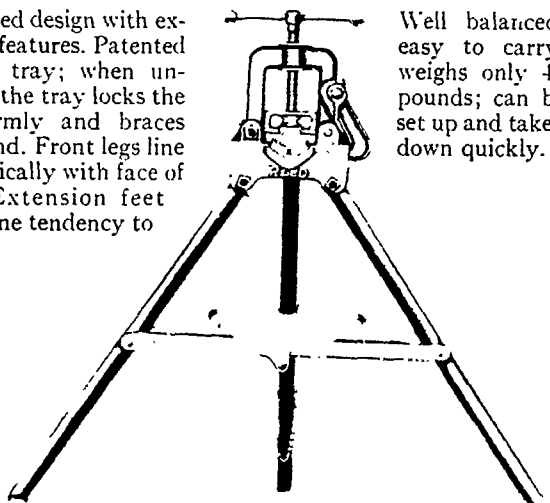

Equipped with long jaws. Holds small rod sizes at either side of vise jaws or 3/8" and smaller pipe on the two largest sizes.

| Cat. No. | Pipe Size Capacity | Price Each | Shpg. Wt. |
|---|---|---|---|
| N700 | 1/8 to 1 1/2" | $15.60 | 6# |
| N70 | 1/8 to 2" | 19.20 | 8 3/4 |
| N71 | 1/8 to 2 1/2" | 22.80 | 12 |
| N72 | 1/2 to 3 1/2" | 34.60 | 21 1/2 |
| N73 | 1/2 to 4 1/2" | 41.80 | 27 1/2 |

## Reed Folding Tray Pipe Vise Stand

Improved design with exclusive features. Patented folding tray; when unfolded, the tray locks the legs firmly and braces the stand. Front legs line up vertically with face of vise. Extension feet overcome tendency to tip.

Well balanced; easy to carry; weighs only 42 pounds; can be set up and taken down quickly.

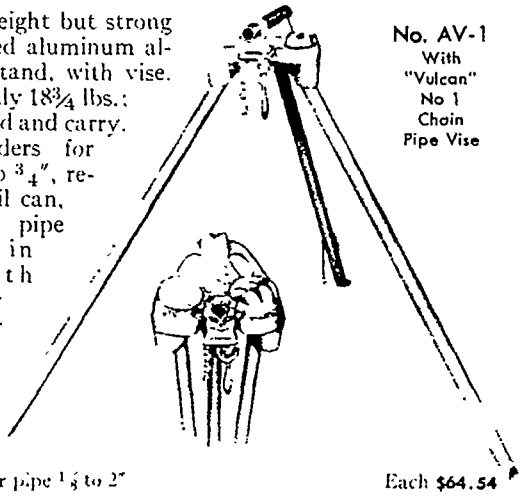


**No. 1-S,** Complete with Long Jaw Vise.... **$65.00**
Pipe capacity 1/8 to 2 1/2".

**No. CT-4,** Ditto, with Chain Vise, Pipe capacity 1/4 to 4".....**$69.60**
Weight complete 42#

## Williams' "Vulcan" Aluminum Vise Stand

A light weight but strong and rugged aluminum alloy vise stand, with vise. Weighs only 18 3/4 lbs.; easy to fold and carry. Has benders for pipe up to 3/4", recess for oil can, and "V" pipe support in rear with handy slots for tools.

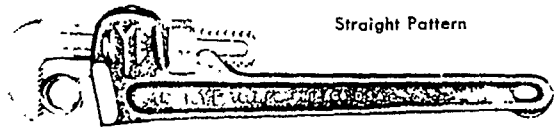


No. AV-1
With "Vulcan" No 1 Chain Pipe Vise

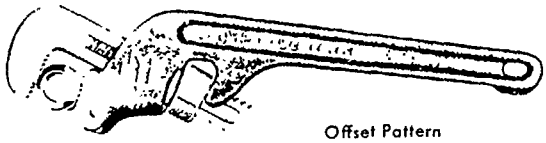
**No. AV-1,** for pipe 1/8 to 2" Each **$64.54**

## Nye Pipe Wrenches

Hardened Forged Jaws--Alloyed Handle



Straight Pattern

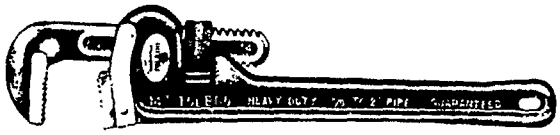


Offset Pattern

| Size | | 6" | 8" | 10" | 14" | 18" | 24" | 36" | 48" |
|---|---|---|---|---|---|---|---|---|---|
| Price Each | Straight | $3.24 | 3.74 | 4.84 | 6.54 | 9.36 | 16.16 | 34.00 | 51.00 |
| | Offset | $3.24 | 3.74 | 4.84 | 6.54 | 9.36 | 16.16 | 34.00 | — |
| Capacity | | 3/4" | 1" | 1 1/2" | 2" | 2 1/2" | 3" | 4 1/2" | 6" |
| Wt. lbs., each | | 1/2 | 3/4 | 1 3/4 | 3 1/2 | 5 1/4 | 8 3/4 | 16 1/4 | 28 |

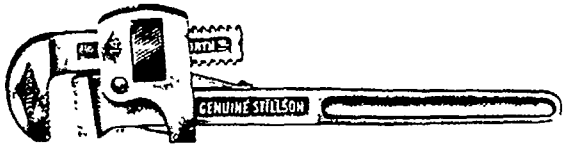
## Toledo Pipe Wrenches

*Unconditionally Guaranteed*



| Size | 6" | 8" | 10" | 12" | 14" | 18" | 24" | 36" | 48" |
|---|---|---|---|---|---|---|---|---|---|
| Price, Each | $2.96 | 3.44 | 4.46 | 5.22 | 6.00 | 8.56 | 14.80 | 31.30 | 46.70 |
| Capacity | 3/4" | 1" | 1 1/2" | 2" | 2" | 2 1/2" | 3" | 4" | 6" |
| Wt., lbs., each | 1/2 | 1 | 2 | 3 | 3 1/2 | 5 1/2 | 9 | 16 1/2 | 33 |

## Genuine Stillson Pipe Wrenches




| Size | 6" | 8" | 10" | 14" | 18" | 24" | 36" | 48" |
|---|---|---|---|---|---|---|---|---|
| Price, Each | $2.20 | 2.56 | 3.30 | 4.46 | 6.38 | 11.02 | 23.20 | 34.80 |
| Capacity | 1/8 to 1 1/2" | 1/8 to 3/4" | 1/8 to 1" | 1/4 to 1 1/2" | 1/4 to 2" | 1/4 to 2 1/2" | 1/4 to 3 1/2" | 1 to 5" |
| Wt., lbs., each | 5/16 | 5/8 | 1 7/16 | 2 5/8 | 3 15/16 | 7 3/16 | 13 1/2 | 23 |



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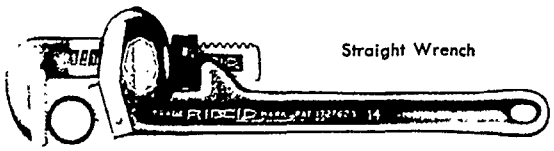
## Ridgid Pipe Wrenches



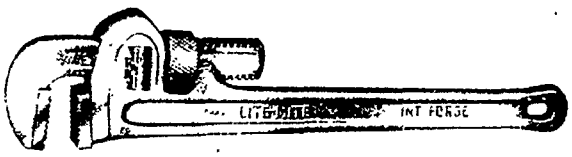
Straight Wrench

End Wrench

Powerful all-alloy housing, guaranteed never to break or warp. Strong alloy jaws will not slip or lock on pipe. Replaceable heel jaw and full floating hook jaw with handy pipe size scale. Adjusting nut spins easily in all sizes. The End Pattern wrenches are especially suited for use where the pipe is close to a wall or in cramped quarters.

| Size | | Complete All-Alloy Wrench | Capacity Inches | Weight Lbs. Each | Straight Handle Assembly | End Handle Assembly | Hook Jaw | Heel Jaw & Pin | Pin | Coil Spring | Flat Spring | Nut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Straight Wrench | End Wrench | | | | | | | | | | | |
| 6" | E6" | $ 3.24 | ¾ | ½ | $ 2.98 | $ 2.98 | $ 1.02 | $ .68 | $.06 | $.06 | $ .34 | $ .26 |
| 8" | E8" | 3.74 | 1 | ¾ | 3.32 | 3.32 | 1.20 | .76 | .06 | .06 | .34 | .26 |
| 10" | E10" | 4.84 | 1½ | 1¾ | 4.26 | 4.26 | 1.88 | .94 | .06 | .06 | .34 | [illegible] |
| 12" | E12" | 5.70 | 2 | 2¾ | 4.84 | 4.84 | 2.12 | 1.10 | .06 | .06 | .42 | [illegible] |
| 14" | E14" | 6.54 | 2 | 3½ | 5.86 | 5.86 | 2.56 | 1.10 | .06 | .06 | .52 | .52 |
| 18" | E18" | 9.36 | 2½ | 5¼ | 8.42 | 8.42 | 3.66 | 1.28 | .06 | .06 | .68 | .60 |
| 24" | E24" | 16.16 | 3 | 8¾ | 13.52 | 13.52 | 5.96 | 1.44 | .06 | .06 | .86 | .94 |
| 36" | E36" | 34.00 | 4½ | 18½ | 25.50 | 25.50 | 9.70 | 1.96 | .08 | .06 | 1.02 | 1.88 |
| 48" | | 51.00 | 6 | 33½ | 42.50 | — | 15.30 | 3.48 | .08 | .06 | 1.36 | 3.40 |
| 60" | | 76.00 | 8 | 51½ | 59.50 | — | 28.90 | 7.74 | .08 | .06 | 2.56 | 6.80 |

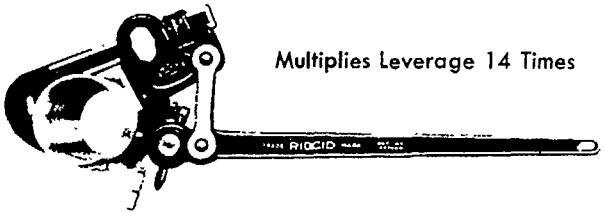
## Lite-Mite Drop-Forged Aluminum Heavy Duty Pipe Wrench



One third the weight of ordinary iron and steel wrenches but of equal strength and performance in heavy duty usage. Housing and hook are drop-forged aluminum alloy, heat treated for strength, toughness and durability. Replaceable heel and hook jaws are drop forged high alloy heat treated steel. Forged steel adjusting nut spins easily.

| Size | 10" | 14" | 18" | 24" | 36" |
|---|---|---|---|---|---|
| Price, Each | $7.42 | $10.42 | $14.92 | $22.42 | $41.92 |
| Pipe Capacity | 1½" | 2" | 2½" | 3" | 4½" |
| Wt. Lbs. Each | 1 | 1¾ | 2¾ | 3¾ | 8 |

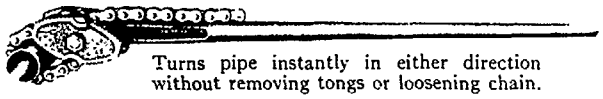
## Ridgid Compound Leverage Wrench



Multiplies Leverage 14 Times

| Size No. | S-2 | S-4 | S-6 | S-8 |
|---|---|---|---|---|
| Price, Each | $21.00 | $56.50 | $70.80 | $110.80 |
| Pipe Capacity | 2" | 4½" | 6" | 8" |
| Weight, Lbs., Each | 6 | 28½ | 40½ | 58½ |

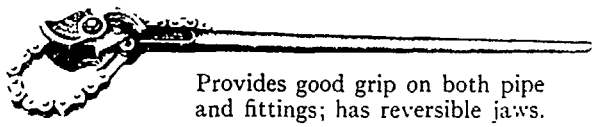
## Williams' "Vulcan" Reversible Drop-Forged Pipe-and-Fittings Tongs



Turns pipe instantly in either direction without removing tongs or loosening chain.

| Tong | No. 27 | No. 37 | No. 47 | No. 57 |
|---|---|---|---|---|
| Price, Each | $31.58 | $44.28 | $50.58 | $61.88 |
| Pipe Capacity | ¼ to 2½" | ¾ to 4" | 1 to 6" | 1½ to 8" |
| Weight, Lbs., Each | 12¼ | 19¾ | 29¼ | 43 |

## Williams' "Vulcan Superior" Drop-Forged Pipe-and-Fittings Tongs



Provides good grip on both pipe and fittings; has reversible jaws.

| Tong | No. 0 | No. 1 | No. 2 | No. 3 | No. 3½ | No. 4 | No. 5 |
|---|---|---|---|---|---|---|---|
| Price, Each | $15.80 | 22.14 | 31.62 | 44.28 | 50.60 | 61.86 | 101.18 |
| For Pipe and Fittings, sizes | ⅛ to ¾" | ⅛ to 1½" | ¼ to 2½" | ¾ to 4" | 1 to 6" | 1½ to 8" | 2 to 12" |
| Overall length | 13¾" | 20" | 27" | 37" | 44½" | 50½" | 64½" |
| Wt. lbs., each | 2 | 5½ | 10 | 17 | 26 | 34 | 54 |

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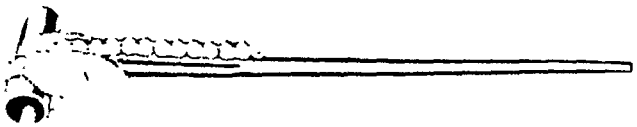
## Billings' Chain Pipe Wrench



"Red Head" reversible: three wrenches in one: quickly and easily engaged. Without removing the wrench or loosening the chain, the pipe may be turned, instantly, in either direction—completely reversible. Has a center jaw; by removing the outer jaws the wrench can be used on the narrow bands on fittings and on the hubs of flanges.

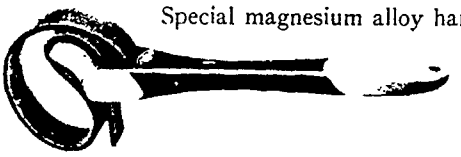
| No. | 20 | 27 | 37 | 47 | 57 | 67 | 87 |
|---|---|---|---|---|---|---|---|
| Price, Each | $17.88 | 25.54 | 35.78 | 46.00 | 56.22 | 91.98 | 191.66 |
| Pipe capacity | 1/8–1 1/2 | 1/4–2 1/2 | 3/4–4 | 1–6 | 1 1/2–8 | 2–12 | 4–18 |
| Length, inches | 20 | 27 | 37 | 44 1/2 | 50 1/2 | 64 1/2 | 87 |

## Ridgid Strap Wrench

For Use on Polished Pipe and Tubing

**No. 2** Wrench, for 1/8 to 2" pipe..... **$5.20** Extra Strap..... **$2.30**
**No. 5** Wrench, for 1 to 5" pipe..... **10.40** Extra Strap..... **5.20**

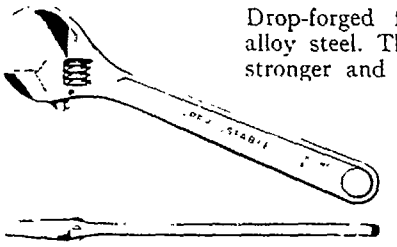
## Trimont Heavy Duty Strap Wrench



Special magnesium alloy handle; light weight but heavy duty. For polished pipe or tubing, 1/8 to 2" size; handle 12" long.

Price, each....**$4.80** Extra Strap.....**$1.44**

## Williams' "Superjustable" Wrenches



Drop-forged from selected quality alloy steel. Thinner and lighter yet stronger and tougher than conventional carbon steel wrenches. Strong, durable, and neat in appearance. All parts are carefully machined to extremely close tolerances.

| Size | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" |
|---|---|---|---|---|---|---|---|---|
| Price, Each | $3.12 | 3.12 | 3.68 | 4.64 | 6.74 | 10.20 | 16.94 | 27.82 |
| Capacity | 1/2" | 7/8" | 15/16" | 1 1/8" | 1 5/16" | 1 3/4" | 2 3/16" | 2 5/16" |

## Brand Internal Pipe Wrenches

Made of heat treated chrome steel for maximum strength and long life. Jaws expand against the inside of the pipe; will not lose their grip; pipe can be turned either way. A simple, practical, and economical wrench for removing broken pipe or close nipples; for making up nickel or chrome plated or brass piping without marring the outside of the pipe; for making up close nipples . . . . by holding the wrench in a vise; and for a wide variety of other similar services.

**Prices, Each, Internal Wrenches**

| | | | |
|---|---|---|---|
| For 1/2" Pipe..... | $ 6.90 | For 2 and 2 1/2" Pipe . . | $ 24.16 |
| For 3/4" Pipe..... | 7.50 | For 3 and 3 1/2" Pipe.. . . | 80.48 |
| For 1" Pipe..... | 8.02 | For 4" Pipe..... | 103.50 |
| For 1 1/4 and 1 1/2" Pipe . | 19.58 | Set of 3 for 1/2, 3/4, and 1" Pipe. | 20.70 |

**Prices, Each, Special Long 5 3/4" Body Type Wrenches**

| | | | |
|---|---|---|---|
| For 1/2" Pipe..... | $11.48 | For 1" Pipe. .. .. | $11.48 |
| For 3/4" Pipe. . . .. | 11.48 | Set of these three | 31.06 |

## Roddick Internal Pipe Wrench

For use in tightening and removing pipe or nipples without damage to threads or walls. It is especially adaptable in tight places where an ordinary pipe wrench will not do the job. Inserted into the pipe and turned, the cam action provides a positive, non-slipping grip on the inside wall; when working with nickel or chrome plate pipe, the possibility of damage to highly polished surfaces is eliminated.

| Pipe Size | Stock Number | Price Each | Pipe Size | Stock Number | Price Each |
|---|---|---|---|---|---|
| 1/8" | A-1 | $3.96 | 3/4" | A-6 | $4.30 |
| 1/4 | A-2 | 3.96 | 1 | A-8 | 5.50 |
| 3/8 | A-3 | 3.96 | 1 1/4 | A-10 | 8.00 |
| 1/2 | A-4 | 3.96 | 1 1/2 | A-12 | 9.00 |
| | | | 2 | A-16 | 10.00 |

Kit with 3/8, 1/2, 3/4, and 1" Wrenches, **Stock No. A-K**.....17.72

Unless otherwise ordered, wrenches for use with standard weight pipe are furnished. When ordering for extra heavy pipe, add "X" after the Stock Number; use "W" after the Stock Number when ordering for brass fittings or water works.

## Trimo Heavy Duty Monkey Wrench

| Size | 10" | 12" | 15" | 18" | 21" |
|---|---|---|---|---|---|
| Price, each | $4.00 | $5.16 | $6.84 | $8.68 | $10.50 |
| Capacity | 1 15/16" | 2 1/2" | 3 1/8" | 4 1/4" | 4 [illegible]" |
| Wt. lbs., each | 1 7/8 | 3 3/16 | 5 1/16 | 7 | 9 1/8 |



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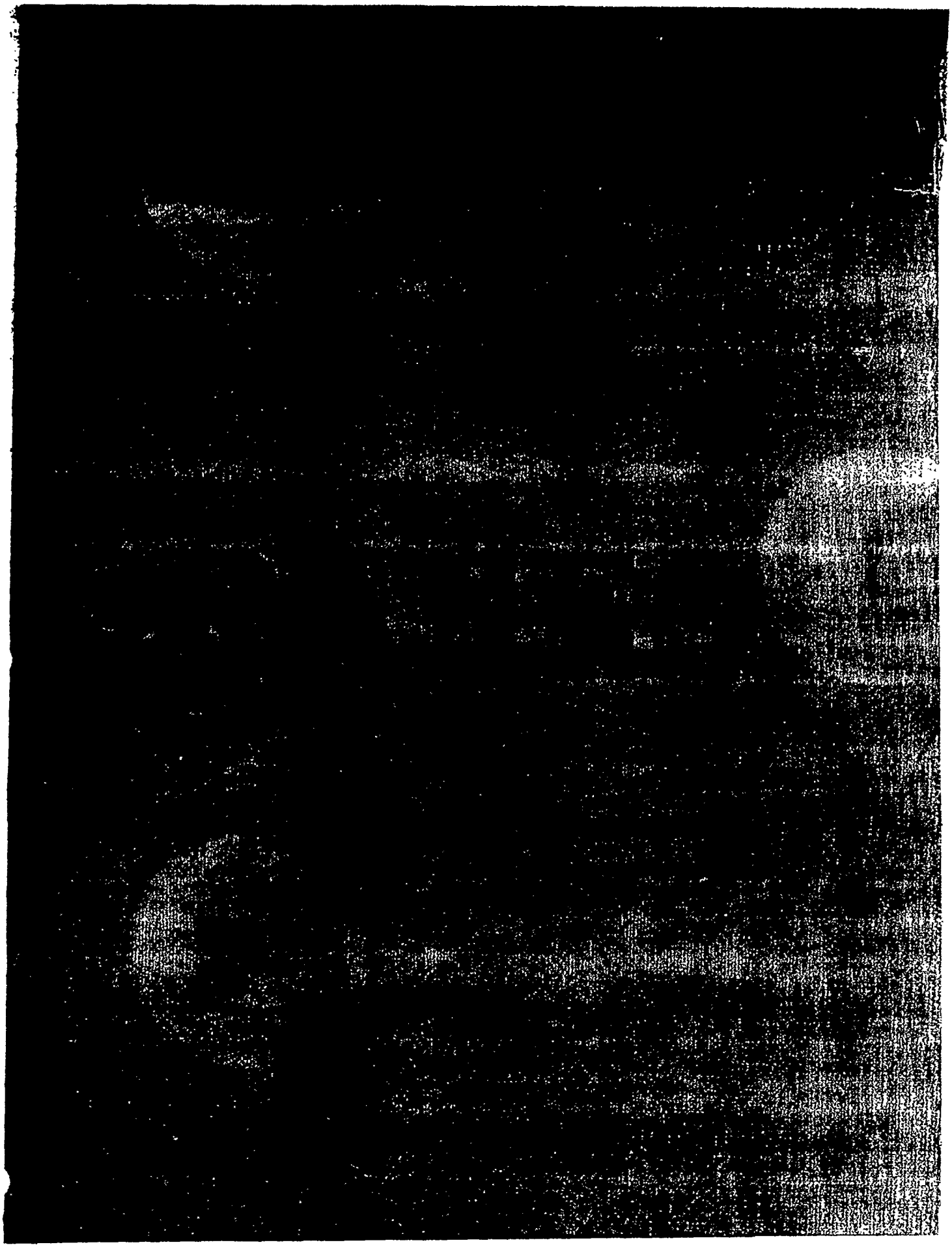
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