CRANE

PLAINTIFF'S EXHIBIT
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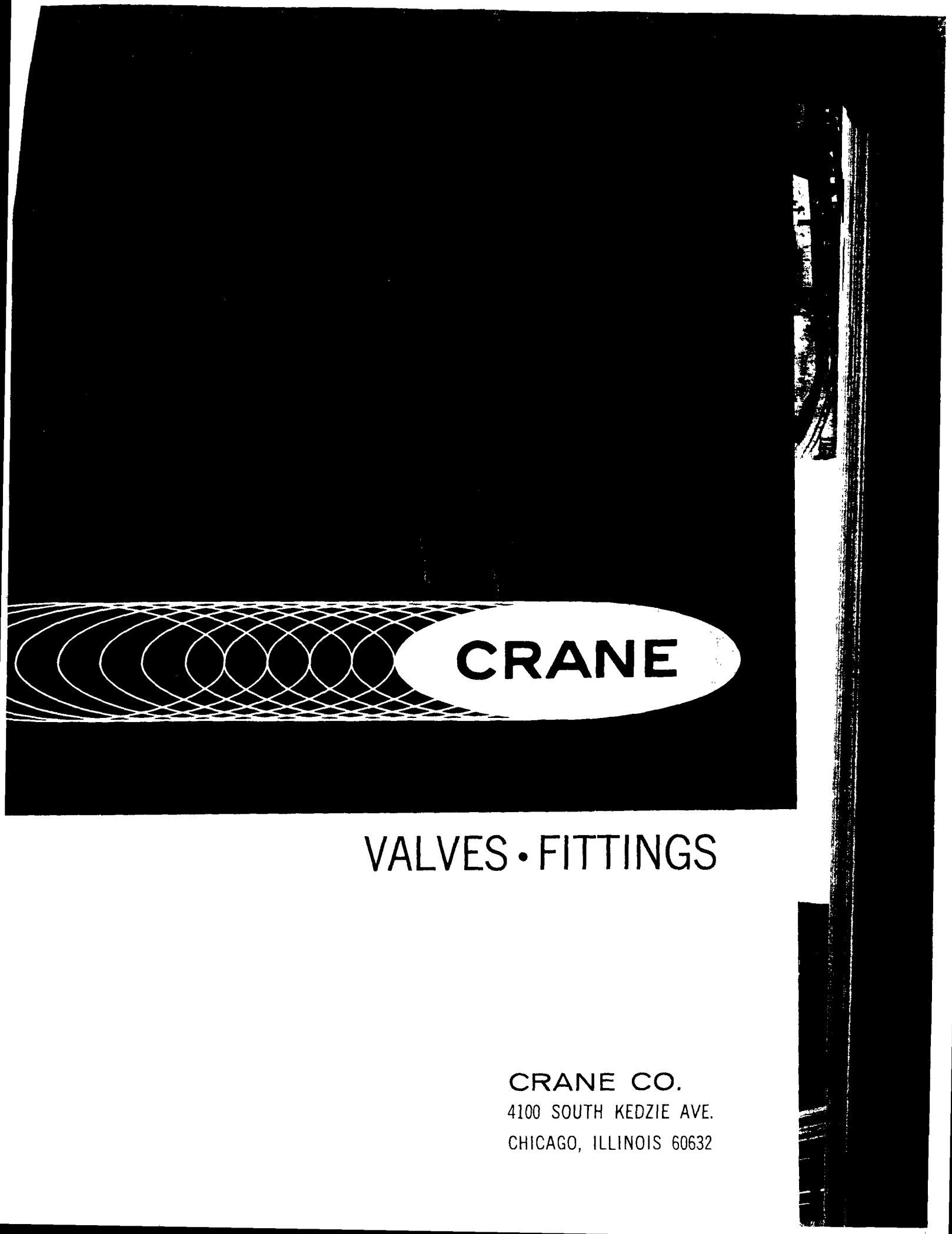
VALVES

CATALOG NO. 60



VALVES • FITTINGS

CRANE CO.
4100 SOUTH KEDZIE AVE.
CHICAGO, ILLINOIS 60632

TERMS AND CONDITIONS

WARRANTY

If, within one year following date of delivery, any material manufactured by or trade-marked for Crane Co. proves defective, Buyer shall not return it unless requested to do so but shall immediately notify Crane Co. stating full particulars in support of his claim and, if faulty workmanship or material is involved, Crane Co. will adjust the matter fairly and promptly. Under no circumstances shall Crane Co. be obligated to allow claims for consequential damages or for any labor or other expenses incurred by reason of the use or sale of any defective material, the sole measure of damages being the price received therefor by Crane Co.

ILLUSTRATIONS

Catalog illustrations 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.

WEIGHTS

Weights shown in catalogs, price schedules, quotations, acknowledgements or orders are approximate and are in no sense guaranteed. They represent the average weight of Crane Co. products as made from patterns in use at time weights were compiled.



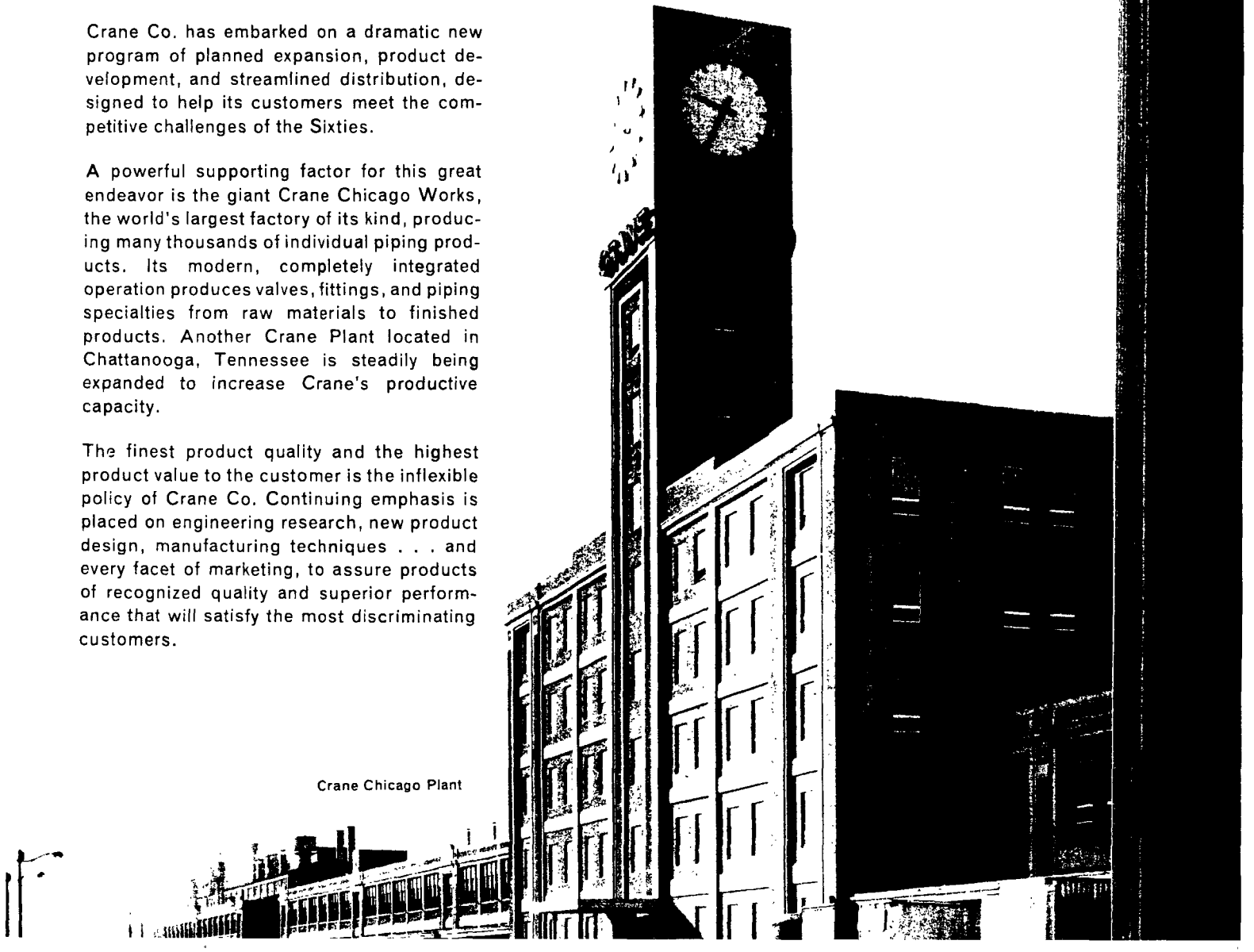
Giant Crane plant in Chattanooga, Tennessee

FROM THESE MODERN CRANE PLANTS COME THE FINEST PRODUCTS FOR INDUSTRY

Crane Co. has embarked on a dramatic new program of planned expansion, product development, and streamlined distribution, designed to help its customers meet the competitive challenges of the Sixties.

A powerful supporting factor for this great endeavor is the giant Crane Chicago Works, the world's largest factory of its kind, producing many thousands of individual piping products. Its modern, completely integrated operation produces valves, fittings, and piping specialties from raw materials to finished products. Another Crane Plant located in Chattanooga, Tennessee is steadily being expanded to increase Crane's productive capacity.

The finest product quality and the highest product value to the customer is the inflexible policy of Crane Co. Continuing emphasis is placed on engineering research, new product design, manufacturing techniques . . . and every facet of marketing, to assure products of recognized quality and superior performance that will satisfy the most discriminating customers.



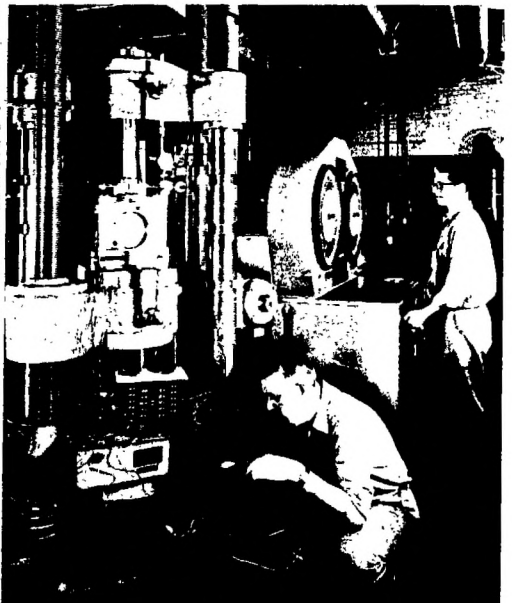
Crane Chicago Plant

CRANE

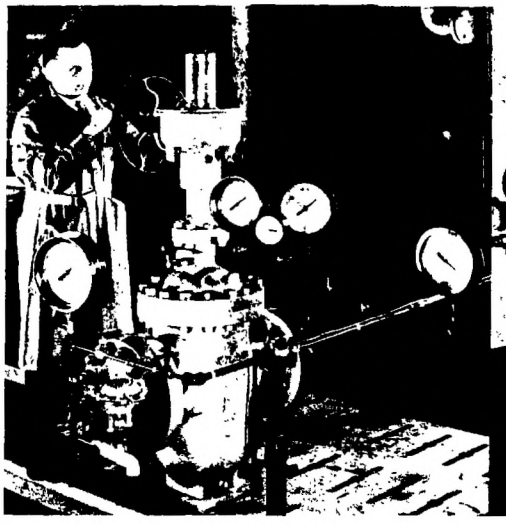
RESEARCH AND ENGINEERING KEY TO PRODUCT DEVELOPMENT

Carefully engineered and tested products have always been a hallmark of the Crane Co., and research and development by Crane Engineers continues to be a vital part of company philosophy. Useful new products, the result of planned engineering development, are being produced regularly. And existing products are continually being improved to assure long life, reliable performance, and minimum maintenance requirements.

Crane engineers are hard at work on solutions to the problems engendered by the super-high temperatures and pressures of modern processing systems. In all industries, Crane engineers are meeting challenges with new, sometimes radical, but always carefully engineered products. For example: valves for operation in a pure helium atmosphere . . . a universal valve trim material for use with oil or steam . . . flexible steel discs that seat tighter with lower operating torques . . . these are but a few of the exciting new ideas produced by Crane engineering . . . ideas that can help you in your job.



Measuring stress by means of electric strain gages in a valve component undergoing tensile and compressive loads similar to service.

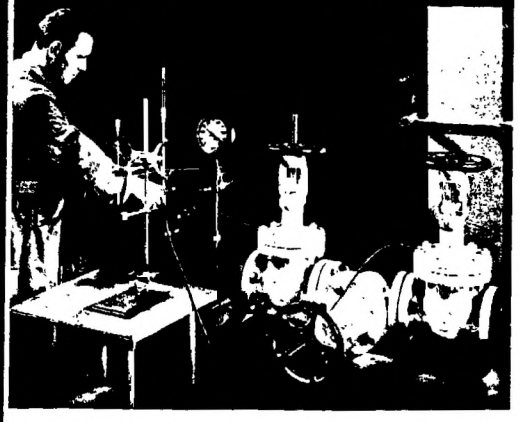


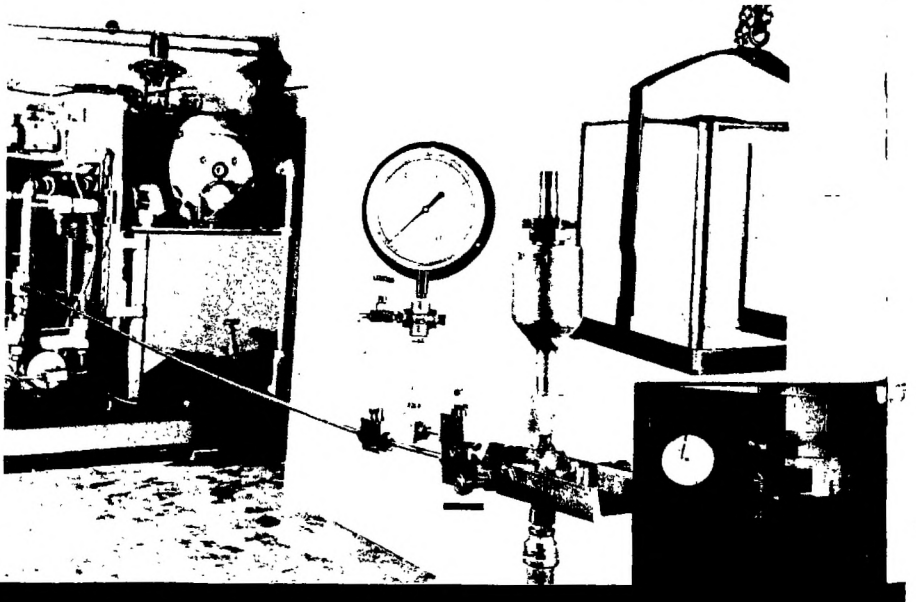
Arrangements used for extreme tightness tests at both inlet and outlet of Conduit Valves with Teflon seats help determine valve suitability for any given application.



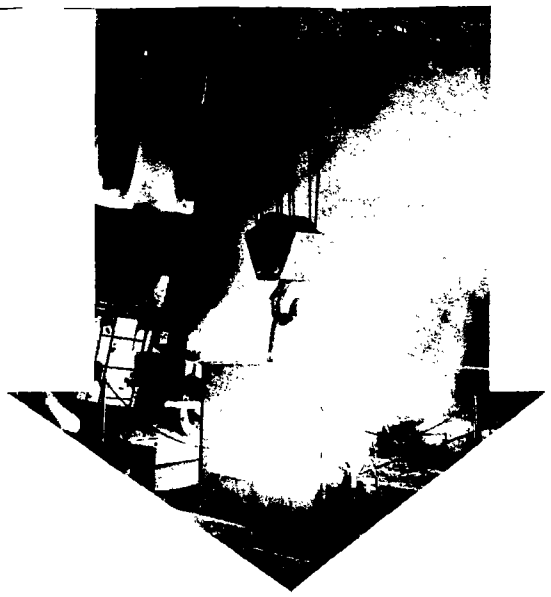
The effect of thousands of operations on seat tightness is determined, as well as the ability of all valve parts to withstand the wear and tear of simulated service conditions.

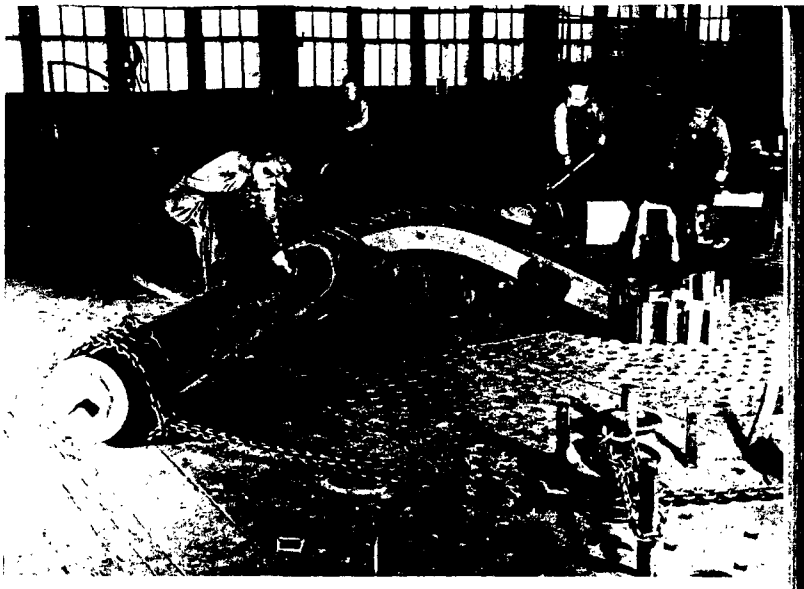
Laboratory set-up of three 6"—300 lb. Crane Steel Flex Gate valves verifies both inlet and outlet seat tightness under actual service conditions.





Tests at pressures up to 75,000 pounds per square inch assure valves and components that will function perfectly in actual service.





CRANE FOUNDRY AND FABRICATION FACILITIES HELP GUARANTEE GREATER PRODUCT PERFORMANCE

An integral part of Crane operations is a full complement of modern foundry and fabrication facilities designed to supply every customer requirement.

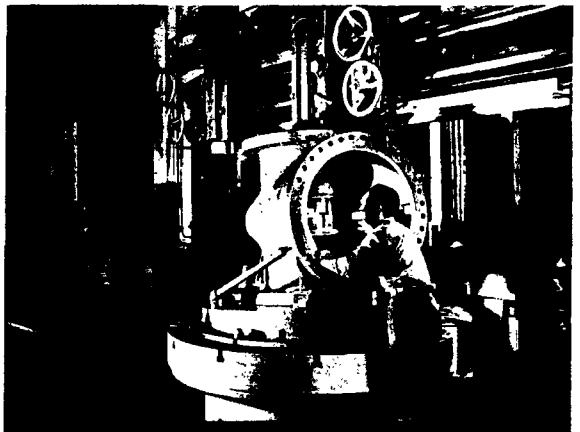
Electric furnaces with capacities ranging from 1000 to 20,000 pounds, with an average melting rate of 24,000 pounds of steel per hour, give Crane a capacity among the largest steel foundries in industry. For melting alloy steels, irons, and bronzes, Crane operates additional furnace units of the most modern design and function, capable of meeting the special quality requirements of the valve industry.

Moulding, pouring, and shakeout operations are fully mechanized, utilizing modern roller, belt, or over-head conveyor systems for continuous movement of castings and equipment.

In the fabrication and bending of piping, Crane supplies years of experience by engineers skilled in piping system design. Fabrication by full-time, skilled specialists . . . members of the United Association of Pipe Fitters, A. F. of L.

CRANE MAINTAINS MODERN METHODS IN MACHINE AND ASSEMBLING OPERATIONS

Basic operations in any manufacturing plant, both machining and assembly are an art at Crane, geared to match the exacting standards established for Crane products. Hundreds of the finest machines, many designed by Crane Engineers for special needs, occupy thousands of square feet in the Chicago Works and at Chattanooga. They insure the exceptional high quality of Crane Valves.



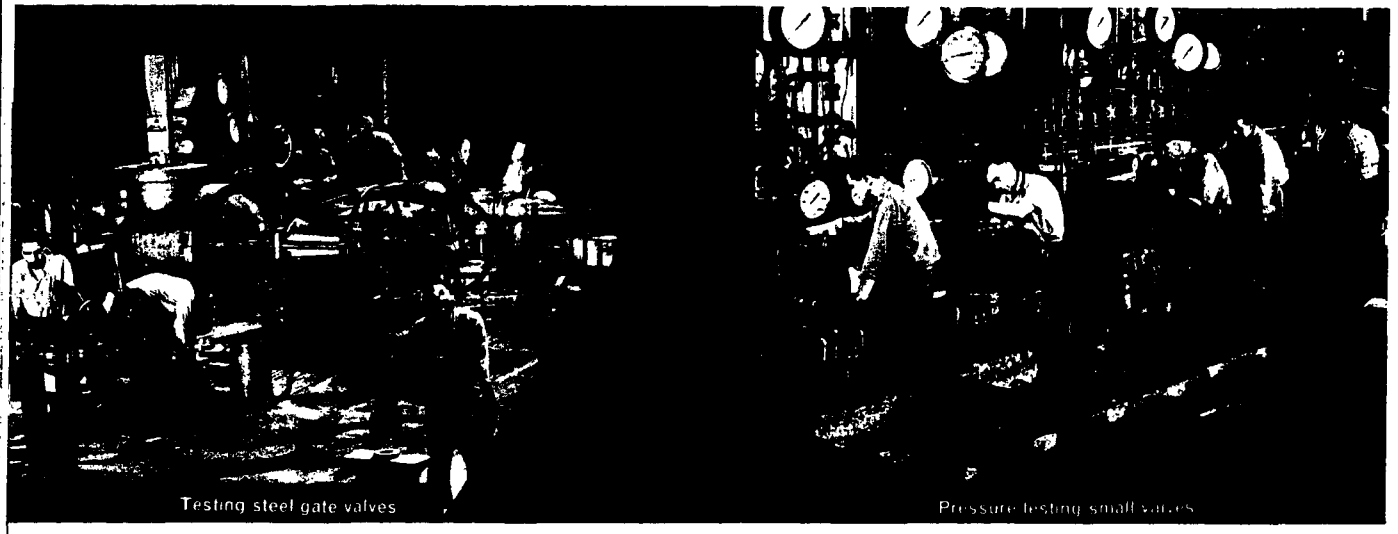
Skilled efficient Crane machine operators



Smooth operating valve assembly line

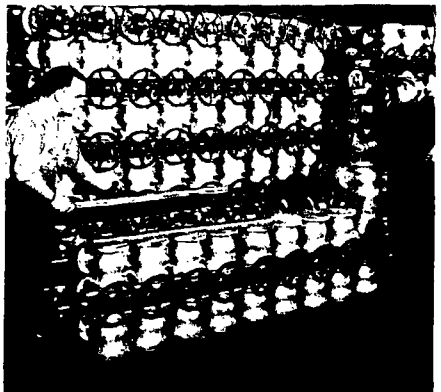
RIGID INSPECTION AND TESTING INSURE PRECISE QUALITY CONTROL

Quality control is absolute at Crane. By insisting on the most uncompromising methods of thorough inspection and rigorous testing, Crane guarantees product performance second to none. At Crane there is no substitute for quality, no short cut to insure it.



Testing steel gate valves

Pressure testing small valves



Distributors have complete stocks on hand



STREAMLINED PRODUCT DISTRIBUTION

Crane is steadily expanding its channels of product distribution through addition of vigorous, aggressive, independent distributors. Geared particularly to serve the industries in their local areas, these independent distributors can give you reliable recommendations for any of your valve applications.

Crane distributors across the country carry a sufficient supply of staple items to permit filling many orders from stock. Further assurance of fast action on your orders is the large factory inventory at both Crane Plants.

SECTION 1

Alphabetical Index

All items shown in this catalog are cross-indexed alphabetically. References under broad classifications are covered by page numbers showing the entire range of products. For example, under the very general heading of "Bronze Valves", group page numbers are shown for each of the various types, but under the specific heading of "Angle Valves, Bronze", etc., will be found a detailed listing of the many available types.

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Crane Bronzes

CRANE STEAM BRONZE — ASTM B 62

Crane Steam Bronze, widely used for valves, fittings, and other products, is recommended for temperatures up to 450 F. The metal is classified as "Leaded Red Brass" in ASTM B 119 (Standard Classification of Cast Copper-Base Alloys). It is commonly known as *Eighty-Five and Three Fives* (85-5-5-5).

Chemical Requirements		Minimum	Maximum
Copper	%	84.0	86.0
Tin	%	4.0	6.0
Lead	%	4.0	6.0
Zinc	%	4.0	6.0
Nickel	%		1.0
Tensile Requirements			
Tensile strength	psi	30,000	
Yield strength	psi	14,000	
Elongation in 2 inches	%	20	

CRANE SPECIAL BRONZE — ASTM B 61

Crane Special Bronze is a high grade alloy used in valves and other products recommended for the higher pressures and for temperatures up to 550 F. It is classified as "Leaded Tin Bronze" in ASTM B119 (Standard Classification of Cast Copper-Base Alloys).

Chemical Requirements		Minimum	Maximum
Copper	%	86.0	90.0
Tin	%	5.5	6.5
Lead	%	1.0	2.0
Zinc	%	3.0	5.0
Nickel	%		1.0
Tensile Requirements			
Tensile strength	psi	34,000	
Yield strength	psi	16,000	
Elongation in 2 inches	%	22	

CRANE NAVAL BRONZE ROD — ASTM B 21, Alloy B, Hard Temper

Crane Naval Bronze Rod is used for stem material and other valve parts which require unusually good bearing qualities and resistance to wear. These properties, plus the strength and corrosion resistance of copper-base alloys, make this material ideally suitable for stems.

Chemical Requirements		Minimum	Maximum
Copper	%	59.0	62.0
Tin	%	0.5	1.0
Lead	%	0.4	1.0
Iron	%		0.10
Zinc	%	(remainder)	
Elements other than above	%		0.10

Tensile Requirements		Minimum *1-inch diameter and less*	Minimum *Over 1-inch diameter to 2½-inch*
Tensile strength	psi	67,000	62,000
Yield strength	psi	45,000	37,000
Elongation in 2 inches	%	11	15

CRANE CAST SILICON BRONZE — ASTM B 198, Alloy 13B

Crane Cast Silicon Bronze has good strength and ductility and offers excellent resistance to corrosion. This metal is used as a valve trim material.

Chemical Requirements		Minimum	Maximum
Copper	%	78.0	84.5
Lead	%		0.5
Zinc	%	12.0	16.0
Silicon	%	3.0	5.0
Tensile Requirements			
Tensile strength	psi	60,000	
Yield strength	psi	24,000	
Elongation in 2 inches	%	16	

CRANE NO. 9 and NO. 11 CAST MANGANESE BRONZES — ASTM B 132, Alloys A and B

Crane No. 9 (Alloy A) and No. 11 (Alloy B) Cast Manganese Bronzes were developed in order to provide stem metals that would withstand the great torsional and tensile strains to which this valve part is subjected.

The unusually good bearing qualities of these metals offer excellent resistance to wear; this, combined with strength and the good corrosion resistance typical of copper-base alloys, has extended the use of Crane No. 9 and No. 11 Cast Manganese Bronzes to yoke sleeves and yoke bushings of iron and steel valves for a wide variety of services.

Crane No. 9 Cast Manganese Bronze has chemical and tensile requirements as follows:

Chemical Requirements		Minimum	Maximum
Copper	%	56.0	62.0
Lead	%	0.5	1.5
Tin	%		1.5
Manganese	%		1.5
Aluminum	%		1.5
Iron	%		2.0
Zinc	%	(remainder)	
Tensile Requirements			
Tensile strength	psi	60,000	
Yield strength	psi	20,000	
Elongation in 2 inches	%	15	

Crane No. 11 Cast Manganese Bronze has chemical and tensile requirements as follows:

Chemical Requirements		Minimum	Maximum
Copper	%	55.0	60.0
Lead	%	0.5	1.5
Tin	%		1.5
Manganese	%		3.5
Aluminum	%		3.0
Iron	%		3.0
Zinc	%	(remainder)	
Tensile Requirements			
Tensile strength	psi	80,000	
Yield strength	psi	32,000	
Elongation in 2 inches	%	15	

Crane Cast and Malleable Irons

CRANE CAST IRON, FERROSTEEL, and HIGH TENSILE STRENGTH IRON — ASTM A 126 Classes A, B, and C

Crane Cast Iron is regularly produced in three grades . . . Cast Iron, Ferrosteel, and High Tensile Strength Iron. These metals are recommended for temperatures up to 450 F.

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.

Cast Iron is used for valves having light metal sections, Ferrosteel is used for sections of medium metal thicknesses, and High Tensile Strength Iron is used for the heavier metal sections.

Crane Cast Iron
ASTM A 126, Class A

Chemical Requirements	Minimum	Maximum
Sulfur, %	...	0.12
Phosphorus, %	...	0.75
Tensile Requirements		
Tensile strength, psi	21,000	....
Transverse strength, pounds	2,200	....
Deflection at center, inches	0.10	....

Crane Ferrosteel
ASTM A 126, Class B

Chemical Requirements	Minimum	Maximum
Sulfur, %	...	0.12
Phosphorus, %	....	0.75
Tensile Requirements		
Tensile strength, psi	31,000	....
Transverse strength, pounds	3,300	....
Deflection at center, inches	0.12	....

Crane High Tensile Strength Iron
ASTM A 126, Class C

Chemical Requirements	Minimum	Maximum
Sulfur, %	...	0.12
Phosphorus, %	....	0.75
Alloying elements, %	....	2.0
Tensile Requirements		
Tensile strength, psi	41,000	...
Transverse strength, pounds	4,000	..
Deflection at center, inches	0.12	...

CRANE 3% NICKEL CAST IRON

Crane 3% Nickel Cast Iron has tensile requirements comparable to ASTM A 126, Class B, and is used for corrosive services where ordinary gray iron is not adequate. The metal is used in valves for the pulp, paper, and petroleum industries. All pressure-containing castings of this iron are identified with the symbol "3NI".

Chemical Requirements	Minimum	Maximum
Nickel, %	2.75	3.25
Sulfur, %	...	0.12
Phosphorus, %	..	0.40
Tensile Requirements		
Tensile strength, psi	31,000	
Transverse strength, pounds	3,300	
Deflection at center, inches	0.12	

CRANE NODULAR CAST IRON — ASTM A 395

Crane Nodular Cast Iron, also known as ductile or spheroidal iron, is cast iron with the graphite substantially in spherical shape and reasonably free of flake graphite. This results in a cast iron having high strength and good ductility. The corrosion resistance of nodular iron is approximately the same as that of gray iron. All pressure-containing castings of this iron are identified with the symbol "NCI".

Chemical Requirements	Minimum	Maximum
Total Carbon, %	3.0	...
Silicon, %	....	2.75
Phosphorus, %	....	0.08
Tensile Requirements		
Tensile strength, psi	60,000	....
Yield strength, psi	45,000	....
Elongation in 2 inches, %	15	....

NI-RESIST CAST IRON — Type II, Copper-Free

Ni-Resist Cast Iron is used where the physical properties of cast iron suffice but where greater resistance to corrosion is required. This copper-free alloy is generally selected for applications where copper contamination cannot be tolerated. All pressure-containing castings of this iron are identified with the symbol "NR2". *Ni-Resist* is the registered trade-mark of the International Nickel Company, Inc.

Chemical Requirements	Minimum	Maximum
Carbon, %	..	3.00
Manganese, %	1.00	1.50
Phosphorus, %	..	0.30
Sulfur, %	....	0.12
Silicon, %	1.00	2.80
Chromium, %	1.75	2.50
Nickel, %	18.00	22.00
Copper, %	..	0.50
Iron, %	(remainder)	
Tensile Requirements		
Tensile strength, psi	25,000	....

NI-RESIST NODULAR CAST IRON

Ni-Resist Nodular Cast Iron has excellent bearing qualities, high melting point, strength, ductility, and good resistance to atmospheric corrosion. It is especially suitable for use in yoke sleeves, yoke bushings, and similar applications. *Ni-Resist* is the registered trade-mark of the International Nickel Company, Inc.

CRANE MALLEABLE IRON — ASTM A 338

Crane Malleable Iron used in valves is characterized by pressure tightness, stiffness, and toughness, the latter property being an especially valuable one for piping materials subjected to expansion and contraction stresses and shock.

Tensile Requirements	Minimum
Tensile strength, psi	50,000
Yield point, psi	32,500
Elongation in 2 inches, %	10

Crane Nickel, Aluminum, and Chromium Alloys

CRANE NO. 49 CAST NICKEL ALLOY

Crane No. 49 Cast Nickel Alloy possesses excellent bearing qualities and corrosion resistance. With hardness up to 235 BHN, it withstands wear and erosion at steam temperatures up to 850 F unusually well.

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

Chemical Requirements		Minimum	Maximum
Nickel	%	52.00	56.00
Tin	%	10.50	13.00
Copper	%	30.50	34.00
Silicon	%		0.40
Manganese	%	0.30	0.75
Phosphorus	%	0.40	1.00
Iron	%	1.00	2.00
Tensile Requirements			
Tensile strength	psi	60,000	....

CRANE CAST ALUMINUM ALLOY

Crane Cast Aluminum Alloy is light in weight, has good corrosion resistance for many services, and its impact strength is retained at extremely low temperatures. All pressure-containing castings of this alloy are identified with the symbol "AL".

Chemical Requirements		Minimum	Maximum
Copper	%		0.25
Iron	%		0.6
Silicon	%	6.5	7.5
Manganese	%		0.35
Magnesium	%	0.20	0.40
Zinc	%		0.35
Titanium	%		0.25
Other elements — each	%		0.05
Other elements — total	%		0.15
Aluminum	%	(remainder)	
Tensile Requirements			
Tensile strength	psi	21,000	
Elongation in 2 inches	%	3.0	

Designation of Seating Metals

Catalog numbers of Crane Steel Valves have a letter suffix which indicates the material of the disc and body seat ring, as follows

"A"	Monel
"L"	18-8 SMo or Type 316 Stainless Steel
"U"	Stellite
"X"	Exelloy
"XR"	Exelloy to No. 49 Nickel Alloy
"XU"	Exelloy to Stellite
"XW"	Exelloy to 500 Brinell Stainless Steel

CAST MONEL

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

All pressure-containing castings of this alloy are identified with the symbol "NI-CU". *Monel* is the registered trade-mark of the International Nickel Company, Inc.

Chemical Requirements		Minimum	Maximum
Nickel	%	62.00	68.00
Copper	%	26.00	33.00
Iron	%		2.50
Manganese	%		1.50
Aluminum	%		0.50
Silicon	%		2.00
Carbon	%		0.35
Tensile Requirements			
Tensile strength	psi	65,000	....
Yield strength	psi	32,500	....
Elongation in 2 inches	%	25	....

HASTELLOY* ALLOY C

Hastelloy Alloy C is a nickel-molybdenum-chromium-iron alloy. Its tensile strength and hardness are comparable to that of alloy steel. It withstands strong oxidizing conditions such as those encountered with free chlorine and aqueous solutions containing chlorine. All parts made of this alloy are identified with the symbol "HC".

CRANE STELLITE* TRIM

Stellite, a cobalt-chromium-tungsten alloy, is a hard facing material deposited on steel discs or body rings of high pressure-temperature steel valves. It is known as **U** trim.

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.

**Hastelloy and Stellite are registered trade-marks of the Union Carbide Corporation*

Crane Siliconized Steel

(Crane Patent No. 2,897,093)

Crane Siliconized Steel is resistant to wear and corrosion, and has good bearing qualities. A typical application of this material is its use for packing glands in some iron and steel valves. The surface of Siliconized Steel is impregnated with silicon (approximately 14% Si).

Crane Exelloy

ASTM A 182, Grade F6, and AISI Type 410

Crane Exelloy is a specially processed corrosion and heat resisting AISI Type 410 chromium steel. It is heat-treated to various hardness ranges depending upon its application for use in a valve part.

As a stem material, it is heat-treated to obtain high strength and good wearing properties. It also possesses good resistance to corrosion by atmosphere; and by steam, gas, air, oil and hot oil vapors.

As a seating material, it is heat-treated to secure greater hardness depending upon the valve part, the hardness of some parts being in excess of 350 BHN. With this high hardness . . . which effectively resists scratching, scoring, or indentation by hard particles . . . is combined adequate strength and ductility, and excellent resistance to wear, seizure, galling, erosion, oxidation, and corrosion.

Crane Exelloy has been more universally suitable for valve seats in oil service than any other material. Crane Exelloy used in steel valves is known as **X** trim. All parts made of Exelloy are marked with the symbol "**X**".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.12
Manganese	%		1.00
Phosphorus	%		0.040
Sulfur	%		0.030
Silicon	%		1.00
Nickel	%		0.50
Chromium	%	11.5	13.5
Tensile Requirements (for Stem Material)			
Tensile strength	psi	100,000	
Yield point	psi	80,000	
Elongation in 2 inches	%	20	
Reduction of area	%	60	
Brinell hardness number		225	255

Crane Hardened Stainless Steel

"500 Brinell"

AISI Type 420

Crane "500 Brinell" Stainless Steel is heat-treated to an unusually high hardness for services where foreign materials in the fluids handled could have adverse effects on the seating surfaces. Because of high hardness through heat treatment, this material is used for seats and discs in plug type bronze and iron globe and angle valves, and also for discs in small steel globe and angle valves. It possesses corrosion resistance comparable to that of Crane Exelloy.

Chemical Requirements		Minimum	Maximum
Carbon	%	0.20	0.24
Manganese	%		0.75
Phosphorus	%		0.03
Sulfur	%		0.03
Silicon	%		0.50
Nickel	%		0.50
Chromium	%	12.00	14.00

Crane Stainless Steels

CRANE 18-8 S ALLOY CAST STEEL — **ASTM A 296 and A 351 Grade CF-8**

Crane 18-8 S, an austenitic stainless steel, has excellent corrosion resistance to many fluids and is especially suitable for use on some nitric acid services. Castings are heat-treated for maximum corrosion resistance. It is comparable in composition to AISI Type 304 wrought stainless steel. All pressure-containing castings are marked "18-8 S".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.08
Manganese	%		1.50
Phosphorus	%		0.040
Sulfur	%		0.040
Silicon	%		2.00
Chromium	%	18.0	21.0
Nickel	%	8.0	11.0
Tensile Requirements			
Tensile strength	psi	70,000	
Yield point	psi	28,000	
Elongation in 2 inches	%	35	

CRANE 18-8 SMo ALLOY CAST STEEL — **ASTM A 296 and A 351 Grade CF-8M**

Crane 18-8 SMo is an austenitic stainless steel containing molybdenum which imparts greater resistance to pitting type of corrosion and higher resistance to general corrosion than the 18-8 S type. Castings are heat-treated for maximum corrosion resistance. This metal is comparable in composition to AISI Type 316 wrought stainless steel. All pressure-containing castings are marked "18-8 SMo".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.08
Manganese	%		1.50
Phosphorus	%		0.040
Sulfur	%		0.040
Silicon	%		1.50
Chromium	%	18.0	21.0
Nickel	%	9.0	12.0
Molybdenum	%	2.0	3.0
Tensile Requirements			
Tensile strength	psi	70,000	
Yield point	psi	30,000	
Elongation in 2 inches	%	30	

CRANELOY 20 ALLOY CAST STEEL

Craneloy 20, developed primarily for sulfuric acid service, has good corrosion resistance over a wide range of concentrations. Its use is being expanded into other services both under oxidizing and reducing conditions where its corrosion resistance is superior to that of austenitic steels. Castings are heat-treated for maximum corrosion resistance. All pressure-containing castings are marked "C 20".

In the absence of standard requirements for alloy of this type, the Crane properties for this material are established as follows:

Chemical Requirements		Minimum	Maximum
Carbon	%		0.07
Silicon	%	1.00	
Chromium	%	19.00	
Nickel	%	28.00	
Copper	%	3.50	
Molybdenum	%	2.00	
Tensile Requirements			
Tensile strength	psi	65,000	
Yield point	psi	30,000	
Elongation in 2 inches	%	35	

Crane Cast Steels

GENERAL

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

To provide for the widely varied services to which steel valves and fittings are subjected, Crane regularly produces a number of different types of quality cast steels. The tensile requirements listed are the minima required by standard specifications, whenever they are applicable.

All steel castings are heat-treated, proper to their design and composition, to obtain the optimum properties for the service for which they are recommended. All pressure-containing castings are marked with the standard ASTM symbol to indicate the type of steel from which they are made.

CRANE CARBON CAST STEEL — ASTM A 216 Grade WCB

Crane Carbon Cast Steel is suitable for use on saturated or superheated steam, cold or hot water, cold or hot non-corrosive oil, gas, air, and other fluids. It has a carbon content not exceeding 0.30 per cent, which assures good welding qualities.

All pressure-containing castings of this steel are identified with the ASTM symbol "WCB".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.30
Manganese	%		1.00
Phosphorus	%		0.05
Sulfur	%		0.06
Silicon	%		0.60
Tensile Requirements			
Tensile strength	psi	70,000	
Yield point	psi	36,000	
Elongation in 2 inches	%	22	
Reduction of area	%	35	

CRANE NO. 4 CARBON-MOLYBDENUM ALLOY CAST STEEL — ASTM A 217 Grade WC1

Crane No. 4 Carbon-Molybdenum Alloy Cast Steel has high temperature properties which make it suitable for service conditions that fall between those for carbon steel and chromium-molybdenum steel. The demand for this metal is diminishing and it is generally being replaced by Crane No. 7, a much superior and more highly alloyed steel.

All pressure-containing castings of this steel are identified with the ASTM symbol "WC1".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.25
Manganese	%	0.50	0.80
Phosphorus	%		0.05
Sulfur	%		0.06
Silicon	%		0.60
Molybdenum	%	0.45	0.65
Tensile Requirements			
Tensile strength	psi	65,000	
Yield point	psi	35,000	
Elongation in 2 inches	%	24	
Reduction of area	%	35	

CRANE NO. 7 CHROMIUM-MOLYBDENUM ALLOY CAST STEEL — ASTM A 217 Grade WC6

Crane No. 7 Chromium-Molybdenum Alloy Cast Steel was introduced when it became apparent that steels need a substantial chromium content to stabilize them against graphitization under the operating conditions of welded power piping systems.

For the purposes of welded piping systems, Crane No. 7 Steel has been found highly satisfactory for its weldability and, when operating at high temperatures, for its stability and high strength. The use of 1.00 to 1.50 per cent chromium and of 0.45 to 0.65 per cent molybdenum as the principal alloying elements establishes the stability of the steel against graphitization and, at the same time, assures excellent strength retention at elevated temperatures. Combined with these qualities is ready weldability, not usually associated with chromium-bearing steels, but made possible by the low carbon content comparable to that of the pipe.

Crane No. 7 Steel is regularly used in Crane Pressure-Seal Bonnet Valves and Lip-Seal Bonnet Valves. All pressure-containing castings are identified with the ASTM symbol "WC6".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.20
Manganese	%	0.50	0.80
Phosphorus	%		0.05
Sulfur	%		0.06
Silicon	%		0.60
Chromium	%	1.00	1.50
Molybdenum	%	0.45	0.65
Tensile Requirements			
Tensile strength	psi	70,000	
Yield point	psi	40,000	
Elongation in 2 inches	%	20	
Reduction of area	%	35	

CRANE NO. 9 CHROMIUM-MOLYBDENUM ALLOY CAST STEEL — ASTM A 217 Grade WC9

Crane No. 9 Chromium-Molybdenum Alloy Cast Steel was developed for high temperature service, where it possesses strength and creep resistance somewhat greater than Crane No. 7 Steel. It is a weldable steel recommended for the extreme temperature conditions encountered in modern power plants and refineries.

All pressure-containing castings of this steel are identified with the ASTM symbol "WC9".

Chemical Requirements		Minimum	Maximum
Carbon	%		0.18
Manganese	%	0.40	0.70
Phosphorus	%		0.05
Sulfur	%		0.06
Silicon	%		0.60
Chromium	%	2.00	2.75
Molybdenum	%	0.90	1.20
Tensile Requirements			
Tensile strength	psi	70,000	
Yield point	psi	40,000	
Elongation in 2 inches	%	20	
Reduction of area	%	35	

Crane Cast Steels

CRANE NO. 5 CHROMIUM-MOLYBDENUM ALLOY CAST STEEL

ASTM A 217 Grade C5

Crane No. 5 Chromium-Molybdenum Alloy Cast Steel is unusually strong at normal temperatures and, at high temperatures, possesses exceptional strength and offers excellent resistance to creep, erosion, and scaling.

Crane No. 5 Steel is ideal for severe service, particularly in high temperature oil refinery service where corrosion resistance is essential. Since heat-treatment after welding is desirable, this steel is best adapted to products having flanged or threaded ends. All pressure-containing castings are identified with the ASTM symbol "C5".

Chemical Requirements	Minimum	Maximum
Carbon, %	...	0.20
Manganese, %	0.40	0.70
Phosphorus, %	....	0.05
Sulfur, %	....	0.06
Silicon, %	....	0.75
Chromium, %	4.00	6.50
Molybdenum, %	0.45	0.65
Tensile Requirements		
Tensile strength, psi	90,000	....
Yield point, psi	60,000	....
Elongation in 2 inches, %	18	....
Reduction of area, %	35	....

CRANE NO. 15 ALLOY CAST STEEL

Crane No. 15 Alloy Cast Steel possesses high strength and is recommended particularly for normal atmospheric temperature service where the high strength is required. Castings are used for discs in steel pipe-line gate valves.

Chemical Requirements	Minimum	Maximum
Carbon, %	0.30	0.40
Manganese, %	...	1.00
Phosphorus, %	...	0.05
Sulfur, %	....	0.06
Silicon, %	....	0.60
Chromium, % } Nickel, % } Molybdenum, % }	....	1.75
Tensile Requirements		
Tensile strength, psi	90,000	....
Yield point, psi	60,000	....
Elongation in 2 inches, %	18	....
Reduction of area, %	35	....

CRANE CARBON CAST STEEL For Low Temperature Service

ASTM A 352 Grade LCB

Crane Carbon Cast Steel can be heat-treated to retain impact resistance at temperatures as low as minus 50 F. All pressure-containing castings that are heat-treated are identified with the ASTM symbol "LCB". Chemical requirements are the same as those for regular Carbon Cast Steel (ASTM A 216; see facing page).

Tensile Requirements	Minimum
Tensile strength, psi	65,000
Yield point, psi	35,000
Elongation in 2 inches, %	24
Reduction of area, %	35
Impact Strength	
Charpy keyhole notch at −50 F, foot pounds	15

CRANE CARBON-MOLYBDENUM ALLOY CAST STEEL For Low Temperature Service

ASTM A 352 Grade LC1

2

Crane Carbon-Molybdenum Alloy Cast Steel can be heat-treated to retain its toughness at temperatures as low as minus 75 F. All pressure-containing castings that are heat-treated are identified with the ASTM symbol "LC1". Impact strength (Charpy keyhole notch at minus 75 F) is 15 foot pounds minimum. Chemical and tensile requirements are the same as those for Crane No. 4 Carbon-Molybdenum Cast Steel; see facing page.

CRANE NO. 3 NICKEL ALLOY CAST STEEL

ASTM A 352 Grade LC2

Crane No. 3 Nickel Alloy Cast Steel provides excellent tensile and impact strength at sub-zero temperatures and is especially recommended for use at temperatures down to minus 100 F. All pressure-containing castings are identified with the ASTM symbol "LC2" and the test temperature.

Chemical Requirements	Minimum	Maximum
Carbon, %	....	0.25
Manganese, %	0.50	0.80
Phosphorus, %	....	0.050
Sulfur, %	....	0.050
Silicon, %	....	0.60
Nickel, %	2.0	3.0
Tensile Requirements		
Tensile strength, psi	65,000	....
Yield point, psi	40,000	....
Elongation in 2 inches, %	24	....
Reduction of area, %	35	....
Impact Strength		
Charpy keyhole notch at −100 F, foot pounds	15	....

CRANE "ARCTIC" NICKEL ALLOY CAST STEEL

ASTM A 352 Grade LC3

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

All pressure-containing castings are identified with the ASTM symbol "LC3" and the test temperature. The trademark "ARCTIC" is registered in the U.S. Patent Office.

Chemical Requirements	Minimum	Maximum
Carbon, %	....	0.15
Manganese, %	0.50	0.80
Phosphorus, %	....	0.050
Sulfur, %	....	0.050
Silicon, %	....	0.60
Nickel, %	3.0	4.0
Tensile Requirements		
Tensile strength, psi	65,000	....
Yield point, psi	40,000	....
Elongation in 2 inches, %	24	....
Reduction of area, %	35	....
Impact Strength		
Charpy keyhole notch at −150 F, foot pounds	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 chemical composition and physical properties of the forged and cast steels are not exactly the same, in general characteristics and ultimate utility, the forged material is the full equivalent of the cast. Steel forgings are carefully heat-treated to develop the optimum properties for the services for which they are recommended.

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 metals 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 STEELS

ASTM A 105, Grade II
ASTM A 234, Grade B

Crane Carbon Forged Steels, like the cast material, are ideally suited for a multitude of services that are beyond the scope of bronze or iron.

Crane forged steel products such as valve bodies and bonnets, flanges of the 400-pound pressure class and higher, and fittings are heat-treated to meet the requirements of ASTM A 105, Grade II and ASTM A 234, Grade B.

Chemical Requirements	Minimum	Maximum
Carbon, %	0.22	0.35
Manganese, %	....	0.90
Phosphorus, %	....	0.04
Sulfur, %	....	0.05
Silicon, %	0.15	0.30
Tensile Requirements		
Tensile strength, psi	70,000	...
Yield point, psi	36,000	....
Elongation in 2 inches, %	22	
Reduction of area, %	30	...

ASTM A 181, Grade II

Crane forged steel products which are not regularly heat-treated, such as 150 and 300-pound flanges, are made of steel conforming to ASTM A 181, Grade II. This steel meets the same chemical and tensile requirements as the carbon steels described above except that elongation in 2 inches is 18 per cent and reduction of area is 24 per cent.

CRANE NO. 7 CHROMIUM-MOLYBDENUM ALLOY FORGED STEEL

ASTM A 182
Grade F11

Crane No. 7 Chromium-Molybdenum Alloy Forged Steel, like the cast material, combines ready weldability with excellent strength retention and is not subject to graphitization at elevated temperatures. All pressure-containing forgings of this steel are identified with the ASTM symbol "F11".

Chemical Requirements	Minimum	Maximum
Carbon, %	0.10	0.20
Manganese, %	0.30	0.80
Phosphorus, %	...	0.040
Sulfur, %	.	0.040
Silicon, %	0.50	1.00
Chromium, %	1.00	1.50
Molybdenum, %	0.45	0.65
Tensile Requirements		
Tensile strength, psi	70,000	
Yield point, psi	40,000	
Elongation in 2 inches, %	20	
Reduction of area, %	30	

CRANE NO. 9 CHROMIUM-MOLYBDENUM ALLOY FORGED STEEL

ASTM A 182
Grade F22

Crane No. 9 Chromium-Molybdenum Alloy Forged Steel possesses somewhat greater strength and creep resistance than Crane No. 7 Steel.

Crane No. 9 is a weldable steel developed for the extreme temperature conditions encountered in modern power plants and refineries.

All pressure-containing forgings of this steel are identified with the ASTM symbol "F22".

Chemical Requirements	Minimum	Maximum
Carbon, %	...	0.15
Manganese, %	0.30	0.60
Phosphorus, %	....	0.040
Sulfur, %	...	0.040
Silicon, %		0.50
Chromium, %	2.00	2.50
Molybdenum, %	0.90	1.10
Tensile Requirements		
Tensile strength, psi	70,000	
Yield point, psi	40,000	
Elongation in 2 inches, %	20	
Reduction of area, %	30	...

CRANE NO. 5 CHROMIUM-MOLYBDENUM ALLOY FORGED STEEL

ASTM A 182
Grade F5a

Crane No. 5 Chromium-Molybdenum Forged Steel like the cast material, offers unusually high retention of strength and creep resistance plus excellent resistance to erosion and scaling at high temperatures.

It is ideal for severe service, particularly in high temperature oil refinery service where corrosion resistance is essential.

All pressure-containing forgings of this steel are identified with the ASTM symbol "F5a".

Chemical Requirements	Minimum	Maximum
Carbon, %	...	0.25
Manganese, %	.	0.60
Phosphorus, %		0.040
Sulfur, %		0.030
Silicon, %		0.50
Nickel, %		0.50
Chromium, %	4.0	6.0
Molybdenum, %	0.45	0.65
Tensile Requirements		
Tensile strength, psi	90,000	....
Yield point, psi	65,000	...
Elongation in 2 inches, %	22	...
Reduction of area, %	50	....

Crane Bolting Materials

In the manufacture of Crane Valves and in bolting flanged valves, fittings, and flanges together to form a complete piping system, the following bolting materials are regularly used:

Machine Bolts, Studs, Stud Bolts, and Nuts

Bolts for temperatures up to 500 F are made from steel complying with ASTM Specification A 307, Grade B.

This steel has a minimum tensile strength of 55,000 pounds per square inch.

Nuts regularly used with machine bolts are hot pressed steel conforming to ASTM Specification A 307.

Studs and stud bolts for temperatures up to 500 F, used primarily for high pressure hydraulic service, are made from cold rolled steel complying with ASTM Specification A 108, Open Hearth free-cutting grade.

Nuts regularly used with cold rolled steel studs and stud bolts are cold formed steel conforming to ASTM Specification A 307.

Alloy Steel Studs and Stud Bolts

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

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

Crane Triplex Steel is a chromium-molybdenum alloy of marked stability. It retains its strength unusually well at elevated temperatures and offers better resistance to creep than most high grade alloy steel bolting materials. Special heat-treatment, by quenching and drawing, produces a dense, uniform, and fine grain with superior physical properties.

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

This steel is regularly used in the bonnet bolting of Crane bolted bonnet carbon steel valves and all Pressure-Seal Bonnet valves

Crane Triplex Steel substantially exceeds minimum requirements of ASTM Specification A 193, Grade B7.

Physical Properties	ASTM Minimum	Crane Triplex average	Crane Templex average
Tensile strength.....psi	125,000	134,000	145,000
Yield point.....psi	105,000	116,000	118,000
Elongation in 2 inches . . per cent	16	20	20
Reduction of area . . . per cent	50	57	57
Brinell hardness number. . range	260-320	270-300	285-320

Crane Templex Steel is a chromium-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.

The exacting heat-treatment developed by Crane Laboratories is the secret of the superiority of Crane Templex Steel. 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—this resistance is much greater than offered in other bolting steels on the market today.

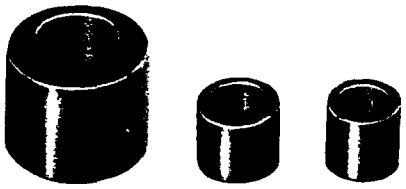
This steel, ideal for exceptionally high temperatures, is regularly used in the bonnet bolting of Crane "U" trimmed bolted bonnet alloy steel valves.

Crane Templex Steel substantially exceeds minimum requirements of ASTM Specification A 193, Grade B14.

Nuts for Alloy Steel Studs and Stud Bolts

Crane Triplex and Templex Steel studs and stud bolts use hot forged, medium carbon steel, oil-quenched nuts conforming to ASTM Specification A 194, Grade 2H. Having a Brinell hardness number of 250 minimum, the nuts are capable of developing the full strength of the stud.

Crane Valve Packings



Packing for Small Size
Bronze and Iron Body Valves

The homogenous type of endless molded ring packing is used in small size bronze and iron body valves. They are made in various shapes to fit each size stuffing box.



Packing for Large Size
Bronze and Iron Body Valves

The large size bronze and iron body valves use a plastic core packing similar to the type used in the smaller size valves, but with an asbestos jacket and a corrosion inhibitor added.



Packing for Steel Valves

Steel valves for use in high pressure, high temperature service require an extremely tough, yet pliable, construction. Crane valves use plastic cores encased in a jacket of Inconel wire and yarn. The cutaway of a straight section of the packing shows how the Inconel wire supports the core.



Packing for Valves
For Corrosive Services

Teflon, a proven material in corrosive services, is used in Crane stainless steel valves and in valves for chlorine service.

Just as there are many types of valves designed for specific purposes, so there are many types of valve packings to handle various liquids and gases. However, since the common lines of valves can be divided into three general classes . . . . and since these three classes handle the bulk of service conditions encountered today . . . . Crane, by careful selection of packing, particularly in regard to quality and adaptability in the intended service, has been able to standardize on relatively few types. These packing types are used in the following valves.

1. Bronze and iron body valves for moderate pressures and for temperatures up to 550 F.
2. Steel valves for high pressure service at temperatures up to 1200 F.
3. Corrosion-resistant valves and valves with special trim for chemical and corrosive services.

Packings for Bronze and Iron Body Valves

Crane bronze and iron body valves in the smaller sizes (usually 2-inch and smaller) use packing made of endless molded rings; larger sizes have plastic cores encased in woven asbestos. The packings are suitable for steam, water, oil, gas, liquefied petroleum gases, gasoline, and air. Although the packings generally are suitable for temperatures up to 550 F, the pressure-temperature ratings specified for the individual valves apply. All rings are accurately die-formed to fit into stuffing boxes with minimum effort.

Endless molded rings (illustrated at upper left) are formed from a homogenous mass consisting principally of asbestos filler, graphite, and binder. The fiber length is carefully determined and the percentage of asbestos and graphite accurately apportioned to maintain deformable qualities in each ring.

Core packing (see second illustration at left) consists of a plastic core encased in an asbestos jacket. The core material is essentially the same as that used in the molded ring packing; the length of asbestos fiber is carefully determined, and a corrosion inhibitor is added. Jackets are generally comprised of a commercial grade yarn or braid. After the braid is applied to the core, the packing is drawn through a light binder and graphite to provide adequate external lubrication. The rings are the split-type so that they are easily slipped on the stem. The diagonally cut ends provide a bevel joint for good sealing when the gland is pulled up.

Packing for Steel Valves

Steel valves intended for high pressure-temperature service demand the utmost in well-constructed packing. In Crane valves, the core materials are asbestos and graphite with a minimum of binder which will not harden in service. The cores are soft enough so that the packing, under fluid and gland pressure, will conform to the shape of the stuffing box with no detrimental effect. Suitable agents are included to inhibit stem corrosion.

Jackets, made by using Inconel wire inserts in each strand of triple-A asbestos yarn (see third illustration), support the cores and provide the strength needed to withstand high pressure and temperature

Packing for Valves for Corrosive Service

Valves used in chemical and corrosive services present the greatest packing problems. Teflon (DuPont tetrafluoroethylene), when used within its temperature range, has proven very effective against almost all chemicals, liquids, and gases. Because of the flexibility and general efficiency offered by the "V" ring construction (see bottom illustration), Teflon "V" Rings of that design have been selected for regular use in Crane 18-8 SMo and Craneloy 20 stainless steel valves for corrosive services and in steel valves for chlorine service.

Crane Sheet Packings and Gaskets

C.C. Rubber Sheet Packing

C.C. Rubber Sheet Packing is a high grade rubber composition packing compounded to a special formula and manufactured solely for Crane. It is exceptionally tough, durable, and resilient. Frequent, careful tests throughout the manufacturing process assure high, uniform quality.

This packing is recommended for all pressures in services such as saturated steam, hot and cold water, air, and gas.

C.C. Rubber is available in rolled sheets (page 320) or in finished cut gasket shapes (pages 321 and 322).

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, oil, acids, alkalies, etc. It is used for temperatures up to 750 F.

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

Cranite is available in flat sheets (page 320), in finished cut gasket shapes (pages 321 to 323), or for tongue and groove flange unions (page 292).

Spiral Wound Gaskets

Spiral wound gaskets consist of plies of preformed metal with asbestos or some other material as the filler strip. Corrugations in the continuous metal strip impart tension and resiliency when the gasket is under compression; the edges of the strip create multiple barriers against leakage; the soft filler strip seals minute imperfections in the flange faces.

The gaskets are self-adjusting to compensate for shock, vibration, and temperature change. They are recommended for use against steam, oil, gases, and liquids including most chemicals, in high pressure, high temperature installations.

Compressibility is made to vary by changing the number of plies to accommodate the pressure requirements and bolt load, it is therefore necessary, when ordering, to specify the nominal pipe size, ASA pressure class, and type of facing.

Styles are available for application to all pressure classes and to all types of end flanges. For large male to male face product, supplemental centering rings or guides may be obtained to position the gasket in relation to the bolts; these contain markings to indicate the nominal pipe size, the ASA pressure rating, the metal, and the manufacturer.

Teflon Gaskets

Teflon flat ring gaskets (or Cranite full face gaskets: see adjacent column) are recommended for use with 18-8 and Craneloy 20 stainless steel end flanges. Solid Teflon (Du Pont tetrafluoroethylene resin) is tough and is particularly characterized by chemical inertness, making it ideal for such use. In fact, these qualities have led to the regular use of Teflon for bonnet gaskets in Crane corrosion-resistant valves.

Normally, for end flange use, gasket dimensions conforming to ASA B16.21 are satisfactory. If crevice corrosion is a factor in handling a particular solution, consideration should be given to a change in the inside diameter.

Corrugated Metallic Gaskets

Corrugated metallic gaskets must have proper strength, ductility, and toughness. They are recommended for service where temperatures exceed 750 F and are generally made of copper or soft iron.

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. For dimensional information, see page 323

Rings for Ring Joints

Ring joints can be utilized as connections for all pressure classes of Crane steel valves and flanges They are particularly recommended for high pressure hydraulic installations and for high pressure-temperature steam and hot oil lines.

Ring joints require the use of a metal ring which seats in a specially prepared groove in each flange face, thus sealing the joint. The rings are generally made of soft steel or of 4 to 6 per cent chromium steel with ½ per cent molybdenum. Oval and octagonal shapes are available. For ring joint dimensions, see pages 334 and 335.

Composition Discs

The dependability of the Crane line of renewable type composition discs for use in globe, angle, and check valves is the result of years of constant research. Crane composition discs are made from high quality materials . . . . compounded, cured, and tested for specific services such as steam, hot and cold water, oil, air, gases, including liquid petroleum gases, and gasoline services. Users are urged to choose the type and material best suited to the service requirements. For complete details and recommendations, see page 281.

Identification of Crane Products



Bronze and cast iron valves are marked with the size, the name "CRANE", and the basic working pressure (steam). Some valve markings will include the cold rating.



Ferrosteel, High Tensile, and alloy iron valves include a material symbol marking. In this case, the metal is Ferrosteel (FS) and the valve bears both the steam (S) and the non-shock cold water, oil, and gas (WOG) rating.



Typical marking for a carbon cast steel valve. Forged steel valves will include the marking "FORGED STEEL."



Alloy cast steel valves include a material symbol marking; in this case "C5" for ASTM A217, Grade C5 steel (Crane No. 5 Cast Steel).



Alloy forged steel valves also include a material symbol marking; in this case, "F5a" for ASTM A182, Grade F5a steel (Crane No. 5 Forged Steel).



Stainless steel valves have a material symbol marking such as 18-8 SMo, C-20 (Craneloy 20), etc.

MSS STANDARD

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

GENERAL

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

In addition, valves made in accordance with the specifications adopted by the American Association of Railroads are marked "AAR" or "ARA" . . . . valves listed by the Underwriters' Laboratories, Inc., are marked "CU" or "UL" . . . . and valves listed by the Factory Mutual Laboratories are marked "FM".

MATERIAL

Bronze products, readily distinguished by the color, bear no material marking.

Cast iron products conforming to ASTM A126, Class A, bear no material marking. Crane Ferrosteel, High Tensile Strength Iron, and alloy irons are marked with appropriate material symbols; see table on facing page. Malleable iron products bear the marking "MI" or "MALL".

Corrosion-resistant alloy products such as 18-8 SMo, Craneloy 20, etc., are marked with appropriate material symbols; see table on facing page.

Steel products are marked "STEEL" (for cast steel) or "FORGED STEEL". Alloy steels are further identified by appropriate material symbols; see table on facing page. Alloy steel castings for pressure-containing parts also have the heat number stamped on a raised pad which is an integral part of the casting.

SERVICE PRESSURE RATINGS

Nearly all Crane products are designated by the general or primary pressure class such as "25-Pound", "100-Pound", "125-Pound", etc. These should not be construed as a recommendation for use of the product at those pressures. The designations are descriptive of a general product class 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 service pressure.

Recommended pressure ratings for Crane products are included on the catalog page or pages pertaining to those products and, practically all products except gas stops are marked with the recommended basic working pressure.

If the product is marked with numerals not followed by a letter suffix, the marking denotes the basic steam pressure rating at the maximum temperature indicated on the page describing the product. If the marking consists of numerals followed by the letters G, L, O, S, or W, either individually or collectively, it denotes the gas, liquid, oil, steam, or water service pressure rating, respectively, at the maximum temperature indicated on the page describing the product.

Valves with leather or composition faced discs are exceptions to the foregoing. These valves use bodies which are regularly marked with a basic steam rating . . . . but the valves should be used only for services for which the type of disc facing is recommended.

Test pressure markings, where used, are followed by the word "TEST".

Identification of Crane Valve Trims

Trim Material	Crane Designation For Material	Catalog No. Suffix (when used)	Marking on Identification Plate
Bronze	Bronze	H	B
Buna N (Synthetic Rubber)	Buna N	SB	. . .
Carbon Steel	Carbon Steel	. . .	CS
Cobalt-Chromium-Tungsten	Stellite	U	HF
Composition (Disc)	Composition	C	No. of Disc
Integral Seats (Steel)	Integral Seats	. . .	INT
Kel-F	Kel-F	KF	. . .
Monel	Monel	A	NICU
Neoprene	Neoprene	. .	. . .
Nickel Copper Alloy	No. 49 Nickel Alloy	R	NICU
Rubber (Natural)	Natural Rubber	RN	. . .
Surface Hardened Steel	"500 Brinell"	W	CR13H
Teflon	Teflon	TF	Teflon
13% Chromium Steel	Exelloy	X	CR13
18-8 Steel with Molybdenum	18-8 SMo (AISI Type 316)	L	18-8 SMo

The Catalog No. suffix for steel valves having a disc and seat of different materials is a combination of letters, such as "XU" for Exelloy to Stellite.

Identification of Crane Products

IDENTIFICATION PLATES

For further product identification, body markings may be supplemented by identification plates, as shown at the right. The plates, depending on type and size of product, are mounted in the most practicable position . . . under the wheel nut, on the yoke, etc.

Bronze valves except checks, and all iron, Ferrosteel, and High Tensile Iron valves including checks, have plates bearing the valve catalog number and the number of the composition disc if so equipped. Bronze checks have no plates and are generally identifiable by body markings or by comparison with catalog illustrations. Check valves having a composition disc, in most cases, have the disc number stamped on the valve cap.

Steel valves and bronze specialties have plates bearing some or all of the following data: catalog number and size . . . material of body, disc, stem, and seat (trim) . . . fluid recommendation . . . and the pressure-temperature rating.

Symbols for trim materials are shown in the table on the facing page.

IMPORTANCE OF PROPER IDENTIFICATION FOR ORDERING OF PARTS, FOR INQUIRIES, ETC.

Proper identification of Crane products in service . . . for ordering of replacement parts, to replace an old valve, for inquiries concerning operation, etc. . . . is extremely important. To expedite handling of such matters, it is imperative that the customer furnish all pertinent data.

Generally, for bronze and iron valves, the catalog number and size will suffice; if these are not available, specify the complete body markings, type of valve, and the size of the pipe line.

In the case of steel valves, specify the catalog number and size, or the assembly part number; if these are not available, furnish all body markings and all information shown on the identification plate.

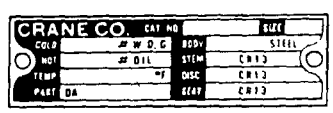
When valves have a composition disc, be sure to include the number of the disc or the service. In all cases where records permit, furnish the approximate purchase date of the product under consideration.



Bronze valves, except checks, have a plate bearing the catalog number of the valve.



Iron valves, including valves made of Crane Ferrosteel and High Tensile Iron, have a plate bearing the catalog number of the valve.



Steel valves have a plate bearing the catalog number, size, rating and fluid, and in some cases, the body, stem, disc, and seat or seat facing material.

Material Symbol Markings on Crane Pressure-Containing Iron and Steel Castings or Forgings

Classification of Material		ASTM Material Designation: Specification	ASTM Material Designation: Class or Grade	AISI Material Type (*)	Crane Material Designation	Symbol on Casting or Forging	For description of material, see:
Cast Irons		A 126	A	. .	Cast Iron	. .	page 3
		A 126	B	. .	Ferrosteel	FS	
		A 126	C	. .	High Tensile Iron	HT	
Alloy Cast Irons		. .	. . .	. .	3% Nickel Cast Iron	3NI	page 3
		. .	. . .	. .	Nodular Cast Iron	NCI	
		. .	. . .	. .	Ni-Resist Cast Iron	NR2	
Malleable Iron		A 338		. .	Malleable Iron	M1 or MALL	page 3
Cast Steels	Carbon	A 216	WCB	. . .	Carbon Cast Steel	.	pages 6 and 7
	Carbon-Molybdenum	A 217	WC1	. . .	No. 4 Cast Steel	WC1	
	1¼% Chromium — ½% Moly.	A 217	WC6	. . .	No. 7 Cast Steel	WC6	
	2¼% Chromium — 1% Moly.	A 217	WC9	. . .	No. 9 Cast Steel	WC9	
	5% Chromium — ½% Moly.	A 217	C5	. .	No. 5 Cast Steel	C5	
Low Temperature Cast Steels	Carbon	A 352	LCB	. .	"LCB" Cast Steel	. . .	page 7
	Carbon-Molybdenum	A 352	LC1	. . .	"LC1" Cast Steel	LC1	
	2½% Nickel Steel	A 352	LC2	. . .	No. 3 Cast Steel	LC2	
	3½% Nickel Steel	A 352	LC3	. .	"Arctic" Cast Steel	LC3	
Forged Steels	Carbon	A 105	II	. . .	Carbon Forged Steel	.	page 8
	Carbon	A 181	II	. .	Carbon Forged Steel	. .	
	Carbon	A 234	B	. .	Carbon Forged Steel	. . .	
	1¼% Chromium — ½% Moly.	A 182	F11	. . .	No. 7 Forged Steel	F11	page 8
	2¼% Chromium — 1% Moly.	A 182	F22	. . .	No. 9 Forged Steel	F22	
	5% Chromium — ½% Moly	A 182	F5a	. .	No. 5 Forged Steel	F5a	
Stainless Steels	11-13% Chromium Steel	A 182	F6	Type 410	Exelloy	F6	page 5
	18-21% Cr—8-11% Ni	A 351*	CF-8	Type 304*	18-8 S Alloy*	18-8S	
	18-21% Cr—9-12% Ni—2-3% Mo	A 351*	CF-8M	Type 316*	18-8 SMo Alloy*	18-8 SMo	
	19% Cr—28% Ni—2% Mo	.	.	. .	Craneloy 20 Alloy	C-20	

*Crane 18-8 S and 18-8 SMo are equivalent to AISI Types 304 and 316 wrought stainless steels, respectively, and conform also to ASTM A296.

Crane Tests and Working Pressures

AIR TESTING

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

In addition, any valve intended for air, gas, or very volatile fluids, where absolute tightness is essential, should be ordered air tested unless the catalog specifically states it is regularly air tested. Air tested valves are provided with end protectors.

When iron or steel gate valves are to be used in pipe lines on natural dry gas service, orders should so specify, so that they can be suitably packed.

NON-DESTRUCTIVE TESTING

All Crane steel foundry practice is developed with the aid of radiography, magnetic particle, or fluid penetrant testing . . . . and these inspections provide continuous control of production. X-Ray and Betatron equipment, radio isotopes, and modern magnetic particle machines are used.

Crane steel pressure castings are qualified by special inspections as required by service application or demands. MSS Standards SP-53 and SP-54 are the basis for examination by pressure classes and requirement for acceptance.

The 900-pound and higher pressure classes of castings are inspected by the magnetic particle method and by radiography. In addition, the lower pressure class castings are monitored by these inspection methods and, for some alloy grades, the examination is regularly extended to lower pressure classes.

HYDROSTATIC AND SHOCK WORKING PRESSURES

Crane valves are suitable for liquid working pressures specified on catalog pages only when used in hydraulic installations in which shock is absent or negligible. 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 one foot per second, to stop instantaneously. As liquids are relatively incompressible, the sudden cessation of flow effects a rise in pressure considerably greater than the static working pressure; this pressure increase is termed "SHOCK" and may, in some cases, be sufficient to cause valves or piping to fail.

Pressure increase due to shock is not dependent upon the working pressure in the system but upon the velocity at which the liquid is flowing. This pressure surge, or shock, severely limits design velocities . . . . a fact readily understandable if it is remembered that pressure rise resulting from arrest of flow may be as high as 60 psi for each foot per second initial velocity. For example, installations of 100 psi and 1000 psi working pressures, with the same initial velocity of 10 feet per second, will be subject to the same increase in pressure (approximately 600 psi) due to instantaneous closure of a valve.

Shock generally prevails in lines equipped with check or quick-closing valves, or in lines supplied by reciprocating pumps. It may also be produced, to a lesser degree, by rapid closure of gate and globe valves. Therefore, care should be exercised when closing valves installed in liquid lines.

Where shock is likely to occur, the maximum shock pressure should be added to the working pressure of the line to determine working pressure of products in the line . . . also, hydraulic installations should be equipped with air chambers or other types of shock absorbers to eliminate, as much as possible, increase in pressure due to shock

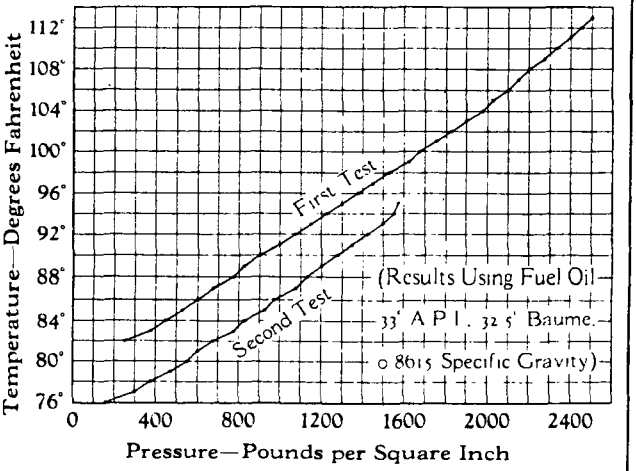
Increase in Pressure Due to Expansion of Liquids

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

Crane tests indicate that when vessels are completely filled with 33° API fuel oil, a rise of 1° F causes an increase in internal pressure of about 75 psi, see chart at right

In the first test, the 31° increase (from 82° to 113°) caused a total pressure increase of 2250 psi (from 250 to 2500 psi) or about a 73 psi per degree average. In the second test, the 19° increase (from 76° to 95°) caused a total pressure increase of 1425 psi (from 150 to 1575 psi) or about a 75 psi per degree average. While results may vary slightly under actual service conditions, depending upon the kind of oil, its cubical coefficient of expansion, the flexibility, if any, of the vessel, the presence of air in the oil, and other variables, the tests prove conclusively that dangerously high pressures can build up in an oil-containing vessel with only moderate temperature increase

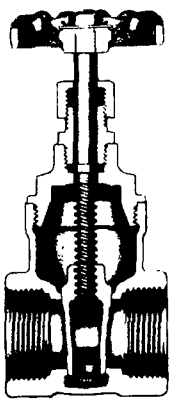
Thermo-Piezo Effects of Oil at Constant Volume



It is recommended, therefore, on valves installed in liquid lines (particularly oil), that some means be taken to prevent entrapment of liquid in the valve bonnet so as to eliminate possible pressure build-up due to rising temperature.

Bronze Gate Valves
Wedge Disc — Non-Rising Stem

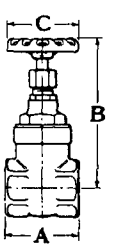
100-Pound Screwed



Cross Section
No. 410



No. 410
Screwed



Working Pressures

Valve	Saturated Steam	Cold Water*	Cold Oil or Gas
		Non-Shock	Non-Shock
No. 410	100 psi	150 psi	150 psi
No. 1320	125 psi	200 psi	....

*No. 1320 Valves, for water service, are suitable for temperatures up to 200 F.

Screwed valves: Crane No. 410 are versatile valves, featuring many advancements in design. They are excellently suited for low pressure service, such as city water lines, domestic hot and cold water lines, domestic gas and fuel oil lines, heating systems, exhaust steam, low pressure condensate or steam process piping, and similar services.

The valves feature wide-faced hexagons at the pipe ends, accurately cut threads, ample metal sections, and long disc guides for correct seating. The upper portion of the body, cylindrical in shape, combines strength with light weight and reinforces the seats against the wedging action of the disc.

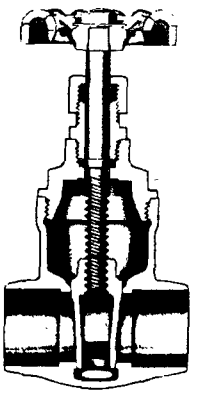
The body is bronze (ASTM B 62). The bonnet, disc, stem, stuffing box, and packing nut are also bronze. The valves, when wide open, can be repacked while under pressure.

Solder-joint valves: Crane No. 1320 Valves, like the No. 410, are non-rising stem gate valves with a one-piece wedge disc. They are recommended for general shut-off valve service on steam lines and on hot and cold water lines, and are widely used in plumbing and heating systems, on low pressure condensation return lines, and similar services.

The valves are sturdily constructed and amply reinforced at points subject to greatest stress to withstand piping and operating strains. All parts are made of good quality materials. The body is bronze (ASTM B 62); ends comply with American Standard, B16.18-1950, for Cast Brass Solder-Joint Fittings. The valves, when wide open, can be repacked while under pressure.

Important: When solder-joint valves are installed on steam lines, the solder used to make the joints must have a melting point high enough to withstand the temperature of the steam. Instructions for soldering accompany each valve.

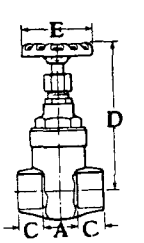
125-Pound Solder-Joint



Cross Section
No. 1320



No. 1320
Solder-Joint



Weights and Dimensions — Prices on Request

Size	No. 410 Screwed Ends				No. 1320 Solder-Joint Ends				
	Weight	Dimensions, in Inches			Weight	Dimensions, in Inches			
Inches	Pounds Each	A	B	C	Pounds Each	A	C	D	E
1/4	0.55	1 3/4	3 1/4	1 1/2					
3/8	0.6	1 13/16	3 1/4	1 1/2	0.66	13/16	13/32	3 1/4	1 1/2
1/2	0.9	1 15/16	3 3/4	1 3/4	0.7	13/16	17/32	3 3/4	1 3/4
3/4	1.3	2 1/16	4 3/8	2 1/16	1.2	7/8	25/32	4 3/8	2 1/16
1	2.0	2 7/16	5 1/8	2 9/16	1.7	1 1/16	29/32	5 1/8	2 9/16
1 1/4	2.9	2 7/8	5 3/4	2 3/4	2.3	1 5/16	31/32	5 3/4	2 3/4
1 1/2	4.0	3	6 3/8	3 1/16	3.3	1 7/16	1 3/32	6 3/8	3 1/16
2	5.9	3 1/4	7 3/8	3 5/8	5.0	1 9/16	1 11/32	7 3/8	3 5/8

Solder-Joint Valves in Larger Sizes or for Higher Pressures

When valves with solder-joint ends are wanted in larger sizes, or for use at higher pressures than recommended for the No. 1320, Crane screwed end valves with solder-joint adapters can be used.

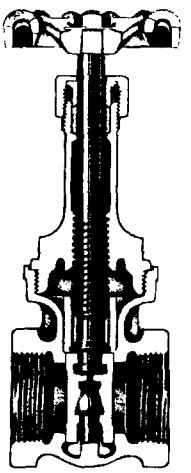
Solder-joint globe and angle valves....page 30

Solder-joint swing check valves.....page 46

125-Pound Bronze Gate Valves

Rising Stem

Double Disc
Parallel Seats

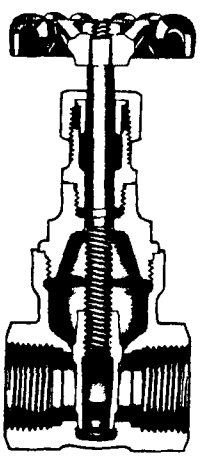


Cross Section
No. 440, with Wheel
No. 441, with Lock Shield

Dependability at low cost with this rugged double disc valve. Ample metal sections assure a high safety factor. Available with wheel, as illustrated, or with lock shield.

Non-Rising Stem

Wedge Disc



Cross Section
No. 438, with Wheel
No. 439, with Lock Shield

An extremely reliable non-rising stem valve featuring a cylindrical-shaped body and a screwed-in type stuffing box. Available with wheel, as illustrated, or with lock shield.

For weights and dimensions see the opposite page.

For 125-pound bronze union bonnet valves, see page 20.

Working Pressures
125 psi saturated steam
200 psi non-shock
cold water, oil, or gas

Screwed bonnet valves . . . . designed to suit every service requirement

The 125-Pound Bronze Gate Valves described on this and the opposite page are recommended for general service on steam, water, oil, or gas lines. Ruggedly constructed throughout, each type offers distinctive advancements in design.

Rising stem valves feature three disc types . . . . the double disc and parallel seats of the Nos. 440 and 441 . . . . the solid wedge disc of the No. 428 . . . . and the double wedge disc of the No. 430. Each meets Crane's high standards for top performance in hard service. The rising stem clearly indicates whether the disc is in the open or closed position.

For use in confined installations, the No. 438 and No. 439 are a logical selection. They have a wedge disc and a non-rising stem.

Cylindrical-shaped body: The body on all wedge disc valves has a cylindrical-shaped neck terminating in a round opening for the bonnet. The design, generally associated with high pressure steel valves, combines strength with light weight. Wide-faced hexagon ends provide added reinforcement and an easy wrench grip. Full diameter seat openings assure straight-through flow.

No. 440 or 441: The No. 440 and No. 441 are rising stem valves. Low cost, dependability in continuous use, and infrequent need for maintenance make them ideal for a variety of services.

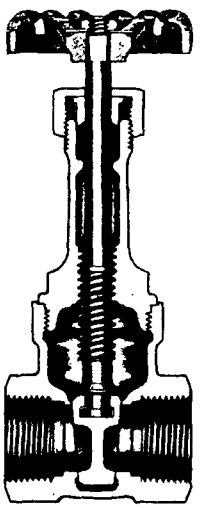
The valves have a double disc, carefully guided in the body, and parallel seats. When closing, the last turn of the wheel forces the discs against the seats; when opening, the first turn releases the discs from their seats.

No. 438 or 439: The No. 438 and No. 439 are non-rising stem valves. Their wedge disc provides tight, positive seating and trouble-free operation. The disc travel is accurately controlled by long guides in the body.

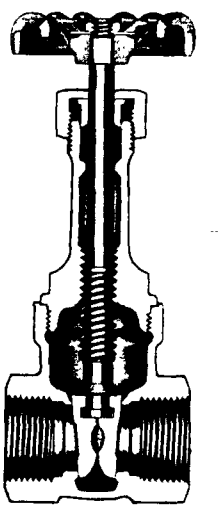
The valves have a cylindrical-shaped body. Their stuffing box, screwed into the bonnet, provides good stem support and assures true alignment and easy operation; in addition, wear on the packing is minimized

Rising Stem

Solid Wedge Disc | **Double Wedge Disc**



Cross Section
No. 428



Cross Section
No. 430

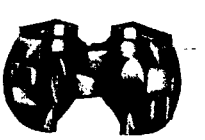
Compact rising stem valves with either a solid or a double wedge disc. The slip-on type disc-stem connection provides smooth, positive performance.

The cylindrical-shaped body combines strength with light weight . . . . reinforces the seats against wedging action of the discs. Wide-faced body ends are easy to grip . . . . assure quick installation of valves.

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

The No. 428, like the other wedge disc valves shown on this page, features a cylindrical-shaped body which provides added strength without added weight and serves to reinforce the seats against the wedging action of the disc.

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



The No. 430 Valves, except for the double wedge disc, are similar to the No. 428. Both feature the full flow, cylindrical-shaped body.

125-Pound Bronze Gate Valves



No. 440
Screwed
With Wheel



No. 441
Screwed
With Lock Shield

Rising Stem
Double Disc, Parallel Seats



No. 428
Screwed
With Wheel

Rising Stem
Solid Wedge Disc



No. 430
Screwed
With Wheel

Rising Stem
Double Wedge Disc



No. 438
Screwed
With Wheel



No. 439
Screwed
With Lock Shield

Non-Rising Stem
Wedge Disc

Materials: The valves are made of quality materials throughout. Except for the wheel and packing, all parts are high grade bronze; the body is made of bronze conforming to ASTM B 62. Each part is carefully designed and liberally proportioned to assure a high factor of safety over recommended working pressures.

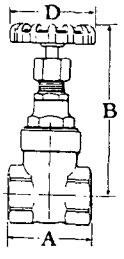
Stuffing box: The stuffing box, amply deep and filled with a long-lasting packing, provides a tight stem seal. All valves are equipped with a gland.

On non-rising stem valves, the stuffing box screws into the bonnet; its long contact with the stem, supports and keeps the stem in true alignment.

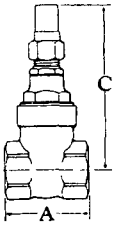
Repacking: The valves, when wide open, can be repacked while under pressure.

Federal Specification: These valves, in all sizes, comply with Federal Specification WW-V-54 for Class "A", 125-Pound Bronze Screwed Valves (for land use), as follows:

Type I, Non-Rising Stem, Wedge Disc . No. 438
Type II, Rising Stem, Wedge Disc No. 428
Type III, Rising Stem, Double Disc . . . No. 430
Type III, Rising Stem, Double Disc . . No. 440



Valves
With Wheel



Valves With
Lock Shield

Solder-joint gate valves . . . . . page 17
Keys for lock shield valves . . . . page 283
Thread engagement . . . . . page 352

Weights and Dimensions — Prices on Request

Valve Type	Size	With Wheel				With Lock Shield		
		Weight	Dimensions, in inches			Weight	Dimensions, in inches	
	Inches	Pounds Each	A	B* open	D	Pounds Each	A	C* open
		No. 440				No. 441		
Rising Stem Double Disc	¼	.7	1⅝	4¼	1¾	.	.	.
	⅜	.7	1¾	4¼	1¾	.	.	.
	½	1.1	1⅞	4¾	2 1/16	1.0	1⅞	5
	¾	1.5	2⅛	6	2 9/16	1.4	2⅛	5¾
	1	2.5	2½	7	2¾	2.4	2½	6¾
	1¼	3.6	2 13/16	8¼	3 1/16	3.4	2 13/16	8
	1½	5.5	3 1/16	9½	3⅝	5.2	3 1/16	9¼
	2	8.5	3½	11¾	4 1/16	8.0	3½	11½
	2½	14.5	4 1/16	14	4¾	.	.	.
	3	20.0	4 9/16	16¼	5⅜	.	.	.
		No. 428 or †430				—		
Rising Stem Solid or Double Wedge Disc	¼†	.9	1 13/16	4½	1¾	.	.	.
	⅜†	.9	1 13/16	4½	1¾	.	.	.
	½	1.2	2⅛	5¼	2 1/16	.	.	.
	¾	1.9	2¼	6½	2 9/16	.	.	.
	1	2.6	2 13/16	7¾	2¾	.	.	.
	1¼	4.0	3	9¼	3 1/16	.	.	.
	1½	5.5	3¼	10½	3⅝	.	.	.
	2	9.0	3 11/16	12¾	4¾	.	.	.
	2½	16.5	4½	15¼	5⅜	.	.	.
	3	26.0	5⅛	18	7	.	.	.
		No. 438				No. 439		
Non-Rising Stem Wedge Disc	¼	.7	1 13/16	3¾	1¾	.	.	.
	⅜	.7	1 13/16	3¾	1¾	.	.	.
	½	1.0	2⅛	4¼	2 1/16	.9	2⅛	4
	¾	1.6	2¼	5	2 9/16	1.4	2¼	4¾
	1	2.5	2 13/16	5¾	2¾	2.4	2 13/16	5½
	1¼	4.0	3	6¼	3 1/16	3.6	3	6¼
	1½	5.4	3¼	7¼	3⅝	5.0	3¼	7
	2	8.5	3 11/16	8¾	4 1/16	8.0	3 11/16	8½
	2½	14.5	4½	10¼	4¾	.	.	.
	3	22.0	5⅛	11¾	5⅜	.	.	.

*Center to top: Dimensions B and C apply to rising stem valves in the open position and to non-rising stem valves either open or closed

†No. 430 Valves are not made in ¼ and ⅜-inch sizes, use the No. 428.

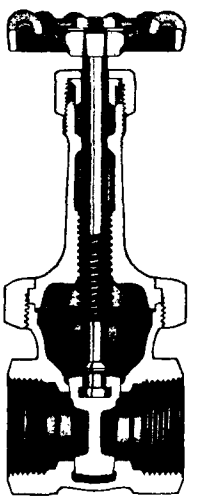
125-Pound Bronze Gate Valves

Rising Stem — Union Bonnet

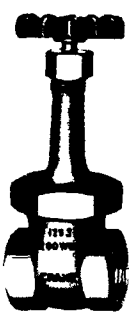
Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

New, compact 125-pound union bonnet valves designed for dependable performance in general service

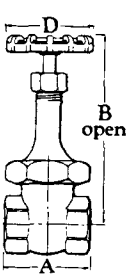
Solid Wedge Disc



Cross Section
No. 428-UB



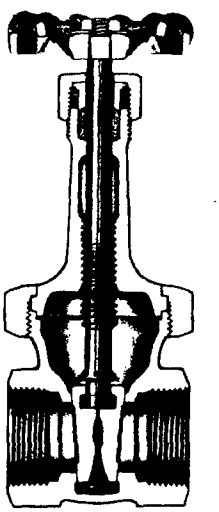
No. 428-UB
Screwed
Solid Wedge Disc



Repacking: No. 428-UB Valves, when wide open, can be repacked while under pressure.

For valves for marine service, see page 230.

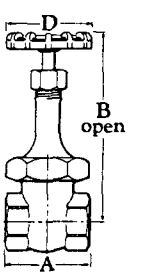
Double Wedge Disc



Cross Section
No. 430-UB



No. 430-UB
Screwed
Double Wedge Disc



Repacking: No. 430-UB Valves, when wide open, can be repacked while under pressure.

For normal thread engagement, see page 352

These newly designed 125-pound bronze gate valves with compact union bonnet construction are recommended for general service on steam, water, oil, and gas lines. They are available with two types of discs . . . . the solid wedge disc of the No. 428-UB and the double wedge disc of the No. 430-UB.

Materials: The body and discs are made of bronze conforming to requirements of ASTM Specification B 62. The bonnet, union bonnet ring, stem, packing nut, and gland are also bronze. Each part is carefully designed and liberally proportioned to assure a high factor of safety over recommended working pressures.

Cylindrical-shaped body: The valve body has a cylindrical-shaped neck terminating in a round opening for the bonnet. The design is generally associated with high pressure steel valves and combines strength with light weight. Wide-faced hexagons at the body ends provide added reinforcement and an easy wrench grip; full diameter seat openings assure straight-through flow.

Union bonnet: All sizes have a union bonnet. The union bonnet ring reinforces the bonnet joint and facilitates dismantling and reassembly of the valve.

Discs: The No. 428-UB have a rising stem and a solid wedge disc which is 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.

The No. 430-UB are similar to the No. 428-UB except for their double wedge disc. The discs are reversible in the body; they are well guided and carefully machined to assure positive, easy operation. When closing, the last turn of the wheel presses the discs against the seats; when opening, the first turn of the wheel releases the discs from the seats. The disc-stem connection is the slip-on type.

Stuffing box: The ample stuffing box is filled with a durable packing, provides a tight stem seal, and is equipped with a gland.

Federal Specification: The No. 428-UB and No. 430-UB comply with Federal Specification WW-V-54 for Class "A" 125-Pound Bronze Screwed Valves . . . . Types II and III respectively.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches					
	No. 428-UB	No. 430-UB	No. 428-UB			No. 430-UB		
Inches	Solid Disc, Screwed	Double Disc, Screwed	A	B open	D	A	B open	D
1/4	1.0	Use No 428-UB	1 13/16	4 1/2	1 3/4	. . .	. . .	. . .
3/8	1.0		1 13/16	4 1/2	1 3/4	. . .	. . .	. . .
1/2	1.3	1.3	2 1/8	5 1/4	2 1/16	2 1/8	5 1/4	2 1/16
3/4	2.0	2.0	2 1/4	6 1/2	2 9/16	2 1/4	6 1/2	2 9/16
1	2.8	2.8	2 13/16	7 3/4	2 3/4	2 13/16	7 3/4	2 3/4
1 1/4	4.2	4.2	3	8 3/4	3 1/16	3	8 3/4	3 1/16
1 1/2	6.0	6.0	3 1/4	10	3 5/8	3 1/4	10	3 5/8
2	9.0	9.0	3 11/16	11 3/4	4 3/4	3 11/16	11 3/4	4 3/4

125-pound bronze gate valves with screwed bonnet . . . . pages 18 and 19

125-Pound Bronze Gate Valves

Wedge Disc — Non-Rising Stem — Bolted Bonnet

Sizes	Working Pressures		Hydrostatic Test Pressures
	Saturated Steam	Cold Water, Oil, or Gas Non-Shock	
4-inch and smaller	125 psi	200 psi	400 psi
5-inch and larger	125 psi	150 psi	300 psi

Indicator-equipped wedge gate valves . . . for dependable performance on large size pipe lines

Recommendations: These flanged end, bolted bonnet wedge gate valves are recommended for general shut-off service on large size steam, water, oil, and gas lines. In addition, they offer excellent service in brewery applications for water and beer transfer lines.

Materials and construction: The body, bonnet, disc, and renewable body seat rings are made of bronze conforming to ASTM Specification B 62. The stem, stuffing box, and gland are also bronze. The valve wheel is malleable iron. All parts are liberally proportioned to assure a high factor of safety.

The bolted bonnet is unusually compact. Equipped with steel studs, bronze nuts, and a Cranite gasket, it maintains a strong, tight joint, yet can easily be dismantled and reassembled with no damage to the valve.

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

Indicator: The valves are regularly equipped with an all-bronze indicator to show whether the disc is in the open or closed position. When specified, they can be furnished without an indicator.

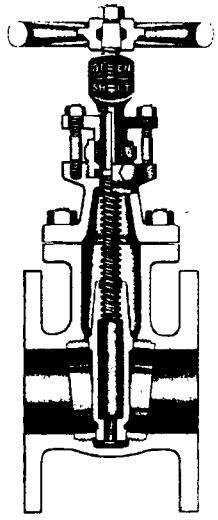
Stuffing box: The stuffing box is deep and is filled with high grade packing to assure a tight seal.

Sizes 2½-inch and larger have a bolted gland as shown in the illustrations; the 2-inch size has a screwed type stuffing box equipped with a gland and a packing nut (not illustrated).

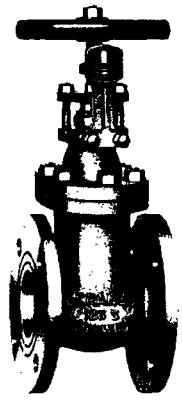
Repacking: The valves, when wide open, can be repacked while under pressure.

End flanges: The dimensions and drilling of end flanges conform to American Standard (B16.24-1953) for 150-Pound Bronze Flanges. Flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

The valves are regularly furnished faced and drilled; faced only valves can be furnished when specified. Full face gaskets should be used; see page 321.



Cross Section
No. 4437

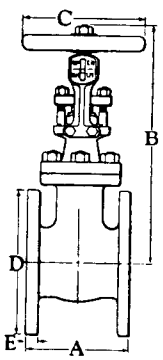


No. 4437
Flanged
With Indicator

Non-rising stem, one-piece wedge disc, bolted bonnet, and renewable seats.

Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches					
						End Flanges		
	Inches	Pounds Each	A	B	C	D	E	No. and diameter of bolts
No. 4437 Flanged F & D With Indicator	2	20	4⅝	9¾	4½	6	½	4-⅝
	2½	30	5	11½	6	7	9/16	4-⅝
	3	41	5½	13¾	7	7½	⅝	4-⅝
	4	66	6½	16	8	9	11/16	8-⅝
	5	84	7	18¼	9	10	¾	8-¾
	6	110	7½	20	9	11	13/16	8-¾
	8	185	8½	25	10	13½	15/16	8-¾



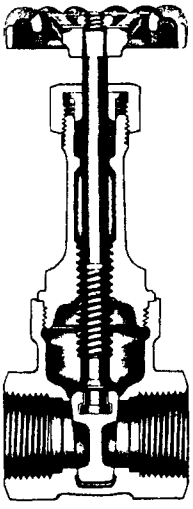
No. 4437

Templates for drilling . . . . page 326

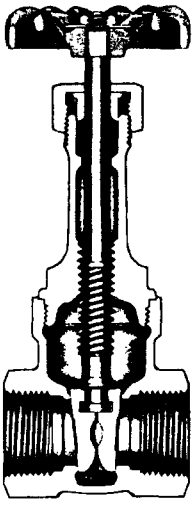
Valves can be furnished without indicator when so ordered.

150-Pound Bronze Gate Valves
Wedge Disc — Screwed Bonnet

Rising Stem



Cross Section
Solid Wedge Disc
No. 431

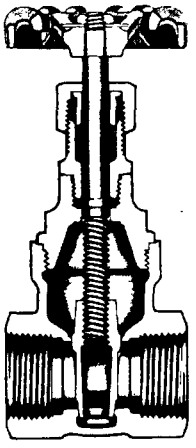


Cross Section
Double Wedge Disc
No. 435

Working Pressures

Valve Ends	Saturated Steam	Cold Water, Oil, or Gas Non-Shock
Screwed	150 psi	300 psi
Flanged	150 psi	225 psi

Non-Rising Stem



Cross Section
No. 437

These valves offer a construction considerably heavier than that found in "Standard" or 125-Pound Valves. The body is designed to reinforce the seats against the wedging action of the disc. Full diameter seat openings assure straight-through flow. Screwed valves feature wide faced hexagons at the pipe ends, assuring an easy wrench grip.

Except for the wheel and packing, all parts are high grade bronze with the body conforming to ASTM B 62. The deep stuffing box has a gland and is filled with quality packing. The valves, when wide open, can be repacked while under pressure.

Rising stem: Rising stem valves include the No. 431 and No. 429 with a solid wedge disc, and the No. 435 with a double wedge disc. In all valves, the discs are reversible in the body and are carefully machined to provide easy, positive operation. The disc-stem connection is the slip-on type. Accurate guiding prevents contact at the seating surfaces until the valve is almost closed. The position of the stem indicates whether the valve is open or closed.

Non-rising stem: The No. 437, a non-rising stem valve with wedge disc, provides tight seating and long, trouble-free operation. The stuffing box screws into the bonnet; its long contact with the stem adds to the support and alignment of the stem.



No. 437, Screwed
Wedge Disc

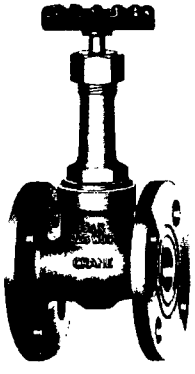


No. 431, Screwed
Solid Wedge Disc



No. 435, Screwed
Double Wedge Disc

Federal Specification: These valves comply with Federal Specification WW-V-54 for Class "B", 150-Pound Bronze Gate Valves, as follows: No. 437 (Type I), No. 431 or No. 429 (Type II), and No. 435 (Type III).



No. 429, Flanged
Solid Wedge Disc

Flanged valves: End flanges conform to American Standard (B16.24-1953) for 150-Pound Bronze Flanges and are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Flanged valves, regularly faced and drilled, can be furnished faced only, when specified. Full face gaskets should be used; see page 321.

For drilling templates, see page 326.

For thread engagement, see page 352.

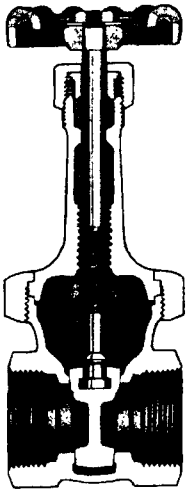
Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches								
	Rising Stem			No. 437	Rising Stem						Non-Rising Stem		
	No. 431	No. 429	No. 435	Non-Rising Stem	End to end	Face to face	Center to top, open	Diameter of wheel	End Flanges		End to end	Center to top	Diameter of wheel
	Solid Disc, Screwed	Solid Disc, Flanged	Double Disc, Screwed	Screwed					Diameter	Thickness			
Inches													
1/4	1.1	. .	Use No 431	.9	1 13/16	. .	4 1/2	1 3/4	. . .	. .	1 13/16	3 3/4	1 3/4
3/8	1.2	. . .		.9	1 13/16	. . .	4 1/2	1 3/4	. . .	. . .	1 13/16	3 3/4	1 3/4
1/2	1.5	. .	1.5	1.3	2 1/8	. .	5 1/4	2 1/16	. . .	. .	2 1/8	4 1/4	2 1/16
3/4	2.3	.	2.3	1.8	2 1/4	.	6 1/2	2 9/16	. .	. . .	2 1/4	5	2 9/16
1	3.2	6.0	3.2	2.8	2 13/16	3 1/2	7 3/4	2 3/4	4 1/4	3/8	2 13/16	5 3/4	2 3/4
1 1/4	5.0	8.0	5.0	4.2	3 1/8	4	9 1/4	3 1/16	4 5/8	13/32	3 1/8	6 1/4	3 1/16
1 1/2	6.6	11.0	6.6	6.0	3 7/16	4 1/2	10 1/2	3 5/8	5	7/16	3 7/16	7 1/4	3 5/8
2	10.0	18.0	10.0	9.0	3 7/8	5 1/2	12 3/4	4 3/4	6	1/2	3 7/8	8 3/4	4 1/16
2 1/2	19.0	30.0	19.0	16.0	4 5/8	6 1/2	15 1/4	5 3/8	7	9/16	4 5/8	10 1/4	4 3/4
3	26.0	39.0	26.0	23.0	5 3/8	7 1/2	18	7	7 1/2	5/8	5 3/8	11 3/4	5 3/8

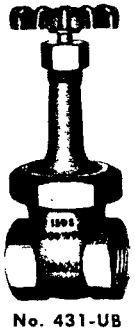
150-Pound Bronze Gate Valves

Rising Stem — Union Bonnet

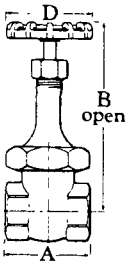
Solid Wedge Disc



Cross Section
No. 431-UB



No. 431-UB
Screwed
Solid Wedge Disc



Working Pressures
150 psi saturated steam
300 psi non-shock cold water, oil, or gas

New, rugged 150-pound union bonnet valves for top performance in general service

These new 150-pound bronze gate valves feature rugged union bonnet construction and a choice of discs . . . . the solid wedge disc of the No. 431-UB or the double wedge disc of the No. 435-UB. The valves are recommended for steam, water, oil, or gas service where conditions require a heavier, more massive construction than that found in "Standard" or 125-pound valves.

Materials: The body and discs are made of bronze conforming to requirements of ASTM Specification B 62; the bonnet, union bonnet ring, stem, packing nut, and gland are also bronze. All parts are of liberal proportions, assuring a high factor of safety.

Body and bonnet: The valves are streamlined throughout. The body is designed to withstand high internal pressures and line strains and to reinforce the seats against the wedging action of the disc. The wide-faced, flat hexagons at the body ends provide an easy wrench grip. Full diameter seat openings assure straight-through flow The union bonnet ring reinforces the body-bonnet joint and facilitates dismantling and reassembly of the valve.

Construction: The No. 431-UB have a rising stem and a solid wedge disc which is reversible in the body. The disc slips onto a strong head on the stem end, and is accurately guided throughout its travel so that there is no contact between the seating surfaces until the valve is almost closed

The No. 435-UB are also rising stem valves. Their double wedge disc, reversible in the body, is carefully machined to assure easy operation. In closing, the last turn of the wheel presses the discs against the seats; when opening, the first turn releases the discs from the seats. The disc-stem connection is the slip-on type.

Stuffing box: The valves have a deep stuffing box filled with high grade packing and equipped with a gland.

Federal Specification: The No. 431-UB and No. 435-UB comply with Federal Specification WW-V-54 for Class "B" 150 Pound Bronze Screwed Gate Valves . . . . Types II and III respectively.

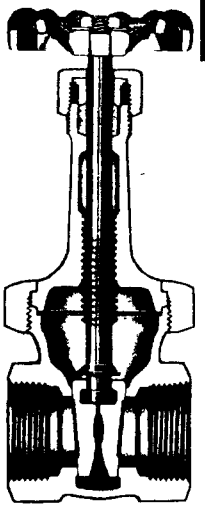
Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches					
			No. 431-UB			No. 435-UB		
	No. 431-UB	No. 435-UB						
Inches	Solid Disc, Screwed	Double Disc, Screwed	A	B open	D	A	B open	D
¼	1.2	Use No 431-UB	1 13/16	4½	1¾			
⅜	1.2		1 13/16	4½	1¾			
½	1.6	1.6	2⅛	5¼	2 1/16	2⅛	5¼	2 1/16
¾	2.5	2.5	2¼	6½	2 9/16	2¼	6½	2 9/16
1	3.4	3.4	2 13/16	7¾	2¾	2 13/16	7¾	2¾
1¼	5.5	5.5	3⅛	8¾	3 1/16	3⅛	8¾	3 1/16
1½	7.0	7.0	3 7/16	10	3⅝	3 7/16	10	3⅝
2	10.5	10.5	3⅞	11¾	4¾	3⅞	11¾	4¾

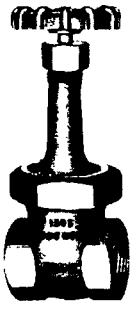
Repacking: No. 431-UB Valves, when wide open, can be repacked while under pressure

For valves for marine service, see page 230.

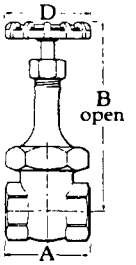
Double Wedge Disc



Cross Section
No. 435-UB



No. 435-UB
Screwed
Double Wedge Disc



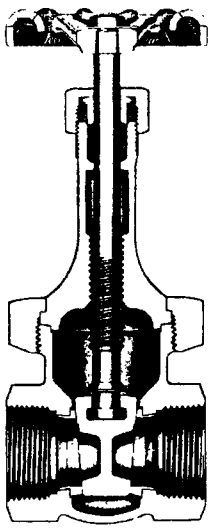
Repacking: No. 435-UB Valves, when wide open, can be repacked while under pressure.

For normal thread engagement, see page 352.

150-pound bronze gate valves with screwed bonnet . . . . page 22

200-Pound Bronze Gate Valves
Wedge Disc — Exelloy Seats

Rising Stem



Cross Section
No. 424

Working Pressures, Non-Shock		Hydrostatic Test Pressures
Steam 550 F	Cold Water, Oil, Gas, Air, or Volatile Fluids	
200 psi	400 psi	600 psi

Air Tested

New, multi-service gate valves featuring long-lasting Exelloy seats. . . . *No. 424 is Underwriters' Approved for LP-Gases

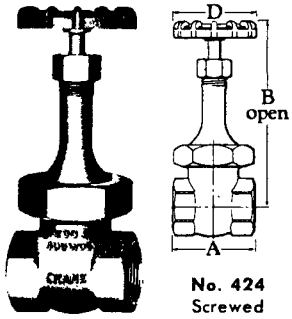
All-new design, externally and internally, plus high quality materials and expert workmanship make these rugged bronze gate valves outstanding values.

Recommendations: Both valves are excellent for use on steam, water, air, oil, gas, gasoline, light oils, volatile fluids, etc., at pressures up to 400 psi.

*No. 424 Rising Stem Valves are approved by the Underwriters' Laboratories, Inc., for the safe handling of all liquefied petroleum gases such as butane, propane, propylene, etc., provided they are installed in branch or by-pass lines where a positive shut-off is not essential and where pressures do not exceed 250 psi; their identification plate is marked "Butane-UL-Propane".

Features: The valves feature a streamlined body, cylindrically designed to withstand high internal pressures and line strains and to reinforce the seats against the wedging action of the disc. Wide-faced hexagons at the pipe ends provide an easy wrench grip.

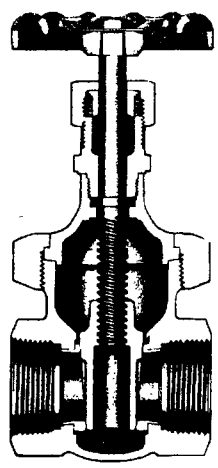
Wear-resistant Exelloy body seat rings, securely expanded into the body under hydraulic pressure, assure trouble-free service. Normal seating wear is absorbed by the bronze disc which can easily be replaced.



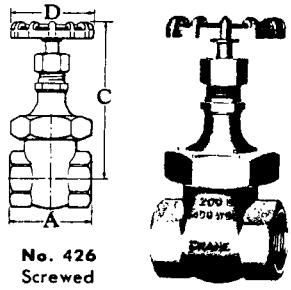
No. 424
Screwed

Efficient cylindrical body design, easy-to-replace slip-on type solid wedge disc, and Exelloy seats.

Non-Rising Stem



Cross Section
No. 426



No. 426
Screwed

Efficient cylindrical body design, easy-to-replace one-piece wedge disc, and Exelloy seats.

Construction and materials: The No. 424 are inside screw, rising stem valves; their solid wedge disc slips onto a strong head on the stem end. The No. 426 are inside screw, non-rising stem valves equipped with a one-piece wedge disc; long clean-cut threads engage the disc and stem.

The body, bonnet, bonnet ring, and disc are Crane Special Bronze conforming to ASTM Specification B 61. Crane Exelloy, used for the seat rings, is an AISI Type 410 stainless steel, specially heat-treated for high resistance to wear, temperature, galling, and scoring.

Bonnets: Sizes 2-inch and smaller have a union bonnet, as shown in the full illustrations; 2½ and 3-inch sizes have a compact, inside screw bolted bonnet, equipped with a gasket, as shown in the partial section of the rising stem valve at the left.



2½ and 3-inch sizes have a bolted bonnet.

Both bonnets provide a strong, tight joint, yet they are easily dismantled and reassembled without danger of damaging the valve.

Stuffing box; repacking: The stuffing box is large and deep, is equipped with a gland, and is filled with high grade packing to assure a tight stem seal. The valves, when wide open, can be repacked while under pressure.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	No. 424 Rising Stem	No. 426 Non-Rising Stem	A	B open	C	D
Inches						
¼	1.2	1.1	2 1/16	4½	4	2 1/16
⅜	1.5	1.4	2 3/16	4½	4	2 1/16
½	1.9	1.6	2 9/16	5½	4½	2 9/16
¾	3.0	2.6	2¾	7	5¼	2¾
1	4.0	3.8	3 3/16	8	6	3 1/16
1¼	6.4	6.0	3 9/16	9¼	6¾	3⅝
1½	8.5	8.0	3 13/16	10½	7½	4 1/16
2	13.0	12.0	4 5/16	12¾	8¾	4¾
2½	23.0	18.0	5	15¼	10¾	5⅜
3	36.0	28.0	5⅝	18	12¼	7

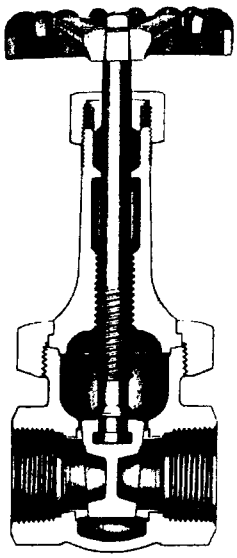
Other Bronze Valves for LP Gases:
Globe and Angle.....page 37
Check.....page 49

For Valves for Marine Service, see page 230.

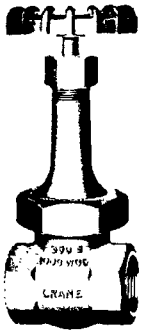
200-Pound Bronze Outside Screw and Yoke Gate Valves....page 26

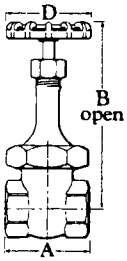
300-Pound Bronze Gate Valves
Wedge Disc — Exelloy Seats

Rising Stem



Cross Section
No. 634 E





No. 634 E
Screwed

Efficient cylindrical body design, easy-to-replace slip-on type solid wedge disc, and Exelloy seats.

Sizes	Working Pressures (Non-Shock)		Hydrostatic Test Pressures
	Steam	Cold Water, Oil, Gas,	
Inches	550 F	or Air	
¼ to 2	300 psi	1000 psi	1500 psi
2½ and 3	300 psi	600 psi	900 psi

Air Tested

New, rugged 300-pound bronze valves designed for hard, tough service and easy maintenance

All-new design, externally and internally, plus high quality materials and expert workmanship make these unusually rugged 300-pound bronze gate valves an ideal choice for high pressure services and for use where operating conditions are particularly severe.

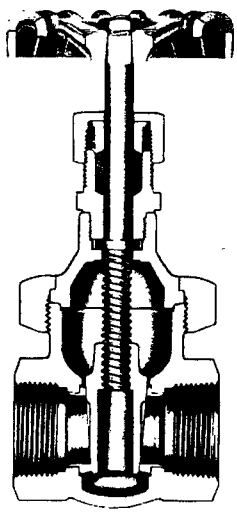
Features: The body, streamlined throughout, has a cylindrical-shaped neck terminating in a round opening for the bonnet. The design withstands high internal pressures and line strains and also serves to reinforce the seats against the wedging action of the disc. Wide-faced hexagons provide an easy wrench grip.

The use of wear-resistant Exelloy body seat rings, securely expanded into the body under hydraulic pressure, assures long maintenance-free service. Normal seating wear is absorbed by the disc which can easily be replaced when necessary.

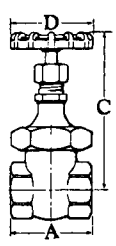
Construction and materials: The No. 634 E are inside screw, rising stem valves; they have a solid wedge disc which slips onto a strong head on the stem end. The No. 636 E are inside screw, non-rising stem valves equipped with a one-piece wedge disc; long clean-cut threads engage the disc and stem.

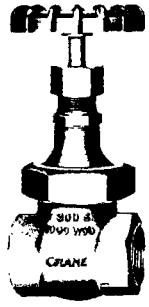
The body, bonnet, bonnet ring, and disc are Crane Special Bronze, a hard, leaded tin bronze conforming to ASTM Specification B 61. Crane Exelloy, used for the seat rings, is a specially heat-treated AISI Type 410 stainless steel having excellent resistance to wear, temperature, galling, and scoring.

Non-Rising Stem



Cross Section
No. 636 E





No. 636 E
Screwed

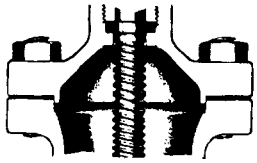
Efficient cylindrical body design, easy-to-replace one-piece wedge disc, and Exelloy seats.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	No. 634 E	No. 636 E	A	B	C	D
Inches	Rising Stem	Non-Rising Stem		open		
¼	1.3	1.2	2⅛	4½	4	2 1/16
⅜	1.8	1.6	2¼	5⅜	4½	2 9/16
½	2.2	1.8	2⅝	6	5	2¾
¾	3.5	3.0	2⅞	7⅜	5⅝	3 1/16
1	4.5	4.4	3 5/16	8⅜	6½	3⅝
1¼	7.5	7.0	3⅝	9⅞	7⅜	4 1/16
1½	10.0	9.5	3 15/16	11⅛	8⅛	4¾
2	15.0	14.0	4⅜	13¾	9⅝	5⅜
2½	28.0	26.5	5⅛	15¼	10⅝	5⅜
3	46.0	42.0	5¾	18	12¼	7

Valves for Marine Service . . . . page 230
Thread engagement . . . . . page 352

Bonnets: Sizes 2-inch and smaller have a union bonnet, as shown in the full illustrations; 2½ and 3-inch sizes have a compact, inside screw bolted bonnet, equipped with a gasket, as shown in the partial section of the non-rising stem valve at the left.



2½ and 3-inch valves have a bolted bonnet.

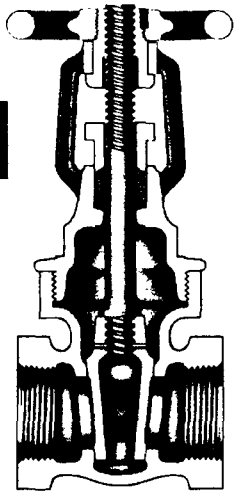
Both bonnet types provide a strong, tight joint, yet they are easily dismantled and reassembled without danger of damaging the valve.

Stuffing box; repacking: The stuffing box is large and deep, has a gland, and is filled with high grade packing to assure a tight stem seal. The valves, when wide open, can be repacked while under pressure.

300-Pound Bronze Flanged Gate Valves . . . . page 26

200-Pound Bronze Gate Valves

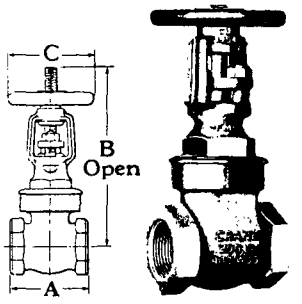
Outside Screw and Yoke — Wedge Disc



No. 459, Cross Section

Working Pressures
200 psi steam, **550** F
400 psi non-shock cold water, oil, or gas

Test Pressure
600 psi hydrostatic



No. 459, Screwed
Underwriters' Pattern in sizes ¾ to 2-inch.

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

Materials and construction: The valves are the outside screw and yoke type. Their body, bonnet, and wedge disc are Crane Special Bronze, a high grade material conforming to ASTM B61 requirements.

The valves are ideally used where action of the fluid in the line might affect inside stem threads; in addition, stem threads can be easily lubricated when necessary, thereby minimizing wear. The valve stuffing box is equipped with a gland and is filled with high grade packing. When wide open, the valves can be repacked while under pressure.

Underwriters' Specifications: The No. 459 in sizes ¾-inch to 2-inch have been approved by the Underwriters' Laboratories, Inc., and Factory Mutual Laboratories. The valve markings include the "CU" and "FM" designations.

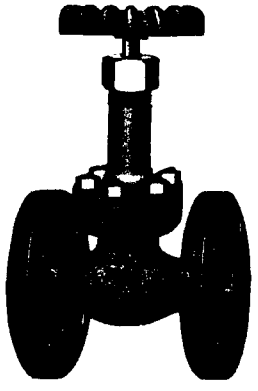
Weights and Dimensions — Prices on Request

Size	No. 459 Screwed	Dimensions, in Inches		
Inches	Pounds Each	A	B	C
½	3.5	2⅝	6⅜	3 5/16
¾	3.5	2⅝	6⅜	3 5/16
1	4.4	3	7⅜	3⅝
1¼	6.8	3½	8¾	3⅞
1½	10.0	4	9¾	4⅜
2	15.5	4¾	11⅝	4 13/16
2½	21.0	5⅜	13⅞	5¾
3	34.0	6	16⅛	6 11/16

Other 200-pound bronze gate valves . . . . page 24

300-Pound Bronze Gate Valves

Rising Stem — Wedge Disc — Monel Seats



No. 623½ E, Flanged
The 1-inch size has a union bonnet (not illustrated).

Working Pressures
300 psi steam, **550** F
500 psi non-shock cold water, oil, gas, or air

Test Pressure
900 psi hydrostatic
Air Tested

The No. 623½ E are exceptionally durable, flanged end gate valves recommended for high pressure service. The body, bonnet, and disc are Crane Special Bronze (ASTM B61); the disc, slipped onto a strong head on the stem end, is accurately guided in the body to prevent contact between the seating surfaces until the valve is almost closed. The renewable type, screwed-in body seat rings are made of wear-resistant, corrosion-resistant Monel. The large, deep stuffing box is equipped with a gland, the valves, when wide open, can be repacked while under pressure.

The 1-inch valves have a union bonnet; larger sizes have an inside screw, bolted bonnet with steel studs, bronze nuts, and Cranite gasket.

End flanges: End flanges conform to the American Standard (B16 24-1953) for 300-Pound Bronze Flanges; they are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. The valves are regularly furnished faced and drilled (F & D); they can be furnished faced only, if specified. Full face gaskets should be used; see page 321.

Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches				
No. 623½ E	Inches	Pounds Each	Face to Face	Center to top, open	Dia. of wheel	Flange diameter	Flange thickness
Flanged F & D	1	11.0	4¾	8⅜	3⅝	4⅞	19/32
	1¼	16.0	5¼	9¾	4 1/16	5¼	⅝
	1½	27.0	6	11	4¾	6⅛	11/16
	2	30.0	6½	13½	5⅜	6½	¾
	2½	44.0	7½	15½	5⅜	7½	13/16
	3	62.0	8	18⅛	7	8¼	29/32

Other 300-pound bronze gate valves..page 25
Templates for drilling.....page 326

SECTION 4

Crane Bronze Globe and Angle Valves

(Including AAR Valves)

Names of Parts.....pages 28 and 42

Globe Valves
100-Pound.....page 29
125-Pound.....pages 30 and 31
150-Pound.....pages 32 to 34
200-Pound.....pages 38 and 39
300-Pound.....pages 40 to 43
2500-Pound Hydraulic.....page 44
Needle Point and Needle Air.....page 36
For Liquefied Petroleum Gases.....page 37

Angle Valves
100-Pound.....page 29
125-Pound.....pages 30 and 31
150-Pound.....pages 32 to 34
200-Pound.....pages 38 and 39
300-Pound.....pages 40, 42, and 43
Needle Point.....page 36
For Liquefied Petroleum Gases.....page 37

AAR Globe and Angle Valves
Types.....page 42
Names of Parts and Ordering Information.....page 42

Diaphragm Valves.....page 35

4

For other bronze products, supplementing those indexed above, refer to:

Bronze gate valves.....Section 3
Bronze check and foot valves.....Section 5
Bronze safety and relief valves.....Section 18
Bronze valves for marine service.....Section 20
Bronze lever-operated quick-opening valves.....pages 56 to 58
Bronze radiator valves.....page 59
Bronze hose valves.....pages 60 and 61
Bronze cocks and stops.....pages 64 and 65
Bronze pressure regulators.....pages 246 to 249

Use Crane steel valves for high pressure-temperature service

For pressures and temperatures that are beyond the scope of bronze or iron valves, and for unusually severe services, Crane manufactures a complete line of steel globe and angle valves. Made to Crane's high standards, these valves are available in a wide range of sizes and with screwed, flanged, butt-welding, or socket-welding ends.

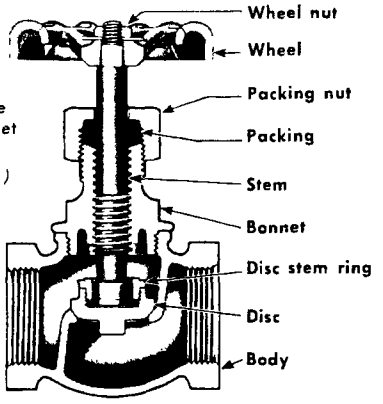
For steel globe and angle valves of the conventional types, see Section 13; for valves of the Pressure-Seal and Lip-Seal Bonnet types, see Section 15.

Bronze Globe and Angle Valves

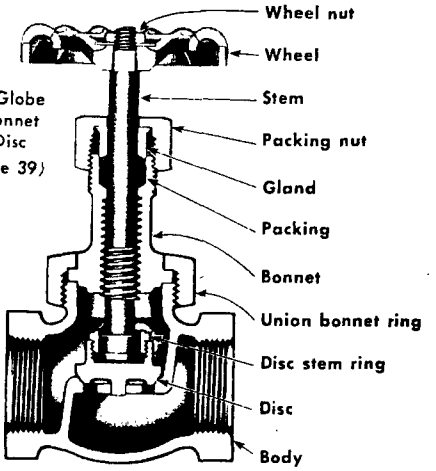
Names of Parts

4

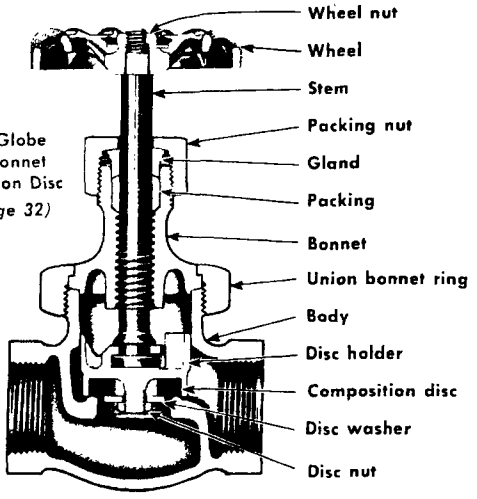
No. 1, Globe
Screwed Bonnet
Metal Disc
(see page 31)



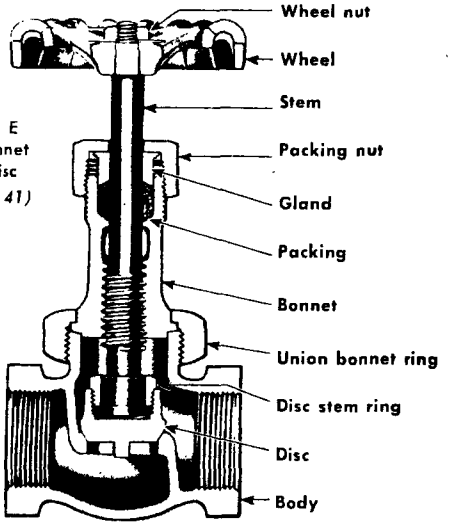
No. 70, Globe
Union Bonnet
Metal Disc
(see page 39)



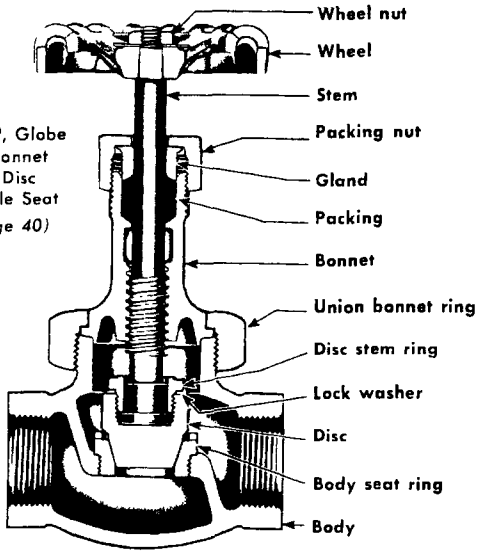
No. 7, Globe
Union Bonnet
Composition Disc
(see page 32)



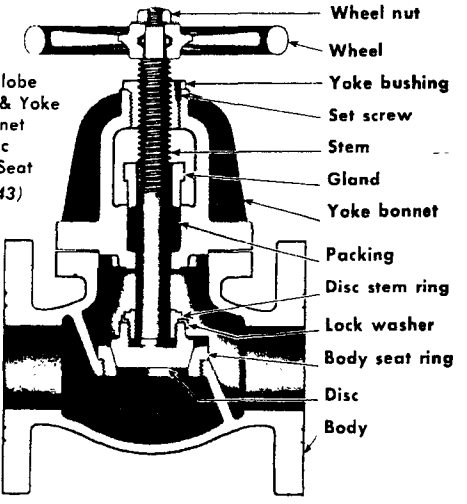
No. 362 E
Union Bonnet
Metal Disc
(see page 41)



No. 382 P, Globe
Union Bonnet
Metal Disc
Renewable Seat
(see page 40)

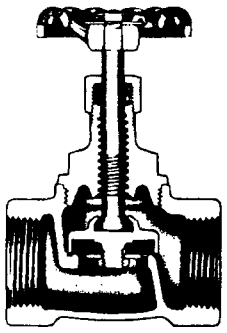


No. 87 P, Globe
Outside Screw & Yoke
Bolted Bonnet
Metal Disc
Renewable Seat
(see page 43)

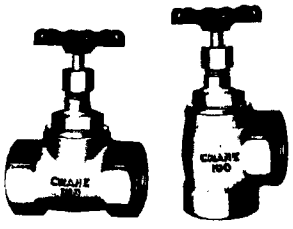


100-Pound Bronze Globe and Angle Valves

Composition Disc



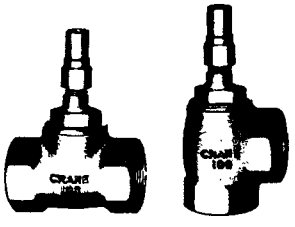
Cross Section
No. 1240



With Wheel

No. 1240 Globe Screwed

No. 1241 Angle Screwed



With Lock Shield

No. 1260 Globe Screwed

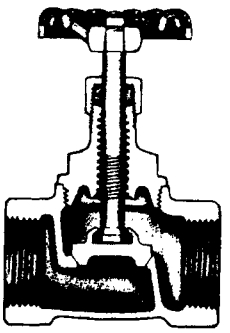
No. 1261 Angle Screwed

Working Pressures, Non-Shock

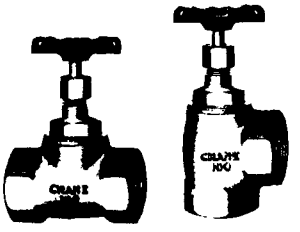
Fluid	Composition Disc Valves		Bronze Disc Valves
	Globe or Angle with No. 12 Disc (regular)	Globe Only with No. 10 Disc (optional)	
Cold Water, Oil, or Gas	150 psi	...	150 psi
Saturated Steam	...	100 psi	100 psi

Composition disc valves are recommended for domestic gas service.

Bronze Disc



Cross Section
No. 1250



No. 1250 Globe Screwed

No. 1251 Angle Screwed

This diversified line of sturdy, well proportioned valves combines wide utility with moderate cost. The valves offer ample strength and durability for any low pressure installation . . . . such as domestic water and gas lines, steam heating systems, for piping on equipment operated at low pressures, and similar services.

Body: The body is made of bronze (ASTM B 62) and is designed with long, flat hexagons which reinforce the openings and afford a positive wrench grip.

Construction: Except for their discs, the composition and bronze disc valves are similar. The bonnet screws into the body and has liberal thread engagement with the stem. An amply deep stuffing box provides a tight stem seal. The seat is integral with the body.

Composition disc: Composition disc valves have a bronze disc holder which is spun onto the end of the stem. The valves are regularly furnished with a No. 12 Disc suitable for water (up to 200 F), oil, and gas (including domestic gas) service. The globe valves only, when specified, can be furnished with a No. 10 Disc making them suitable for saturated steam service. Angle valves may be converted to saturated steam service by the user; simply replace the original disc with a No. 10 disc. For description and service recommendations of composition discs, see page 281.

Bronze disc: Bronze disc valves have a ball-to-angle seat. The disc is spun onto the stem end on sizes ¾-inch and larger and, in smaller sizes, is integral with the stem (not illustrated). The valves are suitable for steam, water, oil, or gas; however, composition disc valves are recommended for domestic gas.

Other low pressure bronze valves: For screwed end gate and lift check valves, see pages 17 and 47 respectively. For solder-joint valves, see page 17 for gates, page 30 for globe and angles, and page 46 for swing checks.

Weights and Dimensions — Prices on Request

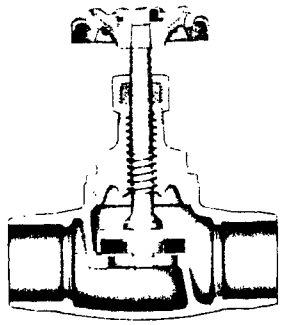
Size	Pounds, Each						Dimensions, in Inches								
	Composition Disc				Bronze Disc		End to end	Center to end	Center to Top, Open						Diameter of wheel
	With Wheel		With Lock Shield		With Wheel				No. 1240	No. 1241	No. 1260	No. 1261	No. 1250	No. 1251	
Inches	No. 1240 Globe	No. 1241 Angle	No. 1260 Globe	No. 1261 Angle	No. 1250 Globe	No. 1251 Angle	All Globe	All Angle							
⅛	0.43	...	...	...	...	...	1⅞	...	2¾	...	...	...	...	...	1½
¼	0.43	0.41	0.43	0.41	...	...	1⅞	⅞	2¾	2½	3¼	2⅝	...	...	1½
⅜	0.52	0.50	0.52	0.50	0.52	0.5	2	15/16	2⅞	2⅜	3¼	2⅞	3	2⅝	1½
½	0.8	0.8	0.8	0.8	0.8	0.8	2⅜	1⅛	3½	3⅛	3¾	3¼	3½	3¼	1¾
¾	1.2	1.1	1.2	1.1	1.2	1.1	2¾	15/16	4	3¾	4	3⅝	4⅛	3⅞	2 1/16
1	1.9	1.7	1.9	1.7	1.9	1.7	3¼	1½	4½	4¼	4¾	4⅝	4¾	4⅜	2 9/16
1¼	2.7	2.6	2.7	2.6	2.7	...	3⅞	1 13/16	4⅞	4⅝	5½	5¼	5	...	2¾
1½	4.0	3.8	...	..	4.0	...	4¼	2	5½	5¼	...	...	5⅝	..	3 1/16
2	6.3	5.8	...	..	6.3	...	5	2¼	6	5⅞	..	...	6¼	...	3⅝

Extra composition discs....page 281

Keys for lock shield valves....page 283

125-Pound Bronze Globe and Angle Valves

Solder-Joint Ends — Composition Disc



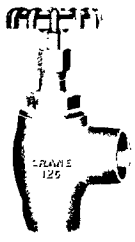
Cross Section, Globe



No. 1310
Globe, Solder-Joint



No. 1310½
Globe, Solder-Joint
With Right Hand Drain



No. 1311
Angle, Solder-Joint

Solder-joint gate and checks: The complete Crane line of solder-joint valves includes gate valves shown on page 17 and swing check valves shown on page 46

Working Pressures, Non-Shock

Fluid	With No. 12 Composition Disc (regular)	With No. 10 Composition Disc (optional)
Water	200 psi, 200 F	....
Saturated Steam	....	125 psi

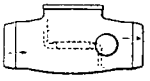
Recommendations: Crane globe and angle valves with solder-joint ends are recommended for use on steam or water lines. They are well suited for plumbing and heating systems, for low pressure steam and water piping in industrial plants, and for similar service

Important —When the valves are installed on steam lines, the solder used to make the joints must have a melting point high enough to withstand the temperature of the steam.

Design: The valves combine the advantages of light weight with sturdy construction. All parts are made of good quality materials, the body being made of bronze conforming to ASTM Specification B62; body ends comply with American Standard, B16 18-1950, for Cast Brass Solder-Joint Fittings.

The disc holder is spun onto the stem end. The stuffing box is amply deep to prevent leakage around the stem.

Composition disc: The valves are regularly furnished with a No. 12 Composition Disc for water service Valves ordered for saturated steam are equipped with a No. 10 Disc For description, dimensions, and service recommendations of composition discs, refer to page 281.

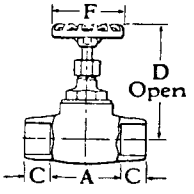


Drain on No. 1310½: The No. 1310½ Globe, available in ½ and ¾ inch sizes only, is furnished with a right hand drain. The inset illustration indicate the position of the drain.

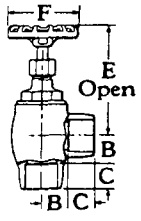
Repacking: Any of the valves, when wide open, can be repacked while under pressure.

Instruction tag: These valves are furnished with a tag giving special instructions for soldering.

Larger sizes and higher pressure valves: When larger sizes or valves suitable for higher pressures are wanted, Crane screwed end valves with solder-joint adaptors are recommended.



Globe



Angle

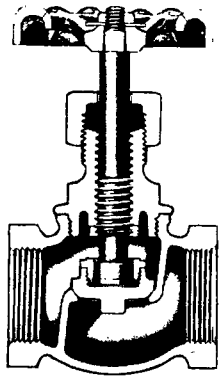
Weights and Dimensions — Prices on Request

Valve Type	Size Inches	Weight Pounds Each	Dimensions, in Inches A	B	C	D	E	F
No. 1310, Globe	⅜	.5	1½		7/16	2⅞		1½
	½	.8	1¾		9/16	3½		1¾
	¾	1.2	1 15/16		13/16	4		2 1/16
	1	1.8	2⅜		15/16	4½		2 9/16
	1¼	2.5	2¾		1	4⅞		2¾
	1½	3.6	3 3/16		1⅛	5½		3 1/16
	2	5.6	3⅞		1⅜	6		3⅝
No. 1310½, Globe With Drain	½	0.8	1¾		9/16	3½		1¾
	¾	1.2	1 15/16		13/16	4		2 1/16
No. 1311, Angle	⅜	.5		9/16	7/16		2⅝	1½
	½	.7		⅝	9/16		3⅛	1¾
	¾	1.0		¾	13/16		3¾	2 1/16
	1	1.6		⅞	15/16		4¼	2 9/16

Extra composition discs . . . .page 281

125-Pound Bronze Globe and Angle Valves

Screwed Ends — Bronze Disc



Cross Section

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

Recommendations: These valves are recommended for general service on steam, water, oil, or gas lines.

Materials: Except for the wheel, metal parts are bronze, the body being made of bronze conforming to requirements of ASTM Specification B 62.

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

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

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

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

Federal Specification: These globe and angles comply respectively to requirements for Type I and Type II Valves, as covered in Federal Specification WW-V-51a for Class "A" 125-Pound Bronze Valves (for land use).

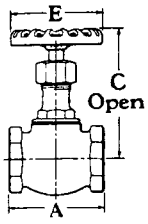
Flanged valves: When flanged valves are required, use the No. 71 Globe or No. 711 Angle Valves described on page 39.



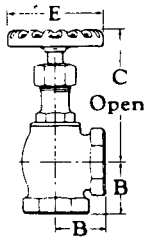
No. 1
Globe, Screwed



No. 2
Angle, Screwed



Globe

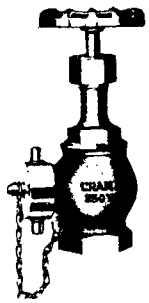


Angle

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	No. 1 Globe	No. 2 Angle	A Globe	B Angle	C	E
Inches	Screwed	Screwed				
⅛	0.3	0.3	1 7/16	¾	2¾	1½
¼	0.5	0.4	1⅝	13/16	3	1¾
⅜	0.6	0.5	1⅞	15/16	3¼	2 1/16
½	1.0	0.9	2 3/16	1⅛	3¾	2 9/16
¾	1.5	1.5	2 11/16	1⅜	4¼	2¾
1	2.4	2.2	3 3/16	1⅝	5	3 1/16
1¼	3.5	3.3	3 11/16	1 13/16	5½	3⅝
1½	5.0	4.8	4 3/16	2 1/16	6¼	4 1/16
2	8.0	8.0	5⅛	2½	7½	4¾
2½	12.0	10.0	6 1/16	3 1/16	7½	5⅜
3	19.5	20.0	7 1/16	3 11/16	9¼	6

Hose Valves



No. 117
Angle Hose Valve
with
Cap and Chain

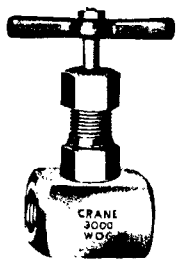
See pages 60 and 61

Crane offers a variety of bronze hose valves in a wide range of sizes. Among these are Angle and Chicago Hose Valves, widely used on standpipes, hose racks, and similar services; Underwriters' Hose Gate; and Garden Hose Valves. A variety of hose threads are available.

Steel Valves

No. 222 H
Globe Valve
Female
Steel Bar Stock

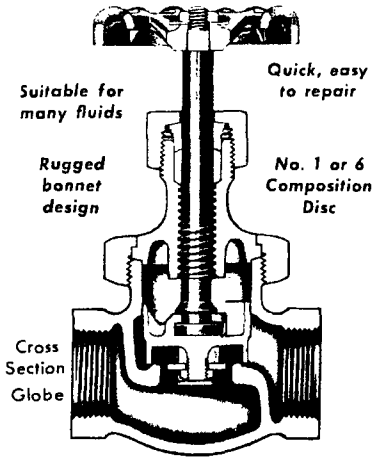
See pages
136 and 196

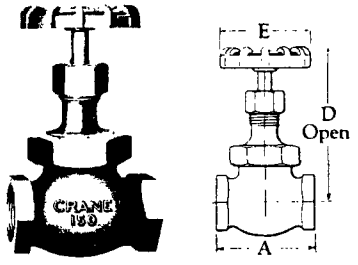


The Crane line of bar stock valves includes small, rugged steel, Exelloy, and 18-8 SMo globe and angle valves. They are used on orifice meters, regulator leads, by-passes, gauges and many similar services. Available with female or with male and female ends.

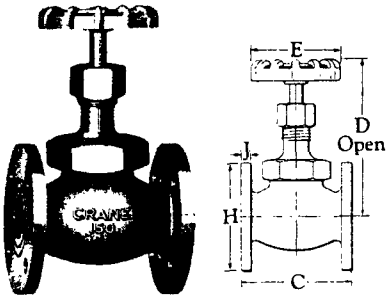
150-Pound Bronze Globe and Angle Valves

Composition Disc

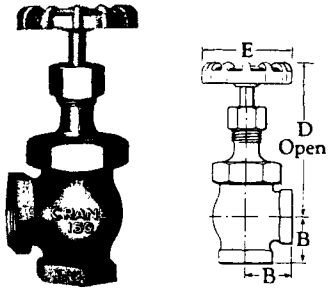




No. 7
Globe, Screwed



No. 9
Globe, Flanged

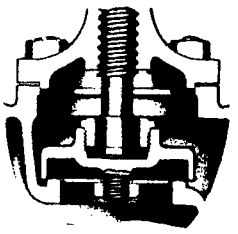


No. 17
Angle, Screwed

Extra composition discs . . . . page 281
Templates for drilling . . . . . page 326

Working Pressures, Non-Shock

Valve Ends	With No. 1 Cranite Disc (regular)		With No. 6 Disc (optional)
	Saturated Steam	Hot Water (200-300 F)	Water up to 200 F, Oil, Gas, or Air
Screwed	150 psi	300 psi	300 psi
Flanged	150 psi	225 psi	225 psi



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

Recommendations: These rugged valves are unexcelled where quick disc replacement is necessary. When equipped with the proper disc, they will give excellent results on steam, water, oil, gas, gasoline, or air lines.

Quick repairs: A leak is easily repaired. Replace the disc holder with an extra complete holder and disc, or, insert a new disc into the original holder. Extra parts should be kept on hand for this purpose.

Materials: Except for the wheel, metal parts are bronze, the body being made of bronze conforming to ASTM B 62.

Construction: Valves 2-inch and smaller have a slip-on disc holder and union bonnet, as illustrated at the upper left. Larger sizes have the disc holder and stem fastened with a disc stem ring and are equipped with an inside screw, bolted bonnet, as illustrated at the upper right. Both bonnet types provide a strong, tight joint, yet either is easily dismantled and reassembled without danger of damaging the valve.

Discs: The valves will be furnished with a No. 1 Cranite Disc for saturated steam or for hot water (from 200 to 300 F), unless a No. 6 Disc for water (up to 200 F), oil, gas, gasoline, or air is specified. For service recommendations and description of discs, see page 281.

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

Federal Specification: Globe and angle valves comply, respectively, to requirements for Type I and Type II Valves, as covered in Federal Specification WW-V-51a for Class "B" 150-Pound Bronze Valves (for land use).

Flanged valves: The dimensions and drilling of end flanges conform to the American Standard (B16.24-1953) for 150-Pound Bronze Flanges. Flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. The valves are regularly furnished faced and drilled; they will be furnished faced only, when specified. Full face gaskets should be used; see page 321.

Weights and Dimensions — Prices on Request

Size	Pounds, Each			Dimensions, in Inches						
	No. 7 Globe	No. 9 Globe	No. 17 Angle	A	B	C	D	E	End Flanges	
		Flanged							H	J
Inches	Screwed	F & D	Screwed				open			
1/8	0.8	. .	0.8	2	15/16		3¾	1¾	. . .	. . .
¼	0.8		0.8	2	15/16		3¾	1¾	. . .	. . .
⅜	1.2	. .	1.1	2 5/16	1 1/16		4⅜	2 1/16	. . .	. . .
½	1.7		1.6	2 11/16	1¼		4¾	2 9/16	. .	. .
¾	2.6	. .	2.3	3 3/16	1 7/16		5⅜	2¾	. . .	. .
1	3.8	6.9	3.6	3¾	1 11/16	4⅜	6⅛	3 1/16	4¼	⅜
1¼	5.7	8.8	5.4	4¼	2	4 13/16	6¾	3⅝	4⅝	13/32
1½	7.9	12.0	7.4	4¾	2 3/16	5½	7⅝	4 1/16	5	7/16
2	13.0	19.5	12.0	5¾	2 11/16	6½	8⅝	4¾	6	½
2½	22.5	32.0	22.0	6¾	3¼	7½	10½	7	7	9/16
3	36.0	45.0		8	. .	8⅞	12	8	7½	⅝

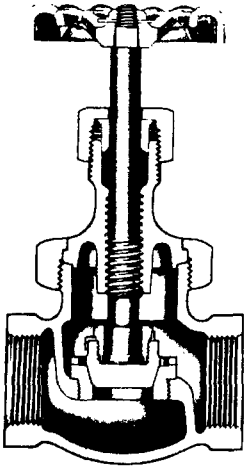
150-Pound Bronze Globe and Angle Valves

Plug Type Disc

Working Pressures
150 psi saturated steam
300 psi non-shock cold water, oil, gas, or air

Air Tested

Crane "500 Brinell" Stainless Steel seating surfaces . . . . plug type disc and renewable body seat ring . . . . union bonnet on sizes 2-inch and smaller . . . . bolted bonnet on sizes 2½ and 3-inch

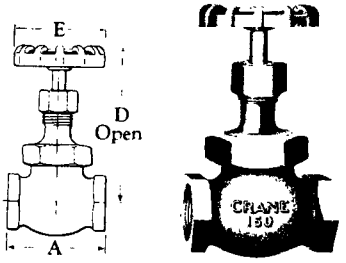


Cross Section, Globe

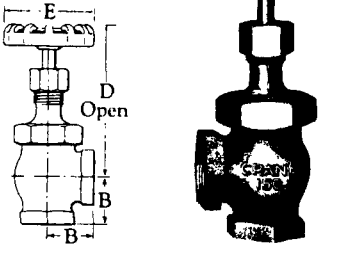
Recommendations: These valves are recommended for throttling, for soot blower, blow-off, boiler feed, drip, and drain lines, and for other hard services. Having a disc and seat made of Crane "500 Brinell" Stainless Steel, they are well suited for use where operating conditions are severe.

Plug type disc valves for moderate pressures: High pressure valves are often used on much lower pressures in order to obtain the better seat construction usually associated with higher pressures. These valves are unique in that, although recommended for 150 psi saturated steam and 300 psi water, oil, gas, or air, they have a seat and disc that will withstand extremely hard operating conditions. For severe and exacting services on moderate pressures, such as throttling, blow-off, boiler feed, frequent operation, etc., they are ideal. They provide abundant seat life without the greater initial cost of a high pressure valve.

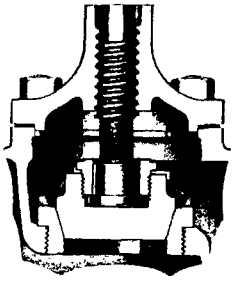
Disc and seat: The valves have a plug type disc and seat whose excellent design characteristics for rigorous service are well known. The wide seating surface is unusually resistant to foreign matter and to wiredrawing, and the tapered disc permits close regulation of flow when throttling.



No. 14½ P
Globe, Screwed



No. 16½ P
Angle, Screwed



2½ and 3-inch valves have a bolted bonnet.

The disc and seat ring are Crane "500 Brinell" Stainless Steel. This metal offers excellent resistance to wear, temperature, galling, and scoring; it is harder, tougher, and stronger than metals ordinarily used in bronze valves.

Sturdy construction: The valves are ruggedly constructed throughout. Their body, bonnet, and stem are proportioned to provide liberal strength and safety under the recommended working pressures. The body is made of bronze conforming to requirements of ASTM Specification B 62.

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

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

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

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

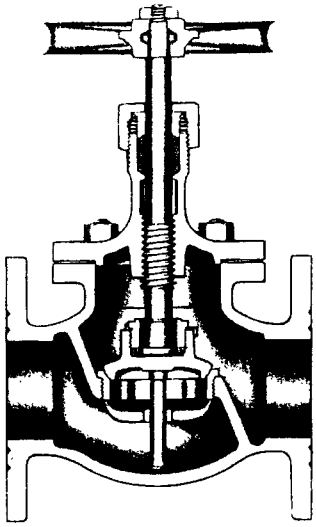
Valves for Marine Service....page 230

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	No. 14½ P Globe	No. 16½ P Angle	A	B	D open	E
Inches	Screwed	Screwed				
⅛	.8	.	2	. . .	4	1¾
¼	.8	.8	2	15/16	4	1¾
⅜	1.1	1.1	2 5/16	1 1/16	4½	2 1/16
½	1.8	1.7	2 11/16	1¼	5	2 9/16
¾	2.5	2.4	3 3/16	1 7/16	5¾	2¾
1	4.0	3.7	3¾	1 11/16	6⅝	3 1/16
1¼	5.7	5.5	4¼	2	7	3⅝
1½	8.0	7.4	4¾	2 3/16	8	4 1/16
2	13.0	13.0	5¾	2 11/16	9⅛	4¾
2½	23.0	. .	6¾		10½	7
3	36.0		8		11⅞	8

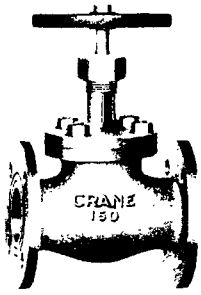
150-Pound Bronze Globe and Angle Valves

Bolted Bonnet



Cross Section, Globe

Construction above is typical of valves 3-inch and smaller The 4-inch valves have outside stem threads and a bolted gland.



No. 4197
Globe, Flanged



No. 4199
Angle, Flanged

Working Pressures		Hydrostatic Test Pressure
Steam 550 F	Cold Water, Oil, or Gas Non-Shock	
150 psi	225 psi	450 psi

Rugged bolted bonnet flanged valves designed for large size pipe lines

Recommendations: These high quality 150-pound bronze valves are especially intended for use in large size pipe lines. They are recommended for general service on steam, water, oil, or gas.

Materials: All parts are made of high grade materials. The body, bonnet, body seat ring, and disc are made of Crane Special Bronze, a hard, leaded tin bronze conforming to ASTM Specification B 61 requirements.

Construction: The valves feature rugged, durable construction. Their bolted bonnet design assures a tight body-bonnet joint which can be easily dismantled and reassembled without danger of damaging the valve.

The disc is accurately guided by a guide stem which operates in a bridge cast integral with the body seat ring; the seat ring is renewable.

Valves 3-inch and smaller have inside stem threads, a screwed packing nut, and a gland, as illustrated in the cross section at the upper left.

In the 4-inch size (not illustrated), the valves have outside stem threads with a crosshead type yoke and one-piece bolted gland and flange.

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.

End flanges: The dimensions and drilling of end flanges conform to the American Standard (B16.24-1953) for 150-Pound Bronze Flanges. The flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

Drilling: The valves are regularly furnished faced and drilled (F & D). Faced only valves can be furnished when specified. Full face gaskets should be used; see page 321.

Weights and Dimensions — Prices on Request

Valve Type	Size	Pounds	Dimensions, in Inches					
			Face to face	Center to face	Center to top, open	Diameter of wheel	End Flanges	
Flanged (F & D)	Inches	Each					Diameter	Thickness
No. 4197 Globe	1½	14.0	5⅞	2 15/16	8	4 1/16	5	7/16
	2	23.0	6⅞	3 7/16	9¼	5⅜	6	½
	2½	36.0	8	4	11	7	7	9/16
	3	48.0	9⅛	4 9/16	12½	8	7½	⅝
	4	88.0	11	5½	13¾	10	9	11/16
No. 4199 Angle	1½	14.0		3⅛	7½	4 1/16	5	7/16
	2	21.5		3¾	9	5⅜	6	½
	2½	36.0		4¼	10½	7	7	9/16
	3	48.0		4⅝	11¾	8	7½	⅝
	4	88.0		5½	12½	10	9	11/16

Valves for Marine Service . . . page 230
Templates for drilling . . . . . page 326

Bronze Packless Diaphragm Valves

(Patented and Patents Pending)

Tight-seating diaphragm valves . . . . unexcelled for a wide variety of general and corrosive services

Crane packless diaphragm valves, long a prime favorite, are built for hard usage and dependable performance in general and corrosive services.

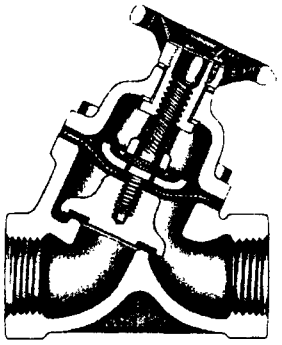
Included in Crane's extensive line of diaphragm valves are the bronze screwed end valves listed on this page. As shown in the illustration at the right, the flexible diaphragm mounted between the body and bonnet eliminates the need for a stuffing box and, coupled with the "tight-seating" disc facing, makes the valves ideal for conveying liquids, compressed air, gases, volatile fluids, etc.

Bronze diaphragm valves are regularly furnished in sizes ½ to 2-inch . . . . with a neoprene, Buna N, natural rubber, or Kel-F diaphragm and disc insert . . . and for wheel or sliding stem operation

A complete line: The bronze valves described briefly on this page are only a small portion of Crane's complete line. In addition to bronze, the Crane line includes both wheel-operated and sliding stem cast iron, aluminum, and 18-8 SMo valves with a choice of disc insert and diaphragm materials and with screwed or flanged ends, the latter being available in sizes up to 14-inch

Cast iron flanged valves having the body internally lined, and the disc coated, with neoprene or natural rubber are also regular products.

For complete design and construction features, weights, dimensions, and recommendations for the entire Crane line, see Section 16, pages 181 to 188.



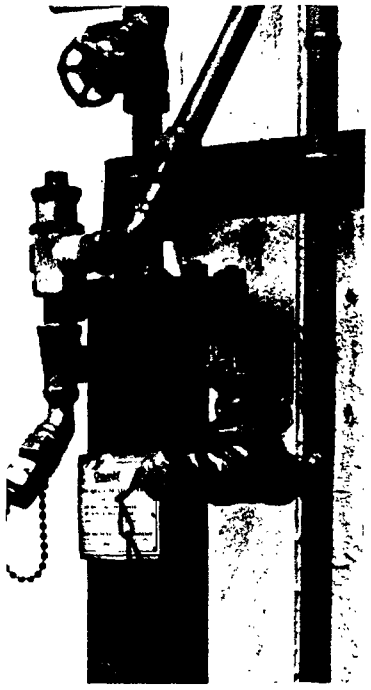
Sectional of a bronze packless diaphragm valve. The valves are described in greater detail in Section 16

4

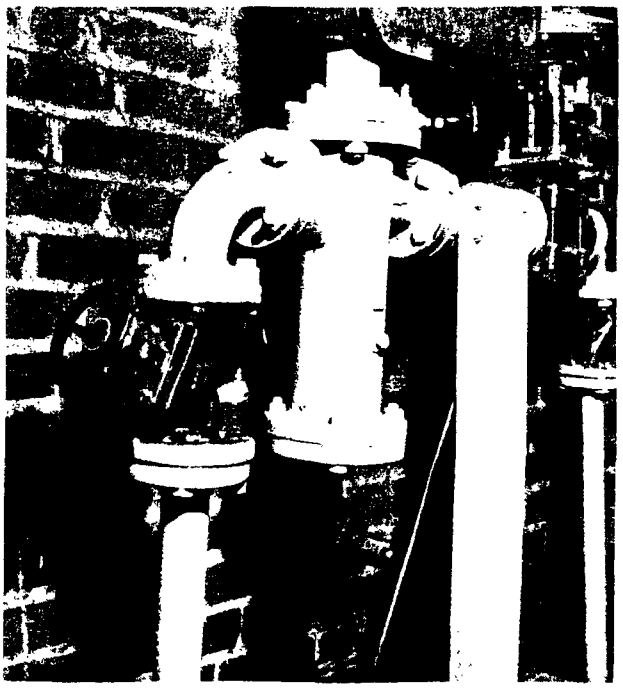
Types, Sizes, and Ratings

Bronze Screwed Diaphragm Valve Catalog Numbers		Sizes	Diaphragm and Disc Insert Materials	Pressure-Temperature Ratings
Wheel-Operated	Sliding Stem	Inches		Water, Oil Air, or Gas
1600	5600	½ to 2	Neoprene	150 psi, 180 F
1600-SB	5600-SB	½ to 2	Buna N	150 psi, 180 F
1600-RN	5600-RN	½ to 2	Natural Rubber	150 psi, 180 F
1600-KF	5600-KF	½ to 2	Kel-F	150 psi, 200 F

For complete description, dimensions, recommendations, etc., for the above valves . . . as well as for cast iron, aluminum, 18-8 SMo, and neoprene or rubber-lined diaphragm valves . . . see Section 16.



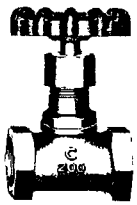
Diaphragm valves especially designed for oxygen service are available; see page 184.



Crane packless diaphragm valves installed in a sulfuric acid line.

Bronze Globe and Angle Valves

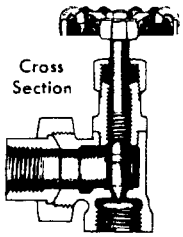
Needle Point



No. 88
Globe, Screwed

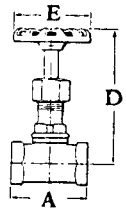


No. 89
Angle, Screwed

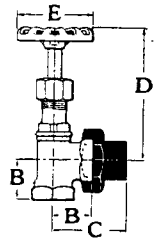


No. 85
Angle, Screwed with
Female Union Outlet

Working Pressures
200 psi saturated steam
400 psi non-shock cold water, oil, or gas



Globe Valve



Angle Valves

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

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

Body: The body is made of bronze conforming to requirements of ASTM Specification B 62.

Construction: The valves are unusually rugged, compact, and well proportioned throughout. The stem is bronze. The stuffing box is large and, on the ¾-inch size, is equipped with a gland.

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

Seat opening: The diameter of the seat opening is listed in the table below. The ⅛-inch size has a nominal seat opening; larger sizes have a reduced seat opening.

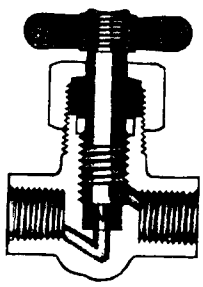
Weights and Dimensions — Prices on Request

Size	Pounds, Each			Dimensions, in Inches					
Inches	No. 88 Globe	No. 89 Angle	No. 85 Angle Union Outlet	A	B	C	D open	E	Diameter of seat opening
⅛	0.3	0.3	0.3	1 3/16	5/8	1 5/16	2 3/8	1 1/2	⅛
¼	0.4	0.4	0.5	1 9/16	1 3/16	1 9/16	2 3/8	1 1/2	3/16
⅜	0.5	0.5	0.7	1 13/16	7/8	1 3/4	2 3/4	1 3/4	¼
½	0.8	0.8	1.0	2 1/16	1 1/16	2	3 1/8	2 1/16	5/16
¾	1.1	1.1	1.8	2 5/16	1 1/4	2 3/16	4	2 9/16	7/16

Bronze Needle Air Valve

Working Pressure
300 psi non-shock cold water, oil, gas, or air

Recommendations: This is a heavy, rugged valve 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.



Cross Section

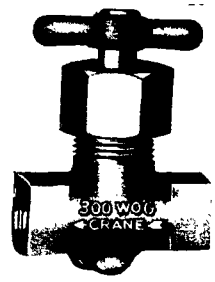
Installation: The valve should always be installed with the pressure above the seat.

Construction: The body and packing nut are made of bronze. The malleable iron tee handle is threaded onto a bronze 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.

Weight and Dimensions — Price on Request

No. 57 Needle Air Valve	Size	Pounds	Dimensions, in Inches		
	Inches	Each	End to end	Center to top of stem, open	Diameter of seat opening
	⅜	0.9	2 5/16	2 1/2	⅛



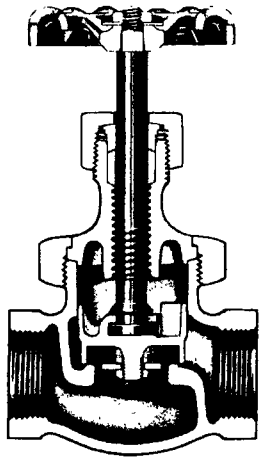
No. 57
Needle Air Valve

Bronze Globe and Angle Valves
For Liquefied Petroleum Gases

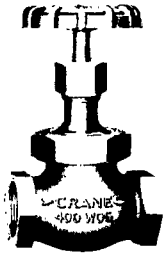
Working Pressure
400 psi non-shock, **150** F
LP-gases, light oils, volatile fluids, or air

Test Pressure
600 psi hydrostatic
Air Tested

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



Cross Section, Globe



No. 130
Globe, Screwed



No. 131
Angle, Screwed

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

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

In addition, the valves are excellent for use on water (up to 200 F), compressed air, gasoline, light oils, volatile fluids, and similar services operating at pressures up to 400 psi.

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

With reasonable attention and occasional replacement of the disc, the valves will remain tight indefinitely.

Body and bonnet: The body is made of Crane Special Bronze, a high grade, leaded tin bronze conforming to ASTM Specification B 61.

The union bonnet provides a strong, tight joint, yet it can be easily dismantled and reassembled without danger of damaging the valve.

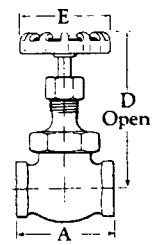
Durable composition disc: The valves have a Crane No. 6 Disc. Made of a specially formulated composition, the disc is particularly suited for use with petroleum products. It is soft enough to make a tight seat, and yet, is sufficiently stiff and resilient to withstand hard wear.

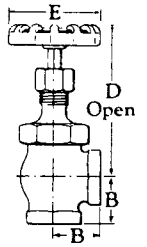
The disc holder slips on to the end of the stem and the disc, in turn, is secured to the underside of the holder by means of a washer and a self-locking nut. The washer and nut also serve to reinforce and protect the disc from strain and distortion ordinarily resulting from tight closure of a valve. As an added precaution against leakage, the disc is sealed into the disc holder.

Quick disc repairs: A leak is easy to repair. Simply replace the disc holder with an extra complete disc holder and disc, or insert a new disc into the original holder. For long, practically uninterrupted valve service, a supply of extra disc holders and discs should be kept on hand for replacement purposes.

Stuffing box; repacking: The stuffing box has a gland and is filled with one-piece molded asbestos packing to provide a long lasting, tight stem seal. The valves, when wide open, can be repacked while under pressure.

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





Weights and Dimensions — Prices on Request

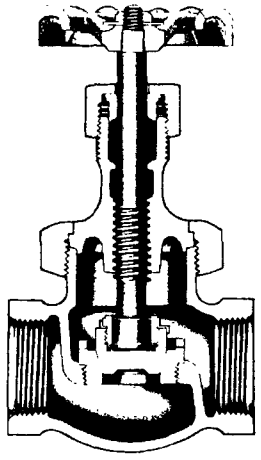
Size	Pounds, Each		Dimensions, in Inches			
Inches	No. 130 Globe Screwed	No. 131 Angle Screwed	A Globe	B Angle	D open	E
1/4	0.8	0.8	2	15/16	3 5/8	1 3/4
3/8	1.2	...	2 5/16	...	4 1/4	2 1/16
1/2	1.7	1.5	2 11/16	1 1/4	4 5/8	2 9/16
3/4	2.5	2.3	3 3/16	1 7/16	5 1/4	2 3/4
1	4.0	3.5	3 3/4	1 11/16	6	3 1/16
1 1/4	6.0	5.5	4 1/4	2	6 5/8	3 5/8
1 1/2	8.0	8.0	4 3/4	2 3/16	7 3/8	4 1/16
2	13.0	12.5	5 3/4	2 11/16	8 3/8	4 3/4

For extra composition discs, see page 281.

Bronze valves for LP-gases.....Gate, see page 24.....Check, see page 49.

200-Pound Bronze Globe and Angle Valves

Plug Type Disc



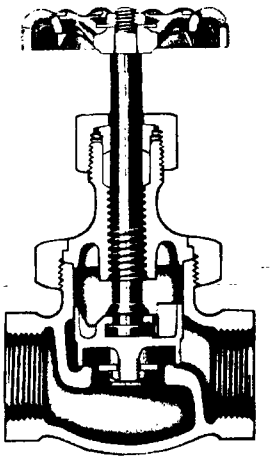
Cross Section, Globe

Valve		Working Pressures: Steam	Working Pressures: Cold Water, Oil, Gas, Air, Non-Shock	Hydrostatic Test Pressures
No. 212 P or 214 P		200 psi, 550 F	400 psi	600 psi
No. 229 C	No. 4 Disc	200 psi, 450 F	*	600 psi
	No. 6 Disc	...	400 psi	600 psi

Nos. 212 P and 214 P are regularly air tested.

**No. 229 C Valves with a No. 4 Cranite Disc (furnished unless No. 6 Disc is specified) are also used for hot water up to 400 psi at temperatures over 200 F up to 420 F.*

Composition Disc

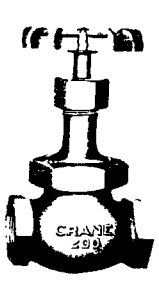


Cross Section, Globe

These valves are made of quality materials. Their body is Crane Special Bronze, a leaded tin bronze conforming to ASTM B 61. Plug type disc valves have a screwed-in body seat ring and a metal disc. In the composition disc valves, the seat is integral with the body.

Plug type disc valves: The No. 212 P and No. 214 P are recommended for severe services such as for throttling, and for blow-off, boiler feed, soot blower, drip, and drain lines. Their plug type disc and seat are designed for exacting use. The wide seating surface is not easily affected by foreign matter or wiredrawing and the tapered disc permits close regulation of flow when throttling.

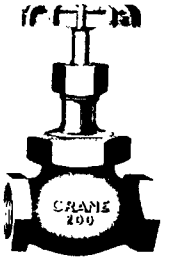
Both the disc and seat, made of Crane "500 Brinell" Stainless Steel (AISI Type 420), offer fine resistance to wear, temperature, galling, scoring, and corrosion.



No. 212 P
Globe, Screwed

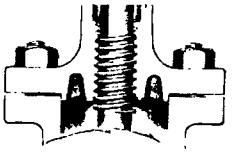


No. 214 P
Angle, Screwed



No. 229 C
Globe, Screwed

Composition disc valves: The No. 229 C is especially suitable where discs must be renewed quickly and easily. The valve is regularly furnished with a No. 4 Cranite Disc for steam up to 450 F (and for hot water from 200 to 420 F). When ordered for cold water, oil, gas, gasoline, or air, the valves will be equipped with a No. 6 Disc. On water under 200 F, especially for frequent operation or easy seating, the No. 6 Disc is preferred to the No. 4.



The 2½ and 3-inch globe valves have a bolted bonnet.

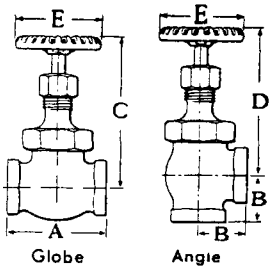
Bonnet: All valves 2-inch and smaller have a union bonnet; 2½ and 3-inch plug type globe valves have a bolted bonnet, inside screw as shown at the lower left. Both types provide a strong tight joint, yet they can be easily dismantled and reassembled without danger of injury to the valve.

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

Repacking: Any of the valves, when wide open, can be repacked while under pressure.

Weights and Dimensions — Prices on Request

Size	No. 212 P Globe, Screwed Plug Type Disc				No. 214 P Angle, Screwed Plug Type Disc				No. 229 C Globe, Screwed Composition Disc			
	Lbs.	Dimensions, In.			Lbs.	Dimensions, In.			Lbs.	Dimensions, In.		
		A	C open	E		B	D open	E		A	C open	E
Inches	Each				Each				Each			
¼	.8	2	4	1¾	.8	15/16	4	1¾	.8	2	3¾	1¾
⅜	1.2	2 5/16	4½	2 1/16	1.2	1 1/16	4⅜	2 1/16	1.2	2 5/16	4½	2 1/16
½	1.8	2 11/16	5⅛	2 9/16	1.8	1¼	5	2 9/16	1.6	2 11/16	4¾	2 9/16
¾	2.8	3 3/16	5¾	2¾	2.5	1 7/16	5⅝	2¾	2.5	3 3/16	5½	2¾
1	4.2	3¾	6⅜	3 1/16	4.0	1 11/16	6¼	3 1/16	3.5	3¾	6¼	3 1/16
1¼	6.2	4¼	7¼	3⅝	6.0	2	7⅛	3⅝	5.8	4¼	6¾	3⅝
1½	8.5	4¾	8⅜	4 1/16	8.5	2 3/16	8¼	4 1/16	7.4	4¾	7¾	4 1/16
2	14.0	5¾	9½	5⅜	14.0	2 11/16	9¼	5⅜	14.0	5¾	8¾	4¾
2½	27.0	7¼	10¾	7								
3	35.0	8¼	12⅜	8								



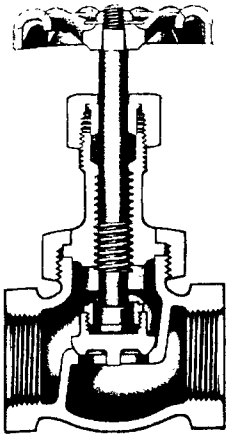
Globe Angle

Extra composition discs.....page 281

Valves for Marine Service....page 230

200-Pound Bronze Globe and Angle Valves

Regrinding



Cross Section, Globe

Valve Ends	Working Pressures		Hydrostatic Test Pressures
	Steam	Cold Water, Oil, or Gas	
	550 F	Non-Shock	
Screwed	200 psi	400 psi	600 psi
Flanged	150 psi	225 psi	450 psi

Recommendations: These valves are sturdily constructed and liberally proportioned. They are recommended for service on steam, water, oil, and gas lines.

Regrinding: The valves can be reground without removing the body from the line; instructions are furnished with each valve.

Materials: Quality materials are used throughout. Except for the packing and wheel, all parts are bronze, the body being made of Crane Special Bronze conforming to ASTM Specification B 61.

Construction: The valves have a union bonnet. The bonnet ring reinforces the bonnet joint, facilitates dismantling and reassembly, and, when valves are being reground, centers and guides the valve trimmings

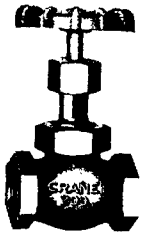
The disc in sizes ½-inch and smaller is integral with the stem; in larger sizes, it swivels on the stem as shown in the sectional view.

Stuffing box; repacking: The stuffing box is deep and is filled with high grade packing; sizes ½-inch and larger have a gland. The valves, when wide open, can be repacked while under pressure.

Flanged valves: Dimensions and drilling of end flanges conform to American Standard (B16.24-1953) for 150-Pound Bronze Flanges. Flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes. Full face gaskets should be used; see page 321.

Flanged valves are regularly furnished faced and drilled (F & D) Faced only valves can be furnished when orders so specify.

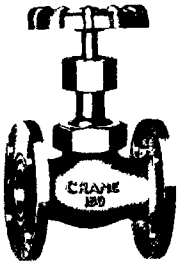
Union end valves available: Globe and angle valves having a male union connection are shown on page 59 (No. 4270 line). They are heavy duty radiator valves similar in design and proportions to the valves on this page. Sizes ½ and ¾-inch with wheel or lock shield are available.



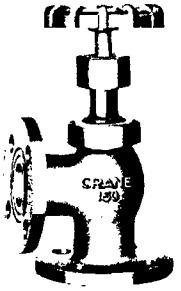
No. 70
Globe, Screwed



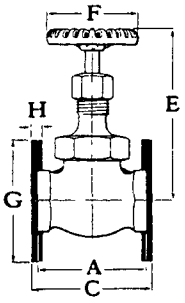
No. 701
Angle, Screwed

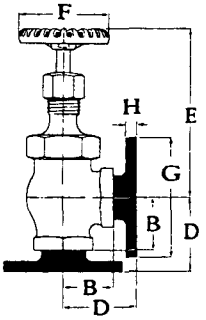


No. 71
Globe, Flanged



No. 711
Angle, Flanged





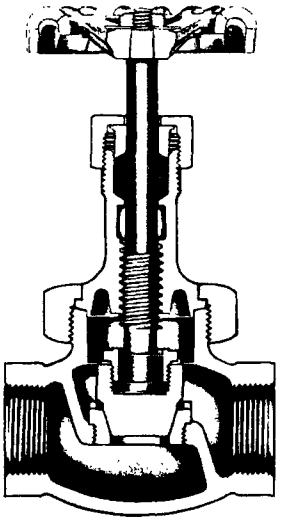
Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches									
	Screwed		Flanged F & D		Screwed				Flanged					
Inches	No. 70 Globe	No. 701 Angle	No. 71 Globe	No. 711 Angle	A Globe	B Angle	E open	F	C Globe	D Angle	E open	F	G	H
⅛	0.6				1 11/16		3½	1¾						
¼	0.6	0.5			1 11/16	13/16	3½	1¾						
⅜	0.8	0.8			1 15/16	1	3⅞	2 1/16						
½	1.2	1.1			2¼	13/16	4¼	2 9/16						
¾	2.0	1.9			2¾	1⅜	5	2¾						
1	3.0	3.0	6.0	5.9	3 5/16	1 11/16	5¾	3 1/16	4 3/16	2⅝	5¾	3 1/16	4¼	⅜
1¼	5.0	5.0	8.3	9.0	3⅞	1 15/16	6⅝	3⅝	4 9/16	2⅞	6⅝	3⅝	4⅝	13/32
1½	7.0	7.0	10.7	11.6	4½	2¼	7⅝	4 1/16	5 5/16	3 3/16	7⅝	4 1/16	5	7/16
2	11.0	11.0	16.8	20.0	5¼	2⅝	8⅜	4¾	6	3¾	8⅜	4¾	6	½
2½	19.0		25.6	32.0	6 5/16		9¼	6	6¾	4 5/16	9¼	6	7	9/16
3	29.0		39.0	38.0	7¼		11	7	7 15/16	4⅝	11	7	7½	⅝

Heavy Duty Bronze Union End Valves....page 59 *Valves for Marine Service....page 230* *Templates for drilling....page 326*

300-Pound Bronze Globe and Angle Valves

Plug Type Disc



Cross Section, Globe

Valve Ends	Sizes	Working Pressures		Hydrostatic Test Pressures
		Steam	Cold Water, Oil, Gas, or Air	
	Inches	550 F	Non-Shock	
Screwed	¼ to 2 2½ and 3	300 psi 300 psi	1000 psi 600 psi	1500 psi 900 psi
Flanged	All sizes	300 psi	500 psi	900 psi

Air tested



No. 382 P
Globe, Screwed



No. 383 P
Globe, Flanged



No. 384 P
Angle, Screwed

Recommendations: These valves are recommended for exceptionally severe service, such as for throttling and for use on soot blower, blow-off, boiler feed, drip and drain lines, etc.

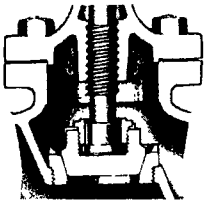
Body: The strong, durable body is made of Crane Special Bronze, a high grade, leaded tin bronze conforming to requirements of ASTM Specification B 61.

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

Both the disc and seat are Crane "500 Brinell" Stainless Steel, a specially heat-treated material. The design of the disc and seat plus the excellent resistance offered by this stainless steel to wear, temperature, galling, and scoring produce a superior seat.

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

Bonnet construction: Sizes 2-inch and smaller have a union bonnet as shown in the marginal illustrations; sizes 2½ and 3-inch are equipped with a compact bolted bonnet of the inside screw type, as shown in the partial section at the left.



2½ and 3-inch valves have a bolted bonnet

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

Flanged valves: The dimensions and drilling of end flanges conform to the American Standard (B16.24-1953) for 300-Pound Bronze Flanges. The end flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

Flanged valves are regularly furnished faced and drilled (F & D); they can be furnished faced only, when specified.

Full face gaskets should be used; see page 321.

Weights and Dimensions — Prices on Request

Size	Pounds, Each			Dimensions, in Inches							
	No. 382 P Globe	No. 383 P Globe	No. 384 P Angle	End to end, globe	Center to end, angle	Face to face, globe	Center to top, open		Diameter of wheel	End Flanges	
							Globe	Angle		Diameter	Thickness
Inches	Screwed	Flanged F & D	Screwed								
¼	1.1	. . .	1.5	2¼	1⅛	. .	4¼	4⅛	2 1/16	.	. . .
⅜	1.6	. . .	1.5	2½	1¼	.	4⅞	4½	2 9/16	. .	. . .
½	2.4	. .	2.2	2 15/16	1½	.	5¼	5	2¾	. .	. .
¾	3.6	. . .	3.5	3½	1¾		6⅜	6⅛	3 1/16	.	. .
1	5.2	11.0	5.2	4⅛	2 1/16	5⅜	7	6¾	3⅝	4⅞	19/32
1¼	8.4	16.0	8.0	4¾	2⅜	6¼	8	7¾	4 1/16	5¼	⅝
1½	11.3	22.5	11.3	5¼	2⅝	7¼	9⅛	8¾	4¾	6⅛	11/16
2	19.0	32.0	18.0	6⅜	3 3/16	8	10 3/8	10	6	6½	¾
2½	36.0	49.0	.	7½	.	9	11½	.	7	7½	13/16
3	53.0	69.0	.	8½	. .	10 5/16	13⅜	.	8	8¼	29/32

Valves for Marine Service . . . . page 230

Templates for drilling . . . . page 326

300-Pound Bronze Globe Valves

Regrinding

Working Pressures
300 psi steam, **550** F
600 psi non-shock cold water, oil, or gas

Test Pressure
900 psi hydrostatic

Recommendations: No. 362 E Globe Valves are recommended for severe operating conditions at high pressures. Combining serviceability with moderate cost, they offer dependable performance on steam, water, oil, and gas lines.

Body and disc: The valves feature high quality materials throughout. The body and disc are Crane Special Bronze, a strong, hard, leaded tin bronze conforming to requirements of ASTM Specification B 61.

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

In addition to making a sturdy, tight joint, the union bonnet 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.

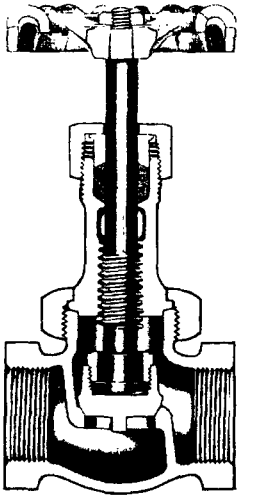
Regrinding: The valves can be reground without removing the body from the line. Instructions for regrinding are furnished with each valve.

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

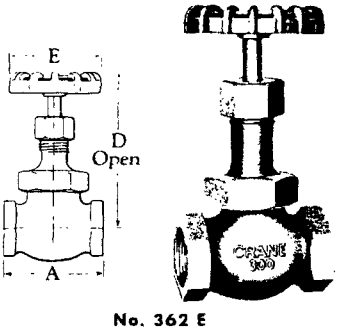
Repacking: The valves, when wide open, can be repacked while under pressure.

Weights and Dimensions—Prices on Request

	Size	Weight	Dimensions, Inches		
	Inches	Pounds Each	A	D	E
No. 362 E Screwed	1/4	0.8	2	4	1 3/4
	3/8	1.2	2 5/16	4 1/2	2 1/16
	1/2	1.8	2 11/16	5	2 9/16
	3/4	2.8	2 15/16	6 1/8	3 1/16
	1	4.0	3 1/2	6 5/8	3 5/8
	1 1/4	6.0	4 1/16	7 5/8	4 1/16
	1 1/2	8.3	4 5/8	8 1/2	4 3/4
	2	15.0	5 3/4	10 1/8	6



Cross Section



No. 362 E
Globe, Screwed

Valves for Marine Service..page 230

4

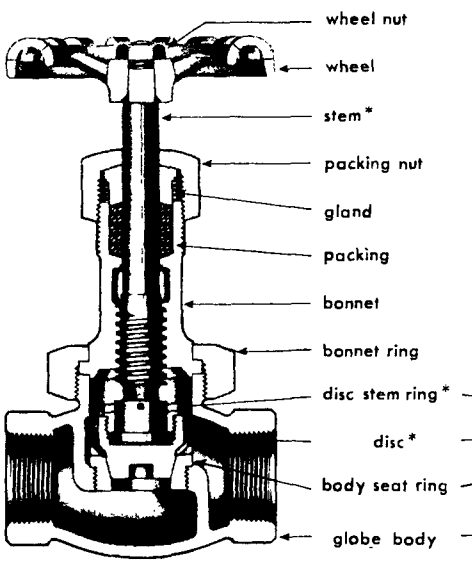
Severe steam throttling problem?
. . . Crane has the solution!

With many users of valves, Crane has always been the standard of quality . . . and with good reason. The case of an eastern food packer is an example. At least once a week, the valves in the steam lines to juice heaters and cooking kettles were acting up . . . the disc and seat would cut out, resulting in uncontrolled steam to kettles and, consequently, a costly loss in product batches.

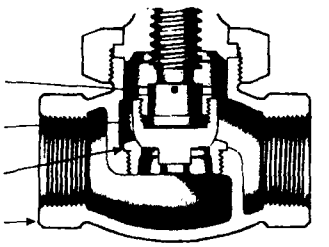
New valves were tried. None could stand up until Crane No. 212 P plug type globes were installed. After four years of no maintenance cost, the No. 212 P were still in like-new condition . . . with no erosion, no leakage . . . even though used to provide close regulation of steam flow, a service for which these valves are outstanding. If yours is a steam throttling problem, Crane bronze plug type globe and angle valves can help you, too. See pages 33, 38, and 40.



AAR 300-Pound Bronze Globe and Angle Valves



Cross Section of Globe
With Plug Type Disc
(No. 376 P)

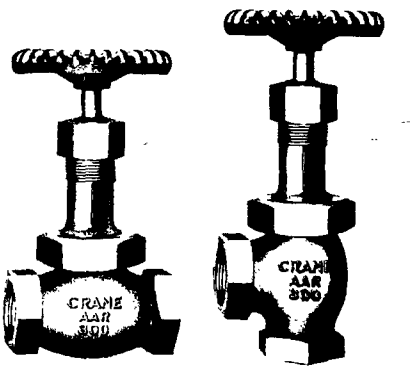


Partial Section of Globe
With Ball Type Disc
(No. 376 E)

Inside screw, rising stem valves designed especially for severe locomotive service

Working Pressure
300 psi steam

Test Pressure
800 psi hydrostatic



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

These heavy, rugged, rising stem globe and angle valves are designed especially for locomotive service. The globe valves are available with either a plug type or ball type disc and seat.

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

Body: The body is made of Crane Special Bronze, a leaded tin bronze having high strength and hardness and offering liberal resistance to wear. This metal conforms to ASTM Specification B 61.

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

Union bonnet ring: The bonnet ring is made of Crane Special Bronze. Valves 1½-inch and smaller have a hexagon shaped ring, as shown in the illustrations; the 2-inch size has a round spanner-type ring.

Disc and seat: In valves ½-inch and smaller, the disc is Monel and is spun onto the stem; in larger sizes, the disc is made of Crane No. 49 Nickel Alloy and is held to the stem by a disc stem ring, as shown in the cross sections. The disc in the 2-inch ball type valves has a bottom pin guide which operates through a bridge in the body seat ring.

Plug type valves have an Exelloy body seat ring. In the ball type valves, the seat ring is Exelloy on sizes ½-inch and smaller and Crane No. 49 Nickel Alloy on sizes ¾-inch and larger.

Crane Exelloy is an AISI Type 410 stainless steel, specially heat-treated for high resistance to wear, temperature, galling, and scoring.

Ordering parts: Except for the disc and seat, corresponding parts for the plug type and ball type valves are identical, size for size. When ordering spare parts, use the cross sections above as a guide.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	Nos. 376 P 376 E Globe	No. 377 P Angle	End to end Globe	Center to end Angle	Center to top, open	Diameter of wheel
Inches						
¼	1.4	1.3	2 5/16	1 5/32	4 7/8	2 3/4
⅜	1.5	1.6	2 1/2	1 1/4	4 7/8	2 3/4
½	2.3	2.2	2 7/8	1 7/16	5 5/8	3 1/16
¾	3.8	3.1	3 9/16	1 25/32	6 1/2	3 5/8
1	5.7	5.9	4 1/8	2 1/16	7 5/8	4 1/16
1¼	8.5	8.9	4 3/4	2 3/8	8 3/8	4 3/4
1½	11.0	11.0	5 1/4	2 5/8	9 1/4	5 3/8
2	19.0	19.0	6 3/8	3 3/16	10 5/8	6

*Note—In sizes ½-inch and smaller, the disc and stem are furnished as a unit (not illustrated); a disc stem ring is not used in these sizes.



Stem end for Universal Joint: When specified, any of these valves can be furnished with the stem end machined for a Universal Joint connection as shown at the right; dimensions conform to the recommended practice of the AAR.

Military Specification: The No. 376 P and 377 P comply with Military Specification MIL-V-1187-B (1956) for 300-Pound WSP Screwed End Bronze Globe and Angle Valves. For other valves complying with military specifications, see page 236

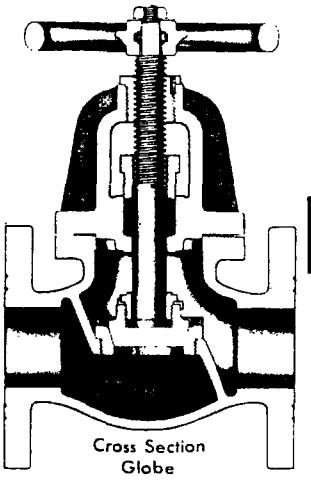
300-Pound Bronze Globe and Angle Valves

Outside Screw and Yoke — Bolted Bonnet

Working Pressures
300 psi steam, **550** F
500 psi non-shock
cold water, oil, gas, or air

Hydrostatic Test Pressure
900 psi
Air tested

Crane Special Bronze body and bolted bonnet
Crane "500 Brinell" Stainless Steel plug type disc and renewable seat



Cross Section Globe

Recommendations: These outside screw and yoke valves are recommended for throttling, soot blower lines, and for exceptionally severe services.

Body and bonnet: The valves are unusually heavy and rugged. Their body and bonnet are made of Crane Special Bronze, a high grade leaded tin bronze conforming to requirements of ASTM Specification B 61. The bolted type bonnet provides liberal strength at the bonnet joint.

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

The disc and body seat ring are made of Crane "500 Brinell" Stainless Steel. This metal offers excellent resistance to wear, temperature, galling, scoring, and corrosion; it is harder, tougher, and stronger than materials ordinarily used in bronze valves.

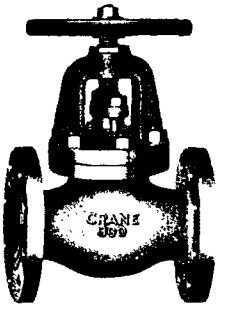
Outside stem threads: The outside stem threads are particularly well suited for services where action of the fluid might affect inside threads. The stem is liberal in diameter and strong.

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

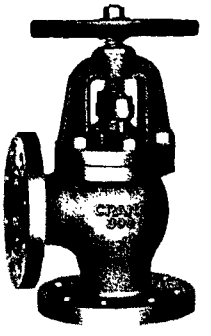
Repacking: The valves, when wide open, can be repacked while under pressure.

End flanges: The dimensions and drilling of end flanges conform to American Standard (B16.24-1953) for 300-Pound Bronze Flanges. The flanges are plain faced, with two V-shaped concentric grooves between the port and the bolt holes.

Drilling: The valves are regularly furnished faced and drilled (F & D); they can be furnished faced only, when specified. Full face gaskets should be used; see page 321.



No. 87 P
Globe, Flanged



No. 87½ P
Angle, Flanged

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches						
			Globe		Angle		Both Valves		
	No. 87 P Globe	No. 87½ P Angle	Face to face	Center to top of stem, open	Center to face	Center to top of stem, open	Diameter of wheel	Diameter of flanges	Thickness of flanges
Inches	Flanged F & D	Flanged F & D							
1½	28	28	7	9⅛	3⅞	8⅜	6	6⅛	11/16
2	38	41	8	10¼	4¼	9½	7	6½	¾
2½	53	55	9	11⅝	4¾	10⅝	8	7½	13/16
3	78	80	10 5/16	13	5 7/16	12	9	8¼	29/32

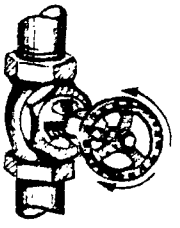
Valves for Marine Service....page 230

Templates for drilling....page 326

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.

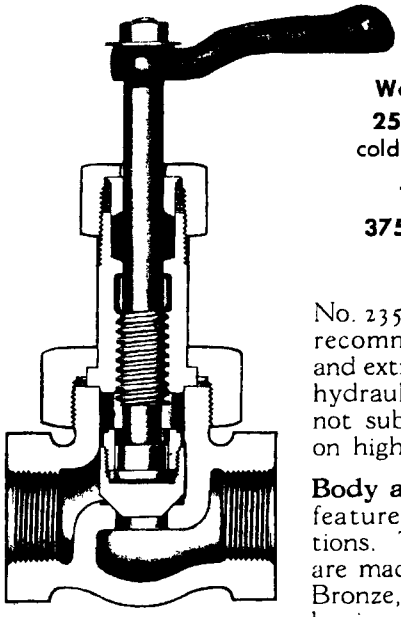
Instead, bring the disc to its seat gently, back it off a turn, and repeat this operation two or three times. A piece of dirt or scale has probably lodged on the seat, and this action may flush it away. If the leak persists, take the valve apart and clean and inspect it.



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 obtained from Crane.

2500-Pound Hydraulic Bronze Globe Valve

45° Seat



Cross section showing construction typical of sizes 1¼-inch and smaller; larger sizes have a bolted bonnet and are wheel-operated.

Working Pressure
2500 psi non-shock
cold water, oil, or gas

Test Pressure
3750 psi hydrostatic

No. 235 H Globe Valves are recommended for severe and extremely high pressure hydraulic service on lines not subject to shock, and on high pressure gas lines.

Body and disc: All sizes feature heavy metal sections. The body and disc are made of Crane Special Bronze, a leaded tin bronze having high strength and hardness and offering liberal resistance to wear. It conforms to requirements of ASTM B 61.

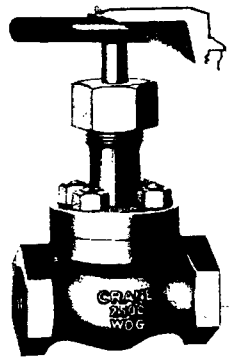
Union and bolted bonnet: Sizes 1¼-inch and smaller have a compact union bonnet. Sizes 1½ and 2-inch are equipped with a rugged inside screw, bolted bonnet and an O-ring rubber gasket set into a depression in the body joint. Both bonnet types provide a strong tight joint, yet are easy to dismantle and reassemble without danger of damaging the valve.

Disc-stem connection: In all sizes except the 1½-inch, the disc and stem are fastened together with a disc stem ring, as illustrated in the cross section. In 1½-inch valves, the disc and stem are fastened together with two disc pins



No. 235 H Globe Screwed

Union bonnet and handle on sizes 1¼-inch and smaller.



Bolted bonnet and wheel on sizes 1½ and 2-inch.

Weights and Dimensions — Prices on Request

Size	No. 235 H	Dimensions, in Inches				
Inches	Pounds Each	End to end	Center to top, open	Center to end of handle	Diameter of wheel	Diameter of seat opening
⅜	3.0	2 13/16	6¼	3⅞	. .	7/16
½	3.0	2 13/16	6¼	3⅞	. . .	7/16
¾	4.8	3 7/16	6¾	4¼	. .	½
1	7.6	4	8¼	4⅝	. .	11/16
1¼	12.0	4 11/16	10	5	. . .	15/16
1½	22.0	5½	10⅛	. .	6	1⅛
2	32.0	6⅜	11½	.	7	1½

Lever handle or wheel: Sizes 1¼-inch and smaller have a lever handle; sizes 1½ and 2-inch have a Style D malleable iron wheel.

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

For Higher Pressures and Temperatures—Use Crane Steel Valves

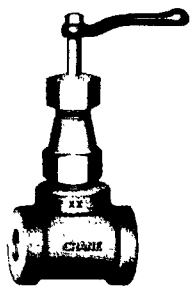
When globe and angle valves are required for hydraulic pressures higher than 2500 psi or for high pressure-high temperature lines, use dependable Crane Steel Valves. The complete line includes a wide range of sizes and types for all service conditions.



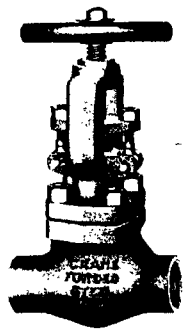
3000-Pound W.O.G. Steel
No. 222 H Globe
(page 136)

Especially desirable for the extremely high steam pressures and temperatures of modern industry are the Crane globe and angles featuring the Pressure-Seal or Lip-Seal type bonnet joint; refer to Section 15 for illustrations, dimensions, and complete description.

For detailed description of the full line of Crane Steel Globe and Angle valves of the conventional types, refer to Section 13.



6000-Pound Hydraulic Forged Steel
No. 225 H, Globe
(page 150)

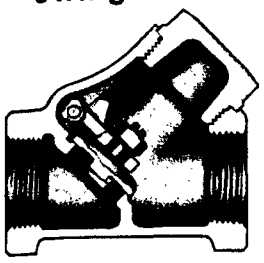


600-Pound Forged Steel
No. 3644 XW, Globe
(page 139)

300-Pound Bronze Check Valves

Regrinding

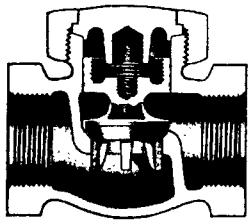
Y-Pattern Swing Check



Cross Section
Horizontal Swing

Sizes	Working Pressures		Hydrostatic Test Pressures
	Steam	Cold Water, Oil, or Gas	
Inches	550 F	Non-Shock	
¼ to 2	300 psi	1000 psi	1500 psi
2½ and 3	300 psi	600 psi	900 psi

Lift Check

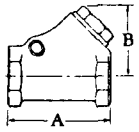


Cross Section
Horizontal Lift

Y-pattern swing check valves featuring full area body design. . . . rugged lift check valves with piston type disc for smooth operation



No. 76 E
Horizontal Swing
Screwed



Swing check valves: No. 76 E are heavy, ruggedly constructed swing check valves recommended for severe service on steam, water, oil, or gas lines. Their Y-pattern design is considerably superior to that of conventional regrinding type swing check valves.

The cap and all internal parts are made of bronze. The body is made of Crane Special Bronze, a hard, leaded tin bronze conforming to requirements of ASTM B61. The body design features full area and smooth interior contours; pressure drop and flow resistance are reduced to a minimum.

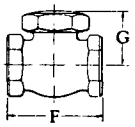
The pressure-tight, easy-seating disc has a threaded spud which passes through a hole in the lower end of the hinge; a disc nut, screwed onto the spud, retains the parts. A hinge bumper prevents the disc from sticking in the open position. All parts are readily accessible and can be quickly replaced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

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

Proper installation of swing checks: Swing check valves may be used in a horizontal position . . . . or in a vertical position for upward flow. Whether used horizontally or vertically, the valves should be installed with the pressure under the disc; an arrow cast on the valve body indicates the correct direction of flow.



No. 366 E
Horizontal Lift
Screwed



No. 366 E Valves feature a piston type disc and are excellently used in services where line pulsations may cause ordinary check valves to hammer. In the Crane design, the dashpot formed above the disc provides an effective cushion.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	No. 76 E Swing Check	No. 366 E Lift Check	No. 76 E		No. 366 E	
			A	B	F	G
Inches	Screwed	Screwed				
¼	.6	.4	2¼	1½	1 13/16	1
⅜	.6	.6	2¼	1½	2	1⅛
½	1.0	.9	2⅝	1¾	2½	1⅜
¾	1.6	1.5	3⅛	2⅛	2 15/16	1⅞
1	2.7	2.6	3⅞	2½	3½	2
1¼	4.2	4.2	4½	3	4 1/16	2⅜
1½	6.0	5.4	5⅛	3½	4⅝	2⅝
2	10.0	10.8	6⅜	4¼	5¾	3¼
2½	16.3	15.6	7⅛	5	6⅞	3⅞
3	25.0	24.0	8⅜	6	8	4½

Valves for Marine Service.....page 230
Proper sizing of check valves....page 427

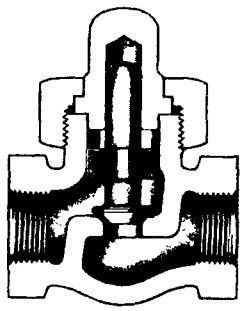
Lift check valves: No. 366 E Horizontal Lift Check Valves are recommended for steam, water, oil, or gas, and especially for service where pulsations in the line are apt to cause an ordinary check valve to hammer. The dashpot formed above the piston type disc effectively cushions the disc.

The body and disc are Crane Special Bronze, a leaded tin bronze (ASTM B61) that resists wear exceptionally well.

These valves can be reground without removing the body from the line. To facilitate regrinding, the top of the disc is tapped with pipe threads so that a nipple can be inserted.

On special order, the valves can be equipped with a spring above the disc to keep the valve normally closed when used on air or gas.

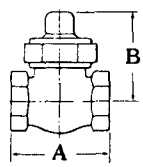
2500-Pound Hydraulic
Bronze Lift Check Valves



Cross Section



No. 237 H
Horizontal Lift
Screwed



Working Pressure
2500 psi non-shock cold water, oil, or gas

Test Pressure
3750 psi hydrostatic

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

Materials: All parts are made of Crane Special Bronze, a strong, hard, leaded tin bronze having excellent resistance to wear. This metal conforms to requirements of ASTM Specification B 61.

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 union cap construction provides a strong, tight joint, easily dismantled or reassembled when necessary for purposes of cleaning or repairing the valve.

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

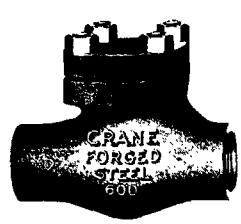
Weights and Dimensions — Prices on Request

	Size	Pounds	Dimensions, in Inches		
	Inches	Each	A	B	Diameter of seat opening
No. 237 H Horizontal Lift Check Screwed	3/8	2.0	2 13/16	2 3/4	7/16
	1/2	2.0	2 13/16	2 3/4	7/16
	3/4	3.5	3 7/16	3 1/4	1/2
	1	6.0	4	4	11/16
	1 1/4	9.0	4 11/16	4 1/2	15/16

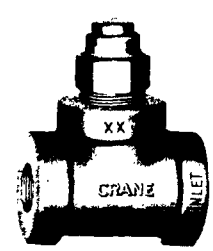
For Higher Pressures and Temperatures — Use Crane Steel Valves

The Crane line of bronze check valves shown in this section is supplemented by a wide assortment of steel check valves designed for severe services and for pressures and temperatures beyond the scope of bronze valves.

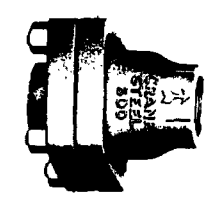
Steel check valves for industrial service are shown in Section 14 (conventional types) and Section 15 (Pressure-Seal and Lip-Seal types). Valves intended particularly for marine service are shown in Section 20.



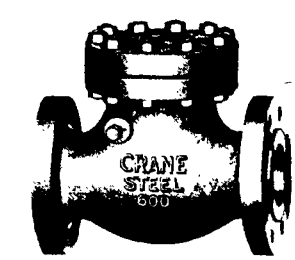
600-Pound Forged Steel
Horizontal Lift Check
No. 3674 X (Page 152)



6000-Pound Hydraulic Forged
Steel Horizontal Lift Check
No. 227 H (Page 160)



600-Pound Cast Steel
Ball Check
No. 3692 XS (Page 153)



600-Pound Cast Steel
Horizontal Swing Check
(Pages 154 and 158)

SECTION 6

Crane Bronze Quick-Opening, Butterfly, Radiator, and Hose Valves

Quick-Opening Valves
Globe, 125-Pound.....page 56
Globe, 150-Pound.....page 57
Gate, 125-Pound.....page 58

Butterfly Valves.....page 58

Radiator Valves
Angle, 150-Pound Government Pattern.....page 59
Angle, 200-Pound.....page 59
Globe, 200-Pound.....page 59

Hose Valves
Hose Gate, 200-Pound.....page 60
Hose Gate, 300-Pound.....page 60
Hose Gate, Underwriters' Pattern.....page 60
Garden Hose.....page 61
Chicago Hose.....page 61
Angle Hose.....page 61

Hose Threads.....page 62

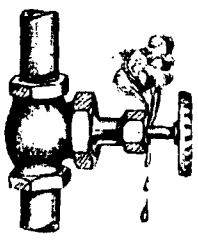
6

For quick-opening iron valves refer to:

Iron body quick-opening clamp gate valves	pages 70 and 71
Ferrosteel quick-opening wedge gate valves	page 78
Iron body quick-opening pulp stock valves	page 85
Alloy iron quick-opening pulp stock valves	page 85
Iron body butterfly valves	page 99

Leaky valve stuffing boxes are easily remedied!

A slight stuffing box leak, if left unattended, gets larger and larger . . . . and eventually can cause serious damage to valve parts. More important, waste of fuel, power, or fluid is surprisingly great . . . . often, in a few months of leakage, many times the cost of the valve itself.

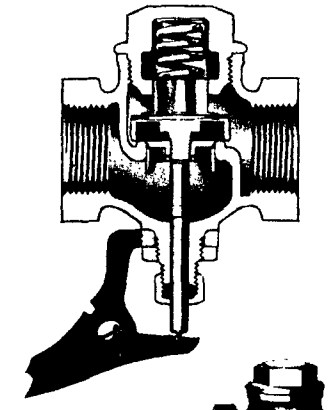


The remedy is generally simple Since packing wears gradually as it is subjected to service, it is only necessary to slightly tighten the packing nut or gland the moment a leak becomes apparent. And when new packing is necessary, most Crane valves can be repacked when wide open and under pressure

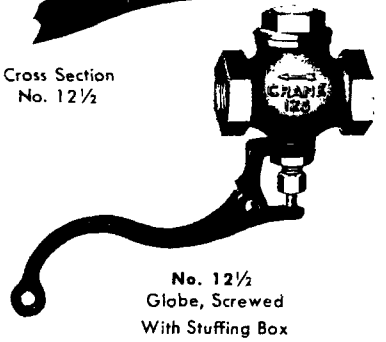
125-Pound Bronze Globe Valves

Quick-Opening—Self-Closing

Composition Disc



Cross Section
No. 12½



No. 12½
Globe, Screwed
With Stuffing Box

Working Pressures

Composition Disc Valves

125 psi air or gas, **150** F
(Air Tested)

125 psi saturated steam
(when furnished with No. 1 Disc)

Bronze Disc Valves

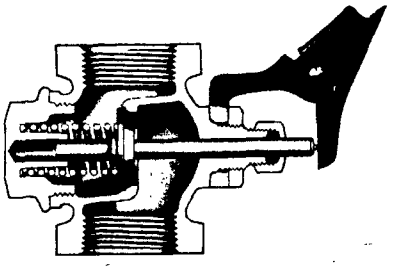
125 psi saturated steam

Recommendations

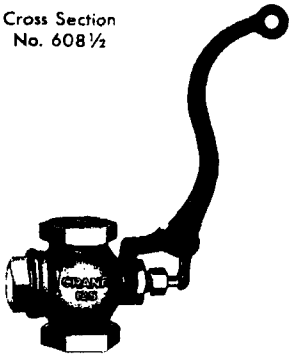
The No. 12½ Valves, as regularly furnished, are air tested and are recommended for air or gas up to 150 F. When equipped with a No. 1 Disc, they are suitable for saturated steam. The valves are ideally suited for cooking vats, soot blowers, can and bottle sterilizers, and similar services.

The No. 608½ Valves are recommended for general industrial service on steam lines only. They are used to control flow to small apparatus such as steam presses, laundry machinery, can and bottle sterilizers, etc.; they are often installed with whistles

Bronze Disc



Cross Section
No. 608½



No. 608½
Globe, Screwed
With Stuffing Box

Materials and construction: The body of the No. 12½ Valve and the body, disc, and cap of the No. 608½ are made of bronze conforming to ASTM Specification B 62. The disc holder in the No. 12½ is also bronze. Both valves have a stainless steel spring.

The valves have a malleable iron lever which can be turned to any desired position by loosening the locknut which holds the bracket to the valve body. A steel pin, inserted into the end of the stem, provides a long wearing contact between the stem and the lever.

Stuffing box: A stuffing box around the stem, amply deep and filled with high grade packing, assures protection against leakage of fluid. This feature makes the valves well suited for use in confined spaces and in installations requiring valves that will not leak at the stem under constant service.

Easy, quick operation: The valves are easily operated. A short pull on the lever lifts the disc from its seat and opens the valve. When the lever is released, the spring above the disc automatically closes the valve.

Operation of larger size No 608½ Valves used with whistles is facilitated when the pull of the lever is at right angles to the center line of the whistle.

Installation: Always install these valves with the pressure above the disc. An arrow cast on the body indicates the correct direction of flow.

Weights and Dimensions — Prices on Request

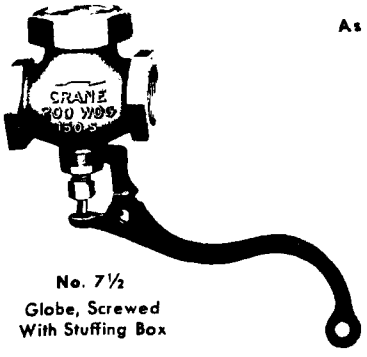
Valve Type	Size	Pounds	Dimensions, in Inches			
			End to end of body	Center of port to end of cap	Center of port to end of lever, open	Center of stem to end of lever, closed
	Inches	Each				
No. 12½ Composition Disc	¼	.9	2⅛	1½	3¾	3⅜
	⅜	1.0	2⅜	1⅝	3¾	3⅜
	½	1.4	2¾	1¾	5⅛	4¼
	¾	2.1	3¼	2	5⅛	5⅝
	1	3.2	3¾	2¼	6⅞	6⅜
	1¼	4.5	4¼	2½	8¾	8⅛
	1½	6.8	5	3	9½	8¼
No. 608½ Bronze Disc	⅜	.8	1⅞	1¼	3⅝	3¼
	½	1.1	2 3/16	1⅜	5¼	3⅞
	¾	1.8	2⅝	1¾	5⅜	5⅝
	1	2.8	3⅛	2	7¾	6⅜
	1¼	4.0	3⅝	2⅛	8¾	8⅛
	1½	5.0	4 1/16	2⅝	9½	8⅛
	2	8.3	4 15/16	2⅞	12⅝	9¾

For extra composition discs for No. 12½ Valves, see page 281.

Composition discs: No. 12½ Valves are regularly furnished with a No. 6 Disc suitable for air or gas. When ordered for saturated steam, they will be furnished with a No. 1 Cranite Disc.

For description, service recommendations, and dimensions of composition discs, see page 281.

150-Pound Bronze Globe Valves
Quick-Opening — Self-Closing



No. 7½
Globe, Screwed
With Stuffing Box

Working Pressures

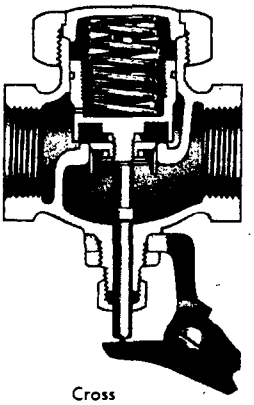
As regularly furnished (with No. 6 Disc), valves are suitable for:

200 psi water.....**200** F
200 psi light oils, gasoline, gas, or air....**150** F
Air Tested

If ordered with No. 1 Disc, valves are suitable for:

150 psi.....saturated steam
200 psi water..**200** to **300** F

Composition disc valves suitable for a variety of quick-opening services when equipped with the proper disc.



Cross
Section

6

Recommendations: No. 7½ Quick-Opening Globe Valves, as regularly furnished, are air tested and are recommended for water up to 200 F, and for light oils, gasoline, air, and gas up to 150 F.

When so ordered, the valves can be furnished with a No. 1 Cranite Composition Disc suitable for saturated steam, and for hot water from 200 to 300 F.

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; information will be furnished on request.

Materials: The body and disc holder are made of quality bronze conforming to ASTM B62. The cap, union cap ring, and the stem also are bronze. The bracket and opening lever are malleable iron. The spring is stainless steel.

Construction: The valves are ruggedly constructed throughout. They have a union cap ring which permits easy dismantling and reassembling for inspection, cleaning, or replacement of the disc.

The stuffing box around the stem is amply deep, is filled with non-friction packing, and is large enough to remain pressure-tight when the valve is open. A steel pin, inserted in the end of the stem, provides a long wearing contact between the stem and lever.

Weights and Dimensions — Prices on Request

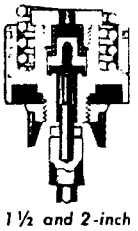
Size	No. 7½ Screwed	Dimensions, in Inches			
		End to end of body	Center of port to top of cap	Center of port to bottom of lever, open	Center of stem to end of lever, closed
Inches	Pounds Each				
½	1.6	2¾	1¾	5¼	4¼
¾	2.4	3¼	2	5½	5⅝
1	3.8	3¾	2¼	7⅜	6⅜
1½	8.0	4¾	3	10	8¼
2	13.3	5¾	3½	12⅝	9½

For extra composition discs, see page 281.

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

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

Pilot valve on 1½ and 2-inch: Sizes 1½ and 2-inch have a pilot valve in the main valve, as shown in the inset illustration. When the valve is operated, the pilot valve opens first, equalizing the pressure around the main disc, thereby assuring easy operation.



1½ and 2-inch sizes have a pilot valve.

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.

Orders for extra pilot valve discs should indicate the service.

Composition discs: Unless otherwise ordered, these valves are furnished with a No. 6 Disc suitable for 200 psi water at temperatures up to 200 F and for 200 psi light oils, gasoline, gas, or air at temperatures up to 150 F. Valves equipped with a No. 6 disc are regularly air tested.

When ordered for saturated steam service, or for hot water at temperatures from 200 to 300 F, the valves are furnished with a No. 1 Cranite Disc.

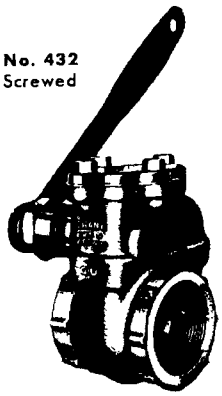
For description, service recommendations, and dimensions of composition discs, see page 281.

Installation: These valves always should be installed so that the pressure is above the disc. An arrow cast on the body indicates the correct direction of flow.

Shock: Quick-opening valves used on liquid lines may produce shock; for details, see page 14.

125-Pound Bronze Gate Valves

Quick-Opening — Cam Action



No. 432
Screwed

Underwriters' Approved for hazardous liquids*

The No. 432 are bronze quick-opening, cam action gate valves designed for dependable performance on saturated steam, water, oil, gas, or air lines.

*All sizes have been approved by the Underwriters' Laboratories, Inc., for hazardous liquid service at pressures not exceeding 50 psi; this is the maximum pressure prescribed by the Underwriters' for such hazardous liquid equipment.

Working Pressures

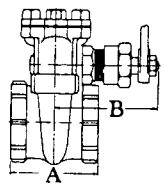
Size (Inches)	Saturated Steam	Cold Water, Oil, Gas, Air Non-Shock
½ to 2	125 psi	200 psi
2½ and 3	100 psi	100 psi

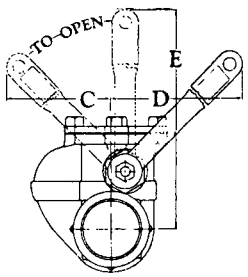
Air Tested

Body: The body is made of bronze conforming to requirements of ASTM Specification B 62.

Construction: The solid wedge disc is operated by means of a quick-opening lever through a specially designed cam arrangement. Fast, positive valve action is assured. Sizes 1-inch and smaller have a screwed cap (not illustrated); larger sizes have a bolted cap, as illustrated.

Operation: To insure proper seating in the closing phase, *operate the lever with a snappy action and plenty of force.* The disc will not jam; nor is there any danger of damage to the parts since the valve is designed to withstand vigorous operation.





Weights and Dimensions — Prices on Request

	Size (Inches)	Weight (Pounds Each)	Dimensions, in Inches A	B	C	D	E
No. 432 Gate	½	1.6	1⅞	2¾	3	2⅛	5⅝
	¾	2.3	2⅛	2⅞	3¼	3⅛	6¼
	1	3.3	2½	3⅛	3½	4	6¾
	1¼	4.4	2¾	3½	4⅝	5½	8⅝
	1½	5.8	2⅞	3⅞	5⅜	6⅜	9⅞
	2	9.4	3⅜	4¼	6⅜	7⅝	12
	2½	19.5	4	4⅞	7½	8¾	13⅞
	3	28.5	4¼	5⅜	8⅛	10	15⅜

Prevent water hammer: Sudden closure of valves used in liquid lines frequently can cause "water hammer".

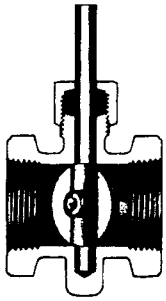
When severe, water hammer must be eliminated by installing a suitable cushioning device in the line. Otherwise, resulting shock might damage both valves and piping; see page 14 for detailed explanation.

Bronze Butterfly Valves

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

These durably constructed bronze butterfly valves provide easy, smooth operation in approximately one-quarter turn from the wide-open to closed position. They are not designed to close pressure-tight and, therefore, should be used only to control or regulate flow.

The body and disc are made of good quality bronze which conforms to requirements of ASTM Specification B 62. The stem is of ample diameter; it is made of corrosion-resisting Exelloy (an AISI Type 410 stainless steel) in sizes 1½-inch and smaller and is steel, nickel-plated in the 2-inch size.

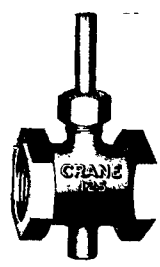


Cross section of No. 44 Valve with disc in a partly opened position.

Weights and Dimensions — Prices on Request

	Size (Inches)	Weight (Pounds Each)	Dimensions, in Inches End to end	Center to top	Center to bottom	Over-all height	Diameter of stem
No. 44 Butterfly Valve	1	1.1	2 9/16	3¼	1⅜	4⅝	5/16
	1¼	1.6	2¾	3⅝	1⅝	5¼	⅜
	1½	2.1	2 15/16	3⅝	1¾	5⅜	⅜
	2	3.8	4 1/16	4⅞	1⅞	6¾	½

Iron Body Butterfly Valves....page 99



No. 44
Butterfly
Screwed

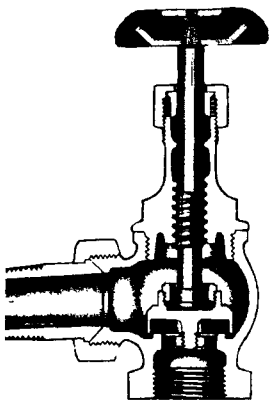
Bronze Radiator Valves

150-Pound Government Pattern Composition Disc

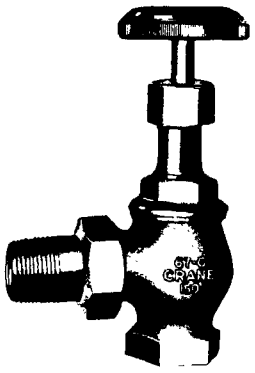
Working Pressures

150-Pound Valves With No. 1 Cranite Disc		200-Pound Valves With Metal Disc
150 psi.....	saturated steam.....	200 psi

When ordered for hot water service (up to 200 F), the 150-pound valves are furnished with a No. 6 Disc.



Angle—Cross Section



Angle
No. 67 G, with Wheel
***No. 68 G, with Lock Shield**

*Not illustrated

Recommendations: These heavy, unusually rugged bronze radiator valves are recommended for use on steam and hot water heating systems.

Important—gravity flow: When the intended use is gravity flow hot water, orders should so specify. Valves for such service will have a small hole drilled through the seat to provide slow circulation in the closed position.

Repacking: All valves listed on this page, when wide open, can be repacked while under pressure.

150-pound: The 150-pound valves have a rising stem, a composition disc, and a gland in the stuffing box. Their body and bonnet are made of bronze conforming to requirements of ASTM Specification B 62.

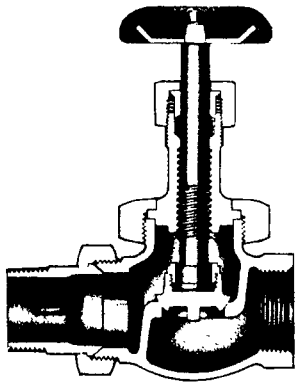
They are regularly furnished with a No. 1 Cranite Disc suitable for saturated steam and for hot water from 200 to 300 F. When ordered for water up to 200 F, they are furnished with a No. 6 Disc.

Both the No. 67 G and 68 G comply with Government Specifications issued by the General Supervising Architect's Office and the Quartermaster General's Office. They also comply with Navy Department (Bureau of Yards and Docks) Specification No. 66-P-1a (INT), dated September 1944, on Power Plant Heating and Ventilating Apparatus and Piping (Shore Use).

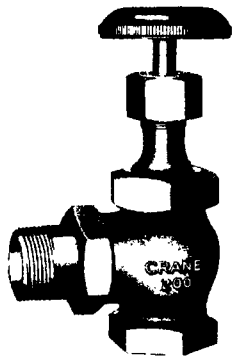
200-pound: The 200-pound valves have a rising stem, a metal disc, and rugged union bonnet construction. The body is Crane Special Bronze, a hard, leaded tin bronze conforming to ASTM Specification B 61.

The valves have a one-piece disc and stem in the ½-inch size; in the ¾-inch size, the disc swivels on the stem, as illustrated in the globe section. The stuffing box on both sizes is equipped with a gland. The valves can be reground without removing the body from the line.

200-Pound Union Bonnet Metal Disc



Globe—Cross Section
No. 4270, with Wheel
***No. 4272, with Lock Shield**



Angle
No. 4271, with Wheel
***No. 4273, with Lock Shield**

*Not illustrated

6

Weights and Dimensions — Prices on Request

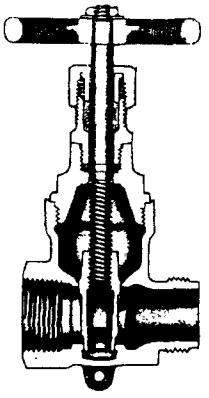
Valve Type	Size	Pounds, Each				Dimensions, in Inches				
		Globe		Angle		Center to male union end	Center to female end	Center to top, open		Diameter of wheel
	Inches	With Wheel	With Lock Shield	With Wheel	With Lock Shield			With wheel	With lock shield	
		—	—	No. 67 G	No. 68 G					
150-Pound Rough Nickel-Plated	½	...		1.5	1.5	2⅜	1¼	4½	5¼	2¼
	¾	...		2.5	2.4	3¼	1⅝	5¼	5¼	2½
	1			3.2	3.0	3½	1¾	6	7	2¾
	1¼			5.3	5.0	3⅞	2	7⅛	8⅜	3
	1½			6.6	6.4	4⅜	2¼	7½	7¼	3
		No. 4270	No. 4272	No. 4271	No. 4273					
200-Pound Rough Body	½	1.4	1.3	1.3	1.2	27/16	1 3/16	4⅛	4¼	2¼
	¾	2.3	2.2	2.1	2.0	3	1⅜	4¾	5	2½

Extra composition discs for No. 67 G or 68 G....page 281

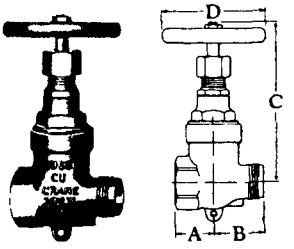
Keys for lock shield valves....page 283

Bronze Hose Gate Valves

Underwriters' Pattern — Wedge Disc — Non-Rising Stem

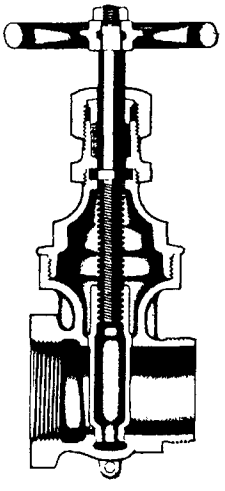


For cold water pressures up to *200 psi non-shock

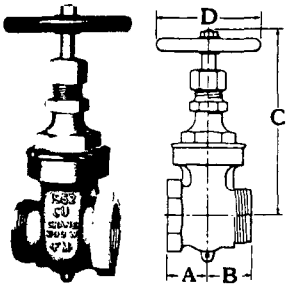


No. 451, Screwed
***Underwriters' Pattern**

*No. 451 is approved by the Underwriters' and Factory Mutual Laboratories for pressures up to 175 psi. A bronze cap and chain and/or drain cock can be furnished when specified.



For cold water pressures up to 300 psi non-shock



No. 453, Screwed
Underwriters' Pattern

No 453 is approved by the Underwriters' and Factory Mutual Laboratories at pressures up to 300 psi. A bronze cap and chain and/or drain cock can be furnished when specified.

Weights and Dimensions — Prices on Request

Valve	Size	Pounds, Each		Dimensions, in Inches			
Rough Body, Plain	Inches	Without Cap & Chain	With Cap and Chain	A	B	C	D
No. 451	1	2.3	2.7	1 7/16	1 3/4	5 1/4	3 1/2
	1 1/2	5.0	5.5	1 5/8	2 3/16	7 1/4	4 1/2
	2	7.5	8.5	1 13/16	2 7/16	9	5 1/2
	2 1/2	16.5	18.0	2 1/4	2 7/8	10 1/4	6
No. 453	1 1/2	5.7	7.0	1 5/8	2 1/4	7 1/2	4 1/2
	2 1/2	16.5	18.0	2 5/16	2 5/8	11	6

Unless otherwise ordered, these valves are furnished without a cap and chain and without a drain cock.

These compact Underwriters' Pattern Hose Gate Valves have a non-rising stem, a wedge disc, and a rugged Style D malleable iron wheel. The stuffing box, amply deep, is fitted with a gland. The body is made of bronze conforming to requirements of ASTM Specification B 62.

The No. 451 features wide-faced hexagons at the female end; the upper portion of the body is cylindrical in shape for maximum strength with light weight.

Underwriters' Specifications: The No. 451 and No. 453 are approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories for water working pressures up to 175 and 300 psi, respectively. The body of each valve is marked "CU" and "FM."



Valves with cap and chain

Cap and chain: When specified, these valves can be equipped with a bronze cap and chain, as shown in the inset illustration at the upper right.



Valves with drain cock

Drain: When specified, the valves can be furnished with the boss on the outlet end tapped and fitted with a drain cock, as shown at the lower right.

Hose threads: The valves are furnished with an American Standard Taper Pipe Thread on the female end.

The male end is available with a variety of threads as indicated in the adjacent table.

Orders for hose threads other than listed in the table should be accompanied by a sample, preferably the male end of a hose coupling; see page 62.

Hose Threads Available on Male Outlet
(Female inlet is furnished with an American Standard Taper Pipe Thread)

Valve	Valve Sizes, in Inches				
	Threads Regularly Furnished		Optional Threads—Furnished if Specified		
	Chicago Standard Hose Thread	American (National) Standard Fire-Hose Coupling Screw Thread	Iron Pipe or California Standard Hose Thread	American (National) Standard Fire Protection Hose Thread	Chicago Fire Department Hose Thread
No. 451	1 to 2	2 1/2	1 to 2 1/2	1 1/2	2 1/2
No. 453	1 1/2	2 1/2	1 1/2 or 2 1/2	1 1/2	2 1/2

For complete hose thread information, see page 62.

Bronze Hose Valves

Garden Hose Valves

With Rubber Composition Disc



No. 58, Screwed

Garden Hose Valves are ideal for garden and lawn hose service for homes, estates, greenhouses, cemeteries, golf courses, and similar locations.

The body is bronze conforming to ASTM Specification B 62.

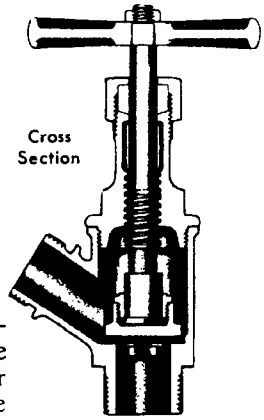
Chicago Hose Valves

With Rubber Composition Disc

For cold water pressures up to **200** psi, non-shock



No. 50, Screwed



The No. 50 Chicago Hose Valve is excellent for use on outside standpipes.

The body, bonnet, stem, and disc holder are made of bronze conforming to ASTM Specification B 62.

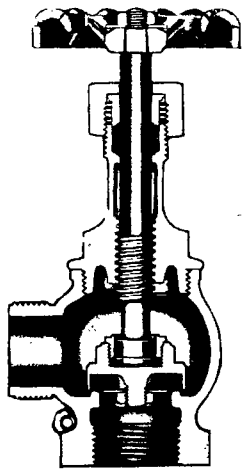
Angle Hose Valves

With Composition Disc

For cold water pressures up to **250** psi, non-shock



No. 117
Screwed
Regularly furnished without cap and chain.



Cross Section



When specified, No. 117 Valves are furnished with a bronze cap and chain.

Angle Hose Valves are recommended for dependable performance on standpipes, hose racks, and similar types of equipment.

Their body and bonnet are bronze conforming to ASTM B 62. They have a Crane No. 6 Composition Disc. For extra discs, and for description, dimensions, and service recommendations of discs, see page 281.

*The No. 117 Valves are furnished with a bronze cap and chain only when orders so specify.

Weights and Dimensions — Prices on Request

Valve	Size	Pounds, Each		Dimensions, in Inches			
		Without Cap & Chain	With Cap & Chain	Center to hose end	Over-all height, open	Diameter of wheel	Length of tee handle
Rough Body, Plain	Inches	Regular	Optional				
No. 58 Garden	½	.8	. . .	1⅜	4⅝	2 1/16	. . .
	¾	.8	. . .	1⅜	4¾	2 1/16	. .
	1	1.3	. .	1⅝	5⅞	2 9/16	
No. 50 Hose	1	2.5	.	2½	8⅛	. . .	4⅛
	1½	5.0	.	3	10½	. . .	6
	2½	9.0	. .	4⅛	13 7/8	. . .	7
*No. 117 Angle	¾	1.7	2.0	1⅝	7 3/16	2¾	. . .
	1	3.0	3.4	1¾	7 13/16	3 1/16	. . .
	1½	6.3	7.0	2⅜	10	4 1/16	. .
	2	10.0	11.0	2¾	12 5/16	5⅜	. . .
	2½	18.5	20.0	3¼	14 3/16	6	. .

Hose threads: All valves shown on this page have an American Standard Taper Pipe Thread on the inlet.

The male outlet is available with a variety of threads as indicated in the adjacent table.

Orders for hose threads other than listed in the table should be accompanied by a sample, preferably the male end of a hose coupling.

Hose Threads Available on Male Outlet
(Inlet is furnished with an American Standard Taper Pipe Thread)

Valve	Valve Sizes, in Inches				
	Threads Regularly Furnished		Optional Threads — Furnished if Specified		
	Chicago Standard Hose Thread	American (National) Standard Fire-Hose Coupling Screw Thread	Iron Pipe or California Standard Hose Thread	American (National) Standard Fire Protection Hose Thread	Chicago Fire Department Hose Thread
No. 58	½ to 1	. .	½ to 1	. . .	. .
No. 50	1 and 1½	2½	1 to 2½	1½	2½
No. 117	¾ to 2	2½	¾ to 2½	1½	2½

For complete hose thread information, see page 62.

Hose Threads

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

The upper portion of the table includes:

1. American Standard Hose Coupling Screw Threads (ASA B33.1-1947) sizes 2-inch and smaller for valves, hose couplings, nozzles, and other fittings used in direct connection with hose intended for fire protection or for domestic, industrial, and general service.

2. American (National) Standard Fire-Hose Coupling Screw Threads (ASA B26-1947) sizes 2½-inch and larger, for fire hose valves, couplings, hydrant outlets, stand-pipe connections, Siamese connections, and all other special fittings on fire lines.

The two ASA Standards mentioned above agree with the data in the Hose Thread section of the handbook of Screw-Thread Standards for Federal Services, No. H-28, Part II, 1957.

The lower portion of the table includes:

Other hose thread standards in general use: The Chicago Hose Thread, Chicago Fire Department Hose Thread, 2½ and 3-inch Iron Pipe Hose Threads, and the California Hose Thread.

Form of thread: The basic form of all Crane hose threads is the American (National) Standard, formerly known as the "U.S. Standard Form".

Ordering: Unless otherwise ordered, Crane Hose Valves are furnished with the threads specified on pages 60 and 61, their dimensions conforming to those shown in the table below.

Special hose threads: Other hose threads included in the table below but not mentioned on pages 60 and 61 can be furnished when so specified; prices on application. When orders are received for American Standard hose threads in sizes ½ or ¾-inch, the garden hose thread will be furnished, and in sizes 1 or 1½-inch the iron pipe hose thread will be furnished, unless otherwise specified. In addition, other types of special threads can be furnished at a special price; orders should be accompanied by a sample, preferably the male end of a hose coupling.

General Classification	Name of Hose Thread		Nominal Size of Hose, Inches	Number of Threads per Inch	Max. Major Dia. (O.D.) of Nipple Thread, Inches	Service Recommendations
American (National) Standard Hose Coupling and American (National) Standard Fire-Hose Coupling Screw Threads	Hose Coupling Screw Threads	Garden Hose Thread	½	11½	1.0625	Garden and similar service
			⅝			
			¾			
		Chemical Hose Thread	¾	8	1.3750	Chemical engine and booster hose
			1			
	American Standard (B33.1-1947) Sizes 2-inch and smaller	Fire Protection Hose Thread	1½	9	1.9900	Fire protection hose
		Iron Pipe Hose Thread	½	14	.8248	Steam, water, air, oil, and all other hose connections
			¾		1.0353	
			1	11½	1.2951	
			1¼		1.6399	
			1½		1.8788	
			2		2.3528	
	American (National) Standard Fire-Hose Coupling Screw Threads (B26-1947) Sizes 2½-inch and larger		2½	7½	3.0686	Fire hose
			3	6	3.6239	
			3½		4.2439	
			4½	4	5.7609	
Other Hose Threads in General Use	Chicago Standard Hose Thread		½ or ¾	11½	1.0682	†Note: Iron Pipe Hose Threads sizes 2-inch and smaller are included in the American Standard B33.1-1947 and are shown above. The 2½ and 3-inch sizes, shown here, are not included in the American Standard.
			1		1.2797	
			1¼		1.6880	
			1½		1.9272	
			2	8	2.5129	
			3	7	3.6365	
	Chicago Fire Department Hose Thread		2½	7½	2.9916	
	†Iron Pipe Hose Threads		2½	8	2.8434	
			3		3.4412	
	California Standard (Pacific Coast) Hose Thread		½	11	1.0504	
			¾			
			1		1.3141	
			1¼		1.8561	
			1½		2.0870	
			2	10	2.5416	
			2½	7½	2.9916	

Hose Valves . . . . pages 60 and 61

SECTION 7

Crane Bronze and Iron Cocks

(and Gas Stops)

Bronze Cocks
Pet Cocks.....page 64
Cylinder Cocks.....page 64
Gauge Cocks.....page 64
Try Cocks.....page 64
Spring-Loaded Cocks.....page 64

Brine Cocks.....page 65
125-Pound Cocks.....page 65
250-Pound Cocks.....page 65

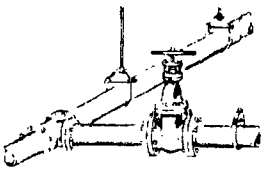
Bronze Stops
Gas Service Stops.....page 64

Iron Cocks
125-Pound W.O.G. Cocks.....page 66
Gas Line Cocks.....page 66
Spring-Loaded Mine Cocks.....page 67
Spring-Loaded Four-Way Cocks.....page 67

Wrenches
For Cocks and Stops.....page 68

7

Every pipe line needs support!

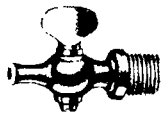


Piping won't stand up and work efficiently without adequate support. Its own weight plus the weight of the fluid will cause a break in the line or will strain joints to the point of leakage and distort or ruin valve seats.

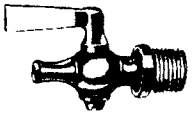
An amply strong pipe hanger or support at about 10-foot intervals is considered good practice for the average or ordinary installation, but the spacing will vary considerably with the size and type of system. Place the hangers close to valves and heavy pieces of equipment.

Bronze Cocks and Stops

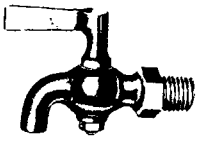
Pet, Cylinder, and Gauge Cocks



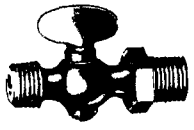
No. 700
Pet Cock
Tee Head



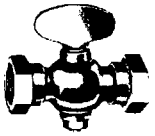
No. 702
Pet Cock
Lever Handle



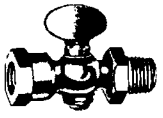
No. 724
Cylinder Cock
Lever Handle



No. 708
Gauge Cock
Male,
Tee Head



No. 712
Gauge Cock
Female,
Tee Head

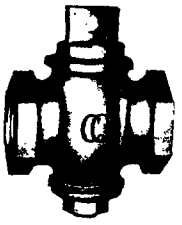


No. 744
Gauge Cock
Male and Female,
Tee Head

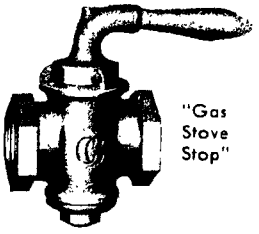
Weights — Prices on Request

Size	Pounds, Each					
	Pet		Cylinder	Gauge		
Inches	No. 700	No. 702	No. 724	No. 708	No. 712	No. 744
1/8	.13	.13	.16	.13	.16	
1/4	.13	.15	.23	.17	.23	.27
3/8	.16	...	...	...	.30	...
1/2	.2	...	...	...	...	...

Gas Service Stops



No. 270
Flat Head



No. 298
Lever Handle, with Check

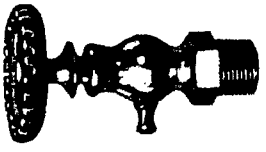
The No. 298, frequently called a "gas stove stop", is commonly used in the gas line to gas stoves (or other appliances) so that the gas can be shut off at the appliance without cutting off the main supply line.

Weights and Dimensions — Prices on Request

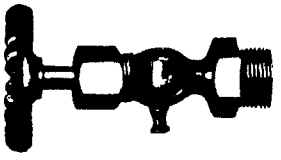
Size	No. 270		No. 298	
	Pounds	End to end	Pounds	End to end
Inches	Each	Inches	Each	Inches
1/4	.3	1 5/8	.4	1 5/8
3/8	.4	1 7/8	.5	1 7/8
1/2	.5	2 1/16	.7	2 1/16
3/4	.9	2 3/8	1.0	2 3/8
1	1.3	2 11/16	1.7	2 11/16
1 1/4	2.3	3 5/16	...	...
1 1/2	2.9	3 11/16	...	...
2	5.8	4 9/16	...	...

Wrenches....page 68

Try Cocks



No. 730, 125-Pound
Short Pattern
125 psi saturated steam working pressure



No. 734, 250-Pound
With Stuffing Box
250 psi saturated steam working pressure

Try cocks, except for their wheel, are furnished polished all over. The No. 734, recommended for saturated steam services up to 250 psi, has a Crane Special Bronze body and is equipped with a stuffing box.

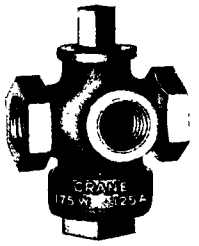
Weights and Dimensions — Prices on Request

Cock No.	Size	Weight Pounds	Over-all height	Dia. of wheel
	Inches	Each	Inches	Inches
No. 730	3/8	.5	3 3/4	2 1/16
	1/2	.5	3 3/4	2 1/16
No. 734	3/8	.7	4 11/16	2 9/16
	1/2	.8	4 13/16	2 9/16
	3/4	.8	4 15/16	2 9/16

Spring-Loaded Cocks

Working Pressures
125 psi air *(air tested)*
175 psi non-shock cold water

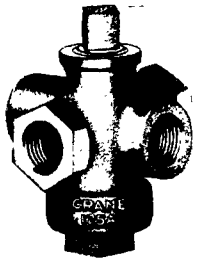
These cocks feature a steel spring between the plug and cap which compensates for undue wear, assures a tight body-plug connection, and permits easy operation. Prices furnished on request.



No. 306
Square Head
Three-Way

Weights and Dimensions

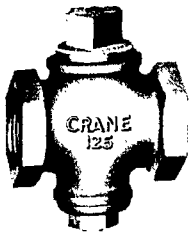
Cock No.	Size	Pounds	Center to end
	Inches	Each	Inches
No. 306	1/4	.6	3 1/32
	3/8	.8	1 1/16
	1/2	1.0	1 3/32
No. 307	1/4	1.0	1 3/32
	3/8	1.0	1 1/8
	1/2	1.6	1 9/32



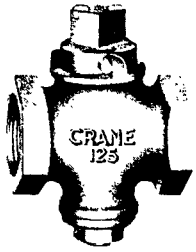
No. 307
Square Head
Four-Way

Wrenches....page 68

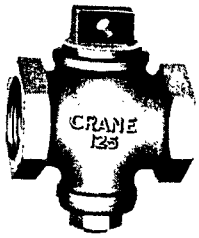
125-Pound Bronze Cocks



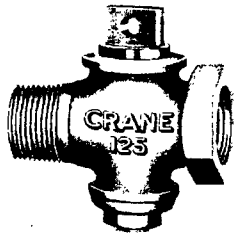
No. 250
Square Head



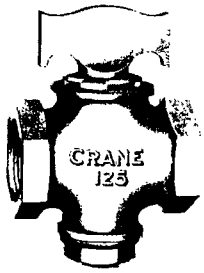
No. 254
Square Head
With Check



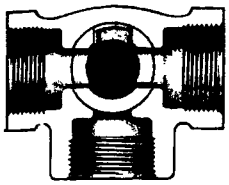
No. 252
Flat Head

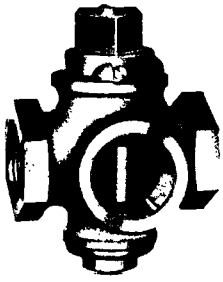


No. 266
Flat Head
(Male and Female)



No. 256
Tee Head



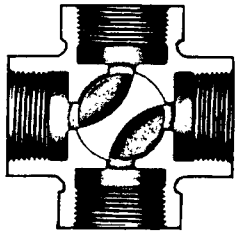


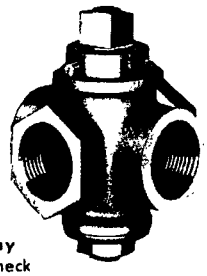
No. 268, Three-Way
Square Head with Check

125 psi
working pressure

Air Tested

These are dependable cocks made of quality bronze. For wrenches see page 68.





No. 269, Four-Way
Square Head with Check

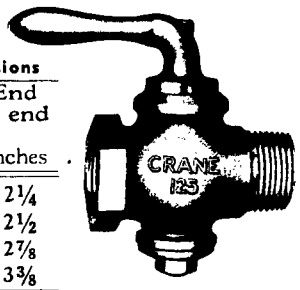
7

Weights and Dimensions — Prices on Request

Size	Pounds, Each							Dimensions, Inches		
	Square Head				Flat Head		Tee Head	End to End		Center to End
Inches	No. 250 Without Check	No. 254 With Check	No. 268 3-Way with Check	No. 269 4-Way with Check	No. 252 Female Ends	No. 266 Male and Female Ends	No. 256	No. 250 No. 252 No. 254 No. 256	No. 266	No. 268 No. 269
1/8	...	...	...	...	...	...	.4	1 5/8	...	..
1/4	.3	...	.4	...	.4	.3	.4	1 5/8	1 15/16	7/8
3/8	.4	...	.6	..	.5	.4	.5	1 3/4	2 3/16	31/32
1/2	.6	.6	1.1	1.5	.7	.6	.6	2 1/16	2 1/2	1 1/4
3/4	1.1	1.1	2.2	2.6	1.0	.9	...	2 7/16	2 7/8	1 17/32
1	1.9	2.0	2.8	3.6	1.8	1.6	...	3	3 3/8	1 5/8
1 1/4	2.9	3.2	5.0	6.0	2.6	...	...	3 1/2	...	2
1 1/2	4.0	4.0	6.0	6.6	4.2	...	...	3 13/16	...	2 3/16
2	7.5	8.5	10.3	12.6	7.5	..	..	4 9/16	...	2 19/32

Bronze Brine Cocks

No. 814
Lever Handle

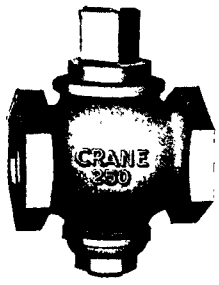


Weights and Dimensions

Size	No. 814	End to end
Inches	Pounds Each	Inches
3/8	.5	2 1/4
1/2	.7	2 1/2
3/4	1.2	2 7/8
1	1.7	3 3/8

The No. 814, designed especially for cold storage plant installations on lines handling brine, are equally effective on many other services requiring bronze cocks with male and female ends. Prices on request

250-Pound Bronze Cocks



No. 80 E, Square Head

250 psi working pressure

Air Tested

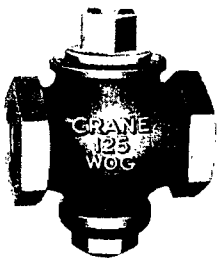
Weights and Dimensions

Size	No. 80 E	End to end
Inches	Pounds Each	Inches
1/4	.4	1 3/4
3/8	.5	2
1/2	1.1	2 3/8
3/4	1.6	2 11/16
1	3.0	3 5/16
1 1/4	5.5	4
1 1/2	7.7	4 1/2
2	13.0	5 1/4

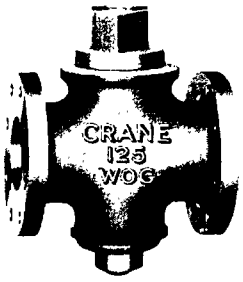
The No. 80E have a body and plug made of Crane Special Bronze, a hard, leaded tin bronze. Prices furnished on request.

Wrenches . . . . page 68

125-Pound W.O.G. Iron Cocks

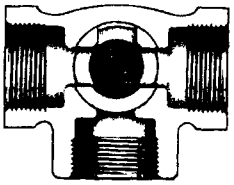


Square Head
Screwed
No. 320, All-Iron
No. 324, With Bronze
Plug and Washer

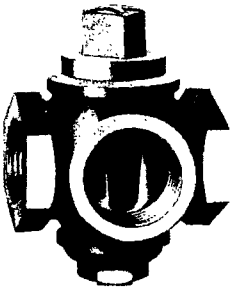


Square Head
Flanged
No. 325, All-Iron

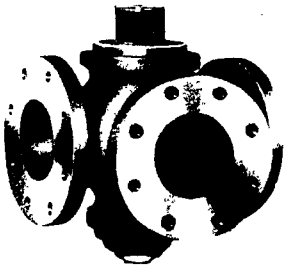
Working Pressure
125 psi non-shock cold
water, oil, air, or gas
Air Tested



Cross-Section, Three-Way



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



Three-Way
Square Head, Flanged
No. 331, All-Iron

These cocks are regularly fitted with an iron nut. End flanges of flanged cocks are plain faced, with a smooth finish and conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). Unless otherwise ordered, flanged cocks are furnished faced and drilled (F & D); they can be furnished faced only, when specified.

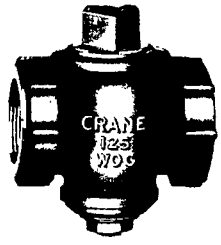
Weights and Dimensions — Prices on Request

Type and Finish	Size	Pounds, Each					Dimensions, in Inches					
		Screwed			Flanged, F & D		Screwed		Flanged			
		No. 320	No. 324	No. 326	No. 325	No. 331	End to end	Center to end of side outlet	Face to face	Center to face of side outlet	Flange diameter	Flange thickness
	Inches	All-Iron	Bronze Plug & Washer	3-Way, All-Iron	All-Iron	3-Way, All-Iron		3-Way		3-Way		
Square Head, Black	½	1.1	1.1				2¼					
	¾	1.8	1.9	2.0			2¾	1 7/16				
	1	3.0	3.2	3.3			3⅜	1 11/16				
	1¼	4.9	5.0	5.6			4⅛	2 1/16				
	1½	6.8	6.8	7.5			4⅝	2¼				
	2	11.0	11.5	12.0	19.0		5¼	2⅝	6⅜	. . .	6	⅝
	2½	20.5	20.5	21.5	33.0		6⅜	3 3/16	8⅝		7	11/16
	3	32.0	30.0	34.0	48.0	55.0	7¾	3⅞	9⅝	4 13/16	7½	¾
	4	58.0	56.0		84.0	102.0	9⅞		12⅛	6 1/16	9	15/16

Wrenches. . . .page 68

Templates for drilling. . . .page 327

Iron Gas Line Cocks



No. 1228
Square Head
With Bronze Plug
and Washer

Working Pressure

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

Air Tested

Full area cocks — Equipped with bronze plug and washer

No. 1228 are compact, sturdily constructed cocks especially recommended for dependable service on gas lines. The cocks have a cast iron body equipped with a bronze plug, a bronze washer, and an iron nut.

Finish: The cocks, regularly furnished black, will be furnished galvanized when so specified.

Available with check: When specified, the No. 1228 can be furnished with a check.

Weights and Dimensions — Prices on Request

	Size	Weight	End to end
	Inches	Pounds Each	Inches
No. 1228 Square Head	½	.9	2¼
Furnished black unless galvanized is specified	¾	1.4	2⅝
	1	2.3	3¼
	1¼	3.6	3¾
	1½	5.1	4¼
	2	9.0	5 1/16

Wrenches. . . .page 68

Iron Spring-Loaded Mine Cocks
With Bronze Plug or All-Iron

Working Pressures
125 psi air
175 psi non-shock cold water

Air Tested

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches		
	No. 319 With Bronze Plug	No. 332	End to end	Center to top	Center to bottom
Inches		All-Iron			
½	1.3	1.3	2¼	1½	2⅛
¾	2.0	2.0	2⅝	1⅞	2½
1	3.2	3.2	3⅛	2⅛	2¾

Wrenches. . . .page 68

Spring-Loaded Mine Cocks are equipped with a steel spring between the plug and cap which compensates for wear, assures tightness between the body and plug, and permits easy operation.

The position of the ports in the plug is indicated on the head of the plug.

No. 319: The No. 319 has a cast iron body and cap and a bronze plug.

No. 332: The No. 332 is an all-iron cock.



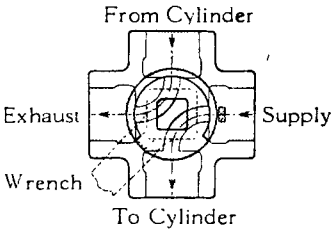
Spring-Loaded Mine Cock

No. 319
Square Head
With Bronze Plug

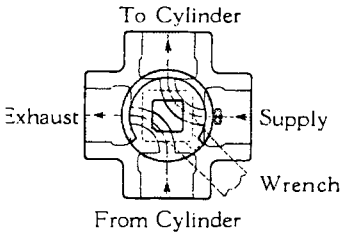
No. 332
Square Head
All-Iron

7

Iron Spring-Loaded Cocks
Four-Way



Supply fluid diverted to one end of cylinder. Fluid from opposite end passes into the exhaust line.



A 90° turn of the wrench moves the piston in the opposite direction and the action is reversed.

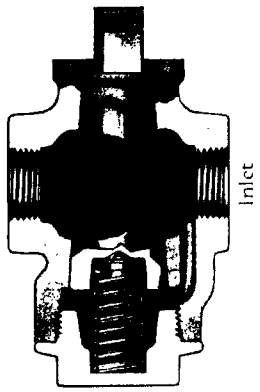
Working Pressures
250 psi air
350 psi non-shock cold water

Air Tested

The No. 339, a spring-loaded four-way cock, is extensively used on hydraulic or air cylinders, hydraulic presses, and similar equipment. The body is cast iron; the plug and cap are bronze.

The cocks have a steel spring between the cap and plug which compensates for wear, assures tightness between the body and plug, and permits easy operation. The body is equipped with an equalizing duct which leads from the inlet port to the chamber beneath the plug.

The position of the ports in the plug is indicated on the head of the plug.



Spring-Loaded Four-Way Cock

No. 339
Square Head
With Bronze Plug

Operation and installation: The two diagrams at the left illustrate the operation of the No. 339. As shown in the upper diagram, the supply fluid is diverted to one end of the cylinder, while fluid from the opposite end passes into the exhaust line. When the wrench is turned 90°, the action is reversed, as shown in the lower diagram. Installation must be as indicated in the diagram.

Bronze spring-loaded cocks: Bronze spring-loaded cocks in both three-way and four-way types are listed and described on page 64.

Weights and Dimensions — Prices on Request

	Size	Pounds	Dimensions, in Inches		
			Center to end	Center to top	Center to bottom
No. 339 Four-Way Cock	Inches	Each			
	½	2.4	1 5/16	2⅛	2⅜
	¾	4.2	1 9/16	2½	2⅞
	1	9.6	1 15/16	3⅛	3½

Wrenches. . . .page 68

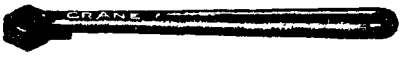
Wrenches for Cocks and Stops

Made of tough malleable iron



Square Head—Series "S"

For all Crane Square Head Cocks except Nos. 319, 332, and 339



Square Head—Series "M"

For Crane Nos. 319, 332, and 339 Square Head Iron Cocks only

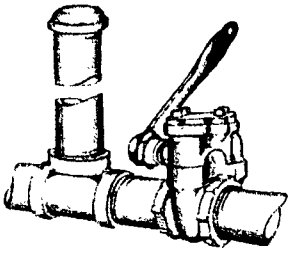


Flat Head—Series "F"

For all Crane Flat Head Cocks and Stops

Catalog Numbers, Weights, Lengths, and Application — Prices on Request

Wrenches				Sizes of Cocks and Stops (Inches) Wrenches Will Fit									
				Bronze Cocks and Stops						Iron Cocks			
Type and Catalog Number		Weight Pounds Each	Length from center of head to end Inches	No. 80 E	Nos. 250 254	Nos. 268 269	Nos. 252 266 270	No. 306	No. 307	Nos. 319 332	Nos. 320 324 325 326 331	No. 339	No. 1228
Square Head Series "S"	1-S	.11	3	1/4	1/4	1/4	..	..	..	..	..	..	..
	2-S	.15	3 1/2	3/8	3/8	.	..	1/4 to 1/2	1/4, 3/8	..	..	..	..
	3-S	.20	4	..	1/2	3/8	.	..	1/2	..	..	..	1/2
	4-S	.33	5	1/2	3/4	1/2	.	.	..	..	1/2	..	3/4
	5-S	.46	6 1/2	3/4	1	3/4	..	..	..	..	3/4	..	1
	6-S	.64	8	1	1 1/4	1	..	..	..	..	..	..	1 1/4
	6 1/2-S	.70	7 5/8	..	..	..	..	..	..	..	1	..	..
	7-S	.9	9 1/2	1 1/4	1 1/2	1 1/4, 1 1/2	..	.	..	..	..	..	1 1/2
	7 1/2-S	.8	8 1/2	..	..	..	..	..	..	..	1 1/4	..	..
	8-S	1.5	12	1 1/2	2	2	..	.	..	..	1 1/2	..	2
	9-S	2.7	14 1/2	2	.	..	..	..	..	..	2	..	..
	10-S	3.8	17	..	..		..	..	..	..	2 1/2	..	..
	11-S	5.8	22	..	..	..	..	..	..	..	3	..	..
	12-S	11.2	30	.	.		.	.	..	..	4	..	..
Square Head Series "M"	1-M	.27	5 1/2	..	.	..	..	..	..	1/2	..	..	..
	2-M	.5	8	..	..	..	.	..	.	3/4, 1	..	1/2, 3/4	..
	4-M	1.0	11	..	.			.		.	..	1	..
Flat Head Series "F"	1-F	.10	3	.	..	.	1/4	..	..	..	..	..	..
	2-F	.15	3 1/2	..	..	..	3/8	..	..	..	..	..	..
	3-F	.21	4	..	..	..	1/2	..	..	..	..	..	..
	4-F	.34	5	..	.	..	3/4	..	..	..	..	..	..
	5-F	.45	6 1/2	..	.	..	1	..	..	..	..	..	..
	6-F	.66	8	..	..	..	1 1/4	.	..	..	..	..	..
	7-F	.97	9 1/2	..	..	..	1 1/2	..	..	..	..	..	..
	8-F	1.5	12	..	.	.	2	..	..	.	..	..	..



Prevent 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 is called "water hammer" or "shock"—and it can do serious damage to 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 which is especially designed for this purpose.

SECTION 8

Crane Iron Body Wedge Gate Valves

(Including Alloy Iron and Pulp Stock Valves)

Clamp Gate Valves.....pages 70 and 71

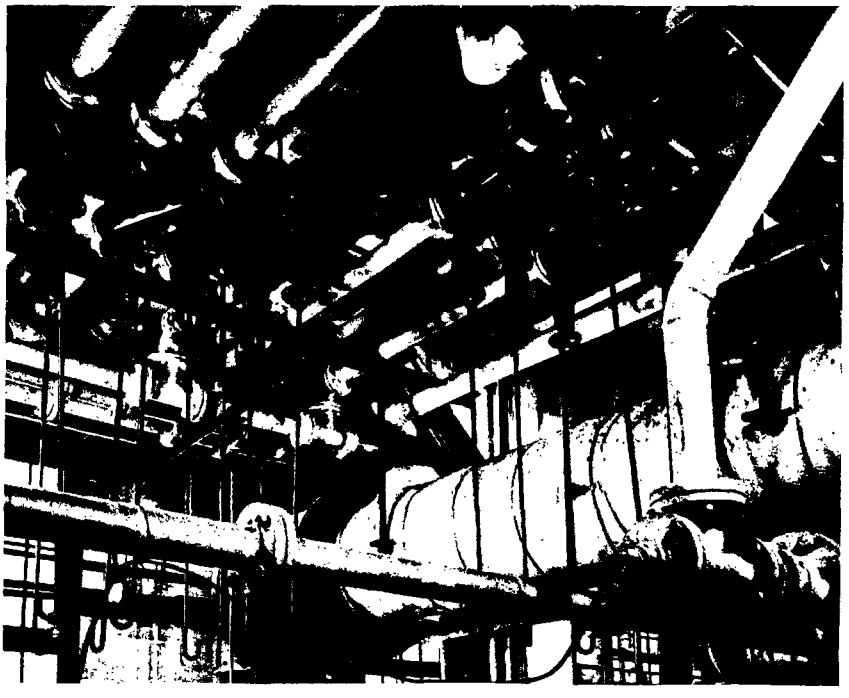
Ferrosteel Wedge Gate Valves
125-Pound, General Description.....pages 72 and 73
125-Pound, Non-Rising Stem.....pages 74 and 75
125-Pound, Outside Screw and Yoke.....pages 76 and 77
125-Pound, Quick-Opening.....page 78
250-Pound.....pages 80 and 81
Underwriters' Pattern.....page 79

Alloy Iron Wedge Gate Valves
3% Nickel Cast Iron, for Process Industries.....page 82
Ni-Resist Cast Iron.....page 83
Nodular (Ductile) Cast Iron.....page 87

Pulp Stock Valves
Iron Body.....pages 84 and 85
3% Nickel Cast Iron Body.....pages 84 and 85
18-8 SMo Body.....page 86

For related data, refer to:

Cast steel pipe-line gate valves.....pages 131 to 133
Iron body gate valves for marine service.....pages 230 and 233
Gearing.....pages 271 to 274
By-passes.....page 282
Accessories for valves.....pages 259 to 283
Gaskets for iron flanged joints.....page 322
Templates for drilling.....pages 327 and 328

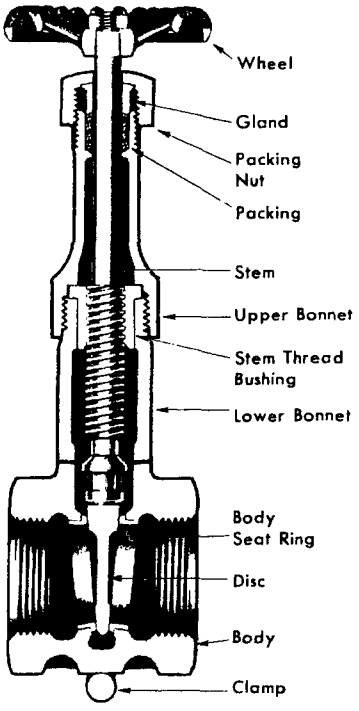


An overhead installation of Crane Iron Body Clamp Gate Valves. Crane Clamp Gate Valves, compact and sturdy, have an especially wide acceptance among process industries, and in oil field or oil refinery installations.

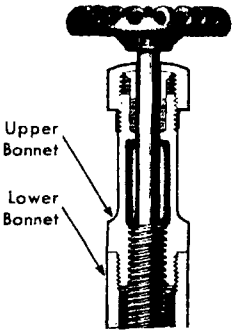
Clamp Gate Valves

Wedge Disc

Bronze Trimmed



Bronze Trimmed Inside Screw Type
Typical construction of 1¼ to 4-inch sizes



Bronze Trimmed Inside Screw Type
Typical construction of ¼ to 1-inch sizes (½-inch and smaller do not have a gland)

Working Pressures

Size (Inches)	Saturated Steam	Cold Water, Oil, or Gas Non-Shock
Screwed Valves		
¼ to 2	150 psi	225 psi
2½ to 4	125 psi	175 psi
Flanged Valves		
1 to 2	125 psi	200 psi
2½ to 4	125 psi	175 psi

Air Tested

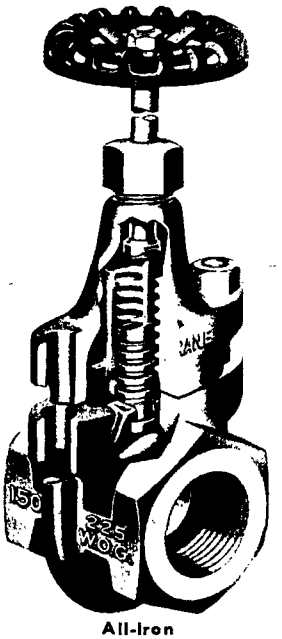
Recommendations

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 bronze trimmed valves are recommended for steam, water, air, or non-corrosive oil lines.

The all-iron valves are recommended for oil, gas, or gasoline, or for fluids that corrode bronze but not iron or steel. For special corrosive services, all-iron valves can be made with a malleable iron disc.

All-Iron



All-Iron Inside Screw Type
Illustration shows partially sectioned All-Iron Inside Screw Valve which features a free-draining bonnet. The bonnet has neither flats nor pockets to trap the fluid.

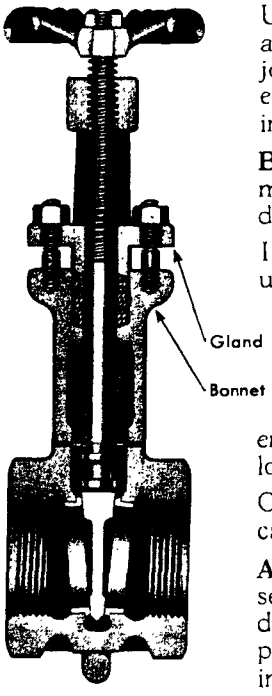
Body: The body is made of cast iron (ASTM A 126, Class A) in sizes 2½-inch and smaller; in sizes 3 and 4-inch, the body is Crane Ferrosteel (ASTM A 126, Class B).

Construction: All valves are made with lugs on both the body and bonnet. A U-shaped clamp passes through these lugs assuring a snug, accurately aligned bonnet joint. In addition, the clamp construction enables quick dismantling of the valve for inspection, cleaning, or repairs.

Bronze trimmed valves: Bronze trimmed valves have bronze body seat rings, disc, and stem.

In inside screw valves ¼ to 1-inch, the upper portion of the bonnet engages the stem threads; it is made of bronze and is renewable. Sizes 1¼-inch and larger have a bronze renewable stem thread bushing in the bonnet. This design provides full stem thread engagement, bronze-to-bronze, and assures long life of stem threads.

Outside screw and yoke valves have a cast iron bolted gland.



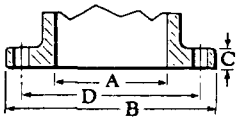
Bronze Trimmed Outside Screw and Yoke Type
All Sizes

All-iron valves: All-iron valves have seats cast integral with the body. The disc is forged steel. The stem is steel; the portion coming in contact with the stuffing box packing is nickel-plated.

All-Iron Inside Screw Valves have a one-piece free-draining bonnet with an interrupted thread for engagement with the stem. This construction, shown at the upper right, permits free passage on either side of the stem from the upper part of the bonnet, preventing the entrapment of line fluids. The interrupted threads have a wiping action on the stem, preventing sticking in heavy fluid service.

Shock: Quick-opening valves used in liquid lines should be installed with a suitable cushioning device to protect against water hammer; see page 14.

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



Dimensions of Flanges, in Inches

Size	A	B	C	D	No. of bolts	Dia. of bolts
1	1	4¼	7/16	3⅛	4	½
1¼	1¼	4⅝	½	3½	4	½
1½	1½	5	9/16	3⅞	4	½
2	2	6	⅝	4¾	4	⅝
2½	2½	7	11/16	5½	4	⅝
3	3	7½	¾	6	4	⅝
4	4	9	15/16	7½	8	⅝

For valve weights and dimensions, see page 71.

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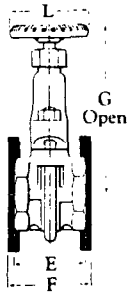
Clamp Gate Valves

Inside Screw, Rising Stem



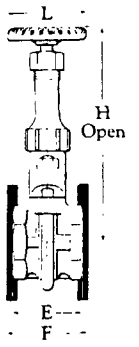




All-Iron

No. 488, Screwed — No. 488½, Flanged





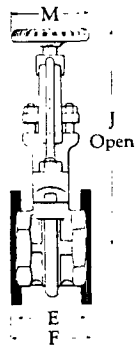


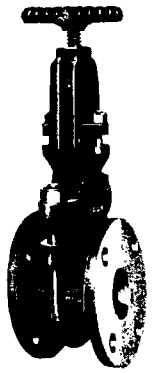
Iron Body, Bronze Trimmed

No. 490, Screwed — No. 490½, Flanged

Outside Screw and Yoke







All-Iron

No. 484½, Screwed — No. 485½, Flanged

Iron Body, Bronze Trimmed

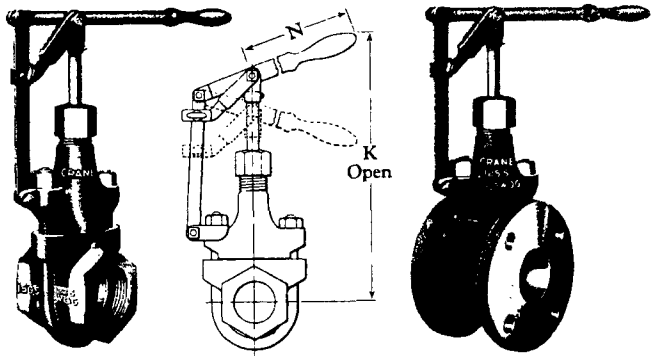
No. 486½, Screwed — No. 487½, Flanged

Flanged valves are furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125; they can be furnished faced only when specified.

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

Quick-Opening

For description, see page 70.



All-Iron

No. 492, Screwed — No. 492½, Flanged

Iron Body, Bronze Trimmed

No. 494, Screwed — No. 494½, Flanged

Weights in Pounds, Each — Prices on Request

Valve Ends	Size	Inside Screw, Rising Stem		Outside Screw and Yoke		Quick-Opening	
	Inches	All-Iron	Bronze Trim	All-Iron	Bronze Trim	All-Iron	Bronze Trim
		No. 488	No. 490	No. 484½	No. 486½	No. 492	No. 494
Screwed	¼	1.2	1.2				
	⅜	1.3	1.4				
	½	1.6	1.8	2.3	2.4	2.2	
	¾	2.6	2.9	3.1	3.1	3.4	
	1	3.9	4.2	4.8	4.8	5.1	5.0
	1¼	5.5	6.1	6.1	6.1	6.7	
	1½	7.3	8.0	9.3	9.3	9.3	9.0
	2	11.3	12.3	13.0	13.3	13.3	13.4
	2½	17.0	19.0	21.5		20.0	21.0
	3	25.0	26.0	30.0		27.0	27.0
	4	54.0	58.0	55.0		55.0	50.0
		No. 488½	No. 490½	No. 485½	No. 487½	No. 492½	No. 494½
Flanged F & D	1	6.6					
	1¼	9.0					
	1½	11.7	12.2	13.8	13.5		
	2	18.0	19.0	19.0	20.0	19.5	20.0
	2½	28.0	28.0	29.0	29.0	30.0	30.0
	3	38.0	38.0	40.0	40.0	38.0	38.0
	4	70.0	70.0	72.0	72.0	76.0	76.0

Dimensions, in Inches

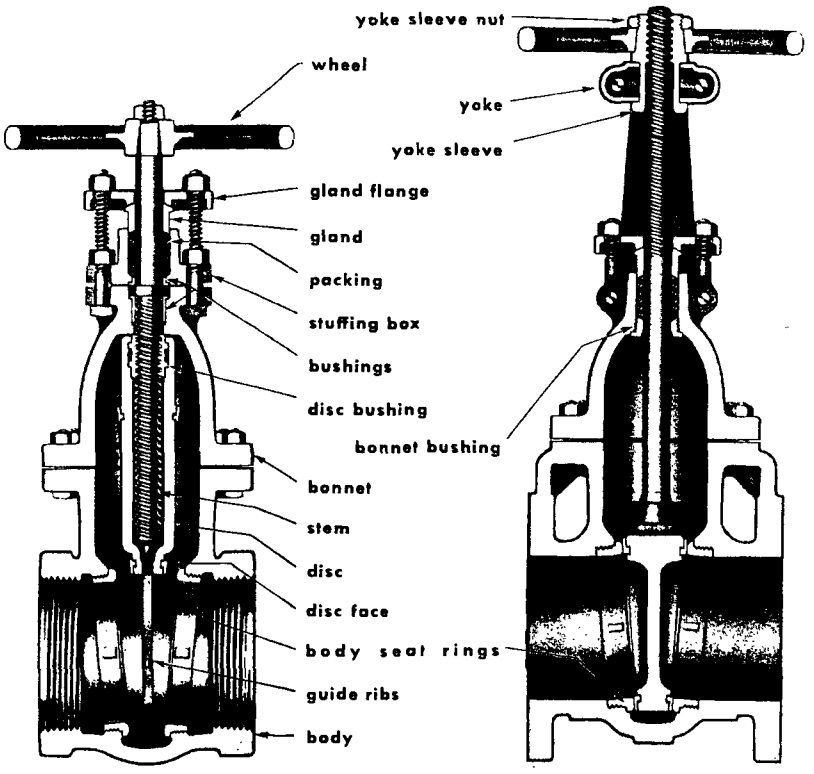
Size	E*	F*	G	H	J	K	L	M	N
¼	1⅞		4⅝	4⅞			1¾		
⅜	2		4⅝	4⅞			1¾		
½	2 1/16		5⅜	6¼	6⅝	7½	2 1/16	2 9/16	6
¾	2 5/16		6¼	7½	7½	8¾	2 9/16	2 9/16	7
1	2 9/16	3 3/16	7⅜	8½	9⅛	9⅛	2¾	2¾	7
1¼	2⅞	3½	9	10⅛	10⅛	12	3 1/16	3 1/16	7
1½	3⅛	3¾	9⅝	11¼	12¼	13¼	3⅝	3⅝	9
2	3⅝	4¼	11¾	13½	14¼	15¾	4 1/16	4 1/16	9
2½	4⅛	4 15/16	13	15¾	16¼	18	4¾	4¾	10⅞
3	4 9/16	5 1/16	15¼	18¼	19	21¾	6	6	10⅞
4	5 9/16	6¾	19¾	24¼	24	25	9	9	14¾

Templates for drilling....page 327 *Thread engagement.....page 352*

8

125-Pound Ferrosteel Wedge Gate Valves

Names of Parts

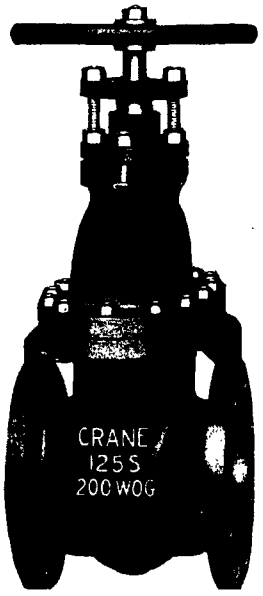


Non-Rising Stem Valve
Bronze Trimmed — Open

Outside Screw and Yoke Valve
Bronze Trimmed — Closed

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 80.

8



Non-Rising Stem Flanged
Bronze trimmed and all-iron valves with screwed, flanged, or hub ends are available.

Crane 125-Pound Ferrosteel Wedge Gate Valves are described in detail on this and the seven pages that follow.

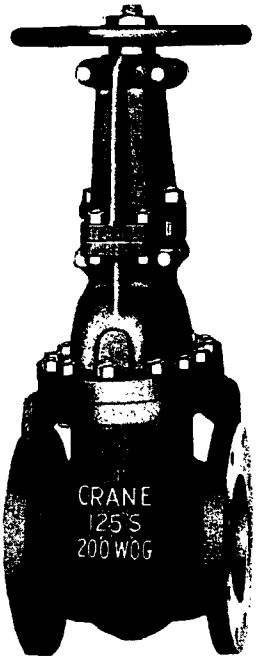
The valves have proved their versatility and dependability in practically every industry. Sizes 16-inch and smaller, particularly, with many features of unusual merit, set a new peak for quality in iron body wedge gate valves; unusual strength, long service life, and fine all-around adaptability in all types of installations are a few of the advantages of the Crane line.

Bronze trimmed and all-iron non-rising stem and outside screw and yoke valves are available; refer to the listings below:

General Description ..... page 73
Non-Rising Stem Valves ..... pages 74 and 75
Outside Screw and Yoke Valves. . pages 76 and 77
Quick-Opening Valves ..... page 78
Underwriters' Pattern Valves ..... page 79

The following alloy iron valves, made to the same high standard of quality and exacting design as the 125-pound valves, are also included in this section:

3% Nickel Cast Iron Wedge Gate Valves . . page 82
Ni-Resist Cast Iron Wedge Gate Valves. . . . page 83
Nodular Cast Iron Wedge Gate Valves. . . . . page 87



Outside Screw and Yoke Flanged
Bronze trimmed screwed and flanged, or all-iron flanged valves, are available.

125-Pound Ferrosteel Wedge Gate Valves

General Description

Body and bonnet

The body and bonnet are oval-shaped; liberal metal sections combined with proper metal distribution assure maximum strength.

Flanged valves 24-inch and smaller have straight through ports, with tie ribs between the bonnet flange and the end flanges providing additional resistance to line strains.

Disc

The disc is made of cast iron, and in bronze trimmed valves has large bronze seating faces rolled securely into machined dovetails.

The disc is of the solid web type. All non-rising stem valves and 14-inch and larger outside screw and yoke valves have the disc built up at the center to accommodate the stem hole. In the non-rising stem bronze trimmed valves the portion of the disc that engages the stem threads is bronze-bushed.

All valves feature long disc guides consisting of ribs in the body and machined grooves in the disc. This minimizes the drag on the seating surfaces and thereby prolongs their life. In sizes 12-inch and smaller, where the disc guide is at least 50 per cent of the port diameter, the engaging surfaces are tapered to prevent a line bearing contact which would cause excessive wear of the guides.

Stem

The stem is of liberal diameter and amply strong. Stem threads have long engagement in the disc or yoke sleeve. In outside screw and yoke valves, sizes 12-inch and smaller have a tee-head disc-stem connection, and sizes 14-inch and larger have a threaded disc-stem connection locked together with a pin.

Gland and stuffing box

These valves have a two-piece ball-type gland, consisting of a gland and a gland flange. This construction maintains an even load on the packing and prevents binding on the stem even when gland bolt nuts are pulled up unevenly.

Non-rising stem valves 12-inch and smaller have through bolts holding the stuffing box to the bonnet and, in the bronze trimmed valves, the stem collar recess is bronze-bushed, top and bottom, to minimize friction and to prevent corrosion.

Outside screw and yoke valves 12-inch and smaller 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.

All valves have an exceptionally deep stuffing box filled with high grade packing.

Repacking

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

The outside screw and yoke bronze trimmed valves in sizes 12-inch and smaller have a bronze bonnet bushing which offers a better back seat for the stem and makes 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 outside screw and yoke 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.

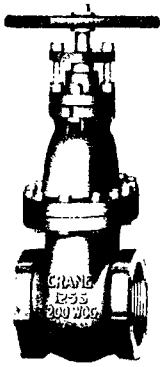
Wheel

Valve wheels are made of malleable iron, assuring maximum strength; they have an oval-shaped rim, affording an easy grip.

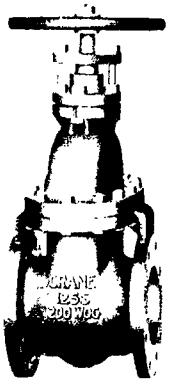
For additional description, see the pages that follow.

125-Pound Ferrosteel Wedge Gate Valves

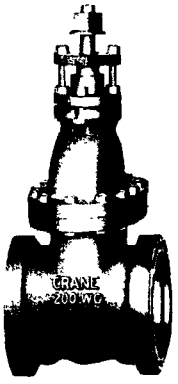
Non-Rising Stem—Bronze Trimmed or All-Iron



Non-Rising Stem
Screwed
No. 460
Bronze Trimmed
No. 472
All-Iron



Non-Rising Stem
Flanged
No. 461
Bronze Trimmed
No. 473
All-Iron



Non Rising Stem
Hub Ends
No. 462
Bronze Trimmed

For additional description, see the preceding two pages.

Ratings—Pounds per Square Inch

Valve Type	Valve Size, Inches	Working Pressures (non-shock): Saturated Steam	Cold Water or Gas	Cold Oil	Hydrostatic Test Pressures: Shell test	Seat test
Screwed or Flanged	2 to 12	125	200	200	350	225
	14 and 16	125	150	150	250	175
	18 to 24	*	150	150	250	175
	30 to 48	*	120	120	200	150
Hub Ends	2 to 12	...	200	...	350	225

*For steam lines larger than 16-inch, Crane 150-Pound Cast Steel Gate Valves are recommended; see page 125.

These are rugged non-rising stem valves. They have a wide application in nearly every kind of industry. Like other valves in the Crane 125-Pound Ferrosteel Wedge Gate line (see pages 76 to 79), they feature a solid web disc; flanged valves 24-inch and smaller have straight-through ports with tie ribs between the bonnet flange and the end flanges. For additional description and sectional illustration, see the preceding two pages; for dimensions, see the facing page.

Body and bonnet: The body and bonnet in sizes 16-inch and smaller are Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than regular gray iron. In larger sizes, they are made of Crane High Tensile Iron. These metals conform to ASTM Specification A 126, Classes B and C respectively.

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

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

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

All-iron valves: All-iron valves are recommended for oil or gas, or for fluids that corrode bronze.

The seats are cast integral with the body and disc. The stem is steel; the portion contacting the packing is nickel-plated.

No. 472 Valves with screwed-in body seat rings can be made to order.

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

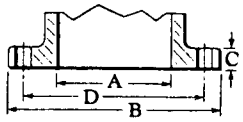
Gland: All valves have a two-piece gland consisting of a malleable iron gland flange and a siliconized steel gland.

In sizes 12-inch and smaller, the bronze trimmed valves have bronze gland bolt nuts; the all-iron valves have steel gland bolts and gland bolt nuts.

Disc rollers: Bronze trimmed valves 30-inch and larger, ordered for use in a horizontal line with the valve stem horizontal, will have a bronze track in the lower side of the body and bronze rollers in the lower side of the disc.

Federal Specification: No. 460 Valves 6-inch and smaller and No. 461 Valves 12-inch and smaller comply with Federal Specification WW-V-58 for Class "A" 125-Pound Iron Body Wedge Gate Valves, Type I, Designations "NS" and "NF" respectively. However, the valves must be ordered with end protectors.

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



Dimensions of Flanges, in Inches

Size	A	B	C	D	No. and diameter of bolts
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
3 1/2	3 1/2	8 1/2	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	13 1/2	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	23 1/2	1 7/16	21 1/4	16-1
18	18	25	1 9/16	22 3/4	16-1 1/8
20	20	27 1/2	1 11/16	25	20-1 1/8
24	24	32	1 7/8	29 1/2	20-1 1/4
30	30	38 3/4	2 1/8	36	28-1 1/4
36	36	46	2 3/8	42 3/4	32-1 1/2
42	42	53	2 5/8	49 1/2	36-1 1/2
48	48	59 1/2	2 3/4	56	44-1 1/2

(description continued on the opposite page)

125-Pound Ferrosteel Wedge Gate Valves

Non-Rising Stem—Bronze Trimmed or All-Iron

(For additional description and ratings, see pages 72 to 74)

Hub ends: Hub ends of the No. 462 fit Class A, B, C, or D cast iron pipe. The valves have a 2-inch square operating nut instead of a wheel. The following sizes are suitable for use with Transite or Century asbestos cement pipe for a poured joint (specify pipe size, type, and class):

For machined or rough end pipe:
3 to 8-inch valves for
Class 50, 100, or 150 Transite
Class 100 or 150 Century
10 and 12-inch valves for
Class 50 or 100 Transite
Class 100 or 150 Century
Class 100 Century (Big 10 and Big 12)

For machined end pipe only:
2-inch valves for Class 50 Transite
4-inch valves for Class 200 Transite or Century

Cleanout: For use on lines carrying an unusual amount of sediment, the 3, 4, 5, 6, 8, 10, and 12-inch flanged valves can be equipped with a cleanout on the side of the body to facilitate cleaning; see page 283.

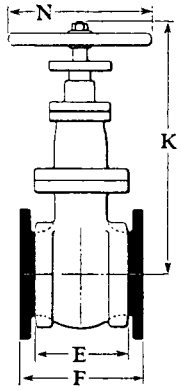
Indicator: Nos. 460 and 461 Valves 12-inch and smaller can be equipped with a Universal" type indicator; see page 283.

Motor or cylinder operation: Valves installed in inaccessible locations can be equipped with some easy means of operation. An electric or air motor drive, or an operating cylinder, is ideal for this purpose; see pages 260 to 270.

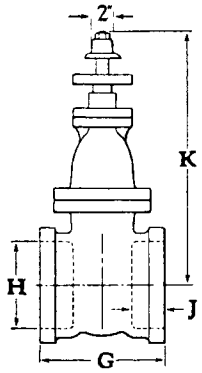
Face to face: Face to face dimensions (F) of flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Wedge Gate Valves. The Standard includes sizes 2 to 24-inch inclusive.

Drilling: Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125 (B16.1-1948); they can be furnished faced only when specified.

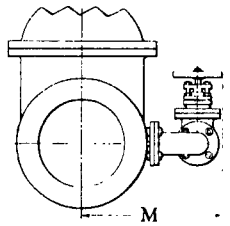
Smaller sizes: For sizes smaller than listed, use Clamp Gate Valves, page 70.



Screwed or Flanged



Hub Ends



By-pass for water service available for sizes 12-inch and larger

8

Weights and Dimensions — Prices on Request

Size	Pounds, Each					Dimensions, in Inches									
	Screwed		Flanged F & D		Hub Ends									By-Pass	
Inches	No. 460 Bronze Trim	No. 472 All-Iron	No. 461 Bronze Trim	No. 473 All-Iron	No. 462 Bronze Trim	E	F	G	H	J	K	N	Turns to open	By-pass size	M
2	34	34	41	39	42	6⅛	7	8¾	3.25	2.75	13	8	7	. .	
2½	41	41	50	40	.	6½	7½	.	. . .		13¾	8	8½	. .	. . .
3	50	50	70	65	60	6¾	8	9¼	4.66	2.75	15½	9	10½	. .	.
3½	. . .	. .	80	. .		.	8½	. .	. . .	.	16½	9	12	.	.
4	90	80	100	100	100	7⅝	9	10⅜	5.70	3.00	18¾	10	9		.
5	120	. .	140	140	. .	8½	10	.		. . .	21½	12	11	.	. . .
6	160	. . .	170	180	170	8⅞	10½	11¼	7.80	3.00	23¼	12	13	. .	. . .
8*	260	. . .	310	295	300	10¼	11½	13	10.00	3.50	27½	16	17	. .	. . .
10*	.	. .	460	460	445	.	13	13¾	12.10	3.50	33	20	21		
12*	.	. . .	690	690	640	.	14	14½†	14.20	3.50	36½	20	25½	2	22
14*	.	.	520	.	.	. . .	15			.	39½	20	30	2	23½
16*	. . .	. . .	1330	.	.	. . .	16	. .	. . .	. .	48½	22	34	3	27½
18*	.	. .	1380	. .	. .	. . .	17	. .	. .	.	49	24	38	3	28½
20*	. .	. . .	1720	.	. .	. . .	18	. .	. .	.	52½	24	42¼	3	29½
24*	. .	. .	2660	. .	. .	.	20	.	. .	. .	63½	30	50	4	35½
30*	. .	. . .		. .	. . .	. . .	24	. .	. .	. .	76	36	95	4	39
36*	. . .	. . .	on	. .	. .	. .	28†	. . .	. .	. . .	92	42		6	45
42*	. . .	. . .	request	. . .	. .	. .	33	. .	. .	. .	106	42	.	6	50
48*	. . .	. . .		. .	. .	.	36	.	. .	.	114	42		8	58

By-pass and gearing: To facilitate operation, by-passes are available for sizes 12-inch and larger, and gearing for sizes 8-inch and larger. The use of either, or both, should be particularly considered for sizes 16-inch and larger. The by-pass serves to balance the pressure on both sides of the disc before the main valve is opened, see pages 271 to 274 for gearing and page 282 for by-passes.

†When equipped with by-pass, 36-inch flanged valves have a face to face (F) of 32 inches and 12-inch hub end valves have an end to end (G) of 16 inches.

Outside Screw and Yoke Valves.....page 76
Quick-Opening Valves.....page 78
Underwriters' Pattern Valves.....page 79
Valves for Marine Service.....page 233
Indicator posts.....page 275
Templates for drilling.....page 327
Thread engagement.....page 352

125-Pound Ferrosteel Wedge Gate Valves

Outside Screw and Yoke — Bronze Trimmed or All-Iron

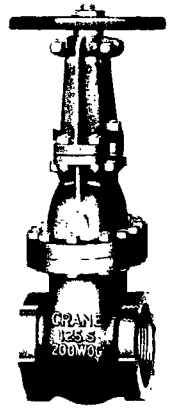
For sectional illustration, see page 72.

Ratings—Pounds per Square Inch

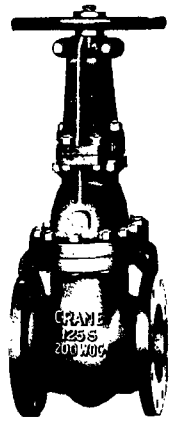
Valve Size, Inches	Working Pressures (non-shock)			Hydrostatic Test Pressures	
	Saturated Steam	Cold Water or Gas	Cold Oil	Shell test	Seat test
2 to 12	125	200	200	350	225
14 and 16	125	150	150	250	175
18 to 24	*	150	150	250	175
30 to 48	*	120	120	200	150

*For steam lines larger than 16-inch, Crane 150-Pound Cast Steel Gate valves are recommended; see page 125.

For additional description, see page 73.



Outside Screw & Yoke
Screwed
No. 464½
Bronze Seats, Bronze Stem



Outside Screw & Yoke
Flanged
No. 465
Bronze Seats, Steel Stem
No. 465½
Bronze Seats, Bronze Stem
No. 475½
All-Iron

8

These rugged outside screw and yoke valves are part of Crane's complete line of 125-Pound Ferrosteel Wedge Gate Valves. Like the other valves, they feature a solid web disc; flanged valves 24-inch and smaller have straight-through ports with tie ribs between the bonnet flange and the end flanges. See pages 72 and 73.

Body and Bonnet: The body and bonnet in sizes 16-inch and smaller are Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than regular gray iron. In larger sizes, for even greater strength, the body and bonnet are Crane High Tensile Iron. These metals conform to ASTM Specification A 126, Classes B and C respectively.

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

The body seat rings are made of bronze and are screwed into the body. The disc faces are bronze, rolled into the disc. As indicated under the lower illustration at the left, the flanged valves are made with either a bronze or a steel stem; on steel stems, the portion in contact with the packing is nickel-plated.

Sizes 12-inch and smaller have a tee-head disc-stem connection with a renewable bronze stem hole bushing in the bonnet.

All-iron valves: The No. 475½ are all-iron valves recommended for oil or gas, or for fluids that corrode bronze.

The seats are cast integral with the body and disc. The stem is made of steel and the portion contacting the packing is nickel-plated. When specified, sizes 12-inch and smaller (except 5-inch) can be made to order with screwed-in body seat rings.

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

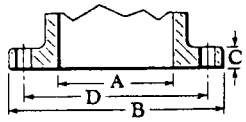
Gland: All valves have a two-piece gland consisting of a malleable iron gland flange and a siliconized steel gland.

Valves 12-inch and smaller have swinging type gland eye bolts. In these sizes, the bronze trimmed valves are equipped with bronze gland bolt nuts and the all-iron valves have steel gland eye bolts and gland bolt nuts.

Disc rollers: Bronze trimmed valves 30-inch and larger, ordered for use in a horizontal line with the valve stem horizontal, will have a bronze track in the lower side of the body and bronze rollers in the lower side of the disc.

Federal Specification: The No. 464½ in all sizes and the No. 465½ in sizes 12-inch and smaller comply with Federal Specification WW-V-58 for Class "A" 125-Pound Outside Screw and Yoke Wedge Gate Valves, Type I, Designations "OS" and "OF" respectively. However, the valves must be ordered with end protectors.

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



American Standard 125-pound templates for drilling are shown on page 327.

Dimensions of Flanges, in Inches

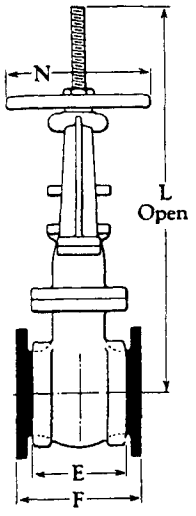
Size	A	B	C	D	No. & dia. of bolts
2	2	6	5/8	4¾	4-5/8
2½	2½	7	11/16	5½	4-5/8
3	3	7½	¾	6	4-5/8
3½	3½	8½	13/16	7	8-5/8
4	4	9	15/16	7½	8-5/8
5	5	10	15/16	8½	8-¾
6	6	11	1	9½	8-¾
8	8	13½	1⅛	11¾	8-¾
10	10	16	1 3/16	14¼	12-⅞
12	12	19	1¼	17	12-⅞
14	14	21	1⅜	18¾	12-1
16	16	23½	1 7/16	21¼	16-1
18	18	25	1 9/16	22¾	16-1⅛
20	20	27½	1 11/16	25	20-1⅛
24	24	32	1⅞	29½	20-1¼
30	30	38¾	2⅛	36	28-1¼
36	36	46	2⅜	42¾	32-1½
42	42	53	2⅝	49½	36-1½
48	48	59½	2¾	56	44-1½

(description continued on the opposite page)

125-Pound Ferrosteel Wedge Gate Valves

Outside Screw and Yoke—Bronze Trimmed or All-Iron

(Continued from the preceding page; for general description, see pages 72 and 73)



Screwed or Flanged Valves

Cleanout: Flanged end valves (non-rising stem type as well as outside screw and yoke) in sizes 3, 4, 5, 6, 8, 10, and 12-inch, intended for use on lines carrying any unusual amount of sediment, tarry fluids, etc., can be equipped with a side cleanout; see illustration at upper right.

Motor or cylinder operation: Valves installed in inaccessible locations or used for emergency purposes should preferably be equipped with some easy means of operation. An electric or air motor drive, or an operating cylinder is ideal for this purpose. See pages 260 to 270.

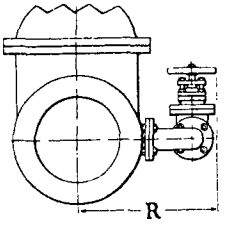
Face to face: Face to face dimensions (F) of flanged valves conform to those in the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Wedge Gate Valves. This Standard includes sizes 2 to 24-inch inclusive.

Drilling: Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125 (B16.1-1948); they can be furnished faced only, when specified.

Smaller sizes: When sizes smaller than 2-inch are required, use the Iron Body Clamp Gate Valves shown on pages 70 and 71.



Cleanout available for 3, 4, 5, 6, 8, 10 and 12-inch flanged valves



By-pass available for water service

8

Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches						
	Screwed	Flanged, F & D								By-Pass*	
Inches	No. 464½ Bronze Seats, Bronze Stem	No. 465 Bronze Seats, Steel Stem	No. 465½ Bronze Seats, Bronze Stem	No. 475½ All-Iron	E	F	L	N	Turns to open	Size	R
2	35	40	43	44	6⅛	7	15	8	7	...	..
2½	43	50	53	50	6½	7½	17	8	8½	..	..
3	50	70	72	65	6¾	8	19½	9	10½	.	..
3½	...	...	90	...	...	8½	21¼	9	12	..	...
4	100	110	107	100	7⅝	9	23¾	10	9	...	...
5	...	155	155	150	...	10	28¾	12	11	...	..
6	...	190	197	190	..	10½	32¾	12	13	..	..
8*	...	330	320	325	...	11½	42¼	16	17	...	..
10*	...	520	520	520	...	13	50¾	20	21	..	..
12*	...	710	720	710	...	14	58	20	25½	2	22
14*	...	910	930	940	...	15	68	20	30	2	23½
16*	...	1400	1410	1400	...	16	75½	22	34	3	27½
18*	...	1600	1600	1520	...	17	83½	24	38	3	28½
20*	...	1950	1920	1900	...	18	91½	24	42¼	3	29½
24*	...	2980	2980	2960	...	20	109	30	50	4	35½
30*	...	5480	5480	5480	...	24	138	36	95	4	39
36*	...	9250	9250	9250	...	28†	160	42	...	6	45
42*	...	15000	15000	15000	...	33	191	42	...	6	50
48*	...	18000	18000	18000	...	36	209	42	...	8	58

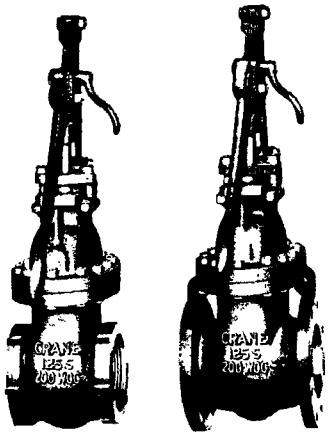
***By-pass and gearing:** To facilitate operation, by-passes are available for sizes 12-inch and larger, and gearing for sizes 8-inch and larger. The use of either, or both, should be particularly considered for sizes 12-inch and larger. The by-pass serves to balance the pressure on both sides of the disc before the main valve is opened; see pages 271 to 274 for gearing and page 282 for by-passes

†36-inch flanged valves equipped with by-pass have a face to face (F) of 32 inches.

Non-Rising Stem Valves.....page 74
Quick-Opening Valves.....page 78
Underwriters' Pattern Valves....page 79
3% Nickel Cast Iron Valves....page 82
Ni-Resist Cast Iron Valves.....page 83
Templates for drilling.....page 327
Thread engagement.....page 352

125-Pound Ferrosteel Wedge Gate Valves

Quick-Opening—Bronze Trimmed



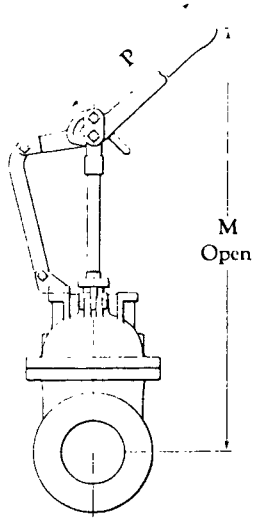
No. 470 Screwed — No. 471 Flanged

Bronze Trimmed

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

Hydrostatic Test Pressures
350 psi shell **225** psi seat

These valves are part of the Crane line of 125-Pound Ferrosteel Wedge Gate Valves. Except for their quick-opening mechanism and the disc-stem connection, they are the same as the outside screw and yoke valves described on the two preceding pages. For a general description of the entire line, see pages 72 and 73.



Screwed or Flanged

Complete dimensions are shown in the table below

Body and bonnet: The body and bonnet are oval-shaped, liberal metal sections combined with proper metal distribution assure maximum strength.

The body and bonnet are made of Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than regular gray iron. This metal conforms to requirements of ASTM Specification A 126, Class B.

Flanged valves have straight through ports with tie ribs between the bonnet flange and the end flanges.

Bronze trimmed: The body seat rings are bronze, screwed into the body. The disc, of the solid web type, has large bronze seating faces rolled securely into machined dovetails.

The stem, liberal in diameter and amply strong, is made of bronze; *for the extra rigidity needed in this type of valve, the disc is threaded on the stem and pinned to it.* The upper part of the bonnet is fitted with a renewable bronze bonnet bushing.

Gland: The two-piece gland consists of a siliconized steel gland and a malleable iron gland flange.

Swinging type gland eye bolts are used; the gland nuts are bronze.

Stuffing box: The stuffing box, amply deep, is filled with high grade packing.

Lever handle: The lever handle is made of rugged malleable iron.

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; for details, refer to page 14.

Face to face: Flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Wedge Gate Valves.

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

Drilling: Flanged valves are furnished faced and drilled (F&D) to the American Cast Iron Flange Standard, Class 125; they can be furnished faced only, when specified.

Smaller sizes: When quick-opening valves are required in sizes smaller than 3-inch, use the Iron Body Clamp Gate Valves illustrated and described on pages 70 and 71.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches							
	No. 470	No. 471	End to end	Face to face	M	P	End Flanges			
							Diam-eter	Thick-ness	Dia. of bolt circle	No. & dia. of bolts
Inches	Screwed	Flanged F & D								
3	50	60	6¾	8	27¾	12	7½	¾	6	4-⅝
4	75	100	7⅝	9	35¼	15½	9	15/16	7½	8-⅝
5		140		10	40	23	10	15/16	8½	8-¾
6	145	180	8⅞	10½	46	23	11	1	9½	8-¾
8		310		11½	59¼	29	13½	1⅛	11¾	8-¾
10		480		13	76¼	41	16	13/16	14¼	12-⅞
12		660		14	83¼	41	19	1¼	17	12-⅞

Additional description.....page 73
125-Pound Ferrosteel Wedge Gates....pages 74 to 77
Templates for drilling....page 327
Thread engagement.....page 352

Ferrosteel Wedge Gate Valves
Underwriters' Pattern

Working Pressure
175 psi non-shock cold water

Hydrostatic Test Pressures
350 psi shell **200** psi seat

These valves, designed for fire protection service, are similar to the valves described on pages 72 to 77.

These valves, companions to the 125-Pound Ferrosteel Wedge Gates described on pages 72 to 77, are designed especially for fire protection service. They are approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories. The valves are marked "CU" and "FM."

Materials and design: The body and bonnet are Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than regular gray iron. This metal conforms to requirements of ASTM Specification A 126, Class B.

The body seat rings are bronze, screwed into the body. The solid web type disc is cast iron with large bronze seating faces rolled securely into machined dovetails.

The stem is bronze; the bonnet and stuffing box are bronze-bushed where they contact the stem. In the non-rising stem valve, the disc is bronze-bushed where it engages the stem threads. The bronze-to-bronze contacts prevent corrosion and assure easy operation.

Outside screw and yoke valves generally are used indoors. Their rising stem indicates whether the valve is open or closed.

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

Gland: The two-piece, ball-type gland consists of a siliconized steel gland and a malleable iron gland flange. The gland nuts are bronze. The No. 467 has swinging type gland eye bolts.

Hub end valves: Hub end valves have a square flange cast integral with the bonnet. An indicator post can be bolted to the flange to simplify operation of valves installed in underground lines.

Hub ends fit Class D cast iron pipe. The following sizes are suitable for use with Transite or Century asbestos cement pipe for a poured joint (specify pipe size, type, and class)

For machined or rough end pipe
4 to 8-inch valves for
Class 50, 100, or 150 Transite
Class 100 or 150 Century
10-inch valves for
Class 50 or 100 Transite
Class 100 or 150 Century
Class 100 Century (Big 10)

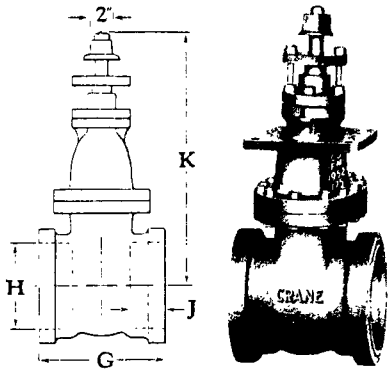
For machined end pipe only
4-inch valves for
Class 200 Transite or Century

Flanged valves: Flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Wedge Gate Valves

The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish. End flange dimensions are the same as those for 125-pound valves; see page 74 or 76.

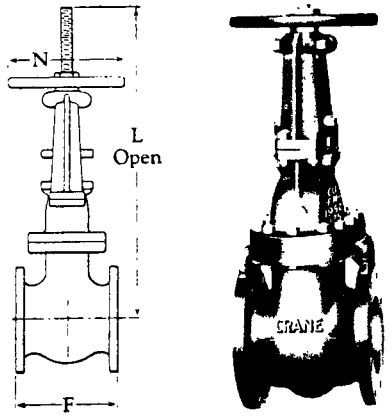
Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125. They are furnished faced only when specified

Non-Rising Stem



No. 462½
Underwriters' Pattern
Hub Ends

Outside Screw and Yoke



No. 467
Underwriters' Pattern
Flanged

8

Weights and Dimensions — Prices on Request

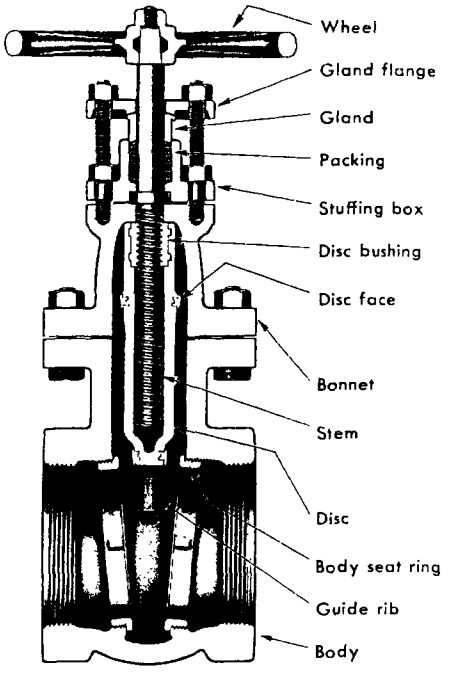
Size	Pounds, Each		Dimensions, in Inches							Turns to open
	No. 462½	No. 467	Hub Ends				Flanged			
Inches	Hub Ends	Flanged F & D	G	H	J	K	F	L	N	
2½	. .	50	. .	. .	. .	. .	7½	17	8	8½
3	. .	80	. .	. .	. .	. .	8	19½	9	10½
4	110	110	10⅜	5.70	3.00	19¼	9	23¾	10	9
5	. .	160	. .	. .	. .	. .	10	28¾	12	11
6	190	190	11¼	7.80	3.00	23¾	10½	32¾	12	13
8	305	320	13	10.00	3.50	27¾	11½	42¼	16	17
10	460	520	13¾	12.10	3.50	33	13	50¾	20	21
12	. .	700	. .	. .	. .	. .	14	58	20	25½

Additional description . . . . . page 73
End flange dimensions . . . . . page 76
Indicator posts . . . . . page 275
Templates for drilling . . . . page 327

250-Pound Ferrosteel Wedge Gate Valves

Bronze Trimmed or All-Iron

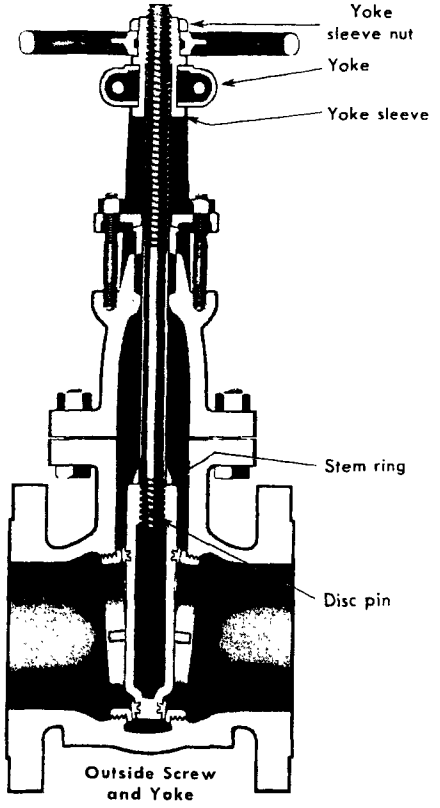
Non-Rising Stem



Non-Rising Stem
Bronze Trimmed Valve — Open

8

Outside Screw and Yoke



Bronze Trimmed Valve — Closed

Working Pressures
250 psi steam, **450** F
500 psi non-shock cold water, oil, or gas

Hydrostatic Test Pressures
1000 psi shell test **550** psi 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, and similar services.

Body and bonnet: The body and bonnet are made of Crane Ferrosteel, a high grade iron, approximately 35 per cent stronger than regular gray iron. This metal conforms to requirements of ASTM Specification A 126, Class B. 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 bronze trimmed valves, the faces are securely rolled into machined dovetails in the disc, assuring tightness under pressure.

Bronze trimmed valves: Bronze trimmed valves are recommended for steam, water, or oil, or for other fluids that do not corrode bronze or iron. The screwed-in body seat rings are made of Crane Special Bronze, a leaded tin bronze of high strength and hardness. The disc is Crane Special Bronze in the 2-inch size and cast iron faced with Crane Special Bronze in larger sizes.

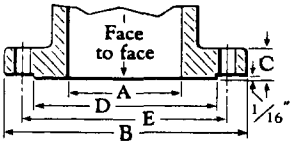
Non-rising stem valves have a Cast Manganese Bronze stem; the disc is bronze-bushed where it engages the stem threads, except on 2-inch valves which have a solid Crane Special Bronze disc.

Outside screw and yoke valves are available with a bronze or steel stem. The bronze 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 bronze but not iron. The seats are cast integral with the body and disc. The stem is steel, the portion in contact with the packing being nickel-plated.

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

Flange dimensions and facing: Dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944).



End flanges have a 1/16-inch raised face. The raised face is finished with approximately 16 concentric grooves per inch, known as a "serrated" finish.

Dimensions of Flanges, in Inches

Size	A	B	C	D	E	No. & dia. of bolts
2	2	6½	⅞	4 3/16	5	8-⅝
2½	2½	7½	1	4 15/16	5⅞	8-¾
3	3	8¼	1⅛	5 11/16	6⅝	8-¾
4	4	10	1¼	6 15/16	7⅞	8-¾
5	5	11	1⅜	8 5/16	9¼	8-¾
6	6	12½	1 7/16	9 11/16	10⅝	12-¾
8	8	15	1⅝	11 15/16	13	12-⅞
10	10	17½	1⅞	14 1/16	15¼	16-1
12	12	20½	2	16 7/16	17¾	16-1⅛

For additional description, weights, and dimensions, see the next page.

250-Pound Ferrosteel Wedge Gate Valves

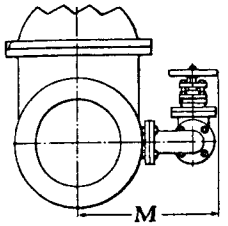
Bronze Trimmed or All-Iron

(continued from the preceding page)

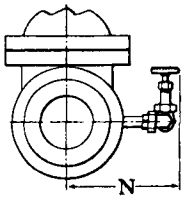
Gland: A two-piece gland, consisting of a gland flange and a gland, prevents binding on the valve stem and assures an even load on the packing. The gland flange is steel or malleable iron. The gland is made of siliconized steel.

Motor or cylinder operation: Valves used for emergency purposes or installed in inaccessible locations should preferably be equipped with some easy means of operation. An electric or air motor drive, or an operating cylinder, is ideal for this purpose. For description, see pages 260 to 270.

By-pass; gearing: To facilitate operation, by-passes are available for sizes 5-inch and larger, and gearing, for sizes 6-inch and larger. The use of either, or both, should be considered particularly for 10 and 12-inch non-rising stem valves and for 8-inch and larger outside screw and yoke valves. Also, a by-pass should be considered for any valve 5-inch and larger intended for steam service.



By-pass for water service available for valves 5-inch and larger



By-pass for steam service available for valves 5-inch and larger

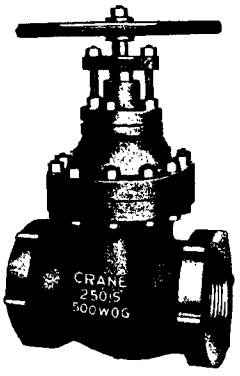
The by-pass serves to balance the pressure on both sides of the disc before the main valve is opened and, in steam service, also serves to pre-heat the line. See pages 271 to 274 for gearing and page 282 for by-passes.

Federal Specification: Nos. 2 E, 3 E, and 7½ E Valves comply with Federal Specification WW-V-58 for Class "B" 250-Pound Iron Body Wedge Gate Valves, Type I, Designations NS, NF, and OF, respectively. However, the valves must be ordered with end protectors.

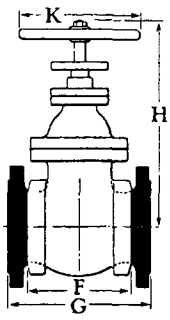
Face to face: Flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 250 Cast Iron Flanged Wedge Gate Valves.

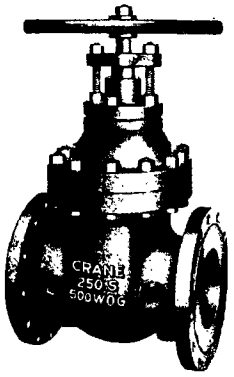
Drilling: Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 250. They can be furnished faced only when orders so specify.

Non-Rising Stem



No. 2 E, Screwed

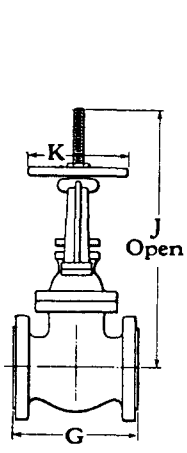


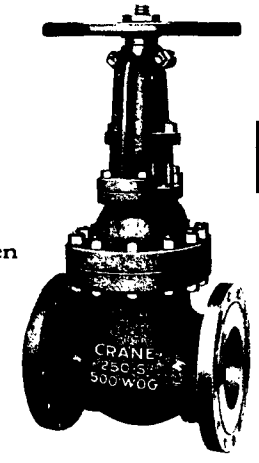


No. 3 E, Flanged

Crane Special Bronze Seats and Bronze Stem

Outside Screw and Yoke





No. 7 E, Flanged

Crane Special Bronze Seats and Steel Stem

No. 7½ E, Flanged

Crane Special Bronze Seats and Bronze Stem

No. 14 E, Flanged

All-Iron

8

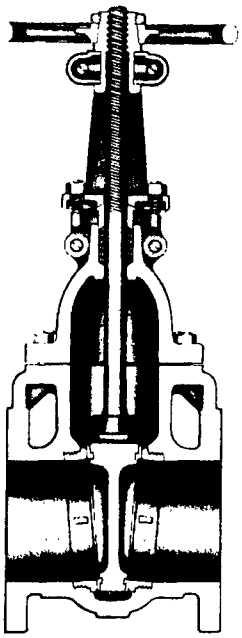
Weights and Dimensions — Prices on Request

Size	Pounds, Each					Dimensions, in Inches									
	Non-Rising Stem		Outside Screw and Yoke									By-Pass For Water		By-Pass For Steam	
	No. 2E	No. 3 E	No. 7 E	No. 7½ E	No. 14 E	F	G	H	J	K	Turns to open	By-pass size	M	By-pass size	N
Inches	Screwed	Flanged F & D	Flanged F & D	Flanged F & D	Flanged F & D										
2	39	47	50	50	50	7	8½	11	14½	8	15	...	...	...	...
2½	70	76	80	80	...	8	9½	13¼	17½	9	15½	...			
3	95	110	110	110	110	9	11⅛	14¾	20½	10	14	...			...
4	140	170	180	180	180	11	12	17½	24¾	12	18½	...	...	...	...
5*	...	250	280	280	...	.	15	20¼	29¾	14	23	1¼	16⅜	¾	11¾
6*	...	325	360	360	360	.	15⅞	23	34½	16	27	1¼	16¾	¾	12½
8*	...	540	590	590	...	...	16½	30¾	43	20	35	1½	21⅛	¾	13¼
10*	...	820	920	920	...	.	18	36	52¾	22	38	1½	21¼	1	16⅝
12*	...	1250	1400	1400	...	.	19¾	39¾	60	24	46	2	25⅝	1	17⅞

*See "By-pass and gearing" recommendations above.

Templates for drilling....page 328 *Thread engagement....page 352*

3% Nickel Cast Iron Wedge Gate Valves
For Process Industries



Cross Section

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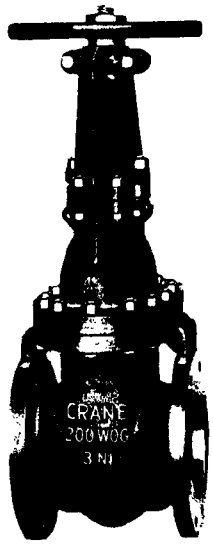


No. 14477
Flanged
Outside Screw and Yoke
18-8 SMo Trimmed

Valve Sizes	Working Pressures Cold water, oil, or gas, non-shock	Hydrostatic Test Pressures	
		Shell	Seat
2 to 12-inch	200 psi	350 psi	225 psi
14 to 18-inch	150 psi	250 psi	175 psi

Better Materials for Greater Resistance to Corrosion

3% Nickel Cast Iron Body and Disc — *Disc faced with 18-8 SMo Alloy*
18-8 SMo Alloy Body Seat Rings and Stem — *Siliconized Steel Gland*

Use Crane No. 14477 Valves wherever conventional "bronze trimmed" or "all-iron" gate valves fail due to corrosion of seating surfaces. In the petroleum industry, for handling of oils containing traces of mineral acids—in the wood treating industry for handling of creosote vapors and oils—in the pulp and paper industry for use with various kinds of alkaline liquors—wherever corrosion is a factor, a Crane No. 14477 assures better results.

3% Nickel Cast Iron: The valve body and disc are Crane 3% Nickel Cast Iron. This metal, developed especially for service in the process industries, extends the usefulness of cast iron valves.

Where ordinary cast iron is not adequate, and where higher physical properties and substantially better corrosion resistance are desired, Crane 3% Nickel Cast Iron Valves are an economical choice.

Rugged body and bonnet: Liberal metal sections in the body and bonnet assure maximum strength. Tie ribs between the bonnet flange and end flanges provide exceptional resistance to line strains. Straight-through ports in the body minimize turbulence and provide a more uniform flow through the valve.

Disc: The solid web disc has extra long disc guides to lessen drag on seating surfaces. Sizes 12-inch and smaller have a tee-head disc-stem connection; larger sizes have a threaded disc-stem connection locked together with a pin.

Stem: The stem is of liberal diameter with long engagement in the yoke sleeve. The position of the stem indicates whether the valve is open or closed.

Gland and stuffing box: A two-piece ball-type gland maintains an even load on the packing and prevents binding on the stem even when gland bolts are not pulled up evenly. Sizes 12-inch and smaller have swinging type gland eye bolts which move out of the way when the stuffing box is being repacked; they will not loosen in service.

Face to face: All sizes conform to the American Standard for Face-to-Face Dimensions (B16.10-1957), for Class 125 Cast Iron Wedge Gate Valves.

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.

Swing checks: For Crane 3% Nickel Cast Iron Swing Checks; see page 114

Drilling: Valves are regularly faced and drilled to the American Cast Iron Flange Standard, Class 125. They can be furnished faced only, when specified.

Drilling templates, page 327
Materials . . . . . Section 2

Weights and Dimensions — Prices on Request

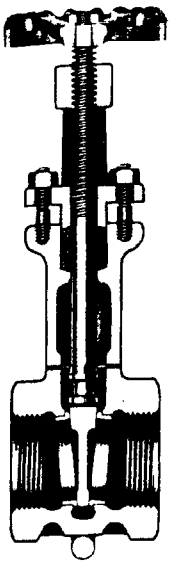
	Size	Weight	Dimensions, in Inches					Turns to open
			Face to face	Center to top, open	Diameter of wheel	End Flanges		
	Inches	Pounds Each				Diameter	Thickness	
No. 14477 Flanged F & D	2	43	7	15	8	6	5/8	7
	2½	50	7½	17	8	7	11/16	8½
	3	70	8	19½	9	7½	¾	10½
	4	100	9	24	10	9	15/16	9
	6	190	10½	33	12	11	1	13
	8	310	11½	42	16	13½	1⅛	17
	10	560	13	50½	20	16	1 3/16	21
	12	730	14	58	20	19	1¼	25½
	14	920	15	68	20	21	1⅜	30
	16	1350	16	75½	22	23½	1 7/16	34
	18	1550	17	83½	24	25	1 9/16	38

The No. 14477 is similar in design to Crane 125-Pound Ferrosteel Wedge Gate Valves shown on page 76.

Ni-Resist Cast Iron Wedge Gate Valves

Outside Screw and Yoke

Sizes 3-inch and smaller



Cross Section



No. 1670
Screwed



No. 1671
Flanged

Templates for drilling, page 327.

Working Pressures
Screwed valves — **225** psi non-shock cold water, oil, or gas
Flanged valves — **200** psi non-shock cold water, oil, or gas
Air Tested

Recommendations: Crane Ni-Resist Valves are safely used where the strength of ordinary cast iron is adequate. They are especially suitable for soda and sulfate pulp mill service, for creosote used in wood preserving, for handling sour distillates and crudes in petroleum refineries, and for kindred services.

Materials: All valves have a body and bonnet made of Type II Ni-Resist Cast Iron. The body seat rings and stem are Crane 18-8 SMo Alloy Steel.

Sizes 3-inch and smaller have an 18-8 SMo Alloy Steel disc; larger sizes have a Ni-Resist Cast Iron Disc with 18-8 SMo seating faces.

Ni-Resist (Type II) is an alloy cast iron containing approximately 18 to 22% nickel, 1.75 to 2.5% chromium, and a maximum of 0.5% copper. Its strength and physical characteristics are similar to ordinary cast iron, but its resistance to corrosion, erosion, and wear is definitely superior.

It is generally selected for application where copper contamination cannot be tolerated; Ni-Resist parts are marked "NR2".

Crane 18-8 SMo Alloy Steel is a material equivalent to AISI Type 316 wrought stainless steel.

Construction: The valves are the outside screw and yoke type. Stem threads, on the outside of the valve, are readily lubricated and are not exposed to the corrosive action of fluid in the line. The yoke is integral with the bonnet on ½ to 4-inch sizes and is bolted to the bonnet on the 6 and 8-inch sizes.

Valves 3-inch and smaller have a clamp type bolted bonnet and a one-piece bolted gland. Larger sizes have a conventional bolted bonnet and a two-piece bolted gland; the latter consists of a malleable iron gland flange and a ball-type gland follower. Both types of bonnets are easily disassembled for cleaning or repairs.

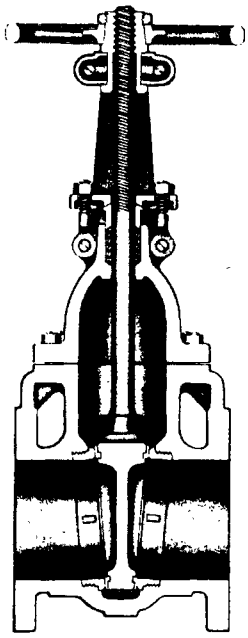
All valves have a solid wedge disc. The seating faces are integral with the disc in sizes 3-inch and smaller and rolled into the disc in sizes 4-inch and larger. The disc-stem connection is in the form of a T-head on the end of the stem which fits loosely into a matching slot in the disc, permitting the disc to be operated easily and safely.

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

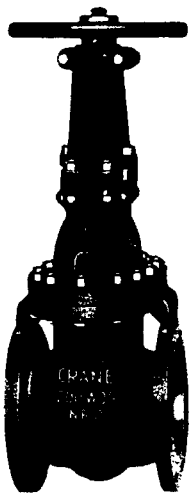
Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches					
	No. 1670	No. 1671	End to end	Face to face	Center to top, open	Diameter of wheel	End Flanges	
							Diameter	Thickness
Inches	Screwed	Flanged F & D						
½	2.4	.	2 1/16	.	6 5/8	2 9/16	.	.
¾	3.1	.	2 5/16	.	7 5/8	2 9/16	.	.
1	4.8	7.5	2 9/16	3 3/16	9 1/8	2 3/4	4 1/4	7/16
1¼	6.3	8.8	2 7/8	3 1/2	10	3 1/16	4 5/8	1/2
1½	9.5	14.0	3 1/8	3 3/4	12 1/8	3 5/8	5	9/16
2	13.0	20.5	3 5/8	4 1/4	14 1/8	4 1/16	6	5/8
2½	.	32.0	.	4 15/16	16 1/4	4 3/4	7	11/16
3	.	40.0	.	5 1/16	19	6	7 1/2	3/4
4		110.0		9	24	10	9	15/16
6		205.0		10 1/2	32 5/8	12	11	1
8		335.0		11 1/2	41 7/8	16	13 1/2	1 1/8

Sizes 4-inch and larger



Cross Section



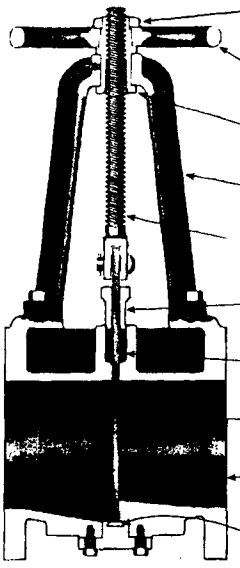
No. 1671
Flanged

End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948), and are faced and drilled unless ordered faced only. They are plain faced, with a smooth finish.

Materials . . . . Section 2

Pulp Stock Valves

Cast Iron or 3% Nickel Cast Iron Body



Cross section of wheel-operated valve. Quick-opening valves, except for their sliding stem mechanism, are similar.

Easy operating outside screw and quick-opening valves. Shearing-action disc for tight closure. Non-clogging . . . self-cleaning . . . full port area.

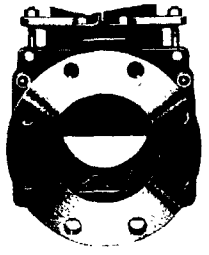
Choice of Types and Materials

Flanged ends only; faced and drilled unless otherwise ordered.

Valve Part	No. 1425 Wheel-Operated No. 1429 Quick-Opening	No. 1447 Wheel-Operated No. 1431 Quick-Opening
Body	*Cast Iron	3% Nickel Cast Iron
Stem	Cast Manganese Bronze	Exelloy
Disc	Bronze	18-8 SMo Alloy Steel
Disc-Stop Holder	Cast Iron holder with lead filler	3% Nickel Cast Iron holder with lead filler
Gland	Bronze	Malleable Iron

*Crane Ferrosteel on sizes 16-inch and larger

60 psi water working pressure



Outlet half of all valves has deep notches . . . incoming pulp fibers are separated into small bunches for clean, thorough shearing.

Recommendations: These are rugged valves especially designed to meet the requirements of modern pulp stock handling. As indicated in the table above, the valves are offered in wheel-operated and quick-opening types and in a choice of body and trim materials.

The valves are recommended for use on discharge lines, on filter, hydrofiner, and Jordan lines, on pulp stock beater lines, and in a host of other locations common to pulp and paper mill piping.

Shearing action; self-cleaning: All valves feature Crane's exclusive, shearing action disc for clog-proof closure and a positive, tight shut-off.

In operation, as the knife-edged disc is lowered, deep specially designed notches in the outlet half of the body comb the pulp fibers into small bunches which are easily sheared by the disc. The fibers are cut cleanly; they cannot jam nor clog the underside of the disc.

The thoroughness of the shearing operation permits the disc to close completely without leaving any accumulation of fibers to wash out later and cause leakage. Once the valve is in the closed position, the pulp packs around the disc assuring an absolutely tight shut-off.

Body: The valves have a two-piece body divided on the vertical center line and bolted together; a special gasket in the joint prevents leakage. Circular end ports and a spacious, rectangular center passage assure full, uninterrupted flow. There are no sections where clogging can occur through pulp impaction or build-up.

Bodies are cast iron, Ferrosteel, or, for added resistance to corrosion, Crane 3% Nickel Cast Iron. Crane cast iron and Ferrosteel conform to requirements of ASTM A 126, Classes A and B respectively. Crane 3% Nickel Cast Iron has tensile requirements comparable to Ferrosteel but offers substantially greater resistance to corrosion.

Disc: Discs are made in a rectangular shape and have a knife-like cutting edge at the bottom to assure complete shearing and a positive shut-off. The disc is precision-guided through machined slots in the body.

Discs are bronze or Crane 18-8 SMo Alloy Steel. Crane 18-8 SMo is a high grade alloy equivalent to AISI Type 316 wrought stainless steel; it offers excellent resistance to corrosion.

Stem: Valve stems are Crane Cast Manganese Bronze or Exelloy. The stem threads do not come in contact with the fluid in the line, and the rising stem effectively indicates the position of the disc. Quick-opening valves have a sliding stem and a non-slip locking device which permits the disc to be held in any desired position.

(continued on the next page)

Pulp Stock Valves

Cast Iron or 3% Nickel Cast Iron Body

(continued from the preceding page)

Disc protection: A lead filler dovetailed into the disc-stop holder located at the bottom of each valve acts as a seat and protects the cutting edge of the disc from dulling or damage at the point of closing.

Cleanout: All valves are easily cleaned out when necessary. Simply remove the disc-stop holder which is attached to the bottom of the valve by means of cap screws.

Stuffing box: A rectangular shaped stuffing box, equipped with a bolted gland, completely surrounds the disc. It is unusually deep and is filled with a special packing which minimizes friction.

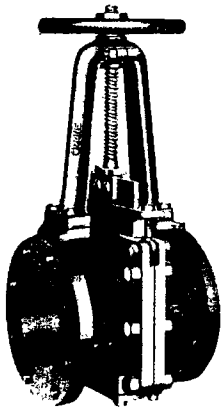
Bosses: Each valve body has six bosses, two on each side and two on the bottom. When specified, they are drilled, tapped, and plugged; openings are ½ inch on 4 and 6-inch valves and ¾ inch on larger sizes.

Special operating equipment: Special operating aids such as floor stands, extension stems, chain wheels, hydraulic or air cylinder operators, and electric motor operators are available; for description, refer to Section 23. Gearing to facilitate operation of larger sizes can also be furnished.

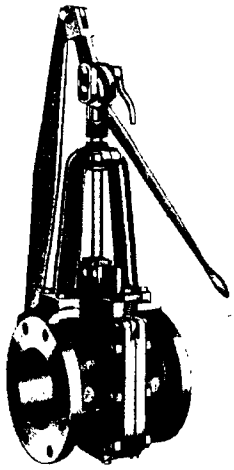
Face to face: These valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) of Class 125 Cast Iron Flanged Wedge Gate Valves. They, therefore, will replace 125-pound iron body flanged wedge gate valves without necessitating piping changes.

End flanges: End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish.

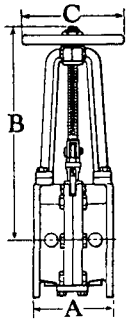
Drilling: The valves, regularly furnished faced and drilled (F & D), can be furnished faced only, when specified.



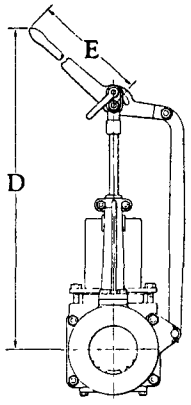
Outside Screw, Rising Stem, Flanged
No. 1425
Iron Body, Bronze Disc
No. 1447
3% Nickel Iron Body
With 18-8 SMo Disc



Quick-Opening Flanged
No. 1429
Iron Body, Bronze Disc
No. 1431
3% Nickel Iron Body
With 18-8 SMo Disc



Dimension "A" applies to Quick-Opening Valves also.



8

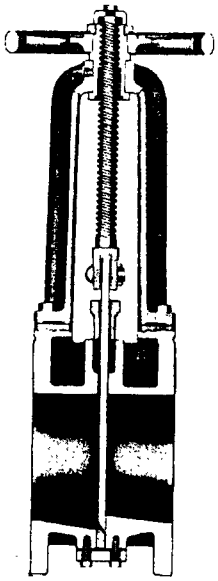
Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches									
	With Cast Iron Body Flanged, F & D		With 3% Nickel Cast Iron Body Flanged, F & D		Wheel-Operated			Quick-Opening			End Flanges			
Inches	No. 1425 With Wheel	No. 1429 Quick-Opening	No. 1447 With Wheel	No. 1431 Quick-Opening	A Face to face	B open	C	A Face to face	D open	E	Diameter	Thickness	Diameter of bolt circle	No. and diameter of bolts
4	100	100	100	105	9	22½	10	9	33¼	12	9	15/16	7½	8-⅝
6	145	150	140	150	10½	28	10	10½	43¼	23	11	1	9½	8-¾
8	240	250	220	260	11½	35	12	11½	57	29	13½	1⅛	11¾	8-¾
10	310	340	310	340	13	41	14	13	68¾	41	16	1 3/16	14¼	12-⅞
12	440	460	430	475	14	48	16	14	80¾	41	19	1¼	17	12-⅞
14	510	560	520	590	15	53	16	15	90½	41	21	1⅜	18¾	12-1
16	690	700	690	700	16	58	18	16	95	41	23½	1 7/16	21¼	16-1
18	870	...	860	..	17	64	20	...	...	.	25	1 9/16	22¾	16-1⅛
20	1230	...	1250	...	18	72	20	.	..	.	27½	1 11/16	25	20-1⅛
24	...	..	1830	...	20	85	30	...	..	...	32	1⅞	29½	20-1¼

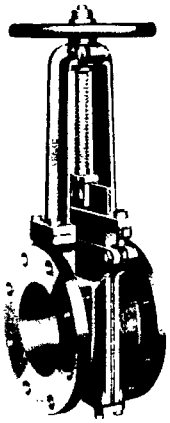
18-8 SMo Pulp Stock Valves with short face to face dimensions....page 86

Templates for drilling....page 327

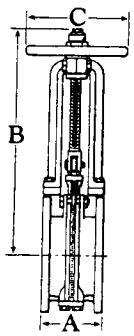
18-8 SMo Pulp Stock Valves



Cross Section



No. 1450
Outside Screw, Rising Stem
With 18-8 SMo Body and Disc



New stainless steel valves for maximum resistance to corrosion. Non-clogging . . . self-cleaning . . . with narrow face-to-face design for reduced weight

75 psi water working pressure

Features; recommendations: These new Crane 18-8 SMo Valves, a companion line to the pulp stock valves shown on the preceding two pages, are designed for use in stock lines where corrosion is a problem. Like the other valves, they feature Crane's time-proven shearing-action disc and notched body design to assure clean, tight closure with no clogging.

The narrow face-to-face design of the body makes possible reduced bulk and weight . . . as much as 35% lighter than conventional valves of the same size . . . with resultant lower cost. The valves are ideal for use on light wall, stainless steel stock lines and are extremely effective in the handling of sulphite stock, sulphate unwashed stock, and stock which must be kept free of contamination; they are used on caustic extraction lines, for soaking sections in bleach plants, and for many other applications.

Body: The body consists of two halves divided on the vertical center line and welded together. The body halves are made of Crane Cast 18-8 SMo Alloy Steel, a high grade material conforming to requirements of ASTM A 351, Grade CF-8M, and comparable to AISI Type 316 stainless steel.

Circular end ports and a spacious rectangular center passage assure full area flow. There are no sections where clogging can occur through pulp impaction or build-up. The outlet body half features deep notches which comb the pulp fibers into small bunches, easily sheared by the disc.

Shearing-action disc: The valve disc, also made of 18-8 SMo, is rectangular in shape with a knife-like cutting edge at the bottom which cuts the pulp fibers cleanly. The thoroughness of the shearing operation permits the disc to close completely without leaving any accumulation of fibers to wash out later and cause leakage. Once the disc is closed, the pulp packs around it, assuring a tight shut-off. The disc is precision-guided through machined slots in the body.

Disc protection: A stem stop, located at the upper part of the stem, limits the downward travel of the disc preventing possible damage to the cutting edge.

Stem: The stem is Crane Exelloy. Stem threads, fast acting for speedy operation, are on the outside of the valve free from corrosive effects of fluid in the line.

Cleanout: To clean the valve, simply remove the bottom plate attached to the underside of the valve body by means of cap screws. The plate is equipped with a full face rubber gasket.

Stuffing box: A rectangular-shaped stuffing box, equipped with a bolted gland, completely surrounds the valve disc. It is unusually deep and is filled with a special packing which minimizes friction.

End flanges: The diameter, thickness, and drilling of end flanges of valves 12-inch and smaller conform to the MSS 150-Pound Corrosion Resistant Cast Flanged Valve Standard, No. SP-42-1957 (see page 326). On 14 and 16-inch sizes, dimensions except for thickness, conform to the 150-Pound American Steel Flange Standard (B16.5-1957).

The flanges are plain faced, with a serrated finish.

The valves are regularly furnished faced and drilled to the foregoing Standards. They can be furnished faced only, when orders so specify. Full face gaskets should be used; see page 321.

Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches						
						End Flanges			
	Inches	Pounds Each	A	B open	C	Diameter	Thickness	Dia. of bolt circle	No. & dia. of bolts
No. 1450 Flanged F & D	4	70	6 1/4	23	10	9	11/16	7 1/2	8-5/8
	6	90	6 3/4	28 1/2	10	11	13/16	9 1/2	8-3/4
	8	180	7	36	12	13 1/2	15/16	11 3/4	8-3/4
	10	220	7 3/8	42	14	16	1	14 1/4	12-7/8
	12	320	8	49	16	19	1 1/16	17	12-7/8
	14	390	8 1/2	54	16	21	1 3/16	18 3/4	12-1
	16	490	9	59	18	23 1/2	1 1/4	21 1/4	16-1

Other pulp stock valves . . . . pages 84 and 85 *Special operating equipment . . . . Section 23* *Information on gearing furnished on request.*

Nodular Cast Iron Wedge Gate Valves

Outside Screw and Yoke

New nodular (ductile) iron valves for low cost handling of oil and oil vapors at temperatures up to 650 F.

Crane nodular iron valves are satisfactory for oil and oil vapor services where high resistance to thermal shock, impact, bending stresses, and corrosion are essential. They are excellent for use on sour crude and other process lines in refinery and tank farm installations, are used extensively aboard tankers and at dockside transfer areas and, in general, can be used where strength and qualities approaching steel are desired, combined with the economy and corrosion resistance of iron.

Body and bonnet: The body and bonnet are nodular cast iron (ASTM A 395). This metal has corrosion resistance equal to that of regular gray iron, with strength approximating that of carbon steel and three times that of cast iron; see page 3.

The body features liberal sections with the metal properly distributed for maximum strength. Tie ribs between the bonnet flange and end flanges provide additional resistance to line strains. Two ribs, cast in opposite sides of the body, engage machined slots in the disc; they guide the disc and prevent contact with the seating surfaces until the valve is almost closed.

Exelloy trimmed: The solid wedge disc is Exelloy in sizes 4-inch and smaller and is carbon steel faced with Exelloy in larger sizes. The stem, and the shoulder type, screwed-in body seat rings are also Exelloy. The stem is finished with a tapered shoulder for back seating in the Exelloy bonnet bushing.

Yoke and yoke sleeve: The yoke is cast integral with the bonnet on sizes 4-inch and smaller; on larger sizes, it consists of two halves, bolted together at the top and also to the bonnet. The yoke sleeve is nickel alloy.

Pressure-Temperature Ratings
(For Oil or Oil Vapor)

Temperature Deg. Fahr.	Psi Non-Shock	Temperature Deg. Fahr.	Psi Non-Shock
−20 to +100	220	400	145
150	205	450	130
200	190	500	120
250	180	550	110
300	170	600	105
350	155	650	95

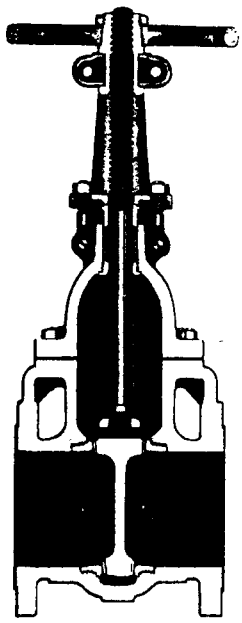
Hydrostatic Test Pressures
Shell . . . **425** psi Seat . . . **300** psi

Valve seat tested 100 psi air-under-water

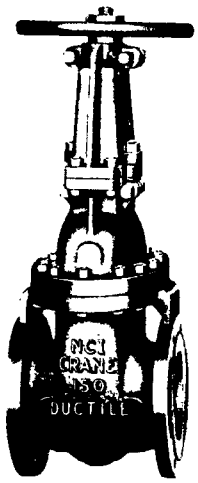
Gland: The two-piece ball-type gland consists of a siliconized steel gland and a malleable iron gland flange. This construction maintains an even load on the packing and prevents binding on the stem even when the gland bolt nuts are not pulled up evenly. Swinging type gland eye bolts move out of the way to simplify repacking of the valve; they will not loosen in service. The gland eye bolts and bolt nuts are steel.

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

Standards: The valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Ferrous Flanged Gate Valves. They also comply dimensionally to the American Petroleum Institute (API) Standard for Valves for Refinery Use, No. 600, Fourth Edition (1958). Ratings shown above are 80 per cent of those listed in API No. 600 for 150-pound carbon steel valves.



Cross Section



No. 6465 X
Nodular Iron Gate
Exelloy Trimmed
Flanged

8

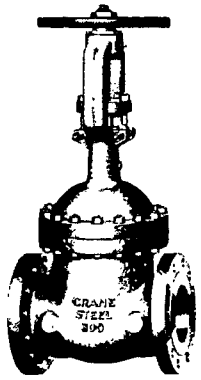
Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches					Turns to open
			Face to face	Center to top, open	Diameter of wheel	End Flanges		
	Inches	Pounds Each				Diameter	Thickness	
No. 6465 X Flanged, F & D	2	44	7	15½	8	6	5/8	7
	2½	50	7½	17	8	7	11/16	8½
	3	65	8	19⅝	9	7½	¾	10½
	4	100	9	23¾	10	9	15/16	9
	6	190	10½	33	12	11	1	13
	8	325	11½	42¼	16	13½	1⅛	17
	10	520	13	50⅞	18	16	1 3/16	21
	12	710	14	58¼	18	19	1¼	25½

End flanges conform to the 150-Pound American Steel Flange Standard (B16.5-1957), and are faced and drilled unless ordered faced only. The flanges have a 1/16-inch raised face, with a serrated finish.

Face to face and thickness of flange dimensions include the 1/16-inch raised face; for drilling templates, see page 329

For pressures and temperatures beyond the range of bronze or cast iron . . . .

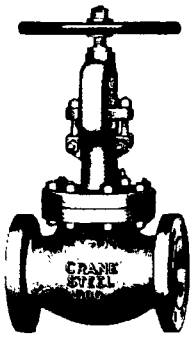


300-Pound
Cast Steel Gate Valve
With Flexible Wedge Disc
(see pages 124 and 125)

Use Crane steel gate valves

When gate valves are required for pressures above 300 psi or temperatures exceeding 550 F, the valve designed for the specific service is certain to be found among the extensive listing of steel gate valves shown elsewhere in this catalog.

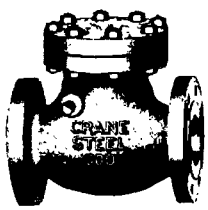
For steel gate valves of the conventional type, refer to Section 12. Small size 600-pound valves with reduced and full port openings are available, as are 150 to 2500-pound cast steel wedge gate valves ranging, in some pressure classes, in sizes up to 24-inch. For extremely high temperature steam service, Crane Pressure-Seal Bonnet Gate Valves can be used; see Section 15.



300-Pound
Cast Steel Globe Valve
(see pages 146 and 147)

Use Crane steel globe and angle valves

Crane cast and forged steel globe and angle valves offer dependable service in installations where pressures and temperatures are beyond the range of bronze or cast iron. For small size bar stock valves, 600-pound forged steel and 6000-pound hydraulic valves as well as a varied selection of bolted bonnet valves of the 150, 300, 400, 600, 900, 1500, and 2500-pound pressure classes, see Section 13. Also included in Section 13 are Monel trimmed globe valves as well as valves designed specifically for chlorine service. For Pressure-Seal and Lip-Seal Bonnet Globe and Angle Valves, see Section 15.



300-Pound
Cast Steel Swing Check Valve
(see pages 158 and 159)

Use Crane steel check valves

The Crane line of steel check valves includes 600-pound steel union and bolted cap lift checks and swing checks in sizes up to 2-inch, as well as bolted cap swing checks in larger sizes and in pressure classes ranging from 150 to 2500-pound; see Section 14. Steel Pressure-Seal Cap and Lip-Seal Cap Lift Checks are shown on pages 175 and 179, respectively, of Section 15.

SECTION 9

Crane Iron Body Double Disc Gate Valves

Names of Parts.....page 90

General Description.....pages 90 and 91

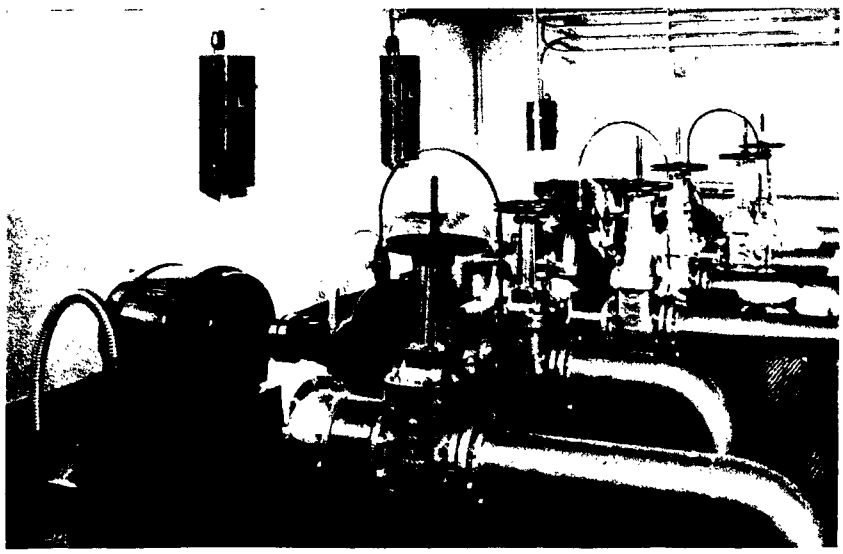
Iron Body Valves
25-Pound.....pages 92 and 93

Ferrosteel Valves
200-Pound W.O.G.....pages 94 and 95
500-Pound W.O.G.....page 96

The Crane line of iron body double disc gate valves includes valves for water, oil, or gas pressures up to 500 psi, as well as valves for low pressure steam. Bronze trimmed and all-iron valves are available. The uniformly superior quality that distinguishes all Crane products has been maintained in this line. Excellence of design, high grade materials, and workmanship of the highest order assure dependability in service.

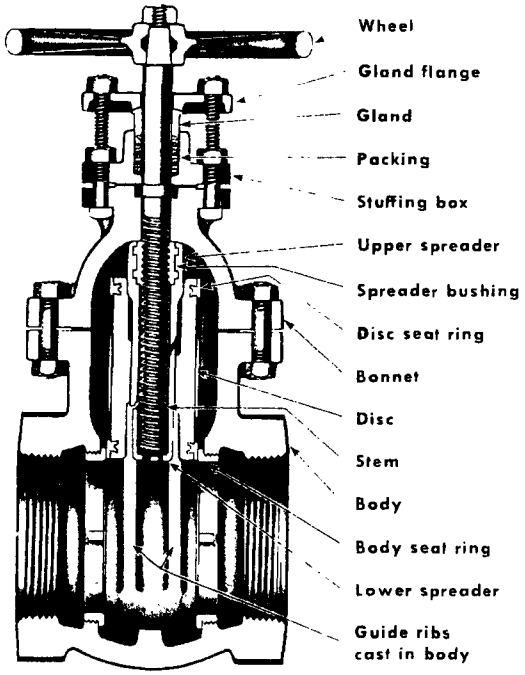
For related data, refer to:

Gearing.....pages 271 to 274
By-passes.....page 282
Accessories for valves.....pages 259 to 283
Gaskets for iron flanged joints.....page 322
Templates for drilling.....pages 327 and 328
Cast steel pipe-line gate valves.....pages 131 to 133

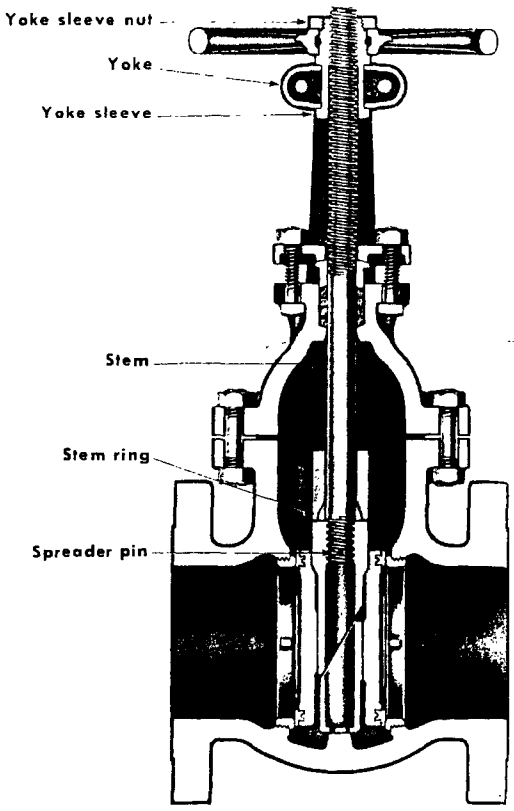


Crane iron body double disc gate valves installed in the pipe lines of a large pumping station

Iron Body Double Disc Gate Valves



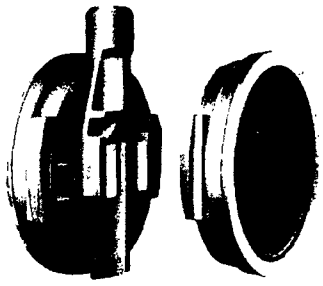
Non-Rising Stem Valve Open



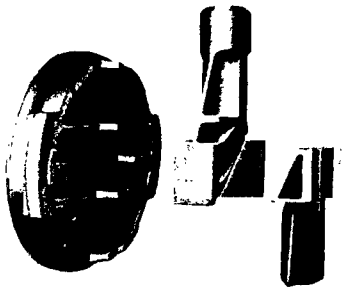
Outside Screw and Yoke Valve Closed

9

Flanged end bodies for 500-Pound W.O.G. Valves have straight through ports; see page 91



Discs with Spreaders



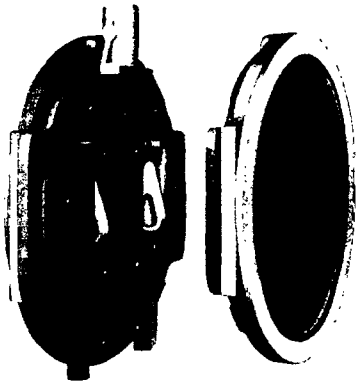
Discs with Spreaders

The discs . . . .

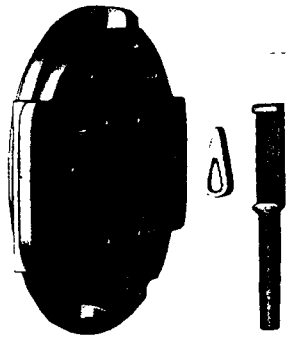
Depending upon the size of the valve and the pressure class, two types of disc construction are used in Crane Iron Body Double Disc Gate Valves.

Discs with spreaders: The upper spreader, engaging the valve stem, raises and lowers the discs. When the valve is being closed, the lower spreader strikes a stop in the bottom of the body; further rotation of the wheel brings the wedging surfaces of the spreaders into contact, and the spreaders force the discs outward against the seats.

Discs with wedges: A disc nut, engaging the valve stem, raises and lowers the discs. When the valve is being closed, two hooks, carrying Manganese Bronze wedges, strike a stop in the bottom of the body; further rotation of the wheel forces the wedges between the discs and the wedges force the discs outward against the seats.



Discs with Wedges



Discs with Wedges

Iron Body Double Disc Gate Valves

General Description

The general characteristics of Crane Iron Body and Ferrosteel Double Disc Gate Valves are illustrated on the preceding page. As the general description below implies, the various lines, quite similar in construction, differ principally in proportions and materials. For specific details on each line, refer to the pages that follow.

Double discs: The seats in the valves are parallel. The disc mechanism, illustrated and described on the preceding page, assures positive, tight seating and easy opening.

Except for certain small size valves having bronze or Crane Special Bronze discs, bronze trimmed valves have cast iron or Ferrosteel discs with bronze or Crane Special Bronze seating faces. The faces are securely rolled into machined dovetails in the discs, assuring tightness under pressure.

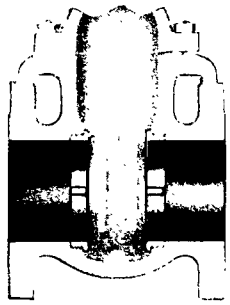
In all-iron valves, the seating faces are cast integral with the discs.

In non-rising stem bronze trimmed valves, the portion of the discs that engages the stem threads is bronze or bronze-bushed.

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

Body and bonnet: All lines of valves have oval-shaped bodies and bonnets. Metal sections are more than ample, and the metal is distributed to assure maximum strength.

Flanged end 500-Pound W.O.G. Valves have straight through ports, as shown in the illustration at the right. The metal sections adjacent to the bonnet and end flanges are heavily reinforced.



Straight Through Ports in Flanged End 500-Pound W.O.G. Valves

Body seat rings: In bronze trimmed valves, the body seat rings are bronze or Crane Special Bronze.

In 25-pound valves 14-inch and larger, the body seat rings are rolled into machined dovetails in the body

In 10 and 12-inch 25-pound valves, and in all bronze trimmed valves for higher pressures, the body seat rings are screwed into the body.

All-iron valves are regularly furnished with the seats integral with the body.

Stem: The stem in non-rising stem bronze trimmed valves is made of Crane Cast Manganese Bronze Outside screw and yoke bronze trimmed valves are made with a rolled bronze stem.

All-iron valves have a steel stem; the portion coming in contact with the packing is nickel plated.

Gland and stuffing box: All valves have a two-piece ball-type gland, consisting of a siliconized steel gland and a malleable iron gland flange.

This construction provides for even distribution of the compressive loading on the packing, the ball-type bearing between the gland and flange compensating for unequal adjustment of the bolts. Binding on the valve stem and frequent stuffing box maintenance are avoided.

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

In non-rising stem valves, jamming the disc in the wide open position forces the stem collar against the machined top of the bonnet, making a pressure-tight joint.

In outside screw and yoke valves, when the valve is jammed wide open, the tapered stem ring engages a tapered machined surface in the under side of the top of the bonnet, forming a tight joint.

Yoke: In smaller size outside screw and yoke valves, the yoke is cast integral with the bonnet. In larger sizes, the yoke is made in two halves, bolted to the bonnet and bolted together at the top.

Yoke sleeve: The yoke sleeve is made of Crane Cast Manganese Bronze.

Wheel: Wheels are made of malleable iron to assure maximum strength. They have an oval-shaped rim, affording an easy grip.

In non-rising stem valves, the wheel has a tapered square hole fitting the tapered square end of the stem, and is held in place by a steel nut.

In outside screw and yoke valves, the hole in the wheel is hexagonal and tapered, and fits the tapered hexagonal top of the yoke sleeve. The wheel is held in place by a malleable iron nut.

In both types of valves, the wheel is attached securely, yet can be removed easily.

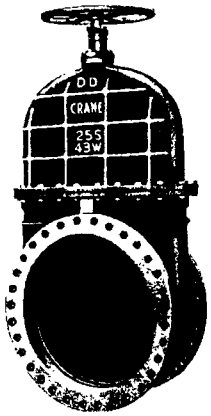
Flange dimensions and facing: The dimensions and drilling of the end flanges on flanged valves conform to the American Cast Iron Flange Standard for their respective working pressures.

The flanges on 25-Pound and 200-Pound W.O.G. valves are plain faced, with a smooth finish.

The 500-Pound W.O.G. flanged valves are regularly furnished with a raised face 1/16-inch high on the end flanges

25-Pound
Iron Body Double Disc Gate Valves
Bronze Trimmed

Non-Rising Stem



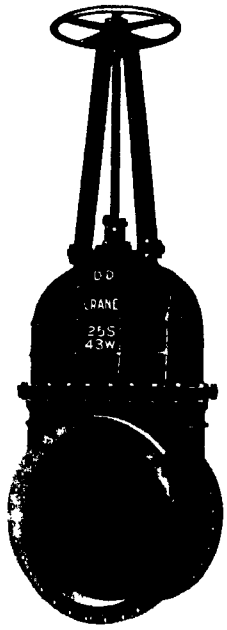
No. 791
Flanged
Non-Rising Stem
Bronze Trimmed

Size of Valve Inches	Working Pressures: Saturated Steam or Cold Gas	Working Pressures: Cold Water Non-Shock	Hydrostatic Test Pressures: Shell test	Hydrostatic Test Pressures: Seat test
10 to 24	25 psi	50 psi	75 psi	65 psi
30 and 36	25 psi	43 psi	75 psi	55 psi
42 and 48	25 psi	35 psi	50 psi	45 psi

For general data on Crane Iron Body Double Disc Gate Valves, see pages 90 and 91

Outside Screw and Yoke

9



No. 793½
Flanged
Outside Screw and Yoke
Bronze Trimmed

For dimensions and additional description, see the facing page.

Recommendations: Crane 25-Pound Iron Body Double Disc Gate Valves, illustrated and described on these facing pages, are admirably suited for a great variety of service conditions.

The valves 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 . . . . in by-product coke installations . . . . and in similar services.

Vacuum or air service: Valves for vacuum exhaust lines or for air service should be air-tested. Such valves are given a special air test to assure absolute tightness. Unless an air test is specified, water-tested valves are furnished.

Body and bonnet: The body and bonnet are oval-shaped. Metal sections are more than ample and the metal is distributed to assure maximum strength.

The body and bonnet are made of cast iron in sizes 10 to 14-inch, of Crane Ferrosteel in sizes 16 to 24-inch, and of Crane High Tensile Iron in sizes 30-inch and larger. These metals conform to requirements of ASTM Specification A 126, Classes A, B, and C, respectively.

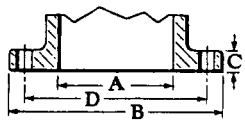
Materials and construction: The valves are short and compact and occupy minimum space in the pipe line. High quality materials are used throughout.

The body seat rings, made of bronze, are screwed into the body on 10 and 12-inch sizes and are rolled into the body on sizes 14-inch and larger. The discs are cast iron with bronze seating faces. Non-rising stem valves have a Cast Manganese Bronze stem; the portion of the discs engaging the stem threads is bronze or bronze-bushed. Outside screw and yoke valves have a bronze stem

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

Gland: Both valves have a two-piece ball-type gland consisting of a silicon-ized steel gland and a malleable iron gland flange.

Flange dimensions and facing: The dimensions and drilling of end flanges conform to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931). The flanges are plain faced, with a smooth finish.



Dimensions of Flanges, in Inches

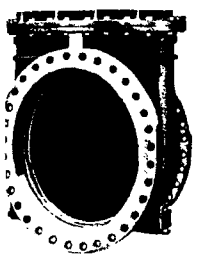
Size	A	B	C	D	No & dia. of bolts
10	10	16	7/8	14¼	12-5/8
12	12	19	1	17	12-5/8
14	14	21	1⅛	18¾	12-¾
16	16	23½	1⅛	21¼	16-¾
18	18	25	1¼	22¾	16-¾
20	20	27½	1¼	25	20-¾
24	24	32	1⅜	29½	20-¾
30	30	38¾	1½	36	28-⅞
36	36	46	1⅝	42¾	32-⅞
42	42	53	1¾	49½	36-1
48	48	59½	2	56	44-1

25-Pound
Iron Body Double Disc Gate Valves
Bronze Trimmed

(continued from the preceding page)

Disc rollers: Valves 14-inch and larger, ordered for use in a horizontal line with the valve stem horizontal, will be equipped with a bronze track in the lower side of the body, and bronze rollers and bronze scrapers in the lower side of the discs.

Cleanouts: When so ordered, valves 14-inch and larger can be fitted with two side cleanouts, as shown at the left; prices on request.



Double Cleanout

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.

Motor or cylinder operation: Valves installed in inaccessible locations or used for emergency purposes should be equipped with some easy means of operation, such as an electric or air motor drive, or an operating cylinder; see pages 260 to 270.

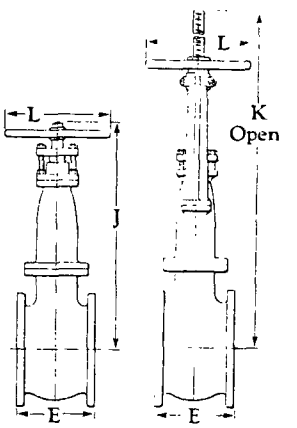
By-passes; gearing: To facilitate operation, by-passes and gearing are available for sizes 14-inch and larger. The use of either, or both, should receive particular consideration for 36-inch No. 791 Valves and for 24-inch and larger No. 793½ Valves. Valves ordered with a by-pass have a longer face to face dimension (E) than those without by-pass.

A by-pass serves to balance pressure on both sides of the discs before the main valve is opened.

For gearing description, see pages 271 to 274; for by-passes, see page 282

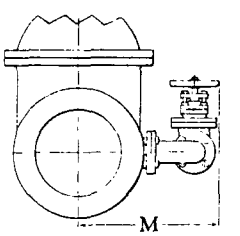
Drilling: Unless otherwise ordered, flanged valves are furnished faced and drilled (F & D) to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931); they can be furnished faced only, when specified.

Larger sizes: Valves in sizes larger than listed in the dimension table below (up to 72-inch) can be made to order; prices and dimensions will be furnished on request.



No. 791 Flanged Non-Rising Stem

No. 793½ Flanged Outside Screw and Yoke



By-pass available for sizes 14-inch and larger

9

Weights and Dimensions — Prices on Request

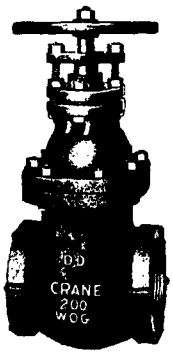
	Size	Pounds, Each		Dimensions, in Inches							
		No. 791	No. 793½	E*		J	K	L	Turns to open	By-Pass	
	Inches	Non-Rising Stem	Outside Screw & Yoke	Without By-Pass	With By-Pass					Size	M
Bronze Trimmed, Flanged, F & D	10	250	280	9½		27¾	47	12	22		
	12	360	390	10		30¾	54¼	12	26		
	14*	500	540	10½	16	34	65½	14	29	2	23½
	16*	610	680	11	18	37	72	14	33	3	27½
	18*	820	880	11½	18½	42½	81	18	38	3	28½
	20*	990	1090	12	18½	45½	89½	18	42	3	29½
	24*	1450	1570	13	20	52½	105	20	49	4	33
	30*	2500	2780	14½	20½	64	129	22	124	4	35½
	36*	3780	4070	16	24	75	148	27	147	6	42
	42*	...	6500	17½	25½		177	30	131	6	45
	48*		9200	19	29½		202	36	149	8	52

*By-pass and gearing are available for sizes 14-inch and larger. The use of either, or both, should receive particular consideration for 36-inch No. 791 Valves and for 24-inch and larger No. 793½ Valves. As indicated in the table, valves with by-pass have a longer face to face dimension (E) than the corresponding size furnished without a by-pass. For gearing, see pages 271 to 274, for by-passes, see page 282

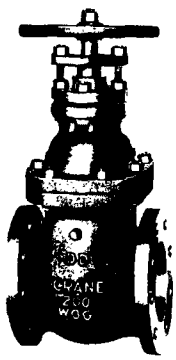
Motor or cylinder operation....pages 260 to 270 *Templates for drilling....page 327*

200-Pound W.O.G.
Ferrosteel Double Disc Gate Valves
Bronze Trimmed or All-Iron

Non-Rising Stem



Screwed
No. 480
Bronze Trimmed



Flanged
No. 481
Bronze Trimmed

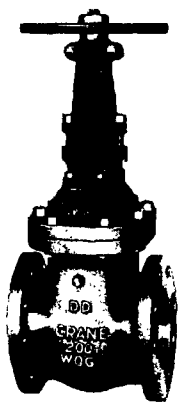
Size of Valve	Working Pressures	Hydrostatic Test Pressures	
	Cold Water, Oil, or Gas Non-Shock	Shell test	Seat test
2 to 12-inch	200 psi	350 psi	225 psi
14 to 24-inch	150 psi	250 psi	175 psi

Air Tested

For general data on Crane Iron Body Double Disc Gate Valves, see pages 90 and 91.

Crane 200-Pound W.O.G. Ferrosteel Double Disc Gate Valves, described on these facing pages, are especially recommended for use in the oil and gas industry and for water lines requiring rugged, substantially constructed valves.

Outside Screw and Yoke



Flanged
No. 483
Bronze Trimmed
No. 1083
All-Iron

9

The valves are excellent for general utility service in oil, gas, or water lines and as such, have a particularly varied application in oil and gas fields, oil refineries, stations for storing and dispensing gasoline or oil, etc.

Body and bonnet: The body and bonnet are made of Crane Ferrosteel in sizes up to 16-inch and of Crane High Tensile Iron in sizes 18-inch and larger. These metals conform to requirements of ASTM Specification A 126, Classes B and C, respectively; see page 3 for details.

Bronze trimmed: Bronze trimmed valves are recommended for water, oil, or gas lines. The body seat rings are bronze, screwed into the body. The discs in sizes 3-inch and smaller are bronze; in larger sizes, they are cast iron with a bronze face.

In non-rising stem valves, the stem is Cast Manganese Bronze and the portion of the discs engaging the stem threads is bronze or bronze-bushed. Outside screw and yoke valves have a bronze stem.

All-iron: The all-iron valves are recommended for oil or gas, or for fluids that corrode bronze. The seats are cast integral with the body and discs. The stem is steel and that portion which comes in contact with the packing is nickel-plated.

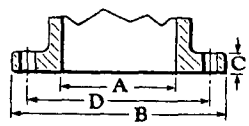
Stuffing box: The stuffing box is amply deep and is filled with high grade packing. The valves, when wide open, can be repacked while under pressure.

Gland: All valves have a two-piece ball-type gland consisting of a siliconized steel gland and a malleable iron gland flange.

Disc rollers: Bronze trimmed valves 16-inch and larger, ordered for use in a horizontal line with the valve stem horizontal, will have a bronze track in the lower side of the body and bronze rollers and scrapers in the lower side of the discs.

Federal Specification: Bronze trimmed No. 480 non-rising stem screwed, No. 481 non-rising stem flanged, and No. 483 outside screw and yoke flanged valves comply with Federal Specification WW-V-58 for Class "A" 125-Pound Iron Body Double Disc Gate Valves, Type II, Designations "NS", "NF", and "OF", respectively. However, the valves must be ordered with end protectors.

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



Dimensions of Flanges, in Inches

Size	A	B	C	D	No. & dia of bolts
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
5	5	10	15/16	8 1/2	8-3/4
6	6	11	1	9 1/2	8-3/4
8	8	13 1/2	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	23 1/2	1 7/16	21 1/4	16-1
18	18	25	1 9/16	22 3/4	16-1 1/8
20	20	27 1/2	1 11/16	25	20-1 1/8
24	24	32	1 7/8	29 1/2	20-1 1/4

(description continued on the next page)

200-Pound W.O.G.
Ferrosteel Double Disc Gate Valves
Bronze Trimmed or All-Iron

(continued from the preceding page)



Non-Rising Stem Valves with Indicator

Indicator: The stem of outside screw and yoke valves indicates the position of the discs. Non-rising stem valves can be equipped with an all-bronze "Universal" type indicator; specify valve number and size.

Cleanout: Flanged valves 3 to 12-inch, intended for use on lines carrying an unusual amount of sediment, tarry fluids, etc., can be ordered with a cleanout to facilitate cleaning. The cleanout is installed on the side of the valve body, as shown at lower left.



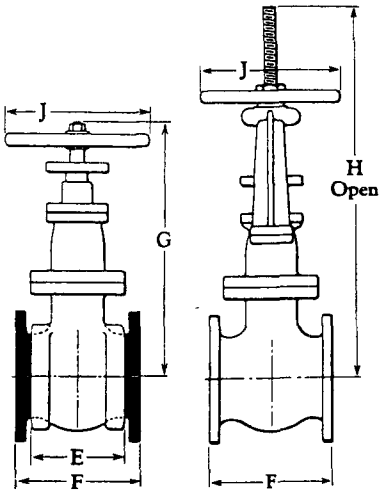
Single Side Cleanout

Motor or cylinder operation: Valves installed in inaccessible locations or used for emergency purposes should be equipped with some easy means of operation, such as an electric or air motor drive, or an operating cylinder; see pages 260 to 270.

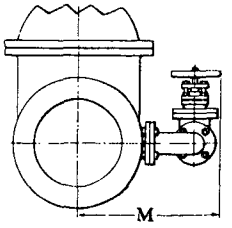
Face to face: Face to face dimensions of flanged valves without by-pass conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Double Disc Gate Valves. The Standard includes sizes up to 12-inch only.

Drilling: Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard (Class 125). The valves can be furnished faced only when specified.

Larger sizes: No. 481 and No. 483 flanged valves can be made to order in sizes up to 48-inch; dimensions furnished on request.



Non-Rising Stem Valves — Outside Screw and Yoke Valves



Valves 12-inch and larger are available with a by-pass

9

Weights and Dimensions — Prices on Request

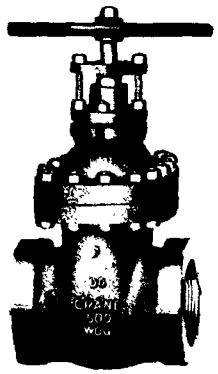
Size	Pounds, Each				Dimensions, in Inches								
	Non-Rising Stem		Outside Screw and Yoke		E	F		G	H	J	Turns to open	By-Pass	
	No. 480 Screwed	No. 481 Flanged F & D	No. 483 Flanged F & D	No. 1083 Flanged F & D		Without by-pass	With by-pass					By-pass size	M
Inches	Bronze Trim	Bronze Trim	Bronze Trim	All-Iron									
2	28	38	40	40	5½	7		12	15	8	7½	...	...
2½	36	40	48	48	6¼	7½		12½	16¼	8	9	...	...
3	50	60	60	60	7	8		14	19	9	10½	...	...
4	80	105	110	110	7½	9	...	17½	23½	10	9	...	...
5	...	150	...	...	..	10	...	19¾	..	12	11	...	...
6	...	200	210	210	..	10½	...	21¼	33	12	13	...	.
8*	...	300	330	320	...	11½	...	26	41¼	14	18	...	...
10*	...	470	510	510	...	13	...	30	50	16	22	...	...
12*	...	690	740	720	...	14	18	34½	57	18	26	2	22½
14*	...	...	1070	...	...	15¾	18½	...	67	20	31	2	23½
16*	...	...	1450	...	...	17	26½	...	75½	22	35	3	26
18*	...	...	1790	..	...	18½	27	...	83½	24	39	3	27½
20*	...	...	2370	...	...	20	28	...	92½	24	44	3	29
24*	...	...	4000	...	..	24	32	...	109½	30	52	4	33

*By-passes and gearing: To facilitate operation, by-passes are available for sizes 12-inch and larger and gearing, for sizes 8-inch and larger. The use of either, or both, should be particularly considered for outside screw and yoke valves 12-inch and larger. As indicated in the table, valves with by-pass have a longer face to face dimension (F) than the same size furnished without a by-pass For description of gearing, see pages 271 to 274; for by-passes, see page 282

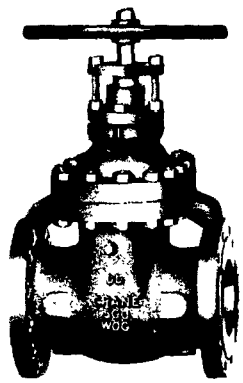
Ratings and description.....page 94
Gearing.....pages 271 to 274
By-passes.....page 282
Templates for drilling.....page 327
Normal thread engagement....page 352

500-Pound W.O.G.—Bronze Trimmed
Ferrosteel Double Disc Gate Valves

Non-Rising Stem



No. 340 E, Screwed



No. 341 E, Flanged

Working Pressure
500 psi non-shock
cold water, oil, or gas

Hydrostatic Test Pressures
1000 psi shell **550** psi seat

Air Tested

Additional description on pages 90 and 91.

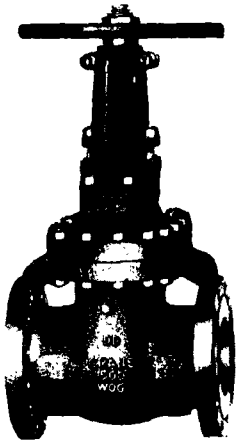
Weight — Pounds, Each

Size In.	No. 340 E	No. 341 E	No. 343 E
2	53	63	
3	90	120	120
4	...	200	210
6	...	350	380
8	...	610	660
10	...	920	
12	...	1430	

These valves are used in oil refineries, in pump houses, in pipe lines, in high pressure water lines, and for similar services requiring heavy, massive iron valves.

Nos. 340 E, 341 E, and 343 E comply with Federal Specification WW-V-58 for Class "B" 250-Pound Iron Body Double Disc Gate Valves, Type II, Designations "NS", "NF", and "OF", respectively.

Outside Screw and Yoke



No. 343 E, Flanged

Materials: The body and bonnet are Ferrosteel in sizes 2 and 3-inch and Crane High Tensile Iron in sizes 4-inch and larger; these metals conform to ASTM A 126, Classes B and C, respectively.

The body seat rings, screwed into the body, are made of Crane Special Bronze, a hard leaded tin bronze. Discs are Crane Special Bronze in sizes 4-inch and smaller and cast iron faced with Crane Special Bronze in sizes 6-inch and larger.

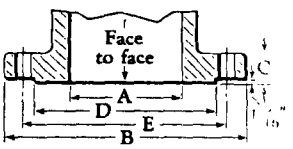
In non-rising stem valves, the stem is Cast Manganese Bronze and the portion of the discs engaging the stem threads is bronze or bronze-bushed. The outside screw and yoke valves have a bronze stem.

Stuffing box; gland: The stuffing box is filled with quality packing. The two-piece gland consists of a silicon-ized steel gland and malleable iron gland flange. When wide open, the valves can be repacked while under pressure.

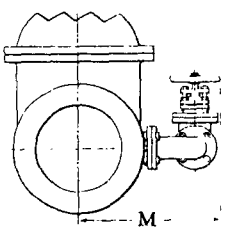
Face to face: Flanged valves without by-pass conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 250 Cast Iron Flanged Double Disc Gate Valves.

Flange dimensions and facing: End flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944). Flanges have a 1/16-inch raised face. The raised face is finished with approximately 16 concentric grooves per inch, known as a "serrated" finish.

Drilling: Flanged valves are regularly furnished faced, drilled, and spot faced (FD & SF) to the American Cast Iron Flange Standard, Class 250. The valves can be furnished faced only when orders so specify.



End Flanges



By-passes available for sizes 6-inch and larger

Dimensions, in Inches — Prices on Request

Size	End to end	Face to face W/o by-pass	Face to face With by-pass	Center to top, open Nos. 340 E 341 E	Center to top, open No. 343 E	Diameter of wheel	Turns to open	End Flanges A	B	C	D	E	No. & dia. of bolts	By-Pass By-pass size	By-Pass M
2	8	8 1/2	.	12 1/2	.	9	15	2	6 1/2	7/8	4 3/16	5	8-5/8	...	.
3	9 5/8	11 1/8	. .	15 1/2	20 3/4	10	15	3	8 1/4	1 1/8	5 11/16	6 5/8	8-3/4	. .	.
4	.	12		18	25	12	19	4	10	1 1/4	6 15/16	7 7/8	8-3/4	...	.
6*	.	15 7/8	16	22 3/4	34	16	28	6	12 1/2	1 7/16	9 11/16	10 5/8	12-3/4	1 1/4	12 3/4
8*	.	16 1/2	18	28 3/4	42 3/4	20	36	8	15	1 5/8	11 15/16	13	12-7/8	1 1/2	15 1/8
10*	...	18	20	36	. .	22	44	10	17 1/2	1 7/8	14 1/16	15 1/4	16-1	1 1/2	16 7/8
12*	.	19 3/4	22	40	.	24	52	12	20 1/2	2	16 7/16	17 3/4	16-1 1/8	2	24 1/2

*For easier operation, by-passes and gearing are available for sizes 6-inch and larger. Use of either, or both, should be particularly considered for 10 and 12-inch No. 341 E Valves and for 8-inch No 343 E Valves. See pages 271 to 274 for gearing and page 282 for by-passes

Drilling templates . . . . page 328
For motor or cylinder operation, see pages 260 to 270.

SECTION 10

Crane Iron Body Globe and Angle Valves

(Including Butterfly Valves)

Globe Valves, Union Bonnet
150-Pound.....pages 98 and 99
1000-Pound W.O.G. (Malleable Iron).....page 103

Angle Valves, Union Bonnet
150-Pound.....page 98

Globe and Angle Valves, Yoke Bonnet
125-Pound.....pages 100 and 101
250-Pound.....page 102

Butterfly Valves.....page 99

Diaphragm Valves.....page 104

For related data, refer to:

Accessories for valves.....pages 259 to 283
Gaskets for iron flanged joints.....page 322
Templates for drilling.....pages 327 and 328
Crane's complete line of packless diaphragm valves (bronze, iron, aluminum, 18-8 SMo).....pages 181 to 188

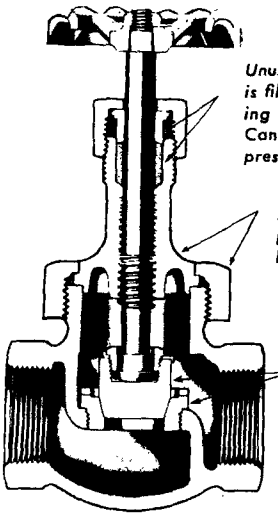
Flow of Fluids Through Valves, Fittings, and Pipe

The more complex industry becomes, the more vital becomes the role played by fluids in the industrial machine. One hundred years ago, water was the only important fluid which was conveyed from one point to another in pipe Today, almost every conceivable fluid is handled in pipe during its production, processing, transportation, or utilization. The age of atomic energy and rocket power has added fluids such as liquid metals . . . . i.e., sodium, potassium, and bismuth, as well as liquid oxygen, nitrogen, etc. . . . to the list of more common fluids such as oil, water, gases, acids, and liquors that are being transported in pipe.

Nor is the transportation of fluids the only phase of hydraulics which warrants attention. Hydraulic and pneumatic mechanisms are used extensively for the controls of modern aircraft, sea-going vessels, automotive equipment, machine tools, earth-moving and road-building machines, and even in scientific laboratory equipment where precise control of fluid flow is required. So extensive are the applications of hydraulics and fluid mechanics that almost every engineer has found it necessary to familiarize himself with at least the elementary laws of fluid flow. To this end, Crane has devoted a section of this catalog to a condensed presentation of data previously published in Crane's Technical Paper No. 410, "Flow of Fluids Through Valves, Fittings, and Pipe" See Section 32, pages 421 to 442.

150-Pound Iron Body Globe and Angle Valves

Plug Type Disc



Unusually deep stuffing box is filled with high grade packing and fitted with a gland. Can be repacked while under pressure.

Rugged union bonnet construction provides a tight joint (2½ and 3-inch sizes have a bolted bonnet).

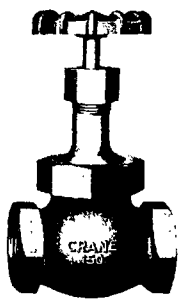
Disc and seat are designed for long wear under severe operating conditions. Tapered plug type disc is excellent for throttling.

Cross Section, Globe

Working Pressures
150 psi saturated steam
250 psi non-shock cold water, oil, or gas

Renewable body seat ring and plug type disc with Crane "500 Brinell" Stainless Steel seating surfaces
Union bonnet on sizes 2-inch and smaller
Bolted bonnet on sizes 2½ and 3-inch

Recommendations: These globe and angle valves are ideal for installations operating under severe conditions. Strong, compact, and durable, they are recommended for throttling service and for soot blower, blow-off, boiler feed, drip, and drain lines. Except for their disc and seat, the valves are similar to the globe valves shown on the opposite page.



No. 314½ P
Globe, Screwed



No. 316½ P
Angle, Screwed

Materials: The body is cast iron conforming to ASTM A 126, Class A. Sizes 2-inch and smaller have a bronze bonnet and malleable iron union bonnet ring; 2½ and 3-inch sizes have a cast iron bonnet.

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 harmed by foreign matter or by wiredrawing and the tapered disc permits close regulation of flow when throttling.

Both the disc and seat are Crane "500 Brinell" Stainless Steel, an AISI Type 420 stainless steel specially heat-treated for high hardness. The disc and seat design 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 seating combination.

Bonnet design: Sizes 2-inch and smaller have a union bonnet as shown in the illustrations at the left; 2½ and 3-inch valves have a bolted bonnet of the outside screw and yoke type as shown below.

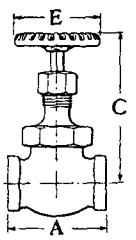
Both bonnet types provide a strong, tight joint, yet they are easily dismantled and reassembled without danger of damaging the valve.

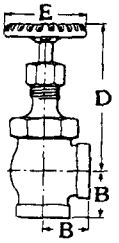
Stuffing box: The stuffing box is unusually deep and is equipped with a gland. It is filled with high grade packing.

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

Interchangeability: Except for their plug type disc and seat and materials, these valves are the same as the No. 350½ and No. 355½ Globes on the opposite page. Corresponding parts are completely interchangeable, size for size.

10

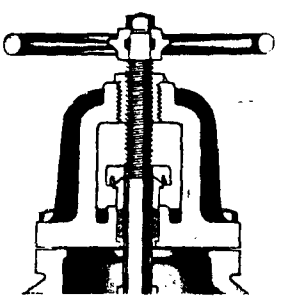




Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches				
	No. 314½ P Globe	No. 316½ P Angle	Globe		Angle		
Inches	Screwed	Screwed	A	C open	B	D open	E
½	2.1	2.0	3	5⅛	1⅜	5	2 9/16
¾	3.1	2.9	3½	5½	1 9/16	5⅜	2¾
1	4.5	4.3	4⅛	6⅝	1⅞	6½	3 1/16
1¼	6.5	6.3	4⅝	7¼	2 3/16	7¼	3⅝
1½	9.3	8.8	5¼	8¼	2⅜	8⅛	4 1/16
2	15.0	14.5	6⅜	9½	3	9¼	4¾
2½	32.0	25.0	7	11½	3½	11¾	8
3	48.0		8	14			9

A metal tag, secured under the wheel nut, shows the catalog number of the valve.



The 2½ and 3-inch valves have a bolted bonnet of the outside screw and yoke type and a Style D malleable iron wheel

Thread engagement . . . . page 352

150-Pound Iron Body Globe Valves

Regrinding Disc — Bronze Trimmed or All-Iron

Working Pressures
150 psi saturated steam
250 psi non-shock cold water, oil, or gas

Renewable seat valves. . . . bronze trimmed with Monel disc and seat. . . . all-iron with steel or iron disc and seat

Recommendations: These compact valves are used on steam, water, oil, and gas lines. They have a wide application in oil and gas fields, mines, gas and chemical plants, sugar refineries, and similar locations.

Body: The valve body is cast iron conforming to ASTM A 126, Class A.

Disc-seat: The disc and renewable screwed-in seat ring are finished to a 35° taper and have wide contacting surfaces; they hold pressure easily and offer good resistance to wear.

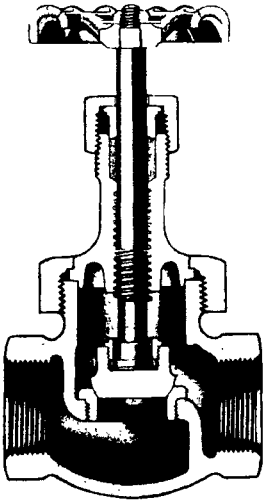
No. 350½: The No. 350½ are ideal for general non-corrosive service. The disc and seat are Monel. The bonnet, gland, and stem are bronze. The union bonnet ring and packing nut are tough malleable iron.

No. 355½: The No. 355½ are all-iron valves. Their bonnet, union bonnet ring, and packing nut are malleable iron. The stem and gland are steel. The disc and seat are steel in the smaller sizes and cast iron in the larger sizes.

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

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

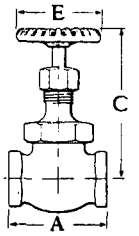
Interchangeability: These valves are a companion line to those on the facing page; parts are interchangeable, size for size.



Cross Section

Weights and Dimensions — Prices on Request

Size	Pounds, Each Screwed		Dimensions, in Inches		
Inches	No. 350½ Bronze Trim	No. 355½ All-Iron	A	C open	E
¼	1.1	1.1	2⅜	4½	1¾
⅜	1.5	1.5	2⅝	4¾	2 1/16
½	2.1	2.0	3	5⅜	2 9/16
¾	3.1	3.1	3½	6	2¾
1	4.5	4.4	4⅛	7	3 1/16
1¼	6.7	6.4	4⅝	7¾	3⅝
1½	8.4	9.2	5¼	8¾	4 1/16
2	15.0	15.0	6⅜	10¼	4¾



Globe, Screwed



No. 350½, Bronze Trimmed With Monel Disc and Seat

No. 355½, All-Iron with Steel or Iron Disc and Seat

10

Iron Body Butterfly Valves

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

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 a bronze disc and a steel stem. A drilled hole in the upper part of the stem permits attaching an operating mechanism. The body is cast iron conforming to ASTM A 126, Class A.

Weights and Dimensions — Prices on Request

Size	Pounds Each		Dimensions, Inches		
Inches	No. 380 Screwed	No. 381 Flanged F & D	End to end or face to face	Center to top of stem	Diameter of stem
2	5.5		4¼	6⅛	½
2½	7.5		4¾	7	½
3	12.0	23.0	5¼	8	9/16
4		37.0	6	9¼	⅝
6		50.0	7½	11½	¾
8		100.0	9¼	12½	15/16

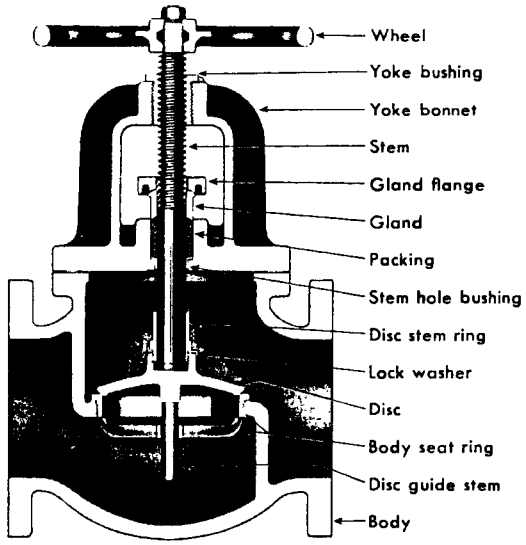


No. 380, Screwed
No. 381, Flanged

Flanged valves: End flanges conform to the American Cast Iron Flange Standard, Class 125 (B16 1-1948) The flanges are plain faced, with a smooth finish. Flanged valves are regularly furnished faced and drilled (F & D) to the aforementioned Standard. Faced only valves can be furnished when specified

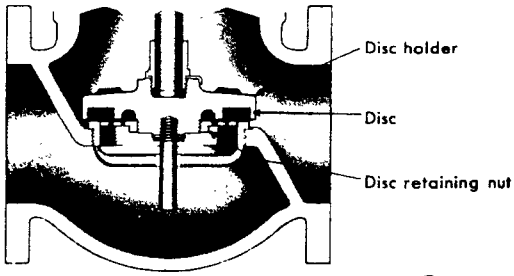
Bronze Butterfly Valves. . . . page 58 *Templates for drilling. . . . page 327* *Thread engagement. . . . page 352*

125-Pound Ferrosteel Globe and Angle Valves
With Yoke Bonnet



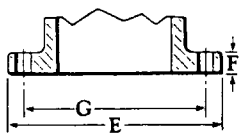
Bronze Trimmed or All-Iron

Except for materials and minor differences in construction, the bronze trimmed valves (illustrated) and the all-iron valves are similar.



Composition Disc

The partial section above shows the disc assembly of composition disc valves. Unless otherwise ordered, the valves have a No. 1 Cranite Disc.



Dimensions of Flanges, Inches

Size	E	F	G	No & dia of bolts
2	6	5/8	4 3/4	4-5/8
2 1/2	7	11/16	5 1/2	4-5/8
3	7 1/2	3/4	6	4-5/8
3 1/2	8 1/2	13/16	7	8-5/8
4	9	15/16	7 1/2	8-5/8
5	10	15/16	8 1/2	8-3/4
6	11	1	9 1/2	8-3/4
8	13 1/2	1 1/8	11 3/4	8-3/4
10	16	13/16	14 1/4	12-7/8

Rugged valves for severe services . . . choice of bronze trimmed, all-iron, or composition disc types

Working Pressures, Non-Shock

Fluid	Bronze Trimmed or All-Iron Valves	Composition Disc Valves	
		With No. 1 Cranite Disc (regular)	With No. 6 Disc (optional)
Saturated Steam	125 psi	125 psi	. . .
Cold Water, Oil, Gas	200 psi	*	200 psi
Air	. . .	. . .	200 psi

*Valves with No. 1 Cranite Disc may be used for 200 psi hot water service at temperatures from 200 to 300 F.

Hydrostatic Test Pressures

350 psi shell test **225** psi seat test

The yoke bonnet globe and angle valves described on these facing pages comprise three distinct types . . . bronze trimmed . . . all-iron . . . and composition disc. Similar in design but differing principally in materials, each features rugged construction and quality materials. Thick metal sections and proper metal distribution assure maximum strength

Bronze trimmed: Bronze trimmed globe and angle valves are recommended for steam and water or for fluids that do not corrode bronze or iron. They have a screwed-in bronze body seat ring and a Cast Manganese Bronze stem. Sizes 6-inch and smaller have a solid bronze disc; larger sizes have an iron disc with a heavy bronze seating face.

All-iron: All-iron globe valves are ideal for fluids corrosive to bronze but not iron. The disc and screwed-in body seat ring are iron. The stem is steel, nickel-plated.

Composition disc: The No. 359 have a composition disc, a bronze screwed-in body seat ring, and a Cast Manganese Bronze stem.

They are regularly furnished with a No. 1 Cranite Disc suitable for saturated steam or for hot water (200 to 300 F). When ordered for water (up to 200 F), oil, gas, gasoline, or air, they are equipped with a No. 6 Disc. For description and service recommendations of composition discs, see page 281.

Body: All valves have a body made of Crane Ferrosteel. This metal conforms to requirements of ASTM Specification A 126, Class B.

Yoke bonnet: The yoke bonnet is also made of Crane Ferrosteel. Stem threads engage the yoke on the outside where they are not affected by fluid in the line and are easily lubricated. The yoke bushing is Cast Manganese Bronze.

Guided disc: Except on 2-inch all-iron valves, the disc or disc holder is closely guided throughout its travel by a disc guide stem operating in a bridge cast integral with the seat ring. The design minimizes vibration of internal parts and assures true seating of the disc.

The disc guide stem in the smaller sizes is integral with the disc; in larger sizes, it is screwed into the disc or disc holder and pinned.

Disc-stem connection: The swivel disc or disc holder is securely fastened to the stem with a disc stem ring. The connection is locked with a special locking device.

Gland: The two-piece gland, consisting of a siliconized steel gland and malleable iron gland flange, prevents binding on the stem and assures an even load on the packing. Gland studs and nuts are bronze on bronze trimmed valves and steel on all-iron and composition disc valves

125-Pound Ferrosteel Globe and Angle Valves
With Yoke Bonnet

(continued from the preceding page)

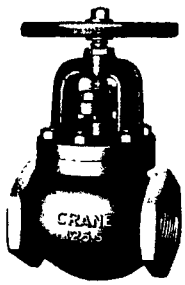
Stuffing box: All valves have an amply deep stuffing box filled with high grade packing. In bronze trimmed valves, the bottom of the stuffing box is fitted with a bronze stem hole bushing.

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

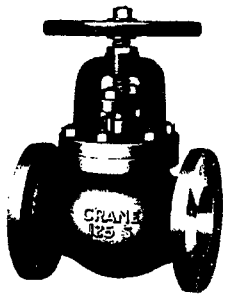
Wheel: The valve wheel, made of tough malleable iron, has a tapered square hole which fits snugly on the square stem end. The wheel is held in place with a wheel nut.

Flanged valves: Flanged valves conform to the American Standard for Face-to-Face and Center-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Flanged Globe and Angle Valves.

Bronze Trimmed and All-Iron



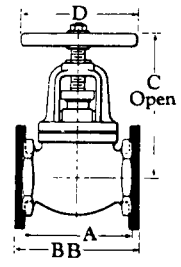
Globe, Screwed
No. 350
Bronze Trimmed



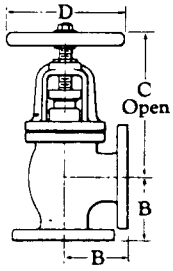
Globe, Flanged
No. 351
Bronze Trimmed
No. 351¼
All-Iron



Angle, Flanged
No. 353
Bronze Trimmed
No. 353¼
All-Iron



Globe
Screwed or Flanged



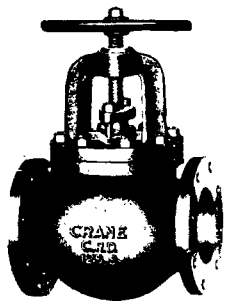
Angle
Flanged

End flanges: The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish. For dimensions of end flanges, see the facing page; for drilling templates, see page 327.

Drilling: Flanged valves are regularly furnished faced and drilled to the American Cast Iron Flange Standard, Class 125. They can be furnished faced only when specified.

250-pound valves: For 250-Pound Ferrosteel Globe and Angle Valves with yoke bonnet, see next page; the valves are bronze trimmed.

Composition Disc



Globe, Flanged
No. 359
Composition Disc

10

Weights and Dimensions — Prices on Request

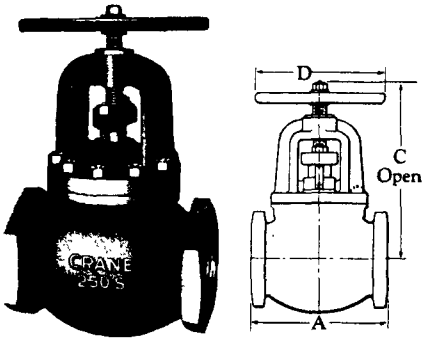
Size	Pounds, Each						Dimensions, in Inches						
	Bronze Trimmed			All-Iron		Composition Disc*	A	BB	B	C Globe		C Angle	D
Inches	No. 350 Globe, Screwed	No. 351 Globe, Flanged	No. 353 Angle, Flanged	No. 351¼ Globe, Flanged	No. 353¼ Angle, Flanged	No. 359 Globe, Flanged				Bronze Trimmed or All-Iron	With Composition Disc		
2	22	29	31	29	28	. .	6½	8	4	11⅛	. . .	11	8
2½	30	41	30	30	37	49	7	8½	4¼	11½	10½	11½	8
3	40	50	40	40	50	65	8	9½	4¾	13¼	12¼	12¾	9
3½	. .	70	.	. .	. .		.	10½	.	13½	. . .	. . .	9
4	60	90	90	90	70	90	10	11½	5¾	15½	14½	15	10
5	. .	120	120	. .	. .	140	. .	13	6½	17½	16¼	17½	10
6	. .	180	150	170	140	180		14	7	19½	18¾	19½	12
8	.	340	280	330	280	.	.	19½	9¾	25		21½	16
10	.	520	470	. . .	. .	.	.	24½	12¼	30	.	27	18

*No 359 Valves are regularly furnished with a No 1 Granite Disc for saturated steam, or for hot water from 200 to 300 F, when specified, they can be furnished with a No 6 Disc suitable for water up to 200 F, oil, gas, gasoline, or air

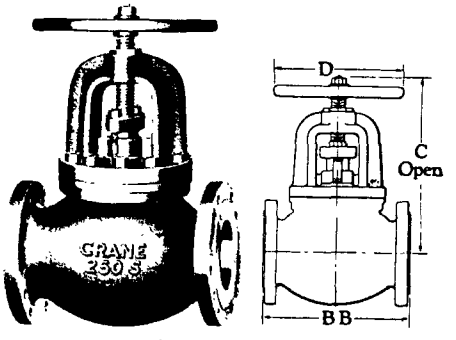
Extra composition discs . . . . . page 281
Valves for marine service . . . . pages 233 and 234
Templates for drilling . . . . page 327
Thread engagement . . . . . page 352

250-Pound Ferrosteel Globe and Angle Valves

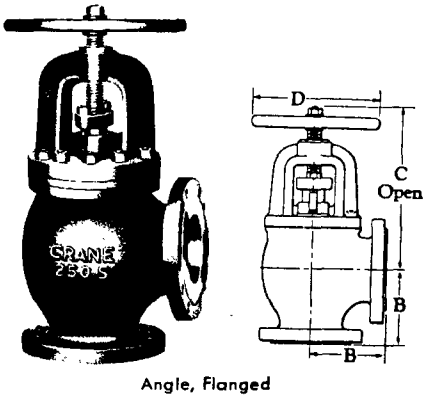
Yoke Bonnet — Bronze Trimmed



Globe, Screwed
No. 20 E



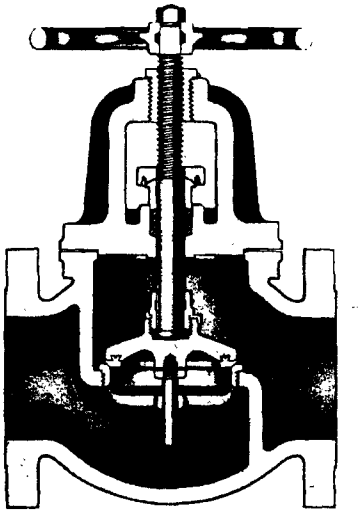
Globe, Flanged
No. 21 E



Angle, Flanged
No. 23 E

Working Pressures
250 psi steam, **450** F
500 psi non-shock cold water, oil, or gas

Hydrostatic Test Pressures
Shell test — **1000** psi
Seat test — **550** psi



Cross Section, Globe

These valves have unusually heavy metal sections and are suitable for severe and high pressure service on steam, water, oil, and gas lines.

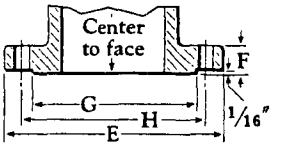
Materials: The body and yoke bonnet are Crane Ferrosteel conforming to ASTM A 126, Class B. The body seat ring is Crane Special Bronze, a strong, wear-resisting, leaded tin bronze.

The stem and yoke bushing are Cast Manganese Bronze. Sizes 3-inch and smaller have a solid Crane Special Bronze disc; larger sizes have an iron disc with a large Crane Special Bronze seating face rolled in. All valves have a two-piece, ball-type gland and gland flange. The gland is siliconized steel or bronze, and the gland flange is forged steel or malleable iron, depending on the valve size

Construction: The disc is securely fastened to the stem with a disc stem ring; the connection is locked with a special lock washer on sizes up to 5-inch and with a set screw on larger sizes. A guide stem (integral with disc in sizes 3-inch and smaller; screwed into the disc and pinned on larger sizes) guides the disc closely throughout its travel, assuring true seating. Valves 6-inch and smaller have a 45° seat; 8-inch valves have a flat seat.

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

Flanged valves: Flanged valves conform to the American Standard for Face-to-Face and Center-to-Face Dimensions (B16.10-1957) for Class 250 Cast Iron Flanged Globe and Angle Valves. End flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944); they have a 1/16-inch raised face with serrated finish (about 16 concentric grooves per inch).



Flanged valves are furnished faced and drilled unless faced only is specified.

10

Weights and Dimensions — Prices on Request

Size	Pounds, Each			Dimensions, in Inches						End Flanges				
	No. 20 E Globe	No. 21 E Globe	No. 23 E Angle	A	BB	B	C		D	E	F	G	H	No. & dia. of bolts
Inches	Screwed	Flanged F & D	Flanged F & D				Globe	Angle						
2	48.5	58.5	54.0	9½	10½	5¼	13¾	13	9	6½	⅞	4 3/16	5	8-⅝
2½	74.5	70.0	80.0	10¾	11½	5¾	14¾	13¾	10	7½	1	4 15/16	5⅞	8-¾
3	90.0	110.0	90.0	11¾	12½	6¼	16½	15½	10	8¼	1⅛	5 11/16	6⅝	8-¾
4	130.0	160.0	160.0	13	14	7	18½	17¼	12	10	1¼	6 15/16	7⅞	8-¾
5		225.0	222.0		15¾	7⅞	21	19½	14	11	1⅜	8 5/16	9¼	8-¾
6		320.0	280.0		17½	8¾	23¼	21¾	16	12½	1 7/16	9 11/16	10⅝	12-¾
8		550.0	470.0		21	10½	28½	26	20	15	1⅝	11 15/16	13	12-⅞

Templates for drilling . . . . page 328

Malleable Iron Globe Valves

1000-Pound W.O.G. — Plug Type Disc

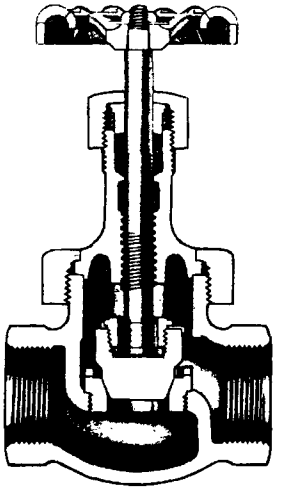
Working Pressures
300 psi steam or hot oil, **550** F
1000 psi non-shock cold water, oil, gas, or air

Test Pressure
1200 psi hydrostatic

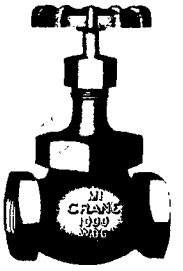
Air Tested

Union Bonnet Valves with Crane "500 Brinell" Stainless Steel Seating Surfaces

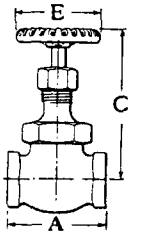
Choice of Exelloy or Steel Stem



Cross Section
Globe Valve with
Exelloy or Steel Stem



Globe, Screwed
No. 254 P
With Exelloy Stem
No. 255 P
With Steel Stem



Recommendations: These 1000-Pound W.O.G. Malleable Iron Globe Valves are exceptionally strong and compact. 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. The valves hold pressure easily and, when throttled, permit accurate regulation of flow.

Materials: The body, bonnet, and union bonnet ring are made from high grade malleable iron conforming to ASTM Specification A 338.

Generous metal sections in all parts and the durability of the materials used contribute to the unusual ruggedness of the valves. They have a very liberal factor of safety at the maximum recommended working pressures.

No. 254 P Valves have an Exelloy stem. The No. 255 P have a steel stem, nickel-plated. A metal tag, secured under the wheel nut, shows the catalog number of the valve.

Plug type 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 harmed by foreign matter or wire-drawing and the tapered disc permits close regulation of flow when throttling.

Both the disc and renewable seat are made of Crane "500 Brinell" Stainless Steel, an AISI Type 420 steel specially heat-treated for high hardness. Their design, 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 seating combination.

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, unusually deep, is fitted with a steel gland and a malleable iron packing nut; it is filled with a high grade packing.

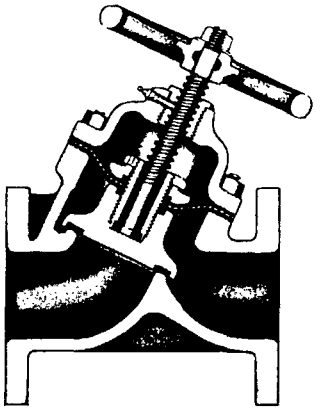
Weights and Dimensions (Inches) — Prices on Request

Size	No. 254 P Globe, Screwed — Exelloy Stem				No. 255 P Globe, Screwed — Steel Stem			
Inches	Pounds Each	A	C open	E	Pounds Each	A	C open	E
1/4	1.1	2 3/8	4 1/2	1 3/4	1.1	2 3/8	4 1/2	1 3/4
3/8	1.5	2 5/8	4 5/8	2 1/16	1.5	2 5/8	4 5/8	2 1/16
1/2	2.1	3	5 1/4	2 9/16	2.1	3	5 1/4	2 9/16
3/4	3.0	3 1/2	5 5/8	2 3/4	3.1	3 1/2	5 5/8	2 3/4
1	4.5	4 1/8	7	3 1/16	4.5	4 1/8	7	3 1/16
1 1/4	6.3	4 5/8	7 5/8	3 5/8	6.3	4 5/8	7 3/4	3 5/8
1 1/2	9.2	5 1/4	8 3/4	4 1/16	9.1	5 1/4	8 3/4	4 1/16
2	16.0	6 3/8	10	4 3/4	15.0	6 3/8	10	4 3/4

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

Thread engagement..page 352

Iron Body Packless Diaphragm Valves



Sectional of an iron body unlined diaphragm valve. Also available with the body lined, and the disc coated, with neoprene or rubber.

Crane Diaphragm Valves are described in detail in Section 16

Lined and unlined valves with wheel or sliding stem . . . . for general and corrosive services

Crane diaphragm valves, available in a wide choice of body, diaphragm, and disc insert materials, are highly recommended for use in general and corrosive services.

The valves belong to that general class known as "packless" valves, so called because the customary stuffing box around the stem has been eliminated through the use of a flexible diaphragm mounted between the body and bonnet. The diaphragm coupled with the "tight-seating" disc facing make the valves ideal for conveying liquids, compressed air, gases, volatile fluids, etc. They are rated for pressures up to 150 psi and, depending on the diaphragm and disc insert material, for temperatures up to 200 F.

Iron body diaphragm valves are regularly made with screwed ends in sizes up to 2-inch and with flanged ends in sizes up to 14-inch . . . . with a neoprene, natural rubber, Buna N, or Kel-F diaphragm and disc insert . . and with wheel or sliding stem operation. Valves lined with neoprene or natural rubber also are available.

A complete line: The iron body unlined and lined valves described briefly on this page are only a small portion of Crane's extensive line. Also included are valves made of bronze, aluminum, and 18-8 SMo with the same choice of diaphragm and disc insert materials. For complete details, refer to Crane's Diaphragm Valve Section 16, pages 181 to 188.

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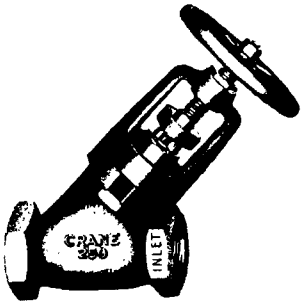
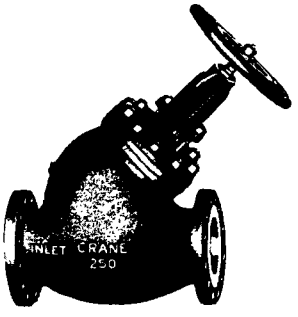


250-Pound Ferrosteel Blow-Off Valve
(see page 218)



250-Pound Ferrosteel Stop-Check Valve
(see page 221)

Crane Iron Body Valves

Specific types are available to suit practically any service requirement

Commonly used types of Crane iron body valves are described in Sections 8 to 11 of this catalog.

In addition to the foregoing, Crane regularly manufactures a wide assortment of iron body valves in designs that will automatically perform a specified duty in piping installations. For the convenience of the catalog user, such valves are described in other sections of the catalog along with related items.

For complete description of commonly used iron body valves as well as those for specific purposes, refer to the following listings.

Iron body wedge gate valves	Section 8
Iron body double disc gate valves	Section 9
Iron body globe and angle valves	Section 10
Iron body check and foot valves	Section 11
Iron body diaphragm valves	Section 16
Iron body valves for marine service	Section 20
Alloy iron wedge gate valves	pages 82, 83, and 87
Iron body and alloy iron pulp stock valves	page 84
Iron body butterfly valves	page 99
3½ nickel iron swing check valves	page 114
Iron body pop safety valves	page 209
All-iron relief valves	page 216
Ferrosteel blow-off valves	page 218
Ferrosteel stop-check valves	page 221

SECTION 11

Crane Iron Body Check and Foot Valves

(Including Alloy Iron Valves)

Iron Body Lift Check

125-Pound.....page 107
150-Pound.....page 106
Vertical Type.....page 107

Iron Body Swing Check

125-Pound.....pages 108 to 110
125-Pound, Outside Lever and Weight.....page 110
250-Pound.....page 113
1000-Pound W.O.G., Malleable Iron.....page 106
Clearway Type, Underwriters' Pattern.....page 112

3% Nickel Cast Iron Swing Check

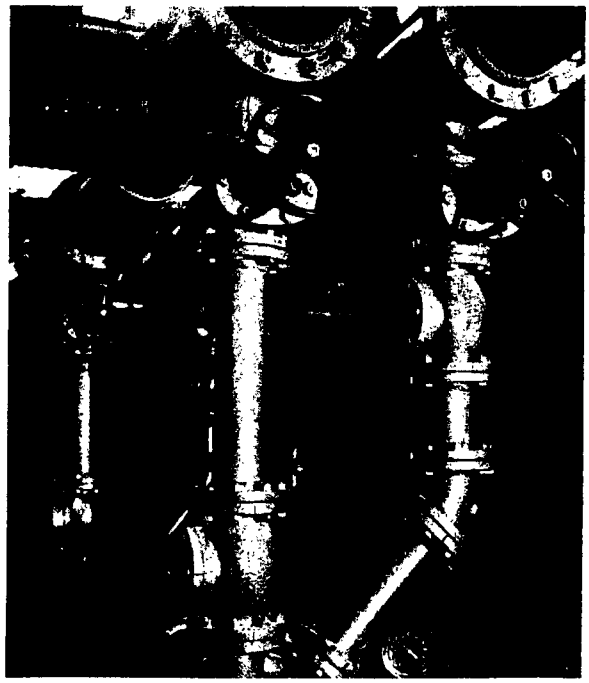
For Process Industries.....page 114

Foot Valves.....page 111

The liberal variety of sizes and types of Crane iron body check and foot valves described in this section assures an adequate selection for all ordinary service requirements. In addition, the stop-check valves shown on page 221 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.

For related data, refer to:

Stop-check valves.....pages 219 to 225
Gaskets for iron flanged joints.....page 322
Templates for drilling.....pages 327 and 328
Proper sizing of check and foot valves.....page 427



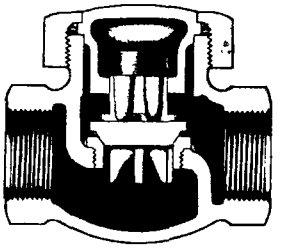
Crane iron body check and gate valves in an electric light and power plant.

150-Pound Iron Body Lift Check Valves

Monel Disc and Seat

Working Pressures
150 psi saturated steam
250 psi non-shock cold water, oil, or gas

Compact valves for small size pipe lines



Cross Section
No. 366½



No. 366½
Horizontal Lift
Screwed

Recommendations: The No. 366½ Lift Check is an excellent valve for use on small lines carrying steam, water, oil, gas, and similar fluids.

Materials: High grade materials are used throughout. The body is made of cast iron conforming to requirements of ASTM Specification A 126, Class A.

The cap is made of bronze. The union cap ring is malleable iron. The valves feature a disc and body seat ring made of Monel, a high strength alloy offering excellent resistance to wear and corrosion.

Construction: The valves are compact and rugged. Their union cap provides a strong, tight joint; it can easily be dismantled or reassembled, when necessary. The disc is guided both at the top and bottom, assuring square seating

Weights and Dimensions

	Size	Weight	End to end	Center to top
	Inches	Pounds Each	Inches	Inches
No. 366½ Screwed	½	1.6	3	1¾
	¾	2.4	3½	2 1/16
	1	3.4	4⅛	2 5/16
	1¼	5.5	4⅝	2 11/16
	1½	7.7	5¼	3 3/16
	2	12.4	6⅜	3⅝

Prices on Request

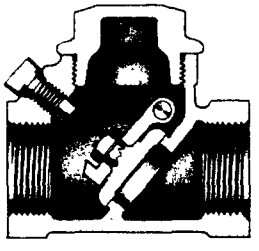
1000-Pound W.O.G.

Malleable Iron Swing Check Valves

Working Pressures
300 psi oil, **550** F
1000 psi non-shock cold water, oil, or gas

Test Pressure
1200 psi hydrostatic

11



Cross Section
No. 346½



No. 346½
Screwed

Recommendations: No. 346½ Swing Checks are compact, ruggedly constructed valves.

They are especially suitable for use on 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.

Materials: The body, cap, disc, and hinge are made of tough, durable malleable iron conforming to ASTM Specification A 338. The hinge pin is Exelloy.

Regrinding: The valves can be reground without taking the body from the line. Simply remove the stop plug; a screw driver can then be engaged with the slot in the disc spud, making it easy to rotate the disc when regrinding.

Weights and Dimensions

	Size	Weight	End to end	Center to top
	Inches	Pounds Each	Inches	Inches
No. 346½ Screwed	½	.9	2¾	1⅞
	¾	2.0	3 1/16	2⅛
	1	2.2	3⅝	2½
	1¼	3.6	4⅛	2⅞
	1½	5.4	4 13/16	3⅜
	2	9.0	5 13/16	3⅞

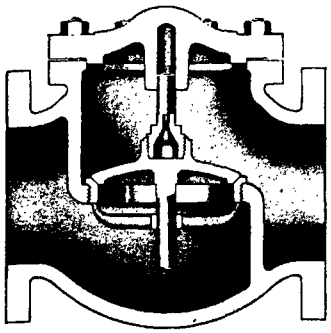
Prices on Request

Normal thread engagement....page 352

Proper sizing of check valves....page 427

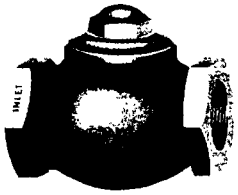
125-Pound Ferrosteel Lift Check Valves
Bronze Trimmed

Horizontal

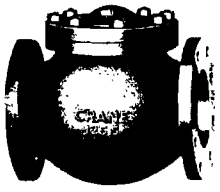


Cross Section

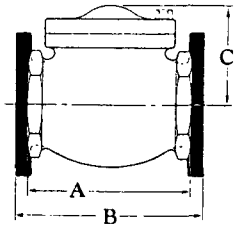
Flanged horizontal lift check valves have an iron bolted cap as shown above. Screwed end valves are furnished with a bronze screwed-in cap as illustrated directly below.



No. 366
Horizontal, Screwed



No. 367
Horizontal, Flanged



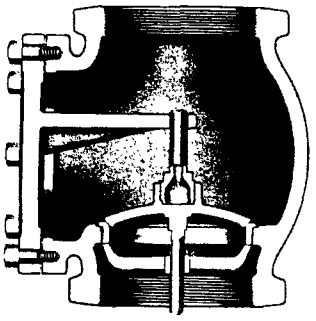
Horizontal Checks

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

Test Pressures
Shell — 350 psi hydrostatic
Seat — 225 psi hydrostatic

Horizontal and vertical lift checks for use in large size pipe lines

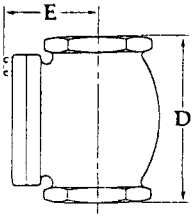
Vertical



Cross Section



No. 368
Vertical, Screwed



Vertical Check

Recommendations: These iron body horizontal and vertical lift check valves are designed for service in large size pipe lines carrying steam, water, oil, gas, and similar fluids.

Materials and construction: The valves are unusually rugged. Their body, well proportioned throughout, is made of Crane Ferrosteel conforming to ASTM Specification A 126, Class B.

All valves are bronze trimmed. The body seat ring is bronze, screwed into the body. The disc is solid bronze and is accurately guided both at the top and bottom to assure square seating.

No. 366 Valves are equipped with a bronze cap, screwed into the body. The No. 367 and No. 368 Valves have an iron cap bolted onto the body.

Proper sizing: In many cases, difficulties arising in the use of check valves are due to oversizing. For proper sizing of check valves, see page 427.

Flange dimensions and facing: The dimensions and drilling of the end flanges of No. 367 Valves conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). The flanges are plain faced, with a smooth finish.

Drilling: Flanged valves are regularly furnished faced and drilled (F & D). They can be furnished faced only when specified.

Weights and Dimensions — Prices on Request

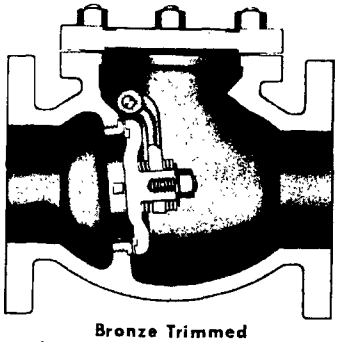
Size	No. 366 Horizontal Lift Screwed			No. 367 Horizontal Lift Flanged, F & D			No. 368 Vertical Lift Screwed		
	Pounds	A	C	Pounds	B	C	Pounds	D	E
Inches	Each	End to end, Inches	Center to top, Inches	Each	Face to face, Inches	Center to top, Inches	Each	End to end, Inches	Center to top, Inches
2	11.0	6½	3½	....	....	....	....	....	....
2½	15.6	7	4¼	....	....	....	....	....	....
3				40.0	9½	5	30.0	8	5
4				70.0	11½	6¼	55.0	10	6
5				90.0	13	7			
6				120.0	14	8¼			

Templates for drilling....page 327 *Thread engagement....page 352*

11

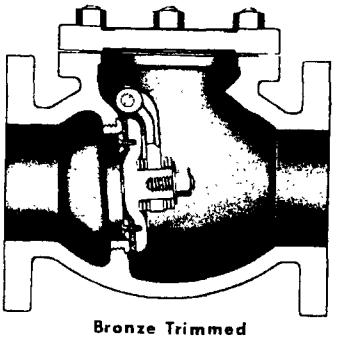
125-Pound Ferrosteel Swing Check Valves

Bronze Trimmed or All-Iron



Bronze Trimmed
(8-inch and smaller illustrated)

All valves . . . bronze trimmed and all-iron . . . in sizes 8-inch and smaller feature the flexible disc-hinge connection illustrated above. The design provides true seating and reduces wear on the parts.



Bronze Trimmed
With Leather Faced Disc
(8-inch and smaller illustrated)

When specified, bronze trimmed valves in some sizes are available with a leather faced disc; such valves are suitable for cold water service only.

11

For additional description, weights, and dimensions, see the facing page.

Valve Size, Inches	Working Pressures: Saturated Steam	Working Pressures: Cold Water, Oil, or Gas Non-Shock	Hydrostatic Test Pressures: Shell test	Hydrostatic Test Pressures: Seat test
2 to 12	125 psi	200 psi	350 psi	225 psi
14 and 16	125 psi	150 psi	250 psi	175 psi
18 to 24	.....	150 psi	250 psi	175 psi

Valves with a leather faced disc are recommended for cold water service only.

Sturdily constructed swing checks . . . with flexible disc-hinge connection on sizes 8-inch and smaller.

The Crane line of Ferrosteel Swing Check Valves, described on these facing pages, includes both bronze trimmed and all-iron types.

Bronze trimmed valves: The bronze trimmed valves are recommended for steam or water . . . or for fluids that do not corrode bronze.

The body seat ring is bronze and is screwed into the body. The hinge pin, also bronze, rides in bronze bushings, one on each side of the valve body, thus assuring a non-corrosive, wear-resistant bearing. The disc is made of bronze in sizes 3-inch and smaller and is iron faced with bronze in larger sizes.

All-iron valves: All-iron valves are recommended for gas . . . or for fluids that corrode bronze but not iron.

The seating surfaces are cast integral with the body and disc. The valves have an Exelloy hinge pin supported at each end by iron bushings in the valve body.

Body and cap metals: The body and cap are made of Crane Ferrosteel in sizes up to 16-inch and of Crane High Tensile Cast Iron in sizes 18-inch and larger.

These metals conform to requirements of ASTM Specification A 126 for Class B Higher Strength and Class C High-Test Castings respectively; for detailed description of these metals, see page 3.

Construction: These are well proportioned, sturdily constructed valves. The body, oval or globular in shape, provides ample flow area around the disc when the valve is wide open. All valves are designed so that the disc cannot stick in the open position.

The hinge is suspended in the body. A tapped and plugged opening in each of the two bosses on the body provides easy access to either end of the hinge and simplifies changing over to outside lever and weight construction.

Disc-hinge connection: Valves 8-inch and smaller (patented) feature a flexible disc-hinge connection. Two springs are used in the connection, one on each side of the hinge. When the disc nut is tightened upon assembly, these springs are compressed sufficiently to provide a flexible but semi-rigid connection which eliminates lost motion between the parts, reduces wear . . . and yet, permits the disc to make true, full contact with the seat. The cross sections at the left illustrate this construction.

Valves 10-inch and larger (not illustrated) have the conventional swing check valve disc-hinge connection; the spud on the disc fits into a hole in the hinge, the parts being held together by a large washer and a nut

Leather faced disc: The bronze trimmed valves (Nos. 372 and 373), in certain sizes, can be furnished with a leather faced disc.

The No. 372 can be furnished with a leather faced disc in sizes 2½, 3, and 4-inch. The No. 373 can be similarly equipped in sizes 3, 3½, 4, 6, 8, and 10-inch.

Valves having a leather faced disc are recommended for cold water service only

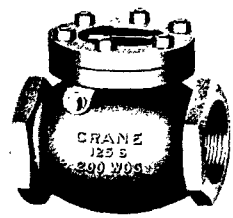
Swing Check Valves Equipped with Outside Lever and Weight

For a complete description of iron body swing check valves equipped with an outside lever and weight, refer to page 110. The lever and weight can be mounted either to assist the disc in closing or to balance the disc so that the valve opens under minimum pressure.

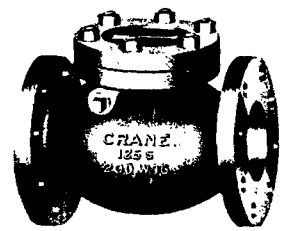
125-Pound Ferrosteel Swing Check Valves

Bronze Trimmed or All-Iron

For working pressures and additional description, see the preceding page.



Screwed
No. 372, Bronze Trimmed
No. 372½, All-Iron



Flanged
No. 373, Bronze Trimmed
No. 373½, All-Iron

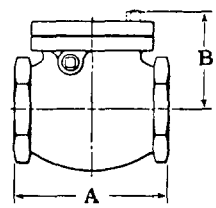
Installation: Crane Ferrosteel Swing Check Valves may be used in a horizontal position or, if desired, in a vertical position for upward flow.

By-passes: A by-pass can be furnished on flanged valves 12-inch and larger when specified; an added charge applies. The valve in the by-pass is a non-rising stem wedge gate valve. The table at the left lists the sizes of main valves and by-pass valves.

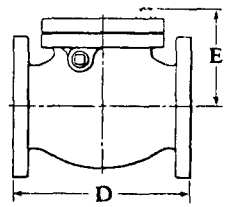
By-Pass Sizes For Main Valves

Main Valve Inches	By-Pass Valve Inches
12 and 14	2
16 to 20	3
24	4

Additional information, prices, and dimensions of valves equipped with by-pass will be furnished on request.



Screwed

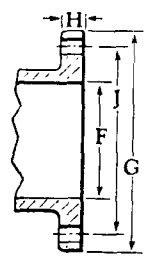


Flanged

Face to face dimensions: The face to face dimensions of flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957), for 125-Pound Cast Iron Swing Check Valves. This Standard does not include a 3½-inch size, nor does it include sizes larger than 14-inch.

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

Drilling: Flanged valves are regularly furnished faced and drilled to the American Cast Iron Flange Standard, Class 125. The valves can be furnished faced only but orders must so specify.



End Flanges

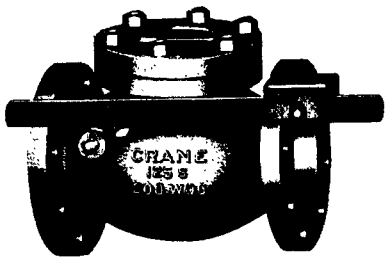
Weights and Dimensions — Prices on Request

Size In.	Pounds, Each *Bronze Trimmed No. 372 Screwed Metal Disc	Pounds, Each *Bronze Trimmed No. 372 Screwed Leather Faced Disc	Pounds, Each *Bronze Trimmed No. 373 Flanged Metal Disc	Pounds, Each *Bronze Trimmed No. 373 Flanged Leather Faced Disc	Pounds, Each All-Iron No. 372½ Screwed Metal Disc	Pounds, Each All-Iron No. 373½ Flanged Metal Disc	Dimensions, in Inches Screwed A	Screwed B	Flanged D	Flanged E	Flanged End Flanges F	G	H	J	No & diameter of bolts
2	18	..	25	..	18	25	6½	4¼	8	4¼	2	6	⅝	4¾	4–⅝
2½	20	20	30	.	20	30	7	4 3/16	8½	4 3/16	2½	7	1 1/16	5½	4–⅝
3	32	30	40	40	32	40	8	5 1/16	9½	5 1/16	3	7½	¾	6	4–⅝
3½	..	..	56	55	.		..	.	10½	5 13/16	3½	8½	13/16	7	8–⅝
4	60	60	80	80	60	80	10	6 3/16	11½	6 3/16	4¼	9	15/16	7½	8–⅝
5	90	..	120	..	.	120	11¼	7 3/16	13	7 3/16	5¼	10	15/16	8½	8–¾
6	120	..	150	150	.	150	12½	7½	14	7½	6 5/16	11	1	9½	8–¾
8	..	..	290	290	.	290	..	..	19½	10 3/16	8	13½	1⅛	11¾	8–¾
10	..	.	450	450	..	450	..	..	24½	12⅛	10	16	1 3/16	14¼	12–⅞
12	..	..	670	..	..	670		..	27½	13¾	12	19	1¼	17	12–⅞
14	..	.	960	..	..	.	.	.	31	16⅛	14	21	1⅜	18¾	12–1
16	..	..	1430	.	.	.	..		36	17⅞	16	23½	1 7/16	21¼	16–1
18		..	1680	..	..	..	..	..	36	17½	18	25	1 9/16	22¾	16–1⅛
20	..	..	2030	..	..	..	..	.	40	20	20	27½	1 11/16	25	20–1⅛
24		.	3010	..	.	.	..	..	48	21	24	32	1⅞	29½	20–1¼

*Bronze trimmed valves are regularly furnished with a metal (bronze or bronze faced) disc. Sizes available with a leather faced disc will be so furnished only if specified

Templates for drilling.....page 327
Normal thread engagement.....page 352
Proper sizing of check valves....page 427

125-Pound Ferrosteel Swing Check Valves
With Outside Lever and Weight



No. 383, Flanged
Bronze Trimmed

Working Pressures
125 psi saturated steam
200 psi non-shock cold water, oil, or gas

Hydrostatic Test Pressures
Shell: **350** psi Seat: **225** psi

These are swing check valves, similar, except for the lever and weight, to the No. 373 valves shown on page 109; they are not to be used as back pressure valves, unloading valves, etc.

Recommendations: Lever and Weight Swing Check Valves with the lever and weight positioned to assist the disc in closing are recommended for use in pipe lines where quick action is necessary to avoid a sudden reversal of flow.

Valves with the weight balancing the disc are used in installations requiring swing check valves that will open under a minimum of pressure.

Construction and materials: The hinge and outside lever are made of malleable iron and are keyed to a long Exelloy hinge pin which extends out of one side of the body through a special stuffing box. The stuffing box ensures a pressure-tight connection.

The lever is also locked to the end of the hinge pin and the weight is locked to the lever with setscrews. All moving parts operate together.

Other parts are the same as the No. 373 Swing Check Valves shown on page 109.

Leather faced disc available: These valves are regularly furnished with a bronze or bronze faced disc. Certain sizes (see table below) can be furnished with a leather faced disc, at added charge, when specified.

No. 383 Valves equipped with a leather faced disc are recommended for cold water service only.

Position of lever and weight: Commonly accepted positions of the lever and weight are illustrated at the right.

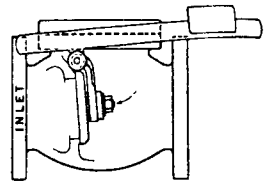
Valves can also be furnished for vertical lines with downward flow, or for lines on an angle, provided sound engineering practices are not violated.

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

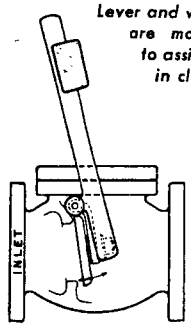
The valves also conform to the American Standard For Face-to-Face Dimensions (B16.10-1957), for 125-Pound Cast Iron Flanged Swing Check Valves. The Standard does not include a 3½-inch size.

Drilling: Flanged valves regularly are furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125. Faced only valves can be furnished when specified.

For use in horizontal lines

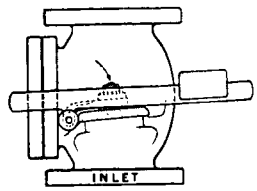


Above: Lever and weight are mounted to assist disc in closing.



Lever and weight mounted to balance the disc.

For use in vertical lines for upward flow



Lever and weight mounted to assist the disc in closing.

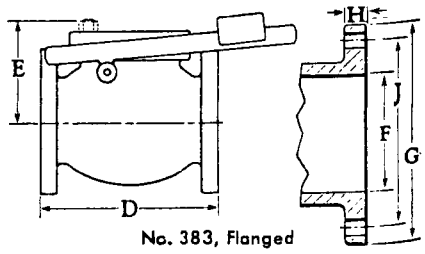
Ordering: State whether for horizontal or vertical installation and, if the latter, the direction of flow; also, whether lever and weight are to assist the disc in closing or to balance it. When not specified, the lever and weight are mounted on the right side of the valve when facing the inlet.

Other valves: Any iron body, Ferrosteel, or cast steel swing check valve can be made to order with lever and weight.

Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches						
					End Flanges				
	Inches	Pounds Each	D	E	F	G	H	J	No. & dia. of bolts
No. 383 Flanged F & D	2	30	8	4¼	2	6	⅝	4¾	4-⅝
	2½	36	8½	4 3/16	2½	7	11/16	5½	4-⅝
	3*	50	9½	5 1/16	3	7½	¾	6	4-⅝
	3½*	65	10½	5 13/16	3½	8½	13/16	7	8-⅝
	4*	83	11½	6 3/16	4¼	9	15/16	7½	8-⅝
	5	132	13	7 3/16	5¼	10	15/16	8½	8-¾
	6*	160	14	7½	6 5/16	11	1	9½	8-¾
	8*	300	19½	10 3/16	8	13½	1⅛	11¾	8-¾
	10*	475	24½	12⅛	10	16	1 3/16	14¼	12-⅞
	12	710	27½	13¾	12	19	1¼	17	12-⅞

**Asterisked sizes available with leather faced disc; orders must specify.*



No. 383, Flanged

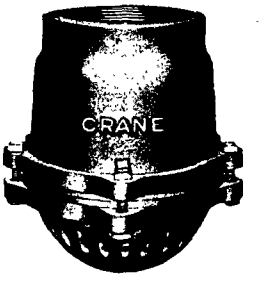
Overall dimensions provided on request; for drilling templates, see page 327.

11

Iron Body Foot Valves

Leather or Bronze Disc

Rugged screwed and flanged foot valves . . . recommended for suction lines on shallow well pumps and similar services



Screwed
No. 394, Leather Disc
No. 394½, Bronze Disc



Flanged
No. 395, Leather Disc
No. 395½, Bronze Disc

Recommendations: Crane Iron Body Foot Valves are recommended for suction lines on shallow well pumps where the pressure does not exceed 34-foot head (approximately 15 psi). The valves, however, will safely withstand 25 psi pressure on priming pump service when not subjected to pulsations of the pump.

Leather disc valves are especially suitable for cold water. The bronze disc valves are recommended for hot water.

Materials and construction: All valves have a body and strainer made of cast iron (ASTM A 126, Class A).

Leather disc valves have a cast iron seat; sizes 6-inch and smaller have one disc and larger sizes have two discs.

Bronze disc valves have a bronze seat; sizes 6-inch and smaller have one disc and larger sizes have four discs.

Shape of strainer: Valves 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.

End flange: The dimensions and drilling of the end flange on flanged valves conform to the 25-Pound American Tentative Cast Iron Flange Standard (B16b2-1931). The flange is plain faced, with a smooth finish.

Drilling: Flanged valves regularly are furnished faced and drilled to the 25-pound American Standard; faced only valves can be furnished when specified.

When specified, the flange on flanged valves can be drilled to the American Standard, Class 125. Full face gaskets should then be used to avoid distorting the flange.

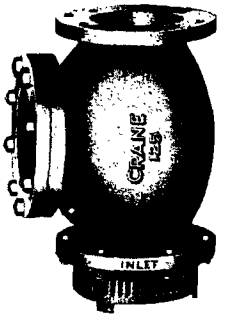
Weights and Dimensions — Prices on Request

Size	Pounds, Each					Dimensions, in Inches								
	Screwed			Flanged, F & D		Screwed		Flanged						
	*No. 394		No. 394½	No. 395	No. 395½	Over-all width	Over-all height	No. 395		No. 395½		End Flange		
Inches	Leather Disc Black	Leather Disc Galv.	Bronze Disc Black	Leather Disc Black	Bronze Disc Black			Over-all width	Over-all height	Over-all width	Over-all height	Diam-eter	Thick-ness	Bolt circle dia.	No. & dia. of bolts
1½	3.9	3.9	...	...	...	4¾	4¾	...	...	...	...	...	...	...	...
2	5.7	5.7	6.0	...	...	5½	5¾	...	...	...	...	...	...	...	...
2½	7.8	7.8	...	...	...	6¼	6½	...	...	...	...	...	...	...	...
3	12.0	12.0	12.8	...	...	7	7¼	...	...	...	...	...	...	...	...
3½	...	21.0	...	...	...	8⅞	9¼	...	...	...	...	...	...	...	...
4	20.0	20.0	20.6	...	...	8⅞	9¼	...	...	...	...	...	...	...	...
5	...	...	32.0	...	...	10½	11	...	...	...	...	...	...	...	...
6	43.0	43.0	41.0	51.0	40.0	11¾	12½	11¾	13¼	11¾	13¼	11	¾	9½	8-⅝
8	...	...	...	90.0	90.0	...	...	15⅛	13½	15⅛	13½	13½	¾	11¾	8-⅝
10	...	...	...	170.0	210.0	...	...	18	15¾	20¼	16¼	16	⅞	14¼	12-⅝
12	...	...	...	250.0	330.0	...	...	20¼	18¼	24⅛	18¼	19	1	17	12-⅝

*No. 394 is furnished black unless galvanized is specified.

Bronze foot valves.....page 47
Selecting proper size.....page 427
Templates for drilling.....page 327
Thread engagement.....page 352

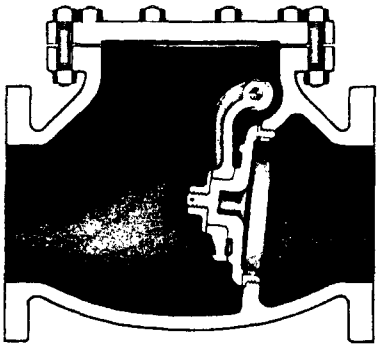
High Pressure Iron Body Foot Valves



When foot valves are wanted for high pressures or for severe service, Crane No. 373 Flanged 125-Pound Iron Body Swing Check Valves having a strainer bolted on the inlet end, as illustrated at the right, are recommended. These valves are furnished with either a leather faced or a solid bronze or bronze faced disc. Prices will be furnished on request.

Ferrosteel Clearway Swing Check Valves

Underwriters' Pattern



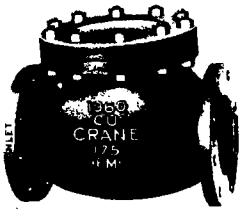
Cross Section

Working Pressure
175 psi non-shock cold water

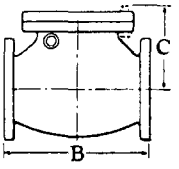
Test Pressures
Shell test — **350** psi hydrostatic
Seat test — **200** psi hydrostatic

Underwriters' approved for fire protection service

These valves are especially designed for fire protection service. They have been approved by the Underwriters' Laboratories, Inc., and the Factory Mutual Laboratories. The valve body bears the "CU" and "FM" markings



No. 375
Flanged



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

Materials: These valves have a body and cap made of Crane Ferrosteel, a high grade iron conforming to requirements of ASTM Specification A 126, for Class B higher strength Gray Iron Castings. The body seat ring, screwed into the body, and the hinge pin are bronze.

In sizes 6-inch and smaller, the disc and hinge are bronze.

In sizes 8 and 10-inch, the disc is iron with a heavy bronze seating face, and has a bronze collar where it engages the hinge. The hinge is malleable iron and is equipped with a bronze hinge-pin bushing and a bronze disc-hub bushing.

Construction: The valves are ruggedly constructed. They have a large body designed with liberal clearance around the disc. When the valve is opened, the disc swings entirely clear of the waterway; it can not stick in the open position.

Through stud bolts with a nut on each end are used in the cap joint. The hinge pin, retained by bronze plugs, is accessible from both sides of the body.

Bosses: Each valve has 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.

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

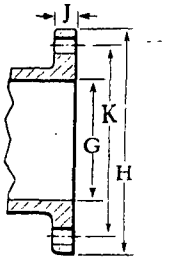
Drilling: The valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 125; they can be furnished faced only, when orders so specify.

Interconnection service: The No. 375 is not recommended for "interconnection service." For such service, reduced pressure backflow preventers can be used; information will be furnished on request.

11

Weights and Dimensions — Prices on Request

No. 375 Flanged F & D	Size Inches	Weight Pounds Each	Dimensions, in Inches						
			B	C	End Flanges G	H	J	K	No & dia. of bolts
	2½	60	10	6¼	2½	7	11/16	5½	4-5/8
	3	70	11	6¾	3	7½	¾	6	4-5/8
	4	110	13	7½	4	9	15/16	7½	8-5/8
	6	190	16	9¼	6	11	1	9½	8-¾
	8	310	18	11¼	8	13½	1⅛	11¾	8-¾
	10	480	22	13½	10	16	13/16	14¼	12-⅞



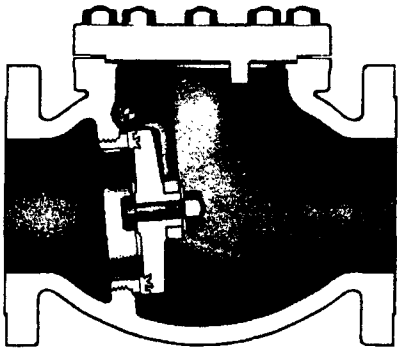
Templates for drilling . . . . page 327

Proper sizing of check valves . . . . page 427

250-Pound Ferrosteel Swing Check Valves
Bronze Trimmed

Working Pressures
250 psi steam, **450** F
500 psi non-shock cold water, oil, or gas

Test Pressures
Shell test — **1000** psi hydrostatic
Seat test — **550** psi hydrostatic



Cross Section

Recommendations: Crane 250-Pound Ferrosteel Swing Check Valves are excellent for a wide variety of services requiring rugged, sturdily constructed valves.

They will give unusually fine results on steam lines where pressure and temperature conditions do not require the use of steel valves and are highly recommended for use on high pressure water, oil, or gas lines, and for similar service.

Materials: The body and cap are Crane Ferrosteel, a high grade iron approximately 35 per cent stronger than regular gray iron; it conforms to requirements of ASTM Specification A 126 for Class B higher strength Gray Iron Castings.

The body seat ring, screwed into the body, is made of Crane Special Bronze, a hard leaded tin bronze conforming to ASTM B 61.

Sizes 3-inch and smaller are equipped with a solid Crane Special Bronze disc. Sizes 4-inch and larger have an iron disc with a Crane Special Bronze seating face.

Construction: The valves are heavily proportioned and unusually rugged. Their oval-shaped body provides ample flow area when the valve is open. A disc stop prevents the disc from sticking in the open position.

Face to face: The face to face dimensions of flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957), for 250-Pound Cast Iron Flanged Swing Check Valves.

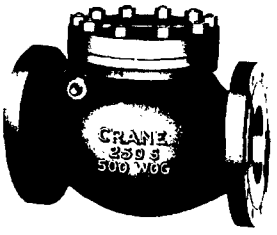
End flanges: The dimensions and drilling of end flanges conform to the American Cast Iron Flange Standard, Class 250 (B16b-1944).

The flanges have a 1/16-inch raised face finished with concentric grooves, approximately 16 grooves per inch, known as a "serrated" finish.

Drilling: Flanged valves are regularly furnished faced and drilled (F & D) to the American Cast Iron Flange Standard, Class 250; they can be furnished faced only, when specified.



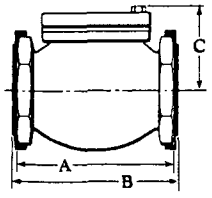
No. 38 E
Screwed



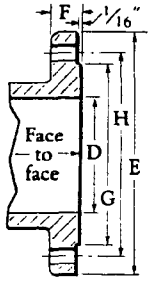
No. 39 E
Flanged

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

11



Screwed or Flanged



Weights and Dimensions — Prices on Request

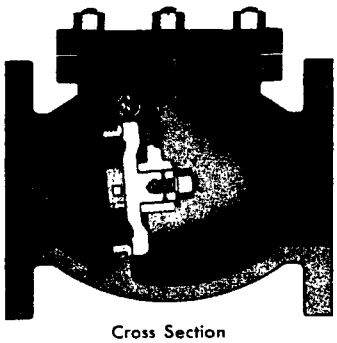
Size	Pounds, Each		Dimensions, in Inches									
	No. 38E	No. 39E	Screwed		Flanged							
							End Flanges					
Inches	Screwed	Flanged F & D	A	C	B*	C	D	E	F*	G	H	No. & dia. of bolts
2	36.0	46.0	9 1/2	5 1/4	10 1/2	5 1/4	2	6 1/2	7/8	4 3/16	5	8-5/8
2 1/2	55.0	64.0	10 3/4	5 7/8	11 1/2	5 7/8	2 1/2	7 1/2	1	4 15/16	5 7/8	8-3/4
3	78.0	90.0	11 3/4	6 1/4	12 1/2	6 1/4	3	8 1/4	1 1/8	5 11/16	6 5/8	8-3/4
4	110.0	133.0	13	7 1/4	14	7 1/4	4	10	1 1/4	6 15/16	7 7/8	8-3/4
5		188.0			15 3/4	8 1/4	5	11	1 3/8	8 5/16	9 1/4	8-3/4
6		250.0			17 1/2	9	6	12 1/2	1 7/16	9 11/16	10 5/8	12-3/4
8		410.0			21	11	8	15	1 5/8	11 15/16	13	12-7/8
10		690.0			24 1/2	13	10	17 1/2	1 7/8	14 1/16	15 1/4	16-1
12		1000.0			28	14 3/4	12	20 1/2	2	16 7/16	17 3/4	16-1 1/8

*The face to face (B) and thickness of flange (F) dimensions include the 1/16-inch raised face.

Templates for drilling . . . . page 328 *Thread engagement . . . . page 352* *Proper sizing . . . . page 427*

3% Nickel Cast Iron Swing Check Valves

For Process Industries

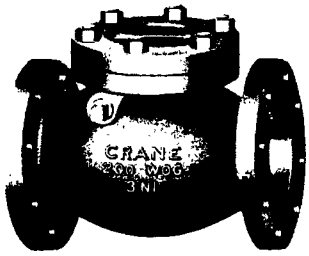


Cross Section

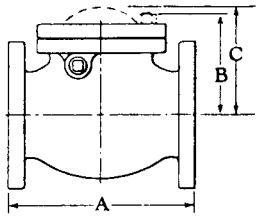
Valve Sizes	Working Pressures Cold water, oil, or gas, non-shock	Hydrostatic Test Pressures	
		Shell	Seat
2 to 12-inch	200 psi	350 psi	225 psi
14 to 18-inch	150 psi	250 psi	175 psi

Valve seat also tested hydrostatically at 40 psi.

Crane 3% nickel cast iron body and bolted cap
Stainless steel seating surface



No. 14493
Flanged, 18-8 SMo Trimmed



The No. 14493 may be used in a horizontal position . . . . or in a vertical position for upward flow.

11

Recommendations: These 3% nickel cast iron swing check valves, with stainless steel seating surfaces, are excellently used wherever conventional "all-iron" and "bronze trimmed" valves fail because of corrosion of seating surfaces.

The valves are used in the petroleum industry handling oils which contain traces of mineral acids, in the wood treating industry handling creosote vapors and oils, in the pulp and paper industry handling alkaline liquors of various kinds, and in other kindred types of installations. They are a companion line to the 3% nickel cast iron wedge gate valves shown on page 82.

Where substantially better corrosion resistance is desired in body as well as seating metals, Crane 3% Nickel Cast Iron Valves are an economical, logical choice.

Materials: The body and cap are Crane 3% Nickel Cast Iron. This metal, with tensile requirements similar to ASTM A 126, Class B higher strength gray iron, was developed especially for piping services in the process industries.

The body seat ring, hinge, and hinge pin in all sizes, and the disc in sizes 12-inch and smaller, are made of Crane 18-8 SMo, an alloy steel equivalent to AISI Type 316 stainless steel. In sizes 14-inch and larger, the disc is 3% nickel cast iron with 18-8 SMo facing.

Construction: These are rugged, well proportioned 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.

The body seat ring is screwed into the body. The hinge is 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.

Face to face: The valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for Class 125 Cast Iron Swing Check Valves. This Standard does not include a 16 or 18-inch size.

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

Drilling: The valves are regularly furnished faced and drilled to the American Cast Iron Flange Standard, Class 125; they can be furnished faced only, when specified.

Other 3% nickel iron valves: For wedge gates, see page 82. For pulp stock valves, see page 85.

Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches				
						End Flanges	
	Inches	Pounds Each	A	B	C	Diameter	Thickness
No. 14493 Flanged, F & D	2	24	8	4 1/4	. . .	6	5/8
	2 1/2	30	8 1/2	4 3/16	. . .	7	11/16
	3	43	9 1/2	5 1/16	. . .	7 1/2	3/4
	4	60	11 1/2	6 3/16	. . .	9	15/16
	5	125	13	7 3/16	. . .	10	15/16
	6	140	14	7 1/2	. . .	11	1
	8	280	19 1/2	10 3/16	. . .	13 1/2	1 1/8
	10	440	24 1/2	12 1/8	. . .	16	1 3/16
	12	660	27 1/2	13 3/4	. . .	19	1 1/4
	14	990	31	16 1/8	. . .	21	1 3/8
	16	1430	36	17 7/8	. . .	23 1/2	1 7/16
	18	1575	36	16	17 1/2	25	1 9/16

Description of materials . . . . Section 2
Templates for drilling . . . . page 327 *Proper sizing of check valves . . . . page 427*

SECTION 12

Crane Steel Wedge Gate Valves

(Including Pipe-Line Valves)

Forged Steel Valves — 2-inch and Smaller

600-Pound, Bolted Bonnet, Inside Screw.....page 116
600-Pound, Bolted Bonnet, Outside Screw and Yoke.....page 117

Cast Steel Valves — 2-inch and Smaller

600-Pound, Bolted Bonnet, Exelloy to Stellite Trimmed..pages 118 and 119
600-Pound, Bolted Bonnet, Monel Trimmed.....page 120

Cast Steel Valves — 150 to 2500-Pound

Pressure-Temperature Ratings and Service Recommendations.....page 121
Description and Specification of Materials.....page 122

150 and 300-Pound Valves:
Description, Sizes, and Weights.....pages 123 to 125
Dimensions.....page 128
By-Passes.....page 129

400, 600, 900, and 1500-Pound Valves:
Description, Sizes, and Weights.....pages 126 and 127
Dimensions.....page 128
By-Passes.....page 129

2500-Pound Valves, Description and Sizes.....page 130

Cast Steel Pipe-Line Valves

Class 400.....pages 131 to 133
Class 600.....pages 131 to 133

Crane forged and cast steel gate valves indicated above as being available in sizes 2-inch and smaller are frequently considered general utility valves. They are used in a variety of services, often at pressures and temperatures lower than the recommended maximum.

Crane cast steel gate valves indicated above as being available in 150 to 2500-pound pressure classes are made, in some of the classes, in sizes as large as 24-inch and as small as 1-inch. The 150 and 300-pound pressure classes in sizes 12-inch and smaller feature Crane's new flexible wedge disc design.

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For related data, and for complete description of other Crane steel products, refer to:

Cylinder and motor operation; gearing.....pages 260 to 274
Gaskets for steel flanged joints.....page 323
Templates for drilling.....pages 329 to 331
Fabricated piping.....pages 355 to 380

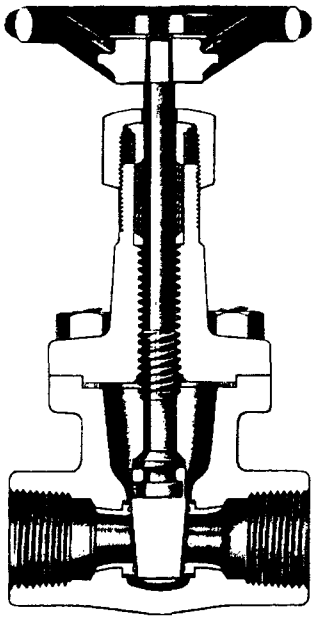
Steel stop-check valves, Pressure-Seal Bonnet.....pages 170 to 173
Steel stop-check valves, bolted bonnet.....pages 219 to 225
Steel sediment separators.....page 254

Steel globe and angle valves.....Section 13
Steel check valves.....Section 14
Steel Pressure-Seal and Lip-Seal Bonnet Valves.....Section 15
Corrosion-resistant alloy valves.....Section 17
Steel valves for special and extreme services.....Section 21

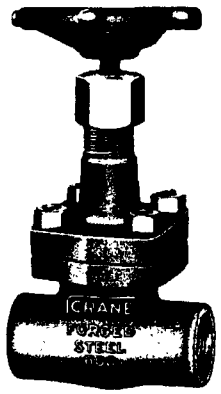
Steel screwed fittings, unions, and flange unions.....Section 24
Steel welding fittings.....Section 25
Steel flanges.....Section 26

600-Pound Forged Steel Wedge Gate Valves

Bolted Bonnet — Inside Screw



Cross Section
No. 3634 XU



No. 3634 XU
Gate, Screwed
Reduced Port

New 600-pound reduced port valves . . . . with "all-service" trim and stainless steel, spiral wound bonnet gasket . . . . fully equal to so-called "800-pound" and "Standard Port" Valves

Features: These neat, compact reduced port valves feature design refinements generally associated only with higher priced valves . . . . such as bolted bonnet, stainless steel spiral wound bonnet gasket, Exelloy to Stellite seating, shoulder-type body seat rings, tee-head disc-stem connection, and a spacious stuffing box area.

The valves offer the same service advantages . . . . and have the same pressure-temperature ratings . . . . as those sometimes termed "800-Pound", "standard port", or "conventional port" valves. In design and functional value, however, the No. 3634 XU offers considerably more.

Recommendations: The No. 3634 XU are ideally used wherever dependable inside screw valves are desired. They are furnished with an "all service" trim . . . "XU" . . . and are recommended for steam, water, air, gas, oil, and oil vapor at temperatures up to 800 F.

Body and bonnet: The body and bonnet are forged carbon steel conforming to ASTM A105, Grade II. The body interior is forged rather than bored and slotted, in order to obtain a smooth inside surface. Long disc guide channels provide full and accurate guidance of the disc throughout its travel.

Flow characteristics: Although the valves have "reduced" seat ports, flow characteristics approximate those of full port valves.

Working Pressures
Steam, Water, Air, Gas, Oil, or Oil Vapor

Temp. Deg. Fahr.	Psi Non-Shock	Temp. Deg Fahr.	Psi Non-Shock
100°	2000	500°	1735
150	1970	550	1640
200	1940	600	1540
250	1915	650	1430
300	1895	700	1305
350	1875	750	1180
400	1850	800	1015
450	1810	...	...

Test Pressures
Shell—2175 psi hydrostatic
Seat—2100 psi hydrostatic
Seat tested 100 psi air-under-water

Bonnet joint and gasket: The valves have a male and female body-bonnet joint equipped with Triplex steel studs and an AISI Type 316 stainless steel, spiral wound gasket with asbestos filler. In the Crane design, the compression load placed upon the gasket . . . predetermined through careful machining of contact surfaces . . . . remains constant, thus assuring maximum joint tightness.

Disc, seats, and stem: The valves are furnished with Class "XU" trim. The disc is Crane Exelloy, a chromium steel, specially heat-treated for high hardness. The body seat rings are Exelloy, faced with Stellite. The seat rings are securely expanded into the body under hydraulic pressure and seat against a square shoulder; they will not loosen in service.

The stem, also Exelloy, is finished with a tapered shoulder for back-seating in the bonnet. The lower end has an integral tee-head which fits in a slot in the disc. The connection (see inset illustration on page 118) provides a rugged but flexible coupling between the stem and disc.

Stuffing box; repacking: The stuffing box, generously sized and filled with high quality, die formed ring packing, is equipped with a gland and a packing bearing ring. The valves, when wide open, can be repacked while under pressure.

Weights and Dimensions — Prices on Request

	Size	Weights	Dimensions, in Inches		
	Inches	Pounds Each	End to end	Center to top, open	Dia of wheel
No. 3634 XU Gate, Screwed	¼	4.0	3⅛	6 3/16	3
	⅜	4.0	3⅛	6 3/16	3
	½	4.0	3⅛	6 3/16	3
	¾	5.2	3½	7⅜	3½
	1	8.0	4⅛	8⅜	4
	1½	15.0	4¾	10⅞	5
	2	22.5	5¼	12⅜	6

600-Pound O.S. & Y. Steel Gate Valves with Reduced Ports.....page 117
600-Pound O.S. & Y. Steel Gate Valves with Full Ports....pages 118 and 119

600-Pound Forged Steel Wedge Gate Valves

Bolted Bonnet — Outside Screw and Yoke

These forged steel valves are fully equal to . . . and have the same ratings as . . . those sometimes termed "800-Pound" or "Standard Port" Valves.

These all-new, high quality reduced port valves offer the same features as the inside screw valves shown on the facing page . . . plus rugged outside screw and yoke construction, two-piece, ball-type gland, and a choice of trims.

Recommendations: As indicated by their catalog numbers, the valves are made with two types of trim . . . . Class 'XU', an "all-service" trim suitable for steam, water, air, and gas up to 850 F, and for oil or oil vapor up to 1000 F . . . . and Class 'L' trim for use up to 750 F on liquids and gases (not steam) that may be corrosive to Exelloy or Stellite but not to 18-8 SMo.

Body and bonnet: The compact, streamlined body and one-piece bonnet and yoke are forged carbon steel (ASTM A105, Grade II). The body interior is also forged, rather than bored and slotted, to assure a smooth finish; long disc guide channels accurately guide the disc throughout its travel.

Bonnet joint and gasket: The close fitting male and female body-bonnet joint is equipped with Triplex steel studs and an AISI Type 316 stainless steel, spiral wound gasket with asbestos filler. The construction provides maximum tightness and eliminates any possibility of a gasket blowout.

Disc, seats, and stem: In the "XU" trimmed valves, the disc and stem are wear-resistant Exelloy; body seat rings are Exelloy, faced with Stellite. In "L" trimmed valves, the body seat rings, disc, and stem are Crane 18-8 SMo Alloy Cast Steel.

Working Pressures

For limitations, see "Recommendations" at left.

Temp. Fahr.	Psi Non-Shock	Temp. Fahr.	Psi Non-Shock
100°	2000	650°	1430
150	1970	700	1305
200	1940	750	1180
250	1915	800	1015
300	1895	850	800
350	1875	875	725
400	1850	900	600
450	1810	925	520
500	1735	950	425
550	1640	975	330
600	1540	1000	235

Hydrostatic Test Pressures

Shell: 2175 psi Seat: 2100 psi

Class "XU" seat tested 100 psi air-under-water.

The shoulder-type body seat rings are securely expanded into the body under hydraulic pressure and will not loosen in service.

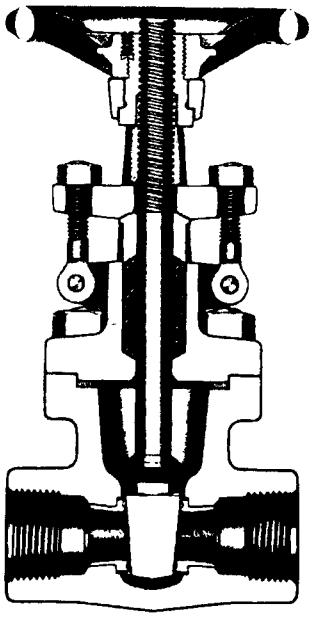
Although seat ports are "reduced", flow characteristics approximate those of full port valves.

The valves have a tee-head disc-stem connection (see inset illustration on page 118) for maximum dependability. The stem is finished with a tapered shoulder for back-seating in the bonnet.

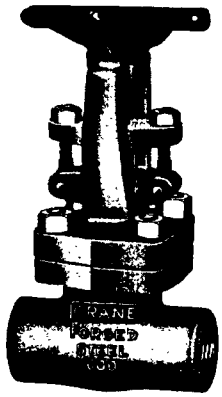
Yoke sleeve: The yoke sleeve is Nodular Ni-Resist Cast Iron . . . . high in bearing qualities, strength, melting point, and resistance to corrosion.

Gland: The two-piece, ball-type siliconized steel gland and steel gland flange exert an even pressure on the packing without binding on the stem. Stainless steel swinging eye bolts hold the gland flange securely in place.

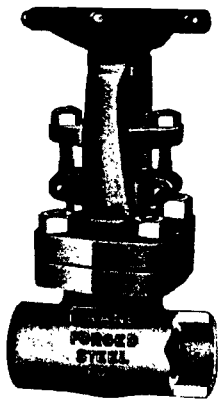
Stuffing box: The deep stuffing box is filled with high quality, die formed ring packing. When wide open, the valves can be repacked under pressure.



Cross Section—"XU" Trimmed

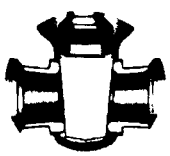


No. 3604 XU or 3604 L
Reduced Port Gate
Screwed



No. 3605 XU or 3605 L
Reduced Port Gate
Socket-Welding

Socket-welding valve ends comply with ASA B16.11.



"L" trimmed valves except for disc, seat, and stem materials, are the same as "XU" trimmed valves.

All valves have a threaded hole malleable iron wheel . . . Style E on the 2-inch size and Style A on sizes 1½-inch and smaller.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches			
	Nos. 3604 XU 3604 L	Nos. 3605 XU 3605 L	End to end	Center to top, open	Diameter of wheel	Depth of socket
Inches	Screwed	Socket-Welding				
¼	4.4	4.4	3⅛	6⅛	3	7/16
⅜	4.4	4.4	3⅛	6⅛	3	9/16
½	4.4	4.4	3⅛	6⅛	3	⅝
¾	5.7	5.7	3½	7	3½	11/16
1	8.0	8.0	4⅛	8⅜	4	¾
1¼	13.0	13.0	4½	10¼	5	13/16
1½	15.0	15.0	4¾	10⅝	5	⅞
2	23.0	23.0	5¼	12½	6	1

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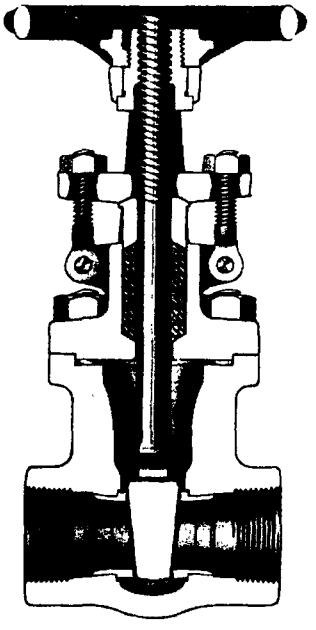
600-Pound Cast Steel Wedge Gate Valves

Bolted Bonnet—Outside Screw and Yoke



Typical cross section. For complete description, see these facing pages.

Rugged, small, full port steel valves for hydraulic lines and high pressure-temperature steam, oil, or oil vapor lines.

These bolted bonnet, outside screw and yoke, full port valves answer the need for high quality, compact, light but strong, small steel wedge gate valves. Their design includes modifications and features generally found only in larger size or more expensive valves.

Screwed, flanged, and socket-welding patterns are regularly furnished in sizes ½ to 2-inch, as indicated on the next page. The valves are a companion line to the reduced port bolted bonnet types shown on the preceding two pages.

Recommendations: The valves are ideal for a wide variety of services in oil refineries, oil and gas fields, central power stations, and industrial plants; they offer top performance on high pressure hydraulic lines and on high pressure-temperature steam or oil lines.

All valves have Class "XU" trim and are recommended for steam, water, air, gas, and general services at temperatures up to 850 F and for oil or oil vapor services at temperatures up to 1000 F.

Body and bonnet: The body is cast from high quality carbon steel conforming to requirements of ASTM Specification A 216, Grade WCB. The port openings are larger than is usual for valves of this type. The diameter of the seat opening is approximately the same as the nominal pipe size.

The one-piece bonnet and yoke, also made of carbon steel, is forged in sizes 1½-inch and smaller and cast in the 2-inch size.

Bonnet joint: The body-bonnet joint is fitted with a spiral-wound gasket made of AISI Type 316 stainless steel with asbestos filler. The gasket provides high resiliency with absolute tightness under all operating conditions. The male and female joint assures alignment and correct gasket compression . . . and eliminates any possibility of a gasket blowout.

The bolted bonnet construction provides generous strength and can be quickly and easily dismantled and reassembled. For greater compactness, the valves are fitted with high-strength Triplex Steel studs.

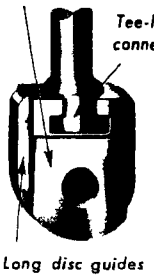
Disc and body seat rings: The disc is Crane Exelloy, a specially heat-treated chromium steel offering high resistance to wear, seizure, erosion, galling, and scoring.

The body seat rings are Exelloy faced with Stellite. The seat rings have heavy sections, are securely expanded into the body under hydraulic pressure, and seat against a square shoulder. There is no danger of leakage around the rings, nor will they loosen in service.

Disc guides: Full length machined guide ribs on each side of the disc operate in channels in the valve body. With the disc closely guided throughout its entire travel, seating surfaces are protected against unnecessary wear.

Stem: The stem is Exelloy. Of liberal diameter, the lower end has an integral tee-head and is finished with a tapered shoulder for backseating in the bonnet. Accurately cut threads on the upper end provide positive control with minimum friction; being outside of the valve, the threads are easily lubricated.

Disc-stem connection: As shown in the inset illustration, the valves feature a tee-head disc-stem connection which provides a safe and rugged, yet flexible, coupling between the stem and disc.



The tee-head on the stem end slips into a machined slot of corresponding shape in the disc. The connection is exceptionally strong and serviceable, yet it cannot distort the stem and binding of parts is avoided.

Working Pressures

Fluid	Temp. Deg. Fahr.	Psi, Non-Shock: Screwed or Socket-Welding Valves	Psi, Non-Shock: Flanged Valves
Steam, Water, Air, Gas, Oil, or Oil Vapor	100°	2000	1440
	150	1970	1420
	200	1940	1400
	250	1915	1380
	300	1895	1365
	350	1875	1350
	400	1850	1330
	450	1810	1305
	500	1735	1250
	550	1640	1180
	600	1540	1110
	650	1430	1030
	700	1305	940
	750	1180	850
	800	1015	730
	850	800	600
Oil or Oil Vapor Only	875	725	525
	900	600	445
	925	520	375
	950	425	310
	975	330	240
	1000	235	170

Hydrostatic Test Pressures

Valve Ends	Psi: Shell	Psi: Seat
Screwed	2175	2100
Socket-Welding	2175	2100
Flanged	2175	1550

Seat tested 100 psi air-under-water.

(continued on the next page)

600-Pound Cast Steel Wedge Gate Valves

Bolted Bonnet — Outside Screw and Yoke

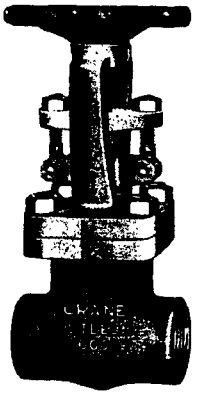
(continued from the preceding page)

Ball-type gland: All valves feature a two-piece ball-type siliconized steel gland and steel gland flange which exert an even pressure on the packing without binding on the stem.

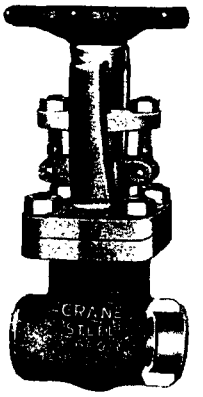
The gland flange is held in place by stainless steel swinging eye bolts which will not loosen in service. The packing load can be easily adjusted.

Stuffing box: The wide, deep stuffing box provides liberal space for a tight seal. It is filled with a high quality, die formed ring packing.

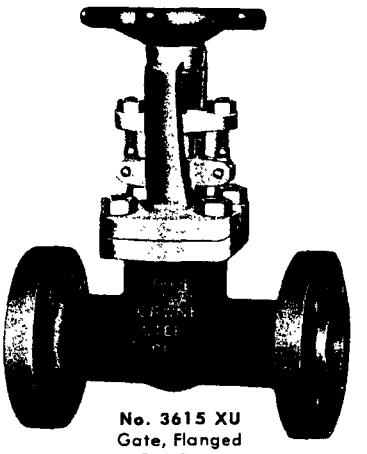
Repacking: The valves, when wide open, can be repacked while under pressure.



No. 3607 XU
Gate, Screwed
Full Port



No. 3611 XU
Gate, Socket-Welding
Full Port



No. 3615 XU
Gate, Flanged
Full Port

Wheels: Valve wheels are made of malleable iron, have a threaded hole, and are locked to the yoke sleeve by means of a set screw. Valves 1¼-inch and smaller have a Style "A" dished design wheel with small gripping knobs around the outer edge, as shown in the illustrations. The 1½ and 2-inch valves have a rugged Style "E" oval rim wheel.

Yoke sleeve: The yoke sleeve is made of Nodular Ni-Resist Cast Iron, a material with excellent bearing qualities, strength and a high melting point.

Socket-welding valves: Ends of socket-welding valves comply with American Standard B16.11.

Flanged valves: Flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) for 600-Pound Ferrous Flanged Gate Valves.

Flange dimensions, facing, and drilling: End flanges on flanged valves conform to the 600-Pound American Steel Flange Standard (B16.5-1957). They have a male face ¼-inch high (large male), with a serrated finish, consisting of approximately 32 concentric grooves per inch.

When so ordered, flanged valves can be furnished with ring joint, female, tongue, or groove facings; for dimensions, see pages 333 and 334.

The valves, as regularly furnished, include drilling to the 600-Pound American Standard (B16.5-1957) and are spot faced. They can be furnished faced only, when specified.

150-pound flanges: Flanged valves having end flanges conforming to the 150-Pound American Standard can be furnished on special order.

Weights and Dimensions — Prices on Request

Valve	Size	Weights	Dimensions, in Inches				End Flanges, Inches				
	Inches	Pounds Each	End to end or *face to face	Center to top, open	Diameter of wheel	Depth of socket	Diameter	Thickness (*)	Dia. of male face	Dia. of bolt circle	No. & dia. of bolts
No. 3607 XU Screwed	½	5.0	3⅛	7	3½	...					
	¾	7.0	3½	8⅜	4	...					
	1	11.0	4⅛	10¼	5	...					
	1¼	14.0	4½	10⅝	5	...					
	1½	21.0	4¾	12½	6	...					
	2	36.0	5¼	15	7	...					
No. 3611 XU Socket-Welding	½	5.0	3½	7	3½	⅝					
	¾	7.0	4	8⅜	4	11/16					
	1	11.0	4⅛	10¼	5	¾					
	1¼	14.0	4½	10⅝	5	13/16					
	1½	21.0	4¾	12½	6	⅞					
	2	36.0	5¼	15	7	1					
No. 3615 XU Flanged, FD & SF	½	9.0	6½	7	3½	...	3¾	9/16	1⅜	2⅝	4-½
	¾	15.0	7½	8⅜	4	...	4⅝	⅝	111/16	3¼	4-⅝
	1	21.0	8½	10¼	5	...	4⅞	11/16	2	3½	4-⅝
	1¼	27.0	9	10⅝	5	...	5¼	13/16	2½	3⅞	4-⅝
	1½	40.0	9½	12½	6	...	6⅛	⅞	2⅞	4½	4-¾
	2	60.0	11½	15	7	...	6½	1	3⅝	5	8-⅝

*Face to face dimensions include the ¼-inch male face; thickness of flange dimensions do not.

Valves with reduced port: Crane small size 600-pound forged steel valves with reduced port are shown on pages 116 and 117.

Valves with Monel trim: For Monel trimmed steel gates and globes designed for specific corrosive services, see pages 120 and 141, respectively.

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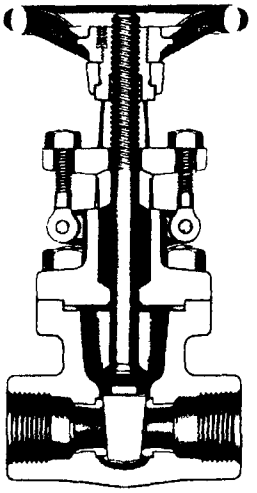
For larger size 600-pound cast steel gate valves, see pages 126 and 127.

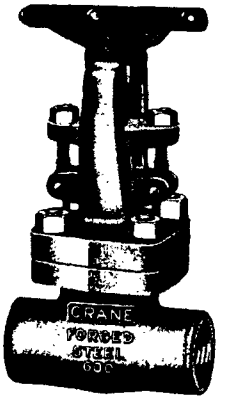
Description of materials....Section 2 *Templates for drilling....page 330*
Dimensions of ring joint and special facings.....pages 333 and 334

Steel Monel Trimmed Wedge Gate Valves

Reduced Port



Cross Section, No. 3604 A



No. 3604 A
Outside Screw & Yoke Gate
Reduced Port, Screwed
Shell is hydrostatically tested at 2175 psi; seat at 2100 psi. Seat also tested 100 psi air-under-water.

New outside screw and yoke valves . . . with Monel trim, spiral wound Monel gasket, and Teflon packing . . . for corrosive service

These compact valves are patterned after the reduced and full port 600-pound steel gate valves shown on pages 117 and 119 respectively. Like those valves, they feature bolted bonnet construction . . . tee-head disc-stem connection . . . shoulder-type seat rings . . . and one-piece bonnet and yoke.

Recommendations: The valves are used on refining units by the petroleum industry and for various processes in chemical plants where high quality steel valves with Monel trim are desired. They offer good service in hydrofluoric alkylation units handling anhydrous H.F., and where mixtures of the acid and hydrocarbons are found. They are not recommended for aqueous solutions of hydrofluoric acid where concentration drops below 80% H.F.

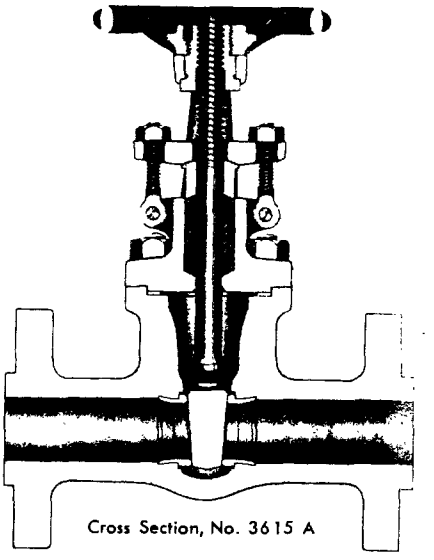
Body and bonnet: The No. 3604 A have a forged carbon steel (ASTM A105, Grade II) body and bonnet. On the No. 3615 A, the body is cast carbon steel (ASTM A216, Grade WCB).

Both valves have a rugged male and female bonnet joint equipped with Triplex steel studs and a spiral wound Monel gasket with Teflon filler, assuring tightness and dependability.

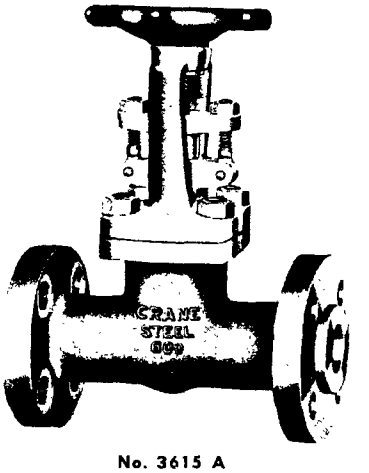
Monel trim: The disc, body seat rings, and stem are Monel. The shoulder-type seat rings, securely expanded into the body under hydraulic pressure, will not loosen in service. The lower end of the stem has an integral tee-head and is finished with a tapered shoulder for back-seating into the bonnet.

Yoke sleeve: The yoke sleeve is made of Nodular Ni-Resist Cast Iron, a material high in bearing qualities, strength, melting point, and resistance to corrosion.

Full Port



Cross Section, No. 3615 A



No. 3615 A
Outside Screw & Yoke Gate
Full Port, Flanged

Shell is hydrostatically tested at 2175 psi and the seat at 1550 psi. The seat is also tested 100 psi air-under-water. End flange and face to face dimensions conform, respectively, to ASA B16.5-1957 and B16.10-1957 for 600-pound valves. For drilling templates, see page 330.

Gland: The two-piece ball-type siliconized steel gland and steel gland flange exert even pressure on the packing without binding on the stem. Stainless steel swinging eye bolts hold the gland flange securely in place and permit easy adjustment of packing.

End flanges: End flanges have a large male face ¼-inch high with a serrated finish. The No. 3615 A are regularly furnished drilled to the 600-Pound American Standard and are spot faced. They can be furnished faced only, when specified.

Stuffing box: The stuffing box is deep and is filled with Teflon packing.

Wheels: Wheels up to 5-inch diameter inclusive are Style A; larger wheels are Style E. All have a threaded hole.

For monel trimmed globe valves, see page 141

Weights and Dimensions — Prices on Request

Sizes	Pounds, Each		Dimensions, in Inches							
	No. 3604 A	No. 3615 A	No. 3604 A			No. 3615 A				
			End to end	Center to top, open	Dia. of wheel	Face to face (*)	Center to top, open	Dia. of wheel	End Flanges	
Inches	Screwed	Flanged FD & SF							Diameter	Thickness (*)
½	4.4	9.0	3⅛	6⅛	3	6½	7	3½	3¾	9/16
¾	5.7	15.0	3½	7	3½	7½	8⅜	4	4⅝	⅝
1	8.0	21.0	4⅛	8⅜	4	8½	10¼	5	4⅞	11/16
1½	15.0	40.0	4¾	10⅝	5	9½	12½	6	6⅛	⅞
2	23.0	60.0	5¼	12½	6	11½	15	7	6½	1

*Face to face dimensions include the ¼-inch male faces, thickness of flange dimensions do not

Cast Steel Wedge Gate Valves

Working Pressures

For Valves Described on Pages 122 to 130

Valves with "XR" trim..... for steam up to 850 F.....for water, air, gas, or oil up to 500 F
Valves with "X" trim..... for oil or oil vapor up to 1100 F
Valves with "XU" trim ....for steam up to 850 F..... for oil or oil vapor up to 1100 F
Valves with "U" trim..... for steam up to 1200 F..... for oil or oil vapor up to 1200 F

Temp. Deg. Fahr.	Working Pressures—Pounds per Square Inch, Non-Shock For 150 and 300-Pound Screwed Valves and 150 to 2500-Pound Flanged or Butt-Welding End Valves												
	Carbon Steel[1] (ASTM A216, Grade WCB)							No. 5 Chromium-Molybdenum Alloy Steel (ASTM A217, Grade C5 — made to order)					
	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound
100°	275	720	960	1440	2160	3600	6000						
150	255	710	945	1420	2130	3550	5915						
200	240	700	930	1400	2100	3500	5830						
250	225	690	920	1380	2070	3450	5750						
300	210	680	910	1365	2050	3415	5690						
350	195	675	900	1350	2025	3375	5625						
400	180	665	890	1330	2000	3330	5550						
450	165	650	870	1305	1955	3255	5430						
500	**150**	625	835	1250	1875	3125	5210						
550	140	590	790	1180	1775	2955	4925						
600	130	555	740	1110	1660	2770	4620						
650	120	515	690	1030	1550	2580	4300						
700	110	470	635	940	1410	2350	3920	485	645	965	1450	2415	4025
750	100	425	575	850	1275	2125	3550	450	600	900	1350	2250	3745
800	92	365	490	730	1100	1830	3050	415	555	835	1250	2080	3470
850	[2]82	[2]**300**	[2]**400**	[2]**600**	[2]**900**	[2]**1500**	[2]**2500**	385	510	765	1150	1915	3190
875	[2]75	[2]260	[2]350	[2]525	[2]785	[2]1305	[2]2180	365	490	735	1100	1830	3055
900	[2]70	[2]225	[2]295	[2]445	[2]670	[2]1115	[2]1855	350	465	700	1050	1750	2915
925	[2]60[3]	[2]190[3]	[2]250[3]	[2]375[3]	[2]565[3]	[2]945[3]	[2]1570[3]	335	445	665	1000	1665	2775
950	[2]55[3]	[2]155[3]	[2]205[3]	[2]310[3]	[2]465[3]	[2]770[3]	[2]1285[3]	315	420	635	950	1585	2640
975	[2]50[3]	[2]120[4]	[2]160[3]	[2]240[3]	[2]360[3]	[2]600[3]	[2]1000[3]	**300**	**400**	**600**	**900**	**1500**	**2500**
1000	[2]40[3]	[2]85[3]	[2]115[3]	[2]170[3]	[2]255[3]	[2]430[3]	[2]715[3]	250	335	500	750	1250	2085
1025	...	...	...	...	...	...	...	215	285	430	645	1070	1785
1050	...	...	...	...	...	...	...	180	240	355	535	890	1485
1075	...	...	...	...	...	...	...	145	195	290	435	730	1215
1100	...	...	...	...	...	...	...	115	150	225	340	565	945
1125[4]	...	...	...	...	...	...	...	95	125	190	285	470	785
1150[4]	...	...	...	...	...	...	...	75	100	150	225	375	630
1175[4]	...	...	...	...	...	...	...	65	85	125	190	315	530
1200[4]	...	...	...	...	...	...	...	50	70	105	155	255	430

At temperatures lower than 700 F, ratings for these valves are the same as those shown at the left for the Carbon Steel Valves

[1]Where welded construction is used, consideration should be given to the possibility of graphite formation on Carbon Steel at temperatures above 775 F.

[2]Product used within the jurisdiction of Section 1, Power Boilers of the ASME Boiler and Pressure Vessel Code, is subject to the same maximum temperature limitations placed upon the material in Table P7, 1959 edition thereof.

[3]Product used within the jurisdiction of Section 1, Power Piping of the ASA Code for Pressure Piping, B31.1, is subject to the same maximum temperature limitations placed upon piping of the same general composition in Table 2a, 1955 edition thereof

[4]Consideration should be given to the possibility of excessive oxidation (scaling) when No. 5 Chromium-Molybdenum Steel is used at temperatures above 1100 F.

Recommendations: Valves with "XR" trim are particularly satisfactory for steam, water, air, gas, and other non-lubricating, relatively non-corrosive fluids such as gasoline, fuel oil, etc.; also for oil of low viscosity such as used in hydraulic systems, especially where seating loads are extremely high. They are recommended for temperatures up to 850 F on steam and up to 500 F on all other services.

Valves with "X" trim should be used for oil or oil vapor at temperatures over 500 F (up to 1100 F) and for most corrosive and unrefined oils regardless of temperature. For lubricating oils up to 500 F, either "X" or "XR" should give equal satisfaction.

Valves with "XU" trim can be used for any of the services for which "XR" or "X" trim is recommended.

Valves with "U" trim are provided primarily for high temperature steam, oil, and oil vapor service or where a premium trim is desired for extremely severe service conditions.

Cold service: Between minus 20 F and plus 100 F, ratings shown in the table for 100 F will apply. For temperatures below minus 20 F, steels with suitable impact strength must be used; pressure ratings for such steels will be the same as shown for 100 F.

Gaskets: The use of these ratings for flanged valves requires gaskets conforming to requirements set forth in ASA B16.5-1957. The user is responsible for selecting gaskets of dimensions and materials capable of withstanding the required bolt loading without injurious crushing, as well as being suitable for the service conditions in all other respects.

Flange facings: Flanged valves of the 150 and 300-pound classes have 1/16-inch raised faces; those of 400-pound and higher classes have 1/4-inch male faces.

ASA and API: Crane ratings agree with those in the American Steel Flange Standard, B16.5-1957, and in the American Petroleum Institute (API) Standard No. 600, Fourth Edition, 1958

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, modern industrial and petro-chemical plants, central power stations, and oil refineries.

The Crane line is complete and includes valves in a wide range of sizes, in seven pressure classes (150, 300, 400, 600, 900, 1500, and 2500-Pound), and with screwed, flanged, or butt-welding ends. Made of carbon cast steel, 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 pages that follow; material specifications are shown in the table below.

Prices are furnished on request; dimensions are shown on page 128 (dimensions of 2500-pound valves are furnished on application).

Hydrostatic Test Pressures, in Psi

Pressure Class	Screwed Valves		Flanged and Butt-Welding Valves	
	Shell	Seat	Shell	Seat
150-Pound	425	350	425	350
300-Pound	1100	775	1100	775
400-Pound	...	...	1450	1000
600-Pound	...	...	2175	1550
900-Pound	...	...	3250	2250
1500-Pound	...	...	5400	3700

Valve seats are tested 100 psi air-under-water.

For working pressures, see page 121.

Specification of Materials

Valves of all pressure classes are regularly made of Crane Carbon Steel, conforming to ASTM Specification A 216, Grade WCB.

The valves are furnished with a variety of trim materials, as indicated below. Orders should specify both the catalog number and letter suffix; see pages 125 and 127.

When specified, the valves can be made to order of Crane No. 5 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade C5), as well as a variety of other alloy steels.

Valves made of Crane No. 5 Alloy Steel are recommended particularly for extremely severe oil or oil vapor services.

Trim*	Names of Parts		150 and 300-Pound Valves (Flexible or Solid Disc)	400, 600, and 900-Pound Valves	1500 Pound Valves	2500 Pound Valves
All Trims	Body and Bonnet		Carbon Steel	Carbon Steel		
	Stem		Exelloy	Exelloy		
	Bonnet Gasket		Corrugated Soft Iron	Soft Steel Ring Joint Gasket		
	Bonnet Stud Bolts		Triplex Steel	Triplex Steel		
"XU" Trim§	Disc		Exelloy§	§	§	§
	Body Seat Rings		Stellite-Faced Exelloy§			
"X" Trim	Disc	Up to 4"	Exelloy	Exelloy	Exelloy	Exelloy or Exelloy-Faced Carbon Steel
		5 and 6"	Exelloy-Faced Carbon Steel			
		8"			Exelloy†	
		10" and up		Exelloy-Faced Carbon Steel	—	
	Body Seat Rings		Exelloy	Exelloy	Exelloy	Exelloy
"XR" Trim	Disc	Up to 4"	Exelloy	Exelloy	Exelloy	—
		5 and 6"	Exelloy-Faced Carbon Steel		Exelloy	—
		8"			Exelloy†	—
		10" and up		Exelloy-Faced Carbon Steel	—	—
	Body Seat Rings		No. 49 Nickel Alloy	No. 49 Nickel Alloy		—
"U" Trim	Disc		Stellite-Faced Carbon Steel‡	Stellite-Faced Carbon Steel		
	Seat Rings	Up to 2½"	Stellite-Faced Exelloy‡	Stellite-Faced Carbon Steel		
		3" and up	Stellite-Faced Carbon Steel‡			

*For detailed service recommendations and temperature limitations applying to each type of trim, see page 121.

†The disc in 8-inch "X" and "XR" trimmed 1500-pound valves is Exelloy-faced carbon steel.

‡Materials apply only to 300-pound valves, the 150-pound valves are not regularly made with "U" trim

§As shown on page 125, the 150 and 300-pound valves in sizes 2½-inch and smaller are regularly made with "XU" trim. Larger sizes, however, and all sizes of 400-pound and higher pressure classes, can also be furnished with half Stellite or "XU" trim when specified

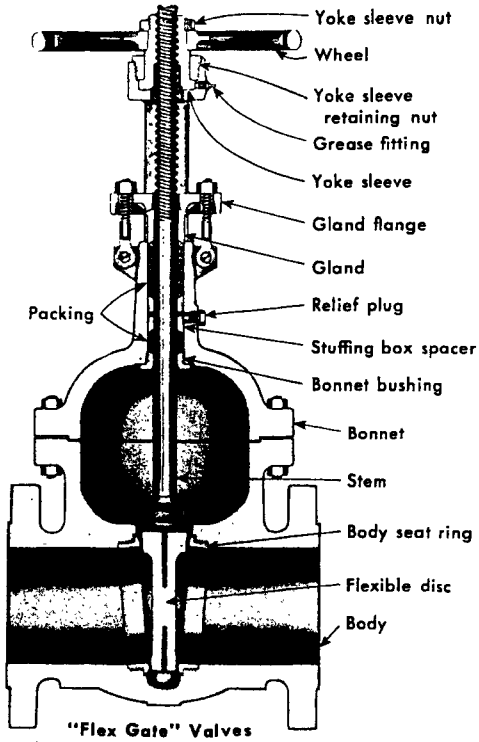
Pressure-temperature ratings.....page 121
Service recommendations.....page 121
150 and 300-pound valves....pages 123 to 125
400 to 1500-pound valves....pages 126 and 127
2500-pound valves.....page 130
Dimensions.....page 128
By-passes.....page 129
Gearing.....pages 271 to 274
Description of materials.....Section 2

Cast Steel Wedge Gate Valves

150 and 300-Pound

"Flex Gate" Valves

(Sizes 2 to 12-inch regular; sizes 14 to 36-inch on order)



"Flex Gate" Valves
(300-Pound Valve illustrated)

Regularly furnished in sizes 2 to 12-inch; available on order in sizes 14-inch to 36-inch.

A complete line . . . featuring Crane's patented "Flex Gate" design in sizes 2 to 12-inch

The term "Flex Gate" is a Crane Co. trademark; registration pending in the U.S. Patent Office.

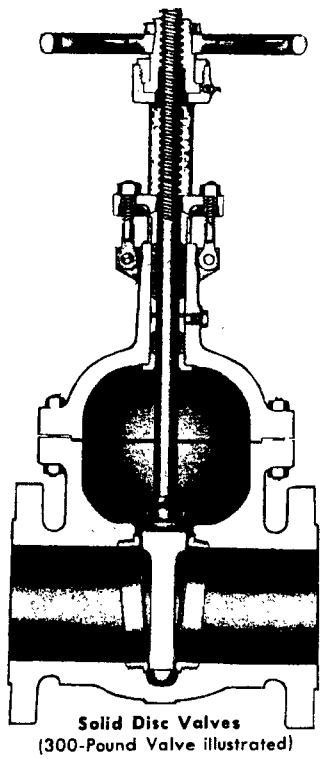
Crane 150 and 300-Pound Cast Steel Wedge Gate Valves offer dependable service in steam, water, oil, and oil vapor lines. Quality materials and fine workmanship combined with tested designs assure high utility in severe service. A variety of trim materials are furnished.

The line, in the popular 2 to 12-inch size range, introduces Crane's "Flex Gate" Valves . . . . with patented one-piece flexible wedge disc . . . . a major step forward in fine valve construction.

"Flex Gate" Valves: Crane "Flex Gate" Valves feature a new concept in valve design . . . . a flexible wedge disc. Instead of being made solid with both seating faces maintained in the same rigid position, flexibility . . . . or resiliency . . . is attained by having the two faces separated from each other except fo a small section at the center. See the two illustrations at the left.

Solid Disc Valves

(Sizes 1½ to 24-inch regular; sizes 30 and 36-inch on order)



Solid Disc Valves
(300-Pound Valve illustrated)

Solid wedge disc valves, except for the disc, are the same design as the "Flex Gate" Valves.

The shape of the flexible disc can be likened to two wheels on a very short axle. The "axle" or spud at the center of the disc is amply strong to carry the two halves of the disc together at all times . . . . and yet, it permits a degree of action between them. It is this "flexibility" that makes the disc tight on both faces over a wide range of pressures . . . . prevents sticking during temperature changes, and assures minimum operating torque.

Although each disc face can move independently of the other . . . . up to two full degrees . . . . the construction is one-piece. There are no loose parts to cause harmful vibration.



Crane's patented one-piece flexible disc . . . solid through the center only . . . permits each disc face to move independently of the other.

Crane "Flex Gate" Valves offer a host of benefits. The design effects easy operation; less torque is required to seat and unseat . . . . the disc will not stick in the closed position, even if closed while hot and allowed to cool . . . . the resiliency of the construction compensates for minor misalignment of seats due to pipeline deflection . . . . and the valves are tight over a wide range of pressures on both the inlet seat and the outlet seat.

Solid Disc Valves: Crane Solid Wedge Disc Valves, illustrated at the upper right, are regularly furnished in the 1½-inch size and in sizes 14 to 24-inch; they are optional in sizes 2 to 12-inch. As in the "Flex Gate" design, careful engineering and workmanship are combined to produce a quality product highly dependable in severe service.

The disc is the solid web type. The facings are smoothly and accurately machined, and are then ground to a mirror-like finish. The disc is carefully fitted into the valve so that an even, wide, and true contact is made with the corresponding faces of the body seat rings.

Disc guides; stem connection: Both the flexible disc and the solid disc have long, machined guide slots which engage the guide ribs in the body to maintain true alignment of the disc throughout its travel. The seating faces do not contact each other until the valve is virtually closed. A tee-head disc-stem connection prevents lateral strains on the stem.

(continued on the next page)

Ratings and recommendations . . page 121
Specification of materials . . . . page 122
Catalog numbers, sizes, and weights . . . . . page 125
400 to 1500-pound gate valves . . . pages 126 and 127

12

Cast Steel Wedge Gate Valves
150 and 300-Pound

Continued from the preceding page; for ratings, tests, service recommendations, and material specifications, see pages 121 and 122.

Crane outside screw and yoke gate valves of the 150 and 300-pound classes . . . . in addition to the flexible disc ("Flex Gate") and solid disc design features described on the preceding page . . . . offer many other refinements in construction.

Body and bonnet: The body and bonnet have unusually heavy metal sections, providing liberal strength with low stress under all working conditions and assuring long service with maximum safety. The smooth flowing contours, combined with generous radius fillets, eliminate hazardous stress concentration.

The bodies of the flanged and welding end valves have straight-through ports without recess except between the seats, assuring minimum turbulence, erosion, and resistance to flow. Long guide ribs in the body mate with full length disc slots in the disc for accurate disc control and alignment.

The bonnet is equipped with a stainless steel (AISI Type 410) bonnet bushing which serves to guide the stem and to provide for back-seating when the valve is wide open and under pressure.

Ball-bearing yoke: The 300-pound valves in sizes 14-inch and larger can be equipped with a ball-bearing yoke on special order.

Body seat rings: All valves have shoulder-type body seat rings which will not loosen in service.

In "**XU**" and "**XU-F**" trimmed valves 2½-inch and smaller, the seat rings are rolled into the body.

In "**X**", "**X-F**", "**XR**", and "**XR-F**" trimmed valves, the seat rings are screwed into the body.

In "**U**" and "**U-F**" trimmed valves of the 2 and 2½-inch sizes, the seat rings are rolled into the body; in larger sizes, they are slipped in and seal welded.

Stem: The stem, of liberal diameter, with long and accurately cut threads, has ample engagement with the yoke sleeve.

Stuffing box: The stuffing box in all valves is deep, assuring tightness and long packing life. The 300-pound valves have a lantern type stuffing box.

When wide open, the valves can be repacked while under pressure.

Gland: All valves have a two-piece ball-type gland and gland flange which exert an even pressure on the packing without binding the stem.

Flange facing and finish: End flanges of flanged valves have a 1/16-inch raised face with a serrated finish. A smooth finish, or other types of facings such as ring joint, female, tongue, groove, etc., can be furnished when orders so specify.

By-pass: The valves can be equipped with a by-pass when specified, see page 129.

Gearing: To facilitate operation, the 150-pound valves in sizes 10-inch and larger and the 300-pound valves in sizes 8-inch and larger are available with a gear operator; see pages 271 to 274.

Motor or cylinder operation: These valves can also be equipped with an electric, air, or gas motor, or an operating cylinder; see pages 260 to 270.

Drilling: Unless otherwise ordered, flanged valves are furnished with the end flanges faced, drilled and spot faced (FD & SF) to the corresponding pressure class of the American Steel Flange Standard, B16.5-1957. They can be furnished faced only, when specified.

Butt-welding valves: Butt-welding valves 12-inch and smaller are bored to match the inside diameter of Standard pipe (heaviest weight on 8, 10, and 12-inch sizes), unless otherwise ordered.

Orders for butt-welding valves 14-inch and larger must specify the diameter of bore (I.D. of pipe).

Double blocking service: In certain cycling operations where it is necessary to prevent intermixture of fluids, the practice of "double blocking" with two conventional solid wedge disc valves can be effectively performed by a single Crane "Flex Gate" Valve. The latter valve, when ordered for such service, will be provided with a drilled, tapped, and plugged hole at location "G" (see page 403) for a drain, so that the fluid in the body chamber can be drained away.

Standards: In design and materials, Crane Cast Steel Gate Valves exceed the requirements of Standards issued by the American Standards Association (ASA) and the American Petroleum Institute (API).

End flanges conform to American Standard B16.5-1957. Butt-welding ends conform to the aforementioned Standard and also to the American Standard for Butt-Welding Ends, B16.25-1958; see page 306 for details.

Flanged and butt-welding valves also conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957, for their respective pressure class. This Standard does not include 3½-inch steel valves.

All valves except those with "**XR**" trimming conform to the API Standard for Flanged and Welding End Steel Gate Valves for Refinery Use, No. 600, Fourth Edition, 1958 . . . . and also to the API Standard for Steel Gate Valves for Pipeline Service, No. 6D, Ninth Edition, 1960. These Standards do not include 3½ and 5-inch sizes.

Catalog numbers: Please note that catalog numbers of Crane "Flex Gate" Valves include the letter "F" in their suffix designation; see next page

(continued on the next page)

Cast Steel Wedge Gate Valves

150 and 300-Pound

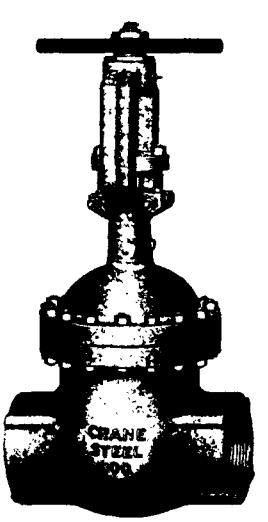
Ratings, material specifications, and descriptions . . . pages 121 to 124.

Catalog suffix: The "X" suffixed catalog numbers indicate valves suitable for oil or oil vapor . . . . "XR", for steam, water, oil, and general service . . . . and "XU", or "U" for steam, water, oil, or oil vapor.

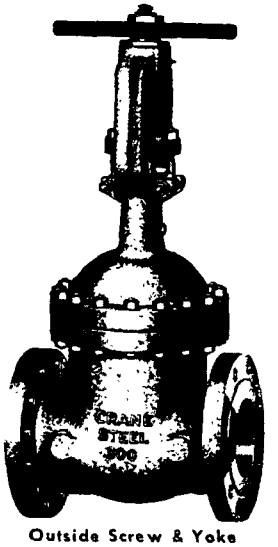
The added suffix "F" distinguishes "Flex Gate" valves from solid disc valves.

Important — ordering: Orders should specify the catalog number and suffix.

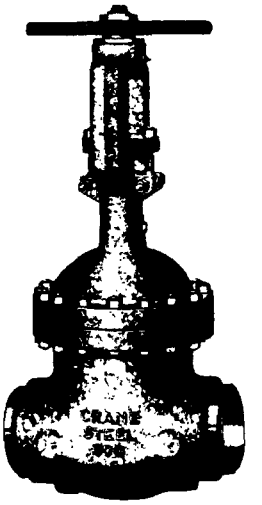
Crane "Flex Gate" Valves are regularly furnished in sizes 2 to 12-inch. For solid disc valves in such sizes, it is advisable to specify both the appropriate catalog number and "solid disc".



Outside Screw & Yoke Gate, Screwed
150 and 300-Pound



Outside Screw & Yoke Gate, Flanged
150 and 300-Pound



Outside Screw & Yoke Gate, Butt-Welding
150 and 300-Pound

Illustrations show 300-Pound Valves; the 150-Pound Valves are similar but have an oval bonnet and conventional stuffing box.

Valves are available with flexible disc ("Flex Gate" with "F" suffix) or solid disc. For catalog numbers of all types furnished, refer to the table below.

Catalog Numbers and Weights (Pounds, Each) — Prices on Request

(Weights shown in light face type indicate optional "Solid Disc" Valves)

Size	150-Pound Valves						300-Pound Valves					
	Screwed		Flanged FD & SF		Butt-Welding		Screwed		Flanged FD & SF		Butt-Welding	
Inches	Flexible Disc	Solid Disc	Flexible Disc	Solid Disc	Flexible Disc	Solid Disc	Flexible Disc	Solid Disc	Flexible Disc	Solid Disc	Flexible Disc	Solid Disc
	No. 46 XU-F	No. 46 XU	No. 47 XU-F	No. 47 XU	No. 47½ XU-F	No. 47½ XU	No. 32 XU-F	No. 32 XU	Nos. 33 XU-F 33 U-F	Nos. 33 XU 33 U	Nos. 33½ XU-F 33½ U-F	Nos. 33½ XU 33½ U
1½	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	60†	. . .	. . .
2	**45**	45	**55**	55	**45**	45	**60**	60	**75**	75	**60**	60
2½	**60**	60	**70**	70	**60**	60	**80**	80	**100**	100	**80**	80
	Nos. 46 X-F 46 XR-F	Nos. 46 X 46 XR	Nos. 47 X-F 47 XR-F	Nos. 47 X 47 XR	Nos. 47½ X-F 47½ XR-F	Nos. 47½ X 47½ XR	Nos. 32 X-F 32 XR-F	Nos. 32 X 32 XR	Nos. 33 X-F 33 XR-F 33 U-F	Nos. 33 X 33 XR 33 U	Nos. 33½ X-F 33½ XR-F 33½ U-F	Nos. 33½ X 33½ XR 33½ U
3*	**80**	80	**95**	95	**80**	80	**120**	120	**145**	145	**120**	120
3½	. . .	. . .	**110**	110	. . .	. . .	. . .	. . .		. . .	. . .	. . .
4	**115**	115	**140**	140	**120**	120	**165**	165	**215**	215	**170**	170
5	. . .	. . .	**190**	190	**165**	165	. . .	. . .	**325**	325	**250**	250
6	. . .	. . .	**240**	240	**210**	210	. . .	. . .	**420**	420	**360**	360
8	. . .	. . .	**400**	400	**340**	340	. . .	. . .	**700**	700	**590**	590
10	. . .	. . .	**630**	630	**550**	550	. . .	. . .	**1050**	1050	**910**	910
12	. . .	. . .	**830**	830	**730**	730	. . .	. . .	**1490**	1490	**1220**	1220
14	. . .	. . .	‡	**1150**	‡	**990**	. . .	. . .	‡	**2170**	‡	**1960**
16	. . .	. . .	‡	**1580**	‡	**1460**	. . .	. . .	‡	**2800**	‡	**2550**
18	. . .	. . .	‡	**1910**	‡	**1730**	. . .	. . .	‡	**3720**	‡	**3300**
20	. . .	. . .	‡	**2350**	‡	**2200**	. . .	. . .	‡	**4640**	‡	**4350**
24	. . .	. . .	‡	**3900**	‡	**3350**	. . .	. . .	‡	**7380**	‡	**6700**

30 and 36-inch 150 and 300-Pound Cast Steel Wedge Gate Valves are also available.

*When 3-inch 300-pound flanged valves with ring joint facing are to be bolted to Cranclap joints orders must specify. A groove of special pitch diameter is required, see page 334 for dimensions.

†Only the No. 33 XU (solid disc) is regularly furnished in the 1½-inch size. The No. 33 U is not made in the 1½-inch size.

‡Crane "Flex Gate" Valves (flexible disc) are made to order in sizes 14-inch and larger.

Dimensions . . . . page 128
By-passes . . . . . page 129
For gate valves of the 400, 600, 900 and 1500-pound classes, see pages 126 and 127
Gearing . . . . . pages 271 to 274
Special facings . . . . pages 332 and 334

Cast Steel Wedge Gate Valves

400, 600, 900, and 1500-Pound

Crane outside screw and yoke gate valves of the 400 to 1500-pound pressure classes offer excellent performance in high pressure and high temperature installations. Like the 150 and 300-pound valves described on pages 123 to 125, they combine high grade materials with outstanding design.

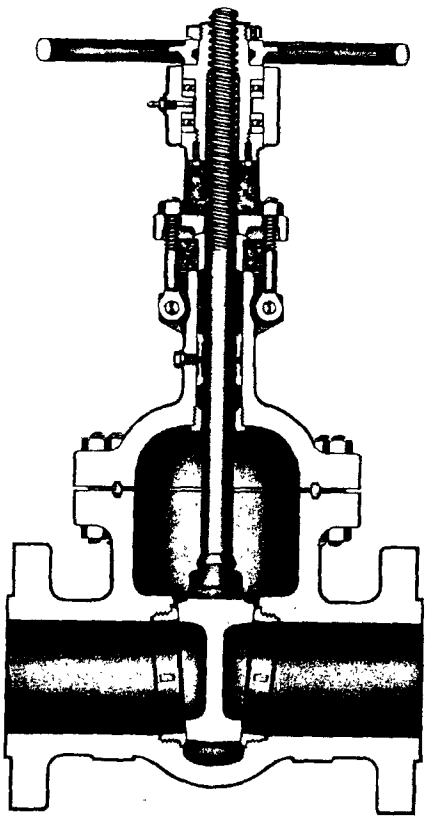
Valves of the 2500-pound class are described on page 130; in general design and construction, they are similar to the 1500-pound valves.

Body and bonnet: The body and bonnet are unusually rugged, having heavy metal sections and ample reinforcement at points subjected to greatest stress. The body has straight-through ports without recess except between the seats, assuring minimum turbulence, erosion, and resistance to flow. The bonnet is equipped with a stainless steel (AISI Type 410) bonnet bushing.

Bonnet joint: All valves have a ring type bonnet joint; Triplex Steel through stud bolts assure a tight, strong joint.

Ball-bearing yoke: The following valves are regularly equipped with a ball-bearing yoke to facilitate operation:

400-Pound . . . . . 8-inch and larger
600 and 900-Pound . . . 6-inch and larger
1500 and 2500-Pound . 5-inch and larger



Typical Construction of 400 to 1500-Pound Outside Screw and Yoke Wedge Gate Valves (With Ball-Bearing Yoke)

Pressure-temperature ratings . . . . page 121
Material specifications . . . . . page 122
Sizes and weights . . . . . page 127

When so ordered, valves can be furnished with other types of facing, such as ring joint, female, tongue, groove, etc. See pages 333 to 335.

Finish of flange faces: The ¼-inch male faces are finished with approximately 32 concentric grooves per inch, known as a serrated finish.

A smooth finish can be furnished on the male faces when orders so specify.

By-passes: The valves can be equipped with a by-pass; for description and clearance dimensions, see page 129.

Gearing: To facilitate operation, the valves can be equipped with a bevel gear operator in the following sizes:

400-Pound . . . . . 8-inch and larger
600-Pound . . . . . 6-inch and larger
900-Pound . . . . . 6-inch and larger
1500-Pound . . . . . 5-inch and larger

For complete information and description of geared valves, see pages 271 to 274.

Motor or cylinder operation: These valves can be equipped with an electric, air, or gas motor, or an operating cylinder; see pages 260 to 265 for cylinder operation and pages 266 to 270 for motor operation.

Body seat rings: All valves have shoulder-type body seat rings. In "X" and "XR" trimmed valves, the seat rings are screwed into the body. In "U" trimmed valves, they are either screwed into the body or slipped in and welded, depending on the valve size.

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Disc and stem: The disc is of the solid web type, with long close-fitting guides to maintain accurate seating and to reduce wear. A tee-head disc-stem connection prevents lateral strains on the stem. The stem is of liberal diameter with long and accurately cut threads, and has ample engagement with the yoke sleeve.

Stuffing box: The stuffing box is the lantern type and is deep, assuring tightness and long packing life. When wide open, the valves can be repacked while under pressure.

Gland: All valves have a two-piece ball-type gland and gland flange which exert an even pressure on the packing without binding the stem.

Flange facings: Flanged valves regularly have a ¼-inch male face (large male) on the end flanges.

Standards: In design and materials, Crane Cast Steel Wedge Gate Valves exceed the requirements of Standards issued by the American Standards Association (ASA) and the American Petroleum Institute (API) for valves of the corresponding pressure class.

End flanges conform to American Standard B16.5-1957. Butt-welding ends conform to the aforementioned Standard and also to the American Standard for Butt-Welding Ends, B16.25-1958 (see page 306).

All valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957, for their respective pressure class. This Standard does not include 3½-inch steel valves.

All valves with Exelloy (X) or Stellite (U) trimming conform to the API Standard for Flanged and Welding End Steel Gate Valves for Refinery Use, No. 600, Fourth Edition, 1958 . . . and also to the API Standard for Steel Gate Valves for Pipeline Service, No 6D, Ninth Edition, 1960. These Standards do not include 3½ and 5-inch sizes.

For description of 150 and 300-pound classes, see pages 123 to 125.

Cast Steel Wedge Gate Valves
400, 600, 900, and 1500-Pound

For ratings, materials, and service recommendations, see pages 121 and 122.

For general description, see the facing page.

Catalog suffix: The "X" suffixed catalog numbers indicate valves suitable for oil or oil vapor service . . . . the "XR" suffixed catalog numbers indicate valves suitable for steam, water, oil, and general service . . . . and the "U" suffixed catalog numbers indicate valves suitable for steam, water, oil, or oil vapor service.

For pressure-temperature ratings, see page 121.

Flanged valves: Unless otherwise ordered, flanged valves of each pressure class are furnished with the end flanges faced, drilled, and spot faced (FD & SF) to the corresponding pressure class of the American Steel Flange Standard, B16.5-1957. They can be furnished faced only, when specified.

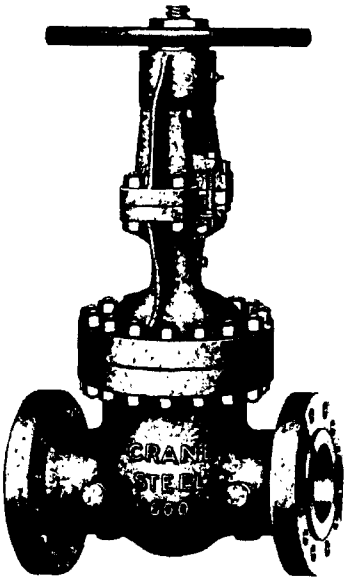
Butt-welding valves: Orders for butt-welding valves must specify the diameter of the bore (inside diameter of pipe).

Sizes smaller than listed: When 400 and 900-pound valves are desired in sizes smaller than listed in the table, valves of the next higher pressure class are recommended.

Crane's extensive line of 600-pound steel gate valves, in addition to those listed on this page, includes 2-inch and smaller reduced and full port types as well as valves with screwed, socket-welding, and flanged ends; see pages 116 to 120.

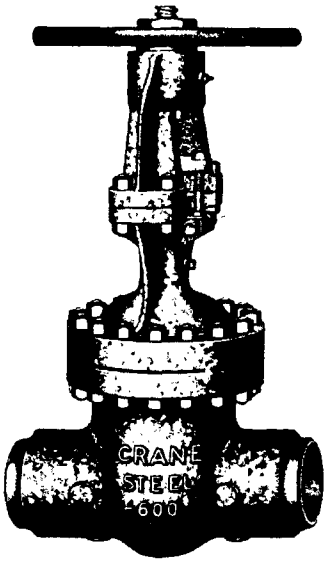
Ordering: When ordering, be sure to specify the catalong number and the suffix.

Dimensions.....page 128
By-passes.....page 129
2500-pound valves.....page 130
Special facings.....pages 333 to 335



Outside Screw and Yoke Flanged

No. 61 X, XR, or U....400-Pound
No. 76 X, XR, or U....600-Pound
No. 83 X, XR, or U....900-Pound
No. 87 X, XR, or U...1500-Pound



Outside Screw and Yoke Butt-Welding

No. 61½ .. XR, or U...400-Pound
No. 76½ X, XR, or U...600-Pound
No. 83½ X, XR, or U...900-Pound
No. 87½ X, XR, or U..1500-Pound

Weights in Pounds, Each — Prices on Request

Size	Flanged — FD & SF				Butt-Welding			
	400 Pound	600 Pound	900 Pound	1500 Pound	400 Pound	600 Pound	900 Pound	1500 Pound
Inches	61 X 61 XR 61 U	76 X 76 XR 76 U	83 X 83 XR 83 U	87 X 87 XR 87 U	61½ XR 61½ U	76½ X 76½ XR 76½ U	83½ X 83½ XR 83½ U	87½ X 87½ XR 87½ U
1	...	...	...	80	...	...	...	65
1¼	..	...	.	90	...	...	..	75
1½	..	...	...	130	...	...	...	105
2	..	95	..	180	...	80	...	155
2½	..	140	...	280	...	120	...	225
3	..	170*	260	370	...	140	220	300
3½	...	310	...	...	....	...	...	.
4	270	330	430	610	220	270	360	520
5	390	520	660	1020	330	430	560	830
6	530	720	900	1410	460	640	750	1250
8	940	1220	1560	2600	830	1080	1300	1910
10	1530	1880	2350	...	1250	1610	1970	
12	2000	2630	3500	..	1800	2240	3200	..
14	2410	3200	4680	..	2210	3000	4350	.
16	3500	4230	6500	...	3100	4030	6000	
18	.	7200		..	...	6760	.	
20	..	9800	.	...	...	8950	..	
24	..	11800	.	..	..	10500	..	

*When 3-inch 600-pound flanged valves with ring joint facing are to be bolted to Cranclap joints, orders must specify. A groove of special pitch diameter is required, see page 334 for dimensions

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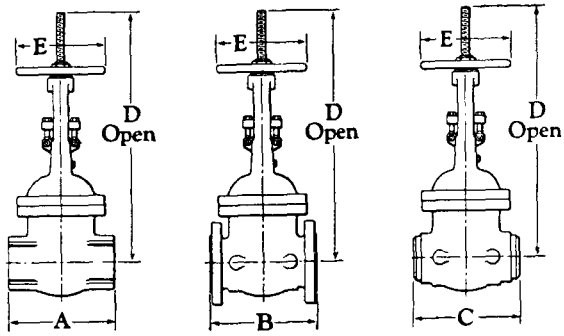
Cast Steel Wedge Gate Valves

150 to 1500-Pound Dimensions



Screwed | Flanged | Butt-Welding

Face to face: Flanged valves of the 150 and 300-pound pressure classes are regularly furnished with a 1/16-inch raised face; those of the 400, 600, 900, 1,500, and 2500-pound classes are regularly furnished with 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, B16.10-1957, for their respective pressure class. This Standard does not include 3 1/2-inch steel valves.

Dimensions, in Inches

Class	Size of Valve	A	B	C	D	E
150-Pound	2	6 1/4	7	8 1/2	15 3/4	8
	2 1/2	7	7 1/2	9 1/2	16 1/2	8
	3	7 3/8	8	11 1/8	20 3/4	9
	3 1/2	...	8 1/2	...	23	9
	4	8	9	12	25 3/4	10
	5	...	10	15	30 1/2	12
	6	...	10 1/2	15 7/8	35 1/4	14
	8	...	11 1/2	16 1/2	44	16
	10	...	13	18	52 1/2	18
	12	...	14	19 3/4	60 1/2	18
	14	...	15	22 1/2	70 1/4	22
	16	...	16	24	79 3/4	24
	18	...	17	26	89	27
	20	...	18	28	97 1/4	30
	24	...	20	32	112 3/4	30
300-Pound	1 1/2	...	7 1/2	...	16 3/4	8
	2	7	8 1/2	8 1/2	18	8
	2 1/2	8	9 1/2	9 1/2	19	8
	3	9	11 1/8	11 1/8	23 1/4	9
	4	11	12	12	28 1/4	10
	5	...	15	15	33 1/2	12
	6	...	15 7/8	15 7/8	38 1/2	14
	8	...	16 1/2	16 1/2	47	16
	10	...	18	18	56 1/2	20
	12	...	19 3/4	19 3/4	64 1/4	20
	14	...	30	30	75 1/4	27
	16	...	33	33	81	27
	18	...	36	36	91 1/2	30
	20	...	39	39	99 3/4	36
	24	...	45	45	120 1/2	36
400-Pound	4	...	16	16	30 3/4	12
	5	...	18	18	35	14
	6	...	19 1/2	19 1/2	40 1/4	16
	8	...	23 1/2	23 1/2	50 1/2	20
	10	...	26 1/2	26 1/2	59 3/4	24
	12	...	30	30	67 3/4	24
	14	...	32 1/2	32 1/2	74 3/4	27
	16	...	35 1/2	35 1/2	80 3/4	27

Class	Size of Valve	B	C	D	E
600-Pound	2	11 1/2	11 1/2	18 1/4	8
	2 1/2	13	13	22 1/4	9
	3	14	14	25 3/4	10
	3 1/2	15	...	32	14
	4	17	17	31 1/2	14
	5	20	20	36 3/4	16
	6	22	22	42 3/4	20
	8	26	26	52 1/4	24
	10	31	31	62 1/4	27
	12	33	33	70	27
	14	35	35	77 1/4	30
	16	39	39	83 3/4	30
	18	43	43	93 3/4	36
	20	47	47	104 1/2	36
	24	55	55	126	42
900-Pound	3	15	15	27 1/4	12
	4	18	18	31 1/2	14
	5	22	22	36 3/4	16
	6	24	24	42 3/4	20
	8	29	29	52 1/2	24
	10	33	33	62 1/4	27
	12	38	38	73 1/2	30
	14	40 1/2	40 1/2	77 1/4	30
	16	44 1/2	44 1/2	85 3/4	36
1500-Pound	1	10	10	16	8
	1 1/4	11	11	16 1/2	8
	1 1/2	12	12	20	9
	2	14 1/2	14 1/2	22 1/8	10
	2 1/2	16 1/2	16 1/2	26 3/8	12
	3	18 1/2	18 1/2	28	14
	4	21 1/2	21 1/2	33	16
	5	26 1/2	26 1/2	38 3/4	20
	6	27 3/4	27 3/4	47	24
	8	32 3/4	32 3/4	55	27
2500-Pound	Dimensions of 2500-Pound Valves are furnished on application				

Ratings and material specifications.....pages 121 and 122
Clearance dimensions of by-passes.....page 129
Locations of by-passes; taps and drains for valves.....page 403
Gearing.....pages 271 to 274
Templates for drilling and end flange dimensions....pages 329 to 331

Description and sizes:
150 and 300-pound.....pages 123 to 125
400 to 1500-pound....pages 126 and 127
2500-pound.....page 130

By-Passes for Cast Steel Wedge Gate Valves

When so ordered, larger size Crane Cast Steel Wedge Gate Valves can be furnished with a Built-Up By-Pass; for sizes, refer to the table below. The by-passes are 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 globe valve having socket-welding ends. All connections in the by-pass are socket-welded to assure a permanently tight and strong assembly.

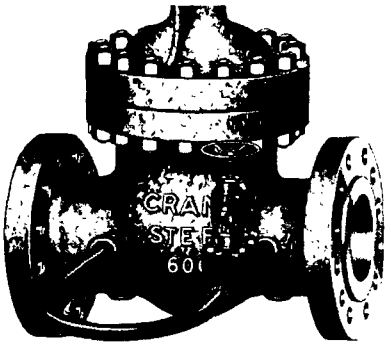
Pipe bends are used on all pressure classes to provide the necessary flexibility and to compensate for expansion strains resulting from unequal temperatures or fluctuating operating conditions.

Materials: High quality materials are used in the by-pass piping and in the by-pass valve. 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 suitable for the same services as the main valves.

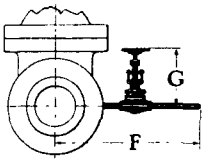
Location of by-pass: When ordered with a main valve, the built-up by-pass will be completely assembled and will be attached to either of the sides or to the bottom of the main valve.

Unless otherwise ordered, the by-pass valve is attached to the side of the main valve, with the stem of both valves parallel and pointing vertically upward.

Special by-passes: By-passes of other designs or specifications can be made to order. Please furnish 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.

Built-Up By-Pass Sizes and Clearance Dimensions — Prices on Request

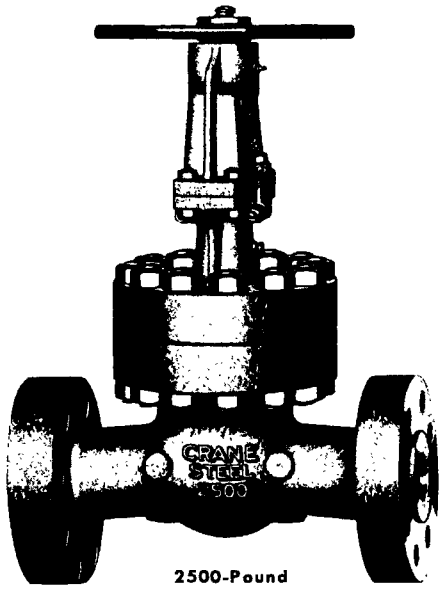
Main Valve		Built-Up By-Passes for Use with Main Valves Of Pressure Classes Specified Below								
Class of trim	Size of valve	Size of by-pass	Approximate Clearance, In Inches							
			F						G (Open)	
	Inches	Inches	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	150 to 600 Pound	900 or 1500 Pound
"XR" Trim	4	3/4	...	...	...	...	21 1/4	21 3/4	...	9 1/8
	5	3/4	...	19 3/4	20 1/8	20 1/4	22 5/8	22 7/8	8 7/8	9 1/8
	6	3/4	...	20 1/4	21 1/4	21 1/2	23 1/8	23 7/8	8 7/8	9 1/8
	8	3/4	...	22 1/4	22 3/4	22 7/8	25	26 5/8	8 7/8	9 1/8
	10	1	...	25	26 1/4	26 5/8	28 7/8	...	9 3/8	10 3/4
	12	1	25 3/8	26 1/2	28 1/8	28 1/2	30 5/8	...	9 3/8	10 3/4
	14	1 1/4	27 1/2	30	30 1/4	30 3/4	33 5/8	...	11	13
	16	1 1/4	29 3/8	31 3/4	31 7/8	32 1/2	35 1/4	...	11	13
	18	1 1/2	32	35 1/2	...	35 3/4	...	...	12	
	20	1 1/2	33 1/4	36 5/8	...	37 1/8	...	...	12	
	24	2	38 3/4	44	...	45 3/8	...	...	14	
"U" Trim	4	3/4	...	...	...	...	21 1/4	21 3/4	...	9 1/8
	5	3/4	...	20 5/8	21 1/8	21 1/4	22 5/8	22 7/8	9 1/8	9 1/8
	6	3/4	...	21 1/4	22 1/4	22 1/2	23 1/8	23 7/8	9 1/8	9 1/8
	8	3/4	...	23 1/4	23 3/4	23 7/8	25	26 5/8	9 1/8	9 1/8
	10	1	...	26 1/2	27	27 3/8	28 7/8	...	10 3/4	10 3/4
	12	1	...	28	28 7/8	29 1/4	30 5/8	...	10 3/4	10 3/4
	14	1 1/4	...	31 5/8	31 7/8	32 3/8	33 5/8	...	13	13
	16	1 1/4	...	33 3/8	33 1/2	34 1/8	35 1/4	...	13	13
	18	1 1/2	...	37 1/8	...	37 7/8	...	...	13 5/8	
	20	1 1/2	...	38 1/4	...	39 1/4	...	...	13 5/8	
	24	2	...	47 3/4	...	48 5/8	...	...	16 1/2	

Description of main valves....pages 124 to 127 *Additional data on by-passes....page 403* *Taps and drains for valves....page 403*

2500-Pound Cast Steel Wedge Gate Valves

For pressure-temperature ratings, see page 121.

For specification of materials, see page 122.



2500-Pound
Outside Screw and Yoke
Cast Steel Wedge Gate Valves

(with flanged or butt-welding ends)

For general description, see page 126.

Prices, weights, and dimensions will be furnished on request.

Crane 2500-Pound 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 Cast Steel Gate Valves be equipped with a by-pass on sizes 4-inch and larger; sizes 8-inch and larger should have gearing; further information furnished on request.

Gearing for Crane 150 to 2500-pound cast steel wedge gate valves . . . for easier operation . . . can be installed in the factory or in the field

To facilitate operation, the larger size Crane 150 to 2500-pound cast steel outside screw and yoke wedge gate valves (pages 123 to 127) can be furnished with a bevel geared operator. The Crane gear unit can be factory-installed or can be shipped separately for field installation on Crane valves in service. For complete details and description, see pages 271 to 274. Valves of the 2500-pound class can also be equipped with gears; information on request.

Class 400 and 600 Cast Steel Pipe-Line Gate Valves

Single Disc — Conduit Type

(Patent Pending)

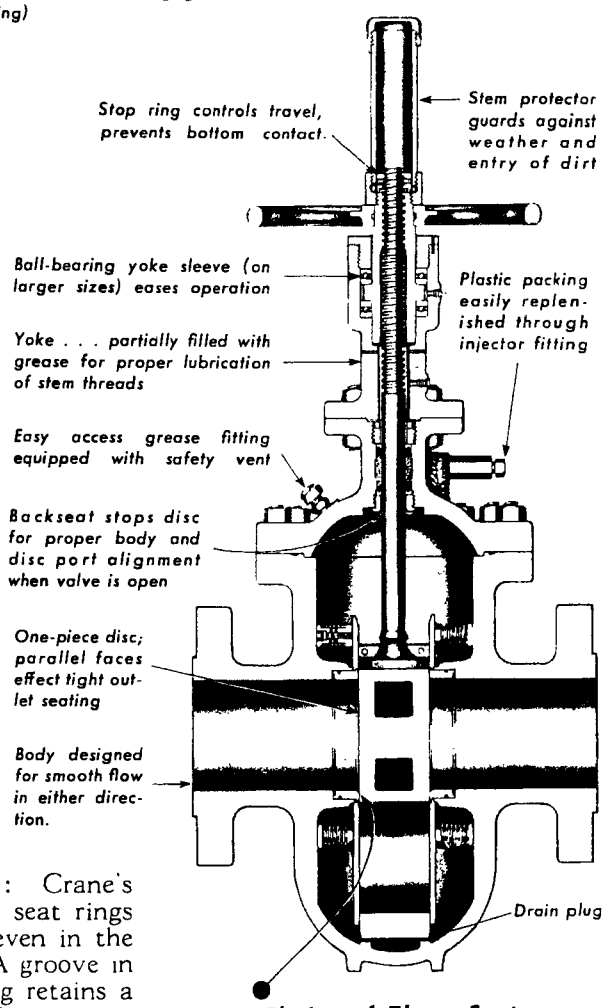
Full-way and venturi type valves . . . single disc design . . . flow in either direction . . . self-sealing, replaceable seats . . . choice of three seat types.

Crane Conduit Type Pipe-Line Gate Valves, described on this and the next two pages, are designed for efficient handling of crude oils, gas, and refined petroleum products of non-corrosive nature, such as gasoline, kerosene, fuel oils, etc. Extensive field tests have proven the valves easy to operate, dependable, and practically maintenance-free.

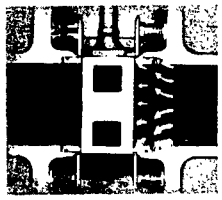
For a complete description of Crane cast steel pipe-line swing check valves, see page 155.

Disc and stem: The simple one-piece disc design permits free flow in either direction. The disc is attached to the stem by means of a slotted tee-head connection which eliminates any tendency of a side-thrust on the stem bearings. The parallel disc faces effect tight outlet seating without excessive stem thrust and with minimum load on the stem head . . . . line pressure does the work. Machined guides in the body prevent lateral disc movement and seating misalignment. The disc cannot stick in operation.

The stem, well lubricated, is enclosed within a capped protector above the yoke sleeve.



Self-Sealing Seating



Upstream pressure, acting on the area back of the seat ring . . . . an area greater than the port area in contact with the disc . . . . creates a differential pressure for absolutely tight seating.

Self-aligning body seat rings: Crane's self-aligning, bottom seated body seat rings can be slipped in by hand . . . even in the field . . . without special tools. A groove in the outside perimeter of each ring retains a synthetic rubber O-ring gasket for positive pressure-tightness. Spring-actuated, oval-shaped disc plates push against the shoulders of the seat rings, maintaining a constant seat-disc contact to assure an immediate seal. Constant lubrication of seating surfaces provides protection against abrasion.

Spring-Loaded Disc Plates



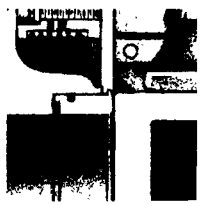
Spring-loaded disc plates assure constant seat-disc contact . . . prevent entry of dirt into, and contain lubricating grease within, the body well.

Body, bonnet, and yoke: The body features a flow-through area as straight and smooth as pipe and permits easy passage of a scraper. There is no line turbulence, nor are there pockets in which dirt might accumulate. Triplex Steel stud bolts, drawn up just enough to form a rubber O-ring gasket into a wedge-shaped groove in the face of the body flange, join body and bonnet into a firm metal-to-metal contact. Internal pressure against the gasket insures a tight, leak-proof seal. The body well is partially filled with grease for quick lubrication of parts. An exclusive Crane safety feature precludes excessive pressure build-up in the body-bonnet chamber by providing an escape through the seat into the port.

On 4-inch Class 400 and 3-inch and smaller Class 600 Valves, the bonnet and yoke are integral. To facilitate operation, the yoke sleeve is equipped with ball bearings on Class 400 Valves 8-inch and larger and on Class 600 Valves 6-inch and larger.

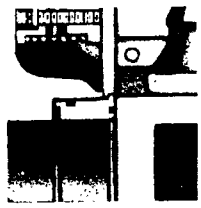
For additional description and dimensions, see next two pages.

Choice of Three Seats



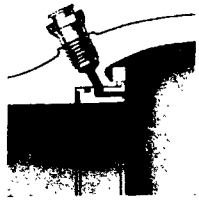
Metal-to-Metal

Seat rings are steel, Stellite faced, also illustrated in full valve view above



Teflon Insert

Exelloy seat rings with Teflon "soft seating" insert in faces.

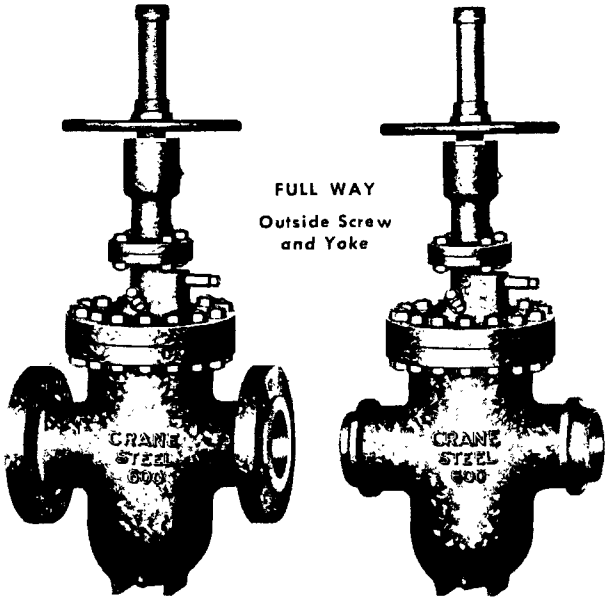


Grease-Sealed

Exelloy seat rings, grease is supplied to seating faces through two or more fittings to channels in seat rings

Class 400 and 600 Cast Steel Pipe-Line Gate Valves

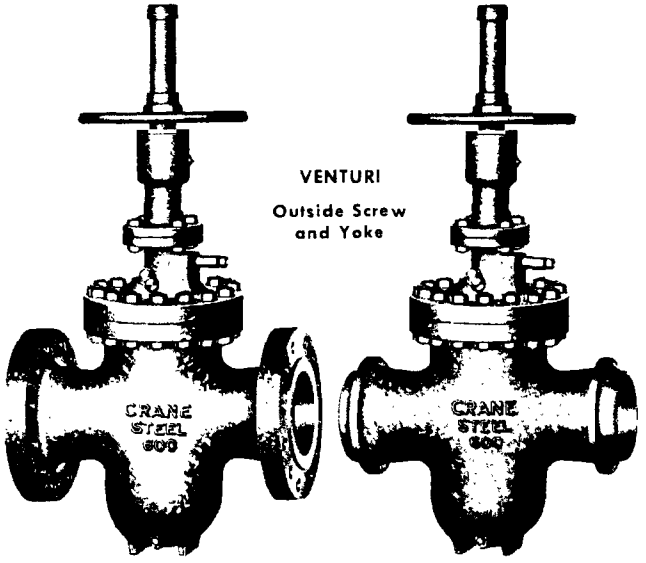
Single Disc — Conduit Type



FULL WAY
Outside Screw and Yoke

Class 400, Flanged		Class 400, Butt-Welding
No. 1490	Metal-to-Metal Seating	No. 1491
No. 1490-TF	Teflon Insert Seating	No. 1491-TF
No. 1490-GS	Grease-Sealed Seating	No. 1491-GS

Class 600, Flanged		Class 600, Butt-Welding
No. 1690	Metal-to-Metal Seating	No. 1691
No. 1690-TF	Teflon Insert Seating	No. 1691-TF
No. 1690-GS	Grease-Sealed Seating	No. 1691-GS



VENTURI
Outside Screw and Yoke

Class 400, Flanged		Class 400, Butt-Welding
No. 1494	Metal-to-Metal Seating	No. 1495
No. 1494-TF	Teflon Insert Seating	No. 1495-TF
No. 1494-GS	Grease-Sealed Seating	No. 1495-GS

Class 600, Flanged		Class 600, Butt-Welding
No. 1694	Metal-to-Metal Seating	No. 1695
No. 1694-TF	Teflon Insert Seating	No. 1695-TF
No. 1694-GS	Grease-Sealed Seating	No. 1695-GS

Class 400 Valves (not illustrated) are similar to the Class 600

Ratings

Valve Class	Working Pressure	Hydrostatic Test Pressure	
	Cold Oil or Gas	Shell	Seat
Class 400	960 psi	1450 psi	1000 psi
Class 600	1440 psi	2175 psi	1550 psi

Valve seat tested 100 psi air-under-water.

For general construction and features, see preceding page.
For dimensions, see the facing page.

Materials: The body, bonnet, and yoke are Crane Carbon Steel conforming to ASTM A 216, Grade WCB. The stem is Exelloy, an AISI Type 410 stainless steel containing 11½ to 13½ per cent chromium (conforms to ASTM A 182, Grade F6). Disc plates are steel, chromium-plated. The valve wheel is malleable iron.

In all valves, the disc is Crane No. 15 Steel, a high tensile strength, low alloy cast steel containing chromium, nickel, and molybdenum; in addition, the disc is chromium-plated. Three types of body seat rings are available . . . Steel, Stellite faced . . . Exelloy with Teflon "soft" seating insert. . . . and Exelloy, Grease-Sealed

Packing chamber: A special plastic packing contained between V-type end rings insures a tight stem seal The packing is easily replenished, with the valve on full line pressure and the disc in any position, through a ball-check injector fitting in the bonnet.

Gearing: For easier operation and as a safety factor in event of operation under high pressure differential, gearing should be considered for Class 400 Valves 14-inch and larger and for Class 600 Valves 10-inch and larger Orders must specify whether bevel or spur gearing is wanted

Indicator: The valves can be equipped with an indicator, at added charge, when so ordered

Standards: The valves comply with requirements of the following Standards (in sizes included therein) for their respective pressure class.

End flanges, and ends of butt-welding valves, comply with American Standard B16.5-1957

The valves conform to the American Standard for Face-to-Face and End-to-End Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957

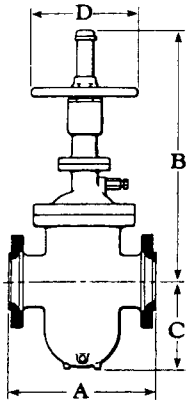
The valves also conform to requirements of the American Petroleum Institute (API) Standard for Pipeline Valves. No. 6-D, Ninth Edition (1960)

Flange facings: Flanged valves regularly have a ¼-inch male face (large male) on the end flanges The faces have a serrated finish (about 32 concentric grooves per inch); a smooth finish is optional

Other types of facings such as ring joint, female tongue, groove. etc , can be furnished

Class 400 and 600 Cast Steel Pipe-Line Gate Valves

Single Disc — Conduit Type



All Valves

Order by catalog number: When ordering, specify the catalog number of the valve desired.

Catalog numbers for each valve type are listed under the valve illustrations on the facing page.

Drilling: Flanged valves are regularly furnished faced, drilled, and spot faced to the corresponding American Standard pressure class

Faced only valves can be furnished when specified.

Butt-welding: The ends of butt-welding valves are bored to match the inside diameter of the pipe to be used; orders must specify the diameter of bore.

Installation: For best performance install the valves upright. Two ribs at the bottom of the body provide a supporting base.

Dimensions, in Inches — Prices and Weights on Request

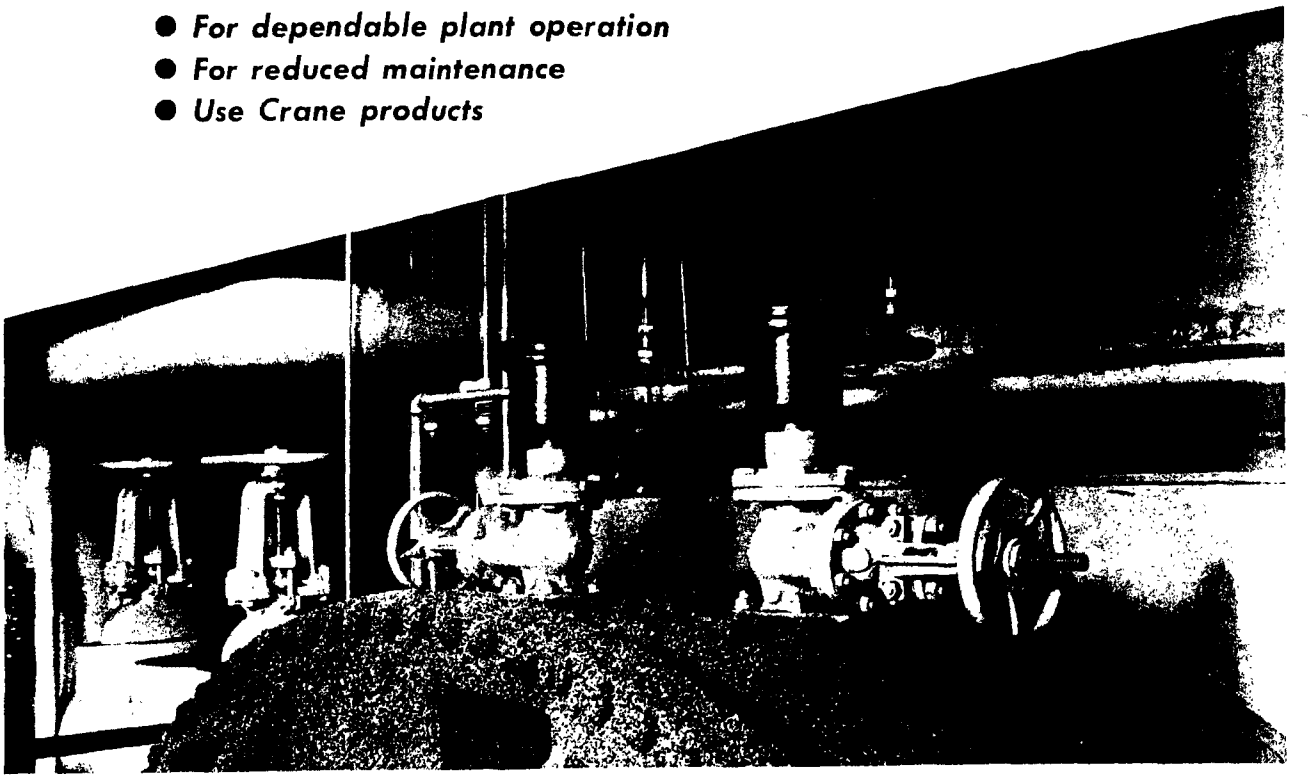
Valve Type Flanged or Butt-Welding	Size (*)	A (†)	B	C	D	End Flanges: Dia	End Flanges: Thickness (†)	End Flanges: Male face dia	End Flanges: Bolt circle dia	End Flanges: No of bolts & dia	Inside Diameter: Ends	Inside Diameter: Seats
Class 400 Full-Way	4	16	28 3/4	9 3/4	10	10	1 3/8	6 3/16	7 7/8	8-7/8	4 1/16	4 1/16
	6	19 1/2	36 5/8	12 3/4	12	12 1/2	1 5/8	8 1/2	10 5/8	12-7/8	6 1/16	6 1/16
	8	23 1/2	46 1/4	16	16	15	1 7/8	10 5/8	13	12-1	8 1/16	8 1/16
	10	26 1/2	55	19 1/2	20	17 1/2	2 1/8	12 3/4	15 1/4	16-1 1/8	10	10
	12	30	62 3/4	23	20	20 1/2	2 1/4	15	17 3/4	16-1 1/4	12	12
	14	32 1/2	69 1/2	25 7/8	24	23	2 3/8	16 1/4	20 1/4	20-1 1/4	13 1/4	13 1/4
	16	35 1/2	78 1/8	29 5/8	24	25 1/2	2 1/2	18 1/2	22 1/2	20-1 3/8	15 1/4	15 1/4
	18	38 1/2	88 1/2	32 5/8	27	28	2 5/8	21	24 3/4	24-1 3/8	17	17
	20	41 1/2	94 1/2	36 1/2	27	30 1/2	2 3/4	23	27	24-1 1/2	19	19
	22	45	107 5/8	39 3/4	36	33	2 7/8	25 1/4	29 1/4	24-1 5/8	21	21
	24	48 1/2	116 1/8	43 3/16	36	36	3	27 1/4	32	24-1 3/4	23	23
	26	51 1/2	123 1/2	47 5/8	36	38 1/4	3 1/2	29 1/2	34 1/2	28-1 3/4	25	25
	30	60	141 3/4	54 3/8	42	43	4	33 3/4	39 1/4	28-2	29	29
Class 400 Venturi	8 x 6	23 1/2	36 5/8	12 3/4	12	15	1 7/8	10 5/8	13	12-1	8 1/16	6 1/16
	10 x 8	26 1/2	46 1/4	16	16	17 1/2	2 1/8	12 3/4	15 1/4	16-1 1/8	10	8 1/16
	12 x 8	30	46 1/4	16	16	20 1/2	2 1/4	15	17 3/4	16-1 1/4	12	8 1/16
	16 x 12	35 1/2	62 3/4	23	20	25 1/2	2 1/2	18 1/2	22 1/2	20-1 3/8	15 1/4	12
	18 x 14	38 1/2	69 1/2	25 7/8	24	28	2 5/8	21	24 3/4	24-1 3/8	17	13 1/4
	20 x 16	41 1/2	78 1/8	29 5/8	24	30 1/2	2 3/4	23	27	24-1 1/2	19	15 1/4
	24 x 16	48 1/2	78 1/8	29 5/8	24	36	3	27 1/4	32	24-1 3/4	23	15 1/4
	24 x 18	48 1/2	88 1/2	32 5/8	27	36	3	27 1/4	32	24-1 3/4	23	17
	26 x 20	51 1/2	94 1/2	36 1/2	27	38 1/4	3 1/2	29 1/2	34 1/2	28-1 3/4	25	19
	30 x 24	60	116 1/8	43 3/16	36	43	4	33 3/4	39 1/4	28-2	29	23
Class 600 Full-Way	2	11 1/2	19	5 3/4	8	6 1/2	1	3 5/8	5	8-5/8	2 1/16	2 1/16
	2 1/2	13	20 3/4	6 13/16	9	7 1/2	1 1/8	4 1/8	5 7/8	8-3/4	2 1/2	2 1/2
	3	14	25	7 3/4	10	8 1/4	1 1/4	5	6 5/8	8-3/4	3 1/16	3 1/16
	4	17	29 1/2	9 3/4	12	10 3/4	1 1/2	6 3/16	8 1/2	8-7/8	4 1/16	4 1/16
	6	22	38 3/4	12 7/8	16	14	1 7/8	8 1/2	11 1/2	12-1	6 1/16	6 1/16
	8	26	48 7/8	16 3/16	20	16 1/2	2 3/16	10 5/8	13 3/4	12-1 1/8	8 1/16	8 1/16
	10	31	56 7/8	19 7/8	24	20	2 1/2	12 3/4	17	16-1 1/4	10	10
	12	33	64 1/4	23 1/4	24	22	2 5/8	15	19 1/4	20-1 1/4	12	12
	14	35	72 5/8	25 7/8	27	23 3/4	2 3/4	16 1/4	20 3/4	20-1 3/8	13 1/4	13 1/4
	16	39	79	29 9/16	27	27	3	18 1/2	23 3/4	20-1 1/2	15 1/4	15 1/4
	18	43	89	32 3/4	30	29 1/4	3 1/4	21	25 3/4	20-1 5/8	17	17
	20	47	99	37	36	32	3 1/2	23	28 1/2	24-1 5/8	19	19
	22	51	110	40 1/4	36	34 1/4	3 3/4	25 1/4	30 1/2	24-1 3/4	21	21
	24	55	119	43 3/4	36	37	4	27 1/4	33	24-1 7/8	23	23
	26	57	130	47 5/8	42	40	4 1/4	29 1/2	36	28-1 7/8	25	25
	30	65	144	55	42	44 1/2	4 1/2	33 3/4	40 1/4	28-2 1/8	29	29
Class 600 Venturi	8 x 6	26	38 3/4	12 7/8	16	16 1/2	2 3/16	10 5/8	13 3/4	12-1 1/8	8 1/16	6 1/16
	10 x 8	31	48 7/8	16 3/16	20	20	2 1/2	12 3/4	17	16-1 1/4	10	8 1/16
	12 x 8	33	48 7/8	16 3/16	20	22	2 5/8	15	19 1/4	20-1 1/4	12	8 1/16
	16 x 12	39	64 1/4	23 1/4	24	27	3	18 1/2	23 3/4	20-1 1/2	15 1/4	12
	18 x 14	43	72 5/8	25 7/8	27	29 1/4	3 1/4	21	25 3/4	20-1 5/8	17	13 1/4
	20 x 16	47	79	29 9/16	27	32	3 1/2	23	28 1/2	24-1 5/8	19	15 1/4
	24 x 16	55	79	29 9/16	27	37	4	27 1/4	33	24-1 7/8	23	15 1/4
	24 x 18	55	89	32 3/4	30	37	4	27 1/4	33	24-1 7/8	23	17
	26 x 20	57	99	37	36	40	4 1/4	29 1/2	36	28-1 7/8	25	19
	30 x 24	65	119	43 3/4	36	44 1/2	4 1/2	33 3/4	40 1/4	28-2 1/8	29	23

*Sizes for venturi type valves indicate the valve ends first, and then the seat.

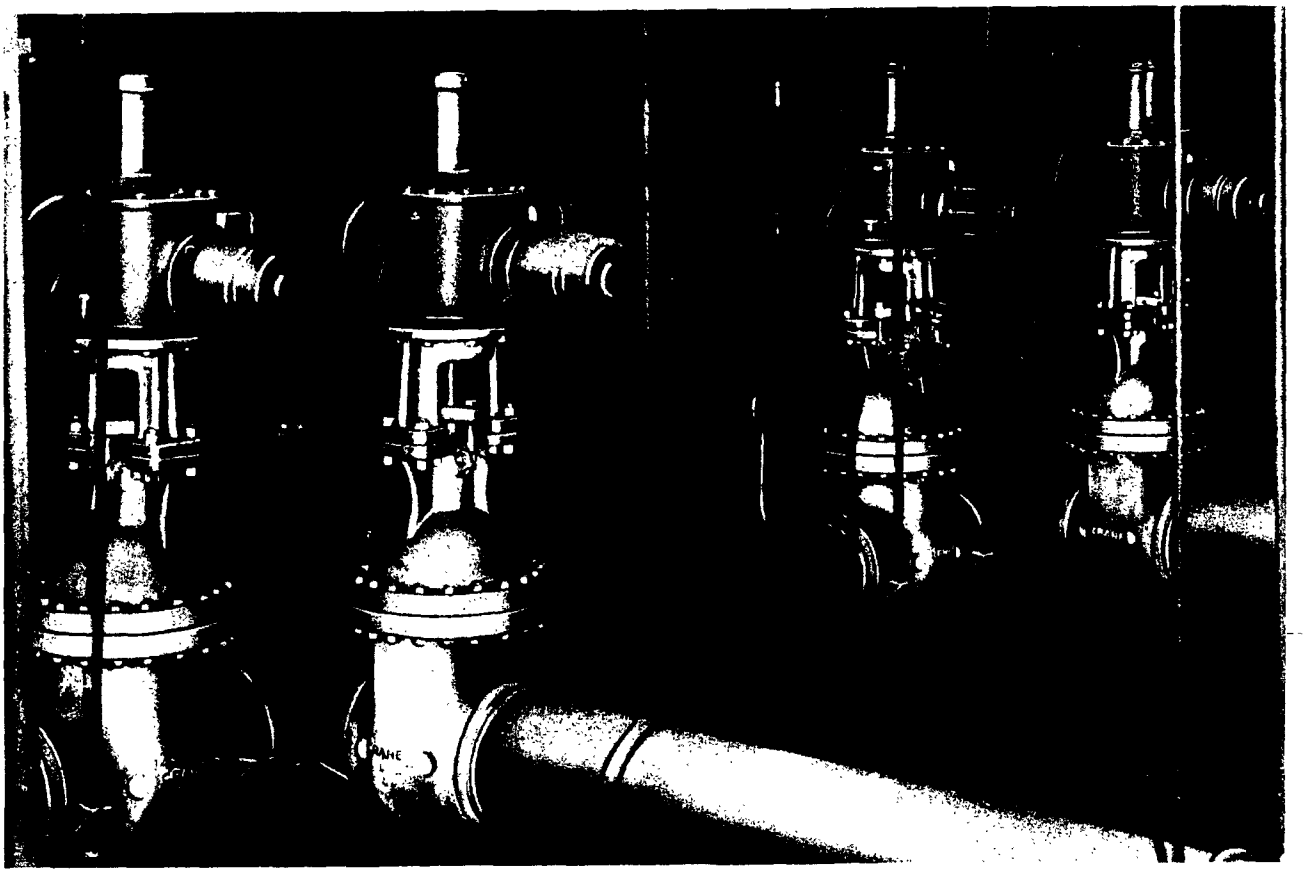
†Dimension "A" (in the case of flanged valves) includes the 1/4-inch male faces, the flange thickness does not.

General description.....pages 131 and 132
Cast steel pipe-line swing check valves....page 155
Volume per lineal foot of pipe.....page 354
Templates for drilling.....page 330
Special facings.....pages 333 to 335
Flow of fluids data.....pages 421 to 442

- *For dependable plant operation*
- *For reduced maintenance*
- *Use Crane products*



Crane Ferrosteel Body Gate Valves (Section 8) and Air Vent Valves (page 252) on a condenser installation in a municipal electric plant.



Crane Steel Gate Valves (Section 12) in central station service—motorized for easier operation. For a description of Crane cylinder and motor operated valves, see pages 260 to 270.

12

SECTION 13

Crane Steel Globe and Angle Valves

Bar Stock Valves.....page 136

Forged Steel Valves
600-Pound, Inside Screw.....page 137
600-Pound, Outside Screw and Yoke.....pages 138 and 139
600-Pound, Outside Screw and Yoke, Monel Trimmed.....page 141
6000-Pound Hydraulic (Globe only).....page 150

Valves for Chlorine Service.....pages 140 and 141

Cast Steel Valves
Sizes 2-inch and Smaller
1500-Pound Globe.....page 142

Cast Steel Valves
150, 300, 400, 600, 900, and 1500-Pound
Pressure-Temperature Ratings.....page 143
Service Recommendations.....page 143
Test Pressures and Material Specifications.....page 144
General Description.....pages 145 and 146
Catalog Numbers, Sizes, and Weights.....page 147
Dimensions.....page 148
Gearing.....page 149

2500-Pound Valves, Description and Sizes.....page 149

Crane forged steel valves, and cast steel valves indicated above as being available in sizes 2-inch and smaller, 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 cast steel valves of the 150 to 2500-pound pressure classes are made in sizes as large as 8-inch; all are similar in design. Globe valves are furnished in each of the American Standard pressure classes Angle valves are regularly furnished in all classes except the 1500-Pound.

For related data, and for complete description of other Crane steel products, refer to:

Cylinder and motor operation.....pages 260 to 270
Gaskets for steel flanged joints.....page 323
Templates for drilling.....pages 329 to 331
Fabricated piping.....pages 355 to 380

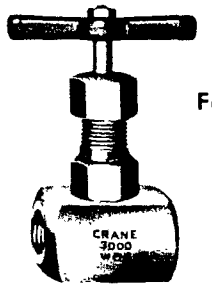
Steel stop-check valves, Pressure-Seal Bonnet.....pages 170 to 173
Steel stop-check valves, bolted bonnet.....pages 219 to 225
Steel sediment separators.....page 254

Steel gate valves.....Section 12
Steel check valves.....Section 14
Steel Pressure-Seal and Lip-Seal Bonnet Valves.....Section 15
Packless diaphragm valves.....Section 16
Corrosion-resistant alloy valves.....Section 17
Steel valves for special and extreme services.....Section 21

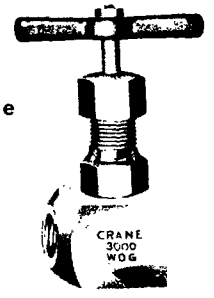
Steel screwed fittings, unions, and flange unions.....Section 24
Steel welding fittings.....Section 25
Steel flanges.....Section 26

High Pressure Bar Stock Valves

Steel and Exelloy

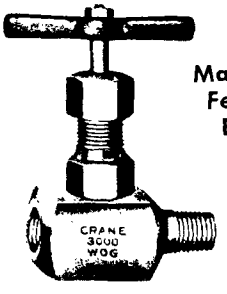


Female Ends

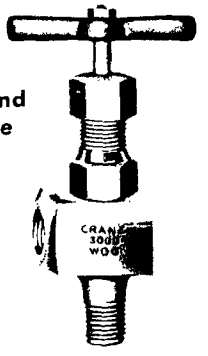


Globe
No. 222 H, Steel
No. 222 X, Exelloy

Angle
No. 223 H, Steel

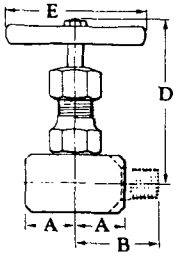


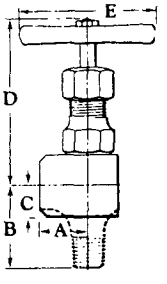
Male and Female Ends



Globe
No. 222½ H, Steel

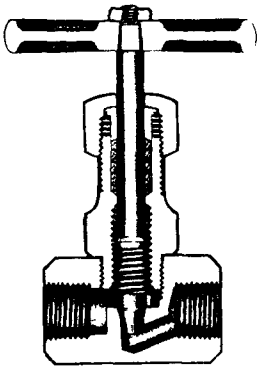
Angle
No. 223½ H, Steel





Working Pressure
3000 psi non-shock
cold water, oil, or gas

Air Tested



Typical cross section shown above is that of a globe valve with female ends.

In valves with male and female ends, the opening in the male end leads to the underside of the disc.

Recommendations: These neat, small, rugged valves find wide application in almost every kind of industry. They are ideal for use on orifice meters, regulator leads, by-passes, gauges, and many other similar services.

The Exelloy valves are particularly suitable for handling oil or gas containing sulphur compounds, or for installations where steel valves do not offer sufficient resistance to atmospheric corrosion.

Steel valves are available in both globe and angle patterns and with female or male and female ends. The Exelloy valves are available in the globe pattern with female ends only.

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 and identification: Steel valves have a steel body, bonnet, packing nut, and gland, and a chromium-plated steel stem. The valve body is marked "STEEL".

In the Exelloy valves, the foregoing parts are made of Exelloy, a specially heat-treated chromium iron having a chromium content of 11½ to 13½ per cent. The valve body is marked "STEEL-F6".

All of the valves have a malleable iron tee handle

Weights and Dimensions — Prices on Request

Size	Pounds, Each					Dimensions, in Inches					
	Steel				Exelloy						
Inches	No. 222 H Globe Female Ends	No. 222½ H Globe Male & Female	No. 223 H Angle Female Ends	No. 223½ H Angle Male & Female	No. 222 X Globe Female Ends	A	B	C	D open	E	Diameter of seat opening
⅛	.7		.7			31/32		9/16	3½	2 9/16	3/16
¼	.7	.7	.7	.7	.7	31/32	1 5/8	9/16	3½	2 9/16	3/16
⅜	1.0		1.1	1.2	1.0	1 3/32	1 7/8	11/16	4	2 9/16	¼
½	1.7	1.8	1.7	1.9	1.7	1¼	2⅛	13/16	4 7/8	3 9/16	5/16
¾	4.0		3.5			1 5/8		1	6 3/8	4¾	7/16
1	6.7		6.9			2⅛		1¼	7 5/8	4¾	9/16

For 18-8 SMo Bar Stock Globe Valves, see page 196.

600-Pound Forged Steel Globe and Angle Valves

Inside Screw

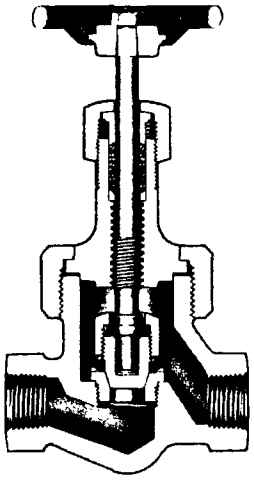
Recommendations: These small, rugged valves with plug type disc and seat are recommended for steam, water, air, gas, oil, oil vapor, and general service at temperatures up to 800 F. They are well used wherever durable, inside screw valves are wanted. The body and bonnet are forged carbon steel conforming to ASTM A 105, Grade II; heavy metal sections assure liberal safety.

Working Pressures
Steam, Water, Air, Gas, Oil, or Oil Vapor

Temp. Deg. Fahr.	Psi Non-Shock	Temp. Deg. Fahr.	Psi Non-Shock
100°	2000	500°	1735
150	1970	550	1640
200	1940	600	1540
250	1915	650	1430
300	1895	700	1305
350	1875	750	1180
400	1850	800	1015
450	1810	...	...

Test Pressures
Shell—**2175** psi hydrostatic
Seat—**2100** psi hydrostatic
Seat tested 100 psi air-under-water

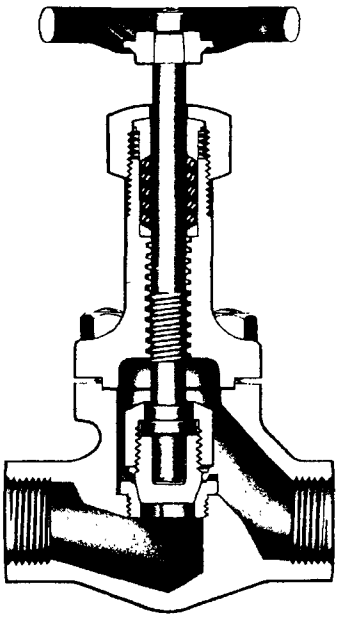
Union Bonnet
Sizes ¼ to ¾-inch



Cross Section, Globe

Bonnet joints: The bonnet joints are fitted with a corrugated soft iron gasket. The ¼ to ¾-inch valves have a union bonnet, the ring being forged steel. The 1 to 2-inch valves have a compact bolted bonnet of the male and female type equipped with Triplex Steel studs. Both types of joints are strong, yet are easily taken apart and reassembled.

Bolted Bonnet
Sizes 1 to 2-inch



Cross Section, Globe

Disc, seat, and stem: The plug type disc and seat are ideal for throttling services. Their wide, carefully finished seating surfaces are unusually resistant to foreign matter and to wiredrawing. The disc is Crane "500 Brinell" Stainless Steel. The body seat ring, screwed into the body, is Exelloy.

The valves feature a swivel disc-stem construction, as illustrated in the cross sections. Clearances are held to a minimum, and the seating load, exerted by the end of the stem on the disc, is much closer to the actual seating surface of the valve.

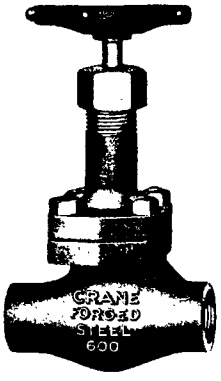
The stem, made of Exelloy, is of generous diameter with long thread engagement in the bonnet. The disc stem ring is locked to the disc by tack welding and will not loosen in service.

Stuffing box; repacking: The stuffing box is exceptionally wide and deep; it is equipped with a gland and filled with cut ring packing. The valves, when wide open, can be repacked while under pressure.

Wheels: Wheels are malleable iron. Sizes 1¼-inch and smaller have a dished design Style A wheel; larger sizes have an oval rim Style D wheel (not illustrated).



No. 3620 XW
Globe, Screwed



No. 3624 XW
Globe, Screwed



No. 3621 XW
Angle, Screwed

Weights and Dimensions — Prices on Request

13

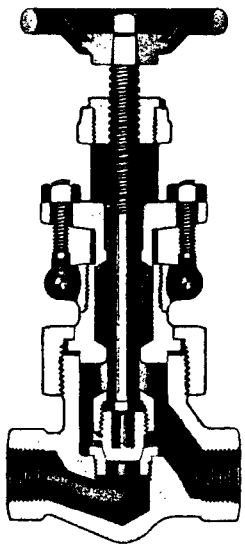
Type of Bonnet	Size	Pounds, Each			Dimensions, in Inches				
		No. 3620 XW	No. 3621 XW	No. 3624 XW	Globe		Angle		Diameter of wheel
	Inches	Globe	Angle	Globe	End to end	Center to top, open	Center to end	Center to top, open	
Union Bonnet	¼	1.5	1.5		2½	4¾	1¼	4¾	2½
	⅜	2.6	2.4		3	5 5/16	1½	5 5/16	2½
	½	3.6	3.5		3½	6 7/16	1¾	6¼	3
	¾	6.7	6.5		4½	7 13/16	2¼	7½	3½
Bolted Bonnet	1			11.0	5⅛	8¾			4
	1¼			15.0	6¼	10¾			5
	1½			27.0	7	10 15/16			6
	2			44.0	8⅛	12⅞			7

600-Pound Forged Steel Globe and Angle Valves

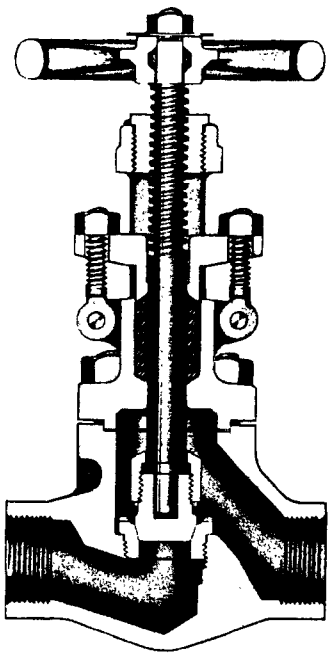
Outside Screw and Yoke

Small, compact union and bolted bonnet valves for steam, water, oil, oil vapor, air, and gas lines

Recommendations: These are compact and rugged valves. Inexpensively priced, yet high in quality, they are ideal for a wide variety of services in oil refineries, oil and gas fields, central power stations, and industrial plants. They offer excellent results on high pressure hydraulic lines and on high-pressure-temperature steam or oil lines.



Union Bonnet Valves
¼ to ¾-inch sizes with screwed ends; ¼ and ⅜-inch sizes with socket-welding ends.



Bolted Bonnet Valves
½ to 2-inch sizes with screwed, socket-welding, or flanged ends.

Sizes, weights, and dimensions are shown on the next page.

For description of materials, see Section 2.

The valves are furnished with Class "XW" trim. They are recommended for steam, water, air, gas, and general service at temperatures up to 850 F and for oil or oil vapor service at temperatures up to 1000 F.

Body, bonnet, and yoke: The body, bonnet, and yoke are made of forged carbon steel conforming to ASTM A 105, Grade II; heavy metal sections assure ample strength. Union bonnet valves have a separate bonnet and yoke 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 for tightness and easy 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, yet easy to dismantle and reassemble.

Plug type disc and seat: All valves feature 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. The surfaces are carefully ground and then are hand lapped to obtain a fine, mirror-like finish. The body seat ring has heavy sections, with a long thread engagement in the body.

The disc is Crane "500 Brinell" Stainless Steel and the body seat ring is Exelloy. These metals, heat-treated for high hardness, offer excellent resistance to wear, seizure, galling, erosion, oxidation, and corrosion; for details, see page 5.

Stem: The valve stem, made of Exelloy, has precision-cut lifting threads to assure smooth operation.

Disc-stem connection: All valves feature a swivel disc-stem connection which holds all clearances to a minimum and places the seating load closer to the actual seating surface of the valve. The disc stem ring is locked to the disc by tack welding; it will not loosen in service.

Working Pressures

Fluid	Temp. Deg. Fahr.	Psi, Non-Shock: Screwed or Socket-Welding Valves	Psi, Non-Shock: Flanged Valves
Steam, Water, Air, Gas, Oil or Oil Vapor	100°	2000	1440
	150	1970	1420
	200	1940	1400
	250	1915	1380
	300	1895	1365
	350	1875	1350
	400	1850	1330
	450	1810	1305
	500	1735	1250
	550	1640	1180
	600	1540	1110
	650	1430	1030
	700	1305	940
	750	1180	850
	800	1015	730
	850	800	600
Oil or Oil Vapor	875	725	525
	900	600	445
	925	520	375
	950	425	310
	975	330	240
	1000	235	170

Hydrostatic Test Pressures

Valve Ends	Psi: Shell	Psi: Seat
Screwed	2175	2100
Socket-Welding	2175	2100
Flanged	2175	1550

Seat tested 100 psi air-under-water.

Yoke bushing: The long, heavy yoke bushing has liberal stem-thread engagement. Screwed into the yoke and tack welded, it is sturdy and secure.

Bolted gland: The bolted gland eliminates the danger of weakening . . . by threading . . . . the yoke legs. Stainless steel swinging type gland eye bolts, hinged to the bonnet, hold the forged steel one-piece gland and gland flange rigidly in place. The packing load is easily adjusted; the bolts, quickly removed when necessary, will not come off in service.

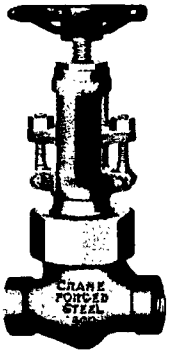
Stuffing box; repacking: The wide, deep stuffing box provides liberal packing space for a tight seal; it is filled with high quality cut ring packing. The valves, when wide open can be repacked while under pressure.

Wheels: Wheels are tough malleable iron. For easier handling, ¼ to 1-inch valves have a dished design wheel with small, rounded gripping knobs.

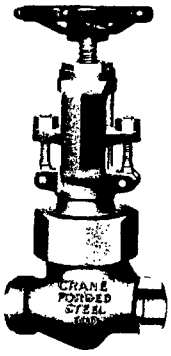
600-Pound Forged Steel Globe and Angle Valves

Outside Screw and Yoke

Union Bonnet Valves



No. 3640 XW
Globe
Screwed

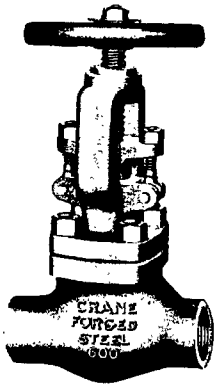


No. 3648 XW
Globe
Socket-Welding

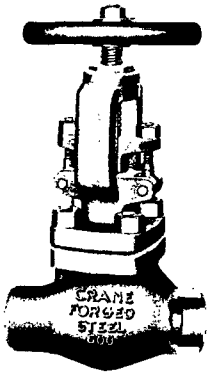
Ratings and details on facing page.

Monel trimmed valves; page 141.

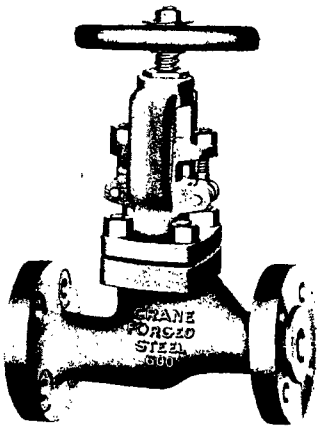
Bolted Bonnet Valves



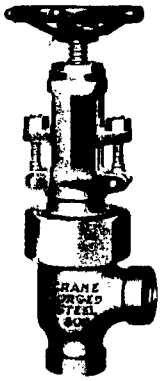
No. 3644 XW
Globe, Screwed



No. 3652 XW
Globe, Socket-Welding



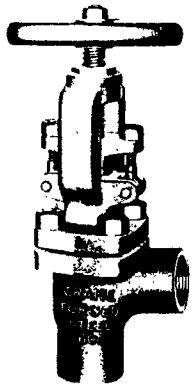
No. 3656 XW
Globe, Flanged



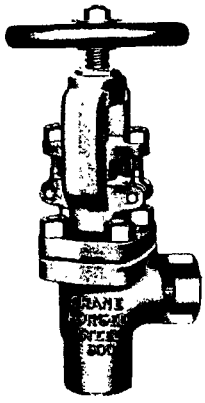
No. 3641 XW
Angle, Screwed

Flanged valves have American Standard B16.10-1957 face-to-face dimensions. End flanges comply with 600-Pound American Standard B16.5-1957 and have a ¼-inch high large male face with a serrated finish; other facings, or valves with 150-pound end flanges can be furnished. Valves are faced, drilled, and spot faced, unless ordered "faced only".

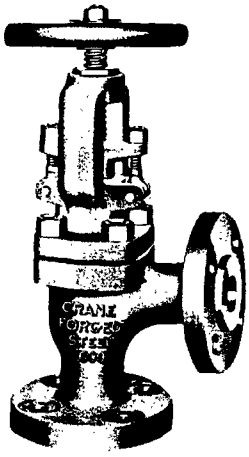
Socket-welding valve ends comply with American Standard B16.11-1946.



No. 3645 XW
Angle, Screwed



No. 3653 XW
Angle, Socket-Welding



No. 3657 XW
Angle, Flanged

Weights and Dimensions — Prices on Request

Type of Bonnet	Size	Pounds, Each						Dimensions, in Inches							
		Screwed		Socket-Welding		Flanged FD & SF		Screwed or Socket-Welding				Flanged			Dia. of wheel
	Inches	Globe Valves	Angle Valves	Globe Valves	Angle Valves	Globe Valves	Angle Valves	Center to end	Center to top, open: Globe	Center to top, open: Angle	Depth of socket	Center to face*	Center to top, open: Globe	Center to top, open: Angle	
		3640 XW	3641 XW	3648 XW	—	—	—								
Union	¼	3.7	3.2	3.5	...	...	...	1½	7⅛	7	7/16	...	...	...	3
	⅜	3.7	3.2	3.5	...	...	...	1½	7⅛	7	9/16	...	...	...	3
	½	4.8	4.6	...	...	...	...	1¾	7 15/16	7⅝	...	...	...	...	3½
	¾	9.0	8.4	...	...	...	...	2¼	9⅝	9⅛	...	...	...	...	4
		3644 XW	3645 XW	3652 XW	3653 XW	3656 XW	3657 XW								
Bolted	½	6.0	5.6	6.0	5.6	11.0	9.6	1 13/16	7⅞	7¼	5/8	3¼	7⅞	7¼	3½
	¾	9.5	8.5	9.5	8.5	17.5	16.0	2 3/16	9⅝	8¾	11/16	3¾	9¾	8¾	4
	1	14.0	11.5	14.0	11.0	22.0	21.0	2 9/16	10	8⅞	¾	4¼	10⅜	9	5
	1¼	20.5	18.0	20.5	18.0	31.5	28.0	3⅛	11½	10	13/16	4½	11¾	10⅛	6
	1½	29.5	25.0	29.5	25.0	42.0	39.0	3½	12¾	10⅞	⅞	4¾	13	11⅛	7
	2	48.0	42.0	48.0	42.0	62.0	57.0	4 3/16	14⅝	12⅝	1	5¾	15¼	12¾	9

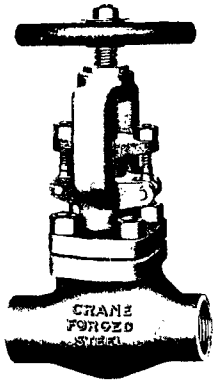
*Center to face dimensions include the ¼-inch male face; thickness of flange dimensions (see page 330) do not.

Dimensions of end flanges; drilling templates.....page 330
Dimensions of ring joint and special facings....pages 333 to 335

13

Steel Globe and Angle Valves

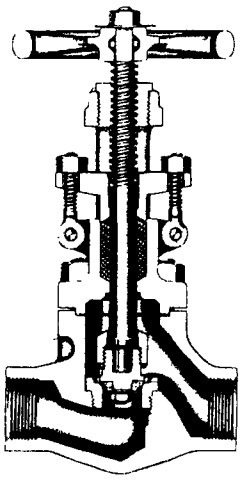
For Chlorine Service



No. 1644-TF
Globe, Screwed

Tight, easy seating valves . . . . with Teflon disc and Teflon packing . . . . for chlorine services at temperatures up to 300 F

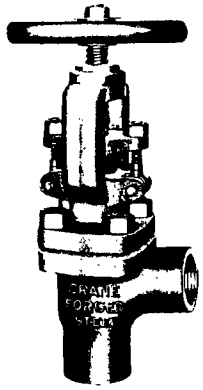
Tested 300 psi air-under-water



Cross section typical of sizes 2-inch and smaller

These newly designed globe and angle valves are recommended for use on water-free chlorine gas and liquid service at temperatures up to 300 F. They are ideally suited for the severe service conditions encountered in chlorine manufacturing and processing plants, pulp and paper mills, textile mills, water and sewage plants, etc.

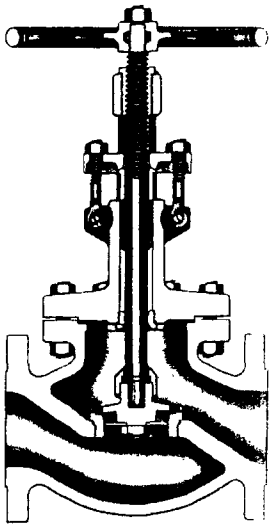
Their Teflon disc seats easily and tightly down and around hard particles, offering superior control over product encrustation on the valve seat, a major problem in chlorine service . . . . and the wide Teflon-to-metal seat bearing assures positive closure.



No. 1645-TF
Angle, Screwed

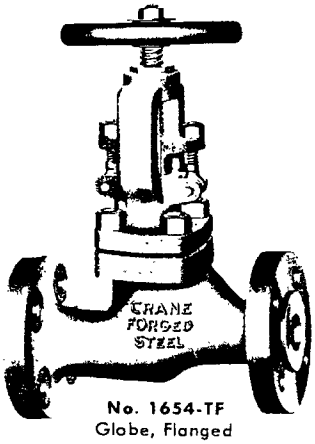
Materials and construction: The valves are the bolted bonnet, outside screw and yoke type. The body and one-piece bonnet and yoke are carbon forged steel (ASTM A 105, Grade II) in sizes 2-inch and smaller and carbon cast steel (ASTM A 216, Grade WCB) in sizes 2½-inch and larger. All sizes have a rugged male and female body-bonnet joint fitted with a corrugated soft Monel gasket; Triplex steel stud bolts assure a tight joint.

The disc holder, disc stem ring, and stem are Monel. The steel gland and gland flange (one-piece on sizes 2-inch and smaller) are held rigidly in place by steel gland eye bolts; the bolts are easily moved out of the way when servicing of the valve is necessary, yet they will not loosen in service.



Cross section typical of sizes 2½-inch and larger

Teflon disc and Hastelloy "C" seat: The valves feature a Teflon disc and a Hastelloy "C" body seat ring. The Teflon disc effects a tight seat . . . . with considerably less effort than that required for tight closure of valves having all-metal seating surfaces. The Teflon disc is tough enough to resist tearing, gouging, or scoring from hard particles which tend to accumulate on the seating surfaces in chlorine service, yet is sufficiently resilient to absorb the particles so that tight, positive seating is assured.



No. 1654-TF
Globe, Flanged

The illustration above of the No. 1654-TF shows typical construction of sizes 2-inch and smaller. For construction of larger sizes, see the bottom sectional view at the right.

Teflon-packed stuffing box: The valves have a wide, deep stuffing box filled with Teflon packing. Teflon packing is highly resistant to abrasion and is unaffected by, and non-contaminating to, chlorine.

Flanged valves: The end flanges of No. 1654 Valves 2-inch and smaller have a ¼-inch male face and conform to the 600-Pound American Steel Flange Standard (B16.5-1957); in sizes 2½-inch and larger, the end flanges have a 1/16-inch raised face and conform to the 300-pound class of the same Standard. Both the ¼-inch male and the 1/16-inch raised faces have a serrated finish.

Flanged valves also conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged Globe Valves, B16.10-1957 . . . . sizes 2-inch and smaller to the 600-pound steel class, and larger sizes, to the 300-pound class.

Drilling: Flanged valves are regularly furnished faced, drilled, and spot faced to the applicable pressure class of the American Standard; they can be furnished faced only, if specified.

For sizes, weights, and dimensions, see the table at the top of the next page.

Steel Globe and Angle Valves

For Chlorine Service — cont.

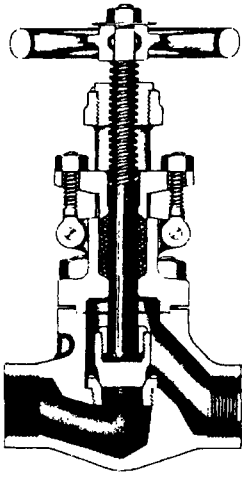
Weights and Dimensions (Inches) — Prices on Request

Size	No. 1644-TF Globe, Screwed			No. 1645-TF Angle, Screwed			No. 1654-TF Globe, Flanged—FD & SF						All Valves
	Weight	Dimensions		Weight	Dimensions		Weight	Dimensions					
		End to end	Center to top, open		Center to end	Center to top, open		Face to face	Center to top, open	End flange diameter	End Flange Thickness* 1/16" raised face	End Flange Thickness* 1/4" male face	Diameter of valve wheel
Inches	Pounds Each			Pounds Each			Pounds Each	(*)					
1/2	6.0	3 5/8	7 3/4	5.4	1 13/16	7 1/8	11.0	6 1/2	7 7/8	3 3/4	.	9/16	3 1/2
3/4	9.5	4 3/8	9 1/2	8.5	2 3/16	8 5/8	17.5	7 1/2	9 5/8	4 5/8	. . .	5/8	4
1	14.0	5 1/8	9 7/8	11.0	2 9/16	8 3/4	22.0	8 1/2	10 3/8	4 7/8	. . .	11/16	5
1 1/4	20.0	6 1/4	11 3/8	18.0	3 1/8	10	. . .	. . .	. . .	. . .	.	.	6
1 1/2	29.0	7	12 5/8	25.0	3 1/2	10 7/8	42.0	9 1/2	12 7/8	6 1/8	.	7/8	7
2	48.0	8 3/8	14 5/8	42.0	4 3/16	12 5/8	62.0	11 1/2	15 1/4	6 1/2	.	1	9
2 1/2	. .	. .	. . .	. .	. .	. . .	90.0	11 1/2	19	7 1/2	1	. . .	10
3	. .	. .	. . .	. .	. .	.	140.0	12 1/2	19 3/4	8 1/4	1 1/8	. .	10
4	. .	. .	. . .	. .	. .	. . .	215.0	14	24 1/2	10	1 1/4	. . .	14
6	. .	. .	. . .	. .	. .	. . .	400.0	17 1/2	30	12 1/2	1 7/16	. . .	18

**Face to face dimensions include the height of the facings. End flange thicknesses include the 1/16-inch raised face, but not the 1/4-inch male face.*

For 600-pound drilling templates applying to sizes 2-inch and smaller, see page 330. For 300-pound drilling templates applying to sizes 2 1/2-inch and larger, see page 329.

Forged Steel Monel Trimmed Globe Valves



Cross Section, Screwed

Weights — Pounds, Each

Size	No. 3644 A Globe Screwed	No. 3656 A Globe Flanged
Inches		
1/2	6.0	11.0
3/4	9.5	17.5
1	14.0	22.0
1 1/2	29.5	42.0
2	48.0	62.0

Dimensions and tests of the Nos. 3644 A and 3656 A are the same, respectively, as those for the Nos. 3644 XW and 3656 XW valves shown on pages 138 and 139.

Teflon Packed — For Corrosive Services

These rugged valves are patterned after the 600-Pound Forged Steel Globe Valves shown on pages 138 and 139.

Recommendations: No. 3644 A and No. 3656 A Valves are used on refining units in the petroleum industry and for various processes in chemical plants where high quality Monel trimmed steel globe valves are desired.

The valves offer good service in hydrofluoric alkylation units handling anhydrous H.F., and where mixtures of the acids and hydrocarbons are found. They are not recommended for aqueous solutions of hydrofluoric acid where the concentration drops below 80 per cent H.F.

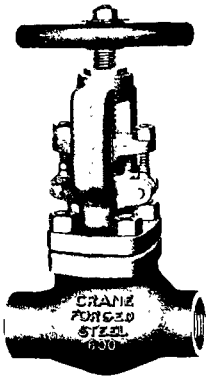
Materials and design: The valve body and one-piece bonnet and yoke are made of carbon forged steel (ASTM A 105, Grade II). The male and female body-bonnet joint is fitted with a soft iron gasket and Triplex steel studs. The valves have a ball-to-35° seat. The disc, body seat ring, stem, and disc stem ring are Monel. Stainless steel swinging eye bolts hold the forged steel one-piece gland and gland flange rigidly in place.

Stuffing box: The wide, deep stuffing box is filled with Teflon packing to provide a tight stem seal, long packing life, and maximum safety.

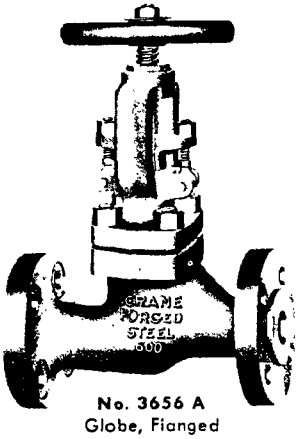
Flanged valves: End flange and face to face dimensions conform, respectively, to the 600-Pound American Standards B16 5-1957 for Steel Pipe Flanges and B16.10-1957 for Face-to-Face Dimensions of Ferrous Globe Valves. End flanges have a 1/4-inch high large male face with a serrated finish; for drilling templates, see page 330.

Flanged valves will be furnished faced, drilled, and spot faced, unless "faced only" is specified.

Monel trimmed steel gate valves . . . . page 120



No. 3644 A
Globe, Screwed

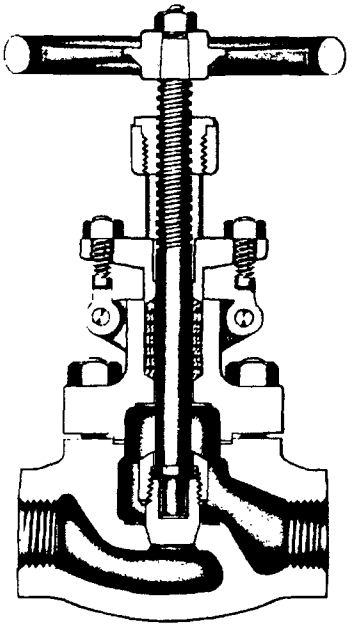


No. 3656 A
Globe, Flanged

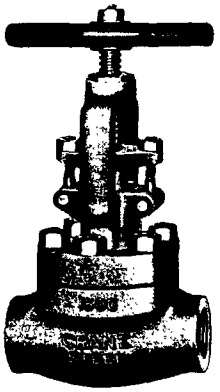
Prices on Request

13

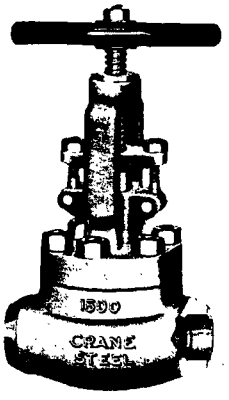
Screwed and Socket-Welding
1500-Pound Cast Steel Globe Valves
Bolted Bonnet — Outside Screw and Yoke



Cross Section, Screwed



No. 3844 U
Globe, Screwed



No. 3852 U
Globe, Socket-Welding

Hydrostatic Test Pressures
Shell—**5400** psi Seat—**3700** psi

Valve seat is tested 100 psi air-under-water.

These small 1500-pound valves except for heavier, more rugged metal sections are similar to, and feature the same swivel plug disc design as, the 600-pound bolted bonnet valves described on pages 138 and 139.

Recommendations: The valves 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 lines.

Equipped with Class "U" trim, the valves are suitable for steam, water, air, gas, oil, oil vapor, and general service at temperatures up to 1000 F.

Materials: The body and yoke bonnet are cast from carbon steel conforming to ASTM A 216, Grade WCB. The male and female body-bonnet joint has a steel gasket to assure tightness and ease of maintenance. Body studs are Triplex steel. The stem is Exelloy, an AISI Type 410 stainless steel. Precision cut stem threads assure smooth operation.

The body has an integral seat. Both the seat and the carbon steel disc are faced with Stellite and offer excellent resistance to wear.

Wheels are made of malleable iron. Sizes ½ and ¾-inch have a Style "A" dished design wheel with round gripping knobs around the outer edge (not illustrated).

Working Pressures
Steam, Water, Oil, Oil Vapor

Temperature Fahr.	Psi Non-Shock	Temperature Fahr.	Psi Non-Shock
100°	3600	650°	2580
150	3550	700	2350
200	3500	750	2125
250	3450	800	1830
300	3415	850	1500
350	3375	875	1305
400	3330	900	1115
450	3255	925	945
500	3125	950	770
550	2955	975	600
600	2770	1000	430

Design features: In addition to their compact, durable construction, the valves 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.

The bolted gland avoids threading . . . . and thereby weakening of . . . . the yoke legs. Stainless steel swinging eye bolts hold the steel one-piece gland and gland flange rigidly in place; the bolts will not come off in service. The packing load is easily adjusted.

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

Standard: Socket-welding valves comply with American Standard B16.11-1946 for end dimensions.

Weights and Dimensions — Prices on Request

Size	Pounds, Each		Dimensions, in Inches						
			Screwed		Socket-Welding			All Valves	
Inches	No. 3844 U Screwed Ends	No. 3852 U Socket-Welding	End to end	Center to end	End to end	Center to end	Depth of socket	Center to top, open	Dia of wheel
½	12.4	12.4	4¼	2⅛	4⅛	2 1/16	⅝	10	4
¾	16.0	16.0	5½	2¾	5⅜	2 11/16	11/16	9⅝	5
1	25.0	25.0	6¼	3⅛	6⅛	3 1/16	¾	11⅛	7
1¼	39.0	39.0	7¼	3⅝	7⅛	3 9/16	13/16	13¼	8
1½	46.0	46.0	7½	3¾	7⅜	3 11/16	⅞	14¼	9
2	88.0	88.0	9½	4¾	9⅜	4 11/16	1	17⅛	14

Description of materials . . . Section 2

Cast Steel Globe and Angle Valves

Working Pressures

For Valves Described on Pages 144 to 149

Valves with "XR" trim.....for steam up to 850 F.....for water, air, gas, or oil up to 500 F
Valves with "X" trim.....for oil or oil vapor up to 1100 F
Valves with "U" trim.....for steam up to 1200 F.....for oil or oil vapor up to 1200 F

Temp.	Working Pressures—Pounds per Square Inch, Non-Shock For 150-Pound Screwed Valves and 150 to 2500-Pound Flanged or Butt-Welding End Valves												
	Carbon Steel[1] (ASTM A216, Grade WCB)							No. 5 Chromium-Molybdenum Alloy Steel (ASTM A217, Grade C5—made to order)					
Deg. Fahr.	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound
100°	275	720	960	1440	2160	3600	6000						
150	255	710	945	1420	2130	3550	5915						
200	240	700	930	1400	2100	3500	5830						
250	225	690	920	1380	2070	3450	5750						
300	210	680	910	1365	2050	3415	5690	At temperatures lower than 700 F, ratings for these valves are the same as those shown at the left for the Carbon Steel Valves.					
350	195	675	900	1350	2025	3375	5625						
400	180	665	890	1330	2000	3330	5550						
450	165	650	870	1305	1955	3255	5430						
500	**150**	625	835	1250	1875	3125	5210						
550	140	590	790	1180	1775	2955	4925						
600	130	555	740	1110	1660	2770	4620						
650	120	515	690	1030	1550	2580	4300						
700	110	470	635	940	1410	2350	3920	485	645	965	1450	2415	4025
750	100	425	575	850	1275	2125	3550	450	600	900	1350	2250	3745
800	92	365	490	730	1100	1830	3050	415	555	835	1250	2080	3470
850	[2]82	[3]**300**	[2]**400**	[2]**600**	[2]**900**	[2]**1500**	[2]**2500**	385	510	765	1150	1915	3190
875	[2]75	[2]260	[2]350	[2]525	[2]785	[2]1305	[2]2180	365	490	735	1100	1830	3055
900	[2]70	[2]225	[2]295	[2]445	[2]670	[2]1115	[2]1855	350	465	700	1050	1750	2915
925	[2]60[3]	[2]190[3]	[2]250[3]	[2]375[3]	[2]565[3]	[2]945[3]	[2]1570[3]	335	445	665	1000	1665	2775
950	[2]55[3]	[2]155[3]	[2]205[3]	[2]310[3]	[2]465[3]	[2]770[3]	[2]1285[3]	315	420	635	950	1585	2640
975	[2]50[3]	[2]120[3]	[2]160[3]	[2]240[3]	[2]360[3]	[2]600[3]	[2]1000[3]	**300**	**400**	**600**	**900**	**1500**	**2500**
1000	[2]40[3]	[2]85[3]	[2]115[3]	[2]170[3]	[2]255[3]	[2]430[3]	[2]715[3]	250	335	500	750	1250	2085
1025	...	...	...	...	...	...	...	215	285	430	645	1070	1785
1050	...	...	...	...	...	...	...	180	240	355	535	890	1485
1075	...	...	...	...	...	...	...	145	195	290	435	730	1215
1100	...	...	...	...	...	...	...	115	150	225	340	565	945
1125[4]	...	...	...	...	...	...	...	95	125	190	285	470	785
1150[4]	...	...	...	...	...	...	...	75	100	150	225	375	630
1175[4]	...	...	...	...	...	...	...	65	85	125	190	315	530
1200[4]	...	...	...	...	...	...	...	50	70	105	155	255	430

[1]Where welded construction is used, consideration should be given to the possibility of graphite formation on Carbon Steel at temperatures above 775 F.

[2]Product used within the jurisdiction of Section 1, Power Boilers of the ASME Boiler and Pressure Vessel Code, is subject to the same maximum temperature limitations placed upon the material in Table P7, 1959 edition thereof.

[3]Product used within the jurisdiction of Section 1, Power Piping of the ASA Code for Pressure Piping, B31.1, is subject to the same maximum temperature limitations placed upon piping of the same general composition in Table 2a, 1955 edition thereof.

[4]Consideration should be given to the possibility of excessive oxidation (scaling) when No. 5 Chromium-Molybdenum Steel is used at temperatures above 1100 F.

Recommendations: Valves with "XR" trim are particularly satisfactory for steam, water, air, gas, and other non-lubricating, relatively non-corrosive fluids such as gasoline, fuel oil, etc.; also for oil of low viscosity such as used in hydraulic systems, especially where seating loads are extremely high. They are recommended for temperatures up to 850 F on steam and up to 500 F on all other services.

Valves with "X" trim should be used for oil or oil vapor at temperatures over 500 F (up to 1100 F) and for most corrosive and unrefined oils regardless of temperature. For lubricating oils up to 500 F, either "X" or "XR" should give equal satisfaction.

Valves with "U" trim are provided primarily for high temperature steam, oil, and oil vapor service or where a premium trim is desired for extremely severe service conditions.

Cold service: Between minus 20 F and plus 100 F, ratings shown in the table for 100 F will apply. For temperatures below minus 20 F, steels with suitable impact strength must be used; pressure ratings for such steels will be the same as shown for 100 F.

Gaskets: The use of these ratings for flanged valves requires gaskets conforming to requirements set forth in ASA B16.5-1957. The user is responsible for selecting gaskets of dimensions and materials capable of withstanding the required bolt loading without injurious crushing, as well as being suitable for the service conditions in all other respects.

Flange facings: Flanged valves of the 150 and 300-pound pressure classes regularly have 1/16-inch raised faces; those of 400-pound and higher pressure classes have 1/4-inch male faces.

ASA and API Standards: Crane pressure-temperature ratings agree with ratings listed in the American Steel Flange Standard, B16.5-1957, and in the American Petroleum Institute (API) Standard No. 600, Fourth Edition, 1958.

Cast Steel Globe and Angle Valves

Hydrostatic Test Pressures, in Psi

Pressure Class	Screwed Valves		Flanged and Butt-Welding Valves	
	Shell	Seat	Shell	Seat
150-Pound	425	350	425	350
300-Pound	...	...	1100	775
400-Pound	...	...	1450	1000
600-Pound	...	...	2175	1550
900-Pound	...	...	3250	2250
1500-Pound	...	...	5400	3700

Valve seats are tested 100 psi air-under-water.

For working pressures, see page 143.

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 suited. Oil services are more efficiently served by a ball-shaped disc contacting a beveled seat in a line bearing.

To avoid the difficulties attending the operation of the larger size or higher pressure valves when used under maximum working pressures, these valves are regularly furnished with gearing. In addition to facilitating operation, the gearing assures accurate regulation of flow.

The valves are available in a wide range of sizes, in 150, 300, 400, 600, 900, 1500, and 2500-pound pressure classes, and with screwed, flanged, or butt-welding ends, as required. Prices of valves of each pressure class, as well as dimensions of the 2500-pound valves, are furnished on request.

Regularly furnished with various kinds of trim as described below, 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

Valves of all pressure classes are regularly made of Crane Carbon Steel, conforming to ASTM Specification A 216, Grade WCB.

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 under the valve illustrations on page 146 and also in the weight table on page 147.

When specified, the valves can be made to order of Crane No. 5 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade C 5), as well as a variety of other alloy steels. Crane cast carbon and alloy steels are described in detail on pages 6 and 7.

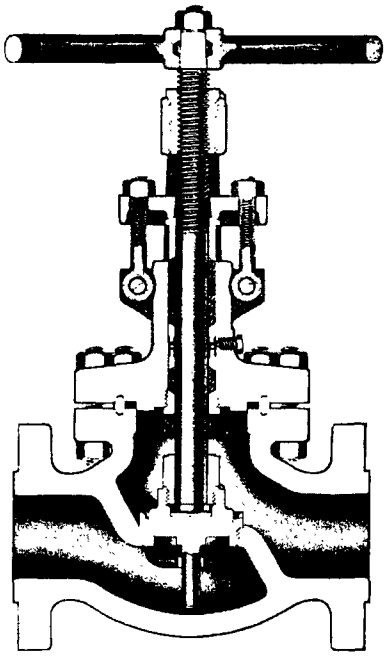
Valves made of Crane No. 5 Alloy Steel are recommended particularly for extremely severe oil or oil vapor services.

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	Body and Bonnet	Carbon Steel						
	Disc	Exelloy						‡Exelloy
	Body Seat Ring	Exelloy						
	Stem	Exelloy						
	Bonnet Gasket	Corrugated Soft Iron		Soft Steel Ring Joint Gasket				
	Bonnet Stud Bolts	Triplex Steel (150-pound valves are furnished with studs.)						
*Class "XR" Steam, Water, or Oil	Body and Bonnet	Carbon 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 Stud Bolts	Triplex Steel (150-pound valves are furnished with studs)						
*Class "U" Steam, Water, Oil, or Oil Vapor	Body and Bonnet	Not listed	Carbon Steel					
	Disc		Stellite-Faced Carbon Steel					
	Body Seat Ring		Stellite-Faced Carbon Steel					
	Stem		Exelloy					
	Bonnet Gasket		§Soft Iron	Soft Steel Ring Joint Gasket				
	Bonnet Stud Bolts		Triplex Steel					

*For detailed service recommendations, see page 143. ‡Exelloy or Exelloy-Faced Carbon Steel §Corrugated Soft Iron

Additional description....pages 145 to 148
2500-pound valves.....page 149
Sizes and weights....page 147
Dimensions.....page 148
Gearing.....page 149
Description of materials....Section 2

Cast Steel Globe and Angle Valves



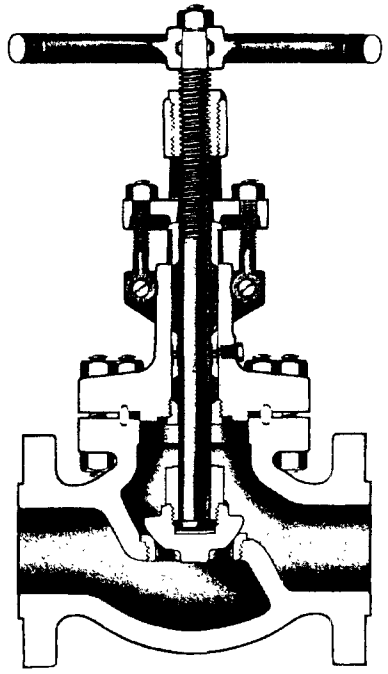
Plug Type Disc

Crane Steel Globe and Angle Valves embody many refinements in design and materials.

Disc and seat: The "XR" trimmed valves (for steam, water, or general service) and "U" trimmed valves (for steam, water, oil, or oil vapor service) in sizes 6-inch and smaller have a plug type disc and seat (illustrated at left); the 8-inch size has a flat disc and seat (not illustrated). The 2-inch valves do not have a disc stem guide.

All sizes of "X" trimmed valves (for oil or oil vapor service) are furnished with a 35° taper seat and a ball shaped seating face on the disc (illustrated at right).

Body seat ring: All valves have the shoulder-type screwed-in body seat ring for utmost tightness and security; in "U" trimmed valves, the rings are also seal brazed or seal welded.



Ball Type Disc

Body and bonnet: The body and bonnet have heavy metal sections with liberal reinforcement at points subjected to greatest stress. The bonnet is fitted with a stem hole bushing.

Bonnet joint: A ring-type bonnet joint holds pressure easily on the 400, 600, 900, 1500, and 2500-pound valves, assuring tightness and maximum strength. On 150 and 300-pound valves, a close-fitting male and female bonnet joint retains the gasket and accurately centers the working parts.

The 300-pound and higher pressure valves have through stud bolts in the bonnet joint. The 150-pound valves employ studs, threaded into the bonnet flange on the body.

Stuffing box: The stuffing box on all valves is deep, assuring tightness and long packing life. The stuffing box is the lantern-type on all except the 150-pound valves. When wide open, the valves can be repacked while under pressure.

Gland: A two-piece ball-type gland and gland flange assure even pressure on the packing without binding on the stem. The gland flange is held in place by swinging eye bolts; the bolts will not loosen in service.

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 (FD & SF) unless otherwise ordered. When orders so specify, flanged valves can be furnished faced only.

Flange facings: The 150 and 300-pound flanged valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges; the 400, 600, 900, 1500, and 2500-pound flanged valves regularly have a 1/4-inch male face (large male).

When so ordered, valves can be furnished with other types of facings, such as ring joint, female, tongue, groove, etc.; see pages 332 to 335.

Finish of flange faces: The 1/16-inch raised faces of the 150 and 300-pound valves and the 1/4-inch male faces of the 400-pound and higher pressure class valves are regularly furnished with a serrated finish.

A smooth finish can be furnished on the raised or male faces, when specified.

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 butt-welding valve ends and the dimensions and drilling of end flanges on flanged valves conform to the American Steel Flange Standard, B16.5-1957, for their respective pressure class.

Flanged and butt-welding valves conform to the American Standard for Face-to-Face and End-to-End Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957, for their respective pressure class. This Standard does not include 3 1/2-inch steel valves.

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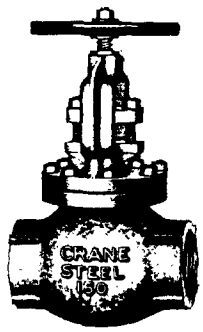
Pressure-temperature ratings....page 143 *Specification of materials.....page 144* *Sizes and weights....page 147*
Service recommendations.....page 143 *Catalog numbers....pages 146 and 147* *Dimensions.....page 148*

Cast Steel Globe and Angle Valves

For ratings, materials, and general description, see pages 143 to 145.



Globe, Screwed
No. 142 X or XR.....150-Pound

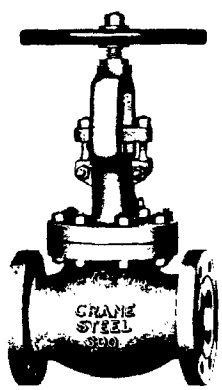
Crane Cast Steel Globe and Angle Valves are regularly furnished in the types and pressure classes listed on this page; for sizes and weights, see the facing page.

"X" suffixed catalog numbers indicate valves suitable for oil or oil vapor service . . . . "XR" suffixed catalog numbers indicate valves suitable for steam, water, oil, and general service . . . . and "U" suffixed catalog numbers indicate valves for steam, water, oil, or oil vapor service.

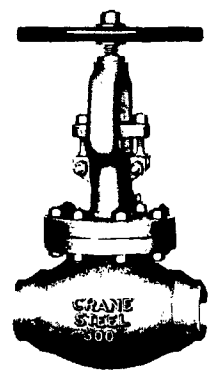
For complete service recommendations and pressure-temperature ratings, see page 143; for specification of materials, see page 144.

Ball-bearing yoke; gearing: In the larger sizes of the 300-pound and higher pressure classes, the valves are regularly equipped with a ball-bearing yoke and either bevel or spur gearing; for sizes so equipped, refer to the right hand column in the table on the facing page.

Gearing is described on page 149; orders must specify whether bevel or spur gears are wanted. Also, if specified, such sizes can be furnished without gears (plain bearing yoke).



Globe, Flanged
No. 143 X, XR.....150-Pound
No. 151 X, XR, or U.....300-Pound
No. 161 X, XR, or U.....400-Pound
No. 171 X, XR, or U.....600-Pound
No. 183 X, XR, or U.....900-Pound
No. 189 X, XR, or U.....1500-Pound



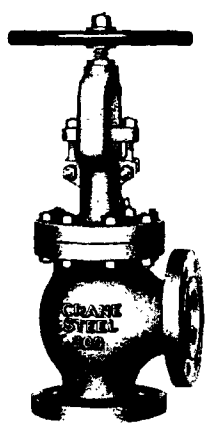
Globe, Butt-Welding
No. 143½ X, XR.....150-Pound
No. 151½ X, XR, or U.....300-Pound
No. 161½...XR, or U.....400-Pound
No. 171½ X, XR, or U.....600-Pound
No. 183½ X, XR, or U.....900-Pound
No. 189½ X, XR, or U....1500-Pound

Drilling: Flanged valves are regularly furnished faced, drilled, and spot faced to the corresponding pressure class of the American Steel Flange Standard, B16.5-1957. They can be furnished faced only, when specified.

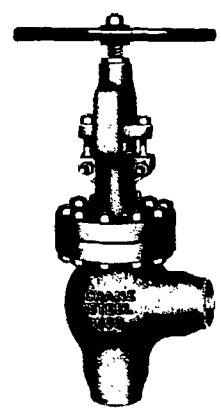
Butt-welding valves: Unless otherwise ordered, 150 and 300-pound butt-welding valves are bored to match the inside diameter of Standard pipe (the heaviest weight on the 8-inch size). For all other pressure classes, orders must specify the diameter of the bore (inside diameter of pipe).

By-pass: The valves can be equipped with a by-pass when specified; information on request.

Motor operation: To facilitate operation, the valves can be equipped with an electric, air, or gas motor; see pages 266 to 270.



Angle, Flanged
No. 145 X, XR.....150-Pound
No. 153 X, XR, or U.....300-Pound
No. 163 X, XR, or U.....400-Pound
No. 173 X, XR, or U.....600-Pound
No. 185 X, XR, or U.....900-Pound



Angle, Butt-Welding
No. 173½ X, XR, or U....600-Pound

When ordering, be sure to specify the catalog number and suffix.

Sizes smaller than listed on the facing page: When 600-pound valves are desired in sizes smaller than listed, use the forged steel valves described on pages 138 and 139.

When 400 and 900-pound flanged and butt-welding globe valves are desired in sizes smaller than listed, use valves of the next higher pressure class.

When 1500-pound screwed and socket-welding globe valves are desired in sizes 2-inch and smaller, use the steel valves shown on page 142.

Ordering: Orders should specify the catalog number and suffix.

For sizes and weights, see the next page; for dimensions, see page 148.

Cast Steel Globe and Angle Valves

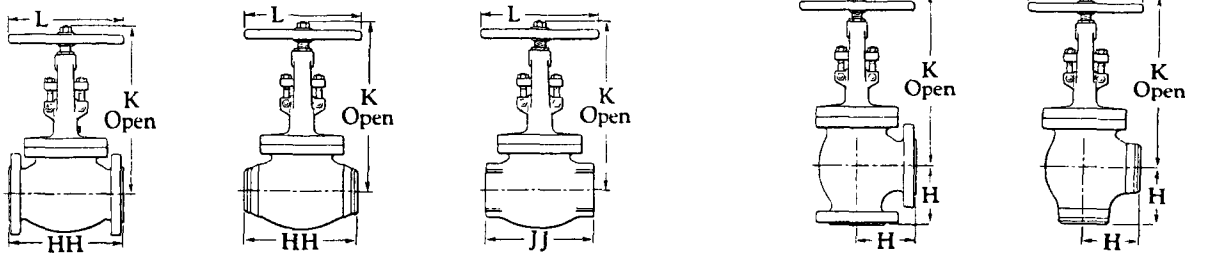
Types, Sizes, and Weights — Prices on Request

Valve Type	Pressure Class	Valve Ends	Catalog No.	Weights in Pounds, Each For Valve Sizes (Inches) Indicated								Sizes Regularly Furnished with Ball-Bearing Yoke & Gears
				2	2½	3*	3½	4	5	6	8	
Globe	150-Pound	Screwed	142 X	41	. .	. . .	. . .	.	. . .	. . .	. . .	. . .
			142 XR	41	. .	. .	. .	.	. . .	.	. .	
		Flanged	143 X	47	64	80	.	140	. .	250	420	
			143 XR	47	64	80	100	140	190	250	420	
		Butt-Welding	143½ X	34	. . .	75	. . .	120	. .	220	. .	
			143½ XR	34	53	75	. .	120	150	220	395	
	300-Pound	Flanged	151 X	82	90	120*	. .	220	. .	390	740	8-inch
			151 XR	82	90	120*	170	220	280	390	740	
			151 U	82	90	120*	170	220	280	390	740	
		Butt-Welding	151½ X	62	80	105	. .	180	. . .	350	640	
			151½ XR	62	80	105	. . .	180	. . .	350	640	
			151½ U	62	80	105		180	.	350	640	
	400-Pound	Flanged	161 X	Use 600-Pound Valves.				250	350	500	820	6 and 8-inch
			161 XR					250	350	500	820	
			161 U					250	350	500	820	
		Butt-Welding	161½ XR	Use 600-Pound Valves			. .	230	315	510	900	
			161½ U				. .	230	315	510	900	
	600-Pound	Flanged	171 X	90	110	160*	215	320	480	640	. . .	5 and 6-inch
			171 XR	90	110	160*	215	320	480	640	. . .	
			171 U	90	110	160*	215	320	480	640	. . .	
		Butt-Welding	171½ X	78	100	130	. . .	230	450	560	. . .	
			171½ XR	78	100	130	. . .	230	450	560	. . .	
			171½ U	78	100	130		230	450	560	. .	
	900-Pound	Flanged	183 X	Use the 1500-Pound Valves listed below.		225	. . .	390	. . .	920	. . .	4 and 6-inch
			183 XR			225	. . .	390	. .	920	. . .	
			183 U			225	. .	390	. . .	920	. . .	
		Butt-Welding	183½ X			180	. . .	330	. . .	650	. . .	
			183½ XR			180	. .	330	. .	650	. . .	
			183½ U			180	.	330	.	650	. . .	
	1500-Pound	Flanged	189 X	215	320	460	. .	. . .	. . .	. . .	. . .	3-inch
			189 XR	215	320	460	. . .	. . .	. . .	. . .	. . .	
			189 U	215	320	460	.	. . .	. . .	. . .	. . .	
		Butt-Welding	189½ X	160	265	425	. . .	.	. . .	. . .	. . .	
			189½ XR	160	265	425	. .	.	. . .	. .	. . .	
			189½ U	160	265	425	. .	. . .	. . .	. .	. . .	
Angle	150-Pound	Flanged	145 X	38	56	70	. . .	110	. . .	210	360	. . .
			145 XR	38	56	70	. .	110	160	210	360	
	300-Pound	Flanged	153 X	72	90	120*	. . .	200	. . .	370	680	8-inch
			153 XR	72	90	120*	. . .	200	. . .	370	680	
			153 U	72	90	120*	150	200	285	370	680	
	400-Pound	Flanged	163 X	. .	Use 600-Pound Valves.			235	340	385	685	6 and 8-inch
			163 XR	. .				235	340	385	685	
			163 U					235	340	385	685	
	600-Pound	Flanged	173 X	. .	120	180*	200	315	500	630	. . .	5 and 6-inch
			173 XR	. . .	120	180*	200	315	500	630	. . .	
			173 U	. . .	120	180*	200	315	500	630	. .	
		Butt-Welding	173½ X	. . .	110	130	. . .	170	370	490	. . .	
			173½ XR	. .	110	130	. . .	170	370	490	. . .	
			173½ U	.	110	130	. .	170	370	490	. .	
	900-Pound	Flanged	185 X	. . .	. . .	230	. . .	370	. . .	1000	. . .	4 and 6-inch
			185 XR	. .	.	230	. . .	370	.	1000	. . .	
			185 U	. . .	. .	230	.	370	.	1000	. . .	

*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 334 for dimensions

General description . . . . . pages 143 to 146
Dimensions . . . . . page 148
Gearing and 2500-pound valves . . . . page 149

Cast Steel Globe and Angle Valves



Globe Flanged | Globe Butt-Welding | Globe Screwed | Angle Flanged | Angle Butt-Welding

Dimensions, in Inches

All dimensions shown below apply to valves without gears; dimensions "HH" and "H" apply also to valves with gears. For sizes regularly furnished with gears, see asterisked (*) note at right.

Class	Size	Globe Valves						Angle Valves		All Valves
		Flanged		Butt-Welding		Screwed		Flanged or Butt-Welding†		
		HH	K	HH	K	JJ	K	H	K	L
150 Pound	2	8	13¾	8	13¾	8	13¾	4	12½	8
	2½	8½	14½	8½	14½	. .	. .	4¼	13	8
	3	9½	16½	9½	16½	. .	. .	4¾	15	9
	3½	10½	17¼	. . .	. . .	. .	. .	. . .	. . .	9
	4	11½	19¾	11½	19¾			5¾	17¾	10
	5	14	23	14	23			7	20¾	10
	6	16	24½	16	24½	. .	. .	8	21¾	12
	8	19½	26	19½	26			9¾	23½	16
300 Pound	2	10½	17¾	10½	17¾	. .	. .	5¼	17¾	9
	2½	11½	19	11½	19			5¾	19	10
	‡3	12½	20½	12½	20½	. .	. .	6¼	20½	10
	3½	13¼	22½		. . .			6⅝	22½	12
	4	14	24¾	14	24¾	. .	. .	7	24¾	14
	5	15¾	26½	. . .	. . .	. . .	. .	7⅞	26½	16
	6	17½	29¾	17½	29¾	. .	. .	8¾	29¾	18
	8	22	36½	22	36½			11	36½	24
400 Pound	4	16	25¼	16	25¼	. .	. .	8	25¼	14
	5	18	28½	18	28½			9	28½	18
	6	19½	31¼	19½	31¼	. .	. .	9¾	31¼	20
	8	23½	38¼	23½	38¼			11¾	38¼	27
600 Pound	2	11½	19	11½	19	. .	. .	. . .	. . .	10
	2½	13	21¼	13	21¼			6½	21¼	12
	‡3	14	23½	14	23½			7	23½	12
	3½	15	25					7½	25	14
	4	17	27½	17	27½	. .	. .	8½	27½	18
	5	20	30¾	20	30¾			10	30¾	20
	6	22	35	22	35			11	35	24
900 Pound	3	15	24	15	24	. .	. .	7½	24	12
	4	18	29½	18	29½			9	29½	20
	6	24	37¾	24	37¾			12	37¾	27
1500 Pound	2	14½	25⅛	14½	25⅛	. .	. .	. .	. .	14
	2½	16½	28⅛	16½	28⅛					18
	3	18½	33½	18½	33½					24

†Angle butt-welding valves are made only in the 600-pound class in sizes 2½, 3, 4, 5, and 6-inch

‡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 334 for dimensions.

Pressure-temperature ratings . . . . page 143
General description . . . . . pages 144 to 147
2500-pound valves . . . . . page 149
Templates for drilling . . . . pages 329 to 331
Special facings . . . . . pages 332 to 335
Taps and drains for valves . . . . . page 403

***Ball-bearing yoke; gearing:** Crane Cast Steel Globe and Angle Valves, in the larger sizes of the 300-pound and higher pressure classes, are regularly furnished with a ball-bearing yoke and spur or bevel gears, as follows:

300-Pound 8-inch
400-Pound . . . . . 6 and 8-inch
600-Pound . . . . . 5 and 6-inch
900-Pound . . . . . 4 and 6-inch
1500-Pound 3-inch

Orders must state whether spur or bevel gears are wanted; see page 149 for description.

When specified, the above valves can be furnished without gears (plain bearing yoke).

Note: All dimensions apply to valves without gears. Face to face (HH) and center to face (H) dimensions also apply to valves with gears; for additional dimensions of geared valves; see page 149.

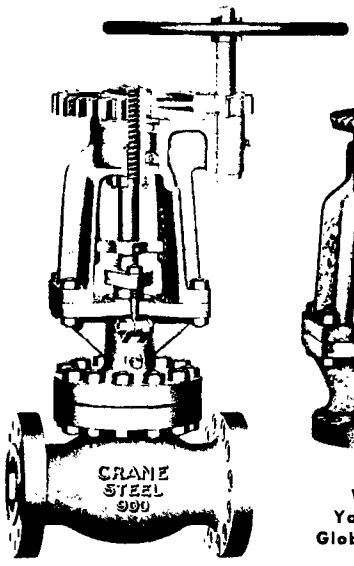
Face to face: The 150 and 300-pound flanged valves are regularly furnished with a 1/16-inch raised face; valves of the 400-pound and higher pressure classes have a ¼-inch high large male face. The face to face (HH) and center to face (H) dimensions include this facing.

Flanged and butt-welding valves conform to the American Standard for Face-to-Face Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957. This Standard does not include steel valves in the 3½-inch size.

Ordering: When ordering, specify catalog number and suffix; see preceding page.

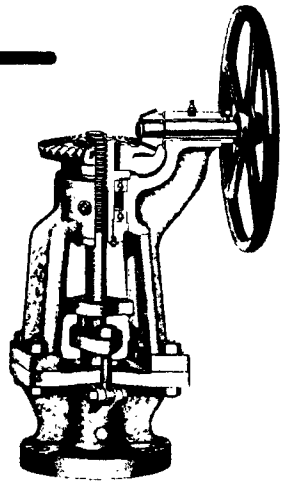
Catalog Nos. and weights. . page 147

Gearing for Cast Steel Globe and Angle Valves



Spur Gearing With Ball-Bearing Yoke Sleeve for Steel Globe and Angle Valves

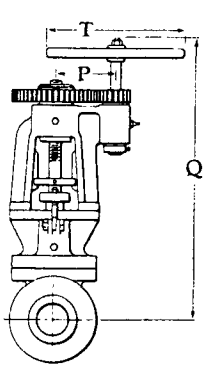
Gearing, bonnet, and yoke are shown turned 90° from position regularly furnished



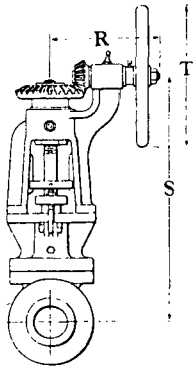
Bevel Gearing With Ball-Bearing Yoke Sleeve for Steel Globe and Angle Valves

Large size or high pressure steel globe and angle valves without gearing would be difficult to open or close when used at the maximum recommended working pressures Such valves, therefore, are regularly equipped with a ball-bearing yoke sleeve and either bevel or spur gearing; for valves so furnished, see table.

In addition to facilitating operation, the gearing provides closer control of flow under the severest service conditions.



Spur Geared



Bevel Geared

Bevel gearing: Globe and angle valves equipped with bevel gearing will have the pinion shaft extending at right angles to the run of the valve with the handwheel *on the left side* when facing the port opening from above the valve seat.

Spur gearing: Spur gearing will have the pinion shaft, extending upward, parallel to the main valve stem, with the handwheel above the gearing and *on the left side* when facing the port opening from above the valve seat.

Ordering: Orders should specify whether bevel or spur gears are wanted. Orders for gearing placed in positions other than those mentioned above must clearly indicate what is wanted.

Dimensions, in Inches

Valve		Spur		Bevel		T
Class	Size	P	Q	R	S	
300-Pound	8	9⅜	44	15	38	20
400-Pound	6	8⅝	40¼	13¼	34½	18
	8	10¾	48½	17¼	41¾	24
600-Pound	5	8⅝	40½	13¼	34¾	18
	6	9⅜	43¼	15	37¼	20
900-Pound	4	8⅝	39¾	13¼	34	18
	6	10¾	47¼	17¼	40½	24
1500-Pound	3	9⅜	42½	15	36½	20
2500-Pound	On application					

Dimensions not shown are the same as for valves without gears; see page 148

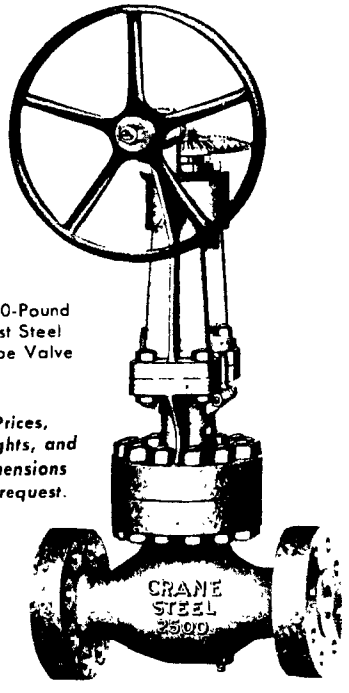
2500-Pound Cast Steel Globe and Angle Valves

Crane 2500-Pound Cast Steel Globe and Angle Valves are available in the 1½, 2, 2½, 3, 4, 5, and 6-inch sizes, with either flanged or butt-welding ends. In addition, the globe valves are made in the ¾, 1, and 1¼-inch sizes, with either butt or socket-welding ends.

The valves can be furnished with Class "X" trimming for oil and oil vapor or with Class "U" trimming for steam, water, oil, and oil vapor. The "U" trimmed valves have a plug type disc; the "X" trimmed have 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 143
General description and specifications of materials....pages 144 and 145

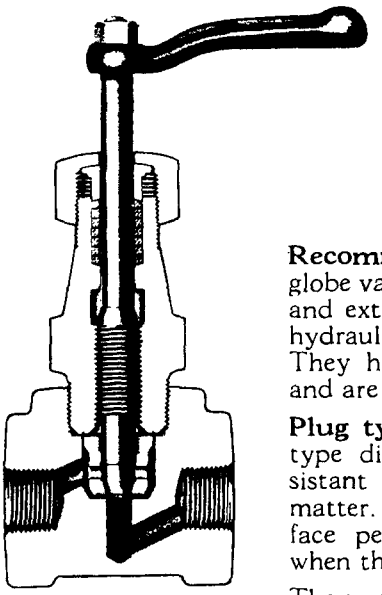


2500-Pound Cast Steel Globe Valve

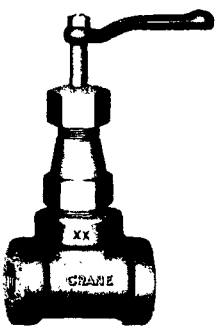
Prices, weights, and dimensions on request.

For high-pressure, high-temperature steam, boiler feed, and similar service in central stations and industrial plants, Crane Pressure-Seal and Lip-Seal Bonnet Valves are available. They embody many excellent features which contribute to long life and efficient operation Refer to Section 15

6000-Pound Hydraulic
Forged Steel Globe Valves
Plug Type Disc



Cross Section
Globe



No. 225 H
Globe
Screwed

The 1¼-inch size (not illustrated) has a bolted bonnet and a separate disc and stem.

Working Pressure
6000 psi cold water or oil, non-shock

Test Pressure
6500 psi hydrostatic

Recommendations: These forged steel globe 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.

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

The seat bushing is made of Exelloy and can be renewed easily. The disc is made of bronze.

Body and bonnet: The body is a solid forging and is made of steel conforming to requirements of ASTM Specification A 105, Grade II. The bonnet, made of bronze, is screwed into the body on sizes 1-inch and smaller and is bolted to the body on the 1¼-inch size.

Disc-stem connection: Sizes 1-inch and smaller have an integral disc and stem, as illustrated in the cross section at the left; the 1¼-inch size has a separate disc and stem with a swivel type connection.

The stem, in all sizes, is bronze.

Stuffing box: The valve stuffing box is large and deep, is filled with high grade packing, and 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.

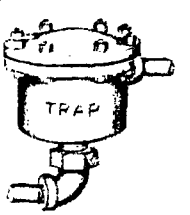
Weights and Dimensions — Prices on Request

	Size	Weight	Dimensions, in Inches			
	Inches	Pounds Each	End to end	Center to end	Center to top, open	Center to end of handle
No. 225 H Globe	¼	3.6	2⅞	1 7/16	6¾	3⅛
	⅜	3.6	2⅞	1 7/16	6¾	3⅛
	½	6.0	3⅝	1 13/16	7⅝	3½
	¾	14.5	5	2½	9¾	4¼
	1	20.0	5¼	2⅝	10¾	5
	1¼	37.0	7	3½	12⅝	5¾

13

Stop Drainage Waste!

When steam lines or steam heated equipment are not fully drained, waste is inevitable. All too frequently accumulation of condensate robs steam of its heat. Excessive heating costs, unsatisfactory operation, and sometimes damaged equipment are the results.



Crane Inverted Open Float Steam Traps provide a complete and efficient method of handling condensate from piping, coils, heaters, and steam heated equipment of many kinds. Low in price and simple in design, they give long and trouble-free service. See pages 250 and 251.

SECTI

Crane Steel

(Including P

Forged Steel Lift Check
600-Pound, Union Cap.....
600-Pound, Bolted Cap.....
6000-Pound Hydraulic.....

Cast Steel Lift and Swing Check
(2-inch and Smaller)
600-Pound Ball Check.....
600-Pound Swing Check.....

Cast Steel Swing Check
(150, 300, 400, 600, 900, and 1500-Po
Pressure-Temperature Ratings.....
Specification of Materials.....
Description.....
Sizes, Weights, and Dimensions.....

With Lever and Weight.....
2500-Pound.....page .

Cast Steel Pipe-Line Swing Check
Class 600.....page 155

Crane forged steel check valves, and cast steel check valves indicated above as being available in sizes 2-inch and smaller, are frequently considered general utility valves. They are used in a wide variety of services, often at pressures and temperatures lower than the recommended maximum.

The cast steel swing check valves of the 150 to 2500-pound pressure classes, in general, are similar in design. The valves are available in each of the American Standard pressure classes; depending on the pressure class, they range in sizes as small as 1¼-inch to sizes as large as 16-inch.

For related data, and for complete description of other Crane steel products, refer to:

Gaskets for steel flanged joints.....page 323
Templates for drilling.....pages 329 to 331
Pipe volume, per lineal foot.....page 354
Fabricated piping.....pages 355 to 380
Proper sizing of check valves.....page 427

Steel stop-check valves, Pressure-Seal Bonnet.....pages 170 to 173
Steel stop-check valves, bolted bonnet.....pages 219 to 225
Steel sediment separators.....page 254

Steel globe and angle valves.....Section 13
Steel Pressure-Seal and Lip-Seal Bonnet Valves.....Section 15
Corrosion-resistant alloy valves.....Section 17
Steel valves for special and extreme services.....Section 21

Steel screwed fittings, unions, and flange unions.....Section 24
Steel welding fittings.....Section 25
Steel flanges.....Section 26

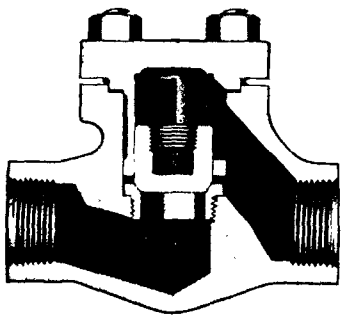
eel Lift Check Valves

Bolted Cap

ecks for high
and oil lines

	Each	
	.ed Cap	
	No. ›82 X ›ocket-Welding	No. 3686 X Flanged FD & SF
	3.8	8.0
	5.7	13.0
.0	8.0	17.0
10.0	10.0	21.0
20.5	20.5	33.0
32.0	32.0	50.0

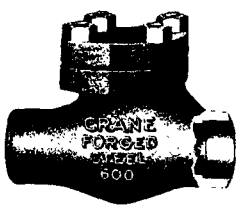
..sions and additional data, see next page.



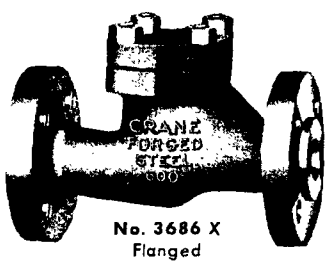
Cross section of bolted cap horizontal lift check valve



No. 3674 X
Screwed



No. 3682 X
Socket-Welding



No. 3686 X
Flanged

. ı orged Steel Lift Check Valves, described on this and ... upper portion of the next page, 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 steam, water, oil, oil vapor, air, gas, and general service at temperatures up to 1000 F.

Body: The valves have a rugged body made of forged carbon steel conforming to requirements of ASTM Specification A 105, Grade II. 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 obtained through the use of studs instead of through-bolts; the studs are made of Triplex steel and the joint is the male and female type. Cap joints, even on the larger sizes, can be easily dismantled and reassembled.

Disc and seat: Both the disc and 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, the ring will not loosen in service.

Working Pressures

Steam, Water, Oil, Oil Vapor (Union or Bolted Cap Valves)

Temp. Deg. Fahr.	Psi, Non-Shock: Screwed or Socket-Welding	Psi, Non-Shock: Flanged
100°	2000	1440
150	1970	1420
200	1940	1400
250	1915	1380
300	1895	1365
350	1875	1350
400	1850	1330
450	1810	1305
500	1735	1250
550	1640	1180
600	1540	1110
650	1430	1030
700	1305	940
750	1180	850
800	1015	730
850	800	600
875	725	525
900	600	445
925	520	375
950	425	310
975	330	240
1000	235	170

For description of materials, see Section 2.

Hydrostatic Test Pressures

Valve Ends	Psi: Shell	Psi: Seat
Screwed	2175	2100
Socket-Welding	2175	2100
Flanged	2175	1550

Valve seat is also tested hydrostatically at 40 psi.

600-Pound Forged Steel Lift Check Valves

(continued from the preceding page)

Flanged valves: Flanged valves conform to the American Standard for Face-to-Face Dimensions (B16.10-1957) of 600-Pound Steel Lift Check Valves.

End flanges conform to the 600-Pound American Steel Flange Standard B16.5-1957. They have a large male face ¼-inch high with a serrated finish (approximately 32 concentric grooves per inch). Flanged valves are regularly furnished faced, drilled, and spot faced; they can be furnished faced only, when specified.

When specified, other types of facings such as ring joint, female, tongue, and groove can be furnished.

Valves with 150-pound end flanges can be furnished on special order.

Socket-welding valves: Dimensions of socket-welding ends comply with American Standard B16.11-1946. The Crane line of steel socket-welding fittings is described in detail on pages 294 to 297.

Dimensions, in Inches — Prices on Request

Size	Union Cap Valve No. 3670 X, Screwed		Bolted Cap Valves									
			No. 3674 X, Screwed No. 3682 X, Socket-Welding			No. 3686 X, Flanged						
	End to end	Center to top	End to end	Center to top	Depth of socket	Face to face *	Center to top	Flange diameter	Flange thickness *	Dia. of male face	Dia. of bolt circle	No & dia of bolts
¼	3	2	...	...	...	...	...	...	...	...	...	...
⅜	3	2	...	...	...	...	...	...	...	...	...	...
½	3½	2⅜	3⅝	2½	⅝	6½	2 9/16	3¾	9/16	1⅜	2⅝	4—½
¾	4½	3	4⅜	3 1/16	11/16	7½	3¼	4⅝	⅝	1 11/16	3¼	4—⅝
1			5⅛	3 11/16	¾	8½	4 1/16	4⅞	11/16	2	3½	4—⅝
1¼			6¼	4⅛	13/16	9	4 5/16	5¼	13/16	2½	3⅞	4—¾
1½			7	5⅛	⅞	9½	5⅜	6⅛	⅞	2⅞	4½	4—¾
2			8⅜	6	1	11½	6 9/16	6½	1	3⅝	5	8—⅝

*The face to face dimensions of flanged valves include the ¼-inch male faces, the flange thicknesses do not.

Templates for drilling.....page 330
Proper sizing of check valves....page 427
600-pound cast steel screwed swing check valves.....page 154
Dimensions of ring joint and special facings...pages 333 and 334

600-Pound Cast Steel Ball Check Valves

Working Pressures
Oil or Oil Vapor

Temp. Deg. Fahr.	Psi Non-Shock
100°	2000
150	1970
200	1940
250	1915
300	1895
350	1875
400	1850
450	1810
500	1735
550	1640
600	1540
650	1430
700	1305
750	1180
800	1015
850	800
875	725
900	600
925	520
950	425
975	330
1000	235

Materials....Section 2

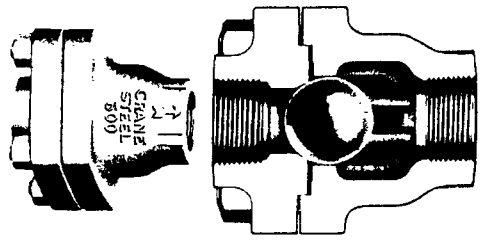
Hydrostatic Test Pressures
Shell—**2175** psi Seat—**2100** psi

Seat is also tested hydrostatically at 40 psi

These compact 600-pound ball check valves are specially designed for oil or oil vapor service at temperatures up to 1000 F.

Design: The two-part body, made of cast carbon steel (ASTM A216, Grade WCB), is held together by Triplex steel studs; the male and female joint is fitted with a corrugated soft iron gasket. The seat is integral with the body. The highly polished ball disc, made of solid Exelloy, is uniform in diameter. Ribs in the outlet half of the body guide the ball.

Installation: The No. 3692 XS preferably should be installed in a horizontal line to reduce pressure drop and to eliminate the possibility of chattering at very low flow. The valve can also be installed in a vertical line with upward flow but, in such service, the valve size should not be larger than the outlet end of the pump connection.



No. 3692 XS
Ball Check, Screwed

(May be used in a vertical position, also)

Weights and Dimensions

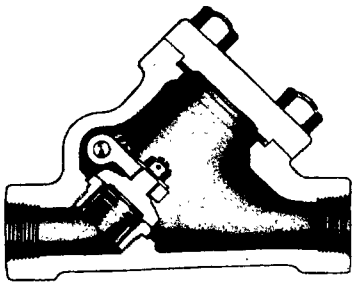
Size Inches	No. 3692 XS Pounds Each	End to end Inches	Over-all width Inches
½	4.0	3⅛	2 15/16 sq.
¾	5.0	3 11/16	3⅛ sq
1	8.0	4⅛	3⅝ sq.
1¼	11.0	4⅞	4 1/16 sq
1½	19.0	5⅝	5⅞ dia
2	29.0	6⅞	6⅝ dia

Prices on Request

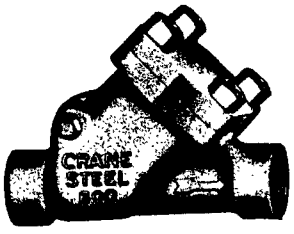
14

600-Pound Cast Steel Swing Check Valves

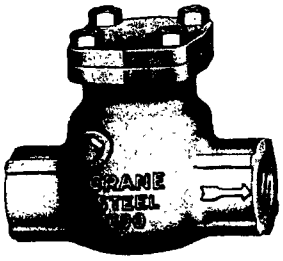
Bolted Cap—Screwed Ends



Cross section showing construction typical of sizes 1-inch and smaller. Larger sizes have a straightway body and the seat face lies at only a slight angle from vertical.



No. 3694 X
Y-Pattern Swing Check
Screwed
(Sizes 1-inch and Smaller)



No. 3694 X
Straightway Swing Check
Screwed
(Sizes 1¼-inch and Larger)

New small size 600-pound screwed end valves . . . with Crane Exelloy seating surfaces and a spiral wound stainless steel gasket . . . for steam, water, oil, and oil vapors

The No. 3694 X are compact, small size bolted cap swing check valves. Made from carefully selected materials, unusually well designed . . . . and featuring an unusually tight body-cap joint equipped with a spiral wound metal gasket . . . . they possess the qualifications required for dependable service in modern piping installations.

The valves have an Exelloy disc and seat. They are recommended for steam, water, oil, and oil vapor services at temperatures up to 1000 F.

Body and cap: The body and cap are made of cast carbon steel conforming to requirements of ASTM Specification A 216, Grade WCB.

Sizes ½, ¾, and 1-inch have a Y-pattern body, as shown in the two upper illustrations at the left. The cap is on the same center line as the seat.

Sizes 1¼, 1½, and 2-inch have a straightway body, as shown in the lower illustration at the left. The seat face is at a slight angle from vertical so as to permit full flow.

Body-cap joint: All sizes have a male and female body-cap joint equipped with Triplex Steel studs for maximum security. Easy maintenance and a tight joint is assured through the use of a spiral wound gasket made of AISI Type 316 stainless steel with asbestos filler.

When necessary, cap joints are easily dismantled and reassembled.

Disc and seat: Both the disc and seat are made of wear-resistant Crane Exelloy, a high grade, heat-treated chromium steel unusually well suited for use in check valves.

Working Pressures
Steam, Water, Air, Gas, Oil, Oil Vapor

Temp. Deg. Fahr.	Psi Non-Shock	Temp. Deg. Fahr.	Psi Non-Shock
100°	2000	650°	1430
150	1970	700	1305
200	1940	750	1180
250	1915	800	1015
300	1895	850	800
350	1875	875	725
400	1850	900	600
450	1810	925	520
500	1735	950	425
550	1640	975	330
600	1540	1000	235

Hydrostatic Test Pressures
Shell—2175 psi Seat—2100 psi

Valve seat is also tested hydrostatically at 40 psi.

The disc is suspended from the hinge; sufficient clearance is allowed between the disc spud and the bore of the hinge so that the disc can rotate freely, thus assuring proper seating.

The shoulder-type seat ring, screwed into the body, provides an ideal seating surface.

Hinge and hinge pin: The valves have the hinge suspended in the body. Easy access to both ends of the hinge pin is provided by a tapped and plugged opening in each of the two bosses on the body.

Both the hinge and the hinge pin are stainless steel.

A complete line: Crane's line of small size 600-pound steel check valves is unusually complete.

For forged steel union cap valves with screwed ends, or bolted cap valves with screwed, socket-welding, and flanged ends, see pages 152 and 153.

For cast steel ball check valves, see page 153.

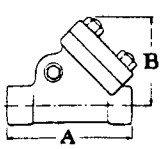
For cast steel swing check valves with flanged and butt-welding ends, in sizes as small as 1¼-inch, see pages 158 and 159.

Weights and Dimensions

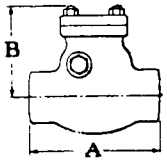
Size Inches	No. 3694 X Pounds Each	Dimensions, in Inches A	B
½	4.5	4⅝	3⅜
¾	8.0	6	4
1	12.0	7	4½
1¼	30.0	7½	5½
1½	40.0	8½	6¼
2	50.0	9½	6¼

Prices on Request

Description of materials.....Section 2
Proper sizing.....page 427



Sizes 1-inch and smaller

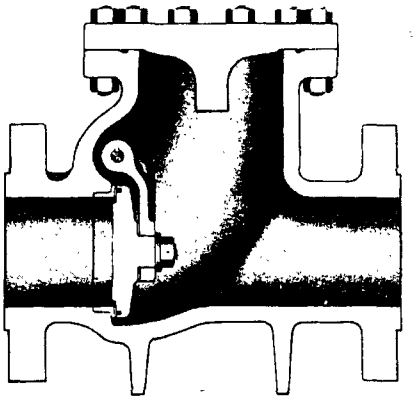


Sizes 1¼-inch and larger

Class 600 Cast Steel Pipe-Line Swing Check Valves

(Patent Pending)

Designed for crude oil, gas, or finished products . . . . Clearway shallow-cavity body for straight-line flow . . . . Stellite-faced seat ring and rubber-seated disc for "soft" tight seating



Cross Section, Flanged

These valves are recommended for all petroleum pipe-line services. They are a companion line to the Steel Pipe-Line Gate Valves shown on pages 131 to 133.

Materials: The body, cap, hinge, and disc are Crane Carbon Steel conforming to ASTM A 216, Grade WCB. The disc has a synthetic rubber insert in the seating face. The body seat ring is steel, Stellite faced.

Design: The smooth, shallow-cavity body provides virtually straight-line flow, assures liberal clearance around the disc, and permits easy passage of a scraper. Triplex Steel stud bolts, combined with a synthetic rubber O-ring gasket compressed within a groove in the face of the body flange, insure a rugged, tight, body-cap connection.

The shoulder-type, screwed-in body seat ring and rubber seated disc provide "soft" tight seating on backflow. The disc swings entirely clear of the fluid-way; a disc stop prevents it from sticking in the open position.

Hinge assembly: The hinge is keyed to a stainless steel hinge pin which rides in two Teflon sleeve bushings. Each bushing runs the full length of a screwed retaining plug at each side of the body wall. Rubber O-rings provide a seal between the plugs and body; Teflon spacer washers are used between the plugs and hinge. The bushings, easily replaced when necessary, absorb normal wear in the assembly.

Working Pressure	Hydrostatic Test Pressure	
Cold Oil or Gas	Shell	Seat
1440 psi	2175 psi	1550 psi

Valve seat is also hydrostatically tested at 40 psi.

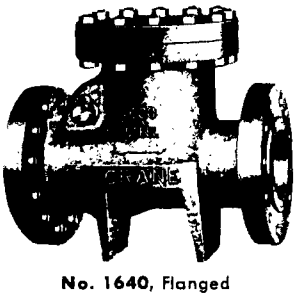
Standards: End flanges, and ends of butt-welding valves, comply with American Standard, B16.5-1957, for swing check valves of the 600-pound class.

The valves, in sizes included therein, also comply with the American Standard for Face-to-Face and End-to-End Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957, and to the American Petroleum Institute (API) Standard for Class 600 Steel Valves for Pipeline Service, No. 6-D, Ninth Edition (1960).

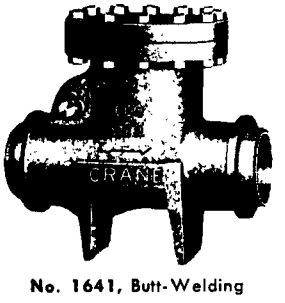
Flanged valves: End flanges have a ¼-inch large male face finished with about 32 concentric grooves per inch (serrated finish); a smooth finish, or special facings such as ring joint, female, tongue, groove, etc., can be furnished when specified.

Flanged valves are regularly faced and drilled to the 600-Pound American Standard, and are spot faced. Faced only valves can be furnished if specified.

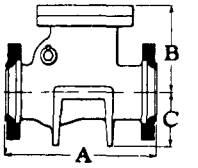
Butt-welding valves: Ends are bored to match the inside diameter of the pipe to be used. Orders must specify the diameter of the bore (I.D. of pipe).



No. 1640, Flanged



No. 1641, Butt-Welding



Flanged or Butt-Welding

Dimensions in Inches — Prices on Request

Size	Pounds, Each		Dimensions, in Inches								
						End Flanges					Dia. of ports
Inches	No. 1640 Flanged FD & SF	No. 1641 Butt-Welding	A (*)	B	C	Diameter	Thickness (*)	Male face dia.	Bolt circle dia.	No. & dia. of bolts	
4	Weights furnished on request		17	10½	5⅝	10¾	1½	6 3/16	8½	8-⅞	4 1/16
6			22	13¾	7¾	14	1⅞	8½	11½	12-1	6 1/16
8			26	16¾	9	16½	2 3/16	10⅝	13¾	12-1⅛	8 1/16
10			31	19½	10¾	20	2½	12¾	17	16-1¼	10
12			33	22	12	22	2⅝	15	19¼	16-1¼	12
14			35	24¾	12⅞	23¾	2¾	16¼	20¾	20-1⅜	13¼
16			39	27½	14½	27	3	18½	23¾	20-1½	15¼
18			43	30⅞	15⅝	29¼	3¼	21	25¾	24-1⅝	17
20			47	33⅛	16½	32	3½	23	28½	24-1⅝	19
24			55	38¾	19	37	4	27¼	33	24-1⅞	23

Installation: Two ribs at the bottom of the body provide a base for supporting the valve on a foundation. An arrow cast on the side of the body indicates the correct direction of flow.

*Dimension A includes the ¼-inch male faces on flanged valves, the flange thickness does not

Drilling templates . . . . . page 330
Special facings . . . . pages 333 and 334
Proper sizing of checks . . . . . page 427
Cast steel pipe-line gate valves . . . pages 131 to 133
Wrought steel pipe data . . . . . pages 346 and 347
Volume per lineal foot of pipe . . . . . page 354

Cast Steel Swing Check Valves

Working Pressures

For Valves Described on Pages 157 to 160

Temp. Deg Fahr.	Working Pressures—Pounds per Square Inch, Non-Shock. For 150 and 300-Pound Screwed Valves and 150 to 2500-Pound Flanged or Butt-Welding End Valves												
	Carbon Steel[1] (ASTM A216, Grade WCB)							No. 5 Chromium-Molybdenum Alloy Steel (ASTM A217, Grade C5—made to order only)					
	150 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound	300 Pound	400 Pound	600 Pound	900 Pound	1500 Pound	2500 Pound
100°	275	720	960	1440	2160	3600	6000						
150	255	710	945	1420	2130	3550	5915						
200	240	700	930	1400	2100	3500	5830						
250	225	690	920	1380	2070	3450	5750						
300	210	680	910	1365	2050	3415	5690						
350	195	675	900	1350	2025	3375	5625						
400	180	665	890	1330	2000	3330	5550						
450	165	650	870	1305	1955	3255	5430						
500	**150**	625	835	1250	1875	3125	5210						
550	140	590	790	1180	1775	2955	4925						
600	130	555	740	1110	1660	2770	4620						
650	120	515	690	1030	1550	2580	4300						
700	110	470	635	940	1410	2350	3920	485	645	965	1450	2415	4025
750	100	425	575	850	1275	2125	3550	450	600	900	1350	2250	3745
800	92	365	490	730	1100	1830	3050	415	555	835	1250	2080	3470
850	[2]82	[2]**300**	[2]**400**	[2]**600**	[2]**900**	[2]**1500**	[2]**2500**	385	510	765	1150	1915	3190
875	[2]75	[2]260	[2]350	[2]525	[2]785	[2]1305	[2]2180	365	490	735	1100	1830	3055
900	[2]70	[2]225	[2]295	[2]445	[2]670	[2]1115	[2]1855	350	465	700	1050	1750	2915
925	[2]60[3]	[2]190[3]	[2]250[3]	[2]375[3]	[2]565[3]	[2]945[3]	[2]1570[3]	335	445	665	1000	1665	2775
950	[2]55[3]	[2]155[3]	[2]205[3]	[2]310[3]	[2]465[3]	[2]770[3]	[2]1285[3]	315	420	635	950	1585	2640
975	[2]50[3]	[2]120[3]	[2]160[3]	[2]240[3]	[2]360[3]	[2]600[3]	[2]1000[3]	**300**	**400**	**600**	**900**	**1500**	**2500**
1000	[2]40[3]	[2]85[3]	[2]115[3]	[2]170[3]	[2]255[3]	[2]430[3]	[2]715[3]	250	335	500	750	1250	2085
1025	...	...	...	...	...	...	...	215	285	430	645	1070	1785
1050	...	...	...	...	...	...	...	180	240	355	535	890	1485
1075	...	...	...	...	...	...	...	145	195	290	435	730	1215
1100	...	...	...	...	...	...	...	115	150	225	340	565	945
*1125[4]	...	...	...	...	...	...	...	95	125	190	285	470	785
*1150[4]	...	...	...	...	...	...	...	75	100	150	225	375	630
*1175[4]	...	...	...	...	...	...	...	65	85	125	190	315	530
*1200[4]	...	...	...	...	...	...	...	50	70	105	155	255	430

At temperatures lower than 700 F, ratings for these valves are the same as those shown at the left for the Carbon Steel Valves.

[1]Where welded construction is used, consideration should be given to the possibility of graphite formation on Carbon Steel at temperatures above 775 F.

[2]Product used within the jurisdiction of Section 1, Power Boilers of the ASME Boiler and Pressure Vessel Code, is subject to the same maximum temperature limitations placed upon the material in Table P7, 1959 edition thereof.

[3]Product used within the jurisdiction of Section 1, Power Piping of the ASA Code for Pressure Piping, B31.1, is subject to the same maximum temperature limitations placed upon piping of the same general composition in Table 2a, 1955 edition thereof.

[4]Consideration should be given to the possibility of excessive oxidation (scaling) when No. 5 Chromium-Molybdenum Steel is used at temperatures above 1100 F.

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 Cast Steel Swing Check Valves are regularly made with only one trim . . . . "X" (Exelloy to Exelloy) . . . . which is suitable for steam, oil, oil vapor, and general service at temperatures up to 1100 F. The valves can be used in any installation where the fluid handled requires "X", "XR", "XW", "XU", or "U" trimmed steel gate, globe or angle valves.

*Over 1100 F, ratings in the table apply only if valves have a special trim; data on request.

Cold service: Between minus 20 F and plus 100 F, ratings shown in the table for 100 F will apply.

For temperatures below minus 20 F, steels with suitable impact strength must be used, pressure ratings for such steels will be the same as shown for 100 F.

Gaskets: The use of these ratings for flanged valves requires gaskets conforming to requirements set forth in ASA B16.5-1957. The user is responsible for selecting gaskets of dimensions and materials capable of withstanding the required bolt loading without injurious crushing, as well as being suitable for the service conditions in all other respects.

Flange facings: Flanged valves of the 150 and 300-pound pressure classes regularly have 1/16-inch raised faces; those of 400-pound and higher pressure classes have 1/4-inch male faces.

ASA and API Standards: Crane pressure-temperature ratings agree with ratings listed in the American Steel Flange Standard, B16.5-1957, and in the American Petroleum Institute (API) Standard No 600, Fourth Edition, 1958.

Lever and weight: For services in which the disc must be more sensitive to flow reversal or must be balanced for low velocities, valves with an outside lever and weight can be furnished; refer to page 157.

Cast Steel Swing Check Valves

Crane Cast Steel Swing Check Valves, described on pages 156 to 160, 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.

Hydrostatic Test Pressures, in Psi

Pressure Class	Screwed Valves		Flanged and Butt-Welding Valves	
	Shell	Seat	Shell	Seat
150-Pound	425	350	425	350
300-Pound	1100	775	1100	775
400-Pound	...	...	1450	1000
600-Pound	...	...	2175	1550
900-Pound	...	...	3250	2250
1500-Pound	...	...	5400	3700

Valve seats are also hydrostatically tested at 40 psi.

For working pressures, see page 156.

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. Weights and dimensions for 2500-pound valves are furnished on request; for description, see page 160.

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.

The valves are well suited for severe services such as are found in modern industrial and power plants, long distance pipe lines, and in oil refineries.

Specification of Materials

All valves are regularly made of Crane Carbon Steel conforming to requirements of ASTM Specification A 216, Grade WCB.

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 to order of Crane No. 5 Chromium-Molybdenum Steel (ASTM A 217, Grade C5; valves made of other alloy steels can also be made to order.

Orders for these valves should specify the catalog number and suffix. Refer to page 158.

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" Steam, Water, Oil, Oil Vapor	Body and Cap		Carbon Steel						
	Disc	8" and smaller	Exelloy			Exelloy			
		10" and larger	Exelloy-Faced Carbon Steel						
	Body Seat Ring		Exelloy						
	Hinge		Alloy Steel						
	Cap Gasket		Corrugated Soft Iron			Soft Steel Ring Joint Gasket			
	‡Cap Stud Bolts		Triplex						

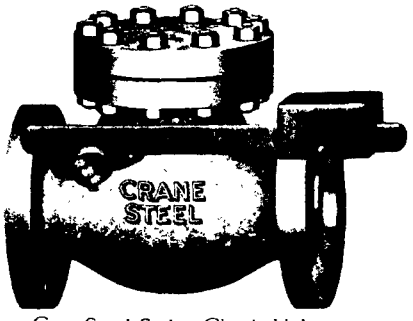
For detailed service recommendations, see page 156. ‡150-pound valves use Triplex Steel cap studs

Catalog numbers....page 158 *Weights and dimensions....page 159* *Description of materials....Section 2*

Valves with Outside Lever and Weight

When so ordered, Crane Cast Steel Swing Check Valves can be furnished with an outside lever and an adjustable weight. Orders must specify whether the weight is to balance the disc or to assist it in closing. Unless otherwise ordered, the lever and weight are mounted on the right hand side of the valve when facing the inlet. Prices are furnished on application.

With the lever and weight mounted so that the weight assists the disc in closing, the valves close the instant the flow stops. Valves so fitted are especially recommended for liquid lines where a sudden reversal of flow may gather considerable momentum before an ordinary valve disc would close, resulting in dangerous or damaging shock. By closing instantly and preventing reversal of flow, they eliminate shock.

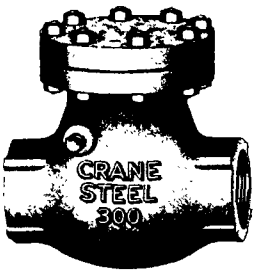


Cast Steel Swing Check Valve
With Outside Lever and Weight

With the lever and weight mounted so that the weight balances the weight of the disc, the valve becomes more sensitive to low inlet velocities.

The floating or feathering action of the disc causes the valve to open with a minimum of pressure, and resistance to flow past the disc is minimized.

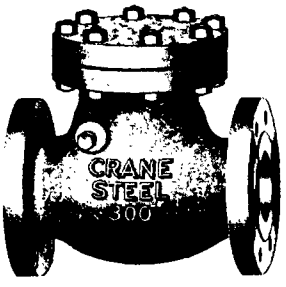
Cast Steel Swing Check Valves



Screwed

For Oil, Oil Vapor, Steam, or Water

No. 148 X, 150-Pound
No. 158 X, 300-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

Ratings . . . . page 156

For small size 600-pound cast steel swing check valves with screwed ends, see page 154.

A rugged line . . . designed for severe service on oil, oil vapor, steam, and water lines.

Crane Cast Steel Swing Check Valves, described on these facing pages, embody the many refinements in design and materials necessary to withstand severe service.

For working pressures, test pressures, service recommendations, and specification of materials, see pages 156 and 157. For weights and dimensions, see the facing page.

Materials: These valves, in all pressure classes, are regularly furnished with a body and cap made of Crane Carbon Steel conforming to requirements of ASTM A 216, Grade WCB.

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.

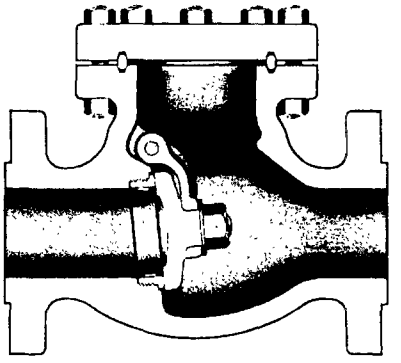
Cap joint: Valves of the 150 and 300-pound pressure classes have a male and female type cap joint.

Valves of the 400, 600, 900, 1500, and 2500-pound pressure classes have a ring type cap joint.

Crane Triplex Steel studs and stud bolts assure an unusually strong and tight joint. The 150-pound valves are equipped with studs; all other valves have through stud bolts.

Flange facings: The 150 and 300-pound flanged valves are regularly furnished with an American Standard 1/16-inch raised face on the end flanges.

The 400, 600, 900, 1500, and 2500-pound flanged valves are regularly furnished with a 1/4-inch male face (large male).



Cross Section of Cast Steel Swing Check Valve

Note: The 150-pound valves in sizes 14 and 16-inch (not Illustrated) have a bottom seated body seat ring . . . . and the complete disc, hinge, and hinge pin assembly is suspended from a hinge bracket; the bracket is securely fastened to a pad which is cast integral with the body.

When so ordered, flanged valves can be furnished with other types of facings, such as ring joint, female, tongue, groove, etc.

Finish of flange faces: The 1/16-inch raised faces and the 1/4-inch male faces are regularly furnished with a serrated finish.

A smooth finish can be furnished on raised or male faces, when specified.

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.

The end flanges on flanged valves as well as the dimensions of butt-welding valve ends conform to the American Steel Standard, B16.5-1957, for their respective pressure class.

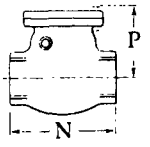
Flanged and butt-welding valves of all classes, in sizes 12-inch and smaller, conform to the American Standard for Face-to-Face and End-to-End Dimensions of Ferrous Flanged and Welding End Valves, B16.10-1957, for their respective pressure class. This Standard does not include 3½-inch steel valves.

Flanged and butt-welding valves of all classes conform also to the API Standard for Pipe Line Valves, No, 6-D, Ninth Edition, April, 1960. This Standard does not include a 3½ or 5-inch size.

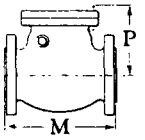
Prices: Prices of all valves are furnished on request.

For additional description, weights, and dimensions, see the facing page.

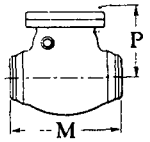
Cast Steel Swing Check Valves



Screwed



Flanged



Butt-Welding

When ordering, specify catalog number and suffix; see the preceding page.

Drilling: Flanged valves are regularly furnished with end flanges faced, drilled and spot faced (FD & SF); they are drilled to the corresponding pressure class of the American Standard; they can be furnished faced only, when specified.

Face to face: Face to face dimensions (M) of flanged valves include the 1/16-inch raised face on the 150 and 300-pound pressure classes and the 1/4-inch high large male face on the 400-pound and higher pressure classes.

Butt-welding valves: Unless otherwise ordered, 150 and 300-pound butt-welding valves are bored to match the inside diameter of standard pipe (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).

Smaller size 400 and 900-pound valves: For smaller size 400-pound valves, use the 600-pound valves. For smaller size 900-pound valves, use the 1500-pound valves.

2500-pound valves: Prices, weights, and dimensions of 2500-pound valves are furnished on request. For sizes and general description, see page 160.

Ratings and description...pages 156 to 158
Specification of materials.....page 157
Lever and weight valves.....page 157
Special facings.....pages 332 to 335
Volume per lineal foot of pipe....page 354
Proper sizing of check valves.....page 427

Weights and Dimensions — Prices on Request

Pressure Class	Size	Pounds, Each			Dimensions, in Inches			
		Screwed Valves	Flanged Valves	Butt-Welding Valves	Screwed		Flanged or Butt-Welding	
	Inches		FD & SF		N	P	M	P
150 Pound	2	27	34	25	8	5	8	5
	2½	40	50	30	8½	5½	8½	5½
	3	50	65	50	9½	6	9½	6
	3½	..	94	..	..	..	10½	6½
	4	96	100	100	11½	7	11½	7
	5	.	140	120	..	..	13	8
	6	.	200	160	.	..	14	9
	8	..	390	360	..	..	19½	10¼
	10	..	510	..	..	..	24½	12⅛
	12	..	775	.	..	..	27½	13¾
	14	..	1200	..	..	..	35	on
	16	..	1450	..	..	..	39	request
300 Pound	2	40	62	47	9½	6¾	10½	6¾
	2½	70	80	60	10¾	8	11½	8
	*3	100	120	80	11¾	8½	12½	8½
	4	..	180	130	..	..	14	9¾
	5	..	250	240	..	..	15¾	10¾
	6	..	330	260	..	..	17½	11¾
	8	..	620	510	..	..	21	14
	10	..	920	760	..	..	24½	15
	12	..	1290	1015	..	..	28	16¾
400 Pound	4	.	200	190	..	.	16	10
	5	.	270	265	..	..	18	12
	6	.	395	310	..	..	19½	12½
	8	..	680	580	..	..	23½	14½
	10	.	900	820	.	..	26½	15¼
	12	.	1250	1150	.	..	30	16⅞
600 Pound	1¼	..	38	32	..	..	9	6¼
	1½	..	58	40	..	..	9½	6¾
	2	..	70	55	..	.	11½	7
	2½	..	105	70	..	..	13	8¼
	*3	..	140	100	..	..	14	9
	4	..	260	170	..	..	17	10¼
	5		400	300	..	..	20	12¾
	6	.	530	420	..	..	22	13½
	8	..	900	740	..	..	26	15¼
	10	..	1440	880	..	..	31	18¾
	12	..	1970	1200	.	..	33	21½
900 Pound	3	..	180	155	..	..	15	9½
	4	..	340	240	..	..	18	11
	6		640	500	.	..	24	13¾
	8	..	1180	890	.	..	29	16½
1500 Pound	1½	.	110	80	..	.	12	8¼
	2		160	130		.	14½	9¾
	2½	.	245	170			16½	10½
	3		280	210		.	18½	11¼
	4	.	630	390	.	.	21½	13¼
	5		950	480			26½	15¼
	6		1360	780			27¾	15¾
	8		2100	1320			32¾	18¼

*3-inch Cranelap Joints: 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 334 for dimensions.

Templates for drilling and dimensions of end flanges....pages 329 to 331

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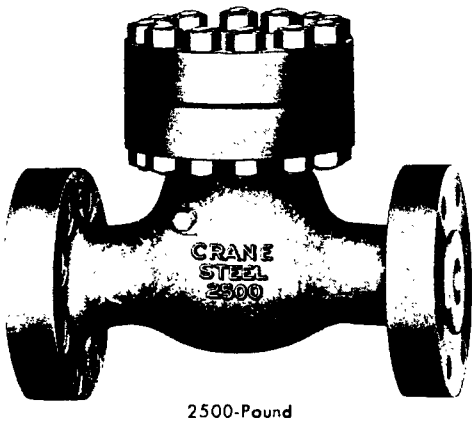
2500-Pound
Cast Steel Swing Check Valves



2500-Pound
Cast Steel
Swing Check Valve

Specification of materials....page 157
Description of materials.....Section 2

For working pressures, service recommendations, and general description, see pages 156 to 158.

Crane 2500-Pound Cast Steel Swing Check Valves with flanged or butt-welding ends are available in the 4, 5, 6, 8, and 10-inch sizes.

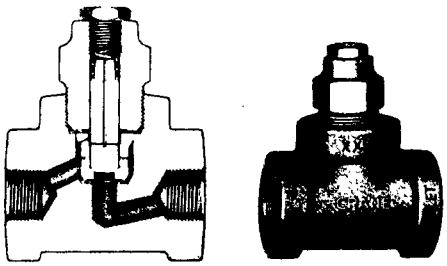
The valves are recommended for the high pressures and temperatures encountered in modern central power stations and oil refineries. They are regularly furnished with Class "X" trimming (Exelloy to Exelloy) and are suitable for oil, oil vapor, steam, water, or general service.

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.

6000-Pound Hydraulic
Forged Steel Lift Check Valves



No. 227 H
Horizontal, Screwed

Sizes 1-inch and smaller are made with a screwed cap, as illustrated; the 1 ¼-inch size has a bolted cap.

Working Pressure
6000 psi cold water or oil, non-shock

Test Pressure
6500 psi hydrostatic

Extremely rugged valves designed for severe high pressure, hydraulic 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 (ASTM A 105, Grade II) forging. Sizes 1-inch and smaller have a screwed cap as shown in the illustrations; the 1¼-inch size has a bolted cap

Disc and seat: The disc is made of bronze and is accurately guided to assure square seating. The seat bushing is made of Exelloy and can easily be renewed.

The valves are equipped with 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 Double Extra Strong Pipe

Weights and Dimensions

	Size	Pounds	End to end	Center to top
	Inches	Each	Inches	Inches
No. 227 H Horizontal	⅜	2.6	2⅞	2⅝
	½	5.6	3⅝	3¼
	¾	11.6	5	4⅜
	1	17.0	5¼	4⅞
	1¼	32.0	7	4⅝

Prices on Request

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SECTION 15

Crane Pressure-Seal Bonnet and Lip-Seal Bonnet Valves

Pressure-Seal Bonnet Valves
General Description of Pressure-Seal Bonnet.....pages 162 and 163
Pressure-Temperature Ratings and Tests.....page 164
Gate.....pages 165 to 167
Globe and Angle.....pages 168 and 169
Stop-Check (Non-Return Valves).....pages 170 and 171
Lift-Check.....page 175
Selecting the Proper Size Stop-Check Valves.....pages 172 and 173
Determining Pressure Drop in Stop-Check Valves....pages 172 and 173
By-passes for Gate Valves.....page 174

Pressure-Seal Line Joints.....page 180

Lip-Seal Bonnet Valves
Globe and Angle.....pages 176 to 178

Lip-Seal Cap Valves
Lift Check.....page 179

For special valves for extreme pressures and temperatures, or for unusual services, see Section 21.

Crane Pressure-Seal Bonnet Valves have revolutionized the design and construction of valves intended for high-pressure, high-temperature steam and general service in modern power, industrial, and chemical plants. Utilization of the internal fluid pressure to seal the bonnet joint is the principal feature, but each type . . . . gate, globe, angle, stop-check, and lift check . . . . has individual refinements that contribute to greater efficiency.

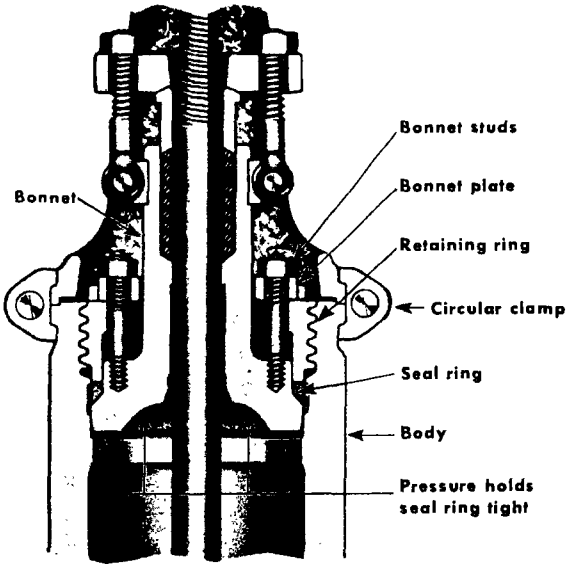
New records for valve performance have been set, not only in the United States but also in many foreign countries. Backed by the tremendous facilities for research, engineering, and production which are Crane's, the line has grown rapidly.

The valves are now a part of the large family of "regular" Crane manufactured product. In addition, patterns and equipment for many other types and sizes are available, and the Pressure-Seal Bonnet principle has been successfully applied to scores of special valves for unusual operating requirements. Inquiries for non-listed items in conventional sizes and types of valves, or for special designs for unique flow control problems, are given prompt attention.

Crane Lip-Seal Bonnet Globe and Angle Valves and Lip-Seal Cap Lift Check Valves are characterized by their superior design. Developed by the same Crane resources which have made Pressure-Seal Bonnet Valves so outstanding in their field, thoroughly tested under rigorous experimental conditions, and proved through the years in demanding services, they fulfill the need for small size valves required in high-pressure, high-temperature steam service.

The exclusive Crane Lip-Seal design has made it possible to produce a compact, relatively lightweight valve without sacrificing strength and without resorting to reduced seat area. Absolute tightness, freedom from bonnet joint maintenance, and easy installation are only a few of the features. See pages 176 to 179.

The Crane Pressure-Seal Bonnet

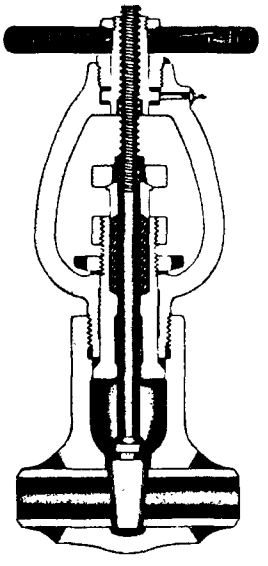


Section of typical Crane Pressure-Seal Bonnet as used on the larger sizes of gate valves.

A general description of Crane's Pressure-Seal Bonnet design . . . as used in gate, globe, angle, stop-check, and lift check valves . . . for better control of high pressure-temperature steam.

Crane Pressure-Seal Bonnet Valves have introduced a new era in valve engineering. Their design, unique in many respects, has eliminated the major problems attending the control of high pressure-temperature steam and water in modern power plant operation.

Announced some years ago after extensive research and experimentation backed by exhaustive laboratory and field testing, the valves were immediately acclaimed by leading power engineers throughout the country. Now, performance-tested in actual use, with their all-around superiority over conventional designs established, they are eagerly accepted for steam and boiler feed service in large central station installations and are being specified . . . . . more and more . . . . . as standard equipment on high-pressure, high-temperature services in the power stations of public utilities, oil refineries, and industrial and chemical plants, as well as for various process piping.



In gate valves 5-inch and smaller, the yoke and retaining ring are integral and screw into the body to hold the seal ring. The 1½-inch 1500-Pound Gate is illustrated.

Pressure-Seal Bonnet: Although each type of valve in the Crane line embodies many distinctive 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 valve style and size, 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 valves. The illustration at the upper left shows a typical Crane Pressure-Seal Bonnet, as used on larger sizes of gate valves.

The bonnet fits into the body, followed by the wedge-shaped seal ring. The retaining ring is then screwed into the body, the bonnet plate added, and the assembly drawn together by the bonnet studs.

Neither the threaded body and retaining ring connection nor the studs are expected to retain high pressure; they merely position the assembly and hold the parts firmly and snugly together.

High sealing pressure: 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. In larger size valves, a stainless steel inlay deposited in the seal ring area of the body neck precludes any possibility of leakage due to minute porosity in that area of the body.

Maintenance of the joint is completely 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 the valves are subjected to high temperatures for long periods.

Designed for efficiency: The valves are built especially for the exacting demands of high-pressure, high-temperature steam and power piping systems. Each type of valve has in common, in addition to the Pressure-Seal Bonnet, many other features that contribute to efficient operation and long life.

Scope of Crane line

The Crane Pressure-Seal Bonnet line includes, in a full range of most commonly used sizes, 600, 900, 1500, and 2500-pound gates, 1500-pound globe and angles, and 900 and 1500-pound stop-check and lift checks.

Complete data on sizes, types, pressure classes, and materials not listed in this section will be furnished on request.

The Crane Pressure-Seal Bonnet

(continued from the preceding page)

Less weight . . . . less 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.

The valves are lighter in weight than corresponding sizes and types of conventional valves . . . . as much as 60 per cent on the larger sizes of the 1500-pound class. Less weight makes the valves easier to handle during erection and in maintenance. Savings in supporting structures or in the suspension of piping are thereby possible.

The end to end dimensions are as short as practicable, commensurate with good design. Close nesting of welding end valves is possible where necessary, without interference from overhanging flanges as is the case with conventional bolted bonnet valves.

In addition, the over-all compactness of Crane Pressure-Seal Bonnet Valves substantially reduces the distance from the center to the top of the valve; thus, less head room is required and installation problems are simplified.

Illustrated directly to the right is an 8-inch 1500-Pound Pressure-Seal Bonnet Gate Valve with an 8-inch bolted bonnet valve silhouetted in the background. The comparison typifies the compactness and the space-saving advantages that are characteristic of the Crane Pressure-Seal line.

Streamlined body: The body in all valves features smooth flowing contours without abrupt changes in metal thickness.

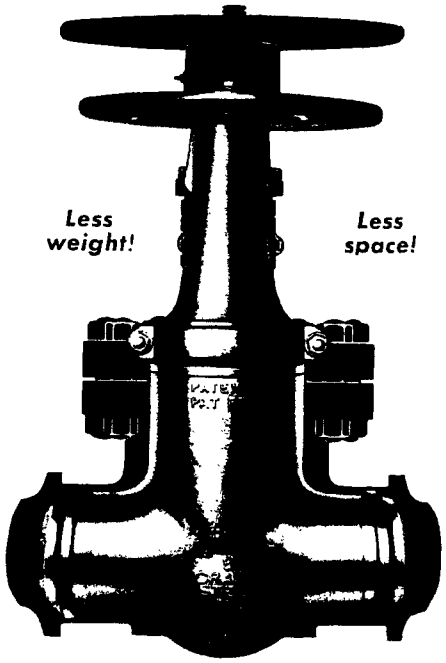
On butt-welding end valves, starting with pipe wall thickness at the ends, the metal sections increase gradually to the full body thickness, eliminating areas where acute stresses might otherwise concentrate.

Easy to insulate: The application of insulation is made easier due to the streamlined body. Less insulating material and labor are required, and neater, more effective results are obtained.

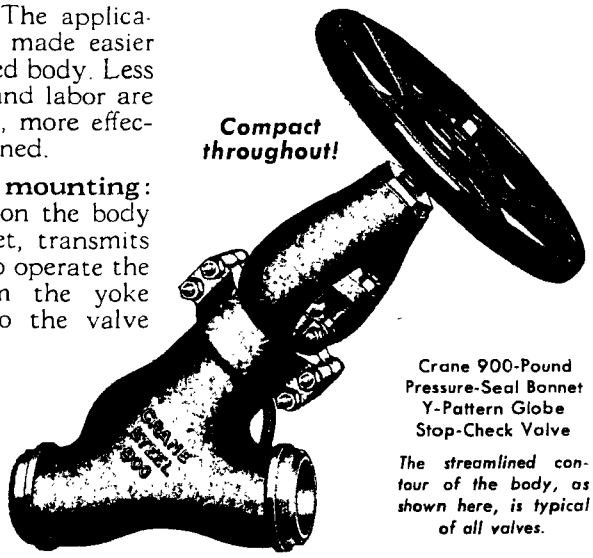
Direct yoke-body mounting: The yoke, mounted on the body instead of the bonnet, transmits the forces required to operate the valve, directly from the yoke sleeve or bushing to the valve body, without going through the bonnet.

The yoke is rugged and accurately centered; true alignment is maintained with the stem.

In smaller sizes, the yoke and retaining ring are integral and screw into the body. In larger sizes, the yoke sets atop the body, positioned by a male and female joint and held rigidly in place by a simple circular clamp; this construction is especially desirable on large sizes which may be ordered geared or motor operated, since the yoke can be turned if necessary, providing an unlimited choice of positions for the operating unit.



Crane 8-inch 1500-Pound Pressure-Seal Bonnet Gate Valve compared with an 8-inch bolted bonnet valve. Note the compactness and saving in weight.



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 valves.

Liberal stuffing box: The stuffing box has generous space for stem packing. All valves have a bolted gland, equipped with swinging gland eye bolts.

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. Body seat rings are accurately fitted into the body and securely welded into 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 Carbon Steel (ASTM A 216, Grade WCB) or Crane No. 7 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade WC6).

Valves can be made to order of Crane No. 9 Chromium Molybdenum Alloy Steel (ASTM A 217, Grade WC9) when specified; this steel is recommended where greater strength and resistance to steam corrosion are desired at elevated temperatures.

For a complete description of Crane metals, see Section 2.

Ratings and recommendations.....page 164
Gate valves.....pages 165 to 167
Globe and angle valves...pages 168 and 169
Stop-check valves.....pages 170 to 173
Lift-check valves.....page 175

Description of materials.....Section 2
Lip-Seal Bonnet Valves....pages 176 to 179

Steel Pressure-Seal Bonnet Valves

Ratings, Tests, and Recommendations

Gate valves.....pages 165 to 167
Globe and angle valves....pages 168 and 169
Stop-check valves.....pages 170 to 173
Lift-check valves.....page 175

Recommendations: Crane Pressure-Seal Bonnet Valves, described in detail in this section, are primarily intended for the high pressure-temperature steam and hot water services encountered in modern steam generating stations and for similar services in large industrial and chemical plants.

The valves, having Stellite faced seating surfaces, are also well suited for air, gas, high pressure hydraulic systems using water or low viscosity oil, and for other fluids in services not involving a major problem of corrosion, erosion, or coking.

"U" suffixed catalog numbers indicate valves have a Crane Carbon Steel body and bonnet; they are recommended for a maximum temperature of 1000 F.

"U7" suffixed catalog numbers indicate valves have a body and bonnet made of Crane No. 7 Chromium-Molybdenum Alloy Steel; they are recommended for a maximum temperature of 1200 F. Crane No. 7 Steel, alloyed especially for welding end valves used on steam service at temperatures over 775 F, exhibits much greater stability against graphitization at elevated temperatures than does carbon steel.

Where greater strength and resistance to steam corrosion are desired at temperatures over 1000 F, up to 1200 F, valves made of Crane No. 9 Chromium-Molybdenum Alloy Steel are recommended; such valves are made to order only.

Flanged valves: The Crane line of Pressure-Seal Bonnet Valves includes 600-pound flanged end gate valves; the flanges are regularly furnished with large male faces ¼-inch high.

Gaskets: The use of these ratings for flanged valves requires gaskets conforming to requirements set forth in ASA B16.5-1957. The user is responsible for selecting gaskets of dimensions and materials capable of withstanding the required bolt loading without injurious crushing, as well as being suitable for the service conditions in all other respects.

ASA and API Standards: Crane pressure-temperature ratings agree with ratings listed in the American Steel Flange Standard, B16.5-1957, and in the American Petroleum Institute (API) Standard No. 600, Fourth Edition, 1958.

Tests: In addition to the hydrostatic tests shown in the table below, lift check valves are given a 40 psi hydrostatic seat test and all other valves are given a 100 psi air-under-water seat test.

Larger size butt-welding end valves have the ends of the body shaped to permit the use of a testing clamp; smaller sizes are plain, being tested without the use of such a clamp.

Hydrostatic Test Pressures

Pressure Class	Shell Test	Seat Test	
	All Valves	All Valves except Stop-Check	Stop-Check Valves
600-Pound	2175 psi	1550 psi	
900-Pound	3250 psi	2250 psi	1350 psi
1500-Pound	5400 psi	3700 psi	2250 psi

Description of the Crane Pressure-Seal Bonnet.....pages 162 and 163

Pressure-Temperature Ratings
Flanged, Butt-Welding, or Socket-Welding Valves

Crane Steel	Temp. Deg. Fahr.	Psi, Non-Shock 600 Pound	900 Pound	1500 Pound
[1]Carbon Steel ASTM A216-WCB "U" Valves	100°	1440	2160	3600
	150	1420	2130	3550
	200	1400	2100	3500
	250	1380	2070	3450
	300	1365	2050	3415
	350	1350	2025	3375
	400	1330	2000	3330
	450	1305	1955	3255
	500	1250	1875	3125
	550	1180	1775	2955
	600	1110	1660	2770
	650	1030	1550	2580
	700	940	1410	2350
	750	850	1275	2125
	800	730	1100	1830
	850	[2]600	[2]900	[2]1500
	875	[2]525	[2]785	[2]1305
	900	[2]445	[2]670	[2]1115
	925	[2][3]375	[2][3]565	[2][3]945
	950	[2][3]310	[2][3]465	[2][3]770
	975	[2][3]240	[2][3]360	[2][3]600
	1000	[2][3]170	[2][3]255	[2][3]430
[4]No. 7 Chromium-Moly. ASTM A217 Grade WC6 "U7" Valves	At 650 F and lower, ratings are same as for Carbon Steel.			
	700	965	1450	2415
	750	900	1350	2250
	800	835	1250	2080
	850	765	1150	1915
	875	735	1100	1830
	900	700	1050	1750
	925	665	1000	1665
	950	635	950	1585
	975	600	900	1500
	1000	535	800	1335
	1025	[2]455	[2]685	[2]1140
	1050	[2]375	[2]565	[2]945
	1075	[2]325	[2]490	[2]815
	1100	[2]275	[2]410	[2]685
	1125	[2][3]225	[2][3]335	[2][3]555
	1150	[2][3]170	[2][3]255	[2][3]430
	1175	[2][3]125	[2][3]190	[2][3]315
	1200	[2]80[3]	[2][3]125	[2][3]205
[4]No. 9 Chromium-Moly. ASTM A217 Grade WC9 (special)	At 1000 F and lower, ratings are same as for No. 7 Steel.			
	1025	465	700	1165
	1050	400	595	995
	1075	[2]345	[2]515	[2]855
	1100	[2]290	[2]430	[2]720
	1125	[2]245	[2]370	[2]615
	1150	[2]205	[2]310	[2]515
	1175	[2][3]170	[2][3]255	[2][3]430
	1200	[2][3]135	[2][3]205	[2][3]345

[1]Where welded construction is used, consideration should be given to the possibility of graphite formation on carbon steel at temperatures over 775 F.

[2]Product used within the jurisdiction of Section 1: Power Boilers of the ASME Boiler and Pressure Vessel Code, is subject to the same maximum temperature limitations placed upon the material in Table P7, 1959 edition thereof.

[3]Product used within the jurisdiction of Section 1, Power Piping of the ASA Code for Pressure Piping B31.1, is subject to the same maximum temperature limitations placed upon piping of the same general composition in Table 2a, 1955 edition thereof.

[4]Consideration should be given to the possibility of excessive oxidation (scaling) when No. 7 or No. 9 Steel is used at temperatures over 1050 F.

Pressure-Seal Bonnet
Cast Steel Wedge Gate Valves

(Patented and Patent Pending)

600, 900, 1500, and 2500-Pound Butt-Welding Ends

600-Pound Flanged Ends

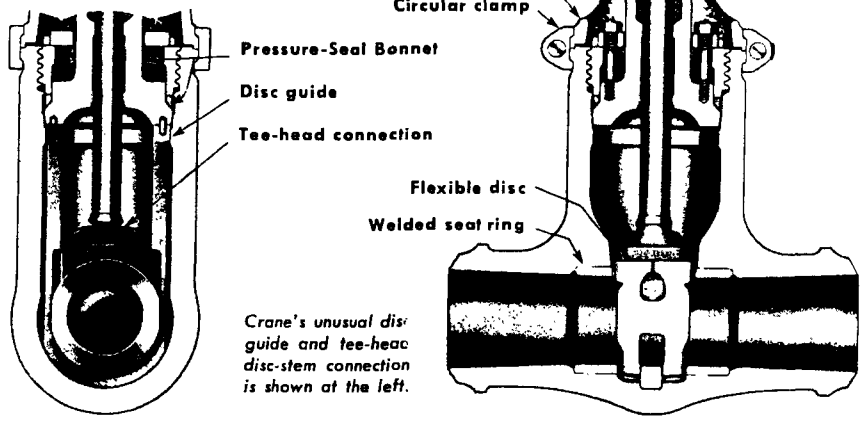
The sectional views at the right are typical of the larger size Crane Pressure-Seal Bonnet Gate Valves.

Body: The body is made without abrupt change in metal section, providing protection against a concentration of stresses produced by pressure, temperature differences, and pipe line strains.

There are no pockets between the end of the body and the seat to cause turbulence or friction.

Body seat rings: The body seat rings are Stellite faced. Accurately made to precision fit, they are slipped in parallel to the run of the valve and are securely welded in place. In 1500-pound valves 1½-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.

Sections illustrating typical construction of the larger size Pressure-Seal Bonnet Gate Valves



Crane's unusual disc guide and tee-head disc-stem connection is shown at the left.

Disc: These valves have a wedge disc with Stellited seating faces. In sizes 3-inch and smaller, the disc is solid. In sizes 4-inch and larger, a one-piece flexible disc, solid through the center section but not around the outer portion, provides enough flexibility to eliminate sticking, thus requiring less torque to open the valve when cold after having been closed while hot. In addition, the disc seating faces adjust themselves to any slight variations in alignment caused by body contraction or pipe line strains.

Disc guide: Sizes 2½-inch and larger have an improved full length, separate "U" shaped disc guide extending along the sides of the body and fitted into a specially machined groove around the bottom of the body. Full disc guiding, even near the point of seating where the maximum force is exerted against the disc by the fluid flow, is assured by this design. The groove in the body for the disc guide and the machining for the body seat rings are made with the same machine setting to maintain proper alignment between the disc, guide, and body seat rings. Sizes 2-inch and smaller have the disc guides integral with the disc, and the body is slotted.

Disc-stem connection: The valves have a sturdy tee-head disc-stem connection. Ample clearance between the head on the stem and the slot in the disc prevents side strains on the stem. The stem is only required to move the disc up and down; it is not forced to also serve as a guide for the disc.

Other features: These valves have the other features common to all of the valves in this line, such as Pressure-Seal Bonnet, direct-mounted yoke, deep stuffing box, and two-piece bolted gland. In addition, 600-pound valves 8-inch and larger and 900 and 1500-pound valves 6-inch and larger are regularly supplied with a ball-bearing yoke sleeve; sizes 1½-inch and larger have a grease fitting to permit proper lubrication of the yoke sleeve.

In sizes 5-inch and smaller (of all pressure classes), the yoke and the retaining ring are integral and screw into the body to hold the seal ring. Larger sizes have the separate yoke and retaining ring, with the yoke held to the body by the circular clamp. The lower end of the stem hole in the bonnet is Stellite faced on sizes 2½-inch and larger, assuring a better back-seat and guide for the stem.

1500-Pound Socket-Welding Ends

Socket-welding end 1500-pound gate 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 the butt-welding end valves described above. In 2-inch valves, the body seat rings are slipped in parallel to the run of the valve and are securely welded in place. Sizes 1½-inch and smaller have longer body seat rings, welded into the body; the welded end of the ring forms the end of the socket in the body.

General description....pages 162 and 163 *Ratings....page 164* *Weights and dimensions....pages 166 and 167*

Pressure-Seal Bonnet
Cast Steel Wedge Gate Valves

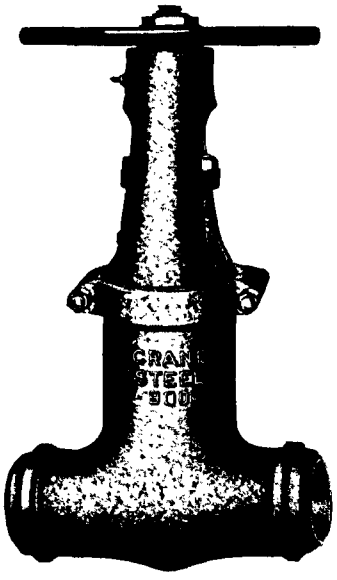
For description, see pages 162 to 165.
For ratings and recommendations, see page 164.

600-Pound Butt-Welding



No. 776 U, Carbon Steel
No. 776-U7, No. 7 Alloy Steel

900, 1500, and 2500-Pound Butt-Welding



900-Pound
No. 783 U, Carbon Steel
No. 783-U7, No. 7 Alloy Steel

1500-Pound
No. 787 U, Carbon Steel
No. 787-U7, No. 7 Alloy Steel

2500-Pound
No. 797 U, Carbon Steel
No. 797-U7, No. 7 Alloy Steel

Weights and dimensions....page 167

High in strength yet light in weight, Crane Pressure-Seal Bonnet Gate Valves offer unusual compactness and rugged durability. Streamlined design permits close nesting of welding end valves . . . . and installation in minimum space. In addition, center to top dimensions are noticeably smaller than usual, making less headroom necessary.

Materials: The body seat rings, welded in place, and the disc, are made of the same material as the body and bonnet and have the seating surfaces faced with Stellite. The stem is made of Exelloy.

"U" suffixed catalog numbers indicate valves have a Crane Carbon Steel body and bonnet; this steel conforms to requirements of ASTM A 216, Grade WCB.

"U7" suffixed catalog numbers indicate valves have a Crane No. 7 Chromium-Molybdenum Alloy Steel body and bonnet; this steel conforms to requirements of ASTM A 217, Grade WC6.

ASA Standards: The dimensions of end flanges and butt-welding ends conform to those in American Standard, B16.5-1957, for valves of the corresponding pressure class.

Flanged and butt-welding end valves also conform to the American Standard for Face-to-Face and End-to-End Dimensions of Ferrous Gate Valves, B16.10-1957, of corresponding pressure classes.

End flange dimensions are listed below. Face to face and end to end dimensions are listed on the next page.

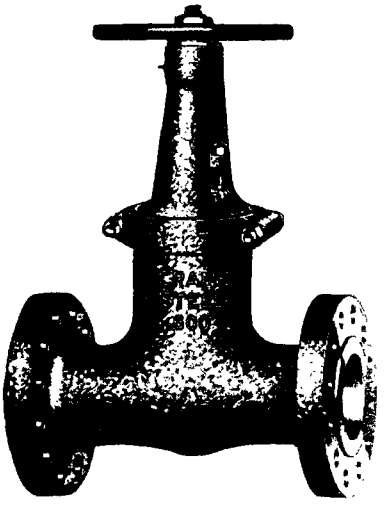
Flange facings: Flanged valves have a large male face, ¼-inch high with a serrated finish (approximately 32 concentric grooves per inch). Ring joint and other types of facings can also be furnished.

600-Pound End Flange Dimensions, Inches

Size Inches	Flange diameter	Flange thickness *	Dia. of male face	Dia. of bolt circle	No. & dia. of stud bolts
2½	7½	1⅛	4⅛	5⅞	8-¾
3	8¼	1¼	5	6⅝	8-¾
4	10¾	1½	6 3/16	8½	8-⅞
5	13	1¾	7 5/16	10½	8-1
6	14	1⅞	8½	11½	12-1
8	16½	2 3/16	10⅝	13¾	12-1⅛
10	20	2½	12¾	17	16-1¼
12	22	2⅝	15	19¼	20-1¼

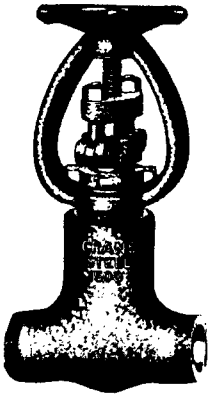
*Thickness of flange dimensions do not include the ¼-inch male face; face to face dimensions, shown on the next page, include the male faces

600-Pound Flanged



No. 676 U, Carbon Steel
No. 676-U7, No. 7 Alloy Steel

1500-Pound Socket-Welding



No. 7811-U7, No. 7 Alloy Steel

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 valve ends can be bored to match.

Prices: Prices of all valves will be furnished on request.

Flanged valves, as regularly furnished, include drilling to the 600-Pound American Steel Flange Standard, and spot facing; the valves can be furnished faced only, when specified.

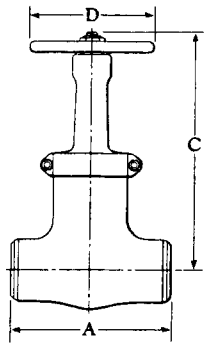
Pressure-Seal Bonnet
Cast Steel Wedge Gate Valves

Weights and Dimensions — Prices on Request

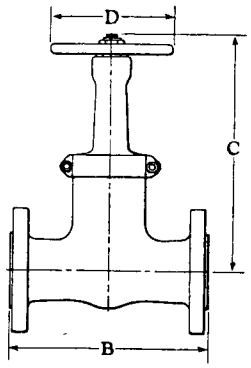
Catalog suffix indicates material of body and bonnet.
U = Crane Carbon Steel U7 = Crane No. 7 Chromium-Molybdenum Alloy Steel

Valve Type and Catalog Nos.	Size Inches	Weight Pounds Each	Dimensions, in Inches A	B*	C open	D	By-pass size ¶
600-Pound Flanged No. 676 U No. 676-U7	2½	75	...	13	19¼	8	...
	3	105	...	14	22	9	...
	4	190	...	17	27	10	...
	5	350	...	20	31¾	12	¾
	6	425	...	22	35	14	¾
	8	855	...	26	45	20	¾
	10	1300	...	31	53½	24	1
	12	1750	...	33	61½	24	1
600-Pound Butt-Welding No. 776 U No. 776-U7	2½	45	8½	...	19¼	8	...
	3	70	10	...	22	9	...
	4	110	12	...	27	10	...
	5	180	15	...	31¾	12	¾
	6	285	18	...	35	14	¾
	8	615	23	...	45	20	¾
	10	915	28	...	53½	24	1
	12	1405	32	...	61½	24	1
	14	1900	35	...	67½	27	1¼
	16	2575	39	...	74½	30	1¼
	18	3400	43	...	80	36	1½
	20	5200	47	...	98	36	1½
	24	7900	55	..	113	42	2
900-Pound Butt-Welding No. 783 U No. 783-U7 *For smaller sizes, use 1500-Pound*	3	105	12	...	23	10	...
	4	165	14	...	27¾	14	¾
	5	260	17	...	33½	16	¾
	6	425	20	...	39½	20	¾
	8	810	26	...	47	24	¾
	10	1130	31	...	52½	24	1
	12	1750	36	...	61½	27	1
	14†	2360	39	...	66½	30	1¼
	16†	2900	43	...	73½	36	1¼
	18†	4000	furnished on request				1½
1500-Pound Butt-Welding No. 787 U No. 787-U7	1	21	5½	...	13	5	...
	1¼	24	6½	...	13¾	5	...
	1½	37	7	...	17¼	8	...
	2	47	8½	...	18½	8	...
	2½	70	10	...	20	9	...
	3	110	12	...	23	10	...
	4	190	16	...	27¾	14	¾
	5	315	19	...	33½	16	¾
	6	490	22	...	39	20	¾
	8	900	28	...	46½	24	¾
	10	1540	34	...	52½	27	1
	12	2400	39	...	61½	30	1
	14†	2710	42	...	66½	36	1¼
	16†	4700	47	...	75½	36	1¼
1500-Pound Socket Welding No. 7811-U7‡	1	22	5½	..	13	5	...
	1¼	25	6½	...	13¾	5	...
	1½	39	7	...	17¼	8	...
	2	53	8½	...	18½	8	...
2500-Pound Butt-Welding No. 797 U No. 797-U7	2500-Pound Valves are available in sizes up to 18-inch; weights and dimensions will be furnished on request						

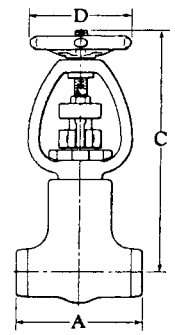
General description, pages 162 to 166 | *Drilling templates, pages 330 and 331* | *Flange facings, pages 333 and 334*



600, 900, 1500, and 2500-Pound Butt-Welding



600-Pound Flanged



1500-Pound Socket-Welding

¶**By-passes:** When specified, 600-pound valves 5-inch and larger and 900 and 1500-pound valves 4-inch and larger can be furnished with a by-pass for steam and general service.

By-pass sizes are indicated in the table at the left. The by-passes are rugged and durable, and have the necessary flexibility to compensate for expansion strains resulting from unequal temperatures or fluctuating operating conditions. Seamless steel pipe is used; all piping connections are welded. The by-pass valve is the full equivalent of the main valve insofar as ratings and service recommendations are concerned.

For description of by-passes and clearance dimensions, see page 174.

Motor operation: Valves installed in inaccessible locations, or used for emergency or other unusual purposes, are frequently required equipped with an electric, air, or gas motor unit; see pages 260 to 270.

Gearing: To facilitate operation, 600 and 900-pound valves 6-inch and larger, and 1500-pound valves 5-inch and larger, can be equipped with a bevel gear operator; see pages 271 to 274. Extension stems also are available

*Face to face dimensions (B) include the ¼-inch male faces. The thickness of flange dimensions (shown on facing page) do not.

†Carbon steel 900 and 1500-pound butt-welding valves (No 783 U and No 787 U) are not made in sizes 14-inch and larger.

‡Socket depth: Depths of sockets on the No 7811-U7 Valves are ½ inch on sizes 1½-inch and smaller and ⅝ inch on the 2-inch size.

Pressure-Seal Bonnet
Cast Steel Globe and Angle Valves

1500-Pound Globe
Butt-Welding Ends

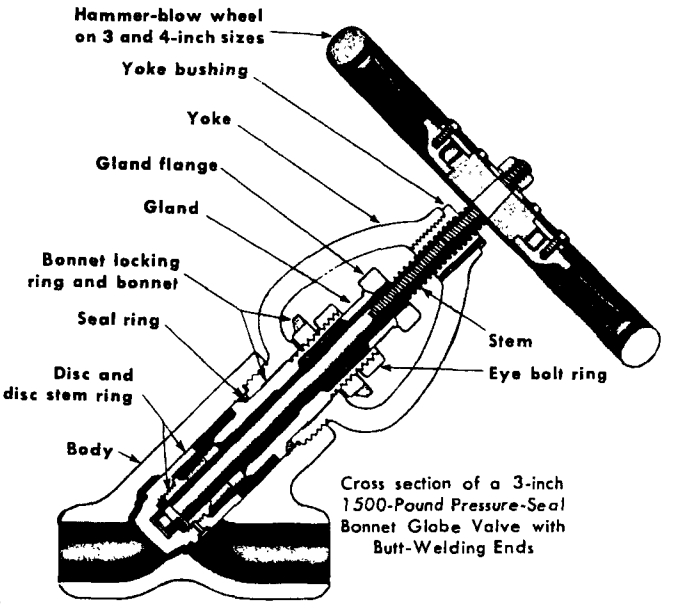
Crane Pressure-Seal Bonnet Globe Valves, like the gate valves described on the preceding pages, feature many advantages. The valves are compact, light in weight, and can be installed in less space than required for conventional valves. Their Pressure-Seal Bonnet assures freedom from bonnet joint leakage and maintenance.

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, consisting of a wide layer of Stellite facing, is integral with the body casting.

Stellite faced disc: The valves feature a newly designed, improved, swivel plug type disc faced with Stellite. In the 2-inch size, the disc stem ring is screwed onto the disc and tack welded in place, as shown in the illustration of the socket-welding end valve below. In sizes 2½-inch and larger, the disc is piston guided; the disc stem ring is screwed in, pinned, and tack welded to the disc as shown in the illustration at the right.

Rising, turning stem: The stem is the rising, turning type and operates through a threaded yoke bushing screwed into and pinned to the yoke. The stem is fully guided by long engagement with the yoke bushing and the lower end of the bonnet.



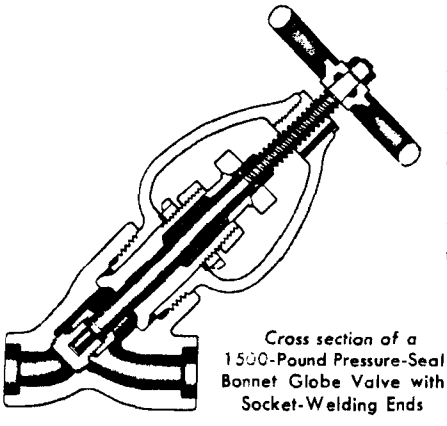
Cross section of a 3-inch 1500-Pound Pressure-Seal Bonnet Globe Valve with Butt-Welding Ends

Bonnet and yoke: The valves have the Crane Pressure-Seal Bonnet, the yoke and retaining ring being integral. The wide yoke arms permit easy accessibility to the stuffing box.

Stuffing box and gland: The stuffing box is large and deep; it is filled with high grade packing. The two-piece gland consists of a gland and gland flange held in place by swinging gland eye bolts; the bolts will not loosen in service.

Handwheel: Sizes 2 and 2½-inch have a conventional style malleable iron wheel; sizes 3 and 4-inch have a cast steel hammer-blow wheel.

1500-Pound Globe and Angle
Socket-Welding Ends



Cross section of a 1500-Pound Pressure-Seal Bonnet Globe Valve with Socket-Welding Ends

Socket-welding end 1500-Pound Globe and Angle Valves in sizes 1, 1¼, 1½, and 2-inch also are included in the Crane Pressure-Seal Bonnet line. They are similar in construction to the 2-inch butt-welding end globe valves described above, except for the end connections; they are also made in the angle pattern.

The globe valve is the Y-pattern design, having an integral Stellite faced seat. The angle valves have a low seat, with a separate Stellite faced seat ring securely welded into the body. Both valves have unusually good flow characteristics, assuring low pressure drop.

The Stellite faced disc is the improved Crane swivel plug type with a new disc stem ring connection and a long vertical fit between the bore of the disc and the pilot end of the stem. The characteristics of this construction assure the maximum in rigidity, while still permitting the disc to swivel.

General description....pages 162 and 163 *Pressure—temperature ratings....page 164* *Weights and dimensions....page 169*

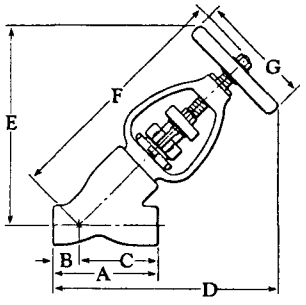
Pressure-Seal Bonnet
Cast Steel Globe and Angle Valves

(continued from the preceding page.)

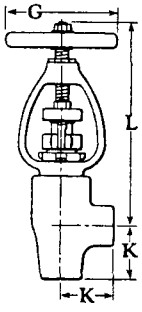
Materials: Valves having the catalog number suffixed with the designation "U" are furnished with a body and bonnet made of Crane Carbon Steel conforming to requirements of ASTM A 216, Grade WCB, and are suitable for temperatures up to 1000 F. The disc is carbon steel with Stellited face.

Valves having the catalog number suffixed with the designation "U7" are furnished with a body and bonnet made of Crane No. 7 Chromium-Molybdenum Alloy Steel conforming to ASTM A 217, Grade WC6, and are suitable for temperatures up to 1200 F. The disc is No. 7 Steel with Stellited face.

All valves have an Exelloy stem, Crane No. 7 Chromium-Molybdenum disc stem ring, cast carbon steel yoke, and Cast Manganese Bronze yoke bushing. Sizes 2½-inch and smaller have a conventional type malleable iron handwheel; sizes 3 and 4-inch have a hammer-blow type cast steel handwheel.



Globe Valves



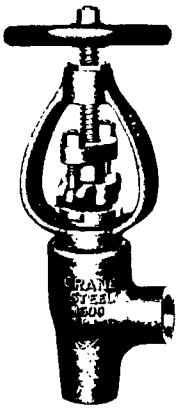
Angle Valves

Butt-welding valves: Butt-welding valve ends comply with American Standard, B16.5-1957, for valves of the 1500-pound class. In addition, end to end dimensions of the valves are the same as those shown in American Standard, B16.10-1957, for 1500-pound pressure-seal bonnet gate valves.

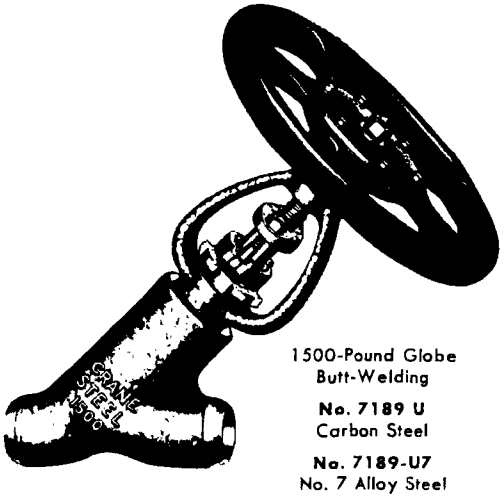
Orders must specify the inside diameter of the pipe with which the valves are to be used, or the pipe wall thickness, so that the valve ends can be bored to match.



1500-Pound Globe
Socket-Welding
No. 7852-U7
No. 7 Alloy Steel



1500-Pound Angle
Socket-Welding
No. 7853-U7
No. 7 Alloy Steel



1500-Pound Globe
Butt-Welding
No. 7189 U
Carbon Steel
No. 7189-U7
No. 7 Alloy Steel

Higher pressure and smaller size valves: Larger sizes, and valves for higher pressures, also are available; information on request. If smaller size valves are desired, use Crane Lip-Seal Bonnet Globe and Angles (pages 176 to 178) They are made in sizes ½ to 2-inch and in three pressure classes . . . . 1500-Pound, 1570 psi at 1050 F, and 2520 psi at 1050 F.

Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches									
	Socket-Welding		Butt-Welding		Globe						Angle		Dia. of wheel	Depth of socket
	No. 7852-U7 Globe	No. 7853-U7 Angle	No. 7189 U Globe	No. 7189-U7 Globe	A	B	C	D open	E open	F open	K	L open	G	
Inches	No. 7 Steel	No. 7 Steel	Carbon Steel	No. 7 Steel										
1	20	20			5½	1⅜	4⅛	12⅝	11¼	13⅝	2¾	12⅛	5½	½
1¼	30	29			6½	1⅝	4⅞	16	13⅜	16⅛	3¼	14	7	½
1½	45	42			7	2	5	17½	15½	18⅞	3½	16¼	8	½
2	55	53			8½	2 7/16	6 1/16	19¾	17¼	20⅝	4¼	17½	10	⅝
2			55	55	8½	2 7/16	6 1/16	20	17½	20½			10	
2½			104	104	10	2⅞	7⅛	24⅝	21¾	25			14	
3			127	127	12	3⅜	8⅝	28⅜	25	26			20	
4			197	197	16	4½	11½	33¾	29¼	32½			20	

Description of Pressure-Seal Bonnet....pages 162 and 163

Ratings, tests, and recommendations....page 164

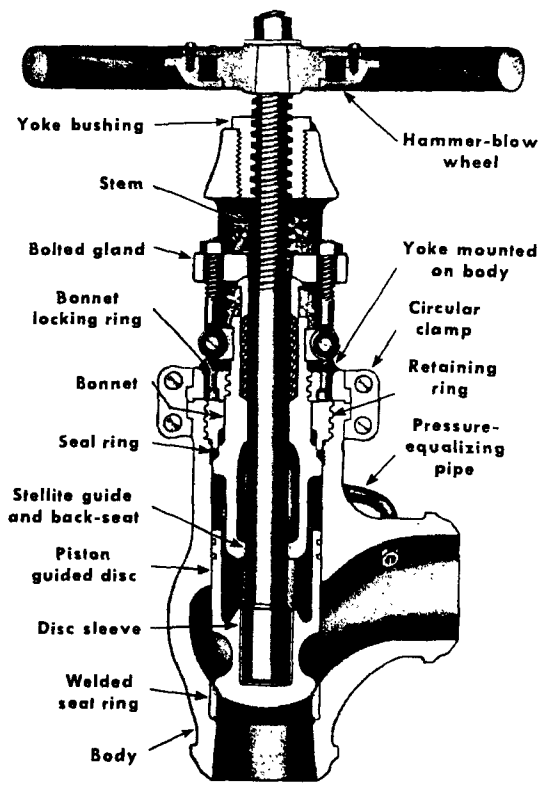
Pressure-Seal Bonnet
Cast Steel Stop-Check Valves

900 and 1500-Pound Butt-Welding Ends

Freedom from bonnet joint leakage and maintenance, savings in space and weight, long service life, unusually low pressure drop—these and other benefits accrue to the user of Crane Pressure-Seal Bonnet Stop-Check Valves.

Body: The body of these valves—Y-pattern in the globe type—has streamlined contours with liberal internal area above the seat. Combined with the special shape of the seat and disc, this design offers minimum resistance to flow. Pressure drop through the valve is lower than is usually accepted as good performance for non-return or stop-check valve service.

The body is equipped with a specially designed external pressure-equalizing pipe, welded in place, connecting the chamber above the disc with the outlet end of the body. The pipe is so assembled to the body that the end on the outlet protrudes into the path of flow. Under high flow conditions, an aspirator effect is produced by the pipe, assuring lower pressure above the disc than beneath the disc and permitting high disc lift; should the flow reverse, the pipe admits the higher pressure to the top of the disc chamber, thereby forcing the disc to close quickly.



Cross section of a 6-inch 900-Pound Pressure-Seal Bonnet Angle Stop-Check Valve

Body seat ring: The body seat ring is of special design; it is slipped into an accurately machined recess in the body and is securely welded in place. It will not loosen in service. The seating surface is Stellite faced.

Disc: The disc, also Stellite faced, is of piston guided construction, and is equipped with two piston rings. It fits snugly in the body, and is additionally guided by the long shoulder on the end of the stem. This shoulder operates in a sleeve fastened in the disc; to prevent galling and scoring, the sleeve and the washer between the stem end and the disc are made of a steel having extreme hardness.

Stem: The stem is of liberal diameter, amply strong, and well guided. It has a long thread engagement with the yoke bushing.

The stem hole in the lower end of the bonnet is Stellite faced to provide a good bearing and back-seat for the stem.

Pressure-Seal Bonnet: These valves have the Crane Pressure-Seal Bonnet described on pages 162 and 163. On the 6 and 8-inch sizes, the retaining ring and bonnet are drawn together by a threaded bonnet locking ring as shown in the cross section at the left.

The 10 and 12-inch sizes have a bonnet plate with bonnet studs, similar to the construction illustrated on page 162.

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 stud bolts on each side of the two halves of the clamp

Handwheel: The handwheel is steel and is mounted on the stem end. It is of hammer-blow construction to enable closing the valve under unbalanced pressure conditions or against boiler test pressure.

Stuffing box: A tight stem seal is provided by the large and deep stuffing box, which is filled with high grade packing.

The valves have a two-piece ball-type gland, consisting of a gland and gland flange. This construction maintains an even load on the packing and prevents the gland from binding on the stem. The swinging gland eye bolts move out of the way when the stuffing box is being repacked.

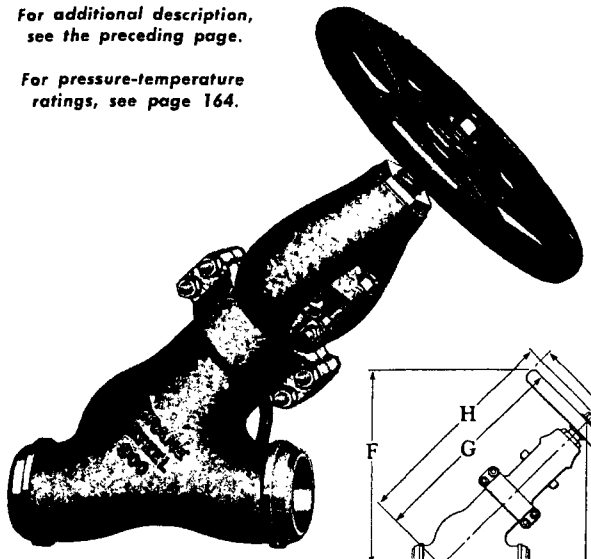
Selecting the proper size: To determine the most efficient size stop-check valve to use, refer to the information shown on pages 172 and 173.

Description of Pressure-Seal Bonnet...pages 162 and 163
Pressure-temperature ratings.....page 164
Weights and dimensions.....page 171

Pressure-Seal Bonnet
Cast Steel Stop-Check Valves

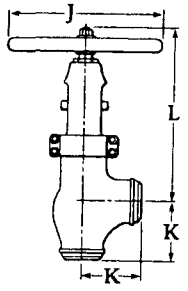
For additional description, see the preceding page.

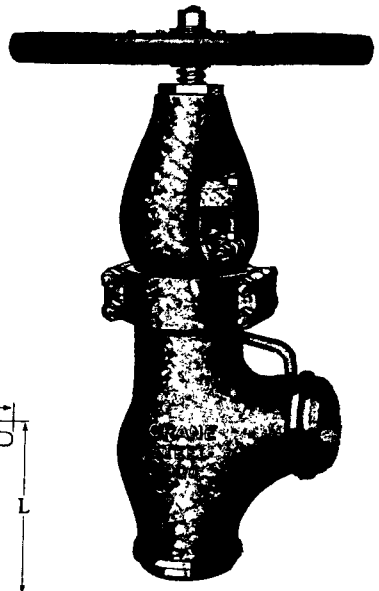
For pressure-temperature ratings, see page 164.



Globe Y-Pattern, Butt-Welding
Crane No. 7 Alloy Steel
No. 7186-U7... 900-Pound
No. 7192-U7... 1500-Pound

Important
A simple and direct method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow will be found on pages 172 and 173.





Angle, Butt-Welding
Crane No. 7 Alloy Steel
No. 7188-U7... 900-Pound
No. 7194-U7... 1500-Pound

Materials: These valves have a Crane No. 7 Chromium-Molybdenum Alloy Steel body, bonnet, body seat ring, and disc, the seating surfaces being faced with Stellite; the seat ring is securely welded in the body. The stem, strong and durable, is made of Crane Exelloy.

Crane No. 7 Chromium-Molybdenum Steel conforms to requirements of ASTM A217, Grade WC 6.

Test pressures: The 900-pound valves are given a 3250 psi shell test and a 1350 psi seat test; 1500-pound valves are given a 5400 psi shell test and a 2250 psi seat test. All valves are also given a 100 psi air-under-water seat test. They are suitable for boiler test conditions one and one-half times the nominal ratings to comply with the ASME Boiler Code. For complete pressure-temperature ratings and service recommendations, see page 164.

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 on special order.

Valve ends: Dimensions of butt-welding ends conform to those in American Standard, B16.5-1957, for valves of the corresponding pressure class. Orders must specify the inside diameter of the pipe to be used with the valves, or pipe wall thickness, so that valve ends can be bored to match.

End to end and center to end dimensions agree with those in ASA B16.10-1957 for pressure-seal bonnet gate valves of corresponding pressure class.

Weights and Dimensions — Prices on Request

Pressure Class	Size	Pounds, Each		Dimensions, in Inches										
		Globe	Angle	Globe								Angle		Wheel
	Inches	Butt-Welding	Butt-Welding	A	B	C	D open	E open	F open	G open	H open	K	L open	J
		No. 7186-U7	No. 7188-U7											
900 Pound	6	weights on request	weights on request	20	5	15	27	41¼	36¼	38	39¾	10	32	26
	8			26	6¾	19¼	32½	50	43¼	46	47¾	13	37¾	30
	10			31	7¾	23¼	37½	57½	50	53	55	15½	42½	36
	12			36	9 5/16	26 11/16	45	66½	57	63½	65½	18	51	36
		No. 7192-U7	No. 7194-U7											
1500 Pound	8	weights on request	weights on request	28	7¾	20¼	32½	51	43¼	46	47¾	14	37¾	30
	10			34	9	25	37½	58¾	50	53	55	17	42½	36
	12			39	11 5/16	27 11/16	45	68½	57	63½	65½	19½	51	36

Crane Pressure-Seal Bonnet Stop-Check Valves

Selecting the Proper Size — Determining Pressure Drop

A problem confronting the power piping designer is the selection of the best size of stop-check valve for his service conditions. This type valve has a floating disc member, hence it is important that the valve be sized to provide full disc lift under flow conditions prevailing during the major portion of the service life of the installation. If the valve is too large for flow conditions, the disc will float in a partially open position; this may result in fluttering of the disc and rapid wear of valve parts. Conversely, if the valve is too small for flow conditions encountered, pressure drop will be excessive.

Crane has conducted numerous tests both in the laboratory and in the field over a period of many years to establish the flow characteristics of Crane Pressure-Seal Bonnet Stop-Check Valves. As a result, Crane Engineers have developed the chart shown on the opposite page.

The chart is a graphical presentation of flow data which were determined by test. Its use offers a simple method of determining the best size of stop-check valve, as well as the pressure drop under varying conditions of flow, without any computation

How to Use the Chart Shown on the Opposite Page

Given: Steam Pressure.....1,000 psi, gauge
Steam Temperature...850 F
Flow Rate.....200,000 pounds per hour, maximum

Find: The catalog number of the valve and the best size for the above installation.

Solution: Reference to the pressure-temperature ratings on page 164 indicates a stop-check valve of the 900-pound pressure class will be required: thus, either of the following may be used:

No. 7186-U7, Globe
No. 7188-U7, Angle

The choice between the globe or angle depends, of course, upon the piping arrangement. The flow characteristics of Crane Pressure-Seal Bonnet Stop-Check Valves are identical for both globe and angle types. *Now, follow the text below and proceed as indicated by the arrows on the chart.*

1. Enter the chart at a temperature of 850 F. Move vertically upward to the curved line for 1000 psi gauge pressure, then horizontally to the right to establish a point on the specific volume scale. From this point, draw a line through the flow rate being investigated (200,000 pounds per hour) and establish a point on Index 1.

2. From the point on Index 1, draw another line through any assumed size of the No. 7186-U7 or No. 7188-U7 (for example, the 6-inch size) and establish a point on Index 2. Move horizontally to the diagonal line in the right side of the chart and read the pressure drop at the intersection as 12 psi.

Chart solutions resulting in a point on Index 2 that falls below Line A-A indicate the valve disc will not be fully lifted under the flow conditions used. Operation under such conditions is not recommended, but at times, must be tolerated for short periods during the low load portion of the operating cycle.

3. Enter the chart where Line A-A intersects Index 2. Move diagonally upward through the size being investigated (6-inch) and establish a second point on Index 1. From this point, extend a line to the specific volume established in Step 1, and at its intersection with the flow rate line, read 74,000 pounds per hour as the minimum flow rate at which the disc will be in the fully lifted position. The pressure drop at this flow rate is 2 psi. At all flow rates less than 74,000 pounds per hour through 6-inch valves, the pressure drop may be expressed as "2 psi or less".

4. Repeat Steps 2 and 3 for all other probable sizes and determine the pressure drop and minimum flow rate for the wide open position. Results are shown at the right.

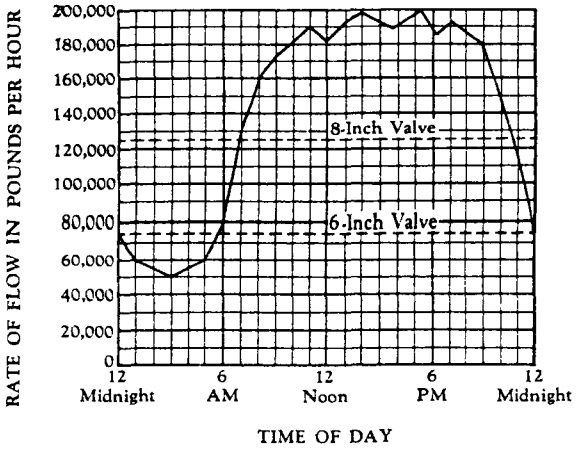
Valve Size Inches	Pressure Drop at Maximum Flow Rate of 200,000 lbs. per hour (In Psi)	Minimum Flow Rate for Wide Open Valve Pounds per hour
6	12.0	74,000
8	4.8	125,000
10	2.2	190,000
12	Less than two	280,000

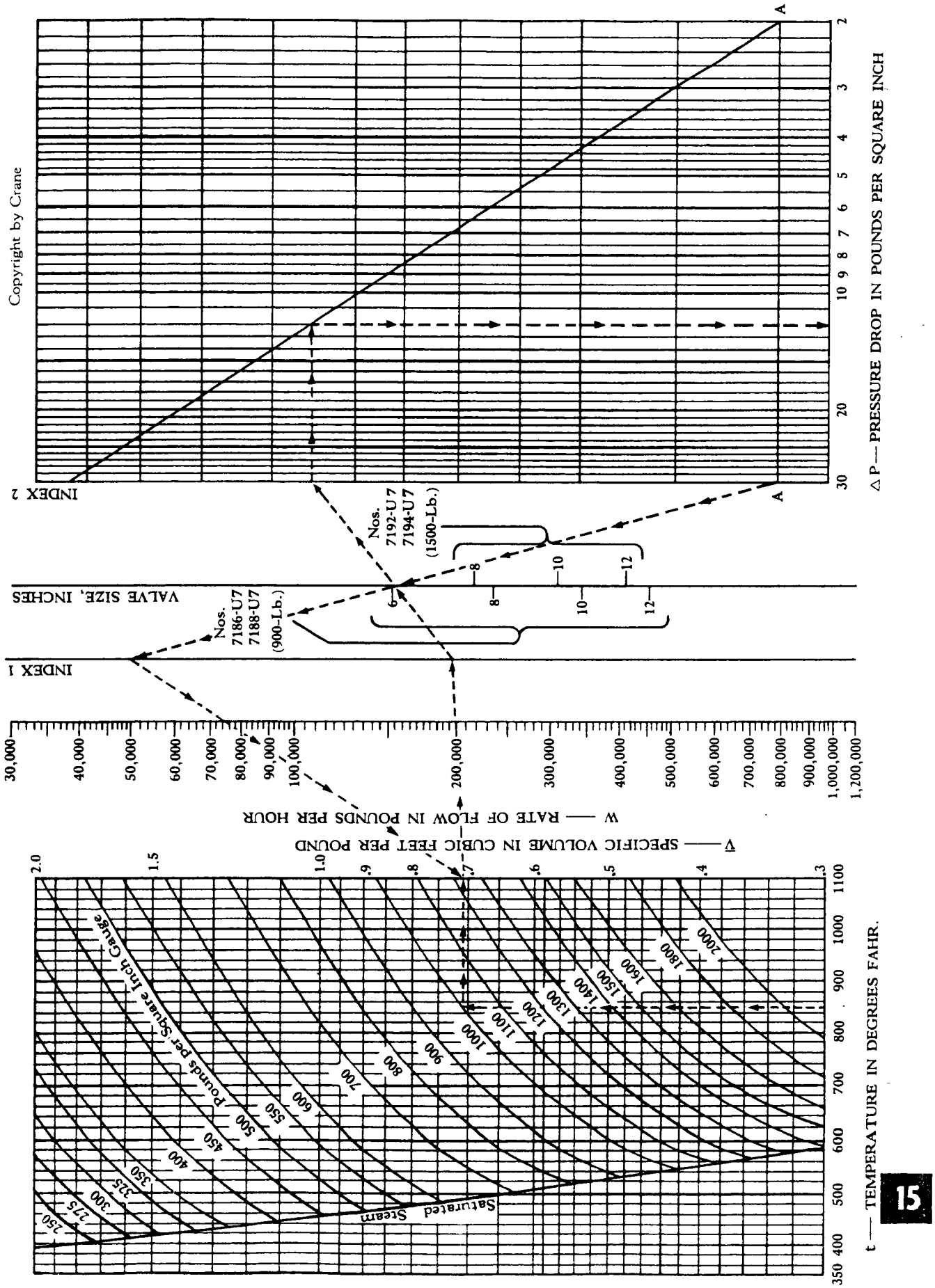
5. Since the flow rate of 200,000 pounds per hour is designated as maximum, it may be assumed the boiler will frequently be operated at lower flow rates. On this basis, it is obvious both the 10 and 12-inch sizes would be too large. The choice between the 6 and 8-inch size depends upon the load-demand curve, and the final selection rests with the piping designer.

6. A typical daily load-demand curve, as shown in the chart below, indicates the advisable size is 8-inch. Minimum flow rates for a fully lifted disc for both 6 and 8-inch sizes are shown in the chart. The disc will not be fully lifted for about 6 hours in the 6-inch valve and for about 8 hours in the 8-inch valve. However, since the pressure drop for the 8-inch is so much lower during high-load operation, it appears to be a better choice than the 6-inch.

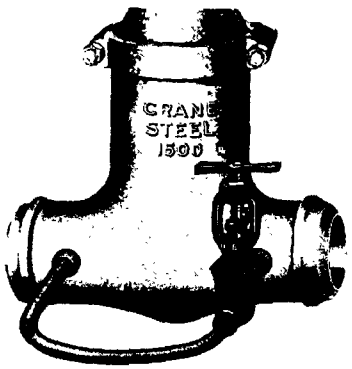
Pressure drop for any intermediate flow condition can be determined as outlined in Steps 1 and 2.

Typical Daily Load-Demand Curve

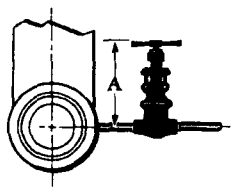



Copyright by Crane
INDEX 2
Nos. 7192-U7 7194-U7 (1500-Lb.)
VALVE SIZE, INCHES
Nos. 7186-U7 7188-U7 (900-Lb.)
INDEX 1
W — RATE OF FLOW IN POUNDS PER HOUR
V — SPECIFIC VOLUME IN CUBIC FEET PER POUND
Saturated Steam
Pounds per Square Inch Gauge
ΔP — PRESSURE DROP IN POUNDS PER SQUARE INCH
t — TEMPERATURE IN DEGREES FAHR.

By-Passes for Cast Steel
Pressure-Seal Bonnet Gate Valves



Standard Arrangement for Crane One-Valve Built-Up By-Pass



Dimension "A" indicates center to top distance for all by-pass valves.

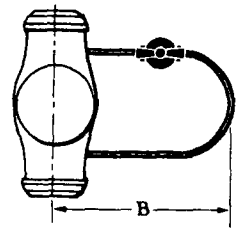
When so ordered, Crane Pressure-Seal Bonnet Gate Valves (pages 165 to 167) can be furnished with a Built-Up By-Pass suitable for "warming up" on steam line service or for equalizing the pressure around main control valves used on steam or other fluids.

One-valve, two-valve, and three-valve by-passes, set up as shown in the line illustrations at the right, are standard types regularly furnished.

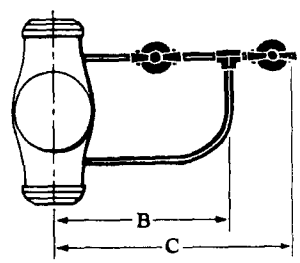
Construction: Crane by-passes are designed to provide maximum strength, durability, and flexibility with a minimum of additional weight on the main valve. The by-pass is furnished with an outside screw and yoke Lip-Seal Bonnet globe valve having socket-welding ends. All connections in the by-pass are welded to assure a permanently tight, secure 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.

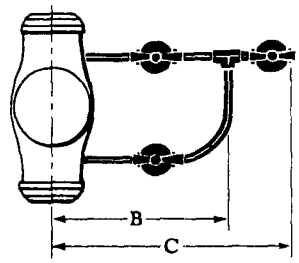
Materials: High quality materials are used in the by-pass piping and for the by-pass valve. The by-pass valve will be made of carbon steel or Crane No. 7 Chromium-Molybdenum Alloy Steel to correspond with the material of the main valve. Similarly, the piping will be seamless carbon steel or seamless chromium-molybdenum alloy steel.



One-Valve By-Pass



Two-Valve By-Pass



Three-Valve By-Pass

The piping and the by-pass valve 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 suitable for the same services as the main valve.

Location of by-pass: By-pass valves are regularly furnished attached to the side of the main valve. The stems of the main valve and the by-pass valve or valves will be parallel and will point upward. When ordering, specify whether a one-valve, two-valve, or three-valve by-pass is desired.

Special by-passes: By-passes of other designs or to other specifications can be made to order. Please furnish complete description, drawings, etc.

Built-Up By-Pass Sizes and Clearance Dimensions — Prices on Request

Main Valve Size	By-Pass Valve Size	Approximate Clearance Dimensions, in Inches							
		A-Open (all pressure classes)		B			C		
		Crane Carbon Steel By-Pass	Crane No. 7 Chromium-Molybdenum By-Pass	600 Pound Class	900 Pound Class	1500 Pound Class	600 Pound Class	900 Pound Class	1500 Pound Class
Inches	Inches								
4	3/4	11 1/4	11 5/8	17 5/8	17 3/4	17 3/4	24	24 3/8	24 3/8
5	3/4	11 1/4	11 5/8	17 3/4	18 1/8	18 1/8	24 1/8	24 5/8	24 5/8
6	3/4	11 1/4	11 5/8	19	19 1/4	19 1/4	25 3/8	26	26
8	3/4	11 1/4	11 5/8	20 3/8	19 5/8	19 5/8	26 3/4	26 1/8	26 1/8
10	1	11 3/4	12 1/8	23 1/2	23 1/2	23 1/2	30 7/8	31 1/8	31 1/8
12	1	11 3/4	12 1/8	24 1/8	24 1/2	24 1/2	31 1/2	32	32
14	1 1/4	14	14	27 1/4	27 5/8	27 5/8	36 7/8	36 3/8	36 3/8
16	1 1/4	14	14	28 3/8	28 5/8	28 5/8	36 7/8	37 3/8	37 3/8
18	1 1/2	16	16 3/16	32 1/2	34		42	43 3/4	
20	1 1/2	16	16 3/16	33 7/8			43 7/8		
24	2	18 1/4	18 3/4	41			52 1/8		

Description of main valves....pages 165 to 167 Additional data on by-passes....page 403 Taps and drains for valves....page 403

Pressure-Seal Cap
Cast Steel Lift Check Valves

(Patented)

New 900 and 1500-pound valves . . . with Crane's exclusive "cage type" disc guide and disc design

These valves are a new addition to Crane's line of Pressure-Seal Bonnet Valves. Like the others, they feature compactness, relatively light weight, and an absolutely tight, leak-proof body-cap joint. Their Y-pattern body, cage type disc guide and disc, and reduced seat opening combine to provide the benefits of full disc lift with minimum pressure drop. The valves are recommended for boiler feed service.

Body and cap: The Y-pattern body has 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 cap and seal ring set into the neck of the body, and are held snug by a retaining ring. Valves 6-inch and smaller have a cap locking ring and washer; larger sizes have a cap plate secured by means of Triplex steel studs and steel stud nuts.

Disc guide and disc: The valves feature Crane's patented cage type disc guide and disc, each designed with three large ports (see illustration below). The disc guide, shoulder seated and tack welded in the body, accurately guides the movement of the piston type disc.

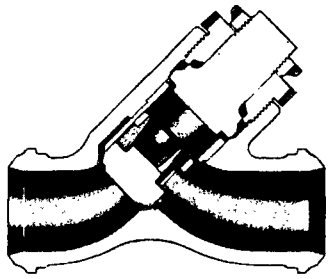
With the disc in the open position, the ports in the disc guide permit unrestricted flow through the valve.



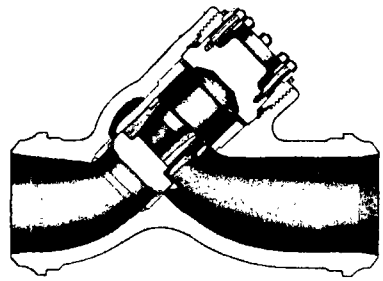
Disc guide (or liner) and disc

With the disc in the closed (or open) position, the ports in the disc guide and the disc allow an open space from the area above the disc to the downstream (outlet) side of the valve, thus equalizing the pressure between these points . . . . and eliminating any need for an equalizer pipe.

The Crane design assures a tight seat, minimizes chattering, and produces high disc lift with minimum pressure drop. It effects a fully opened valve during normal flow . . . . and a quick, positive shut-off when the flow is reversed.



Cross Section
Sizes 6-inch and Smaller



Cross Section
Sizes 8-inch and Larger

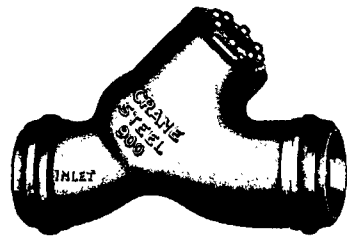
Seat: Valves 6-inch and smaller have a Stellite faced seating surface integral with the body casting; larger sizes have a steel body seat ring faced with Stellite.

Materials: The body, disc guide, disc, retaining ring, and the locking ring or cap plate are Crane Carbon Cast Steel conforming to ASTM A 216, Grade WCB. The disc seating surface is faced with Stellite. The portions of the disc guide and disc in contact with each other are chromium-plated to prevent galling.

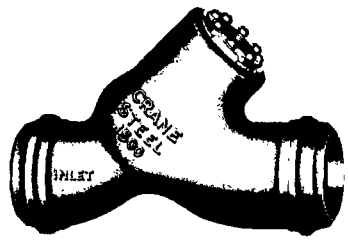
Standards: Dimensions of valve ends comply with American Standard B16.5-1957 for butt-welding valves of the same pressure class. End to end dimensions are the same as those listed in American Standard B16.10-1957 for Pressure-Seal Bonnet Gate Valves of the same pressure class.

Ordering: Orders must specify the inside diameter of the pipe with which the valves are to be used, or the pipe wall thickness, so that the valve ends can be bored to match.

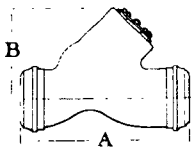
Ratings: For pressure-temperature ratings and tests, see page 164.



No. 7140 U
900-Pound Butt-Welding



No. 7150 U
1500-Pound Butt-Welding



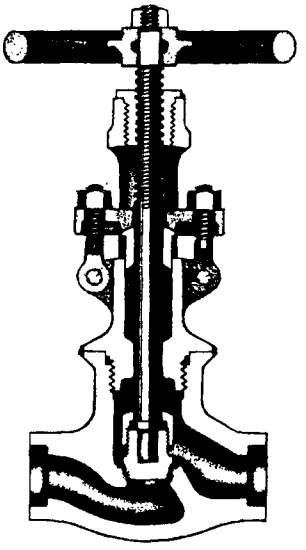
Weights and Dimensions — Prices on Request

	Size	Pounds, Each		Dimensions, in Inches			
		No. 7140 U	No. 7150 U	900-Pound		1500-Pound	
	Inches	900 Pound	1500 Pound	A	B	A	B
Butt-Welding Lift Check Valves	2½	weights on request	weights on request	. . .	. . .	10	7¼
	3			12	8¼	12	8¼
	4			14	9⅛	16	9⅛
	5			17	10⅜	19	10⅜
	6			20	13	22	13
	8			26	14⅛	28	14⅛
	10			31	17⅝	34	17¾
	12			36	20½	39	20¾

Description of Pressure-Seal Bonnet....pages 162 and 163
Pressure-temperature ratings.....page 164
Proper sizing.....page 427
Materials.....Section 2

Lip-Seal Bonnet
Cast Steel Globe and Angle Valves

(Patented)



Typical Cross Section
Lip-Seal Bonnet Globe Valve
Outside Screw and Yoke
Socket-Welding Ends

½ to 2-inch valves in three pressure classes . . . 1500-Pound, 1570 psi at 1050 F, and 2520 psi at 1050 F . . . for high pressure-temperature service

Crane globe and angle valves with patented Lip-Seal Bonnet Joint have proved to be a marked advancement in small steel valve construction. Crane Lip-Seal design has made possible compact, relatively light-weight valves without sacrificing strength or durability. Absolute tightness, full seating area, freedom from bonnet joint maintenance, minimum weight and bulk, and easy dismantling and reassembly are a few of the advantages.

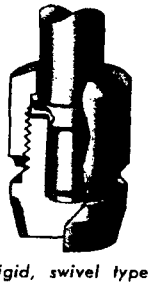
The valves are especially recommended for use in modern power, industrial, and chemical plants on main steam, auxiliary steam, boiler feed, and miscellaneous piping, as well as for drips, drains, by-pass, blowdown, and similar service.

Lip-Seal Bonnet joint: Crane's Lip-Seal design features simplicity. The body and bonnet are screwed together until a firm metal-to-metal contact is made between the smoothly machined, flat surfaces on the shoulder of the bonnet and the top of the body. The lips around the periphery are then seal welded. A small shoulder on the bonnet insures perfect centering of the bonnet on the body, eliminating the possibility of stem binding due to bonnet misalignment.

The welded seal is not subjected to bending moments which might break the seal, nor is it ever required to carry the mechanical load exerted upon the body-bonnet joint by pressure and stem thrust. Threaded members . . . . plated to resist corrosion and to prevent galling or seizure . . . . carry the entire mechanical load at relatively low stresses. The welded seal simply guards against any leakage.

Easy dismantling and reassembly: Dismantling the valve is easy. Merely grind off the seal weld (chipping or burning unnecessary) and unscrew the bonnet. With ordinary care, the seal weld may be repeatedly ground off for dismantling and welded upon reassembly with no damage to the valve.

Disc-stem connection: The disc-stem connection holds all clearances to a minimum and places the seating load closer to the actual seating surface of the valve. In assembly, the disc stem ring is screwed down finger tight, axially forming a continuous metal-to-metal contact between the disc and stem. The disc stem ring is then locked to the disc by a tack weld. The stem is fully guided by a yoke bushing and by long engagement with the lower end of the bonnet.



Rigid, swivel type disc-stem connection with disc tapered to permit close regulation of flow when throttling.

Minimum radial clearance, long vertical fit between the pilot end of the stem and the bore of the disc, and no axial clearance produce maximum rigidity while permitting the disc to swivel.

(description continued on the next two pages)

Maximum Non-Shock Working Pressures, psi

Temp.	(Regular Material)			(Made to Order)	
	Crane Carbon Cast Steel* ASTM A216-WCB	Crane No. 7 Chromium-Molybdenum Cast Steel† ASTM A217-WC6		Crane No. 9 Chromium Molybdenum Cast Steel† ASTM A217-WC9	
Deg. Fahr.	3800 Series Nos.	3900 Series Nos.	4000 Series Nos.	Special 3900 Series	Special 4000 Series
100°	3600	6000	7450		
150	3550	5915	7450		
200	3500	5830	7450		
250	3450	5750	7450		
300	3415	5690	7450		
350	3375	5625	7450		
400	3330	5550	7450	Up to 1000 F, ratings are same as for 3900 Series Valves of No. 7 Steel	Up to 1000 F, ratings are same as for 4000 Series Valves of No. 7 Steel
450	3255	5430	7450		
500	3125	5210	7450		
550	2955	4925	7450		
600	2770	4620	7385		
650	2580	4300	6880		
700	2350	4025	6440		
750	2125	3745	6000		
800	1830	3470	5545		
850	[1]**1500**	3190	5105		
875	[1]1305	3055	4880		
900	[1]1115	2915	4665		
925	[1]945[2]	2775	4440		
950	[1]770[2]	2640	4225		
975	[1]600[2]	**2500**	4000		
1000	[1]430[2]	2230	3560		
1025	. . .	[1]1900	[1]3040	1945	3105
1050	. . .	[1]**1570**	[1]**2520**	1655	2655
1075	. . .	[1]1355	[1]2175	[1]1430	[1]2280
1100	. . .	[1]1145	[1]1825	[1]1200	[1]1920
1125	. . .	[1]930[2]	[1]1480[2]	[1]1030	[1]1650
1150	. . .	[1]715[2]	[1]1145[2]	[1]855	[1]1370
1175	. . .	[1]530[2]	[1]840[2]	[1]715[2]	[1]1145[2]
1200	. . .	[1]345[2]	[1]545[2]	[1]570[2]	[1]910[2]

Cold Service For temperatures from −20 F to 100 F, the ratings shown for 100 F apply.

*Where welded construction is used, consideration should be given to the possibility of graphite formation on Carbon steel at temperatures above 775 F.

†Consideration should be given to the possibility of excessive oxidation (scaling) when No. 7 or No. 9 Steel is used at temperatures above 1050 F.

[1]Product used within the jurisdiction of Section 1, Power Boilers of the ASME Boiler and Pressure Vessel Code, is subject to the same maximum temperature limitations placed upon the material in Table P7, 1959 edition thereof.

[2]Product used within the jurisdiction of Section 1, Power Piping of the ASA Code for Pressure Piping B31.1, is subject to the same maximum temperature limitations placed upon piping of the same general compositions in Table 2a of ASA B31.1-1955.

Hydrostatic Test Pressures

Valve	1500-Pound (Carbon Steel)	1570psi—1050F (No. 7 Steel)	2520psi—1050F (No. 7 Steel)
Shell	5400 psi	9000 psi	11,175 psi
Seat	3700 psi	6100 psi	7,550 psi

Seat tested 100 psi air-under-water.

Lip-Seal Bonnet
Cast Steel Globe and Angle Valves

(Patented)

(continued from preceding page)

Disc and seat: The plug type disc and seat, ideal for rigorous service, provide a wide seating contact not easily affected by foreign matter or wiredrawing. The seating surfaces are faced with Stellite, a material that withstands corrosion and erosion unusually well and displays excellent resistance to wear, seizure, galling, and abrasion.

Body: Valve bodies of each pressure class, similar in design, are well proportioned throughout. Specially shaped internal contours provide excellent flow characteristics and the flow path is designed to reduce turbulence and minimize disc vibration. Ports and seat opening are full line size.

Yoke and yoke bushing: The yoke has heavy metal sections and is cast integral with the bonnet. The yoke bushing, screwed into the yoke and tack welded in place, will not loosen in service.

Stuffing box and gland: The stuffing box, of liberal proportions and filled with highest quality packing, provides a tight seal around the stem. The two-piece ball type gland, consisting of a gland and gland flange, maintains an even load on the packing and prevents binding of the stem. The gland flange is held in place by swinging eye bolts.

Repacking: The valves can be repacked while under pressure. When wide open, the top of the disc stem ring meets the underside of the bonnet in an angle-to-ball seat, forming a tight, line bearing contact.

Materials: As indicated under the illustrations at the right, Crane Lip-Seal Bonnet Globe and Angle Valves are regularly made in three pressure classes . . . 1500-Pound ASA . . . 1570 psi at 1050 F (2500-Pound ASA) . . . and 2520 psi at 1050 F.

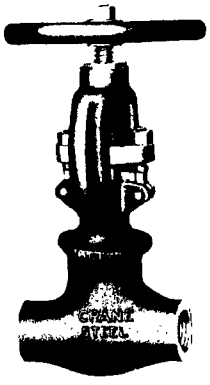
Valves of the 1500-Pound pressure class (Series 3800 catalog numbers) have a body and bonnet made of Crane Carbon Steel conforming to requirements of ASTM A 216, Grade WCB.

Valves of the 1570 psi, 1050 F and the 2520 psi, 1050 F pressure classes (Series 3900 and 4000 catalog numbers respectively) regularly have a body and bonnet made of Crane No. 7 Chromium-Molybdenum Alloy Steel conforming to ASTM A 217, Grade WC6. This steel combines excellent corrosion-erosion resistance, stability against graphitization, and strength retention at elevated temperatures.

For even greater strength and better resistance to steam corrosion at extremely high temperatures, the Series 3900 and 4000 Valves can be made to order of Crane No. 9 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade WC9).

All valves have Stellited seating surfaces and an Exelloy stem. The yoke bushing is made of Cast Manganese Bronze. The gland is bronze on the smaller sizes and siliconized steel on the larger sizes. The gland flange is forged steel and the gland eye bolts are stainless steel.

Ratings: Working pressures are shown on the facing page. Ratings for Series 3800 and 3900 Valves agree with those of the American Steel Flange Standard, B16 5-1957, for the 1500-pound and 2500-pound pressure classes respectively. The Standard does not include ratings for pressure classes above 2500-pound

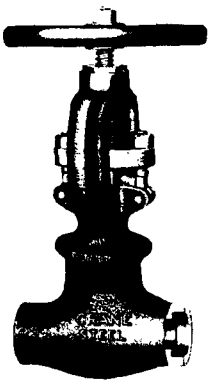


Globe, Screwed

No. 3866 U
1500-Pound
Carbon Steel

No. 3966-U7
1570 psi at 1050 F
No. 7 Alloy Steel

No. 4066-U7
2520 psi at 1050 F
No. 7 Alloy Steel

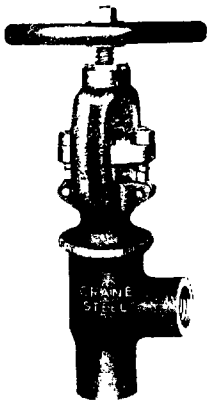


Globe, Socket-Welding

No. 3868 U
1500-Pound
Carbon Steel

No. 3968-U7
1570 psi at 1050 F
No. 7 Alloy Steel

No. 4068-U7
2520 psi at 1050 F
No. 7 Alloy Steel

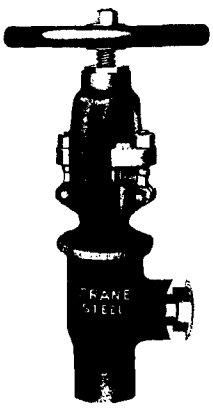


Angle, Screwed

No. 3867 U
1500-Pound
Carbon Steel

No. 3967-U7
1570 psi at 1050 F
No. 7 Alloy Steel

No. 4067-U7
2520 psi at 1050 F
No. 7 Alloy Steel



Angle, Socket-Welding

No. 3869 U
1500-Pound
Carbon Steel

No. 3969-U7
1570 psi at 1050 F
No. 7 Alloy Steel

No. 4069-U7
2520 psi at 1050 F
No. 7 Alloy Steel

All valves in the smaller sizes have a Style S tee handle (not illustrated).

Full seating area: The diameter of the seat opening in these valves is the same as the port diameter, being at least equivalent to the inside diameter of Schedule 160 pipe on Series 3800 Valves and to Double Extra Strong pipe on Series 3900 and 4000 Valves.

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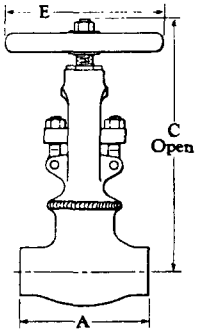
Lip-Seal Bonnet
Cast Steel Globe and Angle Valves

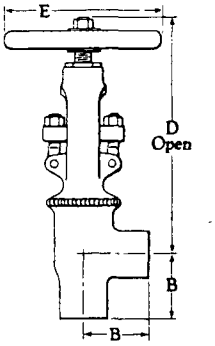
Weights and Dimensions



Globe Valves
Screwed or Socket-Welding

Prices on Request

For ratings and complete description, see pages 176 and 177.



Angle Valves
Screwed or Socket-Welding

Pressure Class	Regular Body and Bonnet Metal	Size	Pounds, Each				Dimensions, in Inches						
			Screwed		Socket-Welding		A	B	C open	D open	E†	Dia of port & seat opening	Depth of socket
		Inches	Globe	Angle	Globe	Angle							
			No. 3866 U	No. 3867 U	No. 3868 U	No. 3869 U							
1500-Pound ASA	Crane Carbon Steel	½	9.0	8.5	9.0	8.5	4	2	9	8½	4⅛	½	⅜
		¾	13.0	12.0	13.0	12.0	4¾	2⅜	11¼	10¾	6	⅝	½
		1	16.0	15.5	16.0	15.5	5½	2¾	11¾	11⅛	7	13/16	½
		1¼	24.0	23.0	24.0	23.0	6½	3¼	14	13⅛	8	15/32	½
		1½	36.0	33.0	36.0	33.0	7	3½	16	15	10	111/32	½
		2	51.0	49.0	51.0	49.0	8½	4¼	18¼	17⅛	12	111/16	⅝
			No. 3966-U7	No. 3967-U7	No. 3968-U7	No. 3969-U7							
1570 psi at 1050 F 2500-Pound ASA	Crane No. 7 Steel*	½	12.0	12.0	12.0	12.0	4	2	8⅞	8⅜	4⅛	⅜	⅜
		¾	16.0	14.5	16.0	14.5	4¾	2⅜	11⅝	113/16	6	½	½
		1	21.0	19.5	21.0	19.5	5½	2¾	12⅛	11⅝	7	⅝	½
		1¼	30.0	26.0	30.0	30.0	6½	3¼	14	135/16	8	⅞	½
		1½	45.0	40.0	45.0	40.0	7	3½	163/16	15⅜	10	15/32	½
		2	65.0	63.0	65.0	63.0	8½	4¼	18¾	17¾	12	1½	⅝
			No. 4066-U7	No. 4067-U7	No. 4068-U7	No. 4069-U7							
2520 psi at 1050 F	Crane No. 7 Steel*	½	Weights on request		Weights on request		4½	2¼	12¼	11 15/16	6	⅜	⅜
		¾					5½	2¾	14½	141/16	7	½	½
		1					6½	3¼	17	16½	8	⅝	½
		1¼					7½	3¾	19 11/16	19	12	⅞	½
		1½					8½	4¼	21 5/16	20 7/16	14	15/32	½
		2					9½	4¾	22 11/16	21⅝	16	1½	⅝

*Valves regularly made of Crane No. 7 Chromium-Molybdenum Steel are also available made to order of Crane No. 9 Chromium-Molybdenum Steel; orders must so specify. Dimensions shown apply to valves made of No. 7 or No. 9 Steel.

†Dimension "E" indicates the length of the handle or the diameter of the wheel. The ½ and ¾-inch Series 3800 and 3900, and the ½ to 1-inch Series 4000 Valves, have a Style S Tee Handle; larger sizes have a Style D wheel, as illustrated.

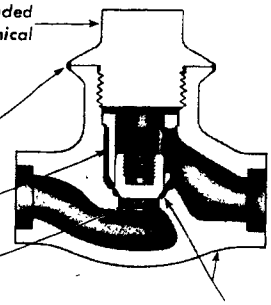
Pressure-Seal Bonnet Valves....pages 162 to 175

Lip-Seal Cap Lift Check Valves....page 179

Lip-Seal Cap
Cast Steel Lift Check Valves

(Patented)

Small size 1500-pound and 1570 psi, 1050 F horizontal lift checks for severe steam services



Smoothly contoured "globe type" body for minimum turbulence and low pressure drop. Integral seating surface, faced with Stellite, resists wear, seizure, galling, and scoring.

These valves are a companion line to the Crane Lip-Seal Bonnet Globe and Angle Valves described on the preceding three pages. Like those valves, they feature construction considerably superior to that generally used for small steel valves . . . . compactness and relatively light weight without sacrifice of strength or durability . . . . absolute tightness, freedom from cap joint difficulties, and easy handling . . . . superior performance on high pressure-temperature steam lines . . . . and wide application in modern power, industrial, and chemical plants.

Lip-Seal joint: Crane's Lip-Seal design is extremely simple. The cap and body are screwed together until a firm metal-to-metal contact is made between the smoothly machined flat surfaces on the shoulder of the cap and the top of the body. The small lips around the outer periphery are then seal welded.

The threaded body-cap connection . . . . with threads plated to resist corrosion and to prevent galling or seizure . . . . carries the entire mechanical load, and at relatively low stresses. The welded seal merely guards against leakage.

Easy dismantling: Dismantling the valve is easy. Simply grind off the seal weld and unscrew the cap. With ordinary care, the seal weld may be repeatedly ground off for dismantling, and welded upon reassembling, with no damage to the valve.

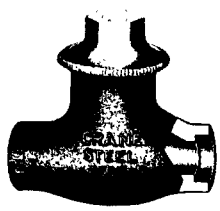
Disc and seat: All valves have an Exelloy disc. The body seating surface is faced with Stellite, a material that withstands corrosion and erosion unusually well. The disc and seat are plug type in shape but, through a reasonable difference in angles, effect what is virtually a line bearing seating contact. A cage type disc guide, tack welded in the body, accurately guides the movement of the disc. This construction, another patented Crane development, assures square seating, minimizes chattering, and produces high disc lift with minimum pressure drop.

Materials: The body and cap are Crane Carbon Steel (ASTM A 216, Grade WCB) in the 1500-Pound Valves and Crane No. 7 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade WC6) in valves of the 1570 psi, 1050 F class. The latter steel offers high corrosion-erosion resistance and excellent strength retention at elevated temperatures. For even greater resistance and strength at extremely high temperatures, valves can be made to order of Crane No. 9 Chromium-Molybdenum Alloy Steel (ASTM A 217, Grade WC9).

1500-Pound



No. 3886 XU
Screwed
Carbon Steel

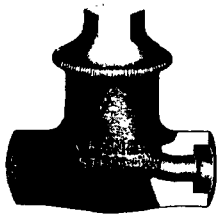


No. 3888 XU
Socket-Welding
Carbon Steel

1570 psi at 1050 F
(2500-Pound ASA)



No. 3986-XU7
Screwed
No. 7 Alloy Steel



No. 3988-XU7
Socket-Welding
No. 7 Alloy Steel

Weights and Dimensions — Prices on Request

Size	Pounds, Each				Dimensions, in Inches					
	1500-Pound Carbon Steel		1570 psi, 1050 F No. 7 Alloy Steel		End to end	Center to top of cap		Diameter of seat opening		Depth of socket
	No. 3886 XU Screwed	No. 3888 XU Socket-Welding	No. 3986-XU7 Screwed	No. 3988-XU7 Socket-Welding		1500 Pound Class	1570 psi at 1050 F Class	1500 Pound Class	1570 psi at 1050 F Class	
Inches										
½	4.2	4.2	5.4	5.4	4	39/16	41/16	7/16	7/16	3/8
¾	7.8	7.8	11.0	11.0	43/4	43/16	51/16	5/8	1/2	1/2
1	8.7	8.7	12.3	12.3	51/2	41/4	51/16	3/4	5/8	1/2
1¼	14.0	14.0	22.0	22.0	61/2	47/8	59/16	11/16	3/4	1/2
1½	20.0	20.0	27.5	27.5	7	59/16	67/16	1¼	11/16	1/2
2	30.0	30.0	44.0	44.0	81/2	63/16	73/8	19/16	19/16	5/8

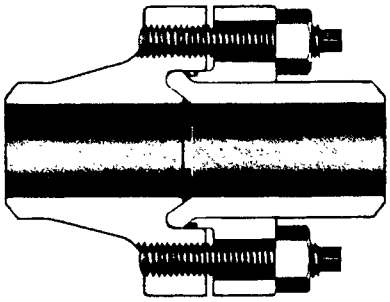
Ratings: Ratings for these valves agree with those in the American Steel Flange Standard, B16.5-1957, and are the same as listed for Crane Lip-Seal Bonnet Globe and Angle Valves of the same material and pressure class; see page 176.

Test: Series 3800 and 3900 Valves are given hydrostatic shell tests of 5400 psi and 9000 psi, respectively. The seats are given a 40 psi hydrostatic test.

Description of materials . . . . Section 2
Proper sizing . . . . . page 427

Pressure-Seal Line Joints

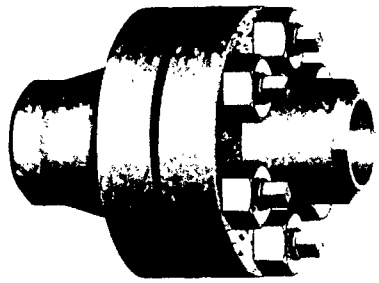
Butt-Welding Ends



Cross Section
1500-Pound Line Joint

Crane Pressure-Seal Line Joints are designed for use on high-pressure high-temperature steam service in welded piping where access to equipment may be desired without necessitating torch-cutting of a line and where conventional flanged joints are susceptible to leakage or require constant maintenance.

Prices and dimensions are furnished on request.



1500-Pound
Pressure-Seal Line Joint

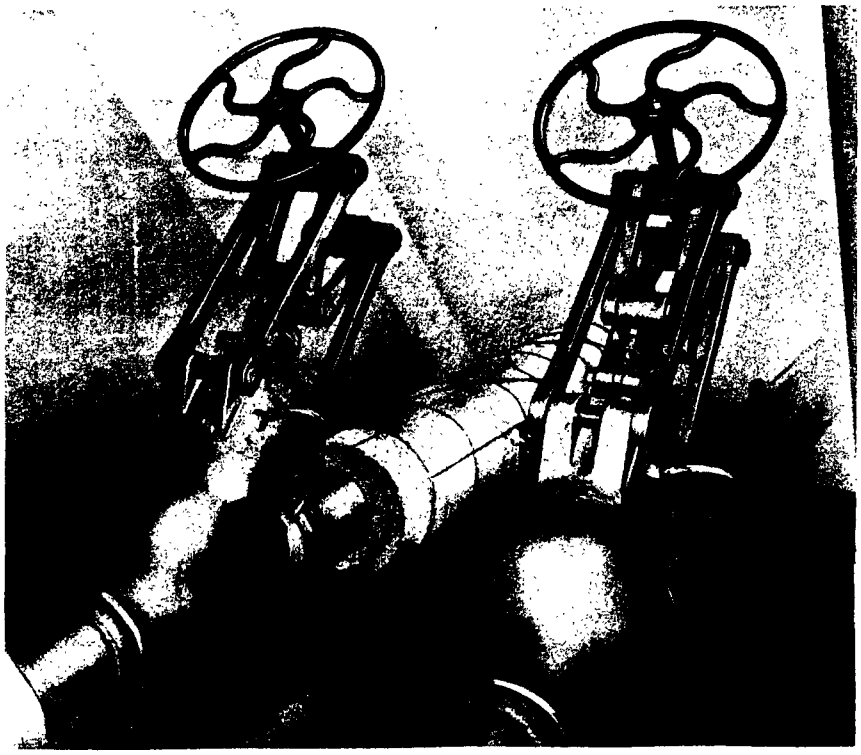
Construction: These joints are considerably smaller and lighter in weight than regular bolted joints of corresponding size made with American Standard flanges. They utilize the internal fluid pressure to assist in forcing the seal ring and mating parts together; the seal ring loading increases as the pressure increases, thus maintaining tightness. All Pressure-Seal Line Joints have butt-welding ends.

The smaller sizes are made with a screwed union ring, a stub end, a seal ring, and a socket end. Larger sizes are semi-flanged, as illustrated above; they are made with a stub end, a ring flange, a seal ring, a socket flange with welding end, and studs and nuts.

Pressure classes and sizes: Pressure-Seal Line Joints are made to order in the 600, 900, and 1500-pound pressure classes, in sizes 1 to 16-inch, with the ends bored for any schedule of pipe.

Material: These joints can be made of a variety of alloy steels to meet specific requirements, or of a combination of alloys, one for each half of the joint. In the latter case, they provide an ideal means of joining dissimilar metals in a piping system, where the welding together of those metals might present an extremely difficult problem.

Inquiries and orders: Inquiries and orders should specify: quantity; size; service conditions in terms of fluid, pressure, and temperature; materials required on each or both ends; schedule number or the outside and inside diameter of the pipe or tubing being used.



Special 12-inch 1500-Pound Crane Pressure-Seal Bonnet Globe Y-Pattern Stop Check Valves installed in the main steam lines of a central station operating at 900 psi, 900 F.

For valves for extremely high pressures and temperatures . . . for nuclear applications . . . for missile and rocket service . . . for extreme vacuums . . . or for other unusual conditions . . . see Crane's Special Service Valves in Section 21.

SECTION 16

Crane Packless Diaphragm Valves

(Patented and Patents Pending)

General Description.....pages 182 and 183

Unlined Valves—Wheel Operated
Description.....pages 184 and 185
Working Pressures.....page 184
Sizes and Weights.....page 185
Dimensions.....page 188

Lined Valves—Wheel Operated
Description.....page 186
Working Pressures.....page 186
Sizes and Weights.....page 186
Dimensions.....page 188

Sliding Stem Valves
Description.....page 187
Working Pressures.....page 187
Sizes.....page 187
Dimensions.....page 188

When ordering valves for corrosive services, refer to the Crane Corrosion Questionnaire on page 202.

The Crane line of Y-Pattern Packless Diaphragm Valves embraces a host of types . . . . . unlined, neoprene-lined, or rubber lined . . . . all available for wheel or sliding stem operation. The unlined valves are furnished in bronze, cast iron, aluminum, or 18-8 SMo and . . . . to further increase their versatility . . . . there is a choice of disc insert and diaphragm materials . . . Neoprene, Buna N, natural rubber, Kel-F, or Teflon. For industrial fluid handling, for general or corrosive service, wherever absolute tightness around the stem is a primary consideration . . . . a Crane Packless Diaphragm Valve may be the answer



Crane packless diaphragm valves fulfill the requirements of a variety of general and corrosive services . . . a petro-chemical installation is illustrated.

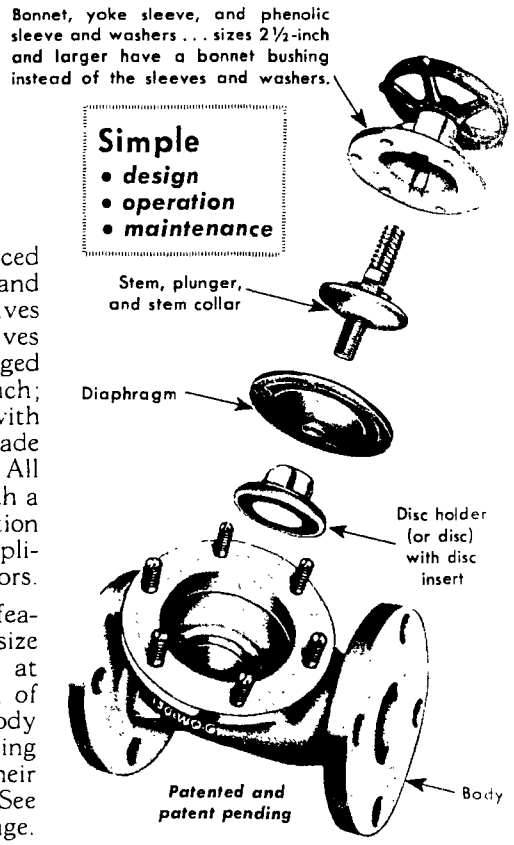
Packless Diaphragm Valves

Unlined and lined types . . . . for general and corrosive services

Choice of . . . bronze, iron, aluminum, or 18-8 SMo Y-pattern body and disc . . . . diaphragm and disc insert materials . . . . wheel or sliding stem operation.

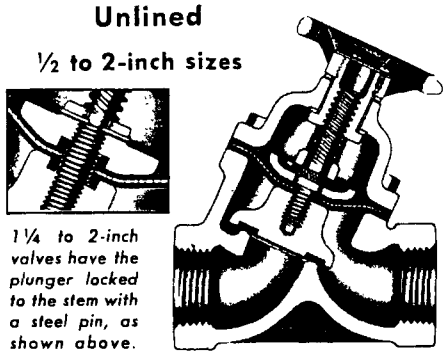
Crane Packless Diaphragm Valves, distinguished by advanced design, proven performance, and a choice of body, disc insert, and diaphragm materials, fulfill the need for moderately priced valves effective on both general and corrosive services. Unlined valves are made with screwed ends in sizes ½ to 2-inch and with flanged ends in sizes up to 14-inch; lined valves, furnished with flanged ends only, are made in sizes ½ to 6-inch. All valves are available with a wheel for hand operation or a sliding stem for application of power operators.

Basically, the valves feature the same design, size for size, as illustrated at the left. Lined valves, of course, have a lined body and coated disc; sliding stem valves differ in their upper end construction. See illustrations on next page.



Unlined

½ to 2-inch sizes



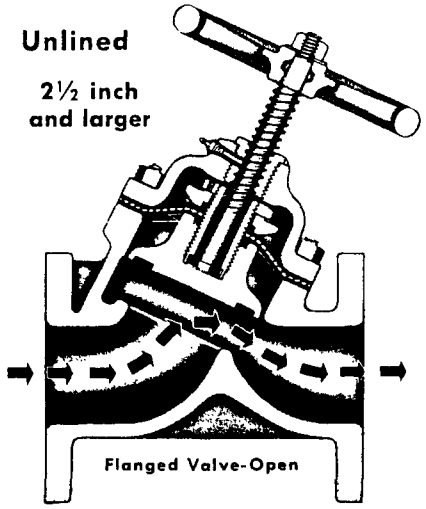
1¼ to 2-inch valves have the plunger locked to the stem with a steel pin, as shown above.

Screwed Valve-Closed

All ½ to 2-inch Crane diaphragm valves (available with screwed or flanged ends) feature the same basic design. Note the diaphragm's sole function is to seal the bonnet. Tightness at the seat, obtained only by the disc . . . . an exclusive Crane feature . . . . assures a positive shut-off of flow even if the diaphragm should fail.

Unlined

2½ inch and larger



Flanged Valve-Open

2½-inch and larger diaphragm valves (available with flanged ends only) feature the same basic design. Note, in the open position, how the high disc lift creates a flat, smooth surface in the upper chamber of the body. This, coupled with the Y-pattern body design, assures an even flow of fluid with minimum turbulence and low pressure drop.

Crane's superior "packless" design provides a tight stem seal . . . . protects working parts . . . . reduces maintenance

In many services, a frequent problem of valve maintenance is to keep a tight stuffing box seal around the stem. With the increasing use of volatile, corrosive, and hard-to-hold fluids as well as of high vacuum processes, and even in the handling of general fluids, the need for absolute tightness around the valve stem is often the primary consideration in valve selection. Under such conditions, provided other essential requirements are met, the Crane diaphragm valve is an inexpensive and logical choice.

No stem packing is used or required in Crane diaphragm valves. They belong to that general class known as "packless" valves, so called because the customary stuffing box around the stem has been eliminated through the use of a flexible diaphragm mounted between the body and bonnet.

The diaphragm keeps an absolutely tight stem seal. There is no chance for leakage and no need for stuffing box maintenance. Because line fluids cannot enter the valve bonnet, operating parts are not exposed to corrosion; nor can costly fluids be contaminated through contact with working parts. Since the diaphragm is used only to form a pressure-tight bonnet closure . . . . and not for seating . . . . it is not subject to cutting, crushing, or rapid wear.

A separate flat-faced disc equipped with a soft insert, or completely coated on lined valves, performs the seating function. The disc, firmly attached to the end of the stem and fastened to the center of the diaphragm by means of a plunger, bears against a crown-shaped seat in the body, assuring leak-proof closure on all fluids.

When the valve is operated (see "open" and "closed" illustrations at left), the stem raises or lowers the non-turning disc, and the diaphragm flexes to permit this travel.

Packless Diaphragm Valves

Choose a Crane Valve for these advantages

Longer diaphragm life because the diaphragm performs the sole function of sealing the bonnet. It is not subject to the crushing, cutting, and abrasion incident to seating . . . . factors which cause rapid wear.

No escape of fluids even if the diaphragm should fail. Tightness at the seat is obtained by the disc, independently of the diaphragm . . . . an exclusive Crane safety feature.

"Packless" construction eliminates the annoyance and expense of stuffing box leakage and maintenance.

Low resistance to flow with Crane's Y-pattern body design. Flow is more accurately controlled . . . . pressure drop is minimized.

Easier operation because Crane's separate disc and diaphragm design reduces the torque . . . . and number of turns . . . . needed to open and close the valves.

Easier maintenance because all parts are readily accessible. Simply unbolt the bonnet and lift out the diaphragm and working parts; the body need not be removed from the line.

High quality materials and rugged construction

Crane diaphragm valves are the compact bolted bonnet type.

Unlined valves have a body and disc of bronze, cast iron, aluminum, or 18-8 SMo. These are available with a neoprene, Buna N, natural rubber, or Kel-F diaphragm and disc insert.

Neoprene and Buna N are synthetic rubber compounds and, like natural rubber, are excellently suited for a wide range of fluids at temperatures up to 180 F.



Section of a Kel-F trimmed valve. The Kel-F diaphragm is heavily reinforced by another member.

Kel-F (trade name for polytrifluorochloroethylene) is an unusually stable thermo-plastic. It is inert to inorganic acids and alkalies in all concentrations, has low cold flow characteristics, and is suitable for temperatures up to 200 F.

Tight seating is accomplished by the disc operating on the stem end. A disc insert, of the same material as the diaphragm, is vulcanized or molded into a recess in the face of the disc and closes against a crowned seating surface in the body. The insert is pliable enough to absorb small particles of foreign matter that might otherwise cause leakage.

The diaphragm is not used as the seating member . . . . it merely retains the fluid. It has a hole through its center and is locked between the disc and plunger. When the valve is operated, the diaphragm flexes to permit the travel of the disc.

Valves ½ to 2-inch have a concealed non-turning, rising bronze stem operating in a bronze yoke sleeve. Guide lugs on the plunger above the diaphragm ride in recesses in the bonnet to keep the stem from turning.

Valves 2½-inch and larger have a turning, rising bronze stem operating in a bronze bonnet bushing. The disc is held to the stem by a threaded bronze sleeve on the plunger which allows the stem to rotate freely.

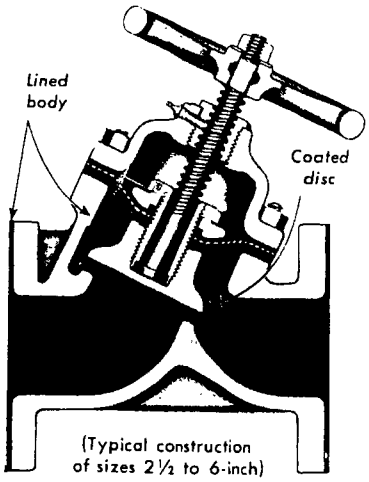
All valves have a cast iron bonnet. Wheels are malleable iron. The plunger is bronze on sizes 1-inch and smaller and cast iron on larger sizes.

Lined valves (see illustration at upper right) have a cast iron body and disc. They are the same, size for size, as the unlined pattern except the body interior, flange faces, and in some cases, the body exterior, are covered with neoprene or natural rubber. In addition, the disc, instead of having an insert, is completely coated with neoprene or natural rubber. Thus, all parts contacting fluid in the line are protected.

Sliding stem valves, designed for easy application of power operators, are available in the same range of sizes and with the same material combinations as wheel-operated valves.

Except for the sliding stem and upper end design, they are the same, size for size, as the wheel-operated valves. As shown at the right, the upper end of the bonnet terminates in a flange (with machined face) which has an inner threaded opening. The flange can be drilled and tapped for a bolted connection or the threaded opening can be used for insertion of a screwed-in adapter, permitting a slip-on or threaded connection.

Valves Lined With Neoprene or Rubber

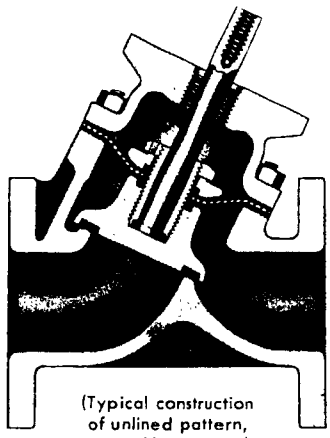


(Typical construction of sizes 2½ to 6-inch)

Lined valves (sizes ½ to 6-inch with flanged ends only) are furnished wheel-operated or with a sliding stem.

Except for the neoprene or hard rubber lining in the body and on the end flanges, and the neoprene or soft rubber coated disc, they feature the same design, size for size, as unlined valves.

Sliding Stem Valves



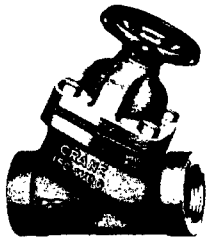
(Typical construction of unlined pattern, sizes 2½ to 6-inch)

Sliding stem valves are especially designed for the application of hydraulic or pneumatic operators. They are made in the same range of sizes, with the same body ends, and with the same material combinations as unlined and lined wheel-operated valves . . . . and except for the sliding stem and upper end construction, are the same design, size for size.

Unlined valves .....*pages 184 and 185*
Lined valves .....*page 186*
Sliding stem valves.....*page 187*
Dimensions .....*page 188*

Packless Diaphragm Valves

Unlined — Wheel Operated



Screwed

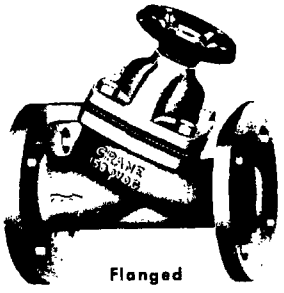
Bronze, Cast Iron, Aluminum, or 18-8 SMo Body

Sizes ½ to 2-inch. Available with Neoprene, Buna N, natural rubber, or Kel-F diaphragm and disc insert.

Working Pressures, Non-Shock

Valve Size	All Valves Except Those with Kel-F Diaphragm	Valves with Kel-F Diaphragm	No. 1650 and No. 1651 Valves	No. 1652 Valve Underwriters' Approved	
	Water, Oil, Air, or Gas	Water, Oil, Air, or Gas	Vacuum Service	Oxygen Service	Acetylene Service
Inches	180 F Max.	200 F Max.	180 F Max.	180 F Max.	180 F Max.
½ to 4	150 psi	150 psi	all	150 psi	15 psi
6	125 psi	125 psi	degrees	...	...
8	100 psi	...	...	...	...
10	80 psi	...	...	...	...
12	65 psi	...	...	...	...
14	50 psi	...	...	...	...

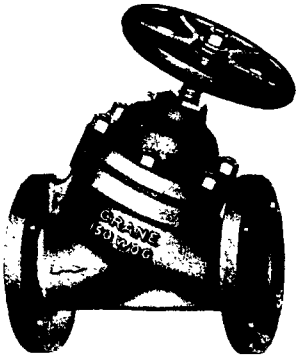
Air Tested



Flanged

Cast Iron, Aluminum, or 18-8 SMo Body

Sizes ½ to 14-inch with cast iron body; sizes ½ to 6-inch with other body metals. All are available with Neoprene, Buna N, natural rubber, or Kel-F diaphragm and disc insert.



2½-inch and larger valves have a rising, turning stem.

For additional description and sectional illustrations, see two preceding pages.

Catalog numbers and weights are listed in the table on the next page.

Recommendations: Crane unlined diaphragm valves are built for hard usage. Being packless, they are used on many services where ordinary valves may fail, or be only moderately effective, due to difficulties with stuffing box leakage. All parts exposed to line fluids are available in a choice of corrosion-resistant materials, making the valves suitable for an extensive list of corrosive services.

The selection of the proper materials combined with the "packless" design render these valves ideal for use on oil, compressed air, compressed and liquefied gases of many commercial kinds, natural and corrosive waters such as mine water, molasses, ammonia liquors, magnesium sulfate, alcohols, and a variety of other fluids.

Among unlined valves are those suitable for the following special services:

Sprinkler service . . . . use the No. 1610. It has been tested and approved for sprinkler service by the Underwriters' Laboratories, Inc., Chicago, and is marked "UL".

Vacuum service . . . . use the No. 1650 and 1651. They have been prepared for all degrees of vacuum (mercury).

No. 1650 and 1651 valves can be given a special mass spectrometer test.

Oxygen and acetylene service . . . . use the No. 1652. This valve, specially handled, has all working parts treated with a non-inflammable lubricant. It has been tested and approved for commercial oxygen and for acetylene service by the Underwriters' Laboratories, Inc., Chicago, and is marked "UL".

Limited space prohibits a complete listing of services for which Crane diaphragm valves are suitable. Specific advice and recommendations on the handling of many corrosive fluids will be furnished on request.

Construction: Valves 2-inch and smaller have a rising, non-turning, bronze stem operating in a bronze yoke sleeve. Guide lugs on the plunger above the diaphragm ride in recesses in the bonnet to keep the stem from turning.

Valves 2½-inch and larger have a rising, turning, bronze stem operating in a bronze bonnet bushing. The disc is held to the stem by a threaded bronze sleeve on the plunger, which allows the stem to rotate freely.

For complete description of construction, see the two preceding pages.

Materials: The body and disc holder are bronze (ASTM B62), cast iron (ASTM A126, Class A in sizes 6-inch and smaller and Class B in sizes 8-inch and larger), aluminum, or 18-8 SMO Alloy Cast Steel (ASTM A351, Grade CF-8M). These materials are described in Section 2.

Valves made of the foregoing materials are regularly furnished with a neoprene, Buna N, natural rubber, or Kel-F diaphragm and disc insert.

All valves have a cast iron bonnet and a malleable iron wheel. The plunger is bronze on sizes 1-inch and smaller, and cast iron on the larger sizes.

Special valves and linings: Diaphragm valves made of metals or with trim material other than listed can be made to order.

Complete details furnished on request

Packless Diaphragm Valves

Unlined — Wheel Operated

Weights — Pounds, Each

Diaphragm and disc insert materials are indicated by the catalog number and suffix:
No suffix = Neoprene **SB** = Buna N **RN** = Natural Rubber **KF** = Kel-F

Valve Type	Size	With Bronze Body	With Cast Iron Body		With Aluminum Body		With 18-8 SMo Body		With Cast Iron Body For Special Services		
									Vacuum		Oxygen or Acetylene
	Inches	Screwed	Screwed	Flanged F & D	Screwed	Flanged F & D	Screwed	Flanged F & D	Screwed	Flanged F & D	Screwed
		Nos. 1600 1600-SB 1600-RN	Nos. 1610 1610-SB 1610-RN	Nos. 1611 1611-SB 1611-RN	Nos. 1620 1620-SB 1620-RN	Nos. 1621 1621-SB 1621-RN	Nos. 1630 1630-SB 1630-RN	Nos. 1631 1631-SB 1631-RN	No. 1650 — —	No. 1651 — —	No. 1652 — —
Unlined Valves Wheel-Operated	½	1.8	1.6	3.3	1.0	1.9	1.6	3.8	1.5	3.3	1.6
	¾	3.0	2.6	4.7	1.6	2.8	2.7	5.0	2.6	4.7	2.7
	1	5.2	4.6	7.1	2.6	5.0	4.7	8.3	4.5	7.2	4.6
	1¼	8.4	7.2	10.3	4.1	6.0	7.5	12.0	7.1	10.3	7.2
	1½	12.2	10.6	14.8	6.3	8.3	11.2	16.0	10.6	14.2	10.6
	2	21.3	19.2	24.8	10.8	14.0	19.4	28.0	18.9	25.0	19.0
	2½	...	...	38.6		21.0	...	43.0	..	39.0	...
	3	..	.	50.0	..	30.0	.	58.0	...	51.0	...
	4	...	...	80.0		48.0	..	97.0	..	87.0	...
	6	...	..	150.0		87.0	.	130.0	..	150.0	..
	8	...	...	290.0	.	...	..	...	.	...	.
	10	...	.	440.0	.	.	.	...	..	...	.
	12	...	...	616.0				...	.	.	..
	14	.		860.0	...		.		.	.	.
		No. 1600-KF	No. 1610-KF	Nc. 1611-KF	No. 1620-KF	No. 1621-KF	No. 1630-KF	No. 1631-KF	—	—	—
	½	1.8	1.6	3.3	1.0	1.9	1.6	3.8	..	...	..
	¾	3.0	2.6	4.7	1.6	2.8	2.7	5.0	.	..	...
	1	5.2	4.6	7.1	2.6	5.0	4.7	8.3	.	...	
	1¼	8.4	7.2	10.3	4.1	6.0	7.5	12.0	..	...	
	1½	12.2	10.6	14.8	6.3	8.3	11.2	16.0	.	...	.
	2	21.3	19.2	24.8	10.8	14.0	19.4	28.0	. .		.
	2½	...	..	38.6	..	21.0	.	43.0	.	.	
	3	.	.	50.0	.	30.0	.	58.0	...	..	
	4	.	.	80.0		48.0	.	97.0	.	..	. .
	6	..		150.0	.	87.0		130.0	.	.	. .

Flange dimensions and facings: The dimensions and drilling of end flanges on valves 1-inch and larger conform to the American Cast Iron Flange Standard Class 125 (B16.1-1948). This Standard does not include sizes smaller than 1-inch.

End flanges of ½ and ¾-inch valves 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.

Face to face: Flanged valves 2-inch and larger conform to the American Standard, for Face-to-Face Dimensions (B16.10-1957) for 125-pound cast iron globe valves. This Standard does not include sizes smaller than 2-inch.

Facing and drilling: Flanged valves are regularly furnished faced and drilled (F & D). They can be furnished faced only, when specified.

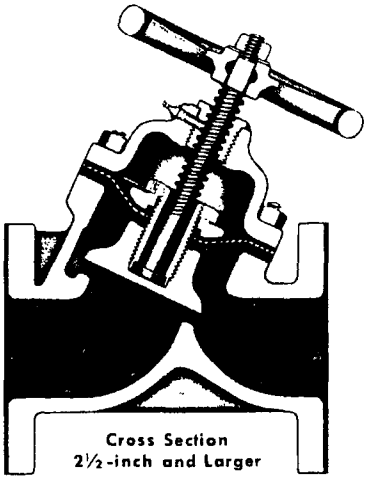
Lined valves: Lined valves are illustrated and described on the next page.

Sliding stem valves: Sliding stem valves are available in the same types, sizes, and material combinations as wheel-operated valves. They can also be furnished with practically any type of power actuator, when specified. For complete details, see page 187.

Special valves: Diaphragm valves made of metals or with trim material other than listed can be made to order. Complete details will be furnished on request.

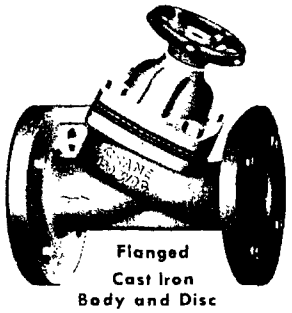
Packless Diaphragm Valves

Neoprene and Rubber Lined — Wheel Operated



Cross Section
2½-inch and Larger

Sizes 2½-inch and larger have a rising, turning stem as shown. Smaller sizes (see below) have a rising, non-turning stem.



Flanged
Cast Iron
Body and Disc

No. 1615, Wheel-Operated

The body is neoprene-lined and the disc is neoprene-coated. The diaphragm is neoprene.

No. 1615-RN, Wheel Operated

The body is hard natural rubber-lined and the disc is soft natural rubber-coated. The diaphragm is natural rubber.

Designed for corrosive services, and particularly for corrosive process fluids, sludges, and slurries

Working Pressures, Non-Shock

Sizes	Water, Oil, Air, or Gas
½ to 4-inch	150 psi, 180 F Max.
6-inch	125 psi, 180 F Max.

Air Tested

Weights in Pounds, Each

Sizes	Flanged, F & D	
	No. 1615	No. 1615-RN
Inches	Neoprene Lined	Rubber Lined
½	3.5	3.5
¾	5.0	5.0
1	7.6	7.6
1¼	10.8	10.8
1½	15.0	15.0
2	28.0	28.0
2½	40.0	40.0
3	52.0	52.0
4	85.0	85.0
6	155.0	155.0

Dimensions . . . .page 188

In the selection of Crane Packless Diaphragm Valves, new wide application, particularly for corrosive services, is afforded by neoprene and rubber lined valves

Recommendations: Lined valves are recommended for fluids corrosive to metals but non-active chemically upon neoprene or rubber. They offer excellent resistance to the action of many types of corrosive process fluids, to sandy waters, sludges, slurries, sewage, liquids with solids in suspension, etc. The neoprene-lined valves are particularly effective where abrasion is a destructive factor. The hard rubber lined valves, however, are not recommended for abrasive service, nor in services where they may be subjected to thermal shock, unusually severe stresses, or rough handling.

Lined body and coated disc: The body is made of cast iron conforming to ASTM Specification A 126, Class A. As shown in the cross section, the interior of the body is fully lined with neoprene or natural rubber. The lining extends over the end flange faces, and the exterior of the valve body may also be covered depending on the size, material, and process used. Instead of having a disc insert, as the unlined valves do, the entire outside surface of the disc is coated. Thus, all parts contacting fluid in the line are protected.

In all sizes the coating on the disc is substantially thicker than the lining to allow for the indentation that results from seating loads.

Construction: Lined valves, except for their lined body and coated disc are the same, size for size, as the unlined pattern; for complete construction details, see pages 182 and 183

End flanges: The dimensions (excluding lining) and drilling of end flanges on valves 1-inch and larger conform to the American Cast Iron Flange Standard, Class 125 (B16 1-1948) This Standard does not include sizes smaller than 1-inch.

End flanges of ½ and ¾-inch valves have the same diameter and drilling as 150-Pound American Standard Steel Flanges, but the thickness and facing are different.

End flanges in all sizes have a smooth finish.

Drilling: The valves are regularly furnished faced and drilled (F & D), they can be furnished faced only, when specified.

Larger sizes: Lined valves in sizes larger than listed, up to 14-inch, can be furnished to order; information on request.

Special linings: Special body linings and disc coatings, such as Teflon (Du Pont polytetrafluoroethylene) can be furnished to order.

Sliding stem valves: Sliding stem lined valves (No. 5615 and No 5615-RN) are available in the same sizes and material combinations as the wheel-operated valves They can be furnished with practically any type of power actuator, when specified. For complete details, see the facing page.

Prices: Prices of all valves are furnished on request

Additional description . . . .pages 182 and 183

Packless Diaphragm Valves

Unlined or Lined — Sliding Stem

A complete line . . . . for hydraulic or pneumatic operation

Crane offers a complete selection of sliding stem packless diaphragm valves suitable for use with hydraulic or pneumatic operators. Except for stem and bonnet construction, the valves, size for size, are duplicates of . . . and feature the same construction as . . . the wheel-operated valves shown on pages 184 to 186.

They are available in the same range of sizes, in the same materials, and with the same diaphragms, discs, disc inserts, and linings.

As illustrated at the right, the upper end of the valve bonnet terminates in a flange (with machined face), which has an inner threaded opening. The flange can be drilled and tapped for a bolted connection, or the threaded opening can be used for the insertion of a screwed-in adapter permitting a slip-on or threaded connection. Thus, almost any make of hydraulic or pneumatic actuator can be readily mounted on these sliding stem valves.

Power actuators: Crane can supply these sliding stem diaphragm valves with air-operated actuators for simple open and close type service, and with air-operated actuators that are spring-loaded to close or spring-loaded to open in case of air supply failure.

Working Pressures, Non-Shock

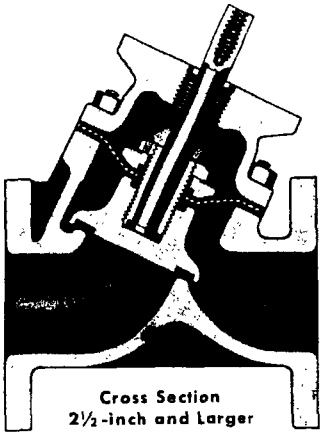
Valve Sizes	For Water, Oil, Air, or Gas	
	Valves with Other Than Kel-F Diaphragm	Valves with Kel-F Diaphragm
Inches	180 F Max.	200 F Max.
½ to 4	150 psi	150 psi
6	125 psi	125 psi
8	100 psi	. . .
10	80 psi	. . .
12	65 psi	. . .
14	50 psi	. . .

Air Tested

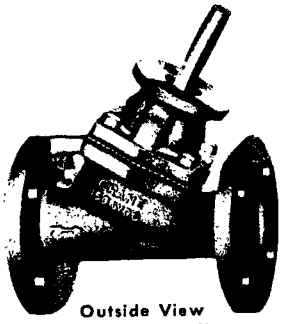
Inquiries should specify the quantity, size, valve catalog number, type of actuator, line pressure, and air-supply pressure. If a particular make of actuator is desired, the manufacturer's name should also be specified.

In addition, Crane sliding stem diaphragm valves are available through such manufacturers, with a wide choice of actuators for manual, automatic, or positioned-control service. Specify "Crane" on your next inquiry for packless diaphragm valves equipped with power operator and control mechanism.

Prices: Prices of valves, with or without actuators, will be furnished on request.



Cross Section
2½-inch and Larger



Outside View
2-inch and Smaller

These valves, except for the stem and bonnet construction, are the same as corresponding type wheel operated valves; for general description, see pages 182 and 183.

Types, Size Ranges, and Catalog Numbers

Body and Disc Holder Material	Valve Ends	Range of Sizes	Catalog Numbers of Unlined Valves				Catalog Numbers of Lined Valves	
			Diaphragm and Disc Insert Materials					
		Inches	Neoprene	Buna N	Natural Rubber	Kel-F	Neoprene Lining and Diaphragm	Rubber Lining and Diaphragm
Bronze	Screwed	½ to 2	No. 5600	No. 5600-SB	No. 5600-RN	No. 5600-KF	. .	
Cast Iron	Screwed	½ to 2	No. 5610	No. 5610-SB	No. 5610-RN	No. 5610-KF	. .	. .
	Flanged	½ to 14*	No. 5611	No. 5611-SB	No. 5611-RN	No. 5611-KF	No. 5615	No. 5615-RN
Aluminum	Screwed	½ to 2	No. 5620	No. 5620-SB	No. 5620-RN	No. 5620-KF	. .	. .
	Flanged	½ to 6	No. 5621	No. 5621-SB	No. 5621-RN	No. 5621-KF	. . .	. .
18-8 SMo	Screwed	½ to 2	No. 5630	No. 5630-SB	No. 5630-RN	No. 5630-KF	. . .	. .
	Flanged	½ to 6	No. 5631	No. 5631-SB	No. 5631-RN	No. 5631-KF	. . .	. .

**Nos. 5611-KF, 5615, and 5615-RN are regularly made in sizes ½ to 6-inch.*

Additional description . . . . pages 182 and 183
Wheel operated valves . . . . pages 184 to 186
Dimensions . . . . page 188
Weights . . . . . on request

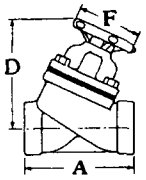
Do you have a corrosion problem?

Behavior of metals and alloys in contact with corrosive fluids is often affected by factors which are not obvious. If your inquiry concerns a corrosion problem, Crane's "Corrosion Questionnaire" on page 202 may prove helpful.

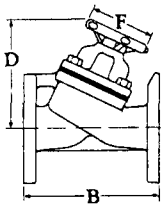
Packless Diaphragm Valves

Dimensions, in Inches

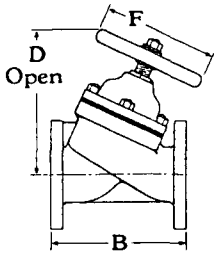
Unlined Valves



Screwed
All Sizes

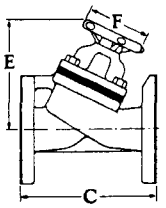


Flanged
½ to 2-inch

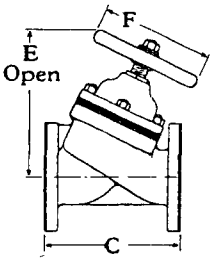


Flanged
2½-inch and larger

Lined Valves



Flanged
½ to 2-inch



Flanged
2½-inch and larger

Sliding stem valves have the same end to end (dimension A), face to face (dimensions B and C), and end flange dimensions as corresponding type wheel-operated valves.

Size	Unlined Valves Only			Lined Valves Only			Unlined or Lined Valves						
	A	B	D	C	E		F		End Flanges				
	End to end	Face to face	Center to top	Face to face	Center to top	Thickness of lining	Dia. of wheel	Turns to open	Dia. of end flange	Thickness Without lining	Thickness With lining	Dia. of bolt circle	No. & dia. of bolts
½	3	4¼	3 5/16	4⅜	3⅜	1/16	2	1½	3½	⅜	7/16	2⅜	4-½
¾	3½	4½	3 15/16	4⅝	4	1/16	2¼	2	3⅞	13/32	15/32	2¾	4-½
1	4¼	5¼	4⅜	5⅜	4½	1/16	2¼	2¾	4¼	7/16	½	3⅛	4-½
1¼	5¼	5¾	5¼	5⅞	5⅜	1/16	3	3½	4⅝	½	9/16	3½	4-½
1½	6	6½	6⅛	6¾	6¼	⅛	4	3¾	5	9/16	11/16	3⅞	4-½
2	7	8	7¼	8¼	7⅜	⅛	5	3½	6	⅝	¾	4¾	4-⅝
2½	. . .	8½	9⅞	8¾	10	⅛	7	4¼	7	11/16	13/16	5½	4-⅝
3	. . .	9½	11⅜	9¾	11½	⅛	8	4	7½	¾	⅞	6	4-⅜
4	. . .	11½	13⅞	11¾	14	⅛	10	5¼	9	15/16	1 1/16	7½	8-⅝
6	. . .	14	17¼	14⅜	17½	3/16	14	7½	11	1	1 3/16	9½	8-¾
8	. .	19½	21⅛	. . .	. . .	. . .	16	9½	13½	1⅛	. . .	11¾	8-¾
10	.	24½	25¼	. . .	. .	. .	20	11¼	16	1 3/16	. . .	14¼	12-⅞
12	.	27½	29	. . .	. . .	. . .	24	13	19	1¼	. . .	17	12-⅞
14	. . .	31	33⅝	. .	.	. . .	30	15	21	1⅜	. . .	18¾	12-1

Flange dimensions and drilling: The dimensions (excluding lining) and drilling of end flanges on valves 1-inch and larger conform to the American Cast Iron Flange Standard, Class 125 (B16.1-1948). This Standard does not include sizes smaller than 1-inch.

End flanges of the ½ and ¾-inch valves 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.

Face to face dimensions: The face to face dimensions of unlined valves 2-inch and larger conform to the American Ferrous Flanged Valve Standard (B16.10-1957), for 125-Pound Cast Iron Globe Valves. This Standard does not include valves smaller than 2-inch.

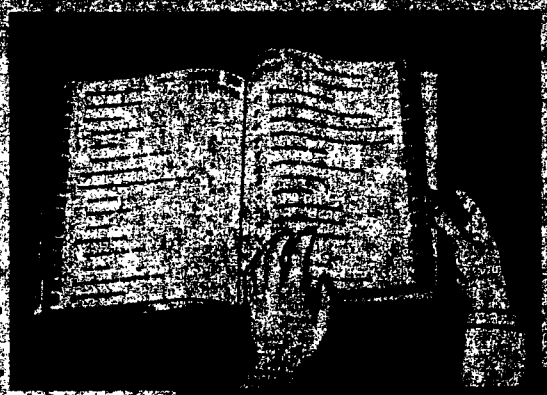
The face to face of lined valves is slightly longer than that of the unlined due to the thickness of the lining. Lining thicknesses are indicated in the table.

Dimensions of sliding stem valves: End to end, face to face, and end flange dimensions apply to both wheel-operated and sliding stem valves. Other dimensions for sliding stem valves will be furnished on request.

3 EASY WAYS TO FIND WHAT YOU WANT

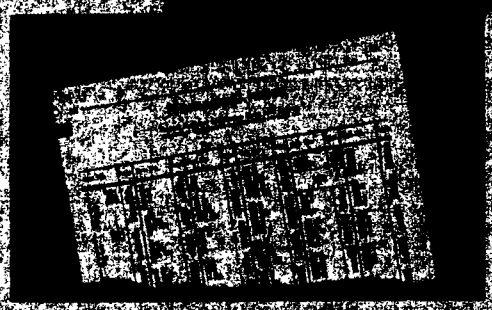
THE CONDENSED SECTION INDEX on the inside cover of this colored paper insert—shows everything in the No. 60 Catalog, classified under condensed section headings and section numbers. The marginal section number markers—with the help of your thumb—take you to the section you want. There, on the first page is a complete 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. 60 Catalog—those more or less familiar with the Crane Line—will find the Section Index a real time saver.



THE ALPHABETICAL INDEX—Starting on page 1 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.

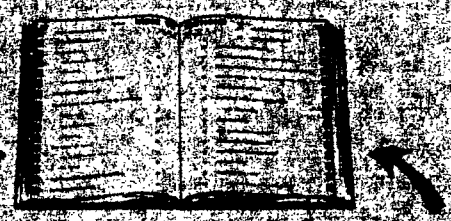




THE NUMERICAL INDEX—which immediately follows the alphabetical index in section one—is always popular with users who have learned to know Crane products by catalog number. Every product with a catalog number is listed here, giving the page number on which it is described. Storeroom and purchasing department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

MANY OTHER PRACTICAL FEATURES OF THE CRANE CATALOG

Section Index in Center of Catalog



Commonly Used Bronze, Iron and Steel Valves are Grouped in Front Part of Catalog.

Special Service Valves, Specialties, Fittings, Flanges, Piping and Engineering Data are Grouped in Back Part.

More Compact Cataloging—Less Turning of Pages

Items of Common Usage are Grouped Together

Standard Page Style Saves Needless Reading

Clear Cross-Section Cuts Appear Throughout

All Data is Concise—In Clear, Easy-to-Read Type

All Tables are Standardized for Convenient Use

Full Dimensional Data are Given with Drawings

Catalog Numbers are Prominently Shown

Handy Engineering Data Section Plus an All-New "Flow of Fluids" Section is Included

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If the item you are looking for readily fall into any of the clas shown, you will find it in the

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