



JUN 1 2004

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May 27, 2004

Federal Express

Harold Hunter, Esq.
Quilling, Selander, Cummiskey & Lownds, P.C.
2001 Bryan Street, Suite 1800
Dallas, TX 75201

Re: Crane Company

Dear Harold:

We are working on providing to you as much information as we can with respect to Crane Valve Company and its use of asbestos products. Enclosed is one of the very best documents we have-a 563-page Crane catalog which shows the breadth of Crane's product line as well as its sale of Asbestos products. Attached is a brief summary of the catalog along with copies of some of the best pages.

Call me with any questions. More Crane documents will be coming.

Very truly yours,

A handwritten signature in cursive script, appearing to read "L. Monica".

Linda A. Monica

LAM:rms



WK CC 5009

CRANE

VALVES

FITTINGS

PIPE

FABRICATED

PIPING

**FOUNDED
BY R. T. CRANE
1855**

CRANE CO.

836 S. MICHIGAN AVENUE, CHICAGO 5, ILLINOIS

CRANE

**VALVES
FITTINGS
PIPE**

**FABRICATED
PIPING**

CATALOG NO. 49

FOUNDED
BY R. T. CRANE
1855

CRANE CO.

836 S. MICHIGAN AVENUE, CHICAGO 5, ILLINOIS

Terms and Conditions

(This Catalog Supersedes All Previous Issues)

PRICES: All prices shown herein are list prices, intended for the customer's convenience in determining his net cost. They are not intended to establish nor to suggest resale prices. All list prices are subject to change without notice.

TAXES: Prices shown herein do not include excise, sales, use, occupation, or other taxes levied on sales transactions. All such taxes will be billed to our customers.

NET TERMS: 30 days. Material is subject to shipment in whole or in part at our option, and each shipment is subject to immediate invoicing. All orders are subject to the approval of our Credit Department.

REMITTANCES: Remittances should be made to the Crane Branch from which our invoice is issued, in funds free of exchange or collection charges.

CLAIMS: No claims for shortage or involving inaccurate filling of orders will be allowed unless made within ten days after receipt of goods. Claims for goods damaged or lost while in possession of the Transportation Company should be filed by the consignee direct with the Transportation Company.

RETURNED GOODS: We cannot accept the return of any goods unless our consent has first been obtained.

DELAYS: We shall not be liable for delays or defaults occasioned by strikes, differences with workmen, fires, accidents, delays or defaults occasioned by the exercise of governmental authority, failure to obtain materials, fuel or transportation, or by any cause unavoidable or beyond our control.

WARRANTIES: If within one year following date of delivery any material supplied by us proves defective, or fails to meet the agreed specifications, buyer shall not return it unless requested to do so, but shall immediately notify us, stating full particulars in support of his claim. If faulty workmanship or material is involved, we will adjust the matter fairly and promptly. Under no circumstances shall we be obligated to allow claims for consequential damages or for any labor or other expense incurred by reason of the use or sale of any defective material; the sole measure of damages being the price received therefor by us.

SPECIAL GOODS: Orders covering special goods are not subject to cancellation, except upon agreement to make payment for the special work which has been performed.

ILLUSTRATIONS: The illustrations in this catalog are actual representations of a certain size of each line of products, but do not necessarily represent all sizes in all details. The designs shown are subject to change without notice.

CRANE CO.

GENERAL OFFICES:

836 S. Michigan Ave., Chicago 5, Illinois — Cable Address: Cranecoy — Chicago

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Chicago, Ill. — Chattanooga, Tenn. — Trenton, N. J.

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Detroit (26) 150 Randolph St.
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Kansas City (7) 1328 W. Twelfth St.
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Reno 401 E. Fourth St.
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Roswell 102 So. Virginia St.
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Lima 207 S. Central Ave.
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Muskogee 302 Commercial St.
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Philadelphia (22) 245 Master St.
West Philadelphia Branch (43) 1600 S. 59th St.
Pittsburgh (30) 40 Twenty-fourth St.
Reading (5) 407 N. Front St.
RHODE ISLAND
Providence (3) 245 W. Exchange St.
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Charleston Meeting Street Rd.
Greenville 223 W. McBee Ave.
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Aberdeen 324 Railroad Ave., S.E.
Sioux Falls 326 E. Eighth St.
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Knoxville (1) 523 W. Jackson Ave.
Memphis (1) 254 Court Ave.
Nashville (2) 532 Eighth Ave., South
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Corpus Christi 1212 N. Toncagua St.
Dallas (2) 814 Young St.
El Paso 1609 Texas St.
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San Antonio (6) 1200 E. Houston St.
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Ogden 2001 Wall Ave.
Salt Lake City (11) 307 W. Second South
VIRGINIA
Norfolk (10) 2 E. Twenty-second St.
Richmond (20) 1225 W. Broad St.
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WASHINGTON
Seattle (14) 419 Second Ave., S.
Spokane (8) 126 S. Post St.
Tacoma (1) 1209 South "A" St.
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Madison (3) 641 Williamson St.
Milwaukee (3) 2123 W. Michigan St.
Oshkosh 37 Market St.
WYOMING
Casper 802 East "C" St.
*(Crane-O'Fallon Co.)
**(Crane Co., Minnesota)

EXPORT

NEW YORK BRANCH
47-30 Twenty-ninth St.,
Long Island City (1) New York

CRANE, LIMITED (Canada)

GENERAL OFFICES: 1170 Beaver Hall Square, Montreal, Que. — Cable Address: Cranelit — Montreal
MANUFACTURING PLANTS: Montreal, Que. — St. John's, Que. — Port Hope, Ont.

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ALBERTA
Calgary 602 Eleventh Ave., W.
Edmonton Jasper Ave. & 109th St.
BRITISH COLUMBIA
Vancouver 540 Beatty St.
Victoria 1010 Government St.
MANITOBA
Winnipeg 93 Lombard St.
NEW BRUNSWICK
Moncton 225 St. George St.

NEWFOUNDLAND
St. John's Hill O'Chips
NOVA SCOTIA
Halifax 131 W. Young St.
Warehouse City Market Bldg.
ONTARIO
Fort William 600 Simpson St.
Hamilton 40 Wellington St., N.
Kingston 71 Brock St.

London 304 York St.
Ottawa 148 Bank St.
Toronto 306 Front St., W.
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Montreal 1121 St. James St., W.
Quebec 39 St. Roch St.
SASKATCHEWAN
Regina 1408 Broad St.
Saskatoon 359 First Ave., N.

CRANE, LIMITED (Great Britain)

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MANUFACTURING PLANT: Ipswich, England (Nacton Works)

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ENGLAND
Birmingham 1277 Coventry Road, South Yardley
Bristol 1, Broadmead, Bristol, 1.
Manchester Westinghouse Road, Trafford Park
Brenthwood Great West Road

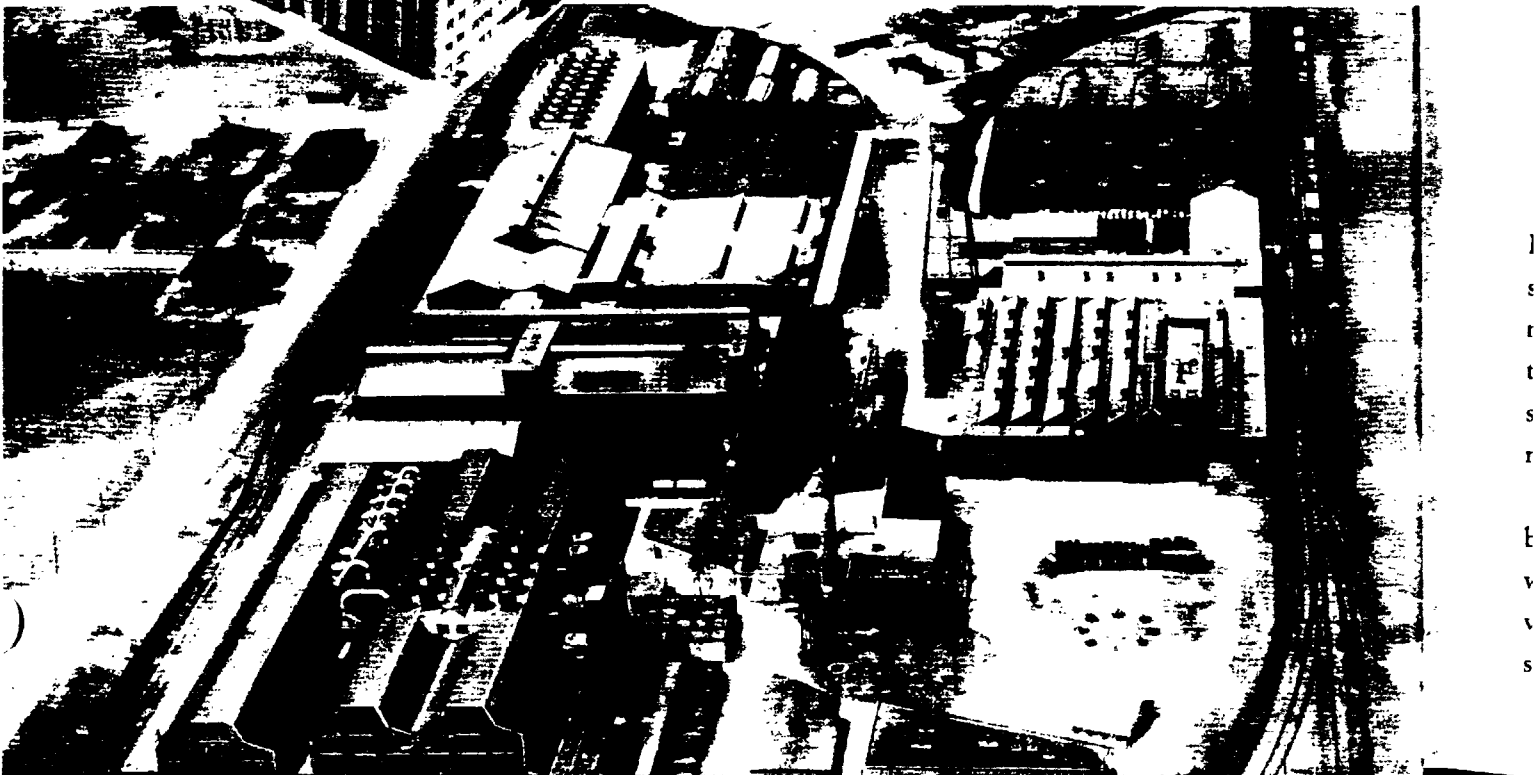
SCOTLAND

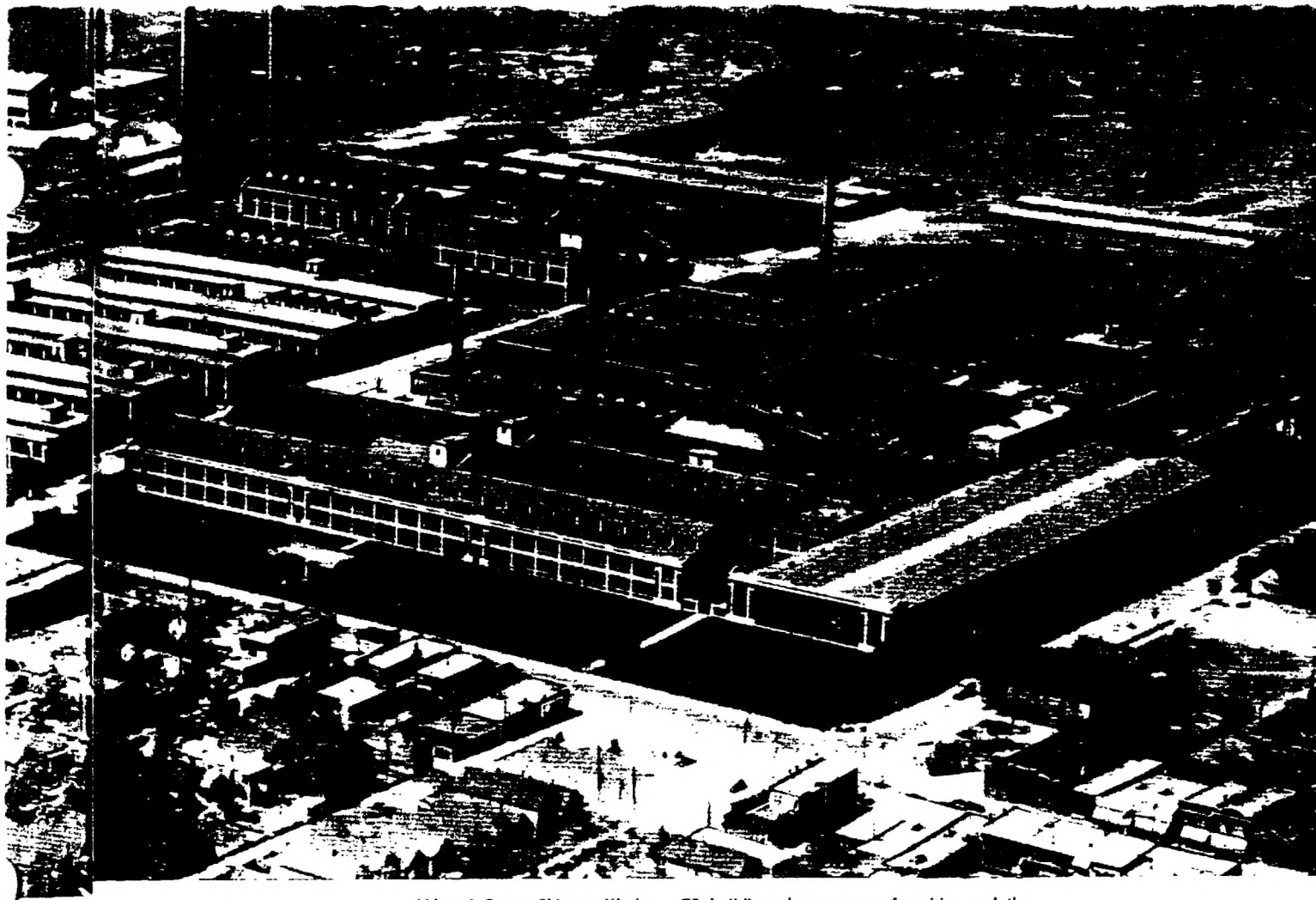
Glasgow 94-100 Clyde Ferry St., Anderston



(Left) One of the two Crane Plants at Trenton, N. J. (Trenton Potteries Co.)

(Below) The Crane Plant at Chattanooga, Tenn.





(Above) Crane Chicago Works — 72 buildings house seven foundries and the manufacturing facilities that produce most of the products shown in this catalog.

Co.)

The Organization Back of the Value That Spells Crane

Back of every quality piping item from Crane stands a vast, closely integrated organization of men, machines and materials. It is an organization that for more than 90 years has had but a single purpose—to supply the best piping equipment available for every industrial need.

Just how well this aim has been realized can be judged by the fact that Crane today is the world's leading manufacturer and supplier of valves and piping equipment. Included in the scope of the broad Crane line are more than

30,000 different piping items—valves, fittings, pipe, pipe line accessories and fabricated piping . . . in brass, iron, steel and corrosion-resistant alloy materials.

Regardless of what you may need in piping to maintain fluid-handling systems at peak operating efficiency, most likely you'll find it at Crane. For completeness of selection . . . for highest quality and best value . . . for better and faster distribution service, it always pays to "get everything in piping from Crane."

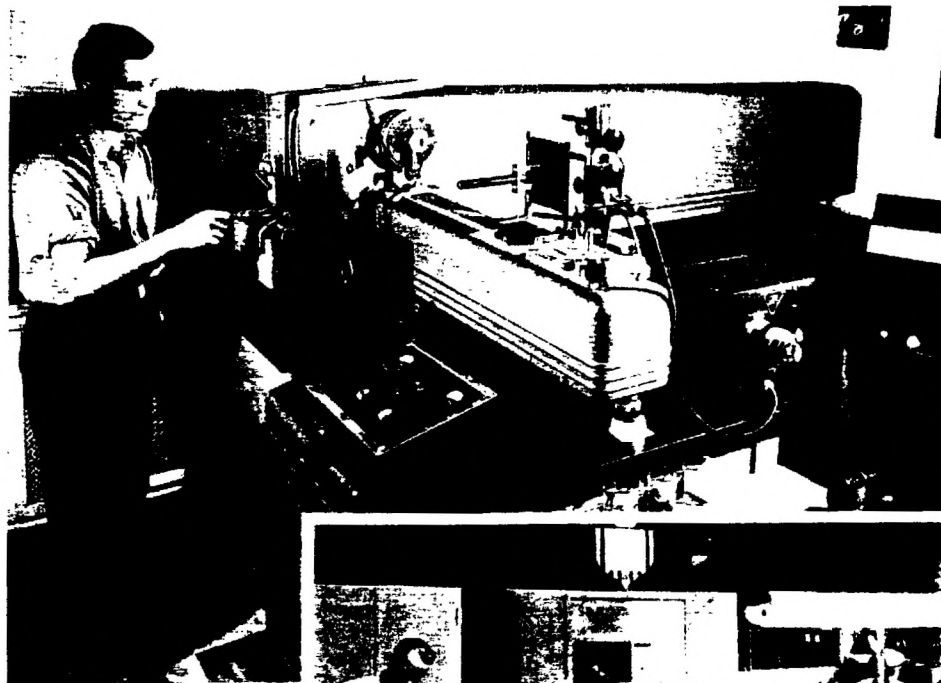
Crane Combines Quality Control with Mass Production

In rising to the position of the world's foremost manufacturer of valves and fittings, Crane has never lost sight of the importance of maintaining the highest possible degree of quality control. By constantly adding to research and design experience as well as to manufacturing skill, Crane is able to mass produce piping materials that consistently set the standard for quality in every field they serve.

Elaborate research and engineering procedures make sure that raw materials are right . . . that design and specifications are sound. Castings and forgings are skillfully inspected . . . dimensions and wall thick-

nesses individually gauged. Repeated checking insures closest tolerances and accuracy in all machining operations, followed by final inspection of parts. All assembled products must undergo thorough tests simulating actual working conditions before they are released for shipment or stock.

Even then, no Crane product is ever considered to be beyond improvement. Betterment of design and refinement of materials are constantly being studied to increase the serviceability and performance of Crane valves and fittings in all their applications in every field of industry.



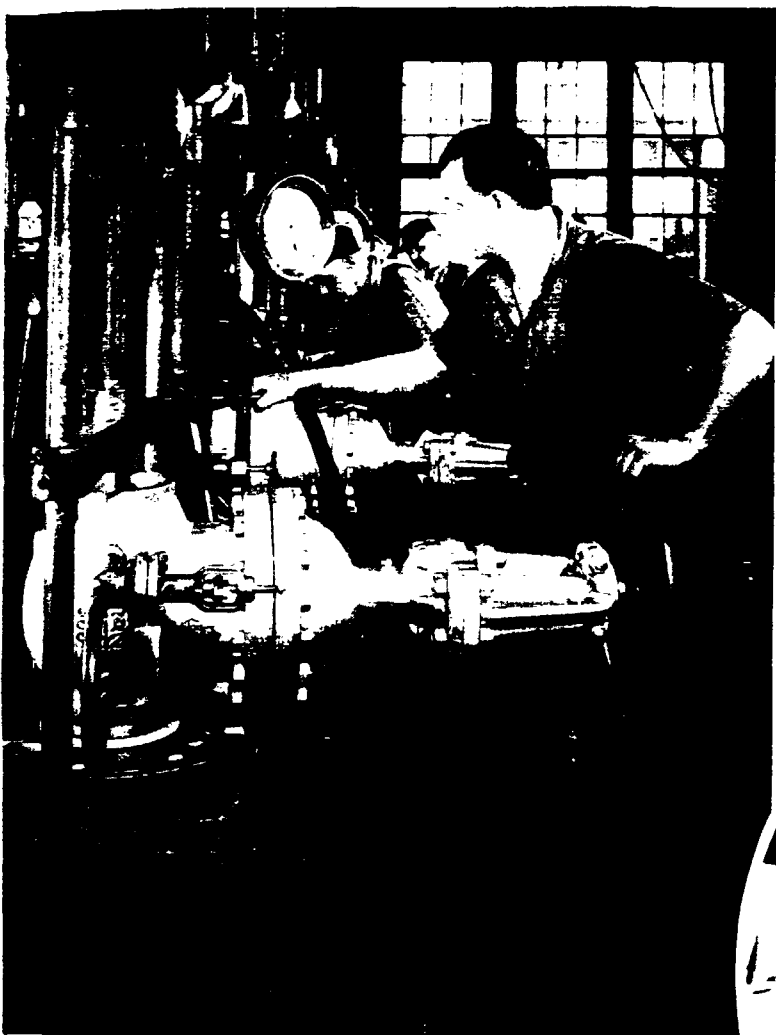
(Left) Spectrophotographs are used to obtain analyses of iron and steel rapidly and accurately. One of many instruments used in the control of chemical composition of metals and alloys in Crane products.

(Right) Fittings must measure up to close limits in every way. All types of fittings are systematically checked — for wall thickness, alignment, threading, drilling, etc.—at every stage of production.



(Right) Impact tests in Crane Research and Development Laboratories are conducted at temperatures ranging from liquid nitrogen (approximately -300° F.) to those of bright red heat.

(Below) Hydrostatic pressure testing of 300-pound steel gate valves — one of the many tests given Crane valves — large and small — before they get a final "O.K." for service.



(Above) Measuring the ability of metals to retain hardness at red heat. Used in the development of materials for valves designed for elevated temperature service.

(Left) Crane metallurgists use microscopic techniques in their development of materials for valves, fittings and piping equipment.

Crane Shops and Foundries...Geared to Modern Manufacturing Techniques

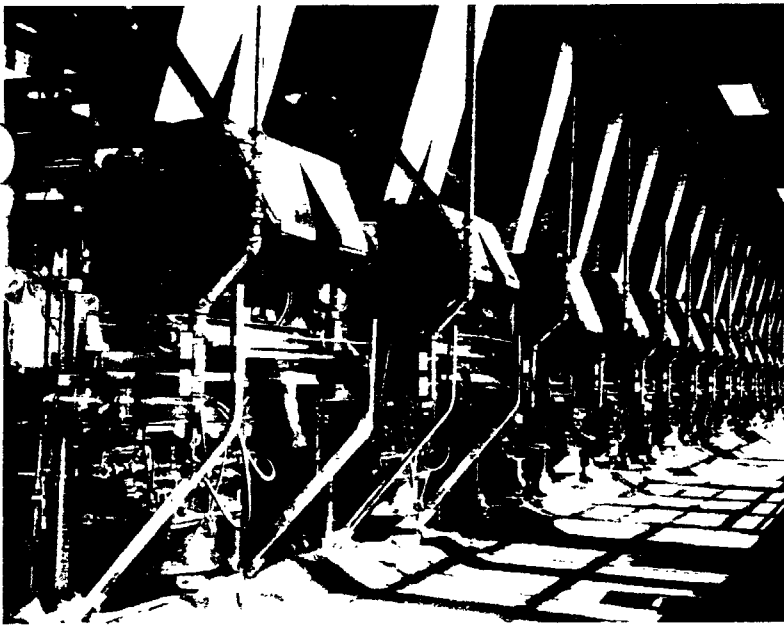
To understand how Crane can produce with highest efficiency such a wide variety of piping materials, one need but see the vastness and completeness of Crane production facilities. In equipping Crane plants, the primary objective has always been to produce a better product more efficiently—with greater value for Crane customers. To assure such results, Crane Shops and Foundries are modern and complete from end to end—with the best equipment available.

In Crane Shops, every type of automatic and semi-automatic machine is used. Much of this equipment is specially built for Crane, just as are many of the

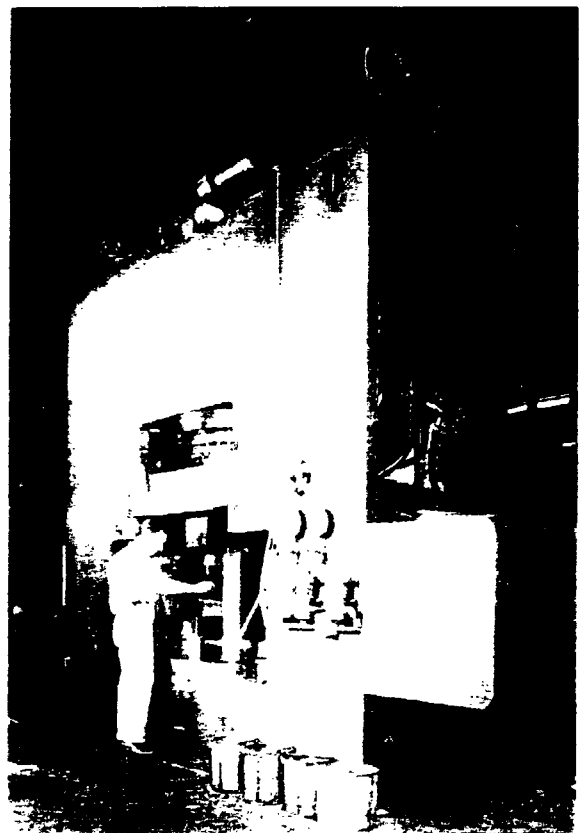
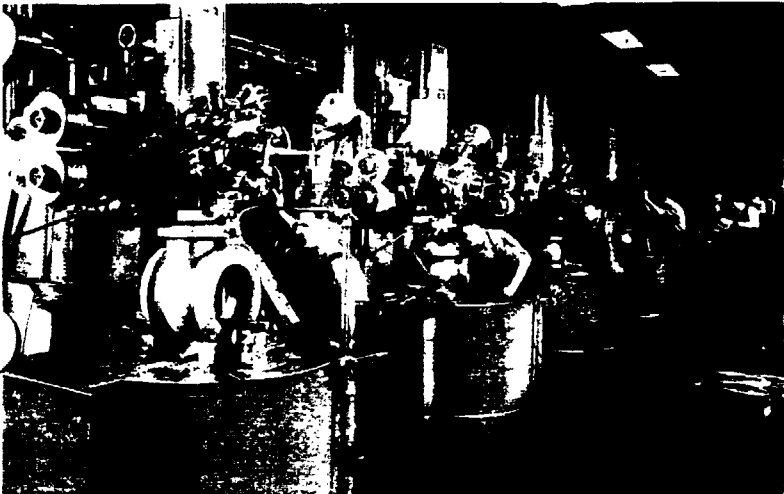
systems by which valve parts and fittings are conveyed to machines and on to other manufacturing processes.

In Crane Foundries — and Crane operates one of the largest steel foundries in industry — improved techniques give extremely accurate control of melting and chemical composition of metals. Skilled metallurgists make sure that every item in the Crane line has been produced from superior metals.

Equally well equipped are Crane Fabricating Shops with specialized skills and facilities for pipe shaping, welding, stress relieving, and testing — to the most exacting requirements.

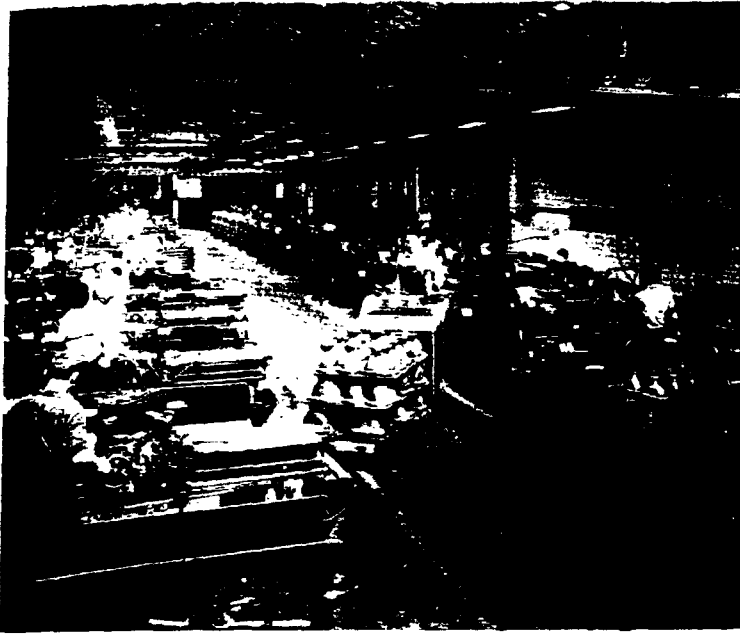
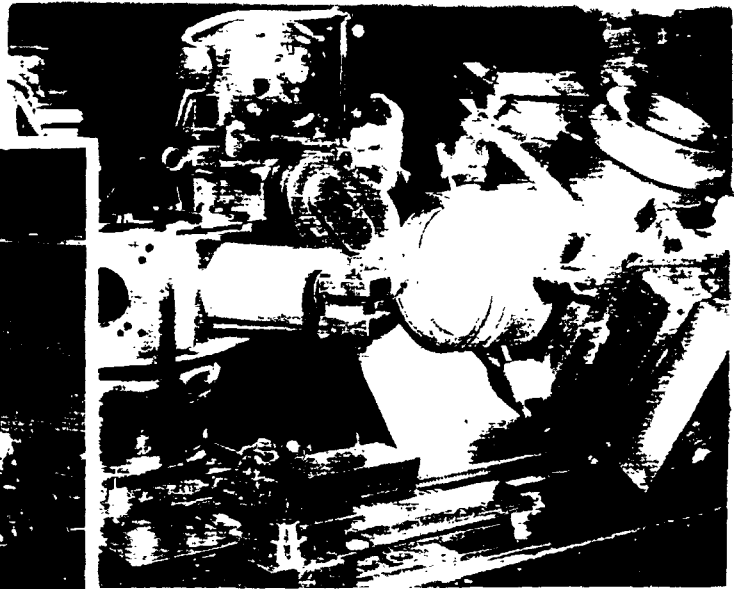


(Left) Battery of molding machines with sand chutes in Crane brass foundry.



(Left) Banks of vertical turret lathes precision-machining Crane steel valve bodies.

(Right) Modern multiple-tool cutting device—specially designed by Crane engineers—for milling threads in bonnet end of Pressure-Seal Bonnet Valves.



(Above) Rows of turret lathes, typical of the modern facilities used in all Crane Shops to increase production efficiency.

(Right) Crane Pipe Fabricating Shops are fully equipped to handle bending, lapping, flanging and welding—special assemblies for all needs. No job is too complex, too large, or too small.



(Left) Assembling Iron Body Wedge Gate Valves.



(Left) Hydraulic press for copper tube fittings. Two plungers—each with a force of 300 tons—enable this press to produce 700 half-inch tees per hour.

(Right) Pouring molds in the Crane Steel Foundry, one of the largest steel foundries in industry.



And Wherever You Are . . . It's Easy To Get CRANE Products

No matter where you are located — or what you need in piping equipment — there's a well-stocked Crane Branch or Crane Wholesaler nearby, ready to serve you. Crane takes pride in making all of its products conveniently available at the points of their use, and Crane distribution service is truly nation-wide.

Close cooperation among the vast network of local Crane Branches is your assurance of getting

the exact piping materials you need . . . when you need them. All Crane Branches have direct access to, and are backed by, large factory stocks representative of the world's most complete line of piping equipment. In addition, your Local Crane Branch can readily draw on the stocks in other nearby Branches to give you more dependable service. It's always best to call your Crane Outlet first for piping materials.



(Left) Part of a storage floor in Crane Chicago Works, showing wide stocks of larger valves ready for shipment.



(Above) Crane Branches carry a complete line of staple items to meet everyday piping needs.

(Left) Shipping is a big operation at Crane, and the facilities are ample. Delivery is accelerated by up-to-date loading methods and hauling equipment. 26 freight cars can be loaded at one time inside Crane Chicago Works.

Alphabetical Index

All items shown in this catalog are described and cross-indexed alphabetically on this and the following nineteen pages. 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 the general classification of "Fittings", will be found group page numbers, the detailed references being made under specific listings such as, "Elbows", "Teas", "Crosses", "Unions", etc.

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Abbreviations Used in This Catalog

AAR.....	Association of American Railroads	NPSL.....	Symbol indicating American Standard Straight Pipe Thread for locknuts and locknut pipe threads
A.G.A.....	American Gas Association	NPSM.....	Symbol indicating American Standard Straight Pipe Thread for mechanical joints
A.I.S.I.....	American Iron and Steel Institute	NPT.....	Symbol indicating American Standard Taper Pipe Threads
API.....	American Petroleum Institute	P.D.....	Used in conjunction with threads to indicate "Pitch Diameter"
ASA.....	American Standards Association	psi.....	Pounds per square inch
A.S.M.E.....	American Society of Mechanical Engineers	rpm.....	Revolutions per minute
A.S.T.M.....	American Society for Testing Materials	S.A.E.....	Society of Automotive Engineers
A.W.W.A.....	American Water Works Association	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.
B&S.....	Brown & Sharp (used herein to indicate thickness of copper gaskets)	S.P.S.....	When used in conjunction with Wrought Copper Solder-Joint Fittings, indicates threaded ends which are "standard pipe sizes" (S.P.S.)
Btu.....	British Thermal Unit	SWP.....	When used in conjunction with working pressure ratings, indicates "steam working pressure"
BWG.....	Birmingham Wire Gauge (used herein to indicate thickness of boiler tubes)		
cfm.....	Cubic feet per minute		
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		

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

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 and data on other Crane metals and material will be furnished on request.

Brasses, Bronzes, Nickel Alloys, and Hardened Stainless Steel

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 Brass

Crane Special Brass, 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 are inadequate.

Strong, tough, and hard, Crane No. 44 Nickel Alloy offers good resistance to wear, as well as to the corrosive action of dilute acids and alkalies, as 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 developed "Cast Manganese Bronze" 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 classes, Class I and Class II, 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

Crane Hardened Stainless Steel

Crane Hardened Stainless Steel is a wrought alloy steel containing 16 to 18 percent chromium, with a carbon content of 0.60 to 0.80 per cent. It belongs to the straight chromium stainless steel family and falls within the "Type 440" classification of the American Iron and Steel Institute.

This material is used for plug type discs and seats in brass and iron globe and angle valves, for plug type discs and seats in small size steel globe and angle valves (designated as "W" trim), and for discs in small steel gate valves in combination with Exelloy body seat rings (designated as "XW" trim). The parts are either forged or machined from bar stock,

and before the final finishing operation, the seating faces are "surface" hardened by induction heating. Only the surface of the seating face (to a relatively small depth) is thus hardened, to a Brinell hardness number of 500, the remainder of the part retaining the ductility, strength, and toughness that are characteristic of this steel.

Seats and discs made of Crane Hardened Stainless Steel withstand high temperatures and offer unusual resistance to wear, wire drawing, cutting, scoring, erosion, seizure, and galling. In addition, they have excellent resistance to the corrosive action of many fluids.

18-8 Mo, Monel, Exelloy, and Stellite

2

Crane 18-8 Mo Alloy Cast Steel

18-8 Mo Alloy (18 to 22% chromium, 12 to 14% 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.

Addition of molybdenum to regular chromium-nickel 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.

Fittings made of this material, shown on pages 365 to 380, may be recommended for use in handling food products as well as a large variety of industrial chemicals.

18-8 Mo Alloy Steel is a casting material conforming to A.I.S.I. (American Iron and Steel Institute) Type 316 wrought stainless steel. It conforms and substantially exceeds the minimum requirements of A.S.T.M. Specification A 200. Grade 316, shown below, and is heat-treated to obtain maximum corrosion resistance.

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

Crane Exelloy for Stems

Exelloy is a specially processed chromium-nickel alloy 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 compression, shear, and other strains attending stem service.

Exelloy withstands wear unusually well and offers liberal resistance to corrosion by atmosphere; dilute alkaline water; and by steam, gas, air, and hot oil vapors.

Remarkable properties of Crane Exelloy as a valve material have resulted in its adoption for use in nearly all Crane Steel Valves.

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
Hardness number (range).....	225-250	225-250
Impact strength (keyhole notch)..... ft. lbs.	40	40

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, alkalis, 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 alkalis and is widely used wherever avoidance of copper contamination is not imperative.

Monel Valves are shown on pages 365 to 380. 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 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 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.

Cast, Malleable, Alloy, and Ni-Resist Irons

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 Tentative A.S.T.M. Specification A 197 for Cupola Malleable Iron.

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.



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

Crane Alloy Cast Irons

Crane Alloy Cast Irons, a development of the Crane Research 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 (sometimes called Monel 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

2

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 453
C.C. Rubber Ring Gaskets.....pages 452, 454, and 456

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.

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 fits in an especially prepared groove in each flange to seal the joint.

The 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.

The rings are furnished in two types: Type A, of steel with a maximum Brinell hardness number of 130, and Type B of 4 to 6% chrome, ½% molybdenum, with a maximum Brinell hardness number of 130.

The rings and ring joints are particularly recommended for high pressure hydraulic installations and high pressure-temperature steam and hot oil lines. The merits of the joint are well known; both the American Standard (ASA B16e) and the American Petroleum Institute recognized its greater efficiency by assigning higher ratings to products with this joint than to those with other types.

Rings for Ring Joints.....page 452

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 inspected and is listed by the Underwriters' Laboratories (National Board of Fire Underwriters), Chicago, for use on hazardous liquids.

Cranite Sheet Packing.....page 453
Cranite Ring Gaskets.....pages 452, 454, 455, and 456
Cranite Union Gaskets.....page 399

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 140, in order to obtain the best results.

Composition Discs.....page 140



Minute measurements give the inside story on creep.

Crane Cast Steels

To provide adequately for the widely varied services to which steel valves and fittings are subjected, Crane regularly produces several differ-

ent 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 1/2% 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 157, Grade C 1, and A.S.T.M. Specification A 217, 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 is a recent addition to the Crane family of fine quality alloy steels. The current practice of building steam power plant systems for operation in the temperature range of 900 to 1000° F. has created a demand for a weldable alloy steel having high strength retention and excellent stability. Crane No. 7 Steel fills this demand.

The steel has 0.20 to 1.50 per cent chromium and of 0.40 to 0.60 per cent molybdenum as the principal alloying elements greatly enhances the stability of the steel against graphitization and at the same time assures excellent strength retention at elevated temperatures—the recognized allowable stress, for example, being 17 per cent higher at 1000° F. than for carbon-molybdenum steels. Combined with these qualities is ready weldability, not usually associated with chromium-bearing steels, but made possible by the low carbon content—0.18 per cent maximum.

Crane No. 7 Chrome-Molybdenum Alloy Cast Steel is regularly used in the Crane Pressure-Seal Bonnet Valves recommended for steam service on temperatures up to 1000° 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, and the steel conforms to A.S.T.M. Specification A217, Grade WC6, covering alloy steel castings suitable for fusion welding for high-temperature service.

Chemical Composition		Min- imum	Max- imum	Crane average
Carbon	per cent	0.18	0.18	0.13
Chromium	per cent	1.00	1.50	1.25
Molybdenum	per cent	0.40	0.60	0.55
Manganese	per cent	0.75*	0.65	0.65
Phosphorus	per cent	0.05	0.03	0.03
Sulphur	per cent	0.06	0.03	0.03
Silicon	per cent	0.60	0.45	0.45

*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.		Min- imum	Crane average
Tensile strength	lbs. per sq. in.	70,000	78,000
Yield point	lbs. per sq. in.	45,000	52,000
Elongation in 2 inches	per cent	22	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 is another new Crane steel for high temperature steam service.

Its characteristics are similar to those of Crane No. 7 steel described above, but the higher percentages of alloying elements (chromium 2.00 to 3.00 per cent and molybdenum 0.80 to 1.10 per cent) offer even greater stability against graphitization, making the steel well suited for steam temperatures as high as 1050° F.

Crane No. 9 is a weldable steel and is available for Crane Pressure-Seal Bonnet Valves and for other Crane valve and fitting products. It conforms to A.S.T.M. Specification A217, Grade WC9.

Chemical Composition		Min- imum	Max- imum	Crane average
Carbon	per cent	0.18	0.18	0.14
Chromium	per cent	2.00	3.00	2.50
Molybdenum	per cent	0.80	1.10	1.00
Manganese	per cent	0.70*	0.60	0.60
Phosphorus	per cent	0.05	0.03	0.03
Sulphur	per cent	0.06	0.02	0.02
Silicon	per cent	0.60	0.50	0.50

*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.		Min- imum	Crane average
Tensile strength	lbs. per sq. in.	70,000	85,000
Yield point	lbs. per sq. in.	45,000	60,000
Elongation in 2 inches	per cent	22	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 Alloy 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 A157, Grade C5A, covering alloy steel castings for valves, flanges, and fittings for service at temperatures from 750 to 1100° F.

Chemical Composition		Min- imum	Max- imum	Crane average
Carbon	per cent	0.15	0.30	0.17
Chromium	per cent	4.00	6.50	5.00
Molybdenum	per cent	0.40	0.65	0.50
Manganese	per cent	0.45	1.00	0.60
Silicon	per cent	0.20	0.75	0.65
Phosphorus	per cent	0.05	0.03	0.03
Sulphur	per cent	0.06	0.03	0.03

Physical Properties at 70° F.		Min- imum	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	30	52
Brinell hardness number			212
Bend test	degrees	90	180
Charpy impact strength (keyhole notch) ft. lbs.			15

Crane Forged Steels

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	As forged	Grade II Heat treated	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.	Min- imum	Crane average
Tensile strength..... lbs. per sq. in.	70,000	78,000
Yield point..... lbs. per sq. in.	45,000	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.	Min- imum	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.	Min- imum	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 A 107.

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 years, Crane Triplex Steel was recognized as the highest quality bolting material available, and today, still ranks well with the best steels obtainable. With the introduction of

Crane Templex Steel, the culmination of a long, patient, exhaustive, and comprehensive study, Crane again offers an outstanding bolting material, unsurpassed for high-pressure high-temperature services.

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 Crane Triplex Steel Bolt-Studs in thousands of steel valve 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-Bonnet steel valves.

Crane Triplex Steel is specially heat treated by quenching and tempering, producing a dense, uniform, and fine grain structure 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
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 exacting 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 B 18.2. 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

The marking and identification of Crane Products conforms 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 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 are all marked with the word "STEEL", which definitely distinguishes them from cast iron. In addition, 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, 100-Pound Brass Valves, 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 gas service without an air test, and therefore when an air test is required, it must be definitely specified.

Any valve intended for air, gas, or very volatile

fluids, or where absolute tightness is essential, should be ordered air tested unless the catalog definitely states that it 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.

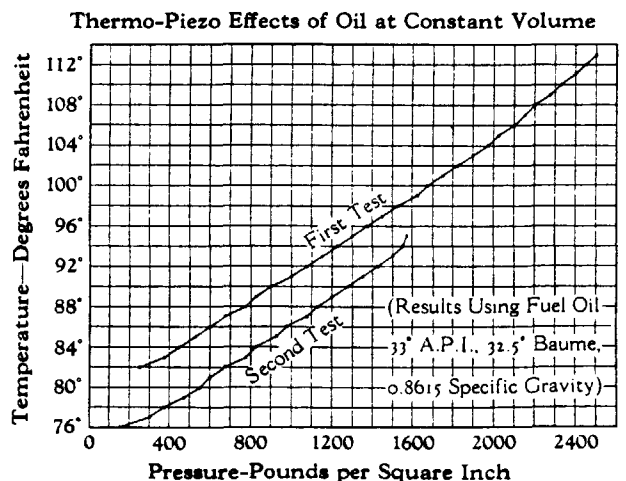
Crane has conducted tests which indicate that when vessels are completely filled with fuel oil of 33° A.P.I., a temperature rise of one degree Fahrenheit causes the internal pressure to increase approximately 75 pounds per square inch. Refer to chart at right.

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 vari-

ables, 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.



Knowledge***Experience******Facilities***

Knowledge gained through untiring research and critical study of new developments and materials—experience derived from a discriminating eye on every product from blueprint to production stage, from tests in laboratory and field—modern facilities and equipment to assure a high and uniform standard of quality—this is the background of Crane products.

No less important than the research and production expended to advance the improvement of products is the Crane service policy. Users confronted with unusual, or ordinary, problems pertinent to the control of fluids are invited to take advantage of this policy by direct inquiry or by referring to one of the many specialized Crane technical publications.

Brass Gate Valves

3

Names of Parts..... page 14

Gate Valves

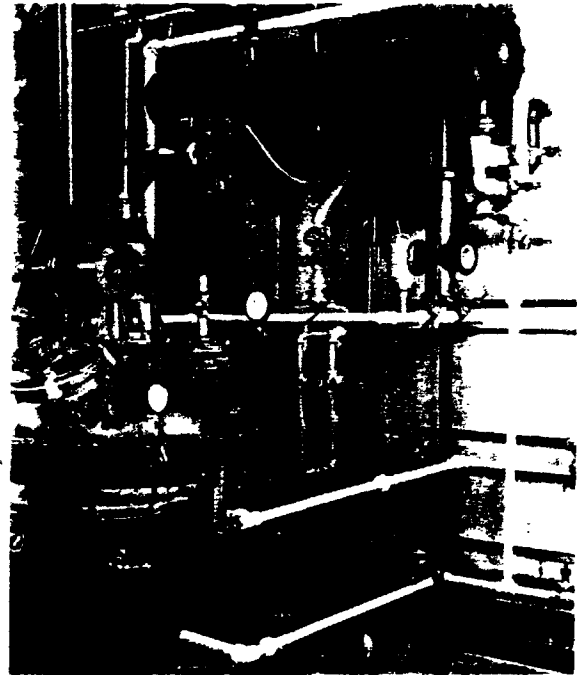
100-Pound..... page 15
 125-Pound..... page 16
 150-Pound..... page 17
 200-Pound..... pages 18 and 19
 300-Pound..... pages 20 and 21
 With Lock Shield..... page 16

The Crane line of Brass Gate Valves 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 valves, supplementing the gate valves indexed above, are shown on the following pages:

Brass Globe and Angle Valves..... pages 23 to 41
 Brass Check and Foot Valves..... pages 43 to 52
 Brass Hose Valves..... pages 60 and 61
 Brass Lever-Operated Quick-Opening Valves..... pages 54 to 57
 Brass Radiator Valves..... page 58

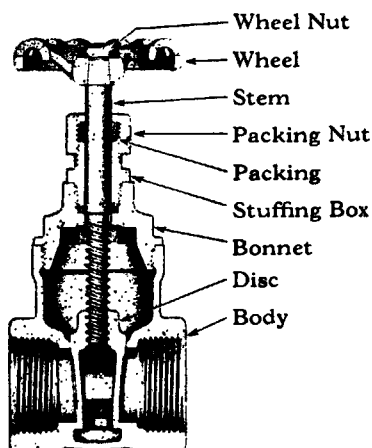
The lists shown above do not include all Crane Brass Valves. Brass Valves that perform a special duty or those made for special services such as Float Valves, Pop Safety Valves, Relief Valves, Pressure Regulators, Pressure Reducing Valves, Solder-Joint Valves, and Valves for Marine Service are described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



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

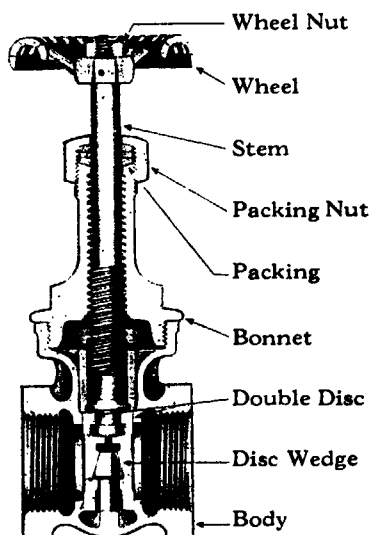
Brass Gate Valves

Names of Parts



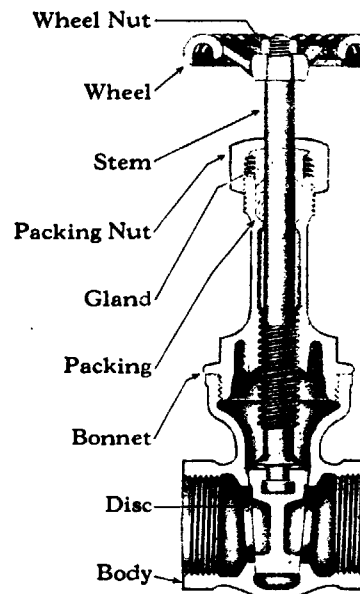
Non-Rising Stem
Wedge Disc Gate Valve

No. 410, page 15



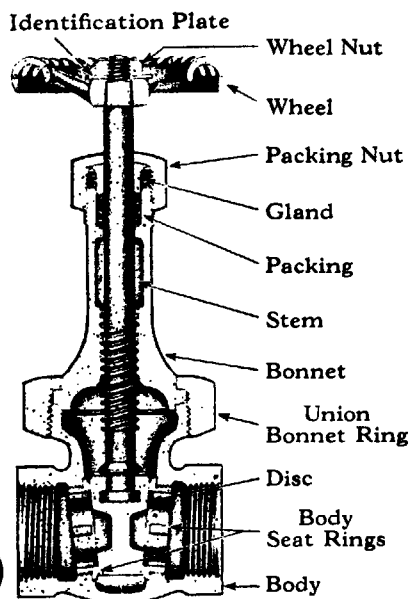
Rising Stem
Double Disc Gate Valve

No. 440, page 16



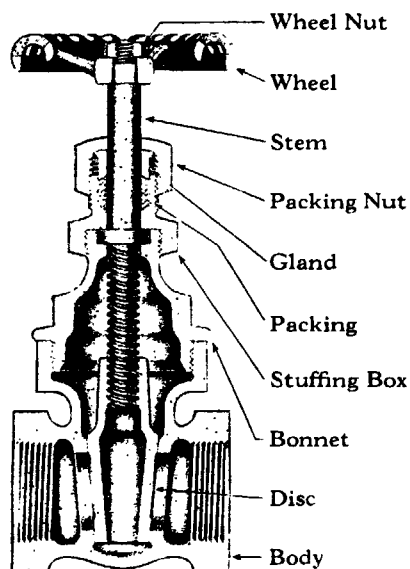
Rising Stem
Wedge Disc Gate Valve

No. 431, page 17



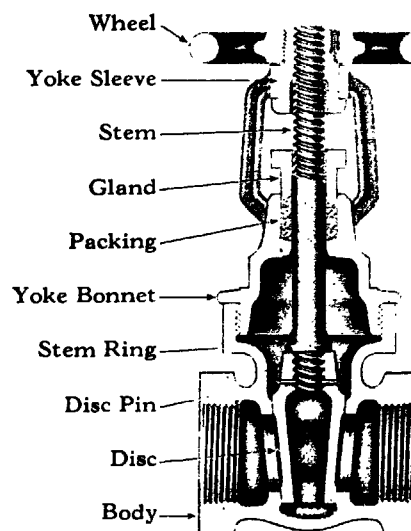
Rising Stem, Union Bonnet
Wedge Disc Gate Valve
With Renewable Seats

No. 423, page 18



Non-Rising Stem
Wedge Disc
Gate Valve

No. 458, page 19



Outside Screw and Yoke
Wedge Disc
Gate Valve

No. 459, page 19

100-Pound Brass Gate Valves

Wedge Disc—Non-Rising Stem

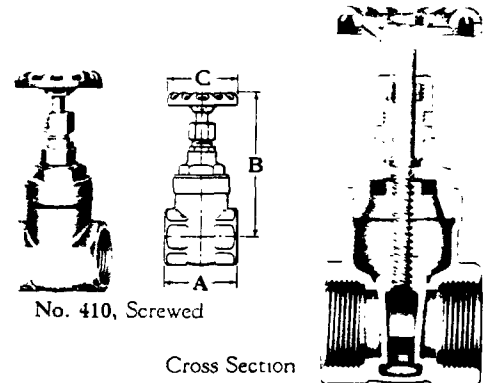
WORKING PRESSURES

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

No. 410 Valves: This is a new, modernized line of 100-Pound Brass Wedge Disc Non-Rising Stem Gate Valves. The upper portion of the body is cylindrical in shape, combining maximum strength with light weight and reinforcing the seats against the wedging action of the disc.

The valves have wide-faced hexagons at the pipe ends, accurately cut threads, ample metal sections, long disc guides for correct seating, and can be repacked when wide open and under pressure. The body, bonnet, disc, stem, stuffing box, and packing nut are made of brass.

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



No. 410, Screwed

Cross Section

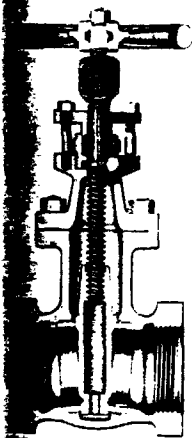
List Prices, Each, and Dimensions

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 410, Screwed		3.00	3.00	3.50	4.10	4.90	6.60	8.40	12.00
Dimensions, in Inches	A	1 3/4	1 13/16	1 15/16	2 1/16	2 7/16	2 7/8	3	3 1/4
	B	3 1/4	3 1/4	3 3/4	4 3/8	5 1/8	5 3/4	6 3/8	7 3/8
	C	1 1/2	1 1/2	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8

100-Pound Valves with Bolted Bonnet

WORKING PRESSURES

100 pounds saturated steam
125 pounds water, non-shock, 200° F.—125 pounds oil or gas, non-shock, 150° F.



Cross Section
No. 4436
With Indicator



No. 4436
Screwed
With Indicator



No. 4437
Flanged

Available without indicator
when orders so specify.

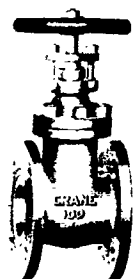
Nos. 4436 and 4437 Valves: Nos. 4436 and 4437 Valves are of liberal proportions and unusually high quality.

The body, bonnet, disc, stem, renewable body seat rings, stuffing box, and gland are brass. The stuffing box is deep, filled with high grade packing, and on sizes 2 1/2 to 10-inch is equipped with a bolted gland (the 2-inch size has a screwed type stuffing box with a gland). These valves, when wide open, can be repacked while under pressure. Indicator furnished unless ordered without.

Flanged valves: End flanges and drilling 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 valves are ordered faced only. Full face gaskets should be used; see page 452.

List Prices, Each, and Dimensions

Size	Inches	2	2 1/2	3	3 1/2	4	5	6	8	10
No. 4436, Screwed	With Indicator	63.00	76.00	111.00						
	Without Indicator	61.00	72.00	107.00						
No. 4437, Flanged F. & D.	With Indicator	74.00	94.00	128.00	170.00	186.00	266.00	342.00	602.00	833.00
	Without Indicator	72.00	90.00	124.00	165.00	181.00	260.00	336.00	593.00	821.00
Dimensions, in inches	End to end, Screwed	4 5/16	5 1/2	6						
	Face to face, Flanged	4 5/8	5	5 1/2	6	6 1/2	7	7 1/2	8 1/2	9 1/2
	Center to top of stem	9 3/4	11 1/2	13 3/4	14 1/2	16	18 1/4	20	25	30
	Diameter of wheel	4 1/2	6	7	7	8	9	9	10	12



Flanged
Valve
Without
Indicator

125-Pound Brass Gate Valves

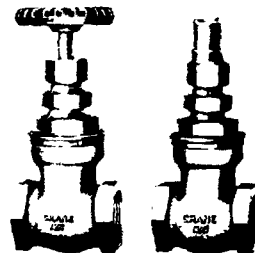
WORKING PRESSURES

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

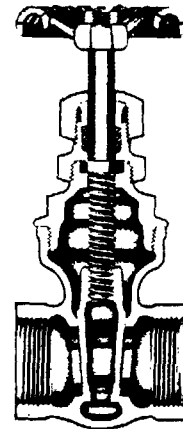
Nos. 440 and 438 furnished
with wheel unless ordered
"with Lock Shield".

An unusually fine as-
sortment of 125-Pound
Valves, offering a style
for every service or pref-
erence. All are ruggedly
constructed and propor-
tioned to assure long life.
Except for the wheel and
packing, all parts are
high grade brass.

Non-Rising Stem Wedge Disc

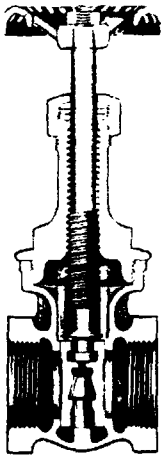


No. 438, Screwed
With Wheel With Lock Shield

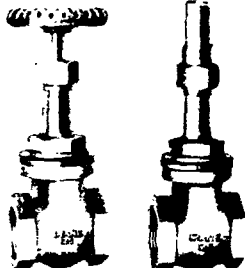


Cross Section
No. 438

Rising Stem Double Disc Parallel Seats

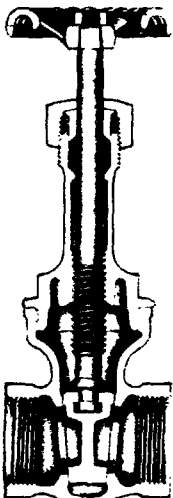


Cross Section
No. 440



No. 440, Screwed
With Wheel With Lock Shield

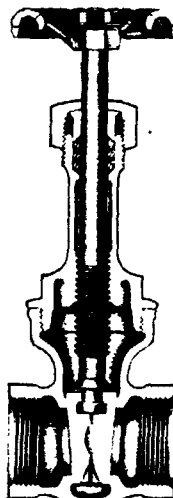
Rising Stem Solid or Double Wedge Disc



Cross Section
No. 428
Solid Wedge Disc



No. 428 or
No. 430
Screwed



Cross Section
No. 430
Double Wedge Disc

All of these valves, when wide open, can be repacked while under pressure. The Nos. 428, 430, and 438 have a gland in the stuffing box.

No. 440 Valves 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. 438 Valves are non-rising stem type and have a wedge disc; the wheel and stem turn but do not rise.

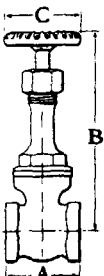
No. 428 Valves have a rising stem and a solid wedge disc, reversible in the body. The disc slips onto a strong head on the stem end; accurate guiding prevents contact at the seating surfaces until the valve is almost closed.

No. 430 Valves have a rising stem and a double wedge disc, reversible in the body. The disc, illustrated at right, 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.



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		
List Prices Each	No. 440	With Wheel, Rising, Double Disc											
		3.90	3.90	4.50	5.30	6.30	8.50	10.80	15.30	24.80	37.00		
		With Lock Shield, Rising, Double Disc											
				5.70	6.80	8.00	10.80	13.80	19.30				
	No. 438	With Wheel, Non-Rising, Wedge											
		4.30	4.30	5.00	5.90	7.00	9.40	12.00	17.00	27.60	41.00		
		With Lock Shield, Non-Rising, Wedge											
				6.20	7.40	8.80	11.70	15.00	21.00				
	No. 428, Rising, Solid Wedge Disc	4.30	4.30	5.00	5.90	7.00	9.40	12.00	17.00	27.60	41.00		
	No. 430, Rising, Double Wedge Disc	4.50	4.50	5.20	6.20	7.40	9.90	12.60	18.70	30.40	45.00		
Dimen- sions, in Inches	No. 440	A	1 5/8	1 3/4	1 7/8	2 1/8	2 1/2	2 13/16	3 1/16	3 1/2	4 1/16	4 9/16	
		B, open	4 1/8	4 1/8	4 3/4	5 5/8	6 7/8	8 1/4	9 3/8	11 5/8	14	16 1/4	
		B, with Lock Shield			4 3/8	5 5/8	6	7 3/8	8 7/8	11 1/4			
		C	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	
	No. 438	A	1 3/4	1 13/16	2	2 1/4	2 11/16	3	3 1/4	3 11/16	4 1/4	4 11/16	
		B	3 5/8	3 5/8	4	4 5/8	5 3/8	6 5/16	7 1/8	8 3/8	9 3/4	11 1/4	
		B, with Lock Shield			3 3/4	4 3/8	5 1/4	6 1/4	7 3/8	8 3/4			
		C	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	
	No. 428 or No. 430	A	1 3/4	1 13/16	2	2 1/4	2 11/16	3	3 1/4	3 11/16	4 1/4	4 11/16	
		B, open	4 7/8	4 7/8	5 1/4	6 1/4	7 5/8	9	10 1/2	12 5/8	14 7/8	17 1/2	
		C	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	



Keys for operating Lock Shield Valves page 139

Thread engagement page 47

150-Pound Brass Gate Valves

Wedge Disc

Non-Rising Stem

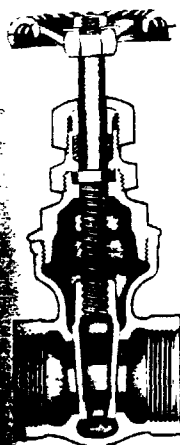
Rising Stem

WORKING PRESSURES

150 pounds saturated steam

Screwed valves—300 pounds cold water, oil, or gas, non-shock

Flanged valves—225 pounds cold water, oil, or gas, non-shock



Cross Section
Non-Rising Stem
No. 437



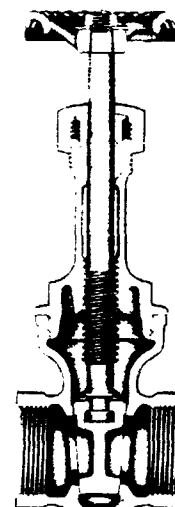
Non-Rising Stem
No. 437
Screwed



Rising Stem
No. 431
Screwed



Rising Stem
No. 429
Flanged



Cross Section
Rising Stem
No. 431

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 437, Screwed		4.70	4.70	5.50	6.50	7.70	10.30	13.20	18.70	33.00	49.00
No. 431, Screwed		4.70	4.70	5.50	6.50	7.70	10.30	13.20	18.70	33.00	49.00
No. 429, Flanged, F. & D.						26.00	30.00	37.00	62.00	85.00	103.00

Service recommendations: These valves are recommended for steam, water, oil, or gas where the service requires a heavier construction than found in "Standard" or 125-Pound Valves.

No. 437 Gate Valves: The No. 437 are non-rising stem valves. They are more massive and are heavier construction than the No. 438 125-Pound Wedge Disc Gate Valves, shown on page 16.

They have a gland in the stuffing box, and when wide open can be repacked while under pressure.

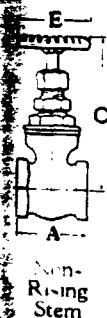
No. 431 and No. 429 Gate Valves: The No. 431 and No. 429 are rising stem valves. Their solid wedge

disc slips onto the stem, and is accurately guided in the body.

The valves have a gland in the stuffing box, and 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 if valves are ordered faced only.

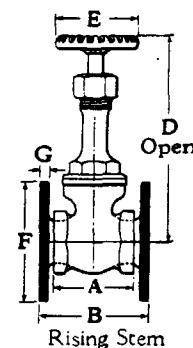
Full face gaskets should be used; see page 452.



Non-Rising Stem

Dimensions, in Inches

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	1 7/8	1 15/16	2 1/8	2 3/8	2 7/8	3 3/16	3 7/16	3 7/8	4 1/2	4 15/16
B					3 3/8	3 7/8	4 3/8	5 1/2	6 1/2	7 1/2
C	3 5/8	3 5/8	4	4 5/8	5 3/8	6 3/8	7 1/8	8 3/8	9 3/4	11 1/8
D	4 7/8	4 7/8	5 1/4	6 1/4	7 5/8	9	10 1/2	12 5/8	14 7/8	17 1/4
E	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8
F					4 1/4	4 5/8	5	6	7	7 1/2
G					3/8	13/32	7/16	1/2	9/16	5/8



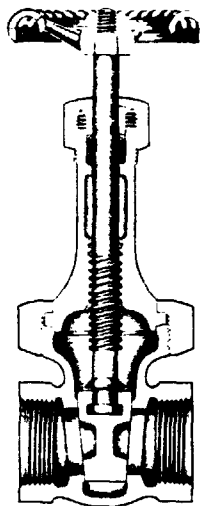
Rising Stem

Templates for drilling ... page 438

200-Pound Brass Gate Valves

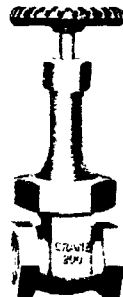
Wedge Disc — Rising Stem

3



Cross Section
No. 422
Crane Nickel Alloy Disc
Integral Seats

Integral Seats



No. 422
Screwed

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

TEST PRESSURE
600 pounds hydrostatic

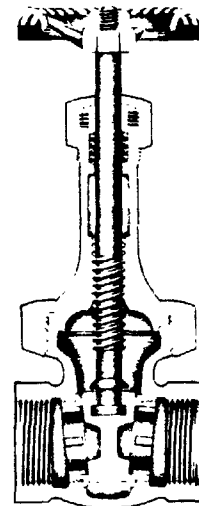
Air Tested

FEATURES
Union or Bolted Bonnet
Nickel Alloy Solid Wedge Disc
Nickel Alloy Renewable
Seats in No. 423 Valves
Slip-On Disc-Stem Connection
Interchangeable Parts

Renewable Seats



No. 423
Screwed



Cross Section
No. 423
Crane Nickel Alloy Disc
Crane Nickel Alloy Renewable Seats

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 422, Screwed, Integral Seats		6.10	6.10	7.30	8.70	12.10	15.50	19.40	30.00	57.00	77.00
No. 423, Screwed, Renewable Seats		8.00	8.00	9.30	11.30	15.50	20.00	25.00	37.00	65.00	96.00

No. 422 Valves: The No. 422 are high quality brass gate valves. Exceptionally sturdy and dependable, they will give excellent service on ordinary steam, water, oil, or gas lines.

The valves have a Crane Nickel Alloy Disc; the body seat rings are integral with the body.

No. 423 Valves: The No. 423 have renewable seats, but otherwise are similar to the No. 422. The renewable seats and the disc are Crane Nickel Alloy. The valves are particularly recommended for severe service on steam, water, oil, or gas lines.

Construction: These are inside screw, rising stem valves. 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.

All parts 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.

Materials: The body and bonnet are made of Crane

Special Brass, a high grade leaded tin bronze. The stem is made of brass. Crane Nickel Alloy, used for the seats and disc, is especially resistant to wear, being hard and tough.

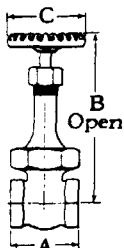
Bonnet construction: Sizes 2-inch and smaller have a union bonnet as shown above. 2 1/2 and 3-inch sizes have a compact, inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Crane gasket, as shown at the right. Both types provide a strong, tight joint, yet they can be easily dismantled 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 1/2-inch and larger are equipped with a gland.

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



CRANE

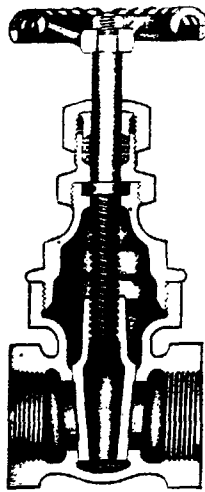


Dimensions, in Inches

Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	No. 422	1 3/4	2	2 1/4	2 9/16	2 7/8	3 3/16	3 1/2	4	4 11/16	5 1/4
	No. 423	1 15/16	2 1/16	2 3/8	2 3/4	3	3 3/8	3 3/4	4 5/16	5	5 11/16
B		3 7/8	4 1/4	5 3/8	6 5/8	7 3/4	9 1/8	10 1/4	12 1/2	15 1/8	17 1/2
C		1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	6

200-Pound Brass Gate Valves Wedge Disc

Non-Rising Stem



Cross Section
Non-Rising
Stem
No. 458



Non-Rising
Stem
No. 458
Screwed

WORKING PRESSURES

200 pounds steam, 500° F.

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

TEST PRESSURE

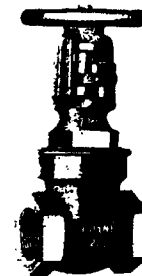
600 pounds hydrostatic

SERVICE RECOMMENDATIONS

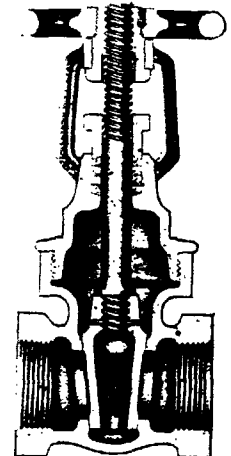
No. 458 and No. 459 Valves are recommended for severe service on steam, water, oil, or gas lines.

Outside Screw and Yoke

Underwriters' Pattern
Sizes 3/4 to 2-inch



Outside Screw
and Yoke
No. 459
Screwed



Cross Section
Outside Screw
and Yoke
No. 459

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 458, Non-Rising Stem		6.10	6.10	7.30	8.70	12.10	15.50	19.40	30.00	57.00	77.00
No. 459, Outside Screw and Yoke				16.80	18.20	21.00	26.00	32.00	48.00	68.00	107.00

These are sturdy, ruggedly constructed brass gate valves. 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.

No. 458 Non-Rising Stem Gate Valves: The No. 458 Gate Valves have a non-rising stem and a wedge disc. The body and disc are made of Crane Special Brass, a strong, hard, leaded tin bronze.

The stuffing box is equipped with a gland and is filled with a high quality packing.

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

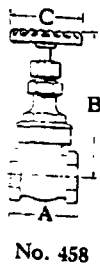
No. 459 Outside Screw and Yoke Gate Valves: The No. 459 Gate Valves are of the outside screw and

yoke type. Their body, bonnet, and wedge disc are made of Crane Special Brass.

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.

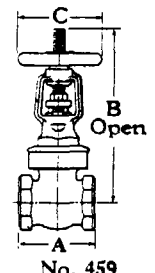
The stuffing box is equipped with a bolted gland and is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

Underwriters' Specifications: The No. 459 Gate Valves, in sizes 3/4 to 2-inch inclusive, conform to the Underwriters' Specification known as "The National Standard". They are listed as approved and inspected by the Associated Factory Mutual Fire Insurance Companies of Boston, and the Underwriters' Laboratories of Chicago.



No. 458

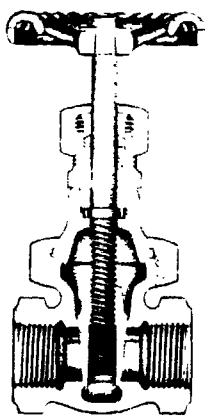
Dimensions, in Inches		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 458	A	2	2	2 3/8	2 5/8	3	3 1/2	4	4 3/4	5 3/8	6
	B	4 1/8	4 1/8	4 7/8	5 1/2	6 1/4	7 1/4	8 1/8	9 5/8	11 1/4	12 3/4
	C	2 1/16	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	6	7
No. 459	A			2 5/8	2 5/8	3	3 1/2	4	4 3/4	5 3/8	6
	B			6 3/8	6 3/8	7 3/8	8 3/4	9 3/4	11 5/8	13 3/8	16 1/8
	C			3 5/16	3 5/16	3 5/8	3 7/8	4 3/8	4 13/16	5 3/4	6 11/16



No. 459

300-Pound Brass Gate Valves

Wedge Disc—Non-Rising Stem



Cross Section
No. 624 E

Crane Nickel Alloy Disc
Integral Seats

Integral Seats



No. 624 E
Screwed

WORKING PRESSURES
300 pounds steam, 550° F.
Cold Water, Oil, or Gas, Non-Shock
2-inch and smaller—1000 pounds
2½ and 3-inch — 600 pounds

HYDROSTATIC TEST PRESSURES
2-inch and smaller—1500 pounds
2½ and 3-inch — 900 pounds

Air Tested

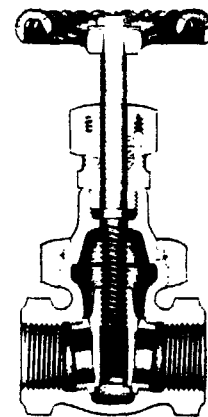
FEATURES
Union or Bolted Bonnet
Nickel Alloy Wedge Disc
Interchangeable Parts
Nickel Alloy Renewable Seats
in the No. 625 E Valve

Renewable Seats



No. 625 E
Screwed

Crane Nickel Alloy Disc
Crane Nickel Alloy Renewable Seats



Cross Section
No. 625 E

List Prices, Each

Size	Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
No. 624 E, Screwed, Integral Seats		9.70	9.70	11.30	13.60	17.00	28.00	36.00	50.00	77.00	108.00
No. 625 E, Screwed, Renewable Seats		12.80	12.80	14.70	17.70	21.80	37.00	46.00	62.00	89.00	124.00

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

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

No. 624 E Valves: The No. 624 E Valves have a Crane Nickel Alloy disc. The body seat rings are integral with the body.

No. 625 E Valves: The No. 625 E Valves have renewable seats, but otherwise are similar to the No. 624 E Valves. The renewable seats and the disc are made of Crane Nickel Alloy.

Construction: These valves are inside screw, non-rising stem type. They have unusually heavy metal sections and are ruggedly constructed. The 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.

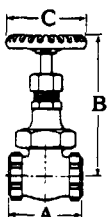
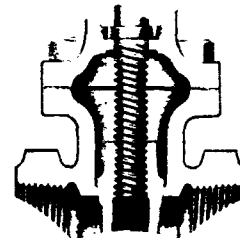
All parts are interchangeable. The bodies, however, are not interchangeable in a line, the No. 625 E having slightly longer end to end dimensions than the No. 624 E.

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

Bonnet construction: Sizes 1-inch and smaller have a union bonnet as shown in the illustrations above. Sizes 1¼-inch and larger have a compact, inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Cranite gasket, as shown in the illustration 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 ¾-inch and larger are equipped with a gland.

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



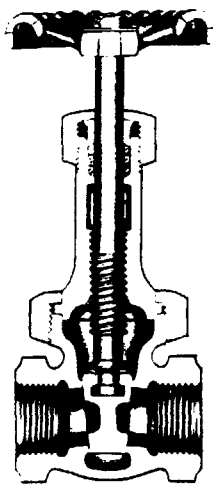
Dimensions, in Inches

Size		¼	⅜	½	¾	1	1¼	1½	2	2½	3
A	No. 624 E	11 ⁵ / ₁₆	21 ¹ / ₁₆	23 ³ / ₈	23 ³ / ₄	31 ³ / ₄	31 ¹ / ₂	33 ³ / ₄	45 ⁵ / ₁₆	53 ³ / ₁₆	58 ³ / ₈
	No. 625 E	21 ¹ / ₈	23 ¹ / ₁₆	21 ¹ / ₂	21 ⁵ / ₁₆	35 ¹ / ₁₆	31 ¹ / ₁₆	4	4 ⁵ / ₈	5 ¹ / ₂	6
B		3 ⁵ / ₈	4 ³ / ₈	41 ³ / ₁₆	5 ³ / ₈	6 ³ / ₈	7 ³ / ₁₆	8	91 ⁵ / ₁₆	10 ³ / ₈	11 ⁷ / ₈
C		21 ¹ / ₁₆	29 ⁹ / ₁₆	23 ³ / ₄	31 ¹ / ₁₆	38 ³ / ₈	41 ¹ / ₁₆	43 ³ / ₄	53 ³ / ₈	5 ³ / ₈	6

300-Pound Brass Gate Valves

Wedge Disc—Rising Stem

Integral Seats



Cross Section
No. 622 E

Crane Nickel Alloy Disc
Integral Seats



No. 622 E
Screwed

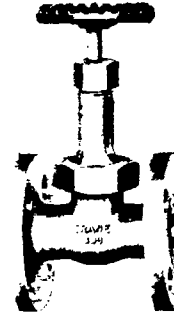
Valves	Working Pressures		
	Steam 550°F.	Cold Water, Oil, or Gas, Non-Shock	Hydrostatic Test Pressures
Screwed	1/4 to 2-inch	300 pounds	1000 pounds
	2 1/2 and 3-inch	300 pounds	600 pounds
Flanged	All sizes	300 pounds	500 pounds

Air Tested

FEATURES
Union or Bolted Bonnet
Nickel Alloy
Solid Wedge Disc
Nickel Alloy
Renewable Seats on
Nos. 623 E and 623 1/2 E
Slip-On
Disc-Stem Connection
Interchangeable
Parts

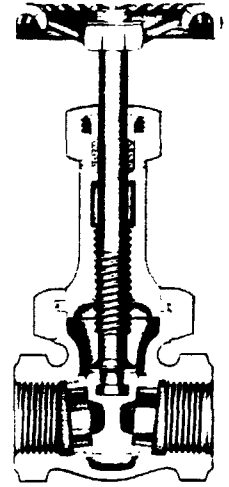


No. 623 E
Screwed



No. 623 1/2 E
Flanged

Renewable Seats



Cross Section
No. 623 E

Crane Nickel Alloy Disc
Crane Nickel Alloy Renewable Seats

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 622 E, Screwed, Integral Seats		9.70	9.70	11.30	13.60	17.00	28.00	36.00	50.00	77.00	108.00
No. 623 E, Screwed, Renewable Seats		12.80	12.80	14.70	17.70	21.80	37.00	46.00	62.00	89.00	124.00
No. 623 1/2 E, Flanged, F. & D., Renewable Seats						39.00	52.00	73.00	100.00	158.00	230.00

These valves are exceptionally durable and rugged and are ideal for high pressure service. Body ends are made with lugs, permitting a better wrench grip and presenting a distinctive appearance.

Construction: Except for the seats, the valves are similar. No. 622 E Valves have the seats integral with the body; No. 623 E and No. 623 1/2 E Valves 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 Brass, a high grade leaded tin bronze. Crane Nickel Alloy, used for the seats and disc, is especially resistant to wear, being very hard and tough.

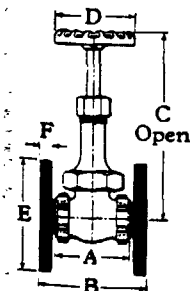
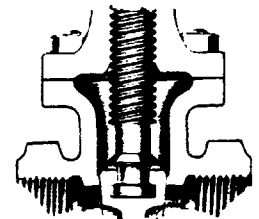
Bonnets: Sizes 1-inch and smaller have a union bonnet as shown above; larger sizes have a compact inside screw bolted bonnet, equipped with steel studs, brass nuts, and a Cranite gasket, as shown at the right.

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 3/8-inch and larger are equipped with a 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). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.



Dimensions, in Inches

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	No. 622 E	1 15/16	2 1/16	2 3/8	2 3/4	3 1/4	3 1/2	3 3/4	4 5/16	5 3/16
	No. 623 E	2 1/8	2 3/16	2 1/2	2 15/16	3 5/16	3 11/16	4	4 5/8	5 1/2
B					4 3/4	5 1/4	6	6 1/2	7 1/2	8
C		4 1/8	5 1/4	6	7 1/8	8 3/8	9 3/4	11	13 1/2	15 1/2
D		2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	5 3/8
E					4 7/8	5 1/4	6 1/8	6 1/2	7 1/2	8 1/4
F					1 9/32	5/8	1 1/16	3/4	1 3/16	2 9/32

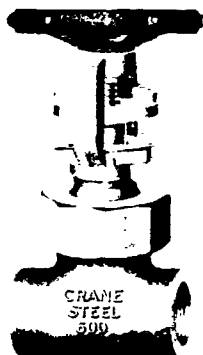
Templates for drilling ... page 438

Values for Marine Service ... page 384

Prices include drilling to the MSS 300-Pound Standard; no deduction made for valves ordered faced only. Full face gaskets should be used; see page 452.

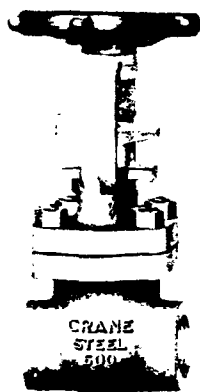
Crane Valves for High Pressures and High Temperatures

3



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

See page 223



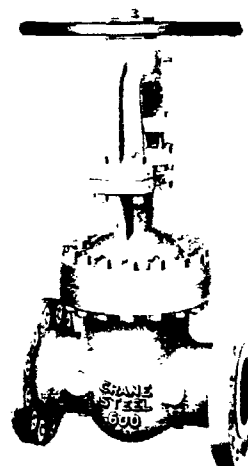
No. 3607 X
Cast Steel
Wedge Gate Valve
Bolted Bonnet
Screwed

See page 225

When gate valves are required for steam pressures above 300 pounds or temperatures exceeding 500° F., Crane Steel Gate Valves are recommended.

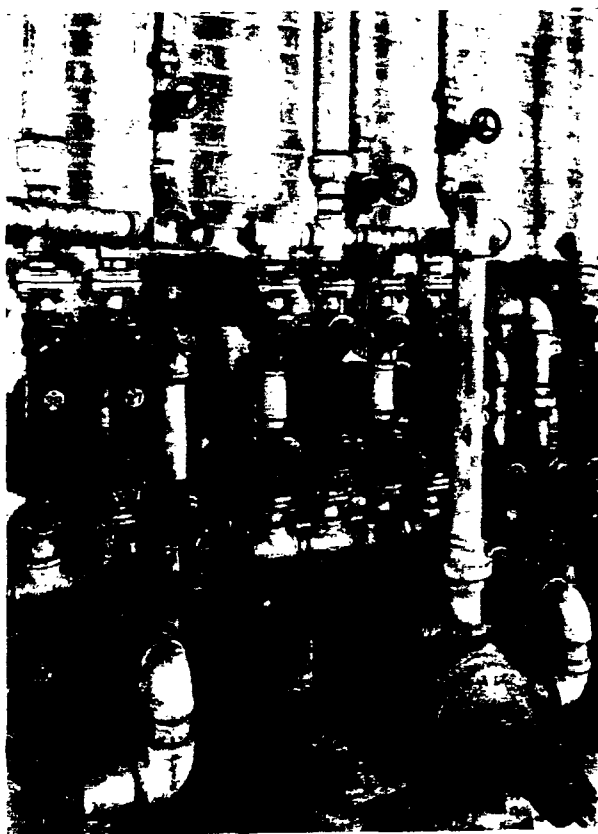
They are made in a wide range of sizes and types for all service conditions and include the new design Crane Pressure-Seal Bonnet Gate Valves, which utilize the pressure in the valve to seal the bonnet joint and are streamlined to conserve space. Valves with pressure-seal bonnets are especially recommended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

Crane Steel Gate Valves are described in detail on pages 209 to 215 and pages 221 to 232.

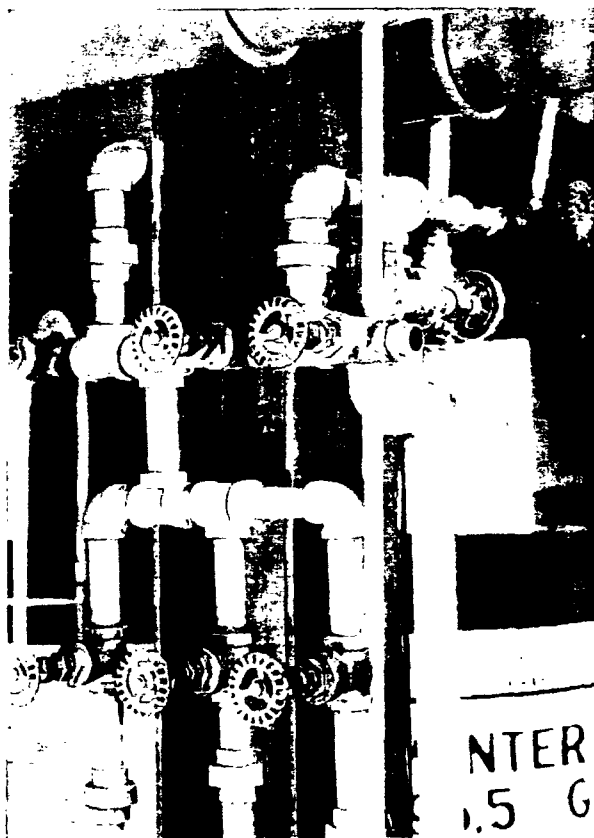


No. 76 X
Cast Steel
Wedge Gate Valve
Flanged

See page 229



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



Distilleries are important users
of Crane Brass Gate Valves.

Brass Globe and Angle Valves

4

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 31 to 33
300-Pound.....	pages 34, 35 and 39
2000-Pound Hydraulic.....	page 40
2500-Pound Hydraulic Globe.....	page 41
With Lock Shield.....	page 25
A.A.R. Globe and Angle Valves.....	pages 36 and 37
A.A.R. Valve Parts.....	page 38
Cab Hose Valves.....	page 38
Globe and Angle Needle Point Valves.....	pages 26 and 27
Globe and Angle Valves for Light Oils and Gases.....	page 30
Vent or Sampling Valve for Transformer Oil Service.....	page 30

The Crane line of Brass Globe and Angle Valves offers a size, style, and weight for every commercial requirement, and in addition, includes in most pressure classifications, a variety of designs that covers all service conditions.

Distinct advantages accrue to the user who standardizes on Crane: a complete assortment, making it possible to select a valve exactly suited for each particular operating requirement; traditionally high quality — quality that results in more efficient service over a longer period of use; uniformity — in design, appearance, and performance.

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

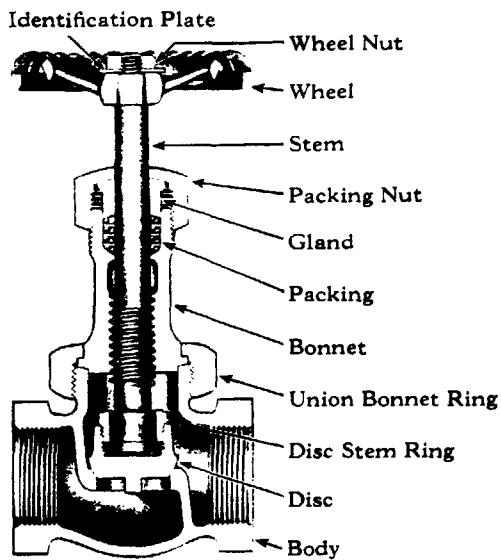
Brass Gate Valves.....	pages 13 to 21
Brass Check and Foot Valves.....	pages 43 to 52
Brass Lever-Operated Quick-Opening Valves.....	pages 54 to 57
Brass Hose Valves.....	pages 60 and 61
Brass Radiator Valves.....	page 58

* * * * *

The lists shown above do not include all Crane Brass Valves. Brass Valves 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.

Brass Globe and Angle Valves

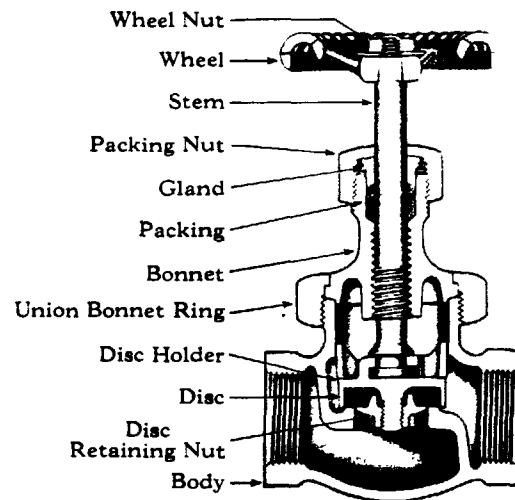
Names of Parts



Above

Union Bonnet Globe Valve
with Metal Disc

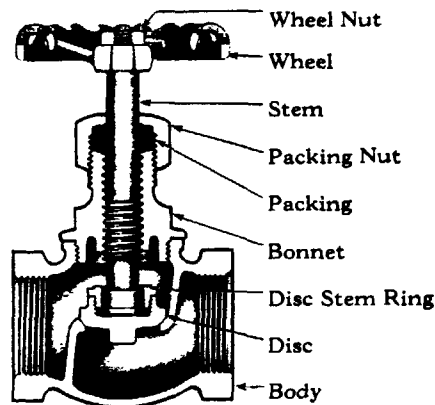
No. 362 E, page 34



Below

Screwed Bonnet
Globe Valve

No. 1, page 26



Below

Union Bonnet Globe Valve
with
Metal Disc and Renewable Seat

No. 382 P, page 35

Above

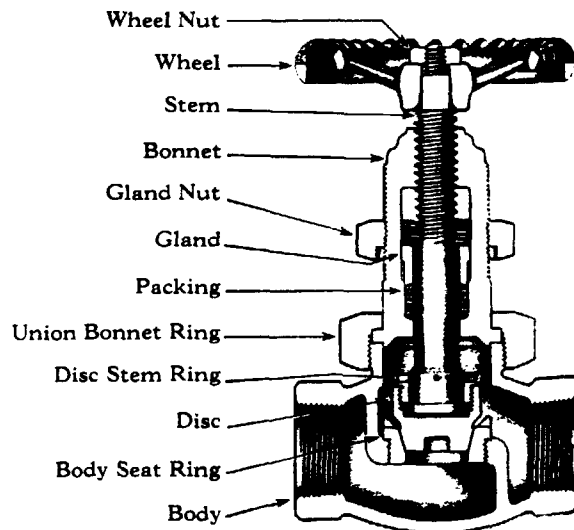
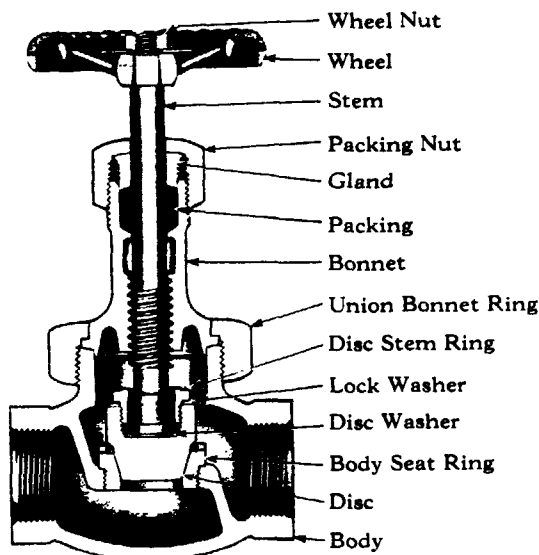
Union Bonnet Globe Valve
with Composition Disc

No. 7, page 28

Below

Union Bonnet Globe Valve
Outside Screw and Yoke
A.A.R. Design
with
Metal Disc and Renewable Seat

No. 396 P, page 37



100-Pound Brass Globe and Angle Valves

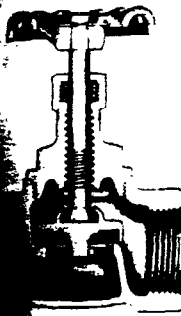
With Composition Disc

With Brass Disc

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.



Cross Section
No. 1240
Globe, Screwed



No. 1240
Globe
Screwed



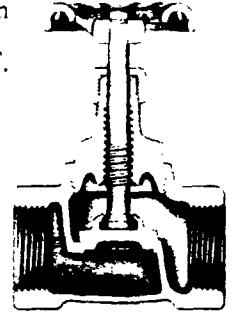
No. 1241
Angle
Screwed



No. 1250
Globe
Screwed



No. 1251
Angle
Screwed



Cross Section
No. 1250
Globe, Screwed

Composition Disc Valves With Lock Shield



No. 1240
Globe
Screwed



No. 1241
Angle
Screwed

No. 1240 and No. 1241 Valves are regularly furnished with a wheel and lock shield. When these valves are ordered with lock shield, specify directly above, must so specify.

Especially recommended for domestic water or steam heating systems, for piping on equipment operated at low pressures, and similar services.

No. 1240 and No. 1241 Valves have a composition disc. No. 1250 and No. 1251 Valves have a brass disc. In other respects, the two types of valves are similar.

Composition disc valves: The composition disc valves are regularly supplied with a No. 12 Disc. Suitable for 150 pounds hot or cold water (maximum temperature 200° F.) and for domestic gas service. When ordered, they will be furnished with a No.

List Prices, Each

Size		Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Composition Disc	No. 1240 Globe	With Wheel	2.10	2.10	2.20	2.90	3.90	5.50	7.00	9.60	15.00
		*With Lock Shield		2.60	2.70	3.60	4.90	6.90	8.70		
	No. 1241 Angle	With Wheel	2.10	2.10	2.20	2.90	3.90	5.50	7.00	9.60	15.00
		*With Lock Shield		2.60	2.70	3.60	4.90	6.90	8.70		
Brass Disc	No. 1250, Globe				2.05	2.60	3.40	4.70	6.10	8.60	12.70
	No. 1251, Angle				2.05	2.60	3.40	4.70	6.10	8.60	12.70

Service recommendations: This new line of 100-Pound Brass Globe and Angle Valves combines wide utility with moderate cost. The valves are well proportioned and sturdily constructed. They offer ample strength and durability for any low pressure installations, and

are 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 140.

Brass disc valves: The 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.

Construction: All of these valves have long hexagons on the body, which 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 3/8 and 1/2-inch brass disc valves which have the stem and disc integral. The stuffing box is amply deep to prevent leakage at the stem.

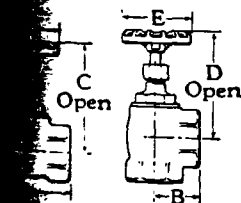
Other 100-Pound Brass Valves: Crane manufactures a complete assortment of 100-Pound Brass Valves. For screwed end gate valves, see page 15; for check valves, page 45; and for solder-joint gate, globe, angle, and check valves, pages 402 and 403.

Dimensions, in Inches

Size		1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
A	No. 1240	1 7/8	1 7/8	2	2 3/8	2 3/4	3 1/4	3 7/8	4 1/4	5
	No. 1241	7/8	7/8	1 5/16	1 1/8	1 5/16	1 1/2	1 13/16	2	2 1/4
B	No. 1240	2 3/4	2 3/4	2 7/8	3 1/2	4	4 1/2	4 7/8	5 1/2	6
	No. 1240, with lock shield		2 3/4	2 3/4	3 1/4	3 5/8	4 1/8	4 1/2		
C	No. 1250			3	3 1/2	4 1/8	4 3/4	5	5 5/8	6 1/4
	No. 1241	2 1/2	2 1/2	2 3/8	3 1/8	3 3/4	4 1/4	4 5/8	5 1/4	5 7/8
D	No. 1241, with lock shield		2 1/4	2 1/2	2 7/8	3 3/8	3 7/8	4 1/4		
	No. 1251			2 5/8	3 1/4	3 7/8	4 3/8	4 7/8	5 3/8	6 1/8
E		1 1/2	1 1/2	1 1/2	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8

Keys for Lock Shield Valves . . . page 139

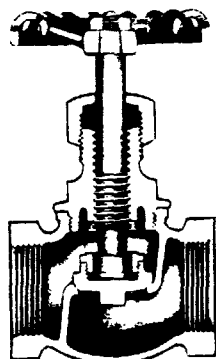
Composition Discs . . . page 140



Angle

Composition Disc or
Brass Disc Valves

125-Pound Brass Globe and Angle Valves Brass Disc



Cross Section
No. 1, 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.



No. 1, Globe
Screwed



No. 2, Angle
Screwed

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
No. 1, Globe or No. 2, Angle		2.10	2.10	2.40	3.40	4.50	6.20	8.00	11.30	17.50	25.50	38.00

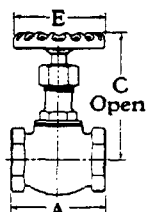
Construction: The valves are sturdy and unusually well constructed. They are heavier and more rugged than is usual with "Standard" or 125-Pound Valves. All parts are liberally proportioned to assure a high factor of safety against pressure, operating strains, and expansion and contraction of the piping.

The disc in sizes 1/8 to 1/2-inch is integral with the

stem. In the larger sizes, the disc swivels on the stem as shown in the cross section above.

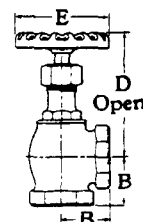
Repacking: These valves, when wide open, can be repacked while under pressure. The stuffing box on 2 1/2 and 3-inch sizes is fitted with a gland.

Flanged valves: When flanged valves are needed, use the No. 71 Globe or Angle; see page 32.

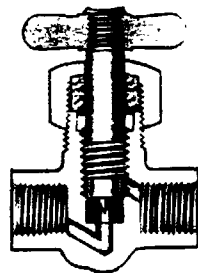


Dimensions, in Inches

Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	1 7/16	1 5/8	1 7/8	2 3/16	2 11/16	3 3/16	3 11/16	4 3/16	5 1/8	6 1/16	7 1/16
B	3/4	1 3/16	1 5/16	1 1/8	1 3/8	1 5/8	1 13/16	2 1/16	2 1/2	3 1/16	3 11/16
C	2 3/4	3	3 1/4	3 3/4	4 1/4	4 7/8	5 3/8	6 1/4	7 3/8	7 1/2	9 1/4
D	2 5/8	2 7/8	3 1/8	3 5/8	4 1/4	4 3/4	5 3/8	6 1/8	7 3/8	7 7/8	9 1/4
E	1 1/2	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	6



Brass Needle Air Valve

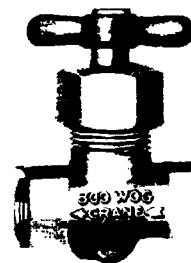


Cross Section
No. 57

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

List Price and Dimensions

Size	Inches	3/8
Price	Each	3.40
Diameter of seat opening	Inches	1/8
End to end	Inches	2 5/16
Center to top of stem, open	Inches	2 1/2



No. 57
Needle Air Valve

Service recommendations: The No. 57 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.

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.

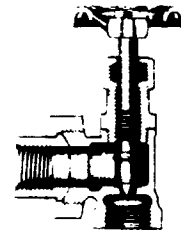
The valve has an extra thick fibre seat that can be easily renewed should it become worn.

Needle Point Brass Globe and Angle Valves

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

List Prices, Each

Size	Inches	1/8	1/4	3/8	1/2	3/4
No. 85, Angle, with union		3.10	3.50	4.20	5.40	6.70
No. 88, Globe		2.30	2.50	2.70	3.20	4.50
No. 89, Angle		2.40	2.60	3.00	3.70	5.00



Cross Section
No. 85, Angle, Screwed
With Female Union Outlet



No. 88
Screwed



No. 89
Angle, Screwed

Recommendations: Crane Needle Point valves are especially suitable where very close and accurate regulation of flow is desired.

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

Construction: The valves are compact and unobtrusively rugged. They have a brass stem. The

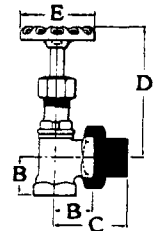
stuffing box is large and on the 3/4-inch size is equipped with a gland.

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

Seat opening: The diameter of the seat opening in these valves is shown in the dimension table below. The 1/8-inch size has nominal seat opening; larger sizes have reduced seat opening.

Dimensions, in Inches

Size	1/8	1/4	3/8	1/2	3/4
A	1 3/16	1 9/16	1 13/16	2 1/16	2 5/16
B	5/8	13/16	7/8	1 1/16	1 1/4
C	1 5/16	1 9/16	1 3/4	2	2 3/16
D — Open	2 3/8	2 3/8	2 3/4	3 1/8	4
E	1 1/2	1 1/2	1 3/4	2 1/16	2 9/16
Diameter of seat opening	1/8	3/16	1/4	5/16	7/16



Hose Valves



No. 117
Angle Hose Valve
With Cap and Chain

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

See pages 59 to 61

Solder-Joint Valves

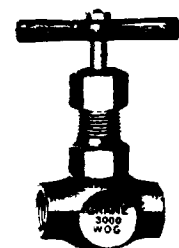


No. 1310
Globe Valve
Solder-Joint

Newly designed 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 3/8 to 2-inch.

See pages 402 and 403

Steel Valves



No. 222 H
Steel Bar Stock Valve
Globe, Female

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 1/8 to 1-inch.

See page 234

150-Pound Brass Globe and Angle Valves

No. 1 Cranite Composition Disc

WORKING PRESSURES

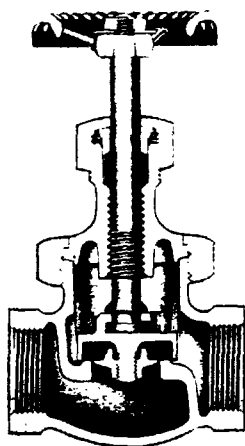
Screwed valves—150 pounds saturated steam
300 pounds cold water, oil, or gas, non-shock
Flanged valves—150 pounds saturated steam
225 pounds cold water, oil, or gas, non-shock

FEATURES

No. 1 Cranite Composition Disc
Suitable for Many Fluids — Quick to Repair
Union or Bolted Bonnet

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. They are especially suited for use in installations where the discs must be renewed quickly. All parts are unusually rugged, to withstand severe operating strains.



Cross Section
No. 7, Globe



No. 7, Globe
Screwed



No. 7, Angle
Screwed



No. 9, Globe
Flanged



No. 9, Angle
Flanged

On orders, specify whether globe or angle type is wanted.

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
No. 7, Globe or Angle, Screwed		3.30	3.30	4.10	5.20	7.20	9.80	13.40	16.70	27.00	49.00	69.00
No. 9, Globe or Angle, Flanged, F. & D.							26.00	33.00	40.00	60.00	91.00	126.00

For list prices of Composition Discs, see page 140.

Quick repairs: A leak can be quickly repaired by replacing the disc holder with an extra complete disc holder and disc. A new disc can be placed in the original holder, at the convenience of the engineer. Users should keep on hand a supply of extra disc holders and discs for this purpose.

Sizes 2-inch and smaller have a slip-on disc holder (see cross-section above). Larger sizes have the disc and stem fastened with a disc stem ring (see illustration at right).

Bonnet construction: Sizes 2-inch and smaller have a union bonnet as shown in the illustrations at the top of the page.

Larger sizes have a bolted bonnet, inside screw, as shown at the right. Both types provide a strong, tight joint, yet they can be easily dismantled and

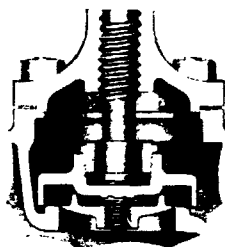
reassembled without danger of injuring the valve.

Discs: 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. See page 140 for discs.

Stuffing box: The stuffing box is deep and is equipped with a gland.

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

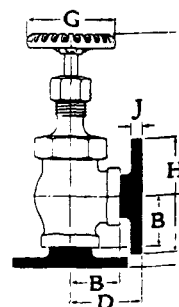
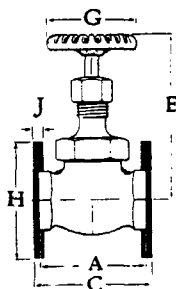
Flanged valves: End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1946). They are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Prices include drilling; no deduction is made if valves are ordered faced only. Full face gaskets should be used; see page 452.



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
A	2	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4	6 3/4	8
B	1 5/16	1 5/16	1 11/16	1 1/4	1 7/16	1 11/16	2	2 3/16	2 11/16	3 1/4	3 13/16
C						4 3/8	4 13/16	5 1/2	6 1/2	7 1/2	8 7/8
D						2 9/16	2 7/8	3 3/16	3 3/4	4 5/16	4 5/8
E — Open	3 3/4	3 3/4	4 5/16	4 3/4	5 3/8	6 1/16	6 3/4	7 9/16	8 5/8	10 1/2	11 13/16
F — Open	3 5/8	3 5/8	4 3/16	4 5/8	5 1/4	5 5/16	6 5/8	7 5/16	8 3/8	10 3/8	11 9/16
G	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	7	8
H						4 1/4	4 5/8	5	6	7	7 1/2
J						3/8	13/32	7/16	1/2	9/16	5/8

Templates for drilling page 438



150-Pound Brass Globe and Angle Valves

Plug Type Disc

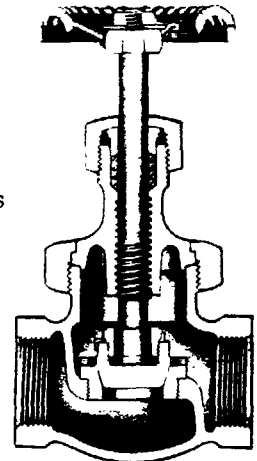
WORKING PRESSURES
 150 pounds saturated steam
 300 pounds cold water, oil, or gas, non-shock



FEATURES
 Surface Hardened Stainless Steel Seating Surfaces
 Plug Type Disc—Renewable Body Seat Ring
 Union or Bolted Bonnet

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.



Cross Section
No. 14 1/2 P, Globe

List Prices, Each

Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 16 1/2 P	5.40	5.40	6.70	7.60	9.50	12.50	17.80	24.00	35.00	63.00	94.00

disc valves for moderate pressures: These valves are often used on much lower pressures in order to secure the better seat construction 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 plug type disc that will stand up under extremely severe operating conditions. For severe and exacting service, moderate pressures, such as throttling, boiler feed, frequent operation, etc., they afford abundant seat life without the added cost of a high pressure valve.

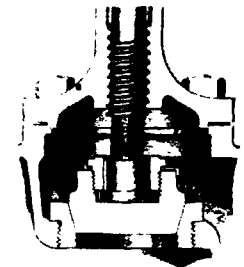
Seat: The valves have a plug type disc whose excellent design characteristics for service are well known. The wide seating surface is not easily ruined by foreign matter or by erosion, and the tapered disc permits close shut-off of flow when throttling.

Disc and seat are Crane Hardened Stainless Steel. The surface of the seating area having a minimum of 500 Brinell. The design of the disc and seat, combined with the natural resistance of stainless steel to corrosion and the excellent resistance offered

by the high hardness to erosion, galling, and scoring, produce a truly superior seat. It will withstand severe operating conditions unusually well.

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 the illustrations above; 2 1/2 and 3-inch sizes have a low-type, compact bolted bonnet, inside screw, 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.



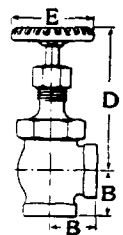
Stuffing box: The stuffing box is large and deep and is equipped with a gland. It is filled with high grade packing.

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

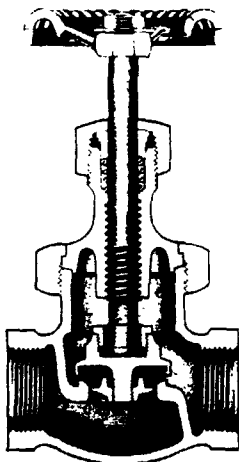
Dimensions, in Inches

Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	2	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4	6 3/4	8
B	1 5/16	1 5/16	1 11/16	1 1/4	1 7/16	1 11/16	2	2 3/16	2 11/16	3 1/4	3 13/16
C - Open	4	4	4 1/2	5	5 3/4	6 3/4	7	8	9 1/8	10 1/2	11 7/8
D - Open	3 7/8	3 7/8	4 3/8	4 7/8	5 5/8	6 1/2	6 3/4	7 3/4	8 7/8	10 3/8	11 5/8
E	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	7	8

Valves for Marine Service . . . page 384



Brass Globe and Angle Valves For Light Oils and Gases



Cross Section, No. 207
Globe, Screwed
Union Bonnet
With Cranoil Disc

400 pounds oil, air, gas, or gasoline working pressure, 250° F.

Air Tested

SERVICE 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.

The valves 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.

These valves have the tight, easy seating No. 5 Cranoil Disc.

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 207 or No. 209		5.80	6.20	6.70	8.70	12.80	16.00	22.00	32.00

Construction: These valves are ruggedly constructed. Sizes 1/4 and 3/8-inch have a slip-on disc holder; larger sizes have the disc and stem fastened with a disc stem ring as shown in the cross section.

The union bonnet provides a strong, tight joint that can be easily dismantled or reassembled without danger of injury to the valve.

Disc and seat: The No. 5 Cranoil Disc, a specially fabricated material, will not swell, harden, or break down. It is permanently cemented into the disc holder, eliminating seepage. See page 140 for description.

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

Stuffing box: Stuffing boxes are equipped with a gland and are filled with high grade packing.

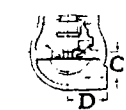
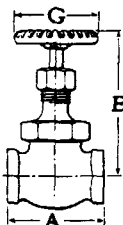
Boss on globe body: Globe valve bodies 1/4-inch and larger have a boss cast on one side. When ordered tapped, or with a No. 211 Valve for transformer oil service (shown below), the boss is drilled and tapped with a 1/4-inch pipe thread without extra charge.



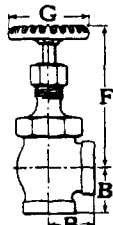
No. 207, Globe
Screwed



No. 209, Angle
Screwed



Boss on body of globe valve, sizes 1/4-inch and larger only.



Dimensions, in Inches

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
A	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4
B	1 5/16	1 1/16	1 1/4	1 7/16	1 11/16	2	2 3/16	2 11/16
C						1 5/16	1 1/8	1 1/2
D						1 7/16	1 1/2	1 3/4
E—Open	3 3/4	4 3/8	5	5 3/4	6 5/8	7 1/2	8 3/8	9 3/8
F—Open	3 5/8	4 1/4	4 7/8	5 5/8	6 1/2	7 3/8	8 1/8	9 1/8
G	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4

Wherever conditions permit, these valves should be installed with the pressure under the disc.

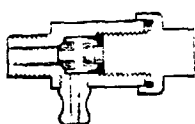
An arrow cast on the body indicates the direction of flow.

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	1/4
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 Brass Globe and Angle Valves Plug Type or No. 4 Cranite Disc

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

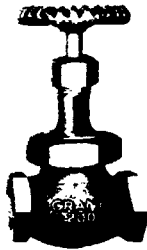
600 pounds hydrostatic

FEATURES

Plug Type Disc or
No. 4 Cranite Composition Disc
Renewable Body Seat Ring
Union or Bolted Bonnet



ion. Globe
Type Disc



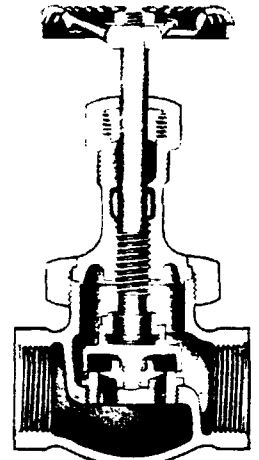
Globe, Screwed

No. 212 P — With Plug Type Disc
No. 212 C — With No. 4 Cranite Disc



Angle, Screwed

No. 214 P
No. 214 C



Cross Section, Globe
With No. 4 Cranite Disc

List Prices, Each

Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Globe or No. 214 P, Angle	6.00	7.40	8.50	10.60	13.80	19.70	27.00	39.00	70.00	104.00
Globe or No. 214 C, Angle	5.40	6.70	7.60	9.50	12.50	17.80	24.00	35.00		

For list prices of Composition Discs, see page 140.

Construction: These valves are ruggedly built, the body being made of Crane Special high grade leaded tin bronze. Except for the disc, the valves are similar; a metal plate wheel nut identifies the type of disc.

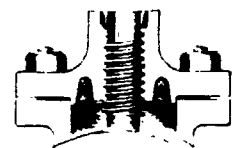
Disc valves: The Nos. 212 P and 214 P are recommended for severe services such as for and for blow-off, boiler feed, soot blower, drain lines.

The type disc and seat are designed for exactness. The wide seating surface is not easily fouled by foreign matter or wire drawing and the disc permits close regulation of flow when closed. Made of Crane Hardened Stainless Steel, the surface of the seating area having a hardness of 400, the disc and seat offer high resistance to wear, erosion, galling, and scoring.

Disc valve: The Nos. 212 C and 214 C can be utilized for a wide range of fluids when equipped with the proper disc. They are especially recommended for installations where the discs must be easily renewed.

Discs: The 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 300 pounds and 200° F., especially for frequent operation or easy seating, a No. 6 Disc is preferred to the No. 4. See page 140 for discs. The body seat ring is Crane Nickel Alloy.

Bonnet: Sizes 2-inch and smaller have a union bonnet as shown above; 2 1/2 and 3-inch sizes have a bolted bonnet, inside screw as illustrated at the right. Both types provide a strong, tight joint, yet they can be easily dismantled and reassembled without danger of injury to the valve.



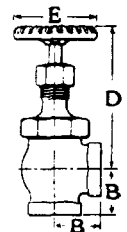
Stuffing box: The stuffing box is equipped with a gland and is unusually deep. It is filled with high grade packing.

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

Dimensions, in Inches

Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A		2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4	7 1/4	8 1/4
B		1 5/16	1 1/8	1 1/4	1 7/16	1 11/16	2	2 3/16	2 11/16	3 3/8	4 1/8
C	Open	No. 212 P	3 15/16	4 1/2	5 1/16	5 3/4	6 5/16	7 1/4	8 5/16	9 1/2	10 3/4
		No. 212 C	4	4 5/8	5 1/8	5 3/4	6 1/2	7 3/8	8 3/8	9 1/2	
D	Open	No. 214 P	3 15/16	4 3/8	4 15/16	5 5/8	6 3/16	7 1/8	8 3/16	9 1/4	9 3/4
		No. 214 C	4	4 1/2	5	5 5/8	6 3/8	7 1/4	8 1/4	9 1/4	
E		1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 3/8	4 1/16	5 3/8	7	8

Values for Marine Service . . . page 384



200-Pound Brass Globe and Angle Valves

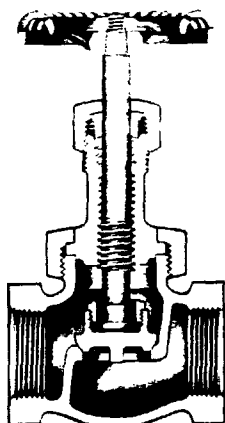
Regrinding

WORKING PRESSURES

Screwed valves — 200 pounds steam, 500° F.
 — 400 pounds cold water, oil, or gas, non-shock
 Flanged valves — 150 pounds steam, 500° F.
 — 225 pounds cold water, oil, or gas, non-shock

TEST PRESSURES

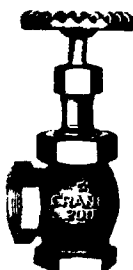
Screwed valves — 600 pounds hydrostatic
 Flanged valves — 450 pounds hydrostatic



Cross Section
No. 70, Globe

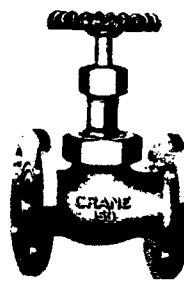


No. 70, Globe
Screwed

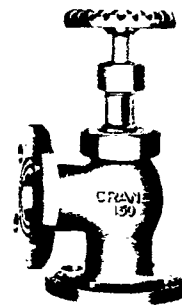


No. 70, Angle
Screwed

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



No. 71, Globe
Flanged



No. 71, Angle
Flanged

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
No. 70, Globe or Angle, Screwed		2.70	2.70	3.40	4.40	5.70	8.30	11.20	14.80	22.50	37.00	55.00
No. 71, Globe or Angle, Flanged, F. & D.							19.00	22.00	29.00	41.00	61.00	94.00

Service recommendations: These valves are well suited for service on steam, water, oil, or gas lines.

Material: The body is made of Crane Special Brass, a strong, hard, leaded tin bronze.

Regrinding: These 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 a valve is being reground, the ring centers and guides the valve trimmings.

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

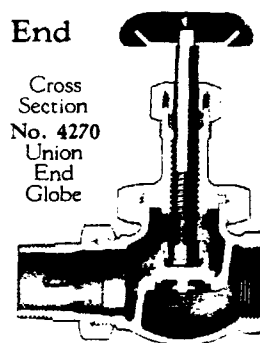
Stuffing box; repacking: The stuffing box is deep and is filled with high grade packing. Sizes 1/2-inch and larger are equipped with a gland; 1/8, 1/4, and 3/8-inch valves do not have a gland. These valves, when wide open, can be repacked while under pressure.

Flanged valves: End flanges conform to the MSS 150-Pound SP Bronze Flange Standard (No. SP-2-1046). 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 valves are ordered faced only. Full face gaskets should be used; see page 451.

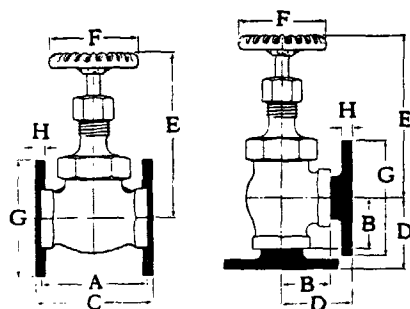
Valves with Union End

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

The valves are made in sizes 3/8 to 1-inch; see page 58.



Cross
Section
No. 4270
Union
End
Globe



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
A	1 11/16	1 11/16	1 15/16	2 1/4	2 3/4	3 5/16	3 7/8	4 1/2	5 1/4	6 5/16	7 1/4
B	1 3/16	1 3/16	1	1 3/16	1 3/8	1 11/16	1 15/16	2 1/4	2 5/8	3 3/16	3 13/16
C						4 3/16	4 9/16	5 5/16	6	6 3/4	7 15/16
D						2 5/8	2 7/8	3 3/16	3 3/4	4 5/16	4 5/8
E — Open	3 1/2	3 1/2	3 7/8	4 1/4	5	5 3/4	6 3/8	7 1/8	8 3/8	9 1/4	11
F	1 3/4	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	6	7
G						4 1/4	4 5/8	5	6	7	7 1/2
H						3/8	13/32	7/16	1/2	9/16	5/8

Templates for drilling, page 438. Valves for Marine Service, page 384.

200-Pound Brass Globe and Angle Valves

Bolted Bonnet

WORKING PRESSURES

Screwed valves — 200 pounds steam, 500° F.
 — 400 pounds cold water, oil, or gas, non-shock
 Flanged valves — 150 pounds steam, 500° F.
 — 225 pounds cold water, oil, or gas, non-shock

TEST PRESSURES

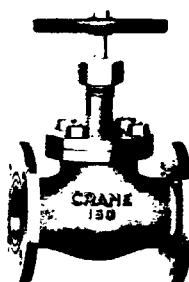
Screwed valves — 600 pounds hydrostatic
 Flanged valves — 450 pounds hydrostatic



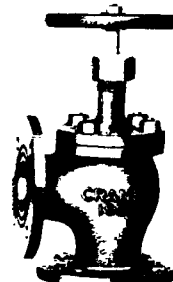
No. 4196, Globe
Screwed



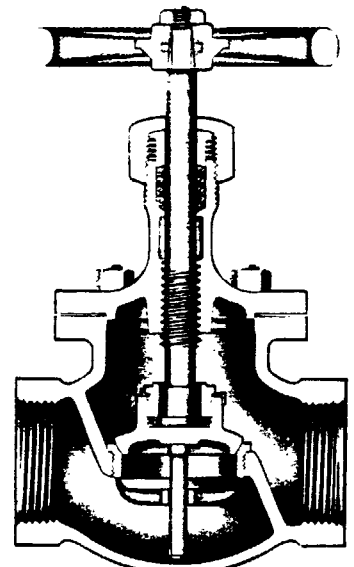
No. 4198, Angle
Screwed



No. 4197, Globe
Flanged



No. 4199, Angle
Flanged



Cross Section
No. 4196, Globe

Sizes 3 1/2-inch and larger have outside stem threads and a bolted gland (not illustrated).

List Prices, Each

Inches	1 1/2	2	2 1/2	3	3 1/2	4	5	6
For No. 4198, Screwed	41.00	55.00	76.00	105.00				
For No. 4199, Flanged, F. & D.	54.00	68.00	111.00	132.00	221.00	282.00	402.00	553.00

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

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

Sizes 1/2-inch and smaller have inside stem threads, a packing nut, and a gland, as illustrated. Sizes 3/4-inch and larger have outside stem threads and a crosshead type yoke and a one-piece bolted end flange (not illustrated).

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

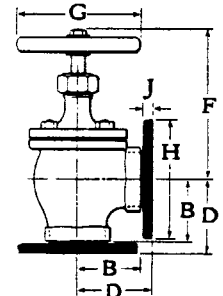
Stuffing box: The stuffing box is unusually deep and is filled with high grade packing.

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 452.

Dimensions, in Inches

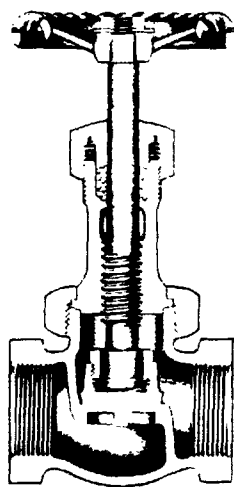
Size	1 1/2	2	2 1/2	3	3 1/2	4	5	6
A	5 5/16	6	7 1/4	8 1/4				
B	2 11/16	3	3 5/8	4 1/8				
C	5 7/8	6 7/8	8	9 1/8	10 3/8	11	12 1/4	14
D	3 1/8	3 3/4	4 1/4	4 5/8	5 1/4	5 1/2	6 1/4	7
E—Open	8	9 1/4	11	12 3/8	12 1/4	13 3/4	16 1/2	18 1/8
F—Open	7 1/2	8 15/16	10 1/2	11 3/4	11 1/4	12 1/2	15	16 1/4
G	4 1/16	5 3/8	7	8	9	10	10	12
H	5	6	7	7 1/2	8 1/2	9	10	11
J	7/16	1/2	9/16	5/8	11/16	1 1/16	3/4	13/16



Templates for drilling... page 438

Valves for Marine Service... page 384

300-Pound Brass 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 Brass, 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

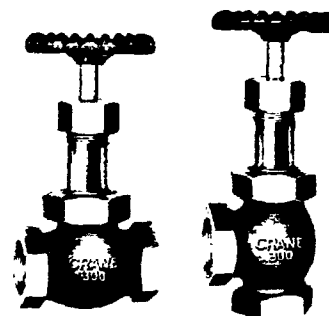
the stem materially lengthens the life of both the stem and the bonnet. In addition to making a sturdy, tight joint, the union bonnet construction facilitates dismantling and reassembling the valve. The union ring reinforces the bonnet joint, and when the valve is being reground, it centers and guides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

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

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

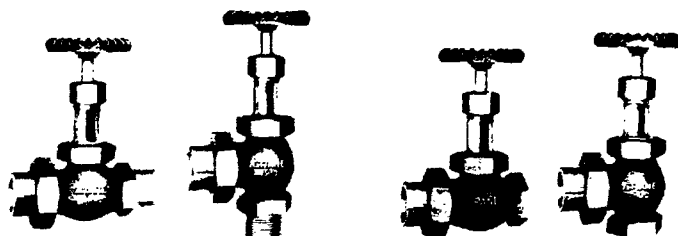
Repacking: These valves, when wide open, can be repacked while under pressure.

Valves with union end: All parts, except the bodies, of the union end valves illustrated at the left are interchangeable with the corresponding parts of the No. 362 E Globe and No. 364 E Angle Valves shown above. Prices and dimensions are included in the table below.



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

Valves with Female Union Outlet



With Male Inlet
No. 1834
Globe No. 1835
Angle

With Female Inlet
No. 1836
Globe No. 1837
Angle

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

Both ends are the same size.

List Prices and Dimensions

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

300-Pound Brass Globe and Angle Valves Plug Type Disc



No. 382 P, Globe
Screwed



No. 384 P, Angle
Screwed



No. 383 P, Globe
Flanged



No. 385 P, Angle
Flanged

WORKING PRESSURES

300 pounds steam, 550° F.

Cold water, Oil, or Gas, Non-shock

Screwed — 2-inch and smaller — 1000 pounds

2½ and 3-inch — 600 pounds

Flanged — All sizes — 500 pounds

HYDROSTATIC TEST PRESSURES

Screwed — 2-inch and smaller — 1500 pounds

2½ and 3-inch — 900 pounds

Flanged — All sizes — 900 pounds

Air Tested

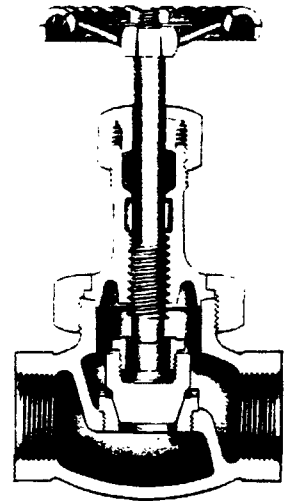
FEATURES

Surface Hardened

Stainless Steel Seating Surfaces

Plug Type Disc — Renewable Body Seat Ring

Union or Bolted Bonnet



Cross Section
No. 382 P
Globe

List Prices, Each

Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
No. 382 P or No. 384 P, Screwed	7.20	7.80	9.60	13.30	18.40	24.00	31.40	48.00	81.50	126.00
No. 383 P or No. 385 P, Flanged, F. & D.					37.00	52.00	69.00	98.00	145.00	220.00

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

Body: The body is strong and durable; it is made of the Special Brass, a high grade leaded tin bronze.

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

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

Bonnet construction: Sizes 2-inch and smaller have a union bonnet as shown at the top of the page;

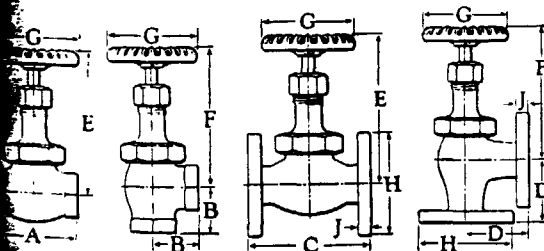
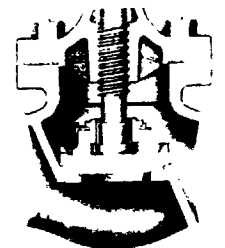
2½ and 3-inch sizes have a bolted bonnet, inside screw, as illustrated at the right.

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

Stuffing box; repacking: The stuffing box is unusually deep; it is equipped with a gland 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 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 plain faced only.

Full face gaskets should be used; see page 452.

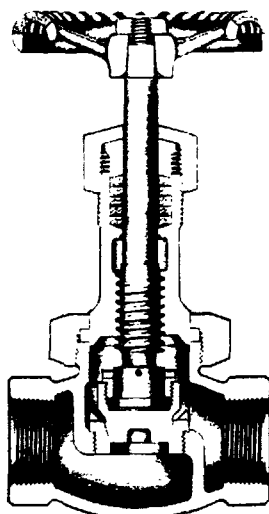


Templates for drilling page 438
Valves for Marine Service page 384

Dimensions, in Inches

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
A	2¼	2½	2⅝	3½	4⅞	4¾	5¼	6⅜	7½	8½
B	1⅞	1¾	1½	1¾	2⅞	2¾	2⅝	3⅜	3¾	4¼
C					5⅝	6¼	7¼	8	9	10⅝
D					3¼	3½	4	4⅝	4¾	5⅞
E-Open	4¼	4⅞	5¼	6⅜	7	8	9⅞	10⅜	11½	13⅜
F-Open	4⅞	4½	5	6⅞	6¾	7¾	8¾	10	10½	12⅜
G	2⅞	2⅞	2¾	3⅞	3⅞	4⅞	4¾	6	7	8
H					4⅞	5¼	6⅞	6½	7½	8¼
J					19/32	⅝	11/16	¾	13/16	29/32

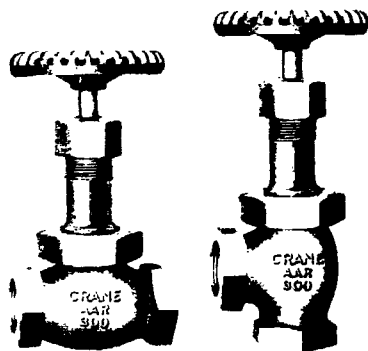
300-Pound—Inside Screw Type A. A. R. Brass Globe and Angle Valves



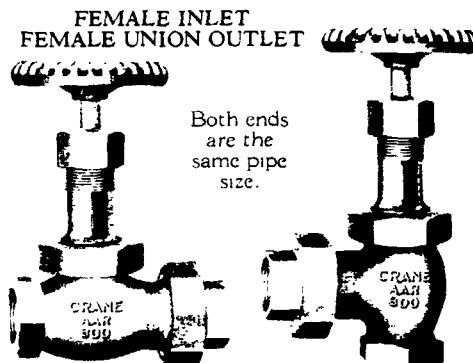
Cross Section
No. 376 P, Globe
Plug Type Disc

WORKING PRESSURE
300 pounds steam

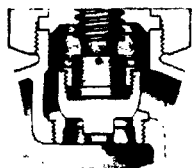
TEST PRESSURE
800 pounds hydrostatic



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



FEMALE INLET
FEMALE UNION OUTLET
Both ends
are the
same pipe
size.
Globe, Screwed
With Plug Type Disc
No. 1870 P
Angle, Screwed
With Ball Type Disc
No. 1871 P
No. 1870 E
No. 1871 E



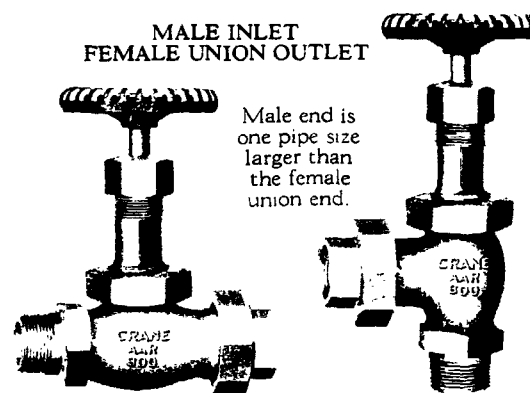
Partial Section
Showing Ball Type
Disc and Seat
(No. 376 E)

Association of American Railroads: These valves conform to the recommended practice of the Association of American Railroads (A.A.R.) 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 O.S. & Y. Valves shown on the opposite page.

Materials: The body, union ring, and tail-piece are made of Crane Special Brass. The bonnet is a special wear-resisting bronze. The disc is Monel in sizes $\frac{1}{2}$ -inch and smaller and Crane Nickel Alloy in larger sizes. The plug type seat ring in all sizes and the ball type seat ring in sizes $\frac{1}{2}$ -inch and smaller are Exelloy; $\frac{3}{4}$ -inch and larger ball type seat rings are Crane Nickel Alloy.



MALE INLET
FEMALE UNION OUTLET
Male end is
one pipe size
larger than
the female
union end.
Globe, Screwed
With Plug Type Disc
No. 1874 P
Angle, Screwed
With Ball Type Disc
No. 1875 P
No. 1874 E
No. 1875 E

List Prices and Dimensions

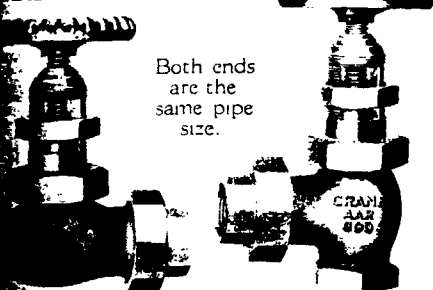
Size		Inches	Female End Valves									
			$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
			Male Inlet Valves									
			$\frac{3}{8} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$3 \times 2\frac{1}{2}$	
Plug Type	No. 376 P or 377 P	Each	7.60	8.20	10.10	14.00	19.40	25.30	33.00	50.60		
	No. 1870 P or 1871 P	Each	11.20	12.40	15.20	19.70	26.00	33.20	42.30	67.50		
	No. 1874 P or 1875 P	Each	12.00	13.30	17.20	22.60	31.20	39.10	49.50	84.50		
Ball Type	No. 376 E or 377 E	Each	7.20	7.80	9.60	13.30	18.40	24.00	31.40	48.00	73.00	112.50
	No. 1870 E or 1871 E	Each	10.80	12.00	14.70	19.00	25.00	31.90	40.70	64.90	107.00	
	No. 1874 E or 1875 E	Each	11.60	12.90	16.70	21.90	30.20	37.80	47.90	81.90	140.50	
Dimen- sions in Inches	End to end, Globe		$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{7}{8}$	$3\frac{9}{16}$	$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$6\frac{3}{8}$	$7\frac{3}{8}$	$8\frac{3}{8}$
	Center to end, Angle		$1\frac{5}{32}$	$1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{25}{32}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{11}{16}$	$4\frac{3}{16}$
	Union End Valves	Center to female end	$1\frac{5}{32}$	$1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{25}{32}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{11}{16}$	
		Center to male end	$1\frac{13}{32}$	$2\frac{1}{16}$	$2\frac{9}{16}$	$3\frac{1}{32}$	$3\frac{5}{16}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{11}{16}$	$5\frac{3}{16}$	
		Center to union end	$2\frac{1}{8}$	$2\frac{5}{16}$	$2\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{9}{16}$	$4\frac{1}{8}$	$4\frac{11}{16}$	$5\frac{5}{16}$	$5\frac{15}{16}$	
	Center to top of wheel, open		$4\frac{7}{8}$	$4\frac{7}{8}$	$5\frac{9}{16}$	$6\frac{7}{16}$	$7\frac{9}{16}$	$8\frac{3}{8}$	$9\frac{1}{4}$	$10\frac{5}{8}$	$12\frac{1}{16}$	$14\frac{3}{16}$
Diameter of wheel		$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{16}$	$3\frac{5}{8}$	$4\frac{1}{16}$	$4\frac{3}{4}$	$5\frac{3}{8}$	6	7	8	

300-Pound—Outside Screw and Yoke A. A. R. Brass Globe and Angle Valves

WORKING PRESSURE
300 pounds steam

TEST PRESSURE
800 pounds hydrostatic

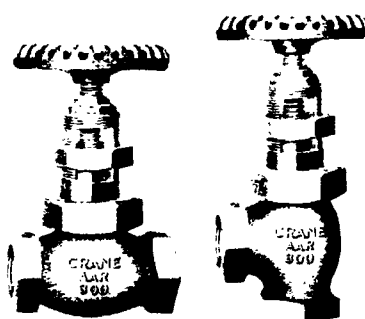
FEMALE INLET
MALE UNION OUTLET



Both ends
are the
same pipe
size.

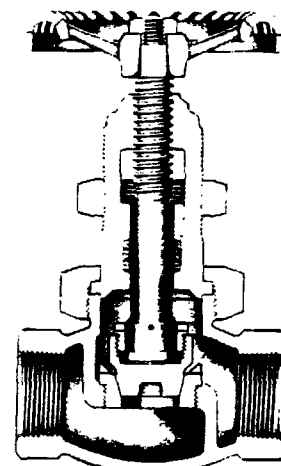
Globe, Screwed
With Plug Type Disc
No. 1890 P
With Ball Type Disc
No. 1890 E

Angle, Screwed
No. 1891 P
No. 1891 E



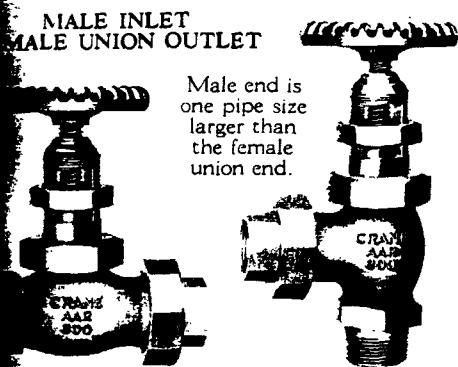
Globe, Screwed
With Plug Type Disc
No. 396 P
With Ball Type Disc
No. 396 E

Angle, Screwed
No. 397 P
No. 397 E



Cross Section
No. 396 P, Globe
Plug Type Disc

MALE INLET
MALE UNION OUTLET



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

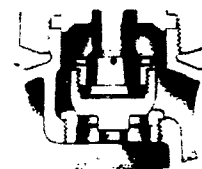
Globe, Screwed
With Plug Type Disc
No. 1894 P
With Ball Type Disc
No. 1894 E

Angle, Screwed
No. 1895 P
No. 1895 E

Association of American Railroads:
These valves conform to the recommended practice of the Association of American Railroads (A.A.R.) 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 opposite page.

Materials: Crane Special Brass is used for the body, union ring, and tail-piece. The yoke bonnet is Crane Cast Manganese Bronze, and the stem is Crane 18-8 Mo Chrome-Nickel Alloy. Seat and disc materials are the same as for the Inside Screw Valves shown on page 36.



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

Stem End
for
Universal Joint

Inside Screw
and O.S. & Y.
Valves can
be furnished
at no extra
charge with
the stem end
threaded for a Universal
Joint connection;
dimensions follow A.A.R.
Recommended Practice.

List Prices and Dimensions

Size		Inches	Female End Valves					
			1/2	3/4	1	1 1/4	1 1/2	2
			Male Inlet Valves					
			3/4 x 1/2	1 x 3/4	1 1/4 x 1	1 1/2 x 1 1/4	2 x 1 1/2	2 1/2 x 2
Plug Type	No. 396 P or 397 P	Each	19.40	23.30	28.80	35.20	44.00	78.80
	No. 1890 P or 1891 P	Each	24.50	29.00	35.40	43.10	53.30	95.70
	No. 1894 P or 1895 P	Each	26.50	31.90	40.60	49.00	60.50	112.70
Ball Type	No. 396 E or 397 E	Each	18.90	22.60	27.80	33.90	42.40	76.20
	No. 1890 E or 1891 E	Each	24.00	28.30	34.40	41.80	51.70	93.00
	No. 1894 E or 1895 E	Each	26.00	31.20	39.60	47.70	58.90	110.00
Dimen- sions in Inches	End to end, Globe		2 7/8	3 9/16	4 1/8	4 3/4	5 1/4	6 3/8
	Center to end, Angle		1 7/16	1 25/32	2 1/16	2 3/8	2 5/8	3 3/16
	Union End Valves	Center to female end	1 7/16	1 25/32	2 1/16	2 3/8	2 5/8	3 3/16
		Center to male end	2 9/16	3 1/32	3 5/16	3 5/8	4 1/8	4 11/16
		Center to union end	2 1/2	3 1/8	3 9/16	4 1/8	4 11/16	5 5/16
	Center to top of wheel, open		5 5/16	5 11/16	6 9/16	7 1/2	8 7/16	10
	Diameter of wheel		3 1/16	3 5/8	4 1/16	4 3/4	5 3/8	6

List Prices of Valve Parts For 300-Pound A.A.R. Brass Globe and Angle Valves

Inside Screw and O. S. & Y. Types

Through the application of uniform dimensions and tolerances, a wide degree of interchangeability of parts is maintained among the A.A.R. Brass 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 $1\frac{1}{2}$ -inch and smaller have a hexagon bonnet ring; larger sizes have a round

spanner-type ring. $\frac{1}{2}$ and $\frac{3}{4}$ -inch O.S. & Y. Valves have an integrally cast union ring and yoke bonnet.

Disc construction: Valves $\frac{1}{2}$ -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 $2\frac{1}{2}$, 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										
		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
		$\frac{3}{8} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$3 \times 2\frac{1}{2}$		
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										
	Disc	Plug Type		Ball Type		Spun on Stem						
	Body Seat Ring	1.65	1.65	1.84	2.50	4.90	5.35	6.81	8.40	7.60	11.49	
	†Body, Globe or Angle	1.74	2.45	2.97	4.41	5.43	8.65	11.50	21.46	34.72	58.94	
	Female Inlet and Outlet	4.76	5.66	6.96	8.67	10.35	13.95	17.38	33.09	59.63		
	Female Inlet, Union Outlet	5.72	6.74	9.36	12.15	16.59	21.03	26.02	53.49	99.83		
For Inside Screw Type Valves Only	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	1.11	
	Stem	2.75	2.75	3.49								
	With Plug Type Disc	2.47	2.47	3.17								
	With Ball Type Disc											
	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	3.88	
For Outside Screw and Yoke Valves Only	Bonnet	1.61	1.61	1.88	2.39	2.61	3.58	4.87	6.65	11.52	16.75	
	Stem			8.58								
	With Plug Type Disc			8.22								
	With Ball Type Disc											
	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			16.34	17.18	4.99	6.03	7.20	17.10			

*Not used on O.S. & Y. Valves in $\frac{1}{2}$ and $\frac{3}{4}$ -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 $\frac{1}{2}$ and $\frac{3}{4}$ -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 A.A.R. design and are interchangeable with the corresponding parts of A.A.R. Plug Type Disc Inside Screw Valves shown on page 36.

List Prices and Dimensions

Size	Inches	$\frac{3}{8}$ female $\times \frac{1}{2}$ hose	$\frac{1}{2}$ female $\times \frac{1}{2}$ hose
No. 1878 P	Each	9.00	11.20
Center to female end	Inches	$1\frac{1}{4}$	$1\frac{7}{16}$
Center to hose end	Inches	$2\frac{1}{8}$	$2\frac{1}{8}$
Center to top, open	Inches	$4\frac{7}{8}$	$5\frac{9}{16}$
Diameter of wheel	Inches	$2\frac{3}{4}$	$3\frac{1}{16}$

Wrenches for removing body seat rings . . . page 139
A.A.R. Malleable Iron Screwed Fittings . . . page 150

A.A.R. Unions and Union Fittings . . . pages 180 to 211
600-Pound Steel Valves for Locomotive Service . . . page 211

300-Pound Brass Globe and Angle Valves Outside Screw and Yoke—Bolted Bonnet

WORKING PRESSURES

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

TEST PRESSURE

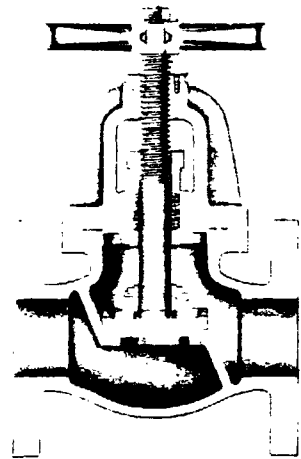
900 pounds hydrostatic
Seat is Air Tested

FEATURES

Surface Hardened
Stainless Steel Seating Surfaces
Plug Type Disc and
Renewable Body Seat Ring
Bolted Bonnet

SERVICE RECOMMENDATIONS

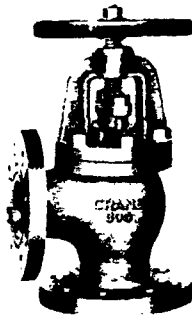
These valves are recommended for throttling, soot blower lines, and other exceptionally severe services. They are unusually heavy and rugged.



Cross Section
No. 87 P, Globe



No. 87 P
Flanged



No. 87 1/2 P
Angle, Flanged

Body and bonnet: The body and bonnet are made of special Brass, a high grade leaded tin bronze.

Disc and seat: The plug type disc and seat are designed for rigorous service. The wide seating surface is easily ruined by foreign matter or wire drawing. The hardened disc permits close regulation of flow and throttling. Made of Crane Hardened Stainless Steel with the surface of the seating area having a hardness of 500 Brinell, the disc and seat offer high resistance to corrosion, erosion, galling, and scoring.

Sealing action: The bolted bonnet provides liberal clearance at the bonnet joint. The outside stem threads are particularly well suited for services where the fluid might affect inside threads.

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

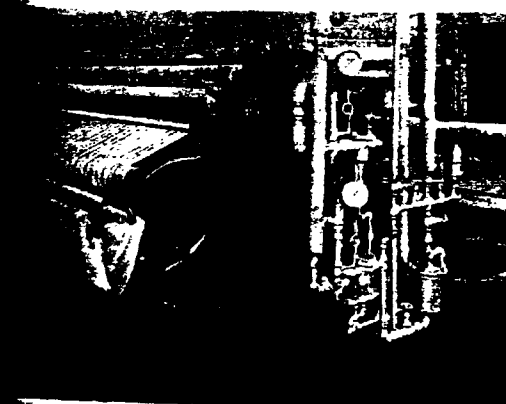
Templates for drilling ... page 438

List Prices, and Dimensions, in Inches

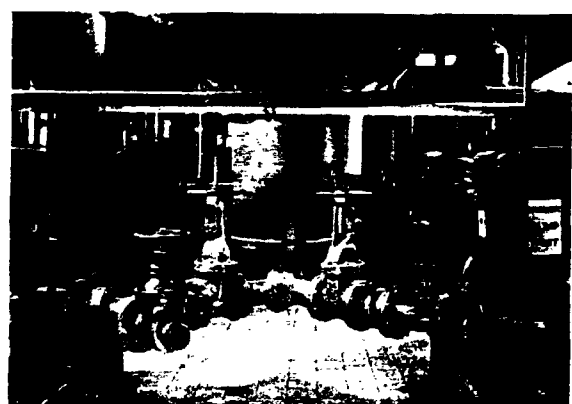
Size	Inches	1 1/2	2	2 1/2	3
Flanged, No. 87 P	Each	87.00	115.00	155.00	228.00
F. & D. No. 87 1/2 P	Each	87.00	115.00	155.00	228.00
Face to face, Globe		7	8	9	10 5/16
Center to face, Angle		3 7/8	4 1/4	4 3/4	5 7/16
Center to top of stem, open	Globe	9 1/8	10 1/4	11 5/8	13
	Angle	8 3/8	9 1/2	10 5/8	12
Diameter of wheel		6	7	8	9
Diameter of flanges		6 1/8	6 1/2	7 1/2	8 1/4
Thickness of flanges		1 1/16	3/4	13/16	29/32

Flanged valves: End flanges conform to the MSS 300-Pound SP Bronze Flange Standard (No. SP-2-1046). 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. Full face gaskets should be used; see page 452.

Valves for Marine Service ... page 384

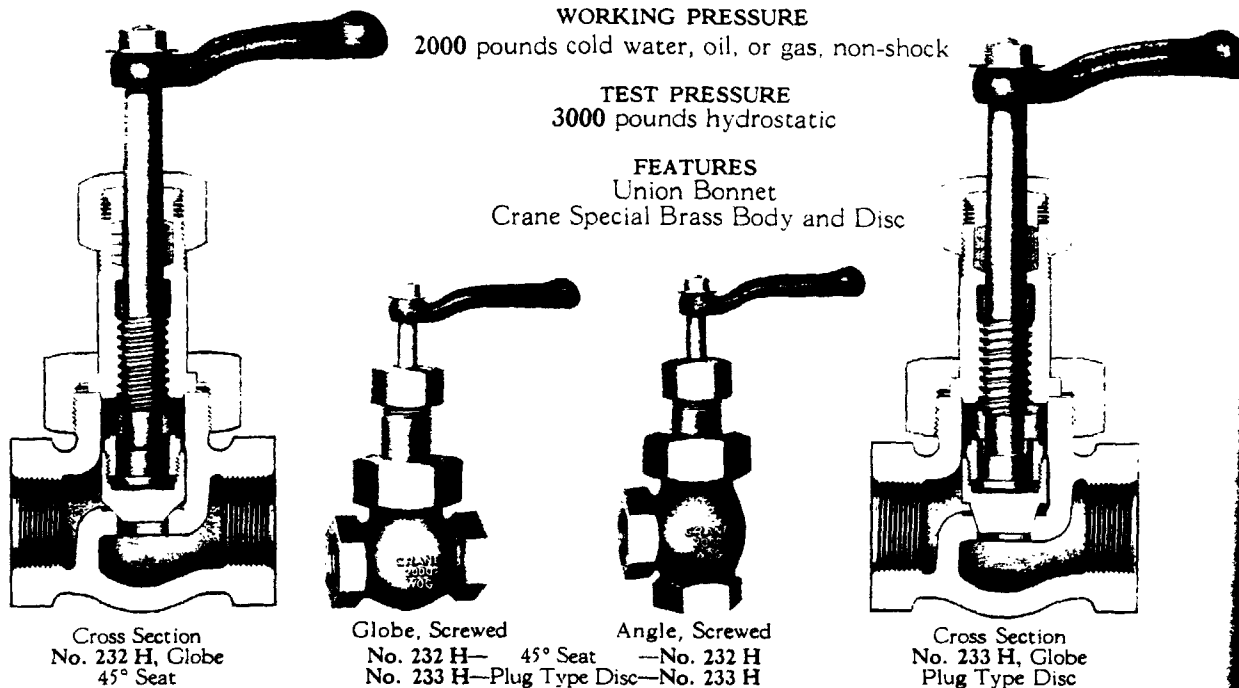


Many machinery builders use Crane quality valves and fittings as standard equipment.



Crane products assure uninterrupted service in the piping system of an automotive plant.

2000-Pound Hydraulic Brass Globe and Angle Valves Union Bonnet



On orders, specify the catalog number and whether globe or angle type is wanted.

List Prices, Each

Size	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Globe or Angle	No. 232 H, With 45° Seat	13.00	15.00	19.00	24.00	33.00
	No. 233 H, With Plug Type Disc	13.00	15.00	19.00	24.00	33.00

No. 232 H Valves; 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 of the No. 232 H Globe and Angle Valves have the disc stem ring construction illustrated in the cross section at the left.

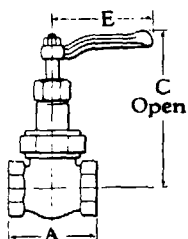
No. 233 H Valves; plug type disc: The No. 233 H Globe and Angle Valves have a plug type disc and seat. They are especially recommended for severe service, such as throttling. The wide seating surfaces have excellent resistance to wiredrawing and to foreign matter, and the tapered disc permits easy regulation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

The $1\frac{1}{4}$ -inch size valves have the disc stem ring construction shown in the cross section at the right. The smaller sizes have the disc cast integral with the stem.

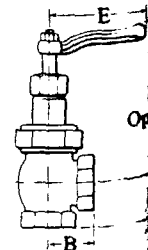
Rugged construction: Both types of valves are well proportioned throughout and are unusually heavy. Bodies and discs are cast of Crane Special Brass, a leaded tin bronze having high strength and hardness and offering liberal resistance to wear. The union bonnet joint is strong and serviceable; it holds a tight joint readily, and it facilitates regrinding.

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

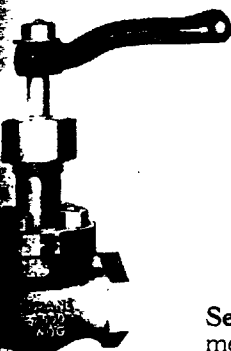
Repacking: These valves, when wide open, can be repacked while under pressure.



Dimensions, in Inches						
Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	
A	$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{7}{16}$	4	$4\frac{11}{16}$	
B	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{3}{8}$	
C	No. 232 H	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{3}{4}$	$8\frac{1}{8}$	$9\frac{7}{8}$
	No. 233 H	$6\frac{3}{8}$	$6\frac{3}{8}$	7	$8\frac{3}{8}$	$9\frac{1}{2}$
D	No. 232 H	$5\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{3}{8}$	$7\frac{1}{2}$	$9\frac{1}{8}$
	No. 233 H	$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{1}{2}$	$7\frac{3}{4}$	$8\frac{3}{4}$
E	$3\frac{7}{8}$	$3\frac{7}{8}$	$4\frac{1}{4}$	$4\frac{5}{8}$	5	



2500-Pound Hydraulic Brass Globe Valves Bolted Bonnet



No. 236 H
Globe, Screwed
Plug Type Disc

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

TEST PRESSURE
3750 pounds
hydrostatic

FEATURES
Bolted Bonnet
Crane Special Brass Body
Crane Special Brass Plug Type Disc

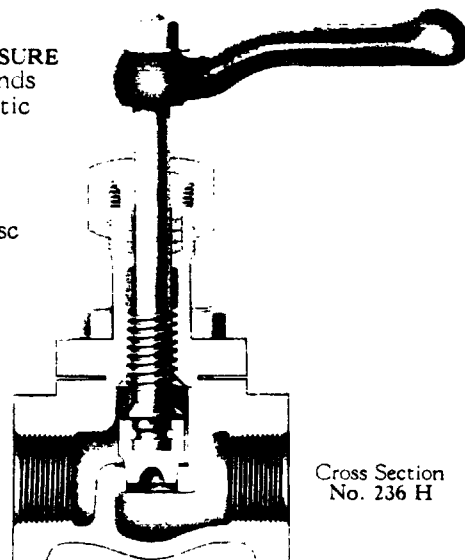
Service recommendations: Recommended for severe and extremely high-pressure hydraulic service on lines not subject to shock, and on high-pressure gas lines.

Exceptionally rugged construction: No. 236 H Valves have very heavy metal sections; their bolted bonnet provides a sturdy, rugged construction. Crane Special Plug Type Disc, used for the body and disc, is a leaded tin bronze, having great 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 erosion in any matter. The wide tapered seating surface permits easy flow regulation when throttling.

Disc-stem connection: On 1-inch valves, the disc and stem are cast integral; 1 1/4 and 1 1/2-inch sizes have the disc and stem cast separately and fastened together with two disc pins as shown in the cross section; on the 2-inch size, the two parts are cast separately and fastened together with a disc stem ring.

Handle or wheel: 1 and 1 1/4-inch valves have lever handles as illustrated; larger sizes have wheels.



Cross Section
No. 236 H

List Prices and Dimensions

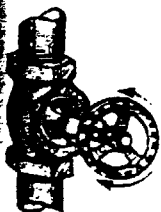
Size	Inches	1	1 1/4	1 1/2	2
No. 236 H	Each	40.00	54.00	71.00	94.00
End to end	Inches	4 1/2	4 15/16	5 1/2	6 3/8
Center to top, open	Inches	8 1/8	9	10 1/8	11 1/2
Center to end of handle	Inches	5	5 3/4		
Diameter of wheel	Inches			8	9

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.

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.



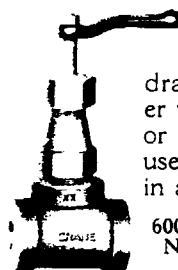
Instead, bring the disc to its seat gently, back it off a turn, and repeat this operation two or three times. A piece of dirt or scale has probably lodged on the seat, and this action may flush it away. If the leak persists, take the valve apart and clean and inspect it.

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.

For Higher Pressures Use Crane Steel Valves



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

When globe and angle valves are required for hydraulic pressures higher than 2500 pounds or for high pressure-temperature lines, use Crane Steel Valves. They are made in an unusually wide range of sizes and types and for all service conditions; see pages 233 to 246.

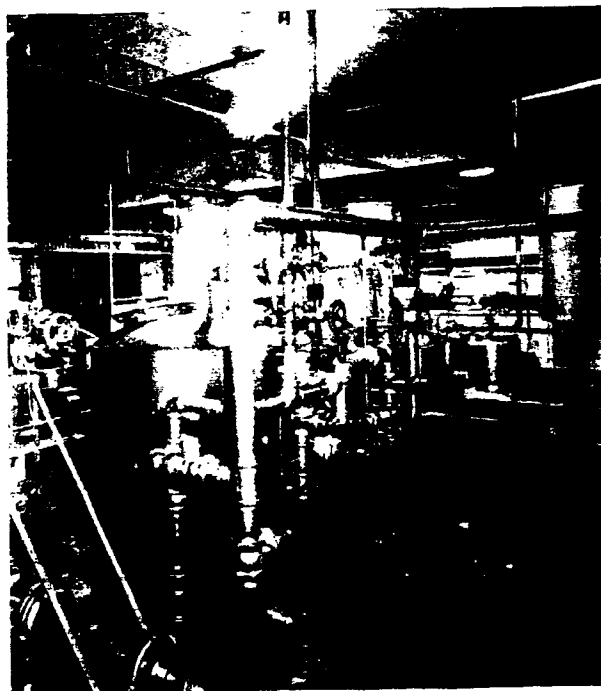
4



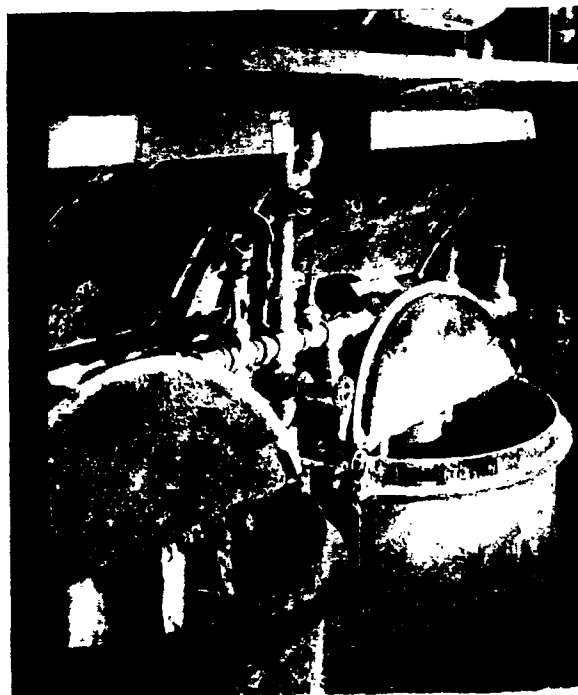
Typical installation of Crane brass valves in the mash processing lines in a brewery.



Crane brass valves are widely used for marine services.



Part of the equipment in a bottling plant utilizing Crane brass valves and fittings.



Paint companies find Crane brass valves withstand severe services.

Brass Check and Foot Valves

Names of Parts.....page 44

Lift Check Valves

100-Poundpage 45
 125-Pound.....page 45
 150-Pound.....page 47
 200-Pound.....pages 48 to 50
 300-Pound.....page 51
 2000-Pound Hydraulicpage 52
 2500-Pound Hydraulic.....page 52

Vertical Lift Check Valves

100-Pound.....page 45

Swing Check Valves

125-Pound.....page 46
 200-Pound.....pages 48 and 50
 300-Pound.....page 51

Brass Foot Valves.....page 46

Crane Brass Check and Foot Valves, 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 valves, supplementing the check and foot valves indexed above, are shown on the following pages:

Brass Gate Valves.....pages 13 to 21
 Brass Globe and Angle Valves.....pages 23 to 41
 Brass Hose Valves.....pages 60 and 61
 Brass Lever-Operated Quick-Opening Valves.. pages 54 to 57
 Brass Radiator Valves.....page 58

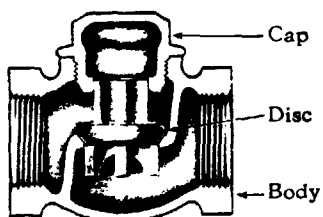
* * * * *

The lists shown above do not include all Crane Brass Valves. Brass 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 Check and Foot Valves

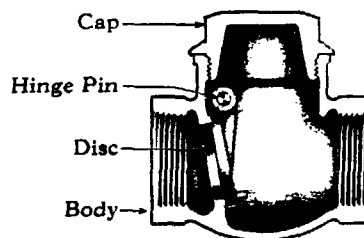
Names of Parts

5



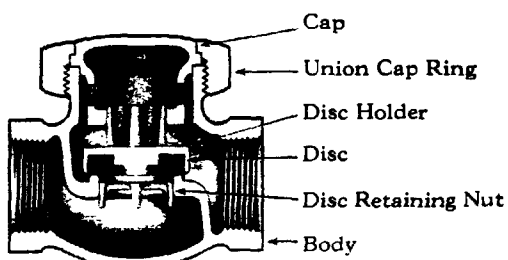
Horizontal Lift Check Valve
With Brass Disc

No. 20, page 45



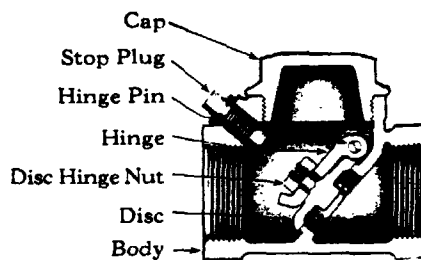
Swing Check Valve
With Brass Disc

No. 34, page 46



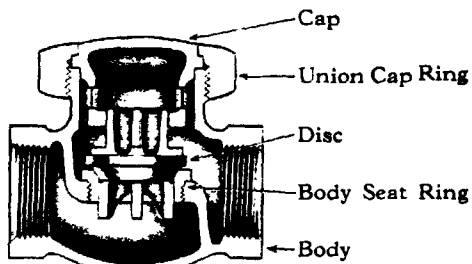
Horizontal Lift Check Valve
With Composition Disc

No. 27, page 47



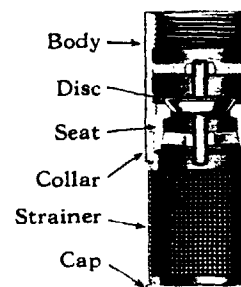
Swing Check Valve
Regrinding Type

No. 35, page 48



Horizontal Lift Check Valve
With Metal Disc and Renewable Seat

No. 218, page 49

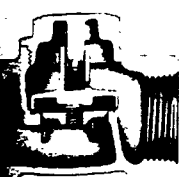


Foot Valve
With Strainer

No. 33½, page 46

100-Pound Brass Lift Check Valves

With Composition Disc



Cross Section
No. 1246



No. 1246
Horizontal, Screwed

WORKING PRESSURES

No. 1246 Valves

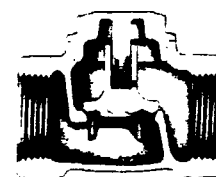
100 pounds saturated steam
150 pounds water, 200° F.
Domestic Gas Service

No. 1256 Valves

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



No. 1256
Horizontal, Screwed



Cross Section
No. 1256

List Prices and Dimensions

		Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 1246, Horizontal With Composition Disc	List Prices	Each	2.10	2.10	2.20	2.80	3.70	4.90	6.10	8.40	12.50
	End to end	Inches	1 7/8	1 7/8	2	2 3/8	2 3/4	3 1/4	3 7/8	4 1/4	5
	Center to top	Inches	1 1/8	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	1 7/8	2 1/8	2 1/2
No. 1256, Horizontal With Brass Disc	List Prices	Each			2.05	2.60	3.40	4.50	5.70	7.50	11.00
	End to end	Inches			2	2 3/8	2 3/4	3 1/4	3 7/8	4 1/4	5
	Center to top	Inches			1 1/8	1 3/8	1 1/2	1 3/4	1 7/8	2 1/8	2 1/2

For extra composition discs for No. 1246 Valves, see page 140.

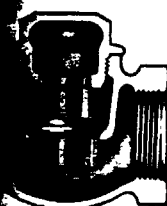
Service recommendations: This new line of 100-Pound Brass Lift Check Valves, well proportioned and sturdily constructed, is particularly recommended for domestic water or gas lines, and for other piping or equipment operated at low pressures. They give wide utility with moderate cost.

Construction: No. 1246 Valves have a composition disc. No. 1256 Valves have a brass disc. Otherwise, the two valves are alike.

In both valves, the seat is integral with the body. The valves have long hexagons on the body, which reinforce the openings and afford 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 (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



Cross Section
No. 20



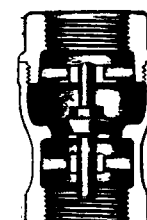
No. 20, Horizontal
Screwed

WORKING PRESSURES

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



No. 24, Vertical
Screwed



Cross Section
No. 24

List Prices and Dimensions

		Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 20, Horizontal	List Prices	Each	2.10	2.10	2.30	3.20	4.30	5.60	7.20	9.30	13.80	23.00	34.00
	End to end	Inches	1 7/16	1 3/8	1 7/8	2 1/4	2 11/16	3 3/16	3 11/16	4 1/4	5 1/8	6 1/16	7 1/16
	Center to top	Inches	1 5/16	1 1/16	1 3/16	1 3/8	1 5/8	1 7/8	2 3/16	2 3/8	2 13/16	3 5/16	3 3/4
No. 24, Vertical	List Prices	Each	2.60	2.80	3.90	4.70	6.20	7.50	10.30	15.20	24.00	36.00	
	End to end	Inches		1 13/16	1 3/4	2 5/16	2 3/4	3 7/16	3 13/16	4 1/8	4 11/16	5 3/4	6 5/16
	Largest diameter	Inches		1 1/8	1 3/8	1 1/2	1 3/4	2 1/8	2 9/16	2 7/8	3 3/8	4 7/16	5 1/4

Service recommendations: Crane 125-Pound Brass Lift Check Valves are recommended for general service on steam, water, oil, or gas lines.

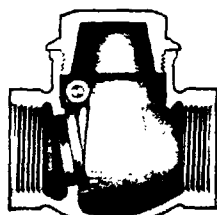
Construction: The valves are heavier and more robust than is usual with 125-Pound or "Standard" valves. All parts are liberally proportioned, to

withstand operating strains and expansion and contraction of the pipe. Sizes 3/8-inch and smaller have a ball disc (not illustrated).

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

125-Pound Brass Swing Check Valves

With Brass Disc



Cross Section
No. 34, Brass Disc

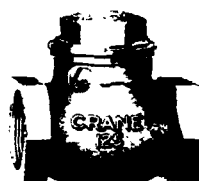


No. 34, Screwed
With Brass Disc

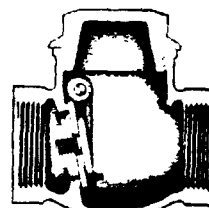
WORKING PRESSURES
125 pounds
saturated steam
200 pounds cold water,
non-shock

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

With Leather Disc



No. 34 1/2, Screwed
With Leather Disc



Cross Section
No. 34 1/2, Leather Disc

Recommended for cold water only.

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
No. 34, with Brass Disc	Each	Use	3.80	4.30	4.90	6.50	8.00	9.70	14.70	24.00	36.00
No. 34 1/2, with Leather Disc	Each	No. 35	5.00	5.60	6.50	8.50	10.40	12.60	18.00		
End to end	Inches	Valve,	1 7/8	2 1/4	2 11/16	3 3/16	3 11/16	4 1/4	5 1/8	6 1/16	7 3/8
Center to top	Inches	page 48.	1 3/8	1 9/16	1 13/16	2 3/16	2 9/16	2 13/16	3 1/4	3 7/8	4 1/8

Service recommendations: The No. 34 Brass Disc Valves are recommended for service on steam or water lines; the No. 34 1/2 Leather Disc Valves are recommended for cold water lines only.

Construction: The valves are heavier and more rugged than is usual with "Standard" or 125-Pound Valves. All parts are liberally proportioned to with-

stand normal operating strains. Except for the disc construction, the valves are identical.

On sizes up to 2-inch, the disc is integral with the hinge as shown in the cross sections; on 2 1/2 and 3-inch brass disc valves, the disc swivels on the hinge. All sizes have a disc stop, preventing the disc from sticking in the open position.

For Solder-Joint Brass Swing Check Valves, see page 402.

Brass Foot Valves

With Strainer



Cross Section
No. 33 1/2

WORKING PRESSURE
200 pounds cold water, non-shock



No. 33 1/2
Screwed

List Prices and Dimensions

Size	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 33 1/2, Screwed	Each	3.30	3.90	4.70	5.80	7.70	10.60	23.60	30.00
End to end	Inches	2 3/8	2 13/16	3 7/8	4 3/4	5 7/16	6 3/8	8 1/8	9 5/16
Size of pipe that valve will pass through	Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4

Service recommendations: These valves are recommended for use on water suction lines.

Construction: Made entirely of brass, the valves are designed to slip through Standard Wrought Pipe,

two pipe 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.

150-Pound Brass Lift Check Valves

With No. 1 Cranite Composition Disc

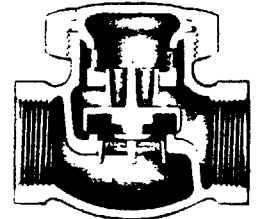


No. 27
Horizontal
Screwed



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

FEATURES
No. 1 Cranite Composition Disc
Suitable for Many Fluids—Quick to Repair
Union or Bolted Cap



Cross Section
No. 27
Horizontal

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
No. 27, Horizontal	Each	3.00	3.40	4.10	5.70	8.00	11.50	14.70	22.00	42.00	60.00
Dimensions, in Inches	A	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4	6 3/4	8
	B	1 3/8	1 1/2	1 3/4	2	2 1/4	2 5/8	3	3 1/2	3 1/2	3 7/8

For list prices of Composition Discs, see page 140.

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. They are especially suited for use where discs must be renewed easily and quickly.

Quick repairs: A leak can be quickly repaired by replacing the disc holder with an extra complete disc holder and disc. A new disc can be placed in the original holder at the convenience of the engineer. Engineers should keep on hand a supply of extra disc holders and discs for this purpose.

Sturdy construction: All parts are strong and rugged, assuring a high factor of safety.

Cap joint: Sizes 2-inch and smaller have a union cap as shown on the illustrations at the top of the page; 2 1/2 and 3-inch valves have a compact bolted cap as illustrated at the right. Both types provide a strong, tight joint, and can be easily dismantled for cleaning or for replacement of disc.



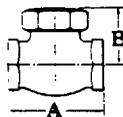
Discs: Unless otherwise ordered, these valves are furnished with a No. 1 Cranite Disc suitable for steam, or for hot water from 200 to 300° F.

When ordered for hot water up to 200° F., cold water, air, gas, gasoline, or oil, they are furnished with a No. 6 Disc. For discs, see page 140.

With Metal Ball Disc



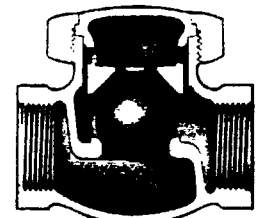
No. 31
Horizontal
Screwed



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

List Prices and Dimensions

Size	Inches	1/2	3/4	1	1 1/4
No. 31, Horizontal	Each	4.50	6.20	8.60	13.00
A	Inches	2 11/16	3 3/16	3 3/4	4 1/4
B	Inches	1 11/16	1 5/16	2 1/4	2 9/16



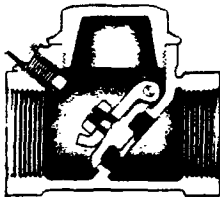
Cross Section
No. 31
Horizontal

Service recommendations: No. 31 are sturdy brass lift check valves recommended for use on steam, water, oil, or gas lines. They have a metal ball disc.

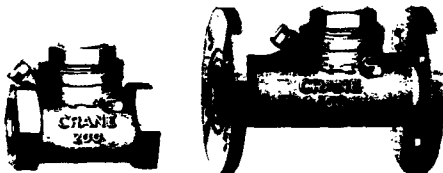
Smaller sizes: When sizes smaller than 1/2-inch are required, the No. 20 Horizontal Lift Check Valves described and illustrated on page 45 are recommended; they have a ball disc.

200-Pound Brass Check Valves Regrinding

Swing Check



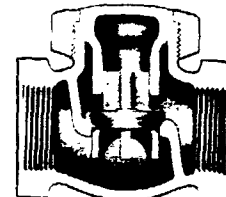
Cross Section
No. 35
Horizontal Swing



No. 35
Horizontal Swing
Screwed

No. 35½
Horizontal Swing
Flanged

Lift Check



Cross Section
No. 72
Horizontal Lift



No. 72
Horizontal Lift
Screwed

WORKING PRESSURES
Screwed Valves
200 pounds steam, 500° F.
400 pounds cold water, oil, or gas, non-shock
Flanged Valves
150 pounds steam, 500° F.
225 pounds cold water, oil, or gas, non-shock

TEST PRESSURES
Screwed Valves
600 pounds hydrostatic
Flanged Valves
450 pounds hydrostatic

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

List Prices, Each

Size	Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
No. 35, Swing, Screwed		4.90	4.90	5.20	6.30	8.00	10.00	12.70	18.40	28.50	46.00
No. 35½, Swing, Flanged, F. & D.						21.50	27.00	35.00	54.00	81.00	107.00
No. 72, Lift, Screwed		2.50	3.10	4.00	5.40	7.70	10.00	13.40	20.50	35.00	51.00

Service recommendations: These are ruggedly constructed valves, made of high quality materials. They are recommended for severe service on steam, water, oil, or gas lines.

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

Regrinding: All check valves shown on this page may be reground without removing the body from the line.

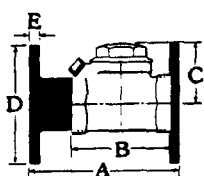
By removing the stop plug on the swing check valves, a screw driver can be engaged with the slot

in the disc spud, making it easy to rotate the disc when regrinding.

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 valves are ordered faced only.

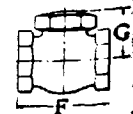
Full face gaskets should be used; see page 452.



No. 35 or 35½

Dimensions, in Inches

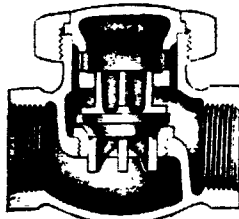
Size		¼	⅜	½	¾	1	1¼	1½	2	2½	3
No. 35	B	2	2⅜	2½	2¾	3¼	3⅜	4¼	5⅜	6	7
	C	1⅝	1⅝	1⅞	1⅞	2	2⅜	2⅞	3⅜	3¾	4⅝
No. 35½	A					5	5⅝	6⅝	7⅝	8½	9⅝
	C					2	2⅜	2⅞	3⅜	3¾	4⅝
	D					4¼	4⅝	5	6	7	7½
	E					3⅝	13/32	7/16	1/2	9/16	5/8
No. 72	F	1⅞	1⅞	2¼	2¾	3⅝	3⅞	4½	5¼	6⅝	7¼
	G	1⅝	1⅞	1⅞	1⅞	1¾	2	2¼	3⅝	3¾	4⅝



No. 72

200-Pound Brass Lift Check Valves

With Crane
Nickel Alloy Disc



Cross Section
No. 218
Horizontal Lift



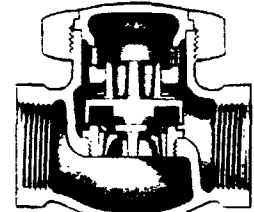
No. 218
Horizontal Lift
Screwed

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

FEATURES
Crane Nickel Alloy
or
No. 4 Cranite Composition Disc
Crane Nickel Alloy Seat
Union Cap

With No. 4 Cranite
Composition Disc



Cross Section
No. 218 C
Horizontal Lift



No. 218 C
Horizontal Lift
Screwed

List Prices, Each

	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 218, With Nickel Alloy Disc		5.50	6.80	7.80	9.40	11.00	15.30	19.50	29.00
No. 218 C, With Composition Disc		4.80	6.00	6.80	8.20	9.80	14.00	18.00	26.00

For list prices of Composition Discs, see page 140.

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. The disc and seat are made of Crane Nickel Alloy, a seating material that resists wear exceptionally well.

Composition disc valves: The No. 218 C Valves can be utilized for a wide range of fluids when equipped with the proper disc. They are especially suitable for installations where the discs must be quickly and easily renewed. As in the No. 218, the body is Crane Nickel Alloy.

These valves are regularly equipped with a No. 4 Cranite Disc, suitable for high pressure steam up to 500° 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 300 pounds and 200° F., especially for frequent operation, a No. 6 Disc is preferred to the No. 4. See page 140 for list prices and description of discs.

Rugged construction: The valves are unusually strong and rugged. 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. The end to end dimensions are the same.

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

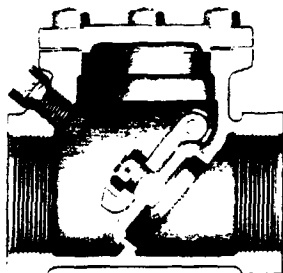
Dimensions, in Inches

Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 218	A	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4
	B	1 5/16	1 1/2	1 11/16	2	2 1/4	2 5/8	2 7/8	3 1/2
No. 218 C	A	2	2 5/16	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4
	B	1 3/8	1 1/2	1 3/4	2	2 1/4	2 5/8	3	3 1/2

200-Pound Brass Check Valves

Bolted Cap

Swing Check



Cross Section
No. 4032, Horizontal Swing

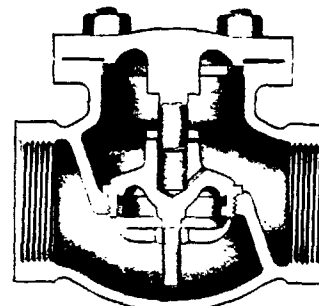
WORKING PRESSURES

Screwed Valves
200 pounds steam, 500° F.
400 pounds cold water, oil, or gas, non-shock
Flanged Valves
150 pounds steam, 500° F.
225 pounds cold water, oil, or gas, non-shock

TEST PRESSURES

Screwed Valves
600 pounds hydrostatic
Flanged Valves
500 pounds hydrostatic

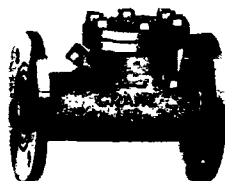
Lift Check



Cross Section
No. 4062, Horizontal Lift

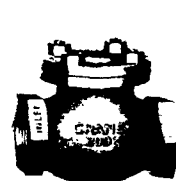


No. 4032, Screwed

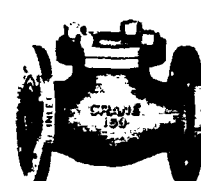


No. 4033, Flanged
Horizontal Swing

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



No. 4062, Screwed



No. 4063, Flanged
Horizontal Lift

List Prices, Each

Size	Inches	1½	2	2½	3	3½	4	5	6
Swing Check	No. 4032, Screwed		57.00	74.00	100.00				
	No. 4033, Flanged, F. & D.		69.00	100.00	130.00	211.00	254.00	305.00	408.00
Lift Check	No. 4062, Screwed	Prices on application							
	No. 4063, Flanged, F. & D.	Prices on application							

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 brass 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: The No. 4032 and No. 4033 Swing Check Valves have a body, cap, and disc made of Crane Special Brass, 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: The No. 4062 and No. 4063 Horizontal Lift Check Valves have a Crane Special Brass body, cap, and disc. The body seat ring is also Crane Special Brass, a strong, hard, leaded tin bronze having good resistance to wear.

Flanged valves: End flanges conform to the MSS 150-Lb. SP Bronze Flange Standard (No. SP-2-1940). 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 452.

Dimensions, in Inches

Size		1½	2	2½	3	3½	4	5	6
Swing Check	End to end, No. 4032		5⅞	6⅞	7¼				
	Face to face, No. 4033		7⅞	8½	9⅞	10¼	11¼	12⅞	14⅞
	Center to top		3¾	4⅞	5	6	6½	7¼	8¼
Lift Check	End to end, No. 4062	5⅞	6	7¼	8¼				
	Face to face, No. 4063	5⅞	6⅞	8	9⅞	10⅞	11	12¼	14
	Center to top	3⅞	3⅞	4⅞	5	5⅞	5¾	6¾	7¾
Flange dimensions	Diameter of flanges	5	6	7	7½	8½	9	10	11
	Thickness of flanges	7/16	1/2	9/16	5/8	11/16	11/16	3/4	13/16

Templates for drilling . . . page 438

Valves for Marine Service . . . page 384

300-Pound Brass Check Valves

Regrinding

ing Check

Cross Section
Horizontal Swing

WORKING PRESSURES

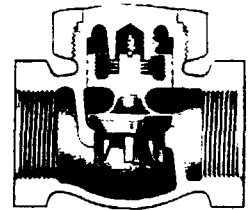
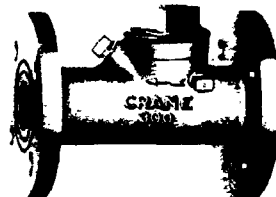
300 pounds steam, 550° F.

Cold Water, Oil, or Gas, Non-Shock
Screwed—2-inch and smaller—1000 pounds
—2½ and 3-inch — 600 pounds
Flanged—All sizes — 500 pounds

HYDROSTATIC TEST PRESSURES

Screwed—2-inch and smaller—1500 pounds
—2½ and 3-inch — 900 pounds
Flanged—All sizes — 900 pounds

Lift Check

Cross Section
No. 366 E, Horizontal LiftNo. 74 E
Horizontal SwingNo. 75 E
Horizontal Swing
Flanged

The No. 74 E and the No. 75 E Swing Check Valves may also be used in a vertical position for upward flow.

No. 366 E
Horizontal Lift
Screwed

List Prices, Each

	Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Swing, Screwed		6.00	6.30	7.10	9.00	10.40	14.00	18.00	26.50	50.00	89.00
Swing, Flanged, F. & D.						31.00	43.00	64.00	89.00	134.00	174.00
Lift, Screwed		6.30	6.90	8.00	10.20	11.70	15.60	20.50	29.00	53.00	93.00

No. 74 E and No. 75 E: The No. 74 E and No. 75 E ruggedly constructed swing check valves, designed for severe service on steam, water, oil, or gas. The body and disc are Crane Special strong, hard, leaded tin bronze.

These valves may be reground without removing the valve from the line. By removing the stop plug, a wrench can be engaged with the disc-spud slot, and the disc rotated to regrind.

No. 366 E: These are horizontal lift check valves, designed for steam, water, oil, air, or gas, especially for service where pulsations in the line might 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 Brass, a leaded tin bronze that resists wear exceptionally well.

These valves can be reground without removing the valve 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.

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.

Full face gaskets should be used; see page 452.

Dimensions, in Inches

Size		¼	⅜	½	¾	1	1¼	1½	2	2½	3
Swing Check	No. 74 E	A	2¼	2¼	2¾	3⅛	3⅝	4⅛	4⅜	5⅜	6⅜
		C	1⅝	1⅝	1⅝	2⅛	2⅞	2⅞	3⅜	3⅜	4⅜
	No. 75 E	B					5⅜	6⅞	7⅞	8⅜	9⅜
		C					2⅞	2⅞	3⅜	3⅜	4⅜
		D					4⅞	5¼	6⅞	6½	7½
		E					19/32	5/8	1⅞	3/4	13/16
Lift Check—No. 366 E	F	1⅜	2	2½	2⅝	3½	4⅞	4⅝	5¾	6⅞	8
	G	1	1⅞	1¾	1¾	2	2⅞	2⅞	3¼	3⅞	4½

Ferrosteel Piston Type Disc Check Valves... page 396

Templates for drilling page 438

Valves for Marine Service page 384

Hydraulic Brass Lift Check Valves

2000 - Pound

2500 - Pound

WORKING PRESSURES

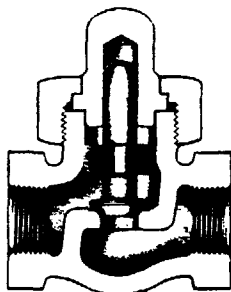
2000 pounds cold water,
oil, or gas, non-shock

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

HYDROSTATIC TEST PRESSURES

3000 pounds

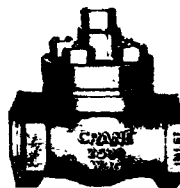
3750 pounds



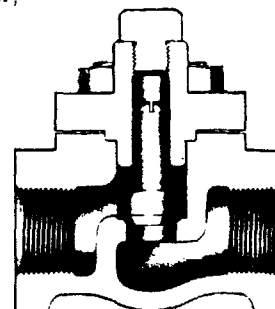
Cross Section
No. 234 H



No. 234 H, Screwed
Horizontal Lift



No. 238 H, Screwed
Horizontal Lift



Cross Section
No. 238 H

List Prices, Each

Size	Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Horizontal, Screwed	No. 234 H, 2000-Pound	12.00	13.00	16.00	21.00	31.00		
	No. 238 H, 2500-Pound				36.00	40.00	55.00	79.00

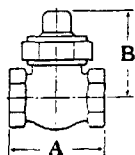
Service recommendations: Crane Hydraulic Brass Check Valves are recommended for severe high pressure hydraulic service on lines not subjected to shock, and for high pressure gas lines.

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, and the No. 238 H have a bolted cap.

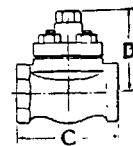
Materials: The body and disc of these valves are made of Crane Special Brass, a strong, hard, leaded tin bronze having excellent resistance to wear.

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.



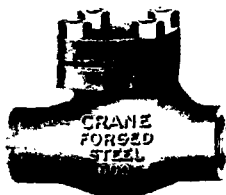
No. 234 H

Dimensions, in Inches		3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 234 H	A	2 13/16	2 13/16	3 7/16	4	4 11/16		
	B	2 5/8	2 5/8	3 1/4	3 7/8	4 7/16		
No. 238 H	C				4 1/2	4 5/16	5 1/2	6 3/8
	D				3 5/8	4 1/8	4 5/8	5 3/8



No. 238 H

For Higher Pressures and Temperatures Use Crane Steel Valves



Forged Steel
600-Pound
No. 3674 X
Horizontal Lift
(Page 249)

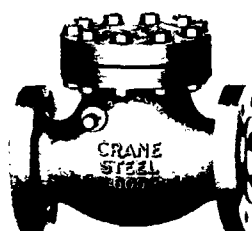


Forged Steel
6000-Pound Hyd.
No. 227 H
Horizontal Lift
(Page 254)

Supplementing the Crane line of brass 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 brass 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 248 and 249
Marine..... page 385

Cast Steel Check Valves
Swing..... pages 250 to 254
Vertical..... page 249
Marine..... page 385



Cast Steel
600-Pound
No. 3692 X
Vertical Ball
(Page 249)

Cast Steel
600-Pound
No. 175 X
Horizontal Swing
(Page 253)

Brass 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
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In addition to the Brass 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 115
Brass Chronometer Valves.....	page 387
Brass Hose Gate Valves for Marine Service.....	page 387

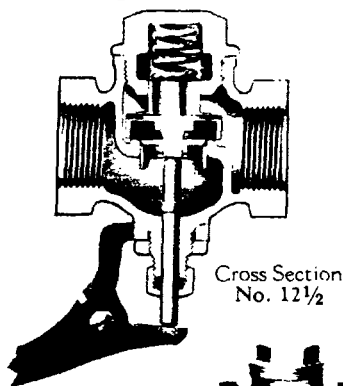


Dependable Crane Valves and Fittings serve many industries.
A typical installation in a turpentine plant.

125-Pound Brass Globe Valves

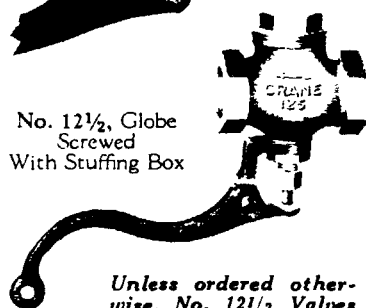
Quick-Opening — Self-Closing

Composition Disc



Cross Section
No. 12 1/2

No. 12 1/2, Globe
Screwed
With Stuffing Box



Unless ordered otherwise, No. 12 1/2 Valves are furnished with a No. 6 Disc for air or gas.

WORKING PRESSURES

No. 12 1/2 Valves
125 pounds air or gas, 100° F.
(125 pounds saturated steam
With No. 1 Disc)

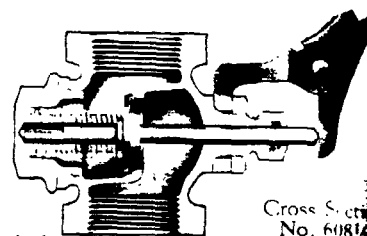
No. 608 and No. 608 1/2 Valves
125 pounds saturated steam

SERVICE RECOMMENDATIONS

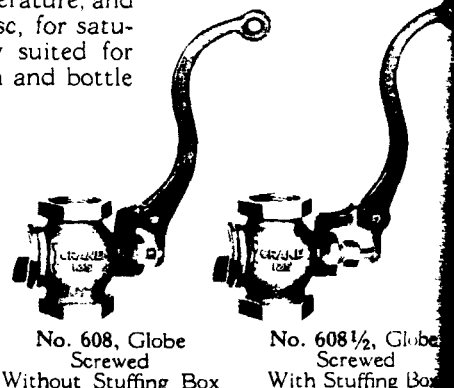
No. 12 1/2 Valves are regularly recommended for air or gas up to 100° F. temperature, and when ordered with a No. 1 Disc, for saturated steam. They are ideally suited for cooking vats, soot blowers, can and bottle sterilizers, and similar service.

No. 608 and No. 608 1/2 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. 608 1/2



No. 608, Globe
Screwed
Without Stuffing Box

No. 608 1/2, Globe
Screwed
With Stuffing Box

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Composition Disc	No. 12 1/2	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	26.50
	No. 608 1/2, with stuffing box		6.50	7.50	9.30	12.00	15.80	20.00	28.50

For list prices of composition discs, see page 140.

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 on the No. 12 1/2 Valve is brass.

The Nos. 12 1/2 and 608 1/2 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, opens the valve. When the lever is released, the spring above the disc automatically closes the valve.

Operation of larger size Nos. 608 or 608 1/2 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, 12 1/2 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 Granite Disc. See page 140 for discs.

Dimensions, in Inches

Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 12 1/2	End to end of body	2 1/8	2 3/8	2 3/4	3 1/4	3 3/4	4 1/4	5	
	Center to top of cap	1 1/16	1 5/8	1 11/16	2	2 3/16	2 1/2	2 15/16	
	Center of stem to end of lever, closed	3 3/8	3 3/8	4 3/16	5 9/16	6 3/8	8 1/8	8 1/4	
	Center of port to bottom of lever, open	3 3/4	3 3/4	5 1/8	5 1/8	6 7/8	8 11/16	9 1/2	
Nos. 608 or 608 1/2	End to end of body		1 7/8	2 3/16	2 5/8	3 1/8	3 5/8	4 1/16	
	Center of port to cap		1 1/4	1 3/8	1 11/16	2	2 1/8	2 5/8	
	Center of stem to end of lever, closed		3 3/16	3 7/8	5 5/8	6 3/8	8 1/8	8 1/4	
	Center of port to bottom of lever, open	No. 608	3 1/4	4 3/4	4 3/4	6 1/4	7 3/4	8 1/2	
		No. 608 1/2	3 5/8	5 1/4	5 3/8	7 3/4	8 3/4	9 1/2	

150-Pound Brass Globe Valves

Quick Opening—Self Closing

With Composition Disc

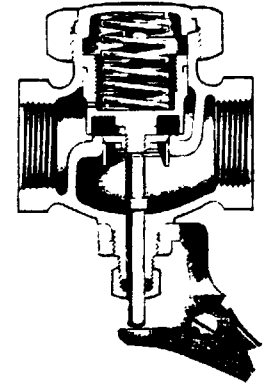
WORKING PRESSURES

200 pounds hot water, 200° F.
200 pounds cold water, light oils, gasoline, air, and gas, 100° F.
150 pounds saturated steam (with No. 1 Disc)

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 (100° 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.

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.



Cross Section
No. 7½

Globe. Screwed
Stuffing Box

Otherwise ordered, No. 6 Disc is furnished with a composition disc suitable for hot or cold water, for light oils or gas, for air and gas. Orders specify service conditions.

List Prices, Each

Inches	½	¾	1	1¼	1½	2
Screwed, with Composition Disc	12.50	16.80	20.30	25.00	40.00	55.00

For list prices of composition discs, see page 140

Operation: The valves are easily operated. A short 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 are made of a good grade steam brass. The lever and opening lever are malleable iron. The lever is stainless steel.

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

The bottom of the disc holder is piston shaped and is fitted with a piston ring. It fits snugly into the bottom of the valve body, forming a dashpot that slowly 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.

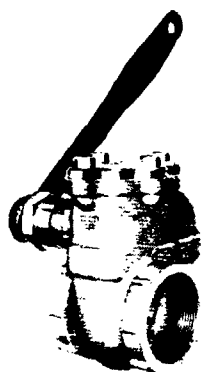
Dimensions, in Inches

	½	¾	1	1¼	1½	2
End of body to top of cap	2 11/16	3 3/16	3 3/4	4 1/4	4 3/4	5 3/4
End of stem to end of lever, closed	4 1/8	5 5/8	6 1/4	8 1/8	8 1/4	9 1/2
End of port to bottom of lever, open	5 3/16	5 1/2	7 3/8	8	9 3/4	12 5/8

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

125-Pound Brass Gate Valves Quick Opening

Cam Action



No. 432
Screwed

WORKING PRESSURES

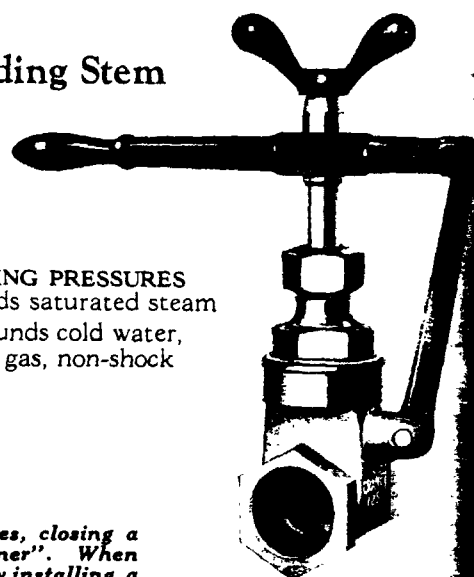
$\frac{1}{2}$ to 2-inch
125 pounds saturated steam
200 pounds cold water,
oil, or gas, non-shock

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

Air Tested

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 shocks might damage the valves or the piping; see page 11.

Sliding Stem



No. 442, Screwed

List Prices

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	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.

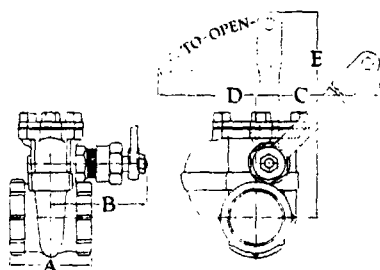
To insure proper seating when closing the valves, a snappy action with plenty of force should be applied to the lever. The disc will not jam, and there is no danger of injuring parts because the valve has been designed to withstand such action.

Underwriters' Approval: No. 432 Gate Valves listed by the Underwriters' Laboratories of Chicago as approved for hazardous liquid service at pressure 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

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

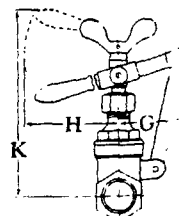
The wing nut at the top of the stem permits forcing the discs to the seats after the valve has been closed; it releases the discs before opening.



Cam Action Valve

Dimensions, in Inches

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	1¼	1½	2	2½	3
A	1⅞	2⅞	2½	2¾	2⅞	3¾	4	4¼
B	2⅞	3⅞	3½	3¾	3¾	4¼	4⅞	5⅞
C	2⅞	3⅞	4	5½	6¾	7⅞	8¾	10
D	3	3¼	3½	4⅞	5¾	6¾	7½	8½
E	5⅞	6¼	6¾	8⅞	9⅞	12	13⅞	15⅞
F	2⅞	2⅞	3¼	3¾	4⅞	4⅞	5¾	
G	2⅞	3	3½	4	4¾	4¾	5¼	
H	4⅞	5¾	7	7¾	8¾	9½	10⅞	
J	7⅞	8⅞	10⅞	11	13¼	15	16⅞	
K	7½	8¼	9⅞	10¾	13¾	16½	17	



Sliding Stem Valve

Brass Butterfly Valves

WORKING PRESSURES

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

Butterfly Valves provide easy operation in approximately one-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 115.



No. 44, Screwed
Brass Body
Brass Disc
Steel Stem

List Prices and Dimensions

	Inches	3/4	1	1 1/4	1 1/2	2
Butterfly Valve	Each	7.20	8.60	10.00	12.00	15.60
End to end		2 1/4	2 9/16	2 3/4	2 13/16	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		1 1/32	3/8	7/16	7/16	1/2

Brass Quick-Acting Throttle Valves

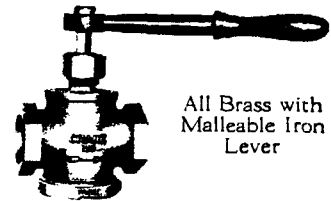
WORKING PRESSURE

125 pounds saturated steam

Sturdily built throttle valves are used extensively on hoisting and engine engines. They open or close in one-quarter turn of the handle. They have an internal stop to prevent 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.



All Brass with
Malleable Iron
Lever

No. 46, Screwed

List Prices and Dimensions

	Inches	3/4	1	1 1/4	1 1/2	2
Throttle Valve	Each	20.00	22.00	28.00	34.00	43.00
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

Brass Chronometer Valves

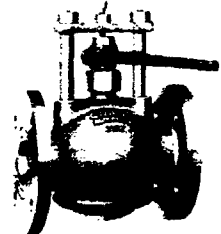
Brass Chronometer Valves are designed for regulating and governing purposes on steam lines where working pressures do not exceed 250 pounds.

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 387.



No. 382
Screwed



No. 4383
Flanged

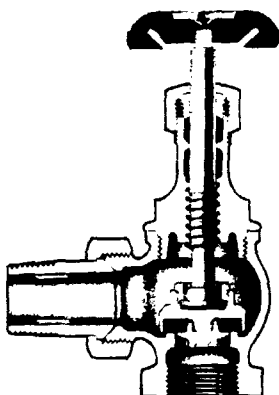
150-Pound Brass Radiator Valves

Government Pattern With Composition Disc

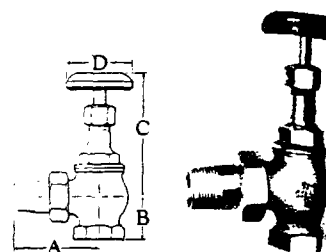
WORKING PRESSURE
150 pounds saturated steam

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.



Cross Section



No. 67 G Angle

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

List Prices and Dimensions

Size	Inches	1/2	3/4	1	1 1/4	1 1/2
No. 67 G, Rough, nickel-plated	Each	6.00	7.40	9.40	12.50	16.40
Dimensions, in Inches	A	2 3/8	3 1/4	3 1/2	3 7/8	4 1/2
	B	1 3/16	1 5/8	1 3/4	2	2 1/8
	C—Open	4 1/2	5 1/4	6	7 1/8	7 3/4
	D	2 1/4	2 1/2	2 3/4	3	3 1/4

For list prices of Composition Discs, see page 140.

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.

Discs: Unless otherwise ordered, the valves are 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., they are furnished with a No. 6 Disc. For discs, see page 140.

Government and Navy Specifications: The valves comply with Government Specifications issued by

the General Supervising Architect's Office and Quartermaster General's Office.

The valves also comply with Navy Department (Bureau of Yards and Docks) Specification 66-P-1a(INT), dated September, 1944, on Plant Heating and Ventilating Apparatus and Piping (Shore Use).

200-Pound Brass Radiator Valves

Union Bonnet with Brass Disc

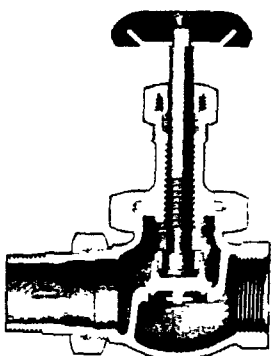
WORKING PRESSURE
200 pounds saturated steam

List Prices and Dimensions

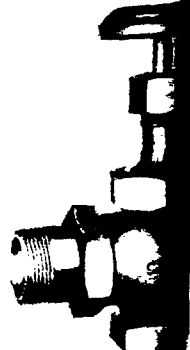
Size	Inches	3/8	1/2	3/4	1
No. 4270	Globe, Rough body	Each 5.40	6.00	8.00	11.00
	Angle, Rough body	Each 5.40	6.00	8.00	11.00
Dimensions, in Inches	Center to female end	1	1 3/16	1 3/8	1 11/16
	Center to union end	2 3/16	2 7/16	3	3 1/4
	Center to top, open	3 3/4	4 1/8	4 3/4	5 3/4
	Diameter of wheel	2	2 1/4	2 1/2	2 3/4

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.



Cross Section
No. 4270, Globe



No. 4270
Angle

No. 4270 Valves are recommended for high pressure steam and hot water systems. They have a Crane Special Brass body and disc, and are heavy and ruggedly constructed. The valves have a union bonnet and can be reground without removing the body

from the line. The stuffing box on sizes 1/2-inch and larger is equipped with a gland; the 3/8-inch size does not have a gland. The valves, when wide open, can be repacked while under pressure. 3/8 and 1/2 valves have a one-piece disc and stem.

Hose Threads

Thread Standards: The table shown below gives the basic dimensions of the American (National) Standard Hose Coupling Threads and of other hose threads now in general use.

Portion of the table includes:

American Standard Hose Coupling Screw Threads (B33.1-1935) sizes 2-inch and smaller for valves, couplings, nipples, and other fittings used in connection with hose intended for fire protection, domestic, industrial, and general service.

American (National) Standard Fire-Hose Coupling Threads (ASA B26-1925) sizes 2½-inch and larger for fire hose valves, couplings, hydrant and pipe connections, Siamese connections, and other special fittings on fire lines.

The S.A. Standards mentioned above agree with the data in the Hose Thread section of the Federal Specification of Screw-Thread Standards for Federal Procurement, No. H-25.

Portion of the table includes:

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.

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 Standard Hose Coupling Screw Threads (B33.1-1935) Sizes 2-inch and smaller	Garden Hose Thread	½		Garden and similar service
		5/8	11½	
	Chemical Hose Thread	¾		Chemical engine and booster hose
		¾	8	
	Fire Protection Hose Thread	1		Fire protection hose
		1½	9	
	Iron Pipe Hose Thread	½		Steam, water, air, oil, and all other hose connections
		¾	14	
		1		
		1¼	11½	
		1½		
		2		
American (National) Standard Fire-Hose Coupling Screw Threads (B26-1925) Sizes 2½-inch and larger		2½	7½	Fire hose
		3		
		3½	6	
		4½	4	
		½ or ¾		
		1		
Chicago Standard Hose Thread		1¼	11½	†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.
		1½		
		2	8	
		3	7	
		2½	7½	
		2½		
Chicago Fire Department Hose Thread		3	8	
		½		
†Iron Pipe Hose Threads		¾		
		1	11	
		1¼		
		1½		
		2	10	
		2½	7½	
California Standard (Pacific Coast) Hose Thread		½		
		¾		
		1		
		1¼		
		1½		
		2		

Hose Valves . . . pages 60 and 61

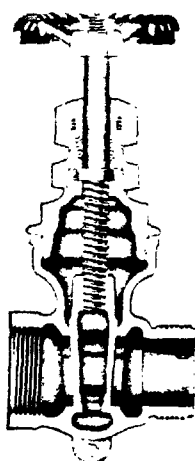
Hose Goods . . . pages 62 to 64

Brass Hose Gate Valves Wedge Disc—Non-Rising Stem

200 pounds
cold water working pressure

300 pounds cold water working pressure

Underwriters' Pattern



Cross Section
No. 451



No. 451
Screwed

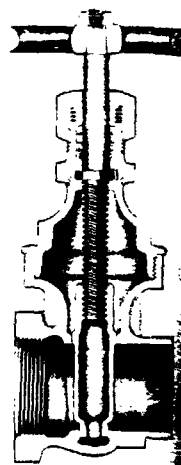
When so ordered, the valves shown on this page can be furnished with a brass cap and chain as illustrated below. An extra charge is made for the cap and chain; see the list price table below.



No. 453
Screwed
Without
Drain
Cock



No. 453
Screwed
With
Drain
Cock



Cross Section
No. 453

No. 453 Valves are furnished without drain cock unless otherwise ordered.

List Prices

Size	Inches	1	1 1/4	1 1/2	2	2 1/2
Rough Body, Plain (Without cap and chain)	No. 451	Each	9.30	12.00	15.50	22.00
	No. 453	Without drain cock	Each		17.00	40.00
	No. 453	With drain cock	Each		20.00	44.00
Brass cap and chain for No. 451 or 453 Valve		Extra per valve	2.80	3.20	3.90	5.00

Hose threads: Unless otherwise ordered, these valves have the following thread on the male end:

No. 451 Hose Gate Valves

- 1 to 2" sizes — Chicago Standard Hose Thread
- 2 1/2" size — Chicago Fire Department Hose Thread

No. 453 Underwriters' Pattern Valves

- 1 1/2" size — Chicago Standard Hose Thread
- 2 1/2" size — American (National) Standard Fire Hose Coupling Screw Thread

When so ordered, the male end can be supplied with the following threads, without additional charge:

No. 451 Hose Gate Valves

- All sizes — Iron Pipe Hose Thread
- All sizes — California Standard Hose Thread
- 2 1/2" size — American (National) Standard Fire Hose Coupling Screw Thread

No. 453 Underwriters' Pattern Valves

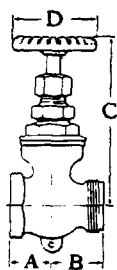
- Both sizes — Iron Pipe Hose Thread
- Both sizes — California Standard Hose Thread
- 2 1/2" size — Chicago Fire Department Hose Thread

When any other hose thread is required, order should be accompanied by a sample, preferably the male end of a hose coupling. See page 59.

Rugged construction: The Hose Gate Valves shown on this page have a non-rising stem and wedge disc.

Their deep stuffing box is fitted with a gland, and the valves are strong and ruggedly constructed. They have an American Standard Taper Pipe Thread on the female end.

Underwriters' Specifications: No. 453 Hose Gate Valves conform to the Underwriters' Specifications known as "The National Standard". They are listed as approved and inspected by the Associated Factory Mutual Fire Insurance Companies, Boston, and Underwriters' Laboratories, Chicago, for water working pressures up to 300 pounds.



No. 451

Dimensions, in Inches

Size	1	1 1/4	1 1/2	2	2 1/2
No. 451	A	1 3/8	1 1/2	1 5/8	2 1/8
	B	1 5/8	1 7/8	2 1/16	2 5/8
	C	5 5/8	6 1/2	7 1/4	8 5/8
	D	2 3/4	3 1/16	3 5/8	4 1/16
No. 453	A		1 5/8		2 5/16
	B		2 1/4		2 5/8
	C		7 1/2		11
	D		4 1/8		6

Marine Hose Gate Valves page 387

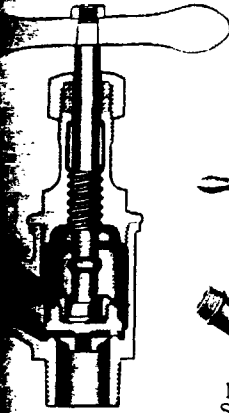


No. 453

Brass Hose Valves

Chicago Hose Valves

With Leather Disc
200 pounds
cold water working pressure



Cross Section
No. 50



No. 50
Screwed

Garden Hose Valves

With Leather Disc



No. 56
Screwed



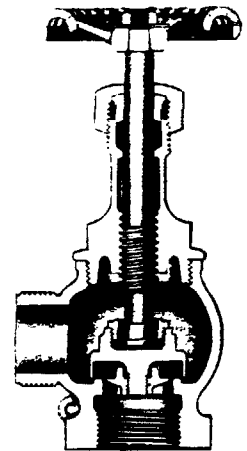
No. 58
Screwed

Angle Hose Valves

With Crane Composition Disc
250 pounds
cold water working pressure



*No. 117
Screwed



Cross Section
*No. 117

*When so ordered, No. 117 Valves can be furnished with a brass cap and chain at the list prices shown in the table below

List Prices

		Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Body,	No. 50	Each			7.50	9.00	13.00	16.70	21.00
	No. 56 or No. 58	Each	3.60	4.00	5.00	9.50	13.00	17.00	
	No. 117, without cap and chain	Each		9.00	10.50	14.00	17.60	26.00	
Cap and chain for No. 117 Valve		Extra per valve		2.50	2.80	3.20	3.90	5.00	

For list prices of composition discs for No. 117 Valves, see page 140.

Threads: All of these valves have an American Standard Pipe Thread on the inlet. Unless otherwise ordered, they are furnished with the same thread on the male outlet:

7" sizes — Chicago Standard Hose Thread
8" size — Chicago Fire Department Hose Thread

When ordered, the outlet can be supplied with the following threads, without additional charge:

1 1/2" size — Iron Pipe Hose Thread
2" size — California Standard Hose Thread
2 1/2" size — American (National) Standard
3" size — Fire Hose Coupling Screw Thread

For any other hose thread should be accompanied by a sample, preferably the male end of a hose. For threads, see page 59.

Chicago Hose Valves: Chicago Hose Valves are especially suitable for use on outside standpipes.

Garden Hose Valves: Garden Hose Valves, ruggedly constructed, are ideal for garden and lawn hose service for homes, estates, greenhouses, cemeteries, golf courses, etc.

Angle Hose Valves: Angle Hose Valves are recommended for use on standpipes and hose racks, and for similar service.

The valves are regularly furnished with a Crane No. 6 Composition Disc; see page 140 for discs.



*No. 117
Angle
Hose Valve
with cap
and chain

Dimensions, in Inches

			1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Chicago Hose Valves	Center to hose end				2 1/2	3	3	3 1/2	4 1/16
	Over-all height, open				8 1/8	9 5/8	10 1/2	11 7/8	13 7/8
	Length of handle				5 1/8	5 3/4	6 1/2	8 1/4	8 1/4
Garden Hose Valves	Center to hose end	No. 56	1 7/8	1 7/8	2 1/4	2 3/4	3 1/16	3 3/4	
		No. 58	1 3/8	1 3/8	1 5/8	2 1/16	2 1/4	2 5/8	
	Over-all height, open		4 9/16	4 3/4	5 13/16	7 1/2	8 3/8	9 3/8	
	Diameter of wheel		2 1/16	2 1/16	2 9/16	3 1/16	3 5/8	4 1/16	
Angle Hose Valves	Center to hose end			1 9/16	1 3/4	2 1/4	2 3/8	2 3/4	
	Over-all height, open			7 3/16	7 13/16	9 1/8	9 7/8	12 3/16	
	Diameter of wheel			2 3/4	3 1/16	3 5/8	4 1/16	5 3/8	

Hose Couplings and Clamps

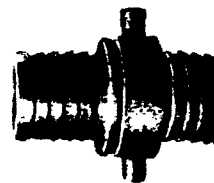
Brass Water Hose Couplings

Larger sizes are available; they have lugs on both the female and male half.



No. 17 C-A
Sizes 1-inch and smaller
(Without Lugs)

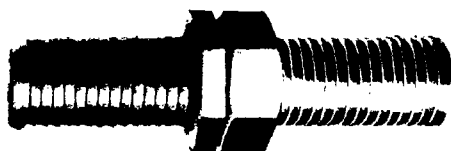
Dimensions, in Inches											
Size of Hose		3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2	2 1/2	
Thread Size	No. 17C-A	3/4	3/4	3/4	3/4	1					
	No. 89-A										
		HPT—Hose Pipe Thread					Specify Thread Wanted				
HPT—Hose Pipe Thread						IPT—Iron Pipe Thread.					



No. 89-A
Sizes 1 1/4 to 2 1/2 inches
(Lugs on Female Half)

Brass Steam Hose Couplings

These couplings have extra heavy swivels, recessed for washers. Tailpieces are extra long.



No. 90-A

		Dimensions, in Inches									
Size of Hose		1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2	2 1/2
*Thread Size		1/4	3/8	1/2	3/4	3/4	1	1 1/4	1 1/2	2	2 1/2
		†Can be had with 1/2-inch IPT.									

Galvanized Steel Hose Clamps

Large Size Extra Heavy Clamps: Large Size Extra Heavy Clamps are available in the following I.D. Sizes: 2 3/4, 2 7/8, 3, 3 1/8, 3 1/4, 3 3/8, 3 1/2, 3 5/8, 3 3/4, 3 7/8, 4, 4 1/8, 4 1/4, 4 3/8, 4 1/2, 4 5/8, 4 3/4, 4 7/8, 5, 5 1/4, 5 3/8, 5 1/2, 6, and 6 1/2 inches.

		Steam Hose Sizes							
Size of Hose	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	
I.D. of Clamp Inches	4-Ply	1 1/16	1 3/8	1 11/16	1 15/16	2 1/4	2 5/8	2 15/16	
	5-Ply	1 3/16	1 7/16	1 3/4	2	2 5/16	2 3/4	3	
	6-Ply	1 1/4	1 1/2	1 13/16	2 1/16	2 3/8	2 7/8	3 1/16	

		Water Hose Sizes													
Size of Hose	Inches	3/16	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	*2	2 1/4	2 1/2	2 3/4
I.D. of Clamp Inches	2-Ply			9/16	3/4	1	1 1/16	1 5/16	1 5/8						
	3-Ply	7/16	1/2	5/8	7/8	1 1/16	1 1/8	1 3/8	1 11/16	2	2 1/4	2 7/16	2 3/4	2 15/16	
	4-Ply			1 1/16	1 5/16	1 1/8	1 3/16	1 7/16	1 13/16	2 1/8	2 3/8	2 9/16	2 13/16	3	3 1/4
	5-Ply				1	1 1/4	1 1/2	1 7/8	2 3/16		2 1 1/16		3 1/8		

*Also available in 3-inch I.D. Suction Hose.



No. 1923-A

Stamped Sheet Brass Hose Clamps

No. 3935-A

		Steam Hose Sizes						
Size of Hose	Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	
I.D. of Clamp Inches	3-Ply	1 7/16	1 5/8					
	4-Ply	1 17/32	1 21/32					
	3-4-Ply			1 15/16	2 7/32	2 11/16	3 1/4	
	5-Ply				2 13/32	2 7/8	3 9/16	

		Water Hose Sizes													
Size of Hose	Inches	3/16	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2	2 1/4	2 1/2		
I.D. of Clamp Inches	2-Ply			5/8	7/8			1 11/32							
	2 1/2-Ply			1 1/16											
	3-Ply	7/16	1/2	3/4	1 5/16	1 1/32	1 3/16	1 7/16	1 21/32	1 15/16					
	4-Ply		9/16		1 3/32	1 1/4	1 17/32	1 13/16	2 1/16						
	3-4-Ply										2 9/16	2 7/8	3 1/16		

Prices on application



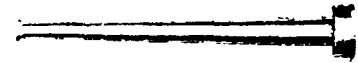
Hose Nozzles, Pipes, and Fittings

Nozzles and Pipes

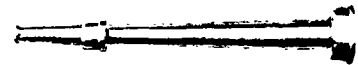
Nozzles and Pipes are furnished with Hose Pipe Thread or Iron Pipe Thread, which is wanted. Other size discharges are made to order at additional cost. 1/4-inch and larger are recessed for washers.

Dimensions and Discharge, in Inches

	3/4	1	1 1/4	1 1/2	2	2 1/2
	3	6	7 1/2	8	4	8
	4 3/4	10	5 3/4	10	12	6 3/4
	12	7 1/2	12	9 1/8	16	5 1/8
No. 97-A	1 1/4	1 1/4	1 1/4	5/16	5/16	3/8
No. 95-A	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2



No. 97-A, Hose Nozzle



No. 95-A, Hose Pipe

Hose Nipples, Brass



No. 91-A

Size and Thread
3/8" IPT x 3/8" IPT
1/2" IPT x 1/2" IPT
3/4" IPT x 3/4" HPT
1" IPT x 3/4" IPT
1 1/4" IPT x 3/4" HPT
1 1/2" HPT x 1" IPT
2" IPT x 1" IPT
2 1/2" IPT x 1 1/4" IPT
3" IPT x 1 1/2" IPT
Threads for following:
3/4" 3" x 3"
1 1/2" 3 1/2" x 3 1/2"
2" 4" x 4"

Iron Pipe Thread.
Hose Pipe Thread.
Chicago Hose Pipe Thread.

Brass Hose Reducers



No. 93-A
No. 9301-A, Less Lugs

Size and Thread
Female x Male
No. 9301-A, without Lugs
3/4" HPT x 1/4" IPT
3/4" HPT x 3/8" IPT
3/4" HPT x 1/2" IPT
1" IPT x 3/4" HPT
No. 93-A, with Lugs
Specify threads wanted.
1 1/4" x 1" 2" x 3/4"
1 1/4" x 3/4" 2 1/2" x 2
1 1/2" x 1 1/4" 2 1/2" x 1 1/2
1 1/2" x 1 2 1/2" x 1 1/4
1 1/2" x 3/4" 2 1/2" x 1
2" x 1 1/2" 2 1/2" x 3/4
2" x 1 1/4" 3" x 2 1/2
2" x 1 3" x 2

*Straight Iron Pipe Thread.
HPT = Chicago Hose Pipe Thread.

Double Female Brass Hose Nipples



No. 9200-A

Size and Thread
1/2" IPT x 3/4" HPT
3/4" IPT x 3/4" HPT
1" IPT x 1" HPT

†Taper Iron Pipe Thread.
HPT = Chicago Hose Pipe Thread.
Larger sizes available, specify threads.

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. 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.

Male and Female Brass Hose Nipples



No. 92-A

Size and Thread
Male x Female
3/4" HPT x 1/2" IPT
1" IPT x 3/4" HPT
1 1/4" HPT x 3/4" IPT
1 1/2" IPT x 1" IPT
Threads for following:
1 1/4" 2 1/2" x 2 1/2"
1 1/2" 3" x 3
2" 3 1/2" x 3 1/2"

Iron Pipe Thread.
Hose Pipe Thread.
Chicago Hose Pipe Thread.

Brass Hose Bushings



No. 94-A
No. 94 L-A

Size and Thread
Male x Female
No. 94-A (Small sizes)
3/4" HPT x 1/2" IPT
1" IPT x 3/4" HPT
No. 94 L-A (Large sizes)
Specify threads wanted.
1 1/4" x 1" 2" x 3/4"
1 1/4" x 3/4" 2 1/2" x 2
1 1/2" x 1 1/4" 2 1/2" x 1 1/2
1 1/2" x 1 2 1/2" x 1 1/4
1 1/2" x 3/4" 2 1/2" x 1
2" x 1 1/2" 2 1/2" x 3/4
2" x 1 1/4" 3" x 2 1/2
2" x 1 3" x 2

*Straight Iron Pipe Thread.
HPT = Chicago Hose Pipe Thread.

Prices on application

Hose Spanner



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

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 $1\frac{1}{4}$ to $2\frac{1}{2}$ -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 $1\frac{1}{2}$ -inch hose rack has a $1\frac{1}{2}$ -inch collar for a $1\frac{1}{2}$ -inch valve and nipple.

Recessed Cabinet for Bowes Hose Rack

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 $1\frac{1}{4}$ -inch projecting trim or with a flat trim. The $1\frac{1}{4}$ -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.

Standard finish: baked on white enamel inside; white priming coat outside. Any special color or graining can be applied when specified.

Bronze cabinets, made of hard copper, bronze plated, instead of steel, bronze plated, can also be furnished.



No. 262-A

Can be furnished wording "Fire Hose" on

Capacity		Cabinet Size in Inches						
Hose Feet	Valve Size Inches	Inside Width	Inside Height	Inside Depth	Trim Width	Trim Height	Glass Size	Valve Inlet From Top
50	$1\frac{1}{4}$ - $1\frac{1}{2}$	$19\frac{3}{4}$	$28\frac{3}{4}$	$5\frac{1}{2}$	$24\frac{1}{2}$	$33\frac{1}{2}$	15×24	$3\frac{1}{4}$
75	$1\frac{1}{4}$ - $1\frac{1}{2}$	$20\frac{3}{4}$	$30\frac{3}{4}$	$5\frac{1}{2}$	$25\frac{1}{2}$	$35\frac{1}{2}$	16×26	$3\frac{1}{4}$
100	$1\frac{1}{4}$ - $1\frac{1}{2}$	$22\frac{3}{4}$	$32\frac{3}{4}$	$5\frac{1}{2}$	$27\frac{1}{2}$	$37\frac{1}{2}$	18×28	$3\frac{1}{4}$
50	2	$19\frac{3}{4}$	$28\frac{3}{4}$	$6\frac{1}{2}$	$24\frac{1}{2}$	$33\frac{1}{2}$	15×24	$3\frac{5}{8}$
75	2	$22\frac{3}{4}$	$32\frac{3}{4}$	$6\frac{1}{2}$	$27\frac{1}{2}$	$37\frac{1}{2}$	18×28	$3\frac{5}{8}$
100	2	$24\frac{3}{4}$	$34\frac{3}{4}$	$6\frac{1}{2}$	$29\frac{1}{2}$	$39\frac{1}{2}$	20×30	$3\frac{5}{8}$
50	$2\frac{1}{2}$	$19\frac{3}{4}$	$28\frac{3}{4}$	$7\frac{1}{2}$	$24\frac{1}{2}$	$33\frac{1}{2}$	15×24	4
75	$2\frac{1}{2}$	$22\frac{3}{4}$	$32\frac{3}{4}$	$7\frac{1}{2}$	$27\frac{1}{2}$	$37\frac{1}{2}$	18×28	4
100	$2\frac{1}{2}$	$24\frac{3}{4}$	$34\frac{3}{4}$	$7\frac{1}{2}$	$29\frac{1}{2}$	$39\frac{1}{2}$	20×30	4

Outside Wall Fire Hose Cabinets

Outside Wall Cabinets are made in any size. This cabinet is recommended where the wall depth is not available for the recessed cabinet, but where protection, given by a hose cabinet, is needed.

These cabinets have a hollow metal construction and can be furnished with either the full glass panel or the duo-panel door.

No. 380-A Alenco Hollow Metal Construc-

tion. In estimating wall space required, add $3\frac{3}{4}$ inches to inside dimensions.

No. 380N-A—Nella Sheet Steel Construction. In estimating wall space required, add 2 inches to inside dimensions.

When ordering, specify whether knock-outs and hinges are to be on left hand side or right hand side.

Prices on application



Brass Stops, Brass Cocks, and Iron Cocks

Brass Stops

Rough.....	page 66
Ground Key.....	page 66
Hydrant.....	page 67
Gas Service.....	page 68

Brass Cocks

Brine.....	page 66
Pet.....	page 67
Gauge.....	page 67
Cylinder.....	page 67
Spring Loaded.....	page 68
125-Pound Steam.....	page 69
250-Pound Steam.....	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
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Accessories

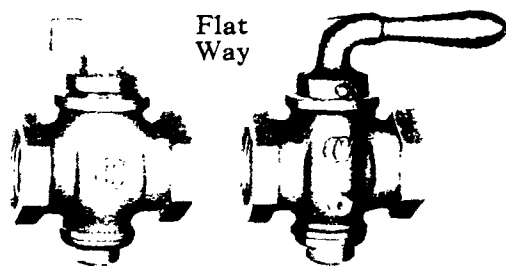
Hydrant Clamps and Handles.....	page 67
Street Washer Keys.....	page 67
Wood Rod Couplings.....	page 67
Wrenches for Brass and Iron Cocks.....	page 72

For Brass Try Cocks, see page 351.



Industrial plants, small and large, utilize Crane products.

Brass Rough Stops



Tee Head

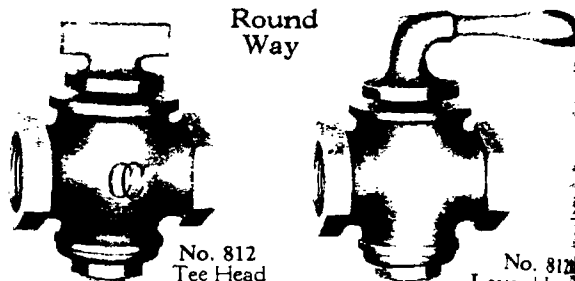
Flat
Way

Lever Handle

Without Check or Drain
No. 804 No. 804½ (not shown)

With Check and Drain
No. 806 (not shown) No. 806½
Drilled Drain Tapped Drain

The drain on the Nos. 806 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 open-

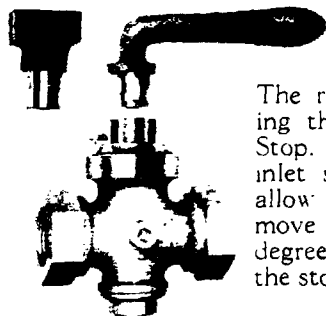
No. 812
Tee HeadNo. 812
Lever Handle

List Prices, Each, and Dimensions, in Inches

Size	Inches	¾	½	⅝	¾	1	1¼	1½	2
Flat Way	No. 804		2.60		3.40	4.90	6.80	9.30	15.1
	No. 804½	2.10	2.60		3.40	4.90	6.80	9.30	15.1
	No. 806		2.80	3.20	3.60	5.20	7.10	10.50	18.1
	No. 806½	2.50	2.80		3.60	5.20			
	End to end	1⅞	2⅞	2½	2⅞	3⅞	3⅞	4⅞	
Round Way	No. 812		3.10	4.00	4.50	6.50			
	No. 812½		3.10		4.50	6.50			
	End to end		2⅞	2⅞	2⅞	3⅞			

ing a valve on the outlet side. The drain on the No. 806½ is tapped for a Drain Tube; Drain Tube (1⅞-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 (2⅞-inch O.D. with 27 threads per inch) are extra.

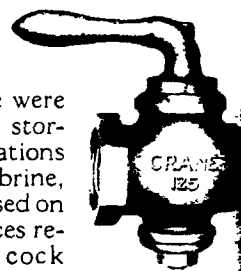
List Prices and Dimensions

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	3⅞	3¼	3⅞

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	¾	½	¾	1
No. 814	Each	2.30	2.80	3.40	
End to end	Inches	2⅞	2½	2⅞	

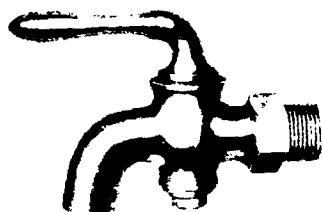
Brass Ground Key Faucets

When ordering, specify whether
Rough or Polished Faucets are wanted.

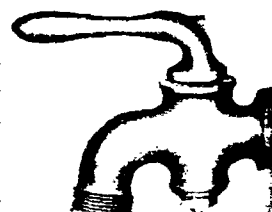
List Prices

Size		Inches	3/8	1/2	3/4	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				3/4"	3/4"	1"

No. 801 Faucets have Chicago Hose Threads on the outlet.



No. 800, Plain

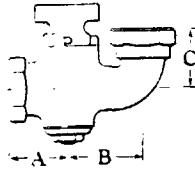


No. 801, For Hose

Brass Hydrant Stops



No. 816, Tee Head
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.

List Prices and Dimensions

Size	Inches	1/2	3/4	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

The hydrant should be open to vent for complete drainage.

Hydrant Clamps



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			$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$
Width of slot Inches			$\frac{7}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
No. 850	Black	Each	.20	.30	.20	.30
	Galv.	Each			.30	.40

Hydrant Handle



No. 860, Malleable Iron
To fit 3/4-inch Square Rod

List Price

No. 860	Each	.60
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Street Washer Keys

No. 856
Malleable Iron
Length, 5 1/4 Inches

List Prices, Black

No. 856	To fit 3/8-inch square rod	Each	.50
	To fit 1/2-inch square rod	Each	.60

Wood Rod Couplings



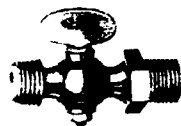
No. 854, Malleable Iron

Pipe thread is 3/8-inch; the couplings may be used with 1 or 1 1/8-inch square rod.

List Prices, Per Set

No. 854	Black	1.50
	Galv.	1.60

Brass Gauge Cocks



Male
No. 708, Tee Head



Female
No. 712, Tee Head



Male and Female
No. 744, Tee Head

List Prices

Size			Inches	1/8	1/4	3/8	1/2
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	*	*	

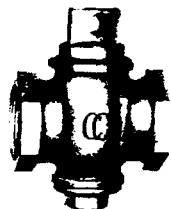
Brass Cylinder Cocks



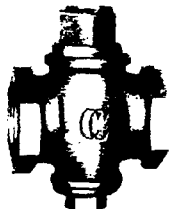
No. 724
Lever Handle

*For No. 724 Cylinder Cocks in sizes larger than 1/4-inch, use No. 800 Ground Key Faucets; see page 66.

Brass Gas Service Stops



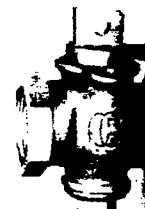
No. 270, Flat Head



No. 272, Square Head



No. 276, Tee Head

No. 278, Tee Head
With CheckNo. 284, Flat Head
With Lockup

List Prices and Dimensions

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
No. 270	Each	1.70	1.90	2.20	2.80	3.60	5.00	6.70
No. 272	Each	1.70	1.90	2.20	2.80	3.60	5.00	6.70
No. 276	Each	1.70	1.90	2.20	2.80			
End to end	Inches	1 5/8	1 7/8	2 1/16	2 3/8	2 11/16	3 5/16	3 11/16
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	1 5/8	1 7/8	2 1/16	2 3/8	2 11/16	
Stop with Lockup	No. 284	Each			2.80	3.60	4.60	6.00
	End to end	Inches			2 1/8	2 5/8	3 1/16	3 5/16

No. 298, Lever Handle
With Check

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.

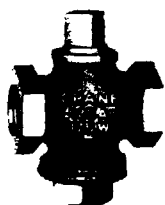
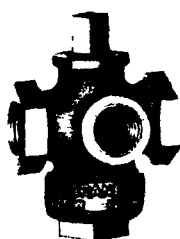
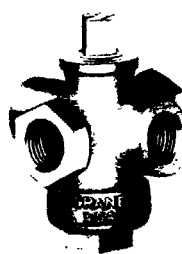
The No. 298, often referred to as a "Gas Stove Stop" is commonly used in the gas line to gas stove (or other appliances) so that the gas can be shut off at the appliance without shutting off the entire supply in the building.

Brass Spring-Loaded Cocks

WORKING PRESSURES

125 pounds air—175 pounds cold water, non-shock

Air Tested

Square Head
No. 305Square Head
No. 306, Three-WaySquare Head
No. 307, Four-Way

List Prices and Dimensions

Size		Inches	1/4	3/8	1/2
No. 305	Price	Each	5.00	5.50	6.20
	Center to end	Inches	31/32	31/32	13/32
No. 306	Price	Each	6.00	7.50	9.50
	Center to end	Inches	31/32	11/16	13/32
No. 307	Price	Each	7.00	8.70	11.00
	Center to end	Inches	11/16	1 1/8	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

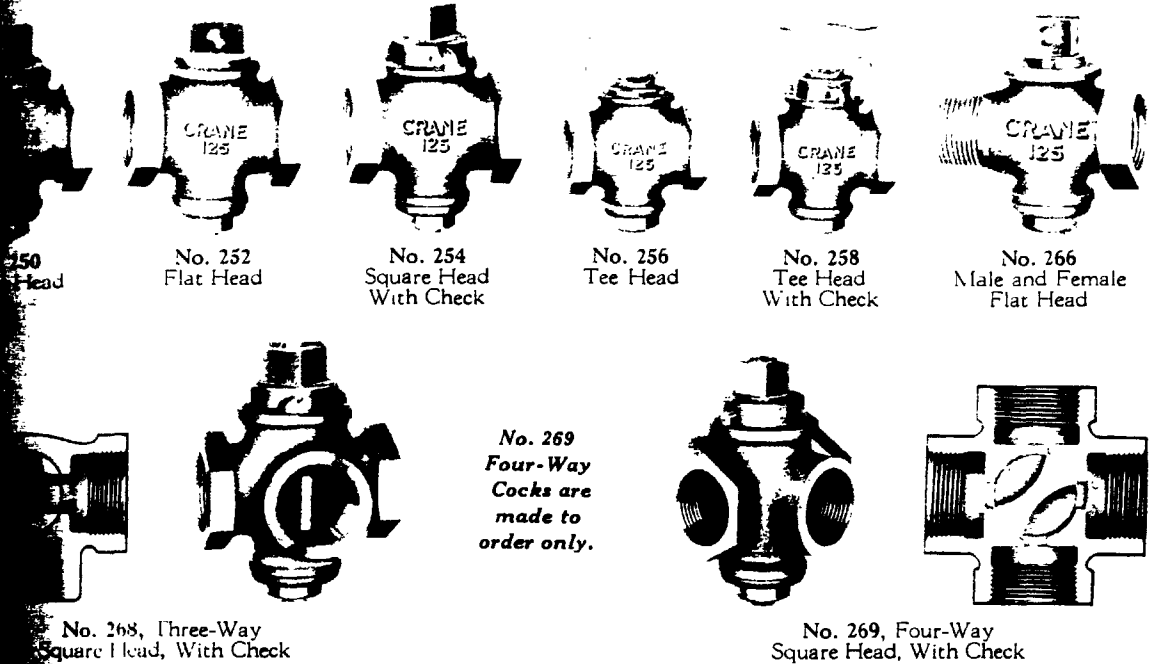
Crane manufactures a variety of brass try cocks suitable for pressures ranging from 15 pounds to 150 pounds steam working pressure. For complete description and prices, see page 351.

Wrenches . . page 72

125-Pound Brass Steam Cocks

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

Air Tested



List Prices and Dimensions

	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
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
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	3 1/32	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 Brass Steam Cocks

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

The body and plug are made of Crane Special Brass, 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

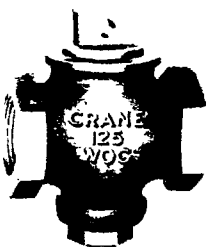
Air Tested

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.



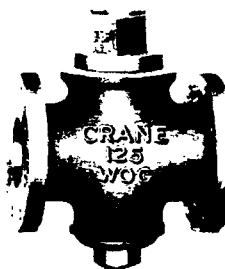
Square Head
No. 320, All-Iron



Flat Head
No. 320 1/2, All-Iron

No. 324

With Brass Plug and Washer



Square Head
Flanged

No. 325, All-Iron



Three-Way, Square Head
No. 326, All-Iron

No. 330

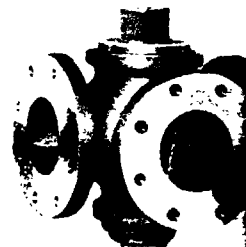
With Brass Plug and Washer

List Prices, Black, and Dimensions, in Inches

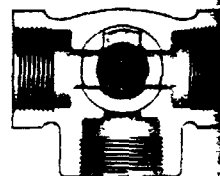
Size		Inches									
		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
Screwed	No. 320	Each	2.50	2.90	3.30	4.30	5.30	7.00	16.00	26.00	43.00
	No. 320 1/2	Each	2.50	2.90	3.30	4.30	5.30	7.00			
	No. 324	Each	3.60	4.30	5.20	7.00	10.00	13.50	28.00	43.00	75.00
	No. 324 1/2	Each	3.60	4.30	5.20	7.00	10.00	13.50			
	No. 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		2 1/4	2 3/4	3 3/8	4 1/8	4 5/8	5 1/4	6 3/8	7 3/4	9 7/8
C. to outlet end (3-way)			1 7/16	1 11/16	2 1/16	2 1/4	2 5/8	3 3/16	3 7/8	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						6 3/8	8 5/8	9 5/8	12 1/8	
	Center to face of side opening (3-way)						4 1/8	4 5/16	4 13/16	6 1/16	
	Diameter of flanges						6	7	7 1/2	9	
	Thickness of flanges						5/8	1 1/16	3/4	1 5/16	

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 439.



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	1/2	3/4	1	1 1/4	1 1/2	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	3 5/8	4	4 3/4	5 3/8	6 7/8

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
End to end	Inches	6 3/4	8 5/8	10
Center to top	Inches	4 1/4	5 1/2	7 3/4
Center to bottom	Inches	4 5/8	6	6 7/8

Price
does not
include
lock

Iron Gas Line Cocks

WORKING PRESSURE

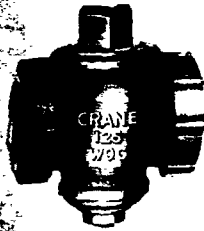
125 pounds cold water, oil, air, or gas, non-shock

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 $\frac{1}{2}$ -inch hole for Lockup in which a padlock or sealing pin may be used.

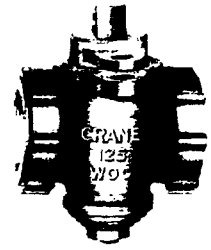
No. 1236 Cocks, ideal for underground installations, have a $\frac{1}{2}$ -inch recess at each end, which protects the threads and assists in supporting the pipe.



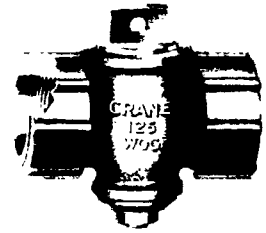
Square Head
No. 1228
With Brass Plug and Washer



Flat Head
No. 1232
With Brass Plug and Washer



Flat Head, with Lockup
No. 1234
With Brass Plug and Washer



Flat Head, with Recessed Ends
No. 1236
With Brass Plug and Washer

List Prices, Each, and Dimensions

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	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	$2\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$
No. 1236		Galv.		3.00	3.60	4.60	
End to end		Inches		$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{3}{4}$	

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
125 pounds cold water,
non-shock

Air Tested



No. 319
Square Head
With
Brass Plug

Mine Cocks also
available, prices are
based on application.

Four-Way Cocks

WORKING PRESSURES

250 pounds air
350 pounds cold water, non-shock

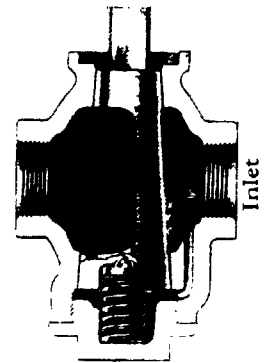
Air Tested

No. 339 Four-Way Cocks are used on hydraulic or air cylinders, hydraulic presses, etc. The diagrams below illustrate how they operate:

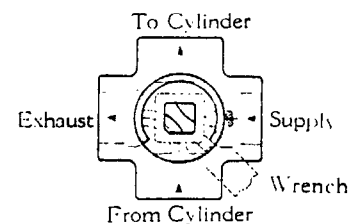
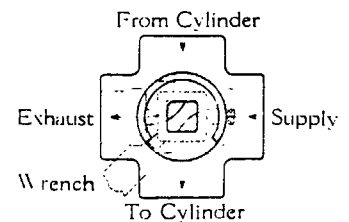
Upper diagram: Supply fluid diverted to one end of cylinder; fluid from opposite end passes into exhaust line.

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

	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price Each		5.10	5.50	6.00	8.00	10.50	15.00
End to end	Inches	$2\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	4	$4\frac{1}{4}$	$5\frac{1}{8}$
Price Each		8.50	9.70	14.00	22.00	32.00	48.00
Center to end	Inches	$1\frac{5}{16}$	$1\frac{9}{16}$	$1\frac{15}{16}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{2}$

Spring-Loaded Cocks have a steel spring between the plug and cap. The spring compensates for wear, assures tightness between body and plug, and permits easy operation.

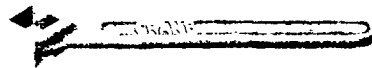
Spring-Loaded Cocks....page 68

Wrenches for Cocks... page 72

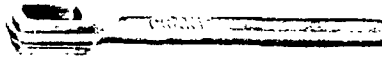
Malleable Iron Wrenches

For Brass and Iron Cocks

List Prices

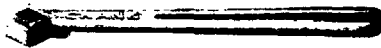


Square Head



Flat Head

Square Head
For No. 319 and No. 339



Square Head Wrenches

Catalog Number of Wrench	List Price	Length from Center of Head to End	Suitable for						
			Brass Cocks				Iron Cocks		
			No. 80 E	Nos. 250 254 272	Nos. 268 269	Nos. 305 306	No. 307	Nos. 320 321 324 325 326 330 331	No. 1228
	Each	Inches							
1-S	.14	3	1/4	1/4	1/4				
2-S	.16	3 1/2	3/8	3/8		1/4, 3/8, 1/2	1/4, 3/8		
3-S	.16	4		1/2	3/8		1/2		1/2
4-S	.22	5	1/2	3/4	1/2			1/2	3/4
5-S	.28	6 1/2	3/4	1	3/4			3/4	1
6-S	.36	8	1	1 1/4	1				1 1/4
6 1/2-S	.42	7 3/8						1	
7-S	.54	9 1/2	1 1/4	1 1/2	1 1/4, 1 1/2				1 1/2
7 1/2-S	.68	8 1/2						1 1/4	
8-S	.80	12	1 1/2	2	2			1 1/2	2
9-S	1.30	14 1/2	2					2	
10-S	2.00	17						2 1/2	
11-S	2.70	22						3	
12-S	7.50	30						4	

Flat Head Wrenches

Catalog Number of Wrench	List Price	Length from Center of Head to End	Suitable for		
			Brass Cocks		Iron Cocks
			Nos. 252 266 270 284	Nos. 320 1/2 324 1/2 334 337	Nos. 1232 1234 1236
	Each	Inches			
1-F	.14	3	1/4		
2-F	.16	3 1/2	3/8		
3-F	.16	4	1/2		1 1/2
4-F	.22	5	3/4	1/2	3/4
5-F	.28	6 1/2	1	3/4	1
6-F	.36	8	1 1/4	1	1 1/4
7-F	.54	9 1/2	1 1/2		1 1/2
8-F	.80	12	2		2
23-F	.74	9 3/4		1 1/4	
24-F	.94	10 1/2		1 1/2	
25-F	1.30	12 1/2		2	

Square Head Wrenches (For Nos. 319 and 339 Cocks Only)

Catalog Number of Wrench	List Price	Length from Center of Head to End	Suitable for	
			No. 319 Iron Cock	No. 339 Iron Cock
	Each	Inches		
1-M	.50	5 1/2	1/2	
2-M	.60	8	3/4, 1	1/2, 3/4
3-M	.70	11	1 1/4, 1 1/2	
4-M	.90	11		1
5-M	1.20	14	2	1 1/4, 1 1/2
6-M	2.40	18		



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.



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 for Wedge Gate Valves

By-Passes. page 84
 Cleanouts. page 84
 Indicators. page 84
 Gearing. page 85

Dimensions of Valves with Gearing or By-Pass. page 86

For Valves for Marine service, see pages 384 and 389.

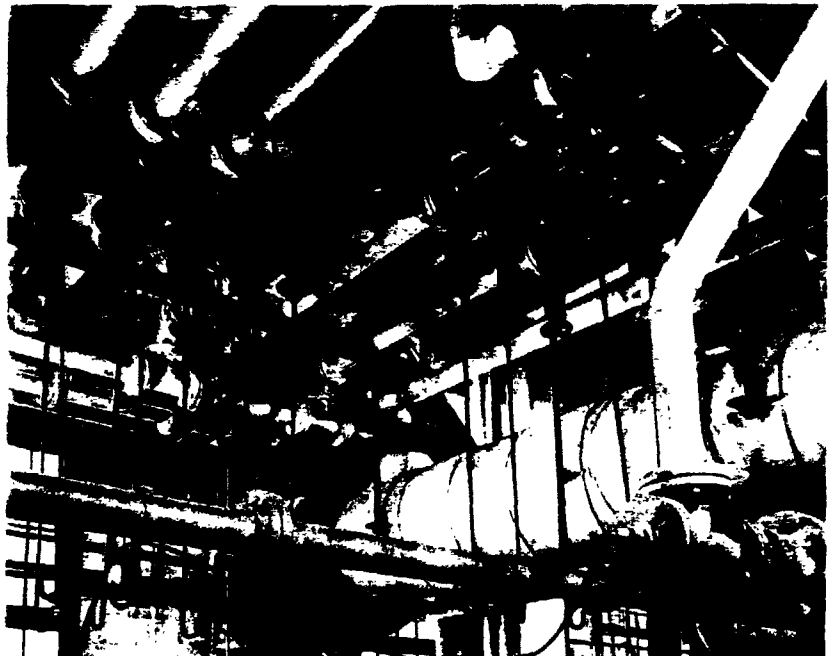
For Alloy Cast Iron Valves for Process Industries, see page 375.

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 375), Ni-Resist Valves (see page 374) and Valves for Marine service (see page 389).

The Crane high standard of quality in design, materials, and workmanship is maintained in these valves, assuring the user satisfactory and long-time service.

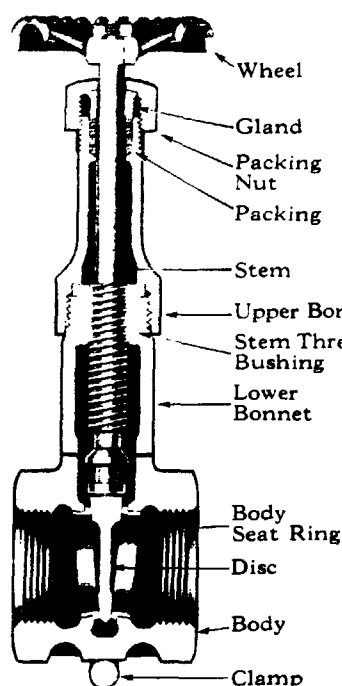
An overall installation of Crane Iron Body Wedge Gate Valves.

Crane Clamp Gate Valves, compact and sturdy, have an especially wide acceptance among process industries, and in field or refinery installations.



Clamp Gate Valves

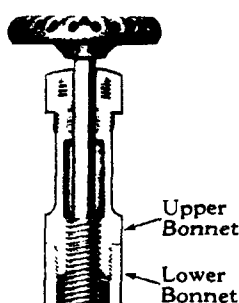
Wedge Disc—All-Iron or Brass Trimmed



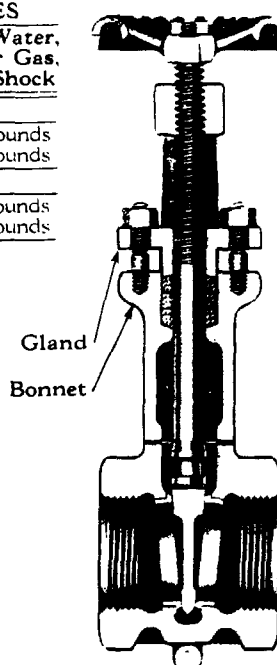
Brass Trimmed
Inside Screw Valves
Sizes 1 1/4 to 4-inch

WORKING PRESSURES		
Size Inches	Saturated Steam	Cold Water, Oil, or Gas, Non-Shock
Screwed Valves		
1 1/4 to 2	150 pounds	225 pounds
2 1/2 to 4	125 pounds	175 pounds
Flanged Valves		
1 to 2	125 pounds	200 pounds
2 1/2 to 4	125 pounds	175 pounds

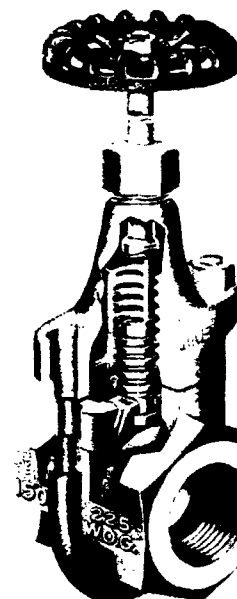
Air Tested



Brass Trimmed
Inside Screw Valves
Sizes 1/4 to 1-inch
(1/4 and 3/8-inch sizes
do not have a gland.)



Brass Trimmed
Outside Screw
and Yoke Valves



All-Iron
Inside Screw Valve
Illustration shows partially
sectioned All-Iron Inside
Screw Valve, featuring free
draining bonnet. Bonnet
has no flats or pockets to
trap fluid.

Service recommendations: Crane Clamp Gate 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, or air 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.

Construction: The clamp construction enables dismantling the valve quickly for inspection, cleaning, or repairs. In addition, it maintains a snug and accurately aligned bonnet joint.

Brass trimmed valves: Brass trimmed valves have brass body seat rings, disc, and stem.

In inside screw valves 1/4 to 1-inch, the upper portion of the bonnet engages the stem threads; it is made of brass and is renewable. Sizes 1 1/4-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.

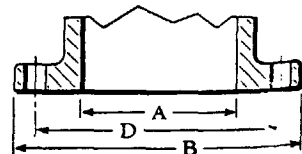
All-iron valves: The seats in all-iron valves are cast

integral with the body. The disc is forged steel. The stem is steel, the portion coming in contact with the stuffing box packing being 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, illustrated 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 (B16.1-1048).

The flanges are plain faced with a smooth finish.



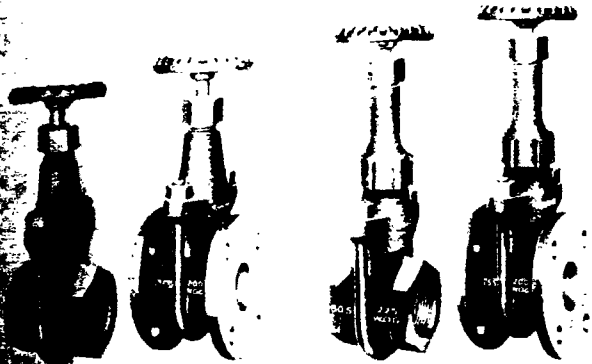
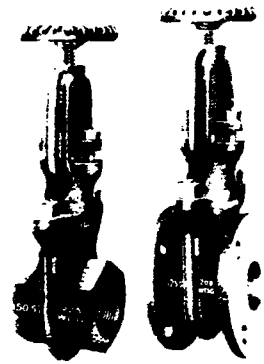
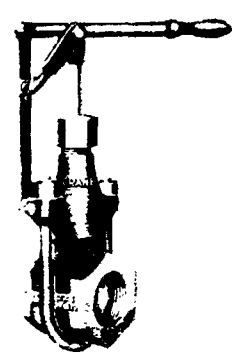
Dimensions of Flanges, in Inches

Size	A	B	C	D	No. of bolts	Dia. of bolts
1	1	4 1/4	7/16	3 1/8	4	1/2
1 1/4	1 1/4	4 5/8	1/2	3 1/2	4	1/2
1 1/2	1 1/2	5	9/16	3 3/8	4	1/2
2	2	6	5/8	4 3/4	4	5/8
2 1/2	2 1/2	7	11/16	5 1/2	4	5/8
3	3	7 1/2	3/4	6	4	5/8
4	4	9	15/16	7 1/2	8	5/8

Clamp Gate Valves

Wedge Disc — All-Iron or Brass Trimmed

Inside Screw, Rising Stem

All-Iron
No. 488
Flanged
No. 488 1/2
FlangedIron Body, Brass Trimmed
No. 490
Screwed
No. 490 1/2
FlangedOutside Screw
and YokeAll-Iron
No. 484 1/2
Screwed
No. 485 1/2
Flanged
Iron Body, Brass Trimmed
No. 486 1/2
Screwed
No. 487 1/2
FlangedQuick
OpeningAll-Iron
No. 492, Screwed
Iron Body
Brass Trimmed
No. 494, Screwed

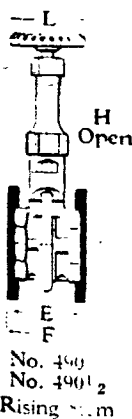
For working pressures and description,
see the preceding page

List Prices, Each

Inside Screw, Rising Stem				Outside Screw and Yoke				Quick Opening			
Screwed		Flanged, F. & D.		Screwed		Flanged, F. & D.		Screwed		Flanged, F. & D.	
No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
488	490	488 1/2	490 1/2	484 1/2	486 1/2	485 1/2	487 1/2	492	494	492 1/2	494 1/2
6.70	7.00										
6.70	7.00										
7.00	7.40			11.60	12.00			13.30	13.70		
7.30	7.90			12.00	12.60			14.20	14.80		
7.60	9.10	12.60		12.50	14.00	17.50		15.00	16.50		
8.40	10.60	13.80		13.40	15.60	18.80		16.00	18.20		
9.40	12.20	16.00	18.70	15.50	18.40	22.00	25.00	17.50	20.50		
13.20	15.80	19.50	23.00	18.80	22.50	26.00	29.50	21.00	25.00	28.50	32.00
18.20	25.00	25.50	32.50	25.00	32.00	33.00	39.50	28.00	35.00	35.50	42.00
25.00	35.00	32.50	42.50	32.00	42.00	40.00	50.00	35.00	45.00	42.50	52.50
55.00	71.50	64.50	80.00	64.00	80.00	72.50	88.00	67.00	82.50	75.50	91.00

The list prices of flanged valves include
and drilling to the American Cast Iron
Standard Class 125. No deduction is made if
valves are ordered faced only.

Shock: A suitable cushioning
device should be in-
stalled with Quick Opening Valves used in liquid
lines to protect against water hammer; see page 11.

No. 490
No. 490 1/2
Rising Stem

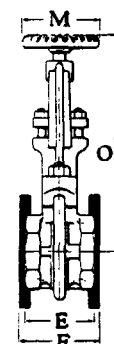
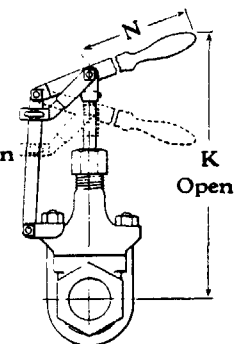
Dimensions, in Inches

Size	E	F	G	H	J	K	L	M	N
1/4	1 7/8		4 9/16	4 7/8			13 3/4		
3/8	2		4 9/16	4 7/8			13 3/4		
1/2	2 1/16		5 5/16	6 1/4	6 5/8	7 7/16	2 1/16	2 9/16	6
3/4	2 5/16		6 1/4	7 1/2	7 1/2	8 3/4	2 9/16	2 9/16	7
1	2 9/16	3 3/16	7 3/8	8 1/2	9 1/8	9 1/8	2 3/4	2 3/4	7
1 1/4	2 7/8	3 1/2	9	10 1/8	10 1/8	12	3 1/16	3 1/16	7
1 1/2	3 1/8	3 3/4	9 9/16	11 1/4	12 1/4	13 1/4	3 3/8	3 3/8	9
2	3 5/8	4 1/4	11 3/4	13 1/2	14 1/4	15 3/4	4 1/16	4 1/16	9
2 1/2	4 1/8	4 15/16	13	15 3/4	16 1/4	18	4 3/4	4 3/4	10 7/8
3	4 9/16	5 1/16	15 1/8	18 1/4	18 7/8	21 11/16	5 3/8	5 3/8	10 7/8
4	5 9/16	6 3/4	19 3/4	24 1/8	24	24 7/8	9	9	14 3/4

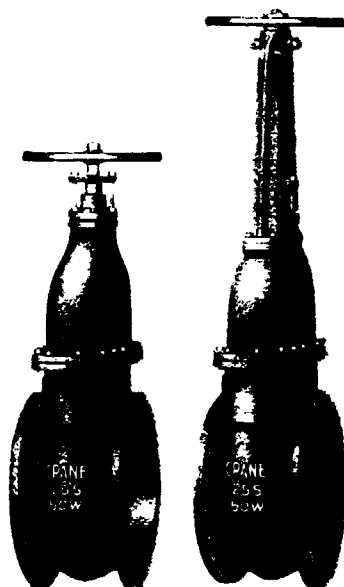
Dimensions "E" (end to end) and "F" (face
to face) apply also to Quick Opening Valves.

For drilling... page 439

Thread engagement... page 474

Outside Screw
and YokeQuick
Opening

25-Pound Iron Body Wedge Gate Valves Brass Trimmed

Non-Rising
Stem
FlangedNo. 491
Brass StemOutside Screw
and Yoke
FlangedNo. 493, Steel Stem
No. 496, Brass Stem

RATINGS IN POUNDS PER SQUARE INCH

Size of valve	Working Pressures			Hydrostatic	
	Saturated Steam	Cold water non-shock	Cold gas	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		Dimensions, in Inches					No. of turns to open
	Non-Rising Stem No. 491	Outside Screw and Yoke No. 493 or No. 496	E	F	G	H		
12	300.00	360.00	11	35½	59	16	25	
14	358.00	452.00	13½	39	64½	16	29	
16	537.00	650.00	14	43¾	71½	18	33	
18	805.00	950.00	14½	47½	79¼	18	37	
20	1095.00	1265.00	15½	51	88	20	41½	
*24	1976.00	2170.00	17	62¼	106	22	49½	
*30	3380.00	3725.00	21	72½	127¾	24	62	
*36	4920.00	5400.00	24	84¼	150½	30	74	

*Should have by-pass. See page 84; dimensions on page 86.

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 brass. 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; page 86 for dimensions.

Gearing: See page 85 for description and page 86 for dimensions.

Vacuum service: When valves for vacuum exhaust

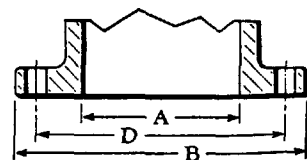
lines are desired, orders must specify. Such valves are especially air-tested to assure absolute tightness. An extra charge is made for air-testing.

Hub end valves: When 25-Pound Hub End Valves are required, use the Double Disc Gate Valves on pages 90 and 91.

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).

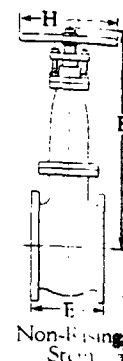
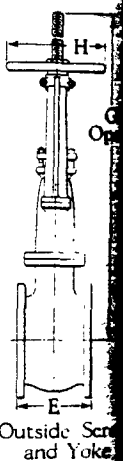
When so ordered, the end flanges can be drilled to the American Standard, Class 125. A full face gasket should be used.

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	Disc
12	12	19	1	17	12	
14	14	21	1½	18¾	12	
16	16	23½	1½	21¼	16	
18	18	25	1¼	22¾	16	
20	20	27½	1¼	25	20	
24	24	32	1¾	29½	20	
30	30	38¾	1½	36	28	
36	36	46	1½	42¾	32	

Non-Rising
StemOutside Screw
and Yoke

Bottom outlet valves are made to order.

Motor or cylinder operation ... pages 129 to 135

Drilling templates ... page 439

125-Pound Iron Body Wedge Gate Valves

General Description

The 125-Pound Iron Body Wedge Gate Valves 12-inch and smaller are an improved design, embodying many features of unusual merit. They are a new peak for utility in iron wedge gate valves, having greater strength, longer life, and greater all-around adaptability for all types of services.

The line, unusually complete, includes the following valves:

Trimmed valves..... pages 78 and 79
 Pattern valves..... page 80
 Opening valves..... page 80
 Process industries..... page 375
 Marine service..... page 389

Bonnet and bonnet: The cast iron bonnet and bonnet are oval-shaped; liberal sections combined with proper distribution assure maximum strength. Flanged valves sizes 24-inch and smaller have straight through tie ribs between the bonnet and the end flanges, providing resistance to line strains.

Disc: The disc is made of cast iron, brass trimmed valves has large flat faces rolled securely into dovetails. Sizes 12-inch and smaller are made to order with brass disc prices on application.

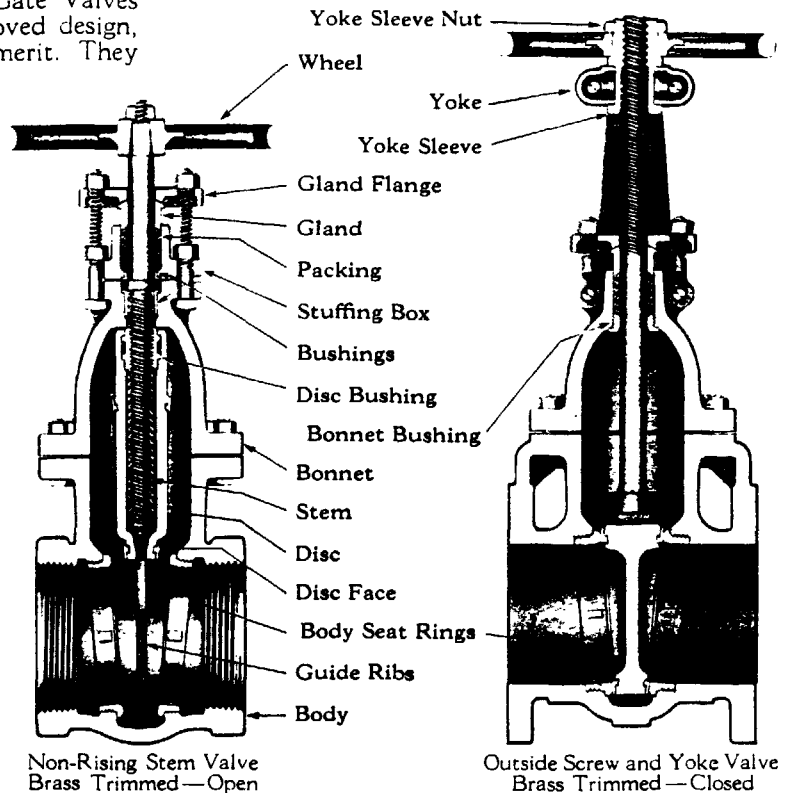
Non-rising stem: 12-inch and smaller have a solid disc for the non-rising stem built up at the center to locate the stem hole. In non-rising stem valves that portion of the disc that engages the threads is brass-bushed.

Disc guides: These valves have long disc guides consisting of ribs and machined grooves in the disc. This is the drag on the seating surfaces and therefore their life. In sizes 12-inch and smaller, the disc guide is at least 50 per cent of the diameter, the engaging surfaces are tapered to give line bearing contact which would cause wear of the guides.

Stem: The stem is of liberal diameter and amply strong. Stem threads have long engagement in the yoke sleeve. Outside screw and yoke valves 12-inch and smaller have a tee-head disc-stem pin; larger sizes have a threaded disc-stem pin locked together with a pin.

Stuffing box: These valves have a two-piece type gland, consisting of a gland and a yoke. This construction maintains an even packing, and prevents binding on the stem. The gland bolt nuts are not pulled up

12-inch and smaller, the non-rising stem valve through bolts holding the stuffing box



These illustrations are representative of sizes 12-inch and smaller only; larger sizes are made similar to the 250-Pound Wedge Gate Valves described on page 82.

to the bonnet, and the stem collar recess in the brass trimmed valves is brass-bushed, top and bottom, to minimize friction and to prevent corrosion. Outside screw and yoke valves in these sizes have swinging gland eye bolts 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 brass trimmed valves in sizes 12-inch and smaller have a brass stem hole bushing, offering a better back seat for the stem and making this point non-corrosive.

Yoke sleeve: The yoke sleeve used in outside screw and yoke valves is made of Cast Manganese Bronze.

Yoke: The yoke in O. S. & Y. valves 4-inch and smaller is cast integral with the bonnet. In larger sizes, the yoke consists of two halves which are bolted together at the top, and also to the bonnet.

Wheel: Wheels are malleable iron, assuring maximum strength; they have an oval-shaped rim, affording an easy grip.

125-Pound Iron Body Wedge Gate Valves Brass Trimmed or All-Iron

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	150 pounds	250 pounds	175 pounds
18 to 24-inch	*	150 pounds	150 pounds	250 pounds	175 pounds
30 to 48-inch	*	120 pounds	120 pounds	200 pounds	150 pounds

*For steam lines larger than 16-inch, Crane 150-Pound Cast Steel Gate Valves are recommended; see page 229.

Crane 125-Pound Iron Body Wedge Gate Valves are sturdy, rugged, well proportioned valves which find wide application in nearly every kind of industry. Sizes 12-inch and smaller include many features of unusual merit, such as tee-head disc-stem connection in outside screw and yoke valves, solid web disc, brass bushed stem collar bearing in non-rising stem brass trimmed valves, straight through ports in flanged end bodies (24-inch and smaller) with tie ribs between the bonnet flange and the end flanges, etc. These and other features are described below or on the preceding page.

Brass trimmed valves: Brass trimmed valves are recommended for steam, water, or oil lines.

The body seat rings are brass, screwed into the body. The disc faces are brass, rolled into the disc.

In non-rising stem valves, the stem is Cast Manganese Bronze, and the disc is brass-bushed where it engages the stem threads. In sizes 12-inch and smaller, brass bushings are used above and below the stem collar to reduce friction and prevent corrosion.

Outside screw and yoke valves are made with a brass stem or a steel stem, as ordered; on steel stems, that portion which comes in contact with the packing is nickel plated. Sizes 12-inch and smaller have a tee-head disc-stem connection with a renewable brass bushing in the top of the bonnet.

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 disc. Valves with screwed-in body seat rings can be supplied to order; prices on application.

The stem is steel, and the portion which comes in contact with the packing is nickel plated.

Stuffing box: The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

Gland: These valves have a two-piece gland, consisting of a malleable iron gland flange and a brass gland in brass trimmed valves or a nickel-plated steel gland in all-iron valves.

In sizes 12-inch and smaller, brass trimmed valves have Cast Manganese Bronze gland bolt nuts, and all-iron valves have zinc-plated steel gland bolts and

gland bolt nuts. The outside screw and yoke valves in these sizes have swinging type gland eye bolts.

Hub end valves: The hubs on hub end valves accommodate Class "A," "B," "C," or "D" iron pipe. In place of a wheel, these valves have square operating nut.

By-passes: A by-pass is recommended on sizes 12-inch and larger. The by-pass enables equalizing the pressure on both sides of the disc before opening the main valve. See page 84 for description, page 86 for dimensions.

Gearing: To facilitate operation, sizes 24-inch and larger should be equipped with gears. See page 84 for description and page 86 for dimensions.

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 operating cylinder, is ideal for this purpose. For description, see pages 129 to 135.

Indicators: The stem of an outside screw and yoke valve indicates the position of the disc. Non-rising stem valves can be easily equipped with a "turning" indicator; see page 84.

Cleanouts: For use on lines carrying an unusual amount of sediment, tarry fluids, etc., flanged valves sizes 12-inch and smaller can be equipped with a cleanout on the side of the body to facilitate cleaning. See page 84.

Standards: Flanged valves conform (except marking) to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 1, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948. 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 Flange Valves (B16.10-1939), for 125-Pound Cast Steel Wedge Gate Valves. This Standard includes sizes 2 to 24-inch, inclusive.

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. Flange dimensions are shown on page 86.

125-Pound Iron Body Wedge Gate Valves Brass Trimmed or All-Iron

Non-Rising Stem

Outside Screw and Yoke



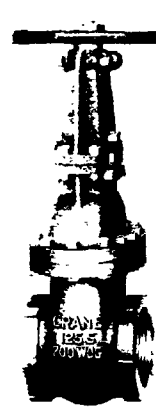
Screwed
No. 460
Brass Seats
and Stem
No. 472
All-Iron



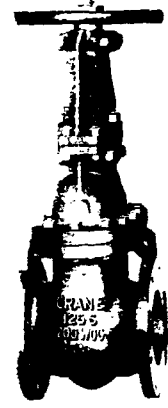
Flanged
No. 461
Brass Seats
and Stem
No. 473
All-Iron



Hub Ends
No. 462
Brass Seats
and Stem



Screwed
No. 464
Brass Seats
and Stem
No. 464½
Brass Seats
and Stem



Flanged
No. 465
Brass Seats
and Stem
No. 465½
Brass Seats
and Stem

No. 475
All-Iron

No. 475½
All-Iron

For working pressures and description,
see the preceding page.

List Prices, Each

Non-Rising Stem					Outside Screw and Yoke					
Screwed		Flanged, F. & D.		Hub Ends	Screwed		Flanged, F. & D.			
No. 460 Brass Seats and Stem	No. 472 All- Iron	No. 461 Brass Seats and Stem	No. 473 All- Iron	No. 462 Brass Seats and Stem	No. 464 Brass Seats, Steel Stem	No. 464½ Brass Seats and Stem	No. 475 All- Iron	No. 465 Brass Seats, Steel Stem	No. 465½ Brass Seats and Stem	No. 475½ All- Iron
For sizes smaller than 2-inch, use Clamp Gate Valves; see page 75.										
34.00	34.00	37.50	37.50	34.00	40.00	40.00	40.00	43.50	43.50	43.50
35.50	35.50	40.00	40.00		43.00	43.00	43.00	47.50	47.50	47.50
39.50	39.50	44.50	44.50	39.50	51.50	51.50	51.50	56.50	56.50	56.50
46.00		52.50			60.50	60.50		67.00	67.00	
54.50	54.50	62.50	62.50	54.50	71.00	71.00	71.00	79.00	79.00	79.00
76.00		84.50	84.50		93.50	93.50		102.00	102.00	102.00
93.00	93.00	102.00	102.00	93.00	117.00	117.00	117.00	126.00	126.00	126.00
163.00		175.00	175.00	163.00				210.00	210.00	210.00
		276.00	276.00	276.00				330.00	330.00	330.00
		395.00	395.00	395.00				468.00	468.00	468.00
		535.00						645.00	645.00	645.00
		763.00						895.00	895.00	895.00
		1025.00						1185.00	1185.00	1185.00
		1580.00						1760.00	1760.00	1760.00
		2500.00						2735.00	2735.00	2735.00
		4275.00						4600.00	4600.00	4600.00
		6450.00						6975.00	6975.00	6975.00
		8680.00						10260.00	10260.00	10260.00
		11840.00						14200.00	14200.00	14200.00

1-inch and larger should have a by-pass, see page 84 for description and page 86 for dimensions.
2-inch and larger should be geared; see page 85 for description and page 86 for dimensions.

Flanging: 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.

Dimensions ... page 81

By-passes and gearing ... pages 84 to 86

Iron Body Wedge Gate Valves

Underwriters' Pattern

WORKING PRESSURE

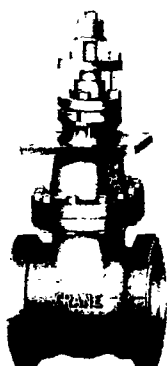
175 pounds cold water, non-shock

HYDROSTATIC TEST PRESSURES

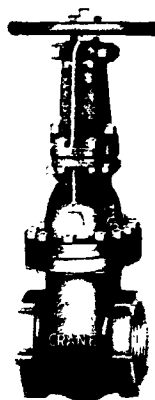
350 pounds shell 200 pounds seat

List Prices, Each

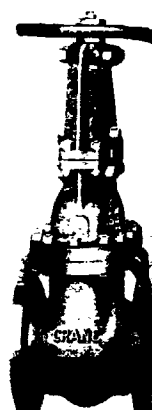
Size Inches	No. 462 1/2 Hub End	No. 467 1/2 Screwed	No. 467 Flanged, F. & D.
2 1/2		51.00	53.00
3		59.00	62.00
4	74.00	77.50	83.50
5			110.00
6	118.00		127.00
8	195.00		213.00
10	323.00		350.00
12			522.00



Non-Rising Stem
Hub Ends
No. 462 1/2



Outside Screw and Yoke Valves
Screwed
No. 467 1/2



Flanged
No. 467

These valves, designed for fire protection service, are similar to the valves described on the preceding three pages.

8

The valves conform to the Underwriters' Specifications known as "The National Standard." They are listed as approved and inspected by the Associated Factory Mutual Fire Insurance Companies, Boston, and the Underwriters' Laboratories, Chicago. The valves are marked "CU" and "FM."

Trimmings: Body seat rings are brass, screwed into the body. Disc faces are brass, rolled into the disc.

The stem is brass, and the bonnet and stuffing box are brass-bushed where they come in contact with the stem. In non-rising stem valves, the disc is brass-bushed where it engages the stem threads. The brass to brass contacts prevent corrosion and assure easy operation of the valve.

The gland is brass and is of the ball type; the gland flange is malleable iron. The gland nuts are brass.

Hub end valves: The hub ends fit Class "D" cast iron pipe. The bonnet has a square flange cast integral, to permit bolting on an indicator post when the valve is installed underground.

Outside screw and yoke: Outside screw and yoke valves are usually used indoors. The rising stem indicates whether the valve is open or closed.

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.

Indicator Posts . . . page 128

125-Pound Iron Body Wedge Gate Valves

Quick Opening—Brass Trimmed

WORKING PRESSURES

125 pounds saturated steam

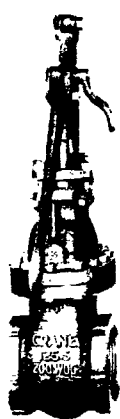
200 pounds cold water, oil, or gas, non-shock

HYDROSTATIC TEST PRESSURES

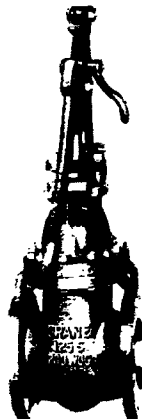
350 pounds shell 225 pounds seat

List Prices, Each

Size Inches	No. 470 Screwed	No. 471 Flanged F. & D.
For sizes smaller than 3", use Clamp Gate Valves (page 75).		
3	55.50	60.50
4	71.00	79.00
5		102.50
6	112.00	121.00
8		198.00
10		330.00
12		460.00



Screwed
No. 470
Brass Trimmed



Flanged
No. 471
Brass Trimmed

These valves, except for the quick-opening mechanism and the disc-stem connection, are the same as the outside screw and yoke valves described on the

three preceding pages. To secure the extra rigidity necessary in this type of valve, the disc is threaded on the stem and pinned to

Drilling: List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction for valves ordered faced only.

Shock: Closing one of these valves quickly on liquid lines may cause "water hammer." When severe, water hammer must be eliminated by installing a suitable cushioning device; see page 11.

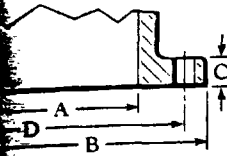
Dimensions of 125-Pound Wedge Gate Valves . . . page 81

Additional description . . . pages 77 and

125-Pound Iron Body Wedge Gate Valves

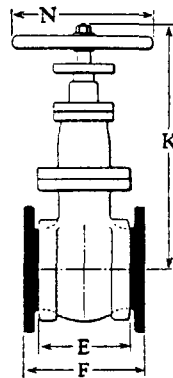
Dimensions, in Inches

General description
125-Pound Valves,
pages 77 to 80.

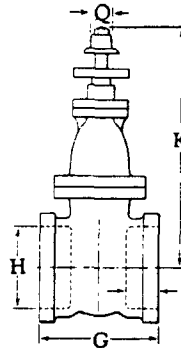


Dimensions and
The dimensions and
of the end flanges
to the American
Flange Standard,
(B10.1-1048).

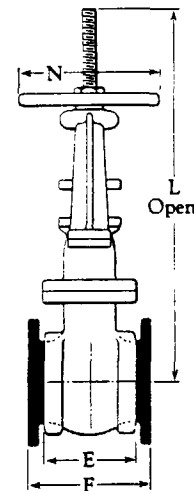
Flanges are plain faced,
smooth finish.



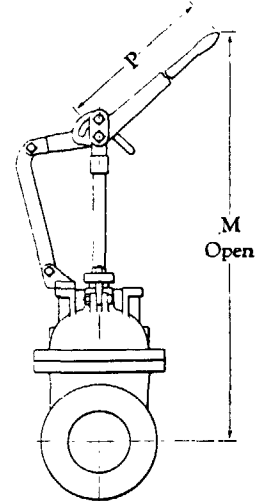
Screwed or
Flanged



Hub
Ends



Screwed or Flanged
O.S. & Y. Valves
Without By-Pass



Quick Opening Valve
Dimensions "E" and
"F" apply also to
Quick Opening Valves

Flanges				Bolts		E	F	G	H	J	K	L	M	N	P	Q	No. of turns to open
B	C	D		No.	Dia.												
6	5/8	43/4	4	5/8	6 1/8	7	8 3/4	3.25	2.75	12 3/4	14 3/4			8		2	7
7	1 1/16	5 1/2	4	5/8	6 1/2	7 1/2					13 3/8	17		8			8 1/2
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
8 1/2	13/16	7	8	5/8	7 3/8	8 1/2					16 1/2	21 1/4		9			12
9	15/16	7 1/2	8	5/8	7 3/8	9	10 3/8	5.70	3.00	18 1/2	23 3/4	35 1/8		10	15 1/2	2	9
10	15/16	8 1/2	8	3/4	8 1/2	10					21 1/4	28 3/4		12			11
11	1	9 1/2	8	3/4	8 7/8	10 1/2	11 1/4	7.80	3.00	23 3/8	32 3/8	45 1/8		12	23	2	13
13 1/2	1 1/8	11 3/4	8	3/4	10 1/4	11 1/2	13	10.00	3.50	27 3/8	41 7/8	59 1/8		16	29	2	17
16	1 3/16	14 1/4	12	7/8		13	13 3/4	12.10	3.50	33	50 1/4	76 1/8		20	41	2	21
19	1 1/4	17	12	7/8		14	14 1/2	14.20	3.50	36 1/4	58	83 1/4		20	41	2	25 1/2
21	1 3/8	18 3/4	12	1		15				39 1/4	67 3/4			20		2	30
23 1/2	1 7/16	21 1/4	16	1		16				45 3/4	76 1/4			22		2	34
25	1 9/16	22 3/4	16	1 1/8		17				48 3/4	83 1/2			24		2	38
27 1/2	1 11/16	25	20	1 1/8		18				52 1/2	91 1/4			24		2	42 1/4
32	1 7/8	29 1/2	20	1 1/4		20				63 1/2	109			30		3	50
38 3/4	2 1/8	36	28	1 1/4		24				75 1/2	137			36		3	95
46	2 3/8	42 3/4	32	1 1/2		28											
53	2 5/8	49 1/2	36	1 1/2		33											
59 1/2	2 3/4	56	44	1 1/2		36											

Face: The face to face dimensions of flanged valves conform to the American Petroleum Institute Standard for Valves for Pipe Line Service, Fifth Edition, June, 1947 (Tentative) and Tentative, issued October, 1948. This Standard includes sizes 2, 2 1/2, 3, 4, 6, 8, 10, and 12-inch.

Valves also conform to the American Standard Face to Face Dimensions of Ferrous Flanged Valves (B10.10-1030), for 125-Pound Cast Iron Gate Valves. This Standard includes sizes not inclusive.

Stems and gearing: Sizes 14-inch and larger have a by-pass to enable equalizing the pres-

sure 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: The hubs on the hub end valves will accommodate Class "A," "B," "C," or "D" cast iron pipe.

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

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.

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 Brass, a leaded tin bronze of high strength and hardness. The disc is Crane Special Brass in the 2-inch size and cast iron faced with Crane Special Brass 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 Brass 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.

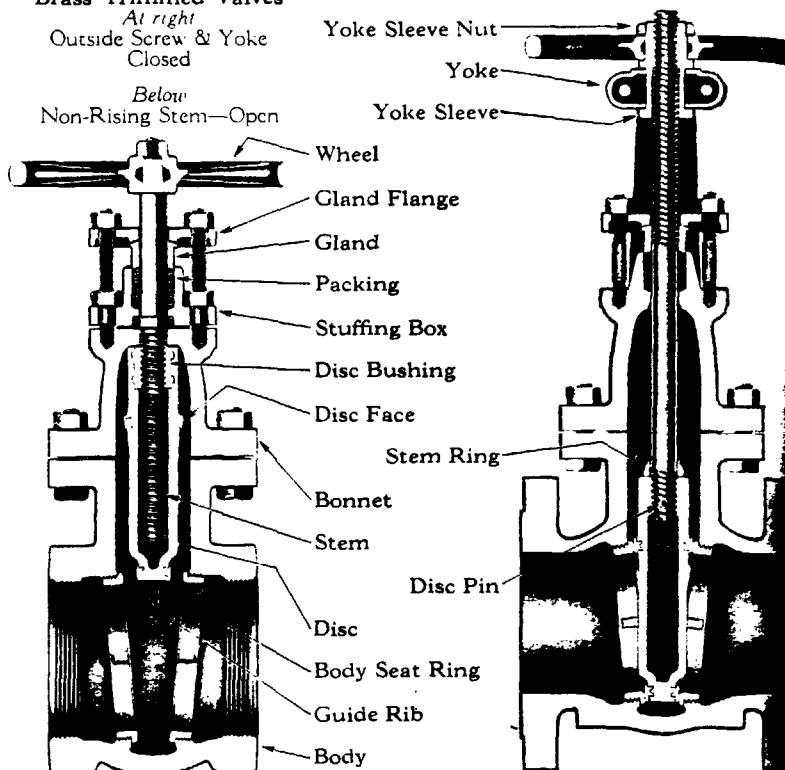
Stuffing box: The stuffing box has high grade packing. The valves, when wide open, can be repacked while under pressure.

Gland: A two-piece gland (a gland flange and a gland) prevents binding on the valve stem and assures an even load on the packing. The gland flange is malleable iron. The gland is brass in brass trimmed valves and nickel-plated steel in all-iron valves.

Wheels: Wheels are made of malleable iron to assure maximum strength. Their oval-shaped rim assures an easy grip.

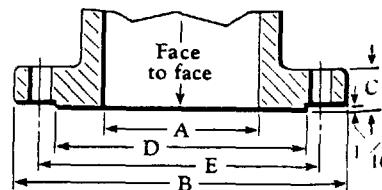
Brass Trimmed Valves

At right
Outside Screw & Yoke
Closed
Below
Non-Rising Stem—Open



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 $\frac{1}{16}$ -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

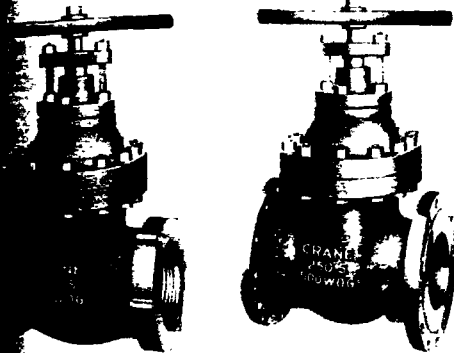
Size	A	B	C	D	E	Bolt No.	D
2	2	6½	7/8	43/16	5	8	
2½	2½	7½	1	415/16	57/8	8	
3	3	8¼	1½	511/16	65/8	8	
3½	3½	9	13/16	65/16	7¼	8	
4	4	10	1¼	615/16	77/8	8	
5	5	11	13/8	85/16	9¼	8	
6	6	12½	17/16	911/16	105/8	12	
8	8	15	1¾	1115/16	13	12	
10	10	17½	17/8	141/16	15¼	16	
12	12	20½	2	167/16	17¾	16	

250-Pound Ferrosteel Wedge Gate Valves

Brass Trimmed or All-Iron

Non-Rising Stem

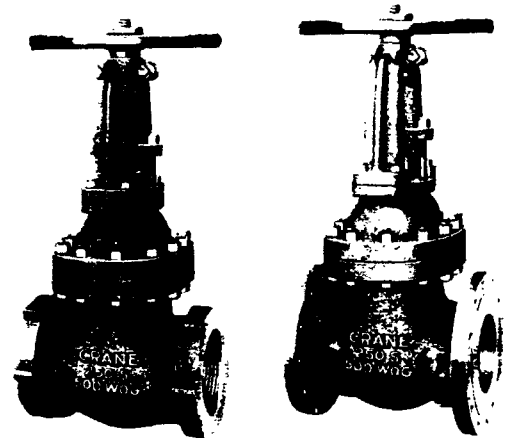
Outside Screw and Yoke



No. 2 E, Screwed
Crane Special Brass Seats
Brass Stem

No. 3 E, Flanged
Crane Special Brass Seats
Brass Stem

For
working
pressures
and
description,
see the
preceding
page.



No. 6 E, Screwed
Crane Special Brass Seats
Steel Stem

No. 7 E, Flanged
Crane Special Brass Seats
Steel Stem

List Prices, Each

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	F	G	H	J	K	L	Turns to open
Screwed	Flanged F. & D.	Screwed	Flanged F. & D.	Flanged F. & D.							
60.00	65.00	70.00	75.00	75.00	7	8½	11	14½	8	8	15
76.00	82.00	87.00	93.00	93.00	8	9½	13¼	17½	9	9	15½
94.00	102.00	106.00	114.00	114.00	9	11¼	14¾	20½	10	10	14
	115.00		136.00			11¾	15½	22	10	10	16½
118.00	133.00	142.00	157.00	157.00	11	12	17½	24¾	12	12	18½
	174.00		208.00	208.00		15	20¼	29¾	14	14	23
	225.00		260.00	260.00		15¾	23	34½	16	16	27
	403.00		470.00	470.00		16½	30¾	42¾	20	20	35
	542.00		630.00	630.00		18	36	52¾	22	22	38
	775.00		900.00	900.00		19¾	39¾	60	24	24	46

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

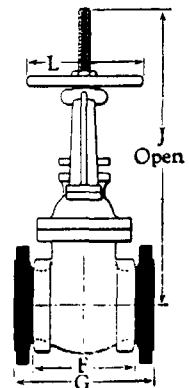
Motor or cylinder operation: Valves used for emergency purposes or installed in inaccessible locations should preferably be equipped with some easy means of operation, such as an electric or air motor drive or an operating cylinder. See pages 130 to 135.

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, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948. 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 & Yoke
Screwed or Flanged

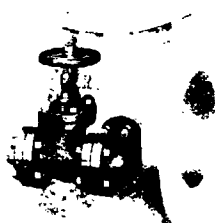
Templates for drilling . . . page 440

Thread engagement . . . page 474

Accessories for Iron Wedge Gate Valves

By-Passes

For Water Service



**By-Pass on
Non-Rising Stem
Gate Valve**

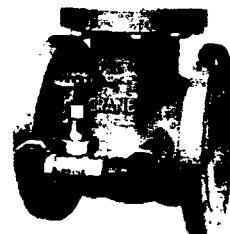
Non-Rising Stem
Gate Valve
Used in By-Pass



**By-Pass on
Outside Screw & Yoke
Gate Valve**

Outside Screw and Yoke
Gate Valve
Used in By-Pass

For Steam Service



**By-Pass on
Non-Rising Stem or
Outside Screw & Yoke
Gate Valve**

Globe Valve
Used in By-Pass

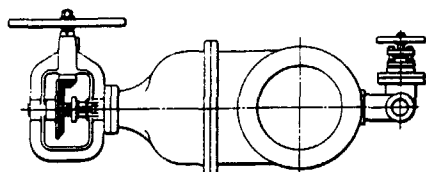
For dimensions, see page 86.

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.

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 Geared Valve with By-pass

Extra List Prices for By-Passes

Pressure Class of Main Valve	Size of Main Valve Inches	For Water Service On Flanged or Hub End Valves			For Steam Service On Flanged End Valves	
		Size of By-Pass Inches	Non- Rising Stem By-Pass Each	Outside Screw & Yoke By-Pass Each	Size of By-Pass Inches	Globe By-Pass Each
25 Pound Page 76	14	2	<i>Prices on Application</i>			
	16 to 20	3				
	24 to 30	4				
	36	6				
125 Pound Page 79	12 and 14	2	<i>Prices on Application</i>			
	16 to 20	3				
	24 and 30	4				
	36 and 42	6				
250 Pound Page 83	48	8	<i>Prices on Application</i>			
	5 and 6	1 1/4			3/4	<i>Prices on Application</i>
	8	1 1/2			3/4	
	10	1 1/2			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 3, 4, 5, 6, 8, 10, and 12-inch



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 and can be installed on the side of the valve or the bottom of the valve.

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



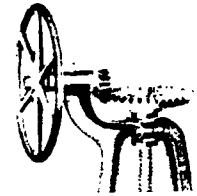
Style U
Bevel Gearing



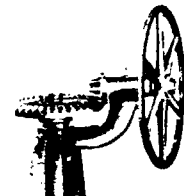
Style S
Spur Gearing

Pressure Class of Valve	Size of Valve Inches	Extra List Price per Valve			
		Non-Rising Stem		Outside Screw & Yoke	
		Bevel	Spur	Bevel	Spur
25-Pound Page 76	14	Prices on Application		Prices on Application	
	16				
	18				
	20				
	24				
	30				
125-Pound Page 79	36	Prices on Application		Prices on Application	
	12				
	14				
	16				
	18				
	20				
	24				
	30				
250-Pound Page 83	36	Prices on Application		Prices on Application	
	42				
	48				
	8	Prices on Application		Prices on Application	
	10				
	12				

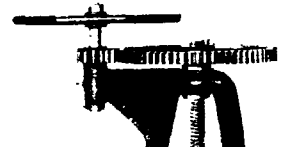
Outside Screw and Yoke



Style N
Bevel Gearing



Style O
Bevel Gearing



Style P
Spur Gearing

8

red, larger size Crane Iron Wedge Gate Valves can be supplied with bevel gears, which greatly facilitate operation.

Gearing: Unless otherwise ordered, non-rising stem bevel geared valves are furnished with the pinion shaft 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.

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

the or will strain joints to the point of failure and distort or ruin valve seats.

A strong pipe hanger or support at 6-foot intervals is considered good for the average or ordinary installation. But the spacing will vary considerably with the size and type of system. Place hangers close to valves and heavy pieces of equipment. This catalog shows many hangers and supports; see pages 409 for spacing, see page 532.

Use Crane Steel Gate Valves For Higher Pressures and Temperatures

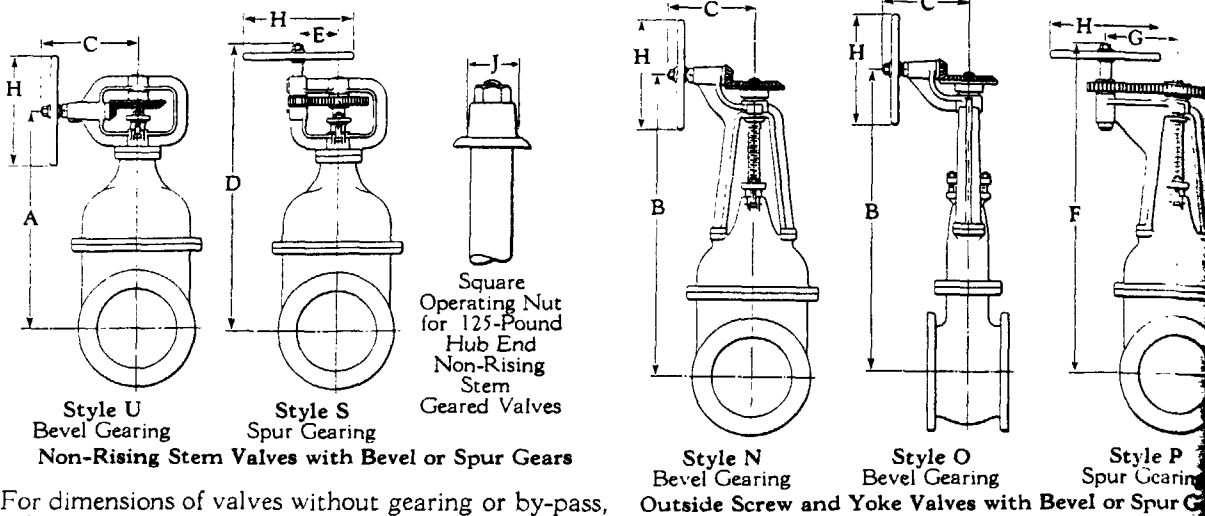
For pressures and temperatures that are beyond the scope of iron valves and for unusually severe services, Crane manufactures a complete line of Cast Steel Wedge Gate Valves.

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 214 and pages 221 to 232.

Iron Wedge Gate Valves with Gearing or By-Pass

Dimensions, in Inches



8

For dimensions of valves without gearing or by-pass, refer to the following pages:

25-Pound
Page 76

125-Pound
Page 81

250-Pound
Page 83

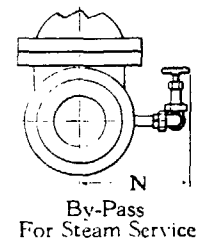
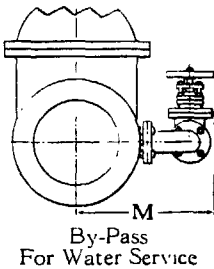
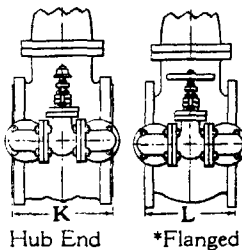
Gearing: Face to face and end to end dimensions are the same for valves with or without gears.

Valves with by-pass: The face to face dimension of valves with by-pass is the same as for valves with-

out by-pass, except on 12-inch hub end and 30-inch flanged end 125-Pound Valves. On these sizes, 250-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



Size of Main Valve	Valves with Gears										Valves with By-Pass				
	Bevel Geared				Spur Geared				H	J	No. of turns to open	K	*L	By-Pass for Water	By-Pass for Steam
	A	B	C	D	E	F	G	Size						M	Size
25-Pound Wedge Gate Valves															
14	33 $\frac{5}{8}$	50 $\frac{1}{4}$	12 $\frac{5}{8}$	43 $\frac{3}{4}$	6	53 $\frac{3}{4}$	10	14		58		*13 $\frac{1}{2}$	2	23 $\frac{1}{4}$	
16	39	55 $\frac{3}{8}$	13	50	6	59 $\frac{1}{2}$	12	18		66		*14	3	27 $\frac{1}{4}$	
18	42 $\frac{5}{8}$	61 $\frac{1}{4}$	13	53 $\frac{1}{2}$	6	65 $\frac{3}{8}$	12	18		74		*14 $\frac{1}{2}$	3	28 $\frac{1}{4}$	
20	46 $\frac{1}{8}$	67 $\frac{1}{2}$	13	57 $\frac{1}{4}$	6	71 $\frac{5}{8}$	12	18		83		*15 $\frac{1}{2}$	3	29 $\frac{1}{4}$	
24	55 $\frac{1}{2}$	81 $\frac{5}{8}$	16 $\frac{7}{8}$	69 $\frac{1}{2}$	8	87 $\frac{1}{2}$	14 $\frac{3}{4}$	22		148		*17	4	35 $\frac{1}{4}$	
30	64 $\frac{5}{8}$	96 $\frac{3}{8}$	16 $\frac{3}{8}$	78 $\frac{5}{8}$	8	102 $\frac{1}{4}$	14 $\frac{3}{4}$	22		186		*21	4	38 $\frac{1}{4}$	
36	75 $\frac{1}{8}$	113 $\frac{7}{8}$	20 $\frac{1}{2}$	91 $\frac{1}{4}$	10 $\frac{13}{16}$	119 $\frac{3}{8}$	17	27		259		*24	6	43 $\frac{1}{4}$	
125-Pound Wedge Gate Valves															
12	32 $\frac{5}{8}$	45 $\frac{7}{8}$	13	43 $\frac{5}{8}$	6	50 $\frac{1}{4}$	12	18	2	50	16	*14	2	22 $\frac{1}{4}$	
14	37 $\frac{3}{4}$	53 $\frac{3}{8}$	13	48 $\frac{5}{8}$	6	58	12	18		60		*15	2	23 $\frac{1}{4}$	
16	43 $\frac{7}{8}$	60 $\frac{3}{8}$	17	57 $\frac{7}{8}$	8	66 $\frac{1}{2}$	14 $\frac{11}{16}$	22		102		*16	3	27 $\frac{1}{4}$	
18	45 $\frac{3}{4}$	65 $\frac{1}{4}$	17	59 $\frac{3}{4}$	8	71	14 $\frac{11}{16}$	22		114		*17	3	28 $\frac{1}{4}$	
20	49 $\frac{1}{8}$	71 $\frac{1}{8}$	17	63 $\frac{3}{8}$	8	77	14 $\frac{11}{16}$	22		127		*18	3	29 $\frac{1}{2}$	
24	57 $\frac{5}{8}$	85 $\frac{1}{8}$	20 $\frac{1}{2}$	73 $\frac{5}{8}$	10 $\frac{13}{16}$	90 $\frac{3}{4}$	17	27		175		*20	4	35 $\frac{1}{4}$	
30	71 $\frac{1}{8}$	106 $\frac{1}{8}$	23	87 $\frac{7}{8}$	12	112	19	30		380		*24	4	38 $\frac{5}{8}$	
36	84 $\frac{3}{4}$	123	26 $\frac{1}{4}$	103	15	127 $\frac{3}{4}$	20 $\frac{1}{8}$	30		560		32	6	45	
42	101 $\frac{7}{8}$	146	31 $\frac{1}{2}$	123 $\frac{1}{2}$	19 $\frac{3}{8}$	151 $\frac{1}{2}$	22 $\frac{7}{8}$	36		785		*33	6	50	
48	107 $\frac{7}{8}$	160	31 $\frac{1}{2}$	129 $\frac{1}{2}$	19 $\frac{3}{8}$	164 $\frac{3}{4}$	22 $\frac{7}{8}$	36		900		*36	8	57 $\frac{3}{4}$	
250-Pound Wedge Gate Valves															
5												*15	1 $\frac{1}{4}$	15	$\frac{3}{4}$
6												*15 $\frac{5}{8}$	1 $\frac{1}{4}$	14 $\frac{3}{4}$	$\frac{3}{4}$
8	24 $\frac{7}{8}$	35	13	35 $\frac{7}{8}$	6	39 $\frac{1}{4}$	12	18		70		*16 $\frac{1}{2}$	1 $\frac{1}{2}$	19 $\frac{1}{4}$	$\frac{3}{4}$
10	30	43	15 $\frac{1}{2}$	42 $\frac{1}{4}$	7	47 $\frac{5}{8}$	14	20		95		*18	1 $\frac{1}{2}$	19 $\frac{1}{4}$	1
12	33 $\frac{1}{2}$	48	15 $\frac{1}{2}$	45 $\frac{3}{4}$	7	52 $\frac{3}{4}$	14	20		115		*19 $\frac{3}{4}$	2	23 $\frac{1}{4}$	1

*Dimension "L", the face to face of flanged valves with by-pass, includes the $\frac{1}{8}$ -inch raised face of 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 439 and 440

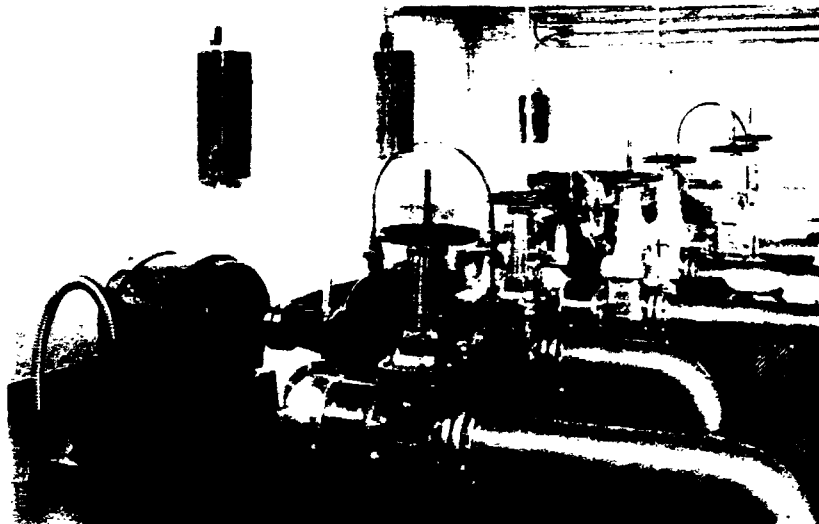
Iron Body Double Disc Gate Valves

A.W.W.A. Valves

Names of Parts and General Description.....	pages 88 and 89
Iron Body Valves	
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
Ironsteel Valves	
500-Pound W O G	page 98
500-Pound Gas—with Spur Gears	page 99
800-Pound W O G	page 100
Accessories for Double Disc Gate Valves	
By-Passes	page 101
Gearing	page 101
Cleanouts	pages 91, 93, and 101
Indicators	page 101
Dimensions of Valves with Gearing or By-Pass.....	pages 102 and 103

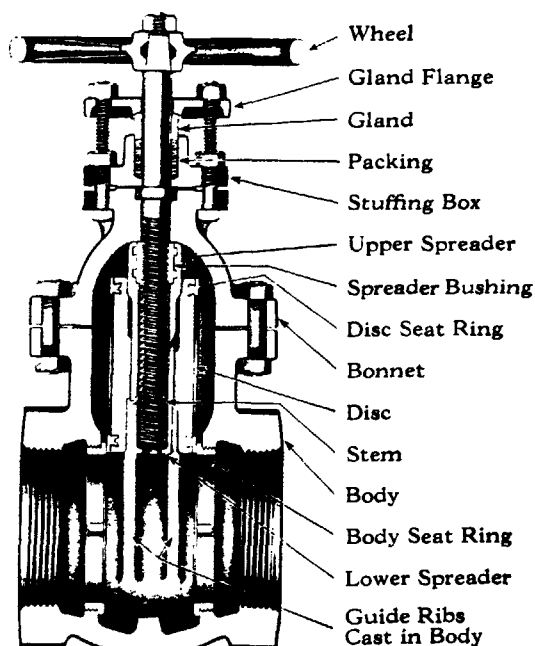
The Crane line of Iron Body Double Disc Gate Valves includes valves for water, oil, or gas pressures up to 800 pounds, also valves for low pressure steam. It includes Brass Trimmed and All-Iron Valves, A.W.W.A. Valves, and 500-Pound Spur Geared Valves especially designed for gas line construction.

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.

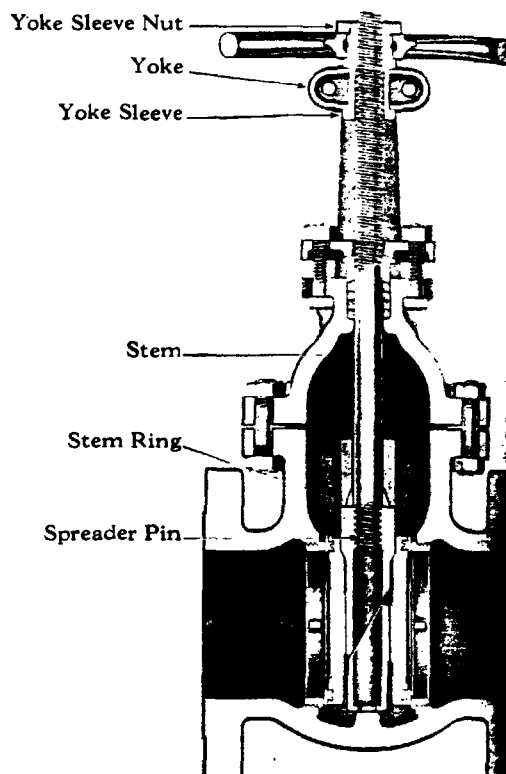


- Crane iron body double disc gate valves installed in the pipe lines of a large pumping station.

Iron Body Double Disc Gate Valves

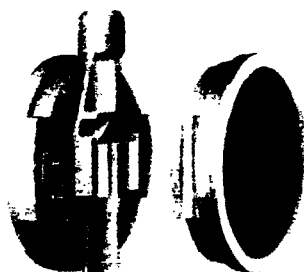


Non-Rising Stem Valve
Open

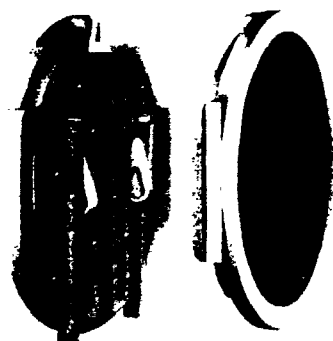


Outside Screw and Yoke Valve
Closed

*Flanged end bodies for
500 and 800-Pound W.O.G. Valves
have straight through ports;
see page 89.*



Discs with Spreaders



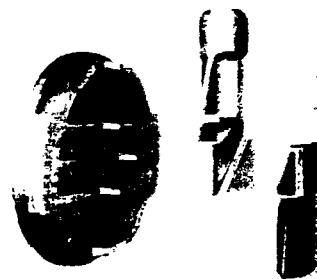
Discs with Wedges

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 Spreaders



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 disc: 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 all-brass bodies, brass trimmed valves have cast iron or Ferrosteel discs with brass or Crane Special Brass seating faces. The faces are securely rolled into machined grooves in the discs, assuring tightness under pressure.

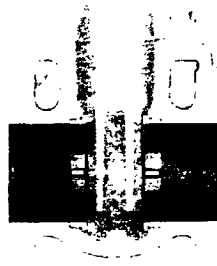
In iron valves, the seating faces are cast integral with the discs.

In non-rising stem brass trimmed valves, the portion of the disc that engages the stem threads is brass or Ferrosteel.

In brass trimmed valves with spreader type discs, the spreader is brass in the smaller sizes, and cast iron with brass wedging faces in the larger sizes.

Disc and bonnet: All lines of valves have oval-shaped discs and bonnets. Metal discs are more than ample, and the metal is distributed to give maximum strength.

In end 500 and 800-Pound W.O.G. Valves have straight through ports, as shown in the illustration at the bottom of 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

Seat rings: In brass trimmed valves, the seat rings are brass or Crane Special Brass.

In 25-Pound Valves 14-inch and larger, the seat rings are rolled into machined dovetail grooves in the body. In 10 and 12-inch 25-Pound Valves, the seat rings are rolled into machined dovetail grooves in the body. In all brass trimmed valves for higher pressures, the seat rings are screwed into the body.

Valves are regularly furnished with the seats and discs with the body. However, they can be furnished with screwed-in body seat rings when so desired, at prices on application.

The stem in non-rising stem brass trimmed valves is made of Crane Cast Manganese Bronze or Ferrosteel, depending upon the pressure class.

In screw and yoke brass trimmed valves are furnished with a rolled brass stem.

In iron valves have a steel stem; the portion coming through the packing is nickel plated.

Gland and stuffing box: All valves have a two-piece ball-type gland, consisting of a malleable iron gland flange and a brass gland in brass trimmed valves or a nickel-plated steel gland in all-iron valves.

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. and 500-Pound Gas flanged valves are regularly furnished with a raised face $\frac{1}{16}$ -inch high on the end flanges.

800-Pound W.O.G. flanged valves are regularly furnished with a $\frac{1}{4}$ -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.

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 a brass seating face. 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.

The valves have a two-piece ball-type gland, consisting of a brass 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 valves: The hubs on hub-end valves will accommodate Class "A" or "B" cast iron pipe. In place of a wheel, the valves have a square operating nut.

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 page 101 for description and pages 102 and 103 for dimensions.

Gearing: To facilitate operation, 42 and 48-inch valves should be equipped with gears. See page 101 for description; pages 102 and 103 for dimensions.

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 operating cylinder; see pages 129 to 135.

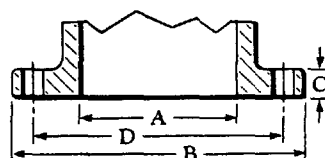
Vacuum or air service: Valves for vacuum exhaust lines or for air service should be specially air-tested; an extra charge is made. Unless orders specify, tested, water-tested valves are furnished.

Disc rollers: Brass trimmed valves, 14-inch and larger, ordered for use in a horizontal pipe with valve stem horizontal, will be equipped with a ball 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.

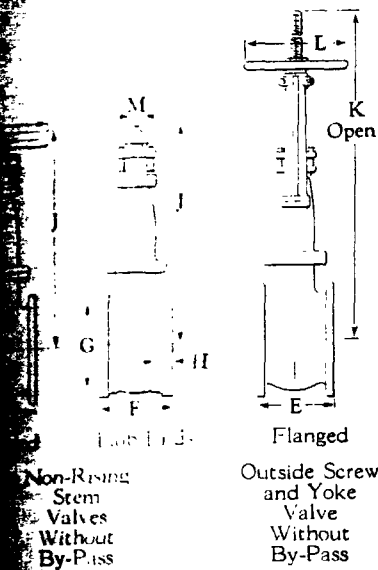


Dimensions of Flanges, in Inches

Size	A	B	C	D	No. of bolts	Disc bolts
10	10	16	7/8	14 1/4	12	4
12	12	19	1	17	12	4
14	14	21	1 1/8	18 3/4	12	4
16	16	23 1/2	1 1/8	21 1/4	16	4
18	18	25	1 1/4	22 3/4	16	4
20	20	27 1/2	1 1/4	25	20	4
24	24	32	1 3/8	29 1/2	20	4
30	30	38 3/4	1 1/2	36	28	4
36	36	46	1 5/8	42 3/4	32	4
42	42	53	1 3/4	49 1/2	36	4
48	48	59 1/2	2	56	44	4

25-Pound Iron Body Double Disc Gate Valves Brass Trimmed

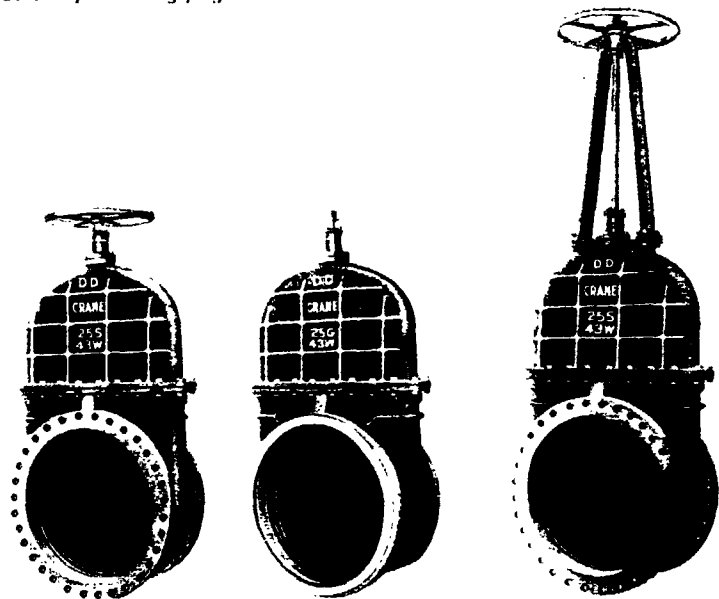
For working pressures and description,
see the preceding page.



Non-Rising
Stem
Valves
Without
By-Pass

Outside Screw
and Yoke
Valve
Without
By-Pass

on the hub end valves will accom-
Class "A" or "B" cast iron pipe.



Non-Rising Stem

No. 791
Flanged

No. 798
Hub Ends

Outside Screw and Yoke

No. 793 1/2
Flanged

List Prices and Dimensions

List Prices, Each			Dimensions, in Inches								
Non-Rising Stem		Outside Screw and Yoke No. 793½ Flanged F. & D.	E	F	G	H	J	K	L	M	No. of turns to open
No. 791 Flanged F. & D.	No. 798 Hub Ends										
185.00	173.00	218.00	9½	12¾	12.10	3.50	27¾	47	12	2	22
230.00	210.00	276.00	10	12⅝	14.20	3.50	30¾	54¼	12	2	26
358.00	333.00	412.00	10½	13⅛	16.10	3.50	33¼	64¾	14	2	29
506.00	470.00	570.00	11	14⅛	18.40	4.00	36	71¾	14	2	33
690.00	640.00	760.00	11½	14⅞	20.50	4.00	41	80¾	18	2	38
880.00	825.00	965.00	12	15⅜	22.60	4.00	44½	88½	18	2	42
1335.00	1235.00	1460.00	13	15¾	26.80	4.00	51¼	104	20	2	49
2600.00	2450.00	2800.00	14½	17⅞	33.00	4.50	62¼	128	22	2	124
3950.00	3700.00	4260.00	16	18½	39.30	4.87	72¼	149¼	27	3	147
		5800.00	17½					176½	30		131
		7800.00	19					200¾	36		149

14-inch and larger should have a by-pass; see page 101 for description and pages 102 and 103 for dimensions.
48-inch should be geared; see page 101 for description and pages 102 and 103 for dimensions.

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.

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.

Templates for drilling . . . page 439

By-passes and gearing . . . pages 101 to 103

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.

Brass trimmed: The body seat rings are brass, screwed into the body. The discs are cast iron with a brass seating face.

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 a brass 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: The hubs on hub end valves will accommodate Class "A", "B", or "C" cast iron pipe. In place of a wheel, the valves have a square operating nut.

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 page 101 for description and pages 102 and 103 for dimensions.

Gearing: To facilitate operation, valves 30-inch and larger should be equipped with gears. Refer to page 101 for description, and pages 102 and 103 for dimensions.

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 129 to 135.

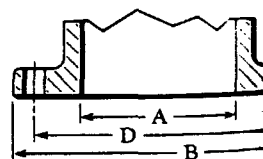
Air service: Valves for air service should be specially air-tested to assure absolute tightness; an air charge is made. Orders must specify air-tested valves; otherwise water-tested valves will be furnished.

Disc rollers: When ordered for use in a horizontal pipe with the valve stem horizontal, valves 12-inch and larger will be equipped with a brass track in the lower side of the body, and with brass roller 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 side cleanouts, as shown on the opposite page.

Indicators: The stem of an outside screw and valve indicates the position of the disc. Non-rising stem valves 12-inch and smaller can be furnished with an indicator; see page 101.

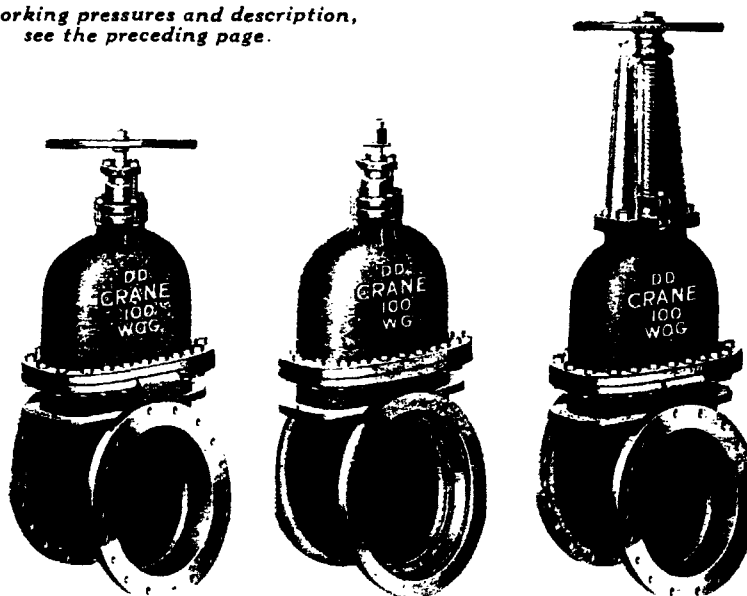
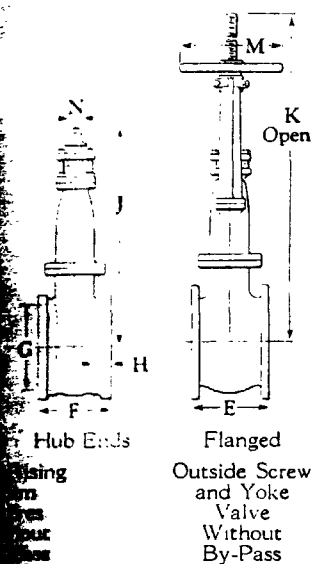
Flange dimensions and facing: Dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Flanges are plain faced, with a smooth finish.



Dimensions of Flanges, in Inches					
Size	A	B	C	D	No. of bolts
4	4	9	15/16	7 1/2	8
6	6	11	1	9 1/2	8
8	8	13 1/2	1 1/8	11 3/4	8
10	10	16	1 3/16	14 1/4	12
12	12	19	1 1/4	17	12
14	14	21	1 3/8	18 3/4	12
16	16	23 1/2	1 7/16	21 1/4	16
18	18	25	1 9/16	22 3/4	16
20	20	27 1/2	1 11/16	25	20
24	24	32	1 7/8	29 1/2	20
30	30	38 3/4	2 1/8	36	28
36	36	46	2 3/8	42 3/4	32

100-Pound W.O.G. Iron Body Double Disc Gate Valves Brass Trimmed

For working pressures and description,
see the preceding page.



The hub end valves will
be Class "A", "B" or "C"
for iron pipe.

Non-Rising Stem

No. 776
FlangedNo. 777
Hub Ends

Outside Screw and Yoke

No. 778
Flanged

List Prices and Dimensions

List Prices, Each			Dimensions, in Inches									
Non-Rising Stem		Outside Screw and Yoke No. 778 Flanged F. & D.	E	F	G	H	J	K	L	M	N	No. of turns to open
No. 776 Faced D.	No. 777 Hubs Ends											
8	52.00	63.00	8	11¾	5.70	4.00	15¾	22¾	9	9	2	13½
10	83.00	104.00	8¾	12½	7.80	4.00	20	31¼	10	10	2	13¼
12	128.00	160.00	10	13¼	10.00	4.00	24¾	40½	12	12	2	17½
14	220.00	270.00	11	14	12.10	4.00	28¼	47¾	12	12	2	22
16	312.00	380.00	12	14½	14.20	4.00	32⅞	56	14	14	2	26
18	415.00	500.00	13½	15¼	16.45	4.00	35¾	62½	14	14	2	30
20	622.00	730.00	15	15½	18.80	4.00	40¾	71¼	16	16	2	34
24	815.00	950.00	16½	16½	20.92	4.00	44	78¾	18	18	2	38
30	1025.00	1175.00	18	18	23.06	4.00	48½	86½	20	20	2	42
36	1500.00	1750.00	19½	19½	27.32	4.00	57	102½	24	24	2	50½
42		4400.00	23				72¼	130¼	30	30		63½
48		6450.00	25½				86	153¾	36	36		114

Larger should have a by-pass. See page 101 for description and pages 102 and 103 for dimensions.
36-inch should be geared. See page 101 for description and pages 102 and 103 for dimensions.

Cleanouts: 100-Pound W.O.G. Valves 12-inch and larger can be fitted with two size 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.

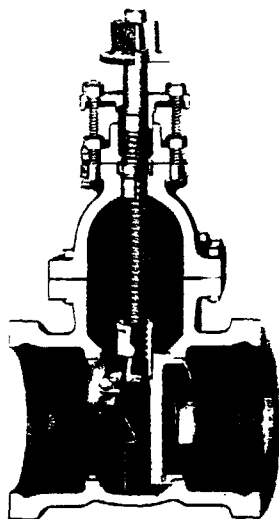
When valves are ordered faced only, they will be furnished at the same price as for faced and drilled.

Templates for drilling....page 439

By-passes and gearing pages 101 to 103

A.W.W.A. Iron Body Double Disc Gate Valve 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



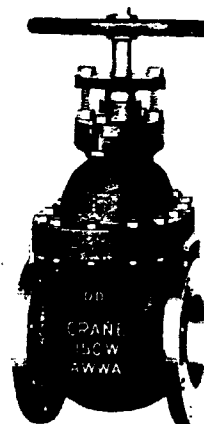
Cross Section
Non-Rising Stem
(Sizes 12-inch and smaller)

*Prices on
application*

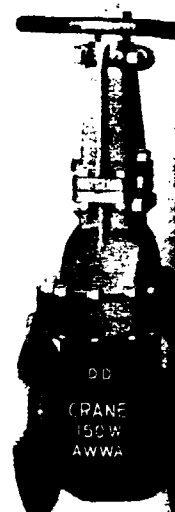
*Dimensions
are shown
on the
opposite
page.*



Non-Rising Stem
No. 480 $\frac{1}{2}$, 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

9

The design and materials of the valves described on this page comply 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 Ferrosteeel 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 stem hole bushing.

Gland and stuffing box: The valves have a one-piece gland consisting of a brass gland and a castable iron gland flange. Zinc-plated gland bolts and brass gland bolt nuts eliminate the possibility of corrosion.

The stuffing box is filled with high grade packing. The valves, when wide open, can be repaired under pressure.

Hub end valves: Hub end valves, made with a rising stem, are equipped with a square operating nut. The hubs will accommodate Class "A", "C", or "D" cast iron pipe.

Flanged valves: Flanged valves, made both with a rising stem and outside screw and yoke, are equipped with a hand wheel. They conform to the American Standard for Face to Face Dimensions of Ferrous Flange Valves (B16.10-1939), for 125-Lb. Cast Iron Flange Double Disc Gate Valves. This Standard includes sizes 2 to 12-inch, inclusive.

Disc rollers: When valves 16-inch and larger are installed 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.

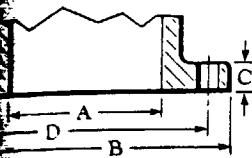
By-passes: Sizes 16-inch and larger can be equipped with a by-pass when so ordered.

Gearing: To facilitate operation, sizes 24-inch and larger should be equipped with gears. Dimensions are shown on the opposite page.

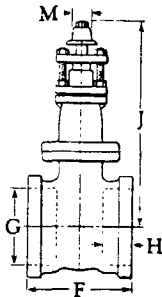
Dimensions of A.W.W.A. Gate Valves

Valves Without Gears

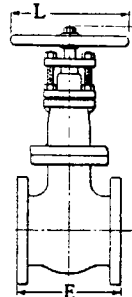
Flange Dimensions
and Facing



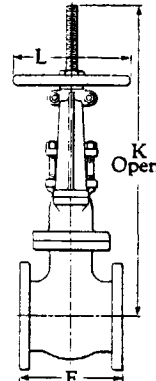
Dimensions and drilling of flanges on flanged valves conform to the American Iron Flange Standard 125 (B16.1-1948). Flanges are plain faced, with smooth finish.



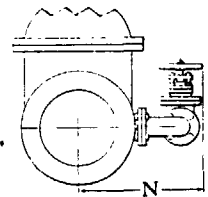
Non-Rising Stem
Hub Ends



Non-Rising Stem
Flanged



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

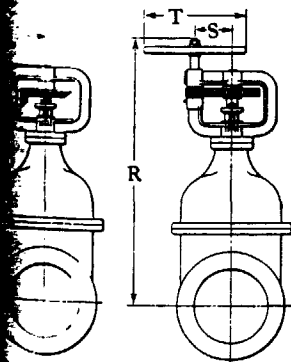
Flanges				Bolts		E		F		G	H	J	K	L	M	N	Size of by-pass
A	B	C	D	No.	Dia.	With- out by-pass	With by- pass	With- out by-pass	With by- pass								
6	3/8	4 3/4	4	4	5/8	7		9 1/4		3.38	3.00	13 1/2	16 1/4	8	2		
7 1/2	3/4	6	4	4	5/8	8		11		4.66	3.50	16 7/8	21 5/8	9	2		
9	1 1/8	7 1/2	8	8	3/4	9		12 1/4		5.70	4.00	18 1/2	24 3/4	10	2		
11	1	9 1/2	8	8	3/4	10 1/2		13 1/4		7.80	4.00	22 1/4	31 1/4	12	2		
13 1/2	1 1/8	11 3/4	8	8	3/4	11 1/2		13 3/4		10.00	4.00	25 3/4	41 1/4	14	2		
16	1 3/8	14 1/4	12	12	7/8	13		14 1/2		12.10	4.00	30 1/2	51 1/2	16	2		
19	1 1/4	17	12	12	7/8	14		15		14.20	4.00	34	58 5/8	18	2		
21	1 3/8	18 3/4	12	1	15 3/4			17 1/4		16.45	4.00	40	67	20	2		
23 1/2	1 7/8	21 1/4	16	1	17	26 1/2	18	21 1/2		18.80	4.00	45 1/2	75 5/8	22	2	26	3
25	1 9/8	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	2	27 1/4	3
27 1/2	1 11/8	25	20	1 1/8	20	28	20	23 1/2		23.06	4.00	52 3/4	93	24	2	28 5/8	3
32	1 3/8	29 1/2	20	1 1/4	24	32	22	26 3/4		27.32	4.00	63 5/8	109 3/4	30	3	32 1/2	4
								32 3/4		33.74	4.50	76 3/4			3	37 5/8	4
								27	32	40.16	4.50				3	44 1/2	6

Valves With Gears

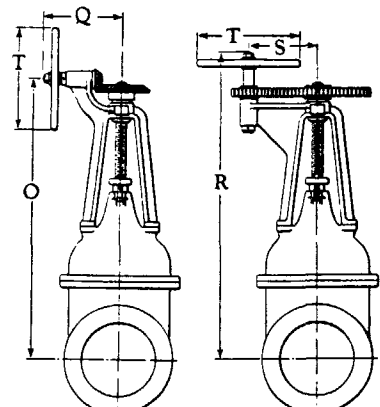
Dimensions not given for valves with gears are the same as those shown for valves without gears.

Dimensions, in Inches

	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
Outside Screw and Yoke	36	79	10 3/4	26 1/4	97 1/2	15	30
	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



Non-Rising Stem Valves
Spur Gearing



Bevel Gearing
Outside Screw and Yoke Valves
Spur Gearing

Templates for drilling... page 439

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

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.

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 2 to 3½-inch are brass; in the 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 gland is the two-piece type, consisting of a malleable iron gland flange and a brass gland in brass trimmed valves or a nickel-plated steel gland in all-iron valves.

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 page 101 for description and pages 102 and 103 for dimensions.

Gearing: To facilitate operation, 24-inch valves should be equipped with gears. See page 101 for description and pages 102 and 103 for dimensions.

Motor or cylinder operation: Valves installed in inaccessible locations or used for emergency purposes

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

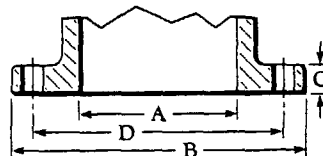
should preferably be equipped with some easy means of operation. An electric or motor drive, or an operating cylinder, is ideal for purpose. For details, see pages 130 to 135.

Cleanouts: For use on lines carrying an unusual amount of sediment, tarry fluids, etc., flanged valves can be equipped with a cleanout on the side of the body to facilitate cleaning; see page 101.

Standards: Flanged valves without by-pass conform (except marking) to the American Petroleum Institute (API) Standard for Valves for Pipe Service, No. 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1947, 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 Cast Iron Flanged Double Disc Gate Valves. This Standard includes sizes 2 to 12-inch inclusive.

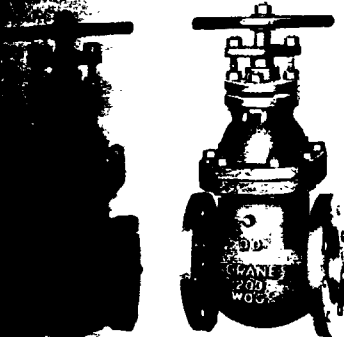
Flange dimensions and facing: Dimensions for drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B10.1-1-1939). The flanges are plain faced, with a smooth finish.



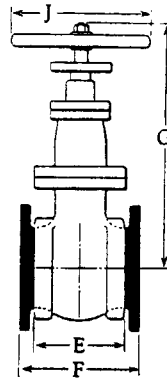
Dimensions of Flanges, in Inches

Size	A	B	C	D	No. of bolts	D ₁
2	2	6	5/8	4 3/4	4	
2½	2½	7	11/16	5 1/2	4	
3	3	7½	3/4	6	4	
4	4	9	15/16	7 1/2	8	
5	5	10	15/16	8 1/2	8	
6	6	11	1	9 1/2	8	
8	8	13½	1 1/8	11 3/4	8	
10	10	16	1 3/16	14 1/4	12	
12	12	19	1 1/4	17	12	
14	14	21	1 3/8	18 3/4	12	
16	16	23½	1 7/16	21 1/4	16	
18	18	25	1 9/16	22 3/4	16	
20	20	27½	1 11/16	25	20	
24	24	32	1 7/8	29 1/2	20	

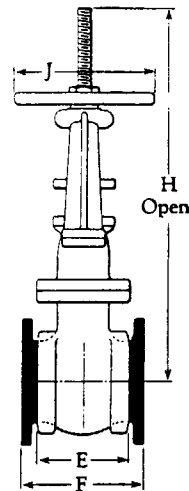
200-Pound W.O.G. Iron Body Double Disc Gate Valves Brass Trimmed or All-Iron

Non-Rising
Stem

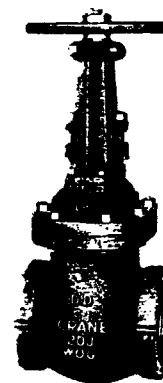
Flanged
No. 481
Brass Trimmed
No. 1081
All-Iron



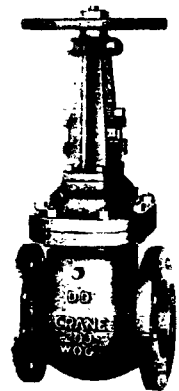
Non-Rising
Stem Valves
Without
By-Pass



Outside Screw
and Yoke Valves
Without
By-Pass

Outside Screw
and Yoke

Screwed
No. 482
Brass Trimmed



Flanged
No. 483
Brass Trimmed
No. 1083
All-Iron

For working pressures and description, see the preceding page.

List Prices and Dimensions

List Prices, Each						Dimensions, in Inches					
Non-Rising Stem			Outside Screw and Yoke			E	F	G	H	J	No. of turns to open
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.						
34.50	38.00	38.00	40.50	44.00	44.00	5½	7	12	14¾	8	7½
36.00	40.50	40.50	43.50	48.00	48.00	6¼	7½	12½	16	8	9
40.00	45.00	45.00	52.00	57.00	57.00	7	8	14	19	9	10½
55.50	63.50	63.50	72.00	80.00	80.00	7½	9	17¾	23¾	10	9
	85.50			103.00			10	19¾	28½	12	11
94.00	103.00	103.00	118.00	127.00	127.00	11¼	10½	21¼	32¾	12	13
	179.00	179.00		212.00	212.00		11½	26	41	14	18
	295.00	295.00		345.00	345.00		13	30	49¾	16	22
	420.00	420.00		492.00	492.00		14	34¾	57	18	26
	570.00			676.00			15¾	40	67	20	31
	815.00			945.00			17	45¼	75½	22	35
	1120.00			1275.00			18½	48¾	83½	24	39
	1660.00			1835.00			20	52¾	92½	24	44
	2615.00			2845.00			24	63¾	109½	30	52

12 inch and larger should have a by-pass. See page 101 for description and pages 102 and 103 for dimensions.
12 inch should be geared. See page 101 for description and pages 102 and 103 for dimensions.

Flanged valves are furnished faced and drilled unless ordered faced only. List price includes 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.

and gearing ... pages 101 to 103

Templates for drilling ... page 439

Thread Engagement ... page 474

500-Pound W.O.G. Ferrosteel Double Disc Gate Valves Brass Trimmed

WORKING PRESSURE

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

HYDROSTATIC TEST PRESSURES

1000-pound shell test 550-pound seat test

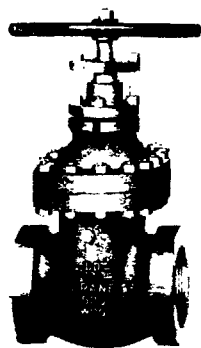
Air tested

List Prices, Each

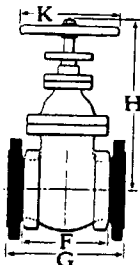
Size Inches	Screwed	Flanged F. D. & S. F.	
		No. 340 E Non- Rising	No. 341 E Non- Rising
2	65.00	80.00	85.00
2½	75.00	92.00	98.00
3	88.00	105.00	112.00
4	152.00	171.00	186.00
6		242.00	268.00
*† 8		418.00	472.00
*† 10		612.00	690.00
*† 12		830.00	930.00

*Sizes 6-inch and larger should have a by-pass; see page 101 for description and pages 102 and 103 for dimensions.

†Sizes 8-inch and larger can be equipped with gears; see page 101 for description, pages 102 and 103 for dimensions.

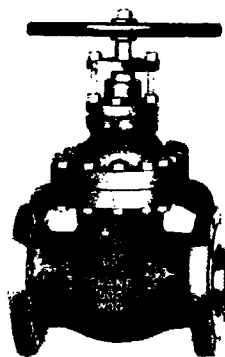


Non-Rising Stem
No. 340 E, Screwed

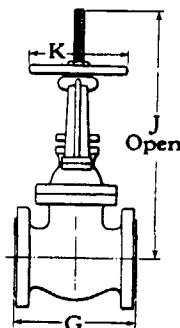


Screwed
or
Flanged

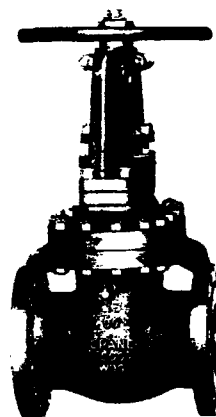
Non-Rising
Stem
Without
By-Pass



Non-Rising Stem
No. 341 E, Flanged



Flanged
Outside Screw
and Yoke
Without By-Pass



Outside Screw and Yoke
No. 343 E, Flanged

*For larger sizes,
use the 500-Pound
Gas Valves
shown on next page.*

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 Brass, a hard, leaded tin bronze.

The discs in sizes 2 to 4-inch are Crane Special Brass; in larger sizes, they are cast iron faced with Crane Special Brass. 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

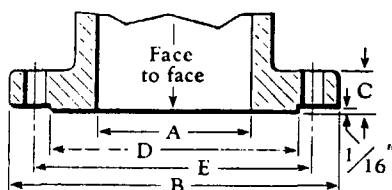
open, can be repacked while under pressure. The gland is the two-piece type, consisting of a malleable iron gland flange and a brass gland.

Standards: Flanged valves without by-pass in all sizes and with by-pass in 6, 8 and 10-inch sizes conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948.

Flanged valves without by-pass in all sizes and with by-pass in 6, 8, and 10-inch sizes also conform to the American Standard for Face to Face Dimensions of Ferrous Flanged Valves (B16.10-1939), for 25-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.



Additional description . . . pages 88 and 89

Dimensions, in Inches

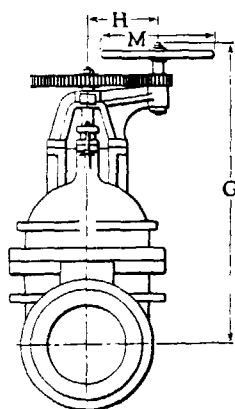
Size	A	B	C	D	E	F	G	H	J	K	Turns to open	No. of Bolts	Dia. of Bolts
2	2	6½	7/8	43/16	5	8	8½	12½	17	9	15	8	5/8
2½	2½	7½	1	415/16	57/8	87/8	9½	14½	18¾	9	18	8	¾
3	3	8¼	1½	511/16	65/8	95/8	11½	15½	21	10	15	8	¾
4	4	10	1¾	615/16	77/8	10½	12	17½	25¼	12	19	8	¾
6	6	12½	17/16	911/16	105/8		157/8	22¾	34	16	28	12	¾
8	8	15	15/8	1115/16	13		16½	28¾	42¾	20	36	12	7/8
10	10	17½	17/8	141/16	15¼		18	36	53¼	22	44	16	1
12	12	20½	2	167/16	17¾		19¾	40	61	24	52	16	1½

Templates for drilling . . . page 440

Thread engagement . . . page 474

Motor or cylinder operation . . . pages 130 to 135

500-Pound Gas Ferrosteel Double Disc Gate Valves Brass Trimmed — With Spur Gears



Non-Rising Stem
No. 348 E, Flanged

WORKING PRESSURE

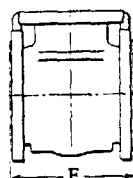
500 pounds gas

HYDROSTATIC TEST PRESSURES

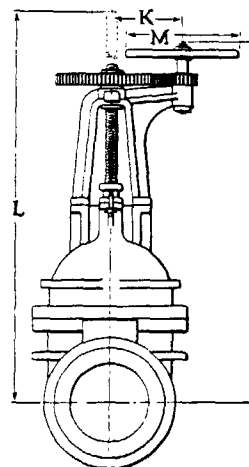
800-pound shell test

550-pound seat test

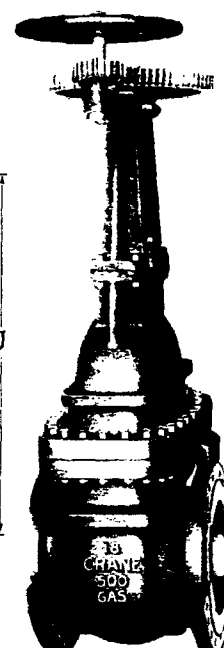
Air tested



Face to Face Dimension
For Both Valves



Outside Screw and Yoke
No. 349 E, Flanged



These valves are especially designed and built for heavy duty service on gas lines. They are equipped with spur gears.

Materials: The body and bonnet are Crane Ferrosteel. The body seat rings, screwed-in, and the disc faces are Crane Special Brass, a hard, leaded tin bronze. The stem is brass. In non-rising stem valves, the portion of the discs engaging the stem threads is brass-bushed.

Stuffing box and gland: The lantern-type stuffing box, unusually deep and filled with high grade packing, has Alemite fittings for quick, easy lubrication.

The valves, when wide open, can be repacked while under pressure. The gland is the two-piece ball-type and consists of a malleable iron gland flange and a brass gland.

By-passes: A by-pass, either built around (preferred) or mounted on the valve, should be used to equalize pressure before opening. Single-valve direct-mounted by-passes and built around or three-valve direct-mounted by-passes for drawing-off either side of the line are available; prices on application.

List Prices, Each

Size Inches	Flanged F.D. & S.F. With Spur Gears	
	No. 348 E	No. 349 E
14	1400.00	1650.00
16	1880.00	2165.00
18	2465.00	2800.00
20	3200.00	3600.00
24	4800.00	5400.00

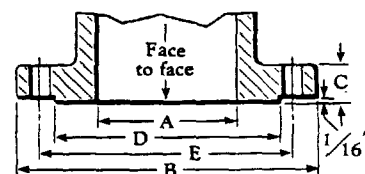
Prices include facing, drilling, and spot facing (F.D. & S.F.) to American Cast Iron Flange Standard, Class 250; no deduction for valves ordered faced only.

Reduced seat opening: Valves (Venturi type) with 22-inch port opening and 18 or 20-inch seat or with 24-inch port opening and 20-inch seat are made to order; prices furnished on application.

Face to face: Face to face dimensions 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).

They are regularly furnished with a $\frac{1}{16}$ -inch raised face, which is finished with concentric grooves, approximately 16 per inch, known as a "seriated" finish.



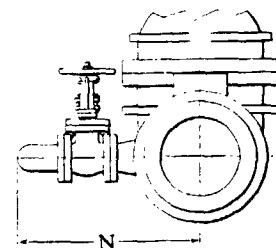
Dimensions, in Inches

Size	A	B	C	D	E	F	G	H	J	K	L	M	Bolts		N	Size By-Pass
													No.	Dia.		
14	13 1/4	23	2 1/4	18 5/16	20 1/4	22 1/2	56	10 1/2	64 1/2	15	74 3/4	22	20	1 1/8	33 1/2	3
16	15 1/4	25 1/2	2 1/4	21 1/16	22 1/2	24	61 1/2	10 1/2	74 1/2	15	86	24	20	1 1/4	37 1/2	4
18	17	28	2 3/8	23 5/16	24 3/4	26	64 3/4	10 1/2	78	15	91 1/2	24	24	1 1/4	38 5/8	4
20	19	30 1/2	2 1/2	25 9/16	27	28	70 1/4	12 1/8	84 1/2	18 1/2	100	27	24	1 1/4	39 7/8	4
24	23	36	2 3/4	30 3/16	32	31	82	12 1/8	99 1/2	18 7/8	117	30	24	1 1/2	44 1/2	4

Additional description ... pages 88 and 89

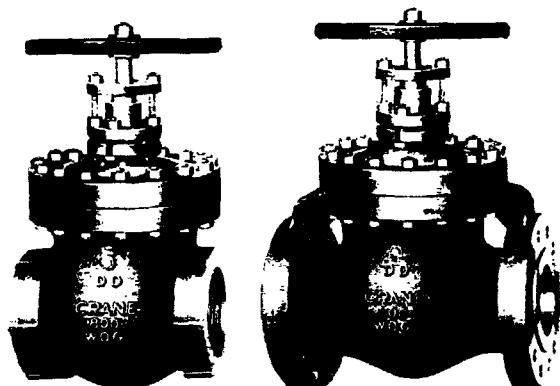
Motor or cylinder operation ... pages 130 to 135

Templates for drilling ... page 440



Clearance of Valves
With Single-Valve
Direct-Mounted By-Pass

800-Pound W.O.G. Ferrosteel Double Disc Gate Valves Brass Trimmed

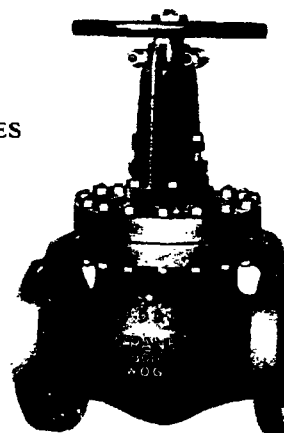


Non-Rising Stem Valves
No. 214 H, Screwed No. 215 H, Flanged

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.	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

*Should have a by-pass. See page 101 for description and pages 102 and 103 for dimensions.

†Should be geared. See page 101 for description and pages 102 and 103 for dimensions.

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.

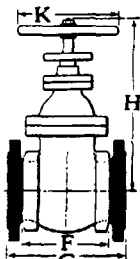
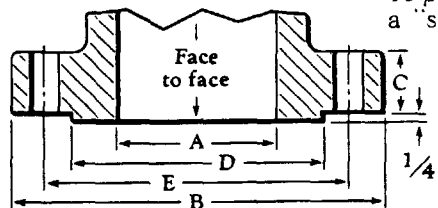
Materials: The body and bonnet are Crane Ferrosteel. Threaded ends of screwed valves are recessed for lead. The screwed-in body seat rings and the discs (2 to 4-inch) are Crane Special Brass, a hard, leaded tin bronze. In larger sizes, the discs are iron faced with Crane Special Brass.

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.

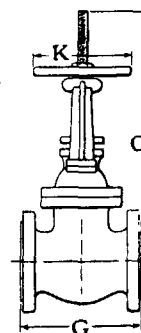
Stuffing box and gland: The stuffing box is filled with high grade packing. The valves, when wide open, can be repacked while under pressure. The gland is two-piece and consists of a malleable iron gland flange and a brass gland.

Standards: Flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948.

Flange dimensions and facing: Dimensions of 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	6⅜	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	1⅞
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
Templates for drilling**

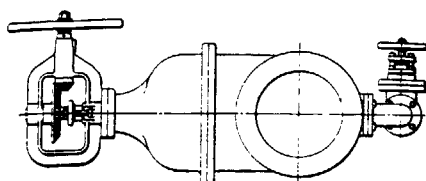
**pages 88 and 89
page 440**

**Motor or cylinder operation
Thread engagement**

**pages 130 to
page**

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-Pass for Water Service on Non-Rising Stem Gate Valve
Non-Rising Gate Valve Used in By-Pass

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	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		
100-Lb. W.O.G. Page 93	48	8	Prices on Application	Prices on Application
	12 and 14	2		
	16 to 20	3		
	24 and 30	4		
200-Lb. W.O.G. Page 97	36	6	Prices on Application	Prices on Application
	12 and 14	2		
	16 to 20	3		
	24	4		
500 and 800-Lb. W.O.G. Pages 98 and 100	6	1 1/4	Prices on Application	Prices on Application
	8 and 10	1 1/2		
	12	2		

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.

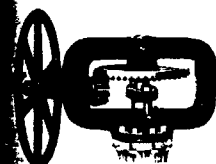
Dimensions... pages 102 and 103



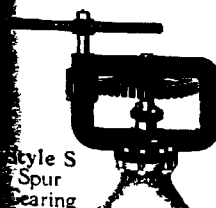
By-Pass for Water Service on Outside Screw & Yoke Gate Valves
Outside Screw & Yoke Gate Valve Used in By-Pass

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.

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.

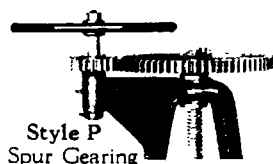
Outside Screw and Yoke



Style N
Bevel Gearing



Style O
Bevel Gearing



Style P
Spur Gearing

Prices on Application
Dimensions of geared valves.... pages 102 and 103

Cleanouts

For 200-Pound W.O.G. Flanged Valves
Sizes 3, 4, 5, 6, 8, 10, and 12-inch

Cleanouts should be used where sediment will accumulate in a valve. They may be either on the side or on the bottom.

Iron Double Disc Gate Valves With Gearing or By-pass

For dimensions, see the following page.

With the exception of A.W.W.A. and 500-Pound Gas Geared Valves, the dimensions of Crane Iron Body and Ferrosteeel Double Disc Gate Valves equipped with gearing or by-pass are shown on the opposite page. For dimensions of the A.W.W.A. and 500-Pound Gas Geared 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
500-Pound Gas Valves.....see page 99
800-Pound W.O.G. Valves.....see page 100

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.

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.

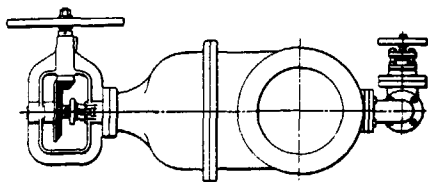
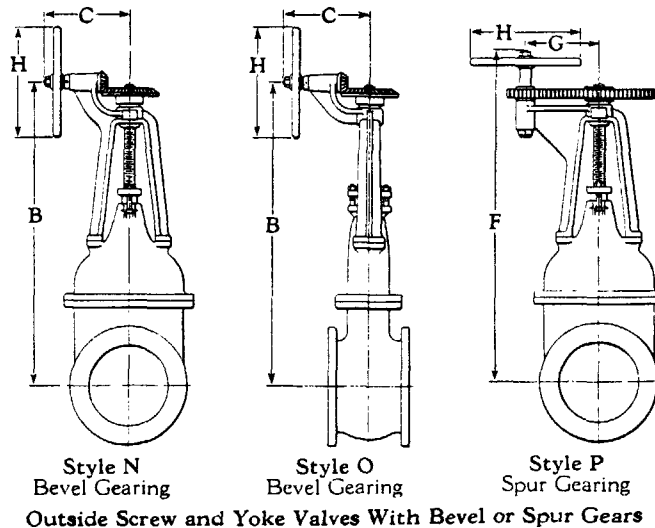
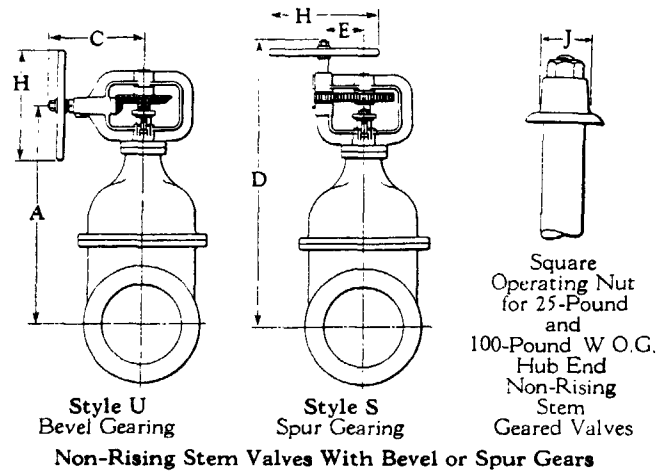
By-passes: Larger size flanged and hub end valves in all pressure classes can be furnished with a by-pass.

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.

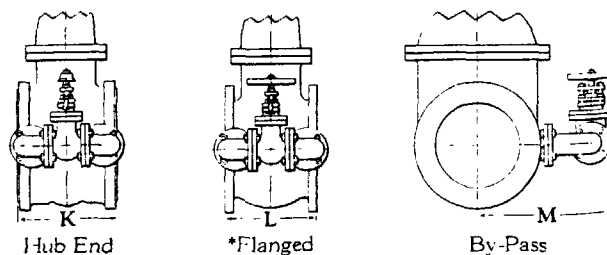
Face to face or end to end with by-pass: Crane 25-Pound, 100-Pound W.O.G., 200-Pound W.O.G., and 500-W.O.G. Valves when furnished with a by-pass have a longer face to face or end to end dimension than the same valves without by-pass.

800-Pound W.O.G. Valves with by-pass have the same face to face as the valves without by-pass. These dimensions are repeated on the opposite page for convenience.

Geared valves with by-pass: Spur-gear valves with by-pass have the by-pass connected at the side of the valve body.



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.



Flanged and Hub End Valves with By-Pass

*Dimension "L" includes the $\frac{1}{8}$ -inch raised faces on 500-Pound W.O.G. Flanged Valves and the $\frac{1}{4}$ -inch male faces on 800-Pound W.O.G. Flanged Valves.

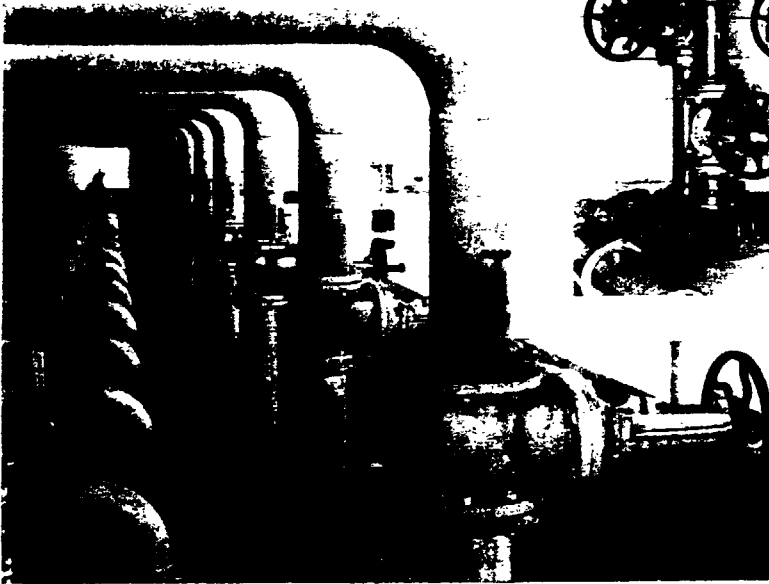
Iron Double Disc Gate Valves With Gearing or By-Pass

Dimensions, in Inches

For list prices, description, and dimensions of valves
without gearing or by-pass, see pages 88 to 100.

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
15	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	14⅛	22	2	152	26	26	31¼	4
30	65¼	100¼	20½	81¼	10⅜	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	35⅝	52⅝	13	46½	6	57	12	18		60		18½	23¼	2
16	41	59⅝	17	55	8	65¾	14⅛	22		102		26½	26	3
18	44⅝	65¼	17	58½	8	71¼	14⅛	22		114		27	27¼	3
20	47¼	72	17	61¼	8	78	14⅛	22		128		28	28¾	3
24	56¼	85⅝	20½	72¼	10⅜	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

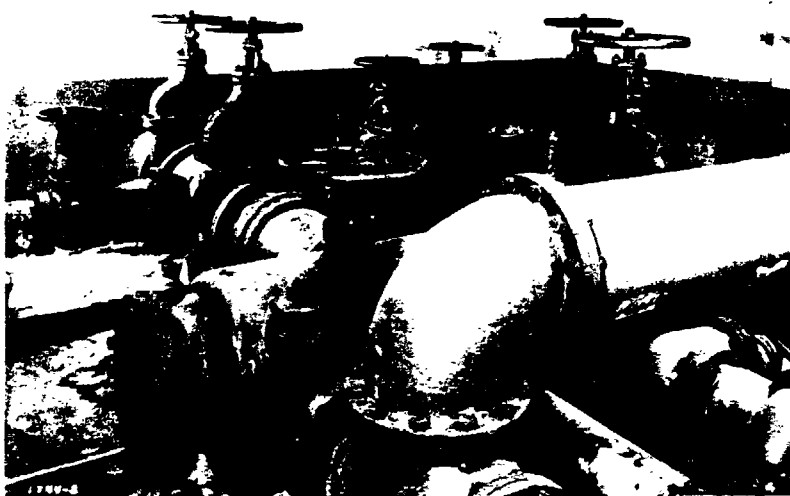
*Dimension "L", the face to face of flanged valves with by-pass, includes the $\frac{1}{16}$ -inch raised faces on 500-Pound W.O.G. Valves and the $\frac{1}{4}$ -inch male faces on 800-Pound W.O.G. Valves.
Dimensions identified by an asterisk are the same as for valves without by-pass.



Crane iron body gate valves installed in a cooling tower manifold in a refinery.

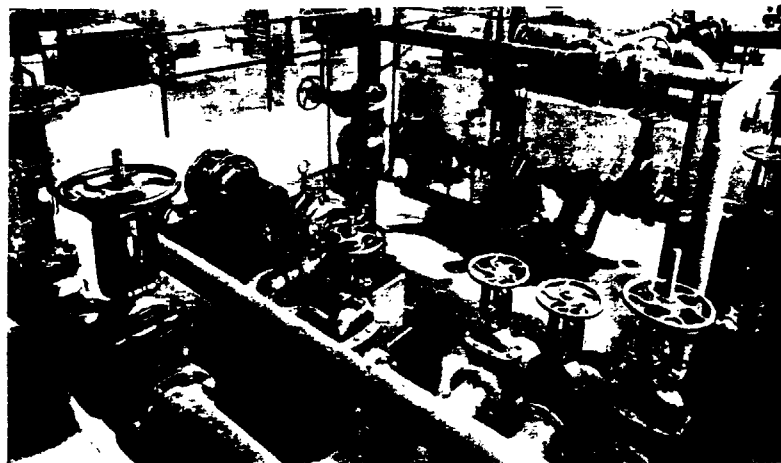


Crane valves in cooler lines of a brewery.



In a sewage disposal plant equipped with Crane valves and fittings.

Gasoline treating plants are large users of Crane iron body gate valves.



Iron Body Globe and Angle Valves Diaphragm Valves

Diaphragm Valves. pages 106 and 107

Globe and Angle Valves, Union Bonnet

150-Pound. pages 108 and 109

1000-Pound W.O.G., Malleable Iron. page 110

Heavy Duty All-Iron. page 115

Globe and Angle Valves, Yoke-Type Bolted Bonnet

General Description and Names of Parts. page 111

125-Pound. pages 112 and 113

250-Pound. page 114

Globe and Angle Valves, Heavy Duty All-Iron. page 115

Butterfly Valves. page 115

10

* * * * *

The Crane line of Iron Body Diaphragm, Globe, and Angle Valves is described and illustrated on pages 106 to 115.

Special attention is directed to the unusually complete line of 150-Pound Iron Body Union Bonnet Globe and Angle Valves shown on pages 108 and 109. 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.

Diaphragm Valves

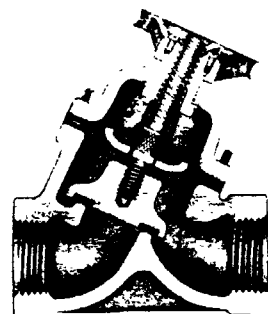
Iron Body — Y-Pattern

An Outstanding Development in Diaphragm Valves

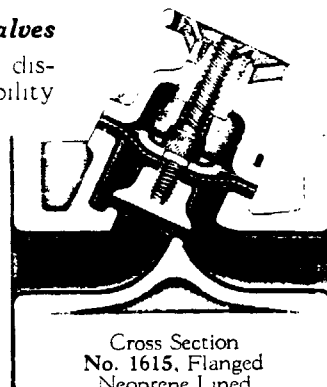
Crane introduces a new type of diaphragm valve, distinguished by marked improvement in the serviceability and operating characteristics. Diaphragm valves belong to the general class known as "packless" valves, so called because the stuffing box around the stem has been eliminated through the use of a flexible diaphragm between the body and bonnet; this seals the operating mechanism from the fluid passing through the body. In the Crane design, seating is accomplished by means of a disc holder operating on the end of the stem. A thick neoprene insert, vulcanized into a recess in the face of the disc holder, closes against the seating surface in the body. The neoprene is soft

enough to absorb small particles of foreign matter that might become lodged on the seat and might otherwise cause leakage. The diaphragm, having a hole through the center, is locked between the disc holder and a plunger. The diaphragm is not used as the seating member; it merely retains the fluid and is only flexed enough to accommodate the travel of the disc holder.

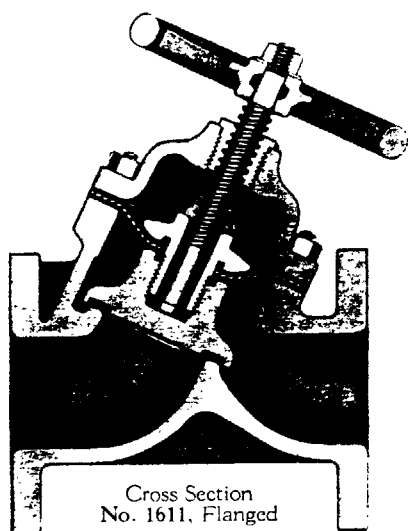
Features of the Crane design: The separate disc-diaphragm construction of these Crane valves offers the user many outstanding advantages. (1) The life of the diaphragm is tremendously increased, since it is not subjected to the crushing, cutting, and abrasion incident to seating. (2) The torque required to close the valve is materially reduced, a feature that is especially appreciated in the larger sizes and at the higher pressures; in addition, the valves require fewer turns to open or close. (3) The separate disc and diaphragm permit the use of a Y-Pattern body design, which offers very low resistance to flow and minimizes pressure drop. (4) Installation on high vacuum lines does not cause failure because there is no weak connection that pulls apart. (5) Because the diaphragm is not the seating member, the valve can be closed tightly even though the diaphragm should fail; thus, flow through the seat opening can be shut off independently of the diaphragm, often preventing the escape and loss of costly fluid.



Cross Section
No. 1610, Screwed



Cross Section
No. 1615, Flanged
Neoprene Lined



Cross Section
No. 1611, Flanged

Materials and construction: The body and bonnet are cast iron. The disc holder is cast iron with a neoprene seating face permanently molded into a groove. The diaphragm is neoprene, having a strong reinforcing member to provide long life under flexing action. The valves have rising stem construction, the position of the stem indicating whether the valve is open or closed. The valves have a rigid, leak-proof disc-diaphragm-stem connection.

Sizes 2-inch and smaller (typified by the cross section of the No. 1610, above) have a 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.

Sizes 2½-inch and larger (see the cross section of the No. 1611) have a turning brass stem operating in a brass yoke bushing.

The No. 1615 Valves are similar to those described above except that the inside of the body, including the flange faces, is neoprene lined, and the disc is neoprene coated (see the cross section above). Thus

all parts of the valve which come in contact with the fluid in the line are neoprene covered; the lining is ⅛-inch thick on sizes 1¼-inch and smaller and ⅝-inch thick on sizes 1½-inch and larger.

Service recommendations: Crane Y-Pattern Diaphragm Valves, being packless, are ideal for a wide variety of services where ordinary valves may fail or be only moderately satisfactory because of difficulties with stuffing box leakage. All parts exposed to the fluid in the line are cast iron or neoprene, making the valves suitable for certain corrosive services.

The valves are particularly well suited for use on compressed air, compressed and liquified gases of many commercial kinds, corrosive gases, many types of process fluids, solvents, natural and corrosive waters such as mine water, sludges, slurries, fluids containing abrasive material, pulp and paper mill liquors, sewerage, etc. They are suitable for 150 pounds pressure and for 180° F. temperature.

Specific recommendations on handling corrosive fluids will be furnished on request.

For Corrosion-Resistant Valves and Fittings, see Section 33, pages 365 to 380.

Diaphragm Valves

Iron Body — Y-Pattern

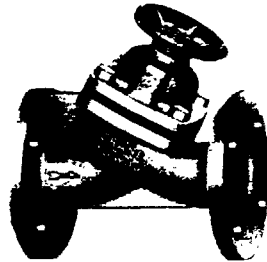
WORKING PRESSURE

150 pounds water, oil, air, or gas—180° F. maximum temperature

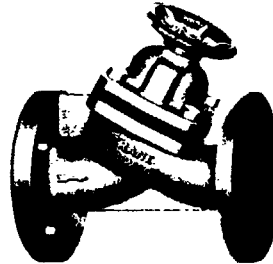
(Patent Pending)



No. 1610
Screwed



No. 1611
Flanged



No. 1615
Neoprene Lined
Flanged



2½, 3, and 4-inch sizes are made with a rising, turning stem as illustrated above.

List Prices, Each

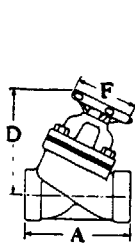
Size	Inches	½	¾	1	1¼	1½	2	2½	3	4
No. 1610, Screwed		6.50	7.90	9.20	14.80	23.10	30.90			
No. 1611, Flanged, F. & D.		11.80	13.40	18.80	24.70	32.90	45.40	63.20	78.40	113.40
No. 1615, Flanged, F. & D., Neoprene Lined		49.00	51.00	56.50	64.00	72.00	88.00	120.00	158.00	212.00

Flange dimensions and drilling: The dimensions (excluding neoprene 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). 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. Flanges are plain faced, with a smooth finish. List prices include facing and drilling; no deduction is made if ordered faced only.

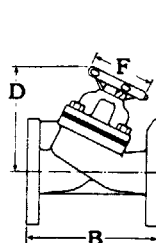
Face to face dimensions: The face to face dimension of the No. 1611 Valves sizes 2-inch and larger conform to the American Ferrous Flanged Standard, B16.10-1939, for 125-Pound Cast Iron Globe Valves. The No. 1615 Valves are longer because of the lining.

Special valves: Valves with diaphragm or lining of material other than neoprene can be made to order. Sizes 2-inch and smaller can be furnished with a protector for the stem end. Prices on application.

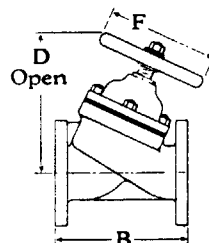
Dimensions, in Inches



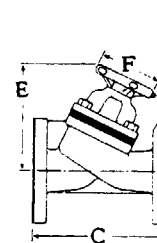
No. 1610
(All sizes)



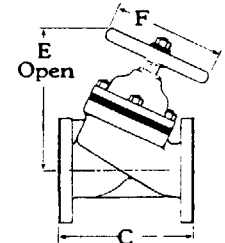
No. 1611
(2-inch and smaller)



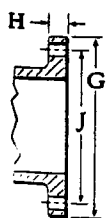
(2½, 3, and 4-inch)



No. 1615
(2-inch and smaller)



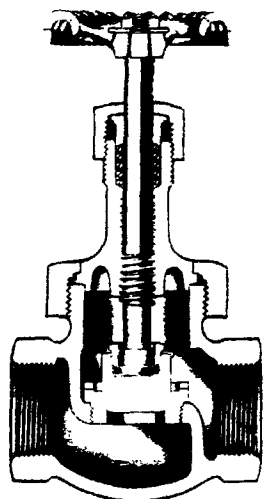
(2½, 3, and 4-inch)



*Dimension "H", the flange thickness, does not include the thickness of the lining on the No. 1615 Valves, which is ⅛-inch on sizes 1¼-inch and smaller and ⅜-inch on sizes 1½-inch and larger.

Size	½	¾	1	1¼	1½	2	2½	3	4
A	3	3½	4¼	5¼	6	7			
B	4¼	4½	5¼	5¾	6½	8	8½	9½	11½
C	4¾	4¾	5¾	5¾	6¾	8¼	8¾	9¾	11¾
D	3¼	3¾	4¼	5½	6	7½	9½	11¾	13¾
E	3⅝	3⅝	4⅝	5⅝	6⅝	7¼	10	11½	14
F	2	2¼	2½	3	4	5	7	8	10
No. of turns to open	1½	2	2¾	3½	3¾	3½	4¼	4	5¼
End Flanges									
G	3½	3¾	4¼	4¾	5	6	7	7½	9
H	¾	13/32	7/16	½	9/16	5/8	11/16	¾	15/16
J	2¾	2¾	3½	3½	3¾	4¾	5½	6	7½

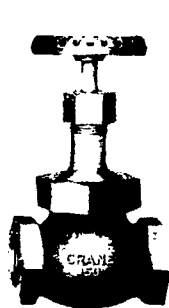
150-Pound Iron Body Globe and Angle Valves Plug Type Disc



Cross Section
No. 314 1/2 P, Globe

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

FEATURES
Surface Hardened
Stainless Steel Seating Surfaces
Renewable Body Seat Ring
Plug Type Disc
Union Bonnet
2-inch and smaller
Bolted Bonnet
2 1/2 and 3-inch



No. 314 1/2 P, Globe
Screwed



No. 316 1/2 P, Angle
Screwed

These valves are the same as the No. 350 1/2 Globe and No. 352 1/2 Angle shown on page 109 except that they have a plug type disc and seat instead of a 35° wide bearing seat.

List Prices, Each

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 314 1/2 P or No. 316 1/2 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. 314 1/2 P Globe and No. 316 1/2 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.

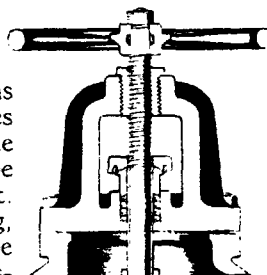
Materials: Sizes 2-inch and smaller have a brass bonnet and a malleable iron union bonnet ring; 2 1/2 and 3-inch sizes have a cast iron bonnet. All sizes have a cast iron body and a brass stem.

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 wire drawing, and the tapered disc permits close regulation of flow when throttling.

Both the disc and seat are Crane Hardened Stainless Steel, the surface of the seating area having a hardness of 500 Brinnell. The design of the disc and seat combined with the natural resistance of stainless steel to corrosion and the excellent resistance offered by the high hardness to erosion, galling, and scoring, produce a truly superior seat. It will withstand severe operating conditions unusually well.

Bonnet construction

Sizes 2-inch and smaller have a union bonnet as shown on the illustrations above; 2 1/2 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.



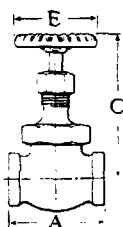
2 1/2 and 3-inch sizes
have a bolted bonnet.

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. 314 1/2 P and 316 1/2 P valves are completely interchangeable, size for size, with all of the 150-Pound Globe and Angle Valves shown on the opposite page.

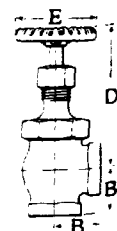
A metal tag, secured under the wheel nut, shows the catalog number of the valve.



Dimensions, in Inches

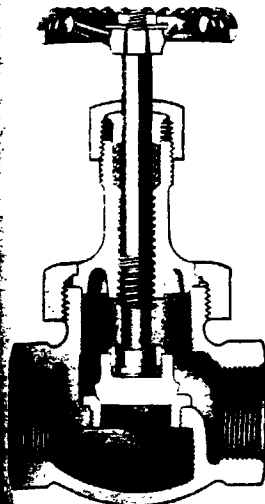
Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	2 3/8	2 5/8	3	3 1/2	4 1/8	4 5/8	5 1/4	6 3/8	7	8
B	1 1/8	1 1/4	1 3/8	1 9/16	1 7/8	2 3/16	2 3/8	3	3 1/2	4
C—open	4 1/8	4 3/8	5 1/8	5 1/2	6 5/8	7 1/4	8 1/4	9 1/2	11 1/2	14
D—open	4	4 1/4	5	5 3/8	6 1/2	7 1/4	8 1/8	9 1/4	11 3/4	13 3/4
E	1 3/4	2 1/16	2 9/16	2 3/4	3 1/16	3 5/8	4 1/16	4 3/4	8	9

Thread engagement page 474



150-Pound Iron Body Globe and Angle Valves

Brass Trimmed, All-Iron, or Composition Discs



Cross Section, Globe
Metal Disc
No. 350 $\frac{1}{2}$, 354 $\frac{1}{2}$, or 355 $\frac{1}{2}$



Globe, Screwed

No. 350 $\frac{1}{2}$ — Brass Trim, Nickel Alloy Disc & Seat — No. 352 $\frac{1}{2}$
 No. 354 $\frac{1}{2}$ — All-Iron, Nickel Alloy Disc & Seat — No. 356 $\frac{1}{2}$
 No. 355 $\frac{1}{2}$ — All-Iron, Iron or Steel Disc & Seat — No. 357 $\frac{1}{2}$
 No. 350 $\frac{1}{2}$ C — Brass Trim, No. 1 Cranite Disc — No. 352 $\frac{1}{2}$ C
 No. 355 $\frac{1}{2}$ C — All-Iron, No. 1 Cranite Disc — No. 357 $\frac{1}{2}$ C

WORKING PRESSURES

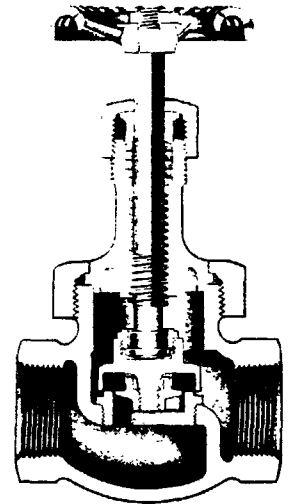
150 pounds saturated steam
 250 pounds cold water, oil, or gas, non-shock

FEATURES

Interchangeable Parts
 Choice of Seating Materials
 Renewable Body Seat Ring
 Union Bonnet 2" and Smaller
 Bolted Bonnet 2 $\frac{1}{2}$ " and 3"



Angle, Screwed



Cross Section, Globe
Composition Disc
No. 350 $\frac{1}{2}$ C or 355 $\frac{1}{2}$ C

List Prices, Each

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
No. 350 $\frac{1}{2}$ or 352 $\frac{1}{2}$		7.50	7.70	8.00	9.60	11.60	14.30	18.00	23.80	42.50	51.00
No. 354 $\frac{1}{2}$, 355 $\frac{1}{2}$, 356 $\frac{1}{2}$, or 357 $\frac{1}{2}$		9.00	9.20	9.60	11.50	12.70	15.70	19.80	26.00	Use 125-Pound Valves, pages 112 and 113.	
No. 350 $\frac{1}{2}$ C or 352 $\frac{1}{2}$ C		7.50	7.70	8.00	9.60	11.60	14.30	18.00	23.80		
No. 355 $\frac{1}{2}$ C or 357 $\frac{1}{2}$ 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 and a tough malleable iron union bonnet ring and packing nut, 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. 350 $\frac{1}{2}$ and 352 $\frac{1}{2}$ are brass trimmed, having a brass bonnet (except 2 $\frac{1}{2}$ " and 3"), stem, and gland, and a Nickel Alloy disc and seat; they are suitable for general non-corrosive service. The Nos. 354 $\frac{1}{2}$ and 355 $\frac{1}{2}$ have a malleable iron bonnet, a steel stem and gland, and a Nickel Alloy disc and seat; they are suitable for many corrosive fluids which attack brass but not Crane Nickel Alloy. The Nos. 355 $\frac{1}{2}$ and 357 $\frac{1}{2}$ 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. 350 $\frac{1}{2}$ C and 352 $\frac{1}{2}$ 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. 355 $\frac{1}{2}$ C and 357 $\frac{1}{2}$ 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 — metal to metal joint. Larger sizes have a cast iron yoke-type bolted bonnet with gasket, similar to the small illustration on page 108.

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 108 are completely interchangeable, size for size. This adds to their general utility and reduces stocks maintained for repairs.

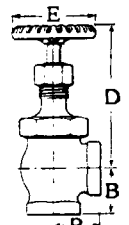
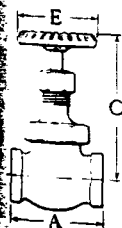
A metal tag, secured under the wheel nut, shows the catalog number of the valve.

Dimensions, in Inches

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
A	2 $\frac{3}{8}$	2 $\frac{5}{8}$	3	3 $\frac{1}{2}$	4 $\frac{1}{8}$	4 $\frac{5}{8}$	5 $\frac{1}{4}$	6 $\frac{3}{8}$	7	8
B	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{9}{16}$	1 $\frac{7}{8}$	2 $\frac{3}{16}$	2 $\frac{3}{8}$	3	3 $\frac{1}{2}$	4
C—open	4 $\frac{1}{2}$	4 $\frac{11}{16}$	5 $\frac{5}{16}$	6 $\frac{1}{16}$	7	7 $\frac{11}{16}$	8 $\frac{13}{16}$	10 $\frac{1}{4}$	11 $\frac{1}{2}$	13 $\frac{1}{8}$
D—open	4 $\frac{3}{8}$	4 $\frac{5}{8}$	5 $\frac{3}{16}$	6	7	7 $\frac{7}{8}$	8 $\frac{5}{8}$	10	11 $\frac{1}{2}$	12 $\frac{3}{4}$
E	1 $\frac{3}{4}$	2 $\frac{1}{16}$	2 $\frac{9}{16}$	2 $\frac{3}{4}$	3 $\frac{1}{16}$	3 $\frac{3}{8}$	4 $\frac{1}{16}$	4 $\frac{3}{4}$	8	9

Composition Discs... page 140

Thread engagement... page 474



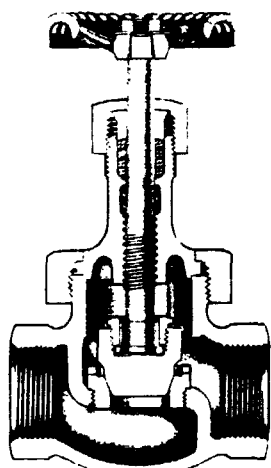
1000-Pound W.O.G. Malleable Iron Globe and Angle Valves Plug Type Disc

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

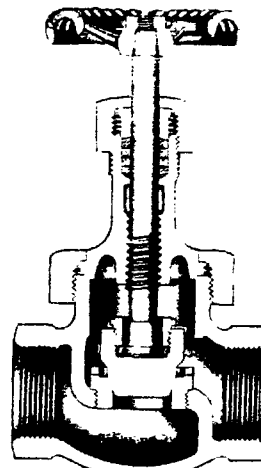


Globe, Screwed
No. 254 P, Exelloy Stem
No. 255 P, Steel Stem



Air
Tested

Angle, Screwed
No. 256 P, Exelloy Stem
No. 257 P, Steel Stem



Cross Section
No. 255 P, Globe
Steel Stem

Surface Hardened Stainless Steel Seating Surfaces

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.

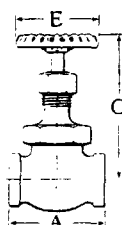
Both the disc and seat are Crane Hardened Stainless Steel, the surface of the seating area having a hardness of 500 Brinell. The design of the disc and seat combined with the natural resistance of stainless steel to corrosion and the excellent resistance offered by the high hardness to erosion, galling, and scoring, produce a truly superior seat.

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.

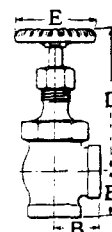
A metal tag, secured under the wheel nut, shows the catalog number of the valve.



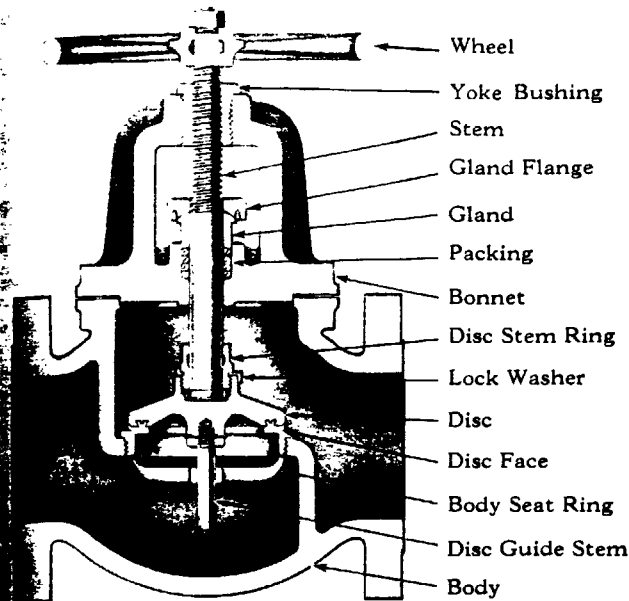
Dimensions, in Inches

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 474

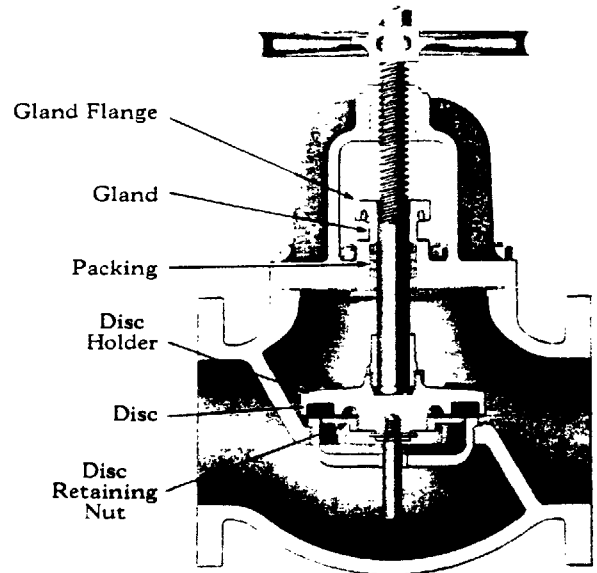


Iron Body Globe and Angle Valves With Yoke Bonnet



Globe Valve—Brass Trimmed

(Illustration shows No. 21 E, 250-Pound, page 114)



Globe Valve—With Composition Disc

(Illustration shows No. 359, 125-Pound, page 113)

10

General Description

Crane Iron Body Globe and Angle Valves with yoke bonnet are made in two weights.

125-Pound Valves pages 112 and 113

250-Pound Valves page 114

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 the pages that follow, numbers 112 to 114.

Rugged construction: The valves are well proportioned and are ruggedly constructed. They have simply 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.

In brass trimmed and composition disc valves, the stem threads engage in a brass yoke bushing which is screwed into the top of the bonnet yoke. This provides a brass to brass non-corrosive contact, reducing friction and increasing the life of the threads.

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 of valves. 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. The gland flange is made of malleable iron. The gland is made of brass for brass trimmed and composition disc valves; for all-iron valves, it is steel, nickel plated.

Gland studs and nuts for all brass trimmed valves are made of bronze; for composition disc valves and all-iron valves, they are steel.

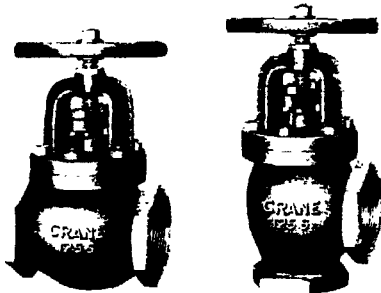
Stuffing box: Stuffing boxes are of liberal depth and are filled with high grade packing. A brass stem hole bushing, fitted in the bottom of the stuffing box, is furnished on all 125-Pound Brass Trimmed Valves. A steel stem hole bushing is furnished in 125-Pound All-Iron Valves.

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

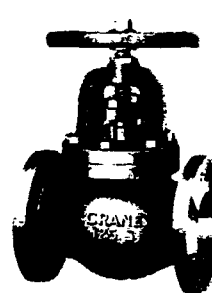


Globe, Screwed
No. 350
Brass Trimmed
No. 350 $\frac{1}{4}$
All-Iron



Angle, Screwed
No. 352
Brass Trimmed
No. 352 $\frac{1}{4}$
All-Iron

TEST PRESSURES
Shell Test
350 pounds hydrostatic
Seat Test
225 pounds hydrostatic



Globe, Flanged
No. 351
Brass Trimmed
No. 351 $\frac{1}{4}$
All-Iron



Angle, Flanged
No. 353
Brass Trimmed
No. 353 $\frac{1}{4}$
All-Iron

List Prices, Each

Size	Inches	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	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. 350 $\frac{1}{4}$ or No. 352 $\frac{1}{4}$, Screwed	36.00	38.00	44.50						
	No. 351 $\frac{1}{4}$ or No. 353 $\frac{1}{4}$, Flanged, F. & D.	40.00	43.00	51.00		76.50		126.00	210.00	

Rugged proportions: These are high quality valves designed to withstand severe service. They are ruggedly proportioned to provide liberal strength.

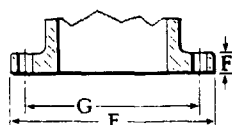
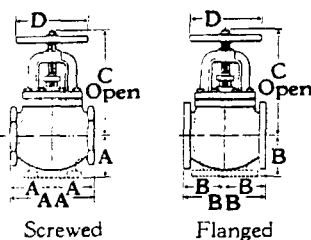
Brass trimmed valves: Brass trimmed valves are ideal for steam or water lines, or for fluids that do not corrode brass or iron. They have an iron body and bonnet, a brass screwed-in body seat ring, a brass stem hole bushing, and a Cast Manganese Bronze stem. A solid brass disc is furnished on sizes 6-inch 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	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6	8	10
AA	6 $\frac{1}{2}$	7	8	9	10	11 $\frac{1}{4}$	13		
A	3 $\frac{1}{4}$	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{5}{8}$	6 $\frac{1}{2}$		
BB	8	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11 $\frac{1}{2}$	13	14	19 $\frac{1}{2}$	24 $\frac{1}{2}$
B	4	4 $\frac{1}{4}$	4 $\frac{3}{4}$	5 $\frac{1}{4}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$	7	9 $\frac{3}{4}$	12 $\frac{1}{4}$
C	Globe	11 $\frac{1}{8}$	11 $\frac{1}{2}$	13 $\frac{1}{8}$	13 $\frac{3}{8}$	15 $\frac{1}{2}$	17 $\frac{3}{8}$	19 $\frac{1}{2}$	24 $\frac{3}{4}$
	Angle	11	11 $\frac{1}{2}$	12 $\frac{3}{4}$	13 $\frac{3}{4}$	14 $\frac{7}{8}$	17 $\frac{3}{8}$	19 $\frac{3}{8}$	22 $\frac{3}{4}$
D		8	8	9	9	10	10	12	16
Flange Dimensions	E	6	7	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9	10	11	13 $\frac{1}{2}$
	F	5 $\frac{5}{8}$	11 $\frac{1}{16}$	3 $\frac{3}{4}$	13 $\frac{1}{16}$	15 $\frac{1}{16}$	15 $\frac{1}{16}$	1	1 $\frac{1}{8}$
	G	4 $\frac{3}{4}$	5 $\frac{1}{2}$	6	7	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{3}{4}$
	No. of bolts	4	4	4	8	8	8	8	12
	Dia. of bolts	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	5 $\frac{5}{8}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$

Additional description... page 111

Valves for Marine Service... page 390

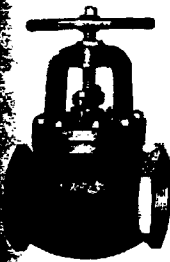
Templates for drilling... page 439

125-Pound Iron Body Globe and Angle Valves

No. 1 Cranite Composition Disc

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

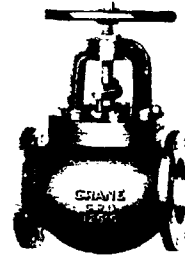
TEST PRESSURES
 Shell Test
 350 pounds hydrostatic
 Seat Test
 225 pounds hydrostatic



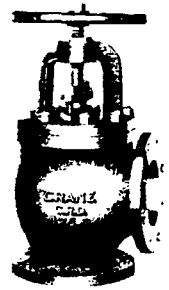
Globe, Screwed
No. 358



Angle, Screwed
No. 360 1/2



Globe, Flanged
No. 359



Angle, Flanged
No. 361 1/2

List Prices, Each

Size	Inches	2 1/2	3	3 1/2	4	5	6
No. 358, Globe, Screwed		46.00	53.50		79.00		
No. 359, Globe, Flanged, F. & D.		51.00	60.00	72.50	90.00	115.00	146.00
No. 360 1/2, Angle, Screwed		46.00	53.50		79.00		
No. 361 1/2, Angle, Flanged, F. & D.		51.00	60.00	72.50	90.00	115.00	146.00

Service recommendations: These valves are sturdy and well proportioned. They are similar in construction to the valves shown on the opposite page. Being equipped with a composition disc, they are suitable for a wide range of service.

Materials: The valves have an iron body and bonnet. The stem is made of Cast Manganese Bronze and the body seat ring is made of brass. The disc holder is made of iron.

Discs: All of 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 description, service recommendations, and dimensions of composition discs, see page 140.

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.

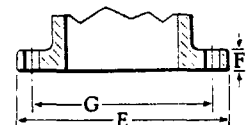
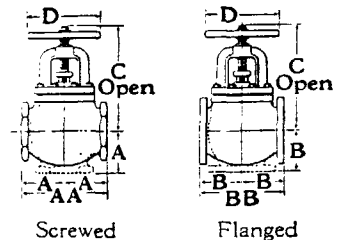
Face to face and center to face: The face to face and center to face dimensions of Flanged Globe and Angle Valves conform to the American Ferrous Flanged Valve Standard (B16.10-1939) for 125-Pound Cast Iron Globe and Angle Valves.

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 1/2	3	3 1/2	4	5	6
AA		8	8 1/4		10 1/2		
BA		4	4 1/8		5 1/4		
BB		8 1/2	9 1/2	10 1/2	11 1/2	13	14
BB		4 1/4	4 3/4	5 1/4	5 3/4	6 1/2	7
C		10 1/4	12 1/4	12 1/2	14 1/2	16 1/4	18 5/8
D		8	9	9	10	10	12
Flange Dimensions	E	7	7 1/2	8 1/2	9	10	11
	F	11 1/16	3/4	13 1/16	15 1/16	15 1/16	1
	G	5 1/2	6	7	7 1/2	8 1/2	9 1/2
	No. of bolts	4	4	8	8	8	8
	Dia. of bolts	5/8	5/8	5/8	5/8	3/4	3/4

Additional description . . . page 111
 Templates for drilling . . . page 439
 Composition discs . . . page 140



250-Pound Ferrosteel Globe and Angle Valves Brass Trimmed

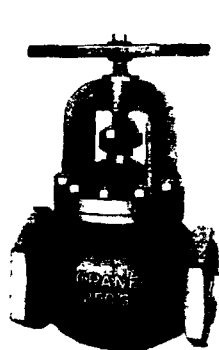
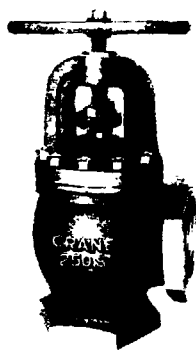
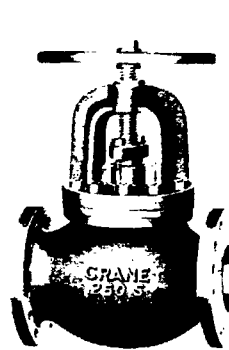
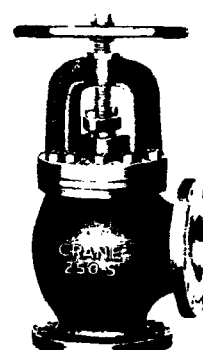
WORKING PRESSURES

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

Globe, Screwed
No. 20 EAngle, Screwed
No. 22 EGlobe, Flanged
No. 21 EAngle, Flanged
No. 23 E

List Prices, Each

Size	Inches	2	2½	3	3½	4	5	6	8
No. 20 E or No. 22 E, Screwed		63.50	78.00	89.00		123.00			
No. 21 E or No. 23 E, Flanged, F. & D.		68.00	86.00	102.00	117.00	139.00	182.00	230.00	376.00

Service recommendations: Crane 250-Pound Ferrosteel Globe and Angle Valves have very heavy metal sections and are unusually rugged. They are recommended for high pressure and severe service on steam, water, oil, or gas lines.

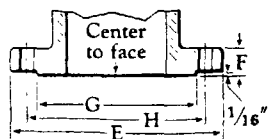
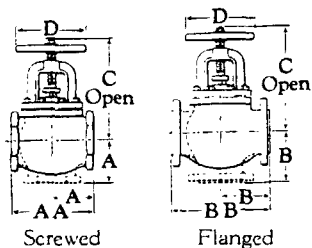
Materials: The body and bonnet are Ferrosteel. The disc is solid Crane Special Brass in sizes 3-inch and smaller, and iron with a large Crane Special Brass seating face rolled in on larger sizes. The body seat ring, too, is Crane Special Brass, a strong, wear-resisting leaded tin bronze. The stem is Cast Manganese Bronze.

Seat: Sizes 6-inch and smaller have a 45° seat; the 8-inch size has a flat seat.

Face to face and center to face: The face to face and center to face dimensions of the flanged globe and angle valves conform to the American Ferrous Flanged Valve Standard (B 16.10-1939).

Flange dimensions and facing: The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 250 (B16.10-1939). Flanges have a 1/16-inch raised face; the raised face is finished with concentric grooves, approximately 10 grooves per inch, known as a "serrated" finish.

Drilling: List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 250. No deduction is made when valves are ordered faced only.



Dimensions, in Inches

Size	2	2½	3	3½	4	5	6	8
AA	9½	10¾	11¾		13			
A	4¾	5¾	5¾		6½			
BB	10½	11½	12½	13¼	14	15¾	17½	21
B	5¼	5¾	6¼	6¾	7	7¾	8¾	10½
C								
Globe	13¾	14¾	16¼	16¾	18½	20¾	23¼	28½
Angle	13	13¾	15¾	16¾	17¼	19¾	21¾	26
D	9	10	10	10	12	14	16	20
E	6½	7½	8¼	9	10	11	12½	15
F	7/8	1	1½	1¾	1¾	1¾	1¾	1¾
G	4¾	4¾	5¼	5¾	6¼	6¾	7¼	8¾
H	5	5¾	6¾	7¼	7¾	9¼	10¾	13
No. of bolts	8	8	8	8	8	8	12	12
Dia. of bolts	5/8	¾	¾	¾	¾	¾	¾	¾

Additional description page 111

Templates for drilling page 40

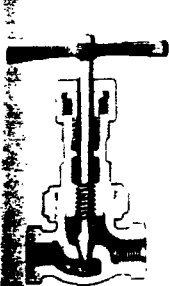
Heavy Duty All-Iron Globe and Angle Valves

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

Union Bonnet



Globe
No. 1504 1/2
Screwed
1/4 to 1-inch



Angle
No. 1505 1/2
Screwed
1/4 to 1-inch

Bolted Bonnet



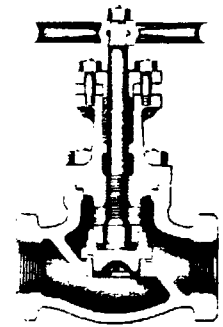
Globe
No. 1501, Flanged
Tongue and Groove
1/2 to 4-inch



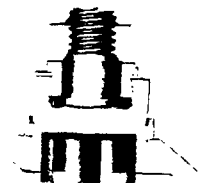
Globe
No. 1504
Screwed
1/4 to 3-inch



Angle
No. 1505
Screwed
1/4 to 3-inch



Cross Section
No. 1504, Globe
With Lead Faced Disc



Section of Steel Disc
and Seat in Bolted
Bonnet Valves

For list prices and dimensions, see page 395.

Service recommendations: These valves are ideally fitted 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 high margin of safety against accidents.

Union bonnet valves: Union bonnet valves have a big type disc that is integral with the stem. They are fitted with a Cranite gasket between the body and bonnet, retained on both the inside and outside. The valves can be reground without removing the body from the line. The stuffing box is extra deep.

Bolted bonnet valves: The bolted bonnet valves are regularly furnished with a Special Lead Face rolled to a machined dovetail in the disc. The face seats on 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 specify "with Steel Disc and Seat" when this 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 1 1/2-inch and smaller have a heavy, threaded packing nut, while the larger sizes have a one-piece bolted gland. 1/4, 3/8, and 1/2-inch valves have a one-piece stem and disc or disc holder.

Materials: All of these valves have a Ferrosteeel 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.

Iron Body Butterfly Valves



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 flanged valves, the dimensions and drilling of the end flanges conform to the American Cast Iron Flange Standard, Class 125 (Br6.1-1948). The flanges are plain faced with a smooth finish. List prices of flanged valves include facing and drilling to this Standard; no deduction is made when valves are ordered faced only.

List Prices and Dimensions

Size	Inches	2	2 1/2	3	4	5	6	8	10	12
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	164.00	268.00	403.00
End to end or face to face	Inches	4 1/4	4 3/4	5 1/4	6	6 3/4	7 1/2	9 1/4	10 3/4	12 1/2
Diameter of stem	Inches	1/2	1/2	9/16	5/8	5/8	3/4	1 1/16	1 1/4	1 3/8
Center to top of stem	Inches	6 1/8	7	7 7/8	9 1/8	10 1/4	11 1/2	12 1/2	12 3/4	15

No. 380, Screwed
No. 381, Flanged

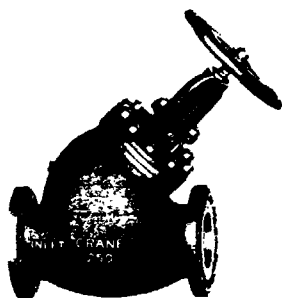
1/2-inch sizes
with bolted gland.
(Not illustrated)

For Brass Butterfly
Valves, see page 57.

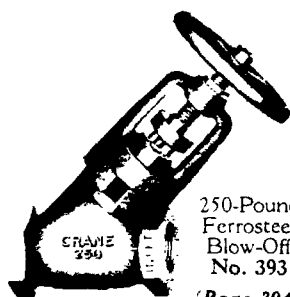
Other Crane Iron Body Valves



Iron Body Back Pressure
No. 385 (Page 302)



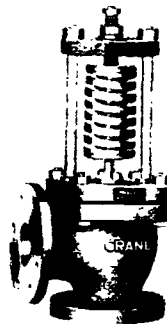
250-Pound Ferrosteel Stop-Check
No. 28 E (Page 296)



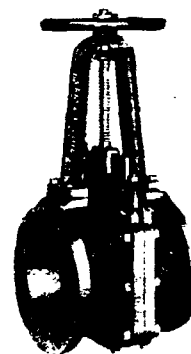
250-Pound
Ferrosteel
Blow-Off
No. 393
(Page 304)

The commonly used types of Crane Iron Body Valves are shown on the preceding and following pages:

- Wedge Gate pages 73 to 86
- Double Disc Gate pages 87 to 103
- Globe and Angle pages 105 to 115
- Check and Foot pages 117 to 124



Iron Body Relief
No. 1113 (Page 322)



Iron Body Pulp Stock
No. 1427 (Page 299)

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.

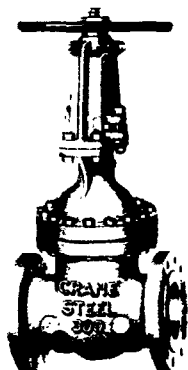
- Ferrosteel Stop-Check Valves.....page 296
- Ferrosteel Blow-Off Valves.....page 304
- Ferrosteel Valves for Ammonia.....pages 395 and 396

- Iron Body Back Pressure Valves.....pages 302 and 303
- Iron Body Float Valves.....pages 305 and 307
- Iron Body Pulp Stock Valves.....page 299
- Iron Body Safety Valves.....pages 312 to 315
- Iron Body Relief Valves.....pages 321, 322, and 324
- Iron Body Valves for Marine Service.....pages 389 and 390

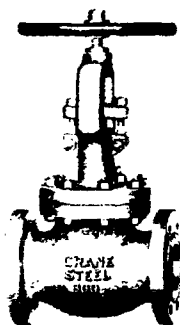
- Alloy and Ni-Resist Iron Gate Valves..... pages 374 and 375

Crane Steel Valves

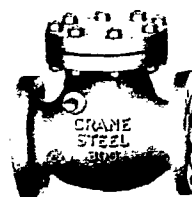
For severe services and for pressures and temperatures that are beyond the scope of brass or iron valves, Crane manufactures a complete line of forged or cast steel valves. Crane Steel Valves are of outstanding quality; they embody many worthwhile refinements in design, materials and workmanship which contribute to longer life, more efficient operation, and more satisfactory service.



300-Pound
Cast Steel
Wedge Gate
No. 33 X
(Page 229)



300-Pound
Cast Steel
Globe
No. 151 X
(Page 244)



300-Pound
Cast Steel
Swing Check
No. 159 X
(Page 253)

- Steel Pressure-Seal Bonnet Valves . . . pages 209 to 219
- Steel Gate Valves.....pages 221 to 232
- Steel Globe and Angle Valvespages 233 to 246
- Steel Check Valves.....pages 247 to 254

Iron Body Check and Foot Valves

Lift Check Valves

125-Pound.....	page 119
150-Pound.....	page 118
Heavy Duty All-Iron.....	page 119

Swing Check Valves

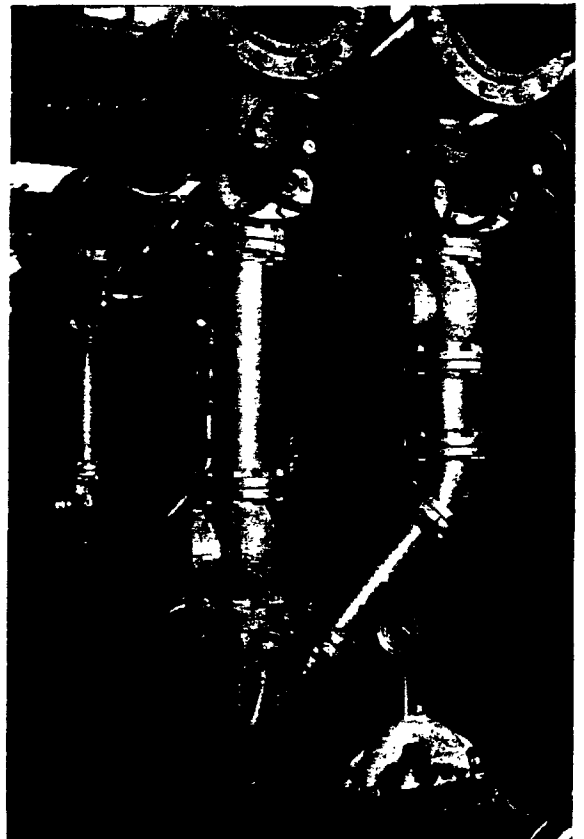
125-Pound.....	pages 120 and 121
Clearway Type, Underwriters' Pattern.....	page 123
250-Pound.....	page 124
1000-Pound W.O.G., Malleable Iron.....	page 118
With Outside Lever and Weight.....	page 120

Foot Valves.....	page 122
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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 294 to 296 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.

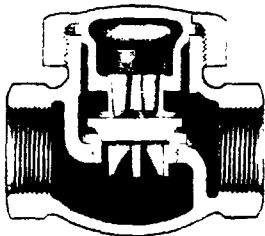
The Ferrosteeel Check Valves for ammonia, shown on page 119 and page 396, also are frequently used on water and air lines under pulsating service.



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

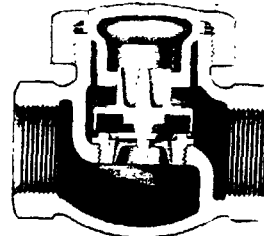


Cross Section
No. 366 1/2
Crane Nickel Alloy Disc
Crane Nickel Alloy Seat

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



Horizontal Lift, Screwed
No. 366 1/2, Nickel Alloy Disc
No. 366 1/2 C, Composition Disc



Cross Section
No. 366 1/2 C
Composition Disc
Crane Nickel Alloy Seat

List Prices and Dimensions

Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 366 1/2, with Crane Nickel Alloy Disc	Each	7.80	8.00	8.60	9.40	10.50	12.00	14.50	19.00
No. 366 1/2 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	2 3/8	2 5/8	3	3 1/2	4 1/8	4 5/8	5 1/4	6 3/8
Center to top	Inches	1 7/16	1 9/16	1 3/4	2 1/16	2 5/16	2 11/16	3 3/16	3 5/8

For list prices of Composition Discs for No. 366 1/2 C Valves, see page 140.

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.

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.

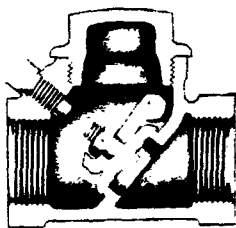
The No. 366 1/2 Valves have a Nickel Alloy disc and body seat ring. Crane Nickel Alloy is hard and offers excellent resistance to wear.

The No. 366 1/2 C Valves have a brass disc holder and a Nickel Alloy body seat ring.

Unless otherwise ordered, the No. 366 1/2 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 140.

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
Air tested



No. 346 1/2, Screwed

List Prices and Dimensions

Size	Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 346 1/2, Screwed	Each	12.50	13.00	13.70	14.70	16.00	18.00	21.00
End to end	Inches	2 3/4	2 3/4	3 1/16	3 5/8	4 1/8	4 13/16	5 13/16
Center to top of cap	Inches	1 7/8	1 7/8	2 1/8	2 1/2	2 7/8	3 3/8	3 5/8

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

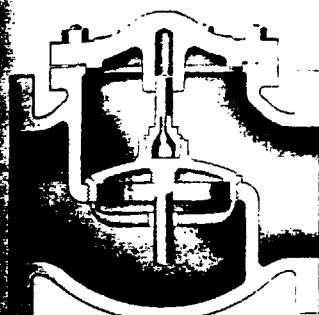
WORKING PRESSURES

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

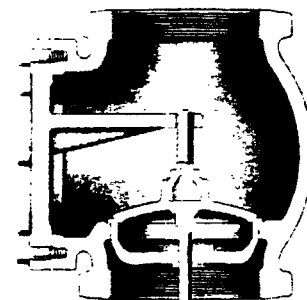
TEST PRESSURES

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. 367, Horizontal



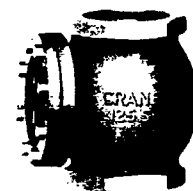
Cross Section
No. 368, Vertical

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

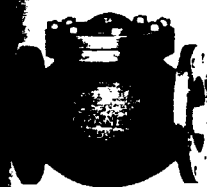


No. 368, Vertical
Screwed

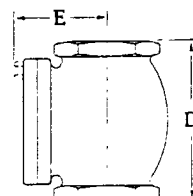
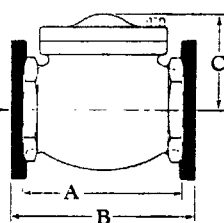
Materials and construction: These are rugged, well proportioned horizontal and vertical lift check valves. Their solid brass disc is accurately guided both at the top and bottom, assuring square seating. The body seat ring is brass and is screwed into the body.

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.

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.



No. 367, Horizontal
Flanged



Templates for drilling ... page 439
Thread engagement ... page 474

Heavy Duty All-Iron Lift Check Valves

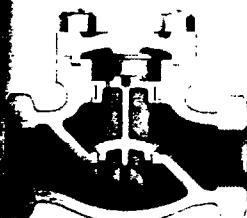
WORKING PRESSURES

500 pounds oil (non-shock), gas, or air, 100° F.
300 pounds oil (non-shock), gas, or air, 300° F.

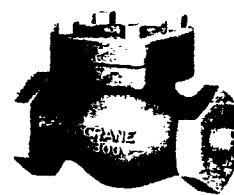
Tested 300 pounds air-under-water

Sizes	Inches	½	¾	1	1¼	1½	2
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For prices and dimensions, see page 396.



Cross
Section



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.

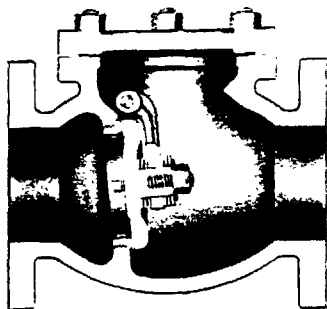
Construction: The body has heavy metal sections, liberally reinforced at points of greatest stress. The cap is bolted on, using four steel stud-bolts. The cap joint is tongue and groove, assuring positive retention of the gasket, which is made from ¼-inch

thick Granite sheet packing. The disc is guided at both ends; the upper end of the disc is piston shaped and fits snugly in the body. The cushioning effect secured by this dashpot construction makes the valve well suited for lines subject to pulsation, as on air compressors or reciprocating type pumps. Each disc is grooved for a piston ring, and 1½ and 2-inch discs are regularly equipped with a piston ring.

Materials: The body and cap are made of Ferro-steel. 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.

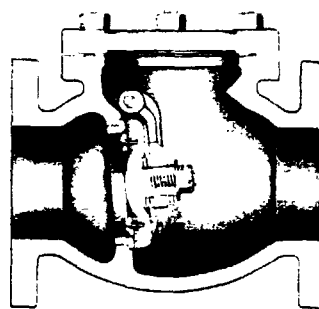
125-Pound Iron Body Swing Check Valves Brass Trimmed or All-Iron

DISC-HINGE CONNECTION



Cross Section
Sizes 8-inch and smaller
No. 373, Flanged
Brass Trimmed

Sizes 8-inch and smaller (patented) are a new design, having 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 and yet permits the disc to make true, full contact with the seat. At the same time, the springs serve to absorb the shock of seating when the valve closes. See the cross sections shown here.



Cross Section
Sizes 8-inch and smaller
With Leather
Faced Disc

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.

Brass trimmed valves: Brass trimmed valves are recommended for steam or water, or for fluids that do not corrode brass.

Unless otherwise ordered, Nos. 372, 373, and 374½ brass trimmed valves are furnished with a brass faced disc. 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.

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.

Leather 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. The table of list prices shown on the opposite page includes the extra charge for leather faced discs.

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 change-over to outside lever and weight construction.

Hub end valves: The hubs on hub end valves accommodate Class "A", "B", "C", or "D" cast iron pipe.

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.

Flanged valves: 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.

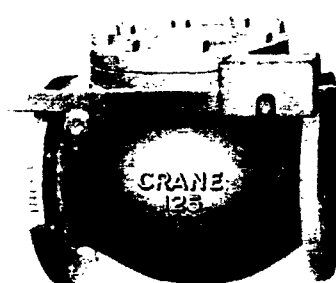
The face to face dimensions of flanged valves 6-inch and smaller also conform to the American Ferrous Flanged Valve Standard (B16.10-1939), for 125-Pound Cast Iron Swing Check Valves. Sizes 8-inch and larger are not included in this Standard.

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, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948. Sizes 3½, 5, and 8-inch and larger are not included in this Standard.

Swing Check Valves With Outside Lever and Weight

Any Crane Iron Body, Ferrosteeel, or Cast Steel Swing Check Valve can be furnished with an outside lever and weight as illustrated at the right. The weight is mounted on the lever either in a position that will assist the disc in closing, thereby making the valve extremely sensitive to a reversal of flow, or in a position where it will balance the disc, causing the valve to open under a minimum of pressure. Orders must specify which type is wanted.

Unless otherwise ordered, the lever and weight are placed on the side that is on the right when looking into the valve inlet.

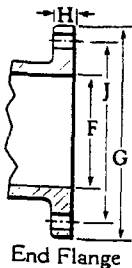
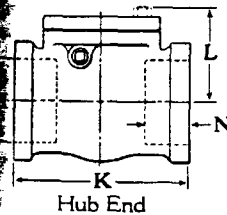
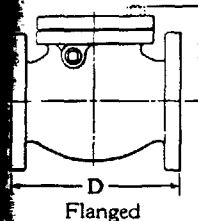
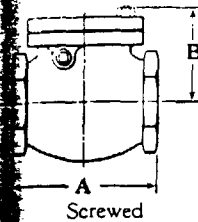


Prices on application

125-Pound Iron Body Swing Check Valves Brass Trimmed or All-Iron

These valves may be used either in a horizontal position or in a vertical position for upward flow.

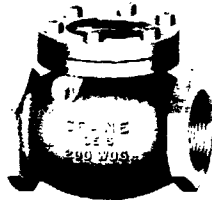
Flanged Valves
The list prices of flanged valves include painting and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered lined only.



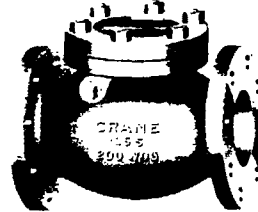
Templates for drilling,
see page 439.

Normal
thread engagement,
see page 474.

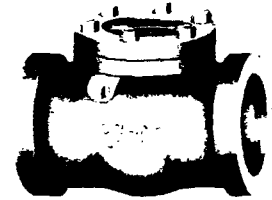
Size of valve	Working Pressures			Hydrostatic Test Pressures	
	Screwed or flanged valves		Hub end valves	Screwed, flanged, or hub-end valves	
	Saturated steam	Cold water, oil, or gas, non-shock	Cold water or gas non-shock	Shell test	Seat test
2 to 12-inch	125 pounds	200 pounds	200 pounds	350 pounds	225 pounds
14 and 16-inch	125 pounds	150 pounds		250 pounds	175 pounds
18 to 24-inch		150 pounds		250 pounds	175 pounds



Screwed
No. 372, Brass Trimmed
No. 372½, All-Iron



Flanged
No. 373, Brass Trimmed
No. 373½, All-Iron



Hub Ends
No. 374¼, Brass Trimmed

List Prices

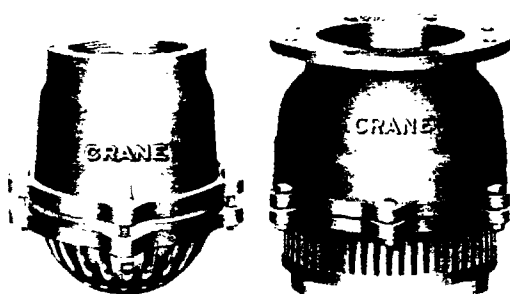
Size Inches	Brass Trimmed Valves				All-Iron Valves	
	No. 372 Screwed Each	No. 373 Flanged F. & D. Each	No. 374¼ Hub Ends Each	Extra for Leather Faced Disc Per Valve	No. 372½ Screwed Each	No. 373½ Flanged F. & D. Each
2	18.00	21.00		2.60	18.00	21.00
2½	19.50	24.00		3.70	19.50	24.00
3	24.00	30.00		4.10	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		
12		357.00		32.00		
14		638.00				
16		890.00				
18		1185.00				
20		1380.00				
24		1975.00				

Dimensions, in Inches

Size	Screwed Valves		Flanged Valves								Hub End Valves			
	A	B	D	E	F	G	H	J	Bolts No. Dia.		K	L	M	N
2	6½	4¼	8	4¼	2	6	⅝	4¾	4	⅝				
2½	7	4⅜	8½	4⅜	2½	7	11/16	5½	4	⅝				
3	8	5⅛	9½	5⅛	3	7½	¾	6	4	⅝				
3½	9	5⅜	10½	5⅜	3½	8½	13/16	7	8	⅝				
4	10	6⅜	11½	6⅜	4¼	9	15/16	7½	8	⅝	12	6⅜	5⅝	3
5	11¼	7⅜	13	7⅜	5¼	10	15/16	8½	8	¾				
6	12½	7½	14	7½	6⅜	11	1	9½	8	¾	14	7½	7⅝	3
8			19½	10⅜	8	13½	1⅝	11¾	8	¾	19½	10⅜	10	3½
10			24½	12⅜	10	16	1⅝	14¼	12	7/8				
12			27½	13¾	12	19	1¾	17	12	7/8				
14			31	16⅝	14	21	1⅝	18¾	12	1				
16			36	17⅝	16	23½	1⅝	21¼	16	1				
18			36	17½	18	25	19/16	22¾	16	1⅝				
20			40	20	20	27½	11/16	25	20	1⅝				
24			48	21	24	32	1⅝	29½	20	1¾				

Iron Body Foot Valves

Leather or Brass Disc



Screwed
No. 394, Leather Disc
No. 394½, Brass Disc

Flanged
No. 395, Leather Disc
No. 395½, Brass Disc

List prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125 on sizes 3-inch and smaller, and to the 25-Pound American Tentative Cast Iron Flange Standard on sizes 4-inch and larger. No deduction is made if valves are ordered faced only.

Brass Foot Valves, see page 46.

Templates for drilling, see page 439.

Service recommendations: These valves are recommended for suction lines on shallow well pumps where the pressure does not exceed 34-foot head (approximately 15 pounds), but they will safely stand 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; larger sizes have a flat bottom strainer as illustrated on the flanged valve.

Materials and construction:

The leather disc valves have a cast iron body, strainer, and seat. Sizes 6-inch and smaller have one disc; larger sizes have two discs.

The 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.

Flange dimensions and facing: The dimensions and drilling of the end flange on valves 4-inch and larger conform to the 25-Pound American Tentative

List Prices and Dimensions

Screwed Valves

Size Inches	List Price, Each		Largest Outside Diameter of Body Inches
	No. 394 Leather Disc	No. 394½ Brass Disc	
¾	2.30	2.50	3¾
1	2.40	2.70	3¾
1¼	2.70	3.00	4½
1½	3.40	3.80	4¾
2	4.60	5.10	5½
2½	6.00	6.50	6¼
3	8.00	8.80	7
3½	10.70	11.80	8¾
4	13.50	15.00	8¾
5	19.00	21.00	10½
6	24.00	27.50	11¾
8	55.00	124.00	15½

Flanged Valves, F. & D.

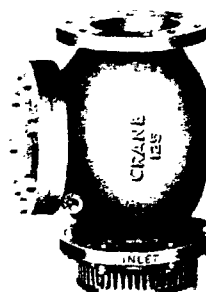
Size Inches	List Price, Each		Largest Outside Diameter of Body		Flange Dimensions in Inches				
	No. 395 Leather Disc	No. 395½ Brass Disc	No. 395 Inches	No. 395½ Inches	Diam- eter	Thick- ness	Bolt Circle	No. of Bolts	Dia. of Bolts
2	9.40		6		6	½	4¾	4	⅝
2½	10.80		7		7	9/16	5½	4	⅝
3	14.00	28.00	7½	7½	7½	⅝	6	4	⅝
4	19.60	36.50	9	9	9	¾	7½	8	⅝
5	26.00	47.00	10½	10½	10	¾	8½	8	⅝
6	32.00	62.00	11¾	11¾	11	¾	9½	8	⅝
8	65.00	142.00	15½	15½	13½	¾	11¾	8	⅝
10	103.00	228.00	18	20¼	16	⅞	14¼	12	⅝
12	152.00	322.00	20¼	24½	19	1	17	12	⅝

Cast Iron Flange Standard (B16b2-1931). On smaller sizes, the diameter and drilling of the end flange conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flange is plain faced, with a smooth finish.

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.

High Pressure Iron Body Foot Valves

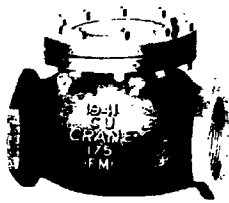
When foot valves are wanted for high pressures or for severe service, Crane No. 373 Flanged 125-Pound Iron Body Swing Check Valves having a strainer bolted on the inlet end, as illustrated at the right, are recommended. These are furnished with either a leather faced or a solid brass or brass faced disc.



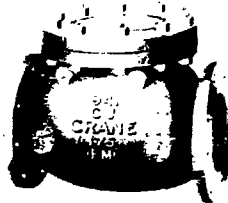
Prices on application

Iron Body Clearway Swing Check Valves

Underwriters' Pattern



No. 374 1/2
Screwed

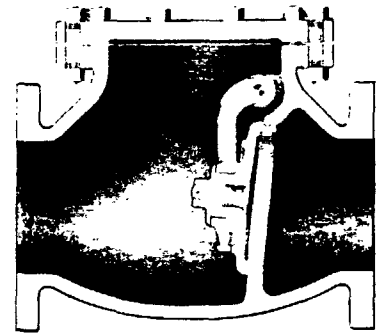


No. 375
Flanged

For use in a horizontal position, or
in a vertical position for upward flow.

WORKING PRESSURE
175 pounds cold water,
non-shock

TEST PRESSURES
Shell Test
350 pounds hydrostatic
Seat Test
200 pounds hydrostatic



Cross Section
No. 375

List Prices

Size	Inches	2 1/2	3	4	5	6	8	10	12
No. 374 1/2, 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

Underwriters' requirements: Designed for fire protection service, these valves conform to the Underwriters' Specifications known as "The National Standard", and they are listed as approved and inspected by the Associated Factory Mutual Fire Insurance Companies, Boston, and the Underwriters' Laboratories, Chicago. They are marked "FM" and "CU". The valves are not recommended for use on "interconnection service".

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-hub bushing.

All sizes have a brass hinge pin.

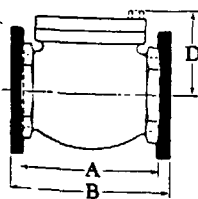
Leather disc: An extra charge is made for leather faced disc valves. See the list prices shown in the table above.

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.

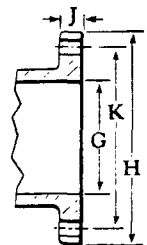
Drilling: The list prices of flanged valves include facing and drilling to the American Cast Iron Flange Standard, Class 125. No deduction is made when valves are ordered faced only.

Dimensions, in Inches

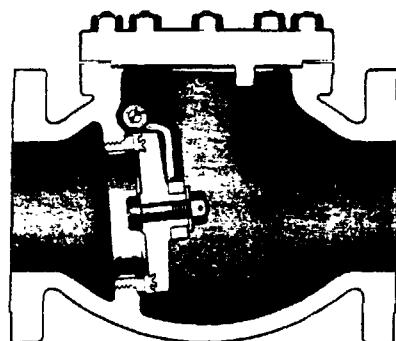


Screwed or Flanged

Size	2 1/2	3	4	5	6	8	10	12
A	10	11	13					
B	10	11	13	15	16	18	22	26
D	6 1/4	6 3/4	7 1/2	8 1/2	9 1/4	11 1/4	13 1/2	15 1/4
Flange Dimensions	G	2 1/2	3	4	5	6	8	10
	H	7	7 1/2	9	10	11	13 1/2	16
	J	1 1/16	3/4	15/16	15/16	1	1 1/8	1 3/16
	K	5 1/2	6	7 1/2	8 1/2	9 1/2	11 3/4	14 1/4
	No. of bolts	4	4	8	8	8	8	12
	Dia. of bolts	5/8	5/8	5/8	3/4	3/4	3/4	7/8



250-Pound Ferrosteel Swing Check Valves Brass Trimmed



Cross Section
No. 39 E

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

*These valves also
may be used in a
vertical position
for upward flow.*



No. 38 E, Screwed



No. 39 E, Flanged

List Prices

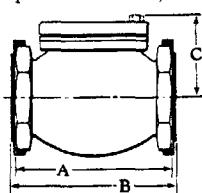
Size	Inches	2	2½	3	3½	4	5	6	8	10	12
No. 38 E, Screwed	Each	48.50	61.50	76.50		100.00					
No. 39 E, Flanged, F. & D.	Each	53.50	69.00	86.00	102.00	112.00	145.00	192.00	334.00	572.00	785.00

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 made of Crane Ferrosteel. The body seat ring is made of Crane Special Brass; it is screwed into the body. Sizes 3½-inch and smaller have a solid Crane Special Brass disc; larger sizes have an iron disc with a Crane Special Brass seating face. Crane Special Brass is a strong, hard, leaded tin bronze.



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 (B1bb-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.

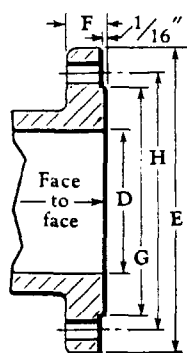
Face to face dimensions: The face to face dimensions of the flanged valves conform to the American Ferrous Flanged Valve Standard (B16.10-1939), for 250-Pound Cast Iron Flanged Swing Check Valves.

API Standard: The flanged valves conform to the American Petroleum Institute (API) Standard for Valves for Pipe Line Service, No. 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948. 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
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	1⅜	1½	1⅝	1⅞	2		
G	4¾	4⅞	5⅛	5⅝	6⅞	8⅞	9⅞	11⅞	14⅞	16⅞
H	5	5⅞	6⅞	7¼	7⅞	9¼	10⅞	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 440

Normal thread engagement page 474

Valve Accessories and Parts

Fluid-Motor Operated Valves.....	page 129
Cylinder Operated Valves.....	pages 130 and 131
Motor Operated Valves.....	pages 132 to 135
Floor Stands.....	pages 126 and 127
Extension Stems.....	page 127
Indicator Posts.....	page 128
Wheels for Valves.....	page 136
Handles for Valves.....	page 137
Size of Hole in Wheels and Handles.....	page 137
Chain Wheels.....	page 138
Adjustable Sprocket Rim with Chain Guide.....	page 139
Keys for Lock Shield Valves.....	page 139
Tee Wrenches.....	page 139
Wrenches for removing Body Seat Rings.....	page 139
Composition Discs.....	page 140

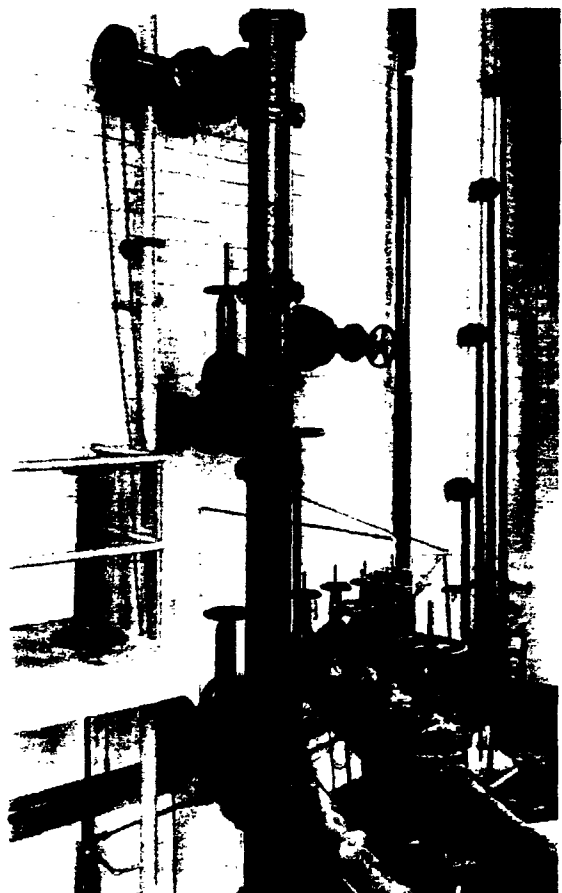
For greater convenience, various valve accessories and parts, many of which are used with nearly all Crane Valves, have been grouped together on pages 125 to 140, as indexed above.

Crane regularly supplies other accessories in addition to those listed above. For complete data on these accessories, refer to the following pages:

Flanges, Gearing, Cleanouts, and Indicators	
For Iron Body Wedge Gate Valves.....	pages 84 and 85
For Iron Body Double Disc Gate Valves.....	page 101
Flanges for Steel Gate Valves.....	page 231
Gearing for Steel Gate Valves.....	page 232
Gearing for Steel Globe and Angle Valves.....	page 246
Valve Parts for A.A.R. Valves.....	page 238

Replacement Parts for Valves

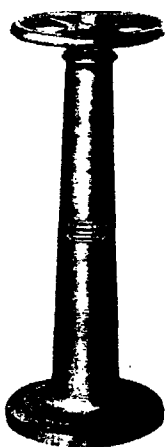
Replacement parts, such as stems, bonnets, discs, packing nuts, etc., for any Crane Valve can be furnished upon receipt of an order. When ordering parts, specify the catalog number and the size of the valve, and give the name of the part required. In addition, since the valve must be clearly identified 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.

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 $2\frac{7}{8}$ -inch diameter or less. Regular Floor Stands with indicator are furnished for use with stems $2\frac{1}{8}$ -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

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

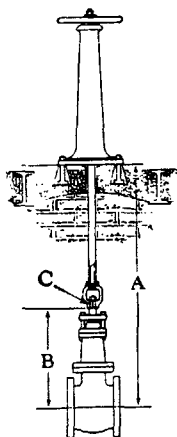
For Crane Valves, specify:

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:

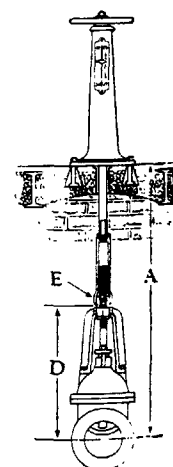
14. Information requested in above items 4 to 10, inclusive, and 12 and 13
15. If non-rising stem gate valve, or globe or angle valve, include:
 - (a) Dimension B, center of valve to bottom of square on stem
 - (b) Dimension C, dimensions of square on stem—in detail
16. If outside screw and yoke gate 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.

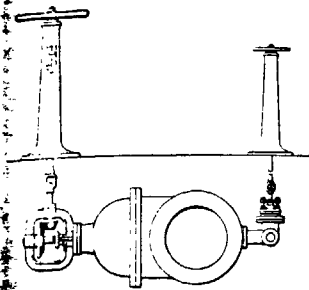


Outside Screw and Yoke Gate Valve

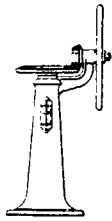
Unusually long extension stems must be properly supported.

Floor Stands

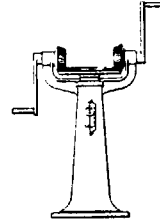
Typical Application and Special Designs



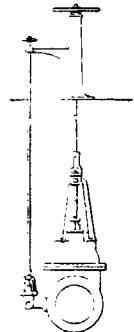
Application E
Floor Stands Applied to
Gate Valve with By-Pass
in Horizontal Position



Application F
Floor Stand with
Single Bevel Gearing
and Handwheel



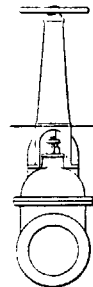
Application G
Floor Stand with
Double Bevel Gearing
and Crank Handles



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



Application J
Wide Bottom Floor Stand
Used on 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.

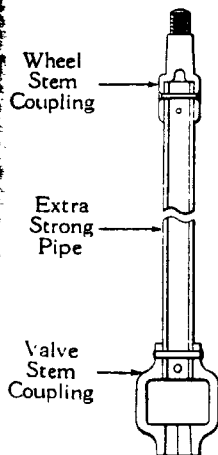
Extension Stems

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 hand-wheel, but in many installations the extension stem only is used.

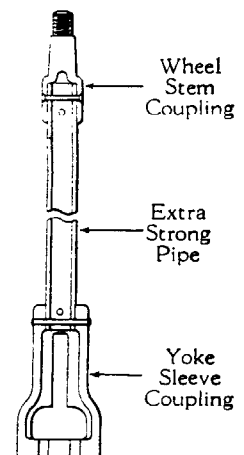
Extension stems for non-rising stem gate valves and for all globe and angle valves are furnished with a wheel stem coupling suitable for a square hole hand-wheel and a valve stem coupling to fit the square on the valve stem. Those for outside screw and yoke gate valves have the same wheel stem coupling 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 Non-Rising Stem
Gate Valves, Globe or
Angle Valves



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 126.

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

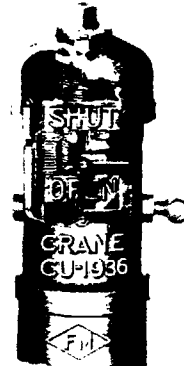


Enlarged
Sectional View
of Head
No. 520 Post



No. 520
Applied to
No. 462
Gate Valve

Underwriters' Pattern



Enlarged
Sectional View
of Head
No. 510 Post



No. 510
Applied to
No. 462
Gate Valve

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."

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 33 1/4

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 sizes 2 to 14-inch inclusive. It is generally used with No. 462 Gate Valves page 79.

The Underwriters' pattern is used with No. 462 1/2 Underwriters' Pattern Gate Valves shown on page 80. It conforms to the Underwriters' specification known as "The National Standard", and is listed as approved and inspected by the Associated Factory Mutual Fire Insurance Companies, Boston, and the Underwriters' Laboratories, Chicago. 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 1 1/4 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 1/2-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 Asso-

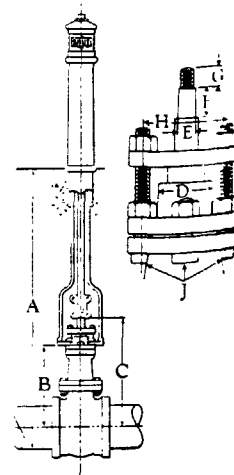
ciation) flange for attachment to the valve; the operating rod has a socket for the valve stem.

When No. 462 Gate Valves are ordered for use with indicator post, they are furnished with an indicator post flange cast integral with 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. 462 1/2 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 give 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.



Fluid-Motor Operated Valves

The need for a universal valve operating unit in the lower price range has been fulfilled through the development of the new Crane Fluid-Motor Operators.

Application: Their application for the present is limited to outside screw and yoke iron body gate valves in the following pressure classes, types, and sizes

25-Pound wedge disc	12-inch to 30-inch
125-Pound wedge disc	5-inch to 20-inch
25-Pound double disc	10-inch to 30-inch
100-Pound W.O.G. double disc	6-inch to 24-inch
A.W.W.A. double disc	4-inch to 20-inch
Pulp Stock Valves	8-inch to 20-inch

Design: The unit is extremely simple in design although of rugged construction and efficient in operation. It consists of a fluid-motor, a worm and worm gear mechanism, and a special valve yoke.

Motor: The motor is of the radial type and has five diaphragm-sealed chambers radially placed around the motor main shaft in such a way that the diaphragm expansion is timed with, and acts directly upon, the main shaft through anti-friction bearings.

Operating pressure is supplied to the chambers by a special, balanced, floating-plate-type distributing valve, driven by the motor main shaft. A double action feature of the distributor allows for both the intake and exhaust of the chambers.

Working parts of the motor are adjusted in manufacture to provide greater torque for opening than for closing, thereby assuring proper valve action.

No limit or torque switches are required; the motor stops automatically when the valve operation is completed.

The motor is suitable for operation with water or oil at pressures from 40 to 300 psi, or with air at pressures from 40 to 100 psi. There are limitations as to the sizes of individual types of valves that must be considered in recommending the Crane Fluid-Motor Operator for the maximum operating pressures available. Line pressure must also be considered. Further information may be had upon request.

Worm and worm gear mechanism: The worm and worm gear mechanism, enclosed in a well constructed housing, is roller bearing mounted and runs on oil. A hammerblow device between the worm gear and stem nut allows the motor to gain sufficient speed before impact.

Auxiliary hand operation: A handwheel, which is the worm shaft, is hung from the unit case by means of a chain and slip-ring connection, for use in the event of failure in the power supply.

Identification of units: Units are identified by the following: W-100-1, W-200-1, W-300-1, and A-100-1. The prefix letters "W" and "A" indicate the operating medium: "W" for water or oil and "A" for air. The numerals "100", "200", and "300" indicate the motor operating pressures in pounds, and the suffix numeral "1" indicates the motor number.

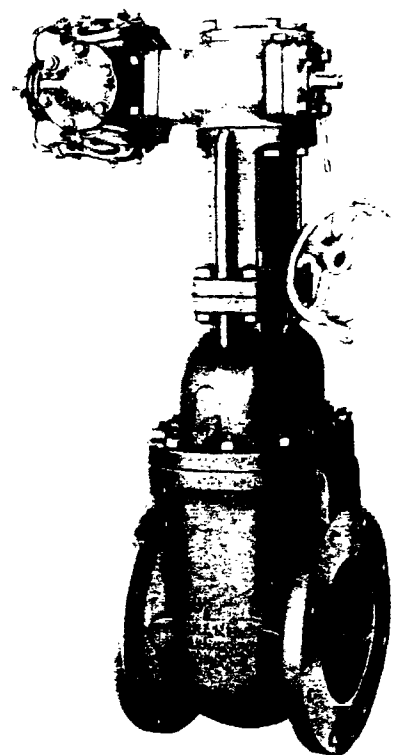
Controls: The following controls can be furnished if desired: for manual adjacent operation—Crane No. 109 Four-Way Cock (see page 71); for manual remote control—Cla-Val No. 110 Forway valve with feather-

touch pilot (see page 306); for electrical remote control—Cla-Val No. 110 Forway Valve with solenoid actuated pilot control (see page 307). The four-way cock or Forway Valve is mounted adjacent to the unit; the pilot control is mounted at a suitable operating center or control board. The horizontal distance at which the pilot is installed from the valve is relatively unimportant, but if liquid is used to control the Forway Valve, the vertical distance must be considered in relation to efficient valve operation.

Converting Crane valves in service: Crane manually operated valves of the types and sizes shown above, and now in service, can easily be converted to fluid-motor operation by removing the handwheel, yoke, and yoke sleeve and substituting a Crane Fluid-Motor Operator complete with a specially designed yoke. Information concerning the proper unit for operating valves now in service, will be furnished on request.

Information Required on Orders or Inquiries:

1. Size and catalog number of valve.
2. Service: steam, water, gas, etc.
3. Working pressure of valve and maximum differential pressure to open against.
4. Motor operating pressure available.
5. Motor operating medium: water, oil, or air.
6. If a conversion unit for Crane valve: complete valve markings, including year of manufacture, and approximate date of purchase.



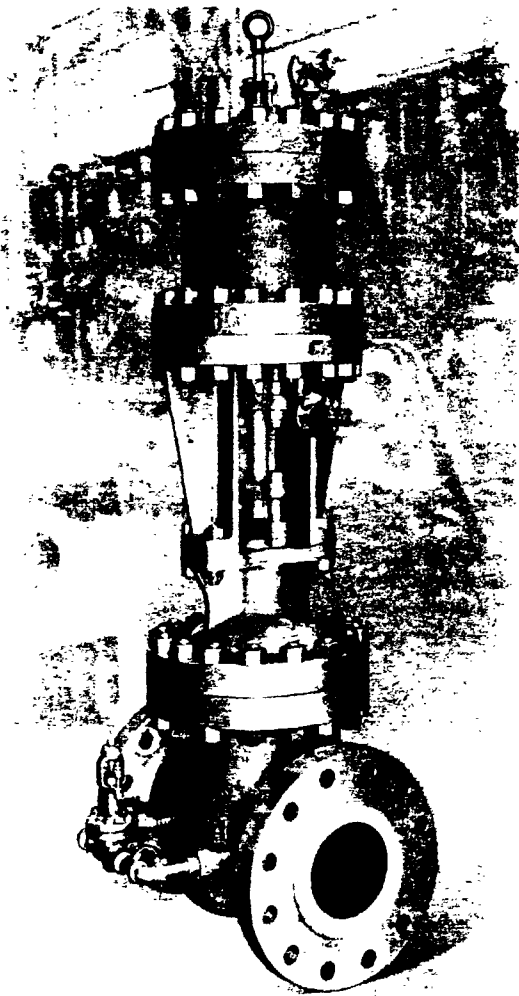
Crane 8-inch No. 465 1/2 Wedge Gate Valve Equipped With Fluid-Motor Operator.

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 at 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 opening, 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, air operated four-way valves for adjacent or remote control may be furnished at an extra charge.

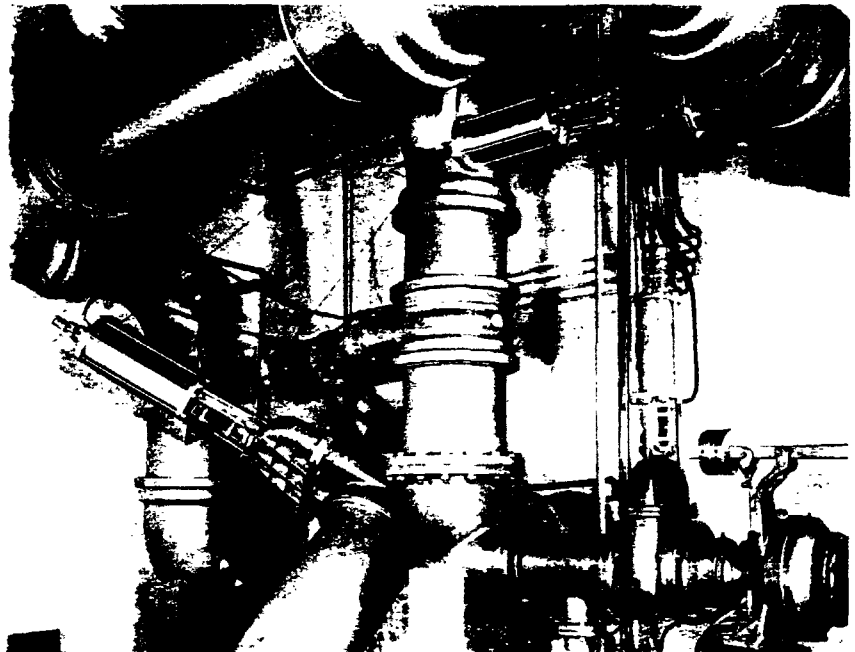
Necessaries: Clean air, water, or oil are requisites for proper cylinder operation.

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.

Prices and complete description furnished on application.

Information required on inquiries and orders

Catalog number and size of valves wanted.

With or without by-pass. If by-pass is wanted, state the location of the by-pass in relation to the valve.

Are the valves to be installed with the stems horizontal or vertical?

Designate the service on which valve is to be used: steam, water, oil, gas, etc.

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.

Motor Operated Valves

Electric Motor Units—Air or Gas Motor Units

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.

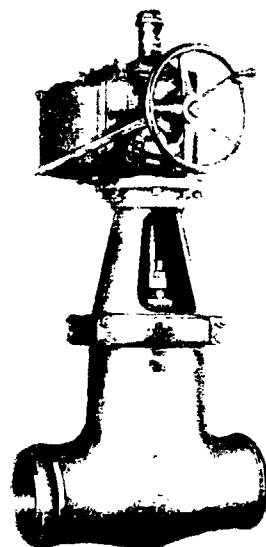
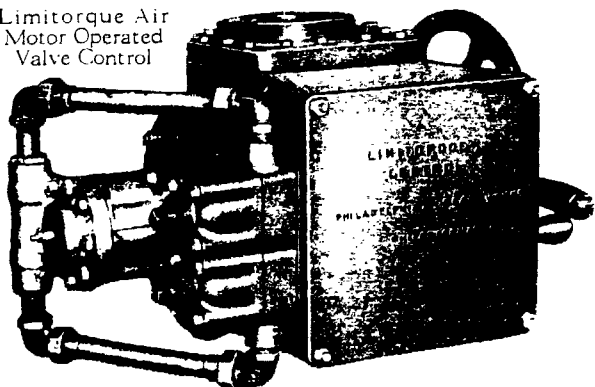
Labor saving: On valves operated frequently, and on especially large valves requiring considerable power and time to open or close, the motor operator is indispensable. It provides a perfect means of reducing the effort necessary to control the valves and the flow in the pipe lines.

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 inter-

connected 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.

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.

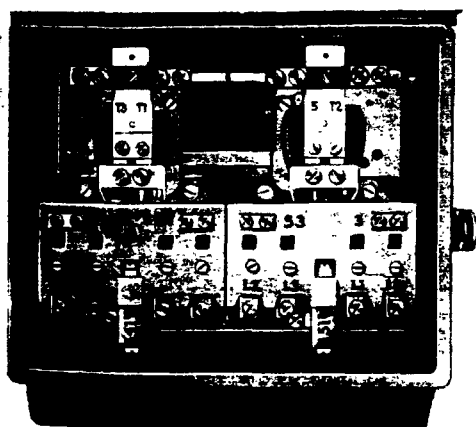
The arc quenchers used on these panels speedily extinguish the arc and provide for long contact life.

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.

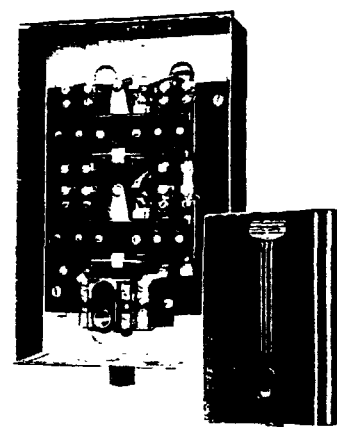
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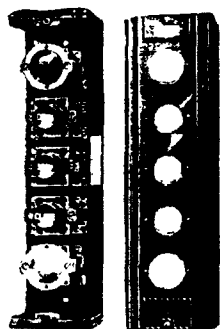
Limitorque Contactor Panels are regularly made in three sizes: No. 0, No 1, and No. 2



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



← Type HD3
Push Button Control Station
in NEMA I Enclosure



→ Type AL
Push Button Control Station
in NEMA V Enclosure

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.

Cutler-Hammer

Type	Enclosure	Buttons	Lights
HD 1	Sheet Steel NEMA I	1	2
	Cast Aluminum NEMA IV or V		
HD 2	Sheet Steel NEMA I	2	2
	Cast Aluminum NEMA IV or V		
HD 3	Sheet Steel NEMA I	3	2
	Cast Aluminum NEMA IV or V		
K	Cast Aluminum NEMA I	1, 2 or 3	2
KA & KB	Cast Aluminum NEMA IV	1, 2 or 3	2
W	Pistol Grip Switch	1	2

Types "K" and "KA" have break-glass doors and are fitted with a Yale type lock. Type "KB" has a break-glass door and is arranged for taking a padlock. Type "K" is furnished for flush mounting; all others are for surface mounting.

Limiterque (Philadelphia Gear Works)

Type	Enclosure	Buttons	Lights
AS	Sheet Steel NEMA I	3	2
AL	Cast Aluminum NEMA V	3	2
ALW	Cast Aluminum NEMA IV	3	2
AL 3	Cast Aluminum NEMA V	3	3
ALW 3	Cast Aluminum NEMA IV	3	3
ALEC	Cast Aluminum NEMA V	1	2
ALEW	Cast Aluminum NEMA IV	1	2
ALEX	Cast Steel NEMA VII	3	2
W	Pistol Grip Switch	1	2

All types except "AS", "ALEX", and "W" have buttons covered by a break-glass door, and are equipped with a Yale lock.

All types can be furnished for either surface or flush mounting.

Step-Down Transformers and Fusible Plugs

2

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.

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 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

- Quantity, size, and end connections of valves (flanged, screwed, or welding ends).
- Catalog number of regular valve preferred.
- Rising or non-rising stem. See "Recommendations" above.
- With or without by-pass. If by-pass is wanted, state its location in relation to the valve.
- Service—steam, water, oil, air, gas, etc.
- Working pressure, maximum differential pressure to open against, and operating temperature.
- Valves used for: main steam, equalizing, boiler feed, circulating water, etc.
- Information on any special conditions, such as: whether valve must close against full flow, open against full pressure, or if coking is present.
- Maximum velocity through valve, if obtainable.
- Position of valve run—horizontal or vertical.
- On valves with horizontal run, give position of valve stem: vertical up, vertical down, horizontal, or other position.
- Position of motor operator handwheel: parallel with or across the run of the valve.
- Approximate maximum temperature at point where valve yoke will be located.
- Desired closing speed of disc, in inches per minute, or all conditions if high speed closing is required.

When Electric Motor Operator is Wanted:

- Electrical characteristics—voltage, type of current (AC or DC) and phase and cycle if AC. See "Recommendations" above.
- 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 134.

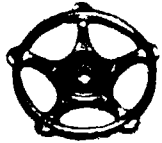
When Air or Gas Motor Operator is Wanted:

- 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.)



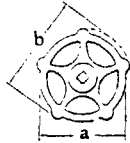
Type "S" Air Operated Limitorque Valve Controls on 4-inch Crane Gate Valves in the fire-water pump house of a refinery.

Wheels for Valves



Style A Wheel, Malleable Iron
Dished Design, Oval Rim, Square Hole
(Also made with a Threaded Hole)

Used on small size Forged Steel Globe and Angle Valves (pages 235 to 237). Threaded Hole wheels are for O.S. & Y. Gate Valves (pages 223 to 225). Orders must specify "Square Hole" or "Threaded Hole".

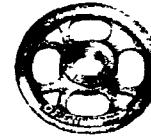


Style F Wheel†
Non-Heat, Round Pattern
Square Hole

Widely used on smaller size Brass, Iron, and Steel Valves (Globe, Angle, and Non-Rising or Rising Stem but not O.S. & Y. Gate). Larger sizes of such valves are fitted with Style D Wheels.



Style L Wheel, Square Socket
Black Moulded Composition
Used on Brass Radiator Valves
or on special polished valves



Style M Wheel, Malleable Iron
Round Pattern, Round Rim
Round Threaded Hole

Used only on No. 459 Brass Gate Valves, shown on page 19

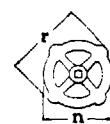


10-inch diameter and smaller

12-inch diameter and larger

Style D Wheel, Malleable Iron
Round Pattern, Oval Rim, Square Hole

Used on larger size Brass, Iron, and Steel Valves (Globe, Angle, and Non-Rising Stem or Rising Stem but not O.S. & Y. Gate).



Style N Wheel, Polished Brass
"Navy" Four-Ball Pattern
Square Hole

Used on special polished valves



10-inch diameter and smaller

12-inch diameter and larger

Style E Wheel, Malleable Iron
Round Pattern, Oval Rim, Hexagon Hole

Used on O.S. & Y. Iron and Steel Gate Valves. (6 & 7-inch diameters are also made with a Threaded Hole, for Steel Gate Valves.)



Style U Wheel, Cast Iron
Round Pattern, Round Rim
Square Hole

Used only on No. 453 Brass Hose Gate Valves shown on page 19

Diameters, in Inches, and List Prices

Style A				Style D		Style E			Style F		Style L		Style M		Style N		
Size		Price, Each		Size	Price Each	Size	Price, Each		Size	Price Each	Size	Price Each	Size	Price Each	Size		Price Each
a	b	Sq. Hole	Thd. Hole	d		e	Hex. Hole	Thd. Hole	f		h		m		n	r	
2 1/2	2 11/16	.20	.40	3 1/2	.45				1 1/2	.13	1 5/8	.20	3 5/16	.80	1 1/2	1 3/4	
*3	3 1/4	.30	.46	4 1/2	.75				1 3/4	.13	2	.22	3 5/8	1.00	1 3/4	2	
3 1/2	3 7/8	.38	.68	5 1/2	1.35				2 1/16	.16	2 1/4	.24	3 7/8	1.20	2	2 3/8	
4	4 1/16	.56	.95	6	1.60	6	1.60	1.85	2 9/16	.20	2 1/2	.28	4 3/8	1.60	*2 1/2	3	Prices on Application
5	5 1/2	1.05	1.60	7	2.00	7	2.00	2.50	2 3/4	.24	2 3/4	.32	4 13/16	1.90	3	3 1/2	
				8	2.50	8	2.50		3 1/16	.30	3	.40	5 3/4	2.20	3 1/2	4 1/8	
				9	3.15	9	3.15		3 5/8	.36			6 11/16	4.30	4	4 5/8	
				*10	3.35	*10	3.35		4 1/16	.44					5	5 5/8	
				12	4.40	12	4.40		4 3/4	.56					6	6 5/8	
				14	6.30	14	6.30		5 3/8	.75							
				16	12.75	16	12.75										
				18	14.00	18	14.00										
				20	19.00	20	19.00										
				22	23.00	22	23.00										
				24	39.00	24	39.00										
				27	42.00	27	42.00										
				30	58.00	30	58.00										
				36	160.00	36	160.00										
				42	200.00	42	200.00										

†1 1/2 to 4 1/8-inch diameter Style F Wheels are die cast. 4 3/4 and 5 3/8-inch diameters are malleable iron.

*The Wheels indicated by a single asterisk are made with two sizes of squares or hexagons; orders should specify the size and catalog number of the valve on which the Wheel will be used.

Above wheels made for 1 1/2 & 2" Gate Valves. page 225.

When ordering a Wheel or Handle, 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 137.

Style U	
Size	Price Each
4 1/8	.65
6	1.30

Handles for Valves



Style J Tee Handle
Cast Iron

Used only on No. 50
Brass Hose Valves.



Style K Lever Handle
Malleable Iron

Used on smaller size Hydraulic
Brass and Steel Globe and Angle
Valves.

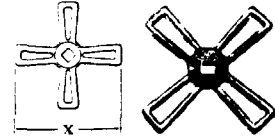
List Prices, and Dimensions in Inches

Style J		Style K		Style S		Style X	
Size j	Price Each	Size k	Price Each	Size s	Price Each	Size x	Price Each
5 1/8	.45	3 1/8	.32	*29/16	.15	*3	.40
5 3/4	.75	3 5/16	.38	39/16	.20	*3 3/4	.50
6 1/2	.85	3 1/2	.40	*4 1/2	.43	*4 3/4	.62
8 1/4	1.00	3 7/8	.42	4 3/4	.46	6	1.00
		4 1/4	.46	6	.62	7	1.10
		4 5/8	.50	*Made with 2 sizes of squares: specify size wanted.			
		5	.60				
		5 3/4	.70				



Style S Tee Handle
Malleable Iron

Used on Bar Stock Valves, on some
Corrosion-Resistant Globe Valves,
and on certain Ammonia Valves.

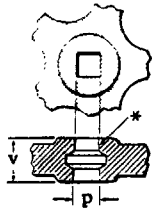


Style X Cross Handle
Malleable Iron

Used on some Corrosion-
Resistant Globe Valves.

Tee Wrenches... page 139
Keys for Lock Shields... page 139

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.

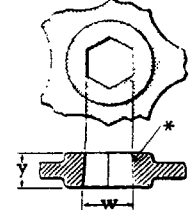
*3/4" total taper per foot

Dimensions, in Inches

Square Hole		Style A	Style F	Style N	Style J	Style K	Style S	Style X	Chain Wheel
p	v	Size a	Size f	Size n	Size j	Size k	Size s	Size x	Pitch Dia.
.20	.30		1 1/2	1 1/2					
.24	.35	2 1/2	1 3/4	1 3/4				3	
.24	.37						29/16		
.29	.35		2 1/16	2		3 1/8		3	
.29	.37						29/16		
.29	.44	3							
.32	.40		29/16	2 1/2		3 5/16		3 3/4	
.32	.44						39/16		
.35	.44		2 3/4	2 1/2		3 1/2	4 1/2	3 3/4	2 3/8
.40	.44	3	3 1/16	3	5 1/8	3 7/8	4 1/2	4 3/4	2 3/8
.40	.56	3 1/2					4 3/4		3
.42	.44		3 5/8	3 1/2		4 1/4		4 3/4	3
.42	.81				5 3/4				
.45	.56		4 1/16	4		4 5/8	6	6	3
.45	.69				6 1/2				
.53	.62	4, 5	4 3/4, 5 3/8	5		5		7	4
.56	.75				8 1/4				
.56	.87			6		5 3/4			5

Square Hole		Style D	Chain Wheel	Square Hole		Style D	Chain Wheel	Hexagon Hole		Style E	Chain Wheel	Hexagon Hole		Style E	Chain Wheel
p	v	Size d		p	v	Size d		w	y	Size e		w	y	Size e	
.35	.44	3 1/2	2 3/8	1.00	1.62	14	14	.9	.69	6		2.38	1.31	18	18
.37	.62	4 1/2	4	1.13	1.75	16	14	.99	.69	7	7 1/2	2.75	1.31	20	18
.44	1.00	5 1/2	4	1.25	1.87	18	18	1.16	.75	8	7 1/2	3.27	1.50	22	18
.56	.87	6	5	1.31	2.12	20	18	1.35	.87	9	7 1/2	3.46	1.62	24	24
.63	1.00	7	5	1.44	2.37	22	18	1.54	.87	10	10	3.53	1.69	27	24
.69	1.06	8	7 1/2	1.50	2.44	24	24	1.67	.87	10	10	4.03	1.75	30	30
.75	1.19	9	7 1/2	1.75	2.50	27	24	1.86	1.00	12	10	4.56	2.19	36	30
.81	1.25	10	10	1.87	2.75	30	30	2.05	1.06	14	14	5.16	2.75	42	
.87	1.37	10	10	2.00	3.25	36	30	2.31	1.19	16	14				
.94	1.50	12	10	2.50	3.50	42									

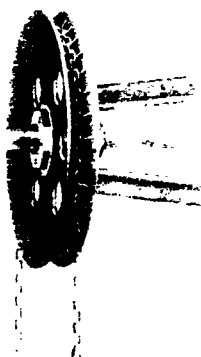
Chain Wheels... page 138



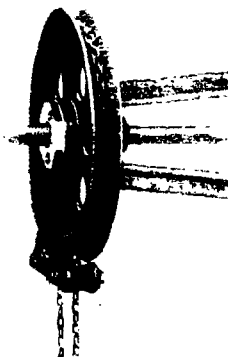
Hexagon Hole
Wheel or Handle

Chain Wheels

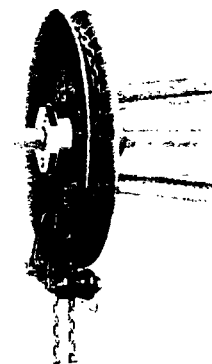
For Brass, Iron, and Steel Valves



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		Chain Wheels are applicable to valves having the following style and size of Wheel or Handle with Square or Hex. holes only					
	Chain Wheels only for Rising or Non- Rising Stem Valves with Square or Hex. Hole Wheels*	Chain Wheels and Guides for Rising or Non- Rising Stem Valves with Square or Hex. Hole Wheels*	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
2 $\frac{3}{8}$	3.75	17.50	3	3 $\frac{1}{2}$		2 $\frac{3}{4}$, 3 $\frac{1}{16}$	3 $\frac{1}{2}$, 3 $\frac{7}{8}$	
3	4.00	17.75	3 $\frac{1}{2}$			3 $\frac{5}{8}$, 4 $\frac{1}{16}$	4 $\frac{1}{4}$, 4 $\frac{5}{8}$	4 $\frac{3}{4}$, 6
4	4.25	18.00	4, 5	4 $\frac{1}{2}$, 5 $\frac{1}{2}$		4 $\frac{3}{4}$, 5 $\frac{3}{8}$	5	
5	4.75	19.50		6, 7			5 $\frac{3}{4}$	
7 $\frac{1}{2}$	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 can be conveniently attached and locked to valves in service; an instruction tag is supplied with each wheel.

Guides: Guides for Crane Chain Wheels, for sizes of 7 $\frac{1}{2}$ -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 7 $\frac{1}{2}$ -inch pitch diameter and larger; prices are furnished on application.

Ordering: When ordering Chain Wheels separately, specify the pitch diameter, the size and catalog number of the valve on which it is to be used, and also advise if Chain Guide is desired.

When Chain for Chain Wheels is ordered separately, orders must specify the pitch diameter of the Chain Wheel for which the Chain is required.

When a valve is ordered with Chain Wheel or Chain Wheel and Guide, no extra charge is made for the labor to mount it on the valve, but no allowance is made for the regular valve wheel or handle.

For size of hole in Chain Wheels, Wheels, or Handles, see page 137.

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	5 $\frac{1}{8}$	4 $\frac{1}{8}$ to 5 $\frac{1}{8}$
1 $\frac{1}{2}$	7 $\frac{1}{2}$	6 to 7 $\frac{1}{2}$
2	9	7 $\frac{3}{4}$ to 9
2 $\frac{1}{2}$	12 $\frac{1}{2}$	9 $\frac{1}{4}$ to 12 $\frac{1}{2}$
3	15 $\frac{1}{2}$	12 $\frac{3}{4}$ to 15 $\frac{1}{2}$
3 $\frac{1}{2}$	19	15 $\frac{3}{4}$ to 19
4	22	19 $\frac{1}{4}$ to 22
4 $\frac{1}{2}$	26	22 $\frac{1}{4}$ to 26
5	30	26 $\frac{1}{4}$ 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.

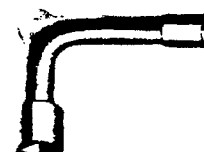


Keys for Lock Shield

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
$\frac{1}{4}$					
$\frac{3}{8}$					
$\frac{1}{2}$		197		197	197
$\frac{3}{4}$	198	198	198		198
1	198 or 199	198 or 199		198	198 or 199
1 $\frac{1}{4}$					
1 $\frac{1}{2}$	199	199	199		
2		199			

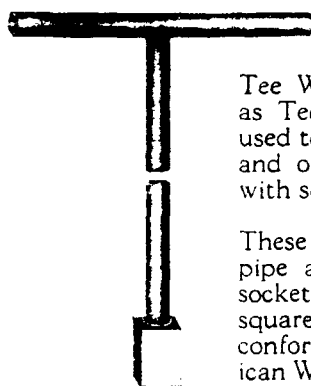
List Prices and Size of Square Hole		
Key Nos.	List Prices	Size of Square Hole
	Each	Inches
No. 197	1.00	.26 and .20
No. 198	1.20	.43 and .32
No. 199	1.60	.49 and .43



L-Shape Key
Malleable Iron
Cadmium Plated
Nos. 197, 198,
and 199

12

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



The two illustrations here show wrenches for A.A.R. Brass 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.

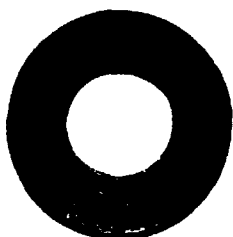


Wrenches for removing body seat rings in Crane Brass Globe and Angle Valves are available. They are made of steel, ruggedly constructed, and correctly designed to provide close guiding and proper engagement with the lugs on the body seat ring. Prices on application.

Composition Discs



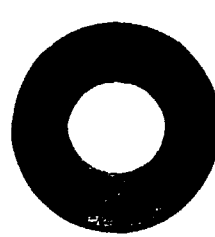
No. 1 Cranite Disc
1/8 to 3-inch



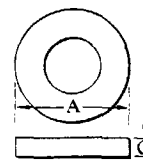
No. 1 Cranite Disc
3 1/2 to 6-inch
No. 6 Composition Disc
1/8 to 6-inch



No. 4 Cranite Disc
1/8 to 3-inch



No. 10 and No. 12
Composition Discs
1/8 to 2-inch



Size Inches	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	
						A	C	A	C
1/8	17.50	50.00	17.50	7.00	7.00	21/32	7/32	1/2	1/8
1/4	17.50	50.00	17.50	7.00	7.00	21/32	7/32	1/2	1/8
3/8	17.70	57.00	17.70	8.00	8.00	3/4	7/32	19/32	1/8
1/2	18.00	57.00	18.00	8.00	8.00	13/16	1/4	21/32	3/16
3/4	22.00	65.00	22.00	10.50	10.50	11/16	1/4	29/32	7/32
1	23.00	82.00	23.00	13.50	13.50	13/8	1/4	11/4	1/4
1 1/4	31.50	119.00	31.50	19.00	19.00	1 5/8	11/32	1 1/2	1/4
1 1/2	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
2 1/2	74.00	334.00	74.00			3 3/16	1 5/32		
3	179.00	471.00	179.00			3 15/16	1/2		
3 1/2	236.00		236.00			4 3/8	9/16		
4	243.00		243.00			4 7/8	19/32		
5	326.00		326.00			6 1/16	19/32		
6	370.00		370.00			7 1/16	19/32		

2

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 1/8 to 3-inch have serrated faces on both sides; one side is marked "No. 1 Cranite", and includes the size marking. Sizes 3 1/2-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 30.

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 300 pounds hot water, 200° F. maximum
600 pounds cold water
600 pounds air, gas, oil, or gasoline, 150° F. max.
(Also for propane and butane when used in Underwriters' approved valves)

Nos. 10 and 12 Discs: Nos. 10 and 12 Discs are not interchangeable with No. 1, No. 4, and No. 6 Discs; they are slightly smaller in size. They are made from homogeneous compounds with synthetic bases, and are highly suitable for their respective recommended services.

All sizes are plain on both sides, without markings

For—No. 10, 100 pounds steam, 338° F. maximum
No. 12, 150 pounds water, 200° F. maximum,
and domestic gas service.

Malleable Iron Screwed Fittings

150-Pound Banded Fittings	
List Prices and Description.....	pages 142 and 143
Dimensions and List of Reducing Sizes....	pages 144 and 145
Plain Pattern Fittings	
List Prices and Description.....	page 143
Dimensions and List of Reducing Sizes.....	page 144
Air-Tested 150-Pound Fittings	page 146
Circulating Boiler Fittings.....	page 147
300-Pound Fittings.....	pages 148 and 149
Heavy Fittings.....	pages 148 and 149
A.A.R. Fittings	page 150

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:

Bushings.....	page 169
Plugs.....	page 168
Single Strap and Double Strap Clamps.....	page 173
Screwed Unions and Union Fittings.....	pages 176 to 182
Flange Unions.....	page 185
Railing Fittings.....	pages 196 and 197
Floor Flanges.....	page 207

How to read reducing fittings.... page 562

150-Pound Malleable Iron Fittings

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
144 and 145; the price is determined
by the size of the largest opening.



90° Elbow



45° Elbow



Tee



Cross

90° Street
Elbow45° Street
ElbowService
Tee

Return Bend



45° Y-Bend



Cap

Coupling
Right HandCoupling
Right & Left

Reducer

List Prices, Each—Banded Fittings

Size Inches	90° Elbows				45° Elbows		Tees				Crosses	
	Straight		Reducing		Black	Galv.	Straight		Reducing		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 Inches	90° Street Elbows				45° Street Elbows		Service Tees				45° Y-Bends	
	Straight		Reducing		Black	Galv.	Straight		Reducing		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 Inches	Return Bends						Caps		Couplings				Reducers	
	Close Pattern		Medium Pattern		Open Pattern		Black	Galv.	Right Hand		R. & L.		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 page 144

List of reducing sizes pages 144 and 145

Air-tested fittings page 146

150-Pound Malleable Iron Fittings

The Crane line of 150-Pound Malleable Iron Fittings, described and illustrated on pages 142 to 146, 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 146.

Reducing fittings: Reducing fittings are made in proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

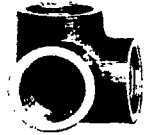
Prices of reducing fittings and reducers are determined by the size of the largest opening and apply only to regularly listed sizes. All other sizes are special; prices on application. For list of sizes of Banded and Plain Reducers, see page 144, for list of sizes of Banded Reducing Elbows and Tees, see page 145.

Dimensions: The dimensions of straight and reducing fittings are shown on pages 144 and 145. Plain fittings have the same center to end dimensions as the corresponding size banded fitting.

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

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.

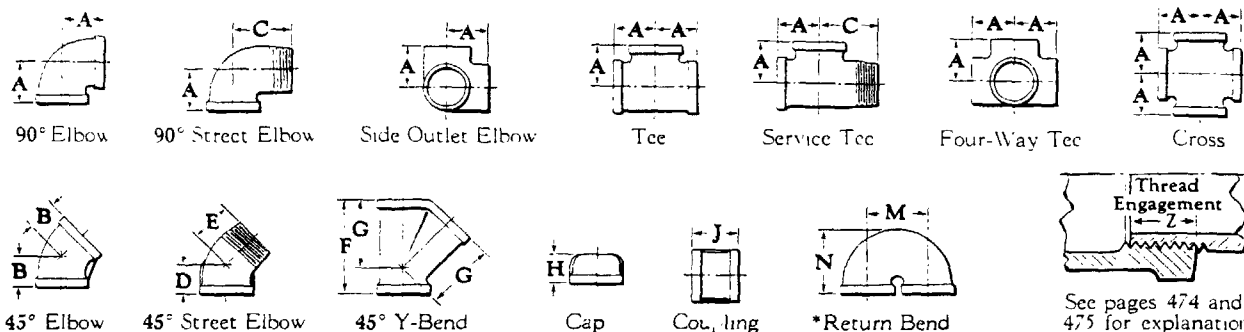
The prices of Reducers apply only to the sizes shown on page 144; the price is determined by the larger opening.

Dimensions (same as Banded) . . . page 144

List of sizes of Reducers . . . page 144

150-Pound Malleable Iron Fittings

Dimensions of Straight Sizes, in Inches Banded and Plain Pattern



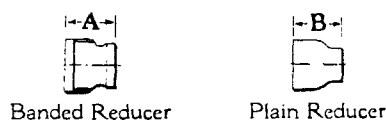
These dimensions apply to both Banded and Plain Fittings; their center to end dimensions are alike.

*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						Z
										Close		Medium		Open		
										M	N	M	N	M	N	
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	21/8	17/16	3/4	13/16							3/8
1/2	11/8	7/8	15/8	13/16	13/16	27/16	111/16	7/8	15/16	1	13/4	11/4	15/8	11/2	17/8	1/2
3/4	15/16	1	17/8	15/16	15/16	27/8	2	11/16	11/2	11/4	23/16	11/2	115/16	2	21/4	9/16
1	11/2	11/8	21/8	11/16	11/2	33/8	27/16	13/16	111/16	11/2	21/2	17/8	21/4	21/2	25/8	11/16
1 1/4	13/4	15/16	27/16	11/4	111/16	41/16	215/16	11/4	115/16	13/4	213/16	21/4	213/16	3	33/16	11/16
1 1/2	115/16	17/16	211/16	13/8	17/8	41/2	35/16	15/16	21/8	23/16	33/16	21/2	33/16	31/2	35/8	11/16
2	21/4	111/16	31/4	111/16	21/4	57/16	4	17/16	21/2	25/8	37/8	3	37/8	4	43/8	3/4
2 1/2	211/16	115/16	313/16			61/4	411/16	111/16	27/8					41/2	415/16	15/16
3	31/8	23/16	41/2			71/4	59/16	113/16	33/16					5	59/16	1
3 1/2	37/16	23/8						115/16								11/16
4	33/4	25/8	511/16			87/8	615/16	21/16	311/16					6	611/16	11/8
5	41/2	31/16						25/16								11/4
6	51/8	37/16						29/16								15/16

List of Sizes of Reducers and Dimensions, in Inches Banded and Plain Pattern

Banded Reducers			
Size	A	Size	A
1/4 x 1/8	1	1 1/2 x 1 1/4	25/16
3/8 x 1/4	11/8	x 1	25/16
x 1/8	11/8	x 3/4	25/16
1/2 x 3/8	11/4	x 1/2	25/16
x 1/4	11/4	2 x 1 1/2	213/16
x 1/8	11/4	x 1 1/4	213/16
3/4 x 1/2	17/16	x 1	213/16
x 3/8	17/16	x 3/4	213/16
x 1/4	17/16	x 1/2	213/16
1 x 3/4	111/16	2 1/2 x 2	31/4
x 1/2	111/16	x 1 1/2	31/4
x 3/8	111/16	x 1 1/4	31/4
x 1/4	111/16	x 1	31/4
1 1/4 x 1	21/16		
x 3/4	21/16		
x 1/2	21/16		



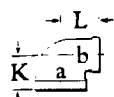
The prices of Banded and Plain Pattern Reducers (pages 142 and 143) apply only to the sizes listed on this page; the size of the larger opening determines the price.

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.

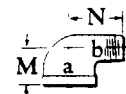
Plain Reducers	
Size	B
1/4 x 1/8	1
3/8 x 1/4	11/8
x 1/8	11/8
1/2 x 3/8	11/4
x 1/4	11/4
x 1/8	11/4
3/4 x 1/2	17/16
x 3/8	17/16
x 1/4	17/16
1 x 3/4	111/16
x 1/2	111/16
x 3/8	111/16
x 1/4	111/16
1 1/4 x 1	21/16
1 1/2 x 1 1/4	25/16

150-Pound Malleable Iron Fittings

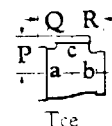
List of Sizes of Banded Reducing Fittings and Dimensions, in Inches



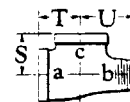
90° Elbow



90° Street Elbow



Tee



Service Tee

The prices of banded reducing fittings (page 142) 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.

90° Elbows				Tees											
Size		K	L	Size			P	Q	R	Size			P	Q	R
a	b			a	b	c				a	b	c			
1/4	1/8	3/4	3/4	1/4	1/4	1/8	3/4	3/4	3/4	1 1/4	3/4	3/4	19/16	17/16	15/16
3/8	1/4	7/8	7/8	1/8	1/8	1/4	3/4	3/4	3/4	1 1/4	1/2	1 1/4	11 1/16	11 1/16	19/16
1/2	3/8	1 1/16	1 1/16	3/8	3/8	1/4	7/8	7/8	7/8	1	1	1 1/4	19/16	15/8	15/8
3/4	1/2	1 1/8	1 1/8	1/2	1/2	3/4	7/8	7/8	13/16	3/4	3/4	1 1/4	19/16	15/8	15/8
1	3/4	1 1/2	1 1/2	3/4	3/4	1	7/8	7/8	7/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
1 1/4	1	1 3/4	1 3/4	1	1	1 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
1 1/2	1 1/8	1 7/8	1 7/8	1 1/2	1 1/2	1 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
1 3/4	1 1/4	2	2	1 3/4	1 3/4	1 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
2	1 1/2	2 1/4	2 1/4	2	2	2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
2 1/4	1 3/4	2 3/4	2 3/4	2 1/4	2 1/4	2 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
2 1/2	2	2 7/8	2 7/8	2 1/2	2 1/2	2 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
2 3/4	2 1/4	3	3	2 3/4	2 3/4	3	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
3	2 3/8	3 1/8	3 1/8	3	3	3 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
3 1/4	2 7/8	3 1/4	3 1/4	3 1/4	3 1/4	3 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
3 1/2	3	3 1/2	3 1/2	3 1/2	3 1/2	3 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
3 3/4	3 1/4	3 3/4	3 3/4	3 3/4	3 3/4	4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
4	3 1/2	4	4	4	4	4 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
4 1/4	3 3/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
4 1/2	3 3/8	4 1/2	4 1/2	4 1/2	4 1/2	4 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
4 3/4	3 7/8	4 3/4	4 3/4	4 3/4	4 3/4	5	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
5	4	5	5	5	5	5 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
5 1/4	4 1/4	5 1/4	5 1/4	5 1/4	5 1/4	5 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
5 1/2	4 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
5 3/4	4 3/4	5 3/4	5 3/4	5 3/4	5 3/4	6	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
6	5	6	6	6	6	6 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
6 1/4	5 1/4	6 1/4	6 1/4	6 1/4	6 1/4	6 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
6 1/2	5 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
6 3/4	5 3/4	6 3/4	6 3/4	6 3/4	6 3/4	7	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
7	6	7	7	7	7	7 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
7 1/4	6 1/4	7 1/4	7 1/4	7 1/4	7 1/4	7 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
7 1/2	6 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
7 3/4	6 3/4	7 3/4	7 3/4	7 3/4	7 3/4	8	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
8	7	8	8	8	8	8 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
8 1/4	7 1/4	8 1/4	8 1/4	8 1/4	8 1/4	8 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
8 1/2	7 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
8 3/4	7 3/4	8 3/4	8 3/4	8 3/4	8 3/4	9	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
9	8	9	9	9	9	9 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
9 1/4	8 1/4	9 1/4	9 1/4	9 1/4	9 1/4	9 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
9 1/2	8 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
9 3/4	8 3/4	9 3/4	9 3/4	9 3/4	9 3/4	10	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
10	9	10	10	10	10	10 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
10 1/4	9 1/4	10 1/4	10 1/4	10 1/4	10 1/4	10 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
10 1/2	9 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
10 3/4	9 3/4	10 3/4	10 3/4	10 3/4	10 3/4	11	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
11	10	11	11	11	11	11 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
11 1/4	10 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
11 1/2	10 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
11 3/4	10 3/4	11 3/4	11 3/4	11 3/4	11 3/4	12	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
12	11	12	12	12	12	12 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
12 1/4	11 1/4	12 1/4	12 1/4	12 1/4	12 1/4	12 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
12 1/2	11 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
12 3/4	11 3/4	12 3/4	12 3/4	12 3/4	12 3/4	13	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
13	12	13	13	13	13	13 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
13 1/4	12 1/4	13 1/4	13 1/4	13 1/4	13 1/4	13 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
13 1/2	12 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
13 3/4	12 3/4	13 3/4	13 3/4	13 3/4	13 3/4	14	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
14	13	14	14	14	14	14 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
14 1/4	13 1/4	14 1/4	14 1/4	14 1/4	14 1/4	14 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
14 1/2	13 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
14 3/4	13 3/4	14 3/4	14 3/4	14 3/4	14 3/4	15	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
15	14	15	15	15	15	15 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
15 1/4	14 1/4	15 1/4	15 1/4	15 1/4	15 1/4	15 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
15 1/2	14 1/2	15 1/2	15 1/2	15 1/2	15 1/2	15 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
15 3/4	14 3/4	15 3/4	15 3/4	15 3/4	15 3/4	16	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
16	15	16	16	16	16	16 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
16 1/4	15 1/4	16 1/4	16 1/4	16 1/4	16 1/4	16 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
16 1/2	15 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 3/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
16 3/4	15 3/4	16 3/4	16 3/4	16 3/4	16 3/4	17	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
17	16	17	17	17	17	17 1/4	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
17 1/4	16 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/2	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/4	11 3/16	11 3/16	11 3/16
17 1/2	16 1														

150-Pound Malleable Iron Fittings

Air Tested

For air brake and other compressed air service



90° Elbow



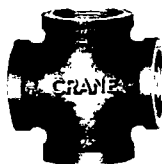
45° Elbow



90° Street Elbow



Tee



Cross



Return Bend



Coupling



Reducer

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 $\frac{1}{4}$ to 2-inch, are carried in stock air tested; other types and sizes are furnished to order on short notice.

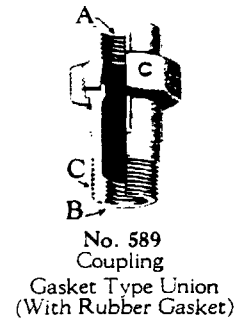
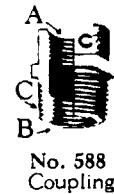
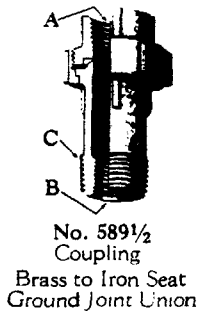
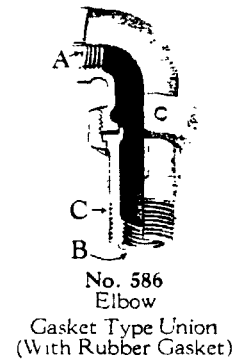
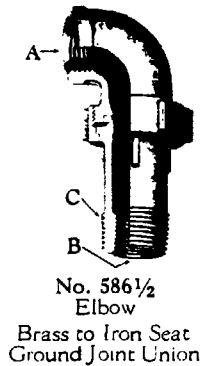
Circulating Boiler Fittings

Malleable Iron—Galvanized

Ground Joint

WORKING PRESSURE
150 pounds water, 200° F.

Gasket Type



When ordering Circulating Boiler Fittings, be sure to specify the correct size; refer to illustrations.

List Prices, Each, Galvanized

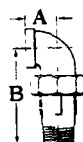
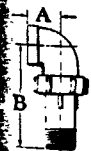
Size Inches A B C	Ground Joint Type Union		Gasket Type Union		Without Union	
	No. 586 1/2 Elbow	No. 589 1/2 Coupling	No. 586 Elbow	No. 589 Coupling	No. 587 Elbow	No. 588 Coupling
1/2 x 1/2 x 1	1.55	1.35	1.55	1.35	.85	.75
3/4 x 1/2 x 1	1.70	1.50	1.70	1.50	.85	.75
3/4 x 3/4 x 1	1.70	1.50	1.70	1.50	.85	.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 con-

nected 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 177.



Dimensions, in Inches

Size	A	B	C	H	K	L
A B C						
1/2 x 1/2 x 1	1 1/8	3 13/16	3 3/8	3 3/8	1 13/16	1 13/16
3/4 x 1/2 x 1	1 5/16	3 15/16	3 3/8	3 7/16	2	1 13/16
3/4 x 3/4 x 1	1 5/16	3 15/16	3 3/8	3 7/16	2	1 13/16

For extra gaskets for the No. 586 Elbow and No. 589 Coupling, see page 456.

300-Pound Malleable Iron Fittings



No. 260 E
90° Elbow



No. 262 E
45° Elbow



No. 268 E
90° Street Elbow



No. 262 1/2 E
45° Street Elbow



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

WORKING PRESSURES
300 pounds steam or oil, 550° F.

Cold Water, Oil, or Gas, Non-Shock

1/4 to 1-inch — *2000 pounds

1 1/4 to 2-inch — *1500 pounds

2 1/2 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 3 1/2-inch and larger were formerly known as "Heavy Malleable Iron," and are marked "Heavy" as illustrated above.

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
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. 262 1/2 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	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2	2	2		
Center to Center	Inches	1 3/4	2 1/2	3	2 1/4	2 1/2	3	3	3 1/2	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 3 1/2-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.

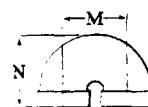
Reducing fittings: The prices of reducing fittings and of reducers apply to regularly listed sizes only, as shown on the opposite page; the size of the largest opening determines the price. All other sizes are special; prices on application.

***Working pressures:** The working pressures given above for cold service do not apply to Street Elbows; these are recommended for 500 pounds cold water, oil, or gas, non-shock.

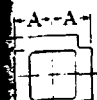
Larger sizes: For sizes larger than those listed, 1000-Pound W.O.G. Cast Steel Fittings are recommended; see page 260 for complete description.

Dimensions, in Inches

Straight Fittings



No. 272 E
Return Bend



No. 266 E
Cross

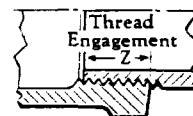
Size	A	B	C	D	E	F	K	L'
$\frac{1}{4}$	$\frac{15}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{17}{16}$			$\frac{25}{32}$	$\frac{13}{8}$
$\frac{3}{8}$	$\frac{11}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{15}{8}$			$\frac{7}{8}$	$\frac{15}{8}$
$\frac{1}{2}$	$\frac{1}{4}$	1	$\frac{1}{4}$	2	1	$\frac{13}{8}$	$\frac{11}{16}$	$\frac{17}{8}$
$\frac{3}{4}$	$\frac{17}{16}$	$\frac{11}{8}$	$\frac{17}{16}$	$\frac{23}{16}$	$\frac{11}{8}$	$\frac{19}{16}$	$\frac{11}{4}$	$\frac{21}{8}$
1	$\frac{15}{8}$	$\frac{15}{16}$	$\frac{15}{8}$	$\frac{29}{16}$	$\frac{15}{16}$	$\frac{113}{16}$	$\frac{13}{8}$	$\frac{23}{8}$
$\frac{11}{4}$	$\frac{115}{16}$	$\frac{11}{2}$	$\frac{115}{16}$	$\frac{27}{8}$	$\frac{11}{2}$	$\frac{27}{8}$	$\frac{11}{2}$	$\frac{27}{8}$
$\frac{11}{2}$	$\frac{21}{8}$	$\frac{111}{16}$	$\frac{21}{8}$	$\frac{31}{8}$	$\frac{111}{16}$	$\frac{25}{18}$	$\frac{111}{16}$	$\frac{27}{8}$
2	$\frac{21}{2}$	2	$\frac{21}{2}$	$\frac{311}{16}$	2	$\frac{211}{16}$	$\frac{113}{16}$	$\frac{37}{8}$
$\frac{21}{2}$	$\frac{215}{16}$	$\frac{21}{4}$	$\frac{215}{16}$	$\frac{41}{2}$			$\frac{21}{8}$	$\frac{41}{8}$
3	$\frac{33}{8}$	$\frac{21}{2}$	$\frac{33}{8}$	$\frac{51}{8}$			$\frac{21}{4}$	$\frac{41}{8}$
$\frac{31}{2}$	$\frac{41}{8}$	$\frac{25}{8}$						
4	$\frac{41}{2}$	$\frac{213}{16}$						
5	$\frac{51}{2}$	$\frac{33}{16}$						
6	$\frac{61}{4}$	$\frac{31}{8}$						

No. 272 E Return Bends	
Size x M	N
1 x 1 3/4	2 1 3/16
1 x 2 1/2	3 1/4
1 x 3	3 1/2
1 1/4 x 2 1/4	3 9/16
1 1/4 x 2 1/2	3 11/16
1 1/4 x 3	3 15/16
1 1/2 x 3	4 3/16
1 1/2 x 3 1/2	3 15/16
1 1/2 x 6	5 11/16
2 x 4	4 3/4
2 x 6	6 1/8
2 x 8	6 5/8



No. 267 E
Reducer

When specifying reducing 90° elbows and reducing tees, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations above.



Dimension "Z" applies to all 300-Pound Malleable Iron Fittings.

It is the engagement normally required between male and female pipe threads to make a tight joint; see pages 474 and 475 for explanation.

No. 260 E Reducing 90° Elbows			
Size		G	H
a	b		
1 3/8	1/4	1 1/16	1 1/16
1 1/2	3/8	1 3/16	1 3/16
3/4	1/2	1 5/16	1 3/8
	5/8	1 5/16	1 3/8
1	3/4	1 1/2	1 9/16
	1/2	1 1/2	1 9/16
1 1/4	1	1 3/4	1 13/16
	3/4	1 3/4	1 13/16
1 1/2	1 1/4	2	2 1/16
	1	2	2 1/16
2	1 1/2	2 1/4	2 3/8
	1 1/4	2 1/4	2 3/8
2 1/2	2	2 11/16	2 3/4
3	2 1/2	3 1/16	3 5/16

No. 267 E Reducers			
Size	J	Size	J
1 $\times \frac{1}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{2} \times \frac{3}{4}$	2 $\frac{11}{16}$
2 $\times \frac{3}{8}$	1 $\frac{11}{16}$	$\times \frac{1}{2}$	2 $\frac{11}{16}$
3 $\times \frac{1}{4}$	1 $\frac{11}{16}$	2 $\times 1 \frac{1}{2}$	3 $\frac{3}{16}$
4 $\times \frac{1}{2}$	1 $\frac{3}{4}$	$\times 1 \frac{1}{4}$	3 $\frac{3}{16}$
5 $\times \frac{3}{8}$	1 $\frac{3}{4}$	$\times 1$	3 $\frac{3}{16}$
6 $\times \frac{1}{4}$	1 $\frac{3}{4}$	$\times \frac{3}{4}$	3 $\frac{3}{16}$
7 $\times \frac{1}{2}$	2	$\times \frac{1}{2}$	3 $\frac{3}{16}$
8 $\times \frac{1}{2}$	2	2 $\frac{1}{2} \times 2$	3 $\frac{11}{16}$
9 $\times \frac{3}{8}$	2	$\times 1 \frac{1}{2}$	3 $\frac{11}{16}$
10 $\times \frac{1}{4}$	2	3 $\times 2 \frac{1}{2}$	4 $\frac{1}{16}$
11 $\times \frac{1}{4}$	2 $\frac{3}{8}$	$\times 2$	4 $\frac{1}{16}$
12 $\times \frac{3}{8}$	2 $\frac{3}{8}$	$\times 1 \frac{1}{2}$	4 $\frac{1}{16}$
13 $\times \frac{1}{2}$	2 $\frac{3}{8}$	4 $\times 3$	4 $\frac{3}{8}$
14 $\times 1$	2 $\frac{11}{16}$	$\times 2 \frac{1}{2}$	4 $\frac{3}{8}$
15 $\times 1$	2 $\frac{11}{16}$	$\times 2$	4 $\frac{3}{8}$

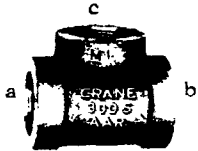
[illegible]

Size	Z
$\frac{1}{4}$	$\frac{3}{8}$
$\frac{3}{8}$	$\frac{3}{8}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{3}{4}$	$\frac{9}{16}$
1	$1\frac{1}{16}$
$1\frac{1}{4}$	$1\frac{1}{16}$
$1\frac{1}{2}$	$1\frac{1}{16}$
2	$\frac{3}{4}$
$2\frac{1}{2}$	$1\frac{5}{16}$
3	1
$3\frac{1}{2}$	$1\frac{1}{16}$
4	$1\frac{1}{8}$
5	$1\frac{1}{4}$
6	$1\frac{3}{8}$

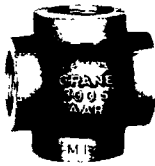
A. A. R. Malleable Iron Fittings

No. 260 E
90° ElbowNo. 262 E
45° ElbowNo. 262 1/2 E
45° Street ElbowNo. 268 E
90° Street Elbow

WORKING PRESSURE
300 pounds steam
TEST PRESSURE
300 pounds air-under-water

No. 267 E
ReducerNo. 278 E
CapNo. 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	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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. 262 1/2 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

Reducing Fittings Carried in Stock

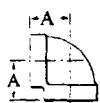
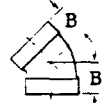
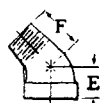
No. 260 E 90° Elbows	No. 264 E, Tees			No. 267 E Reducers		
	a	b	c	a	b	c
1/2 x 3/8	1/2 x 1/2 x 3/8	1 1/4 x 1 1/4 x 1		2 x 2 x 1 1/2	3/8 x 1/4	1 1/2 x 3/4
3/4 x 1/2	x 3/8 x 1/2	x 3/4		x 1 1/4	1/2 x 3/8	x 1/2
1 x 3/4	3/4 x 3/4 x 1/2	x 1 1/2		x 1	3/4 x 1/2	2 x 1 1/2
1 1/4 x 1	x 1/2 x 3/4	1 1/4 x 1 x 1 1/4		x 3/4	1 x 3/4	x 1 1/4
1 1/2 x 1 1/4	1 x 1 x 3/4	1 1/2 x 1 1/2 x 1 1/4		x 1 1/2	x 1/2	x 1
2 x 1 1/2	x 1/2	x 3/4		2 1/2 x 2 1/2 x 2	1 1/4 x 1	2 1/2 x 2
2 1/2 x 2	x 3/8	x 1/2		x 1 1/2	x 3/4	3 x 2 1/2
3 x 2 1/2	1 x 3/4 x 1	1 1/2 x 1 1/4 x 1 1/2		2 1/2 x 2 x 2 1/2	x 1/2	x 2
				3 x 3 x 2 1/2	1 1/2 x 1 1/4	x 1 1/2
				x 2	x 1	
				3 x 2 1/2 x 3		

Association of American Railroads: These fittings conform to the specifications and recommended practice of the Association of American Railroads (A. A. R.) for 300-Pound screwed pipe fittings. They are exactly the same as the fittings shown on pages 148 and 149, the types and sizes listed here being marked "AAR" because they are included in the A.A.R. Specifications.

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.

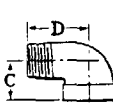
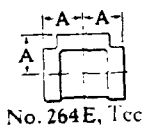
Reducing sizes: A.A.R. Reducing 90° Elbows, Reducing Tees, and Reducers are carried in stock in the sizes shown in the table above. Prices of reducing fittings are determined by the size of the largest opening, and apply only to the sizes carried in stock.

Dimensions, in Inches

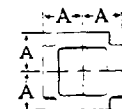
No. 260 E
90° ElbowNo. 262 E
45° ElbowNo. 262 1/2 E
45° Street Elbow

Dimensions of straight sizes and of Reducers are shown in the table below.

For dimensions of reducing sizes, see page 149

No. 268 E
90° Street ElbowNo. 267 E
ReducerNo. 278 E
Cap

No. 264 E, Tee

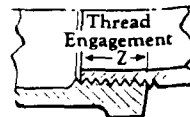


No. 266 E, Cross

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	15/16	1 1/16	1 1/4	1 7/16	1 5/8	1 15/16	2 1/8	2 1/2	2 15/16	3 3/8
B	13/16	7/8	1	1 1/8	1 5/16	1 1/2	1 11/16	2	2 1/4	2 1/2
C			1 1/4	1 7/16	1 5/8	1 15/16	2 1/8	2 1/2	2 15/16	3 3/8
D		2	2 3/16	2 9/16	2 7/8	3 1/8	3 11/16	4 1/2	5 1/8	
E			1	1 1/8	1 5/16	1 1/2	1 11/16	2		
F			1 3/8	1 9/16	1 13/16	2 1/8	2 5/16	2 11/16		
J		1 7/16	1 11/16	1 3/4	2	2 3/8	2 11/16	3 3/16	3 11/16	4 1/8
K	25/32	7/8	1 1/16	1 1/4	1 3/8	1 1/2	1 11/16	1 13/16	2 1/8	2 1/4
L	1 3/8	1 5/8	1 7/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 1/2
Z	3/8	3/8	1/2	9/16	1 1/16	1 1/16	1 1/16	3/4	15/16	1

A.A.R. Valves... pages 36 to 38

A.A.R. Unions... pages 180 to 182

No. 279 E
Coupling

See page 474
for explanation.

Cast Iron Screwed Fittings Sprinkler Fittings

125-Pound Fittings

List Prices and Description.....pages 152 and 153
Dimensions and List of Reducing Sizes.....pages 153 to 157

Sprinkler Type Fittings.....page 158

250-Pound Short Pattern Fittings.....page 159

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 161 to 166.

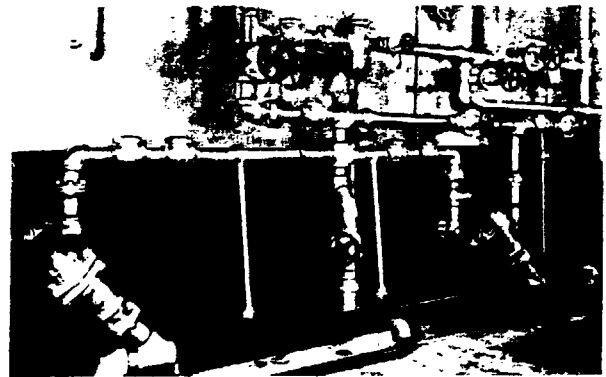
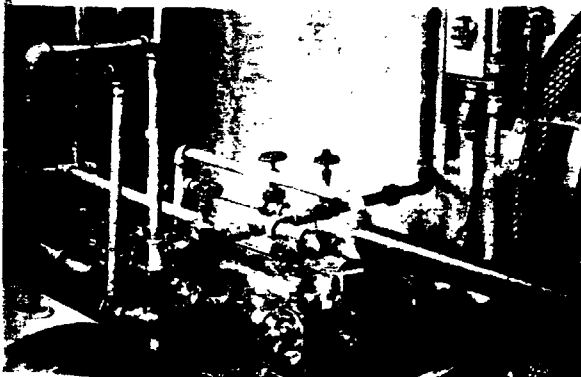
The list above does not include all the Cast Iron Screwed Fittings manufactured by Crane. For greater convenience, the following fittings are shown in other sections of this catalog:

Bushings.....page 169
Plugs.....page 168
Flange Unions.....page 185
Floor Flanges.....page 207
Companion Flanges.....pages 206 to 208

Drainage Fittings.....pages 161 to 166
Steel Pipe Couplings.....page 172
Wrought Steel Nipples.....pages 170 and 171
Unions and Union Fittings.....pages 175 to 187

Malleable Iron Screwed Fittings.....pages 141 to 150
Steel Screwed Fittings.....pages 255 to 260
How to read reducing fittings.....page 562

14



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 Inches	90° Elbows								45° Elbows		Tees			
	Straight				*Reducing						Straight		*Reducing	
	Right Hand	Right & Left	Pitched		Right Hand	Pitched					Black	Galv.	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	.31	.62	.39	.78	.43	.86
1	.34	.68	.38	.76	.36	.72	.38	.76	.43	.86	.38	.76	.44	.88
1 1/4	.44	.88	.48	.96	.48	.96	.48	.96	.53	1.06	.48	.96	.66	1.32
1 1/2	.60	1.20	.66	1.32	.68	1.36	.69	1.38	.76	1.52	.68	1.36	.82	1.64
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
2 1/2	1.45	2.90					1.55	3.10			1.55	3.10	1.85	3.70
3	2.20	4.40					2.50	5.00			2.40	4.80	2.80	5.60
3 1/2	3.10	6.20					3.30	6.60			3.30	6.60	4.35	8.70
4	4.00	8.00					4.30	8.60			4.50	9.00	5.40	10.80
5	6.85	13.70					7.50	15.00			7.50	15.00	9.40	18.80
6	9.00	18.00					10.30	20.60			10.00	20.00	12.00	24.00
8	18.50	37.00					20.00	40.00			20.00	40.00	25.00	50.00

Wide assortment: The Crane line of 125-Pound Cast Iron Fittings is illustrated on pages 152 to 158. 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 158, 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 propor-

tion 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 152 to 158 are listed as approved and inspected by the Underwriters' Laboratories, Chicago, for sprinkler service.

***Pricing reducing fittings:** The prices of reducing fittings and of reducers apply only to the regularly listed sizes shown on pages 154 to 157. 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 154 to 157.

Iron Plugs and Bushings... pages 168 and 169
Cast Iron Flanged Fittings and Flanges... pages 199 to 208

Cast Iron Flange Unions... page 185

125-Pound Cast Iron Fittings

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



Cross



45° Y-Bend



Reducer



Eccentric Reducer



Cap



Locknut

For description,
see opposite page.

List Prices, Each

Size Inches	Crosses				45° Y-Bends		*Reducers (Concentric)		*Eccentric Reducers		Caps		Locknuts	
	Straight		*Reducing		Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
3/4	.47	.94			.84	1.68	.31	.62						
1	.66	1.32			1.00	2.00	.37	.74						
1 1/4	.88	1.76			1.30	2.60	.62	1.24	1.20	2.40				
1 1/2	1.10	2.20	1.30	2.60	1.70	3.40	.87	1.74	1.50	3.00				
2	1.75	3.50	2.10	4.20	2.20	4.40	1.20	2.40	2.20	4.40				
2 1/2	2.80	5.60	3.30	6.60	4.00	8.00	1.60	3.20	2.80	5.60				
3	4.50	9.00	5.20	10.40	5.60	11.20	2.00	4.00	3.45	6.90				
3 1/2			7.25	14.50					4.35	8.70				
4	7.80	15.60	9.00	18.00	9.50	19.00	3.45	6.90	5.60	11.20	1.85	3.70	1.25	2.50
5	14.00	28.00	16.00	32.00			5.00	10.00	7.80	15.60	3.00	6.00		
6	18.00	36.00	22.00	44.00			6.60	13.20	10.50	21.00	3.75	7.50		
8			45.00	90.00			14.50	29.00	20.00	40.00	8.00	16.00		

For smaller
sizes, use
Malleable Iron.
See page 142.

For smaller
sizes, use
Malleable Iron
See page 143

.63 1.26
.78 1.56

Return Bends

Size Inches	List Prices		Dimensions, In Inches	
	Black Each	Galv. Each	Center to Center	Face of openings to back
Close Pattern, Right Hand				
1 1/2	.50	1.00	1 1/4	1 23/32
3/4	.55	1.10	1 1/2	2 1/32
1	.70	1.40	1 3/4	2 3/8
1 1/4	.90	1.80	2 1/4	2 29/32
1 1/2	1.15	2.30	2 1/2	3 1/4
2	1.90	3.80	3 1/4	3 31/32
Open Pattern, Right Hand				
3/4	.62	1.24	1 7/8	2 7/32
1	.78	1.56	2 1/2	2 11/16
1 1/4	1.10	2.20	3	3 9/32
1 1/2	1.40	2.80	3 1/2	3 3/4
2	2.30	4.60	4 1/2	4 19/32
2 1/2	3.75	7.50	5 1/2	5 7/16
3	6.00	12.00	6 1/2	6 5/16
Open Pattern, Right and Left				
1	.82	1.64	2 1/2	2 11/16
1 1/4	1.15	2.30	3	3 9/32
1 1/2	1.50	3.00	3 1/2	3 3/4
Special Wide Pattern, Right Hand				
1 3/4	1.20	2.40	3	3
2	1.25	2.50	4	3 1/2
2 1/4	1.60	3.20	4	3 3/4
2 3/4	2.00	4.00	6	4 3/4
3 1/4	2.25	4.50	6	5
4	3.25	6.50	6	5 5/16

Return Bend
Close PatternReturn Bend
Open Pattern

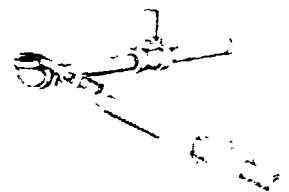
Close pattern return bends cannot be used to make up parallel coils. The center to center dimension is so close that the bands of adjacent bends will not clear each other.

For cast iron return bends with union ends and for other iron ammonia type return bends, see pages 397 and 398.

***Pricing reducing fittings:** The prices of reducing fittings and of reducers apply only to the regularly listed sizes shown on pages 154 to 157. Other sizes are special; prices on application.

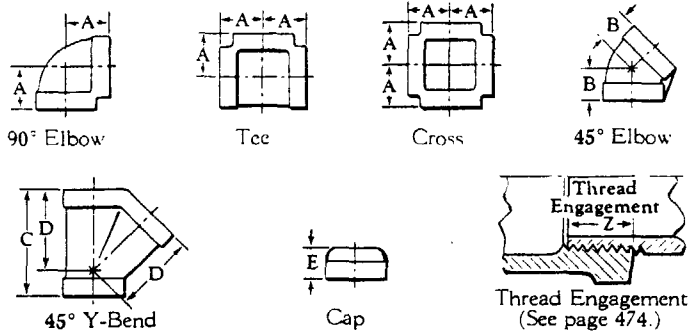
Never use a "Hickey"!

Never slip a piece of pipe over the wrench handle to get extra leverage when making up a joint. Sharp, clean threads, well lubricated, will only make up so far because of their taper, and the additional power secured with the extra length handle will result in distorted valves stretched fittings, crushed pipe, or other damage. The only safe place to use a "hickey" is on a stubborn joint when taking down a line.



125-Pound Cast Iron Fittings

Dimensions of Straight Sizes, in Inches

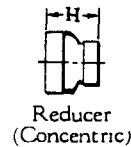
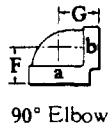


The engagement normally required to make a tight joint between male and female pipe threads is shown as dimension "Z" in the table; it applies to all 125-Pound Cast Iron Fittings.

Size	A	B	C	D	E	Z
1/4	13/16	3/4				3/8
3/8	15/16	13/16				3/8
1/2	1 1/8	7/8				1/2
3/4	1 5/16	1	3	2 1/4		9/16
1	1 1/2	1 1/8	3 1/2	2 3/4		1 1/16
1 1/4	1 3/4	1 5/16	4 1/4	3 1/4		1 1/16
1 1/2	1 15/16	1 7/16	4 7/8	3 13/16		1 1/16
2	2 1/4	1 11/16	5 3/4	4 1/2		3/4
2 1/2	2 11/16	1 15/16	6 3/4	5 3/16		15/16
3	3 1/8	2 3/16	7 7/8	6 1/8		1
3 1/2	3 7/16	2 3/8				1 1/16
4	3 3/4	2 5/8	9 3/4	7 5/8	2 1/16	1 1/8
5	4 1/2	3 1/16			2 3/8	1 1/4
6	5 1/8	3 7/16			2 5/8	1 5/16
8	6 9/16	4 1/4			3 1/8	1 7/16

List of Sizes of Reducing Elbows and Reducers and Dimensions, in Inches

90° Elbows		
Size a b	F	G
1/2 x 3/8	1 1/16	1 1/16
3/4 x 1/2	1 3/16	1 1/4
1 x 3/4	1 5/16	1 3/8
1 x 1/2	1 1/4	1 5/16
1 1/4 x 1	1 9/16	1 5/8
1 1/4 x 3/4	1 7/16	1 9/16
1 1/4 x 1/2	1 7/16	1 9/16
1 1/2 x 1 1/4	1 3/4	1 13/16
1 1/2 x 1	1 5/8	1 3/4
1 1/2 x 3/4	1 5/8	1 3/4
1 1/2 x 1/2	1 5/8	1 13/16
2 x 1 1/2	2	2 1/8
2 x 1 1/4	1 15/16	2 1/16
2 x 1	1 3/4	2
2 x 3/4	1 3/4	2
2 x 1/2	1 3/4	2
2 1/2 x 2	2 1/2	2 9/16
2 1/2 x 1 1/2	2 1/4	2 7/16
2 1/2 x 1 1/4	2 1/4	2 7/16
2 1/2 x 1	2 1/4	2 7/16
3 x 2 1/2	2 3/4	3
3 x 2	2 9/16	2 15/16
3 x 1 1/2	2 9/16	2 15/16
3 x 1 1/4	2 9/16	2 15/16
3 1/2 x 3	3 7/16	3 7/16
4 x 3 1/2	3 3/4	3 3/4
4 x 3	3 1/4	3 11/16
4 x 2 1/2	3 1/4	3 11/16
4 x 2	2 3/4	3 1/2
5 x 4	3 15/16	4 5/16
5 x 3	3 7/16	4 1/4
5 x 2 1/2	3 7/16	4 1/4
6 x 5	4 5/8	5 1/16
6 x 4	4 1/8	4 15/16
6 x 3	4 1/8	4 15/16
8 x 6	5 1/2	6 5/16



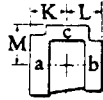
The prices of Reducing 90° Elbows and of Reducers shown on pages 152 and 153 apply only to the sizes listed here; the size of the larger opening determines the price.

90° Elbows, Pitched		
Size a b	F	G
3/4 x 1/2	1 3/16	1 1/4
1 x 3/4	1 5/16	1 3/8
1 1/4 x 1	1 9/16	1 5/8
1 1/2 x 1 1/4	1 3/4	1 13/16
2 x 1 1/2	2	2 1/8

Reducers (Concentric)	
Size	H
3/4 x 1/2	1 1/2
1 x 3/4	1 7/8
1 x 1/2	1 11/16
1 1/4 x 1	2 1/8
1 1/2 x 1 1/4	2 1/4
2 x 1 1/2	2 7/16
2 x 1 1/4	2 7/16
2 x 1	2 7/16
2 1/2 x 2	2 5/8
3 x 2 1/2	2 7/8
3 x 2	2 7/8
4 x 3 1/2	3 3/8
4 x 3	3 3/8
4 x 2 1/2	3 3/8
4 x 2	3 3/8
5 x 4	3 7/8
6 x 5	4 3/8
6 x 4	4 3/8
8 x 6	5 1/4

Eccentric Reducers			
Size	J	Size	J
1 1/4 x 1	2 1/8	3 1/2 x 1 1/4	3 1/8
1 1/4 x 3/4	2 1/8	3 1/2 x 1	3 1/8
1 1/2 x 1 1/4	2 1/4	4 x 3 1/2	3 3/16
1 1/2 x 1	2 1/4	4 x 3	3 3/8
1 1/2 x 3/4	2 1/4	4 x 2 1/2	3 3/8
2 x 1 1/2	2 7/16	4 x 2	3 3/8
2 x 1 1/4	2 7/16	4 x 1 1/2	3 3/8
2 x 1	2 7/16	4 x 1 1/4	3 3/8
2 x 3/4	2 7/16	4 x 1	3 3/8
2 1/2 x 2	2 11/16	5 x 4	3 7/8
2 1/2 x 1 1/2	2 11/16	5 x 3 1/2	3 7/8
2 1/2 x 1 1/4	2 11/16	5 x 3	3 7/8
2 1/2 x 1	2 11/16	5 x 2 1/2	3 7/8
2 1/2 x 3/4	2 11/16	5 x 2	3 7/8
3 x 2 1/2	2 15/16	6 x 5	4 3/8
3 x 2	2 15/16	6 x 4	4 3/8
3 x 1 1/2	2 15/16	6 x 3 1/2	4 3/8
3 x 1 1/4	2 15/16	6 x 3	4 3/8
3 x 1	2 15/16	6 x 2 1/2	4 3/8
3 1/2 x 3	3 1/8	8 x 6	5 1/4
3 1/2 x 2 1/2	3 1/8	8 x 5	5 1/4
3 1/2 x 2	3 1/8		
3 1/2 x 1 1/2	3 1/8		

125-Pound Cast Iron Fittings

List of Sizes of
Reducing Tees
and
Dimensions, in Inches

Reducing Tee

The prices of Reducing Tees on page 152 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				K	L	M
a	b	c				
1 1/4 x 3/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	3/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1 1/4 x 1/2	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1 1/2 x 1 1/4	1 1/2	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	3/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1/2	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1 1/2 x 1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
1 1/2 x 1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
1 1/2 x 3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
1 1/4 x 1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
2 x 2	2	2	2	2	2	2
	1 1/4	2	2	2	2	2
	1	2	2	2	2	2
	3/4	2	2	2	2	2
	1/2	2	2	2	2	2
2 x 1 1/2	2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
2 x 1	2	1	1	1	1	1
	1 1/4	1	1	1	1	1
	1 1/2	1	1	1	1	1
	1	1	1	1	1	1
	3/4	1	1	1	1	1
	1/2	1	1	1	1	1
2 x 3/4	2	3/4	3/4	3/4	3/4	3/4
	1/2	3/4	3/4	3/4	3/4	3/4
	1/2 x 1 1/2	2	2	2	2	2
1 1/2 x 1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
1 1/4 x 1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
2 1/2 x 2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
	1 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
	1 1/4	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
	1	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
	3/4	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
	1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
2 1/2 x 2	2 1/2	2	2	2	2	2
	1 1/2	2	2	2	2	2
	1 1/4	2	2	2	2	2
	1	2	2	2	2	2
	3/4	2	2	2	2	2
	1/2	2	2	2	2	2
2 1/2 x 3 1/2	2 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1 1/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	3/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
3 1/2 x 3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	2 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1 1/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	3/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
	1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2

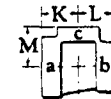
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125-Pound Cast Iron Fittings

Size				K	L	M	Size				K	L	M
a	b	c	a				b	c					
Continued from preceding page.							5	×5	×3	37/16	37/16	41/4	
3 1/2 × 3	×1 1/4	2 1/4	2 3/16	3				×2 1/2	3 3/8	3 3/8	43/16		
	×1	2 1/8	2 1/16	2 15/16				×2	27/8	27/8	41/16		
3 1/2 × 2 1/2 × 3 1/2		37/16	35/16	37/16				×1 1/2	25/8	25/8	315/16		
	×3	33/16	3 3/8	3 3/8				×1 1/4	2 1/2	2 1/2	37/8		
	×2 1/2	27/8	2 13/16	35/16		5	×4	×5	4 1/2	45/16	4 1/2		
	×2	25/8	25/16	33/16				×4	3 15/16	3 3/4	45/16		
3 1/2 × 2	×3 1/2	37/16	35/16	37/16				×3 1/2	3 3/4	3 1/2	45/16		
	×3	33/16	3 3/8	3 3/8				×3	3 1/2	3 1/2	45/16		
3 1/2 × 1 1/2 × 3 1/2		37/16	35/16	37/16				×2 1/2	33/16	33/16	4 1/4		
	×3	33/16	3 3/8	3 3/8				×2	2 15/16	2 11/16	4 1/8		
3 1/2 × 1 1/4 × 3 1/2		37/16	35/16	37/16				×1 1/2	2 11/16	27/16	4		
	×3	33/16	3 3/8	3 3/8				×1 1/4	2 11/16	27/16	4		
3 1/2 × 1	×3 1/2	37/16	35/16	37/16		5	×3 1/2 × 5	4 1/2	4 3/8	4 1/2			
3 × 3	×3 1/2	33/8	3 3/8	33/16			×4	4	4	4 3/8			
	×2 1/2 × 3 1/2	3 3/8	3 3/8	33/16			×3 1/2	3 3/4	3 1/2	45/16			
	×2	3 3/8	3 3/8	33/16			×3	3 1/2	3 1/2	45/16			
	×1 1/2 × 3 1/2	3 3/8	3 3/8	33/16		5	×3	×5	4 1/2	45/16	4 1/2		
2 1/2 × 2 1/2 × 3 1/2		35/16	35/16	2 7/8			×4	4	3 3/4	4 3/8			
4 × 4	×3 1/2	3 1/2	3 1/2	3 11/16			×3 1/2	3 3/4	3 1/2	45/16			
	×3	3 1/4	3 1/4	3 11/16		5	×2 1/2 × 5	4 1/2	4 1/4	4 1/2			
	×2 1/2	2 15/16	2 15/16	3 5/8			×4	4	3 3/4	4 3/8			
	×2	23/4	23/4	3 1/2		5	×2	×5	4 1/2	4 1/16	4 1/2		
	×1 1/2	2 1/2	2 1/2	3 3/8			×1 1/2 × 5	4 1/2	4 1/4	4 1/2			
	×1 1/4	2 3/8	2 3/8	3 1/4			×1 1/4 × 5	4 1/2	4 1/4	4 1/2			
	×1	2 3/16	2 3/16	3 3/16		4	×4	×5	45/16	45/16	3 15/16		
	×3/4	2 3/16	2 3/16	3 3/16			×3 1/2 × 5	4 3/8	45/16	4			
4 × 3 1/2 × 4		3 3/4	3 3/4	3 3/4			×3	×5	43/8	45/16	4		
	×3 1/2	3 1/2	37/16	3 11/16			×2 1/2 × 5	4 3/8	45/16	4			
	×3	3 1/4	3 1/4	3 5/8		3 1/2 × 3 1/2 × 5	45/16	45/16	45/16	3 3/4			
	×2 1/2	2 15/16	27/8	3 9/16			×3	×5	45/16	45/16	3 3/4		
	×2	2 11/16	25/8	3 1/2		3 × 3 × 5	45/16	45/16	45/16	3 3/4			
	×1 1/2	27/16	23/8	35/16		6	×6	×5	45/8	45/8	5 1/16		
	×1 1/4	25/16	2 1/4	35/16			×4	4 1/8	4 1/8	4 15/16			
	×1	25/16	2 1/4	35/16			×3 1/2	4 1/16	4 1/16	4 15/16			
4 × 3	×4	3 3/4	3 11/16	3 3/4			×3	3 5/8	3 5/8	47/8			
	×3 1/2	3 1/2	37/16	3 11/16			×2 1/2	35/16	35/16	4 13/16			
	×3	3 1/4	3 1/16	3 11/16			×2	3 1/16	3 1/16	4 11/16			
	×2 1/2	2 15/16	27/8	3 5/8			×1 1/2	27/8	27/8	4 9/16			
	×2	23/4	29/16	3 1/2			×1 1/4	27/8	27/8	4 9/16			
4 × 2 1/2 × 4		3 3/4	3 5/8	3 3/4			×1	29/16	29/16	4 7/8			
	×3 1/2	3 1/2	37/16	3 11/16		6	×5	×6	5 1/8	5 1/8	5 1/8		
	×3	3 1/4	3 3/8	3 5/8			×5	4 5/8	47/16	5 1/16			
	×2 1/2	2 15/16	2 13/16	3 9/16			×4	4 1/8	3 15/16	4 15/16			
4 × 2	×4	3 3/4	3 1/2	3 3/4			×3 1/2	4 1/16	4	4 15/16			
	×3 1/2	3 3/4	3 1/2	3 3/4			×3	3 5/8	3 5/8	47/8			
	×3	3 1/4	2 15/16	3 11/16			×2 1/2	35/16	3 1/8	45/8			
	×2	23/4	29/16	3 1/2			×2	3 1/16	27/8	4 11/16			
4 × 1 1/2 × 4		3 3/4	3 3/8	3 3/4			×1 1/2	2 3/4	2 3/4	4 1/2			
	×1 1/4 × 4	3 3/4	3 1/4	3 3/4			×1 1/4	2 5/8	2 5/8	4 7/16			
	×1 × 4	3 3/4	3 1/4	3 3/4		6	×4	×6	5 1/8	4 15/16	5 1/8		
3 1/2 × 3 1/2 × 4		3 11/16	3 11/16	3 1/2			×5	4 5/8	47/16	5 1/16			
	×3 × 4	3 11/16	3 11/16	3 1/2			×4	4 1/8	3 3/4	4 15/16			
	×2 1/2 × 4	3 11/16	3 11/16	3 1/2			×3	3 9/16	3 9/16	4 13/16			
	×2 × 4	3 11/16	3 11/16	3 1/2		6	×3 1/2 × 6	5 1/8	4 15/16	5 1/8			
3 × 3 × 4		3 11/16	3 11/16	3 1/4			×5	4 5/8	4 1/2	5			
	×2 1/2 × 4	3 5/8	3 5/8	3 1/4		6	×3	×6	5 1/8	47/8	5 1/8		
2 1/2 × 2 1/2 × 4		3 5/8	3 5/8	2 15/16			×5	4 5/8	4 1/2	5			
2 × 2 × 4		3 5/8	3 5/8	2 15/16			×4	4 1/16	4	4 15/16			
5 × 5	×4	3 15/16	3 15/16	4 5/16			×3	3 9/16	3 9/16	4 13/16			
	×3 1/2	4	4	4 3/8		6	×2 1/2 × 6	5 1/8	47/8	5 1/8			

List of Sizes of Reducing Tees and Dimensions, in Inches

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Reducing Tee

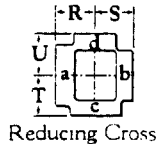
The prices of Reducing Tees on page 152 apply only to the sizes listed here and on the preceding page; the size of the largest opening determines the price.

When ordering, always name the size of openings in the sequence of the lower case letters shown on the illustration above.

Size			K	L	M
a	b	c			
6	×2	×6	5 1/8	4 11/16	5 1/8
	×1 1/2 × 6		5 1/8	4 13/16	5 1/8
	×1 1/4 × 6		5 1/8	4 13/16	5 1/8
5	×5	×6	5 1/16	5 1/16	4 5/8
	×4	×6	5	5	4 5/8
	×3 1/2 × 6		5	4 7/8	4 5/8
	×3	×6	5	4 7/8	4 5/8
4	×4	×6	4 15/16	4 15/16	4 1/8
	×3 1/2 × 6		4 15/16	4 15/16	4 1/16
8	×8	×6	5 1/2	5 1/2	6 5/16
	×5		4 15/16	4 15/16	6 3/16
	×4		4 7/16	4 7/16	6 1/8
	×3 1/2		4 1/2	4 1/2	6 1/8
	×3		4 1/2	4 1/2	6 1/8
	×2 1/2		3 11/16	3 11/16	6
	×2		37/16	37/16	5 7/8
8	×6	×8	6 9/16	6 9/16	6 9/16
	×6		5 9/16	5 9/16	6 3/8
	×5		5 9/16	5 9/16	6 3/8
	×4		4 1/2	4 1/2	6 1/8
8	×5	×5	5 9/16	5 9/16	6 3/8
	×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	5 1/2
	×5	×8	6 3/8	6 3/8	5 9/16
5	×5	×8	6 3/8	6 3/8	5 9/16

125-Pound Cast Iron Fittings

List of Sizes of Reducing Crosses and Dimensions, in Inches



The prices of Reducing Crosses on page 153 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 $2\frac{1}{2}$ ", "b" is 2", and "c" and "d" are 1", the size is written: $2\frac{1}{2} \times 2 \times 1 \times 1$ ".

Size					R	S	T	U	Size					R	S	T	U
a	b	c	d						a	b	c	d					
$1\frac{1}{2}$	$1\frac{1}{2}$	1	1		$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$3\frac{1}{2} \times 3$	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{1}{4}$	$2\frac{1}{4}$	3	3
	$1\frac{1}{4}$	1	1		$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{13}{16}$	$1\frac{13}{16}$		1	1			$2\frac{1}{4}$	$2\frac{1}{4}$	3	3
2	2	$1\frac{1}{4}$	$1\frac{1}{4}$		$1\frac{3}{4}$	$1\frac{3}{4}$	2	2	4	4	$3\frac{1}{2} \times 3\frac{1}{2}$			$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$
	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$		$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{1}{16}$	$2\frac{1}{16}$		3	3			$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{5}{8}$
	$1\frac{1}{2}$	1	1		$1\frac{3}{4}$	$1\frac{3}{4}$	2	2		$2\frac{1}{2} \times 2\frac{1}{2}$				$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$
$2\frac{1}{2} \times 2\frac{1}{2}$	2				$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$		$2\frac{1}{2} \times 2$				$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$		2	2			$2\frac{11}{16}$	$2\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$
	$1\frac{1}{2}$	$1\frac{1}{4}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$		2	$1\frac{1}{2}$			$2\frac{11}{16}$	$2\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{7}{16}$	$2\frac{7}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
	$1\frac{1}{4}$	1			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		$1\frac{1}{4} \times 1\frac{1}{4}$				$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
	1	1			$1\frac{5}{16}$	$1\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$		1	1			$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
$2\frac{1}{2} \times 2$	2	2			$2\frac{7}{16}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{9}{16}$		$3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$				$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$		$2\frac{1}{2} \times 1$				$2\frac{11}{16}$	$2\frac{11}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		2	2			$2\frac{11}{16}$	$2\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$
	$1\frac{1}{4}$	1			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		2	$1\frac{1}{2}$			$2\frac{11}{16}$	$2\frac{11}{16}$	$3\frac{1}{2}$	$3\frac{1}{2}$
	1	1			$1\frac{5}{16}$	$1\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{7}{16}$	$2\frac{7}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
$2\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{7}{16}$		$1\frac{1}{2} \times 1$				$2\frac{7}{16}$	$2\frac{7}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		$1\frac{1}{4} \times 1\frac{1}{4}$				$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
	$1\frac{1}{4}$	1			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$		$1\frac{1}{4} \times 1$				$2\frac{5}{16}$	$2\frac{5}{16}$	$3\frac{5}{16}$	$3\frac{5}{16}$
3	3	$2\frac{1}{2} \times 2\frac{1}{2}$			$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$		4	3	$2\frac{1}{2} \times 2$		$2\frac{15}{16}$	$2\frac{15}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$
	2	2			$2\frac{9}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$		5	5	4	4	4	4	$4\frac{3}{8}$	$4\frac{3}{8}$
	2	$1\frac{1}{2}$			$2\frac{9}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$			$3\frac{1}{2} \times 3\frac{1}{2}$			4	4	$4\frac{3}{8}$	$4\frac{3}{8}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$		3	3			$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{16}$	$4\frac{5}{16}$
	$1\frac{1}{2}$	$1\frac{1}{4}$			$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$		$2\frac{1}{2} \times 2\frac{1}{2}$				$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$2\frac{3}{4}$		$2\frac{1}{2} \times 2$				$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$
	$1\frac{1}{4}$	1			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$2\frac{3}{4}$		2	2			$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$
	1	1			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$		2	$1\frac{1}{2}$			$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$
$3 \times 2\frac{1}{2} \times 2\frac{1}{2}$	2	2			$2\frac{13}{16}$	$2\frac{13}{16}$	$3\frac{1}{16}$	$3\frac{1}{16}$		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{11}{16}$	$2\frac{11}{16}$	4	4
	2	$1\frac{1}{2}$			$2\frac{9}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$		$1\frac{1}{2} \times 1\frac{1}{4}$				$2\frac{11}{16}$	$2\frac{11}{16}$	4	4
	2	$1\frac{1}{4}$			$2\frac{9}{16}$	$2\frac{9}{16}$	$2\frac{15}{16}$	$2\frac{15}{16}$		$1\frac{1}{4} \times 1\frac{1}{4}$				$2\frac{9}{16}$	$2\frac{9}{16}$	$3\frac{15}{16}$	$3\frac{15}{16}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{13}{16}$	$2\frac{13}{16}$		5	4	3	3	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{16}$	$4\frac{5}{16}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$2\frac{3}{4}$		$2\frac{1}{2} \times 2\frac{1}{2}$				$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$
	$1\frac{1}{4}$	1			$2\frac{3}{16}$	$2\frac{3}{16}$	$2\frac{3}{4}$	$2\frac{3}{4}$		$2\frac{1}{2} \times 2$				$3\frac{3}{16}$	$3\frac{3}{16}$	$4\frac{1}{4}$	$4\frac{1}{4}$
	1	1			$2\frac{1}{16}$	$2\frac{1}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$		2	2			$2\frac{15}{16}$	$2\frac{15}{16}$	$4\frac{1}{8}$	$4\frac{1}{8}$
$3\frac{1}{2} \times 3\frac{1}{2}$	3	3			$3\frac{3}{16}$	$3\frac{3}{16}$	$3\frac{3}{8}$	$3\frac{3}{8}$		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{11}{16}$	$2\frac{11}{16}$	4	4
	$2\frac{1}{2} \times 2\frac{1}{2}$				$2\frac{7}{8}$	$2\frac{7}{8}$	$3\frac{5}{16}$	$3\frac{5}{16}$		6	6	5	5	$4\frac{5}{8}$	$4\frac{5}{8}$	5	5
	2	2			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$			4	4		$4\frac{1}{16}$	$4\frac{1}{16}$	$4\frac{15}{16}$	$4\frac{15}{16}$
	2	$1\frac{1}{2}$			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$		$3\frac{1}{2} \times 3\frac{1}{2}$				$4\frac{1}{16}$	$4\frac{1}{16}$	$4\frac{15}{16}$	$4\frac{15}{16}$
	2	$1\frac{1}{4}$			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$		3	3			$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$	$4\frac{13}{16}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$		$2\frac{1}{2} \times 2\frac{1}{2}$				$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$
	$1\frac{1}{2}$	$1\frac{1}{4}$			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$		$2\frac{1}{2} \times 2$				$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$
	$1\frac{1}{2}$	1			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$		2	2			3	3	$4\frac{5}{8}$	$4\frac{5}{8}$
	$1\frac{1}{4}$	$1\frac{1}{4}$			$2\frac{1}{4}$	$2\frac{1}{4}$	3	3		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{3}{4}$	$2\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$
	1	1			$2\frac{1}{4}$	$2\frac{1}{4}$	3	3		$1\frac{1}{4} \times 1\frac{1}{4}$				$2\frac{5}{8}$	$2\frac{5}{8}$	$4\frac{7}{16}$	$4\frac{7}{16}$
$3\frac{1}{2} \times 3$	$2\frac{1}{2} \times 2\frac{1}{2}$				$2\frac{7}{8}$	$2\frac{7}{8}$	$3\frac{5}{16}$	$3\frac{5}{16}$		6	5	3	3	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{13}{16}$	$4\frac{13}{16}$
	$2\frac{1}{2} \times 2$				$2\frac{7}{8}$	$2\frac{7}{8}$	$3\frac{5}{16}$	$3\frac{5}{16}$			2	2		3	3	$4\frac{5}{8}$	$4\frac{5}{8}$
	2	2			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$		$1\frac{1}{2} \times 1\frac{1}{2}$				$2\frac{3}{4}$	$2\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$
	2	$1\frac{1}{2}$			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$		8	8	6	6	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$	$6\frac{3}{8}$
	2	$1\frac{1}{4}$			$2\frac{5}{8}$	$2\frac{5}{8}$	$3\frac{3}{16}$	$3\frac{3}{16}$			5	5		$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{3}{8}$	$6\frac{3}{8}$
	$1\frac{1}{2}$	$1\frac{1}{2}$			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$			4	4		$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$	$6\frac{1}{8}$
	$1\frac{1}{2}$	$1\frac{1}{4}$			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$		8	6	4	4	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$	$6\frac{1}{8}$
	$1\frac{1}{2}$	1			$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$									

List prices... pages 152 and 153
Description... pages 152 and 153
Thread engagement... page 154
Iron Plugs... page 168
Iron Bushings... page 169

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
		Galv.	11.00	13.00	17.00	19.00	24.00	30.00
	45° Short Turn, Flanged and Screwed	Black	6.00	7.00	9.00	10.00	13.00	18.00
		Galv.	12.00	14.00	18.00	20.00	26.00	35.00
Tees, Long Turn	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.

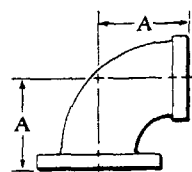
The fittings are primarily used in sprinkler piping, but they are equally well suited for other services where combination screwed and flanged iron fittings for 125 pounds steam or for 175 pounds water are needed.

Flanged ends: On flanged ends, the dimensions and drilling of the flange conforms to the American Cast

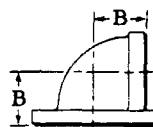
Iron Flange Standard, Class 125 (B16.1-1948). The flange is plain faced, with a smooth finish, and is regularly furnished faced and drilled.

Underwriters' approved: These fittings are listed as approved and inspected by the Underwriters' Laboratories, Chicago, for sprinkler service.

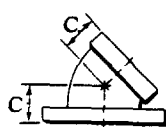
Other sprinkler items: The Crane line includes a wide variety of items suitable for sprinkler piping. Cast Iron Screwed Fittings are shown in this section, pages 151 to 159; Cast Iron Flanged Fittings and Flanges are shown on pages 199 to 208; for other Underwriters' items, see the alphabetical index.



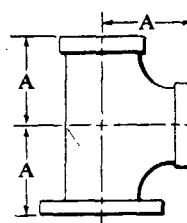
90° Long Turn Elbow



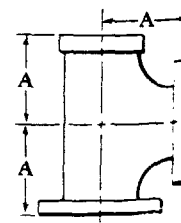
90° Short Turn Elbow



45° Short Turn Elbow



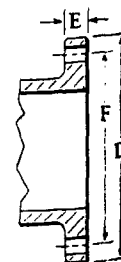
Long Turn Tee



Long Turn Tee

Dimensions, in Inches

Size	Inches	2½	3	3½	4	5	6	8
A		5			6½	7½	9	
B		2½	3½	3¾	4½	5½	6½	8
C		1½	2½	2¾	3½	4½	5½	7
D		7	7½	8½	9	10	11	13½
E		1½	¾	1¾	1½	1½	1	1½
F		5½	6	7	7½	8½	9½	11¾
No. of bolts		4	4	8	8	8	8	8
Dia. of bolts		¾	¾	¾	¾	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.

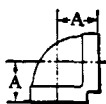
Rugged Construction: Crane 250-Pound Cast Iron Fittings are of the Short Pattern. They are unusually rugged and have a high factor of safety above the recommended working pressure.

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.

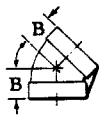
Sprinkler service; Underwriters' approved: Crane 250-Pound Cast Iron Fittings are listed as approved and inspected by the Underwriters' Laboratories, Chicago, for sprinkler service.

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.

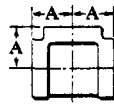
Dimensions, in Inches



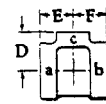
No. 182 E
90° Elbow



No. 186 E
45° Elbow

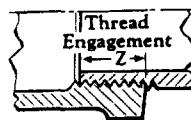


No. 188 E
Tee, Straight



No. 190 E
Tee, Reducing

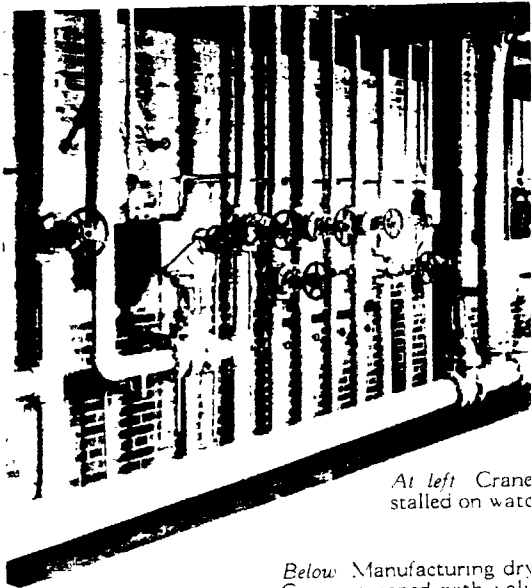
Size	A	B	Z
1/4	1 1/4		5/8
3/8	1 3/8		3/4
1/2	1 1/4	1	1/2
3/4	1 7/8	1 1/8	9/16
1	1 5/8	1 5/16	11/16
1 1/4	2	1 1/2	11/16
1 1/2	2 1/8	1 11/16	11/16
2	2 1/2	2	3/4
2 1/2	2 15/16	2 1/4	15/16
3	3 3/8	2 1/2	1
3 1/2	3 3/4	2 9/16	1 1/16
4	4 1/8	2 13/16	1 1/8
5	4 7/8	3 3/16	1 1/4
6	5 5/8	3 11/16	1 5/16
8	7	4 5/8	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 474 and 475 for explanation.

Size	D	E	F
a b c			
3/4 x 3/4 x 1/2	1 3/8	1 5/16	1 5/16
1 x 1 x 3/4	1 9/16	1 1/2	1 1/2
1 x 1 x 1/2	1 9/16	1 1/2	1 1/2
1 1/4 x 1 1/4 x 1	1 13/16	1 3/4	1 3/4
1 1/4 x 1 1/4 x 3/4	1 13/16	1 3/4	1 3/4
1 1/2 x 1 1/2 x 1 1/4	2 1/16	2	2
1 1/2 x 1 1/2 x 1	2 1/16	2	2
1 1/2 x 1 1/2 x 3/4	2	1 7/8	1 7/8
2 x 2 x 1 1/2	2 3/8	2 1/4	2 1/4
2 x 2 x 1 1/4	2 3/8	2 1/4	2 1/4
2 x 2 x 1	2 3/8	2	2
2 x 2 x 3/4	2 3/8	2	2

When specifying reducing tees, always name the size of openings in the sequence of the lower case letters, as shown above.



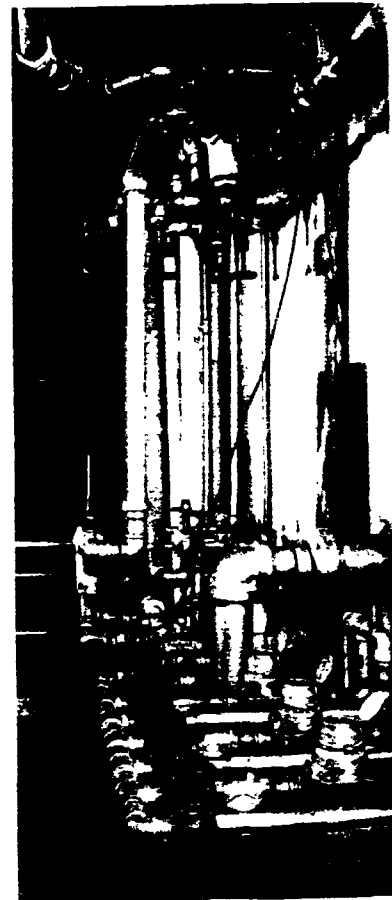
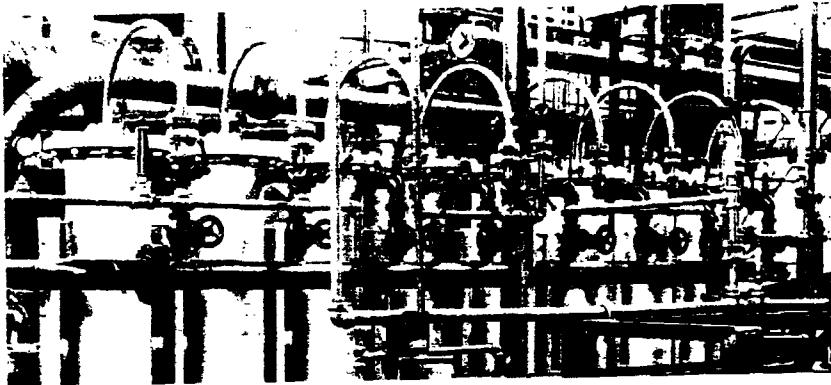
One Source

CRANE

*For Valves
For Fittings
For Pipe*

At left Crane Iron Gate Valves installed on water lines in an oil refinery.

Below: Manufacturing dry ice and carbon dioxide gas. Crane-equipped with valves, fittings, and pipe bends.



Small Crane valves and fittings satisfy many users. Illustrated above is a typical installation in a sewage disposal plant.

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*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 162 and 163
Tees.....	page 163
90° Y-Branches.....	page 164
45° Y-Branches.....	page 165
Couplings.....	page 163
Increasesers.....	page 163
Roof Connections.....	page 163
Tucker Connections.....	page 163
Traps.....	page 165
Crane-Hulbert Drainage Fittings.....	page 166

Other Cast Iron Screwed Fittings pages 151 to 159



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 passage-

way 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 $\frac{1}{4}$ inch per foot, assuring positive drainage; wherever practicable, the face of the pitched opening is tilted $\frac{1}{4}$ 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.

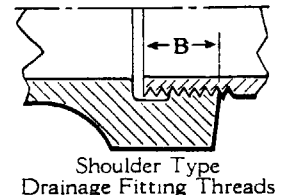
Brass Drainage Fittings also can be furnished on special order; prices on application.

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, B16.12-1942.

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.



Thread Engagement, in Inches										
Size	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10
B	5/8	5/8	5/8	7/8	15/16	1 1/16	1 3/16	1 1/4	1 3/8	1 9/16

Cast Iron Drainage Fittings



*No. 1000
90° Elbow



No. 1002
60° Elbow



No. 1003
45° Elbow



No. 1005
22½° Elbow



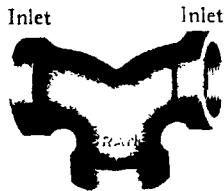
No. 1006
11¼° Elbow



*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				No. 1002 60° Elbows		No. 1003 45° Elbows		No. 1005 22½° Elbows		No. 1006 11¼° Elbows	
	Straight		†Reducing		Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
Inches	Black	Galv.	Black	Galv.								
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		No. 1009 90° Elbows with 2-inch Heel Outlet		No. 1010 Three-Way Elbows				No. 1057 90° Street Elbows		No. 1058 45° Street Elbows	
					Straight		†Reducing		Black	Galv.	Black	Galv.
Inches	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.				
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								

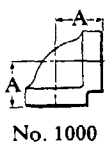
*Inlets are pitched ¼-inch per foot.

†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 de-

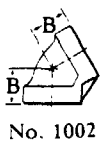
termines the price. When specifying, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations below.

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Dimensions, in Inches



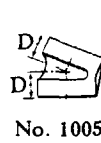
No. 1000



No. 1002



No. 1003



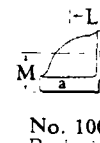
No. 1005



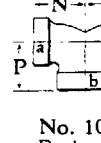
No. 1006



No. 1008

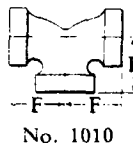


No. 1000
Reducing

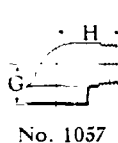


No. 1010
Reducing

Size	A	B	C	D	E	F	G	H	J	K
1¼	1¾	1⅞	1⅞	1⅞	1⅞	2¼	1⅞	2⅞	1⅞	1⅞
1½	1⅞	1¾	1⅞	1¾	1¼	2½	1⅞	2⅞	1¼	2
2	2¼	2⅞	1⅞	1⅞	1⅞	3¼	2⅞	3⅞	1¾	2⅞
2½	2⅞	2⅞	2⅞	2⅞	1¾	3⅞	2⅞	3⅞	1¾	2⅞
3	3⅞	2⅞	2⅞	2⅞	2	4⅞	2⅞	4⅞	2	2⅞
4	4⅞	3⅞	2⅞	2⅞	2	5⅞	2⅞	5⅞	2	2⅞
5	5⅞	4⅞	3⅞	3⅞		6⅞	2⅞	6⅞		
6	6⅞	5⅞	4⅞	4⅞		7⅞	2⅞	7⅞		
8	8⅞	6⅞	5⅞	5⅞		9⅞	2⅞	9⅞		
10	10⅞	8⅞	6⅞	6⅞		11⅞	2⅞	11⅞		



No. 1010



No. 1057



No. 1058

No. 1000, Reducing			
Size	a	b	
1½	1¼	1⅞	1⅞
2	1½	2⅞	2⅞
4	3	3¾	3¾

No. 1010, Reducing			
Size	a	b	
1¼	1½	2½	2⅞
1½	2	2⅞	2⅞

Cast Iron Drainage Fittings



No. 1001
90° Elbow
Long Turn



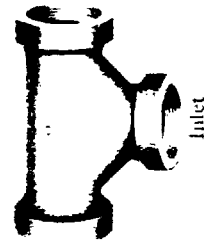
*No. 1001 1/2
90° Elbow
Extra Long Turn



No. 1004
45° Elbow
Long Turn



No. 1017, Tee



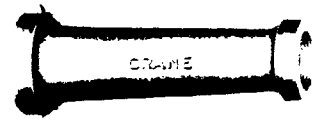
No. 1018, Basin Tee

*Inlets are pitched
1/4-inch per foot.

List Prices, Each

Size Inches	No. 1001 90° Elbows Long Turn		No. 1001 1/2 90° Elbows Extra Long Turn		No. 1004 45° Elbows Long Turn		No. 1017, Tees			
	Black	Galv.	Black	Galv.	Black	Galv.	Straight		†Reducing	
1 1/4	.75	.98	1.10	1.40	.75	.98	.85	1.10		
1 1/2	.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
2 1/2	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 Inches	No. 1018 Basin Tees		No. 1033 †Increases		No. 1034 Roof Connections		No. 1048 Tucker Connections		No. 1070 Couplings	
	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
1 1/4	1.20	1.60					1.45	1.90	.95	1.25
1 1/2	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
2 1/2									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



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.

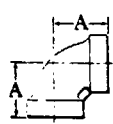


No. 1048
Tucker
Connection

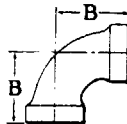
†Prices of Reducing Tees and Increases apply only to the sizes shown at the lower right; the size of the largest opening determines the price. When specifying reducing tees, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustration below.

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.

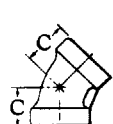
Dimensions, in Inches



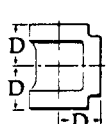
No. 1001



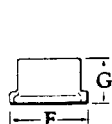
No. 1001 1/2



No. 1004



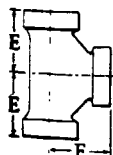
No. 1017



No. 1034



No. 1048



No. 1018

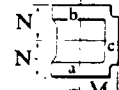


No. 1070

Size	A	B	C	D	E	F	G	H	J	K
1 1/4	2 1/4	3	1 3/4	1 3/4	2 5/16			3 1/4	3 3/4	3
1 1/2	2 1/2	3 1/2	1 7/8	1 5/8	2 11/16	2 7/8	3	3 1/2	4	3 3/8
2	3 1/16	4	2 1/4	2 5/16	3 1/2	3 13/16	2 1/2	3 3/8	4 1/2	3 3/4
2 1/2	3 11/16	4 1/2	2 1/2	2 11/16						4
3	4 1/4	5 1/4	2 5/8	3 1/8		4 15/16	3	5 5/16	4 3/4	4 1/4
4	5 3/16	6 1/4	3 1/2	3 3/16		6	3	6 5/8	7	4 1/2
5	6 1/8		4 1/8					7 13/16	7	4 3/4
6	7 1/8		4 7/8					9	7	5
8										5 5/8



No. 1033



No. 1017
Reducing

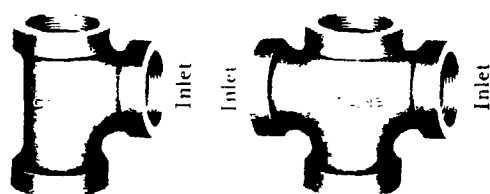
No. 1033 Increases	
Size	L
2 x 1 1/2	9
3 x 2	9
4 x 3	9
5 x 2	9
5 x 4	9
6 x 5	9
7 x 4	9

No. 1017 Reducing Tee				
Size			M	N
a	b	c		
1 1/2 x 1 1/2 x 1 1/4			1 15/16	1 15/16
2 x 2 x 1 1/2			2 3/16	2 1/32
2 x 2 x 1 1/4			2 3/16	2 1/32
2 1/2 x 2 1/2 x 2			2 5/8	2 13/32
3 x 3 x 2			2 7/8	2 17/32
3 x 3 x 1 1/2			2 7/8	2 17/32
4 x 4 x 3			3 3/4	3 1/2
4 x 4 x 2			3 7/16	2 3/4

Description . . . page 161

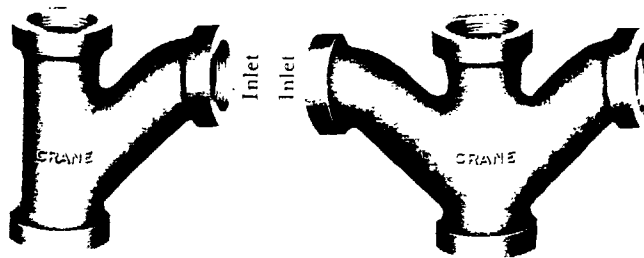
Thread engagement . . . page 474

Cast Iron Drainage Fittings



Tee Pattern
No. 1020 90° Y-Branch No. 1024 90° Double Y-Branch

All inlets on Y-Branches
are pitched $\frac{1}{4}$ -inch per foot.



Long Turn, Tee Pattern
No. 1022 90° Y-Branch No. 1026 90° Double Y-Branch

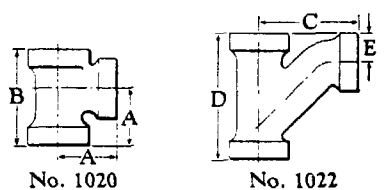
List Prices, Each

Size Inches	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	
	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
1 1/4	.85	1.10			1.45	1.90			1.55	2.00			2.30	3.00		
1 1/2	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	3.4
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	6.1
2 1/2	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	17.1
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,

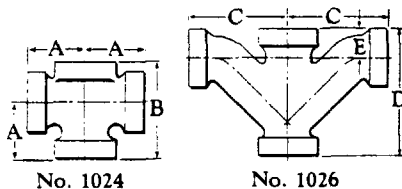
always name the size of openings in the sequence of the lower case letters shown on the dimensions illustrations below.

Dimensions, in Inches



No. 1020

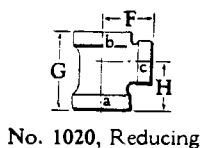
No. 1022



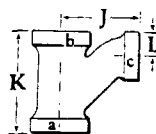
No. 1024

No. 1026

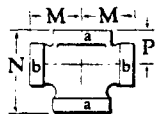
Size	A	B	C	D	E
1 1/4	2 1/4	3 3/4	3 5/8	4 3/4	1 1/8
1 1/2	2 1/2	4 1/4	4 1/8	5 3/8	1 1/4
2	3 1/16	5 3/16	5 1/4	7	1 3/4
2 1/2	3 11/16	6 5/16	6 1/4	8 1/4	2
3	4 1/4	7 1/4	7 1/2	9 7/8	2 3/8
4	5 3/16	8 3/4	9 7/8	13	3 1/8
5	6 1/8	10 5/16			
6	7 1/8	11 15/16			



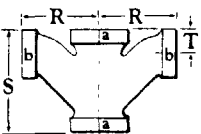
No. 1020, Reducing



No. 1022, Reducing



No. 1024, Reducing



No. 1026, Reducing

Reducing 90° Y-Branches

Size	No. 1020			No. 1022		
	a	b	c	F	G	H
1 1/2 x 1 1/2 x 1 1/4	2 1/2	3 7/8	2 3/8	3 7/8	5 1/8	1 3/4
2 x 2 x 1 1/2	2 15/16	4 5/8	2 11/16	4 3/8	5 3/4	1 5/8
2 x 1 1/2 x 1 1/4	2 13/16	4 3/8	2 11/16	4 3/8	5 3/4	1 5/8
2 x 1 1/2 x 1 1/2	2 15/16	4 5/8	2 11/16	4 3/8	5 3/4	1 5/8
2 1/2 x 2 1/2 x 2	3 5/16	5 1/2	3 1/4	5 3/4	7 3/8	1 5/8
3 x 3 x 2 1/2	3 5/8	5 11/16	3 5/16	6 1/16	7 9/16	1 5/8
3 x 3 x 1 1/2	3 5/16	5 1/16	2 15/16	5	5 15/16	1 5/8
3 x 3 x 1 1/4	3 5/16	5 1/16	2 15/16			
4 x 4 x 3	4 3/4	7 3/8	4 5/16	8 1/16	10	2 3/8
4 x 4 x 2	4 1/16	5 13/16	3 3/8	6 5/8	7 11/16	1 5/8
4 x 4 x 1 1/2	3 13/16	5 1/4	3	5 7/16	6 1/16	1 5/8
5 x 5 x 4	5 11/16	9 1/8	5 3/8			
6 x 6 x 5	6 5/8	10 9/16	6 1/4			
6 x 6 x 4	6 3/16	9 1/4	5 7/16			
Size	No. 1024			No. 1026		
	a	b	c	M	N	P
1 1/2 x 1 1/4	2 1/2	3 7/8	1 1/2	3 7/8	5 1/8	1 3/4
2 x 1 1/2	2 15/16	4 5/8	1 15/16	4 3/8	5 3/4	1 5/8
2 x 1 1/4	2 15/16	4 5/8	1 15/16	4 3/8	5 3/4	1 5/8
3 x 2	3 5/8	5 11/16	2 3/8	6 1/16	7 9/16	1 5/8
3 x 1 1/2	3 7/16	5 1/4	2 1/4			
4 x 2	4 1/16	5 13/16	2 7/16			
4 x 1 1/2	3 13/16	5 1/4	2 1/4			

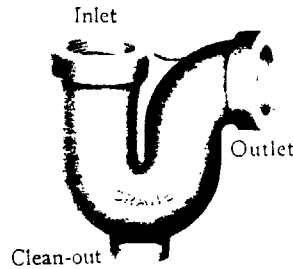
Cast Iron Drainage Fittings



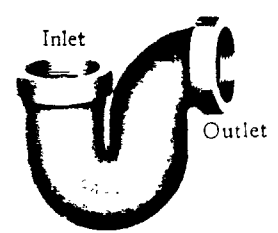
No. 1028
45° Y-Branch



No. 1030
45° Double Y-Branch



No. 1059
P Trap



No. 1059 1/2
Bath P Trap

List Prices, Each

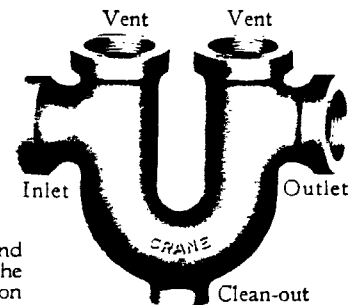
Size Inches	No. 1028 45° Y-Branches				No. 1030 45° Double Y-Branches			
	Straight		*Reducing		Straight		*Reducing	
	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
1 1/4	1.05	1.40			2.20	2.90		
1 1/2	1.50	2.00	1.65	2.15	2.80	3.65		
2	2.50	3.25	2.75	3.55	3.90	5.00	4.30	5.60
2 1/2	4.45	5.75	4.70	6.15	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 Inches	No. 1038 Running Traps		No. 1059 P Traps		No. 1059 1/2 Bath P Traps	
	Black	Galv.	Black	Galv.	Black	Galv.
	Black	Galv.	Black	Galv.	Black	Galv.
1 1/4	4.40	5.75	1.80	2.35		
1 1/2	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
2 1/2	14.00	18.00	7.00	9.10		
3	28.00	36.50	17.50	23.00		

The outlet on P and Bath P Traps and the inlet and outlet on Running Traps are pitched 1/4-inch per foot.

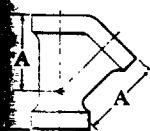
*The prices of Reducing 45° Y-Branches apply only to the sizes shown at the lower right; the size of the largest opening determines the price. When specifying, always name the size of openings in the sequence of the lower case letters shown on the dimensional illustrations below.

Description... page 161
Normal thread engagement... page 474

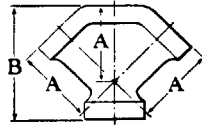


No. 1038
Running Trap

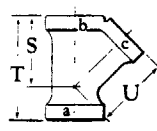
Dimensions, in Inches



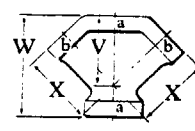
No. 1028



No. 1030

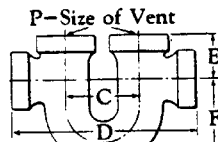


No. 1028, Reducing

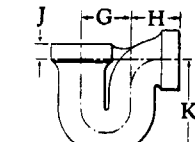


No. 1030, Reducing

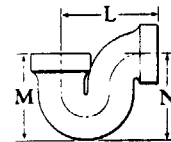
Size	A	B
1 1/4	3 1/4	5
1 1/2	3 5/8	5 1/2
2	4 3/8	6 1/2
2 1/2	5 3/8	7 7/8
3	6 3/16	9
4	7 11/16	10 7/8
5	9 3/16	12 5/16
6	10 3/4	14 3/4
8	13 9/16	18 13/16
10	16 1/2	23



No. 1038



No. 1059



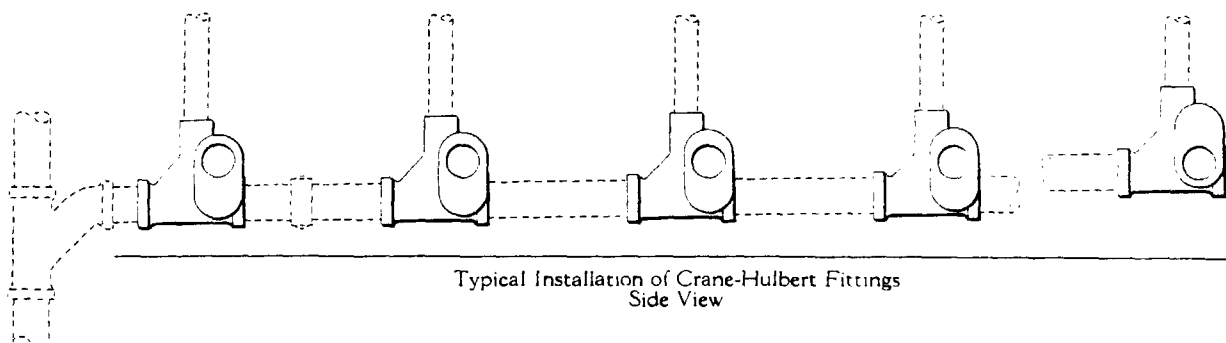
No. 1059 1/2

Size	C	D	E	F	G	H	J	K	L	M	N	P	Q
1 1/4	3 1/8	7 3/8	2	4 1/2	2	1 5/16	3/4	4 1/2				1 1/4	3/4
1 1/2	3 3/8	8 3/8	2 1/4	4 5/16	2 1/4	2 1/8	7/8	5	4 1/2	4 3/8	4 5/8	1 1/2	1
2	4	10 1/8	2 9/16	5 11/16	2 3/4	2 9/16	7/8	5 11/16	5 5/16	5 3/8	5 3/8	2	1
2 1/2	5 3/8	13 3/4	3 1/2	7 3/4	3 5/8	3 1/2	1 3/16	7 3/4				3	1 1/4
3	7	17 1/4	4 3/16	9 3/8	5	4 1/4	1 1/2	9 3/16				4	2

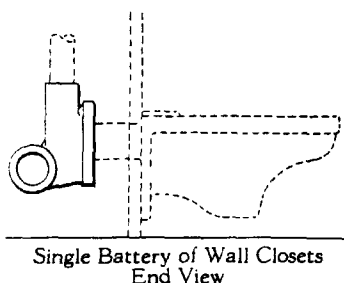
Reducing 45° Y-Branches		No. 1028			
Size		a	b	c	U
1 1/2 x 1 1/2 x 1 1/4		3 1/2	5 1/4	3 7/16	
2 x 2 x 1 1/2		4 1/16	5 7/8	4 1/8	
2 x 2 x 1 1/4		4 1/16	5 7/8	4 1/8	
2 x 1 1/2 x 1 1/2		3 5/8	5 7/16	3 5/8	
2 1/2 x 2 1/2 x 2		4 5/16	7 1/16	5 1/8	
2 1/2 x 2 1/2 x 1 1/2		4 9/16	6 7/16	4 5/8	
3 x 3 x 2 1/2		5 11/16	8	5 13/16	
3 x 3 x 2		5 5/16	7 3/8	5 3/8	
3 x 3 x 1 1/2		4 5/16	6 5/8	5 1/16	
4 x 4 x 3		6 7/8	9 1/4	7 3/16	
4 x 4 x 2		6	7 11/16	6 5/16	
4 x 4 x 1 1/2		5 3/4	7 3/16	6 1/16	
5 x 5 x 4		8 7/16	11 3/8	8 1/2	
6 x 6 x 5		9 13/16	13	10	
6 x 6 x 4		9 1/16	11 7/8	9 3/8	
8 x 8 x 6		11 7/8	14 5/16	12 3/8	
8 x 8 x 4		10 7/16	11 7/16	11	

Size		No. 1030		
a	b	V	W	X
2 x 1 1/2		4 1/16	5 7/8	4 1/8
3 x 2		5 5/16	7 3/8	5 3/8

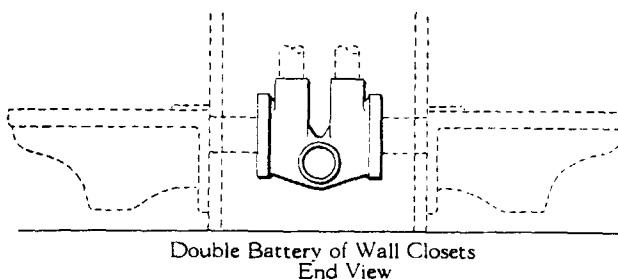
Crane-Hulbert Drainage Fittings For Wall Closets



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 types 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 and Bushings; Steel Nipples; Couplings; Clamps

Plugs and Bushings	
Iron	pages 168 and 169
Nipples	
Wrought Steel	pages 170 and 171
Pipe Couplings	
Steel	page 172
Dresser Couplings	page 174
Clamps	
Single Strap and Double Strap	page 173
Dresser	page 174
Band-It	page 174

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 190 and 192
Brass Locknuts	page 190
Brass Plugs and Bushings	page 191
Brass Nipples	page 192
Steel Plugs and Bushings	page 258
Malleable Iron Couplings	pages 142 and 148
A.A.R. Malleable Iron Couplings	page 150
Forged Steel Couplings	pages 256 and 257

Iron Plugs



Cored
Square Head Plugs



Cored
Bar Plugs



Countersunk
Plug

List Prices, Each

Size Inches	Square Head Plugs Right Hand				Bar Plugs Right Hand				Countersunk Plugs Right Hand	
	Cored		Solid		Cored		Solid		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			.13	.22					.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:

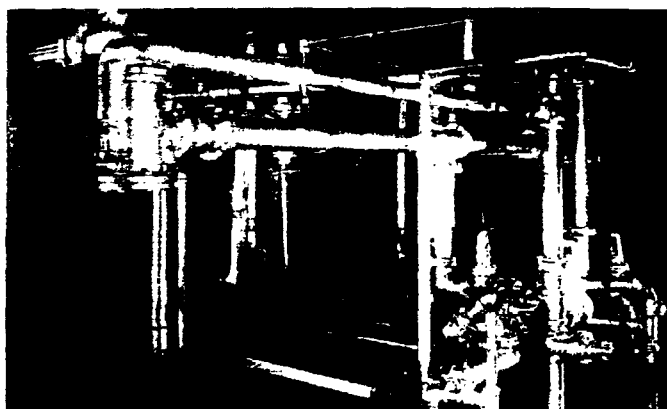
- 250-Pound Cast Iron Fittings
- 300-Pound Malleable Iron Fittings

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 258.

American Standard: These plugs conform to the American Standard for Ferrous Plugs with Pipe Threads (B16.14-1943).

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"	3/8 to 1 1/4"	1 1/2" and larger



Diversified and complete, the Crane line fulfills the requirements of specialized or general piping installations.

Iron Bushings



Outside Hexagon



Inside Hexagon



Face

List Prices, Each

Size Inches	Hexagon Bushings		Face Bushings		Eccentric Bushings	
	Black	Galv.	Black	Galv.	Black	Galv.
1/4	.12	.18	.18	.27		
3/8	.12	.18	.18	.27		
1/2	.13	.20	.20	.30		
5/8	.15	.22	.24	.36		
3/4	.17	.26	.28	.42		
7/8	.21	.32	.36	.54	.60	.90
1	.25	.38	.45	.69	.66	1.00
1 1/4	.45	.61	.92	.90	1.35	
1 1/2	.63	.80	1.20	1.50	2.25	
1 3/4	.85	1.05	1.60	2.10	3.15	
2	1.35	1.75	2.65	2.80	4.25	
2 1/4	1.75	2.10	3.15	3.70	5.50	
2 1/2	2.00	3.00	3.20	4.80	5.00	7.50
2 3/4	2.40	3.60	4.80	7.20	6.60	10.00
3	4.50	6.70	13.00	19.50		

Face Bushings in sizes 3/4-inch and smaller do not have lugs (not illustrated)



Eccentric

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	
	Size	Material	Size	Material	Size	Material
1/4	2 x 1 1/2 b	4 x 3 1/2	1/4 x 1/8 c	2 1/2 x 2 b	1 1/4 x 3/4	3 1/2 x 2 1/2
3/8	1 1/4	x 3	3/8 x 1/4 c	x 1 1/2 b	x 1/2	x 2
1/2	x 1 a	x 2 1/2 a	x 1/8 c	x 1 1/4 b	1 1/2 x 3/4	x 1 1/2
5/8	x 3/4 a	x 2 a	1/2 x 3/8 c	3 x 2 1/2 b	x 1/2	x 1 1/4
3/4	x 1/2 a	x 1 1/2 a	x 1/4 c	x 2 b	2 x 1 1/4	4 x 3
7/8	x 3/8 a	x 1 1/4 a	x 1/8 c	x 1 1/2 b	x 1	x 2 1/2
1	x 1/4 a	x 1 a	3/4 x 1/2 c	x 1 1/4 b	x 3/4	x 2
1 1/4	2 1/2 x 2 b	5 x 4	x 3/8 c	3 1/2 x 3 b	x 1/2	x 1 1/2
1 1/2	x 1 1/2 a	x 3 1/2 a	x 1/4 c	x 2 1/2 b	2 1/2 x 1 1/2	x 1 1/4
1 3/4	x 1 1/4 a	x 3 a	1 x 3/4 b	x 2 b	x 1 1/4	x 1
2	x 1 a	x 2 1/2 a	x 1/2 b	4 x 3 1/2 b	x 1	5 x 4
2 1/4	x 3/4 a	x 2 a	x 3/8 b	x 3 b	x 3/4	x 3 1/2
2 1/2	x 1/2 a	6 x 5	x 1/4 b	x 2 1/2 b	x 1/2	x 3
2 3/4	3 x 2 1/2	x 4 a	1 1/4 x 1 b	x 2	3 x 2	x 2 1/2
3	x 2 a	x 3 1/2 a	x 3/4 b	5 x 4 b	x 1 1/2	x 2
3 1/4	x 1 1/2 a	x 3 a	x 1/2 b	x 3	x 1 1/4	6 x 4
3 1/2	x 1 1/4 a	x 2 1/2 a	1 1/2 x 1 1/4 b	6 x 5 b	x 1	x 3
3 3/4	x 1 a	x 2 a	x 1 b	x 4	x 3/4	x 2 1/2
4	x 3/4 a	8 x 6 a	x 3/4 b	x 3		x 2
4 1/4	1/2 a	x 5 a	x 1/2 b	8 x 6 b		
4 1/2	3 1/2 x 3	x 4 a	2 x 1 1/2 b			
4 3/4	x 2 1/2 a	x 3 1/2 a	x 1 1/4 b			
5	x 2 a	x 3 a	x 1 b			
5 1/4	x 1 1/2 a		x 3/4 b			
5 1/2	x 1 1/4 a		x 1/2 b			
5 3/4	x 1 a					
6	x 1/2 a					

Indicates made with inside hexagon; other sizes have outside hexagon.

Indicates made of malleable iron.

Indicates made of steel.

Not indicated by "b" or "c" are made of cast iron.

Wrought Steel Nipples



Close Nipple



Long Nipple

Standard Black Right Hand Nipples

Pipe Size Inches	Length Inches Close	List Prices, Each																	
		Close	Length																
			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	.56	
¼	⅞	.18	.19	.20	.21	.22	.23	.25	.27	.29	.31	.33	.38	.42	.46	.50	.53	.56	
⅜	1	.18	.19	.20	.21	.22	.23	.25	.27	.29	.31	.33	.38	.42	.46	.50	.53	.56	
½	1⅛	.19	.20	.22	.23	.25	.27	.29	.31	.33	.35	.37	.43	.47	.51	.56	.60	.63	
¾	1⅜	.24		.26	.27	.29	.31	.33	.36	.39	.42	.45	.52	.58	.63	.69	.74	.77	
1	1½	.35		.38	.41	.43	.46	.49	.52	.56	.59	.62	.70	.78	.85	.93	1.01	1.07	
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	2.19	
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	3.81	
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	7.73	
5	3	4.88						6.05	6.44	6.83	7.22	7.97	8.72	9.47	10.22	10.97	11.72	12.47	
6	3⅛	6.57						8.10	8.61	9.11	9.63	10.59	11.55	12.51	13.47	14.43	15.39	16.35	
8	3½	14.88							16.60	17.18	17.76	18.92	20.08	21.24	22.40	23.56	24.72	25.88	
10	3⅞	20.35							21.89		23.47	25.05	26.63	28.21	29.79	31.37	32.95	34.53	
12	4½	27.00									30.44		35.04	37.34	39.64	41.94	44.24	46.53	

Extra Strong Black Right Hand Nipples

Pipe Size Inches	Length Inches Close	List Prices, Each																	
		Close	Length																
			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	1.2	
¼	7⁄8	.28	.28	.30	.32	.34	.36	.38	.40	.43	.46	.49	.56	.61	.67	.72	.78	.8	
⅜	1	.28	.28	.30	.32	.34	.36	.38	.40	.43	.46	.49	.56	.61	.67	.72	.78	.8	
½	1⅛	.28	.30	.32	.34	.37	.40	.43	.47	.50	.53	.56	.65	.71	.77	.83	.89	.9	
¾	1⅜	.36		.39	.41	.44	.47	.50	.54	.58	.62	.66	.76	.84	.92	1.00	1.08	1.1	
1	1½	.53		.57	.61	.64	.68	.72	.77	.81	.86	.91	1.03	1.14	1.25	1.36	1.48	1.5	
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	2.0	
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	2.4	
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	3.2	
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	5.6	
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	7.1	
3½	2¾	3.65						4.36	4.59	4.99	5.37	5.79	6.49	7.19	7.89	8.59	9.29	9.9	
4	2⅞	4.17						5.00	5.28	5.72	6.17	6.61	7.41	8.23	9.04	9.85	10.67	11.4	
5	3	7.31							9.06	9.65	10.23	10.82	11.94	13.06	14.18	15.37	16.43	17.2	
6	3⅛	9.98							12.34	13.12	13.89	14.69	16.17	17.65	19.13	20.61	22.10	23.3	

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															
			1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
Inches	Close	Close																
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 1/8 to 12-inch and Standard Galvanized Butt Nipples 1/8 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 3/8 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 1/8 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 1/8 to 1 1/2-inch sizes, Extra Strong in 1/8 to 1 1/2-inch sizes, and Double Extra Strong in 1/2 to 1 1/2-inch sizes. See the Crane Discount Sheet for prices.

Standard Tank Nipples

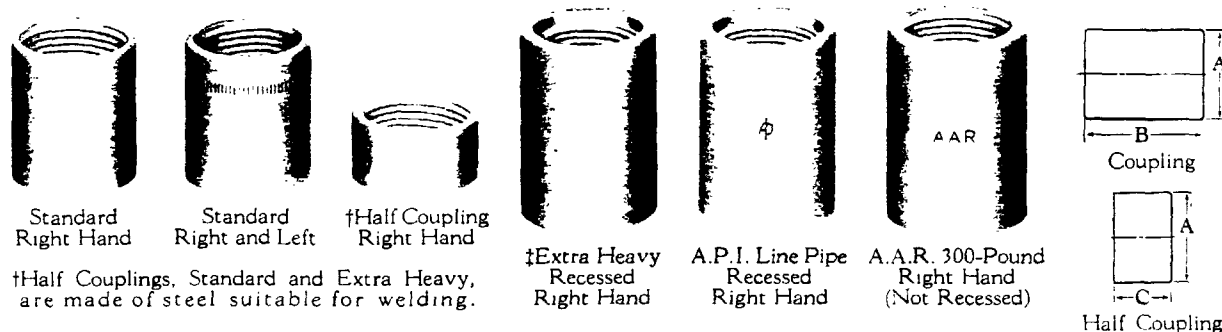


Tank Nipple

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 Lock-nut Thread for a total thread length of 4 inches.

Pipe Size Inches	Length Inches	List Prices Each	
		Black	Galv.
1/4	6	.83	.96
3/8	6	.83	.96
1/2	6	.89	1.02
3/4	6	1.10	1.27
1	6	1.35	1.55
1 1/4	6	1.75	2.01
1 1/2	6	2.05	2.35
2	6	2.63	3.03
2 1/2	6	4.50	5.18
3	6	5.35	6.16

Steel Pipe Couplings



‡Extra Heavy Couplings also are listed Not Recessed, both Right Hand and Right & Left.

Extra Heavy Right Hand Couplings are furnished with recessed ends unless orders specify "not recessed".

Size Inches	List Prices, per 100 Pieces													
	Standard						Extra Heavy							
	Right Hand		Right & Left		Half Right Hand		Recessed Right Hand		Not Recessed Right Hand		Right & Left		Half Right Hand	
	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.	Black	Galv.
1/8	*3.30	*5.10			*2.60	*4.10	*14.10	*17.25	*14.10	*17.25				
1/4	*4.90	*6.50	10.30	11.90	*3.90	*5.20	19.90	21.70	19.90	21.70			15.90	17.40
3/8	*5.30	*6.70	10.80	12.60	*4.30	*5.40	21.20	23.00	21.20	23.00			17.00	18.40
1/2	*7.60	*8.90	15.50	18.30	*6.10	*7.10	28.00	33.80	28.00	33.80	27.50	35.00	22.30	27.00
3/4	*10.80	*13.30	19.20	21.70	*8.70	*10.70	34.50	40.00	34.50	40.00	40.00	48.60	27.60	32.10
1	*15.60	*18.60	26.20	29.30	*12.50	*14.90	51.80	57.30	51.80	57.30	58.00	70.00	41.50	45.80
1 1/4	*19.00	*23.20	30.00	34.20	*15.30	*18.60	54.00	61.80	54.00	61.80	63.00	77.00	43.30	49.50
1 1/2	*25.40	*30.30	35.60	40.60	*20.30	*24.30	58.20	67.00	58.20	67.00	70.50	83.40	46.60	53.50
2	*38.30	*47.40	60.00	69.00	*30.60	*38.00	98.80	122.00	98.80	122.00	109.00	132.00	79.00	97.70
2 1/2	71.40	86.90			57.10	69.50	162.00	192.00	162.00	192.00			129.60	153.60
3	105.00	127.80			84.00	102.20	192.60	224.00	192.60	224.00			154.00	179.30
3 1/2	155.00	191.40			124.00	153.00	256.50	303.60	256.50	303.60			205.20	243.00
4	193.00	226.00			154.30	180.70	291.00	339.60	291.00	339.60			232.80	271.70

Size Inches	List Prices, per 100 Pieces				Dimensions, in Inches						
	A.P.I. Line Pipe Right Hand		A.A.R. Right Hand		Standard			Extra Heavy, A.P.I. Line Pipe, and A.A.R.			
	Black	Galv.	Black	Galv.	A	B	C	A	B	C	
1/8					.563	13/16	11/32	.563	11/16		
1/4	19.90	21.70	19.90	21.70	.719	13/16	17/32	.719	15/8	3/4	
3/8	21.20	23.00	21.20	23.00	.875	13/16	17/32	.875	15/8	3/4	
1/2	28.00	33.80	28.00	33.80	1.063	19/16	23/32	1.063	2 1/8	1	
3/4	34.50	40.00	34.50	40.00	1.313	15/8	3/4	1.313	2 1/8	1	
1	51.80	57.30	51.80	57.30	1.576	2	15/16	1.576	25/8	1 1/4	
1 1/4	54.00	61.80	54.00	61.80	1.900	2 1/16	31/32	2.054	2 3/4	1 5/16	
1 1/2	58.20	67.00	58.20	67.00	2.200	2 1/16	31/32	2.200	2 3/4	1 5/16	
2	98.80	122.00	98.80	122.00	2.750	2 1/8	1	2.875	3 1/4	1 9/16	
2 1/2	162.00	192.00	162.00	192.00	3.250	3 1/8	1 1/2	3.375	4 1/8	2	
3	192.60	224.00	192.60	224.00	4.000	3 3/4	1 9/16	4.000	4 1/4	2 1/16	
3 1/2	256.50	303.60			4.625	3 3/8	1 5/8	4.625	4 3/8	2 1/8	
4	291.00	339.60			5.000	3 1/2	1 11/16	5.200	4 1/2	2 3/16	

§1" Extra Heavy and A.A.R. Couplings are 1.660" O.D. (Dimension "A").

Conform to Standards: Standard and Extra Heavy Couplings conform to dimensions listed in the American Iron and Steel Institute Steel Products Manual, Section 18, dated March, 1947. A.P.I. Couplings conform to the American Petroleum Institute's Standard No. 5-L, 10th Edition, dated August, 1945, and Supplement No. 2, dated September, 1947; they bear the A.P.I. monogram. A.A.R. Couplings conform to Specification M-404-42 and Leaflet L-141-1946 of the Association of American Railroads.

furnished straight tapped; prices on application. Right and Left Couplings are knurled on the end having the left hand thread.

Other Couplings: Larger sizes of Standard, Extra Heavy, and A.P.I. Line Pipe Couplings, 1/8-inch Extra Heavy Half Couplings, Drive Pipe Couplings etc., are also available; prices on application.

Malleable Iron Couplings... pages 142, 143, 148, and 150
Forged Steel Couplings... pages 256 and 257

Rugged construction: These Couplings are of exceptionally high quality, unusually strong and rugged. Inspection is continuous during all stages of manufacture; threads are accurately cut to gauge. The special bevel, or recess, at the ends, not only protects the first threads, but assures easy starting and true alignment.

***Threads:** Standard Right Hand Couplings (including Half Couplings) in sizes 2-inch and smaller and 1/8-inch Extra Heavy Couplings, as marked with an asterisk, are straight tapped. All other Couplings listed here are taper tapped.

The Extra Heavy Couplings (including Extra Heavy Half Couplings) in sizes 1/4 to 1 1/2-inch, inclusive, can be

Single Strap and Double Strap Clamps

Malleable Iron with Wrought Steel Straps

List Prices

Type	Catalog Number of Clamp	Clamp Will Fit				Size of Pipe Tapping in Clamp	List Prices
		Wrought Pipe	O.D. Casing	Cast Iron Pipe	O.D. of Circle		
		Size Inches	Size Inches	Size Inches	Inches	Inches	Black Each
Single Strap Clamps	0	1½			1⅞	½ or ¾	2.30
	1	2	2½		2⅞	½ to 1	2.60
	2	2½	2¾ & 3	2	2⅞	½ to 1¼	2.90
	3	3	3½		3½	½ to 1	3.25
	4	3	3½		3½	1¼ to 2	3.25
	5	3½	4	3	4	½ to 1	3.75
	6	3½	4	3	4	1¼ to 2	3.75
	7	4	4½		4½	½ to 1½	4.25
	8	4	4½		4½	2	4.25
	13	5	5½		5⅞	¾ to 1½	4.75
	14	5	5½		5⅞	2	4.75
	19	6	6¾		6¾	¾ to 1½	5.25
Double Strap Clamps	20	6	6¾		6¾	2	5.25
	41	2	2½		2⅞	½ to 1½	5.25
	42	2½	2¾ & 3	2	2⅞	¾ to 1½	5.85
	43	3	3½		3½	¾ to 2	6.50
	44	3½	4	3	4	¾ to 2	7.50
	45	4	4½		4½	¾ to 2	8.50
	47	5	5½		5⅞	¾ to 2	9.50
	49	6	6¾		6¾	¾ to 2	10.50
	50	6	6¾		6¾	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

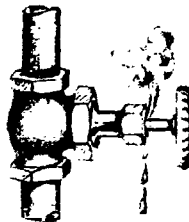


Double Strap Clamp

Ordering: When ordering Single Strap or Double Strap Clamps, specify the catalog number of the Clamp and the size of the pipe tapping.

Leaky Valve Stuffing Boxes!

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.

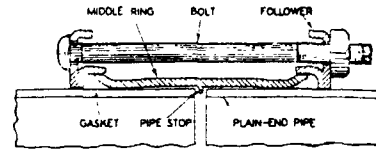
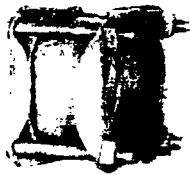


The remedy is simple. Since packing wears gradually as it is subjected to service, it is only necessary to slightly tighten the packing nut or gland to stop a leak when it starts. And when new packing is necessary, Crane Valves can be repacked when wide open and under pressure.



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.

Dresser Couplings and Clamps



Style 38 Regular Coupling

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.

Equipped with new gaskets and bolts, they may be used over and over.

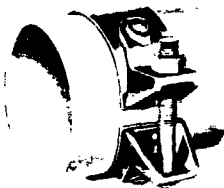
Gaskets available for gas, water, oil, air, and other lines. Specify service when ordering. Asbestos gaskets available for temperatures over 215° F. Sizes $\frac{3}{8}$ to 24 inches and larger.

Dimensions, in Inches

Pipe Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	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	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
Length of bolt	5	5	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	8	8	8	8	8	8	8	10	8	10

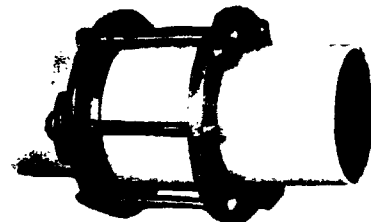
Style 77 A Band Clamps

These Clamps are good friends of the pipe repair man when small holes and leaks appear in straight runs of steel pipe. The one piece steel band is sprung over pipe and bolted together. Cone gaskets or sheet rubber supplied only on order. Use asbestos for temperatures over 215° F. Several band widths available: 2, 3, 4, 6 inches. Sizes 1 to 6 inches and larger.



Styles 4 and 41 Collar Leak Clamps

These screw collar leak clamps stop the leak by compression of resilient gaskets between metal rings. Style 4 (malleable followers), sizes $\frac{3}{4}$ " through 4". Style 41 (steel followers), sizes 4 $\frac{1}{2}$ " to 6" and larger.

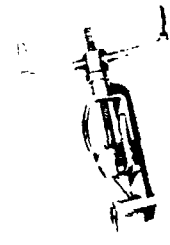


Band-It Pipe and Hose Clamps

Band-It Clamps are formed from one continuous roll of stainless steel band to handle any clamping job from $\frac{1}{2}$ -inch to 30 feet in diameter. Band-It Clamps are used to repair hose, steel pipe, tanks, electrical cable, wooden beams, etc.

Clamping Bands: These bands are stainless steel and are furnished in 100-foot rolls in widths of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, and $\frac{3}{4}$ inches.

Clamping Tool: The Clamping Tool applies all widths of stainless steel band and has a ball bearing action for ease of operation.



Clamping Band Buckles

These Clamping Band Buckles are made of stainless steel and are furnished in packages of 100.

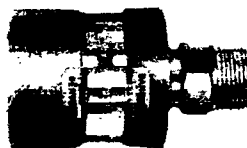


Available in widths of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, and $\frac{3}{4}$ inches.

Clamping Band Scru-Lokt Buckles

These Scru-Lokt Buckles are recommended for use in close quarters.

Available in widths of $\frac{1}{2}$ and $\frac{3}{4}$ inches. The $\frac{1}{2}$ -inch buckle can be used with the $\frac{3}{8}$ or $\frac{1}{2}$ -inch Clamping Band, and the $\frac{3}{4}$ -inch size can be used with the $\frac{5}{8}$ or $\frac{3}{4}$ -inch Clamping Band



Pipe Repair Clamp

Band-It repairs leaks or splits in any diameter pipe or tank. Packing is placed over leak and under band. It is not necessary to disconnect pipe or tank.

Hose Clamp

Band-It can be used for all types of pressure and suction hose

Clamps hold old, oil-soaked hose efficiently.

Prices on application

Iron and Steel Unions, Union Fittings, and Flange Unions

Malleable Iron Unions

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Forged Steel Unions

A.A.R.....	page 182
Brass to Steel Seat.....	page 183
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Malleable Iron Union Fittings

150-Pound, Gasket Type.....	page 176
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A.A.R., with Steel Male Tail-piece.....	page 182

Flange Unions

Cast Iron.....	page 185
Malleable Iron.....	page 185
Tongue and Groove.....	page 186
Forged Steel.....	page 187

Forged Steel Combination Elbows.....	page 186
Saving Materials and Labor with Unions and Union Fittings.....	pages 176 and 184

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.

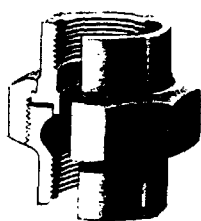
* * * * *

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 193
Circulating Boiler Fittings.....	page 147
Brass Solder-Joint Union.....	page 404
18-8 Mo Unions.....	page 373

Malleable Iron—Gasket Type 150-Pound Unions and Union Elbow

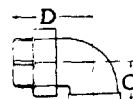
WORKING PRESSURES
150 pounds saturated steam — 300 pounds cold water



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		1 3/16	1 5/16	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 456.

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 consists of a union ring and a tail-piece (gasket not furnished). They are 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 474

Crane Unions and Union Fittings Save Material and Labor

Figure A

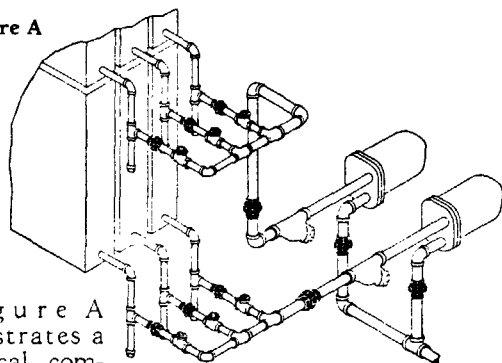


Figure A illustrates a typical complicated arrangement of piping on the return side of double tiered blast heaters. The return from the stacks in each tier are drained individually by a trap, and the condensation is accumulated by a single return header. The illustration shows the most common method 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.

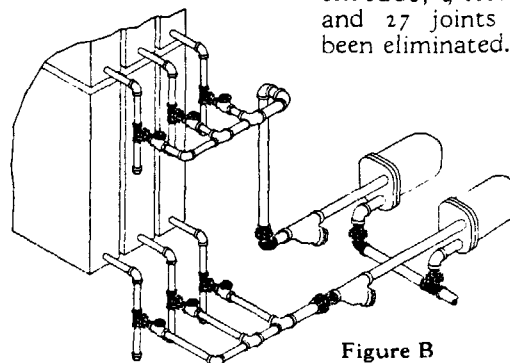
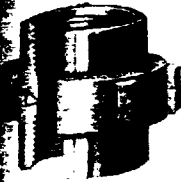
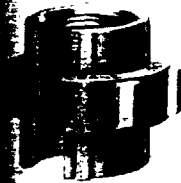


Figure B

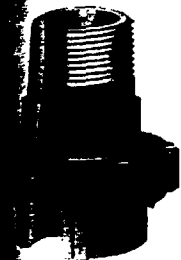
Malleable Iron—Ground Joint 150-Pound Unions and Union Fittings



No. 1280, Union
Female
Brass to Iron Seat



No. 1280 1/2, Union
Female
All-Iron Seat



No. 1281, Union
Male and Female
Brass to Iron Seat

These unions and union fittings, designed to combine liberal strength with light weight and minimum overall dimensions, have a high safety factor. Their tail-piece, thread-piece, and union ring are circular in shape; generous lugs provide an exceptionally good wrench grip.

Ground joint: The ground joint seat holds pressure with no gasket is required. It can be taken apart and reassembled repeatedly without affecting the length or tightness of the joint.

Seats: All of the union fittings and the No. 1280 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. 1280 1/2 Unions have an all-iron

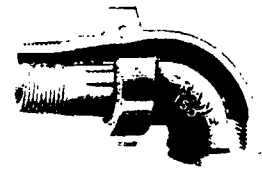
WORKING PRESSURES
150 pounds saturated steam
300 pounds cold water,
oil, gas, or gasoline, non-shock

FEATURES
Brass to Iron Seat
(Underwriters' Approved)
or All-Iron Seat
Ground Joint—Air Tested

SERVICE RECOMMENDATIONS
These are unusually sturdy and rugged unions and union fittings. They 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.

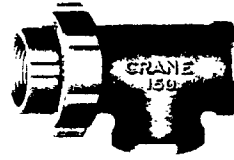


No. 1282, 90° Elbow
Female Union



No. 1283, 90° Elbow
Male Union

Brass to Iron Seat



No. 1284, Tee
Female Union on Run



No. 1285, Tee
Male Union on Run

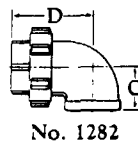
Brass to Iron Seat

List Prices, Each

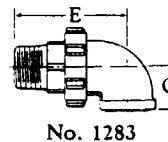
Size		Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Unions	No. 1280, Female	Black	1.10	1.10	1.15	1.30	1.70	2.35	2.85	3.60	7.35	12.00
		Galv.	1.30	1.30	1.40	1.55	2.05	2.85	3.45	4.30	8.80	14.50
	No. 1280 1/2, Female	Black	1.10	1.10	1.15	1.30	1.70	2.35	2.85	3.60	7.35	12.00
		Galv.	1.30	1.30	1.40	1.55	2.05	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		

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.

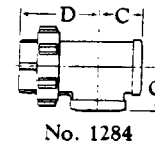
Listed by Underwriters' Laboratories: Crane 150-Pound Malleable Iron Unions and Union Fittings with Brass to Iron Seat have been inspected and are listed by the Underwriters' Laboratories (National Board of Fire Underwriters), Chicago, for use on hazardous liquids.



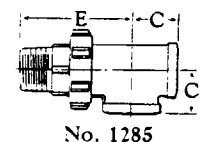
No. 1282



No. 1283



No. 1284



No. 1285

Dimensions, in Inches

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A	1 3/8	1 1/2	1 11/16	1 7/8	2 1/4	2 5/16	2 3/8	2 9/16	3 1/4	3 9/16
B	2 3/16	2 3/8	2 5/8	3	3 5/16	3 5/8	3 15/16	4 1/4	4 15/16	5 5/8
C	1 3/16	1 5/16	1 7/8	1 5/16	1 1/2	1 3/4	1 11/16	2 1/4		
D	1 11/16	1 7/8	2 1/8	2 7/16	2 7/8	3 3/16	3 3/8	3 7/8		
E	2 7/16	2 7/8	3	3 3/16	3 13/16	4 7/16	4 7/8	5 1/2		



No. 1280 or
No. 1280 1/2



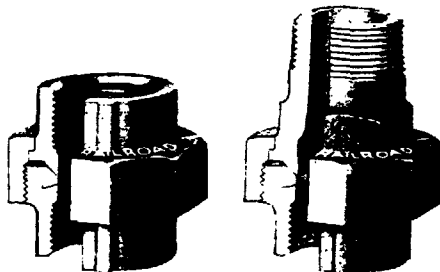
No. 1281

For thread engagement,
see page 474.

Malleable Iron Railroad Unions and Union Elbows

Unions

WORKING PRESSURES
250 pounds saturated steam
500 pounds cold water,
oil, gas, or gasoline, non-shock



No. 519
Union
Female

No. 519 1/2
Union
Male and Female

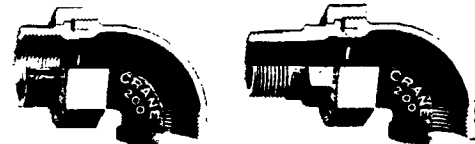
FEATURES
Brass to Iron Seat
Ground Joint
Air Tested

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,
oil, gas, or gasoline, non-shock



No. 590
90° Elbow
Female Union

No. 592
90° Elbow
Male Union

List Prices, Each

Size		Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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. 519 1/2, 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.

Listed by Underwriters' Laboratories: Crane Railroad Unions and Railroad Union Elbows have been inspected and are listed by the Underwriters' Laboratories (National Board of Fire Underwriters), Chicago, for use on hazardous liquids.



No. 519

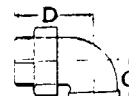


No. 519 1/2

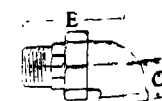
Dimensions, in Inches

Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Unions	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 7/8	4 1/2
	B	2 1/4	2 7/16	2 11/16	3 1/16	3 5/16	3 11/16	4	4 5/16	4 7/8	5 5/8
90° Elbows	C	1 3/16	1 5/16	1 7/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4		
	D	1 13/16	2 1/16	2 5/16	2 3/8	3	3 7/16	3 13/16	4 3/8		
	E	2 7/16	2 3/4	3 1/16	3 1/2	3 15/16	4 7/16	4 3/4	5 3/8		

Thread Engagement page 474



No. 590



No. 592

300-Pound Malleable Iron Unions

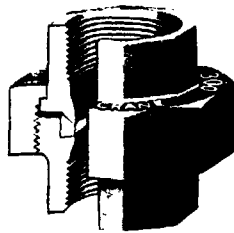
WORKING PRESSURES

No. 198 E and No. 198½ E — 300 pounds steam, 550° F.
 No. 197 E — 300 pounds saturated steam
 All types — 600 pounds cold water, oil, or gas, non-shock

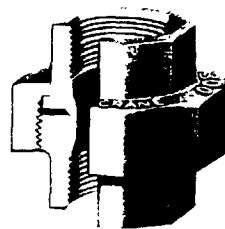
TEST PRESSURE — 150 pounds air-under-water

FEATURES

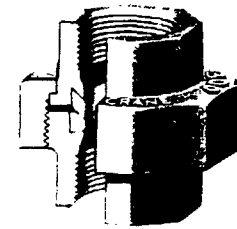
Brass to Iron, All-Iron, or Brass to Brass Seat
 Ground Joint Octagon Ends



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

List Prices, Each

		Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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 re-assembled 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	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	1 1/2	1 3/8	1 13/16	1 15/16	2 1/4	2 7/16	2 13/16	3	3 3/8	4	4 5/16	5

Thread engagement . . . page 474

A. A. R. Malleable Iron Unions

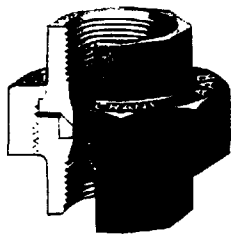
WORKING PRESSURES

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

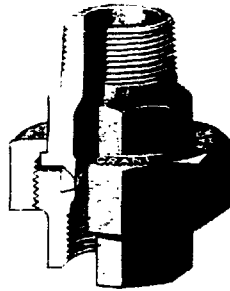
TEST PRESSURE — 150 pounds air-under-water

FEATURES

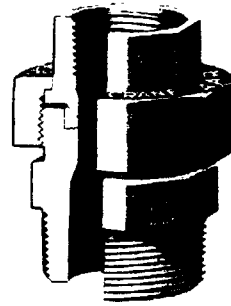
Brass to Iron Seat — Ground Joint
Octagon Ends



No. 819 E
Union
Female



No. 819 1/2 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. 819 1/2 E,
or the
No. 919 1/2 E
shown on
page 182.

**For FORGED STEEL
A.A.R. Unions,
see page 182.**

List Prices, Unions

Size		Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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. 819 1/2 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	1 1/4 x 1	1 1/2 x 1 1/4	2 x 1	2 x 1 1/4	2 x 1 1/2
No. 817 E, Reducing, Black	Each	3.75	4.50	6.00	6.00	6.00

Service recommendations: Crane A. A. R. 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. 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.

Listed by Underwriters' Laboratories: Crane A. A. R. Unions (except No. 817E) and Union Fittings have been inspected and are listed by the Underwriters Laboratories (National Board of Fire Underwriters) Chicago, 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 (A. A. R.) for 300-pound unions and union fittings. When subjected to tensile tests, their breaking strengths exceed those required by the specifications.

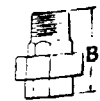
Interchangeability: The tail-pieces and the union rings on all of these unions and union fittings are interchangeable, size for size.

Dimensions, in Inches

SANDWICHES, IN INCHES										
Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
A—No. 819 E	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—No. 819 1/2 E	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
Size	1 1/4 x 1		1 1/2 x 1 1/4		2 x 1		2 x 1 1/4		2 x 1 1/2	
B—No. 817 E	3 1/2		3 13/16		3 3/4		4		4 1/8	



No. 819 E



No. 819 1/2 E
or No. 817 E

A. A. R. Unions and Union Fittings with STEEL male tail-piece page 182

A.A.R. Malleable Iron Screwed Fittings page 150

A.A.R. Brass Valves

pages 36 to 38

A. A. R. Malleable Iron Union Fittings

WORKING PRESSURES

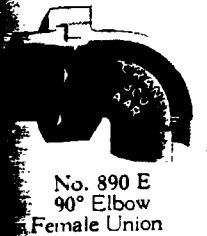
300 pounds steam, 550° F.

600 pounds cold water, oil, gas, or gasoline, non-shock

TEST PRESSURE — 150 pounds air-under-water

FEATURES

Brass to Iron Seat — Ground Joint
Octagon Ends



No. 890 E
90° Elbow
Female Union



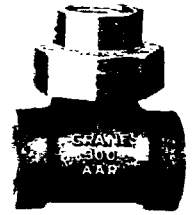
No. 891 1/2 E
45° Elbow
Female Union



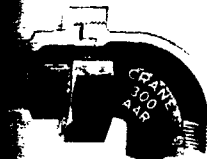
No. 894 E
Tee
Female Union on Run



No. 895 E
Reducing Tee
Female Union on Run



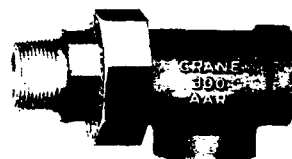
No. 898 E
Tee
Female Union
on Outlet



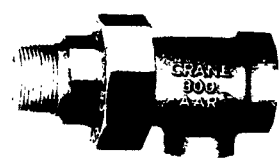
No. 892 E
90° Elbow
Male Union



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. 898 1/2 E
Tee
Male Union
on Outlet

List Prices, Each, Black

		Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
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
Elbows	No. 891 1/2 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	
	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. 898 1/2 E, Male Union on Outlet		2.25	2.25	2.60	3.35	3.90	5.30	6.70	9.30	19.00	
		Inches	1 x 1 x 3/8	1 x 1 x 1/2	1 x 1 x 3/4							
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 A. A. R. Union Fittings can be made to order; prices are furnished on application.

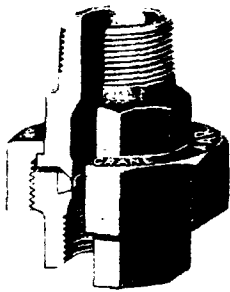
Dimensions, in Inches

	No. 890 E	No. 892 E	No. 891 1/2 E	No. 893 E	No. 894 E or 895 E	No. 896 E or 897 E	No. 898 E	No. 898 1/2 E
1/4								
3/8								
1/2								
3/4								
1								
1 1/4								
1 1/2								
2								
2 1/2								
3								
1 x 1 x 3/8								
1 x 1 x 1/2								
1 x 1 x 3/4								
1 5/16	1 1/16	1 1/4	1 7/16	1 5/8	1 15/16	2 1/8	2 1/2	2 15/16
1 15/16	1 1/16	1 1/4	1 7/16	1 5/8	1 15/16	2 1/8	2 1/2	2 15/16
1 13/16	7/8	1	1 1/8	1 5/16	1 1/2	1 11/16	2	2 1/4
2	2 1/4	2 7/16	2 7/8	3 3/16	3 11/16	3 15/16	4 1/2	5 7/16
2 9/16	2 7/8	3 3/16	3 3/4	4 1/16	4 5/8	4 7/8	5 3/8	6 7/16
1 5/8	1 3/4	1 15/16	2 3/16	2 1/2	2 7/8	3 3/16	3 11/16	4 3/16
2 3/16	2 7/16	2 11/16	3 1/16	3 7/16	3 13/16	4 1/8	4 9/16	5 3/16

Description . . . page 180

Thread engagement . . . page 474

A.A.R. Malleable Iron Unions and Union Fittings With Steel Male Tail-Piece



No. 919 1/2 E
Union

WORKING PRESSURES

300 pounds steam, 550° F.
600 pounds cold water, oil, or gas, non-shock
Tested 150 pounds air-under-water

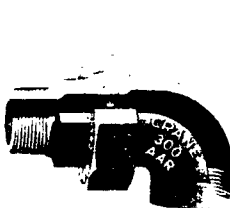
FEATURES

Brass to Steel Seat
Ground Joint — Octagonal Ends

2 1/2 and 3-inch male tail-pieces are cast steel.

These unions and union fittings are the same as those shown on the preceding two pages except that they have a steel tail-piece, making the male end unusually rugged. They are especially suited for the severe services where the strength and toughness of steel is needed in the male end.

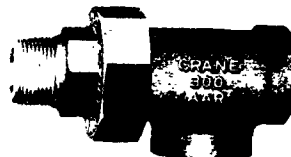
All parts are interchangeable, size for size, with the corresponding parts of Malleable Iron A.A.R. Unions and Union Fittings (pages 180 and 181). Galvanized unions and union fittings are made to order; prices on application.



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. 998 1/2 E
Tee
Union on Outlet

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	Size Inches	1 x 1 x 3/4 1 x 1 x 1/2 1 x 1 x 3/4
No. 919 1/2 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. 997 E Reducing Tees	5.70
No. 998 1/2 E, Tees		3.20	3.20	3.65	5.00	5.70	8.00	9.75	13.50	26.50			

A.A.R. Forged Steel Ground Joint Unions

WORKING PRESSURE

300 pounds steam

Tested 150 pounds
air-under-water

FEATURES

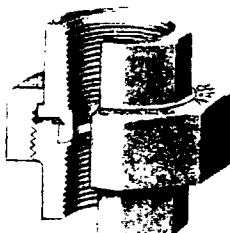
Brass to Steel Seat

Ground Joint
Octagonal Ends

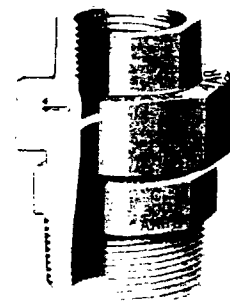
These are light weight, rugged Forged Steel A.A.R. Unions, ideal for locomotive and other railroad services subject to vibration, expansion, and contraction.

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 180 and above.

A.A.R. These unions conform to the A.A.R. specifications for 300-pound unions. The union ring is marked "Crane-AAR-300".



No. 950 H
Union
Female



No. 953 1/2 H
Reducing Air Pump Union
(Male end is larger)

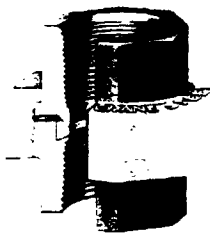
List Prices, Black

		List Prices, Each									
Size	Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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									
		1 1/4 x 1		1 1/2 x 1 1/4		2 x 1		2 x 1 1/4		2 x 1 1/2	
No. 953 1/2 H, Reducing Air Pump Unions	Each	8.50		11.50		14.75		14.75		14.75	

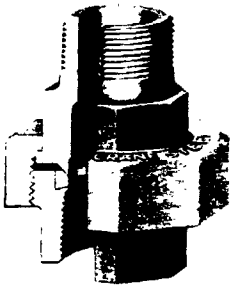
Dimensions are the same as A.A.R. Malleable Iron Unions and Union Fittings see pages 180 and 181

Forged Steel Ground Joint Unions

Brass to Steel Seat

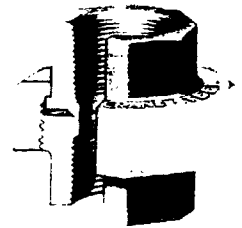


No. 250 H
Female

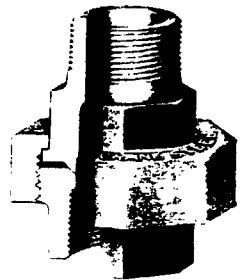


No. 253 H
Male and Female

Steel to Steel Seat



No. 252 H
Female



No. 254 H
Male and Female

WORKING PRESSURES

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

Brass to Steel Seat—600 pounds steam or hot oil, 550° F.
Steel to Steel Seat—585 pounds steam or hot oil, 900° F.

(For other ratings on Steel to Steel Seat, see table below.)

Tested 300 pounds air-under-water

Working Pressures, Non-Shock
Steel to Steel Seat Unions Only
(Steam, Water, Oil, Oil Vapor, Gas, or Air)

Temp.	Pounds	Temp.	Pounds
100° F.	2000	600° F.	1550
150	1980	650	1440
200	1950	700	1320
250	1920	750	1190
300	1900	800	1020
350	1880	850	835
400	1850	900	585
450	1830	950	460
500	1740	1000	335
550	1640		

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.

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

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.

A.A.R. design: In design and dimensions, the No. 250 H and No. 253 H Unions sizes 1/4 to 3-inch comply with the specifications of the Association of American Railroads for 300-pound unions.

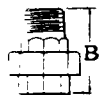
Identification of seat: Brass to steel seat unions are marked "600S-550° F."; steel to steel seat unions are marked "585S-900° F."



No. 250 H
or
No. 252 H

Dimensions, in Inches

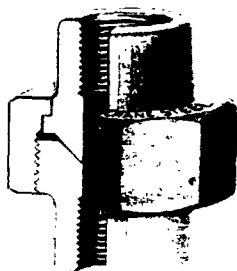
Size		1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
End to end	A	1 1/2	1 5/8	1 13/16	1 15/16	2 1/4	2 7/16	2 13/16	3	3 3/8	4	4 5/16
	B		2 1/4	2 1/2	2 11/16	3 1/8	3 3/8	3 3/4	3 15/16	4 5/16	5 1/16	5 1/2



No. 253 H
or
No. 254 H

Forged Steel Ground Joint Unions

Steel to Steel Seat—Chromium Plated Thread-Piece



No. 246 X, Female

Tested 300 pounds air-under-water

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.

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		

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 187.

Thread engagement... page 474

Save Material and Labor with Crane Unions and Union Fittings

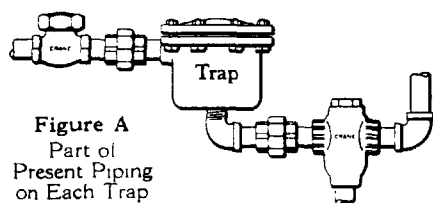
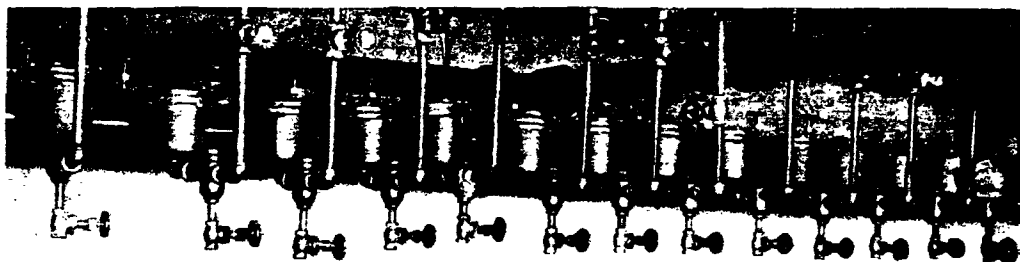


Figure A
Part of
Present Piping
on Each Trap

Photograph of a battery of 13 Crane Inverted Open Float Steam Traps draining condensate from cooking kettles in a candy manufacturing plant.

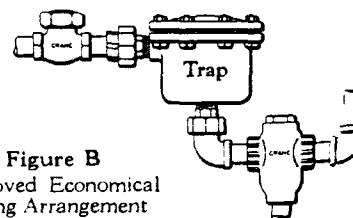


Figure B
Improved Economical
Piping Arrangement

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.

Cast Iron Gasket Type Flange Unions

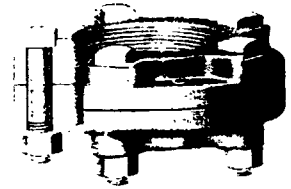
125-Pound

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	1 3/16	1 5/16	1 7/16	1 9/16	1 11/16	1 13/16	2 1/16	2 3/16	2 5/16	2 7/16	2 9/16	3 1/16	3 3/16
	Dia. of flanges	Inches	2 3/4	3 3/8	3 3/4	4 1/8	4 1/2	5 1/8	5 3/4	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	4-3/8	4-3/8	4-3/8	5-3/8	5-3/8	6-3/8	8-5/8

These 125-Pound Cast Iron Gasket Type Flange Unions are equipped with a 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 106) may be bolted together.

Extra gaskets . . . page 456

Malleable Iron Ground Joint Flange Unions

Three-Part

WORKING PRESSURES

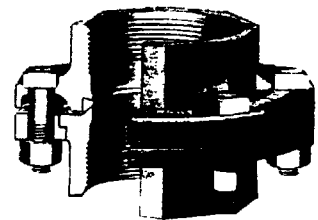
600 pounds cold water, oil, or gas, non-shock

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.

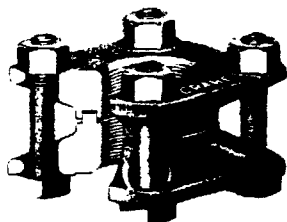
Identification: The loose ring is painted yellow so that the union can be easily identified.

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 Gasket

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

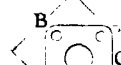
*The No. 1589 Union in the 4-inch size is rated for only 600 pounds cold water, oil, or gas, non-shock.



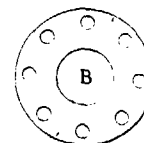
"A" is end to end of threads



Oval



Square

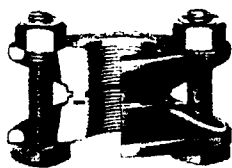


Round

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	1 5/16	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	2 3/8	2 15/16	3 1/16	3 1/2	3 13/16		
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

shown on page 398). The No. 1589 Unions are equipped with a Cranite gasket.



No. 1591 1/2
With Cranite Gasket

List Prices and Dimensions

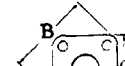
Size	Inches	1	1 1/4	2
No. 1591 1/2	Each	4.25	4.75	8.20
Style of flanges		Oval		Square
A	Inches	2	2 1/8	2 11/16
B	Inches	4 3/4	5 1/4	5 13/16
C	Inches	2 5/8	3	4 1/2
No. and dia. of bolts		2-5/8	2-5/8	4-5/8



"A" is end to end of threads.



Oval



Square

Unusually compact, these forged steel unions are ideal for making up pipe coils with close centers and

for other services where a good union joint is needed in limited space. The unions have a Cranite gasket.

Forged Steel Combination Elbows

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



View of Elbow Only



No. 1529, Complete
With Flange, Bolts,
and Cranite Gasket

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.

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.

The flange portion is the No. 1547 (shown on page 398) on the 1/2 and 3/4-inch sizes and the tongue half of the No. 1591 1/2 Union (shown above) on the 1-inch and 1 1/4-inch sizes.

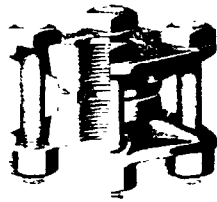
Extra gaskets . . . page 399

2000 and 6000-Pound W.O.G. Forged Steel Ground Joint Flange Unions



Steel to Steel Seat

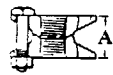
No. 328 D
2000-Pound



Brass to Steel Seat

No. 329 D
2000-Pound

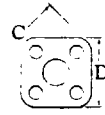
No. 340 D
2000-Pound, with
Triplex Steel Bolt-Studs
threaded full length and
fitted with a nut on each end



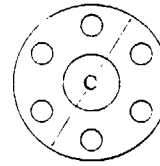
2000-Pound



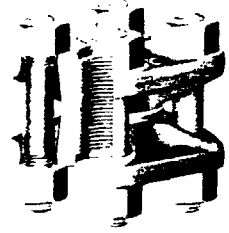
Oval



Square

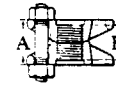


Round



Steel to Steel Seat

No. 330 D
6000-Pound, with
Cold Rolled Steel Bolt-Studs



6000-Pound

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									6000-Pound Flange Unions								
Size Inches	List Prices			Dimensions, in Inches				Style of flange	Size Inches	List Prices			Dimensions, in Inches				Style of flange
	No. 328 D Each	No. 329 D Each	No. 340 D Each	A	C	D	No. & dia. of bolts			No. 330 D Each	No. 331 D Each	A	B	C	D	No. & dia. of bolts	
1/4	5.70	6.50	7.00	1 3/4	3 3/8	1 3/8	2-1 1/2	Oval	1/4	6.85	8.25	2 1/4	1 11/16	3 7/8	2	2-5/8	Oval
3/8	6.00	6.90	7.30	1 7/8	3 13/16	1 3/4	2-1 1/2		3/8	6.85	8.25	2 1/4	1 11/16	3 7/8	2	2-5/8	
1/2	6.50	7.40	8.00	2	4	2	2-9/16		1/2	6.85	8.25	2 1/4	1 11/16	3 7/8	2	2-5/8	
3/4	7.00	8.00	8.80	2 1/8	4 3/4	2 1/4	2-3/4		3/4	9.00	10.75	2 3/8	1 13/16	3 5/8	3	4-9/16	
1	7.50	8.60	10.00	2 3/8	4 3/4	2 5/8	2-3/4	Square	1	10.00	12.00	2 1/2	2	4 1/2	3 5/8	4-5/8	Square
1 1/4	8.70	10.00	12.00	2 5/8	5	3 15/16	4-5/8		1 1/4	11.80	14.00	2 3/4	2 3/16	5 1/4	4 1/4	4-3/4	
1 1/2	10.00	11.50	14.00	2 5/8	6	4 11/16	4-5/8		1 1/2	14.50	17.50	2 7/8	2 5/16	5 7/8	4 3/4	4-7/8	
2	12.00	14.00	16.50	2 3/4	6 1/2	5 1/16	4-3/4		2	22.50	27.00	3 11/16	3	6 7/8	5 1/2	4-1 1/8	
2 1/2	17.50	20.00	23.00	3 3/8	7 1/2	5 13/16	4-7/8	Round	2 1/2	35.00		3 15/16	3 1/8	7 13/16	6 1/4	4-1 1/4	Round
3	28.00	32.00	36.00	3 3/8	8 1/4		6-7/8		3	71.00		4 5/8	3 7/8	9 1/2		6-1 1/4	
4	43.00	48.00	53.00	3 3/8	10		8-1										

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.

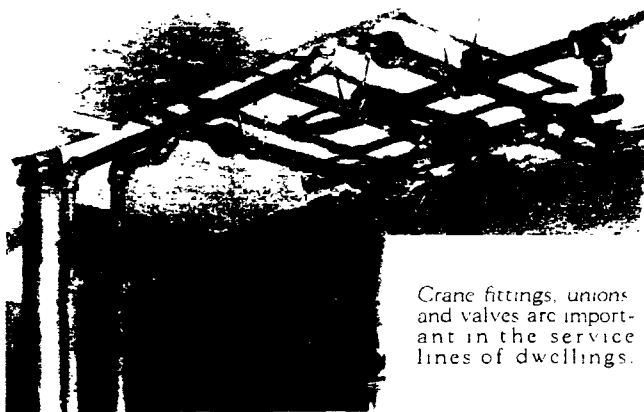
Bolting: The No. 328 D and No. 329 D Unions have commercial bolts. The No. 330 D Unions have cold rolled steel bolt-studs.

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

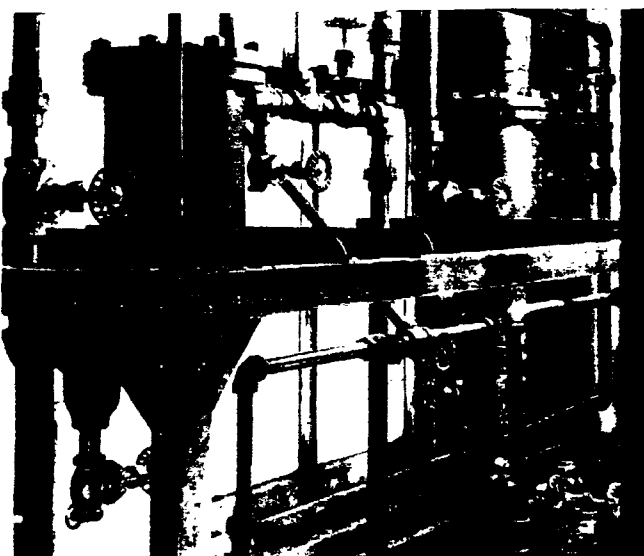
Temper- ature	Working Pressures—Pounds (Non-Shock)			
	2000-Pound		6000-Pound	
	No. 328 D and No. 329 D	No. 340 D	No. 330 D	No. 331 D
Degrees Fahr.				
100	2000	2000	6000	6000
150	1980	1980	5915	5915
200	1950	1950	5830	5830
250	1920	1920	5750	5750
300	1900	1900	5690	5690
350	1880	1880	5625	5625
400	1850	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



Crane fittings, unions, and valves are important in the service lines of dwellings.



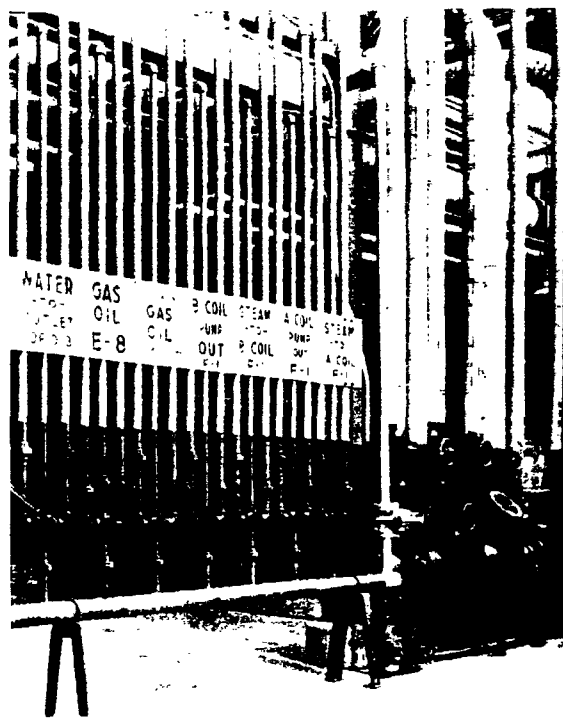
Housing project piping where Crane fittings, unions, and valves are installed.



Piping system in the boiler room of a candy manufacturer.



A portion of the ventilating system of a large gymnasium utilizing Crane fittings and unions

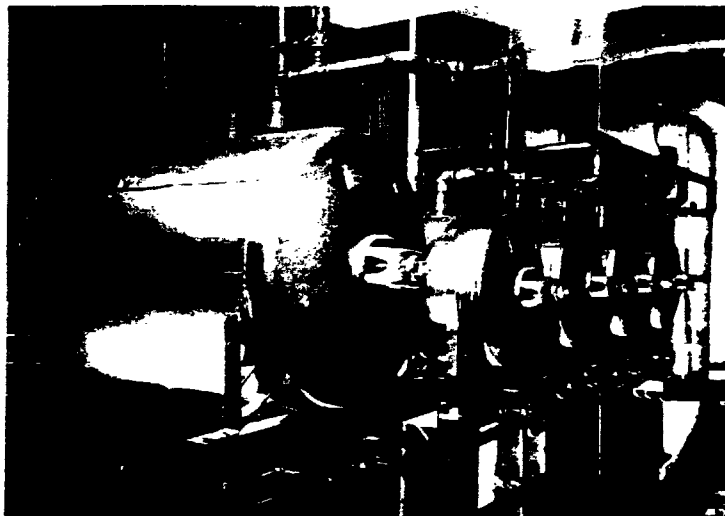


Crane fittings, unions, and valves used in piping for controlling air operated valves in a large refinery

Brass Fittings, Nipples, Unions, and Flanges

Screwed Fittings	
125-Pound	pages 190 and 191
250-Pound	page 192
Flanges	
150-Pound Companion Flanges	page 194
300-Pound Companion Flanges	page 194
Floor Flanges	page 190
Unions	
125-Pound	page 193
300-Pound	page 193
Government Pattern, 200-Pound	page 193
Union Elbows	page 193
Plugs and Bushings	page 191
Nipples	page 192

<i>How to read reducing fittings</i>	<i>page 562</i>
<i>Brass Solder-Joint Fittings</i>	<i>pages 404 to 407</i>
<i>Brass Fittings for Marine Service</i>	<i>page 383</i>



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.

125-Pound Brass Fittings



90° Elbow



90° Street Elbow

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

Air Tested



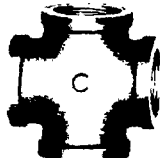
45° Elbow



45° Street Elbow



Tee



Cross



Cap
 1/8-inch size
 is hexagon
 bar stock

Right Hand
CouplingsRight & Left
Couplings

Reducer

Hexagon
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															
Hexagon 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 3/8	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			.75	.75	.88	1.20	1.88	2.15	3.00	4.00														

Reducing Fittings Carried in Stock

List prices apply only to these sizes.

Reducing 90° Elbows

1/4 x 1/8	1 x 3/4	2 x 1 1/2
3/8 x 1/4	x 1/2	x 1 1/4
x 1/8	1 1/4 x 1	2 1/2 x 2
1/2 x 3/8	x 3/4	3 x 2 1/2
x 1/4	1 1/2 x 1 1/4	x 2
3/4 x 1/2	x 1	4 x 3

Reducers

1/4 x 1/8	1 x 3/4	2 x 1 1/2
3/8 x 1/4	x 1/2	x 1 1/4
x 1/8	1 1/4 x 1	x 1
1/2 x 3/8	x 3/4	2 1/2 x 2
x 1/4	1 1/2 x 1 1/4	3 x 2 1/2
3/4 x 1/2	x 1	x 2
x 3/8	x 3/4	4 x 3
x 1/4		

Reducing Tees

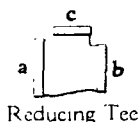
a	b	c	a	b	c	a	b	c	a	b	c
1/4 x 1/4 x 1/8	1 x 1 x 3/4	1 1/4 x 3/4 x 1 1/4	1 x 1 x 3/4	1 1/4 x 3/4 x 1 1/4	2 x 2 x 1 1/2	1 1/4 x 3/4 x 1 1/4	1 x 1 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2
3/8 x 3/8 x 1/4	x 1/2 x 3/8	1 x 1 x 1 1/4	1 x 1 x 1 1/4	1 1/4 x 1 1/4 x 1 1/4	2 x 2 x 1 1/2	1 1/2 x 1 1/2 x 1 1/4	1 x 1 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2
3/8 x 1/4 x 3/8	x 1/4 x 1/2	1 1/2 x 1 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 x 1 1/2 x 1 1/2	1 1/2 x 1 1/2 x 1 1/4	1 x 1 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2	2 x 1 1/2 x 1 1/2
1/2 x 1/2 x 3/8	x 1/2 x 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2	1 1/2 x 1 1/2 x 1 1/4	2 x 2 x 1 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2	2 x 2 x 1 1/2
1/2 x 3/8 x 1/2	x 3/8 x 1/2	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
3/8 x 3/8 x 1/2	3/4 x 3/4 x 1	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
3/4 x 3/4 x 1/2	1 1/4 x 1 1/4 x 1	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
1 1/2 x 1 1/2 x 3/4	1 1/4 x 1 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
1 1/2 x 1 1/2 x 3/4	1 1/4 x 1 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
1 1/2 x 1 1/2 x 3/4	1 1/4 x 1 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4
1 1/2 x 1 1/2 x 3/4	1 1/4 x 1 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	1 1/2 x 1 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4	2 1/2 x 2 1/2 x 1 1/4

The largest opening on reducing fittings determines the list price; e.g., 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 below.

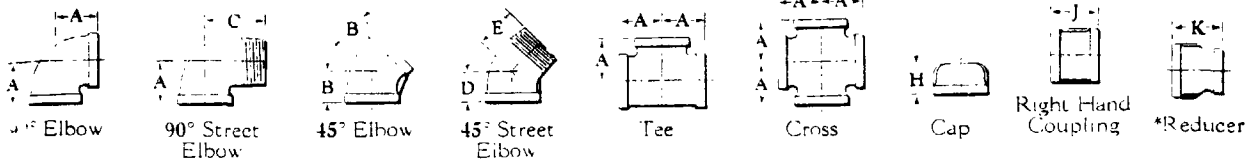


Reducing Tee

125-Pound Brass Fittings

Dimensions, in Inches

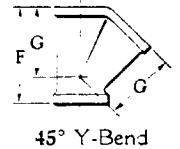
For list prices, see the preceding page.



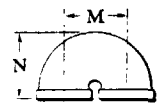
The dimensions shown cover most currently used straight size fittings and Reducers. Dimensions of reducing sizes and other types of fittings furnished on application.

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	1 1/16	1 3/16	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	1 5/16	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	1 1/16	13/16	1 5/16	1 1/4	1 1/4	1 3/8	1 11/16			
E	1 3/16	1 5/16	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 1/16	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 1/16	1 1/8	1 3/8	1 9/16	Dimensions on application					
Return Bends	Close	M		1	1 1/4	1 1/2	1 3/4	2 3/16	2 5/8			
		N		1 7/16	1 3/4	2 1/16	2 1/2	2 7/8	3 3/8			
	Open	M		1 1/2	2	2 1/2	3	3 1/2	4			
		N		1 11/16	2 1/8	2 9/16	3 1/16	3 1/2	4			
Z		1/4	3/8	3/8	1/2	9/16	1 1/16	1 1/16	1 1/16	3/4	1 5/16	1 1/8

*Dimension "K" is for reducers having either one or two size reductions.



45° Y-Bend



Return Bend



For explanation, see page 474.

Brass Plugs and Bushings



Square Head Plug



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
		Solid	Each	.21	.21	.21	.33	.40	.60	.90	1.25	2.10	3.70	6.00	14.50
	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
		Reducing 3 to 5 sizes	Each				.30	.42	.64	1.08	1.40	2.05	4.10	6.00	13.00
	Face	Each		.42	.42	.48	.66	.99	1.32	1.65	2.10				

*Hexagon Bushings: Hexagon Bushings are made either with an outside hexagon or an inside hexagon as illustrated above, depending on the size of bushing.

Face Bushings: Face Bushings in sizes 1/2-inch and smaller are made from bar stock. These do not have the two small lugs shown in the illustration above.

Service suggestions: Square Head Plugs and Countersunk Plugs are generally used with the 125-Pound Brass Fittings shown on page 190. Solid (Square Head) Plugs are generally used with the 250-Pound Brass Fittings shown on page 192.

Brass Unions.....page 193
250-Pound Brass Fittings.....page 192

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	3/4 x 1/2	
x 1/8	x 1	x 2	1 x 3/4	
3/4 x 1/2	x 3/4	x 1 1/2	x 1/2	
x 3/8	x 1/2	x 1 1/4	1 1/4 x 1	
x 1/4	2 x 1 1/2	4 x 3	1 1/2 x 1 1/4	
1 x 3/4	x 1 1/4	x 2 1/2	2 x 1 1/2	
x 1/2	x 1	x 2	x 1 1/4	
x 3/8	x 3/4			
x 1/4	x 1/2			

250-Pound Brass Fittings



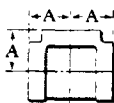
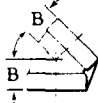
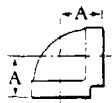
90° Elbow



45° Elbow



Tee



WORKING PRESSURES
 250 pounds saturated steam
 400 pounds cold water,
 oil, or gas, non-shock
Air Tested

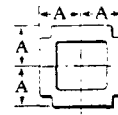


Cross



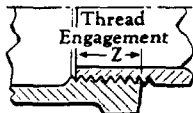
Coupling

Dimensions of 90° Elbows
 and Tees apply only to
 straight sizes; dimensions
 of reducing sizes will be
 furnished on request.



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
	45° Reducing				1.10	1.30	2.40	3.60	5.40	9.00	14.40	24.00	44.50
Tees	Straight		.62	.62	.88	1.20	2.10	3.15	4.75	7.75	12.50	21.00	39.00
			.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	1 3/16	1 5/16	1 7/8	1 5/16	1 1/2	1 3/4	1 5/16	2 1/4	2 11/16	3 1/8	3 3/4
		Tees	1 3/16	1 5/16	1 7/8	1 5/16	1 1/2	1 3/4	1 5/16	2 1/4	2 7/8	3 5/16	4
	B	Crosses	3/4	7/8	1 1/16	1 5/16	1 1/2	1 3/4	1 5/16	2 1/4	2 7/8	3 5/16	4
		F	1 5/16	1 7/16	1 7/16	1 9/16	1 3/4	2 1/16	2 5/16	2 5/8	3	3 1/4	4

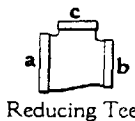


See page 474
 for explanation.

List price of re-
 ducing 90° elbows
 and tees apply
 only to sizes car-
 ried 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
$\frac{1}{2} \times \frac{3}{8}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	$1 \times \frac{3}{4} \times 1$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$\frac{1}{2} \times 1 \times \frac{1}{2}$	$3 \times 3 \times 2$							
$\frac{3}{4} \times \frac{1}{2}$	$\times 1$	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$\times \frac{3}{4}$	$1 \times 1 \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$3 \times 2\frac{1}{2} \times 3$							
$1 \times \frac{3}{4}$	$2 \times 1\frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	$\frac{3}{4} \times \frac{3}{4} \times 1$	$\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4}$	$2 \times 2 \times \frac{1}{2}$	$3 \times 2 \times 3$							
$\times \frac{1}{2}$	$\times 1\frac{1}{4}$	$\times \frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	$\times 1$	$\times 1\frac{1}{4}$	$4 \times 4 \times 3$							
$1\frac{1}{4} \times 1$	$2\frac{1}{2} \times 2$	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	$\times \frac{3}{4}$	$\times \frac{3}{4}$	$\times 1$	$\times 2$							
$\times \frac{3}{4}$	$3 \times 2\frac{1}{2}$	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	$\times \frac{1}{2}$	$\times \frac{1}{2}$	$\times \frac{3}{4}$	$4 \times 3 \times 4$							
	$\times 2$	$1 \times 1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$								
	4×3	$\times \frac{1}{2}$	$\times 1$	$\times 1$	$\times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$							

Red Brass Nipples

List Prices

Pipe Size Inches	Length Inches	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	.56	
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		



Close Nipple



Long Nipple

These are high quality Brass Nipples, made from new pipe, having clean, sharp threads accurately cut to gauge.

Brass Plugs.... page 191
 Brass Bushings... page 191
 Brass Unions.... page 193
 Brass Locknuts. page 190

Brass Ground Joint Unions

125-Pound

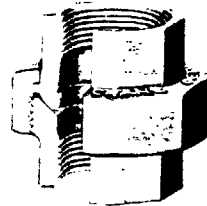
WORKING PRESSURES
125 pounds saturated steam
200 pounds cold water,
oil, or gas, non-shock
Air Tested



125-Pound
Octagon Ends

Government Pattern

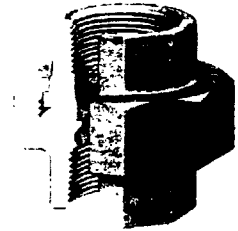
WORKING PRESSURES
200 pounds saturated steam
400 pounds cold water,
oil, or gas, non-shock
Air Tested



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	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	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 15/32	1 3/8	1 3/4	1 3/4	2	2 9/32	2 7/32	2 1/2	2 3/4		
Government Pattern	No. 523 1/2, 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	1 3/4	1 15/16	2 1/8	2 7/16	2 11/16	2 3/4	3 3/16	3 9/16	3 3/4
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		1 5/8	1 13/16	1 15/16	2 1/4	2 7/16	2 13/16	3	3 3/8		

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 Brass, a high grade steam metal.

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.

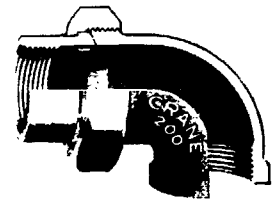
Brass Ground Joint Union Elbows

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

Ground joint—no gasket is 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

List Prices and Dimensions

		List Prices and Dimensions									
Size		Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 524 1/2	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	1 1/8	1 5/16	1 7/16	1 3/4	1 15/16	2 1/4
	Center to union end	Inches	1 1/2	1 3/4	1 15/16	2 3/16	2 5/8	3	3 7/16	3 3/4	4 1/4

150 and 300-Pound Brass Flanges



Companion Flange
No. 2104, 150-Pound
No. 2109, 300-Pound

WORKING PRESSURES

150-Pound
150 pounds saturated steam
225 pounds cold water, oil,
or gas non-shock

300-Pound
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-2-1946).

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-2-1946).

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 Crane-lap Flanged Pipe Joints.

Templates for drilling page 438



At the Crane Chicago Works.
Inspecting and checking the alignment of Crane Screwed Fittings.

Railing Fittings

Malleable Iron Ball Pattern Railing Fittings.....	page 106
Malleable Iron Adjustable Railing Fittings.....	page 107
Railing Threads — Dimensions and Normal Engagement	page 108
Rivets for Railing Fittings.....	page 108

Brass Floor Flanges
Iron Floor Flanges

page 190
page 207

* * * * *

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.



2-inch Galvanized Double Pipe Railing — total length of railing 6000 feet
Fabricated in a Crane Branch House Shop

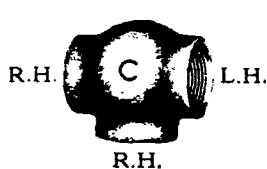
Malleable Iron Ball Pattern Railing Fittings



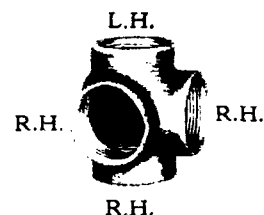
90° Elbow
No. 1, Right Hand



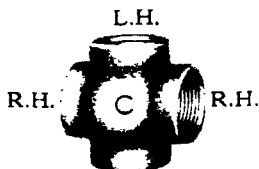
90° Side Outlet Elbow
No. 2, Right Hand



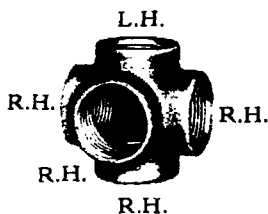
Tee
No. 3, Tapped as shown
No. 3 1/2, Right Hand



Side Outlet Tee
No. 4, Tapped as shown
No. 4 1/2, Right Hand



Cross
No. 5, Tapped as shown
No. 5 1/2, Right Hand



Side Outlet Cross
No. 6, Right Hand
No. 6 1/2, Tapped as shown



Square Floor Flange
No. 7, Right Hand



Male Ball Ornament
No. 8, Left Hand
No. 8 1/2, Right Hand



Female Ball Ornament
No. 13, Right Hand

List Prices, Each

Size		Inches	1/2	3/4	1	1 1/4	1 1/2	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	Black	.47	.57	.70	1.00	1.30	1.80
		Galv.	.61	.74	.91	1.25	1.70	2.25
	No. 3 1/2	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	Black	.69	.82	1.10	1.45	1.95	2.60
		Galv.	.90	1.05	1.45	1.90	2.55	3.40
	No. 4 1/2	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	Black	.60	.74	.95	1.30	1.75	2.35
		Galv.	.78	.96	1.20	1.65	2.25	2.95
	No. 5 1/2	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	Black	.80	.93	1.20	1.65	2.20	2.95
		Galv.	1.05	1.20	1.55	2.15	2.85	3.85
	No. 6 1/2	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	Black	.67	.80	.95	1.15	1.40	1.75
		Galv.	.87	.99	1.25	1.50	1.80	2.35
	No. 8 1/2	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.

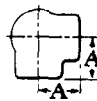
Orders should be accompanied by a sketch.

Iron Round Floor Flanges
page 207

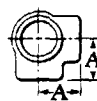
Brass Round Floor Flanges
page 190

Threading, normal thread engagement, and rivet data
page 198

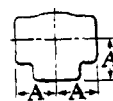
Dimensions, in Inches



No. 1



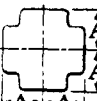
No. 2



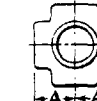
No. 3 or 3 1/2



No. 4 or 4 1/2



No. 5 or 5 1/2



No. 6 or 6 1/2



No. 7



No. 8
No. 8 1/2

Size	1/2	3/4	1	1 1/4	1 1/2	2
A	1 1/8	1 5/16	1 1/2	1 3/4	1 15/16	2 1/4
B	1 3/16	1 1/2	1 3/4	2 3/16	2 1/2	2 15/16
D	2 1/8	2 1/2	3 5/16	4 3/16	4 3/4	5 3/4
E	2	2 1/2	2 11/16	3 3/8	3 3/4	4 11/16
F	2 1/2	3 1/16	3 7/16	4 3/16	4 11/16	5 9/16
G	1 1/2	1 7/8	2 1/16	2 1/2	2 13/16	3 7/16



No. 13

Malleable Iron Adjustable Railing Fittings

Ball Type



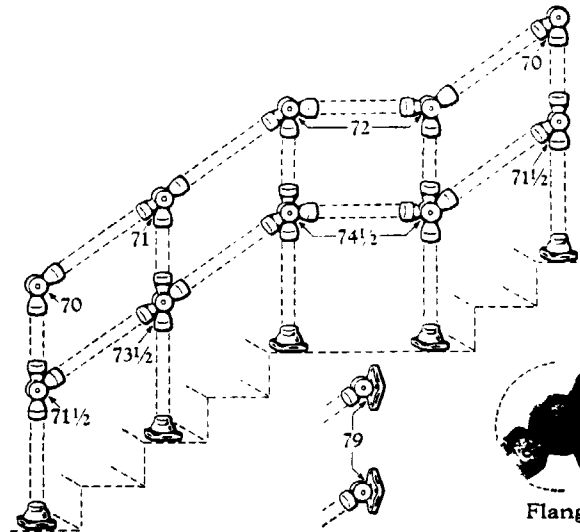
Elbow
No. 70
Female
Right Hand



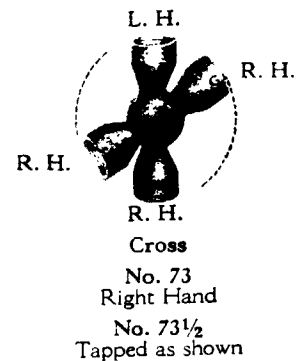
Tee
No. 71
Right Hand
No. 71½
Tapped as shown



Stair Landing Tee
No. 72
Right Hand



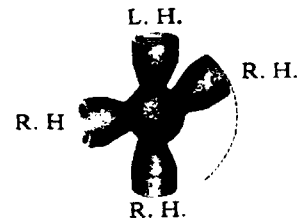
Elbow
No. 70½
Male and Female
Right Hand



Cross
No. 73
Right Hand
No. 73½
Tapped as shown



Flange
No. 79
Right Hand



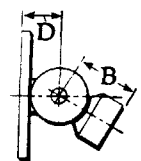
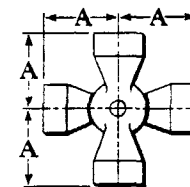
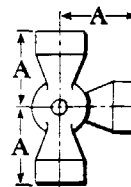
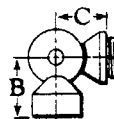
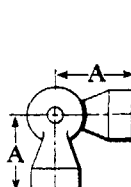
Stair Landing Cross
No. 74
Right Hand
No. 74½
Tapped as shown

*Galvanized fittings are made to order.
Add 50% to list prices of 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
Crosses	No. 72	Each 3.50	4.15	4.60	8.00
	No. 73	Each 4.20	5.10	6.00	10.00
Crosses	No. 73½	Each 4.20	5.10	6.00	10.00
	No. 74	Each 4.20	5.10	6.00	10.00
Flanges	No. 74½	Each 4.20	5.10	6.00	10.00
	No. 79	Each 3.45	4.10	4.75	8.50

Dimensions, in Inches



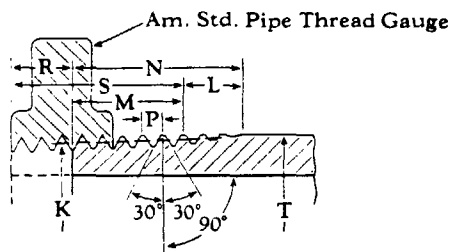
Size	1	1¼	1½	2
A	2¾	3¼	3¾	4¼
B	2¾/16	2½	2¾/16	3¼
C	1¾/16	2⅛	2¾/8	2¾/16
D	1¾/16	1¾/16	1¾/8	2¼

These fittings are adjustable as shown in the illustrations, and may be used in railings of any angle from horizontal to 45 degrees. All openings are threaded to afford rigidity to the railing.

No. 70½ Male and Female Elbows may be used in combination with Ball Pattern Railing Fittings shown on page 196. Such combinations provide for corner fittings, and enable erecting railings of a steeper angle than 45 degrees.

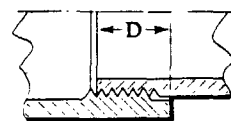
Crane Railing Pipe Threads

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 $\frac{3}{4}$ -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. Inches	P Pitch of Thread	L Imperfect Threads due to Lead of Die (Max.) Thds. Inches	D Length of Pipe Entering Recessed Railing Fitting
$\frac{1}{2}$	.840	14	.77182	.5337	.3194	.4980	3 .2143	.07143	$2\frac{1}{2}$.1786	$\frac{1}{2}$
$\frac{3}{4}$	1.050	14	.98107	.5457	.3314	.5100	3 .2143	.07143	$2\frac{1}{2}$.1786	$\frac{1}{2}$
1	1.315	$11\frac{1}{2}$	1.22993	.6828	.4219	.6393	3 .2609	.08696	$2\frac{1}{2}$.2174	$\frac{5}{8}$
$1\frac{1}{4}$	1.660	$11\frac{1}{2}$	1.57343	.7068	.4459	.7068	3 .2609	.08696	3 .2609	$1\frac{1}{16}$
$1\frac{1}{2}$	1.900	$11\frac{1}{2}$	1.81239	.7235	.4626	.7235	3 .2609	.08696	3 .2609	$\frac{3}{4}$
2	2.375	$11\frac{1}{2}$	2.28532	.7565	.4956	.7565	3 .2609	.08696	3 .2609	$\frac{3}{4}$

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 444

Rivet Data

For Malleable Iron Ball Pattern Railing Fittings

The Malleable Iron Ball Pattern Railing Fittings illustrated on page 190 can be especially prepared for rivets, when so ordered; prices on application.

9

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 table at the right. Any other drilling for rivets is considered special, and order must be accompanied by complete details or sketch; prices 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 Rivet	Length of Rivet (Measured from under Head)
	Diameter of Hole	Center of Hole to End of Fitting		
$\frac{1}{2}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{3}{16}$	$1\frac{1}{4}$
$\frac{3}{4}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{3}{16}$	$1\frac{1}{2}$
1	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$1\frac{3}{4}$
$1\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$2\frac{1}{4}$
$1\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$2\frac{1}{2}$
2	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{5}{16}$	3

Iron Flanged Fittings and Flanges

125-Pound Fittings

General Description.....	pages 200 to 202
Dimensions.....	pages 200 and 201
Working Pressures.....	page 202
List Prices.....	page 203

250-Pound Fittings

General Description.....	page 204
Dimensions.....	page 204
Working Pressures.....	page 204
List Prices.....	page 205

125-Pound Flanges.....	pages 206 and 207
250-Pound Flanges.....	page 208
Round Floor Flanges.....	page 207

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 261 to 268
Forged Steel Flanges.....	pages 285 to 292
Welding Fittings.....	pages 269 to 284
Brass Flanges.....	page 194
18-8 Mo Fittings and Flanges.....	page 373

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 200 to 203 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, are listed as approved and inspected by the Underwriters' Laboratories, Chicago, 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 ¾-inch diameter, the bolt holes are drilled ⅛-inch larger than the diameter of the bolts; for bolts ¾-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 439 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 203. The base is intended for support in compression and is not to be used for anchoring or supporting in tension or shear.

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; 46° to 90°, the same center to face dimensions as 90° Elbows. These fittings are made to order only.

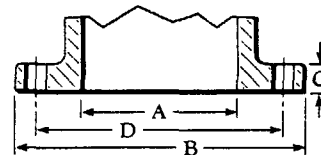
Galvanized Fittings: Crane 125-Pound Cast Iron Flanged Fittings are regularly listed black only. Galvanized fittings, however, can be made to order, at an extra charge of 40 per cent over the price of the black fittings.

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 445.

Gaskets: A wide variety of gaskets for 125-pound cast iron flanged joints is listed on page 454, including ⅛-inch cloth inserted rubber, ⅛-inch "CC" Rubber, 4-ounce canvas, and ⅛-inch Cranite—all 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 444.

Dimensions of End Flanges, in Inches

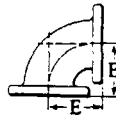


Size	A	B	C	D	No. of bolts	Dia. of bolts
1½	1½	5	9/16	3 7/8	4	1/2
2	2	6	5/8	4 3/4	4	5/8
2½	2½	7	11/16	5 1/2	4	5/8
3	3	7½	3/4	6	4	5/8
3½	3½	8½	13/16	7	8	5/8
4	4	9	15/16	7 1/2	8	5/8
5	5	10	15/16	8 1/2	8	3/4
6	6	11	1	9 1/2	8	3/4
8	8	13½	1 1/8	11 3/4	8	3/4
10	10	16	1 3/16	14 1/4	12	7/8
12	12	19	1 1/4	17	12	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	29 1/2	20	1 1/4

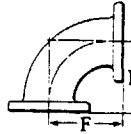
List prices page 203
How to read reducing sizes page 562

125-Pound Cast Iron Flanged Fittings

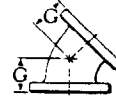
Dimensions, in Inches



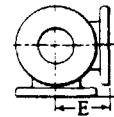
90° Elbow
No. 525, Straight
No. 545, Reducing



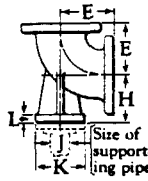
90° Long Radius Elbow
No. 531, Straight
No. 546, Reducing



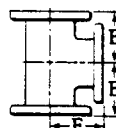
45° Elbow
No. 527
Straight



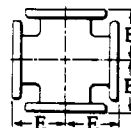
Side Outlet Elbow
No. 526
Straight



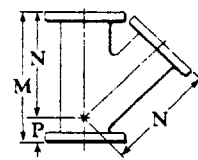
90° Base Elbow
No. 549, with Square Base
No. 550, with Round Base



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 Support- ing Pipe for Base	K Diameter of Round Base or Size of Square	L Thick- ness 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	7
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	5/8	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	8¾	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 of Side Outlet Elbows is alike for all three openings; all openings are on intersecting center lines.

Dimensions of reducing fittings: The center to face dimensions of the Reducing 90° Elbows, Reducing 90° Long Radius Elbows, and Reducing Tees

listed on page 203 are the same as for the straight sizes corresponding to the size of the largest opening.

Dimensions of Reducers: The face to face of Reducers is 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.

125-Pound Cast Iron Flanged Fittings

WORKING PRESSURES

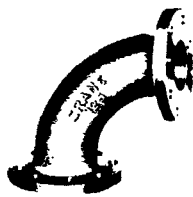
1½ to 12-inch—125 pounds saturated steam, 175 pounds cold water, oil, or gas. non-shock
14 to 24-inch—100 pounds saturated steam, 150 pounds cold water, oil, or gas. non-shock



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



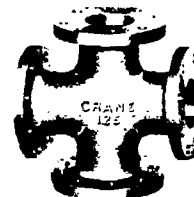
No. 550
90° Base Elbow
Round Base



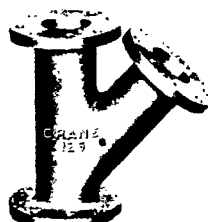
No. 529
Tee
Straight



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 207.



Elbow with Reducing
Flange Bolted On

Sprinkler service; Underwriters' approved: Crane 125-Pound Cast Iron Flanged Fittings sizes 1½ to 8-inch, inclusive, are listed as approved and inspected by the Underwriters' Laboratories, Chicago, 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 439 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 Ferrosteeel.

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					

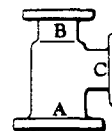
List of Reducing Elbows and of Reducers

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	
× 3	14 × 12	10 × 8	× 2	10 × 8	× 12		12 × 10	
6 × 5	16 × 12	12 × 10	5 × 4	× 6	× 10			
× 4			× 3					
× 3			× 2½					

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	A B C	A B C
2	× 2	× 1½	6 × 6 × 5	10 × 10 × 8
2½	× 2½	× 2	× 4	× 6
3	× 3	× 2½	× 3	× 5
		× 2	× 2½	× 4
		× 1½	× 2	× 3
3	× 2½	× 3	6 × 5 × 6	10 × 8 × 10
		× 2½	× 5	× 8
3	× 2	× 3	× 4	× 6
		× 2	6 × 4 × 6	8 × 8 × 10
2½	× 2½	× 3	× 4	12 × 12 × 10
4	× 4	× 3	× 3	× 8
		× 2½	6 × 3 × 6	× 6
		× 2	× 4	× 5
		× 1½	× 3	× 4
4	× 3	× 4	6 × 2 × 6	12 × 10 × 12
		× 3	5 × 5 × 6	× 10
4	× 2½	× 4	4 × 4 × 6	× 8
		× 3	8 × 8 × 6	× 6
4	× 2	× 4	× 5	12 × 8 × 12
3	× 3	× 4	× 4	× 8
		× 3	8 × 6 × 8	10 × 10 × 12
5	× 5	× 4	× 6	14 × 14 × 8
		× 3	× 5	
		× 2½	× 4	
		× 2	× 3	
5	× 4	× 5	8 × 5 × 8	
		× 4	8 × 4 × 8	
4	× 4	× 5	× 6	
			6 × 6 × 8	

Dimensions pages 200 and 201
 Templates for drilling page 439
 How to read reducing sizes page 562
 Bolting on Flanges page 437

250-Pound Cast Iron Flanged Fittings

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

American Standard: The dimensions of Crane 250-Pound Cast Iron Flanged Fittings conform to the American Standard for Cast Iron Flanged Fittings, Class 250 (B16b-1944).

Sprinkler service; Underwriters' approved: Sizes 2 to 8-inch, inclusive, are listed as approved and inspected by the Underwriters' Laboratories, Chicago, 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 sizes 6-inch and smaller are cast iron, and 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 $\frac{1}{16}$ -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 ($\frac{1}{8}$ -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 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. This base is intended for support in compression and is not to be used for anchoring or supporting in tension or shear.

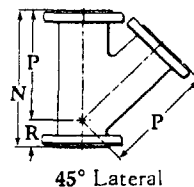
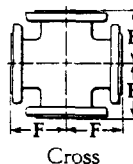
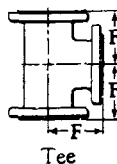
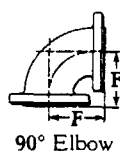
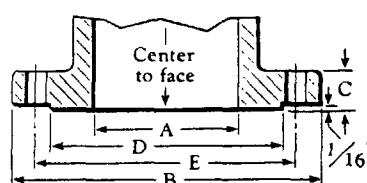
Spot facing: The bolt holes are not spot faced unless so ordered, and then at an extra list price of 20 cents per hole.

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 flange joints are listed on page 454. These include $\frac{1}{4}$ -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 444 for lubricants.

Dimensions, in Inches



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	4⅜	5	8	⅝	5	10	3									
2½	2½	7½	1	4⅝	5⅞	8	¾	5½	11	3½								5½	
3	3	8¼	1⅛	5⅞	6⅝	8	¾	6	12	3½					14	11	3	6	
3½	3½	9	1⅜	6⅞	7¼	8	¾	6½	13	4									
4	4	10	1¼	6⅝	7⅞	8	¾	7	14	4½	6	2	6½	⅞	16½	13½	3	7	
5	5	11	1⅜	8⅝	9¼	8	¾	8	16	5	6¾	2½	7½	1	18½	15	3½	8	
6	6	12½	1⅞	9⅞	10⅝	12	¾	8½	17	5½	7½	2½	7½	1	21½	17½	4	9	
8	8	15	1⅝	11⅝	13	12	⅞	10	20	6	9	4	10	1¼	25½	20½	5	11	
10	10	17½	1⅞	14⅞	15¼	16	1	11½	23	7	10½	4	10	1¼	29½	24	5½	12	
12	12	20½	2	16⅞	17¾	16	1⅛	13	26	8									

Dimensions of Reducing Elbows and Tees: The center to face is the same as for the straight size corresponding to the size of the largest opening.

Dimensions of Reducers: The face to face dimension is governed by the size of the larger opening regardless of the size of the smaller opening.

90° Base Elbow

Round Base

45° Elbow

90° Elbow

45° Elbow

90° Elbow

45° Elbow

90° Elbow

45° Elbow

90° Elbow

45° Elbow

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. 125 1/2 E
Base Elbow
Round Base



No. 105 E, Tee
Straight



No. 107 E, Tee
*Reducing



No. 113 E, Cross
Straight

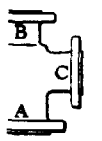


No. 117 E
45° Lateral
Straight

List Prices, Black, Each—Faced and Drilled

	No. 101 E 90° Elbow Straight	No. 121 E 90° Elbow Reducing	No. 103 E 45° Elbow	No. 125 1/2 E		No. 105 E Tee Straight	No. 107 E Tee Reducing	No. 113 E Cross	No. 117 E 45° Lateral	No. 123 E Taper Reducer
				90° Round Base Elbow Base Plain	Extra for Facing and Drilling Base					
	11.00		12.00			16.00		32.00		
1/2	11.50	21.00	13.50			16.50	23.00	34.00		19.50
	13.50	23.00	15.50			18.50	26.00	38.00	42.00	21.00
1/2	17.00		20.00			27.00				
	18.00	34.00	21.00	51.00	10.50	28.00	36.00	49.00	54.00	30.00
	22.00	41.00	26.00	58.00	12.00	39.00	49.00	65.00	71.00	37.00
	31.00	50.00	31.00	69.00	12.00	49.00	61.00	80.00	88.00	44.00
	48.00	83.00	47.00	102.00	17.50	75.00	88.00	124.00	136.00	60.00
	86.00	122.00	86.00	186.00	17.50	117.00	132.00	195.00	215.00	101.00
	125.00		125.00			169.00				

*List of Reducing Fittings



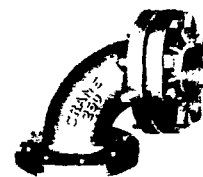
107 E Tee

*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.

121 E Reducing Elbows	No. 107 E Reducing Tees				No. 123 E Taper Reducers	
	A B C	A B C	A B C	A B C		
2	2 1/2 x 2 1/2 x 2	5 x 5 x 4	8 x 8 x 6	10 x 10 x 8	2 1/2 x 2	6 x 5
2 1/2	2 x 2	x 3	x 5	x 6	3 x 2 1/2	x 4
3	3 x 3 x 2 1/2	x 2 1/2	x 4	x 5	x 2	x 3
3 1/2	x 2	x 2	x 3	x 4	x 3	x 2 1/2
4	3 x 2 1/2 x 3	5 x 4 x 5	x 2 1/2	10 x 8 x 10	x 2 1/2	x 2
4 1/2	x 2 1/2	x 4	x 2	x 8	x 2	8 x 6
5	3 x 2 x 3	6 x 6 x 5	8 x 6 x 8	x 6	x 5	x 5
5 1/2	x 2	x 4	x 6	x 5	x 4	x 4
6	4 x 4 x 3	x 3		10 x 6 x 10	x 3	10 x 8
6 1/2	x 2 1/2	x 2 1/2		x 8	x 2 1/2	x 6
7	x 2	x 2		x 6	x 2	x 5
7 1/2	4 x 3 x 4	6 x 5 x 6		8 x 8 x 10		x 4
8	x 3	x 5				
8 1/2	x 2					
9						

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 208 for flanges.

How to read reducing sizes page 562
Taps and drains for flanged fittings page 534
Bolting on Companion Flanges page 437
Templates for drilling page 440

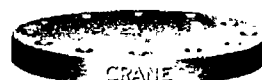
Cast Steel Fittings

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 261 to 268.

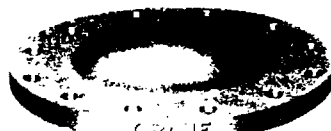
125-Pound Cast Iron Flanges



No. 553
Screwed Flange

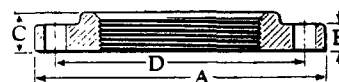


16 inches O.D. and smaller



19 inches O.D. and larger

No. 555
Blind 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

List Prices and Dimensions

Size of pipe Inches	List Prices, Black, Each		Dimensions, in Inches					
	No. 553 Screwed Flanges Faced and Drilled	No. 555 Blind Flanges Faced and Drilled	A Diameter of flange	B Thickness of flange	C Length through hub	D Diameter of bolt circle	No. of Bolts	Dia. of Bolts
1	1.35	1.50	4 1/4	7/16	1 1/16	3 1/8	4	1/2
1 1/4	1.45	1.60	4 5/8	1/2	1 3/16	3 1/2	4	1/2
1 1/2	1.53	1.70	5	9/16	7/8	3 7/8	4	1/2
2	1.70	1.85	6	5/8	1	4 3/4	4	5/8
2 1/2	1.87	2.05	7	1 1/16	1 3/16	5 1/2	4	5/8
3	2.30	2.55	7 1/2	3/4	1 1/4	6	4	5/8
3 1/2	2.90	3.20	8 1/2	1 3/16	1 1/4	7	8	5/8
4	3.45	3.85	9	1 5/16	1 5/16	7 1/2	8	5/8
5	4.15	5.20	10	1 5/16	1 7/16	8 1/2	8	3/4
6	5.00	6.30	11	1	1 9/16	9 1/2	8	3/4
8	7.50	9.30	13 1/2	1 1/8	1 3/4	11 3/4	8	3/4
10	11.00	13.70	16	1 3/16	1 15/16	14 1/4	12	7/8
12	15.00	21.00	19	1 1/4	2 3/16	17	12	7/8
14	24.00	33.50	21	1 3/8	2 1/4	18 3/4	12	1
16	35.00	49.00	23 1/2	1 7/16	2 1/2	21 1/4	16	1
18	42.00	59.00	25	1 9/16	2 11/16	22 3/4	16	1 1/8
20	50.00	70.00	27 1/2	1 11/16	2 7/8	25	20	1 1/8
24	70.00	98.00	32	1 7/8	3 1/4	29 1/2	20	1 1/4

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, are listed as approved and inspected by the Underwriters' Laboratories, Chicago, 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 Ferroteel, 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.

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.

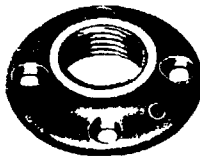
List Prices, Black, Each

Size Inches	No. 557 Faced and Drilled	Size Inches	No. 557 Faced and Drilled
1 x 5	2.20	3 x 10	6.25
1 x 6	2.45	4 x 10	7.50
1 1/4 x 6		2 x 11	
1 1/2 x 6		2 1/2 x 11	
1 1/2 x 7	2.70	3 x 11	
2 x 7		4 x 11	11.20
1 1/2 x 7 1/2	3.45	5 x 11	
2 x 7 1/2		3 x 13 1/2	
2 1/2 x 7 1/2		4 x 13 1/2	
3 x 8 1/2	4.35	5 x 13 1/2	16.50
1 1/2 x 9	5.20	6 x 13 1/2	
2 x 9		6 x 16	
2 1/2 x 9		8 x 16	
3 x 9		8 x 19	22.50
3 1/2 x 9		10 x 19	

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.

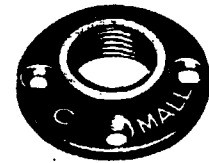
Round Floor Flanges Cast Iron or Malleable Iron



Cast Iron
Floor Flange



Floor Flanges are cast with counter-sunk holes for screws and are not faced.



Malleable Iron
Floor Flange

List Prices and Dimensions

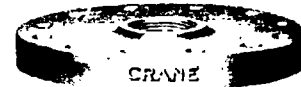
Size Inches	Cast Iron Round Floor Flanges						Malleable Iron Round Floor Flanges					
	List Prices		Dimensions, in Inches				List Prices		Dimensions, in Inches			
	Black Each	Galv. Each	Flange thick- ness A	Hub length B	Bolt circle C	No. and dia. of holes	Black Each	Galv. Each	Flange thick- ness A	Hub length B	Bolt circle C	No. and dia. of holes
1/4 x 2 13/16	.26	.52	7/32	1/2	1 7/8	4-1/4						
3/8 x 3	.26	.52	7/32	7/16	2	4-1/4						
1/2 x 3 1/2	.32	.64	9/32	9/16	2 1/2	4-1/4	.32	.64	9/32	9/16	2 1/2	4-1/4
3/4 x 3 1/2	.32	.64	5/16	5/8	2 1/2	4-1/4	.32	.64	5/16	5/8	2 1/2	4-1/4
1 x 4	.40	.80	11/32	1 1/16	3	4-1/4	.40	.80	11/32	1 1/16	3	4-1/4
1 1/4 x 4	.40	.80	11/32	3/4	3	4-1/4	.40	.80	11/32	3/4	3	4-1/4
1 1/2 x 4 1/2	.50	1.00	3/8	7/8	3 1/2	4-5/16	.50	1.00	3/8	7/8	3 1/2	4-5/16
2 x 5 1/2	.65	1.30	13/32	1	4 1/4	4-5/16	.65	1.30	13/32	1	4 1/4	4-5/16

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

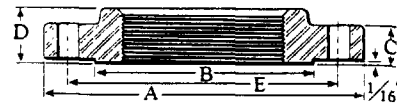


15-inch O.D. and smaller



17 1/2-inch O.D. and larger

No. 153 E
Blind Flange



Screwed Flange

List Prices, Each, and Dimensions

Size of pipe Inches	List Prices, Black		Dimensions, in Inches						
	No. 151 E Screwed Flanges Faced and Drilled	No. 153 E Blind Flanges Faced and Drilled	A	B	C	D	E	No. of Bolts	Dia. of Bolts
1 1/2	2.75	3.15	6 1/8	3 9/16	1 3/16	1 1/8	4 1/2	4	3/4
2	3.00	3.40	6 1/2	4 3/16	7/8	1 1/4	5	8	5/8
2 1/2	3.35	3.85	7 1/2	4 15/16	1	1 7/16	5 7/8	8	3/4
3	4.15	4.50	8 1/4	5 11/16	1 1/8	1 9/16	6 5/8	8	3/4
3 1/2	5.20	5.60	9	6 5/16	1 3/16	1 5/8	7 1/4	8	3/4
4	6.20	6.80	10	6 15/16	1 1/4	1 3/4	7 7/8	8	3/4
5	7.50	9.40	11	8 5/16	1 3/8	1 7/8	9 1/4	8	3/4
6	9.00	11.50	12 1/2	9 11/16	1 7/16	2	10 5/8	12	3/4
8	13.50	17.00	15	11 15/16	1 5/8	2 3/16	13	12	7/8
10	20.00	24.50	17 1/2	14 1/16	1 7/8	2 3/8	15 1/4	16	1
12	27.00	38.00	20 1/2	16 7/16	2	2 9/16	17 3/4	16	1 1/8

Size Inches	No. 155 E Reducing Screwed Flanges Faced and Drilled Black, Each
2 x 8 1/4	6.20
2 1/2 x 8 1/4	
3 x 10	9.50
4 x 11	11.00
4 x 12 1/2	13.50
5 x 12 1/2	
6 x 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 1 1/2 to 8-inch, inclusive, are listed as approved and inspected by the Underwriters' Laboratories, Chicago, 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 285 to 292.

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.

Crane Pressure-Seal Bonnet Valves

(Patented and Patents Pending)

General Description of Pressure-Seal Bonnet.	pages 210 and 211
Ratings and Tests.	page 212
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Gate Valves	
Description.	page 213
List Prices.	page 214
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Globe and Angle Valves	
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Stop-Check Valves	
Description.	page 218
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Line Joints.	page 220

Crane Pressure-Seal Bonnet Valves represent a revolutionary change in 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 of all of these valves, but each type—gate, globe, angle, and stop-check—has many additional features that contribute to easier operation, greater efficiency, and longer service life.

Announced only a few years ago and eagerly accepted by engineers, literally hundreds of these valves are setting new performance records, 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 is growing rapidly.

The valves illustrated, described, and listed on pages 210 to 219 have already become 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 Pressure-Seal Bonnet

Steel Gate, Globe, Angle, and Stop-Check Valves

(Patented and Patents Pending)

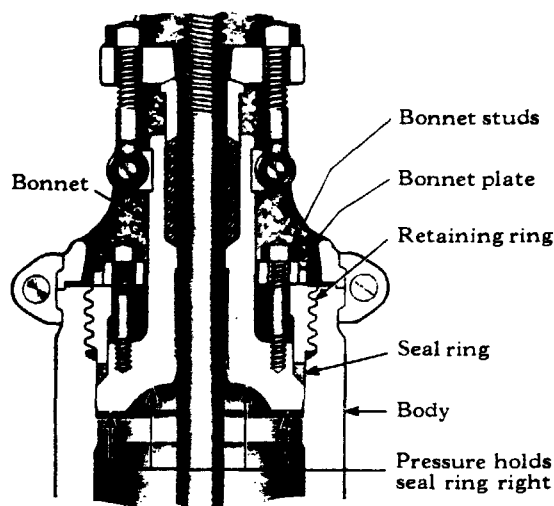
General Description

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-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

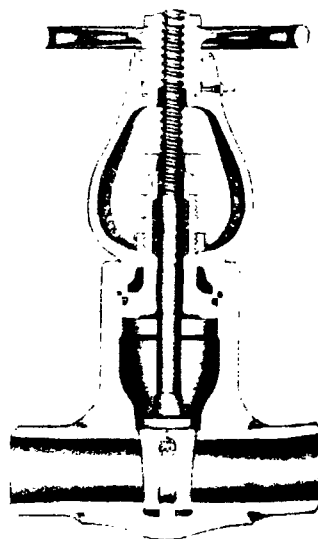
light weight of the parts of the Pressure-Seal Bonnet, the use of ample metal sections but without the extra thickness usually added for corrosion allowance on valves also recommended for oil refining services, and the unique compactness of design, make a surprising reduction in weight.

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 have been made as short as practicable, commensurate with good design. Close nesting of valves is possible where necessary, without interference from overhanging flanges as is the case in conventional bolted bonnet valves. In addition,

(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)

tion, the over-all compactness of Crane Pressure-Seal Bonnet Valves substantially 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 specially 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, made welding end only, 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.

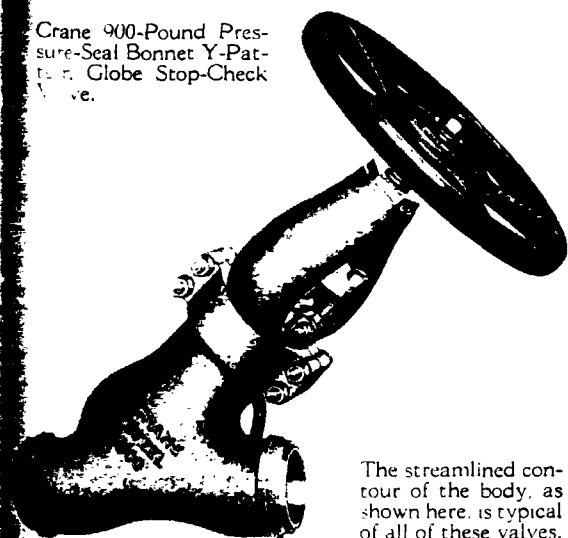
Easy to insulate: The application of insulation is made easier due to the streamlined body. Less insulating material—only a little more than used on a welding end tee—and labor are required, and neater and more effective results are obtained.

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.

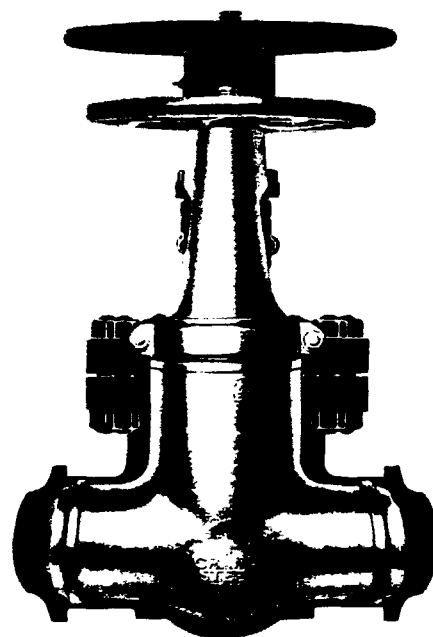
In smaller sizes, the yoke and retaining ring are integral, and screw into the body. In larger size valves, the yoke sets on top of the body, positioned by a male and female joint, and held rigidly in place by a single circular clamp; this latter construction is especially desirable on large sizes which may be hand 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 end, 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.



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.

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. unless equipped with special stuffing box packing for services such as boiler feed, on which the temperature limit is 700° F.; valves made of No. 7 Steel are recommended for 1000° F. maximum temperature.

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, although relatively new, is growing rapidly. It already 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. Information on sizes, types, and pressure classes not listed in this section will be furnished on application.

List prices and dimensions
Pressure-temperature ratings
Description of materials

pages 214 to 219
page 212
pages 1 to 9

Steel Pressure-Seal Bonnet Valves

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 high-temperature steam and hot water services encountered in modern steam generating stations and for similar services found 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 "U4A" are recommended for a maximum temperature of 700° F. They are made with Crane No. 4 Carbon-Molybdenum Alloy Steel body and bonnet and are equipped with stuffing box packing that is especially suited for boiler feed or similar lower temperature service. Valves having the catalog number suffixed with the designation "U4S" are recommended for a maximum temperature of 850° F. They also are made with Crane No. 4 Carbon-Molybdenum Alloy Steel body and bonnet.

Valves having the catalog number suffixed with the designation "U7" or "U" are recommended for a maximum temperature of 1000° F. They have the body and bonnet made of Crane No. 7 Chrome-Molybdenum Steel. No. 7 Steel is a new material alloyed for welding end valves used on steam service at temperatures from 850° to 1000° F. It exhibits much greater stability against graphitization at these temperatures than does carbon-molybdenum steel; see page 7 for description.

Subject to the temperature limitation explained in the foregoing, Crane Pressure-Seal Bonnet Valves are recommended for the pressures shown in the table at the upper right.

Standards: Pressure-temperature ratings for Crane Pressure-Seal Bonnet Valves for temperatures up to

PRESSURE-TEMPERATURE RATINGS

See service recommendation at left.	Temperature Degrees Fahr.	Max. Non-Shock Working Pressures Pounds per Square Inch		
		600-Lb. Valves	900-Lb. Valves	1500-Lb. Valves
"U4A" valves limited to 700° F. max. temperature	100	1440	2160	3600
	150	1420	2130	3550
	200	1400	2100	3500
	250	1380	2070	3450
	300	1365	2050	3415
"U4S" valves limited to 850° F. max. temperature	350	1350	2025	3375
	400	1330	2000	3330
	450	1320	1975	3295
	500	1250	1875	3125
	550	1180	1775	2955
"U7" and "U" valves limited to 1000° F. max. temperature	600	1110	1660	2770
	650	1030	1550	2580
	700	940	1410	2350
	750	850	1275	2125
	800	750	1125	1875
	850	700	1050	1750
	900	650	975	1625
	950	600	900	1500
	1000	550	820	1370

and including 950° F. agree with those in Supplement No. 1 to American Standard A.S.A. B16e-1930. Steam ratings at 1000° F. are based on the permissible stresses defined in the A.S.M.E. 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 219.

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 on temperatures over 1000° F., Crane 1500-Pound Pressure-Seal Bonnet Valves made of No. 9 Chrome-Molybdenum Alloy Steel are recommended; they are made to order only and prices are furnished on application. Crane No. 9 Steel contains higher percentages of the alloying elements (chromium and molybdenum) than does No. 7 Steel, offering even greater stability against graphitization; 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 (based on allowable stresses defined by the A.S.M.E. Boiler Code for this type of material) for Crane 1500-Pound Pressure-Seal Bonnet Valves made of No. 9 Chrome-Molybdenum Steel are shown at the left. 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; see the "1500-Lb. Valve" column in the large table above.

List prices and dimensions pages 214 to 219

Description of Pressure-Seal Bonnet pages 210 and 211

Pressure-Seal Bonnet Cast Steel Wedge Gate Valves

(Patented and Patent Pending)

600, 900, and 1500-Pound Butt-Welding Ends

The two sectional views at the right are typical of the construction of the larger size Crane Pressure-Seal Bonnet Gate Valves having butt-welding ends.

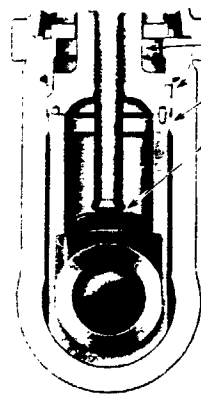
Body: The body is made without abrupt change in metal section, providing protection against a concentration of stresses produced by pressure, temperature differences, and pipe line strains. The valves have a slightly reduced seat area to improve flow characteristics, and there are no pockets between the end of the body and the seat to cause turbulence or friction.

Body seat rings: The body seat rings are a new design, Stellite faced. Accurately made to precision fits, 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.

Disc: These valves have a wedge disc with Stellite 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 between the seating faces, 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 that may be caused by contraction of the valve body or minute pipe line strains.

Disc guide: Sizes 2½-inch and larger have an improved full length disc guide, which extends not only along the sides of the body but also all around the bottom. It is a separate piece, "U" shaped, which fits 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 disc, guide, and body seat rings.

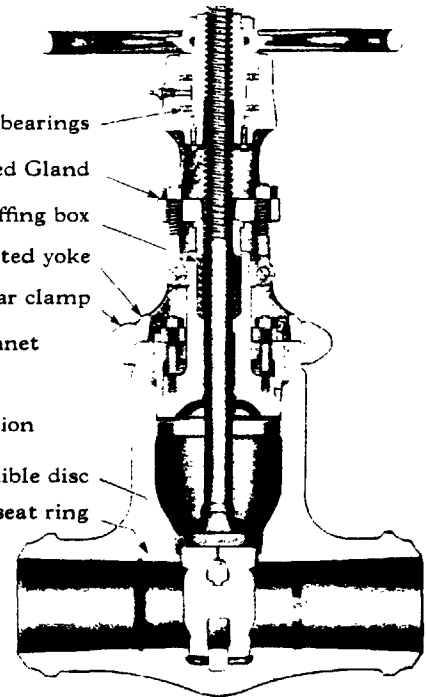
Sections showing typical construction of the larger size Pressure-Seal Bonnet Gate Valves



Pressure-Seal Bonnet
Disc guide
Tee-head connection

The section at the left illustrates the unusual disc guide and the tee-head disc-stem connection.

Ball bearings
Bolted Gland
Deep stuffing box
Direct mounted yoke
Circular clamp



Flexible disc
Welded seat ring

Sizes 2-inch and smaller have the disc guides integral with the sides of the valve body.

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 new 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; all sizes 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 for the stem and providing the proper stem guiding required in these larger sizes.

1500-Pound Socket-Welding Ends

The Crane line of Pressure-Seal Bonnet Gate Valves also include 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

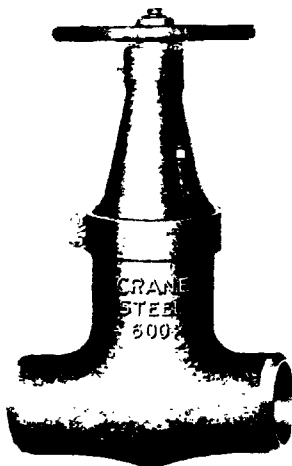
the butt-welding end described above. The body seat rings are long and are fillet welded into the body, the welded end of the ring forming the end of the socket in the body.

General description . . . pages 210 and 211

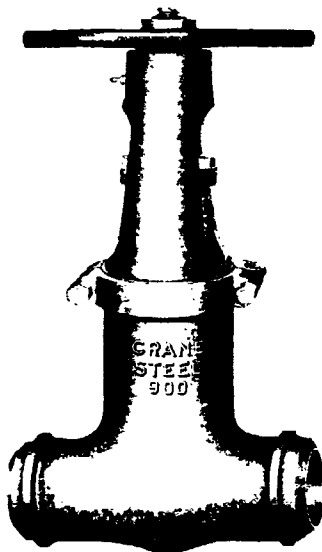
List prices and dimensions . . . pages 214 and 215

Pressure-Seal Bonnet Cast Steel Wedge Gate Valves

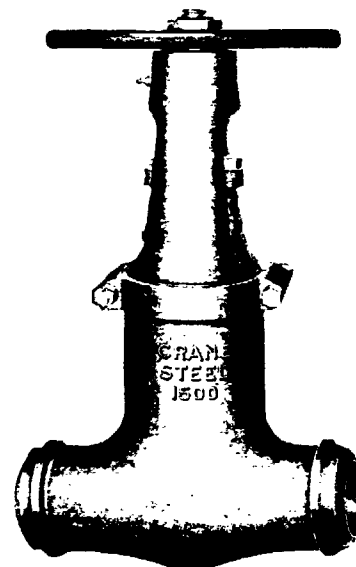
*For description, ratings, tests,
and service recommendations,
see pages 210 to 213.*



600-Pound Butt-Welding
No. 776-U4A, 700° F. max.
No. 776-U4S, 850° F. max.
No. 776-U7, 1000° F. max.

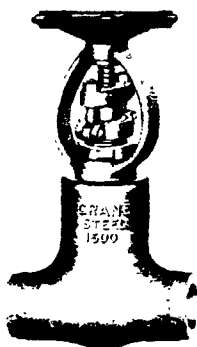


900-Pound Butt-Welding
No. 783-U4A, 700° F. max.
No. 783-U4S, 850° F. max.
No. 783-U7, 1000° F. max.



1500-Pound Butt-Welding
No. 787-U4A, 700° F. max.
No. 787-U4S, 850° F. max.
No. 787-U7, 1000° F. max.

List Prices, Each



1500-Pound
Socket-Welding
No. 7811 U
1000° F. max.

Size Inches	Butt-Welding End						Socket- Welding End 1500-Pound No. 7811 U
	600-Pound		900-Pound		1500-Pound		
	No. 776-U4A or 776-U4S	No. 776-U7	No. 783-U4A or 783-U4S	No. 783-U7	No. 787-U4A or 787-U4S	No. 787-U7	
1					405.00	405.00	324.00
1¼					445.00	445.00	356.00
1½					490.00	490.00	392.00
2					610.00	610.00	488.00
2½	430.00	430.00			770.00	770.00	
3	525.00	525.00	815.00	815.00	1015.00	1015.00	
4	805.00	805.00	1065.00	1065.00	1395.00	1395.00	
5	1205.00	1205.00	1435.00	1435.00	2185.00	2185.00	
6	1565.00	1565.00	1930.00	1930.00	2845.00	2845.00	
8	2245.00	2245.00	2870.00	2870.00	4360.00	4360.00	
10	3285.00	3285.00	4030.00	4030.00	6715.00	6715.00	
12	4325.00	4325.00	5465.00	5465.00	9690.00	9690.00	
14	5745.00	5745.00		7725.00		14100.00	
16	7420.00	7420.00		9680.00		On Request	
18	9265.00	9265.00		13300.00			
20	13830.00	13830.00					
24	22555.00	22555.00					

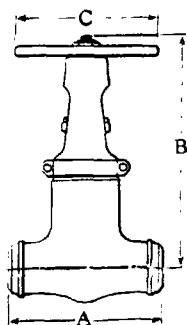
Materials: The body seat rings, seal-welded in place, and the disc are made of the same material as the body and bonnet and have the seating surfaces faced with Stellite. The stem is made of Exelloy.

Valves having the catalog number suffixed with the designation "U4A" are made with a Crane No. 4 Carbon-Molybdenum Alloy Steel body and bonnet, and are recommended for 700° F. maximum temperature. Valves having the catalog number suffixed with the designation "U4S" also have a Crane No. 4 Steel body and bonnet but are recommended for

850° F. maximum temperature. Valves having the catalog number suffixed with a "U7" or "U" have a Crane No. 7 Chrome-Molybdenum Alloy Steel body and bonnet and are recommended for 1000° F. maximum temperature.

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.

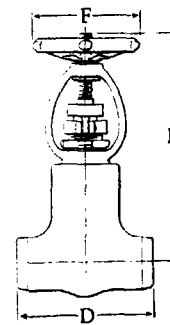
Pressure-Seal Bonnet Cast Steel Wedge Gate Valves



600, 900, and 1500-Pound
Butt-Welding

Crane Pressure-Seal Bonnet Gate Valves, while having liberal strength, are considerably lighter in weight than valves of any other design, being unusually compact. The space required by these valves is substantially less, and close nesting of valves is possible because of their streamlined design.

The end to end dimension in almost all instances is shorter than specified in the American Standard for Face-to-Face Dimensions of Ferrrous Flanged and Welding End Valves, B16.10-1939. The center to top dimensions in all cases are noticeable smaller, making less headroom necessary.



1500-Pound
Socket-Welding

Dimensions, in Inches

Size Inches	Butt-Welding End Valves									Socket-Welding End Valves			
	600-Pound			900-Pound			1500-Pound			1500-Pound			
	A	B Open	C	A	B Open	C	A	B Open	C	D	E Open	F	Depth of socket
1							5½	11½	5	5½	11½	5	½
1¼							6½	12½	5	6½	12½	5	½
1½							7	16	8	7	16	8	½
2							8½	17½	8	8½	17½	8	¾
2½	8½	19¼	8				10	20	9				
3	10	21	9	12	23	10	12	23	10				
4	12	25¾	10	14	27¾	14	16	27¾	14				
5	15	30½	12	17	33½	16	19	33½	16				
6	18	33½	14	20	39½	20	22	39	20				
8	23	43¾	20	26	47	24	28	46½	24				
10	28	51½	24	31	52½	24	34	52¾	27				
12	32	59½	24	36	61½	27	39	61¼	30				
14	35	65½	27	39	67	30	42	66	36				
16	39	72	30	43	73½	36	47	75¼	36				
18	*	*	*	*	*	*				*Dimensions will be furnished on request.			
20	*	*	*										
24	*	*	*										

By-Passes: When so ordered, 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 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 at the right.

By-Passes for 600, 900,
and 1500-Pound Valves

Size of Main Valve	Size of By-Pass
*4	
5	
6	
8	
10	
12	
14	
16	1¼
18	
20	1½
24	2

*900 and 1500-Pound only.

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 steel pipe is used, made of material which corresponds to that

used in the body of the main valve. The by-pass valve is the full equivalent of the main valve as far as ratings and service recommendations are concerned. All piping connections are welded.

Unless otherwise specified, the by-pass is attached to the main valve at an angle of 30° from the center line of the stem of the main valve and is positioned as close as practicable to the side of the valve body. The by-pass valve is mounted so that its stem is approximately 30° from vertical.

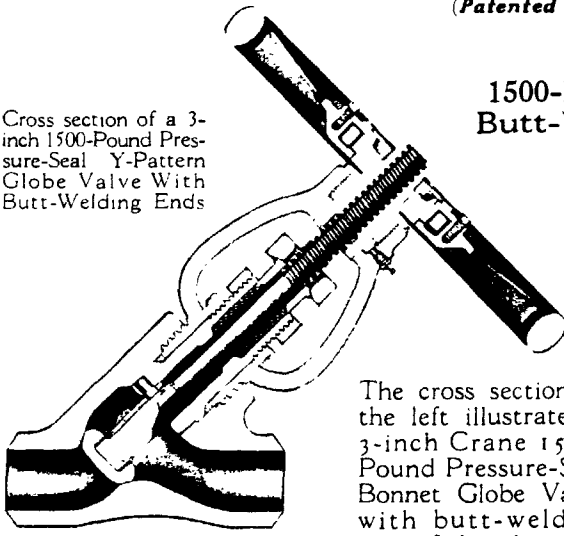
Motor operated valves: Valves installed in inaccessible locations or used for emergency or other unusual purposes are frequently required equipped with an electric, air, or gas motor unit; see pages 132 to 135 for complete description.

Gearing: To facilitate operation, the larger size valves 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.

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 Pressure-Seal Bonnet assures freedom from bonnet joint leakage and maintenance. The valves are compact, lighter in weight, and save space. Because of the shape of the interior, pressure drop is low.

The cross section at the left illustrates a 3-inch Crane 1500-Pound Pressure-Seal Bonnet Globe Valve with butt-welding ends. Like the gate valves described on the preceding pages, these globe valves have many new features of unusual merit. For general description, see pages 210 and 211.

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.

Disc: The disc also is Stellite faced. On sizes 3-inch and smaller it is rigidly attached to the stem, and is

accurately guided to the seat by the long shoulder on the stem which fits snugly in the bore of the bonnet.

Rising stem: In sizes 3-inch and smaller, the hand-wheel turns a yoke sleeve which can be lubricated through the grease fitting on the yoke. The stem rises but does not turn. Turning movement is prevented by the stem holder pin which sets in the bonnet; the end of the pin rides in a long slot in the lower end of the stem, assuring longitudinal movement only. On the 4-inch size, the handwheel is mounted on the end of the stem; it turns and rises with the stem, which operates through a long bushing on the top of the yoke.

Handwheel: The 2 and 2½-inch sizes have a conventional style malleable iron wheel; the 3 and 4-inch sizes have a cast steel hammer-blow handwheel.

Other features: These valves have the Crane Pressure-Seal Bonnet, the yoke and retaining ring being integral. The stuffing box is large and deep, and is filled with high grade packing.

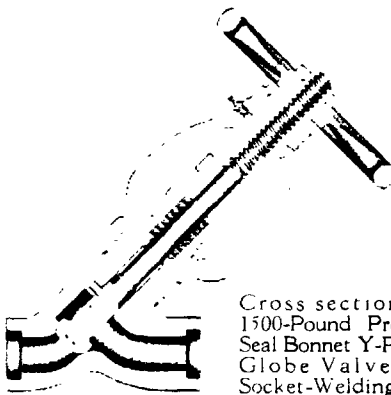
The valves have a two-piece bolted gland, consisting of a gland and gland flange. The flange is equipped with swinging gland eye bolts.

1500-Pound Globe and Angle 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 smaller sizes of butt-welding end Globe Valves described above, but 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 disc face is integral with the stem end on the 1-inch size; larger size have a separate disc faced with Stellite and rigidly attached to the stem. The valves have a rising, non-turning stem, the handwheel being mounted on a yoke sleeve. The yoke and retaining ring are integral, and the deep stuffing box is equipped with a bolted gland, equipped with swinging gland eye bolts.



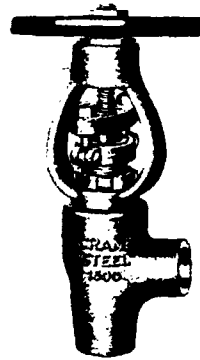
Cross section of a 1500-Pound Pressure-Seal Bonnet Y-Pattern Globe Valve with Socket-Welding Ends

Pressure-Seal Bonnet Cast Steel Globe and Angle Valves

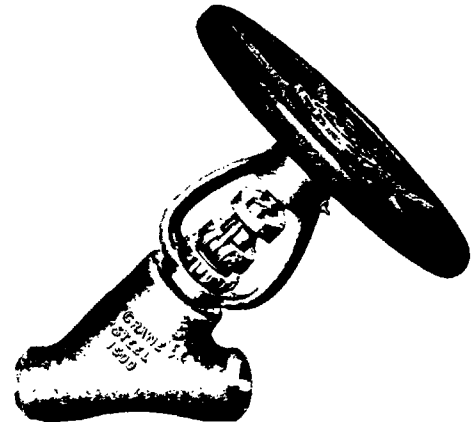
For description, ratings, tests,
and service recommendations,
see pages 210, 211, 212, and 216.



Globe, 1500-Pound
Socket-Welding
No. 7852 U
1000° F. max



Angle, 1500-Pound
Socket-Welding
No. 7853 U
1000° F. max



Globe, 1500-Pound Butt-Welding
No. 7189-U4A, 700° F. max.
No. 7189-U4S, 850° F. max.
No. 7189-U7, 1000° F. max.

Materials: The seating surfaces are Stellite faced, the seat facing being deposited directly on the body in globe valves; angle valves have a separate seat ring, made of the same material as the body and welded into it. In 1-inch valves, the Stellite disc facing is deposited on the end of the stem, the stem and disc being integral; larger sizes have a separate disc made of the same material as the body. All sizes have an Exelloy stem.

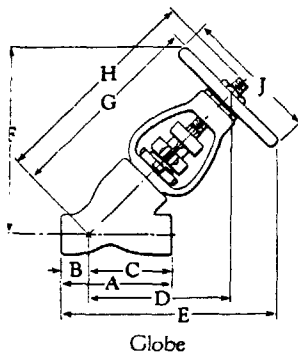
Valves having the catalog number suffixed with the designation "U4A" have a Crane No. 4 Carbon-Molybdenum Alloy Steel body and bonnet, and are recommended for 700° F. maximum temperature. Valves having the catalog number suffixed with "U4S" also have a No. 4 Steel body and bonnet but are recommended for 850° F. maximum temperature. Valves

with a "U7" or "U" suffix have a Crane No. 7 Chrome-Molybdenum Alloy Steel body and bonnet and are recommended for 1000° F. maximum temperature.

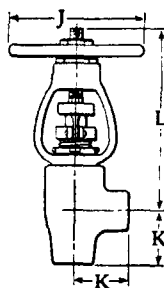
Ordering Butt-Welding End Valves: Orders for butt-welding end valves must always specify the inside diameter of the pipe with which they are to be used, or its wall thickness, so that the ends of the valve can be bored to match.

Rising stem: Sizes 3-inch and smaller have the handwheel mounted on a yoke sleeve; the stem rises but does not turn. The 4-inch size has the handwheel mounted on the end of the stem; the stem and wheel turn and rise together; clearance dimensions of the 4-inch size will be furnished on request.

Small size valves: Small size (1/2 and 3/4-inch) 1500-Pound Socket-Welding End Globe and Angle Valves are available; prices, description, and dimensions will be furnished on application.



Globe



Angle

List Prices, Each

Size Inches	1500-Pound Socket-Welding End		1500-Pound Globe Butt-Welding End	
	No. 7852 U Globe	No. 7853 U Angle	No. 7189-U4A or 7189-U4S	No. 7189-U7
1	121.00	121.00		
1 1/4	176.00	176.00		
1 1/2	239.00	239.00		
2	322.00	322.00	550.00	550.00
2 1/2			800.00	800.00
3			1060.00	1060.00
4			1500.00	1500.00

Dimensions, in Inches

Type of Valve	Size	A	B	C	D	E	F	G	H open	J	K	L open	Depth of socket
Socket-weld Globe and Angle	1	5 1/2	1 3/8	4 1/8	7 1/2	11	9 1/2	10 5/8	11 1/2	6	2 3/4	10	1 1/2
	1 1/4	6 1/2	1 5/8	4 7/8	8 7/8	13 1/4	11 5/8	12 1/2	14 1/4	8	3 1/4	12 1/8	1 1/2
	1 1/2	7	2	5	10 1/4	15 1/4	13 3/8	14 3/8	16 1/4	9	3 1/2	13 7/8	1 1/2
	2	8 1/2	2 7/16	6 1/16	10 3/4	16 3/4	14 1/4	15 1/4	17 3/4	10	4 1/4	14 3/8	5/8
Butt-weld Globe Only	2 1/2	10	2 7/8	7 1/8	13 1/8	20 1/4	17 3/8	18 1/2	21 1/2	12			
	3	12	3 3/8	8 5/8	14 1/8	24 5/8	21 1/4	20	22 3/4	20			
	4	16	4 1/2	11 1/2	*	*	*	*	*	*			

*Dimensions
furnished
on request.

General description of Pressure-Seal Bonnet... pages 210 and 211
Ratings, tests, and service recommendations... page 212

Pressure-Seal Bonnet Cast Steel Stop-Check Valves

(Patented and Patent Pending)

900 and 1500-Pound Butt-Welding Ends

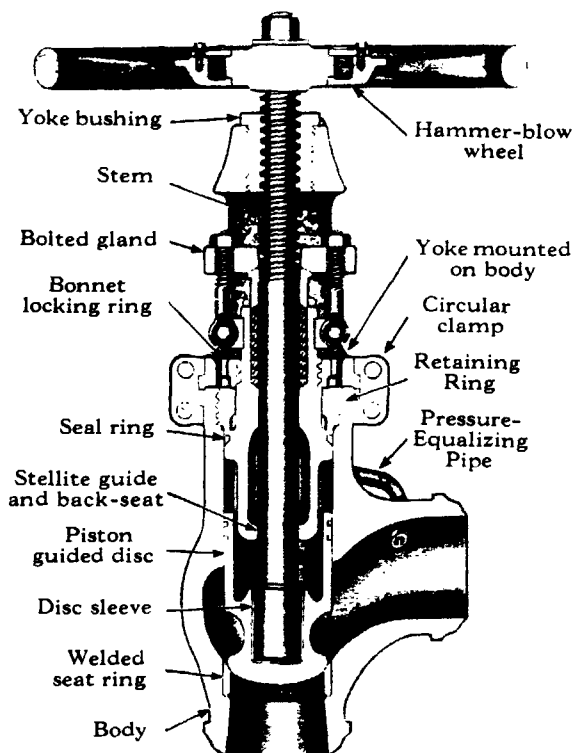
Freedom from bonnet joint leakage and maintenance, savings in space and weight, long service life, unusually low pressure drop—these and other benefits accrue to the user of Crane Pressure-Seal Bonnet Stop-Check Valves.

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.

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.



Cross section of a 6-inch
900-Pound Pressure-Seal Bonnet
Angle Stop-Check Valve

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 210 and 211. 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 210.

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.

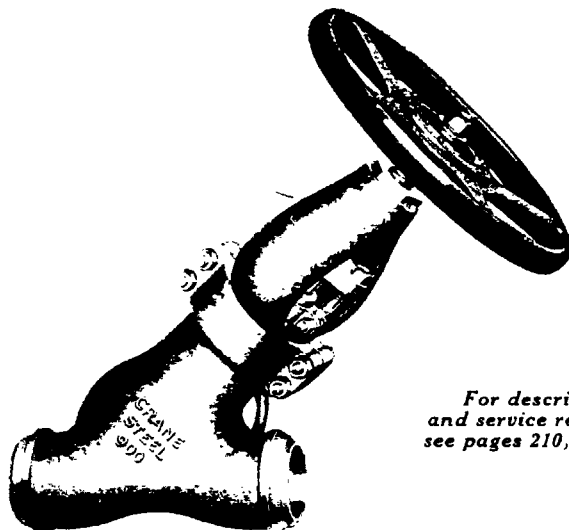
Stuffing box: A tight stem seal is provided by a large and deep stuffing box, which is filled with high grade packing.

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.

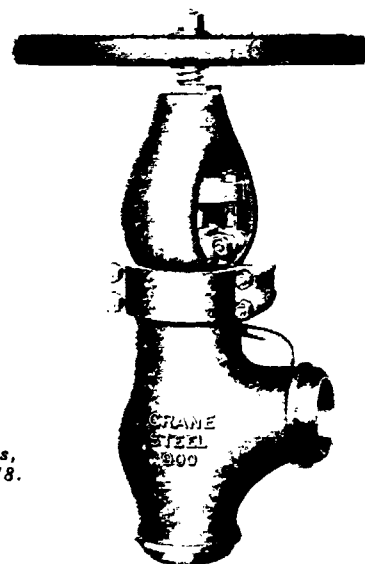
List prices and dimensions
Pressure-temperature ratings.
General description...
Selecting size of Stop-Check Valve

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page 212
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Pressure-Seal Bonnet Cast Steel Stop-Check Valves



Globe Y-Pattern
Butt-Welding, 1000° F. max.
900-Pound—No. 7186 U
1500-Pound—No. 7192 U



Angle
Butt-Welding, 1000° F. max.
900-Pound—No. 7188 U
1500-Pound—No. 7194 U

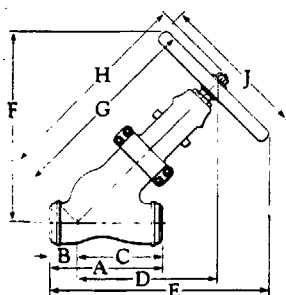
For description, ratings,
and service recommendations,
see pages 210, 211, 212, and 218.

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.

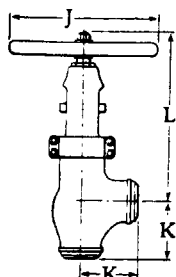
The body and bonnet also are made of Crane No. 7 Chrome-Molybdenum Alloy Steel, and the valves are recommended for 1000° F. maximum temperature.

List Prices, Each

Size Inches	900-Pound		1500-Pound	
	No. 7186 U Globe	No. 7188 U Angle	No. 7192 U Globe	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

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.

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 hydrostatically tested under the seat at $1\frac{1}{2}$ times the nominal working pressure (1350 pounds on 900-Pound Valves and 2250 pounds on 1500-Pound Valves), and also are given a 100-pound air-under-water seat test.

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.

Dimensions, in Inches

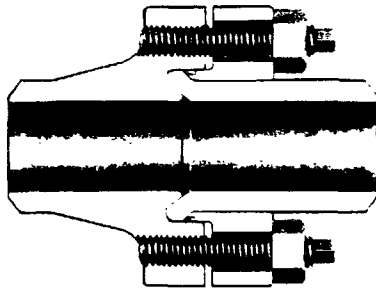
Pressure Class	Size	A	B	C	D open	E open	F open	G open	H open	J	K	L open
900-Pound	6	20	5	15	26 $\frac{7}{8}$	41 $\frac{1}{8}$	36 $\frac{1}{8}$	38	39 $\frac{3}{4}$	26	10	32
	8	26	6 $\frac{3}{4}$	19 $\frac{1}{4}$	32 $\frac{1}{2}$	49 $\frac{7}{8}$	43 $\frac{1}{8}$	46	47 $\frac{3}{4}$	30	13	37 $\frac{5}{8}$
	10	31	7 $\frac{3}{4}$	23 $\frac{1}{4}$	37 $\frac{1}{2}$	57 $\frac{1}{2}$	49 $\frac{7}{8}$	52 $\frac{3}{4}$	54 $\frac{3}{4}$	36	15 $\frac{1}{2}$	42 $\frac{3}{8}$
	12	36	9 $\frac{5}{16}$	26 $\frac{11}{16}$	44 $\frac{3}{4}$	66 $\frac{3}{8}$	57	63 $\frac{1}{4}$	65 $\frac{1}{4}$	36	18	50 $\frac{5}{8}$
1500-Pound	8	28	7 $\frac{3}{4}$	20 $\frac{1}{4}$	32 $\frac{1}{2}$	50 $\frac{7}{8}$	43 $\frac{1}{8}$	46	47 $\frac{3}{4}$	30	14	37 $\frac{5}{8}$
	10	34	9	25	37 $\frac{1}{2}$	58 $\frac{3}{4}$	49 $\frac{7}{8}$	52 $\frac{3}{4}$	54 $\frac{3}{4}$	36	17	42 $\frac{3}{8}$
	12	39	11 $\frac{5}{16}$	27 $\frac{11}{16}$	44 $\frac{3}{4}$	68 $\frac{3}{8}$	57	63 $\frac{1}{4}$	65 $\frac{1}{4}$	36	19 $\frac{1}{2}$	50 $\frac{5}{8}$

General description of Pressure-Seal Bonnet... pages 210 and 211
Ratings and service recommendations... page 212

Pressure-Seal Line Joints

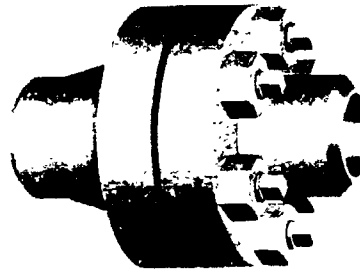
1500-Pound Butt-Welding Ends

(Patent Pending)



Cross Section

*Prices and dimensions
are furnished
on application.*



Pressure-Seal 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.

Design: 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.

The smaller sizes employ a screwed union ring, and consist of a stub end, a socket, the seal ring, and the union ring.

The larger sizes are flanged as illustrated above; they consist of a stub end, a socket flange, a ring flange, the seal ring, and studs and nuts.

Welding end: Pressure-Seal Line Joints have butt-welding ends and are regularly made for use with Schedule 160 Pipe.

Available sizes: These joints are available in the 1500-Pound pressure class and are made in sizes 1 to 16-inch, inclusive.

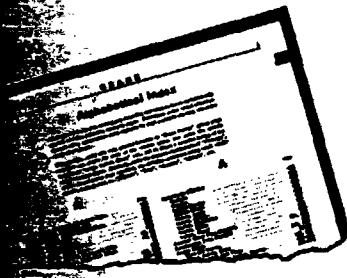


Special 12-inch 1500-Pound Crane Pressure-Seal Bonnet Globe Y-Pattern Stop Check Valves installed in the main steam lines of a central station operating at 900 pounds 900° F

3 Easy Ways to Find What You Want in This Catalog

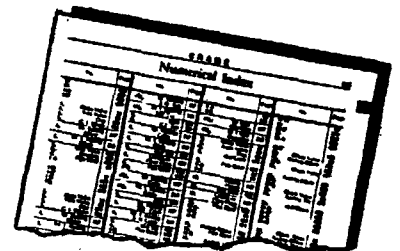
1. THE CONDENSED SECTION INDEX—on the inside pages of this colored paper insert—shows everything in the No. 49 Catalog, classified under condensed section headings and section numbers. The marginal section number markers—with the help of your thumb—take you to the section you want. There, on the first 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. 49 Catalog—those more or less familiar with the Crane Line—will find the Section Index a real time-saver.



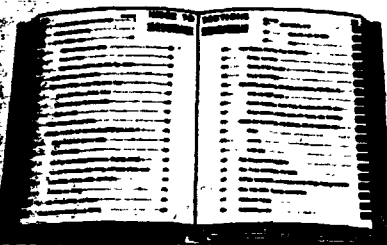
2. THE 20-PAGE ALPHABETICAL INDEX—starting on page I of section one—is perhaps the most complete and thoroughly cross-indexed listing of piping materials ever cataloged. This is the index to use if you're looking for something by name—if you need something new or unusual—or if you want to see all the 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. 49 CATALOG

Section Index in Center of Catalog



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

Most commonly used Brass, Iron, and Steel Goods are Grouped in Front Part of Catalog.

Less Frequently Used Items are Grouped in Back Part.

If the item you are looking for does not readily fall into any of the classifications shown, you will find it in the complete

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catalog number of the product,
Numerical Index, Section One.

START ON PAGE

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Helpful Literature for Piping Users and Specifiers Available Free from CRANE

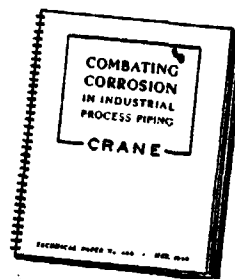
From time to time, Crane publishes literature of practical value to all people concerned with usage and installation of piping materials. Coming from Crane, such literature is of high authority, and well worth having. Below are typical publications cur-

rently 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"

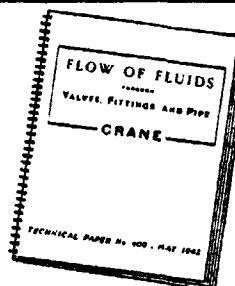
An illustrated study of more than 100 pages giving basic technical information for dealing with problems of corrosion in industrial process piping. Based on extensive experimentation in Crane Research Laboratories, and on wide field experience, this scientific report is highly dependable and helpful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



2

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

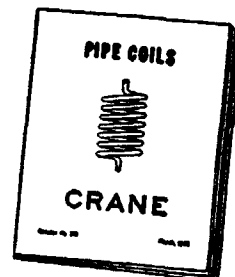
One of the most popular Crane Technical Papers—this 92-page handbook on the theory of flow, with formulas and procedures for solving flow control problems. Contains an abundance of data, presented in chart form for quick graphical calculation with a minimum of reading matter. Deals with flow of steam,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



3

"PIPE COILS"—CIRCULAR NO. 318

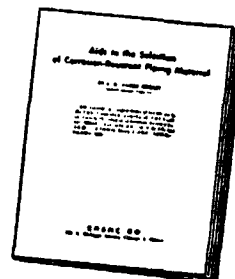
Keep this circular handy for its complete descriptions, specifications, and catalog information on all types of pipe coils and coil materials for most applications. Also covers the theory of heat transfer through pipe walls, and gives newest findings on subjects such as heating water with steam, etc.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



4

"AIDS TO SELECTION OF CORROSION-RESISTANT PIPING MATERIALS"

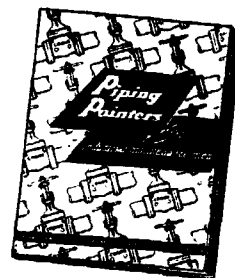
All specifiers and buyers of piping equipment in the process industries will appreciate this up-to-date condensed visual guide showing the relative efficiency of commercial alloys on more than 150 commonly used corrosive fluids. Includes an illustrated "Question and Answer" discussion of the main factors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



Cast Steel Wedge Gate Valves

The Crane line of Steel 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 1500-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 232
2500-Pound.....page 232

Steel Valves with Pressure-Seal Bonnet.... pages 209 to 219

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:

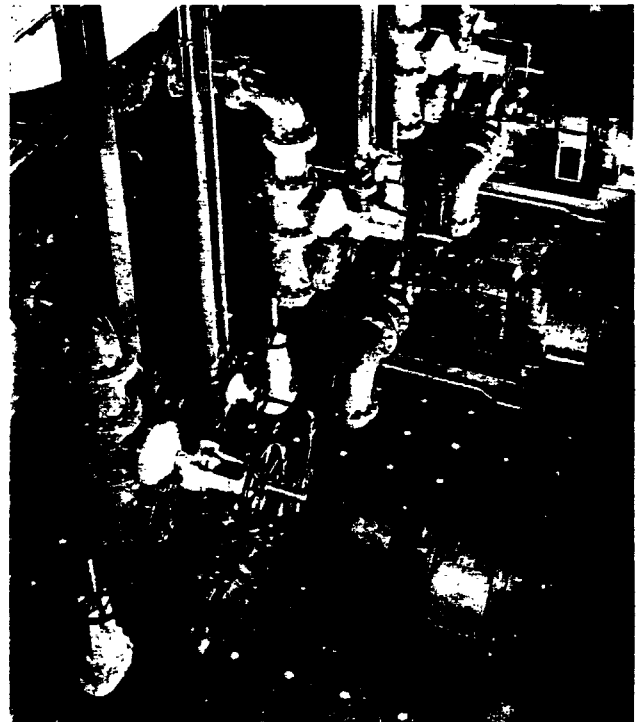
Steel Globe and Angle Valves.....pages 233 to 246
Steel Check Valves.....pages 247 to 254
Steel Stop-Check Valves.....pages 297 and 298

Steel Safety Valves.....page 314
Steel Relief Valves.....pages 323 to 325
Steel Sediment Separators.....page 342

Steel Flanged Fittings.....pages 261 to 268
Steel Welding Fittings.....pages 269 to 284
Steel Flanges.....pages 285 to 292
Steel Screwed Fittings.....pages 255 to 260

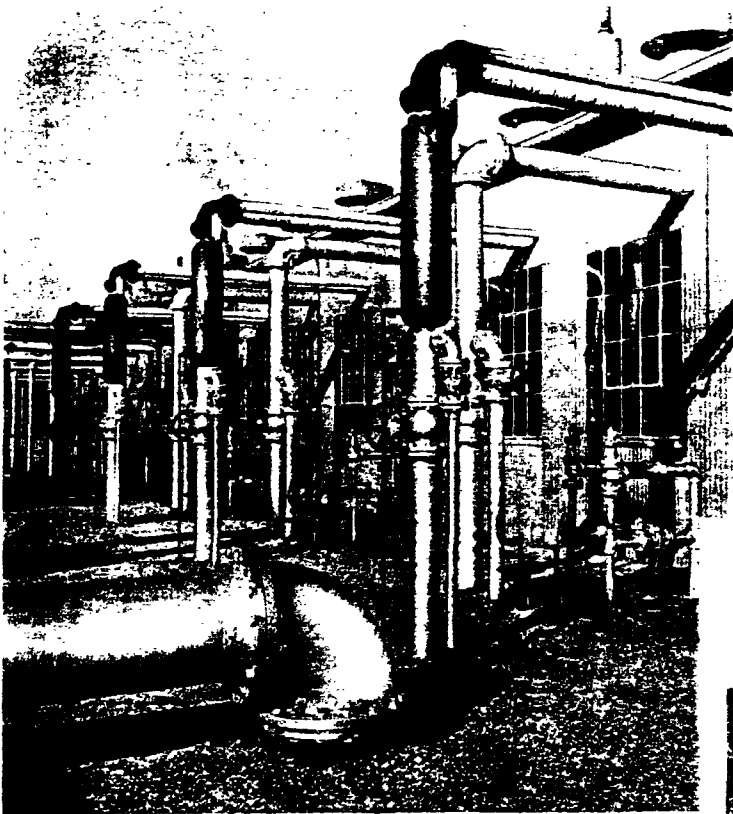
Forged Steel Unions.....pages 183 and 184
Forged Steel Flange Unions.....pages 186 and 187

Corrosion-Resistant Alloy Products.....pages 365 to 380



Condensate and feed water piping in an electric power plant. Crane valves and fittings assure safe, efficient operation.

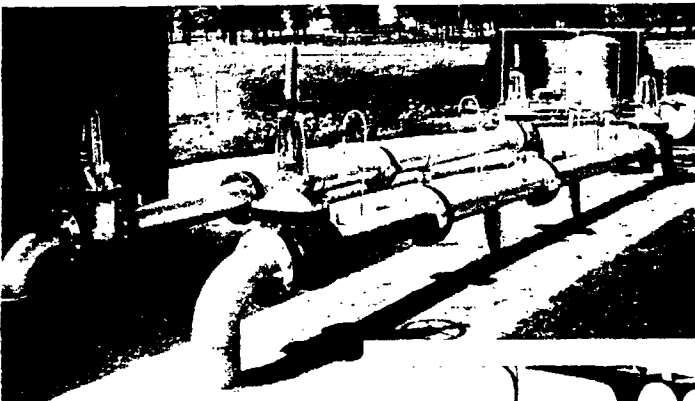
Fabricated Piping... pages 477 to 504

*At the left*

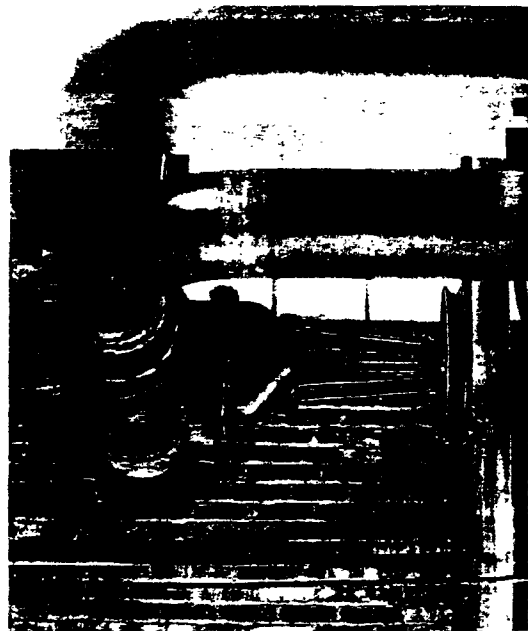
Flanged fittings, flanges, and valves made by Crane in lines between compressors and distillation unit in a natural gasoline plant.

Below

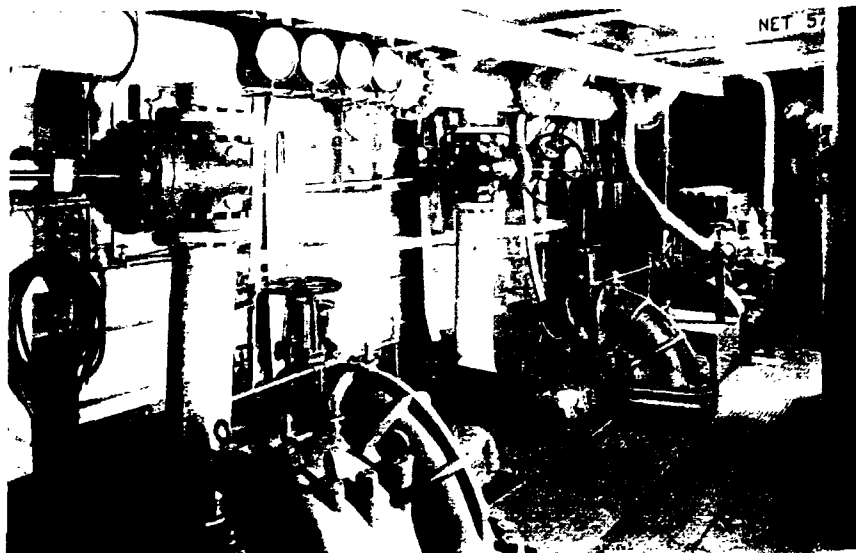
Crane welding ell and chain wheel operated valve on exhaust steam in a rubber plant.

*Above*

Crane welding fittings, flanges and double disc gate valves in natural gas pipe line.

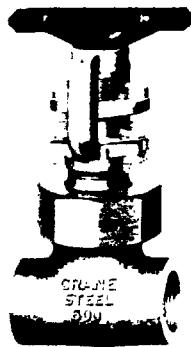
*At the right*

A municipal fire boat with Crane steel gate valves in water pumping lines, and other Crane marine equipment.

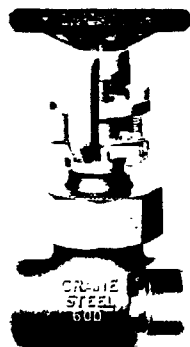


600-Pound Cast Steel Wedge Gate Valves

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

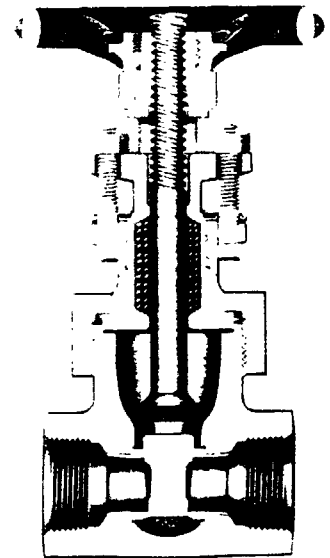
For additional information on working pressures, refer to paragraph on "Service Recommendations" shown below.

WORKING PRESSURES

Temperature Degrees F.	Pounds Non-Shock
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
*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
Union Bonnet
Outside Screw and Yoke

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	1 1/16	3/4	13/16	7/8	1
	Center to top, open	4 3/4	4 3/4	5 1/4	6 3/8	7 7/8	9 3/8	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 a bolted bonnet and the higher quality of the 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.

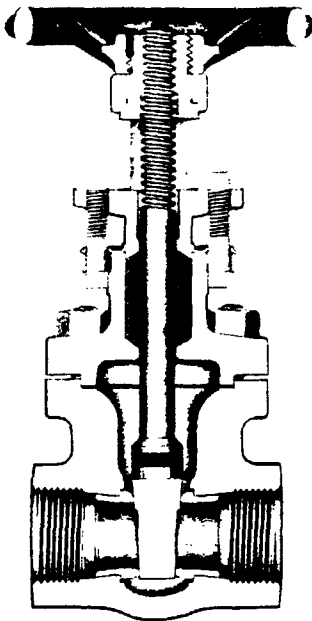
Disc: Long machined guide ribs on each side of the disc operate in channels in the valve body. With the disc closely guided throughout its entire travel, seating surfaces are protected against unnecessary wear.

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 tee-head bolts hold a steel one-piece gland and gland flange rigidly in place. A special gland bolt retainer anchors the bolt heads; they 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.

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 $\frac{1}{2}$ to 2-inch sizes. For union bonnet valves in sizes $\frac{1}{4}$ 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 ring, and they will not loosen in service.

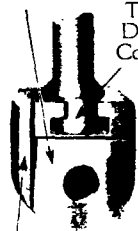
Disc guides: Full length machine guide ribs on each side of the disc operate in channels in the valve body. With the disc closely guided throughout its entire travel, seating surfaces are protected against unnecessary wear.

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 on the outside, 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.

Wide Seating Surface
Tee-Head
Disc-Stem
Connection



Long Disc Guides

WORKING PRESSURES

Temp.	Pounds, Non-Shock		
	Screwed or Socket-Welding Valves	Flanged Valves *With $\frac{1}{4}$ -inch Male Facing	With Ring Joint Facing
Deg. F.			
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 large male and female facings are used with solid metal gaskets, these ratings are permitted only if the gasket contact area is not greater than in large tongue and groove joints.

TEST PRESSURES

Valve	Pounds Hydrostatic		
	Screwed or Socket-Welding Valves	Flanged Valves With $\frac{1}{4}$ -inch Male Facing	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 tee-head bolts hold the steel one-piece gland and gland flange rigidly in place; the packing load can be adjusted easily. Lugs on the bonnet and a special gland bolt retainer anchor the bolt heads; 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 cut ring packing.

Yoke sleeve: The yoke sleeve has excellent bearing qualities, strength, and a high melting point.

Handwheel: Wheels are made of tough, durable malleable iron and are locked in place by a setscrew. For easier handling, valves $\frac{1}{4}$ -inch and smaller have a new dished design wheel, made with small rounded gripping knobs around the outer edge.

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:

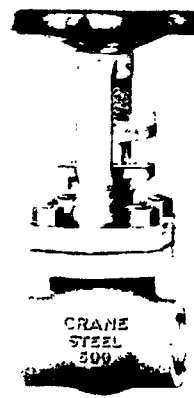
These valves are ideal for a wide variety of services in oil refineries, oil and gas fields, central power stations, and industrial plants, on high pressure hydraulic lines and on high pressure-temperature steam or oil lines.

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. They also are well suited for oil having low viscosity such as is used in hydraulic systems, especially where seating loads are extremely high. Maximum recommended temperatures for "XW" trimmed valves are: 850° F. on steam and 500° F. on all other services.

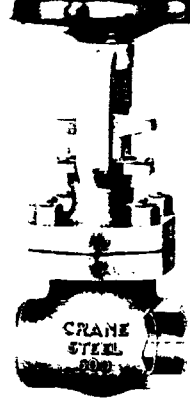
For lubricating oils up to 500° F., either "X" or "XW" should give equal satisfaction.

For all oil or oil vapor service at temperatures over 500° F. up to 1000° F., and for most corrosive and unrefined oils regardless of temperature, "X" trim should always be used.

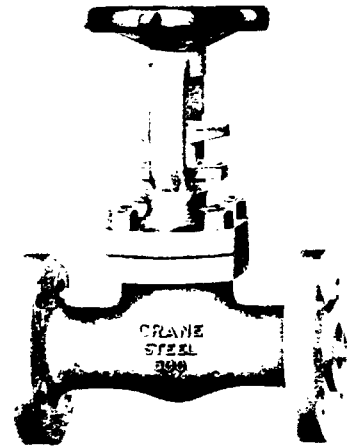
These are high quality valves, having large area seat opening and full size, rugged construction throughout. Their bolted bonnet makes it easy to dismantle even the larger sizes with a small wrench.



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	1/2	3/4	1	1 1/4	1 1/2	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	3 1/2	4 1/8	4 1/4	4 1/2	5 1/4
	End to end, Socket-Welding	3 1/2	4	4 1/8	4 1/4	4 1/2	5 1/4
	Depth of socket	5/8	1 1/16	3/4	13/16	7/8	1
	*Face to face, Flanged	6 1/2	7 1/2	8 1/2	9	9 1/2	11 1/2
	Center to top, open	6 3/8	7 13/16	9 3/16	10 5/16	12	14 1/2
	Diameter of wheel	3 1/2	4	5	5	6	7
	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	1 1/16	1 3/16	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
Dimensions in Inches	Number of bolts	4	4	4	4	4	8
	Diameter of bolts	1/2	5/8	5/8	5/8	3/4	5/8

*Face to face dimensions include the 1/4" male face, thickness of flange dimensions do not.

Face to face: Face to face dimensions of flanged valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged Valves (No. B16.10-1939). 1/2 and 3/4-inch 600-Pound Gate Valves are not included in this Standard.

Flange dimensions, facing, and drilling: End flanges on flanged valves conform to the 600-Pound American Standard (B16-1939). They have a male face 1/4-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 (B16-1939), 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 377.

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 442

For dimensions of ring joint and special facings, see pages 449 to 451.

Cast Steel Wedge Gate Valves

Working Pressures, Pounds per Square Inch, Non-Shock—For Valves Shown on pages 227 to 23.

Fluid	Temp. Deg. Fahr.	Flanged Valves with Standard Facings Other Than Ring Joint							Flanged Valves with Ring Joint Facing, Butt-Welding ² and Screwed End Valves						
		Carbon Steel		No. 4 Carbon-Molybdenum Alloy Steel					Carbon Steel		No. 4 Carbon-Molybdenum Alloy Steel				
		150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.	2500 Lb.	150 Lb.	300 Lb.	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
Oil or Oil Vapor Class X	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 ⁵	340	450	680	1020	1700	2830	92 ⁵	375	500	750	1125	1875	3125
Steam Class U	850	82 ⁵	320	425	640	960	1600	2665	82 ⁵	350	475	700	1050	1750	2925
	900	470 ⁵	300	400	600	900	1500	2500	470 ⁵	325	425	650	975	1625	2700
	950	455 ⁵	265	350	530	795	1325	2205	455 ⁵	300	400	600	900	1500	2500
	1000	440 ⁵	190	250	380	570	950	1580	440 ⁵	230	310	470	700	1170	1950
	1050									4135	4180	4270	4405	4675	41125
Oil Vapor, Oil, Class X	1100									490	4120	4180	4270	4450	4750

Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)

Fluid	Temp. Deg. Fahr.	Facings Other Than Ring Joint						Ring Joint Facing					
		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.					
Oil or Oil Vapor only Class X	100 to 750												
	800												
	850												
	900	310	410	620	930	1550	2580	400	525	800	1200	2000	3325
	950	300	400	600	900	1500	2500	375	500	750	1125	1875	3125
	1000	200	275	400	600	1000	1675	350	475	700	1050	1750	2925
	1050	135	180	270	405	675	1125	325	425	650	975	1625	2700
	1100	90	120	180	270	450	750	300	400	600	900	1500	2500
								225	275	425	650	1075	1775
								150	200	275	425	700	1175

¹When raised face, lapped, and large male and female facings are used with solid metal gaskets, the above pressure-temperature ratings are permitted only when the gasket contact area is not greater than the large tongue and groove gasket contact area and the I.D. of the gasket is not less than the I.D. of the large tongue and groove gasket.

²When 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. They also are well suited for oil having low viscosity such as is 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.

For lubricating oils up to 500° F., either "X" or "XR" should give equal satisfaction.

For all oil or oil vapor service at temperatures over 500° F. and for most corrosive and unrefined oils regardless of temperature, "X" trim should always be used. Maximum recommended temperatures for

"X" trimmed valves are: 1000° F. on 150-Pound and 1100° F. on 300, 400, 600, 900, 1500, and 2500-Pound Valves.

"U" trim is provided primarily for high temperature (up to 1000° F.) steam lines.

⁴These ratings apply only to oil or oil vapor service.

⁵Ratings for 150-Pound Valves for 800° F. and higher apply to sizes 12-inch and smaller only.

Flange facings: Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with $\frac{1}{16}$ -inch raised faces, and 400-Pound and higher pressure valves, with $\frac{1}{4}$ -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 B16b-1940) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16-1930. The higher ratings that are shown above for products made of No. 5 Chrome-Molybdenum Alloy Steel are taken from ASA B31.1-1942 (Code for Pressure Piping).

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,

HYDROSTATIC TEST PRESSURES, IN POUNDS

Pressure Class	Flanged Valves With Facing Other Than Ring Joint		Flanged Valves With Ring Joint Face	
	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.

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 speci-

fications 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).

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						Exelloy or Exelloy-Faced Alloy Steel
	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 Rings	Exelloy							
	Stern	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							
	Stern	Exelloy							
	Bonnet Gasket	Corrugated Soft Iron		Soft Steel Ring Joint Gasket					
Bonnet Bolt-Studs	Triplex Steel								
*Class "U" Steam or Water 1000° 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						
	Stern		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. Shoulder-type screwed-in body seat rings are used. The bonnet is equipped with a stem hole bushing.

Bonnet joint: The bonnet joint of the 150-Pound Valves has a plain face, accurately machined and fitted with a gasket. On the 300-Pound Valves, the male and female bonnet joint is self-centering. All other valves have a ring-type joint for maximum strength and tightness.

Triplex or Templex Steel through bolt-studs produce a tight, strong bonnet joint.

Ball-bearing yoke: The 400, 600, 900, 1500, and 2500-Pound Valves in the larger sizes have a ball-bearing yoke to facilitate operation; see the opposite page for sizes so equipped.

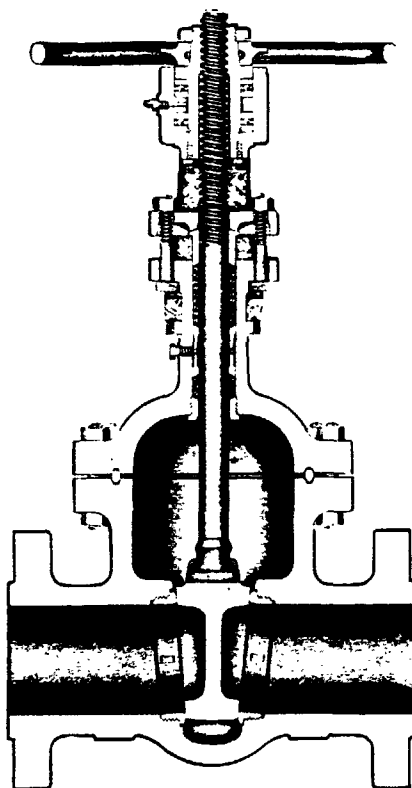
Disc and stem: The disc is of the solid wedge type, with long close-fitting guides to maintain accurate seating and to reduce wear. A tee-head disc-stem connection prevents lateral strains on the stem. The stem is of liberal diameter with long and accurately cut threads, and has ample engagement with 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.

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 valves are ordered faced only.

Flange facings: The 150 and 300-Pound Flanged Valves are regularly furnished with an American Standard $\frac{1}{16}$ -inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a $\frac{1}{4}$ -inch male face (large male)



Outside Screw and Yoke
Wedge Gate Valve

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 $\frac{1}{16}$ -inch raised faces and the $\frac{1}{4}$ -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.

Gearing: Larger size valves can be made with gears to facilitate operation; prices on application.

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 130 to 135 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, B16.1c-1939, for their respective pressure class. (This Standard does not include $3\frac{1}{2}$ -inch 600-Pound Valves, or butt-welding valves larger than 8-inch.)

All flanged end valves with Exelloy ("X") trimmings conform to the API Standard for Flanged Steel Outside-Screw-and-Yoke Wedge Gate Valves, No. 606 A-42. (This Standard does not include sizes $3\frac{1}{2}$ and 5-inch, or sizes larger than 12-inch.)

150, 300, 400, and 600-Pound Flanged Valves with Exelloy ("X") trimmings conform also to the API Standard for Pipe Line Valves, 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement No. 1, issued October, 1948. (This Standard does not include sizes $3\frac{1}{2}$ -inch and 5-inch, or sizes smaller than 2-inch.)

Pressure-temperature ratings
Service recommendations
Material specifications

page 226
page 226
page 227

Cast Steel Wedge Gate Valves

BALL-BEARING YOKE

The following valves are regularly equipped with a ball-bearing yoke, to facilitate operation:

400-Pound
(8" and larger)
600 and 900-Pound
(6" and larger)
1500-Pound
(5" and larger)

The 300-Pound Valves in sizes 14" and larger can be made with a ball-bearing yoke when so ordered; prices on application.

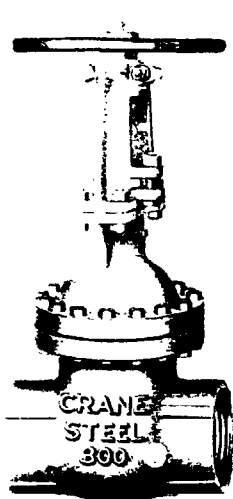
BUTT-WELDING VALVES

Unless otherwise ordered, 150 and 300-Pound Butt-Welding Valves sizes 12-inch and smaller are bored to match the inside diameter of Standard pipe (heaviest weight on 8, 10, or 12-inch size).

For 150 and 300-Pound Valves larger than 12-inch and for all sizes of 400, 600, 900, 1500, and 2500-Pound Valves, orders must specify the diameter of bore (I.D. of pipe).

*By-passes,
page 231*

*Special facings,
pages 448 to 451*



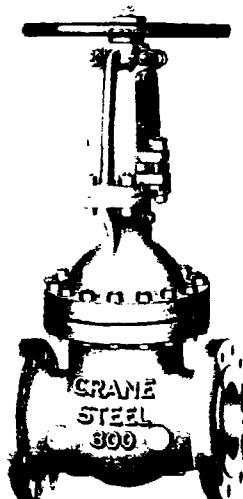
Outside Screw and Yoke
Screwed

For Oil or Oil Vapor
No. 46 X, 150-Pound
No. 32 X, 300-Pound

For Steam or Water
No. 46 XR, 150-Pound
No. 32 XR, 300-Pound

*When ordering, specify
the catalog number
and suffix.*

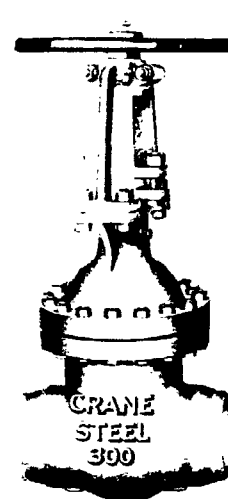
*See page 227 for speci-
fication of materials.*



Outside Screw and Yoke
Flanged

For Oil or Oil Vapor
No. 47 X, 150-Pound
No. 33 X, 300-Pound
No. 61 X, 400-Pound
No. 76 X, 600-Pound
No. 83 X, 900-Pound
No. 87 X, 1500-Pound

For Steam or Water
No. 47 XR, 150-Pound
Nos. 33 XR or U, 300-Pound
Nos. 61 XR or U, 400-Pound
Nos. 76 XR or U, 600-Pound
Nos. 83 XR or U, 900-Pound
Nos. 87 XR or U, 1500-Pound



Outside Screw and Yoke
Butt-Welding

For Oil or Oil Vapor
No. 47½ X, 150-Pound
No. 33½ X, 300-Pound
No. 76½ X, 600-Pound
No. 83½ X, 900-Pound
No. 87½ X, 1500-Pound

For Steam or Water
No. 47½ XR, 150-Pound
Nos. 33½ XR or U, 300-Pound
Nos. 61½ XR or U, 400-Pound
Nos. 76½ XR or U, 600-Pound
Nos. 83½ XR or U, 900-Pound
Nos. 87½ XR or U, 1500-Pound

List Prices, Each

Size Inches	Screwed End Valves		Flanged End Valves, F.D. & S.F., or Butt-Welding End Valves					
	150 Pound	300 Pound	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound
1								347.00
1¼								385.00
1½				†194.00				430.00
2	153.00	209.00	160.00	221.00		298.00		550.00
2½	173.00	247.00	180.00	261.00	Use 600 Pound Valves	358.00		695.00
*3	194.00	280.00	200.00	*294.00		*437.00	726.00	928.00
†3½			†236.00	†348.00		†510.00		
4	264.00	361.00	278.00	381.00	570.00	690.00	947.00	1280.00
5			368.00	548.00	755.00	1060.00	1288.00	2040.00
6			437.00	675.00	940.00	1390.00	1755.00	2670.00
8			604.00	996.00	1500.00	2015.00	2640.00	4130.00
10			820.00	1390.00	2055.00	2995.00	3740.00	6425.00
12			1096.00	1872.00	2715.00	3975.00	5115.00	9340.00
14			1582.00	2662.00	3580.00	5340.00	7320.00	13685.00
16			2116.00	3410.00	4740.00	6955.00	9215.00	
18			2850.00	4427.00	6890.00	8745.00	12780.00	
20			3566.00	5798.00	9440.00	13250.00		
24			5480.00	8527.00	13910.00	21860.00		

For smaller sizes, use the Cast Steel Valves shown on pages 223 to 225.

*When 3" 300 and 600-Pound Flanged Valves with ring joint facing are to be bolted to Cranelap joints, orders must specify. A groove of special pitch diameter is required; see page 450 for dimensions.

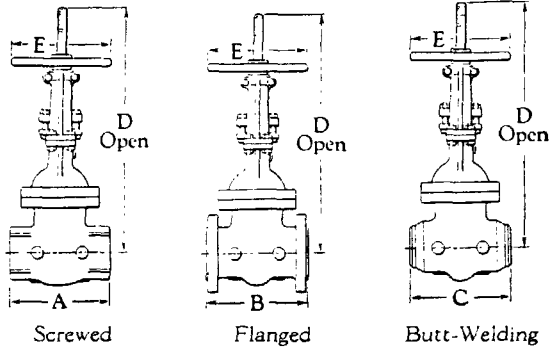
†This price applies only to No. 33 X and No. 33 XR Valves; 300-Pound Butt-Welding End or "U" trimmed valves in the 1½-inch size are special; prices on application.

‡Butt-welding end valves are not made in the 3½-inch size; these prices apply only to flanged end.

Service recommendations and ratings... page 226

Cast Steel Wedge Gate Valves

Dimensions, in Inches



Face to face: 150 and 300-Pound Flanged Valves are regularly furnished with a $\frac{1}{16}$ -inch raised face, and 400, 600, 900, 1500, and 2500-Pound Flanged Valves are regularly furnished with $\frac{1}{4}$ -inch high large male facing; face to face dimensions include these facings.

All flanged and butt-welding valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.1-1939, for their respective pressure class. This Standard does not include $3\frac{1}{2}$ -inch 600-Pound Valves or butt-welding valves larger than 8-inch.

Class	Size of Valve	A	B	C	D	E	Class	Size of Valve	B	C	D	E	
150-Pound	2	6¼	7	7	16½	8	600-Pound	2	11½	11½	18¼	8	
	2½	7	7½	7½	18	8		2½	13	13	22¼	9	
	3	7⅜	8	8	20¾	9		3	14	14	25¾	10	
	3½		8½		23	9		3½	15		32	14	
	4	8	9	9	25¾	10		4	17	17	32	14	
	5		10	10	30½	12		5	20	20	36¾	16	
	6		10½	10½	35¼	14		6	22	22	42¾	20	
	8		11½	11½	43	14		8	26	26	52¼	24	
	10		13	13	52½	18		10	31	31	62¼	27	
	12		14	14	60½	18		12	33	33	70	27	
	14		15	15	70¼	22		14	35	35	77¼	30	
	16		16	16	79¾	24		16	39	39	83¾	30	
18		17	17	89	27	18	43	43	93¾	36			
20		18	18	97¼	30	20	47	47	104½	36			
24		20	20	112¾	30	24	55	55	126	42			
300-Pound	1½		7½		17½	8	900-Pound	3	15	15	28½	12	
	2	7	8½	8½	18½	8		4	18	18	32	14	
	2½	8	9½	9½	20¼	8		5	22	22	36¾	16	
	3	9	11⅛	11⅛	23¼	9		6	24	24	42¾	20	
	3½		11⅞		25¼	9		8	29	29	52½	24	
	4	11	12	12	28¼	10		10	33	33	62¼	27	
	5		15	15	33½	12		12	38	38	73½	30	
	6		15⅞	15⅞	38½	14		14	40½	40½	77¼	30	
	8		16½	16½	47	16		16	44½	44½	85¾	36	
	10		18	18	56½	20		18	48	48	97¾	36	
	12		19¾	19¾	64¼	20		1500-Pound	1	10	10	16	8
	14		30	30	74¾	27			1¼	11	11	16½	8
16		33	33	80½	27	1½	12		12	20	9		
18		36	36	91	30	2	14½		14½	23¼	10		
20		39	39	100½	36	2½	16½		16½	27½	12		
24		45	45	120½	36	3	18½		18½	29	14		
400-Pound	4		16	16	31½	12	4		21½	21½	34	16	
	5		18	18	35	14	5		26½	26½	38¾	20	
	6		19½	19½	40¼	16	6		27¾	27¾	47	24	
	8		23½	23½	50½	20	8		32¾	32¾	55	27	
	10		26½	26½	59¾	24	10		39	39	65	36	
	12		30	30	67¾	24	12		44½	44½	78¾	36	
	14		32½	32½	74¾	27	14	49½	49½	82¾	36		
	16		35½	35½	80¾	27	2500-Pound	Dimensions of 2500-Pound Valves are furnished on application.					
	18		38½	38½	91¼	30							
	20		41½	41½	100½	36							
	24		48½	48½	120¾	36							

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.

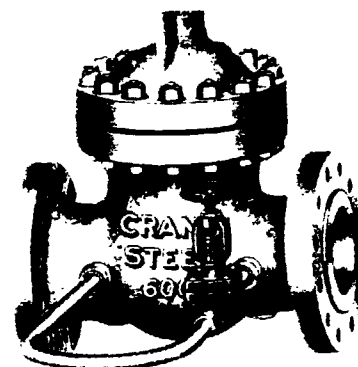
The by-pass is furnished with a steel bolted bonnet outside screw and yoke socket-welding end globe valve. All connections in the by-pass are socket-welded to assure a permanently tight and strong assembly.

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.

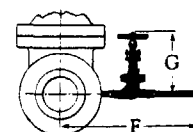
Materials: The materials used in the by-pass piping and in the by-pass valve are of high quality. The pipe bend is seamless steel. The pipe and by-pass valves are of ample weight to withstand the pressures and temperatures for which the main valve is recommended, and the by-pass valve is trimmed with 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)

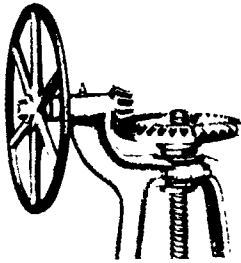
Clearance dimensions
F and G are
identical for bottom mounting

Extra List Prices and Dimensions for Built-Up By-Passes

Main Valve		Size of By-Pass Used Inches	Built-Up By-Passes for Use with Main Valves Of Pressure Classes Specified Below													
Class of Trim	Size of Valve Inches		Extra List Prices Per By-Pass						Approximate Clearance Dimensions, in Inches							
			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.
"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 3/8	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	34 3/8	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	36		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 3/8	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

Gearing for Cast Steel Wedge Gate Valves

Prices and dimensions on application.



Style N
Bevel Gearing
For O.S. & Y.
Gate Valves



Gear Covers
For Spur or Bevel
Geared Steel O.S. & Y.
Wedge Gate Valves

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.

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.

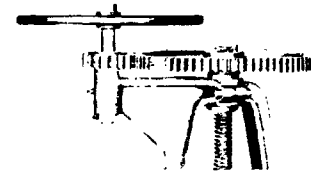
When so ordered, gate valves with bevel gearing, having the pinion shaft extending parallel to the run of the valve, can be furnished. In this position the bevel gearing will be known as Style "O".

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.



Style P
Spur Gearing
For O.S. & Y. Gate Valves

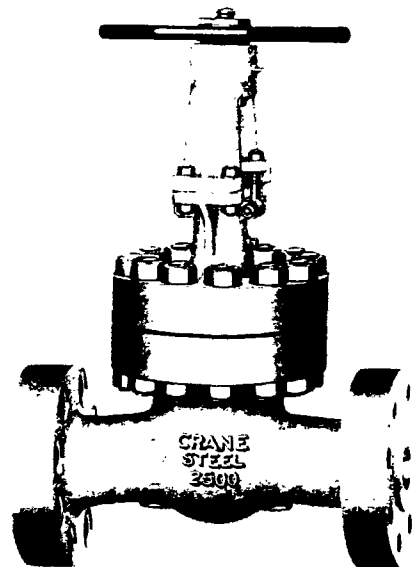
2500-Pound Alloy Cast Steel Wedge Gate Valves

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, pages 209 to 220.

Cast and Forged Steel Globe and Angle Valves

23

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 234
600-Pound Cast Steel, for Locomotive Service.....	page 238
600-Pound Forged Steel, Inside Screw.....	page 235
600-Pound Forged Steel, O.S. & Y.....	pages 236 and 237
1500-Pound Cast Steel, O. S. & Y.....	page 239
6000-Pound Hydraulic Forged Steel.....	page 240

Cast Steel Valves, 150, 300, 400, 600, 900, and 1500-Pound

Pressure-Temperature Ratings.....	page 241
Description and Specification of Materials.....	pages 242 and 243
List Prices.....	page 244
Dimensions.....	page 245
Service Recommendations.....	page 241

Gearing.....	page 246
2500-Pound.....	page 246

*For Pressure-Seal Bonnet Valves,
see Section 21, pages 209 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:

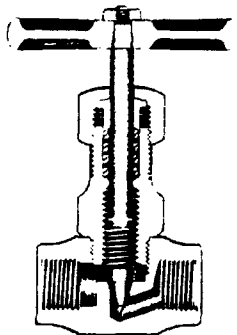
Steel Globe and Angle for Chlorine Service.....	page 376
Steel Gate Valves.....	pages 221 to 232
Steel Check Valves.....	pages 247 to 254
Steel Stop-Check Valves.....	pages 297 and 298
Steel Safety Valves.....	page 314
Steel Relief Valves.....	pages 323 to 325
Steel Sediment Separators.....	page 342
Steel Flanged Fittings.....	pages 261 to 268
Steel Welding Fittings.....	pages 269 to 284
Steel Flanges.....	pages 285 to 292
Steel Screwed Fittings.....	pages 255 to 260
Steel Bushings.....	page 258
Steel Plugs.....	page 258
Corrosion-Resistant Products.....	pages 365 to 380
Wrought Steel Nipples.....	pages 170 and 171
Forged Steel Unions.....	pages 183 and 184
Forged Steel Flange Unions.....	pages 186 and 187
Fabricated Piping.....	pages 477 to 504



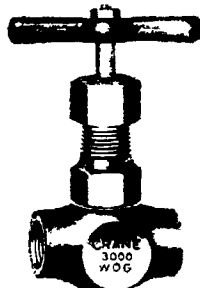
A Crane-equipped piping system meets the rigid requirements of high pressure-temperature installations.

High Pressure Steel, Exelloy, or 18-8 Mo Bar Stock Valves

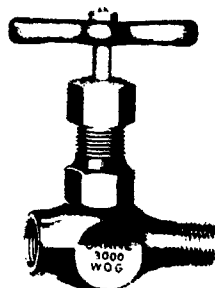
WORKING PRESSURE
3000 pounds cold water, oil, or gas, non-shock
Air Tested



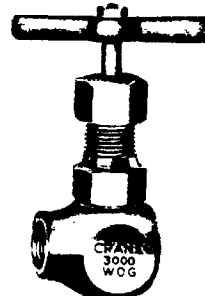
Cross Section
Globe
Female
Steel, Exelloy,
or 18-8 Mo



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	1/8	1/4	3/8	1/2	3/4	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 and gasoline 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.

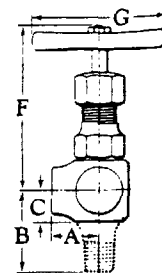
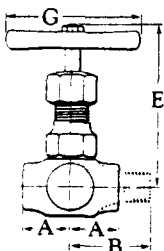
Materials: Steel Valves have a steel body, bonnet, packing nut, and gland, and a chromium plated steel stem. In the Exelloy Valves, all of these parts are made of Exelloy; and in the 18-8 Mo Alloy Valves, of Crane 18-8 Mo Chrome-Nickel-Molybdenum Alloy Steel. All valves have a malleable iron tee handle.

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 10 per cent nickel, with 2.5 to 3 per cent molybdenum.

Dimensions, in Inches

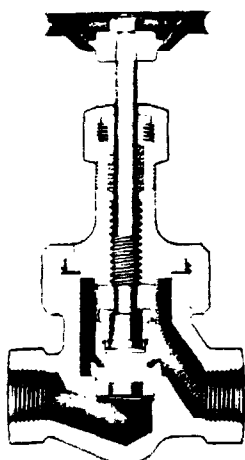
Size	1/8	1/4	3/8	1/2	3/4	1
A	31/32	31/32	13/32	1 1/4	1 5/8	2 1/8
B	1 1/2	1 5/8	1 7/8	2 1/8	2 5/8	
C	9/16	9/16	11/16	1 3/16	1	1 1/4
E or F — Open	3 7/16	3 7/16	3 15/16	4 7/8	6 3/8	7 5/8
G	2 9/16	2 9/16	2 9/16	3 9/16	4 3/4	4 3/4
Diameter of seat opening	3/16	3/16	1/4	5/16	7/16	9/16

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

23



Cross Section
Globe
Union Bonnet

WORKING PRESSURES			
Temp. Deg. F.	Pounds Non-Shock	Temp. Deg. F.	Pounds Non-Shock
Class "X", for Oil or Oil Vapor only			
100	2000	500	1280
150	1910	550	1190
200	1820	600	1110
250	1730	650	1030
300	1640	700	940
350	1550	750	850
400	1460	800	780
450	1370		

TEST PRESSURES

Shell — 2175 pounds hydrostatic

Seat — 2100 pounds hydrostatic

Valve seat tested 100 pounds air-under-water

These are small, rugged Inside Screw Globe and Angle Valves, made with a plug type disc and seat.

Service recommendations: The valves are suited for use where strong, durable inside screw valves are wanted. They 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 $\frac{1}{4}$ to $\frac{3}{4}$ -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.

Plug type disc and seat: The plug type disc and seat are made of Exelloy. Their wide, carefully finished seating surfaces are unusually resistant to foreign matter and to wiredrawing; they are ideal for throttling services. The seat ring is screwed into the body.

Stem: The stem, made of Exelloy, is of generous diameter with long thread engagement in the bonnet. The stem

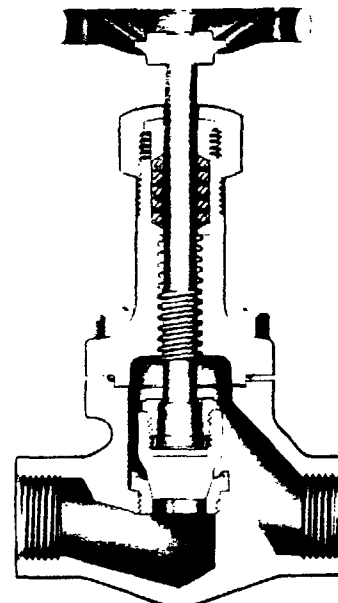
end is retained in the disc by a disc stem ring, screwed into the disc and lock-welded.

Stuffing box:

The stuffing box, equipped with a gland, is exceptionally wide and deep. It is filled with cut ring packing.

Handwheel: Wheels are malleable iron. For easier handling, valves $\frac{1}{4}$ -inch and smaller have a dished design wheel, made with small gripping knobs on the outer edge.

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



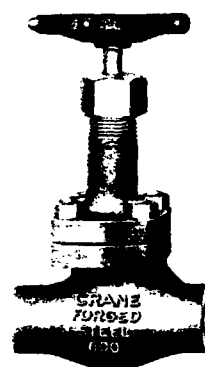
Cross Section
Globe
Bolted Bonnet



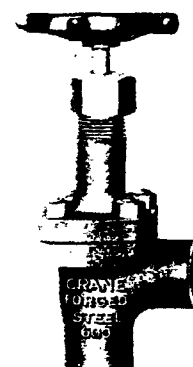
Union Bonnet
Globe, Screwed
No. 3620 X



Union Bonnet
Angle, Screwed
No. 3621 X



Bolted Bonnet
Globe, Screwed
No. 3624 X

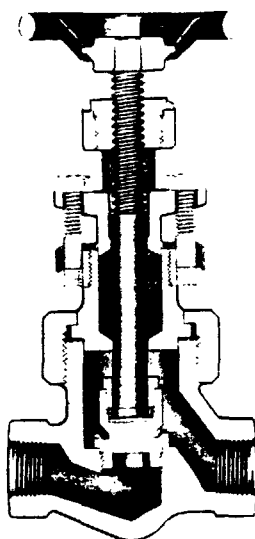


Bolted Bonnet
Angle, Screwed
No. 3625 X

List Prices and Dimensions

Union Bonnet Valves						Bolted Bonnet Valves					
Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 3620 X, Globe	Each	16.50	16.50	19.70	22.80	No. 3624 X, Globe	Each	29.00	40.20	59.00	80.40
No. 3621 X, Angle	Each	16.50	16.50	19.70	22.80	No. 3625 X, Angle	Each	29.00	40.20	59.00	80.40
Dimensions, in Inches	Center to end	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	Dimensions, in Inches	Center to end	$2\frac{9}{16}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$4\frac{3}{16}$
	Center to top, open	Globe $4\frac{3}{4}$	$5\frac{3}{16}$	$6\frac{7}{16}$	$7\frac{13}{16}$		Center to top, open	Globe $8\frac{3}{4}$	$10\frac{3}{4}$	$10\frac{15}{16}$	$12\frac{9}{16}$
		Angle $4\frac{3}{4}$	$5\frac{1}{16}$	$6\frac{1}{4}$	$7\frac{1}{2}$			Angle $7\frac{5}{8}$	$9\frac{5}{16}$	$9\frac{1}{8}$	$10\frac{1}{2}$
	Diameter of wheel	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$		Diameter of wheel	4	5	6	7

600-Pound Forged Steel Globe and Angle Valves 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 $\frac{1}{4}$ to $\frac{3}{4}$ -inch or socket-welding ends in sizes $\frac{1}{4}$ and $\frac{3}{8}$ -inch; and bolted bonnet valves with screwed, socket-welding, or flanged ends in sizes $\frac{1}{2}$ 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 241 ("W" trim is recommended for the same services as defined there for "XR").

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.

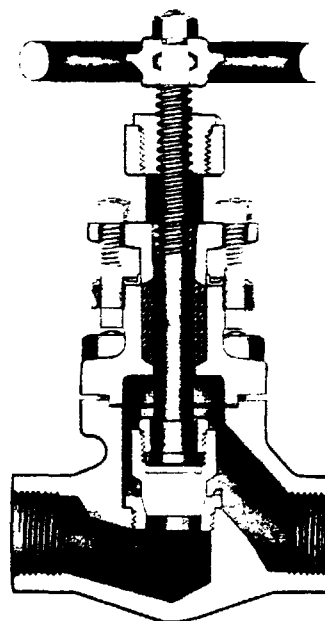
Plug type disc and seat: These valves have a Crane plug type disc and seat, well known for ability to maintain tightness and for effectiveness on throttling services. The wide, tapered seating surfaces offer excellent resistance to foreign matter and to wiredrawing. In "X" trimmed valves, the disc and seat are Exelloy, in "W" trimmed valves, the seat and disc are Crane Hardened Stainless Steel, having a hardness of 500 Brinnell. 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. The portion

WORKING PRESSURES			
Temp. Deg. F.	Pounds, Non-Shock		
	Screwed or Socket Welding Valves	Flanged *With $\frac{1}{4}$ -inch Male Facing	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	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 large male and female facings are used with solid metal gaskets, these ratings are permitted only if the gasket contact area 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 $\frac{1}{4}$ " Male	With Ring Joint
Shell	2175	1800	2175
Seat	2100	1550	1550

passing through the stuffing box is polished to reduce friction and to prolong the life of the packing.

Disc-stem connection: A shoulder-seating screwed-in disc stem ring retains the stem shoulder within the disc; the disc swivels on the end of the stem, preventing scoring or galling of the seating surfaces. The stem ring is lock-welded to the disc.

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 leg. 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 $\frac{1}{4}$ 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.

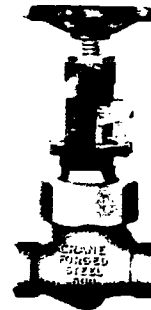
600-Pound Forged Steel Globe and Angle Valves Outside Screw and Yoke

23

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		
	No. 3641 X or W, Screwed	22.30	22.30	26.40	30.80
Angle	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

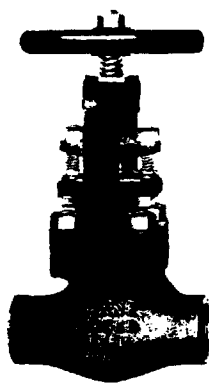


Angle, Screwed
(Not illustrated)
No. 3641 X
No. 3641 W
Angle, Socket-Welding
No. 3649 X
No. 3649 W



Globe, Screwed
No. 3640 X
No. 3640 W
Globe, Socket-Welding
(Not illustrated)
No. 3648 X
No. 3648 W

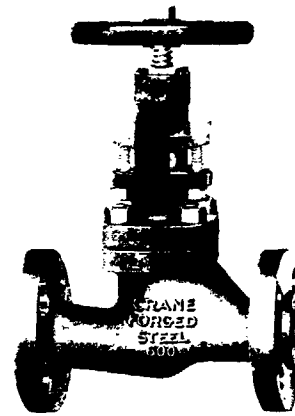
Bolted Bonnet Valves



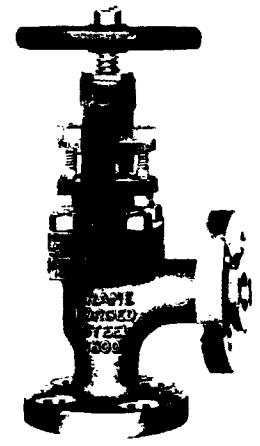
Globe
Screwed
No. 3644 X
No. 3644 W
Socket-Welding
No. 3652 X
No. 3652 W



Angle
Screwed
No. 3645 X
No. 3645 W
Socket-Welding
No. 3653 X
No. 3653 W



Globe, Flanged
No. 3656 X or 3656 W



Angle, Flanged
No. 3657 X or 3657 W

Globe valves with socket-welding ends and angle valves with screwed ends are not illustrated.

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 3/8	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	1 1/16	3/4	1 3/16	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	1 1/16	1 3/16	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 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.

Flanged valves: End flanges conform to the 600-Pound American Standard (B16-1939). 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.

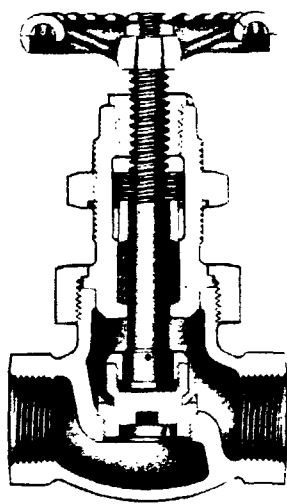
Valves with 150-Pound end flanges are made to order; prices on request.

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.

For working pressures and description, see the preceding page.
Dimensions of ring joint and special facings. pages 449 to 451

Monel trimmed valves page 377
Templates for drilling page 442

600-Pound Alloy Cast Steel Globe Valves 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 Shell—1100 pounds

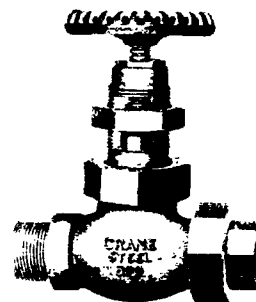
Valves are tested at the seat with 100 pounds air-under-water.



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	1/2	3/4	1	1 1/4	1 1/2	2
	No. 496 P, Female Outlet	Each	36.00	43.00	50.00	63.50	80.50	94.50
Female Inlet	No. 1880 P, Female Union Outlet	Each	53.00	58.00	65.00	80.50	108.00	149.00
	No. 1884 P, Female Union Outlet	Each	57.00	65.50	73.50	88.50	123.00	165.00
Male Inlet	No. 1884 P, Female Union Outlet	Each	57.00	65.50	73.50	88.50	123.00	165.00
	No. 1884 P, Female Union Outlet	Each	57.00	65.50	73.50	88.50	123.00	165.00

These valves are patterned after the A.A.R. 300-Pound O. S. & Y. Brass Valves. They are especially recommended for service on railroad locomotives using high pressure superheated steam. The valves are liberally reinforced and are 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 Hardened Stainless Steel, offering excellent resistance to erosion, galling, and corrosion.

Yoke bushing: The yoke bushing, made of Crane No. 49 Nickel Alloy, 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 a Crane No. 48 Nickel Alloy gland.

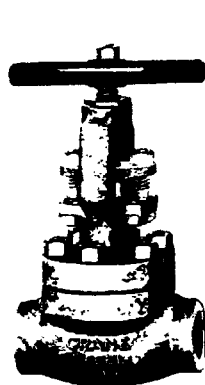
Repacking: These valves, when wide open, can be repacked while under pressure.

Dimensions, in Inches

Size	Inches	1/2	3/4	1	1 1/4	1 1/2	2
No. 496 P or No. 1880 P Female Inlet Valves	Center to female end	19 1/16	17 3/8	21 1/4	29 1/16	213 1/16	33 3/8
	Center to union end, No. 1880 P	29 1/16	3	37 1/16	315 1/16	45 1/16	51 3/8
	Center to top, open	51 1/16	6	71 1/16	81 3/8	93 3/4	105 3/8
	Diameter of wheel	31 1/16	35 3/8	41 1/16	43 3/4	53 3/8	6
Size	Inches	3/4 x 1/2	1 x 3/4	1 1/4 x 1	1 1/2 x 1 1/4	2 x 1 1/2	2 1/2 x 2
No. 1884 P Male Inlet Valves	Center to male end	29 1/16	31 3/8	31 1/2	313 1/16	45 1/16	47 3/8
	Center to union end	29 1/16	3	37 1/16	315 1/16	45 1/16	51 3/8
	Center to top, open	51 1/16	6	71 1/16	81 3/8	93 3/4	105 3/8
	Diameter of wheel	31 1/16	35 3/8	41 1/16	43 3/4	53 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



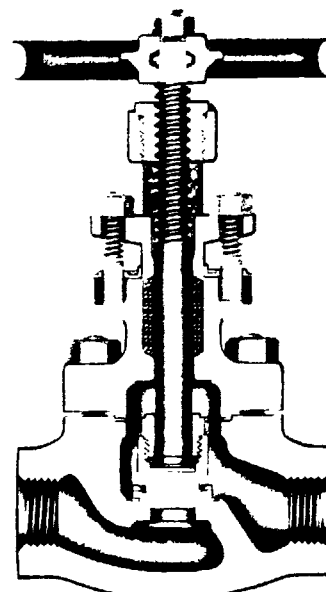
Angle, Screwed
(Not illustrated)
No. 3845 X
No. 3845 U

Globe, Socket-Welding
(Not illustrated)
No. 3852 X
No. 3852 U

Angle, Socket-Welding
(Not illustrated)
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	
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



Cross Section
Globe
Screwed
"X" Trimmed

List Prices and Dimensions

Size		Inches	1/2	3/4	1	1 1/4	1 1/2	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
Dimen- sions, in Inches	Center to end, Screwed		2 1/8	2 3/4	3 1/8	3 5/8	3 3/4	4 3/4
	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	9 1/2	9 1/8	10 3/4	13	13 5/8	16 1/2
	Center to top, open	Angle	9 1/4	9 1/4	10 3/8	12 3/8	12 5/8	15 3/8
	Depth of socket		5/8	1 1/16	3/4	13/16	7/8	1
	Diameter of wheel		4	5	7	8	9	14



Cross Section
Through
Seat of
"U" Trimmed

These small 1500-Pound Steel Valves are similar in design to the 600-Pound Bolted Bonnet Valves shown on pages 236 and 237, except that they are heavier and more rugged.

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.

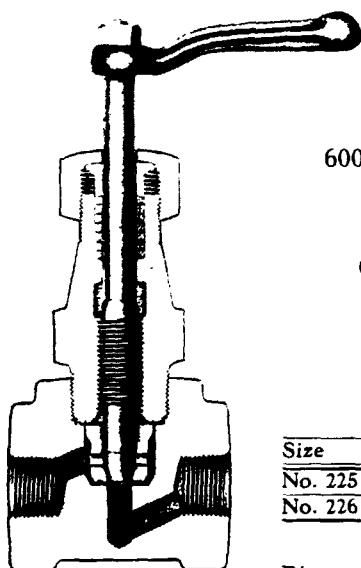
The "X" trimmed valves have Triplex steel body studs, and the plug type disc and seat are Exelloy with carefully ground seating surfaces.

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

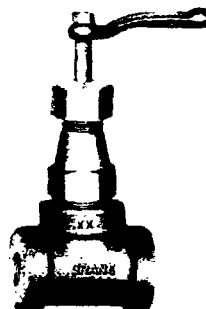
6000-Pound Hydraulic Forged Steel Globe and Angle Valves Plug Type Disc



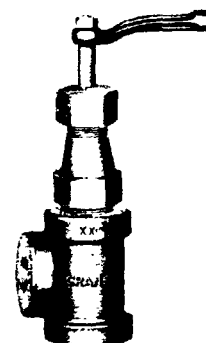
Cross Section
No. 225 H
Globe

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 wire drawing 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).

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; larger sizes have a wheel.

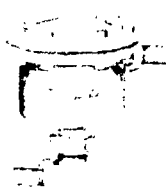
Stuffing box: These valves have a deep stuffing box, filled with high grade packing. It is equipped with a gland.

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—simple in design, they give long and trouble-free service. See pages 335, 336, and 337.

Cast Steel Globe and Angle Valves

Working Pressures, Pounds per Square Inch, Non-Shock
For Valves Shown on pages 242 to 246

Fluid	Temp. Deg. Fahr.	Flanged Valves with Standard Facings Other Than Ring Joint							Flanged Valves with Ring Joint Facing, Butt-Welding ² and Screwed End Valves						
		Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel						Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel					
		150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.	2500 Lb.	150 Lb.	300 Lb.	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
Oil or Oil Vapor Class X	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
Steam Class U	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	70	300	400	600	900	1500	2500	70	325	425	650	975	1625	2700
	950	55	265	350	530	795	1325	2205	55	300	400	600	900	1500	2500
Oil Vapor, Oil, Class X	1000	40	190	250	380	570	950	1580	40	230	310	470	700	1170	1950
	1050									135	180	270	405	675	1125
	1100									90	120	180	270	450	750

Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)

Fluid	Temp. Deg. Fahr.	Facings Other Than Ring Joint						Ring Joint Facing					
		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.					
Oil or Oil Vapor only Class X	100 to 750												
	800												
	850												
	900	310	410	620	930	1550	2580	400	525	800	1200	2000	3325
	950	300	400	600	900	1500	2500	375	500	750	1125	1875	3125
	1000	200	275	400	600	1000	1675	350	475	700	1050	1750	2925
	1050	135	180	270	405	675	1125	325	425	650	975	1625	2700
	1100	90	120	180	270	450	750	300	400	600	900	1500	2500
								225	275	425	650	1075	1775
								150	200	275	425	700	1175

¹When raised face, lapped, and large male and female facings are used with solid metal gaskets, the above pressure-temperature ratings are permitted only when the gasket contact area is not greater than the large tongue and groove gasket contact area and the I.D. of the gasket is not less than the I.D. of the large tongue and groove gasket.

²When 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. They also are well suited for oil having low viscosity such as is 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.

For lubricating oils up to 500° F., either "X" or "XR" should give equal satisfaction.

For all oil or oil vapor service at temperatures over 500° F. and for most corrosive and unrefined oils regardless of temperature, "X" trim should always

be used. Maximum recommended temperatures for "X" trimmed valves are: 1000° F. on 150-Pound, and 1100° F. on 300, 400, 600, 900, 1500, and 2500-Pound Valves.

"U" trim is provided primarily for high temperature (up to 1000° F.) steam lines.

⁴These ratings apply only to oil or oil vapor service.

Flange facings: Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with $\frac{1}{16}$ -inch raised faces, and 400-Pound and higher pressure valves, with $\frac{1}{4}$ -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 B16b-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16-1939. The higher ratings that are shown above for products made of No. 5 Chrome-Molybdenum Alloy Steel are taken from ASA B31.1-1942 (Code for Pressure Piping).

Cast Steel Globe and Angle Valves

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

HYDROSTATIC TEST PRESSURES, IN POUNDS

Pressure Class	Flanged Valves With Facing Other Than Ring Joint		Flanged Valves With Ring Joint Face	
	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 241.

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.

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 244.

For extremely severe oil or oil vapor services, valves can be made of Crane No. 5 Chrome-Molybdenum Steel. They are made to order only; see the Crane Discount Sheet for prices.

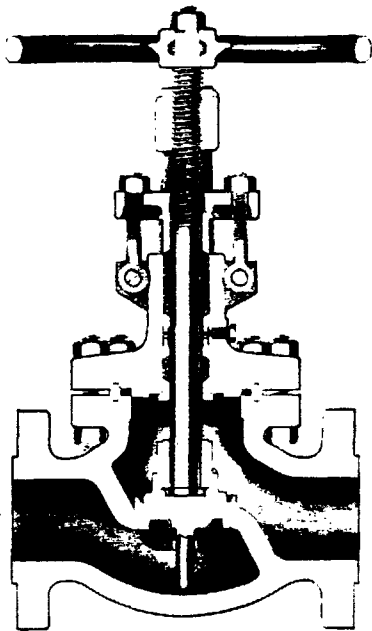
Trim	Names of Parts	150 Pound Valves	300 Pound Valves	400 Pound Valves	600 Pound Valves	900 Pound Valves	1500 Pound Valves	2500 Pound Valves	
*Class "X" Oil or Oil Vapor 1100° F. Max.	Body and Bonnet	Carbon Steel	No. 4 Carbon-Molybdenum Steel						
	Disc	Exelloy							‡Exelloy
	Body Seat Ring	Exelloy							
	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 1000° 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 241.

‡Exelloy or Exelloy-Faced Alloy Steel.

§Corrugated Soft Iron

Cast Steel Globe and Angle Valves



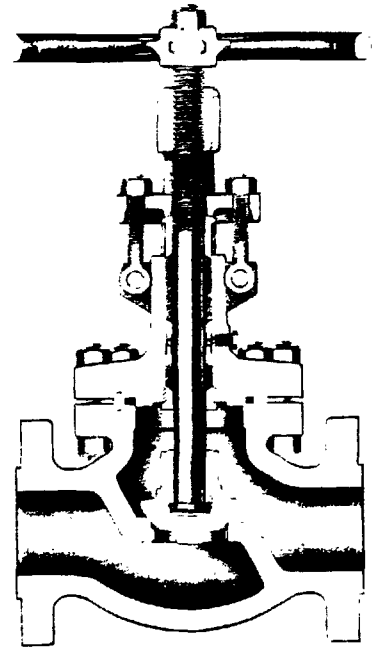
Plug Type Disc

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 6-inch and smaller are regularly furnished with a plug type disc and seat (illustrated at left); the 8-inch size is regularly 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.



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. 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.

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.

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 pres-

sure 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 $\frac{1}{8}$ -inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-Pound Flanged Valves regularly have a $\frac{1}{4}$ -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 $\frac{1}{8}$ -inch raised faces and the $\frac{1}{4}$ -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, B16-1939, 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 $3\frac{1}{2}$ -inch 600-Pound Valves.

Pressure-temperature ratings	page 241
Service recommendations	page 241
List prices	page 244

Cast Steel Globe and Angle Valves

When ordering, specify catalog number and suffix.

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	Use 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		626.00	1566.00	1983.00
5	468.00	562.00		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 450 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:

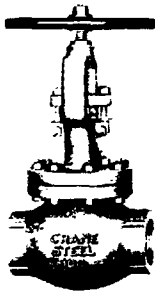
300-Pound..... 8" 600-Pound..... 5 and 6"
400-Pound..... 6 and 8" 900-Pound..... 4, 5, and 6"
1500-Pound..... 3, 4, 5, and 6"

For description, see page 246. Orders must state whether spur or bevel gears are wanted.

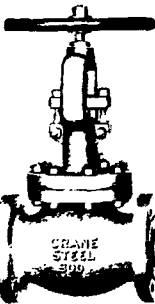
When specified, valves can be furnished without gears (plain bearing yoke); prices on application.

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).

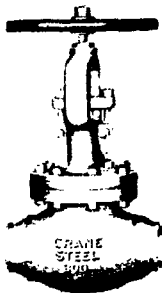
Prices of flanged valves include facing, drilling, and spot facing to the corresponding pressure class of the American Standard. No deduction will be made if valves are ordered faced only.



Globe, 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



Globe
Butt-Welding

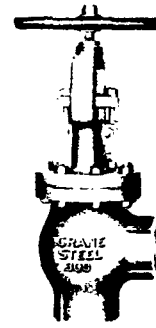
For Oil or Oil Vapor
No. 143½ X, 150-Pound
No. 151½ X, 300-Pound
No. 171½ X, 600-Pound
No. 183½ X, 900-Pound
No. 189½ X, 1500-Pound
For Steam or Water
No. 143½ XR, 150-Pound
Nos. 151½ XR or U, 300-Pound
Nos. 161½ XR or U, 400-Pound
Nos. 171½ XR or U, 600-Pound
Nos. 183½ XR or U, 900-Pound
Nos. 189½ XR or U, 1500-Pound

For service
recommendations,
see page 241.

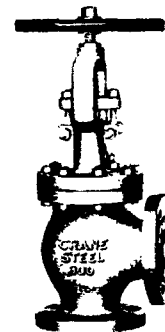
For
specification
of materials,
see page 242.

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

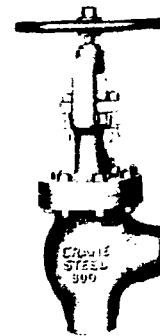
For Steam or Water
No. 145½ XR, 150-Pound
Nos. 153½ XR or U, 300-Pound
Nos. 163½ XR or U, 400-Pound
Nos. 173½ XR or U, 600-Pound
Nos. 185½ XR or U, 900-Pound
Nos. 190½ XR or U, 1500-Pound



Angle, 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



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 236 and 237.

900-Pound Valves: For sizes ½ to 2-inch screwed and socket-welding, use the 1500-Pound Steel Valves shown on page 239.

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 239.

* * * * *

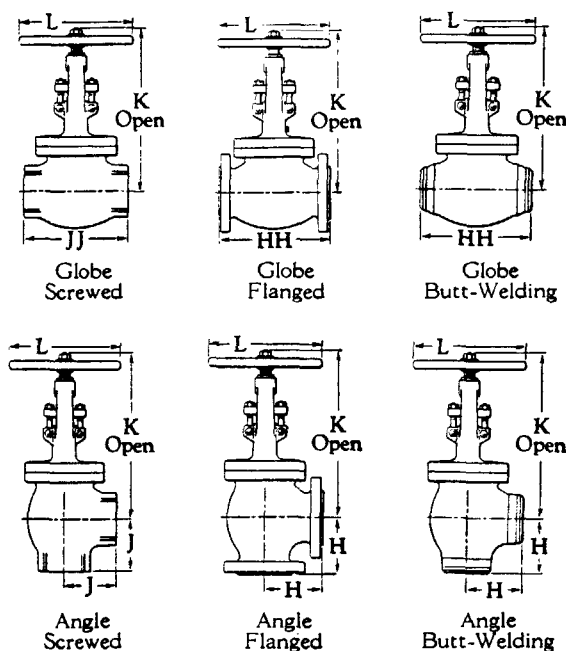
By-passes: Crane Cast Steel Globe and Angle Valves can be equipped with a by-pass; prices on request.

valves can be equipped with an electric, air, or gas motor; prices are furnished on application.

Motor operation: To facilitate operation, the

See pages 132 to 135 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		L
						Globe	Angle	
150 Pound	2	8	8	4	4	13¾	12½	8
	2½	8½	8½	4½	4½	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	5¾		19	10
	3	12½	11¾	6¼	5¾		20½	10
	3½	13¼		6¾			22½	12
	4	14	13	7	6½		24¾	14
	5	15¾		7¾			26½	16
	6	17½		8¾			29¾	18
	8	22		11			*35½	*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
900 Pound	6	22		11			*35	*24
	3	15		7½			24	12
	4	18		9			*29½	*20
	5	22		11			*34¼	*24
1500 Pound	6	24		12			*37¾	*27
	2	14½		7¼			25¼	14
	2½	16½		8¼			28¼	18
	3	18½		9¼			*33½	*24
	4	21½		10¾			*37¾	*27
	5	26½		13¼			*41¾	*30
	6	27¾		13¾			*45¾	*30

*These dimensions apply only to valves without gearing, for dimensions of geared valves, see page 246.

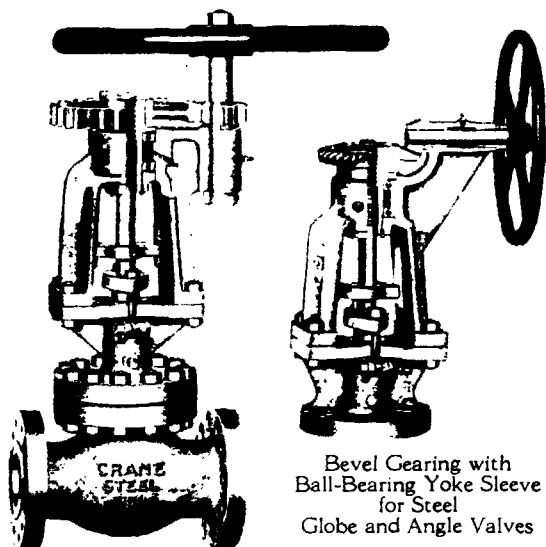
†Butt-welding valves are not made in the 3½-inch size; the dimensions shown for this size apply only to flanged valves.

Pressure-temperature ratings.....	page 241
Service recommendations.....	page 241
Specification of materials.....	page 242
List prices.....	page 244
Description of construction.....	pages 242 to 244

Templates for drilling.....	pages 441 to 443
Taps and drains for valves.....	page 535

Special facings.....	pages 448 to 451
Gearing.....	page 246

Gearing for Cast Steel Globe and Angle Valves



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).

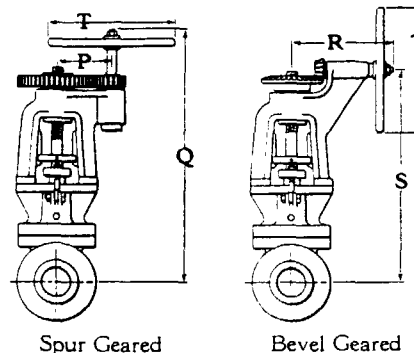
Bevel gearing: Globe and angle valves equipped with bevel gearing will have the pinion shaft extending at right angles to the run of the valve with the handwheel on the left side when facing the port opening from above the valve seat.

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.

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.



Dimensions, in Inches

Valve Class	Size	Spur P	Spur Q	Bevel R	Bevel S	T
300-Pound	8	9 $\frac{3}{8}$	44	15	38	20
400-Pound	6	8 $\frac{5}{8}$	40 $\frac{1}{4}$	13 $\frac{1}{4}$	34 $\frac{1}{2}$	18
	8	10 $\frac{3}{4}$	48 $\frac{1}{2}$	17 $\frac{1}{4}$	41 $\frac{3}{4}$	24
600-Pound	5	8 $\frac{5}{8}$	40 $\frac{1}{2}$	13 $\frac{1}{4}$	34 $\frac{3}{4}$	18
	6	9 $\frac{3}{8}$	43 $\frac{1}{4}$	15	37 $\frac{1}{4}$	20
900-Pound	4	8 $\frac{5}{8}$	39 $\frac{3}{4}$	13 $\frac{1}{4}$	34	18
	5	9 $\frac{3}{8}$	42 $\frac{3}{4}$	15	36 $\frac{3}{4}$	20
1500-Pound	6	10 $\frac{3}{4}$	47 $\frac{1}{4}$	17 $\frac{1}{4}$	40 $\frac{1}{2}$	24
	3	9 $\frac{3}{8}$	42 $\frac{1}{2}$	15	36 $\frac{1}{2}$	20
2500-Pound	4	10 $\frac{3}{4}$	47 $\frac{1}{2}$	17 $\frac{1}{4}$	40 $\frac{3}{4}$	24
	5	10 $\frac{5}{8}$	52 $\frac{1}{2}$	20 $\frac{5}{8}$	45 $\frac{1}{2}$	27
2500-Pound	6	14 $\frac{1}{8}$	56	24 $\frac{5}{8}$	48 $\frac{3}{4}$	27
	On application					

List prices page 244

Dimensions not shown are the same as for valves without gears; see page 245.

2500-Pound Alloy Cast Steel Globe and Angle Valves

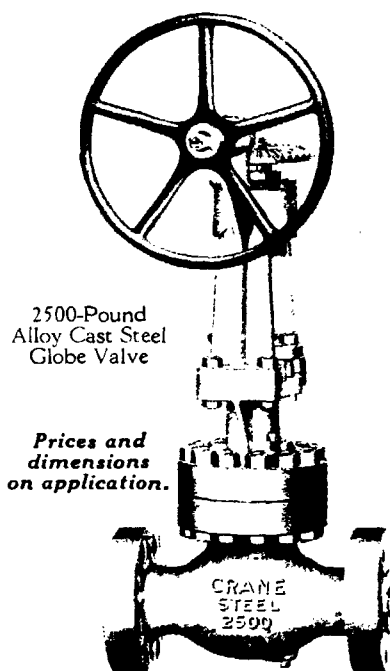
Crane 2500-Pound Alloy Cast Steel Globe and Angle Valves are available in the 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3, 4, 5, and 6-inch sizes, with either flanged or butt-welding ends. In addition, the Globe Valves are made in the $\frac{3}{4}$, 1, and 1 $\frac{1}{4}$ -inch sizes, with either butt or 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 241
General description and specifications of materials pages 242 and 243

For high-pressure high-temperature steam, boiler feed, and similar service in central stations and industrial plants, Crane Pressure-Seal Bonnet Valves are available. They embody many excellent features which contribute to long life and efficient operation. See Section 21, page 209 to 220.



2500-Pound Alloy Cast Steel Globe Valve

Prices and dimensions on application.

Cast and Forged Steel Check Valves

24

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.

Sizes 2-Inch and Smaller Lift Check Valves

600-Pound Forged Steel, Screwed, Flanged, or Socket-Welding ..	pages 248 and 249
600-Pound Cast Steel, Vertical, Screwed	page 249
6000-Pound Hydraulic, Forged Steel, Screwed	page 254

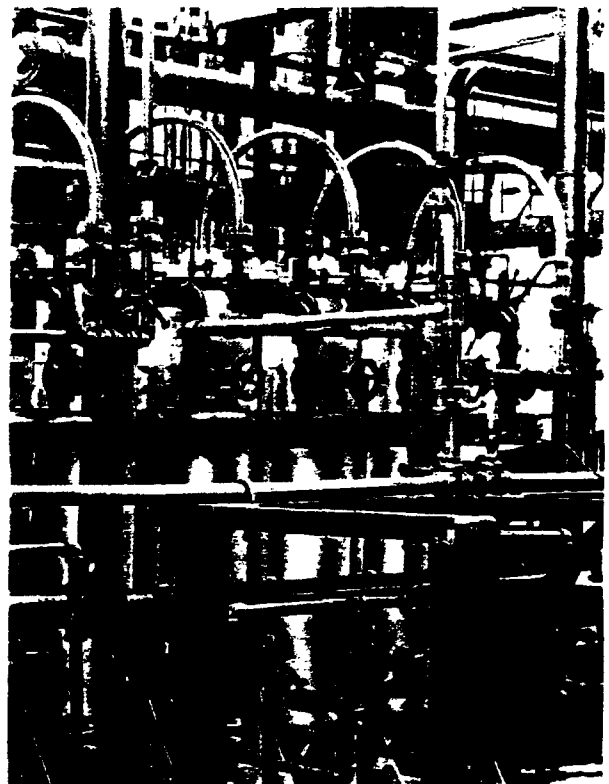
Cast Steel 150, 300, 400, 600, 900, and 1500-Pound Swing Check Valves

Pressure-Temperature Ratings	page 250
Description and Specification of Materials	pages 251 and 252
List Prices	page 253
Dimensions	page 253
Lever and Weight	page 251
2500-Pound	page 254

The Cast and Forged Steel Check Valves listed above comprise only a part of the complete line of Crane steel products.

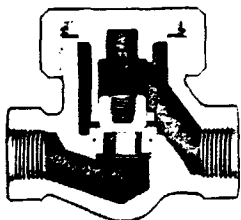
Other steel products are shown and described in detail in other sections of this catalog. Refer to the following pages:

Pressure-Seal Bonnet Valves	pages 209 to 220
Steel Gate Valves	pages 221 to 232
Steel Globe and Angle Valves	pages 233 to 246
Steel Stop-Check Valves	pages 297 and 298
Steel Safety Valves	page 314
Steel Relief Valves	pages 323 to 325
Steel Sediment Separators	page 342
Steel Flanged Fittings	pages 261 to 268
Steel Welding Fittings	pages 269 to 284
Steel Flanges	pages 285 to 292
Steel Screwed Fittings	pages 255 to 260
Steel Bushings	page 258
Steel Plugs	page 258
Corrosion-Resistant Products	pages 365 to 380
Wrought Steel Nipples	pages 170 and 171
Forged Steel Unions	pages 183 and 184
Forged Steel Flange Unions	pages 186 and 187
Fabricated Piping	pages 477 to 504



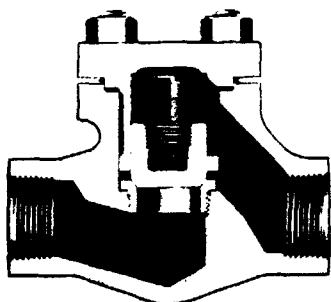
An unusual assortment of Crane Valves and Fittings

600-Pound Forged Steel Lift Check Valves



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.

plex 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.

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 $\frac{1}{4}$ to $\frac{3}{4}$ -inch or socket-welding ends in sizes $\frac{1}{4}$ and $\frac{3}{8}$ -inch; and with a bolted cap and screwed, socket-welding, or flanged ends in sizes $\frac{1}{2}$ 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 Tri-

WORKING PRESSURES

Temp. Deg. F.	Pounds, Non-Shock		
	Screwed or Socket- Welding Valves	Flanged Valves *With $\frac{1}{4}$ -inch Male Facing	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 large male and female facings are used with solid metal gaskets, these ratings are permitted only if the gasket contact area is the same as in large tongue and groove joints.

TEST PRESSURES

Valve	Pounds Hydrostatic		
	Screwed or Socket- Welding Valves	Flanged Valves With $\frac{1}{4}$ -inch Male Facing	With Ring Joint Facing
Shell	2175	1800	2175
Seat	2100	1550	1550

Valve seat tested
40 pounds air-under-water

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.

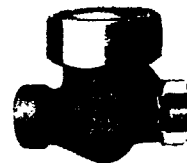


No. 3670 X
Screwed

Union Cap, Horizontal

List Prices and Dimensions

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
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	3 $\frac{1}{2}$	4 $\frac{1}{2}$
	Center to top	2	2	2 $\frac{3}{8}$	3
	Depth of socket	$\frac{7}{16}$	$\frac{9}{16}$		



No. 3678 X
Socket-Welding
Union Cap, Horizontal

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.

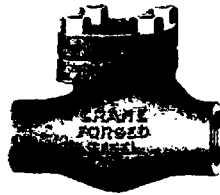
Flanged valves: End flanges conform to the 600-Pound American Standard (B16e-1939). They have a large male face $\frac{1}{4}$ -inch high with a serrated finish (approximately 32 concentric grooves per inch). Prices include drilling and spot facing; no deduction if ordered faced only.

When so ordered, flanged valves can be furnished with ring joint, female, tongue, or groove facing; refer to the Crane Discount Sheet for prices.

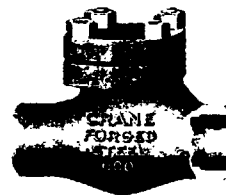
Valves with 150-Pound end flanges are made to order; prices on application.

Socket-Welding Fittings: For socket-welding fittings, see pages 269 to 273.

Templates for drilling . . . page 442



Bolted Cap, Horizontal
No. 3674 X, Screwed



Bolted Cap, Horizontal
No. 3682 X, Socket-Welding



Bolted Cap, Horizontal
No. 3686 X, Flanged

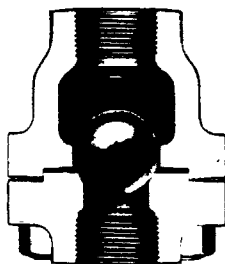
List Prices and Dimensions

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	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	$3\frac{5}{8}$	$4\frac{3}{8}$	$5\frac{1}{8}$	$6\frac{1}{4}$	7
		Socket-Welding	$3\frac{5}{8}$	$4\frac{3}{8}$	$5\frac{1}{8}$	$6\frac{1}{4}$	$8\frac{3}{8}$
	Depth of Socket		$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{3}{4}$	$1\frac{3}{16}$	$\frac{7}{8}$
	*Face to face, Flanged		$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	9	$9\frac{1}{2}$
	Center to top	Screwed	$2\frac{1}{2}$	$3\frac{1}{16}$	$3\frac{11}{16}$	$4\frac{1}{8}$	$5\frac{1}{8}$
		Socket-Welding	$2\frac{1}{2}$	$3\frac{1}{16}$	$3\frac{11}{16}$	$4\frac{1}{8}$	$5\frac{1}{8}$
		Flanged	$2\frac{9}{16}$	$3\frac{1}{4}$	$4\frac{1}{16}$	$4\frac{5}{16}$	$5\frac{3}{8}$
	Diameter of flange		$3\frac{3}{4}$	$4\frac{5}{8}$	$4\frac{7}{8}$	$5\frac{1}{4}$	$6\frac{1}{8}$
	*Thickness of flange		$\frac{9}{16}$	$\frac{5}{8}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$\frac{7}{8}$
	Diameter of male face		$1\frac{3}{8}$	$1\frac{11}{16}$	2	$2\frac{1}{2}$	$2\frac{7}{8}$
	Diameter of bolt circle		$2\frac{5}{8}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{7}{8}$	$4\frac{1}{2}$
	No. and dia. of bolts		4— $\frac{1}{2}$	4— $\frac{5}{8}$	4— $\frac{5}{8}$	4— $\frac{3}{4}$	4— $\frac{3}{4}$

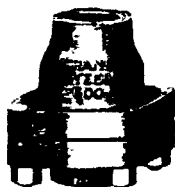
*Face to face dimensions include $\frac{1}{4}$ " male faces; thickness of flange dimensions do not.

Dimensions of ring joint and special facings . . . pages 449 to 451

Cast Steel Vertical Ball Lift Check Valves



Cross Section



Vertical Ball Check
No. 3692 XS
Screwed

These Crane 600-Pound Vertical Ball Lift Check Valves are especially designed for oil or oil vapor service on temperatures up to 1000° F. They have heavy metal sections, are unusually compact, and are sturdily constructed.

Materials and construction: The body is made in two parts, of cast carbon steel, held together by Triplex Steel studs; the joint is male and female, and is fitted with a corrugated soft iron gasket. The ball disc is solid Exelloy, uniform in diameter, and highly polished. Ribs in the outlet half of the body guide the ball.

These valves are made with the seat integral with the body. They are for use in vertical lines with upward flow or in horizontal lines.

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

List Prices and Dimensions

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 3692 XS	Each	23.00	25.70	32.00	41.70	53.30	74.50
End to end	Inches	$3\frac{1}{8}$	$3\frac{11}{16}$	$4\frac{1}{8}$	$4\frac{7}{8}$	$5\frac{5}{8}$	$6\frac{7}{8}$
Width over all	Inches	$2\frac{15}{16}$ sq.	$3\frac{1}{8}$ sq.	$3\frac{3}{8}$ sq.	$4\frac{1}{16}$ sq.	$5\frac{7}{8}$ dia.	$6\frac{5}{8}$ dia.

Valve seat tested 40 pounds air-under-water.

Cast Steel Swing Check Valves

Working Pressures, Pounds per Square Inch, Non-Shock
For Valves Shown on pages 251 to 254

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³ Fluid	Temp. Deg. Fahr.	Flanged Valves with Standard Facings Other Than Ring Joint							Flanged Valves with Ring Joint Facing, Butt-Welding ² and Screwed End Valves						
		Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel						Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel					
			150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.		150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 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	470	300	400	600	900	1500	2500	470	325	425	650	975	1625	2700
	950	455	265	350	530	795	1325	2205	455	300	400	600	900	1500	2500
	1000	440	190	250	380	570	950	1580	440	230	310	470	700	1170	1950
	1050									4135	180	4270	4405	675	1125
	1100									490	120	4180	4270	4450	750
Flanged No. 5 Chrome-Molybdenum Alloy Steel Valves (Made to order)															
Oil or Oil Vapor only ³ Class X	100 to 750	Facings Other Than Ring Joint						Ring Joint Facing							
		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		

¹When raised face, lapped, and large male and female facings are used with solid metal gaskets, the above pressure-temperature ratings are permitted only when the gasket contact area is not greater than the large tongue and groove gasket contact area and the I.D. of the gasket is not less than the I.D. of the large tongue and groove gasket.

²When 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 241.

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 1000° 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 251.

⁴These ratings apply only to oil or oil vapor service

Flange facings: Unless otherwise ordered, flanged end 150 and 300-Pound Valves regularly are furnished with $\frac{1}{16}$ -inch raised faces, and 400-Pound and higher pressure valves, with $\frac{1}{4}$ -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 B1600-1949) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16-1939. The higher ratings that are shown above for products made of No. 5 Chrome-Molybdenum Alloy Steel are taken from ASA B31.1-1942 (Code for Pressure Piping).

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	
	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 40 pounds air-under-water.

For working pressures, see page 250.

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.

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 252.

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		Exelloy			
		10 and 12"	Exelloy-Faced Carbon Steel	Exelloy-Faced Alloy Steel				
	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 250.

‡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 253

Description of materials . . . page 1 to 9

Valves with Outside Lever and Weight

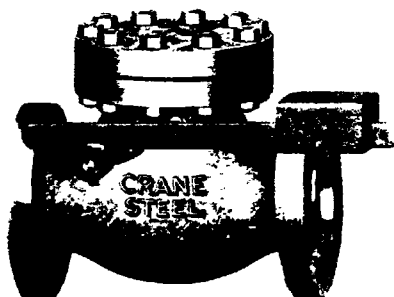
When so ordered, Crane Cast Steel Swing Check Valves can be furnished with an outside lever and an adjustable weight. Orders must specify whether the weight is to balance the disc or to assist it in closing. Prices are furnished on application.

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 accumulate 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.

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.

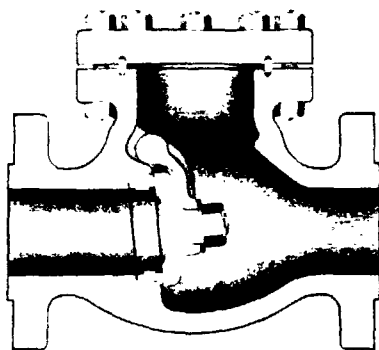
The floating or feathering action of the disc causes the valve to open with a minimum of pressure, and resistance to flow past the disc is minimized.



Cast Steel Swing Check Valve With Outside Lever and Weight

Cast Steel Swing Check Valves

4

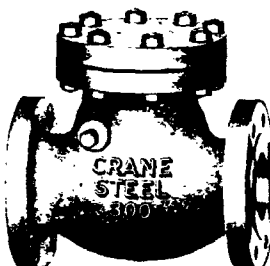


Cross Section
Cast Steel
Swing Check Valve



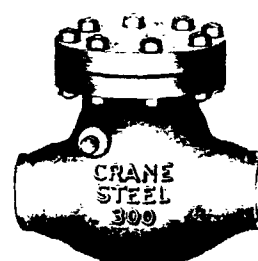
Screwed
For Oil,
Oil Vapor,
Steam,
or Water

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 ⅛-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 ⅛-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, B16-1939, 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.

150, 300, 400, and 600-Pound Flanged Valves conform also to the American Petroleum Institute Standard for Valves for Pipe Line Service, No. 6-D, Fifth Edition, June, 1947 (Tentative) and Supplement 1, issued October, 1948. This Standard does not include 1¼, 1½, 3½, and 5-inch valves; also 150-Pound Valves larger than 6-inch are not included.

Working pressures	page 250
Service recommendations	page 250
Test pressures	page 251
Specification of materials	page 251
Lever and Weight Valves	page 251
2500-Pound Valves	page 254

Cast Steel Swing Check Valves

List Prices, Each

Size Inches	Screwed End Valves			Flanged End Valves, F.D. & S.F. or Butt-Welding End Valves					
	150 Pound	300 Pound	600 Pound	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound
1/2			86.30						
3/4			97.70						
1			115.00						
1 1/4			132.00						
1 1/2			149.00						
2	140.00	167.00	184.00	147.00	174.00	Use 600 Pound Valves	144.00		
2 1/2	161.00	187.00		167.00	194.00		161.00	Use 1500 Pound Valves	388.00
*3	181.00	214.00		187.00	*221.00		195.00		481.00
3 1/2							253.00		589.00
4							*288.00	726.00	775.00
5	241.00	281.00		247.00	294.00	386.00	334.00		
6				334.00	401.00	515.00			
8				401.00	495.00	631.00	598.00	1270.00	1550.00
10				589.00	736.00	953.00	805.00	1617.00	2015.00
12					1030.00	1287.00	1150.00	2393.00	2945.00
					1404.00	1738.00	1553.00	3300.00	4340.00
							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 450 for dimensions.

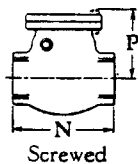
†10 and 12-inch 150-Pound Valves can be made to order; prices on application.

‡Butt-Welding End Valves are not made in the 3 1/2-inch size; these prices apply only to flanged end.

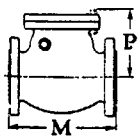
Drilling: Flanged valves are furnished with the end flanges faced, drilled, and spot faced (F.D. & S.F.), unless otherwise ordered. List prices include drilling to the corresponding pressure class of the American Standard. No deduction is made if flanged valves are ordered faced only.

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).

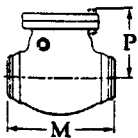
When ordering, specify the catalog number and suffix; see the preceding page.



Screwed



Flanged



Butt-Welding
(Not made in
3 1/2-inch size)

Dimensions, in Inches

Class	Size	M	N	P	Class	Size	M	N	P	Class	Size	M	P
150 Pound	2	8	8	5	400 Pound	4	16		10	900 Pound	3	15	9 1/2
	2 1/2	8 1/2	8 1/2	5 1/2		5	18		12		4	18	11
	3	9 1/2	9 1/2	6		6	19 1/2		12 1/2		5	22	13 1/4
	3 1/2	10 1/2		6 1/2		8	23 1/2		14 1/2		6	24	13 3/4
	4	11 1/2	11 1/2	7		10	26 1/2		**		8	29	16 1/2
	5	13		8		12	30		**		10	33	**
	6	14		9	600 Pound	1 1/2		4 5/8	3 1/2	1500 Pound	12	38	**
	8	19 1/2		10 1/4		3/4		6	4		1 1/2	12	8 1/4
300 Pound	10	**		**		1		7	4 1/2		2	14 1/2	9 3/4
	12	**		**		1 1/4	9	7 1/2	6 1/4		2 1/2	16 1/2	10 1/2
	2	10 1/2	9 1/2	6 3/4		1 1/2	9 1/2	8 1/2	6 3/4		3	18 1/2	11 1/4
	2 1/2	11 1/2	10 3/4	8		2	11 1/2	9 1/2	7		4	21 1/2	13 1/4
	3	12 1/2	11 3/4	8 1/2		2 1/2	13		8 1/4		5	26 1/2	15 1/4
	3 1/2	13 1/4		9 1/4		3	14		9		6	27 3/4	15 3/4
	4	14	13	9 3/4		3 1/2	15		9 3/4		8	32 3/4	18 1/4
	5	15 3/4		10 3/4		4	17		10 1/4	2500 Pound	10	39	**
	6	17 1/2		11 3/4		5	20		12 3/4		12	44 1/2	**
	8	21		14		6	22		13 1/2		On application		
	10	24 1/2		15		8	26		15 1/4				
	12	28		16 3/4		10	31		18 3/4				
						12	33		21 1/2				

**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 1/4-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 441 to 443

Description . . . pages 251 and 252

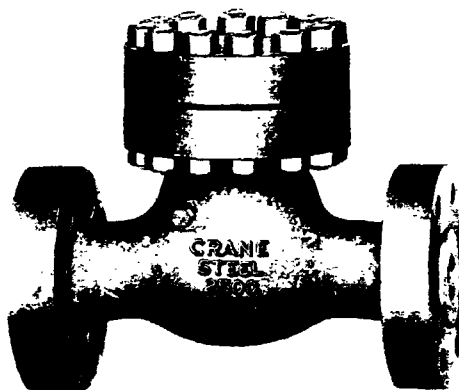
Special facings . . . pages 448 to 451

2500-Pound Alloy Cast Steel Swing Check Valves

24

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.

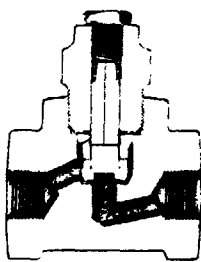
The full port area is maintained without pockets, from the inlet flange to the valve seat, to avoid turbulence. On the outlet side of the valve seat, the body is of generous proportions, allowing full swing of the disc and minimizing erosion and flow resistance.

Prices and dimensions will be furnished on application.

Working pressures and service recommendations page 250
General description pages 251 and 252

Specification of materials page 251
Description of materials pages 1 to 1

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	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 227 H, Horizontal	Each	49.00	54.00	63.00	77.00	105.00
End to end	Inches	$2\frac{7}{8}$	$3\frac{5}{8}$	5	$5\frac{1}{4}$	7
Center to top	Inches	$2\frac{5}{8}$	$3\frac{1}{4}$	$4\frac{3}{8}$	$4\frac{7}{8}$	$4\frac{5}{8}$

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 $1\frac{1}{4}$ -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.

Forged and Cast Steel Screwed Fittings

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:

25

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.

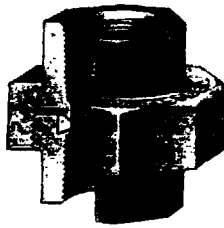
General description	page 256
Working pressures	page 256
List prices	pages 257 and 258
Dimensions	page 259

Cast Steel Fittings

1000-Pound W.O.G. page 260

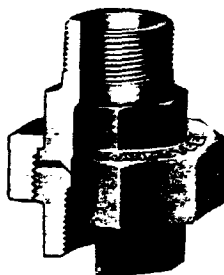
How to read reducing fittings page 562

The Cast and Forged Steel Screwed 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:



Forged Steel
Ground Joint
Female Unions
Brass to Steel Seat

See page 183



Forged Steel
Ground Joint
Male and Female Unions
Steel to Steel Seat

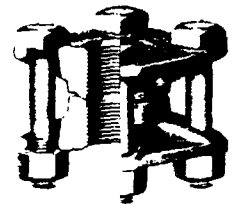
See page 183

Steel Couplings	page 172
Wrought Steel Nipples	pages 170 and 171
Forged Steel Unions	pages 183 and 184
Forged Steel Flange Unions	pages 186 and 187

Steel Flanged Fittings	pages 261 to 268
Steel Welding Fittings	pages 269 to 284
Steel Flanges	pages 285 to 292

Steel Pressure-Seal Bonnet Valves	pages 209 to 220
Steel Gate Valves	pages 221 to 232
Steel Globe and Angle Valves	pages 233 to 246
Steel Check Valves	pages 247 to 254
Steel Stop-Check Valves	pages 297 and 298

Steel Safety Valves	page 314
Steel Relief Valves	pages 323 to 325
Corrosion-Resistant Valves and Fittings	pages 365 to 380
Valves and Fittings for Marine Service	pages 381 to 392
Steel Sediment Separators	page 342
Fabricated Piping	pages 477 to 504



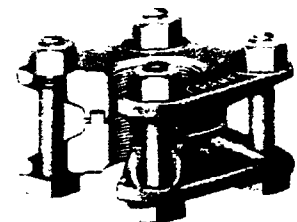
Forged Steel
Ground Joint
Flange Unions

See page 187



Forged Steel Combination Elbows

See page 186



Forged Steel
Tongue and Groove
Flange Unions
With Granite Gasket

See page 186

Forged Steel Screwed Fittings

2000, 3000, and 6000-Pound W.O.G.

25



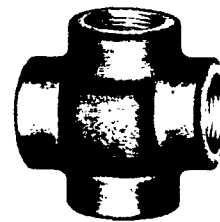
90° Elbow
No. 240, 2000-Lb. WOG
No. 380, 3000-Lb. WOG
No. 660, 6000-Lb. WOG



Tee
No. 241, 2000-Lb. WOG
No. 381, 3000-Lb. WOG
No. 661, 6000-Lb. WOG



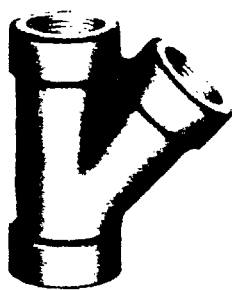
45° Elbow
No. 242, 2000-Lb. WOG
No. 382, 3000-Lb. WOG
No. 662, 6000-Lb. WOG



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

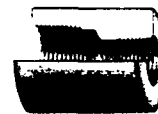


45° Y-Bend
No. 245, 2000-Lb. WOG
No. 385, 3000-Lb. WOG
No. 665, 6000-Lb. WOG

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.

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 care-

WORKING PRESSURES Pounds, Non-Shock For Steam, Water, Oil, Oil Vapor, Gas, or Air

Temp. Deg. F.	Carbon Steel Fittings			Carbon-Molybdenum Steel Fittings		
	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	2975
900	585	875	1750	900	1350	2700
950	460	690	1375	835	1250	2500
1000	335	500	1000	650	975	1950

fully 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.

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	90° Elbows	Tees	45° Elbows	Crosses	90° Street Elbows	45° Y-Bends	Couplings	Reducers	Half Couplings	
2000-Pound W.O.G.	Size Inches	No. 240	No. 241	No. 242	No. 243		No. 245			
	1/8	.55	.80	.68	1.10	Use 3000-Pound W.O.G.	1.40	Use 3000-Pound W.O.G.		
	1/4	.55	.80	.68	1.10		1.85			
	3/8	.55	.80	.68	1.10		2.00			
	1/2	.65	.95	.78	1.30		2.50			
	3/4	.75	1.10	.90	1.50		3.00			
	1	.90	1.35	1.08	1.90		3.75			
	1 1/4	1.20	1.75	1.44	2.80		4.75			
	1 1/2	1.50	2.30	1.80	3.50		5.80			
	2	1.90	2.90	2.28	5.00					
	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 and flange unions are shown on pages 183, 184, 186, and 187. 1000-Pound W.O.G. Cast Steel Screwed Fittings in sizes as large as 12-inch are listed on page 260.

Steel Screwed Caps, Plugs, and Bushings

3000 and 6000-Pound W.O.G.

25



No. 389
Cap

3000-Pound
W.O.G.



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.



No. 600
Hexagon
Bushing

6000-Pound
W.O.G.



No. 601
Face
Bushing

6000-Pound
W.O.G.

List Prices, Each—Carbon Steel Fittings

Size Inches	Caps No. 389 3000 Pound	Plugs		
		No. 309 Square Head 3000 Pound	No. 308 Round Head 3000 Pound	No. 602 Hexagon Head 6000 Pound
1/8	.35	.25	.25	.25
1/4	.35	.25	.25	.25
3/8	.35	.25	.25	.25
1/2	.45	.25	.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
5	18.00			
6	22.00			

*For description
and working pressures,
see page 256.*

Galvanized fittings: Galvanized caps, plugs, and bushings can be made to order; see the Crane Discount Sheet for prices.

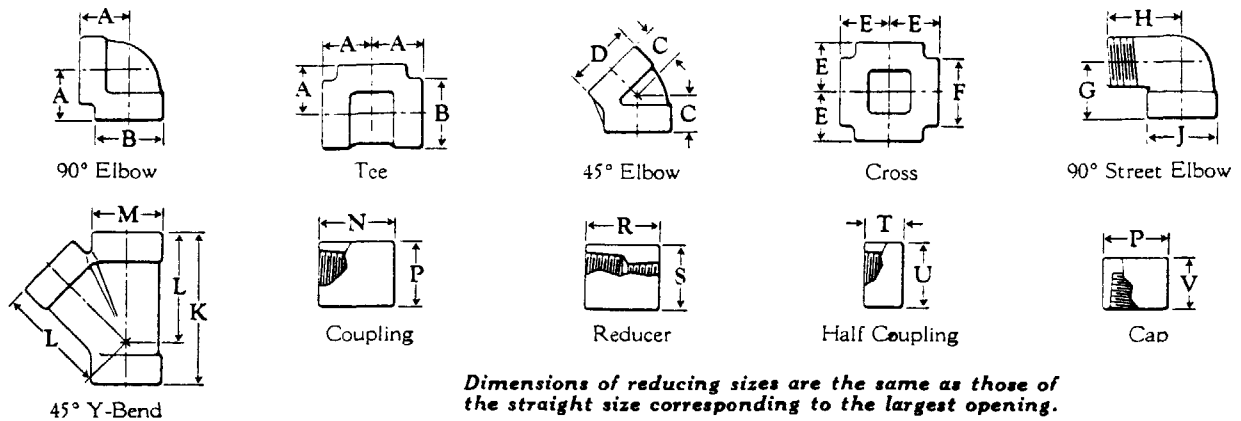
Alloy steel fittings: Caps, plugs, and bushings made of Carbon-Molybdenum Steel, Chromium-Molybdenum Steel (4 to 6% Chrome), or Stainless Steel (18-8) can be made to order; prices are furnished on application.

*For dimensions of Caps,
see page 259.*

Bushings					
Size Inches	No. 600 Hexagon 6000 Pound	No. 601 Face 6000 Pound	Size Inches	No. 600 Hexagon 6000 Pound	No. 601 Face 6000 Pound
1/4 x 1/8	.45	.50	3 x 2 1/2	8.00	5.00
3/8 x 1/4	.45	.50	x 2		
x 1/8			x 1 1/2		
1/2 x 3/8			x 1 1/4	7.25	
x 1/4	.45	.50	x 1		
x 1/8			x 3/4		
3/4 x 1/2			x 1/2		
x 3/8	.45	.55	3 1/2 x 3		
x 1/4			x 2 1/2	9.00	6.00
x 1/8			x 2		
1 x 3/4			x 1 1/2		
x 1/2	.50	.60	x 1 1/4	8.25	
x 3/8			x 1		
x 1/4			x 3/4		
x 1/8			4 x 3 1/2		
1 1/4 x 1			x 3	10.50	7.50
x 3/4	.66	.75	x 2 1/2		
x 1/2			x 2		
x 3/8			x 1 1/2		
x 1/4			x 1 1/4	9.50	
1 1/2 x 1 1/4			x 1		
x 1	.83	.95	x 3/4		
x 3/4			x 1/2		
x 1/2			5 x 4		8.75
x 3/8			x 3 1/2		
x 1/4			x 3		
2 x 1 1/2	1.32	1.50	x 2 1/2	12.50	
x 1 1/4			x 2		
x 1			x 1 1/2		
x 3/4	1.20		x 1 1/4		
x 1/2			x 1		
x 3/8			6 x 5		10.00
x 1/4			x 4		
2 1/2 x 2	5.00	2.00	x 3 1/2		
x 1 1/2			x 3	20.00	
x 1 1/4			x 2 1/2		
x 1	4.50		x 2		
x 3/4			x 1 1/2		
x 1/2			x 1 1/4		
			x 1		

Forged Steel Screwed Fittings

Dimensions, in Inches



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	11/32	31/32	1				25/16	15/8	13/16							
3/8	31/32	11/32	3/4	11/32	31/32	1				211/16	17/8	1							
1/2	15/8	15/16	7/8	15/16	15/8	15/16				3	21/8	15/16							
3/4	15/16	1 1/2	1	1 1/2	15/16	1 1/2				39/16	29/16	1 1/2							
1	1 1/2	1 13/16	1 1/8	1 13/16	1 1/2	1 13/16				41/8	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	5/8	7/8	31/32	1							1 1/8	19/32					
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 1/16
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	1 5/16	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	39/16	29/16	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 3/8	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
5														6 1/2					3 1/16
6														8					3 3/16
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			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	39/16	29/16	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 5/8	3 5/8	3 5/8	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 256 to 258

Thread engagement ... page 474

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

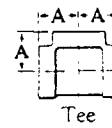
For Steam, Water, Oil,
Oil Vapor, Gas, or Air

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



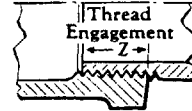
90° Elbow



Tee



45° Elbow



For explanation,
see page 474.

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	3¾	3½	4½	5¾	6
	Z—Thread engagement	1¼	1½	1¾	1¾	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 256 and 257.

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 444.



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
90° Long Radius Elbows
90° Base Elbows
45° Elbows
Tees

Crosses
45° Laterals
Taper Reducers
Eccentric Reducers
Return Bends

26

Pressure-Temperature Ratings... page 262
General Description and Tests... page 263

List Prices

150 and 300-Pound... page 264
400, 600, 900, and 1500-Pound... page 265

Dimensions

150 and 300-Pound... page 266
400, 600, 900, 1500, and 2500-Pound... page 267
4000-Pound Fittings... page 268

Cast Steel Flanged Fittings listed above
give only a part of the complete line of
steel products.

Steel products are shown and described in
other sections of this catalog. Refer to
following pages:

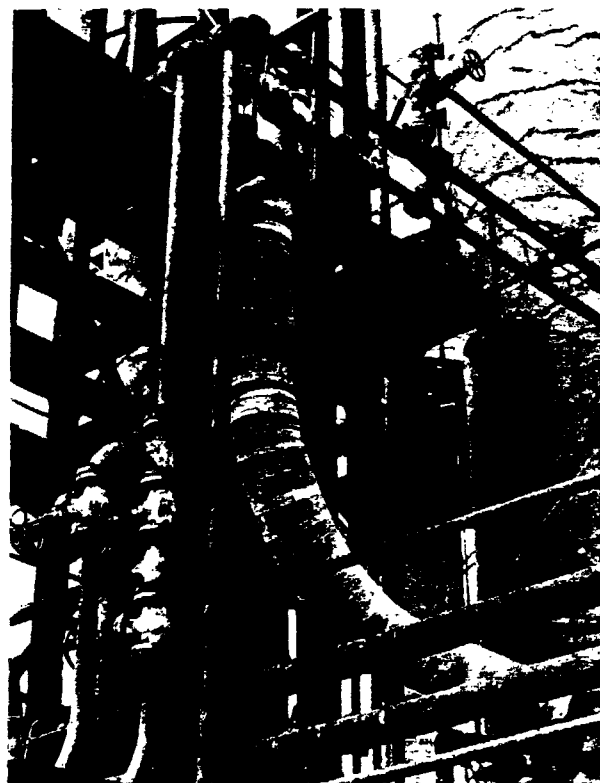
Flanges... pages 285 to 292
Welding Fittings... pages 269 to 284
Steel Flange Unions... pages 186 and 187
Steel Unions... pages 183 and 184

Threaded Fittings... pages 255 to 260
Couplings... page 172
Cast Steel Nipples... pages 170 and 171
Non-Resistant Products... pages 365 to 380

Gate Valves... pages 221 to 232
Globe and Angle Valves... pages 233 to 246
Check Valves... pages 247 to 254
Stop-Check Valves... pages 297 and 298

Safety Valves... page 314
Relief Valves... pages 323 to 325
Pressure-Seal Bonnet Valves... pages 209 to 220
Sediment Separators... page 342

How to read reducing fittings... page 562
Fabricated Piping... pages 477 to 504



Severe services, tough materials —
Crane Steel Valves, Fittings, and Flanges

Cast Steel Flanged Fittings

Working Pressures, Pounds per Square Inch, Non-Shock
For Fittings Shown on pages 263 to 267

Fluid	Temp.	1Flanged Fittings with Standard Facings Other Than Ring Joint							Flanged Fittings with Ring Joint Facing						
	Deg. Fahr.	Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel						Carbon Steel	No. 4 Carbon-Molybdenum Alloy Steel					
		150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.	2500 Lb.	150 Lb.	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	2320	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	270	300	400	600	900	1500	2500	270	325	425	650	975	1625	2700
	950	255	265	350	530	795	1325	2205	255	300	400	600	900	1500	2500
	1000	240	2190	2250	3380	2570	2950	21580	240	2230	2310	2470	2700	21170	21950
	1050									2135	2180	2270	2405	2675	21125
	1100									290	2120	2180	2270	2450	2750
Flanged No. 5 Chrome-Molybdenum Alloy Steel Fittings (Made to order)															
		1Facings Other Than Ring Joint						2Ring Joint Facing							
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.							
	800 850														
	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		

¹When raised face, lapped, and large male and female facings are used with solid metal gaskets, the above pressure-temperature ratings are permitted only when the gasket contact area is not greater than the large tongue and groove gasket contact area and the I.D. of the gasket is not less than the I.D. of the large tongue and groove gasket.

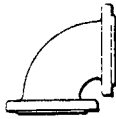
²These ratings apply only to oil or oil vapor service.

Flanged facings: Unless otherwise ordered, 150 and 300-Pound Flanged Fittings regularly are furnished with $\frac{1}{16}$ -inch raised faces, and 400-Pound and higher pressure Flanged Fittings, with $\frac{1}{4}$ -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-1049) to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16e-1039. The higher ratings that are shown above for products made of No. 5 Chrome-Molybdenum Alloy Steel are taken from ASA B31.1-1942 (Code for Pressure Piping).

Cast Steel Flanged Fittings

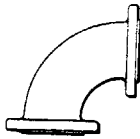


90° Elbow
Straight

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 264 to 267 (prices for 2500-Pound on application).

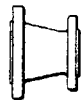
Materials: The 150-Pound Flanged Fittings are regularly made of Crane Carbon Steel. All other fittings are made of Crane No. 4 Carbon-Molybdenum Steel, unless otherwise ordered.

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 conform to the American Standard for Steel Pipe Flanges and Flanged Fittings, B16-1939, for their respective pressure class. This Standard does not include Return Bends or ½ and ¾-inch 45° Laterals in the 1500-Pound class.



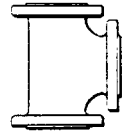
Taper Reducer

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



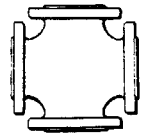
Tee

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



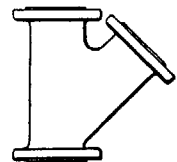
Cross

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.

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 $\frac{1}{16}$ -inch raised face on the end flanges; 400, 600, 900, 1500, and 2500-Pound Fittings regularly have a $\frac{1}{4}$ -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 x 1½	1500 Lb.
2½ x 2	
3 x 2½	
3½ x 3	
4 x 3	
4 x 2½	
5 x 4	150, 300, and 600 Lb.
6 x 5	400 and 900 Lb.
8 x 6	
10 x 8	
12 x 10	
12 x 8	

Catalog numbers, description, and tests... page 263

Taps and drains for flanged fittings... page 534

How to read reducing sizes... page 562

Dimensions... pages 266 and 267

Galvanized fittings... page 456

List Prices, Each—F.D. & S.F.

150-Pound Carbon Steel and 300-Pound No. 4 Carbon-Molybdenum Steel Fittings

Pressure Class	Size Inches	Elbows			90° Base Elbows		Tees		Crosses or 45° Laterals		Taper Re- ducers (Sizes above)	Return Bends	
		90° or 45°	90° Reduc- ing (Sizes above)	90° Long Radius	With Base Faced Only	Extra to Drill & Spot Face Base	Straight	Reduc- ing Any reduc- tion	Straight	Reduc- ing Any reduc- tion		Size by Center to Center Inches	List Price
150-Pound	1	26.00					39.00		52.00			2x7	47.50
	1¼	28.00					41.50	47.00	54.50	61.00		3x7½	60.00
	1½	31.00					44.00	49.50	60.00	67.50		x8	62.00
	2	34.00	41.50	44.00			47.00	52.50	65.00	73.50	34.00	x9	64.00
	2½	39.00	47.00	49.50			52.00	58.50	75.50	86.00	39.00	4x9	80.50
	3	44.00	52.00	57.00			60.00	67.50	86.00	96.00	44.00	x10	84.50
	3½	52.00	62.50	67.50			67.50	77.00	100.00	112.00	52.00	x11	88.00
	4	57.00	67.50	75.50	83.00	7.80	75.50	86.00	110.00	124.00	57.00	x12	91.00
	5	70.00	83.00	101.00	107.00	7.80	96.00	110.00	135.00	151.00	70.00	x13	94.50
	6	86.00	101.00	125.00	130.00	7.80	120.00	135.00	165.00	186.00	86.00	x14	97.50
	8	125.00	146.00	182.00	182.00	15.60	170.00	192.00	240.00	268.00	125.00	x18	114.00
	10	174.00	205.00	240.00	252.00	21.00	235.00	265.00	330.00	374.00	174.00	6x12	134.00
	12	218.00	260.00	300.00	312.00	26.00	285.00	325.00	416.00	473.00	218.00	x15	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			2x7½	63.50
	1¼	37.00					54.00	60.50	71.00	79.50		*3x8½	81.00
	1½	40.50					57.50	64.00	77.50	88.00		*x12	89.50
	2	44.00	54.00	57.50			60.50	68.50	84.50	95.50	44.00	4x10	110.00
	2½	50.50	60.50	64.00			67.50	76.00	98.00	111.00	50.50	x11	114.00
	*3	57.50	67.50	74.50			77.50	88.00	111.00	125.00	57.50	x11½	116.00
	3½	67.50	81.00	88.00			88.00	100.00	128.00	145.00	67.50	x12	118.00
	4	74.50	88.00	98.00	108.00	10.00	98.00	111.00	142.00	160.00	74.50	x16½	141.00
	5	91.00	108.00	132.00	138.00	10.00	125.00	142.00	172.00	196.00	91.00	x17	143.00
	6	111.00	132.00	162.00	169.00	10.00	155.00	176.00	213.00	241.00	111.00	x17½	146.00
	8	162.00	189.00	236.00	236.00	20.50	219.00	250.00	307.00	348.00	162.00	x18	149.00
	10	226.00	267.00	311.00	327.00	27.00	304.00	344.00	429.00	486.00	226.00	6x14	189.00
	12	284.00	338.00	388.00	405.00	34.00	371.00	422.00	540.00	614.00	284.00	x15	194.00
	14	365.00		530.00	540.00	40.50	496.00	567.00	692.00	790.00		x16½	206.00
	16	473.00		692.00	692.00	50.50	640.00	732.00	894.00	1020.00		x17	209.00
	18	608.00		910.00	910.00	50.50	827.00	945.00	1150.00	1310.00		x18	216.00
	20	760.00		1180.00	1180.00	50.50	1080.00	1230.00	1450.00	1655.00		8x17½	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 450 for dimensions.

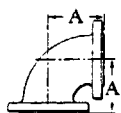
List Prices, Each—F.D. & S.F.
400, 600, 900, and 1500-Pound No. 4 Carbon-Molybdenum Steel Fittings

Pressure Class	Size Inches	Elbows		90° Base Elbows		Tees		Crosses or 45° Laterals		Taper Reducers
		90° or 45°	90° Reducing Page 264 For Sizes	With Base Faced Only	Extra to Drill & Spot Face Base	Straight	Reducing Any reduction	Straight	Reducing Any reduction	
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
	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	
For smaller sizes, use 600-Pound.	24	1905.00		2700.00	67.50	2685.00	3065.00	3745.00	4280.00	
600-Pound	1/2	40.50				59.00		82.50		
	3/4	44.00				64.00	72.50	89.50	101.00	
	1	49.00				72.50	82.50	101.00	115.00	
	1 1/4	52.50				77.50	88.00	106.00	120.00	
	1 1/2	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
	2 1/2	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
	3 1/2	98.00	118.00			145.00	164.00	203.00	230.00	98.00
	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
	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	1/2	65.50				96.00		130.00		
	3/4	70.00				105.00	119.00	138.00	157.00	
	1	77.00				118.00	136.00	157.00	178.00	
	1 1/4	84.00				130.00	147.00	180.00	206.00	
	1 1/2	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
	2 1/2	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	

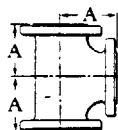
Prices of 2500-Pound Flanged Fittings furnished on application.

Cast Steel Flanged Fittings

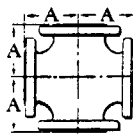
Dimensions, in Inches



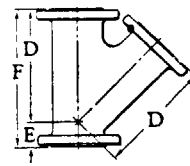
90° Elbow



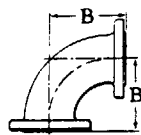
Tee



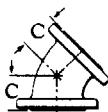
Cross



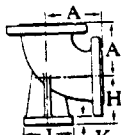
45° Lateral



90° Long
Radius Elbow



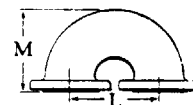
45° Elbow



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	4½	4½	½
	2½	5	7	3	9½	2½	12	5½	4½	4½	½
	3	5½	7¾	3	10	3	13	6	4¾	5	9/16
	3½	6	8½	3½	11½	3	14½	6½	5¼	5	9/16
	4	6½	9	4	12	3	15	7	5½	6	5/8
	5	7½	10¼	4½	13½	3½	17	8	6¼	7	1½/16
	6	8	11½	5	14½	3½	18	9	7	7	11/16
	8	9	14	5½	17½	4½	22	11	8½	9	15/16
	10	11	16½	6½	20½	5	25½	12	9¾	9	15/16
	12	12	19	7½	24½	5½	30	14	11¼	11	1
	14	14	21½	7½	27	6	33	16	12½	11	1
	16	15	24	8	30	6½	36½	18	13¾	11	1
	18	16½	26½	8½	32	7	39	19	15	13½	1½/8
20	18	29	9½	35	8	43	20	16	13½	1½/8	
24	22	34	11	40½	9	49½	24	18½	13½	1½/8	
300 Pound	1	4	5	2¼	6½	2	8½	4½			
	1¼	4¼	5½	2½	7¼	2¼	9½	4½			
	1½	4½	6	2¾	8½	2½	11	4½			
	2	5	6½	3	9	2½	11½	5	4½	5¼	¾
	2½	5½	7	3½	10½	2½	13	5½	4¾	5¼	¾
	3	6	7¾	3½	11	3	14	6	5¼	6½	13/16
	3½	6½	8½	4	12½	3	15½	6½	5¾	6½	13/16
	4	7	9	4½	13½	3	16½	7	6	6½	7/8
	5	8	10¼	5	15	3½	18½	8	6¾	7½	1
	6	8½	11½	5½	17½	4	21½	9	7½	7½	1
	8	10	14	6	20½	5	25½	11	9	10	1¼
	10	11½	16½	7	24	5½	29½	12	10½	10	1¼
	12	13	19	8	27½	6	33½	14	12	12½	17/16
	14	15	21½	8½	31	6½	37½	16	13½	12½	17/16
	16	16½	24	9½	34½	7½	42	18	14¾	12½	17/16
	18	18	26½	10	37½	8	45½	19	16¼	15	15/8
20	19½	29	10½	40½	8½	49	20	17½	15	15/8	
24	22½	34	12	47½	10	57½	24	20¾	17½	17/8	

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					
2	3½	3⅞		4½		5
2½	3½	3⅞		4½		5
3	3⅞	4½		5	5	5⅞
3½	3⅞	4½		5		
4	4¾	5	5	5⅞	5⅞	7⅞
5	5½	5⅞	5⅞	7⅞	7⅞	7⅞
6	5½	5⅞	5⅞	7⅞	7⅞	10⅞
8	7½	7⅞	7⅞	10⅞	10⅞	10⅞
10	7½	7⅞	7⅞	10⅞	10⅞	13
12	9½	10⅞	10⅞	13	13	13
14	9½	10⅞	10⅞	13	13	15¼
16	9½	10⅞	10⅞	13	13	
18	11¾	13	13			
20	11¾	13	13			
24	11¾	15¼	15¼			
	Diameter of Bolts					
2	½	⅝		¾		⅝
2½	½	⅝		¾		⅝
3	½	¾		⅝	⅝	¾
3½	½	¾		⅝		
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	¾
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

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	8½	9½	9½	10½	10½	11½	13½	11¼	12¾			
	300 Pound	Size	2		3				4						6			
		L	7½	8½	12	10	11	11½	12	16½	17	17½	18	14	15	16½	17	18
	M	6½	8	9¾	9½	10½	10¾	10½	12½	13½	13¾	13½	13	13½	14¼	14½	15	16