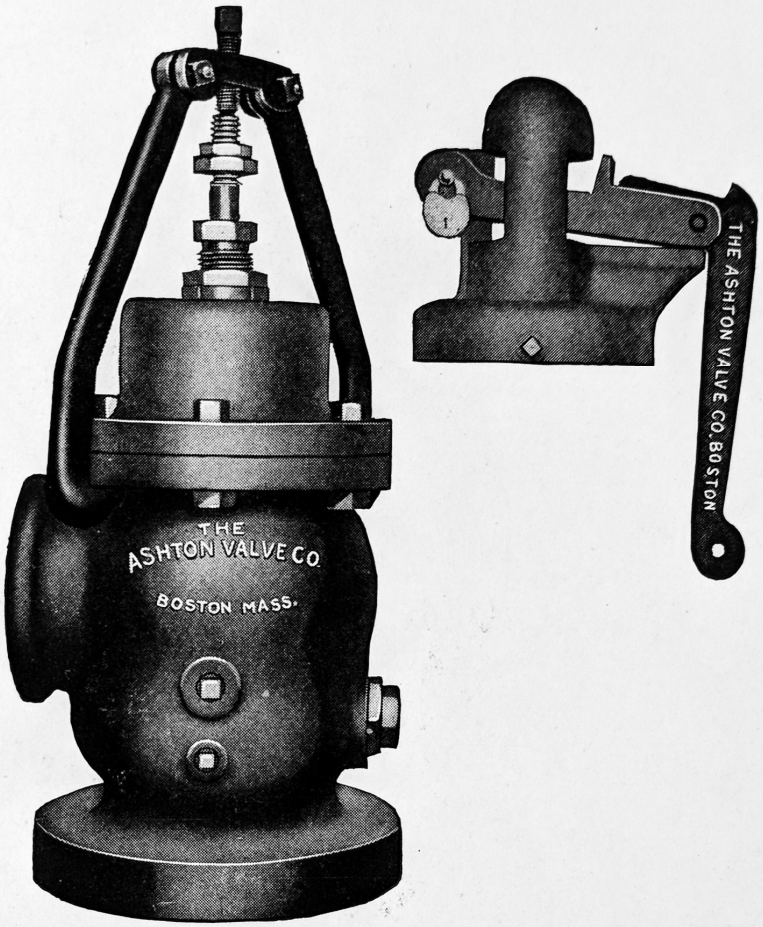
Ashton Valve Testing Clamps



No. 5

With these testing clamps, the safety valve need not be taken off when a boiler is tested, nor is it necessary to change the set pressure of the valve. This saves the valve spring from excessive and undue strain. Testing clamps are furnished with our Stationary and Marine Pop Safety Valves when requested.

To apply the clamps, first remove the valve cap, then place the ends of the clamp arms beneath the flange as shown above. Setting down the clamp screw on the valve spindle will hold the valve rigidly on its seat. After the boiler test is over, remove clamp and replace valve cap, — the valve will then work perfectly at exactly the original set pressure.

Don't forget to remove clamp after test is over.

Ashton Duplex Lock-up Pop Safety Valve

No. 20 A.

It is considered good engineering practice to use duplex safety valves on all boilers large enough to require a single valve of more than 4½ inches diameter. This is especially true of the water-tube type, for the single nozzle connection of the duplex valve is better suited to the smaller drums with its economy of space.

In the duplex form the valve bodies are cast in one piece, requiring but one safety valve connection on the boiler and a single outlet connection on the valve. It minimizes the chance for leakage by having only half the number of boiler connection joints of two single valves.

The Ashton Duplex Stationary Valve, with iron body, is shown above; the interior working parts are identical with those of the No. 20 Valve, as explained in detail on pages 7 to 11 inclusive.

This valve is regularly made to conform with A. S. M. E. standard, and when specified, to comply with any State requirements.

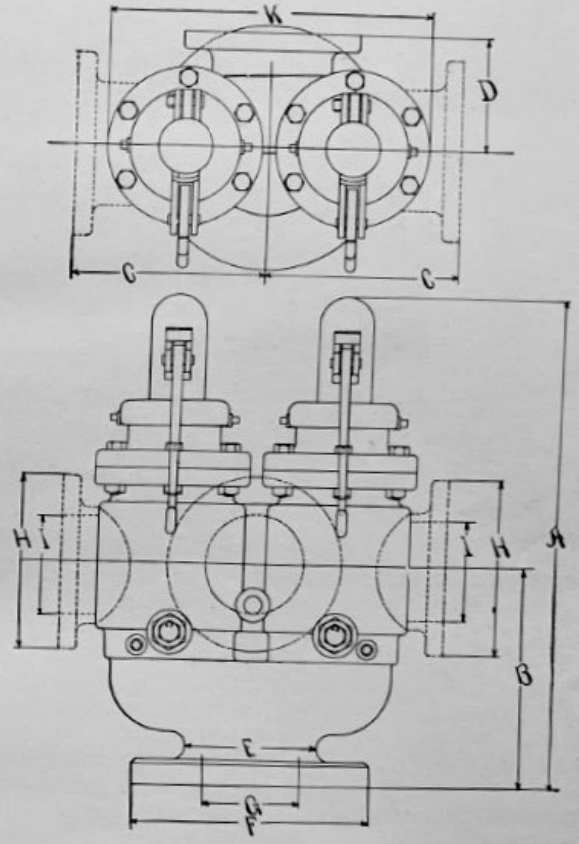
LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Composition Seat	$125.00	$155.00	$190.00	$225.00	$260.00	$295.00	$330.00	$375.00	$435.00
Nickel Seat	131.00	163.00	200.00	237.00	274.00	312.00	350.00	399.00	463.00
Diam. Inlet Flange	8¼ in.	9 in.	10½ in.	11 in.	12½ in.	14 in.	14 in.	15 in.	16¼ in.
Diam. Outlet Flange	7½ in.	8½ in.	9¼ in.	10 in.	11 in.	12½ in.	12½ in.	13½ in.	15 in.
Weight, pounds	109	169	234	280	331	458	540	760	840

For Sheet of Dimensions see page 17. For Price List of Parts see page 21.

Ashton Duplex Lock-up Pop Safety Valve

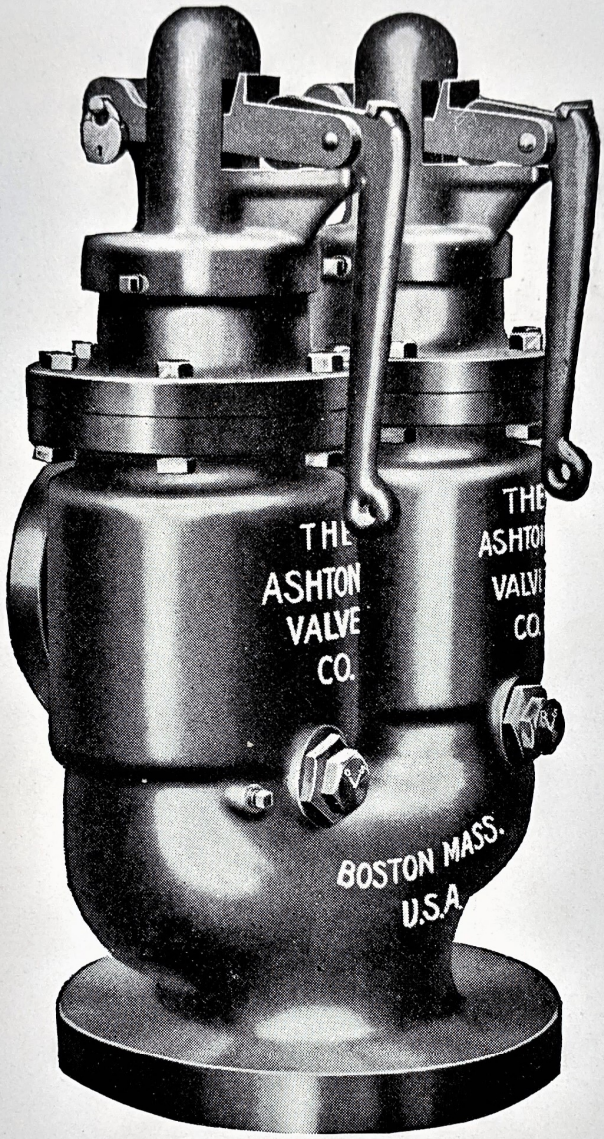
No. 20A. Style Dimension Sheet



DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	18 1/8	8 1/8	8	4¾	4¾	8¼	2⅞	7½	2⅞	12¾
2½	21⅛	9⅞	9⅛	5⅜	5¼	9	3⅛	8½	3⅛	15
3	23½	11¾	10½	6⅛	6	10½	4¼	9¼	4¼	17¼
3½	23⅞	12⅛	11	6¾	7	11	5	10	5	17¼
4	26¾	12¾	11⅛	6¾	7⅜	12½	5⅛	11	5⅛	18¾
4½	27⅞	13⅝	11½	6¾	8⅜	14	6⅜	12½	6⅜	20¼
5	29¾	14⅝	12¾	7½	9⅛	14	7⅛	12½	7½	20½
5½	34	15⅞	14	8	9⅞	15	7⅛	13½	7⅛	24¼
6	34½	16⅝	14⅝	8	10¾	16¼	8½	15	8½	24½

Ashton Duplex Lock-up Pop Safety Valve



No. 20A.

It is considered good engineering practice to use duplex safety valves on all boilers large enough to require a single valve of more than 4½ inches diameter. This is especially true of the water-tube type, for the single nozzle connection of the duplex valve is better suited to the smaller drums with its economy of space.

In the duplex form the valve bodies are cast in one piece, requiring but one safety valve connection on the boiler and a single outlet connection on the valve. It minimizes the chance for leakage by having only half the number of boiler connection joints of two single valves.

The Ashton Duplex Stationary Valve, with iron body, is shown above; the interior working parts are identical with those of the No. 20 Valve, as explained in detail on pages 7 to 11 inclusive.

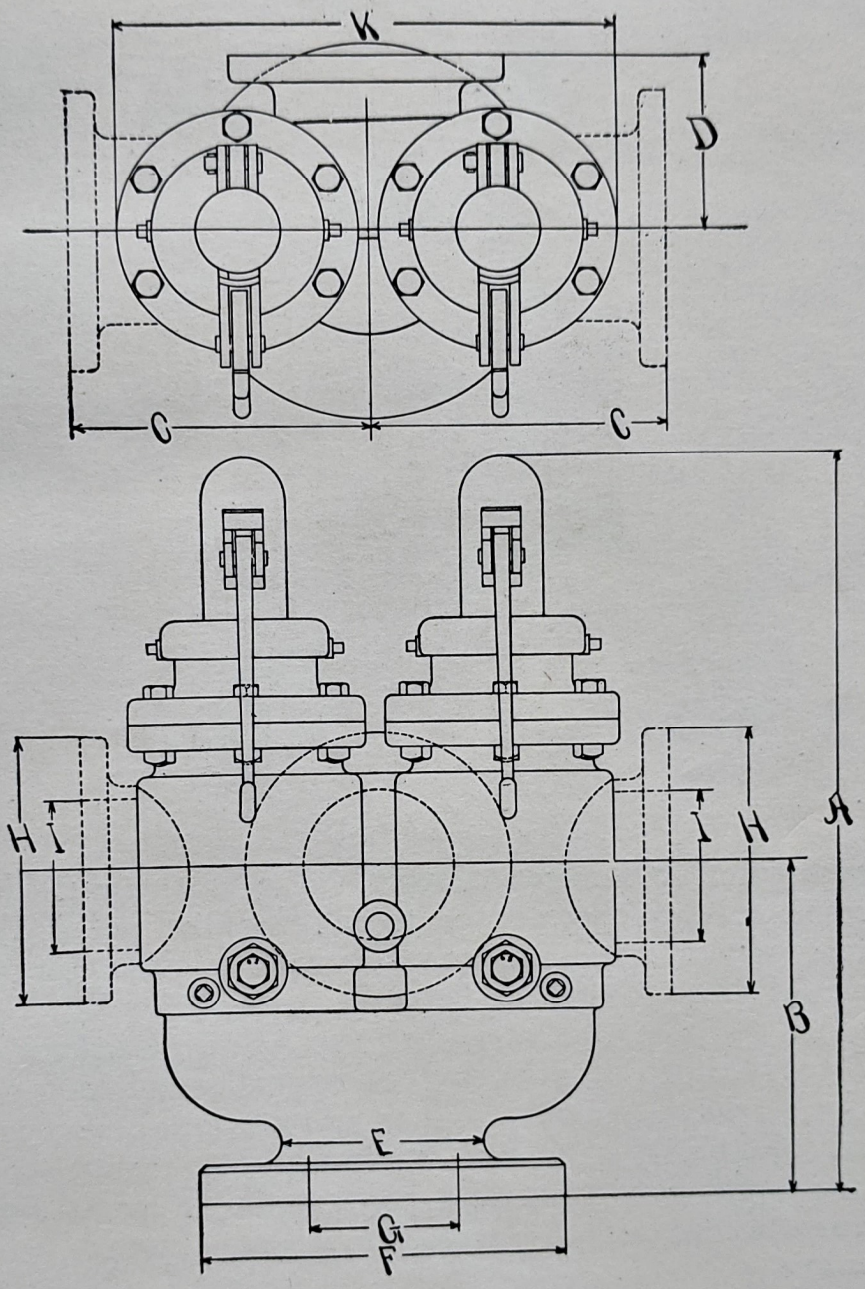
This valve is regularly made to conform with A. S. M. E. standard, and when specified, to comply with any State requirements.

LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Composition Seat	$125.00	$155.00	$190.00	$225.00	$260.00	$295.00	$330.00	$375.00	$435.00
Nickel Seat	131.00	163.00	200.00	237.00	274.00	312.00	350.00	399.00	463.00
Diam. Inlet Flange	8¼ in.	9 in.	10½ in.	11 in.	12½ in.	14 in.	14 in.	15 in.	16¼ in.
Diam. Outlet Flange	7½ in.	8½ in.	9¼ in.	10 in.	11 in.	12½ in.	12½ in.	13½ in.	15 in.

Ashton Duplex Lock-up Pop Safety Valve

No. 20A. Style Dimension Sheet

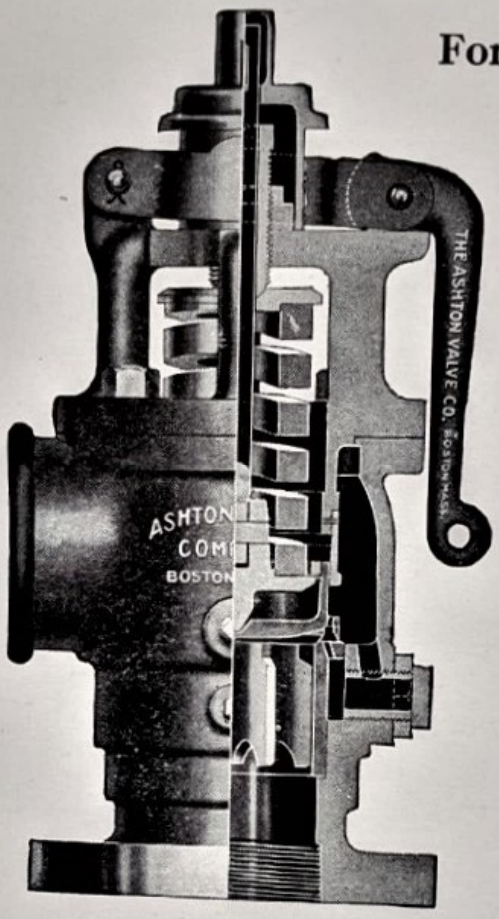


DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	18 7/16	8 3/16	8	4 3/4	4 1/4	8 1/4	2 7/8	7 1/2	2 7/8	12 3/4
2 1/2	21 1/8	9 7/8	9 3/16	5 3/8	5 1/4	9	3 9/16	8 1/2	3 9/16	15
3	23 1/2	11 3/4	10 1/2	6 1/8	6	10 1/2	4 1/4	9 1/4	4 1/4	17 1/4
3 1/2	23 7/8	12 3/8	11	6 3/4	7	11	5	10	5	17 1/4
4	26 3/4	12 3/4	11 1/8	6 3/4	7 3/4	12 1/2	5 11/16	11	5 11/16	18 3/4
4 1/2	27 7/8	13 5/8	11 1/2	6 3/4	8 3/8	14	6 3/8	12 1/2	6 3/8	20 1/4
5	29 3/4	14 3/8	12 3/4	7 1/2	9 1/8	14	7 1/8	12 1/2	7 1/8	20 1/2
5 1/2	34	15 7/8	14	8	9 7/8	15	7 13/16	13 1/2	7 13/16	24 1/4
6	34 1/2	16 5/8	14 5/8	8	10 3/4	16 1/4	8 1/2	15	8 1/2	24 1/2

Ashton Outside Spring Pop Safety Valve

For Superheaters



No. 17 (Steel)

The distinctive feature of this valve is the outside spring, an arrangement peculiarly adapted to superheater installations, because the spring never comes in contact with high-temperature steam, which would affect its temper.

In other respects this valve has the Ashton features described on pages 7 to 11, including spring of special steel, compound lifting device, lock-up attachment, etc., except that No. 17 has a cast-steel body and solid nickel valve and seat bushing to insure proper strength as well as equal expansion and contraction of parts. Every detail has been worked out to give greatest satisfaction when used on superheaters.

This valve is regularly made to conform with A. S. M. E. standard, and when specified, to comply with any State requirements.

LIST PRICES

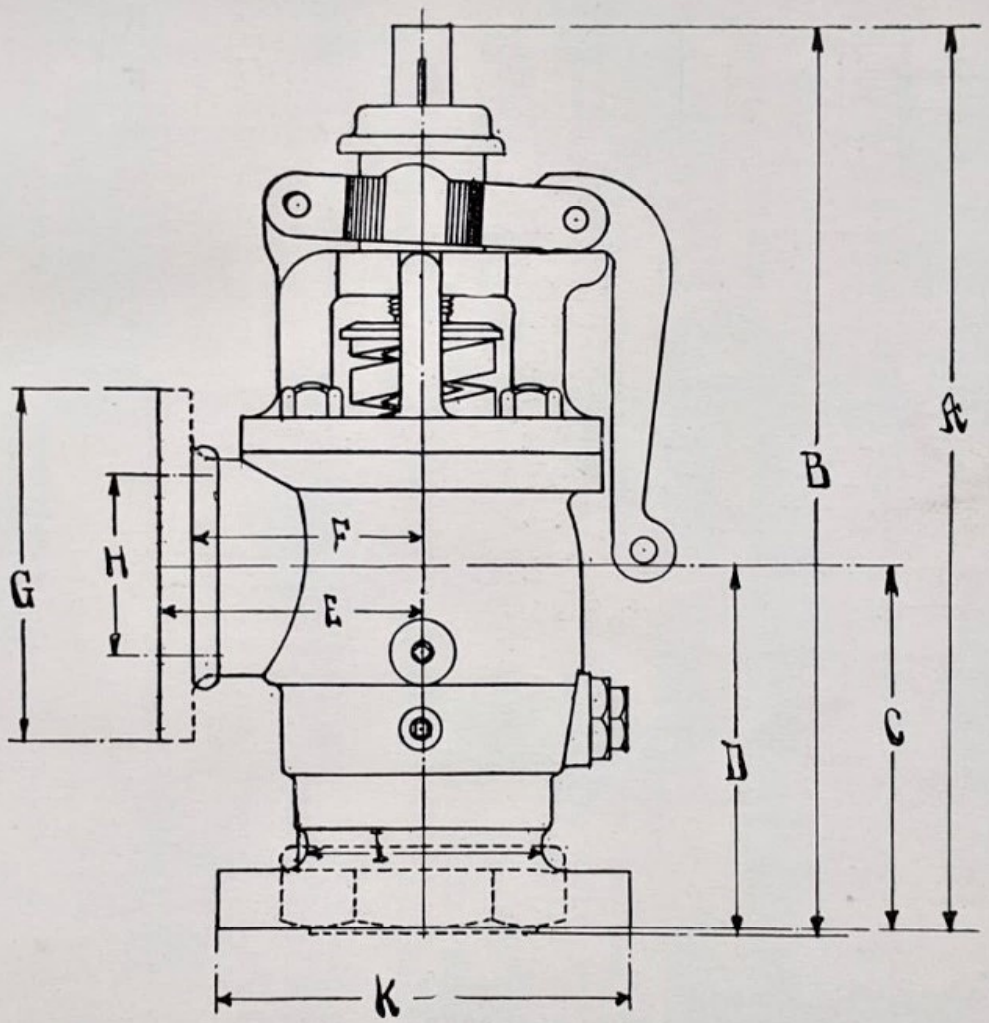
Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.
Price	$135.00	$160.00	$185.00	$235.00	$285.00	$350.00	$425.00
Diameter of Inlet Flange	6½ in.	7½ in.	8¼ in.	9 in.	10 in.	10½ in.	11 in.
Weight, pounds	45	67	89	128	144	190	230

When ordering always state maximum working pressure, and whether flanged or screwed inlets are desired.

For sheet of dimensions see page 19. For price list of parts see page 21.

Ashton Outside Spring Pop Safety Valve

No. 17 Style Dimension Sheet



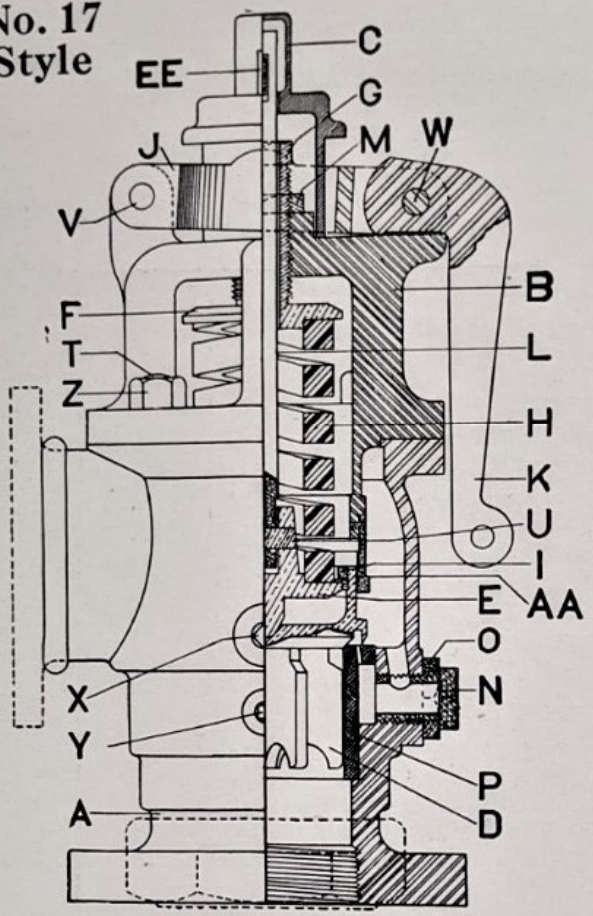
DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	15 3/8	15 3/8	5 5/16	5 5/16	4	3 3/8	6	2	3 5/8	6 1/2
2 1/2	16 3/4	16 3/4	6 7/8	6 7/8	5 1/16	4 3/8	7	2 1/2	3 5/8	7 1/2
3	18	18	6 1/2	6 1/2	5 1/2	4 3/4	7 1/2	3	5 5/8	8 1/4
3 1/2	20	20	7 13/16	7 13/16	6 1/16	5 1/4	8 1/2	3 1/2	5 3/4	9
4	21 5/8	21 5/8	8 3/4	8 3/4	6 1/2	5 9/16	9	4	6 1/4	10
4 1/2	23 1/4	23 1/4	8 3/4	8 3/4	6 9/16	5 5/8	9 1/4	4 1/2	6 3/4	10 1/2
5	23 5/8	23 5/8	9 3/8	9 3/8	6 11/16	5 3/4	10	5	7 1/4	11

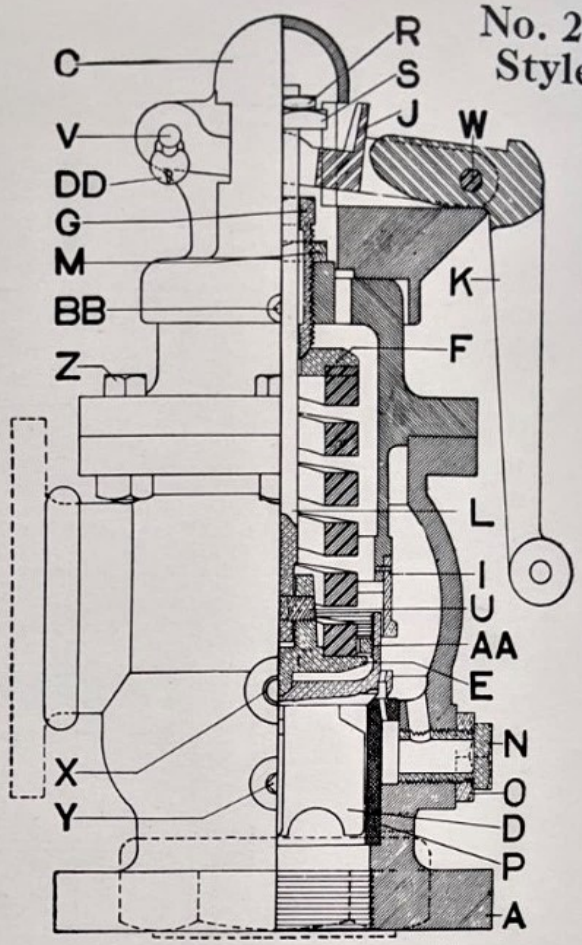
Ashton Lock-up Pop Safety Valves

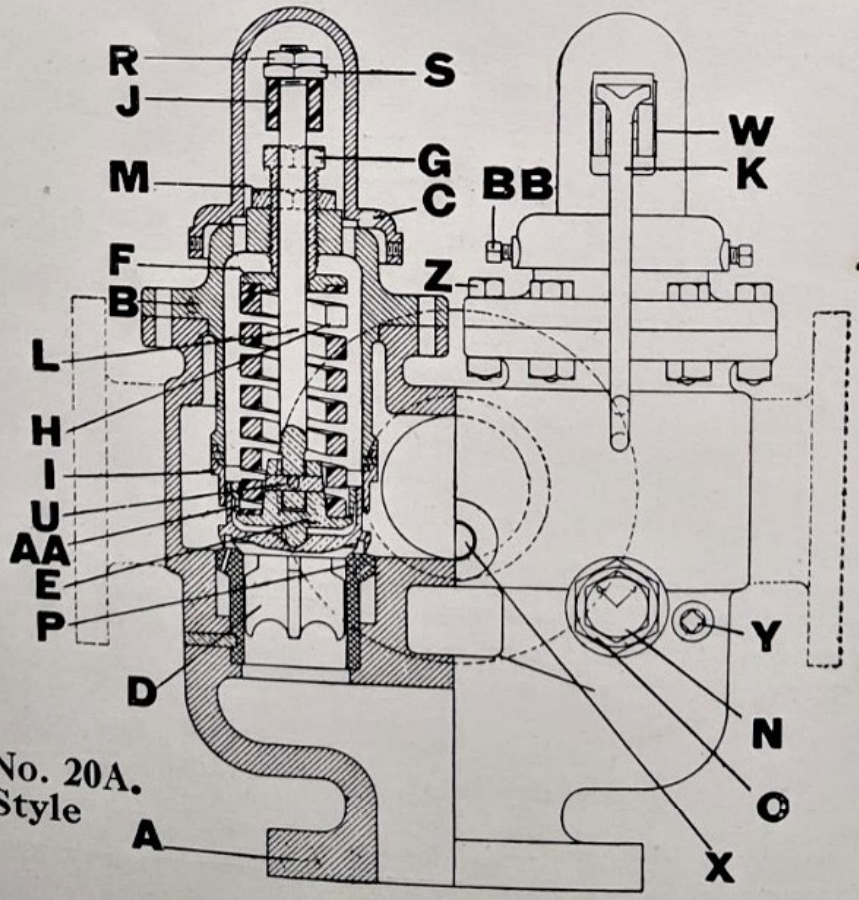
Reference List of Parts

No. 17 Style



No. 20 Style

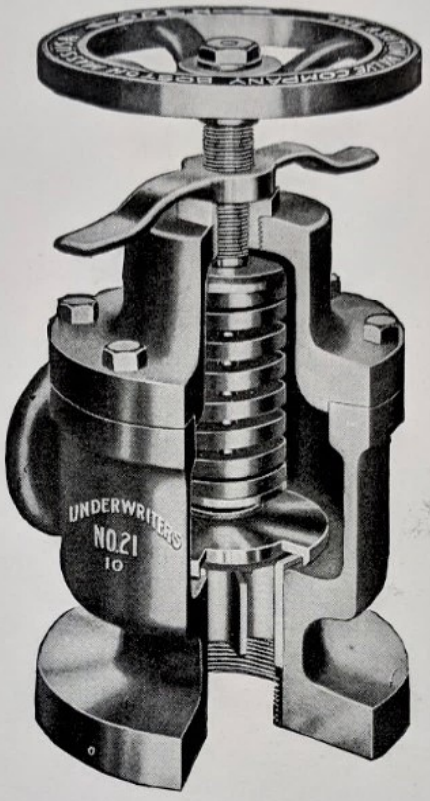




No. 20A. Style

Ashton Water Relief Valve

Underwriter Pattern



No. 21

This valve has been competitively tested and formally accepted by the Associated Factory Mutual Fire Insurance Companies, having complied fully with all their requirements. It has capacity such "that when set at 100 pounds it can pass all the water discharged by the pump at full speed, at a pump pressure not exceeding 125 pounds per square inch."

This valve is made with iron body and high-grade composition metal working parts which prevent corrosion. The spring is of special steel and of extra length.

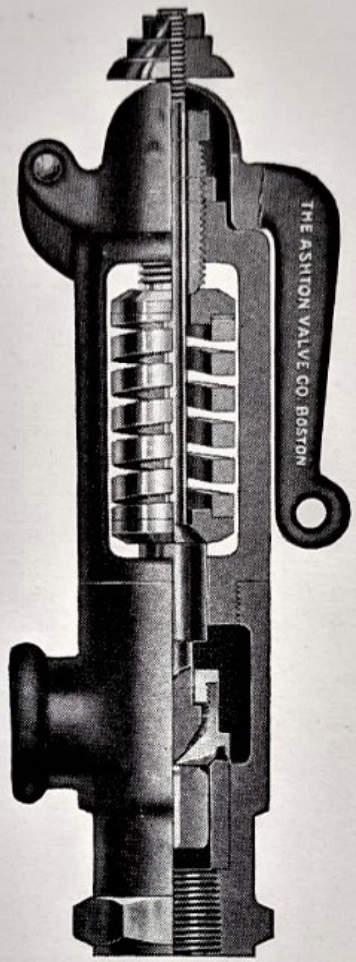
Directions

To increase relief pressure, turn adjusting wheel at top from left to right, in the same way that an ordinary globe valve is closed. The wheel moves up or down as the pressure is decreased or increased.

LIST PRICES

Size Valve	3 in.	3½ in.	4 in.	5 in.
Pump Rating, gallons per minute	500	750	1,000	1,500
Diameter Inlet Flange, inches	7½	8½	9	10
Price	$90.00	$105.00	$120.00	$160.00
Weight, pounds	105	165	180	205

Ashton Outside Spring Steel Body Pop Safety Valve



No. 17B.

This valve as made with steel body and outside spring has been specially designed for use on very high pressure steam boilers. It is of heavy construction with unusually strong lifting gear and has nickel seat and all necessary qualifications to insure durability and efficiency on high temperature and high pressure service, such as 300 pounds or over.

It can also be used to advantage on superheat steam installations where a smaller size valve is desired than the No. 17 style, shown on page 18.

LIST PRICES

Size	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwed Connections	$46.00	$55.00	$65.00	$80.00	$100.00
Flanged Inlet, Screwed Outlet	52.00	61.00	72.00	89.00	112.00
Flanged Inlet and Outlet	58.00	68.00	80.00	100.00	125.00

Ashton Standard Yokes

No. 11

Ashton Standard Yokes, shown above, are made of the same quality of cast iron metal as our No. 20 and No. 16 valves, and are guaranteed free from blowholes and other defects. They are extra heavy and meet the requirements of the most exacting safety-valve users.

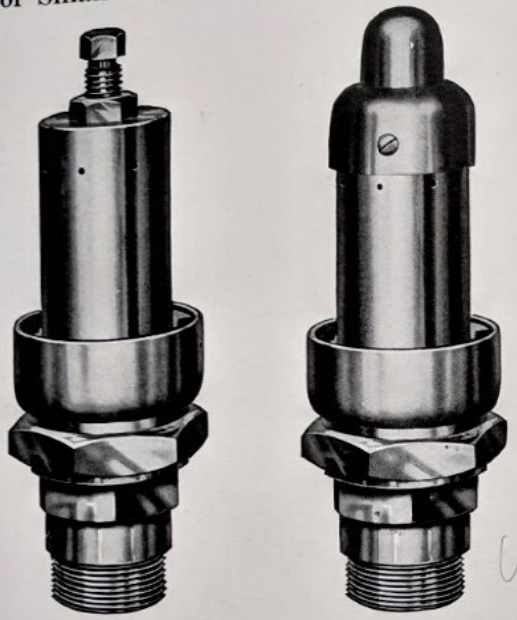
These yokes when shipped will be drilled to A. S. M. E. standard or furnished blank, as specified in the order.

LIST PRICES

Size	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Price	$18.00	$22.00	$27.00	$33.00	$40.00	$48.00	$57.00	$67.00	$77.00
Diameter Top Flanges	6½ in.	7½ in.	8¼ in.	9 in.	10 in.	10½ in.	11 in.	12½ in.	12½ in.
Diameter Bottom Flange	8¼ in.	9 in.	10½ in.	11 in.	12½ in.	14 in.	14 in.	15 in.	16¼ in.
Diameter Inlet Hole	3 in.	3½ in.	4¼ in.	5 in.	5¾ in.	6⅜ in.	7 in.	7⅞ in.	8½ in.
Weight	58	85	103	150	155	214	250	310	380

Ashton Pop Safety Valves

For Small Stationary and Portable Boilers



No. 6 No. 7

These valves are of Ashton quality throughout — spring of special steel, knife-edge pop lip, pivoted spring discs, encased spring. They are of high-grade composition metal and have open discharge outlet.

No. 7 is furnished with top cap, which covers and protects the pressure screw.

To Change Set Pressure

Slack check nut and turn pressure screw down for increased pressure, or up for less pressure, then set up check nut.

When it is desired to change set pressure more than 15 pounds above or below original set pressure, a new spring should be ordered to obtain greatest efficiency.

LIST PRICES

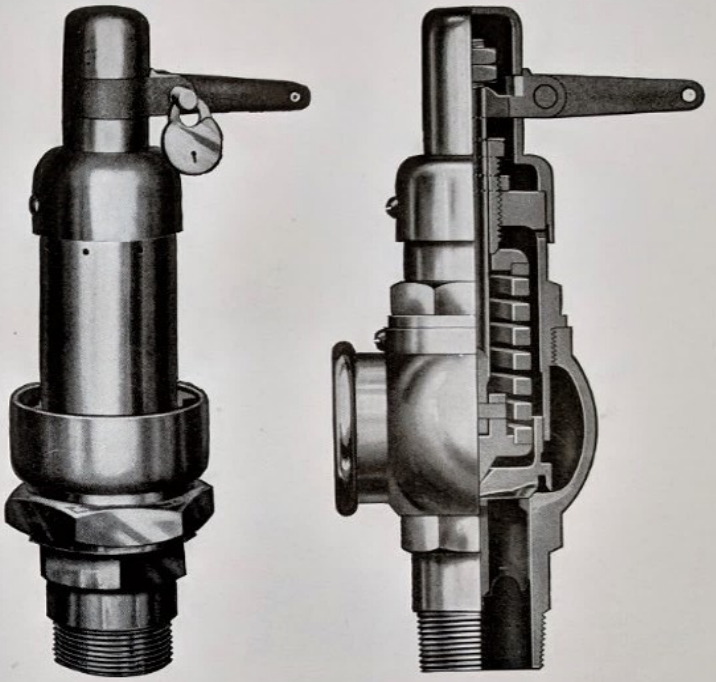
Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
No. 6	$10.50	$12.50	$15.00	$18.00	$22.00	$30.00	$40.00	$60.00
Weight, pounds	1	1¾	3¼	4¼	6¾	8¼	11	16
No. 7	12.00	14.00	17.00	20.00	24.00	32.00	45.00	65.00
Weight, pounds	1¼	2	3½	4¾	7¼	9¼	12½	19

For smaller valves see page 26.

When ordering always state maximum working pressure.

Ashton Lock-up Pop Safety Valves

For Small Stationary and Portable Boilers



No. 8 No. 9

These valves are of the best composition metal throughout, with the exception of the springs, which are of special steel. They have lock-up attachment, trip lever, knife-edge pop lip, encased spring, pivoted discs, etc.

No. 8 has open discharge outlet, while No. 9 has pipe outlet.

This valve is regularly made to conform with A. S. M. E. standard, and when specified, to comply with any State requirements.

LIST PRICES

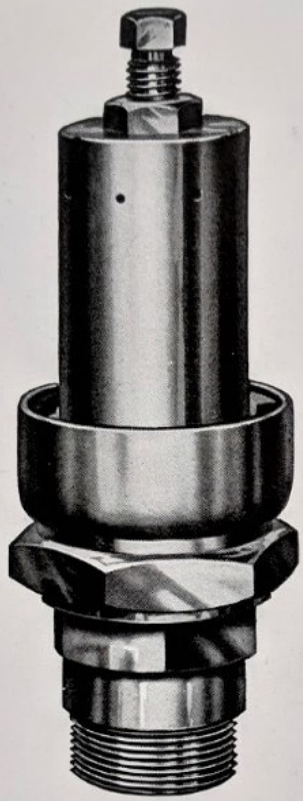
Size Valve	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
No. 8	$17.00	$20.00	$23.00	$27.00	$35.00	$50.00	$72.00
Weight, pounds	2¾	3¾	5½	7½	9¾	20½	32
No. 9	19.00	22.00	25.00	29.00	38.00	55.00	77.00
Weight, pounds	3¼	4½	6	8¼	12	23	39

For smaller valves see page 26.

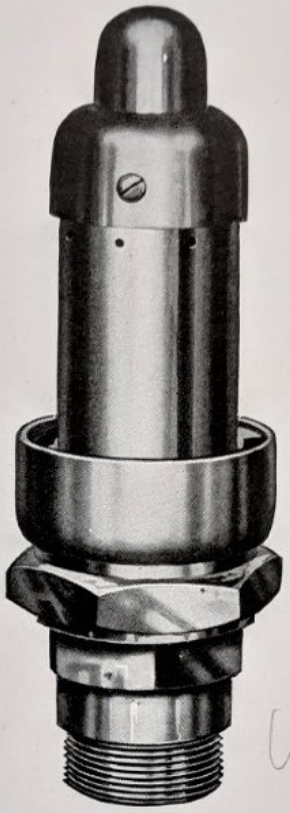
When ordering always state maximum working pressure.

Ashton Pop Safety Valves

For Small Stationary and Portable Boilers



No. 6



No. 7

These valves are of Ashton quality throughout — spring of special steel, knife-edge pop lip, pivoted spring discs, encased spring. They are of high-grade composition metal and have open discharge outlet.

No. 7 is furnished with top cap, which covers and protects the pressure screw.

To Change Set Pressure

Slack check nut and turn pressure screw down for increased pressure, or up for less pressure, then set up check nut.

When it is desired to change set pressure more than 15 pounds above or below original set pressure, a new spring should be ordered to obtain greatest efficiency.

LIST PRICES

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
No. 6	$10.50	$12.50	$15.00	$18.00	$22.00	$30.00	$40.00	$60.00
Weight, pounds	1	1¾	3¼	4¼	6¾	8¼	11	16
No. 7	12.00	14.00	17.00	20.00	24.00	32.00	45.00	65.00
Weight, pounds	1¼	2	3½	4¾	7¼	9¼	12½	19

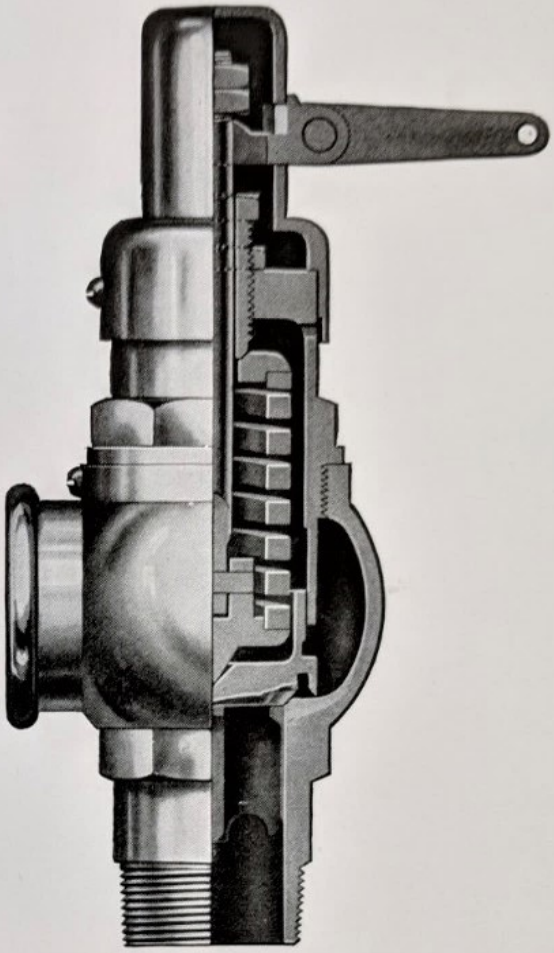
For smaller valves see page 26.

When ordering always state maximum working pressure.

Ashton Lock-up Pop Safety Valves

For Small Stationary and Portable Boilers

No. 8



No. 9

These valves are of the best composition metal throughout, with the exception of the springs, which are of special steel. They have lock-up attachment, trip lever, knife-edge pop lip, encased spring, pivoted discs, etc.

No. 8 has open discharge outlet, while No. 9 has pipe outlet.

This valve is regularly made to conform with A. S. M. E. standard, and when specified, to comply with any State requirements.

LIST PRICES

Size Valve	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
No. 8	$17.00	$20.00	$23.00	$27.00	$35.00	$50.00	$72.00
Weight, pounds	2¾	3¾	5½	7½	9¾	20½	32
No. 9	19.00	22.00	25.00	29.00	38.00	55.00	77.00
Weight, pounds	3¼	4½	6	8¼	12	23	39

For smaller valves see page 26.

When ordering always state maximum working pressure.

Ashton Pop Safety Valves

For Very Small Boilers and Pressure Tanks

No. 31

No. 32

These valves are very compact, but solidly built for either low or high pressures. They have encased spring made of special steel, knife-edge pop lip, beveled seats, and a lever for raising the valve off its seat.

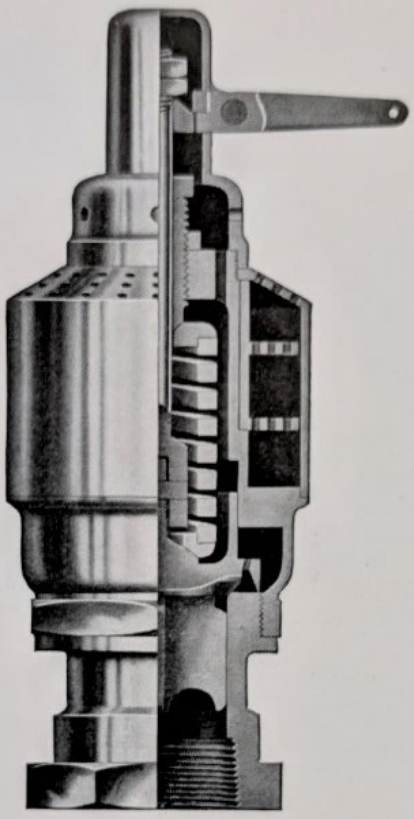
Every valve is carefully tested and set to blow at the desired pressure. They will not cause trouble by leaking.

No. 31 has open discharge outlet, while No. 32 has pipe outlet.

LIST PRICES

Size Valve	⅛ in.	¼ in.	⅜ in.	½ in.	¾ in.
No. 31 Valve	$7.50	$8.75	$10.00	$11.25	$12.50
No. 32 Valve	8.00	9.25	10.50	11.75	13.00
Weight in ounces	8	8	13	14	30

Ashton Stationary Muffled Safety Valve



No. 34

The Ashton Stationary Muffled Pop Safety Valve is largely used on steam roller and traction engine boilers. It is particularly desirable for use on any application where a quiet safety valve discharge is required.

This valve has the same efficiency as the open discharge valves and is made with either plain top or trip lever and lock-up attachment as above shown. It is serviceable for pressure up to 250 pounds per square inch.

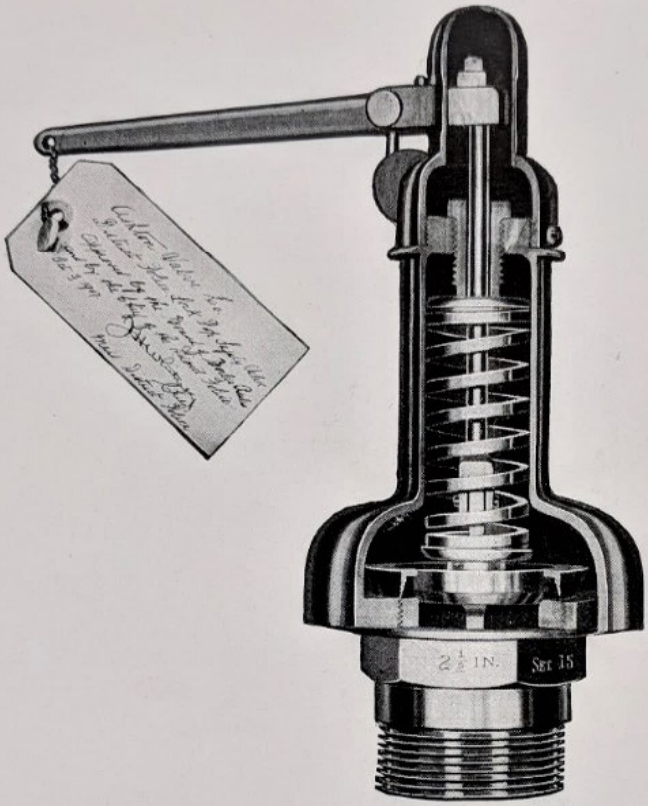
LIST PRICES

Size Valve	1 in.	1¼ in.	1½ in.	2 in.
Plain	$27.00	$29.00	$33.00	$43.00
With Lever	30.00	33.00	38.00	49.00

Ashton Police Lock-up Pop Safety Valve

For Low-Pressure Heating Boilers

Complies with the latest Revised Laws of the States of Massachusetts and Ohio



No. 14

Boilers equipped with these valves and operated at less than 15 pounds per square inch do not require a licensed engineer or fireman.

The lock-up attachment prevents tampering with the adjustment. A standard lock is furnished for each valve. Pressure regulating screw is so arranged that the valve cannot be set for more than 15 pounds,— an additional safeguard against carrying more pressure.

The downward discharge outlet prevents dust or dirt getting into the interior, a valuable feature where service conditions are such that valve is liable to neglect.

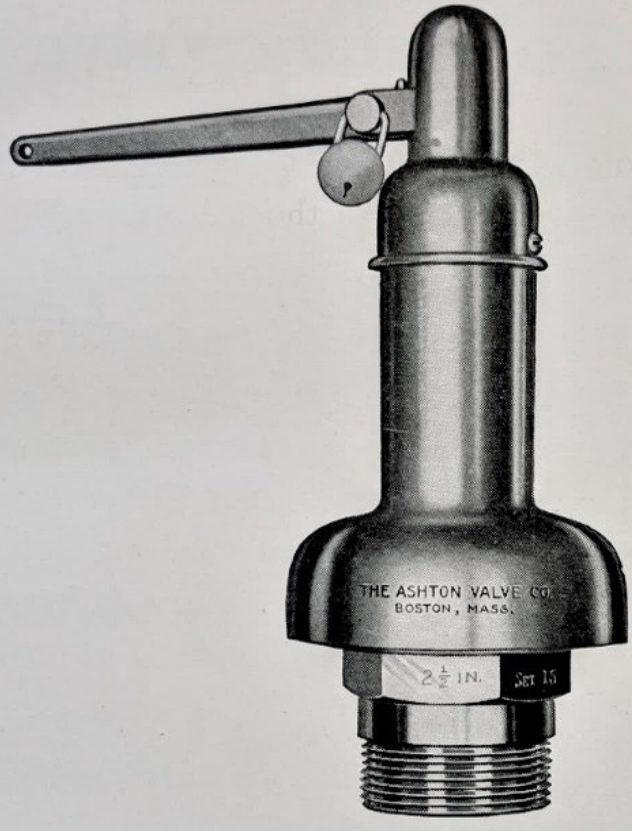
The spring is of good length, of special steel, and all other working parts are of high-grade composition which insures great durability. A long trip lever is capable of raising the wing valve off its seat a distance equal to one-fourth the diameter of the valve. The spindle is directly connected to the wing valve.

LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.
Price	$22.00	$30.00	$42.00	$57.00	$75.00
Grate Area, square feet	7.9	12	17.6	24	31.4

Boilers having over 31.4 square feet of grate surface require two safety valves.

Ashton Low Pressure Lock-up Pop Safety Valve



No. 14B.

This valve is of the same style as the No. 14 valve shown on opposite page, but is made for a greater range of pressure, having the usual ordinary pressure screw adjustment whereby it can be used up to a maximum of 30 pounds pressure.

It is made with composition body and has open downward discharge, trip lever, and lock-up attachment.

LIST PRICES

Size Valve	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.
Price . .	$8.00	$10.00	$13.00	$17.00	$22.00	$30.00	$42.00	$57.00	$75.00

The Ashton
Marine Pop Safety Valve

is the most extensively used safety valve on vessels of the better class. It may be chosen for any steam-propelled craft with the full assurance that it is unexcelled in design, material, and finish.

Among the first (1872) to be approved by the United States Board of Supervising Inspectors, the Ashton Marine Pop Safety Valve has been improved from time to time, keeping pace with the increasing rigidness of the official requirements. Today the Ashton not only fulfills every requirement of the rules and regulations prescribed by the Board, but in almost every feature is better than called for.

Still further, the Ashton Valve Company has filed with the Supervising Inspector General of the United States Board of Supervising Inspectors a certificate stating that all Ashton Marine Pop Safety Valves comply fully with the requirements of the rules and regulations.

The Bureau of Steam Engineering, United States Navy Department, also approves the Ashton Marine Pop Safety Valve, which is extensively used on battleships, cruisers, torpedo boats, and other craft in Navy service.

The United States Emergency Shipping Fleet Corporation is also a large user of Ashton Marine Pop Safety Valves.

Rules and Regulations

Relating to Safety Valves as prescribed by the United States Board of Supervising Inspectors and approved by the Secretary of Commerce

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The General Rules and Regulations as prescribed by the Board of Supervising Inspectors, as amended, require that:

All spring-loaded safety valves shall be equipped with a lever that will raise the valve from its seat a distance equal to one-eighth of the diameter of the valve opening.

Two or more safety valves, having a combined area equal to the area required, shall be used whenever the area is greater than that corresponding to 4½ inches diameter.

The seats of beveled-seat safety valves shall have an angle of inclination of 45 degrees.

When more than 3 inches diameter, the safety valve shall be subjected to a hydrostatic test of three and one-half times the pressure to which it will be subjected in service.

Screwed bonnets on cast-iron safety valves are positively prohibited; and all safety valves over 2 inches in diameter shall have bolted bonnets or covers. Valves of less than 2½ inches diameter connected direct to the boiler shall be of cast steel, hard brass, or bronze.

Manufacturers must guarantee the cast steel used for valves and fittings to have a tensile strength of 50,000 to 70,000 pounds per square inch, elastic limit not less than 45 per cent of the tensile strength, and an elongation in 2 inches of at least 25 per cent. Cast iron must have a tensile strength of at least 20,000 pounds per square inch if the valve is of over 3 inches diameter.

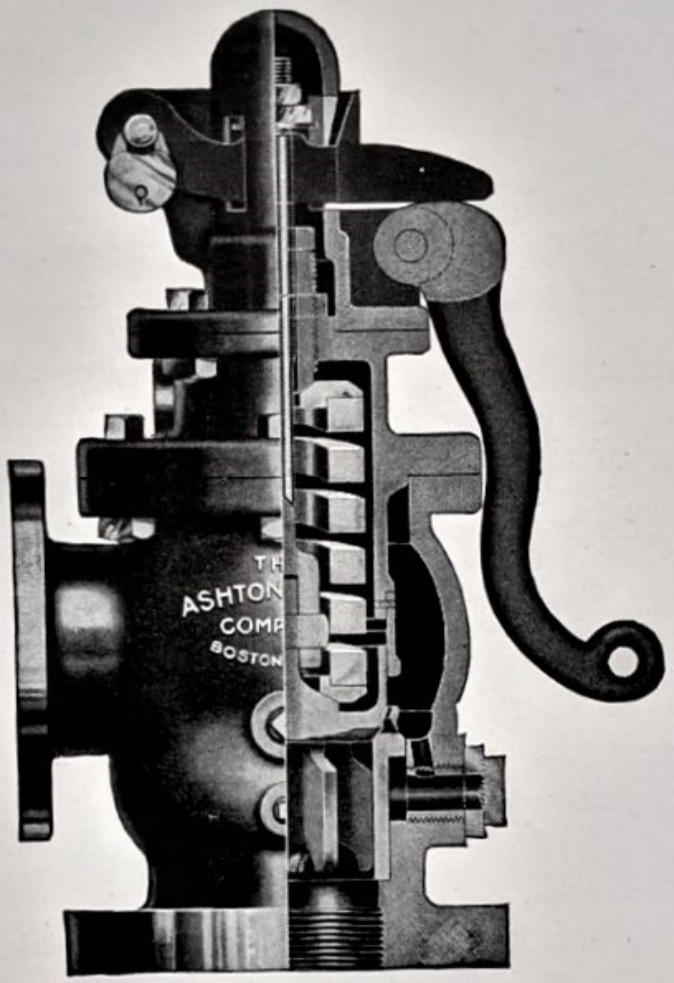
The size of all safety valves shall be in accordance with the following formula:

$$a = .2074 \frac{W}{P}$$

Where a = area of safety valve in square inches per square foot of grate surface
W = pounds of water evaporated per hour per square foot of grate surface
P = absolute pressure per square inch = working pressure (gage) + 15 pounds.

The result, a, multiplied by the grate surface is the area of the safety valve, the diameter of which may be found from a table, or by dividing by .7854 and then finding the square root.

Ashton Cam Lever Marine Pop Safety Valve



No. 16

Approved by the United States Board of Supervising Inspectors of Steam Vessels, by the Bureau of Steam Engineering, United States Navy Department, and by Lloyds Register.

This valve is especially adapted to marine service, and has become the standard for many large steamship lines. It is extensively used on steamboats, towboats, steam yachts, United States colliers, repair ships, etc.

The unexcelled reputation of the Ashton is the inevitable result of the superior features explained in detail on pages 7 to 11, especially the Cam Lever Attachment whereby the valve can be lifted by hand to a height even greater than the official requirement.

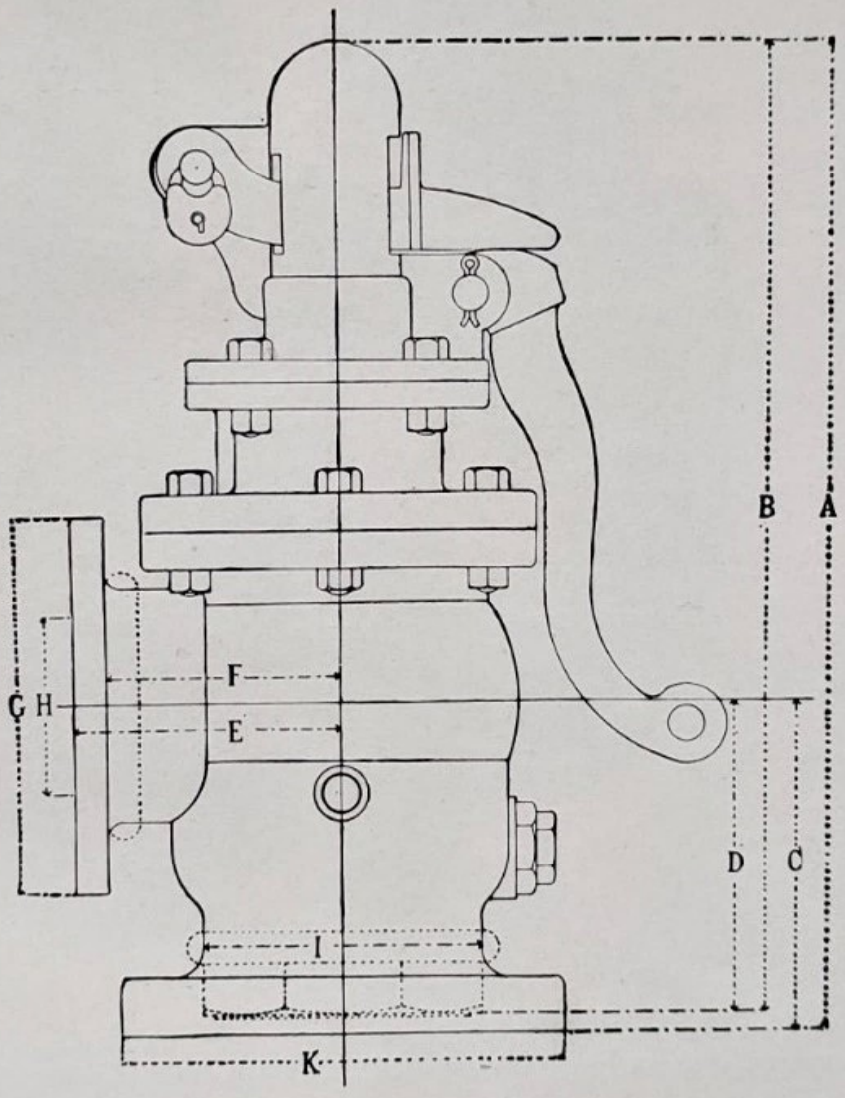
Unless otherwise specified, all Ashton Marine Pop Safety Valves above 2-inch size have flanged inlet and outlet.

LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Composition Seats	$66.00	$78.00	$91.00	$105.00	$120.00	$145.00	$175.00	$210.00	$250.00
Nickel Seats	69.00	82.00	96.00	111.00	127.00	153.00	185.00	222.00	264.00
Inlet Flange	6½ in.	7½ in.	8¼ in.	9 in.	10 in.	10½ in.	11 in.	12½ in.	12½ in.
Outlet Flange	6 in.	7 in.	7½ in.	8½ in.	9 in.	9¼ in.	10 in.	11 in.	11 in.
Weight, pounds	71	80	118	152	158	190	219	310	338

Ashton Cam Lever Marine Pop Safety Valve

No. 16 Style Dimension Sheet

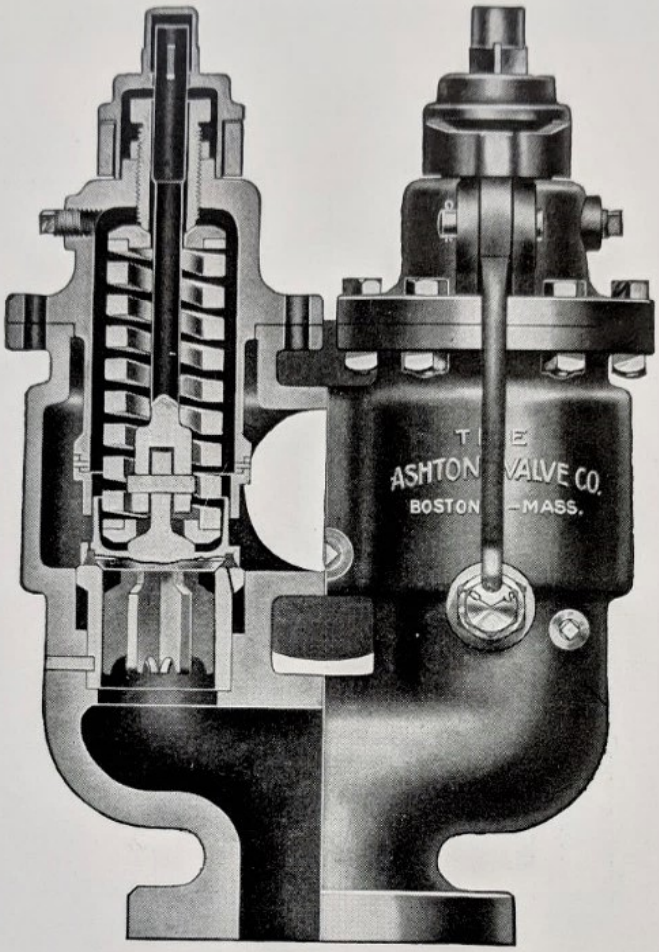


DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	15 5/8	15 5/8	5 1/8	5 1/8	3 5/8	3	6	2	4	6 1/2
2 1/2	17 3/4	17 3/4	6 1/4	6 1/4	4 11/16	4	7	2 1/2	4 3/8	7 1/2
3	20 1/8	20 1/8	6 3/4	6 3/4	5 1/2	4 3/4	7 1/2	3	5 1/8	8 1/4
3 1/2	22 1/4	22 1/4	7 3/4	7 3/4	5 13/16	5	8 1/2	3 1/2	5 1/4	9
4	21 7/8	21 7/8	7 3/8	7 3/8	6 3/16	5 1/4	9	4	6 1/4	10
4 1/2	23 1/4	23 1/4	7 5/8	7 5/8	6 7/16	5 1/2	9 1/4	4 1/2	6 3/4	10 1/2
5	25 1/2	25 1/2	8 1/4	8 1/4	6 7/8	5 7/8	10	5	7 1/4	11
5 1/2	23 7/8	23 7/8	8 7/16	8 7/16	7 1/2	6 1/2	11	*5 1/2	8 1/8	12 1/2
					7 1/2		11	6	9	12 1/2

Ashton Duplex Cam Lever Marine Pop Safety Valve

With Lock-up Attachment



No. 16 A.

Approved by the United States Board of Supervising Inspectors of Steam Vessels, by the Bureau of Steam Engineering, United States Navy Department, and by Lloyds Register.

Made under the same patents as No. 16 and of the same high quality throughout. The duplex form saves space and piping; it requires but one valve connection on the boiler and has a single discharge outlet, yet has the capacity of two valves.

Regularly furnished with iron body and independent cam levers, but can be fitted with rocker shaft if desired. At special price can be made of composition metal or cast steel when specifications accompany order.

For details see pages 7 to 11.

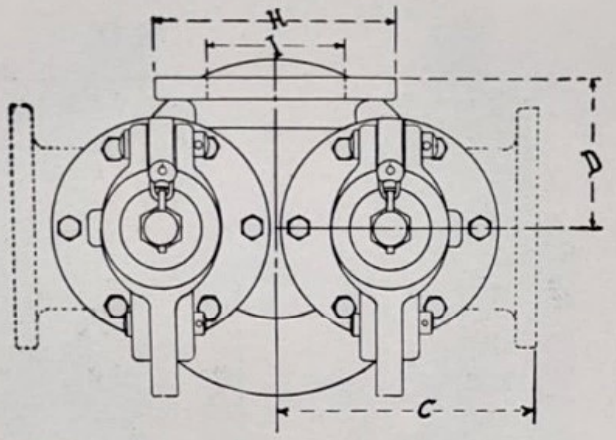
LIST PRICES

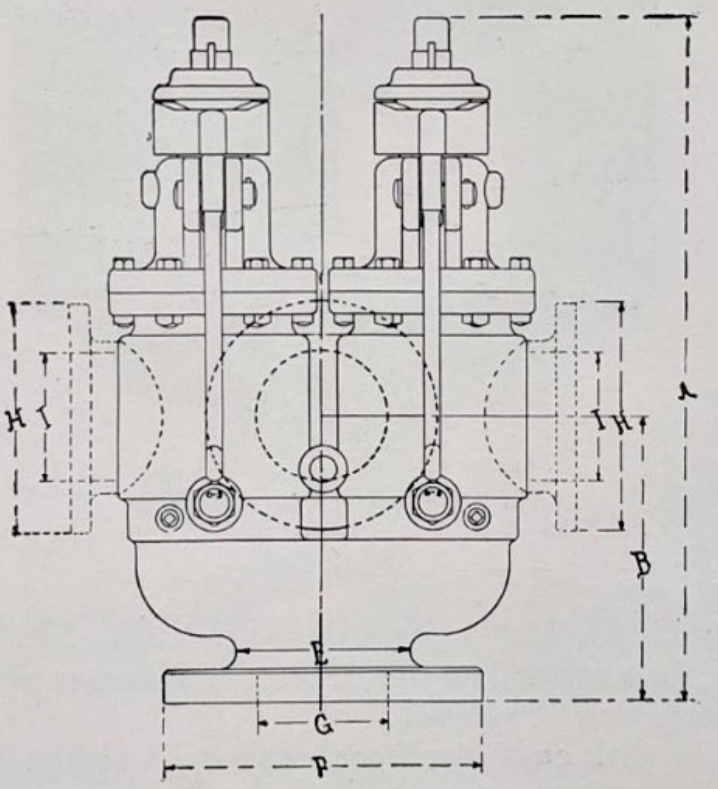
Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Composition Seat	$130.00	$160.00	$195.00	$230.00	$265.00	$300.00	$335.00	$380.00	$440.00
Nickel Seat	136.00	168.00	205.00	242.00	279.00	317.00	355.00	404.00	468.00
Diameter Inlet Flange	8¼ in.	9 in.	10½ in.	11 in.	12½ in.	14 in.	14 in.	15 in.	16¼ in.
Diameter Outlet Flange	7½ in.	8½ in.	9¼ in.	10 in.	11 in.	12½ in.	12½ in.	13½ in.	15 in.
Weight, pounds	190	270	335	363	4.50	533	695	850	938

For dimensions see page 35. For price list of parts see page 39.

Ashton Duplex Cam Lever Marine Pop Safety Valve

No. 16A. Style Dimension Sheet



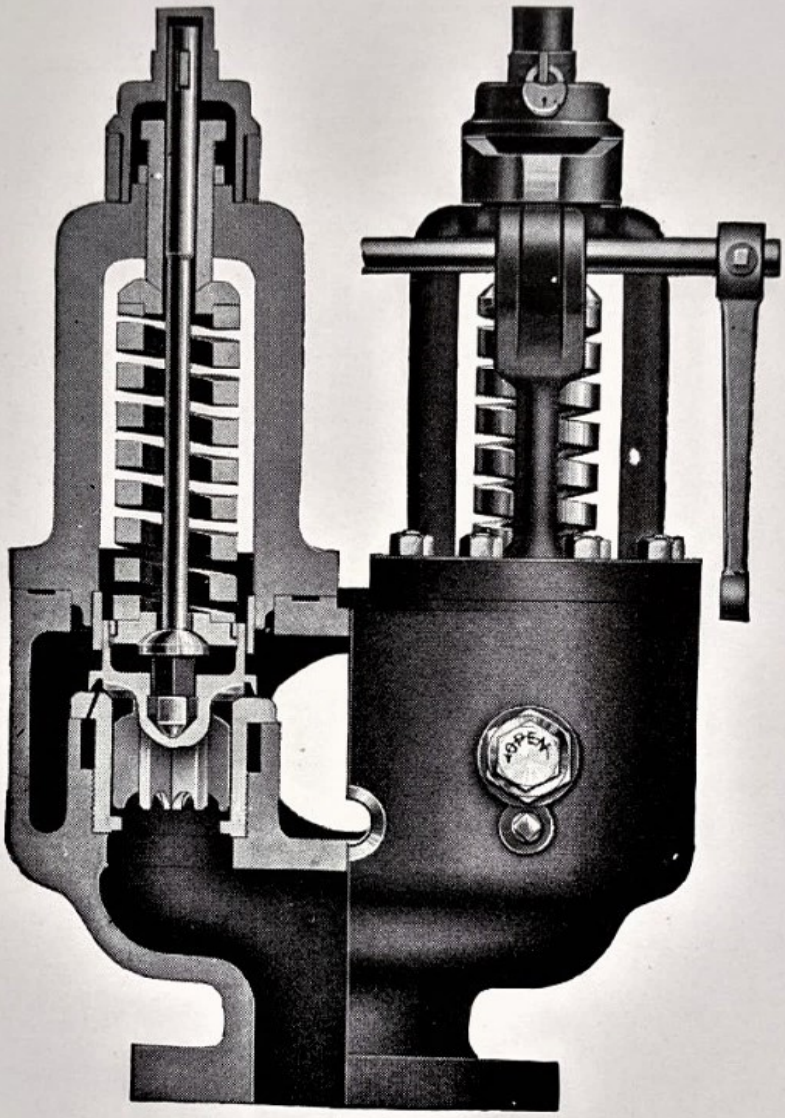


DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I
2	19 1/8	8 3/16	8	4 3/4	4 1/4	8 1/4	2 7/8	7 1/2	2 7/8
2 1/2	20 5/16	9 7/8	9 3/16	5 3/8	5 1/4	9	3 9/16	8 1/2	3 9/16
3	24 7/8	11 5/8	10 1/2	6 1/8	6	10 1/2	4 1/4	9 1/4	4 1/4
3 1/2	27 1/2	12 1/2	11	6 3/4	7	11	5	10	5
4	30	12 3/8	11 1/8	6 3/8	7 3/4	12 1/2	5 11/16	11	5 11/16
4 1/2	31	13 5/8	11 1/2	6 3/4	8 3/8	14	6 3/8	12 1/2	6 3/8
5	30 7/8	14 1/4	12 3/4	7 1/2	9 1/8	14	7 1/8	12 1/2	7 1/8
5 1/2	37 1/8	15 5/8	14	8	9 7/8	15	7 13/16	13 1/2	7 13/16
6	38 1/4	16 7/8	14 5/8	8	10 3/4	16 1/4	8 1/2	15	8 1/2

Ashton Duplex Cam Lever Marine Pop Safety Valve

with Outside Spring



No. 16B.

This valve is similar in general design to the No. 16A style shown on page 34, but embodies the necessary changes which the outside spring construction involves.

It is made with cast iron body, and with either independent cam levers or with rockershaft with single lever. When of the latter style it is customary to adjust the cams so that the valves will be lifted from their seats in succession.

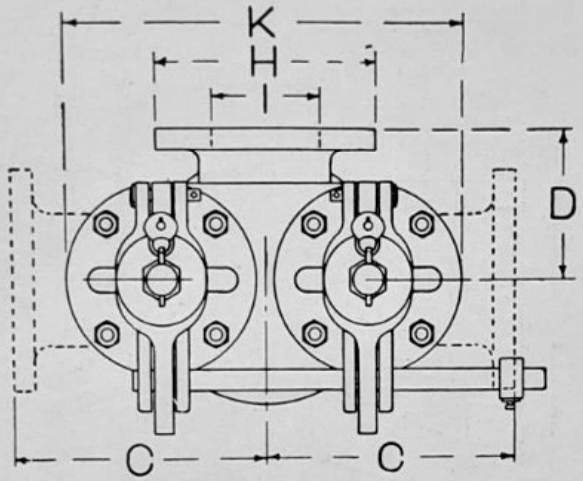
The outside spring offers the advantage of greater durability of spring, which does not come in contact with the discharged steam. It makes it also possible to more readily discover any defect in the spring.

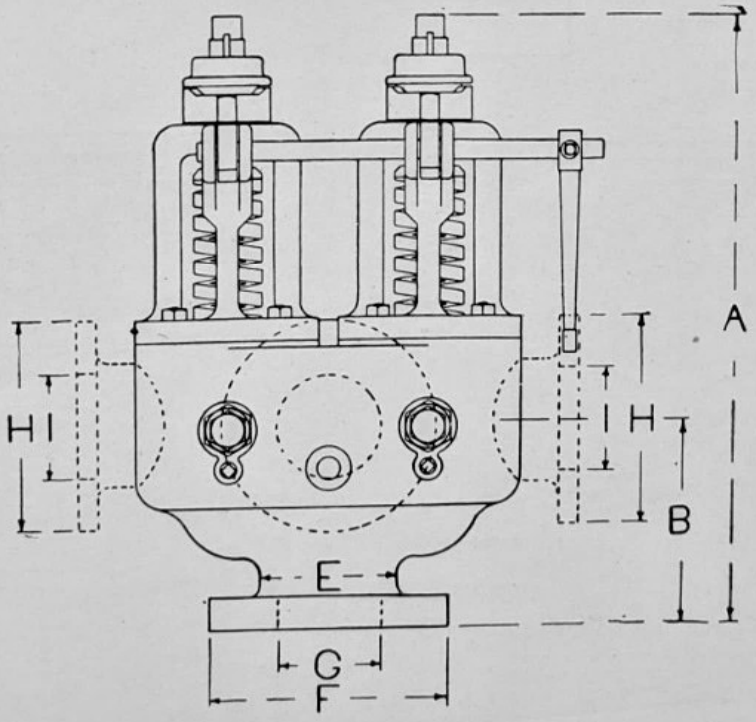
This style valve largely used on vessels of U. S. Emergency Shipping Fleet, being also of similar design required on U. S. Navy vessels.

Ashton Duplex Cam Lever Marine Pop Safety Valve

With Outside Spring

No. 16 B. Style Dimension Sheet



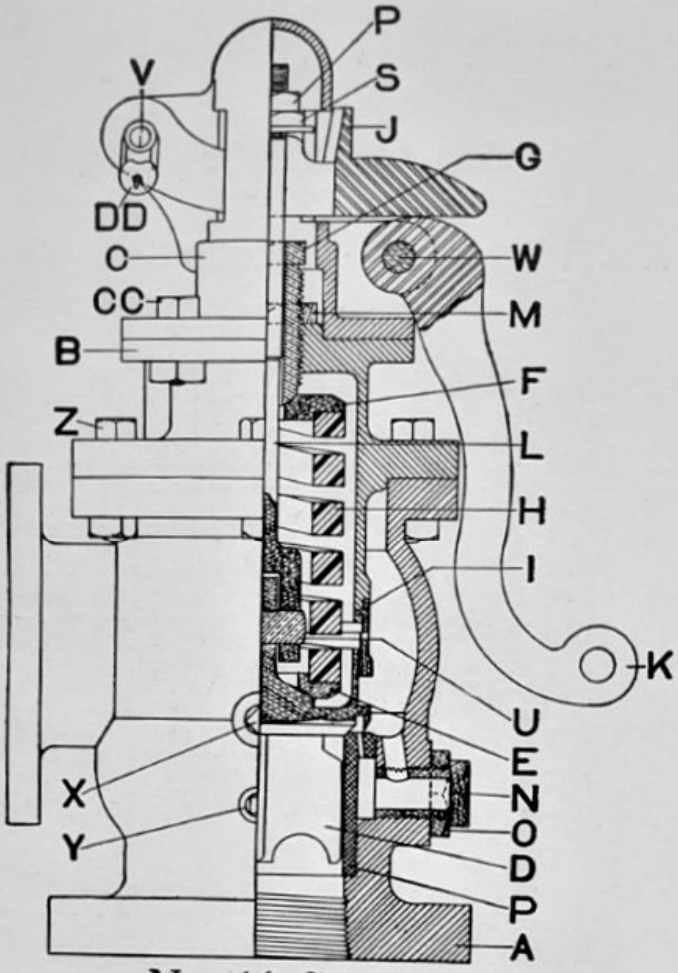


DIMENSIONS IN INCHES

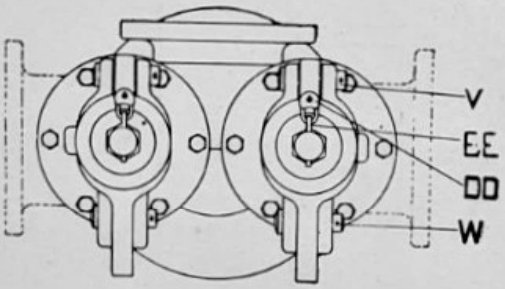
Sizes	A	B	C	D	E	F	G	H	I	K
3 . . .	27¾	9⅛	10½	6⅛	6	10½	4½	9¼	4½	17
3½ . .	28¾	9⅛	11 5/16	6¾	6¾	11	5	10	5	19

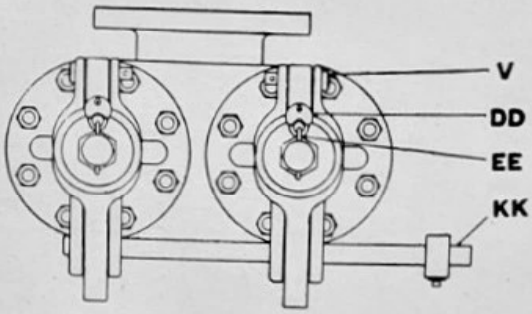
Ashton Marine Pop Safety Valves

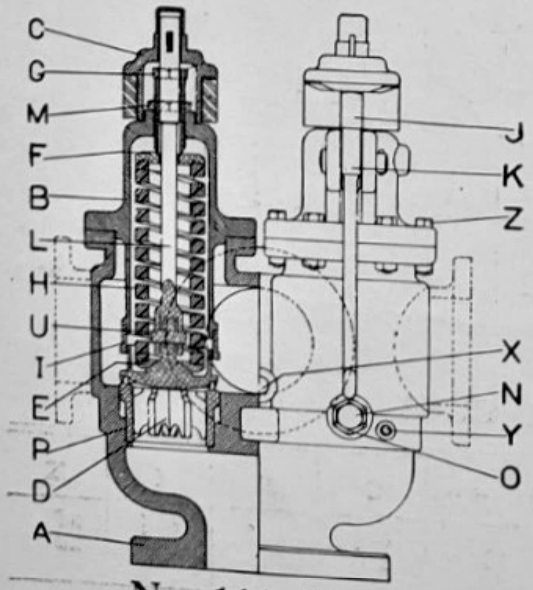
Reference List of Parts



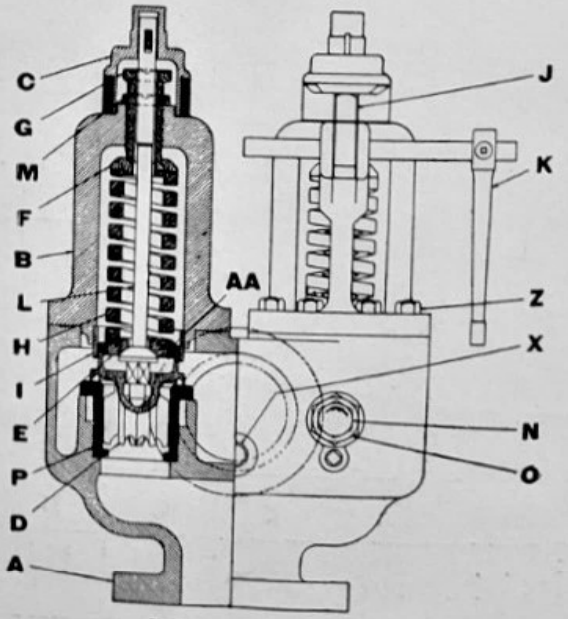
No. 16 Style







No. 16A. Style



Ashton Marine Pop Safety Valves

Price List of Parts

No. 16, No. 16 A., and No. 16 B. Styles

Name of Part	Letter	Style Valve No.	SIZE OF VALVE								
			2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Shell	A	16A	$28.00	$35.00	$43.00	$52.00	$60.00	$68.00	$79.00	$92.00	108.00
		16B	....	....	40.00	45.00	....	....	....	....	....
		16	13.00	14.00	15.50	17.50	20.50	24.50	30.50	38.50	48.50
Head	B	16	4.50	5.75	7.50	8.25	9.00	11.00	12.25	15.00	18.50
		16A	5.00	6.50	8.50	11.75	15.00	18.25	20.50	26.00	29.00
		16B	....	....	11.00	13.00	....	....	....	....	....
		16	3.00	3.00	3.00	5.00	5.00	6.50	6.50	11.25	11.25
Cap	C	16A	1.50	1.75	2.50	3.25	3.25	4.00	4.75	8.00	8.00
		16B	....	....	3.00	3.25	....	....	....	....	....
Wing Valve	D	16 16A	8.00	9.00	10.00	12.00	15.00	18.00	22.00	27.00	33.00
		16B	....	....	11.00	15.00	....	....	....	....	....
Bottom Disc	E	16 16A	1.50	1.50	1.75	2.25	2.25	3.50	3.50	4.50	4.50
		16B	....	....	2.25	3.00	....	....	....	....	....
Top Disc	F	16 16A	1.50	1.50	1.75	2.50	2.50	3.50	4.00	5.00	5.00
		16B	....	....	2.00	3.00	....	....	....	....	....
Pressure Screw	G	16 16A	2.75	2.75	3.00	4.00	4.00	5.25	6.00	7.25	7.25
		16B	....	....	4.00	5.00	....	....	....	....	....
		16	3.00	4.00	5.00	6.00	9.00	14.00	20.00	25.00	30.00
Spring	H	16A	4.00	6.00	8.00	11.00	16.00	22.00	28.00	34.00	40.00
		16B	....	....	8.00	11.00	....	....	....	....	....
Head Ring	I	16 16A	2.75	3.00	3.25	3.50	3.75	4.25	5.00	6.00	8.75
		16B	....	....	3.25	3.50	....	....	....	....	....
		16	.65	.70	1.00	1.10	1.25	2.00	2.00	2.25	2.50
Fork	J	16A	2.50	2.50	2.50	5.50	5.50	7.75	7.75	8.50	10.25
		16B	....	....	5.50	5.50	....	....	....	....	....
		16	.55	.60	.90	1.25	1.50	1.75	1.75	2.25	2.75
Lever	K	16A	1.25	1.50	1.50	3.25	3.25	4.25	4.25	5.25	5.25
		16B	....	....	3.00	3.25	....	....	....	....	....
		16	1.50	1.75	2.50	4.00	4.25	5.25	7.00	9.25	9.25
Spindle	L	16A	4.00	5.00	6.25	9.00	10.25	12.50	14.25	16.75	18.75
		16B	....	....	10.00	12.00	....	....	....	....	....
Pressure Screw Check Nut	M	16 16A	.75	.75	.85	.85	1.00	1.35	1.60	1.75	1.75
		16B	....	....	.85	1.00	....	....	....	....	....
Regulator	N	16 16A	1.50	1.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
		16B	....	....	2.00	2.00	....	....	....	....	....
Regulator Check Nut	O	16 16A	.65	.75	.75	.75	.75	.75	.75	.85	.85
		16B	....	....	.75	.75	....	....	....	....	....
Seat Bushing (Nickel)	P	16 16A	8.00	10.00	13.00	16.00	19.00	22.00	25.00	30.00	35.00
		16B	....	....	13.00	22.00	....	....	....	....	....
Seat Bushing (Composition)	P	16 16A	6.00	7.00	9.00	11.00	13.00	15.00	18.00	22.00	26.00
UpperSpindle Nut	R	16	....	.40	.50	.75	.75	1.00	1.00	1.00	1.00
LowerSpindle Nut	S	16	....	.55	.65	.70	.70	1.05	1.05	1.05	1.05
Studs	T	16B	....	....	.15	.15	....	....	....	....	....
Spindle Pin	U	16 16A	.50	.50	.50	.75	.75	.90	1.00	1.00	1.00
Fork Pin	V	16 16A	1.10	1.10	1.50	1.50	1.50	1.50	1.50	1.75	1.75
		16B	....	....	1.50	1.50	....	....	....	....	....
Lever Pin	W	16 16A	1.10	1.10	1.50	1.50	1.50	1.50	1.50	1.75	1.75
Seat Drip	X	16 16A	.10	.10	.10	.10	.10	.10	.10	.10	.10
		16B	....	....	.15	.15	....	....	....	....	....
Chamber Drip	Y	16 16A	.10	.10	.10	.10	.10	.10	.10	.10	.10
Body Bolts and Nuts	Z	16 16A	.10	.10	.10	.10	.15	.15	.15	.15	.15
Stud Nuts	Z	16B	....	....	.10	.10	....	....	....	....	....
Valve Ring	AA	16B	....	....	1.00	1.00	....	....	....	....	....
Cap Bolts	CC	16	.10	.10	.10	.10	.10	.10	.10	.10	.10
Lock and Key	DD	16 16A	.50	.50	.50	.50	.50	.50	.50	1.00	1.00
		16B	....	....	.50	.50	....	....	....	....	....
Lock Pin	EE	16A	.60	.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		16B	....	....	1.00	1.00	....	....	....	....	....
Rocker Shaft		16B	....	....	2.00	2.50	....	....	....	....	....
Cam		16B	....	....	1.50	1.50	....	....	....	....	....
Cam Set Screw		16B	....	....	.10	.10	....	....	....	....	....
Lever Set Screw		16B	....	....	.10	.10	....	....	....	....	....
Bushing Set Screw		16B	....	....	.20	.20	....	....	....	....	....

In ordering new parts it is necessary to specify size of valve and style number, name of part and letter, and if new springs are ordered, the *working pressure*. It is also advisable to give the serial number of valve, which will be found stamped on the "Head B" between the heads of the bolts.

General Instructions

For the Application, Care, and Maintenance of Ashton Stationary and Marine Pop Safety Valves

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1. **Always apply valves close to the boiler or main supply of steam,** on short nipples or nozzles having full inside diameter. When otherwise connected they are likely to chatter when blowing, and will not give full capacity of relief, due to restricted steam supply.

2. **Each safety valve should be applied to a separate boiler nozzle,** with no other engine or auxiliary pipe line connected thereto. This will insure the valves of having a full and steady supply of steam to maintain their full efficiency lift without fluctuation.

3. **Joints between safety valves and connections must be carefully made up.** Red lead, or other similar material, used on screwed joints, should be put on sparingly and be applied only on the male connection. Packing used for gaskets on flanged joints should be carefully trimmed on its inside diameter. By following these instructions it will prevent any joint material from working up into the valves to clog them or make them leak.

4. **Safety valves should be placed in a vertical position.** When otherwise applied they will wear unevenly and become out of alignment, which will cause them to leak by preventing true seating.

5. **Valves should be operated frequently.** If this does not happen in regular service at least once a day, they should be opened by hand, as can readily be done by use of the trip lever. This practice keeps the valves in good working condition and prevents the accumulation of dirt or other foreign matter that might clog the important working parts.

6. **Never change set pressure adjustment of valves,** when they do not operate at apparently the correct pressure unless the steam gage is known to be absolutely correct. Gages are more likely to be inaccurate than safety valves owing to their more sensitive action and delicate construction.

7. **The cause of safety valves leaking** may be due to several reasons. Generally it is because of some foreign substance having blown out of the boiler or the safety valve connection and becoming lodged on the valve seat. When this occurs the valve should be taken apart at the first opportunity and the seat cleaned. If the seat has become scratched or slightly defaced it can be made perfect by grinding in with fine quartz and oil. If more than slightly defaced it will require machining, in which case the same amount of metal should be removed from the lip as from the seat.

7a. As previously stated valves will also leak if red lead or packing from the connection joints gets into the valves. They will also leak if they are allowed to chatter, due to improper installation or wrong adjustment of the pop, giving too small a blow-down.

7b. Valves having long, unsupported outlet pipes connected to them are often found to be leaking because of the weight of the pipe unduly straining the valve body and distorting the seat. Such pipes must be supported otherwise than by the valve only.

7c. Lifting mechanism attached to safety valve levers must be so arranged that when it is not being used the lever will stand in its normal position. If there is the slightest drag on the lever the valve is likely to leak.

8. The cause of safety valves chattering. This fault in operation is usually due to wrong application such as mentioned in above paragraphs 1 and 2. Pop safety valves give such a large and sudden relief that they must be so connected that they will obtain a full supply of steam to keep them well off their seats during their entire operation. They are also so sensitive that if an engine pipe or other auxiliary is connected to the safety valve nozzle, it will cause sufficient fluctuation of pressure to make the valve correspondingly fluctuate in its lift when blowing and result in chattering.

8a. Valves which have the pop, or blow-down, regulated too fine will chatter. The adjustment should be such that the difference between the opening and closing pressures will not be much less than 3 pounds, otherwise the valves will remain on a balance.

9. Valves which have an excessive blow-down, or pop, such as over 5 pounds, are usually hung up in the head of the wing valve, or between the valve wings and the seat bushing. They should be taken apart and cleaned. If the spring is too light the pop is likely to be too heavy. A satisfactory pop for ordinary pressures is 3 pounds and for high pressures 5 pounds. Adjustments should be made within these limits for satisfactory service and economy in steam. The outside pop regulator will accomplish this under normal conditions.

10. Safety valve springs have a limited range of service. They cannot be used for a greater range than 15 pounds above or below the original set pressure without impairing the efficiency of the valve and the regulation of the pop control. When a greater change of set pressure is desired, new springs of proper strength must be used.

10a. Screwing down safety valve springs beyond their maximum range, to make hydrostatic tests, subjects them to an excessive strain that may destroy their life and efficiency. It is a bad as well as a dangerous practice.

11. Capacity of safety valves. Ashton Pop Safety Valves are made to give a desired capacity of relief. They are regularly furnished, when not otherwise specified, with a moderate lift adjustment, whereby they will operate with a discharge capacity equal to that as specified in the Intermediate schedule of Table 15 of the A.S.M.E. Boiler Code, Edition of 1918. This we recommend as the best practice for ordinary installations, the valves being made with bevel seats. However, when larger capacity valves are required they are made to operate with high lift to equal the capacity specified in the maximum schedule of the Code. Flat seat safety valves, with their slightly increased capacity, are furnished when specially requested.

Special Instructions

For Repairing and Adjusting Ashton Stationary and Marine Pop Safety Valves

The following special instructions embody the fundamental principles found in all Ashton Pop Safety Valves, and with slight modifications have general application to all styles shown in the catalogue.

1. To take Ashton Safety Valves apart, open and remove lock and lock pin. Then take out fork lever, unbolt and remove top cap, thus exposing the pressure screw. Valves having loosely fitted caps held on by keys extending through top of spindle require only the removal of the key to release the cap, and the fork lever need not be unbolted but simply thrown over. The pressure screw should then be unscrewed, after loosening its check nut, until all the tension is taken off from the spring. The valve bonnet, or top, can be unbolted or unscrewed, as the case may be, and then removed from the body, whereby all interior parts are accessible.

2. To reseat Ashton Safety Valves particular attention should be given to retain the original lines and proper relation of the lip of the wing valve to the seat bushing. Valve seats that are only slightly defaced can usually be ground in tight by the use of fine quartz and oil, and the best results can be obtained by alternating the direction of each grinding operation. Seats which require machining must afterwards be ground in. Such valves also require the removal of the same amount of metal from the bottom of the knife-edge lip as was taken from the seat, otherwise the wing valve will rest on the lip and not on the seat. The lip should always extend down as close as possible to the bushing, but must never touch it. The clearance under the lip should be about 1/100th of an inch, or equal to about the thickness of a piece of thin paper. An easy way to test a valve to determine whether it is properly resting on its seat and not on the lip is to note if it can be slightly rocked by hand, as should be possible. If it does not, the bottom of the lip should be filed down a trifle, or else a light chip turned off it. When in service the lip wears down equally with the seat and requires no special attention.

3. To change the set pressure of Ashton Valves it is only necessary to adjust the pressure screw by screwing it downward for a higher working pressure, or upward for a lower pressure. It is obviously necessary to release the pressure screw check nut before making an adjustment and always tightening it afterwards. It should be understood that valve springs have only a maximum range of 30 pounds. Therefore, for a greater range than 15 pounds above or below the original set pressure adjustment a change of spring is necessary.

4. To change the pop, or blow-down, of Ashton Valves, it is unnecessary to take them apart, as this can be done while the valves are in service. The only exception to this is that of the small size valves, which do not have outside pop regulators. These regulators, which are applied to the more commonly used larger size iron body valves, consist of a hollow screw plug located on the outside back part of the valve body just above the neck. The face of the hexagon head of the regulator is stamped "O" and "S." To increase the pop the regulator should be turned to the left so that the letter "S" stands nearer perpendicular; or for less pop turn regulator to the right until letter "O" is nearer perpendicular. One sixth of a turn gives the full range of adjustment of the pop regulator, and the maximum or minimum pop is

less pop regulation than other valves, and their regulators do not stick and become inoperative in ordinary service.

5. The main pop chamber in Ashton Valves should be kept to approximately its original dimensions. This chamber is the space enclosed within the walls of the knife-edge lip of the wing valve into which the steam passes immediately after the valve raises from its seat, where it exerts a substantial pressure upon an increased area of the wing valve, thereby adding considerably to the lift, and consequently to the discharge capacity of the valve. It is, therefore, essential when making substantial repairs to see that the original depth of the pop chamber is fairly closely maintained, also that the knife-edge lip bears its proper relation to the seat bushing by extending down as close to it as possible without touching.

6. The following cuts show in outline the design of the essential parts of the wing valve and seat bushing in Ashton valves.

6a. Figure 1 of the wing valve "A" represents the knife-edge lip, and "E" the supplementary relief holes in top of pop chamber. By decreasing or increasing the number of these holes the pop of the valve is made more or less. It is only in exceptional cases that these require any change, for the outside pop regulators usually give all the regulation desired.

6b. Figure 2 shows a portion of the seat bushing "B" with its bevel seat "C." To obtain the best results it is advisable to maintain the original narrow width of seat of not over one eighth of an inch regardless of the size of the valve.

6c. Figure 3 shows the wing valve in normal position on the seat bushing. "D" is the main pop chamber above referred to. The proper clearance below the knife-edge lip is also indicated.

FIG.1

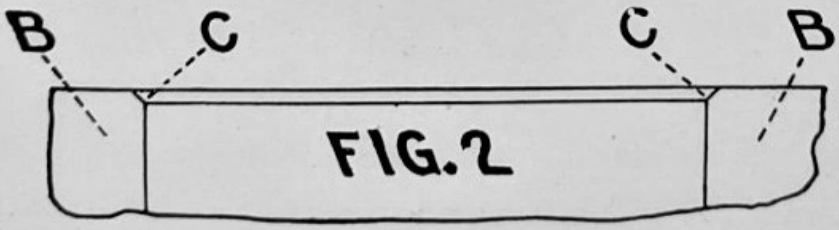


FIG.2

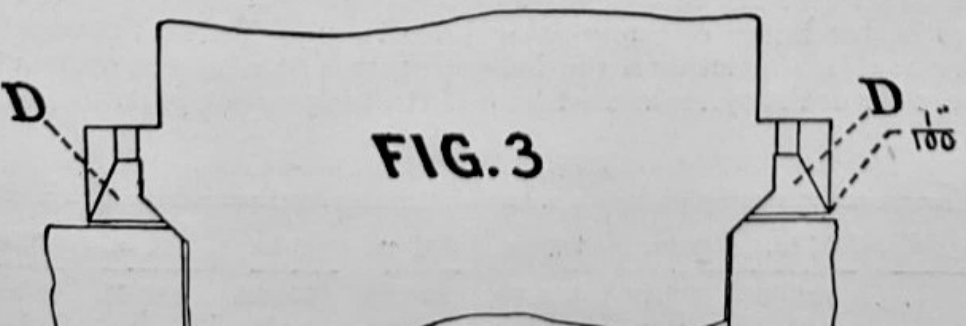
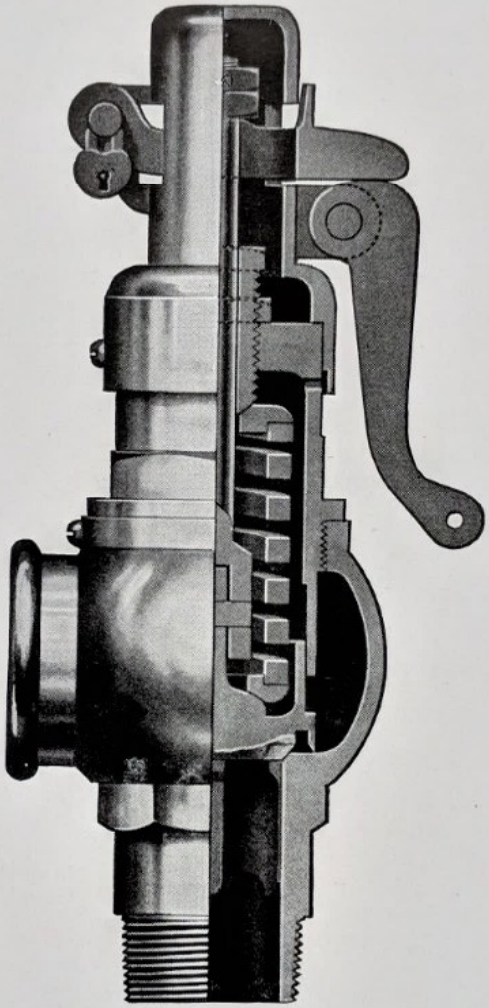


FIG.3

Ashton Cam Lever Marine Pop Safety Valve

With Lock-up Attachment



No. 15

This valve, shown above with screw connections but made also with flanged connections, as shown on following page, is primarily for yachts and other small craft. It has pipe outlet, so that the steam discharged may be carried outside the boiler room.

With bevel seat, encased spring, cam-lifting attachment, and other Ashton features explained on pages 7 to 11, this valve fully complies with the Rules and Regulations of the United States Board of Supervising Inspectors of Steam Vessels.

This valve has base outlet construction with threaded joint above outlet, so it may be taken apart for ordinary repairs without disturbing outlet pipe.

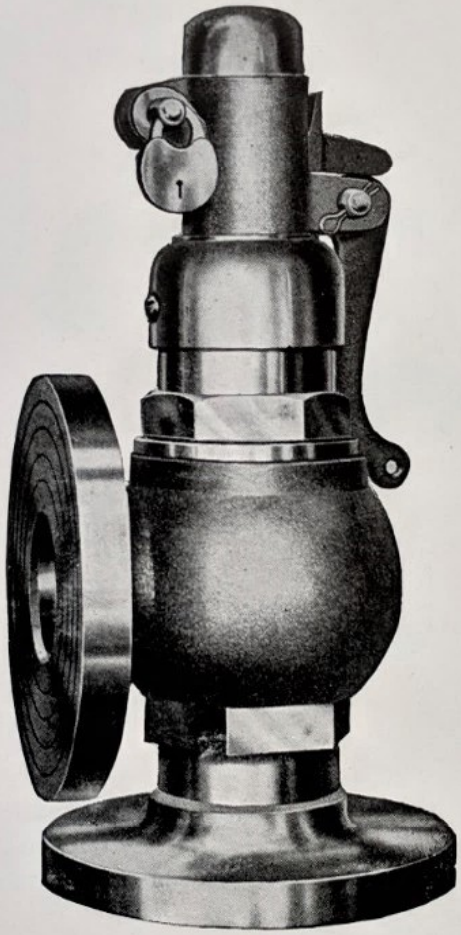
LIST PRICES

Size Valve	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	3½ in.
Price	$21.00	$23.00	$26.00	$30.00	$40.00	$58.00	$78.00	$105.00
Weight, pounds	4	5½	7½	10	14	28	45	60

In ordering always state maximum pressure.

Ashton Cam Lever Marine Pop Safety Valve

with Flanged Connections



No. 15F.

This valve is identically the same as the No. 15 style shown on preceding page, with the exception that both inlet and outlet connections are flanged, as is often desired on high pressure service.

It is made with composition body, nickel or composition seat, base outlet construction, and powerful cam lever lifting attachment with lock-up.

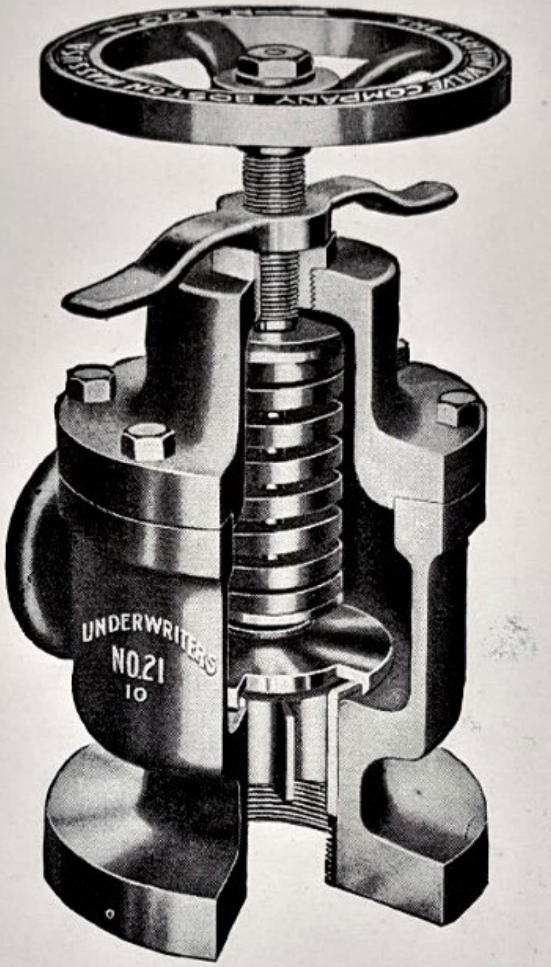
When ordering state diameter of both flanges wanted, also maximum working pressure.

LIST PRICES

Size Valve	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Price	$42.00	$46.00	$52.00	$60.00	$80.00
Weight, pounds	8½	11½	16	19	26

Ashton Water Relief Valve

Underwriter Pattern



No. 21

This valve has been competitively tested and formally accepted by the Associated Factory Mutual Fire Insurance Companies, having complied fully with all their requirements. It has capacity such "that when set at 100 pounds it can pass all the water discharged by the pump at full speed, at a pump pressure not exceeding 125 pounds per square inch."

This valve is made with iron body and high-grade composition metal working parts which prevent corrosion. The spring is of special steel and of extra length.

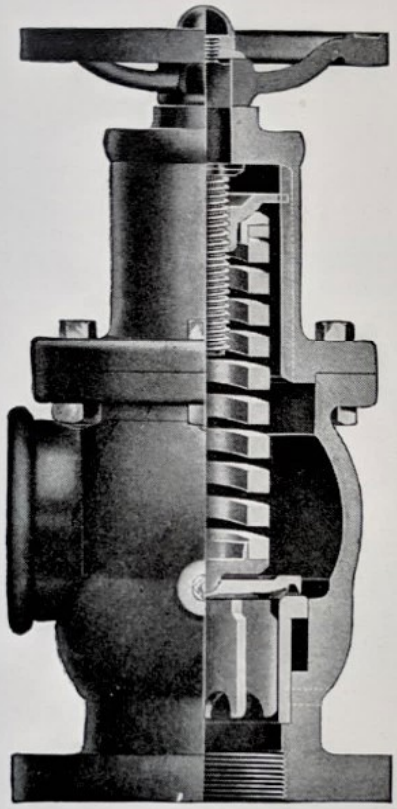
Directions

To increase relief pressure, turn adjusting wheel at top from left to right, in the same way that an ordinary globe valve is closed. The wheel moves up or down as the pressure is decreased or increased.

LIST PRICES

Size Valve	3 in.	3½ in.	4 in.	5 in.
Pump Rating, gallons per minute	500	750	1,000	1,500
Diameter Inlet Flange, inches	7½	8½	9	10
Price	$90.00	$105.00	$120.00	$160.00
Weight, pounds	105	165	190	295

Ashton Standard Water Relief Valve



No. 22

For Pumps, Hydraulic Elevators, Water Works, Pumping Stations, and Standpipes. These valves give automatic relief, preventing overpressure of water and water hammer, and when used on a fire pump, absolutely prevent bursting of hose or pipe.

Extra large relief is what distinguishes this valve from other makes — the iron body is large, giving a generous discharge chamber, and the extra long, flexible spring insures ample lift. Easy adjustment of set pressure is secured because of the large wheel top.

As shown above, both inlet and outlet are in the same base casting, which allows taking valve apart for regrinding or other repairs without breaking connections or altering adjustment. Working parts are of high-grade composition metal to prevent corrosion, and the spring is of special steel.

No. 22 relief valve is regularly furnished with flanged inlet and screwed outlet, as shown above; but inlet and outlet can be screwed or flanged as desired.

Directions

To set for *higher* relief pressure, turn wheel at top of valve from right to left. To *decrease* relief pressure, turn wheel from left to right. This is the reverse of changing our "pop" safety valves.

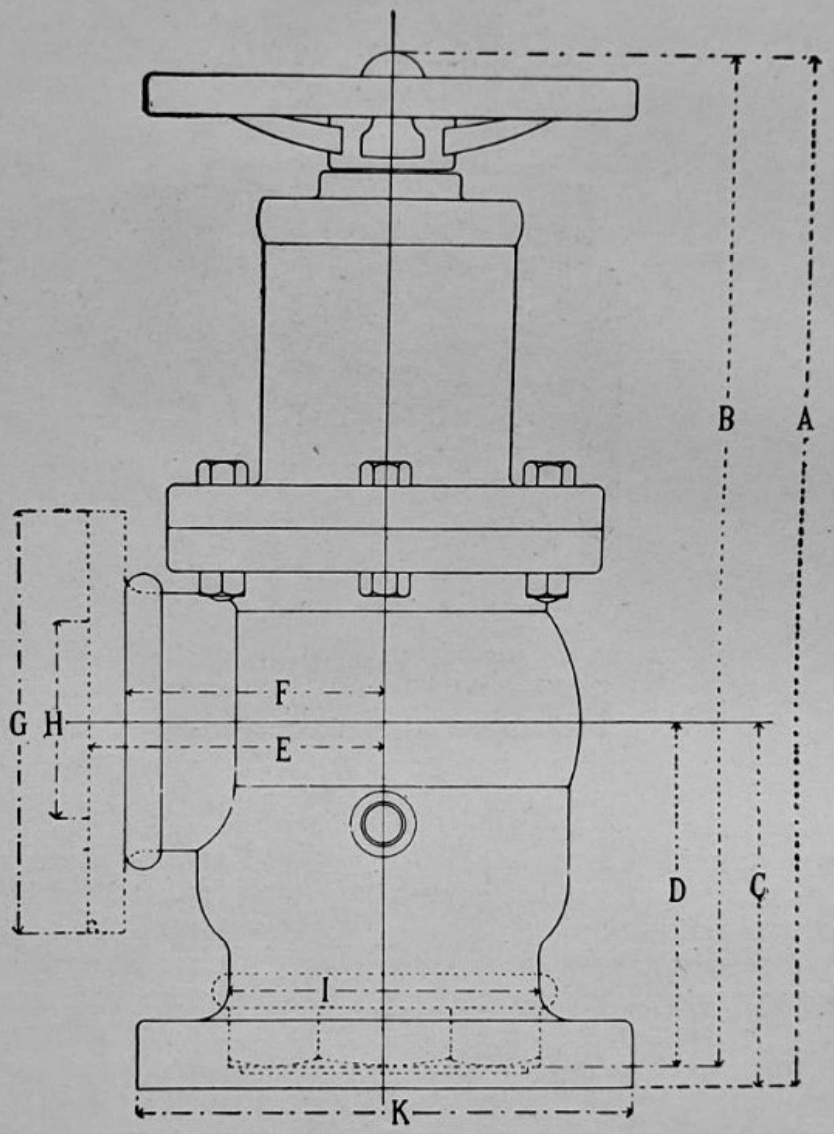
LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Price	$60.00	$75.00	$90.00	$105.00	$120.00	$140.00	$160.00	$180.00	$200.00
Diam. Inlet Flange	6½ in.	7½ in.	8¼ in.	9 in.	10 in.	10½ in.	11 in.	12½ in.	12½ in.
Weight, pounds . .	55	65	94	105	130	182	195	230	300

For dimensions see page 48. For price list of parts see page 49.

Ashton Standard Water Relief Valve

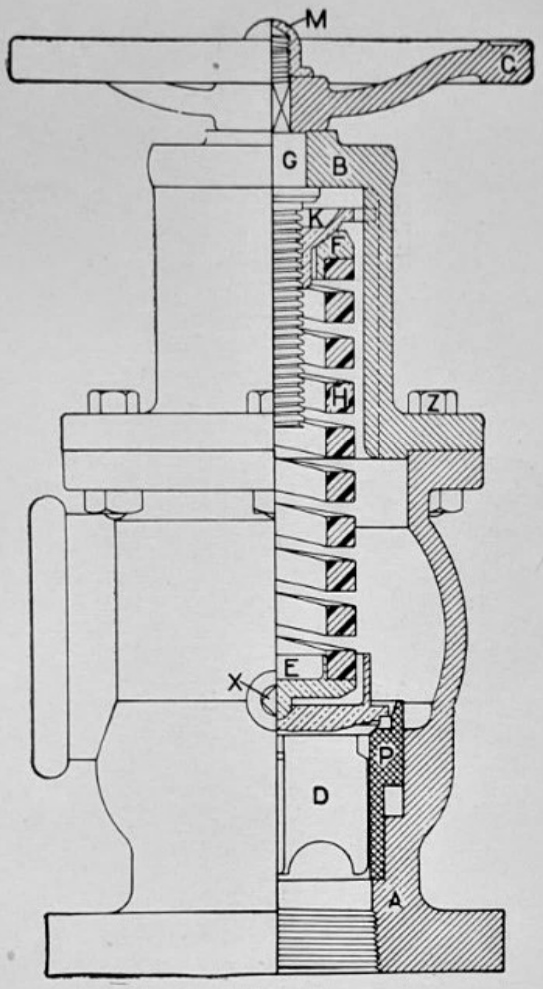
No. 22 Style Dimension Sheet



LIST OF DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	13 5/8	13 5/8	5 1/8	5 1/8	4	3 3/8	6	2	4	6 1/2
2 1/2	17 3/4	17 3/4	6 5/16	6 5/16	4 13/16	4 1/8	7	2 1/2	4 3/8	7 1/2
3	19	19	6 3/4	6 3/4	5 1/4	4 1/2	7 1/2	3	5 1/8	8 1/4
3 1/2	20 5/8	20 5/8	7 11/16	7 11/16	6 1/16	5 1/4	8 1/2	3 1/2	5 1/4	9
4	20 3/16	20 3/16	7 3/8	7 3/8	6 1/4	5 5/16	9	4	6 1/4	10
4 1/2	19 1/8	19 1/8	7 5/8	7 5/8	6 9/16	5 5/8	9 1/4	4 1/2	6 3/4	10 1/2
5	20 5/16	20 5/16	8 1/4	8 1/4	6 15/16	6	10	5	7 1/4	11
5 1/2	22 5/8	22 5/8	8 7/16	8 7/16	7 1/2	6 1/2	11	*5 1/2	8 1/8	12 1/2
6	24 1/4	24 1/4	9	9	7 3/4	6 3/4	11	6	9	12 1/2

Ashton Standard Water Relief Valve



No. 22 Style

Price List of Parts

Name of Part	Letter	Style Valve No.	SIZE OF VALVE								
			2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Shell	A	22	$11.50	$12.50	$14.00	$16.00	$19.00	$23.00	$29.00	$37.00	$47.00
Head	B	22	3.75	4.50	5.50	7.25	7.25	8.75	8.75	11.25	11.25
Hand Wheel .	C	22	.75	.85	1.25	1.75	1.75	2.00	2.00	2.50	2.50
Wing Valve .	D	22	4.00	5.00	6.00	8.00	10.00	12.00	15.00	18.00	23.00
Bottom Disc .	E	22	1.50	1.50	2.00	2.00	2.00	4.00	4.00	4.25	4.25
Top Disc . . .	F	22	1.25	1.25	1.75	1.75	1.75	3.75	3.75	4.00	4.00
Pressure Screw	G	22	3.00	4.00	4.50	6.00	6.00	8.00	8.00	9.75	9.75
Spring	H	22	4.00	5.00	6.00	8.00	10.00	12.00	17.00	22.00	27.00
Pressure Screw Nut	K	22	2.75	3.00	3.50	3.50	3.50	5.00	5.50	6.00	6.50
Wheel Nut . .	M	22	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50	1.50
Seat Bushing (Composition)	P	22	6.00	7.00	9.00	11.00	13.00	15.00	18.00	22.00	26.00
Seat Drip . .	X	22	.10	.10	.10	.10	.10	.10	.10	.10	.10
Body Bolts and Nuts	Z	22	.10	.10	.10	.10	.15	.15	.15	.15	.15

In ordering new parts it is necessary to specify size of valve and style number, name of part and letter, and if new springs are ordered, the *working pressure*. It is also advisable to give the serial number

Ashton Snifting Relief Valve

No. 18

The Ashton Snifting Valve is used on cylinders, condensers, or on any apparatus which needs a quick-working relief valve. It is made of composition metal, with pipe outlet, and is similar in construction to our No. 10 valve shown on page 52.

This valve has base outlet construction which permits taking valve apart for cleaning or regrinding without breaking connections.

It is often made with side-pipe connection on the bottom part for indicator attachment, as shown in cut, but this is not furnished unless specified on the order.

The above cut shows screwed connections, but valve is also furnished with flange inlet and screwed outlet or with both inlet and outlet flange.

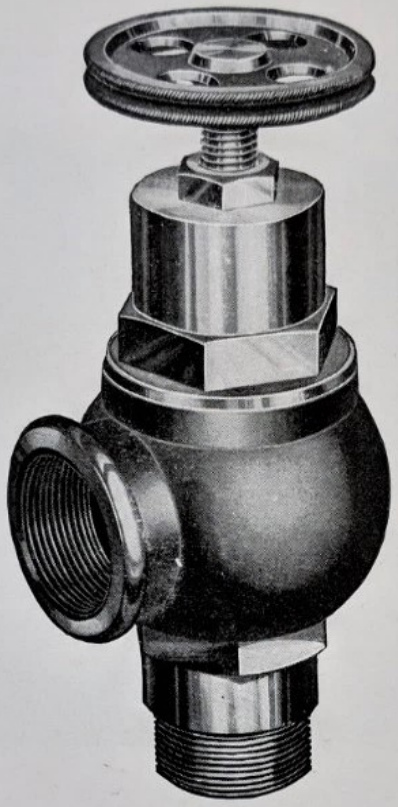
Always give highest working pressure when ordering.

LIST PRICES

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
Price	$11.00	$13.00	$15.00	$18.00	$22.00	$28 00	$36.00	$52.00
Weight, pounds . .	1	3	4	5½	7½	11½	18	38

Ashton Water Relief Valve

Small Composition Pattern



No. 24

This valve is automatic in relief and is adapted to similar service as our No. 22 valve, but it is made on a smaller scale. It is of high grade composition metal, finely finished and with spring of special steel.

The base outlet construction permits cleaning and regrinding without breaking connections, for both inlet and outlet are in same casting.

It is equipped with hand wheel for easy adjustment and has lock nut to prevent change in relief pressure through vibration.

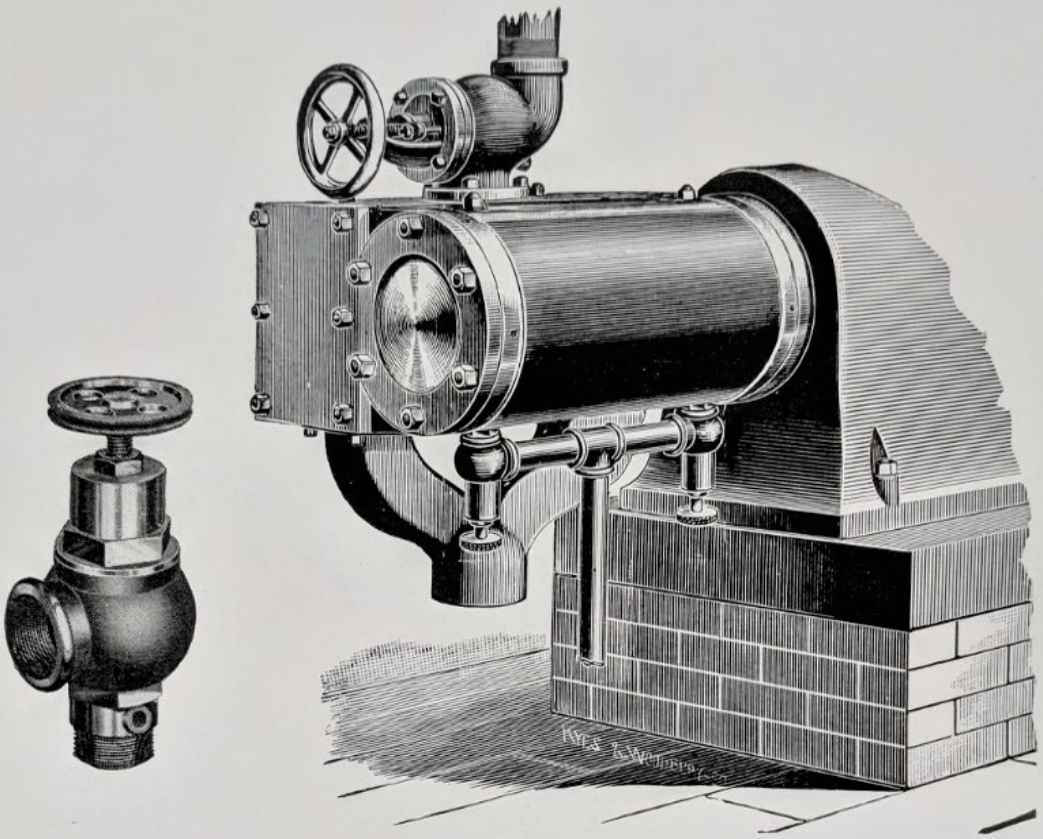
Directions

To increase relief pressure, turn wheel *down;* for less pressure turn wheel in opposite direction.

LIST PRICES

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
Price	$11.00	$13.00	$15.00	$18.00	$22.00	$28.00	$36.00	$52.00
Weight, pounds . .	1⅛	2¾	3¾	5¼	7½	11	23	37

Ashton Cylinder Relief Valve



No. 10

An Ashton Cylinder Relief Valve applied to each end of an engine cylinder insures perfect protection against blownout cylinder heads and other damage resulting from an accumulation of water in the cylinder.

The Ashton Cylinder Relief Valve is provided with wheel top so that the set pressure can be readily changed, and with a lock nut to prevent alteration of set pressure through vibration. When requested, this valve is made with side connection on bottom for indicator attachment.

In ordering, state highest pressure. It is customary to set these valves at 10 or 15 pounds above highest working pressure to prevent unnecessary operation from simply engine cylinder compression.

LIST PRICES

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Price	$11.00	$13.00	$15.00	$18.00	$22.00	$28.00	$36.00
Weight, pounds . .	1⅛	2¾	3¾	5¼	7½	11	23

The Ashton Exposed Spring Relief Valves

No. 7 B.

The above illustration shows a revised form of the No. 7 Valve having the spring exposed to view instead of wholly encased. This construction makes it possible to examine the condition of the spring at any time without taking the valve apart.

The No. 6 B. Valve, listed below, is a similar revised form of the No. 6 Valve, and differs only from the No. 7 A. style by having plain top with exposed pressure screw and not the protecting cap.

These valves are extensively used in U. S. Navy and Merchant Marine service as safety or relief valves on fuel oil heaters, evaporators, condensers, cylinders, and other steam or water line applications.

Price List No. 6 B.

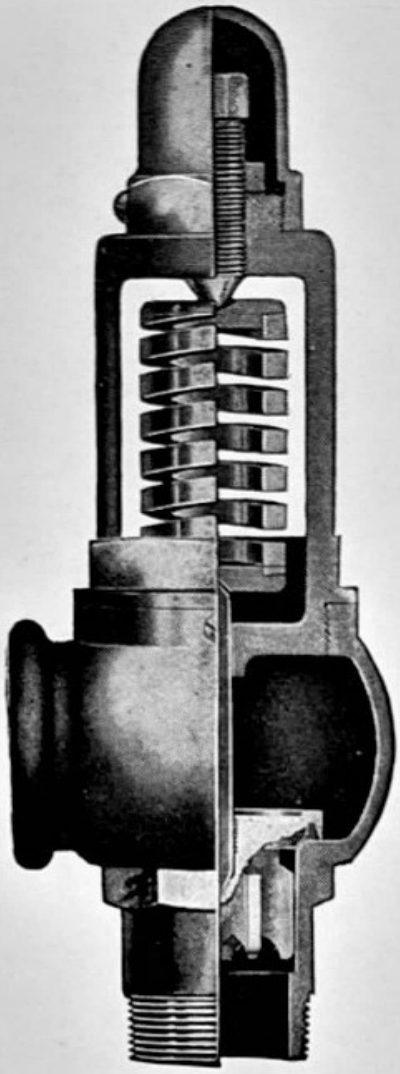
Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Screwed Inlet	$12.00	$14.00	$17.00	$20.00	$24.00	$32.00	$45.00
Weight, pounds	1¼	2	3½	4¾	7¼	9¼	12½
Flanged Inlet	18.50	20.50	23.50	28.50	32.50	40.50	55.50
Weight, pounds	5	6	8	10	12	15	20

Price List No. 7 B.

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Screwed Inlet	$13.50	$15.50	$19.00	$22.00	$26.00	$34.00	$50.00
Weight, pounds	1½	2¼	33¾	5¼	7¾	10¼	14
Flanged Inlet	20	22.00	25.50	30.50	34.50	42.50	60.50
Weight, pounds	5¼	6¼	8¼	10½	12½	16	21½

For valves of the Outside Spring Style see pages 54, 55.

The Ashton Outside Spring Relief Valve



No. 18R

The outside spring design of relief valve, above shown, meets the requirements of a valve which has the spring fully exposed to view, and which can be readily removed without taking the valve body apart. The spring also does not come in contact with the steam or water discharge.

It is made with composition body and wing valve with the spring of special hand forged steel, and is suitable for pressures up to 250 pounds per square inch.

The No. 18B Valve is extensively used in U. S. Navy and Merchant Marine service where a particularly reliable safety or relief valve application is desirable.

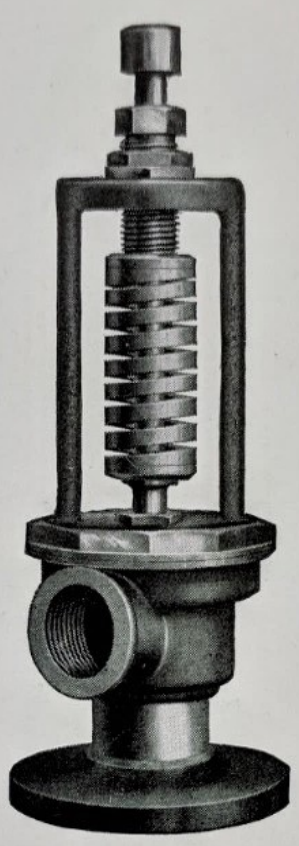
When ordering, it should be specified whether screwed or flanged connections are desired, and the pressure at which the valves are to operate in order that they may be fitted with proper size springs and adjusted for the correct working pressure.

PRICE LIST

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Screwed Inlet and Outlet . .	$17.50	$20.00	$22.50	$25.00	$30.00	$37.50	$57.50
Weights, pounds	3	4	5	7	8	11	12
Flanged Inlet							

The Ashton Outside Spring Safety and Relief Valve

U. S. Navy Style



No. 19R

The above style of outside spring safety and relief valve is designed to meet special requirements of the U. S. Navy Department. The body is of special Navy bronze, the seat of nickel, and the spring of special hand forged steel nickel plated.

This valve is constructed with a lifting spindle directly connected at the bottom to the wing valve, and extending through the bonnet, spring and pressure screw, where at the top a suitable lifting nut is fitted. Space is provided between this nut and the top of the pressure screw for the insertion of a lever to enable the valve to be lifted off its seat when so desired. The joint between the spindle and the bonnet is made tight by a gland packing nut.

When specially ordered these Valves are made with steel bodies to comply with any required specification.

PRICES ON APPLICATION

Ashton Standard Ammonia Relief Valve

No. 23

This valve is suitable for pressures up to 500 pounds per square inch and will remain tight in continued service. It gives prompt and free relief. Its cast semi-steel head and body is of substantial construction and so designed that it can be taken apart for cleaning or regrinding without breaking inlet or outlet connection.

The No. 23 Valve is made with lock-up to prevent tampering with set pressure adjustment, and has full size inlet and outlet connections. To change pressure adjustment when desired unlock and remove top cap, thus exposing pressure screw, which should be turned downward for increased pressure, or upward for less pressure. After each readjustment the lock nut on pressure screw should be set up tight.

When required, valves are furnished with flange connections.

LIST PRICES

Size	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
Price	$12.00	$14.00	$22.00	$25.00	$30.00	$40.00	$60.00	$75.00

Ashton Ammonia Relief Valve

Approved Massachusetts Style

No. 23M.

The Ashton No. 23M. style Ammonia Relief Valve has been approved by the Board of Boiler Rules of the State of Massachusetts and fully complies with the requirements of Chapter 467, Acts of 1914.

All working parts are of special noncorrosive metal excepting the spring, which is of special hand forged steel nickel plated. The body is of semi-steel, with both inlet and outlet connections threaded standard pipe size unless otherwise specified. The inlet is same diameter as valve size but outlet is always larger, as required by the Rules. The top cap protecting pressure screw is sealed.

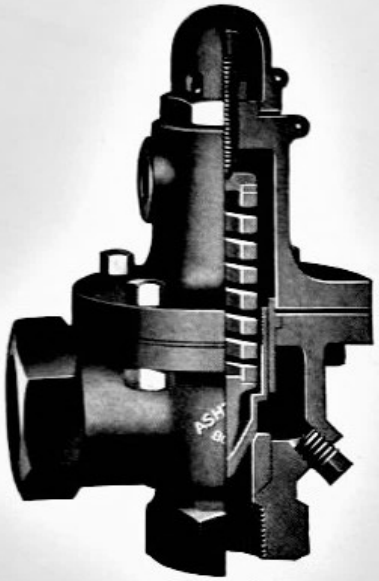
LIST PRICES

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Price	$25.00	$30.00	$37.00	$45.00	$55.00	$65.00

For capacity table see page 58.
For Ammonia Diffusers see page 59.

Ashton Ammonia Relief Valve

Approved Massachusetts Style



No. 23M.

Requirements of Massachusetts Board of Boiler Rules

The minimum size of Relief Valves required on Ammonia Compressors, in accordance with paragraph 21 of the Specifications of the Massachusetts Board of Boiler Rules, based upon cubic feet displacement per minute, is as follows:

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Displacement in cubic feet	120	280	510	830	1,200	2,120

All relief valves are tested and set to open at 250 pounds pressure with full lift of at least one sixth their diameter at maximum pressure of 275 pounds pressure.

Valves are stamped "Massachusetts Standard Ammonia, 250–275 pounds," together with maker's name, and sealed before shipment.

Ashton Ammonia Diffuser

Approved Massachusetts Style

No. 23D.

The Ashton No. 23D. Ammonia Diffuser has been approved by the Massachusetts Board of Boiler Rules for use in connection with the No. 23M. Approved Ammonia Relief Valve. By its use the discharge of ammonia gas from the relief valve will be effectively diluted with the air before being freed into the atmosphere.

This diffuser is made with standard pipe thread size nozzle of the same diameter as relief valve outlet. The air inlets have a combined area approximately double the area of the ammonia nozzle, and the top discharge outlet has an area equal to that of the air inlets and the ammonia nozzle.

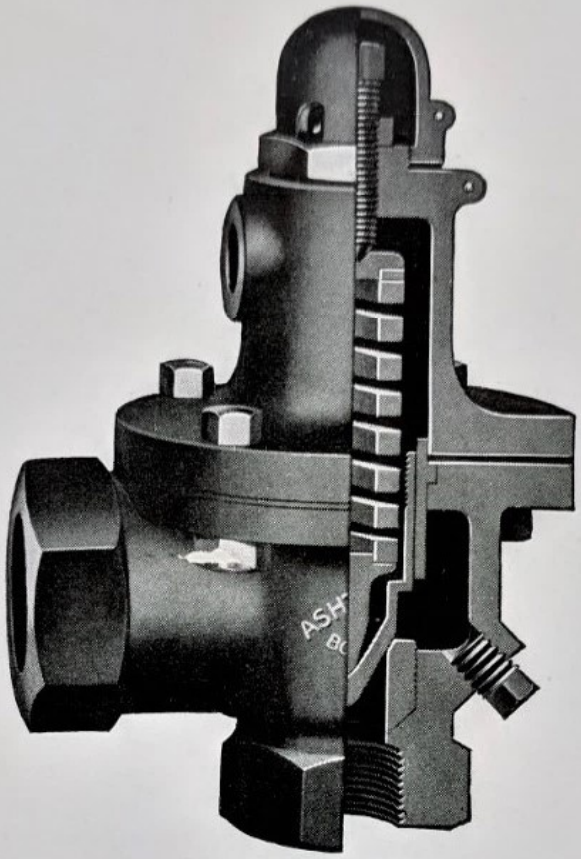
The design of the diffuser is such that it will not readily corrode or otherwise become inoperative, nor will it offer any obstruction to the free flow of the ammonia gas. It should always be applied in a vertical position at the end of the relief valve discharge pipe.

LIST PRICES

Size Diffuser	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
For Size Valve			½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Price	$5.00	$5.00	$9.00	$15.00	$20.00	$25.00	$35.00	45.00

Ashton Ammonia Relief Valve

Approved Massachusetts Style



No. 23M.

Requirements of Massachusetts Board of Boiler Rules

The minimum size of Relief Valves required on Ammonia Compressors, in accordance with paragraph 21 of the Specifications of the Massachusetts Board of Boiler Rules, based upon cubic feet displacement per minute, is as follows:

Size Valve	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Displacement in cubic feet	120	280	510	830	1,200	2,120

All relief valves are tested and set to open at 250 pounds pressure with full lift of at least one sixth their diameter at maximum pressure of 275 pounds pressure.

Valves are stamped "Massachusetts Standard Ammonia, 250–275 pounds," together with maker's name, and sealed before shipment.

Ashton Ammonia Diffuser

Approved Massachusetts Style

No. 23D.

The Ashton No. 23D. Ammonia Diffuser has been approved by the Massachusetts Board of Boiler Rules for use in connection with the No. 23M. Approved Ammonia Relief Valve. By its use the discharge of ammonia gas from the relief valve will be effectively diluted with the air before being freed into the atmosphere.

This diffuser is made with standard pipe thread size nozzle of the same diameter as relief valve outlet. The air inlets have a combined area approximately double the area of the ammonia nozzle, and the top discharge outlet has an area equal to that of the air inlets and the ammonia nozzle.

The design of the diffuser is such that it will not readily corrode or otherwise become inoperative, nor will it offer any obstruction to the free flow of the ammonia gas. It should always be applied in a vertical position at the end of the relief valve discharge pipe.

LIST PRICES

Size Diffuser	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
For Size Valve			½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Price	$5.00	$5.00	$8.00	$15.00	$20.00	$25.00	$35.00	45.00

Ashton Hydraulic Relief Valve

No. 25

Ashton Hydraulic Relief Valves are made for use on hydraulic presses, pumps, or wherever an automatic high-pressure relief is required. They are of substantial construction with composition body, having great tensile strength. The working parts are of high-grade composition metal which does not corrode and the spring is of special hand forged steel.

These valves are so designed that they may be taken apart for cleaning or regrinding without breaking inlet or outlet connection.

When ordering, the highest working pressure should be stated; also whether flanged or screwed connections are desired.

LIST PRICES
For Pressures 2,000 pounds and less

Size Valve	⅛ in.	¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Screwed Connections	$13.00	$14.00	$15.00	$16.00	$19.00	$22.00	$27.00	$32.00	$45.00	$67.00
Flanged Connections	21.00	22.50	24.00	26.00	30.00	34.00	40.00	46.00	61.00	87.00

HEAVY PATTERN
For Pressures above 2,000 pounds

Size Valve	⅛ in.	¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.
Screwed Connection	$20.00	$25.00	$30.00	$35.00	$40.00	$50.00	$65.00	$85.00	$110.00	$145.00
Flanged Connection	29.00	34.00	40.00	47.00	55.00	65.00	80.00	100.00	125.00	165.00

Ashton Hydraulic Relief Valve

For 2,000 Pounds Pressure

No. 25 B.

The Ashton Hydraulic Relief Valve is designed for pressures up to and including 2,000 pounds per square inch. It is made with extra heavy body and head of semi-steel, with interior working parts of composition metal, and long spring of special hand forged steel, and with flanged inlet and outlet connections.

The construction is such that it may be taken apart and cleaned or repaired without disturbing the inlet or outlet piping.

LIST PRICES

Size Valve	2½ in.	3 in.	3½ in.	4 in.	4½ in.
Diameter Inlet Flange, inches . . .	8¾	10	10¾	11½	12½

For pressures exceeding 2,000 pounds we are prepared to furnish similar valves with cast steel bodies, and will quote prices on application.

Ashton Safety and Relief Valve Springs

The springs used in Ashton Valves are of a superior quality and workmanship and are essentially different from those of ordinary commercial manufacture. They are made of special high grade steel and hand forged in our own factory.

Each spring is drawn to a uniform temper, accurately squared up on both ends, and when completed is subjected to a compression test double that for which it is ever intended to be used in service. They are guaranteed against defects and to give entirely satisfactory service.

VALVE SPRING LIST PRICES

Size of Valve	⅛ in.	¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.
Nos. 6, 7, 8, 9, 10, 14, 14 B, 15, 15 F, 18, 24 and 34 Style Valves	.....	.....	.....	$ .80	$0.90	$1.00	$1.25	$1.50
No. 6 B, 7 B Style Valves	.....	.....	.....	.90	1.00	1.25	1.50	2.00
No. 17 B Style Valve	.....	.....	.....	.....	1.00	1.25	1.50	1.75
No. 18 B Style Valve	.....	.....	.....	1.25	1.50	2.00	2.50	3.00
No. 23 Style Valve	.....	.....	.....	.50	.75	1.00	1.25	1.75
No. 23 M Style Valve	.....	.....	.....	.75	1.00	1.50	2.50	3.50
No. 31, 32 Style Valves	$ .50	$ .60	$ .70	.80	.90	.....	.....	.....

Size of Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Nos. 6, 7, 8, 9, 10, 14, 14 B, 15, 15 F, 18, 24 and 34 Style Valves	$2.00	$3.00	$5.00	.....	.....	.....	.....	.....	.....
No. 6 B, 7 B Style Valves	2.50	3.50	.....	.....	.....	.....	.....	.....	.....
No. 17 B Style Valve	2.50	.....	.....	.....	.....	.....	.....	.....	.....
No. 18 B Style Valve	4.00	5.00	.....	.....	.....	.....	.....	.....	.....
No. 23 Style Valve	2.75	3.75	4.75	.....	.....	.....	.....	.....	.....
No. 23 M Style Valve	4.50	.....	.....	.....	.....	.....	.....	.....	.....
No. 31, 32 Style Valve	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. 16 Style Valve	3.00	4.00	5.00	$6.00	$9.00	$14.00	$20.00	$25.00	$30.00
No. 16 A, 16 B Style Valves	4.00	6.00	8.00	11.00	16.00	22.00	28.00	34.00	40.00
No. 17, 20 Style Valve	2.00	3.00	4.00	6.00	8.00	11.00	14.00	20.00	28.00
No. 20 A Style Valve	3.00	4.00	5.00	7.00	9.00	12.00	16.00	22.00	30.00
No. 21 Style Valve	.....	.....	4.00	12.00	16.00	.....	24.00	.....	.....
No. 22 Style Valve	4.00	5.00	6.00	8.00	10.00	12.00	17.00	22.00	27.00

Special Springs of similar styles of any desired dimensions can be furnished and will be quoted on upon receipt of specifications.

Ashton Locomotive Safety Valves

With an enviable record covering nearly fifty years Ashton Safety Valves are well known to the railroads of America. The most important features of design and construction are described on the following pages. These features have proved most successful in both locomotive and stationary service, and they may therefore in no wise be considered experimental.

Their springs of special hand forged steel are made in our own shops and we guarantee them for at least five years when used on the pressures for which they are designed.

The wing valves, springs, spring discs, pressure screws, and lock nuts of all latest styles interchange between our open and muffled types, thereby reducing the number of spare parts carried in the store department.

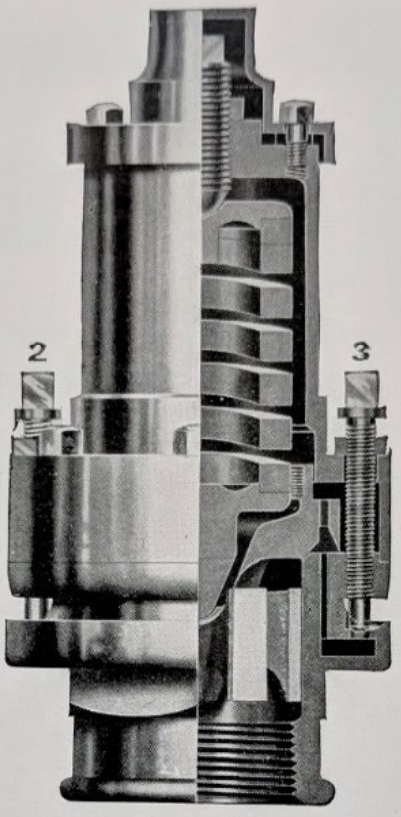
One of the essential features in safety valve construction is the means provided for pop regulation. The pop for Ashton Valves is regulated from the outside, easily accessible to the men making the adjustment. The regulation requires no special wrenches, no rings or sleeves which usually become so corroded that they cannot be operated.

We will furnish upon request one or more of any of our various styles of locomotive valves, for trial and subject to approval only if satisfactory after actual service. We guarantee them to fully relieve the boiler, require less attention, operate closer, that is with less reduction of pressure, to be of heavier construction, and stay out of the shop longer than any other make of safety valve on the American market.

We also furnish those interested in our product a form showing the number and size of valves we recommend for locomotive boilers of various sizes and pressures.

Our M.M. Safety Valves are constructed in accordance with the recommended practice of the Committee on Safety Valves of the American Railway Master Mechanics' Association, 1912. They include these features: hexagon of standard specified wrench size; standard pipe thread connections the same size as valves; .10 valve

Ashton Locomotive Open Pop Safety Valve



No. 28

The most extensively used Open Pop Locomotive Valve. It is the only valve of its kind having these important features:

OUTSIDE ADJUSTMENT for regulating the pop. This feature saves time and expense because it is easily accessible. It requires no special wrenches, no rings or sleeves, which soon corrode and stick fast. To increase pop, simply slack the check nuts on the top pop regulators 2 and 3 and screw down. For less pop, turn regulators in opposite direction.

KNIFE-EDGE pop lip which wears evenly with the valve seat, giving unvarying pop.

ENCASED SPRING of special hand forged steel and Downward Discharge Outlet for protection against cinders.

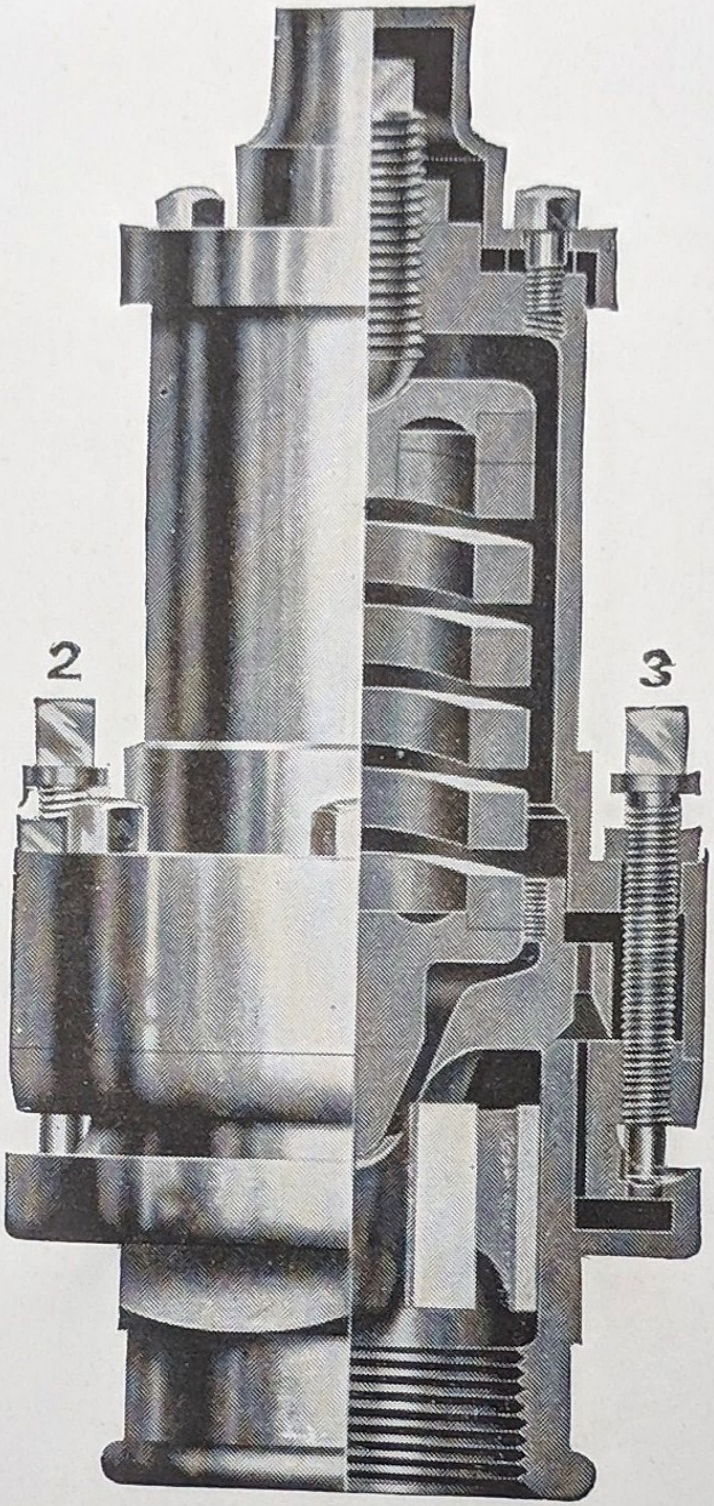
To change set pressure, remove top cap, exposing the pressure screw. Slack check nut and turn pressure screw down for increased pressure, or upward for less pressure; set up check nut. When the set pressure is to be changed more than 15 pounds above or below original set pressure, new springs of suitable size should be ordered.

Standard sizes 2½, 3, 3½ and 4 inches. When ordering always specify size, style, pressure, and connection desired.

For dimensions and parts see pages 71 to 75. General instructions on pages 76-77.

PRICES ON APPLICATION

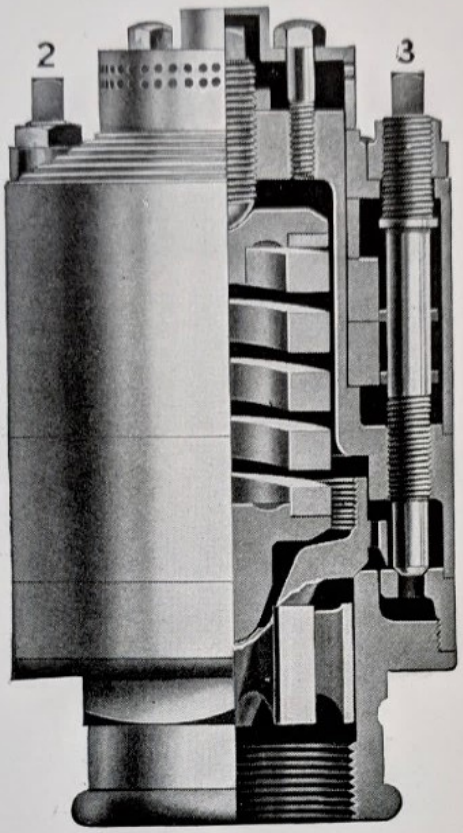
shton Locomotive Open Po Safety Valve



No. 28

Ashton Locomotive Muffled Pop Safety Valve

(Patented)



No. 30

The Ashton Muffled Pop Safety Valve has been used so extensively during the last thirty years that this form may be considered standard. It is a quiet, perfect muffler, and has all the pop safety valve features which distinguish Ashton valves. It operates with moderate lift and above all has an outside adjustment for regulating the pop, a typical and exclusive Ashton feature. All that is necessary is to turn either or both of the two regulating posts 2 and 3, and this may be done while steam is on the boiler. Much time is saved and the regulation is so easy that there is no tendency to neglect the valve. Largely because of its moderate lift, it shows lowest cost of maintenance. This valve is made with standard pipe threads one half size smaller than the size of the valve, but will be made, at no extra charge, with special threads to fit any size dome connections, thus enabling a railroad to keep its standard.

DIRECTIONS

To Change "Pop," slack the check nut on either or both of the regulators (Nos. 2 and 3) and screw down for increased pop or up for less pop.

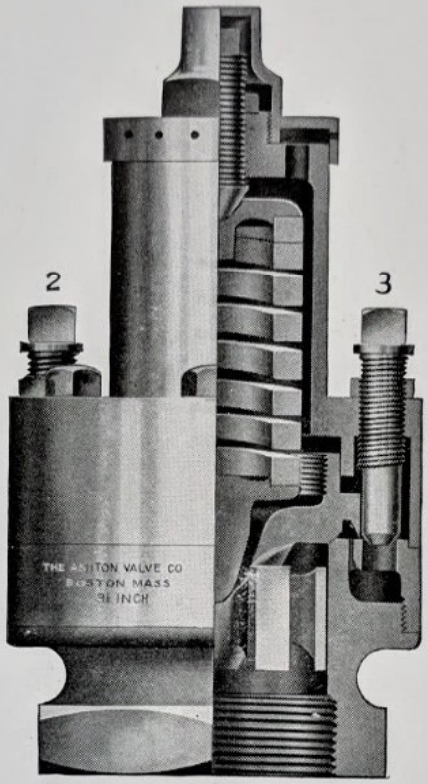
To Change Set Pressure, remove top cap, exposing the pressure screw, then slack check nut and turn pressure screw down for increased pressure or upward for less pressure; then set up on check nut. If the set pressure is to be changed more than 15 pounds above or below original set pressure, new springs of suitable size should be ordered.

When ordering always specify size, style, set pressure, and connection desired.

For dimensions and parts see pages 71 to 75.

PRICES ON APPLICATION

Ashton Master Mechanics' Open Pop Locomotive Safety Valve



No. 28 M.M.

This valve follows our No. 28 Locomotive Valve both in design and construction. It is made in accordance with the practice recommended by the Committee on Safety Valves of the American Railway Master Mechanics' Association, 1912. It has hexagon base of standard wrench size, standard pipe thread connections same size as valve, .10 inch valve lift, and 45 degree seats.

The wing valves, springs, spring discs, pressure screws, and lock nuts interchange in the several sizes with the Muffled Pop Valve No. 30M.M., thus reducing the number of spare parts carried in store department.

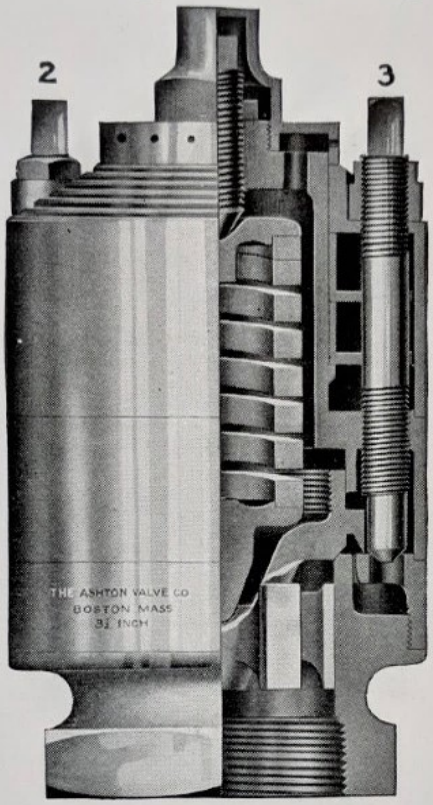
We guarantee our special hand forged steel springs for five years when used on pressures for which they are made and we guarantee these safety valves to stay out of the shop longer than any other make of safety valve.

For directions for adjusting set pressure and pop see page 64. For dimensions and parts see pages 71 to 75. General Instructions on pages 76-77.

Standard sizes 2½, 3, 3½, and 4 inch. When ordering always specify size, style, and pressure.

PRICES ON APPLICATION

Ashton Master Mechanics' Muffled Pop Safety Valve



No. 30 M.M.

This form of Ashton Pop Safety Valve conforms to the requirements of the Committee on Safety Valves of the American Railway Master Mechanics' Association, 1912. It has hexagon base of standard wrench size, standard pipe thread connections same size as valve, .10 valve lift, and 45 degree seats.

It follows in general design and construction the No. 30 Muffled Valve and all working parts have the typical Ashton features, including outside pop regulator and knife-edge lip wing valve.

It is a well-known fact that the durability and efficiency of a safety valve depends largely upon the spring. We positively guarantee our special hand forged steel springs for five years when used on the pressures for which they are designed.

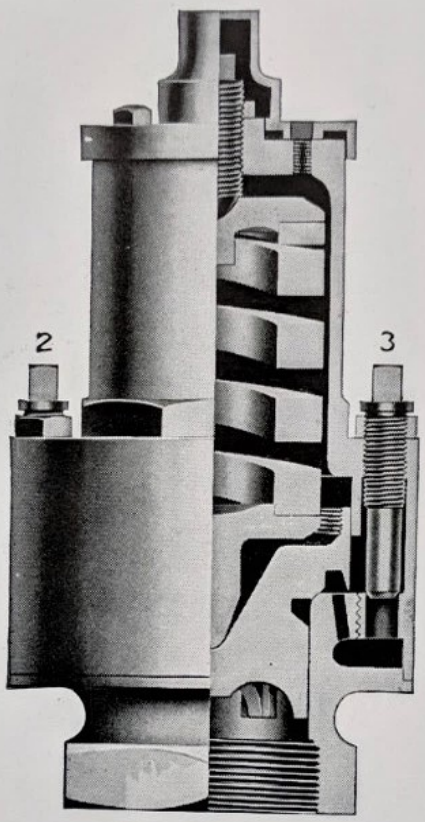
The working parts are interchangeable with those of No. 28 M.M. Valve, thus reducing the number of spare parts to be carried in the store department.

On application we will furnish a schedule showing the number and size of this valve that we recommend for locomotive boilers of various sizes and pressures. We will also furnish a set of valves for trial and guarantee them to fully relieve the boiler, require less attention, and show greater durability than any other similar valve on the market. When ordering always specify size, style, and pressure.

For directions for altering set pressure and regulating pop, see page 65. For dimensions and parts see pages 71 to 75. General Instructions pages 76-77.

PRICES ON APPLICATION

Ashton Locomotive Increased Lift Open Pop Safety Valve



No. 28 I.L.

The increase in locomotive boiler capacity calls for larger safety valves of moderate lift, or more valves, but some railroads have not favored this practice. To meet such conditions we brought out the Ashton Increased Lift Open Pop Safety Valve which is a development of our No. 28 Open Pop Valve.

Our Increased Lift Valve has been thoroughly tested — it is equal in capacity to any on the market, is heavier, and will operate longer without adjustment or repairs.

The wing valves, springs, etc., interchange with the Increased Lift Muffled Valve No. 30 I.L. and the inlet connections are the same.

This valve is furnished with standard pipe thread connection same size as valve unless otherwise specified.

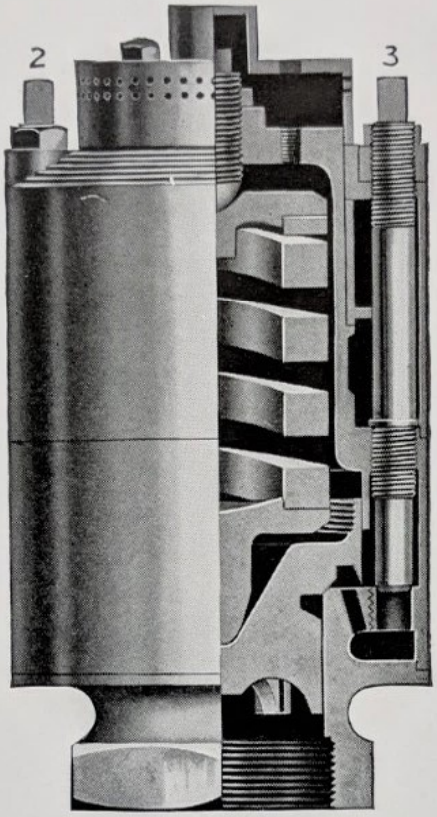
On application we will furnish a schedule showing the number and size of Increased Lift Valves which we recommend for locomotive boilers of various sizes and pressure. Trial sets of valves will be furnished on application.

When ordering always give size, style, pressure, and connection desired.

For directions see page 69. General Instructions, pages 76-77.
For dimensions and parts see pages 71 to 75.

PRICES ON APPLICATION

Ashton Locomotive Increased Lift Muffled Pop Safety Valve



No. 30 I. L.

We designed this type of muffled safety valve to relieve large locomotive boilers without the necessity of increasing the size or number of regular safety valves.

With due consideration of all conditions imposed by this increase in capacity we produced this valve by modifying the design of the No. 30 Valve. Our Increased Lift Valve has been thoroughly tested. In every way it is equal to any on the market; it is of heavier construction, and will give long service without adjustments or repairs.

The wing valve, spring, etc., interchange with our Increased Lift Open Pop Safety Valve, No. 28 I. L.

This No. 30 I. L. Valve is furnished with standard pipe thread connection same size as valve, but will be made without extra charge with special threads to fit any size dome connection.

When ordering give size, style, pressure, and connection desired.

DIRECTIONS

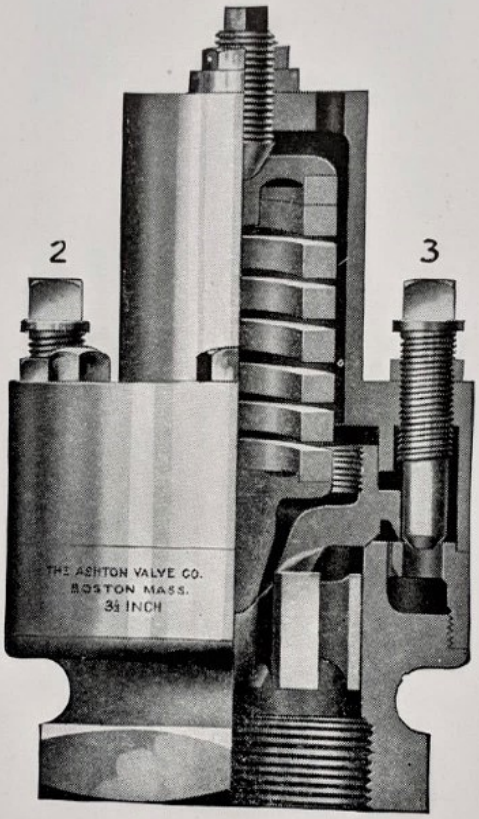
To Change "Pop," slack the check nut on either or both the regulating posts 2 and 3 and screw down for increased pop or up for less pop.

To Change Set Pressure, remove top cap, exposing the pressure screw, then slack check nut and turn pressure screw down for increased pressure or upward for less pressure; then set up on check nut. If the set pressure is to be changed more than 15 pounds above or below original set pressure, new springs should be ordered.

For dimensions and parts see parts 71 to 75. General Instructions, pages 76-77.

PRICES ON APPLICATION

United States Government Standard Style Locomotive Safety Valves



No. 28 U.S.

The valve, as above shown, has been formally approved and adopted as an accepted standard by the United States Railroad Administration for new locomotive equipment. It embodies the essential features of merit found in the various other styles of Ashton Locomotive Open Pop Safety Valves, and differs from them only in dimensions and minor details of construction.

This valve is made with interchangeable parts in standard sizes 3 inch and 3½ inch. The inlet connections have full size standard pipe thread. The body as well as all working parts are of high grade composition metal and the spring of special hand forged steel.

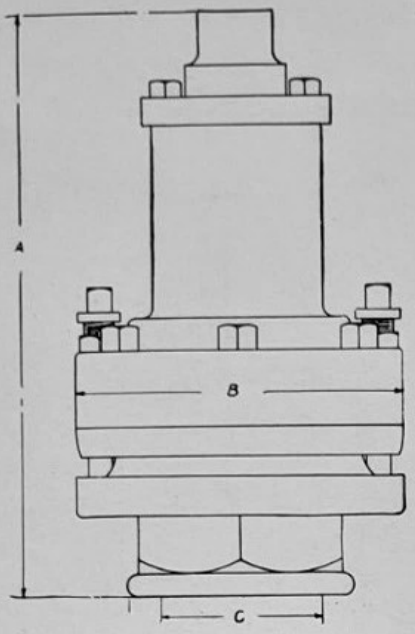
When ordering always give size, style, and pressure desired.

For dimensions and parts see pages 71 to 75. For directions see page 64. General Instructions, pages 76-77.

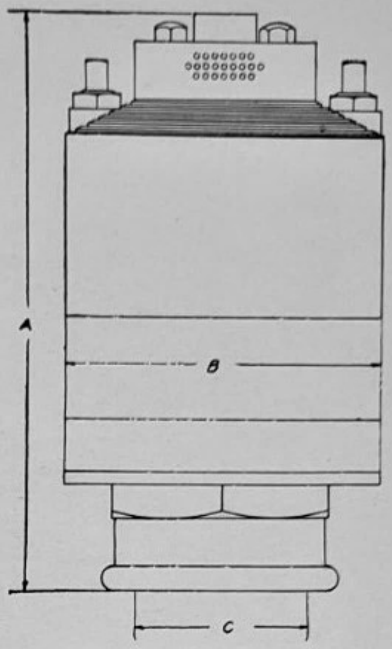
PRICES ON APPLICATION

Ashton Locomotive Safety Valves

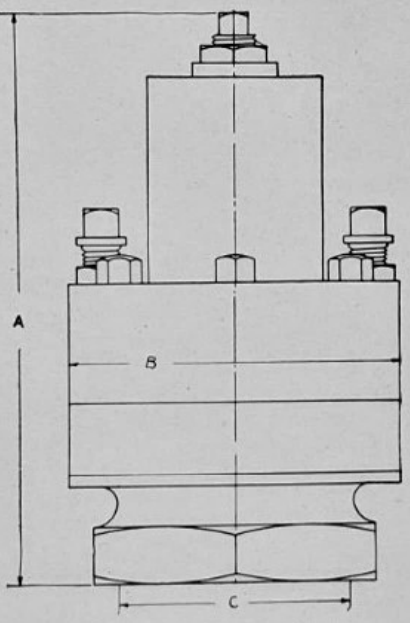
Dimension Sheets



No. 28, No. 28 M.M., No. 28 I.L. Styles



No. 30, No. 30 M.M., No. 30 I.L. Styles



No. 28 U.S. Style

ALL DIMENSIONS IN INCHES

Style	Size	A	B	C
No. 28	2½	10⅝	5	2 in. pipe
	3	11½	5½	2½ " "
	3½	11½	6¾	3 " "
	4	13⅜	7⅝	3½ " "
No. 28 M.M.	2½	10⅞	5½	2½ in. pipe
	3	12	6	3 " "
	3½	12¼	6⅜	3½ " "
	4	13	7⅝	4 " "
No. 28 I.L.	2½	12	6	2½ in. pipe
	3	12⅞	6½	3 " "
	3½	13⅝	7⅛	3½ " "
	4	14	8⅝	4 " "

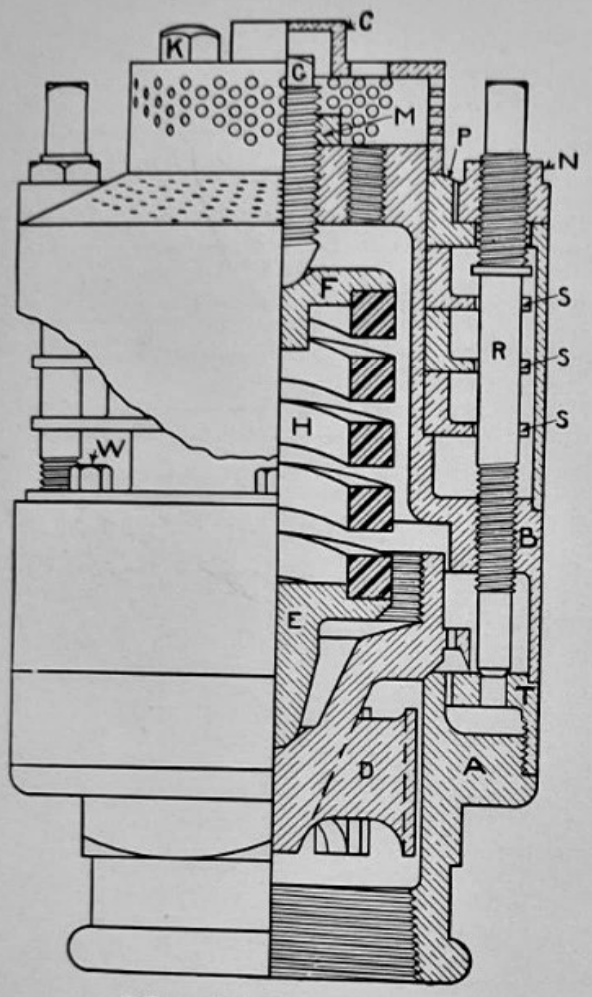
Style	Size	A	B	C
No. 28 U.S.	3	11 1/16	6	3 in. pipe
	3½	11	6⅜	3½ " "

NOTE: Inlet connections of Locomotive Safety Valves are regularly made with standard pipe threads, as given in this dimension sheet; but when so specified are made to fit any size dome connection.

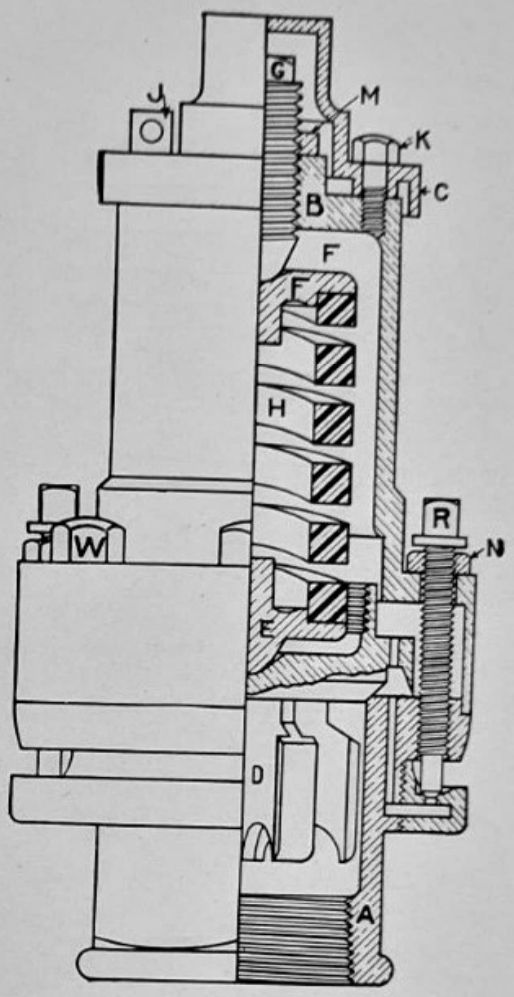
Style	Size	A	B	C
No. 30	2½	9¾	5½	2 in. pipe
	3	11½	6	2½ " "
	3½	11½	6½	3 " "
	4	12½	7⅝	3½ " "
No. 30 M.M.	2½	10⅞	5½	2½ in. pipe
	3	12	6	3 " "
	3½	12¼	6⅜	3½ " "
	4	13	7⅝	4 " "
No.30 I.L.	2½	11½	6	2½ in. pipe
	3	12½	6½	3 " "
	3½	13½	7⅛	3½ " "
	4	14	8⅝	4 " "

Ashton
Locomotive Pop Safety Valves

Reference List of Parts



No. 30 Muffler



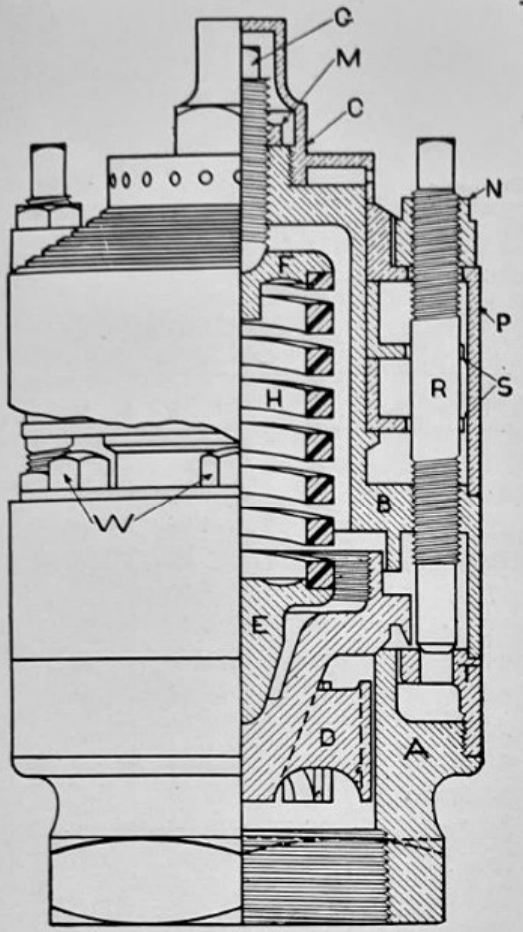
No. 28 Open Pop

In Ordering New Parts

It is necessary to specify size of valve and style number, name of part and letter. For bottoms (Part A) specify diameter and number of threads per inch, if connection is special. When new springs are ordered, state length and inside diameter, also working pressure. It is also advisable to give the serial number of valve, which will be found stamped on the "Head B" near bottom.

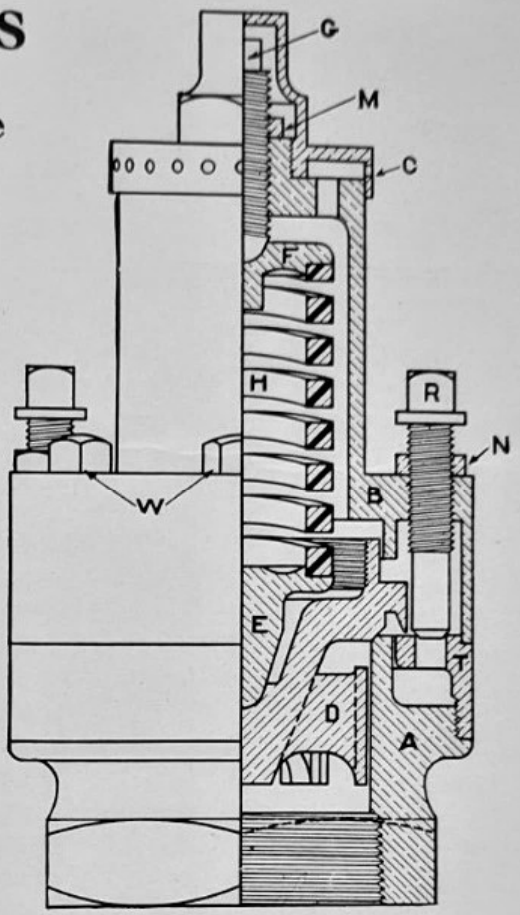
For list prices of parts see pages 74 and 75.
For General Instructions see pages 76-77.

Ashton Locomotive Pop Safety Valves

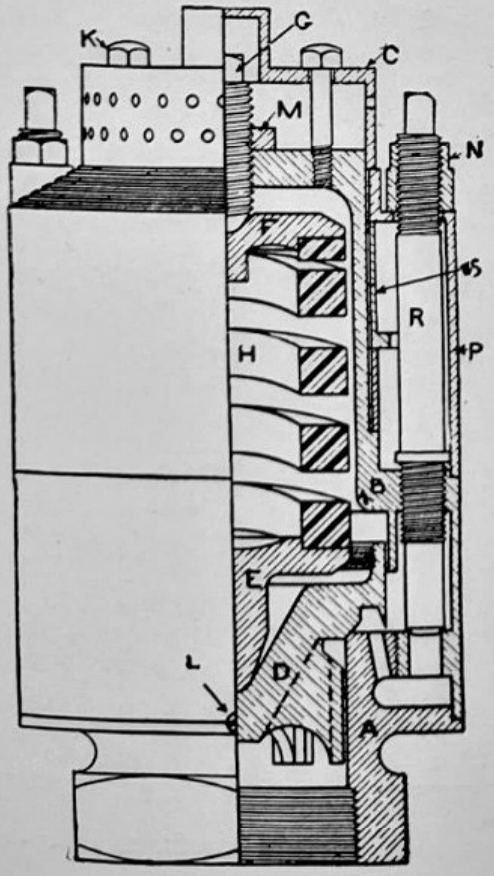


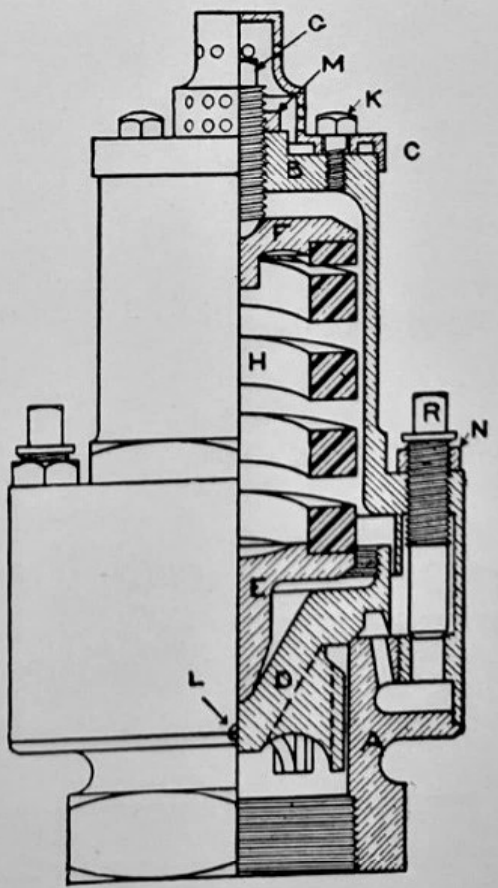
No. 30 M. M. Muffler

Reference List of Parts



No. 28 M. M. Open Pop





No. 28 L. L. Open Pop

Ashton Locomotive Safety Valves

Price List of Parts

Name of Parts	Letter	Style of Valve	SIZE OF VALVE			
			2½ in.	3 in.	3½ in.	4 in.
Bottom	A	28-30	$20.00	$27.00	$32.00	$46.00
		28IL-30IL	16.00	20.00	26.00	35.00
		28MM-30MM	22.00	28 00	37.00	45.00
		28B-30B	.....	19.00	25.00	.....
Head	B	28	16.00	19.00	25.00	32.00
		28IL	20.00	26.00	37.00	51.50
		28MM	16.00	19.00	20.00	31.00
		28B	.....	26.00	34.00	.....
		30	16.00	18.00	22.00	26.00
		30IL	23.00	27.00	37.00	51.50
		30MM	16.00	18.00	20.00	33.00
		30B	.....	20.00	26.00	.....
Cap	C	28-30	3.50	4.00	4.00	4.00
		28IL-30IL	3.50	4.00	4.50	4.50
		28MM-30MM	3.00	4.00	4.00	4.50
		28B-30B	.....	4.50	4.50	.....
Wing Valve	D	28-30	8.50	11.00	12.00	15.00
		28IL-30IL	8.50	10.00	13.00	16.00
		28MM-30MM	8.00	10.00	12.00	15.00
		28B-30B	.....	11.00	13.00	.....
Lower Disc	E	28-30	1.00	1.60	1.60	2.40
		28IL-30IL	1.60	2.00	2.60	2.80
		28MM-30MM	1.40	1.60	1.60	2.60
		28B-30B	.....	1.60	1.80	.....
Upper Disc	F	28-30	1.00	1.30	1.30	1.60
		28IL-30IL	1.20	1.50	2.00	2.50
		28MM-30MM	1.10	1.30	1.30	2.40
		28B-30B	.....	1.40	1.50	.....
Pressure Screw	G	28-30	.70	.80	.90	1.00
		28IL-30IL	.70	.80	.90	1.30
		28MM-30MM	.70	.80	.90	1.30
		28B-30B	.....	.80	90	.....
Spring	H	28-30	5.00	5.50	6.00	7.00
		28IL-30IL	5.50	6.00	7.00	8.50
		28MM-30MM	5.00	5.50	6.00	7.50
		28B-30B	.....	5.50	6.00	.....
Lock Staple	J	28	.50	.50	.50	.50
Cap Bolt	K	28-30	.10	.10	.10	.20
		28IL-30IL	.10	.10	.10	.10
		28B	.....	.10	.10	.....

For reference list of parts for 28 B and 30 B valves, and dimensions, refer to Instruction Book, Railroad Edition, No. 15.

Ashton Locomotive Pop Safety Valves

Price List of Parts

Name of Part	Letter	Style Valve No.	SIZE OF VALVE 2½ in.	3 in.	3½ in.	4 in.
Body Lock Screw	L	28IL-30IL	$ .10	$ .10	$ .10	$ .10
		28B-30B	.....	.10	.10	.....
Pressure Screw Check Nut	M	All Styles	.40	40	.40	.40
Regulator Check Nut	N	All Styles	.40	.40	.40	.40
Casing Lock Collar	O	30B	.....	1.80	1.80	.....
Dome Top	P	30	8.50	10.00	12.50	20.00
		30IL	9.00	10.00	13.00	20.00
		30MM	9.00	10.00	11.00	13.00
		30B	.....	9.50	14.50	.....
Pop Regulator	R	28	1.20	1.20	1.20	1.30
		28IL	1.00	1.00	1.10	1.10
		28MM	1.00	1.10	1.20	1.50
		28B-30B	.....	1.30	1.30	.....
		30	1.50	1.50	1.50	1.60
		30IL	1.30	1.30	1.40	1.40
		30MM	1.30	1.40	1.50	1.70
Muffler Plate	S	30	1.70	2.10	2.20	3.10
		30IL	1.80	2.30	2.50	3.40
		30MM	1.90	2.00	2.10	2.50
		30B	.....	2.10	2.20	.....
Base Ring	T	Furnished only as part of Bottom "A"				
Muffler Plate Space Ring	U	30	1.00	1.00	1.10	1.50
		30IL	1.20	1.40	1.80	2.10
		30MM	1.00	1.00	1.10	1.40
		30B	.....	1.00	1.10	.....
Head Bolt	W	28-30	.15	.15	.15	.30
		28MM-30MM	.20	.25	.25	.30

Subject to discount

3 inches and 3½ inches No. 28 U. S. Standard Style Open Pop Locomotive Safety Valve parts take same list as No. 28MM style

For Reference List of Parts see pages 72 and 73.

SPECIAL STYLES

2½ inch No. 26A parts take same list as 2½ inch No. 28 style
3 inch No. 26B parts take same list as 3 inch No. 28 style
3½ inch No. 26C parts take same list as 3½ inch No. 28 style
3½ inch No. 28A parts take same list as 3½ inch No. 28 style
3 inch No. 30C parts take same list as 3 inch No. 30 style
3½ inch No. 30D parts take same list as 3½ inch No. 30 style

For reference list of above special styles refer to Instruction Book, Railroad Edition,

General Instructions

Applying to Ashton Locomotive Muffled and Open Pop Safety Valves

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To change "pop," slack check nut on either one or both of the pop regulators, and screw down for increased "pop" or contrary for less "pop."

Never change set pressure of a safety valve until gage has been tested and found correct.

To change set pressure first remove top cap, thus exposing the pressure screw; then slack check nut and turn pressure screw down for increased or upward for less pressure; afterwards set up check nut. When it is desired to change set pressure more than fifteen pounds above or below original set pressure, new springs should be ordered to obtain the greatest efficiency.

Valves must be repaired in such a manner as to retain original lines. When necessary to turn seats or wing valves do this to template.

Valve seats, 45 degree, 3/32 inch wide; 4 inch, 1/8 inch wide.

Valve bottom should not be bored out. This practice increases the diameter of the valve, overloads the spring, and decreases the extended area of the lip on wing valve, which will prevent the valve popping as it should.

If valve wing is loose in body, wings should be peined out, then turned up true with 45 degree seat and allow 1/100 inch diameter for expansion.

If necessary to turn up seat on valve bottom take cut straight across face of valve seat and same amount off recess into which head fits. If this practice is not followed the repairing will eventually lower the wing valve below the top sleeve, which may prevent valve opening.

Before facing off seat on valve bottom care should be taken to see that bottom is trued up with diameter and length of bore, not with face of valve seat.

Do not turn off 1/16 inch if 1/64 inch will answer the purpose. Frequently the service of valves is shortened years by excess cuts.

Extended lip on wing valve must be within 1/100 inch of face of valve seat to obtain pop regulation and good results. Wing valve must rest solidly on the bevel seat *and slightly heavy on inside edge;* therefore the knife-edge lip must never touch, otherwise the valve will leak. It is customary to carefully fit the valve when new so that the lip will have a space below it that will permit of a thin sheet of paper being passed between it and the flat seat, or so that the

After valve is repaired assemble without spring and see that the wing valve can be moved freely from its seat ¼ inch or more, and that the wings do not extend below pipe thread, or strike the shoulder at end of thread where valve screws on to nipple.

Use graphite on bolts and pivot points of spring discs, also on dome nipple.

Pressure of springs stamped on outside of center coil. Limit of variation, 15 pounds over or under this pressure.

Springs showing a deflection of ⅜ inch or more from original length, or out of line ⅛ inch when measured parallel with the length, should be discarded.

Thoroughly clean out the turret or dome on boiler with air or water pressure before valves are applied, to prevent chips or foreign substances working into the valves.

Strong pop or blow-back is essential to efficiency. If valves are properly repaired pop regulators will control blow-back 0 to 10 pounds, they are effective from a closed position for full pop to an elevation equal to their diameter for no pop.

Example for setting safety valves, locomotive boiler equipped with three valves, pressure 200 pounds.

Third valve set 205 pounds; pop or blow-back,
5 pounds; closes 200 pounds.
Second valve set 202 pounds; pop or blow-back,
4 pounds; closes 198 pounds.
First valve set 200 pounds; pop or blow-back,
3 pounds; closes 197 pounds.

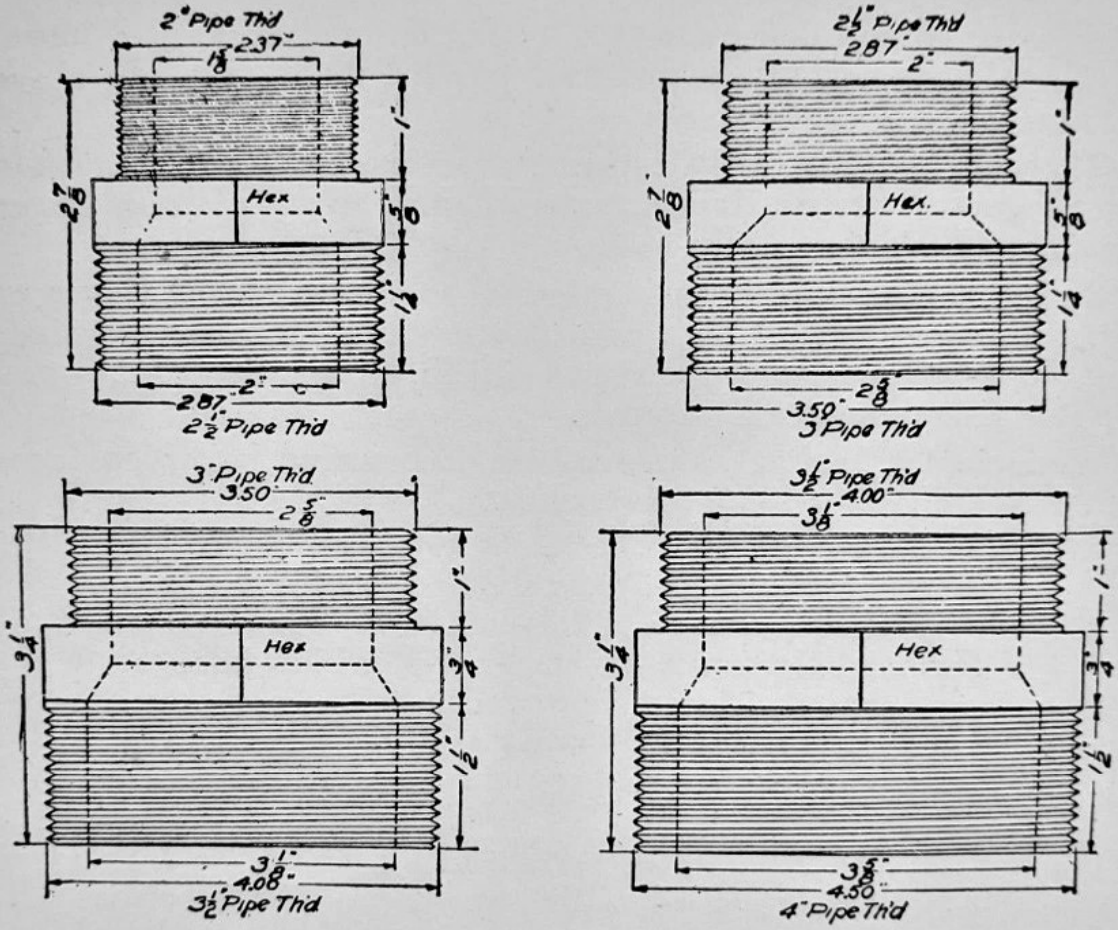
Always set and regulate pressure and blow-back on high valve first. Locomotives equipped with two valves use same formula. After setting valves at required pressure and when adjusting blow-back, should valve then open a pound or two light, do not change the pressure adjustment; the repeated opening of the valve and flow of steam heats up the body and spring, and may cause a slight reduction in set pressure that will not accrue in regular service.

Please note following suggestions

Our Pop Safety Valves are set at our works under steam to the required pressure; but if, after being in use a few days, they should blow off at a slightly lower pressure (as is likely to be the case with any new valve), please see that the pressure is set back promptly to the original pressure again. If allowed to run light it causes the valve to remain on a balance and hammer to its injury. When adjusted in this way once or twice, as needed, the valve will run for months without further readjustment.

Ashton Safety Valve and Locomotive Dome Connections

Recommended Practice



No. 37

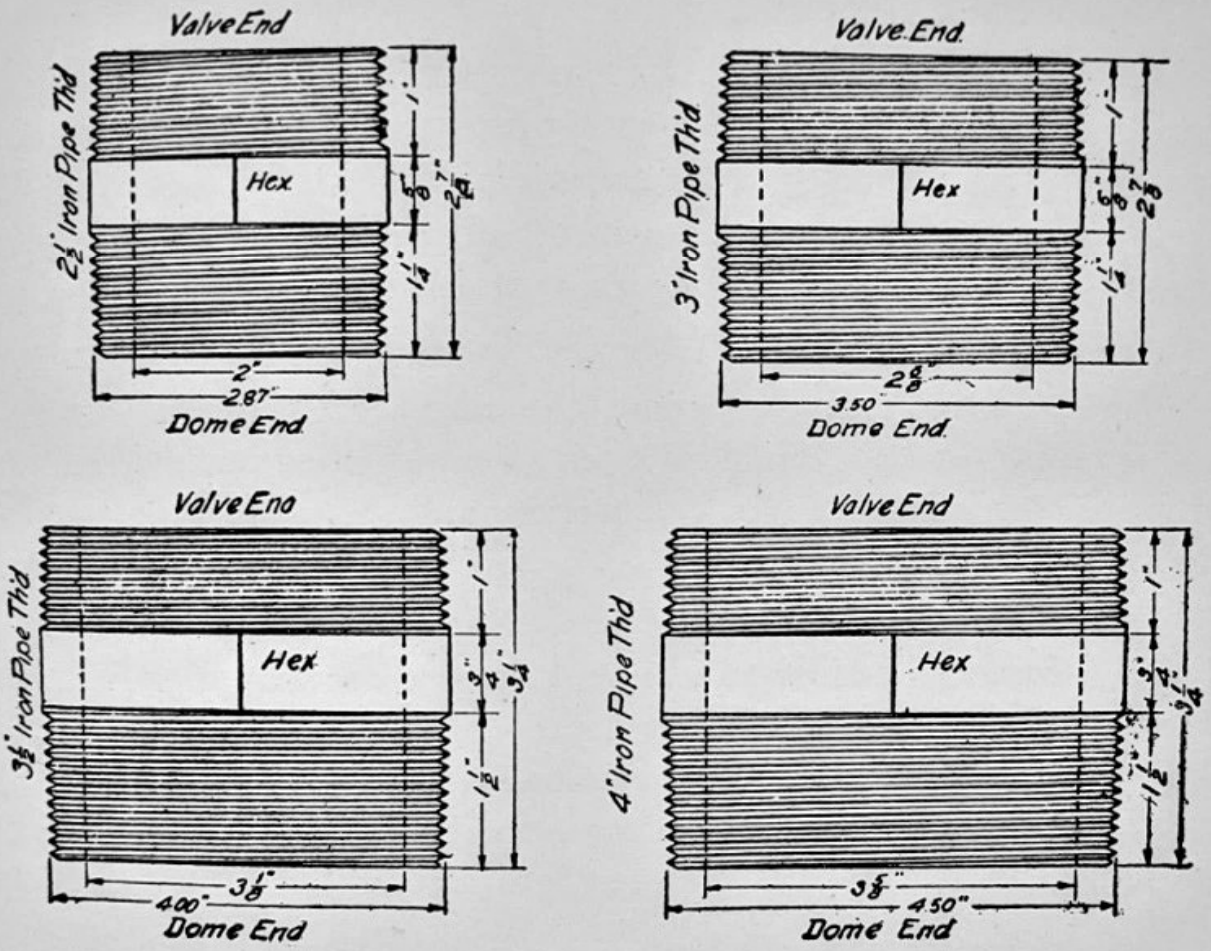
The above cuts show the dimensions of standard bushings for Ashton No. 28 and No. 30 Valves in the regular sizes of 2½ inch, 3 inch, 3½ inch, and 4 inch. The top connection is made smaller to fit the reduced size of the valve inlet. The threads are all standard pipe size.

These bushings are substantially made of high grade composition castings and give durable and satisfactory service. We do not recommend greater lengths or smaller diameters than mentioned above.

PRICES ON APPLICATION

Ashton Safety Valve and Locomotive Dome Connections

Recommended Practice



No. 38

The above cuts show the dimensions of standard cast bushings for Ashton Master Mechanics and Increased Lift Styles of Muffled and Open Pop Valves in the regular sizes of 2½ inch, 3 inch, 3½ inch, and 4 inch. Both top and bottom ends are of the same size and threaded to standard pipe sizes.

These bushings are substantially made of high grade composition metal and will give durable and satisfactory service. We do not recommend greater lengths or smaller diameters than above specified.

PRICES ON APPLICATION

Locomotive Pressure Gages

Locomotive service, with its high pressures and severe external vibrations, calls for a double-spring pressure gage of substantial construction, which is distinctly superior for this kind of service to the single-spring type. The double spring eliminates most of the vibration of the gage hand and causes a steadier operation of the gage movement, resulting in much less wear and greater durability.

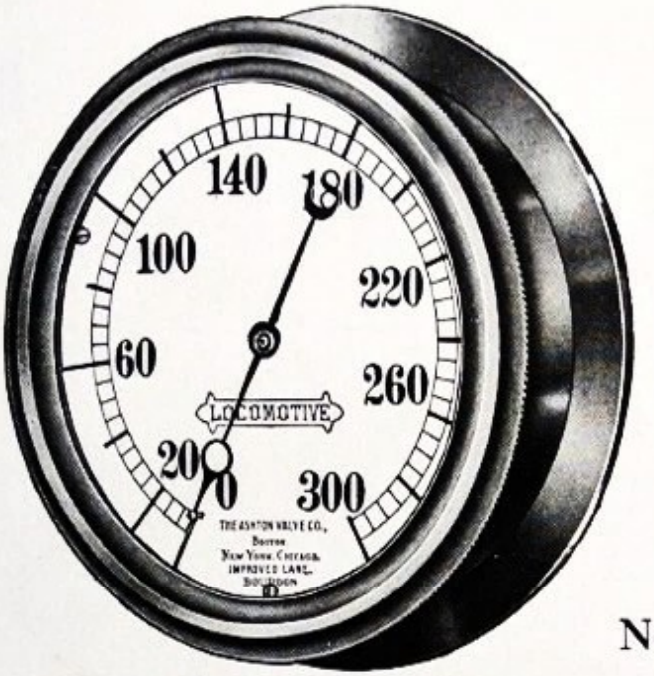
Ashton Locomotive Gages are the result of a careful study of railway conditions. That they meet all requirements is evident from an inspection of the gages themselves and the fact that they are giving such excellent service on a great majority of the largest railroads.

Solid-drawn seamless tube spring, well seasoned to prevent set, a movement of noncorrosive metals with nickel silver pinions and arbors, and individual graduation of the dial to exactly match the individual mechanism, — these features insure accuracy not only when the gage is first put into service but after long, hard use.

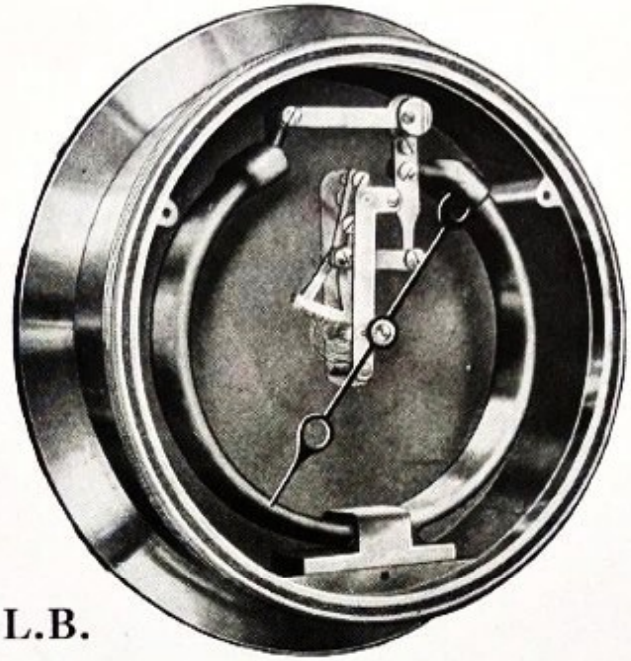
While all Ashton gages combine the best of materials and most skillful workmanship, we have developed certain designs that best meet the requirements of various conditions, and to insure most satisfactory service the proper type should be selected.

We also make gage testing and proving outfits for locomotive inspectors who must test the steam gages more frequently than heretofore according to the rules of the Interstate Commerce Commission.

Ashton - Lane - Bourdon Locomotive Gage



WHITE ENAMELED DIAL AND FLUSH RING



SHOWING SCREWED RING WITH DUST-PROOF FELT GASKET

No. 52 L.B.

This improved gage, particularly adapted to high-pressure locomotive service, meets the conditions of close regulation required by the rules of the Federal Boiler Inspectors.

It combines the durability, rigidness, and non-freezing features of the Lane double spring with the Bourdon movement, which by reducing vibration makes it possible to keep the gage in perfect adjustment and yet sensitive in action.

A dust-proof (felt gasket) screwed ring reduces the glass breakage, caused by expansion, and saves time in making test. Other distinctive features are an eccentric adjustment, wide sector and pinion of nickel silver, bushed movement, and the individual graduation of dial to correspond with individual movement in the gage.

Made with O. G. or flush ring, black, silvered, or white enameled dial; graduated to 300 or to 400 pounds, or as specified.

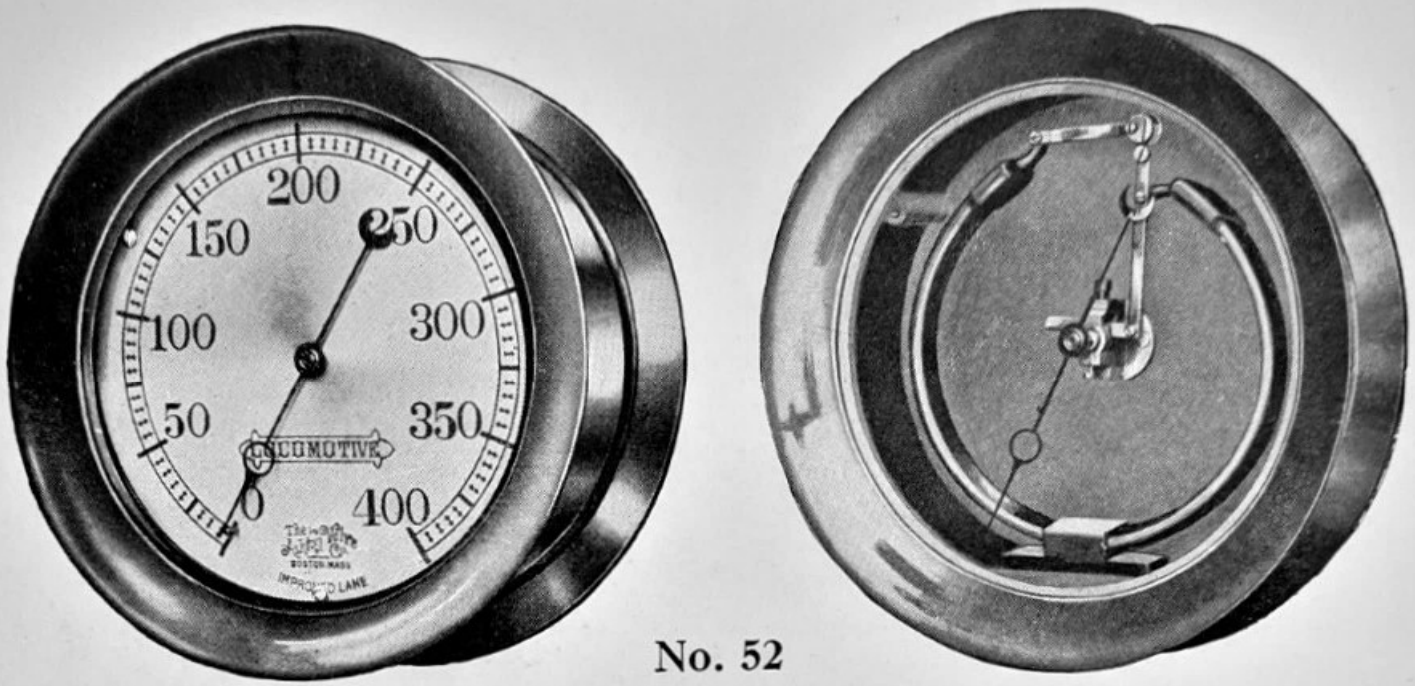
Locomotive standard size, 6¾ inch dial.

LIST PRICES

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case
8½ inch Dial	**$25.00**	**$25.75**	**$34.00**	**$36.50**
6¾ inch Dial	**18.00**	**18.60**	**22.00**	**24.00**
6 inch Dial	**15.00**	**15.50**	**18.00**	**19.50**

Ashton Standard Locomotive Steam Gage

With Double Spring



No. 52

Specifically a locomotive gage, in which service it has established in the last twenty years an enviable reputation with many of the most prominent railroads of America.

A distinct improvement over the ordinary single-spring gage. The double spring gives rigidness, and both sides are self-draining, eliminating any possibility of freezing. The movement is the Lane pattern, which insures the least possible vibration of the hand with perfect adjustment. As there is little vibration of the hand there is little wear on the movement, which includes nickel silver pinion and arbors.

Threaded rings, O. G. or flush, facilitate repairs or adjustments. The dial is hand-graduated to the individual movement of the gage.

Graduated to 300 or to 400 pounds or as specified.

Standard locomotive size, 6¾ inch dial.

A siphon must invariably be used with all steam gages.

LIST PRICES

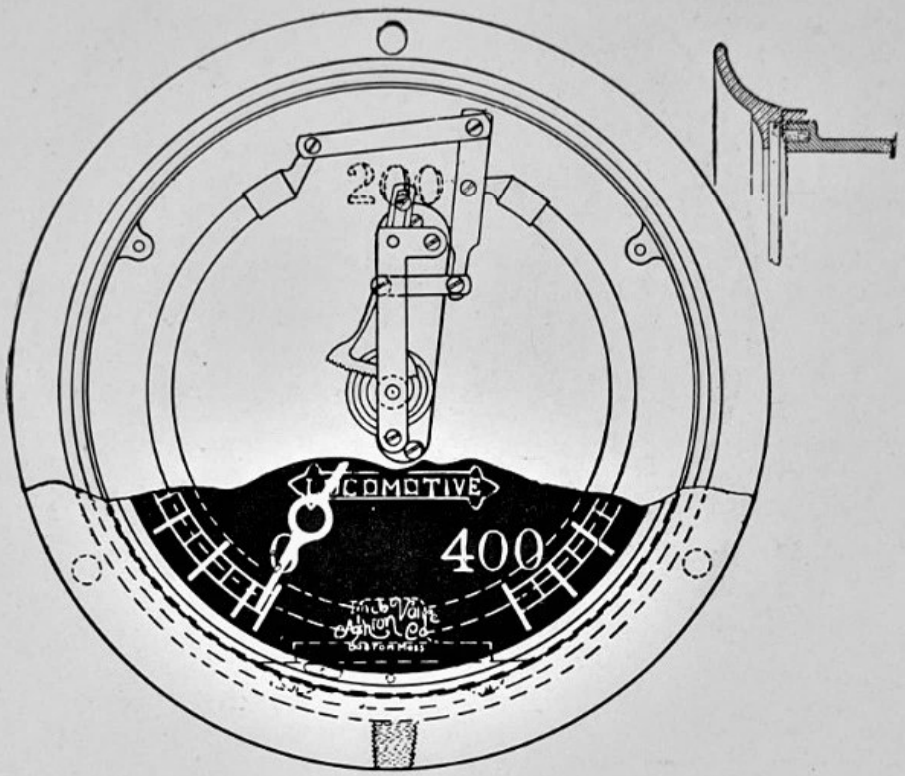
Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case
8½ inch Dial	$25.00	$25.75	$34.00	$36.50
6¾ inch Dial	18.00	18.60	22.00	24.00
6 inch Dial	15.00	15.50	18.00	19.50

Subject to discount

For reference list of parts and prices see pages 93 and 97.

United States Government Standard Style Locomotive Steam Gage

With Double Spring



No. 52 U. S.

The above cut shows a special style of the Ashton Locomotive Steam Gage as approved and adopted for use by the United States Railroad Administration for their standard locomotives. It fully complies with their specifications both as to dimensions, quality of material, and general construction.

In the upper section of the illustration is shown the interior working parts of the gage. The lower section shows the full size pipe connection, the black dial with its white enamel graduations, pressure marks, and white enamel hand. The cross-section cut, in upper right-hand corner, shows portion of gage ring as to its shape and fit on case, together with the dust-proof joint as made between glass and packing.

This gage is made in only one size and style, as indicated below.

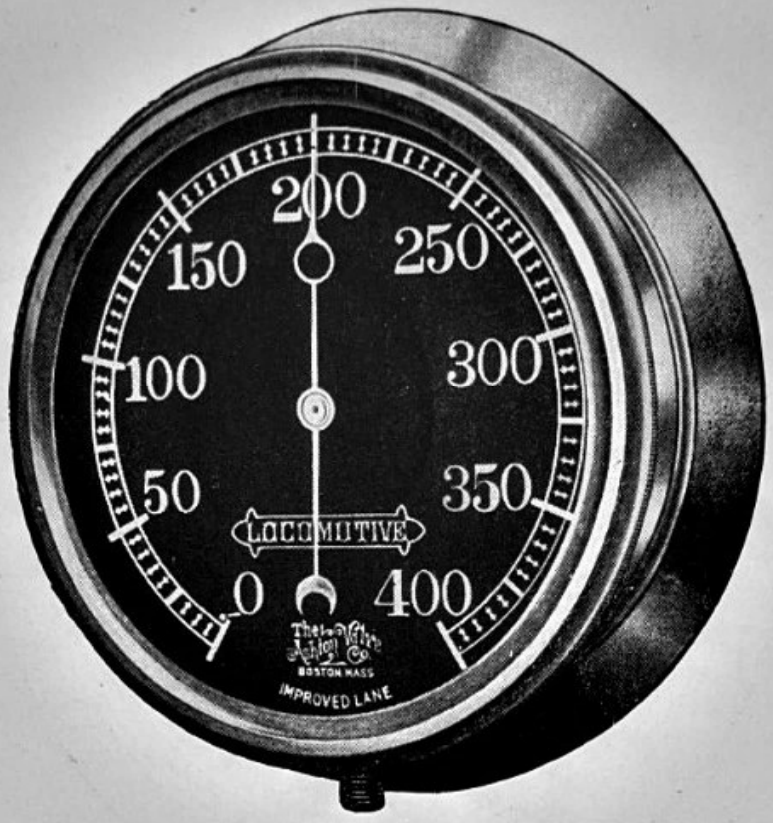
LIST PRICE

6¾ inch dial size, with dust-proof iron case and brass threaded ring $18.00

Subject to discount

Ashton Double Spring Locomotive Steam Gage

With Vertical Reading Adjustable Dial



No. 66

By a simple dial adjustment and resetting of hand this gage can be made to always show the highest working pressure at the top of the dial, and the gage hand always vertical when at maximum pressure. This arrangement enables the enginemen to see at a glance the working pressure of the locomotive to which they are assigned. Simply noting the position of the hand, without reading the graduations, permits the engineer and fireman to observe how close the pressure is to the maximum.

This locomotive gage has double spring, Lane movement, and is of Ashton quality throughout. Made with flush ring and black dial, as above shown, or when so specified, furnished with regular style O. G. ring and silvered dial.

Always use a siphon to protect the gage.

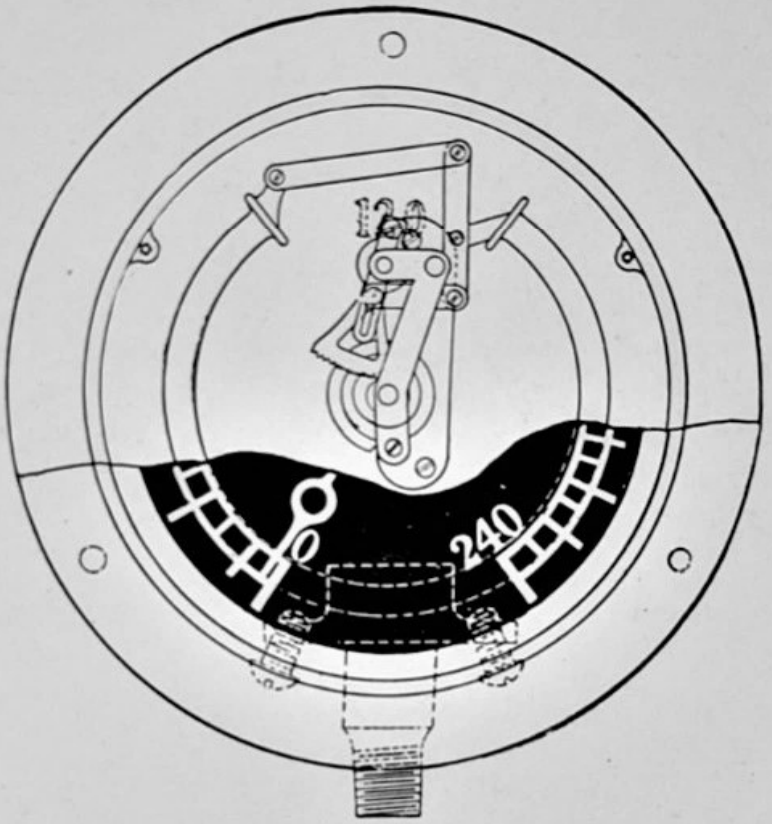
Standard locomotive size, 6¾ inch dial.

LIST PRICES

Size	Brass Case	Iron Case
6¾ inch Dial	$22.00	$18.00
6 inch Dial	18.00	15.00

United States Government Standard Locomotive Steam Heat Gage

With Double Spring



No. 52 U.S.

The above cut shows a special style of the Ashton Locomotive Steam Heat Gage, as approved and adopted for use by the United States Railroad Administration for their standard locomotives. It fully complies with their specifications, both as to dimensions, quality of material, and general construction.

The cut shows in upper section the interior working parts, while in the lower section is shown the full size pipe connection, as well as the black dial with white enamel graduations, pressure marks, and indicating hand.

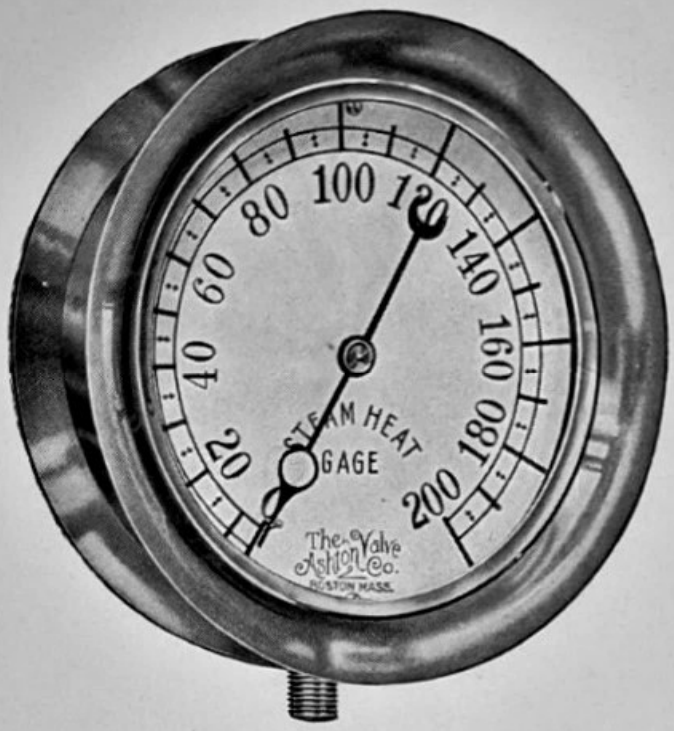
This gage is made in only one size and style, as indicated below.

LIST PRICE

4½ inch dial size, with iron case and brass threaded ring $10.00

Subject to discount

Ashton Double Spring Locomotive Steam Heat Gage



With O. G. Ring Screwed

No. 52 A.

With Flush Ring Screwed

For indicating the pressure in the train heating system.

This gage is of the same general design and high quality as our No. 52, but smaller, usually with 4½ inch dial, and graduated to either 160, 200, or 230 pounds maximum.

It has double spring to reduce the effect of engine vibration and to insure greater durability in the heat and trying conditions in the engine cab.

It is furnished with silvered, black, or white enamel dial as specified. The figures on the dial are large and prominent. The ring is threaded and furnished either O. G. style as above shown on left or flush style as on right-hand cut.

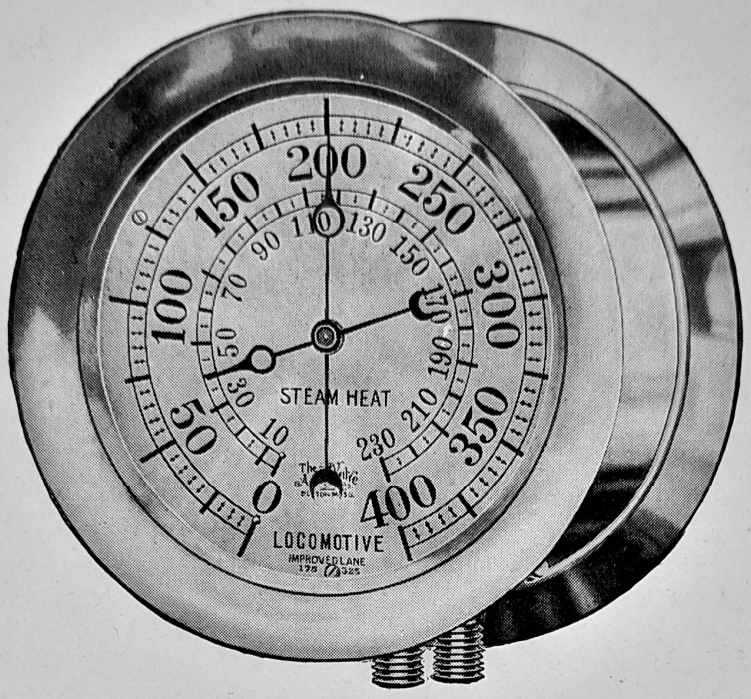
Protect steam gages with siphons.

LIST PRICES

Size	Brass Case	Iron Case, Brass Ring
6 inch Dial	**$18.00**	**$15.00**
5 inch Dial	**13.00**	**11.00**
4½ inch Dial	**12.00**	**10.00**

Subject to discount

Ashton Duplex Locomotive and Steam Heat Gage



No. 52 C.

An Ashton Idea that makes it unnecessary to use a separate steam heat gage. Two separate and independent springs and movements are embodied in this gage and enable the engineman to read pressures in boiler and car heating system from one gage.

The boiler pressure part is of the same double-spring construction as our No. 52 Gage, while the steam heat part is smaller and the dial graduated to a lower maximum pressure.

Both movements are of substantial construction, with nickel silver pinions and arbors, and the springs of seamless-drawn tubing.

Dials graduated as above unless otherwise specified.

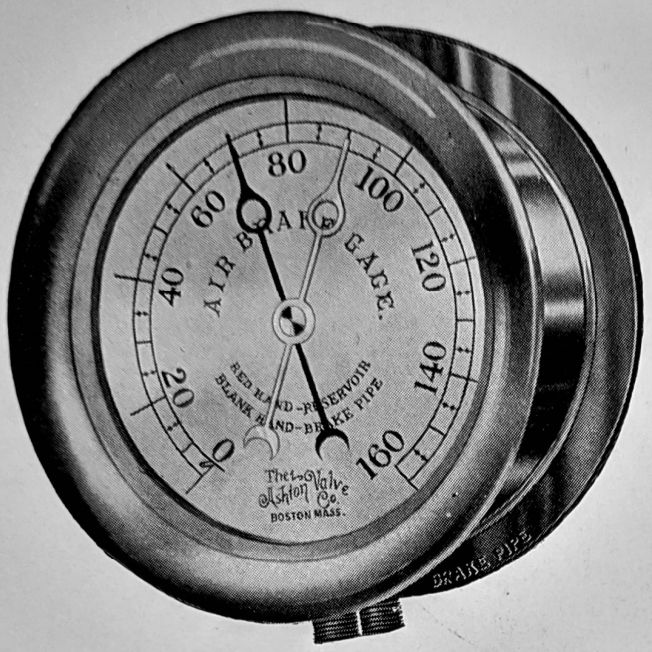
Always use a siphon to protect the gage.

LIST PRICES

Size	Iron Case	Brass Case
6¾ inch Dial	$28.00	$34.00

Subject to discount

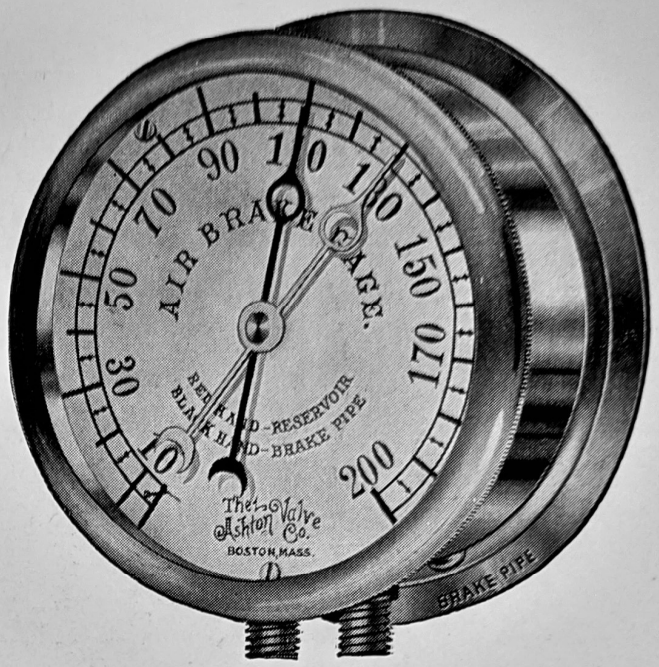
Ashton Improved Duplex Air Brake Gages



Standard Style

Showing O. G. Ring and
Standard Westinghouse Connections

No. 62 B.



High Speed Style

Showing Flush Ring and
Standard New York Connections

These gages indicate two separate pressures on a single dial and on the same scale. The red hand usually indicates Reservoir Pressure and the black hand Train Line or Brake Pipe pressure. This is accomplished by placing two independent springs in the case, each having a separate mechanism and hand.

The movements are of substantial construction, with nickel silver pinions and arbors, and the springs are of seamless-drawn tubing. As most of the wear takes place on the segments of the train line part of the gage, these are entirely of nickel silver, extra heavy.

A distinctive feature of these gages is a spring stop pin at the zero mark. It serves as a cushion to prevent the gage hands from being jarred loose or bent when they strike the pin on sudden release of pressure.

The High-Speed style is adapted for high-speed brake service and is made heavier for the higher pressures, and graduated to 200 pounds.

In ordering, specify whether the Standard or High-Speed style is desired, also whether Westinghouse or New York Standard connections are wanted.

LIST PRICES

Size	Brass Case	Iron Case
5 inch Dial	**$20.00**	**$17.50**

Subject to discount

For reference list of parts and prices see pages 94 and 98.

Ashton Improved Duplex Air Brake Gage

Small Pattern

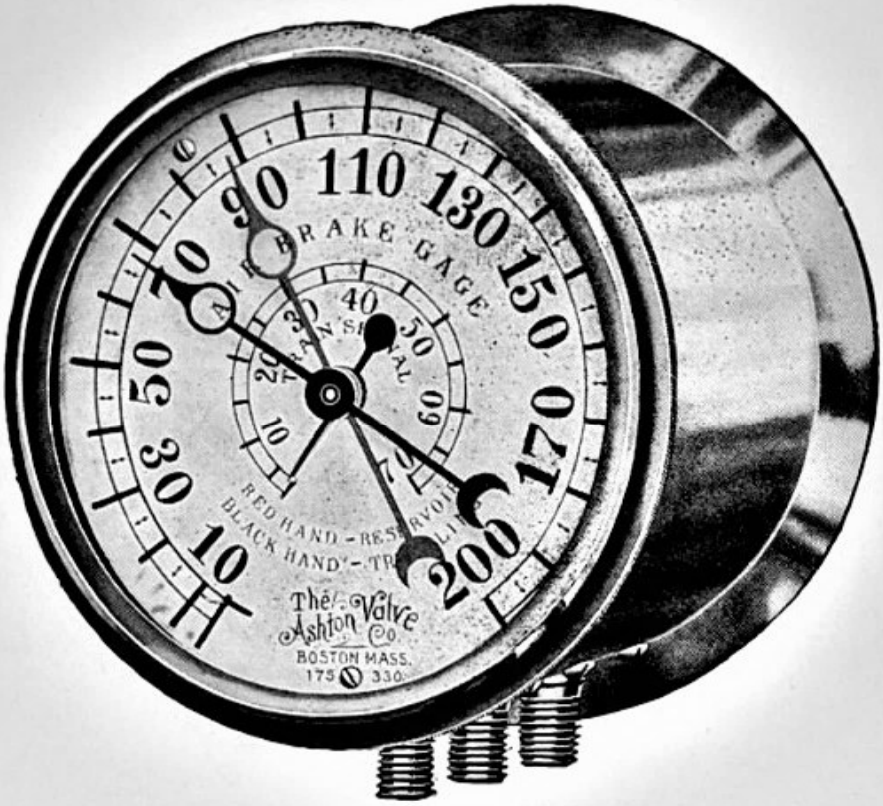
No. 62 C.

This gage is similar in construction and operation to the No. 62 B. Duplex Air Brake Gage shown on page 88, but is made of smaller size with 3½ inch diameter dial. It is used specially on locomotive driving wheel brake systems, and is made with special back flange so as to occupy as small a space in the locomotive cab as possible.

LIST PRICES

Size	Brass Case	Iron Case
	$10.00	**$8.00**

Ashton Triplex Air Brake and Train Signal Gage



No. 62 A.

A new idea that means one less gage in the locomotive cab. By a single glance at this Triplex gage, the engineer reads his air brake reservoir pressure, and train line pressure as well as the pressure carried in the train signal system.

This is distinctively an Ashton feature — it is not found in any other gage.

The air brake part has the same hands and dial as all Ashton Duplex Air-Brake Gages (see No. 62) and in addition a third hand operates on a smaller graduated dial, to show pressure carried in the train signal system.

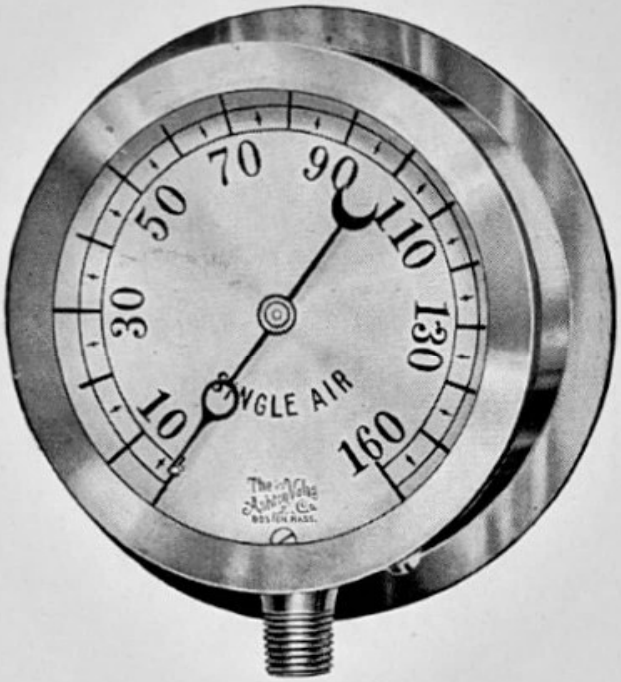
This Ashton Triplex Gage will be sent on trial if desired, acceptance subject to satisfactory service.

Dials graduated as indicated above unless otherwise specified, but can be made to indicate any three air brake pressures and so marked to order.

LIST PRICE

Size	Brass Extra Deep Case
5 inch Dial	**$30.00**

Ashton Improved Single Air Brake Gage



No. 51 B.

This gage is used in connection with Straight Air Brake Equipment on locomotives and also on test racks in repair shops. The dial graduations are similar to that of the Duplex Air Brake Gage. The large figures and flush ring give a full and unobstructed view of the dial, making it possible to read the gage at greater distance than can be done with the ordinary gage used for this service.

It is usually made in sizes 3½ inch, 4½ inch, and 5 inch, Brass or Iron Case graduated 100, 160, or 200 pounds as specified.

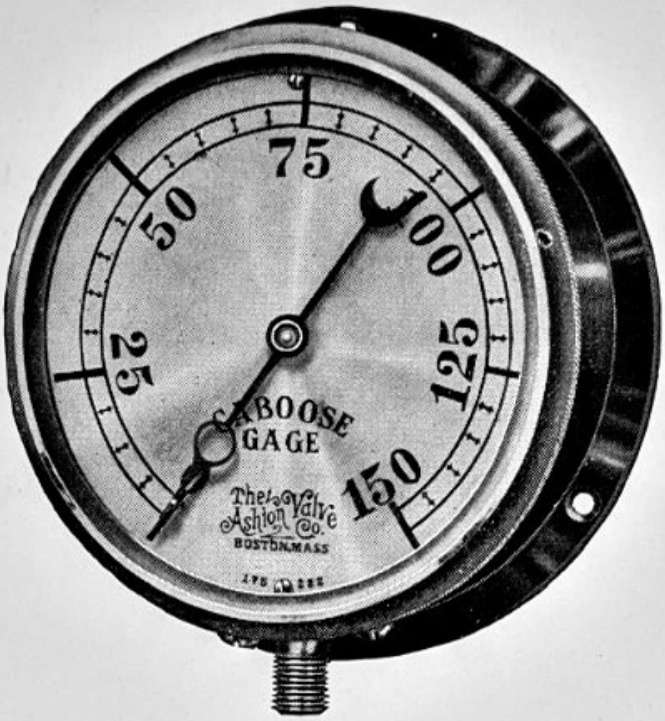
LIST PRICES

Size	Iron Case	Brass Case
5 inch dial	**$9.00**	**$11.00**
4½ inch dial	**8.00**	**10.00**
3½ inch dial	**7.00**	**9.00**

Subject to discount

For reference list of parts and prices see pages 93 and 98.

Ashton Special Caboose Air Brake Pressure Gage



No. 51 C.

Designed especially for caboose service. It is a constant indicator of the train line or brake pipe pressure — a telltale for the freight train conductor. It has large prominent figures and hand, so that train men may read it from a distance. The flush ring also gives a better view of the dial, and being threaded on the case, reduces the chance of broken glass so common because of shocks and vibration.

Made in 5 inch size, brass or iron case.

LIST PRICES

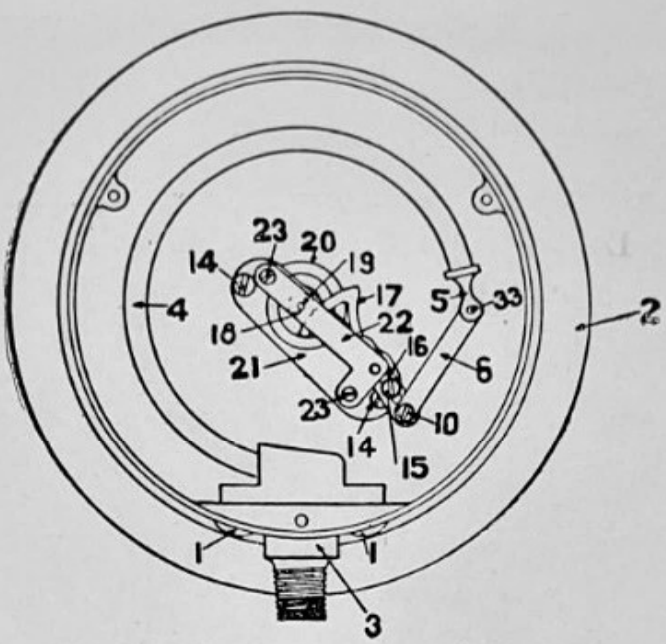
Size	Iron Case Brass Ring	Brass Case
5 inch dial	$9.00	$11.00

Subject to discount

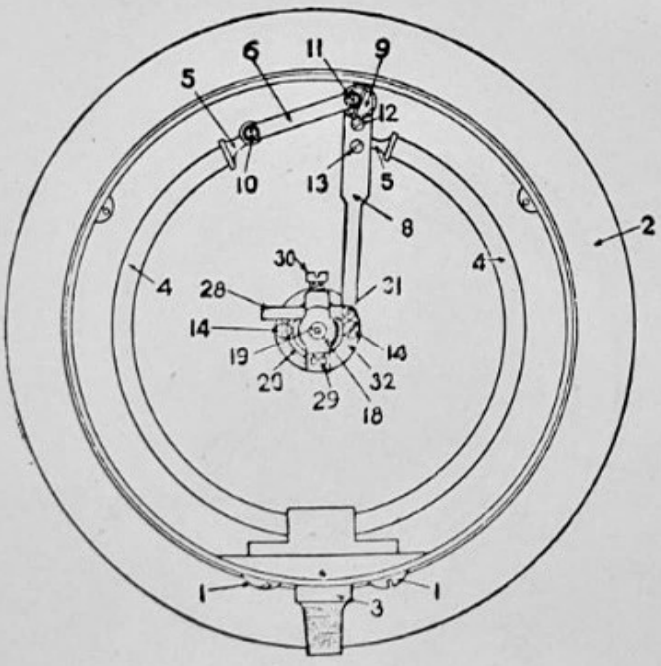
For reference list of parts and prices see pages 93 and 98

Ashton Single Air, Caboose, Steam Heat and Locomotive Steam Gages

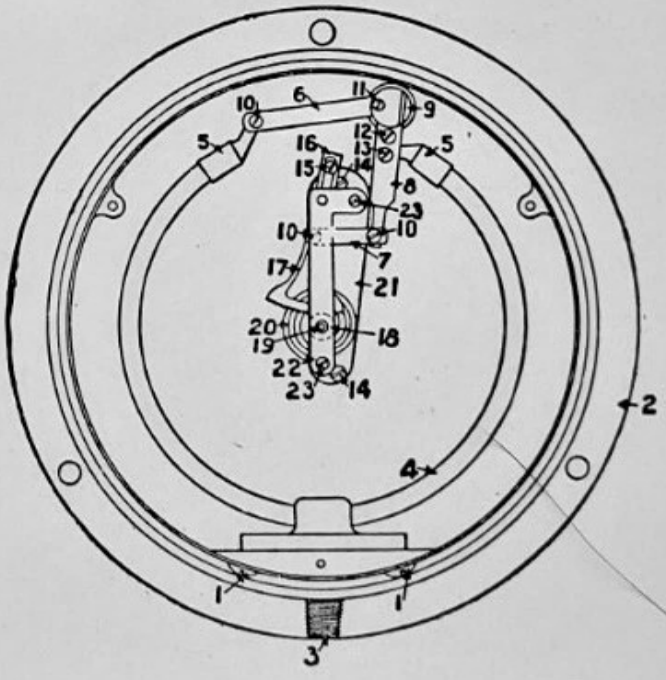
Reference List of Parts



No. 51 B Single Air Gage
No. 51 C Caboose Gage
(Single Spring)



No. 52 Locomotive Steam Gage
No. 66 Locomotive Steam Gage
No. 52 A.
Locomotive Steam Heat Gage



No. 52 L. B. Locomotive Steam Gage
No. 52 U. S. Locomotive Steam Gage
No. 52 U.S.
Locomotive Steam Heat Gage

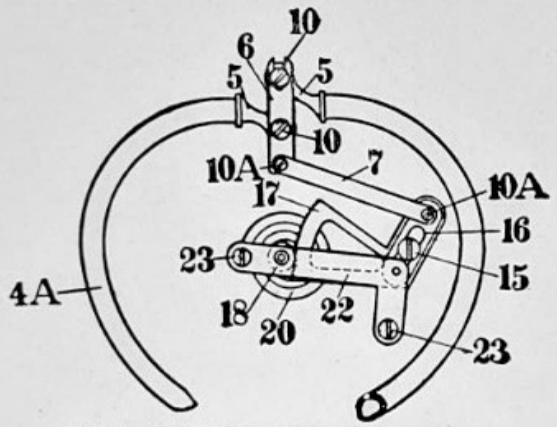
(Note: On the latter two styles, parts Nos. 9, 11, and 12 are not furnished. Connection screw same as part No. 10 is used.)

In ordering parts always specify style number of gage, size, maximum dial

Ashton Duplex Air Brake Gages

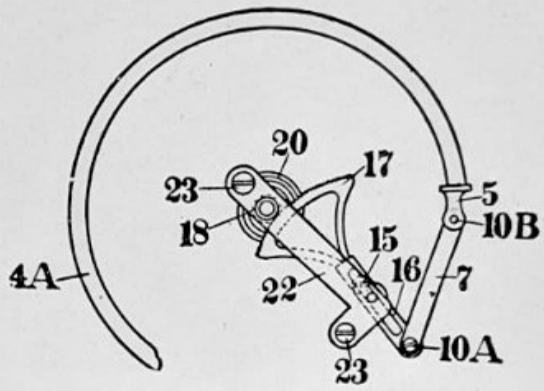
Reference List of Parts

5 inch No. 62
Duplex Air Brake Gage
(Double Spring)

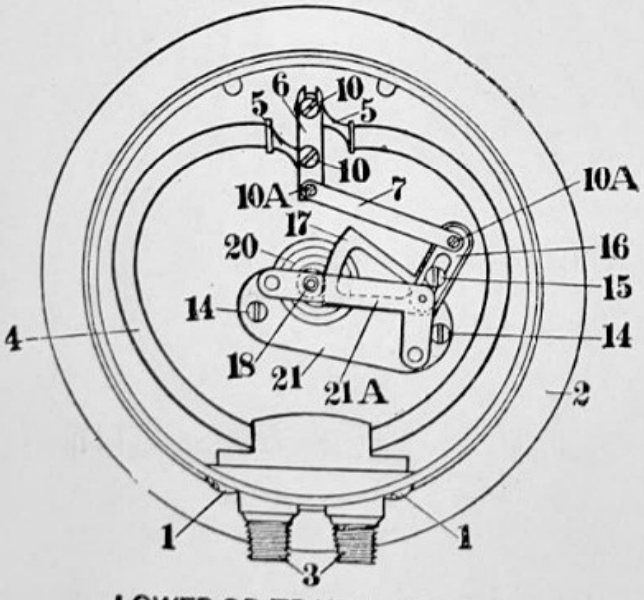


UPPER OR RESERVOIR SPRING
&CONNECTIONS.

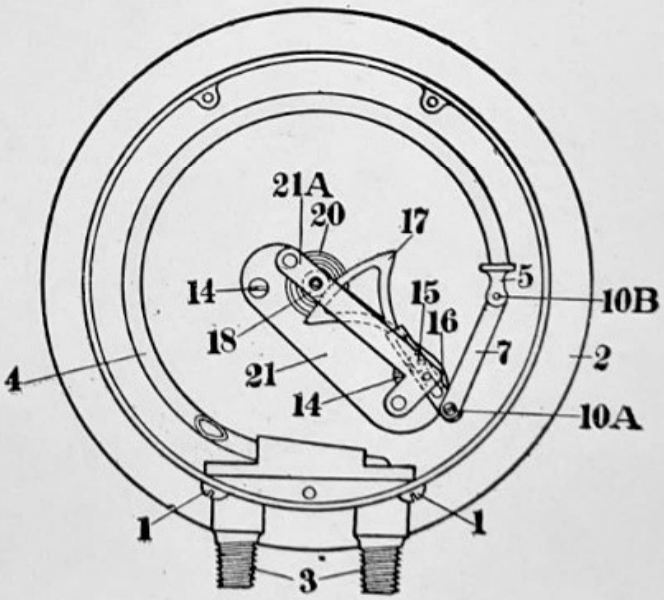
5 inch No. 62 B.
Duplex Air Brake Gage
(Single Spring)



UPPER OR MAIN RESERVOIR SPRING
&CONNECTIONS.



LOWER OR TRAIN-LINE SPRING
&CONNECTIONS.



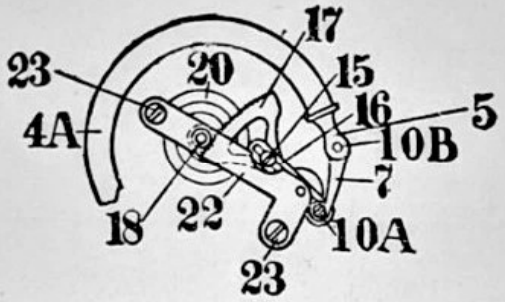
LOWER OR EQUALIZING RESERVOIR SPRING
&CONNECTIONS.

In ordering parts always specify style number of gage; maximum dial graduations; Westinghouse or New York connections; iron or brass case; whether threaded or slip style of ring or case; hairsprings, top or bottom

Ashton Triplex and Duplex Air Brake Gages

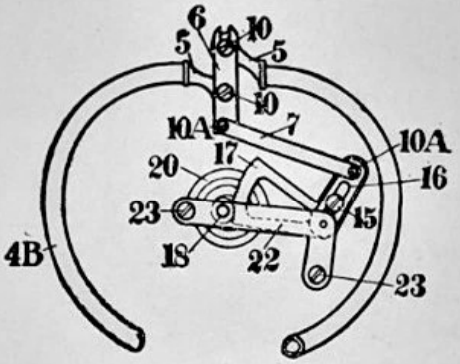
Reference List of Parts

3½ inch No. 62 C.
Duplex Air Brake Gage
(Single Spring)

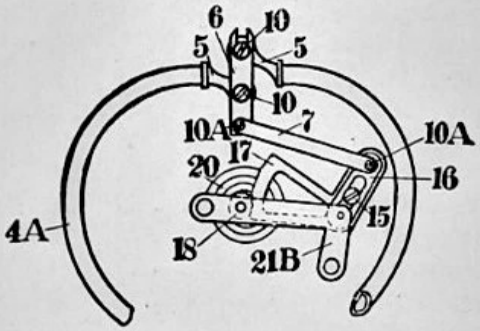


INNER OR BRAKE PIPE SPRING & CONNECTIONS.

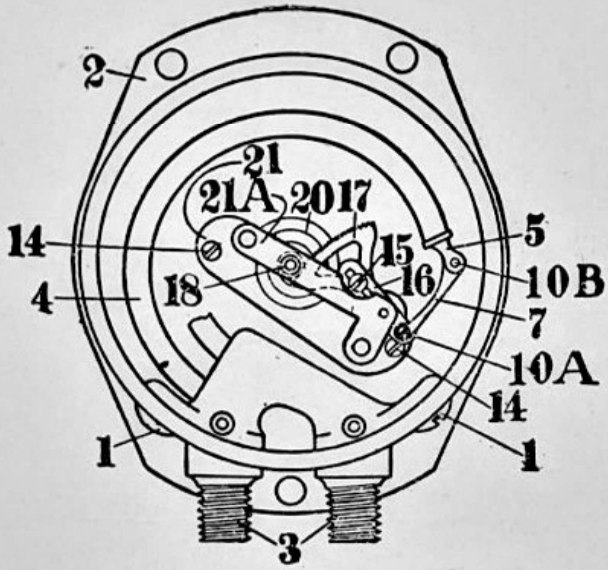
5 inch No. 62 A.
Triplex Air Brake Gage
(Double Spring)



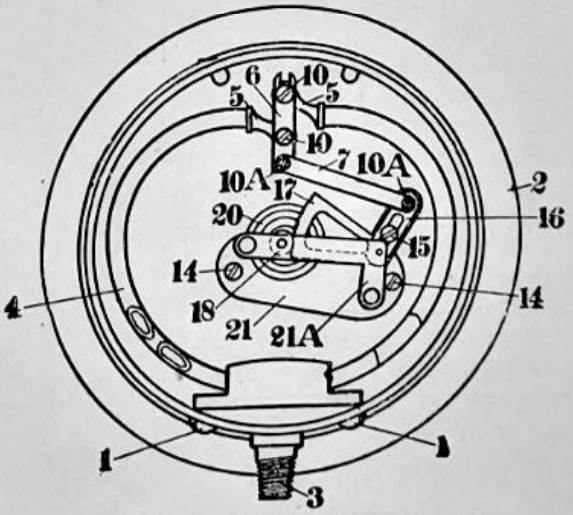
TRAIN SIGNAL-LINE SPRING & CONNECTIONS.



RESERVOIR SPRING & CONNECTIONS.



OUTER OR CYLINDER SPRING & CONNECTIONS.



TRAIN-LINE SPRING & CONNECTIONS.

In ordering parts always specify style number of gage; maximum dial graduations; Westinghouse or New York connections; iron or brass case; whether threaded or slip style of ring or case; hairsprings, top or bottom style; hands, red or black; dials, marking desired.

For price list of parts see page 98.

Ashton Locomotive Steam and Steam Heat Gages

Price List of Parts

Style Gage / Size / Name of Part	Fig.	No. 52 U.S. Standard Steam Heat 4½ in.	No. 52 L. B. 6 in.	No. 52 L. B. 6¾ in.	No. 52 U.S. Standard Loco. Style 6¾ in.	No. 52 L. B. 8½ in.
Socket Screws, Iron	1	$ .08	$ .08	$ .08	$ .08	$ .08
Socket Screws, Brass	1	.....	.10	.10	.....	.10
Case, Iron	2	1.50	3.50	4.50	4.50	5.50
Case, Brass	2	.....	5.50	7.00	.....	8.50
Socket, Spring and Tip complete	3-4-5	2.50	2.80	3.00	3.00	3.00
Connection Arm	6	.10	.10	.10	.10	.10
Movement Connection Arm	7	.10	.10	.10	.10	.10
Lever	8	.15	.15	.15	.15	.15
Hub	9	.....	.15	.15	.....	.15
Connection Screw	10	.10	.10	.10	.10	.10
Hub Screw	11	.....	.10	.10	.....	.10
Hub Lock Screw	12	.....	.08	.08	.....	.08
Lever Connection Screw	13	.10	.10	.10	.10	.10
Movement Case Screws	14	.10	.10	.10	.10	.10
Adjusting Slide Lock Screw	15	.08	.08	.08	.08	.08
Adjusting Slide	16	.10	.10	.10	.10	.10
Segment, Nickel Silver	17	.40	.40	.40	.40	.40
Pinion, Nickel Silver	18	.30	.30	.30	.30	.30
Bushing, Nickel Silver	19	.20	.20	.20	.20	.20
Hair Spring	20	.20	.20	.20	.20	.20
Bottom Movement Plate Bushed	21	.28	.28	.28	.28	.28
Top Movement Plate, Bushed	22	.24	.24	.24	.24	.24
Movement Screws	23	.10	.10	.10	.10	.10
Dial, Silvered or Black	24	1.00	1.50	1.80	1.80	2.50
Dial, White Porcelain Enamel	24	.....	1.80	2.00	.....	2.50
Ring, O.G. or Flush Threaded	25	1.10	1.70	2.30	2.30	3.00
Dial Screws	26	.05	.05	.05	.05	.05
Hand, Black or White	27	.20	.20	.20	.20	.30
Glass	34	.20	.20	.20	.20	.30
Movement Complete	.....	2.20	2.20	2.20	2.20	2.20
Hand Stop Pin	.....	.05	.05	.05	.05	.05

Subject to discount

In ordering parts always specify number and name of parts, style number of gage, size, maximum dial graduations, iron or brass case, O. G. or flush threaded rings, and whether silvered, black or white enameled dials.

For reference list of parts see page 93.

Ashton Locomotive Steam and Steam Heat Gages

Price List of Parts

Style Gage Size		No. 52A 4½ in.	No. 52A 5 in.	No. 52 No. 52A No. 66 6 in.	No. 52 No. 66 6¾ in.	No. 52 8½ in.
Name of Part	Fig.					
Socket Screws, Iron	1	$ .08	$ .08	$ .08	$ .08	$ .08
Socket Screws, Brass	1	.10	.10	.10	.10	.10
Case, Iron	2	1.50	2.00	3.00	4.00	5.00
Case, Brass	2	3.00	3.50	5.00	6.50	8.00
Socket, Spring, and Tip complete	3-4-5	2.50	2.50	2.80	3.00	3.00
Connection Arm	6	.10	.10	.10	.10	.10
Lever	8	.15	.15	.15	.15	.15
Hub	9	.15	.15	.15	.15	.15
Connection Screw	10	.10	.10	.10	.10	.10
Hub Screw	11	.10	.10	.10	.10	.10
Hub Lock Screw	12	.08	.08	.08	.08	.08
Lever Connection Screw	13	.10	.10	.10	.10	.10
Movement Case Screws	14	.10	.10	.10	.10	.10
Pinion Nickel Silver	18	.30	.30	.30	.30	.30
Bushing Nickel Silver	19	.20	.20	.20	.20	.20
Hair Spring	20	.20	.20	.20	.20	.20
Dial, Silvered or Black	24	1.00	1.00	1.50	1.80	2.50
Dial, White Porcelain Enamel	24	1.50	1.60	1.80	2.00	2.50
Ring, O. G. or Flush Slip	25	.90	1.00	1.50	2.00	2.50
Ring, O. G. or Flush Threaded	25	1.10	1.20	1.70	2.30	3.00
Dial Screws	26	.05	.05	.05	.05	.05
Hand, White or Black	27	.20	.20	.20	.20	.30
Rack, Nickel Silver	28	.30	.30	.30	.30	.30
Bushing Screw, Nickel Silver	29	.10	.10	.10	.10	.10
Rack Adjusting Screw	30	.10	.10	.10	.10	.10
Rack Connecting Screw	31	.10	.10	.10	.10	.10
Movement Frame	32	.60	.60	.60	.60	.60
Glass	34	.20	.20	.20	.20	.30
Hand Stop Pin	.....	.05	.05	.05	.05	.05
Movement, Complete	.....	1.80	1.80	1.80	1.80	1.80
Ring Screws	.....	.05	.05	.05	.05	.05

Subject to discount

In ordering parts always specify number and name of part, style number of gage, size, maximum dial graduation, iron or brass case, O.G. or flush threaded or slip style ring or case, whether silvered, black or white enamel dials.

For reference list of parts see page 93.

Ashton Triplex, Duplex, Caboose and Single Air Brake Gages

Price List of Parts

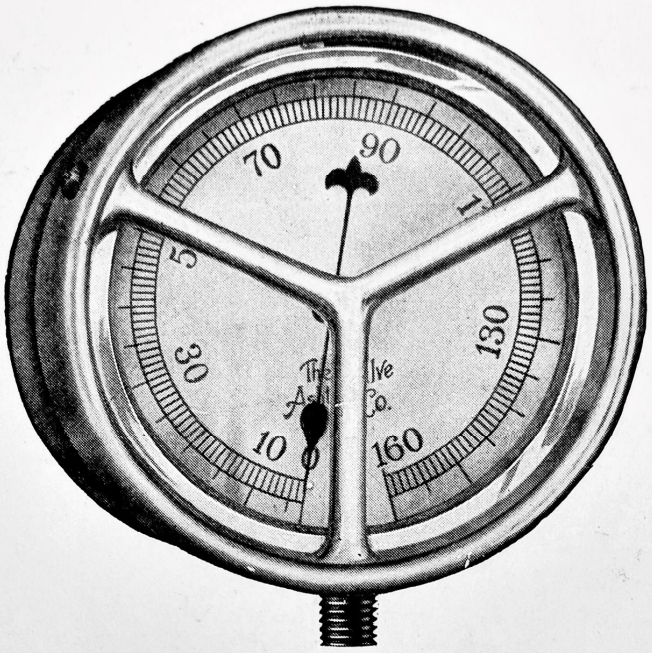
Style Gage		No. 51-B	No. 51-B No. 51-C	No. 51-B	No. 62-C	No. 62	No. 62-B	No. 62-A
Size		3½ inch	5 inch	4½ inch	3½ inch	5 inch	5 inch	5 inch
Name of Part	Fig.							
Socket Screws, Iron	1	$ .08	$ .08	$ .08	$ .08	$ .08	$ .08	.....
Socket Screws, Brass	1	.10	.10	.10	.10	.10	.10	$ .10
Case, Iron	2	1.30	1.50	1.50	1.50	2.50	2.50	.....
Case, Brass	2	2.80	3.50	3.00	3.00	4.50	4.50	6.00
Socket Spring and Tip Complete	3-4-5	1.50	1.80	1.80	2.00	2.50	2.30	2.50
Socket Spring and Tip Complete	3-4-A-5	.....	.....	.....	2.00	2.50	2.30	2.50
Socket Spring and Tip Complete	3-4-B-5	.....	.....	.....	.....	.....	.....	2.50
Connection Arm	6	.08	.08	.08	.....	.08	.....	.08
Movement Connection Arm	7	.....	.....	.....	.08	.10	.10	.10
Connection Screw	10	.10	.10	.10	.....	.....	.....	.....
Connection Screw, Phos. Bronze	10	.....	.....	.....	.....	.10	.....	.10
Movement Arm Connection Screw	10-A	.....	.....	.....	.10	.10	.10	.10
Tip Pin	10-B	.05	.05	.05	.05	.....	.05	.....
Movement Case Screws	14	.10	.10	.10	.10	.10	.10	.10
Adjusting Slide Lock Screw	15	.08	.08	.08	.08	.08	.08	.08
Adjusting Slide	16	.10	.10	.10	.10	.10	.10	.10
Segment Nickel Silver	17	.....	.....	.....	.30	.40	.40	.40
Segment Brass	17	.20	.20	.20	.....	.....	.....	.....
Pinion Nickel Silver	18	.20	.20	.20	.20	.20	.20	.20
Bushing Nickel Silver	19	.10	.10	.10	.....	.....	.....	.....
Hair Springs	20	.20	.20	.20	.20	.20	.20	.20
Bottom Movement Plate, Bushed	21	.24	.24	.24	.24	.28	.28	.28
Middle Movement Plate, Bushed	21-A	.....	.....	.....	.24	.24	.24	.24
Upper Middle Movement Plate	21-B	.....	.....	.....	.....	.....	.....	.24
Top Movement Plate, Bushed	22	.22	.22	.22	.24	.24	.24	.24
Movement Screws	23	.10	.10	.10	.10	.10	.10	.10
Dial, Silvered or Black	24	.80	1.00	1.00	1.20	1.50	1.50	2.50
Dial, White Porcelain Enamel	24	.....	1.60	1.50	.....	1.60	1.60	.....
Ring, O.G. or Flush Slip	25	.80	1.00	.90	.80	1.00	1.00	.....
Ring, O.G. or Flush Threaded	25	1.00	1.20	1.10	1.00	1.20	1.20	1.20
Dial Screws	26	.05	.05	.05	.05	.05	.05	.05
Hands, Black or Red	27	.20	.20	.20	.20	.20	.20	.20
Tip Pin (See 10-B)	33	.....	.....	.....	.....	.....	.....	.....
Glass	34	.20	.20	.20	.20	.20	.20	.20
Movement, Complete	.....	1.20	1.20	1.20	2.50	3.00	3.00	4.50
Hand Stop Pin	.....	.05	.05	.05	.05	.05	.05	.05
Ring Screws	.....	.05	.05	.05	.05	.05	.05	.....

Subject to discount

In ordering parts always specify number and name of part, style number of gage, maximum dial graduations, Westinghouse or New York connections, iron or brass case, and whether threaded or slip style of ring or case.

For reference list of parts see pages 93, 94 and 95.

Ashton Protected Dial Pressure Gage



No. 59 B.

The Ashton Protected Dial Gage is a specially constructed gage to suit the requirements in air brake service and particularly in connection with the rear end train brake cock. With such a gage rear end trainmen having in charge the backing of trains can know at a glance the exact pressure on the brake system, assuring perfect control. It is also a handy and practical instrument for use of Air Brake Inspectors in repair, classification, and passenger-car yards.

The face of the gage is protected from damage by having the glass and dial set considerably below the top rim, and furthermore by protecting cross-bars. These bars will not only prevent ordinary projections from penetrating the gage, but will also stand being struck with considerable force without breaking, and when broken can be readily replaced.

These gages are made in two styles, both of which are of the 3 inch dial size, with ¼ inch connection. That as shown above has aluminum case and ring with the crossbars combined with the ring in one casting. Those with the iron or brass case have separate crossbars which can be replaced without change of ring.

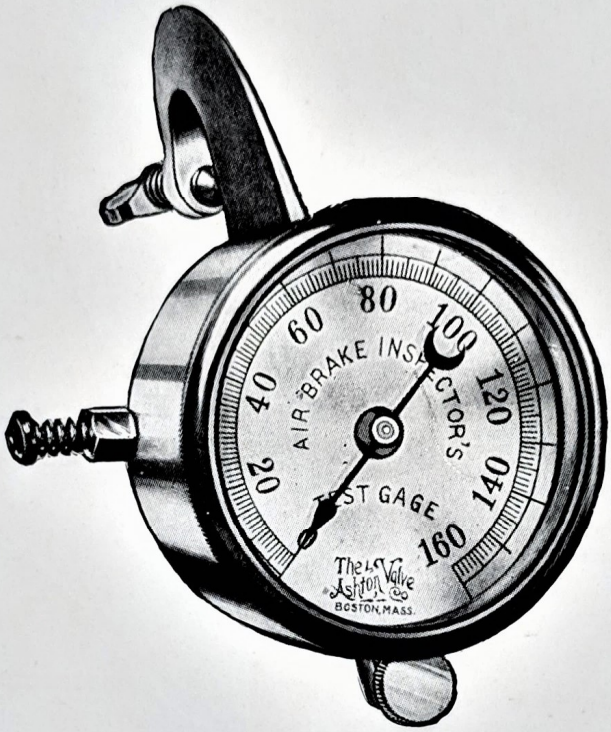
LIST PRICES

3 inch Dial Size, with Iron Case and Brass Ring	**$7.00**
3 inch Dial Size, with Brass Case and Ring	**9.50**
3 inch Dial Size, with Nickel-Plated Case and Ring	**10.00**
3 inch Dial Size, with Aluminum Case and Ring	**11.00**

Subject to discount

Ashton Air Brake Inspectors' Test Gage

With Hose Coupling Clamp Attachment



No. 68

A handy, compact test gage having hose coupling bracket for instant attachment to air brake or signal line couplings, thus enabling the inspector to make frequent tests, unobserved, at the rear of the train.

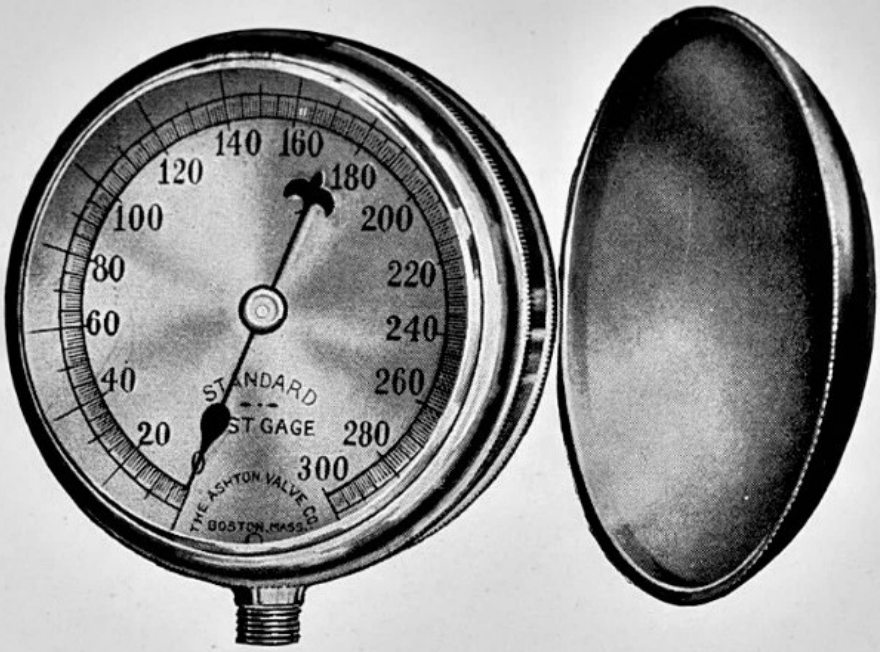
This gage has 2½ inch dial and the case is fully nickeled. By means of the top and bottom thumbscrews a perfectly tight connection is easily made and the side valve serves as a drain cock to allow the escape of air pressure between the hose cock and gage when the cock is shut off after the test.

LIST PRICE

Size	Nickel-Plated Case
2½ inch Dial	$16.00

Subject to discount

Ashton Inspectors' Pocket Test Gage



No. 59 A.

A neat, light test gage of suitable size for carrying in the pocket or tool box. It weighs only about one pound. For perfect protection of dial and hand, this gage has bevel plate glass front with metal cover.

Used principally by air-brake inspectors, boiler inspectors, and master mechanics, it is graduated for any desired pressure up to 500 pounds. Dials for 300 pounds maximum and less are graduated in one-pound marks; for greater maximum in two-pound marks.

Its accuracy is unquestioned. Only the highest grade of material and most skillful workmanship are allowed in making these gages, which are carefully tested before leaving the factory.

Like all other Ashton gages, this pocket test gage has spring of solid drawn seamless tubing, movement of noncorrosive material, and is the best that can be produced.

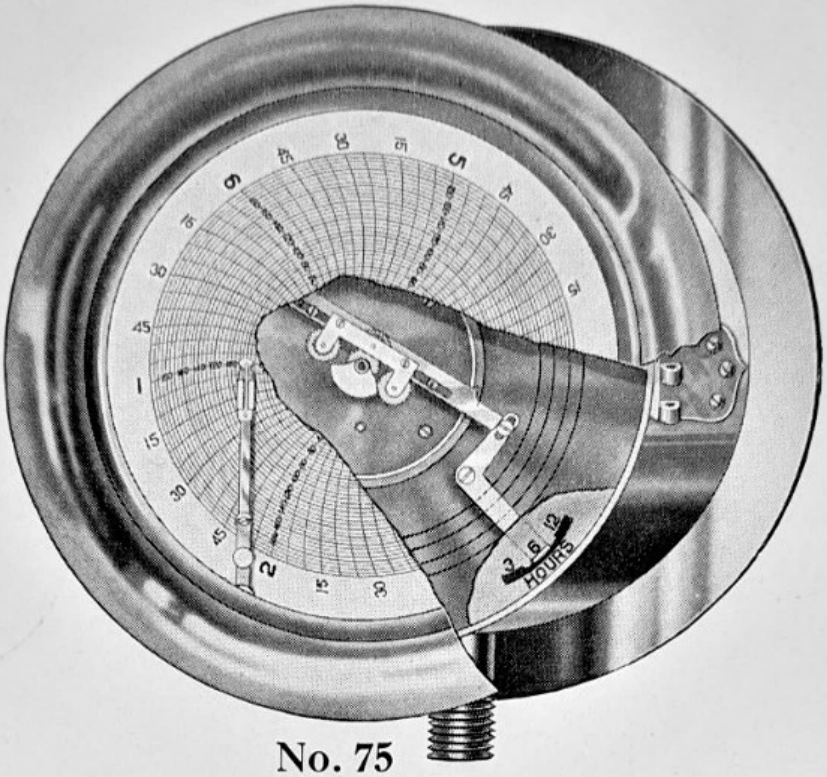
Standard graduation, 160, 300, 500 pounds. Always specify graduations desired.

LIST PRICES

Size	Brass Case	N. P. Case	Aluminum Case
3 inch Dial	**$14.00**	**$14.60**	**$15.50**
Weight, ounces	**16**	**16**	**10**

Subject to discount

Ashton Three-Speed Air Brake Recording Gage



No. 75

This gage is designed to meet the requirements of Air Brake Inspectors in making tests and recording the operation of air brakes on passenger and freight trains as desired, but may be used for recording pressures where a variable speed of chart is required.

It has the distinct advantage of a fast rotating chart, which more clearly indicates the variations in pressure or reductions made.

It is constructed with high grade clock movement; special tube to eliminate excessive vibration; capillary glass pen with platinum tube point, which is noncorrosive and gives a clear record, and may be refilled or cleaned without taking apart or detaching.

With each instrument is furnished a bottle of special recording ink, not affected by ordinary changes of temperature; one extra pen with cleaning wires, and 100 each of the three styles of charts.

PRICES

	Aluminum Case	Brass Case
10 in. size 1½, 3, and 6 hour charts in 5 lb. increments to 125 lbs.	**$125.00**	**$120.00**
10 in. size 3 , 6, and 12 hour charts in 5 lb. increments to 160 lbs.	**125.00**	**120.00**
12 in. size 1½, 3, and 6 hour charts in 5 lb. increments to 200 lbs.	**150.00**	**140.00**
12 in. size 3 , 6, and 12 hour charts in 5 lb. increments to 200 lbs.	**150.00**	**140.00**

When specially desired this gage is mounted in locked portable hardwood box, as illustrated in connection with Portable Recording Gage No. 73 A., page 138, at the following extra net prices:

10 inch size	**$28.00**
12 inch size	**31.00**

Ashton Inspectors' Testing and Proving Outfit

No. 45

This outfit is particularly adapted to the requirements of officials of Mechanical Departments of Railroads in connection with tests and inspections of stationary boilers and is also extensively used by Boiler and Power Plant Inspectors, Mechanical and Operating Engineers.

It is accurate, durable, and easily portable, weighing less than ten pounds, and approximately twelve inches by four inches in size.

The finely finished, velvet-lined case, with handle and lock, contains the following nickel-plated instruments and tools:

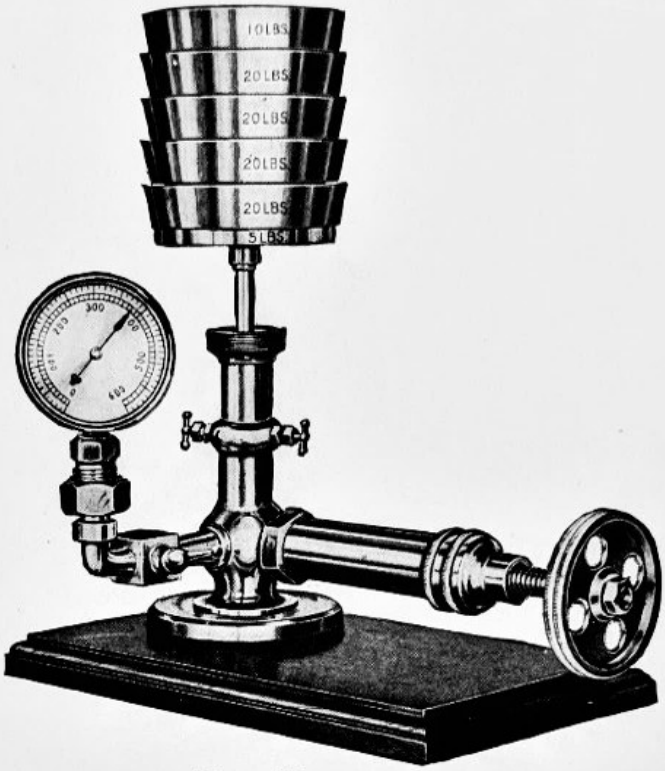
One 3 inch No. 59A Standard Pocket Test Gage graduated to 300 pounds.
One No. 3 Screw Test Pump.
One No. 94 Gage Hand Puller.
One Hand Set
One Lever Handle Union Gage Cock
One Screwdriver

LIST PRICE, $45.00

Subject to discount

Ashton Improved Dead-Weight Pressure Gage Tester

Patented



No. 79

The Ashton Dead-Weight Gage Tester, as above shown, offers in convenient form an improved method for accurately testing pressure gages by means of weights, and is a recognized standard extensively adopted for this important service. It is equal in accuracy to that of a mercury column, and has the added advantage of compactness, portability, and much lower cost.

These testers are also much to be preferred over the ordinary styles of similar designs because of their special distinctive construction with double area piston. This exclusive feature renders it possible to make tests within their designated range of pressure with only one fourth the usual number of weights, which is a matter of considerable convenience, as well as economy of time.

For details of operation and equipment see opposite page.

LIST PRICES

No. 80	Style for testing to 2,000 pounds	$235.00
" 80A	" " " " 1,500 "	200.00
" 79	" " " " 1,000 "	165.00
" 79A	" " " " 500 "	130.00
" 79B	" " " " 300 "	125.00
" 79C	" " " " 200 "	120.00

Subject to discount

Ashton Improved Dead-Weight Pressure Gage Tester

Directions

For low range of pressure testing the Tester should be adjusted so as to make use of the combined large and small areas of the piston, which is done by closing the left-hand cock on the vertical pressure cylinder and opening the right-hand one. When the maximum pressure with this adjustment is obtained, and it is desired to test at higher pressures, the reverse adjustment of the cylinder cocks is made, with the left one opened and the right closed. This makes the machine operate on the small area of the piston only, and the pressure then exerted will be four times greater than before, which applies to the weight holder as well as to each of the weights. These changes of regulation can be made while the machine is in use and without taking it apart. It is necessary, however, to remove all pressure in the tester by unscrewing the handwheel before making such readjustments.

The tester should always be placed in a level position so that the weight piston will stand exactly vertical. To insure accuracy of readings, the piston should be revolved slowly to reduce any friction there might be in the cylinder. As the weights force the piston to the bottom of the cylinder, the handwheel should be screwed in more, thus raising the piston and preventing it from striking the bottom. All interior parts should be kept clean, and best results are obtained by using sperm oil or a similar light grade.

In preparing the tester for use, the three-way cock on the gage connection arm should be closed by turning the lever handle to a vertical position. The handwheel screw should be screwed into the oil reservoir as far as it will go. Then remove cap on top of vertical cylinder and slowly fill cylinder with oil, during which operation the handwheel should be gradually unscrewed until the instrument is completely filled. The gage to be tested should next be applied, and the three-way cock opened by turning lever handle horizontal to the right. The weight pistons with tray may then be inserted in the cylinder, making the tester complete and ready for use with the application of the weights.

The piston with weight holder, as well as each of the weights, is plainly marked with the pounds pressure they will exert on the gage, with double area adjustment. When the single area adjustment is being used the pressure as above stated is four times greater.

Equipment

With each tester is furnished a complete equipment of necessary weights with tools, consisting of screwdriver, oil can, gage hand puller, hand set, and six connecting nipples for attaching gages. They are all packed in two separate cases with substantial handles, so as to be easily carried.

The gage shown in cut is not furnished, being merely an illustration of a gage as applied for test.

Ashton Improved Dead-Weight Pressure Gage Tester

PRICE LIST OF PARTS

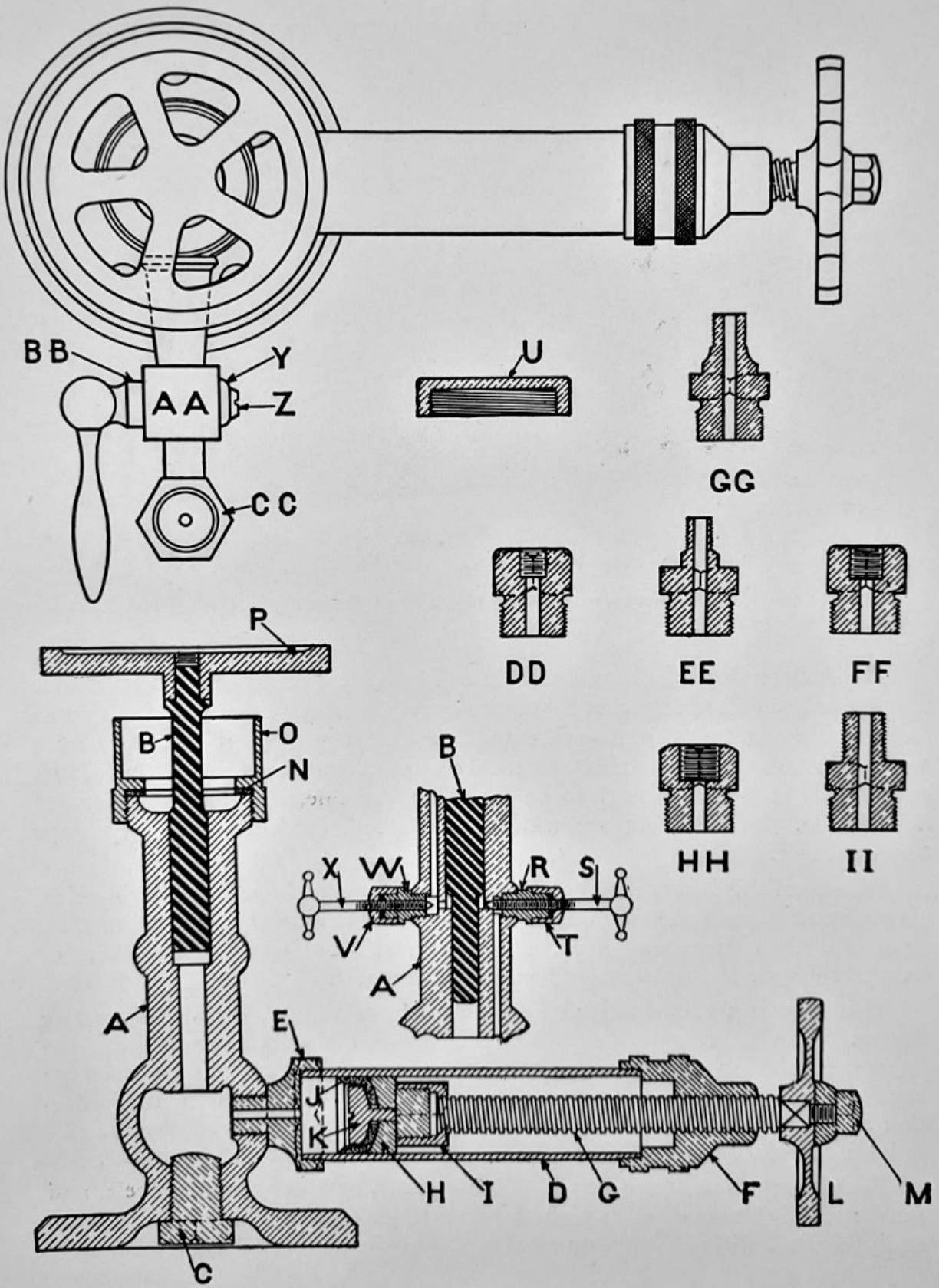
A.	Body:	
	Double Area	$15.50
	Single Area	12.50
B.	Piston:	
	Double Area	9.00
	Single Area	7.00
C.	Plug	.40
D.	Oil Cylinder	1.35
E.	Pressure End of Oil Cylinder	1.25
F.	Oil Cylinder Nut	3.25
G.	Plunger Screw	3.00
H.	Follower	.40
I.	Follower Nut	.25
J.	Cup Washer	.50
K.	Washer Screw	.35
L.	Handwheel	2.00
M.	Handwheel Nut	.35
N.	Leather Washer	.15
O.	Oil Overflow Cup	1.50
P.	Weight Holder	6.25
U.	Cover to replace O when Tester is not in use	1.25
Y.	D Washer for Three-Way Cock	.10
Z.	Screw for Three-Way Cock	.10
AA.	Three-Way Cock Body	4.00
BB.	Three-Way Cock Plug	1.00
CC.	Coupling Nut	.25
DD.	1/8 in. Female Connection	.50
EE.	1/8 in. Male Connection	.50
FF.	1/4 in. Female Connection	.40
GG.	1/4 in. Male Connection	.60
HH.	3/8 in. Female Connection	.60
I I.	3/8 in. Male Connection	.75
R.	Bonnet for Needle Valve of Pressure By-pass	.40
S.	By-pass Needle Valve	.75
T.	Packing Nut	.35
V.	Packing Nut	.35
W.	Bonnet for Atmosphere Needle Valve	.40
X.	Atmosphere Needle Valve	.75

Pressed Steel Boxes for Weights	$6.25
Pressed Steel Boxes for Instruments	18.00
1/4 pound Weights	3.25
1/2 pound Weights	3.75
1 pound Weights	5.50
2 pound Weights	5.75
4 pound Weights	6.25

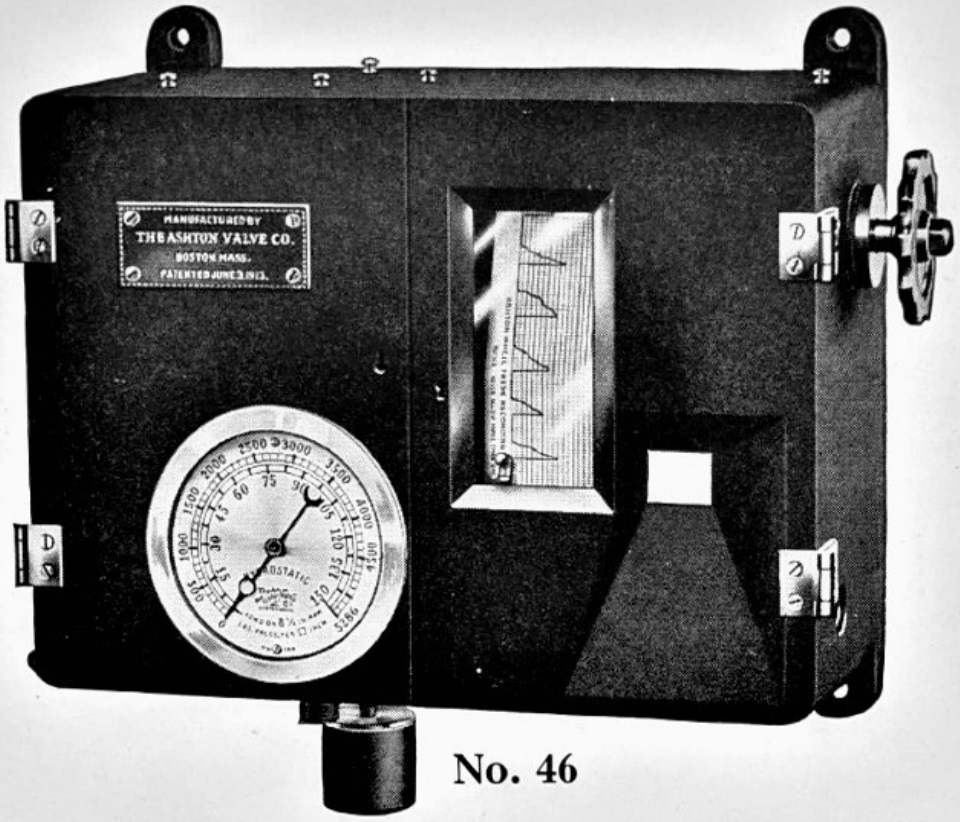
Subject to discount

Ashton Improved Dead-Weight Pressure Gage Tester

List of Parts



Ashton Wheel Press Recording Gage



No. 46

Full size of Gage, 18¾ x 13 x 9 inches

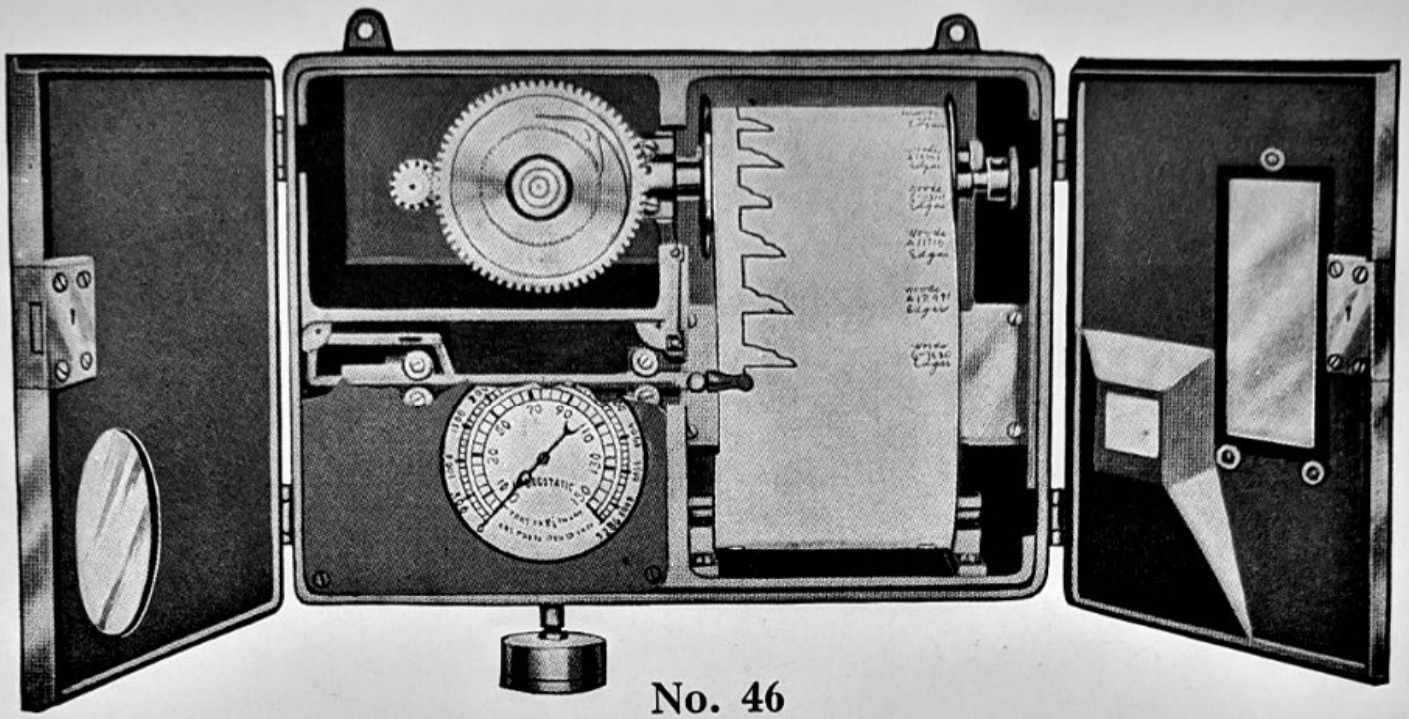
The Ashton Wheel Press Recording Gage is a meritorious safety device which has been on the market for several years, during which time it has won an enviable reputation and been extensively used by a large number of the most prominent railroads throughout the United States, as well as in foreign countries. It is guaranteed to be accurate, durable, and in every respect dependable. Trial orders are willingly accepted, subject to a sixty days approval test.

The use of this instrument insures the perfect mounting of wheels on axles, giving an accurate and indisputable record of the fit at every point from start to finish, thus furnishing a protection against loose wheels from short or irregular fits, or broken wheels from excess pressure.

This gage is a combination of a hydraulic pressure gage and a recording device. The latter operates automatically and simultaneously with the former, furnishing on a continuous record chart a diagram of each pressure application, and means for registering opposite each diagram such information as may be desired to be recorded to identify the wheel number, its size of bore, length of hub, names of fitter, pressman, and date of operation.

Each record has a capacity of 300 diagrams, or 150 pairs of wheels, and can be readily removed each night for checking and filing. New records are easily inserted without any appreciable loss of time.

Ashton Wheel Press Recording Gage



No. 46

The Capillary Glass Pen as used in Ashton Recording Gages is of exceptional merit. It is unique in design and overcomes the troubles commonly experienced with recording gage pens. It is made with platinum tube point, giving a clear, fine line record, and is noncorrosive. Its design is such that it will stand vibration and yet not throw ink. It has a large, easily filled reservoir, which obviates the necessity of frequent filling, and is so fitted to the gage that it can be refilled, as well as cleaned, without taking apart or detaching from the gage. Cleaning wires are supplied with each instrument.

The Ashton Wheel Press Recording Gage is adapted for use on any single ram wheel press.

In ordering always specify the diameter of the ram of the wheel press and the maximum pressure in tons desired. This should be based upon the regular run of work and not the capacity of the wheel press; recorders graduated to 400 tons will necessarily make a small record when used for 40 to 50 tons pressure.

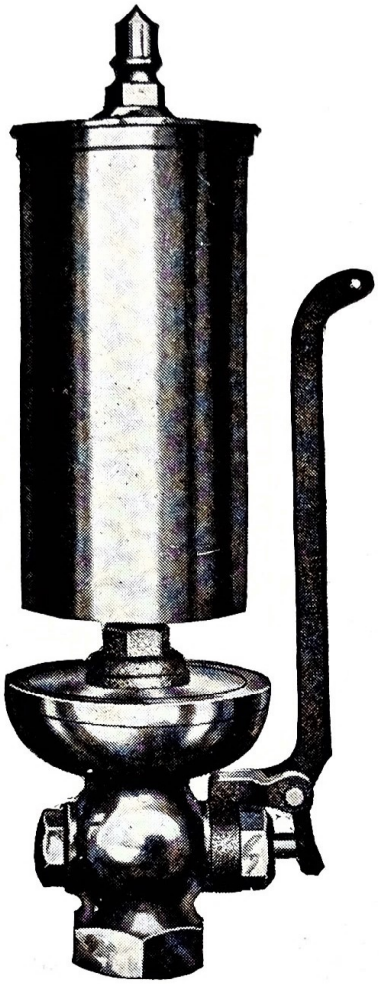
The Recorders, unless otherwise specified, are furnished for wheel presses, with the ram head or cylinder on right-hand side, facing same; if for left-hand presses, order should so specify.

Unless otherwise specified, Recorders are furnished with ruled charts graduated to 200 tons, but charts for 150, 300, or 400 tons maximum can be supplied if desired.

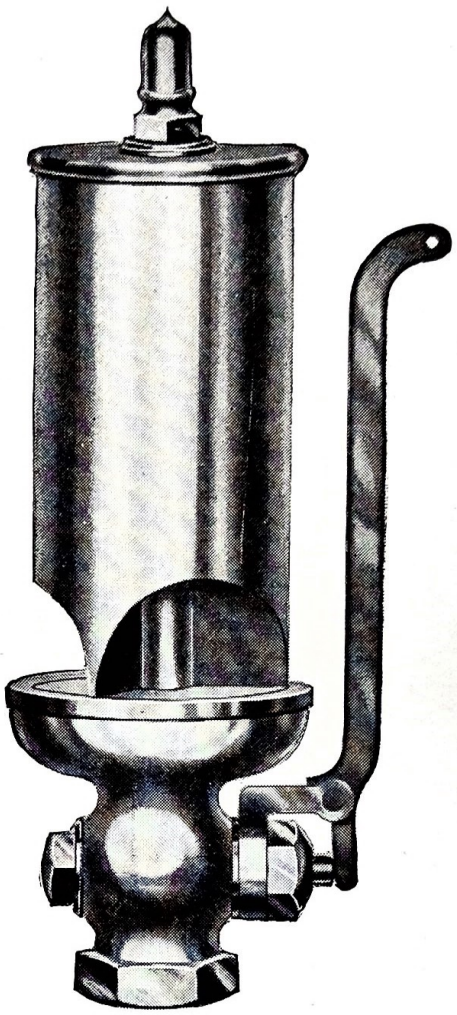
Send for Circular No. 59 giving detailed information.

PRICE ON APPLICATION

Ashton Locomotive Steam Whistles



No. 90
PLAIN WHISTLE



No. 91
CHIME WHISTLE

These whistles are particularly designed for the extreme hard service on locomotives, the bodies being extra heavy to stand the constant jar and vibration. They are made from the best steam metal and suitable for the highest pressure.

The No. 90 Plain Whistle is more often used on freight locomotives.

The No. 91 Chime Whistle is recommended for passenger locomotives and is adjusted to produce the most agreeable and penetrating tone.

LIST PRICES

Diameter of Bell	Size Steam Pipe		No. 90 Plain Whistle	No. 91 Chime Whistle
4 inch	1 inch		$ 8.00	$ 10.00
5 inch	1¼ inch		12.00	15.00
6 inch	1½ inch		16.00	20.00
7 inch	2 inch		20.00	25.00
8 inch	2½ inch		30.00	40.00
10 inch	3 inch		50.00	60.00
12 inch	3½ inch		70.00	80.00

Ashton Reversible Piston Swab

No. 47

The Ashton Piston Swab is specially designed for use on piston rods of locomotive air pumps. It is a most durable and efficient lubricator that gives an economical and satisfactory distribution of oil and is a positive protection from hot piston rods. It also serves as an effective lock nut, preventing the packing nuts on piston rods from working off.

The body is of composition metal and made in two parts substantially hinged and clamped together by a strong sheet steel spring. Each side of the body has a lever handle and by drawing them together by hand both halves of the Swab are spread apart wide enough to go over the piston rod.

Both top and bottom of the Swab are of the same construction, making it reversible, whereby in either position the oil chamber with its projected lip is always at the top where the oil is applied, from which it reaches the packing through perforations and is absorbed by it, thereby coming in contact with the piston rod.

PRICE, $2.50

Subject to discount if ordered in quantity.

When ordering always give size of piston rod or size of air pump, so proper size Swab may be furnished.

Pressure and Vacuum Gages

Ashton gages are accurate, and provide for even the slightest lack of uniformity in material or difference in movement. The dials are hand graduated individually, each dial corresponding exactly to the actual movement of the mechanism to which it is fitted. This method is more expensive, but results are more satisfactory to the user than when the dials are marked according to the average movement of springs, for the spring may or may not agree with the average.

Only the best material, most skilled, careful workmanship, and critical inspection are permissible in a factory exercising such care of graduation. It is needless to question the quality of the solid-drawn seamless brass tubes which are well seasoned to prevent setting. The pinions and arbors are of nickel silver, noncorrosive, and the entire movement is of solid construction, for *Ashton gages are dependable.*

A siphon must invariably be used with all steam gages so that nothing but water will enter the gage tube. Unless the steam gage is so protected it cannot be guaranteed. Gages used for pressure applications where there is no appreciable heat do not need a siphon.

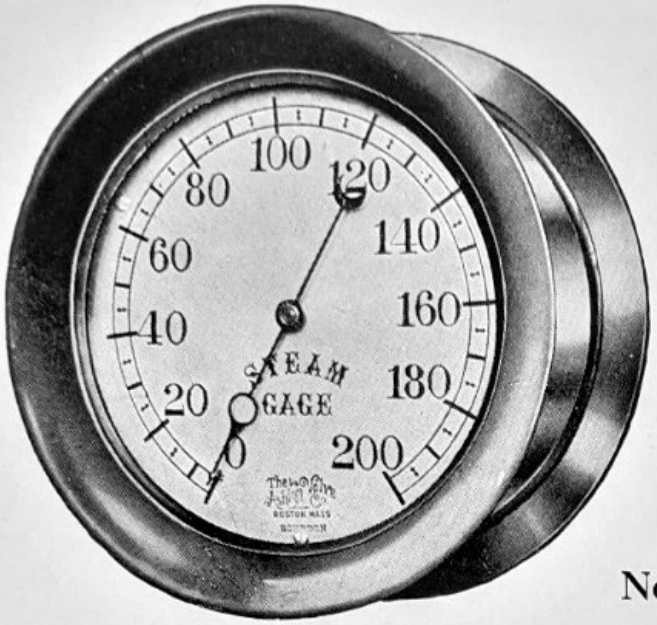
Ashton Pressure and Vacuum Gages are made in many designs to meet the varied requirements of stationary and marine practice, hydraulic work, air, gas, etc. Some have a single Bourdon spring, some the Lane double spring, while others are made with the Lane spring and Bourdon movement. The two latter reduce the vibration of the hand when used with fluctuating pressures, and also prevent freezing by automatically draining.

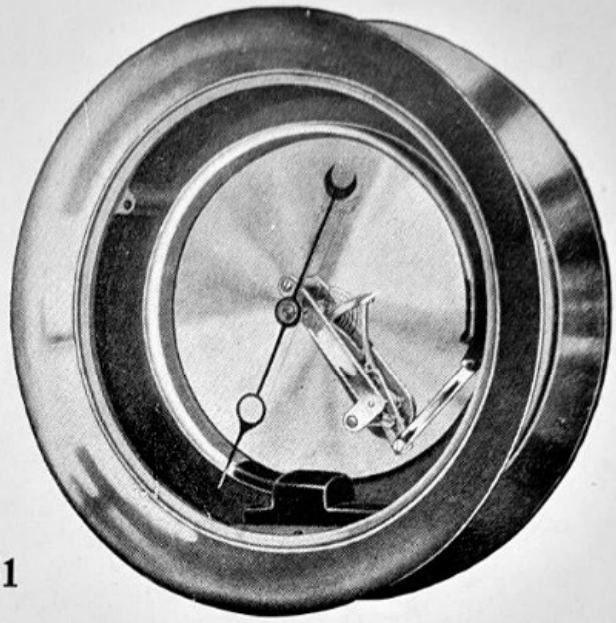
The following pages point out the distinguishing features, so that it is not difficult to select an Ashton gage exactly suited to conditions.

For standard dial graduations of Ashton Pressure Gages and approximate weights see page 143.

For General Instructions for the application, care, and maintenance of gages see page 148.

Ashton Single Spring Pressure Gage





No. 51

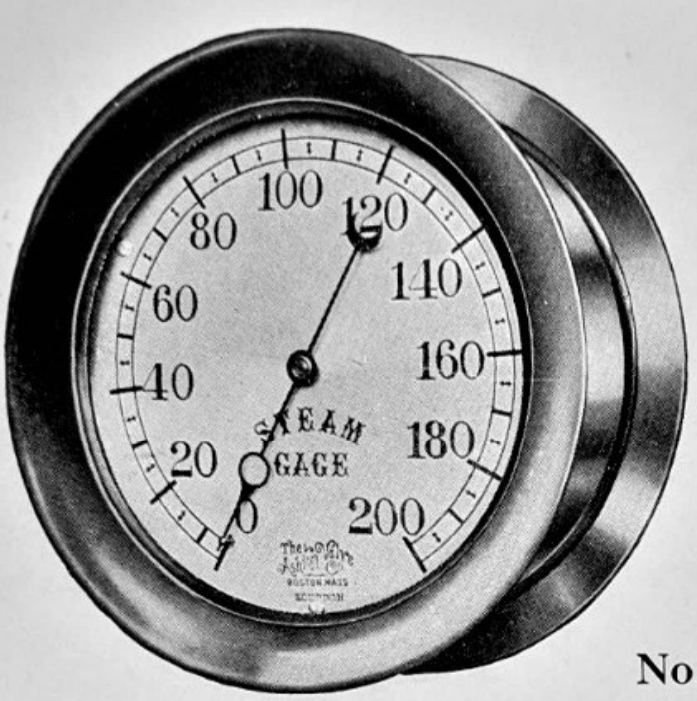
A high-grade single-spring pressure gage specially adapted and most commonly used for stationary boilers, pressure tanks, etc. It has movement of noncorrosive metal, spring of solid-drawn brass tubing, and hand-graduated dial.

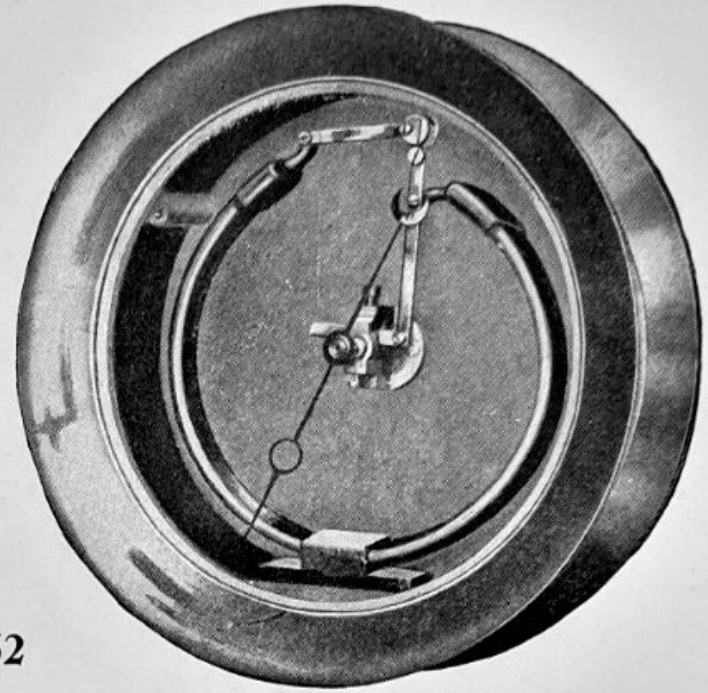
Siphons must be used with all steam gages.

LIST PRICES, INCLUDING COCK

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O.G. or Oct. Ring	N. P. Deep Case, O.G. or Oct. Ring
24 inch Dial	$200.00	$206.00	$260.00	$280.00		
20 " "	135.00	140.00	190.00	205.00		
18 " "	110.00	113.00	155.00	167.50		
16 " "	90.00	92.00	125.00	135.00		
14 " "	75.00	76.50	100.00	107.50		
12 " "	50.00	51.50	75.00	79.00	$80.00	$84.00
10 " "	32.00	33.00	40.00	43.00	44.00	47.00
8½ " "	22.00	22.75	30.00	32.50	33.50	36.00
6¾ " "	16.00	16.60	20.00	22.00	23.00	25.00
6 " "	13.00	13.50	16.00	17.50	18.50	20.00
5½ " "	10.00	10.25	12.00	13.25	13.75	15.00
5 " "	8.00	8.20	11.00	12.00	12.50	13.50
4½ " "	8.00	8.20	10.00	11.00	11.50	12.50
3½ " "	7.00	7.18	9.00	9.75	10.25	11.00
3 " "	6.00	6.15	8.00	8.60	9.25	9.75
2½ " "	6.00	6.15	8.00	8.60	9.25	9.75
2 " "	6.00	6.15	8.00	8.60	9.25	9.75

Ashton Double Spring Pressure Gage





No. 52

Extensively used in stationary, marine, pump, and hydraulic service, this gage is a distinct improvement over the ordinary single-spring gage. The double spring and movement insures the least possible vibration of the hand. The short double spring also prevents freezing. The movement, which has nickel silver pinions and arbors, is very durable.

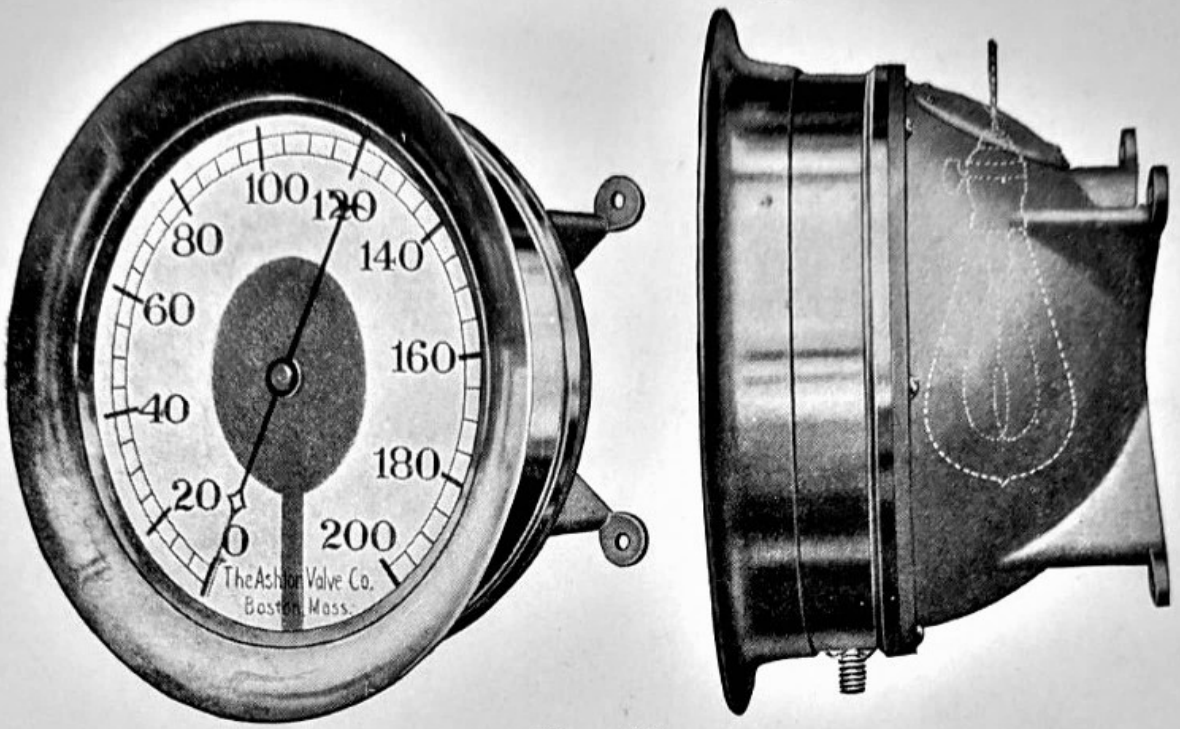
Threaded rings, O. G. or flush, facilitate repairs or adjustments. The dial is hand graduated to the individual movement of the gage.

Graduated to any desired maximum pressure up to 500 pounds per square inch.

LIST PRICES

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O.G. or Oct. Ring	N. P. Deep Case, O.G. or Oct. Ring
24 inch Dial	$230.00	$236.00	$280.00	$300.00		
20 " "	155.00	160.00	200.00	215.00		
18 " "	125.00	128.00	170.00	182.50		
16 " "	105.00	107.00	140.00	150.00		
14 " "	90.00	91.50	115.00	122.50		
12 " "	55.00	56.50	80.00	84.00	$85.00	$89.00
10 " "	37.00	38.00	45.00	48.00	49.00	52.00
8½ " "	25.00	25.75	34.00	36.50	37.50	40.00
6¾ " "	18.00	18.60	22.00	24.00	25.00	27.00
6 " "	15.00	15.50	18.00	19.50	20.75	22.25
5½ " "	12.00	12.25	14.00	15.25	16.25	17.50
5 " "	11.00	11.20	13.00	14.00	15.00	16.00
4½ " "	10.00	10.20	12.00			

Ashton Illuminated Dial Pressure Gage



No. 69

This gage is designed especially for poorly lighted boiler rooms, and for use when the steam plant is operated at night.

The incandescent electric light is placed within the bowl back of the gage case, as shown above. The light illuminates the interior and reflects onto the ground-glass dial whereby the position of the gage hand and the pressure graduations show plainly.

The gage is attached to the wall or bracket by means of the lugs on the casing, and the steam pipe is connected in the usual way.

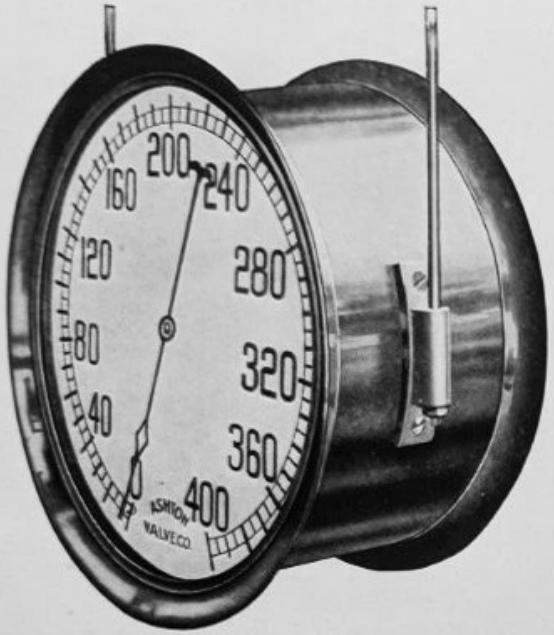
LIST PRICES, INCLUDING COCK
Single Spring, Bourdon Style

Size	Iron Case Brass Ring	Iron Case N.P. Ring	Brass Case	N.P. Case
12 inch Dial	$77.00	$79.00	$86.00	$90.00
10 " "	67.00	68.50	74.00	77.00
8½ " "	60.00	61.00	66.00	68.00

LIST PRICES, INCLUDING COCK
Double Spring, Lane Style

Size	Iron Case, Brass Ring	Iron Case, N.P. Ring	Brass Case	N.P. Case
12 inch Dial	$81.00	$83.00	$90.00	$94.00
10 " "	71.00	72.50	78.00	81.00
8½ " "	64.00	65.00	70.00	72.00

Ashton Master Pressure Gage



No. 100

This style gage is for use in large power plants where it is desired to have a gage which can readily be seen from any location, whereby the steam pressure can easily be noted from a distance when occasion requires.

When installed at the end of the boiler or engine room, only a single dial gage is required, but if located in the center of the room, the double dial gage is necessary. To provide for poorly lighted applications, or for night service, these gages are made with special illuminated dial of opal glass, and so arranged that electric lamps may be inserted inside the gage case, from which the light is reflected through the dial, making it possible to see the indicating hand and pressure marks at all times. The above illustration shows the double dial gage made with the usual support brackets furnished with this style.

The Ashton Standard Master Pressure Gage is made in the sizes as below mentioned, which are considerably larger than the ordinary commercial pressure gage.

LIST PRICES

	18 inch Dial Size			24 inch Dial Size		
	Iron Case	Brass Case	N. P. Case	Iron Case	Brass Case	N. P. Case
With Single Plain Dial	$100.00	$125.00	$140.00	$135.00	$165.00	$185.00
With Double Plain Dials	150.00	190.00	215.00	190.00	245.00	275.00
With Single Illuminated Dial	120.00	145.00	160.00	160.00	190.00	210.00
With Double Illuminated Dials	180.00	220.00	245.00	225.00	280.00	310.00

Ashton Master Pilot Pressure Gage

No. 100 A

The Ashton Pilot Gage, as above shown, differs from the Standard Master Gage by having the dial graduated to show only the limited pressure scale, such as would be included in the ordinary range of working pressure. Consequently it is made with a special operating mechanism by which the movement of the registering hand is discontinued for the lower pressures that are below the minimum graduation on the dial. The advantage of this special form of gage is that the dial can be graduated with wide space divisions between the pressure marks, and the figures are considerably larger in size. This enables the slightest variation of pressure to be quite noticeable, and the reading of the gage to be otherwise readily observed.

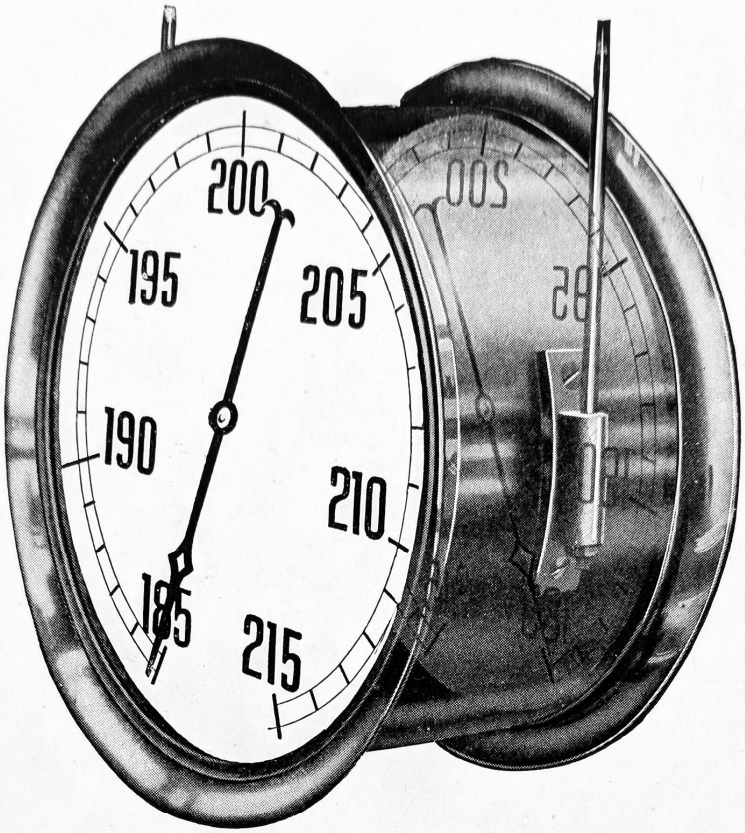
This gage, when connected to the main steam pipe from a battery of boilers, serves as a firing gage, enabling the operator of the boilers to run them at a closer and steadier maximum pressure than is possible from the ordinary boiler pressure gages, thus obtaining a correspondingly increased efficiency.

It is made with single or double face, plain or illuminated dials. That shown in the illustration is the double dial style, with the usual support brackets. The multiple tube construction in this gage is an exclusive feature insuring increased flexibility of operation and greatest durability.

LIST PRICES

	18 inch Dial Size			24 inch Dial Size		
	Iron Case	Brass Case	N. P. Case	Iron Case	Brass Case	N. P. Case
With Single Plain Dial	$110.00	$135.00	$150.00	$145.00	$175.00	$195.00
With Double Plain Dials	170.00	210.00	235.00	210.00	265.00	295.00
With Single Illuminated Dial	130.00	155.00	170.00	170.00	200.00	220.00
With Double Illuminated Dials	200.00	240.00	265.00	245.00	300.00	330.00

Ashton Master Pilot Pressure Gage



No. 100 A

The Ashton Pilot Gage, as above shown, differs from the Standard Master Gage by having the dial graduated to show only the limited pressure scale, such as would be included in the ordinary range of working pressure. Consequently it is made with a special operating mechanism by which the movement of the registering hand is discontinued for the lower pressures that are below the minimum graduation on the dial. The advantage of this special form of gage is that the dial can be graduated with wide space divisions between the pressure marks, and the figures are considerably larger in size. This enables the slightest variation of pressure to be quite noticeable, and the reading of the gage to be otherwise readily observed.

This gage, when connected to the main steam pipe from a battery of boilers, serves as a firing gage, enabling the operator of the boilers to run them at a closer and steadier maximum pressure than is possible from the ordinary boiler pressure gages, thus obtaining a correspondingly increased efficiency.

It is made with single or double face, plain or illuminated dials. That shown in the illustration is the double dial style, with the usual support brackets. The multiple tube construction in this gage is an exclusive feature insuring increased flexibility of operation and greatest durability.

LIST PRICES

	18 inch Dial Size			24 inch Dial Size		
	Iron Case	Brass Case	N. P. Case	Iron Case	Brass Case	N. P. Case
With Single Plain Dial	$110.00	$135.00	$150.00	$145.00	$175.00	$195.00
With Double Plain Dials . . .	170.00	210.00	235.00	210.00	265.00	295.00
With Single Illuminated Dial .	130.00	155.00	170.00	170.00	200.00	220.00
With Double Illuminated Dials	200.00	240.00	265.00	245.00	300.00	330.00

Ashton Improved Vacuum Gage

No. 53

In this gage the spring and movement is the same as in our single-spring pressure gage No. 51; but the spring is reversed to indicate vacuum. Ordinarily this gage is graduated to 30 inches of mercury.

When so specified it will be graduated to pounds equivalent to inches of mercury.

LIST PRICES, INCLUDING COCK

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O. G. or Oct. Ring	N. P. Deep Case, O. G. or Oct. Ring
24 inch Dial	$200.00	$206.00	$260.00	$280.00		
20 " "	135.00	140.00	190.00	205.00		
18 " "	110.00	113.00	155.00	167.50		
16 " "	90.00	92.00	125.00	135.00		
14 " "	75.00	76.50	100.00	107.50		
12 " "	50.00	51.50	75.00	79.00	$80.00	$84.00
10 " "	32.00	33.00	40.00	43.00	44.00	47.00
8½ " "	22.00	22.75	30.00	32.50	33.50	36.00
6¾ " "	16.00	16.60	20 00	22 00	23.00	25.00
6 " "	13.00	13.50	16.00	17.50	18.50	20.00
5½ " "	10.00	10.25	12.00	13.25	13.75	15.00
5 " "	8.00	8.20	11.00	12.00	12.50	13.50
4½ " "	8.00	8.20	10.00	11 00	11.50	12.50
3½ " "	7.00	7.18	9.00	9.75	10.25	11.00
3 " "	6.00	6.15	8.00	8.60	9.25	9.75
2½ " "	6.00	6.15	8.00	8.60	9 25	9.75
2 " "	6.00	6.15	8.00	8.60	9.25	9.75

Ashton Compound Pressure and Vacuum Gage

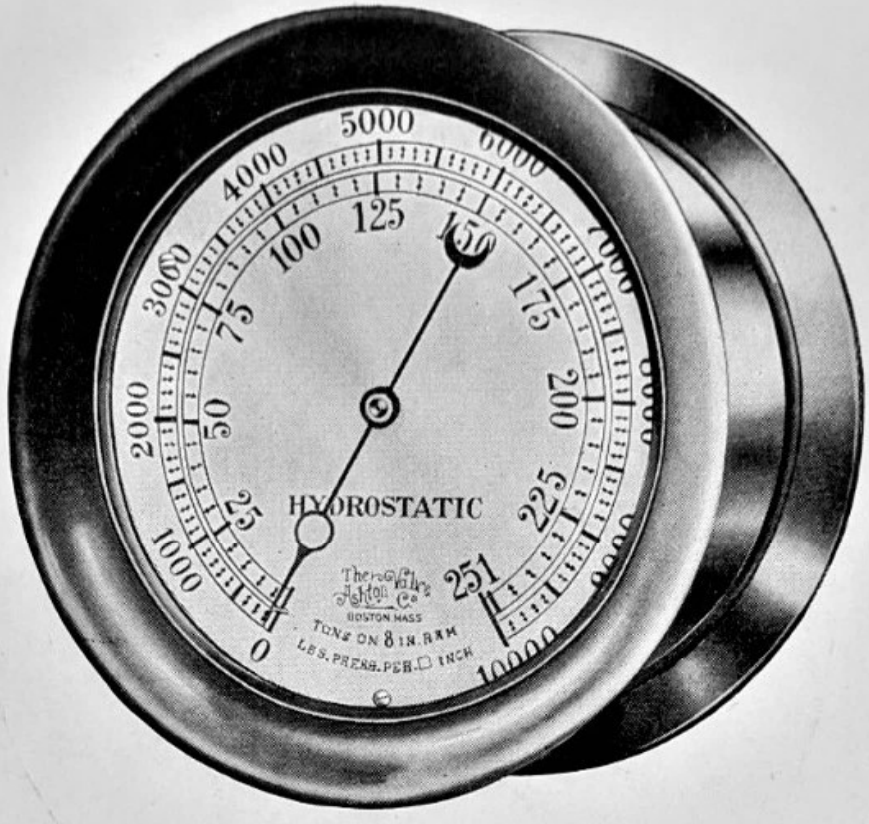
No. 54

This gage indicates either pressure or vacuum and is graduated in pounds per square inch for pressure and inches of mercury for vacuum. Regularly graduated to 15 pounds pressure and 30 inches vacuum, but can be graduated to any pressure or vacuum specified.

LIST PRICES INCLUDING COCK

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O.G. or Oct. Ring	N. P. Deep Case, O. G. or Oct. Ring
12 inch Dial	$60.00	$61.50	$80.00	$84.00	$85.00	$89.00
10 " "	40.00	41.00	50.00	53.00	54.00	57.00
8½ " "	30.00	30.75	40.00	42.50	43.50	46.00
6¾ " "	20.00	20.60	25.00	27.00	28.00	30.00
6 " "	16.00	16.50	20.00	21.50	23.00	24.50
5½ " "	14.00	14.25	16.00	17.25	18.50	19.75
5 " "	14.00	14.25	16.00	17.25	18.50	19.75
4½ " "	12.00	12.20	14.00	15.00	16.00	17.00
3½ " "	10.00	10.18	12.00	12.75	13.75	14.50

Ashton Hydraulic Pressure Gage



No. 55

This gage with special bored tool steel spring is for indicating pressures above 1,000 pounds. These gages are accurate and durable.

When ordering state maximum pressure; and if dial is also to show pressure in tons on ram, give exact diameter of ram.

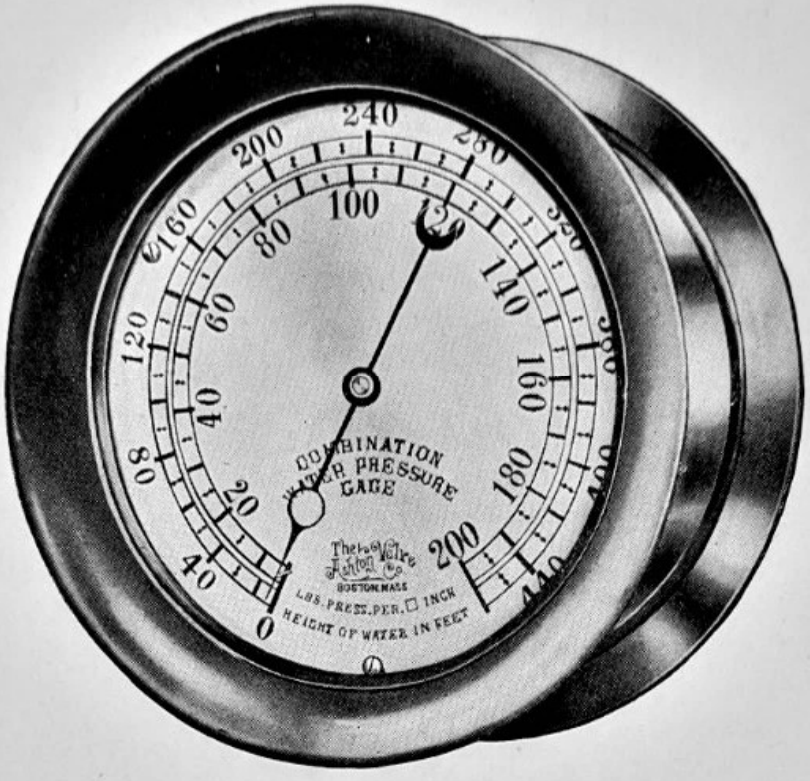
LIST PRICES

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case
12 inch Dial	$110.00	$111.50	$125.00	$129.00
10 " "	90.00	91.00	100.00	103.00
8½ " "	70.00	70.75	80.00	82.50
6¾ " "	50.00	50.60	60.00	62.00
6 " "	35.00	35.50	40.00	41.50
5 " "	30.00	30.50	35.00	36.00
4½ " "	25.00	25.50	30.00	31.00

Subject to discounts

No extra charge for marking tons on ram on dials. For maximum hands add $5.00 to list price. Special prices on Bourdon Brass Tube Hydraulic Gages for pressure not over two thousand pounds.

Ashton Combination Water Pressure Gage



No. 56

This gage is used principally in pumping stations, water works, service pipes, etc. It has double graduated dial so that the one dial shows pressure in pounds per square inch and corresponding height of water column.

Can be graduated for any pressure. In ordering, maximum pressure or maximum height of water should be stated.

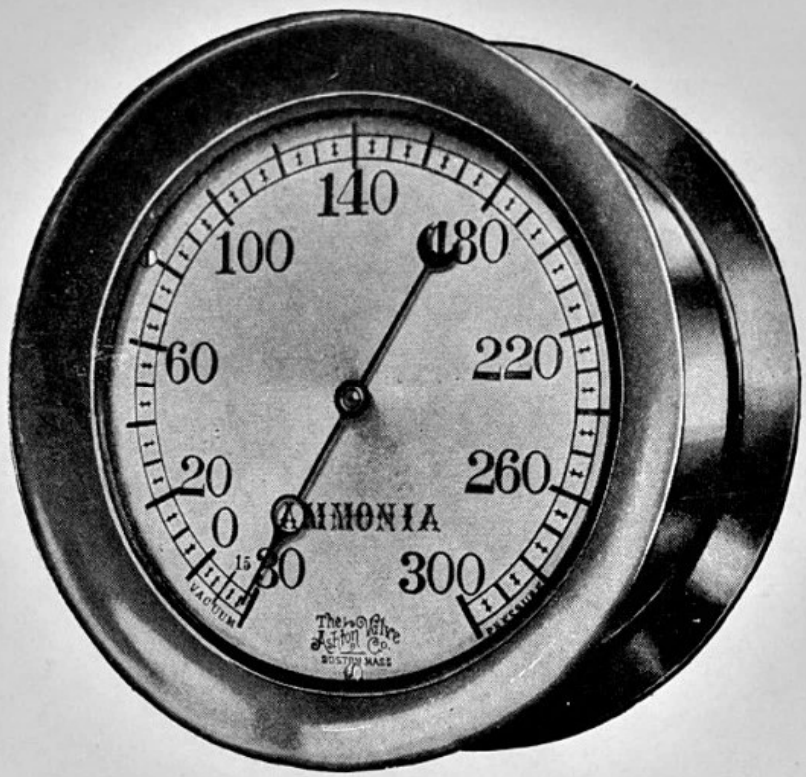
No siphon is needed.

LIST PRICES, INCLUDING COCK

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O. G. or Oct. Ring	N. P. Deep Case, O. G. or Oct. Ring
12 inch Dial	$60.00	$61.50	$80.00	$84.00	$85.00	$89.00
10 " "	40.00	41.00	50.00	53.00	54.00	57.00
8½ " "	30.00	30.75	40.00	42.50	43.50	46.00
6¾ " "	20.00	20.60	25.00	27.00	28.00	30.00
6 " "	16.00	16.50	20.00	21.50	23.00	24.50
5½ " "	14.00	14.25	16.00	17.25	18.50	19.75
4½ or 5 "	12.00	12.20	14.00	15.00	16.00	17.00

To raise a column of mercury 2.04 inches, or to raise a column of water 27.67 inches, requires one pound pressure.

Ashton Ammonia Gage



No. 57

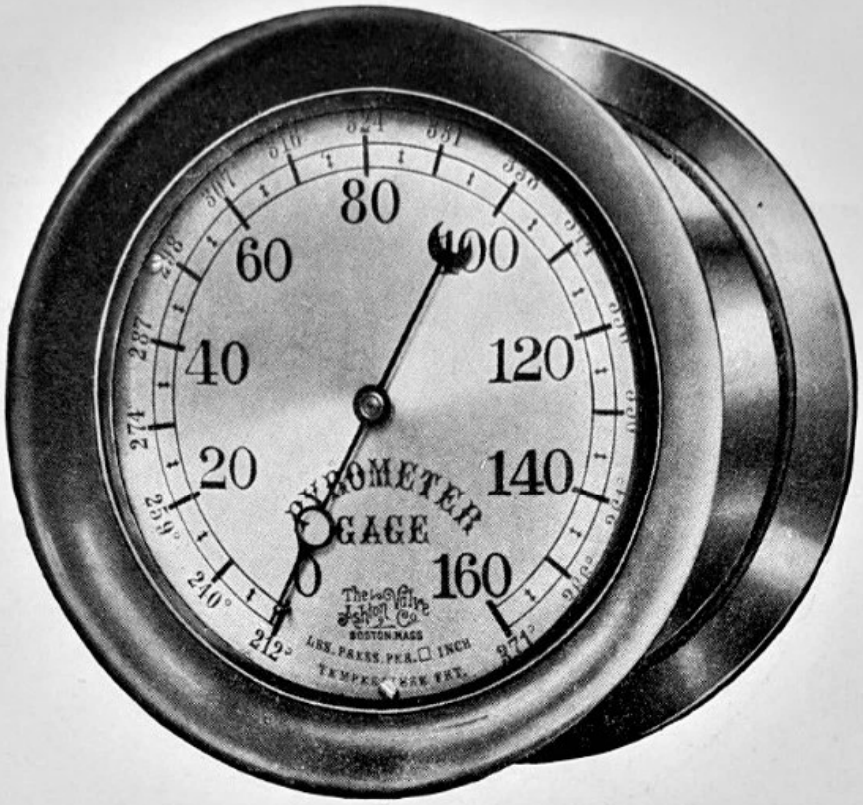
Made especially for use with ammonia or any other gas or liquid which attacks the brass spring of ordinary gages. The spring is of steel and all other interior parts are of iron.

When so specified, these gages will be graduated to indicate both pressure and vacuum on the same dial, but ordinarily they show pressure only.

LIST PRICES

Size	Iron Case N. P. Ring	Brass Case	N. P. Case
12 inch Dial	$79.50	$98.00	$102.00
10 " "	58.00	68.00	71.00
8½ " "	45.75	55.00	57.50
6¾ " "	40.60	45.00	47.00
6 " "	35.50	39.00	40.50
5½ " "	30.50	33.00	34.25
5 " "	30.50	33.00	34.25
4½ " "	25.50	27.00	28.00
3½ " "	25.50	27.00	28.00

Ashton Pyrometer Steam Gage



No. 58

The inner circle on the dial of this gage is graduated in pounds per square inch in the usual way and the outer circle in corresponding degrees of heat, Fahrenheit. This is convenient wherever both pressure and temperature should be read simultaneously.

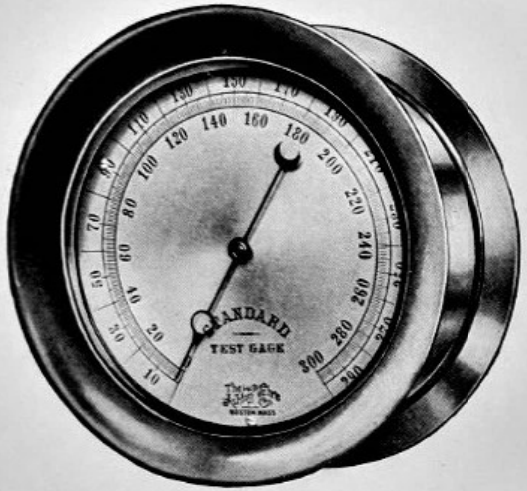
In ordering state maximum pressure.

A siphon must be used.

LIST PRICES, INCLUDING COCK

Size	Iron Case Japanned	Iron Case N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O. G. or Oct. Ring	N. P. Deep Case, O. G. or Oct. Ring
12 inch Dial	$60.00	$61.50	$80.00	$84.00	$85.00	$89.00
10 " "	40.00	41.00	50.00	53.00	54.00	57.00
8½ " "	30.00	30.75	40.00	42.50	43.50	46.00
6¾ " "	20.00	20.60	25.00	27.00	28.00	30.00
6 " "	16.00	16.50	20.00	21.50	23.00	24.50

Ashton Standard Test Gage



No. 59

The Ashton Standard Test Gage is unexcelled for accuracy and sensitiveness; it can be relied upon always, whether used for testing other gages or for indicating pressure under conditions calling for extreme precision.

Every care is exercised both in workmanship and selection of material, and the test is the most exacting that can be applied. Each gage is tested by Dead Weight Gage Tester and scaled in one-pound marks.

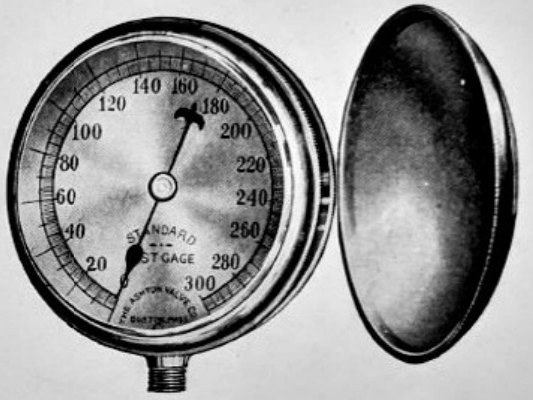
Regularly graduated to 300 pounds, but can be graduated to any desired pressure.

LIST PRICES, INCLUDING COCK

Size	Brass Case	N. P. Case
10 inch Dial	$50.00	$53.00
8½ " "	40.00	42.50
6¾ " "	30.00	32.00
6 " "	25.00	26.50
5½ " "	20.00	21.25
4½ " "	16.00	17.00
3½ " "	14.00	14.75
3 " "	14.00	14.60

For small Pocket Test Gages see page 125.

Ashton Standard Pocket Test Gage



No. 59 A.

This neat, light test gage is adapted for boiler inspectors, chief engineers, master mechanics, and air brake inspectors. It has Ashton quality throughout — spring of solid-drawn seamless tubing, non-corrosive movement, and hand-graduated dial.

A bevel plate glass front with cover insures perfect protection whether carried in the pocket or in the tool box.

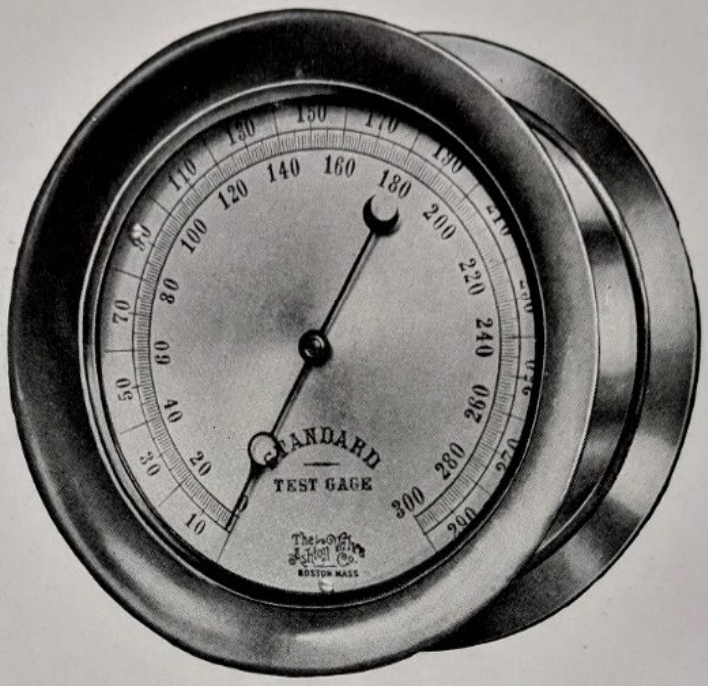
It is made in 3 inch size, graduated for any pressure up to and including 500 pounds, with solid brass, nickel-plated, or aluminum case and cover.

Dials for 300 pounds maximum and less are graduated in one-pound marks; for greater maximum, in two-pound marks.

LIST PRICES

Size	Brass Case	N. P. Case	Aluminum Case
3 inch Dial	$14.00	$14.60	$15.50
Weight ounces	16	16	10

Ashton Standard Test Gage



No. 59

The Ashton Standard Test Gage is unexcelled for accuracy and sensitiveness; it can be relied upon always, whether used for testing other gages or for indicating pressure under conditions calling for extreme precision.

Every care is exercised both in workmanship and selection of material, and the test is the most exacting that can be applied. Each gage is tested by Dead Weight Gage Tester and scaled in one-pound marks.

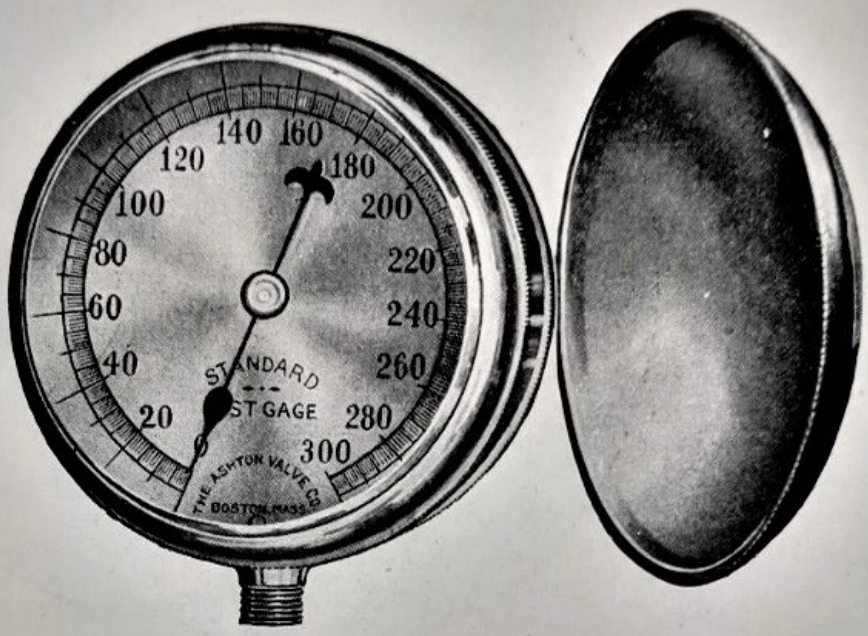
Regularly graduated to 300 pounds, but can be graduated to any desired pressure.

LIST PRICES, INCLUDING COCK

Size	Brass Case	N. P. Case
10 inch Dial	**$50.00**	**$53.00**
8½ " "	**40.00**	**42.50**
6¾ " "	**30.00**	**32.00**
6 " "	**25.00**	**26.50**
5½ " "	**20.00**	**21.25**
4½ " "	**16.00**	**17.00**
3½ " "	**14.00**	**14.75**
3 " "	**14.00**	**14.60**

For small Pocket Test Gages see page 125.

Ashton Standard Pocket Test Gage



No. 59 A.

This neat, light test gage is adapted for boiler inspectors, chief engineers, master mechanics, and air brake inspectors. It has Ashton quality throughout — spring of solid-drawn seamless tubing, non-corrosive movement, and hand-graduated dial.

A bevel plate glass front with cover insures perfect protection whether carried in the pocket or in the tool box.

It is made in 3 inch size, graduated for any pressure up to and including 500 pounds, with solid brass, nickel-plated, or aluminum case and cover.

Dials for 300 pounds maximum and less are graduated in one-pound marks; for greater maximum, in two-pound marks.

LIST PRICES

Size	Brass Case	N. P. Case	Aluminum Case
3 inch Dial	$14.00	$14.60	$15.50

Ashton Altitude Gage

No. 60

Designed for indicating both the actual and required water level in tanks, standpipes, reservoirs, and the expansion tanks of hot-water heating systems.

The red hand, called the index or lazy hand, is fixed when the gage is put in place and shows the water level that should be maintained. The black hand, operated by the gage spring and mechanism, shows the actual height of water and the fluctuations. The red hand is independent of the movement of the black hand.

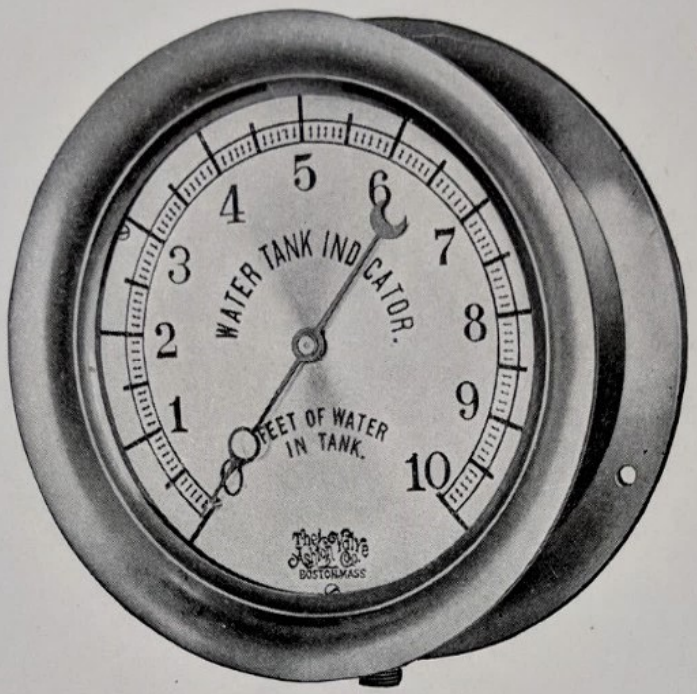
The dial is graduated in feet of water column.

LIST PRICES, INCLUDING COCK

Size	Iron Case Brass Ring	Iron Case N. P. Ring	Brass Case	N. P. Case	Brass Deep Case, O. G. or Oct. Ring	N. P. Deep Case, O. G. or Oct. Ring
12 inch Dial	$60.00	$61.50	$80.00	$84.00	$85 00	$89.00
10 " "	40.00	41.00	50.00	53.00	54.00	57.00
8½ " "	30.00	30.75	40.00	42.50	43.50	46.00
6¾ " "	20.00	20.60	25.00	27.00	28.00	30.00
6 " "	16.00	16.50	20.00	21.50	23.00	24.50
5½ " "	14.00	14.25	16.00	17.25	18.50	19.75
4½ or 5 "	12.00	12.20	14.00	15.00	16.00	17.00

Ashton Water Tank Indicator

Altitude Gage



No. 60 A.

The special design altitude gage, as above illustrated, is particularly adapted for use on standpipes, reservoirs, or similar installations where it is desired to have an indicator gage that will show the exact height of water in feet and inches at any time.

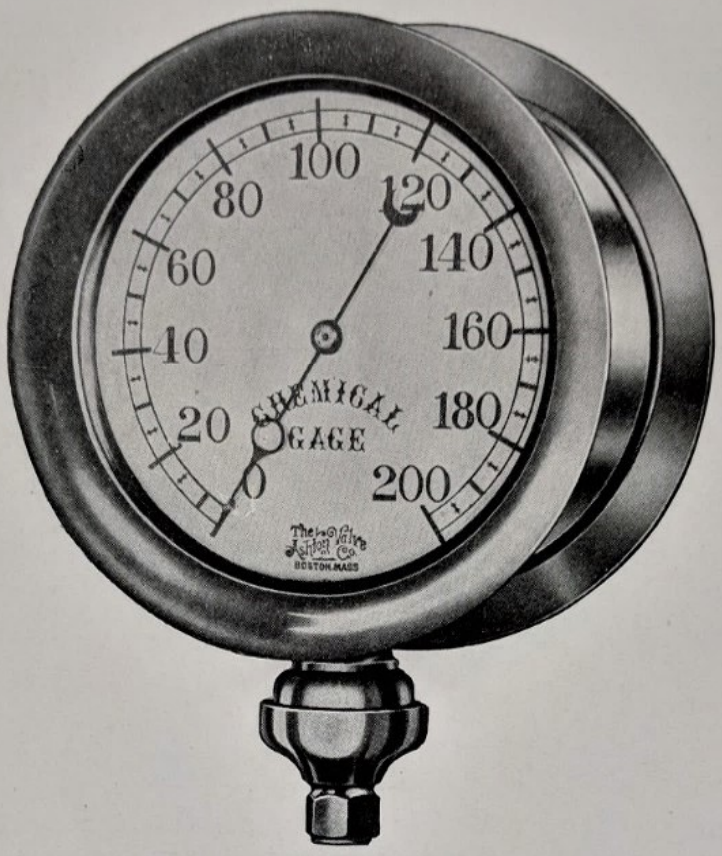
This gage is so made that, regardless of the application, it will register only whatever may be the height of water in the tank or reservoir. This is accomplished by means of a slide adjustment of the gage-operating mechanism, whereby the difference in elevation between the location of the gage and that of the tank is equalized. The gage hand does not operate until the water rises above the bottom of the tank or reservoir.

In ordering this type of gage it is necessary to specify the exact height that the gage is located below the bottom of the tank or reservoir, and also in order to have the dial properly graduated the maximum height of water level in tank should be given.

LIST PRICES INCLUDING COCK

Size	Iron Case Japanned	Iron Case N. P. Ring	Brass Case	N. P. Case
12 inch Dial	$60.00	$61.50	$80.00	$84.00
10 " "	40.00	41.00	50.00	53.00
8½ " "	30.00	30.75	40.00	42.50
6¾ " "	20.00	20.60	25.00	27.00

Ashton Chemical Pressure Gage



No. 61

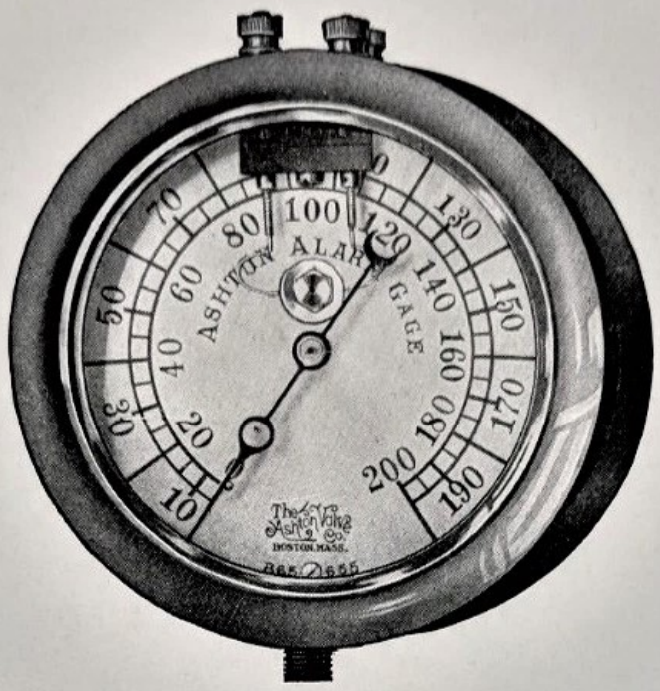
This gage is designed especially for service where the springs of ordinary gages require protection from the corroding action of liquids and chemicals.

The pressure acts on a tapered volute, or coiled steel spring, which is protected by an elastic diaphragm from direct contact with the liquid or gas. It is so constructed that it can be repaired easily.

LIST PRICES

Size	Iron Case Brass Ring	Iron Case N. P. Ring	Brass Case	N. P. Case
12 inch Dial	$78.00	$79.50	$98.00	$102.00
10 " "	57.00	58.00	68.00	71.00
8½ " "	45.00	45.75	55.00	57.50
6¾ " "	40.00	40.60	45.00	47.00
6 " "	35.00	35.50	39.00	40.50
5½ " "	30.00	30.50	33.00	34.25
5 " "	30.00	30.50	33.00	34.25
4½ " "	25.00	25.50	27.00	28.00

The Ashton Alarm Gage



No. 78

The Ashton Alarm Gage is constructed for pressure or vacuum, and is fitted with an electric circuit closing device adjusted to establish contacts at any desired high and low points, for operating a signal or bell located at a distance from the gage. When desired the gage is constructed with only single contact to operate at either high or low point.

This gage is adapted for use on dry pipe sprinkler systems. It takes the place of the usual air gage, and by its use a timely warning is given of over or under pressure, thus limiting the damage and loss caused by unnecessary flooding, due to leaks or accidents, when there is no fire.

It is also extensively used in connection with automatic pumping systems, digesters, vulcanizers, vacuum dryers, etc., where an automatic alarm is desired for either high or low pressure or both.

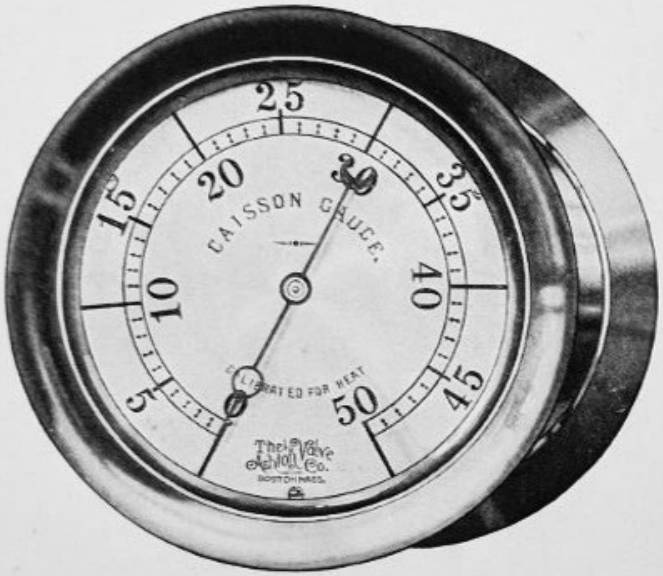
This gage may be used with AC or DC current up to 220 volts. We recommend, however, the use of either dry cells or storage battery.

Orders should specify maximum working pressure, also alarm points for contacts.

LIST PRICES

Size	Iron Case Brass Ring	Brass Case	Nickel-Plated Case
5 inch Dial	**$20.00**	**$25.00**	**$26.00**

Ashton Caisson Pressure Gage



No. 95

This gage is an exclusive Ashton production, especially adapted to caisson service, indicating the air pressure maintained. It is carefully calibrated to give accurate readings by making allowance for the increased temperature of compressed air.

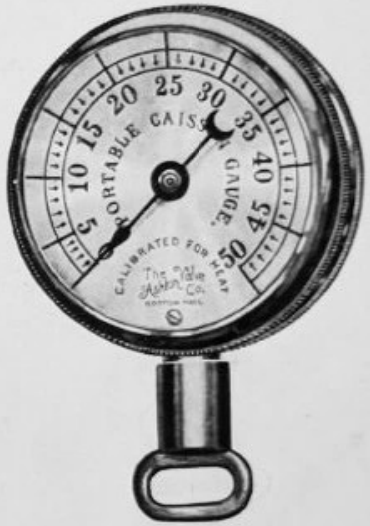
It does not require any piping connection, being self-contained and operated entirely by the atmospheric pressure surrounding it. Its location may therefore be at any convenient place in the caisson.

The spring and movement is of Ashton quality and the dial figures are large and prominent for easy reading from a distance, it being possible to place the gage at any convenient location most desired.

LIST PRICES

Size	Brass Case	Nickel-Plated Case	Aluminum Case
6 inch Dial	$31.00	$32.50	$34.00
Weight, pounds	6	6	4

Ashton Pocket Caisson Pressure Gage



No. 95 A.

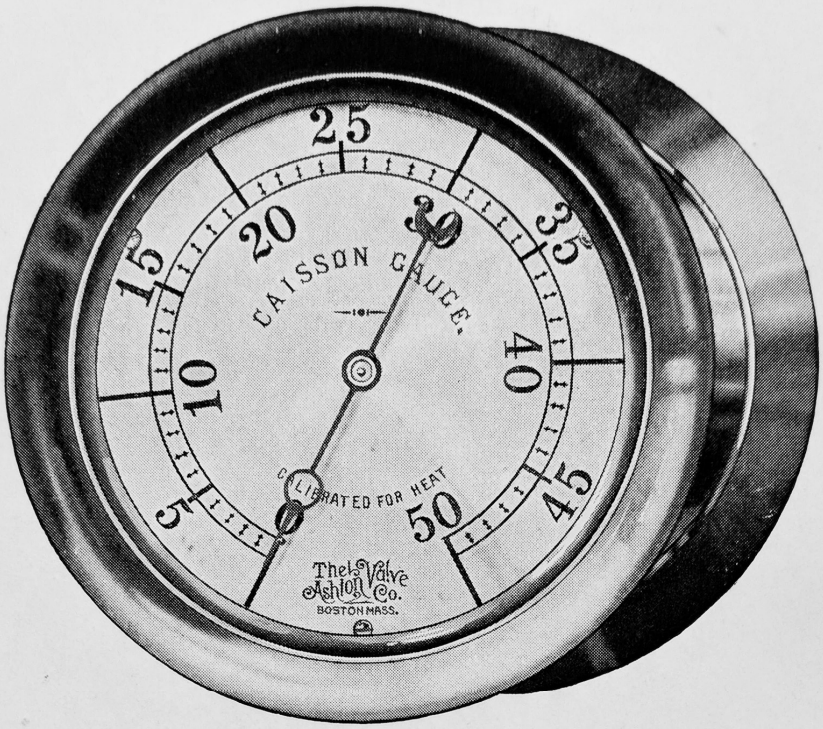
This special design of Caisson Gage, with bevel glass and flush case, is fitted with loop holder, by means of which it may be conveniently hung around the neck of the workman, thus leaving both hands free. This gage may also be carried in the pocket and besides is free from projecting parts which catch on the clothing.

It is a miniature of Caisson Gage No. 95 and is made only in the 2½ inch dial size, either brass, nickel plated, or aluminum case, and is accurately adjusted and calibrated for heat.

LIST PRICES

	Brass Case	Nickel-Plated Case	Aluminum Case
2½ inch Dial	$18.00	$18.75	$19.25
Weight	1 pound	1 pound	7 ounces

Ashton Caisson Pressure Gage



No. 95

This gage is an exclusive Ashton production, especially adapted to caisson service, indicating the air pressure maintained. It is carefully calibrated to give accurate readings by making allowance for the increased temperature of compressed air.

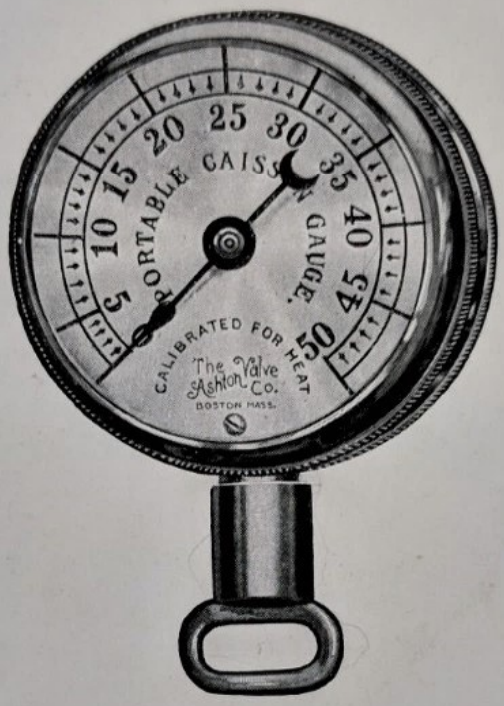
It does not require any piping connection, being self-contained and operated entirely by the atmospheric pressure surrounding it. Its location may therefore be at any convenient place in the caisson.

The spring and movement is of Ashton quality and the dial figures are large and prominent for easy reading from a distance, it being possible to place the gage at any convenient location most desired.

LIST PRICES

Size	Brass Case	Nickel-Plated Case	Aluminum Case
6 inch Dial	**$31.00**	**$32.50**	**$34.00**
Weight, pounds	**6**	**6**	**4**

Ashton Pocket Caisson Pressure Gage



No. 95 A.

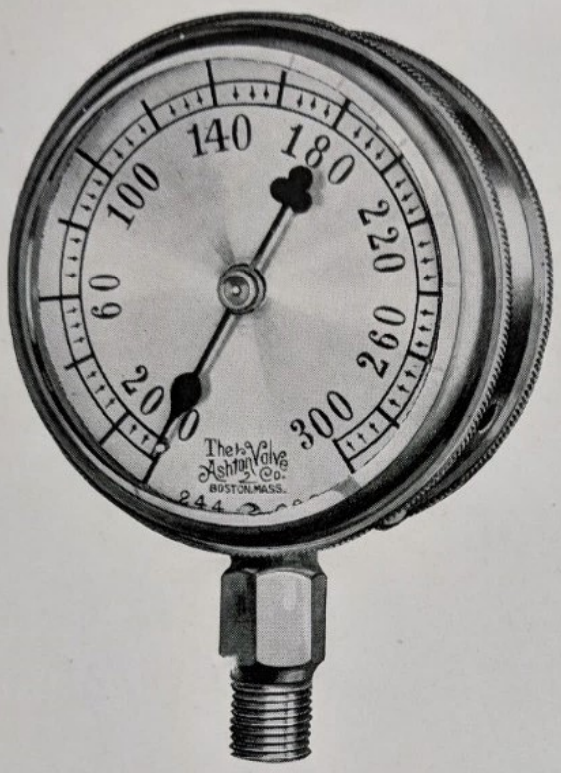
This special design of Caisson Gage, with bevel glass and flush case, is fitted with loop holder, by means of which it may be conveniently hung around the neck of the workman, thus leaving both hands free. This gage may also be carried in the pocket and besides is free from projecting parts which catch on the clothing.

It is a miniature of Caisson Gage No. 95 and is made only in the 2½ inch dial size, either brass, nickel plated, or aluminum case, and is accurately adjusted and calibrated for heat.

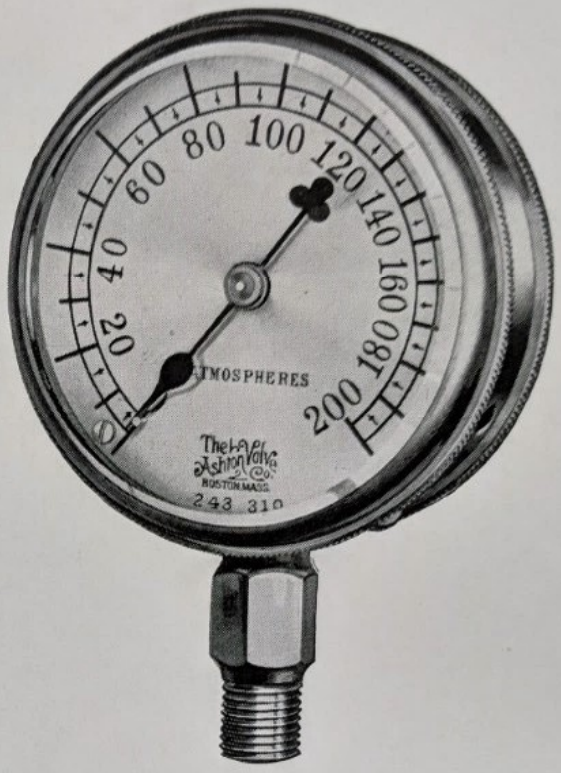
LIST PRICES

	Brass Case	Nickel-Plated Case	Aluminum Case
2½ inch Dial	**$18.00**	**$18.75**	**$19.25**
Weight	**1 pound**	**1 pound**	**7 ounces**

Ashton Oxy-Acetylene Gas Pressure Gages



No. 96



No. 97

The two styles of pressure gages above shown are those commonly required for oxy-acetylene apparatus. They are durable in construction, accurately graduated, and embody the best quality of material and workmanship. They are made with heavy hexagon sockets ¼ inch size, making it easily possible to screw them tightly onto their connections without straining the gage case.

Style No. 96 is graduated in pounds pressure per square inch to any desired maximum for the reduced pressure line.

Style No. 97 is for high cylinder pressure service, and with dial graduated in atmospheres, as above shown, and if desired with corresponding pounds pressure per square inch or to show the equivalent in cubic feet of gas in the cylinder.

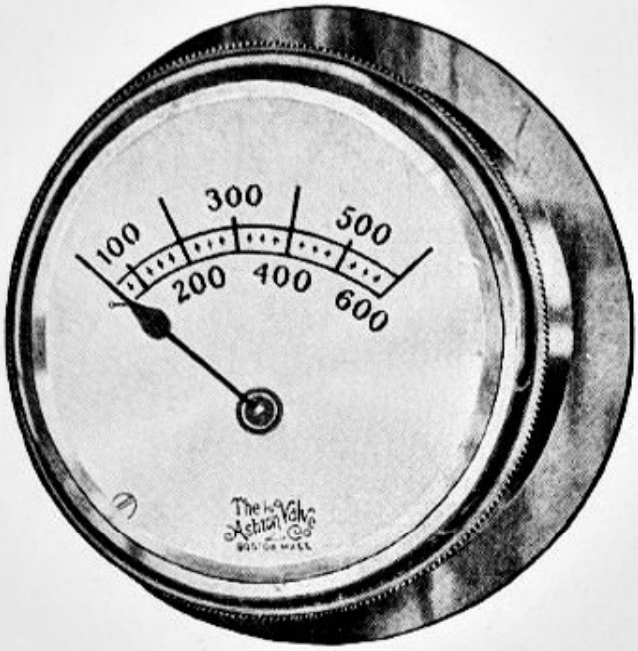
Both gages are, as a matter of safety, made with vented cases to prevent any appreciable accumulation of pressure within the gage case in the event of leak or rupture in the tube from overpressure, or otherwise. The No. 97 style has special spring safety back, giving enlarged vent, and is also furnished, if desired, with celluloid instead of glass face.

Acetylene gages should be graduated to double the highest working pressure to insure greatest durability. To avoid danger they should be thoroughly cleaned from oil both on their connections as well as interior parts. No cocks are furnished with these Gages.

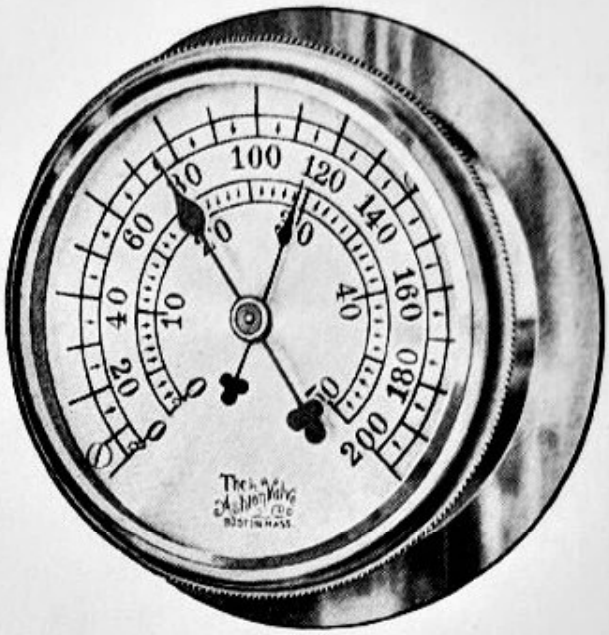
LIST PRICES

No. 96 Style				No. 97 Style			
Size	Iron Case Brass Ring	Brass Case	N. P. Case	Size	Iron Case Brass Ring	Brass Case	N. P. Case
3 inch Dial	$9.00	$10.50	$11.00	3½ in. Dial	$12.50	$14.50	$15.00
2½ " "	8.00	9.50	10.00	3 " "	11.50	13.00	13.50
2 " "	7.00	8.50	9.00	2½ " "	10.50	12.00	12.50

Ashton Single and Duplex Automobile Gages



No. 67



No. 67 A.

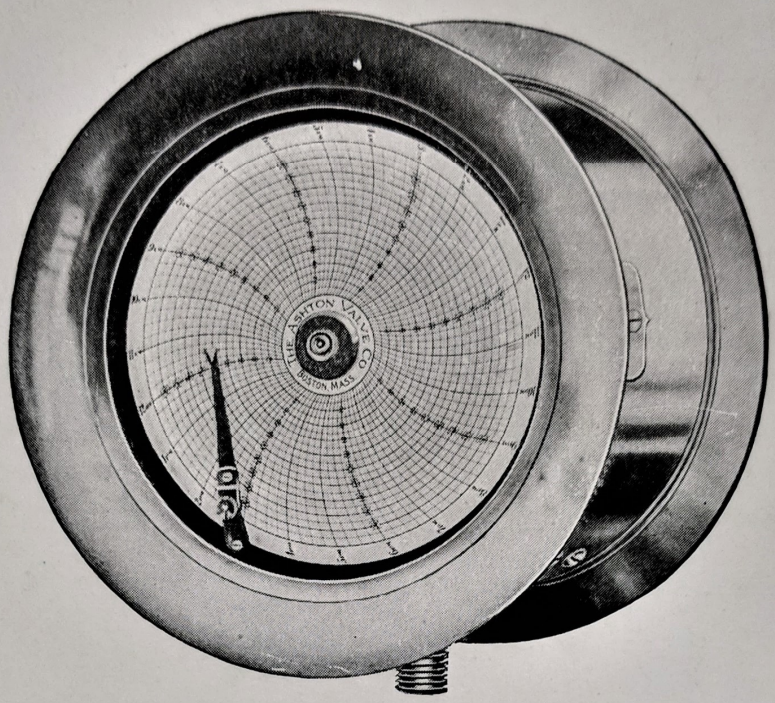
The two styles of gages above shown are particularly adapted for automobile service, where an attractive small size gage is desired having a back flange and back pipe connection. These gages can be fastened by screws on the front of the dashboard, or be inserted from behind through proper size holes, so that only the ring, glass, and dial are visible.

Either style gage can be furnished to any required high or low maximum graduation other than above illustrated. The duplex gage is made with two entirely separate movements and pipe connections, and is the same as two independent gages combined in one case. Cocks are not furnished with these gages.

LIST PRICES

Size	Brass Case	Nickel-Plated Case
No. 67 — Single, 3½ inch Dial	$12.00	$12.50
No. 67 A — Duplex, 3½ inch Dial	16.00	16.50

Ashton Improved Pressure Recording Gage



No. 73

The Ashton Recording Gage shows graphically in red ink, on a paper chart, the variations or fluctuations in pressure and the duration of time of each variation. The chart is graduated with pressure lines and in fractions of an hour, and is rotated by an eight-day clock movement, which is full jeweled and of a superior quality. The chart is ordinarily made to rotate once in twenty-four hours, and can be furnished for Pressure, Vacuum, or Compound Pressure and Vacuum.

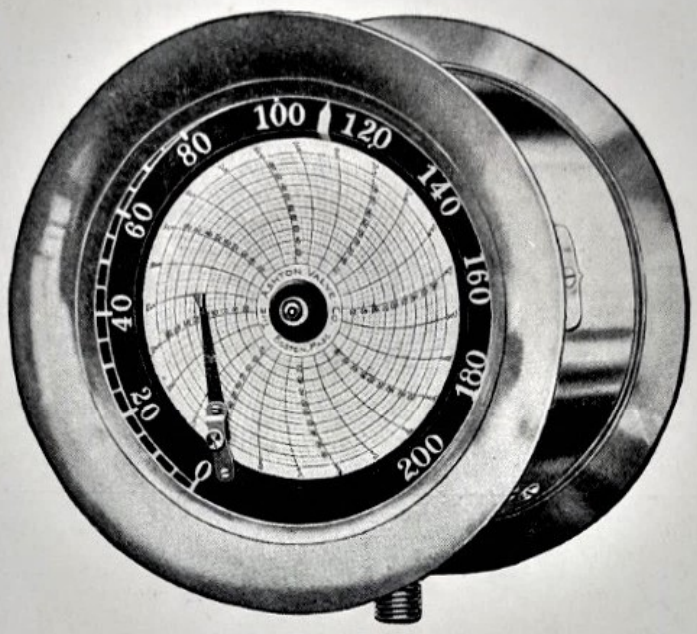
With the use of this gage in a boiler room there is always a tendency toward more careful firing. The record on the chart shows whether or not the fireman is constantly keeping up the steam at the proper working pressure.

This gage is adapted for steam, water, ammonia, air, or gas service.

One year's supply of 400 charts in cardboard box and ink with pen filler are furnished with each gage.

For prices see next page.

Ashton Improved Pressure Recording Gage



No. 74

The Ashton No. 74 Recording Gage is similar to the No. 73 style, but has the additional feature of an indicating hand and figured dial outside the recording chart, whereby the pressure may be more easily read from a distance.

LIST PRICES

Finish	Iron Case — Brass Ring					Iron Case — N. P. Ring				
Size	6	6¾	8½	10	12	6	6¾	8½	10	12
No. 73 Pressure Recording	$32.00	$36.00	$44.00	$58.00	$76.00	$32.75	$36.75	$44.75	$59.00	$77.00
Vacuum Recording	32.00	36.00	44.00	58.00	76.00	32.75	36.75	44.75	59.00	77.00
Compound Pressure and Vacuum Recording	.....	43.50	51.50	65.50	87.00	.....	44.25	52.25	66.50	88.00
No. 74 Pressure Recording and Indicating	.....	43.50	51.50	65.50	87.00	.....	44.25	52.25	66.50	88.00
Vacuum Recording and Indicating	.....	43.50	51.50	65.50	87.00	.....	44.25	52.25	66.50	88.00
Compound Pressure and Vacuum Recording and Indicating	.....	51.00	59.00	73.00	91.00	.....	51.75	59.75	74.00	92.00

Finish	Brass Case					N. P. Case				
Size	6	6¾	8½	10	12	6	6¾	8½	10	12
No. 73 Pressure Recording	$35.00	$40.00	$50.00	$65.00	$85.00	$36.50	$42.00	$52.50	$68.00	$89.00
Vacuum Recording	35.00	40.00	50.00	65.00	85.00	36.50	42.00	52.50	68.00	89.00
Compound Pressure and Vacuum Recording	.....	47.50	57.50	72.50	96.00	.....	49.50	60.00	75.00	100.00
No. 74 Pressure Recording and Indicating	.....	47.50	57.50	72.50	96.00	.....	49.50	60.00	75.00	100.00
Vacuum Recording and Indicating	.....	47.50	57.50	72.50	96.00	.....	49.50	60.00	75.00	100.00
Compound Pressure and Vacuum Recording and Indicating	.....	55.00	65.00	80.00	100.00	.....	57.00	67.50	83.00	104.00

Ashton Pressure and Vacuum Recording Gages

The following standard charts for Recording Gages are regularly carried in stock.

Charts for 6 inch Ashton No. 73 Recording Gages
Charts for 6¾ inch Ashton No. 74 Recording Gages

Chart No.	Pressure		Intermediate Graduations		Time
1	200 lbs.		10 lbs.		24 hours
2	230 "		10 "		6 "
3	200 "		10 "		1 "
4	125 "		5 "		24 "
5	30 "	x 30 inch	2½ "	x 2½ inch	24 "
6	150 "		5 "		24 "
7	15 "		1 "		24 "
8	15 "	x 30 inch	1 "		24 "
9	225 "		10 "		24 "
10	240 "		10 "		24 "
6A	150 "		5 "		24 "
A1	30 "		1 "		24 "
A2	300 "		10 "		24 "
A3	150 "	x 15 inch	5 "	x 5 inch	24 "
A4	50 "		5 "		24 "

Charts for 6¾ inch Ashton No. 73 Recording Gages
Charts for 8½ inch Ashton No. 74 Recording Gages

Chart No.	Pressure		Intermediate Graduations		Time
11	15 lbs.		1 lbs.		24 hours
12	30 "		2½ "		24 "
13	50 "		2 "		24 "
14	60 "		2 "		24 "
15	100 "		2½ "		24 "
16	150 "		5 "		24 "
17	200 "		5 "		24 "
18	200 "		10 "		24 "
19	250 "		10 "		24 "
20	15 "	x 30 inch	2½ "	x 2½ inch	24 "
21	30 "	x 30 inch	5 "	x 5 inch	24 "
22	120 "		5 "		24 "
23	150 "	x 30 inch	5 "	x 5 inch	24 "
24	1,400 "		50 "		24 "
25	200 "	x 30 inch	5 "		24 "
26	300 "		10 "		24 "
27	30 "	Vac.	5 "		24 "

Charts for 8½ inch Ashton No. 73 Recording Gages
Charts for 10 inch Ashton No. 74 Recording Gages

Chart No.	Pressure		Intermediate Graduations		Time
30	1,500 lbs.		50 lbs.		24 hours
31	1,200 "		50 "		24 "
32	800 "		20 "		24 "
33	500 "		20 "		1 "
34	400 "		10 "		24 "
35	300 "		10 "		24 "
36	300 "		10 "		24 "
37	250 "		10 "		24 "
38	200 "		10 "		24 "
39	160 "		5 "		24 "
40	150 "		5 "		24 "
41	120 "		5 "		24 "
42	80 "		2 "		24 "
43	50 "		1 "		24 "
44	15 "		1 "		24 "
45	30 "		1 "		24 "
46	50 "	x 30 inch	5 "	x 2 inch	24 "
47	30 "	Vac.	1 "		24 "
48	491 ft.	(458 ft. take-up)	1 ft.		24 "
49	15 lbs.	x 30 inch.	1 lb.	x 1 inch	24 "
50	150 lbs.	x 30 inch	5 lbs.	x 5 inch	24 "
51	225 "		5 lbs.		24 "
52	120 "		5 "		1 "
53	15,000 "		500 "		24 "

Ashton Pressure and Vacuum Recording Gages

The following standard charts for Recording Gages are regularly carried in stock.

Charts for 8½ inch Ashton No. 73 Recording Gages
Charts for 10 inch Ashton No. 74 Recording Gages
(Continued)

Chart No.	Pressure		Intermediate Graduations		Time
54	500 lbs.		25 lbs.		24 hours
55	5 "	x 30 inch	1 "	x 2 inch	24 "
56	500 "	(300 lb. take-up)	10 "		24 "
57	500 "		25 "		24 "
59	100 "		5 "		24 "
60	100 "	x 30 inch Vac.	5 "	x 5 inch	24 "
61	30 "	Vac.	1 inch		7 day
62	300 "		10 lbs.		7 "
63	10 "	x 15 inch	1 "	x 1 inch	24 hours
64	100 "		2½ "		12 "
65	10 "	x 30 inch	1 "	x 2 inch	24 "
66	120 "	x 30 inch	5 "	x 10 inch	24 "

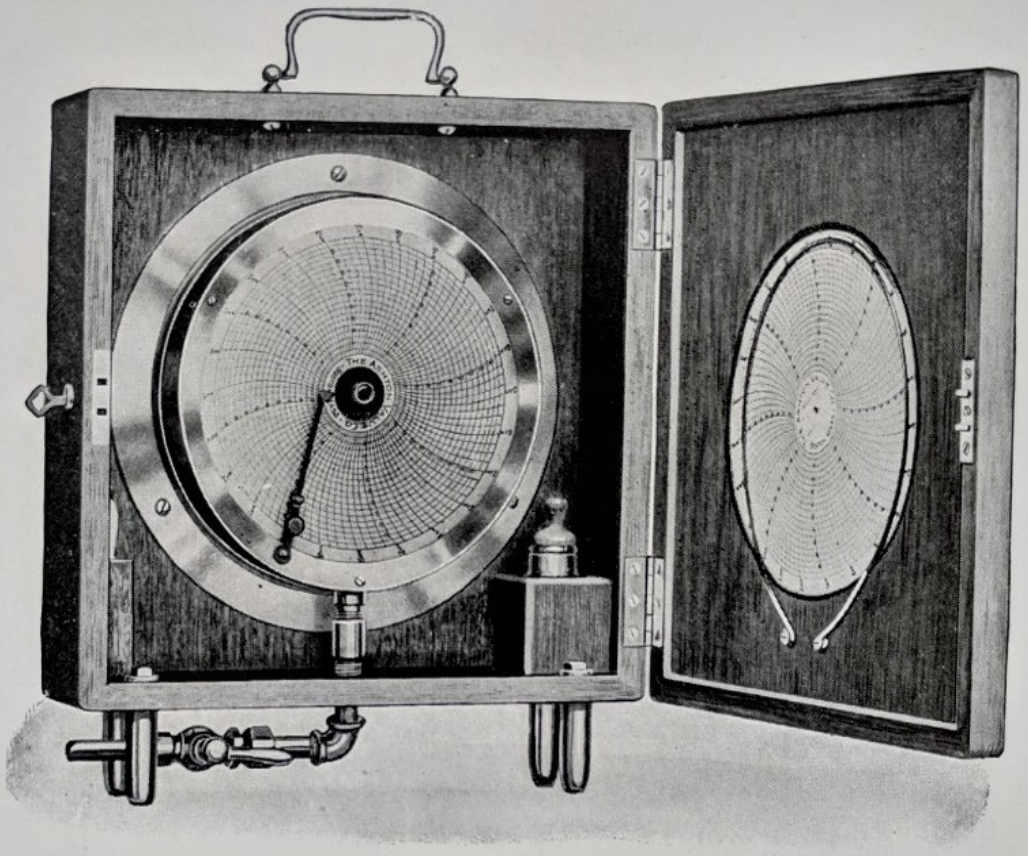
Charts for 10 inch Ashton No. 73 Recording Gages
Charts for 12 inch Ashton No. 74 Recording Gages

Chart No.	Pressure		Intermediate Graduations		Time
71	5,000 lbs.		100 lbs.		24 hours
72	300 "		10 "		24 "
73	200 "		10 "		24 "
74	200 "		10 "		1 "
75	160 "		5 "		24 "
76	140 "		5 "		24 "
77	100 "		2 "		24 "
78	15 "	x 30 inch	1 "	x 1 inch	24 "
79	1,200 "		25 "		24 "
80	600 "		10 "		24 "
81	250 "		10 "		24 "
82	30 inch		1 inch		24 "
83	30 lbs.		1 lbs.		24 "
84	240 "		5 "		24 "
85	240 "		5 "		12 "
86	240 "		5 "		6 "
87	240 "		5 "		3 "
88	200 "	Duplex	10 "		24 "
89A	160 "		5 "		3 "
89B	160 "		5 "		6 "
89C	160 "		5 "		12 "
90	400 "		10 "		24 "
90A	200 "	x 30 inch	5 "	x 10 inch	24 "

Charts for 12 inch Ashton No. 73 Recording Gages

Chart No.	Pressure		Intermediate Graduations		Time
91	300 lbs.		10 lbs.		24 hours
92	200 "		5 "		3 "
93	200 "		5 "		3 "
94	200 "		5 "		6 "
95	200 "		5 "		12 "
96	200 "		5 "		6 "
97	200 "		5 "		1½ "
98	200 "		5 "		24 "
99	125 "		5 "		3 "
100	125 "		5 "		1½ "
101	125 "		5 "		6 "
102	30 "		1 "		24 "
103	13 ft.		¼ ft.		24 "
104	250 lbs.		5 lbs.		24 "
105	50 "		1 "		24 "
106	15 "	x 30 inch	1 "	x 1 inch	24 "
107	150 "		5 "		3 "
108	150 "		5 "		6 "
109	150 "		5 "		12 "
110	125 "		5 "		12 "
111	150 "		5 "		9 "
112	200 "		5 "		24 "
113	180 ft.	Differential Gage 10 ft.			24 "

Ashton Inspectors' Portable Recording Gage



No. 73 A.

The Ashton Portable Recording Gage is of great convenience to Inspectors and Engineers in making pressure tests at outlying points. By its use it is also possible to secure a permanent record to cover variations during any desired interval of time.

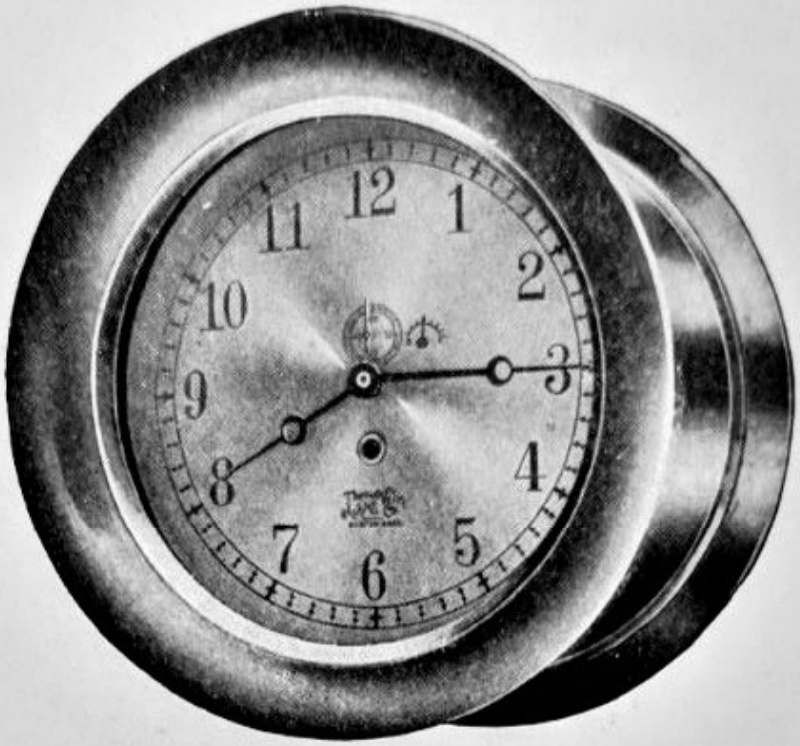
The gage is securely fastened to a neat, portable hardwood box with lock, in which are suitable holders for charts and ink. The box, also, has four substantial base posts, or legs, whereby it can be placed on a bench or other support without interfering with the inlet connection piping. The records are made in red ink on paper charts, which are graduated to any desired interval of pressure and time.

One year's supply of charts, ink and pen filler are furnished with each instrument.

LIST PRICES

Size Dial	Brass	Aluminum
8½ inch	$123.00	$135.00
10 "	140.00	153.00
12 "	165.00	180.00

Ashton Engine Room and Marine Clocks



No. 63

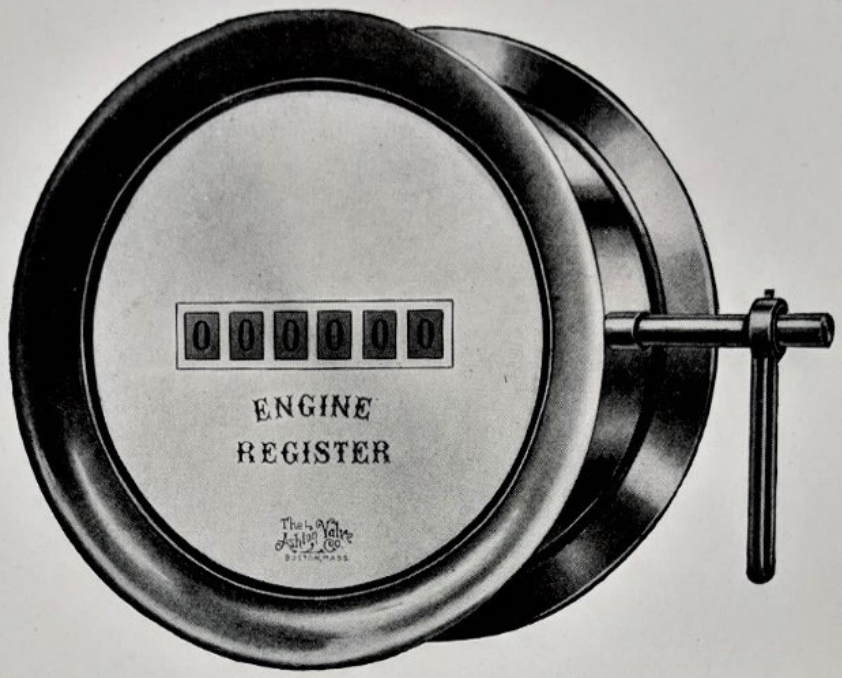
The Howard and Chelsea movements are full jeweled, with chronometer balance, and have patented regulators.

The cases are made with hinged rings and snap latch, or lock and key when desired.

LIST PRICES

Size	Movement	Time	Brass Case	N. P. Case, O.G. or Oct. Ring
12 inch Dial	Howard	Eight-day	$110.00	$114.00
10 " "	"	"	90.00	93.00
8½ " "	"	"	80.00	82.50
6¾ " "	"	"	70.00	72.00
12 " "	Seth Thomas	"	90.00	94.00
10 " "	"	"	65.00	68.00
8½ " "	"	"	55.00	57.50
6¾ " "	"	"	45.00	47.00
12 " "	Chelsea	"	90.00	94.00
10 " "	"	"	65.00	68.00
8½ " "	"	"	55.00	57.50
6¾ " "	"	"	45.00	47.00
6 " "	"	"	40.00	41.50
5½ " "	"	"	38.00	39.25
5 " "	"	"	35.00	36.00

Ashton Improved Engine Register



No. 64

These instruments are for either right or left revolutions and reciprocating motions, and work equally well under varying lengths of stroke or revolving motions.

Unless otherwise ordered, they are driven from the right-hand side by a lever, as shown in the cut.

This style register has positive movement, is durable, accurate, and reliable.

LIST PRICES

Size	Brass Case	N.P. Case, O.G., or Oct. Ring
12 inch, 8 wheels	$110.00	$114.00
10 " 8 "	95.00	98.00
8½ " 8 "	80.00	82.50
12 " 6 "	100.00	104.00
10 " 6 "	85.00	88.00
8½ " 6 "	70.00	72.50
6¾ " 6 "	60.00	62.00
6 " 6 "	50.00	52.00

Always state number of wheels in ordering.

Ashton Rectangular Counter

No. 65

This form of revolution counter can be used for right or left revolutions, reciprocating motions, and strokes of varying lengths. Can be used on direct-acting pumps even if the length of stroke varies, but if so used it should be adjusted for the shortest stroke.

Made with enameled iron case with glass front and silvered dial.

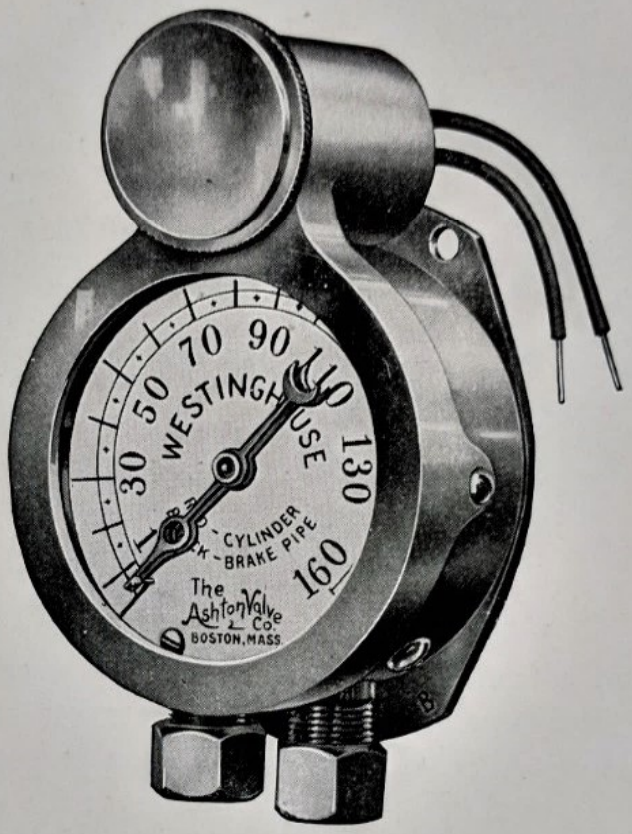
Supplied in large or small pattern, with or without resetting attachment.

LIST PRICES

Size	Number of Figures	Plain	Resetting
7 x 2½ inch, large size	4	$20.00	$24.00
8 x 2½ " " "	5	24.00	28.00
9 x 2½ " " "	6	28.00	32.00
10 x 2½ " " "	7	32.00	36.00
4½ x 1¾ " small "	4	17.50	21.50
5 x 1¾ " " "	5	20.00	24.00
5½ x 1¾ " " "	6	24.00	28.00
6 x 1¾ " " "	7	28.00	32.00

In ordering specify whether large or small size, number of figures, plain or resetting.

Ashton Improved Illuminated Dial Duplex Air Brake Gage



No. 62 D.

The above Gage is specially adapted for Air Brake Service on Electric Cars and Electric Locomotives

It is of substantial construction, with solid cast brass case and ring, and furnished complete with electric lamp and wire connections. The bottom socket connections and the back flange fit the regular Westinghouse standard.

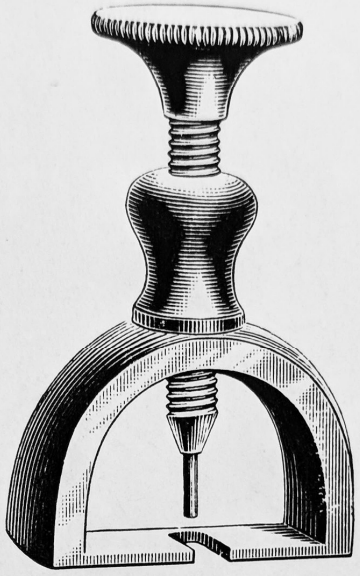
A special meritorious feature in this gage is its simplicity of design. The ring and lamp case are made in one casting, which is readily detachable from the gage case. The lamp is easily accessible by simply unscrewing the top cover, and is for three-volt current.

The illumination of the dial is accomplished through an opening in the lamp case in line with the dial, the light from the lamp being further intensified by reflectors in the lamp case and around the dial.

LIST PRICES

3½ inch Dial size	**$22.00**

The Ashton Gage Hand Puller



No. 94

The Ashton Gage Hand Puller is a valuable and handy little tool for easily taking off gage hands. It is made in two sizes, the small size for gages up to 8½ inch and the large size for 8½ inch gages and larger.

LIST PRICE, $1.50

APPROXIMATE WEIGHTS OF ASHTON STANDARD IRON AND BRASS CASE PRESSURE AND VACUUM GAGES

2 inch Gage . . . ½ pound	3½ inch Gage . 2½ pounds	6¾ inch Gage . . 8 pounds
2¼ " " . . . ½ "	4½ " " . 3 "	8½ " " . . 12 "
2½ " " . . . 1 "	5 " " . 4 "	10 " " . . 16 "
3 " " . . . 1½ "	5½ " " . 5 "	12 " " . . 23 "
. . . . .	6 " " . 6½ "	. . . . .

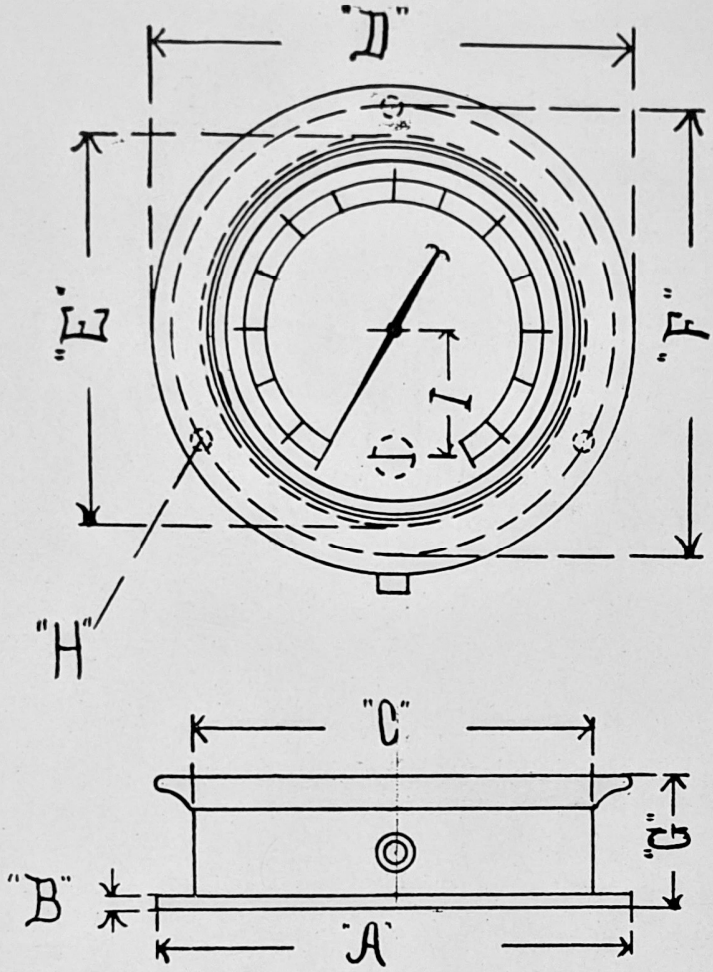
Ashton Marble or Slate Tablets

Style E

We are prepared to furnish gage tablets and boards of marble, slate, or wood of any design desired to suit specifications, with or without nameplates. These tablets are particularly attractive and are extensively used in engine rooms.

Ashton Gages, Clocks, and Engine Registers

Dimension Sheet



Brass or Nickel Plated Case and Ring

	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
Size of Gage	2 1/2	3	3 1/2	4 1/2	5	5 1/2	6	6 3/4	8 1/2	10	12
Diameter of Back Flange "A"	....	4	4 5/8	5 7/8	6 5/16	7	7 5/8	8 1/2	10 3/4	12 1/2	14 5/8
Thickness of Flange "B"	....	3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	5/32	3/16
Diameter of Case "C"	2 5/8	3 3/16	3 11/16	4 3/4	5 1/4	5 5/8	6 1/4	7	8 11/16	10 1/4	12 5/16
Diameter of Ring "D"	2 13/16	3 1/2	4 1/4	5 1/2	6	6 5/8	7 5/16	8 3/16	10 1/4	12 3/8	14 5/16
Diameter of Dial "E"	2 7/16	3	3 1/2	4 1/2	5	5 7/16	6	6 3/4	8 7/16	9 1/8	12
Diameter of Bolt Circle "F"	....	3	4 1/8	5 3/8	5 7/8	6 3/8	7	7 3/4	9 3/4	11 1/2	13 3/4
Size of Hole "H"	....	1/8	3/16	3/16	3/16	3/16	1/4	1/4	1/4	1/4	1/4
Depth of Gage "G"	1 5/16	1 3/8	2	2 1/4	2 3/8	2 1/2	2 1/2	2 5/8	2 5/8	2 3/4	3 1/2
Extra Deep Case "G"	....	3 3/8	3 1/2	..	3 1/8	..	3 3/4	3 3/4	3 7/8	3 7/8	4 1/2
Location of Back Connection "I"	....	1 3/32	1 1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	3 1/2	4	5

Iron Case with Brass or Nickel Plated Ring

	Inch	Inch	Inch	Inch	Inch	Inch
Size of Gage	2	2 1/2	3	3 1/2	4 1/2	5
Diameter of Back Flange "A"	.....	.....	3 13/16	4 5/8	5 13/16	6 3/8
Thickness of Flange "B"	.....	.....	1/8	1/8	1/8	1/8
Diameter of Case "C"	2 3/16	2 3/4	3 3/16	3 3/4	4 3/4	5 5/16
Diameter of Ring "D"	2 7/32	2 15/16	3 1/4	4 5/16	5 1/2	6 3/16
Diameter of Dial "E"	2	2 1/2	3	3 1/2	4 1/2	4 15/16
Diameter of Bolt Circle "F"	.....	.....	3 1/2	4 1/8	5 3/8	5 7/8
Size of Hole "H"	.....	.....	1/8	3/16	3/16	3/16
Depth of Gage "G"	1 1/16	1 5/16	1 1/4	1 11/16	2 1/16	2 3/8
Location of Back Connection "I"	.....	.....	1	1 1/8	1 1/2	1 3/4

The dimensions for iron case instruments above 5 inch are the same for brass or

Ashton Syphons and Cocks

FIG. 1.

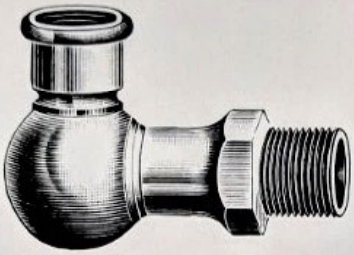


FIG. 2.

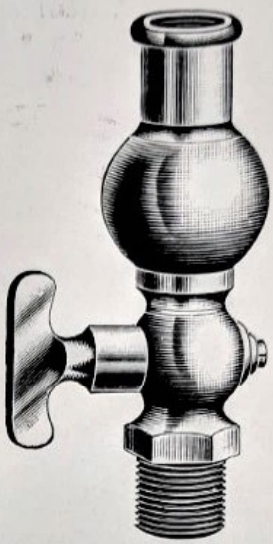


FIG. 3.

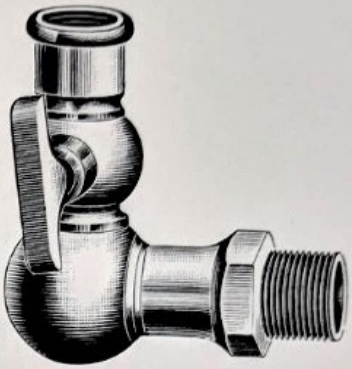
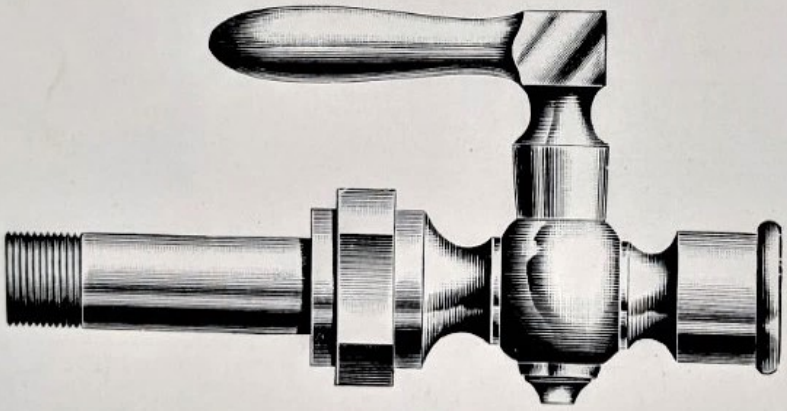
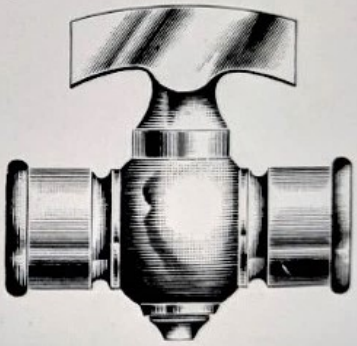


FIG. 4.



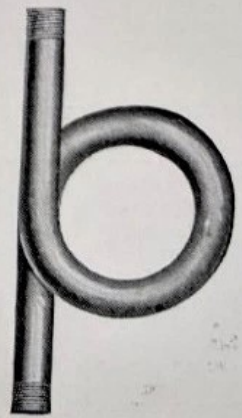
Lever Handle
Union Steam Gage Cock



T Handle
Steam Gage Cock

Hydraulic Cock

Hydraulic Check Valve



Pipe Syphon

For List Prices see next page.

Ashton Syphons and Cocks

LIST PRICES

	Size Inch		Brass	Nickel Plated
Fig. 1. Straight Ball Syphon	¼	.....	$2.20	$2.50
	⅜	.....	2.40	2.70
	½	.....	2.60	2.90
Fig. 2. Angle Ball Syphon	¼	.....	3.10	3.40
	⅜	.....	3.30	3.60
	½	.....	3.50	3.80
Fig. 3. Straight Ball Syphon with Cock	¼	.....	3.60	3.90
	⅜	.....	3.80	4.10
	½	.....	4.00	4.30
Fig. 4. Angle Ball Syphon with Cock	¼	.....	4.10	4.40
	⅜	.....	4.30	4.60
	½	.....	4.50	4.80
Lever Handle Union Steam Gage Cock, heavy	⅛	.....	.85	.95
	¼	.....	.90	1.00
	⅜	.....	1.40	1.50
Lever Handle Union Steam Gage Cock, light	⅛	.....	.80	.90
	¼	.....	.85	.95
T Handle Steam Gage Cocks, light	⅛	.....	.30	.35
T Handle Steam Gage Cocks, light	¼	.....	.35	.40
T Handle Steam Gage Cocks, heavy	¼	.....	.65	.70
Hydraulic Check Valve, single	⅛	.....	2.00	2.10
	¼	.....	2.60	2.70
	⅜	.....	3.30	3.40
	½	.....	4.00	4.10
Hydraulic Check Valve, double	⅛	.....	2.40	2.50
	¼	.....	3.00	3.10
	⅜	.....	3.70	3.80
	½	.....	4.40	4.50
Hydraulic Cock	⅛	.....	5.25	5.50
	¼	.....	6.00	6.25
	⅜	.....	6.75	7.00
	½	.....	7.50	7.75
		Iron		
Common Pipe Syphon	⅛	$ .15	$1.00	$1.25
	¼	.20	1.10	1.35

General Instructions

For the Application, Care, and Maintenance of Ashton Pressure and Vacuum Gages

All gages used on steam must be protected by a water syphon of sufficient capacity to fill the gage tube, and thus prevent any steam from entering the tube, the heat from which would otherwise anneal it and render it useless. Joints between the syphon and gage must be absolutely tight to prevent leaking of water from the syphon. Gages should be protected from external heat exposure as far as possible. A gage that is unduly heated will register inaccurately, due to expansion of the various parts of its operating mechanism. Boiler gages should be piped direct to the steam drum, or main steam chamber, of the water line with no intervening fittings, except the syphon and stopcock.

Gages that are correct will frequently be found to register a few pounds heavy, due to the weight of the column of water, or other liquid, accumulated in the gage pipe. To correct this on such an installation the gage hand requires resetting to compensate for the added pressure caused by the weight of the liquid.

Care should be used in attaching gages to pipes, or other connections, so as to prevent any strain on the gage by being screwed on too tight. When attached to brackets, or other holdings, by means of screws through the back flange of the gage case, the bearing surface must be sufficiently smooth and flat, so that the gage case will not be distorted when properly fastened to it, otherwise the gage will not register accurately.

Gages are usually made with from two to five pounds take-up, which holds the hand firmly against the stop pin, and thus prevents them from being jarred loose from their spindles in shipment, or when otherwise handled. For this reason there is an unequaled spacing in the dial graduation between the stop pin and the first pressure marking. When gage hands require resetting to correct inaccuracy they should be removed by a gage hand puller and afterwards refitted to the spindle by a very light hammer blow that will not bend the spindle.

Gage tubes which develop defects in service, such as cracks or pinhole leaks, cannot be satisfactorily repaired by soldering, but should be replaced.

The graduation of gages should be approximately twice the maximum working pressure for satisfactory results and durability.

The size of gages is determined by measuring the diameter of the dial and not that of the face ring or gage back.

Gage connections are ¼ inch standard pipe thread for all sizes above 3½ inches. On smaller sizes they are ⅛ inch. Both are male thread unless otherwise specified.

When ordering gages always specify style number, size dial, style case, whether iron, brass, or nickel plated, and maximum dial graduation.

When ordering gage parts specify name of part, dial size of gage, style number, maximum graduation, and serial number of gage, as stamped on bottom of the dial.

Ashton Standard Lever Test Pump

No. 1

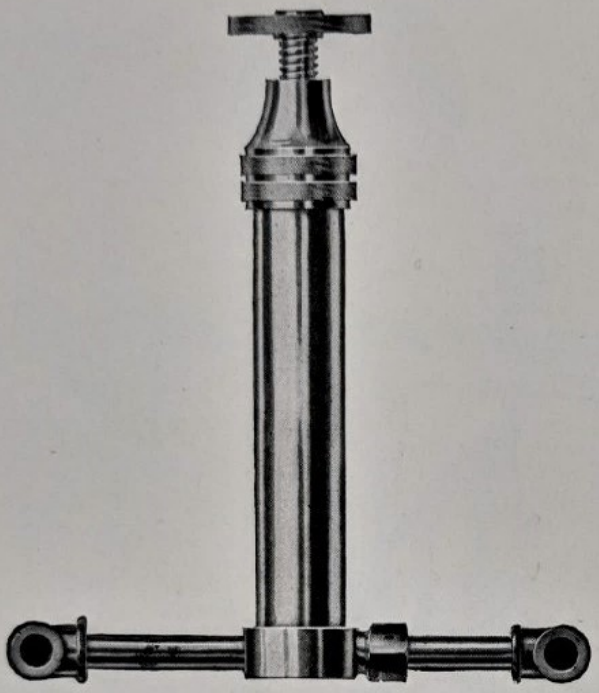
A complete and substantial bench apparatus for testing gages. It has three connections so that two gages may be compared with the test gage at the same time. Suitable for pressures up to 300 pounds.

Railroads and others using many gages will find this pump convenient and in every way desirable for shop use.

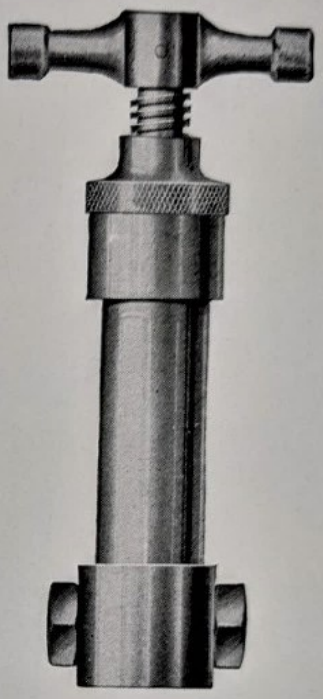
Price without test gage, $50.00

For prices of Test Gages see page 124.

Ashton Screw Test Pumps



No. 3 Style



No. 3 A. Style

These screw test pumps are extensively used in testing pressure gages. They are compact, light, and durable.

The No. 3 Style is constructed of composition metal, and nickel plated if desired.

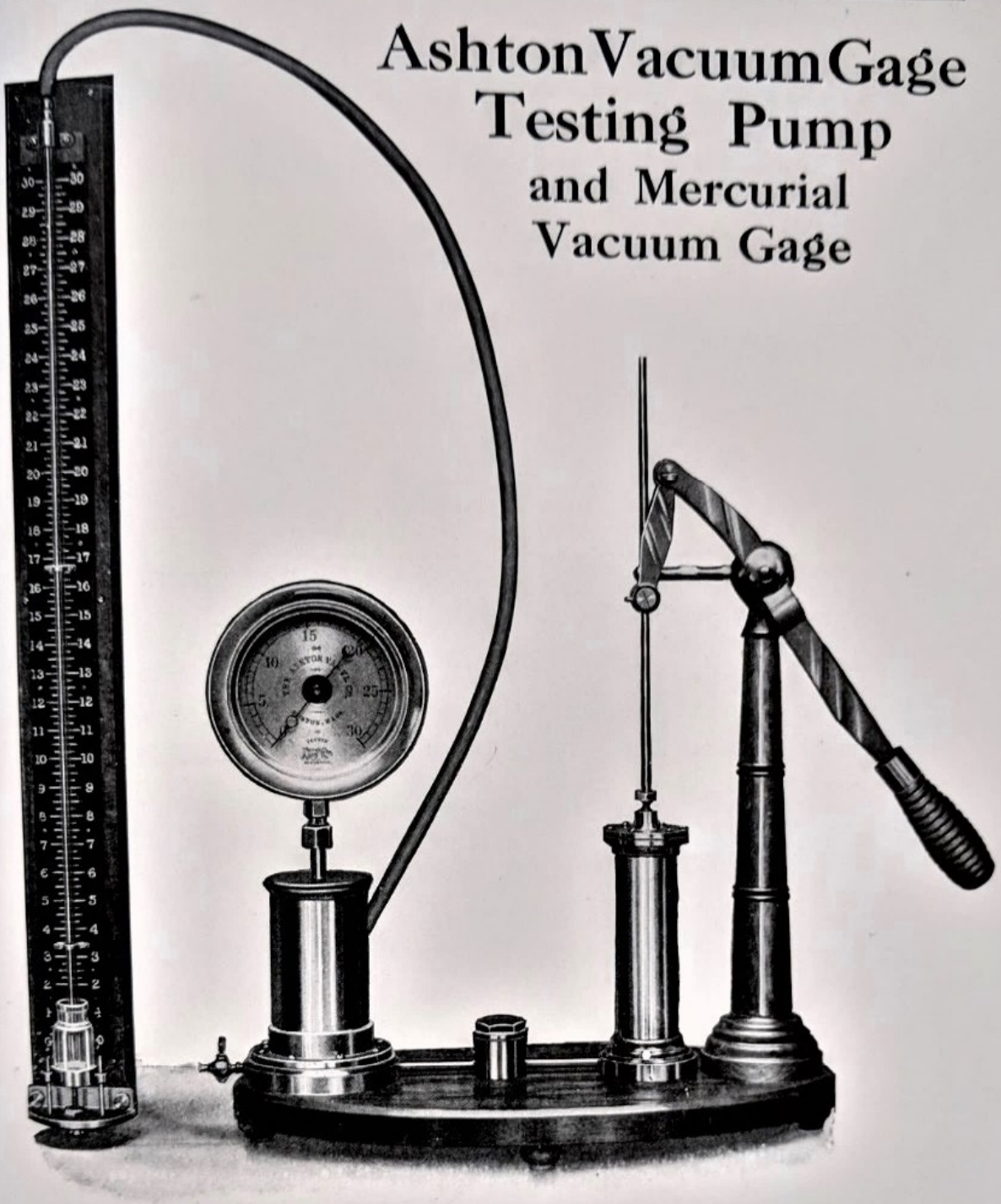
The No. 3 A. Style, short pattern, has quick opening top, often preferred by boiler inspectors, and is made with composition body, nickel plated, or of lighter weight aluminum body.

LIST PRICES

	Brass	Nickel Plated	Aluminum
No. 3	**$31.00**	**$32.00**	
No. 3 A.	**24.00**	**25.00**	**$26.00**

With these pumps we recommend the use of our No. 59 A. Standard Pocket Test Gages, page 125.

Ashton Vacuum Gage Testing Pump and Mercurial Vacuum Gage



No. 87

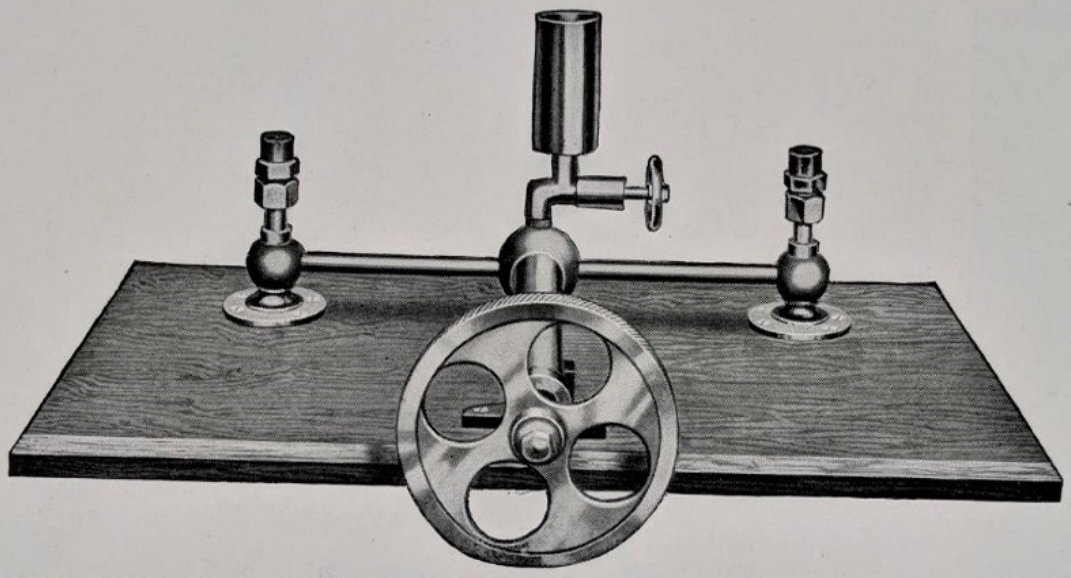
The outfit above illustrated is particularly designed for testing the accuracy of Vacuum Gages in comparison with a Mercury Column. It consists of a Hand Vacuum Pump mounted on wood base, with rubber tube connecting with a Mercury Column. The gage shown in cut is not required or furnished. The Mercury Column consists of a metal scale, accurately graduated in inches of mercury, glass tube, and adjustable pot of mercury, all mounted on wood panel. A wood shield with glass front, hinged to the wood panel for protecting the Mercury Column, is furnished when specially ordered.

The Mercury Column is frequently furnished separate from the Vacuum Pump for use as a Mercurial Vacuum Gage.

PRICE LIST

Vacuum Gage Testing Outfit, complete with pump and mercury column	**$110.00**
Vacuum Pump only	**70.00**
Mercury Column	**40.00**
Mercury Column with shield	**45.00**

Ashton Light Hydraulic Pressure Gage Test Pump



No. 85

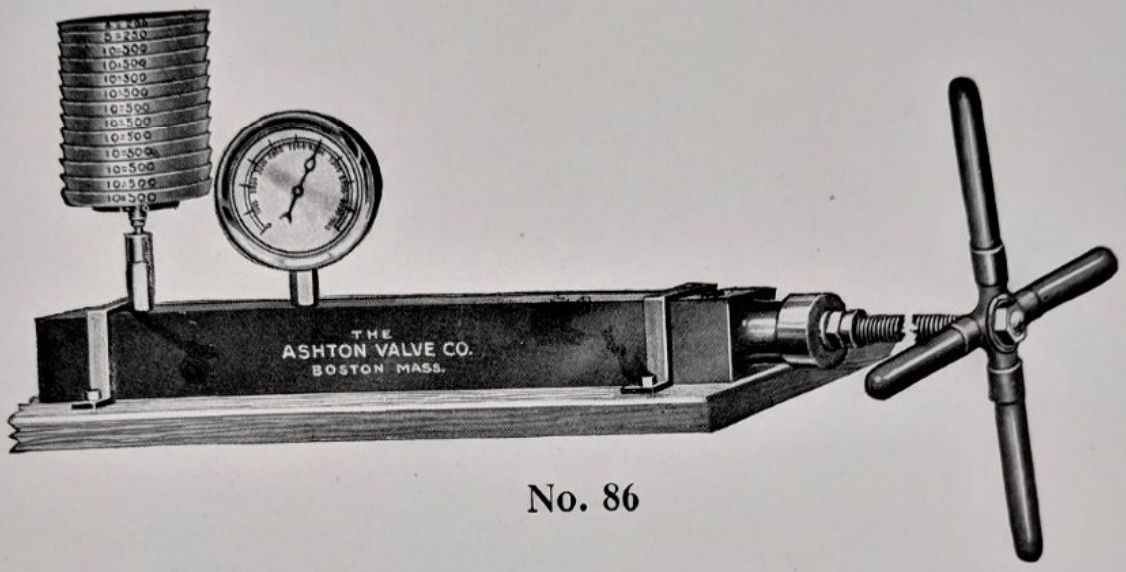
The Ashton Hydraulic Gage Test Pump above shown is designed for testing high pressure gages up to 7,000 pounds pressure per square inch, and is easily operated by means of a large handwheel. This test pump is constructed of our HIGH GRADE composition metal, with extra heavy fittings, and mounted on a substantial wood base that can be readily clamped or bolted to bench. Weight complete, approximately twelve pounds.

LIST PRICE, $84.00

For price of Hydraulic Test Gage for use with pump, see page 120.

Ashton Hydraulic Dead-Weight Pressure Gage Tester

For Extreme High Pressure



No. 86

The Ashton Hydraulic Tester above illustrated is constructed on the same principle as our regular Dead-Weight Gage Tester, on page 104, but specially designed for testing pressure gages at extreme high pressures.

The cylinder, which is approximately forty inches long and three and one half inches square, is made from a solid bar of tool steel. The piston is also of hardened tool steel, accurately ground and lapped into the cylinder, and both the piston and cylinder are renewable. The tester is easily operated at the highest pressures, by means of extra long wrought iron pipe crossbar handles.

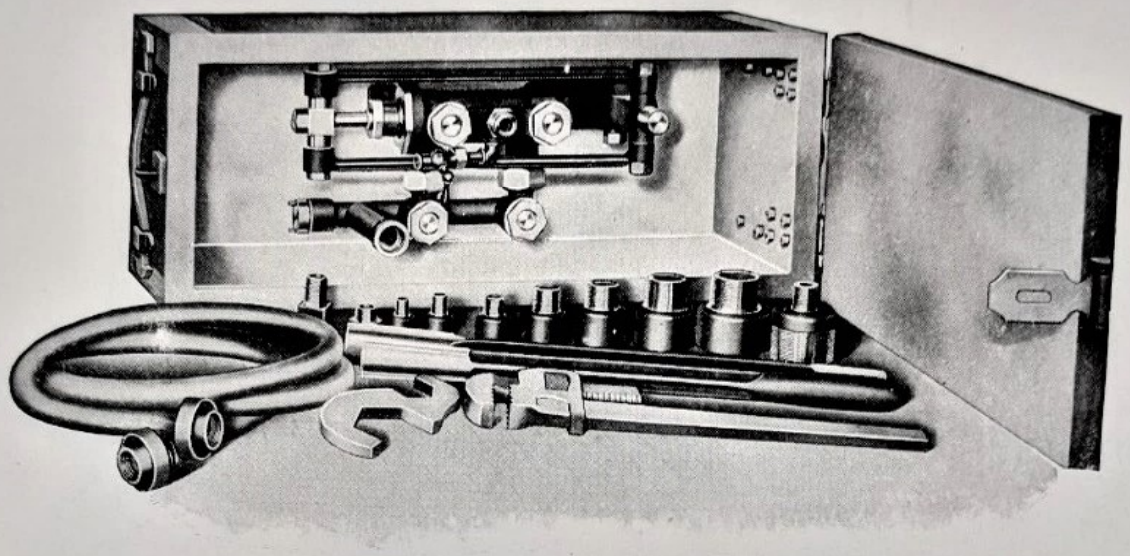
The gage shown in cut is not furnished, but merely an illustration of a gage as applied for test.

LIST PRICE

No. 86	Style for testing to **10,000** lbs.	**$430.00**
No. 86A	" " " " **15,000** "	**465.00**
No. 86B	" " " " **20,000** "	**500.00**
No. 86C	" " " " **25,000** "	**535.00**

For price of Hydraulic Test Gage for verifying weights, if desired, see page 120.

Ashton Portable Boiler Test-Pump Outfit



No. 88

Specially adapted for making hydrostatic tests on locomotive and stationary boilers at outlying points, and extensively used by State and Boiler Insurance Inspectors.

The above cut shows the Ashton Portable Boiler Test-Pump, with complete outfit of hose and all necessary fittings and tools, as usually required, packed in a substantial iron-bound locked case. The following special features of construction of practical value are embodied in this equipment.

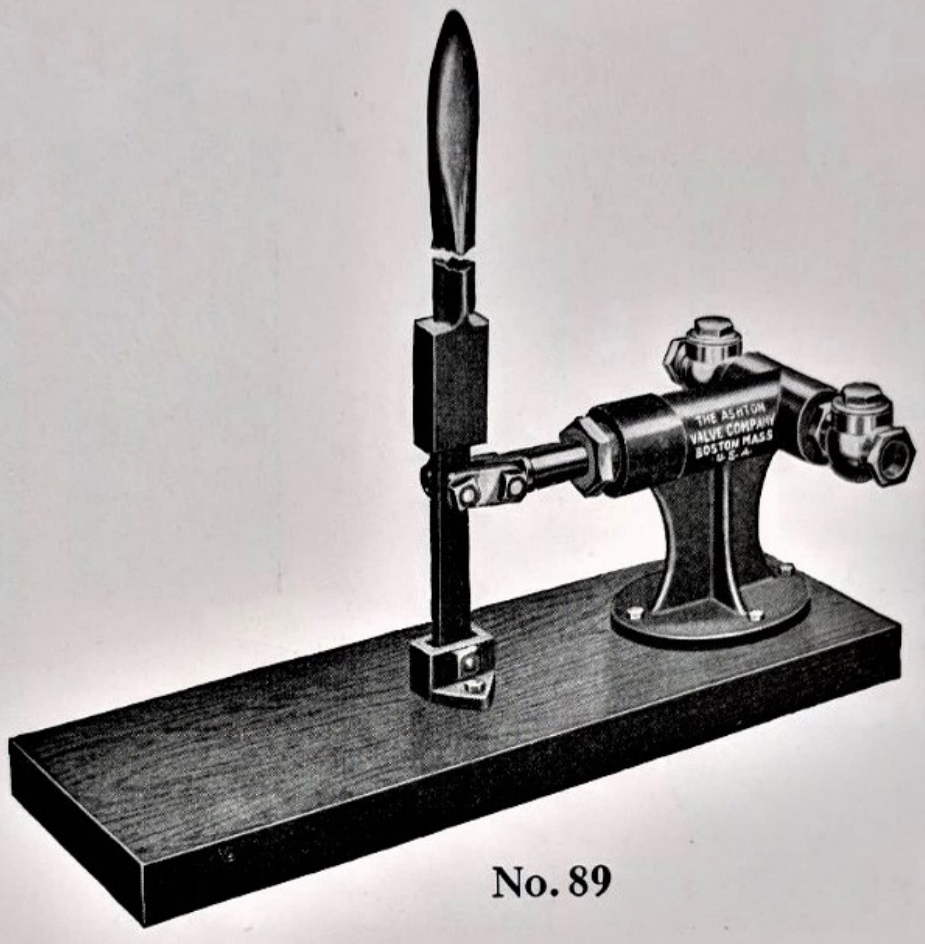
The case is metallic lined and watertight, therefore can be used as a reservoir for the pump to draw from. The pump has a supplementary water-service connection which can be used for the supply instead of the tank.

There are no interior parts of iron to rust, the pump being made entirely of high-grade composition metal. The suction valves can be taken out for repairs or the piston repacked without removing the pump body.

Size of pump piston, 1¾ inches; length of stroke, 3 inches, double acting; capacity for 400 pounds per square inch. Size of case: width, 10½ inches; height, 11½ inches; length, 26 inches; weight, complete with fittings and tools, 95 pounds.

LIST PRICE, $170.00

The Ashton Improved Boiler Test Pump



No. 89

The Ashton Boiler Test Pump above shown is a compact, convenient size pump of the outside packed plunger style, having a 5 inch stroke and 1¼ inch diameter cylinder. It is made with a long, upright lever, which is handily operated from a standing position, and which can be readily disconnected at its lower socket end and set aside when not in use.

Being mounted on a hardwood floor base, it can be held firmly in position by the feet while in use, and afterwards easily removed, awaiting future requirements.

The pump body is made of high grade cast iron and fitted with brass plunger and check valves. The total weight is approximately 65 pounds and the maximum service capacity 1,000 pounds pressure per square inch.

LIST PRICE, $65.00

Subject to discount

Ashton Improved Plain Steam Whistles

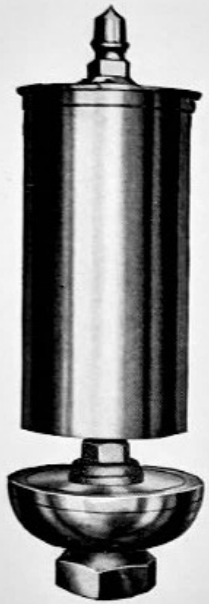


Fig. 1
Without Valve

No. 90

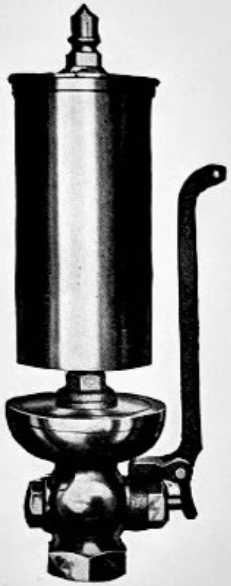


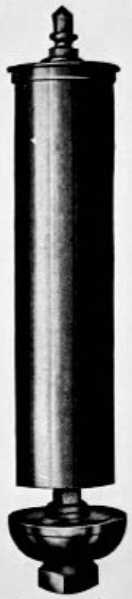
Fig. 2
With Side Valve

Ashton Whistles are designed for high pressures. The bottoms are heavily constructed and the bells are made of solid drawn seamless brass tubing, in length about twice the diameter.

Diameter of Bell	Size of Steam Pipe	Fig. 1	Fig. 2
2 inch	¾ inch	$10.00	$13.00
3 "	1 "	15.00	19.00
4 "	1¼ "	20.00	25.00
5 "	1½ "	28.00	35.00
6 "	2 "	40.00	50.00
8 "	2½ "	70.00	90.00
10 "	2½ "	150.00	180.00
12 "	3 "	260.00	300.00

Orders should specify style, figure, diameter of bell, and the working pressure.
For Whistle Valves see page 161.

Ashton Plain Whistle
With Extra Long Bell



No. 90 A.

To meet the demand for a whistle with deep, far-reaching tone, to suit special conditions, we have brought out the whistle above illustrated. It is of the single bell type with extra long bell which is adjustable for different pressures.

It is constructed of our high grade bronze metal, with forged steel spindle and solid drawn seamless brass bell, and extra heavy base, to stand extreme hard service.

For marine service, large factories, and other installations where a whistle with an individual, deep penetrating tone is required, we recommend that the length of the bell be four times the diameter.

With these whistles, for high pressures or in the large sizes, we particularly recommend the use of a balanced whistle valve, page 161.

LIST PRICES

Diam. of Bell in Inches	Size of Steam Pipe in Inches	Length of Bell in Inches	Screwed	Flanged
6	2	14	$71.00	$80.00
6	2	16	74.00	83.00
6	2	18	77.00	86.00
6	2	20	80.00	89.00
6	2	24	85.00	94.00
8	2½	18	110.00	122.00
8	2½	20	115.00	127.00
8	2½	22	120.00	132.00
8	2½	24	125.00	138.00
8	2½	28	135.00	148.00
8	2½	30	141.00	154.00
8	2½	32	147.00	160.00
10	2½	25	212.00	225.00
10	2½	30	237.00	250.00
10	2½	35	262.00	275.00
10	2½	40	287.00	300.00
12	3	30	305.00	330.00
12	3	36	350.00	375.00
12	3	42	395.00	420.00
12	3	48	440.00	465.00

Ashton Improved Single Bell Chime Whistles

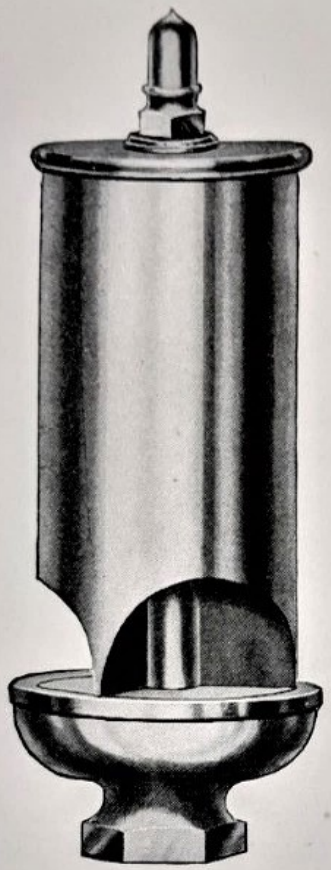


Fig. 1
Without Valve

No. 91

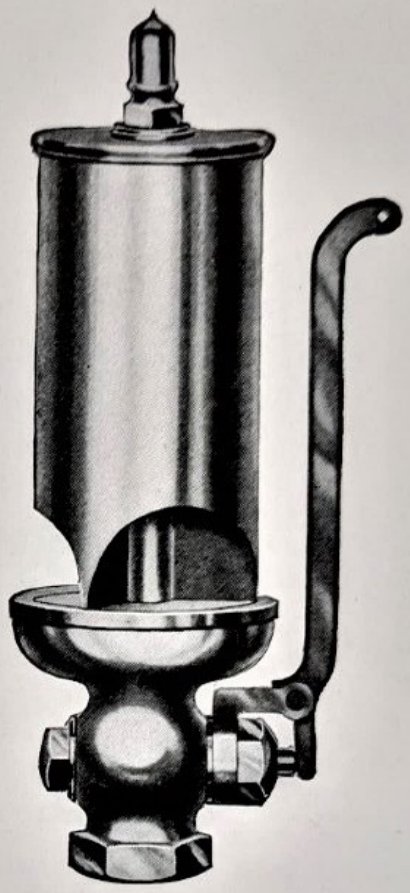


Fig. 3
With Side Valve

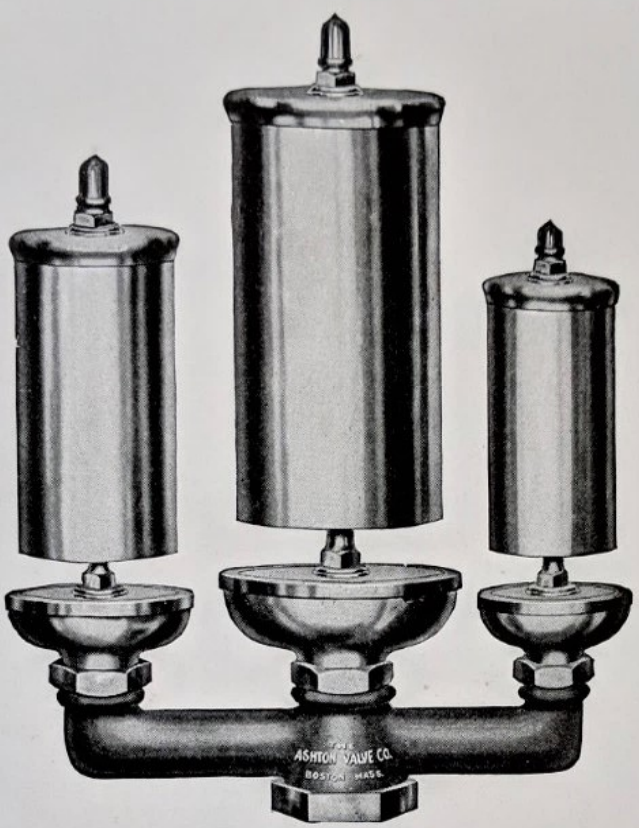
Ashton Chime Whistles are heavily constructed throughout of best steam metal, finished all over, and designed for pressures up to 250 pounds.

They are adjusted to produce the most agreeable and yet penetrating tones in contrast to the harshness of the Plain Whistle.

Diameter of Bell	Size of Pipe	Fig. 1	Fig. 3
2 inch	¾ inch	$11.00	$14.00
3 "	1 "	16.00	20.00
4 "	1¼ "	21.00	26.00
5 "	1½ "	30.00	37.00
6 "	2 "	45.00	55.00
8 "	2½ "	95.00	105.00
10 "	2½ "	175.00	205.00
12 "	3 "	280.00	325.00

Orders should specify style, figure, diameter of bell, and the working pressure.
For Whistle Valves see page 161.

Ashton Three-Bell Chime Whistle



No. 91 A.

This type of whistle produces the most far-reaching tone of any other chime whistle of equal size. Each combination is made up of three individual No. 90 Plain Steam Whistles, page 156, all mounted on one yoke with single connection, and all are adjusted to produce the most agreeable and penetrating tone.

COMBINATION A: Consists of one each 1½, 2, and 2½ inch diameter bell No. 90 Plain Steam Whistles, mounted on yoke, with 1 inch pipe connection . . . . . Price, **$35.00**

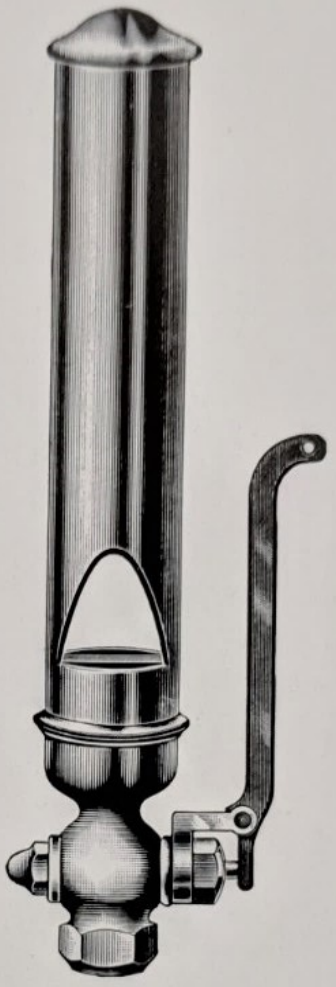
COMBINATION B: Consists of one each 3, 4, and 5 inch diameter bell No. 90 Plain Steam Whistles, mounted on yoke with 1½ inch pipe connection. Price, **$70.00**

COMBINATION C: Consists of one each 5, 6, and 8 inch diameter bell No. 90 Plain Steam Whistles, mounted on yoke with 3 inch pipe connection. Price, **$150.00**

The bells of the above individual whistles have a length about twice the diameter. Orders should specify working pressure.

For Whistle Valves see page 161.

Ashton Organ Whistles



No. 92

The Ashton Organ Whistle, as above shown, is a modified form of the common whistle, having an extra long bell which gives a very low, full tone. It is largely used on yachts and launches, being preferred by many for this class of service.

LIST PRICES

Size of Steam Pipe	Diameter of Bell	Length of Bell	Price
½ inch	1¼ inch	9 inches	$9.00
½ "	1¾ "	10 "	13.00
¾ "	2 "	11 "	19.00
¾ "	2½ "	12 "	25.00
1 "	3 "	17 "	32.00
1 "	3½ "	19 "	40.00
1¼ "	4 "	20 "	60.00

Ashton Whistle Valves

No. 90 B.
Plain Style

No. 91 B.
Balanced Style

The No. 90 B. Plain Whistle Valves are more particularly designed for use in connection with small high pressure or large low pressure whistles. They are fitted with levers that are adjustable to any desired position, contain a minimum number of parts, and are suitable for 200 pounds working pressure. Made of bronze composition, with seats that may be reground.

The No. 91 B. Balanced Whistle Valves are recommended for large and high pressure whistles. The principles upon which these valves are constructed make them easy to operate, and they will remain tight in continued service. They are heavily constructed of composition bronze, with either screwed or flanged connections, and are suitable for 200 pounds working pressure.

LIST PRICES

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Plain Valve, No. 90 B.	**$2.00**	**$2.00**	**$2.50**	**$3.00**	**$4.40**	**$5.60**	**$7.40**	**$14.00**	**$18.00**	**$29.50**
Balanced Valve, No. 91 B, Screwed Connections					**18.00**	**22.20**	**26.60**	**35.50**	**44.40**	**62.20**
Balanced Valve, No. 91 B, Flanged Inlet, Screwed Outlet					**21.40**	**26.00**	**31.80**	**41.80**	**51.00**	**74.80**
Balanced Valve, No. 91 B, Flanged Inlet and Outlet . . .					**22.20**	**27.50**	**33.60**	**43.80**	**53.20**	**77.00**

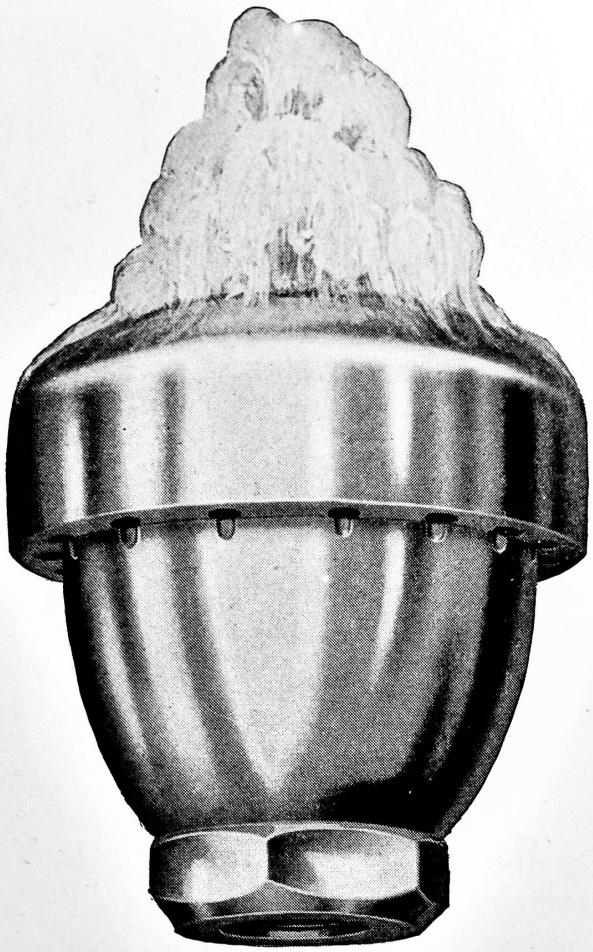
Ashton Sanitary Bubbling Drinking Fountains

The Ashton Bubble is practical, inexpensive, and sanitary; readily attached to ordinary faucets and is fast replacing the common drinking cup, and adaptable for use in schools, factories, public parks, etc.

It is simple in construction, having no interior working parts or springs to be affected by sediment, and cannot be tampered with or easily taken apart. It is constructed of non-corrosive composition metal, finished and nickel plated, with either convex or concave top, and is made with ¼-inch standard pipe thread female connections.

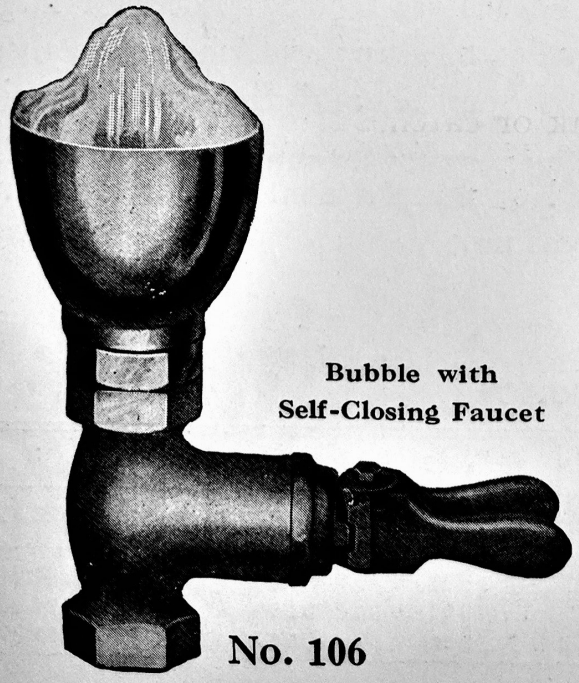
No. 105 shows the Non-Squirting style Bubble. No. 107 plain style Bubble with Pipe and Coupling fitted to an ordinary faucet, which makes a flexible arrangement, readily adaptable to any diameter or depth of sink. These Bubbles are often fitted to self-closing faucets, as shown by No. 106.

With ordinary city pressure a satisfactory volume of flow is obtained without any change of the bubble as regularly furnished. In case of unusual high or low pressure the bubble may be regulated by means of the adjusting screw in the top. This does not require taking the bubble apart, and after the flow is made satisfactory no further adjustment is required.



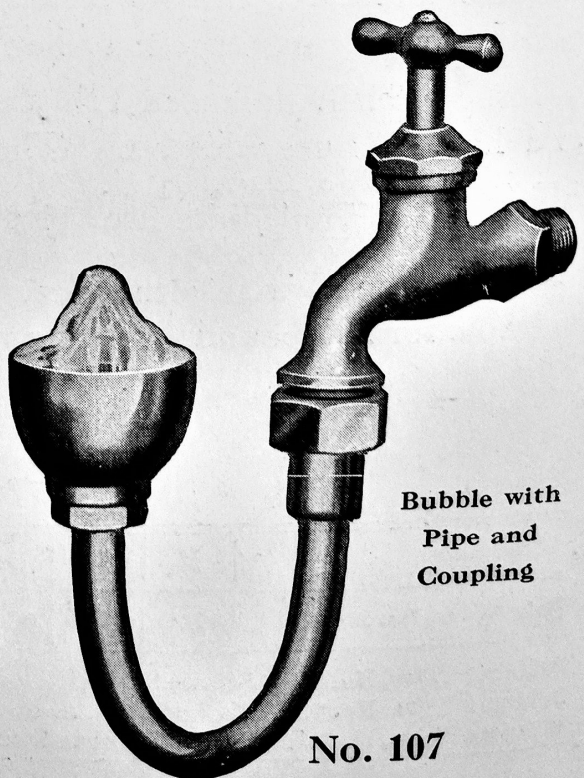
Non-Squirting Bubble

No. 105



Bubble with Self-Closing Faucet

No. 106

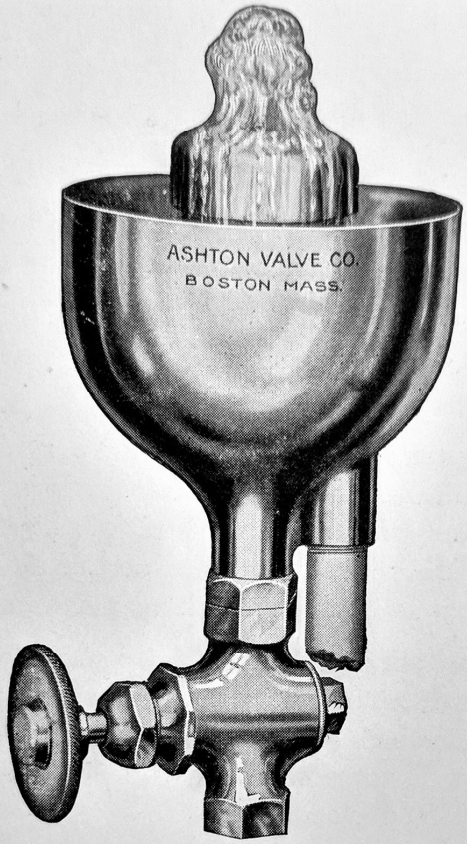


Bubble with Pipe and Coupling

No. 107

Ashton Sanitary Bubbling Drinking Fountains

Especially designed for use in Schools, Gymnasiums, Hotels, Depots, etc.



With Overflow Basin and Drain

No. 108

The Drinking Fountain above illustrated consists of an Ashton Sanitary Fountain (either plain or non-squirting style) with overflow basin and drain and self-closing valve or faucet. This fountain may be connected in an upright position to any supply pipe, when it will be ready for immediate use, no sink or catch basin being necessary, arrangement being made so that the waste water may be piped from the overflow.

This outfit is compact and sanitary, and constructed of composition metal, finished and nickel plated.

LIST PRICES

Fountain, Plain Style	$2.00
" " " with pipe and coupling	3.50
" " " " spring faucet	5.00
" Non-Squirting Style	3.00
" " " with pipe and coupling	4.50
" " " spring faucet	6.00
" with overflow basin and drain (plain bubble)	11.00
" " " " " " (non-squirting bubble)	12.00

When specially ordered these bubbles are fitted with lip and mouth guard at an extra price of $1.25 to above lists.

Useful Information

For the circumference of a circle, multiply diameter by 3.1416.

For the diameter of a circle, multiply the circumference by .31831.

For the area of a circle, multiply square of diameter by .7854.

For the side of an equal square, multiply diameter by .8862.

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

A gallon of water (United States standard) weighs 8⅓ pounds, and contains 231 cubic inches. A cubic foot of water weighs 62½ pounds and contains 1,728 cubic inches, or 7½ gallons.

Ordinary speed to run pumps is 100 feet of piston per minute. To find quantity of water elevated in one minute running at 100 feet of piston per minute: Square the diameter of water cylinder in inches and multiply by 4. Example: Capacity of a five-inch cylinder is desired; the square of the diameter (5 inches) is 25, which multiplied by 4 gives 100, which is gallons per minute (approximately).

The area of the steam piston, multiplied by the steam pressure, gives the total amount of pressure exerted. The area of the water piston multiplied by the pressure of water per square inch gives the resistance. A margin must be made between the power and resistance to move the pistons at the required speed, usually reckoned at about 50 per cent.

To find the area of a required pipe, the volume and velocity of water being given, multiply the number of cubic feet of water by 144, and divide the product by the velocity in feet per minute. The area being found, it is easy to get the diameter of pipe necessary.

To find the capacity of a cylinder in gallons: Multiplying the area in inches by the length of stroke in inches will give the total number of cubic inches; divide this amount by 231 (which is the cubical contents of a gallon in inches), and the product is the capacity in gallons.

To find the diameter of a pump cylinder to move a given quantity of water per minute (100 feet of piston being the speed), divide the number of gallons by 4, then extract the square root, and the result will be the diameter in inches.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434. (Approximately every foot elevation is called equal to one half pound pressure per square inch.)

To find the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144, and divide the product by the area of the pipe in inches.

The rate of combustion in a furnace is computed by the pounds of fuel consumed per square foot of grate per hour.

Method of Computing Discharge Capacity of Safety Valves according to American Society of Mechanical Engineers' Boiler Code Rules, 1918 Edition.

The required discharge capacity of a safety valve or valves for a boiler may be based either on the heat units in the fuel consumed or on the amount of steam generated.

The number of heat units in the fuel that each safety valve will handle per hour, for valves of the ordinary types in which the discharge capacity is proportioned to the lift, may be obtained as follows:

$U = 161{,}000 \times P \times D \times L$ for Bevel Seats at 45 degrees

$U = 227{,}500 \times P \times D \times L$ for Flat Seats

The amount of steam that a valve will discharge in pounds per hour may be found as follows:

$W = 110 \times P \times D \times L$ for Bevel Seats at 45 degrees

$W = 155 \times P \times D \times L$ for Flat Seats

where

U = Number of heat units, B. t. u. in the fuel that a safety valve will handle per hour

W = Quantity of steam in pounds that a safety valve will handle per hour

P = Absolute boiler pressure per square inch = gage pressure + 14.7 pounds

D = Inside diameter in inches of valve seat

L = Vertical lift in inches of valve disc, measured with 3 per cent excess pressure

Method of Checking the Safety Valve Capacity by Measuring the Maximum Amount of Fuel that Can be Burned.

The maximum quantity of fuel C that can be burned per hour at the time of maximum forcing is determined by a test. The maximum number of heat units per hour, or $C \times H$, is then determined, using the values of H given below. The weight of steam generated per hour is found by the formula:

$$W = \frac{C \times H \times 0.75}{1100}$$

where

W = weight of steam in pounds generated per hour,

C = total weight or volume burned per hour at time of maximum forcing, pounds or cubic feet

H = heat of combustion of fuel B.t.u. per pound or per cubic foot as given below

The sum of the safety valve capacities marked on the valves shall be equal to or greater than W.

VALUES OF HEATS OF COMBUSTION OF VARIOUS FUELS

	H = B.t.u. per lb.		H = B.t.u. per cu. ft.
Semi-bituminous Coal	14,500	Natural Gas	960
Anthracite	13,700	Blast Furnace Gas	100
Screenings	12,500	Producer Gas	150
Coke	13,500	Water Gas, uncarbureted	290
Wood Shavings	6,400		
Kerosene	20,000		
Petroleum, crude oil	18,500		

Circumferences and Areas of Circles

Diam., inches	Circum., inches	Area, sq. inches	Diam., inches	Circum., inches	Area, sq. inches	Diam., inches	Circum., inches	Area, sq. inches
1/8	.39270	.012272	7	21.991	38.4846	13	40.841	132.733
1/4	.78540	.049087	1/8	22.384	39.8713	1/8	41.233	135.297
3/8	1.1781	.110447	1/4	22.776	41.2826	1/4	41.626	137.887
1/2	1.5708	.19635	3/8	23.169	42.7184	3/8	42.019	140.501
5/8	1.9635	.306796						
3/4	2.3562	.441787	1/2	23.562	44.1787	1/2	42.412	143.139
7/8	2.7489	.601322	5/8	23.955	45.6636	5/8	42.804	145.802
			3/4	24.347	47.1731	3/4	43.197	148.49
1	3.1416	.7854	7/8	24.740	48.7071	7/8	43.590	151.202
1/8	3.5343	.99402						
1/4	3.9270	1.2272				14	43.982	153.938
3/8	4.3197	1.4849	8	25.133	50.2656	1/8	44.375	156.7
			1/8	25.525	51.8487	1/4	44.768	159.485
1/2	4.7124	1.7671	1/4	25.918	53.4563	3/8	45.160	162.296
5/8	5.1051	2.0739	3/8	26.311	55.0884			
3/4	5.4978	2.4053				1/2	45.553	165.13
7/8	5.8905	2.7612	1/2	26.704	56.7451	5/8	45.946	167.99
			5/8	27.096	58.4264	3/4	46.338	170.874
2	6.2832	3.1416	3/4	27.489	60.1322	7/8	46.731	173.782
1/8	6.6759	3.5466	7/8	27.882	61.8625			
1/4	7.0686	3.9761						
3/8	7.4613	4.4301				15	47.124	176.715
						1/8	47.517	179.673
1/2	7.8540	4.9087	9	28.274	63.6174	1/4	47.909	182.655
5/8	8.2467	5.4119	1/8	28.667	65.3968	3/8	48.302	185.661
3/4	8.6394	5.9396	1/4	29.060	67.2008			
7/8	9.0321	6.4918	3/8	29.452	69.0293	1/2	48.695	188.692
						5/8	49.087	191.748
3	9.4248	7.0686	1/2	29.845	70.8823	3/4	49.480	194.828
1/8	9.8175	7.6699	5/8	30.238	72.7599	7/8	49.873	197.933
1/4	10.210	8.2958	3/4	30.631	74.6621			
3/8	10.603	8.9462	7/8	31.023	76.5888			
						16	50.265	201.062
1/2	10.996	9.6211				1/8	50.658	204.216
5/8	11.388	10.3206				1/4	51.051	207.395
3/4	11.781	11.0447	10	31.416	78.54	3/8	51.444	210.598
7/8	12.174	11.7933	1/8	31.809	80.5158			
			1/4	32.201	82.5161	1/2	51.836	213.825
4	12.566	12.5664	3/8	32.594	84.5409	5/8	52.229	217.077
1/8	12.959	13.3641				3/4	52.622	220.354
1/4	13.352	14.1863	1/2	32.987	86.5903	7/8	53.014	223.655
3/8	13.744	15.033	5/8	33.379	88.6643			
			3/4	33.772	90.7628			
1/2	14.137	15.9043	7/8	34.165	92.8858	17	53.407	226.981
5/8	14.530	16.8002				1/8	53.800	230.331
3/4	14.923	17.7206				1/4	54.192	233.706
7/8	15.315	18.6655				3/8	54.585	237.105
			11	34.558	95.0334			
5	15.708	19.635	1/8	34.950	97.2055	1/2	54.978	240.529
1/8	16.101	20.629	1/4	35.343	99.4022	5/8	55.371	243.977
1/4	16.493	21.6476	3/8	35.736	101.6234	3/4	55.763	247.45
3/8	16.886	22.6907				7/8	56.156	250.948
			1/2	36.128	103.8691			
1/2	17.279	23.7583	5/8	36.521	106.1394			
5/8	17.671	24.8505	3/4	36.914	108.4343	18	56.549	254.47
3/4	18.064	25.9673	7/8	37.306	110.7537	1/8	56.941	258.016
7/8	18.457	27.1086				1/4	57.334	261.587
						3/8	57.727	265.183
6	18.850	28.2744	12	37.699	113.098			
1/8	19.242	29.4648	1/8	38.092	115.466	1/2	58.119	268.803
1/4	19.635	30.6797	1/4	38.485	117.859	5/8	58.512	272.448
3/8	20.028	31.9191	3/8	38.877	120.277	3/4	58.905	276.117
						7/8	59.298	279.811
1/2	20.420	33.1831	1/2	39.270	122.719			
5/8	20.813	34.4717	5/8	39.663	125.185	19	59.690	283.529
3/4	21.206	35.7848	3/4	40.055	127.677	1/8	60.083	287.272
7/8	21.598	37.1224	7/8	40.448	130.192	1/4	60.476	291.04

PROPERTIES OF SATURATED STEAM

Gage Pressure in lbs. per sq. in.	Temperature in Degrees Fahr.	Total Heat in Heat Units from Water at 32°F.	Heat Units in Liquid from 32° F.	Heat of Vaporization in Heat Units	Density of Weight of 1 cu. ft. in lbs.	Volume of 1 lb. in cubic feet	Weight of 1 cu. ft. of water
0	212.00	1146.6	180.8	965.8	0.03760	26.60	59.76
10	239.36	1154.9	208.4	946.5	0.06128	16.32	59.04
20	258.68	1160.8	227.9	932.9	0.08439	11.85	58.50
30	273.87	1165.5	243.2	922.3	0.1070	9.347	58.07
40	286.54	1169.3	255.9	913.4	0.1292	7.736	57.69
50	297.46	1172.6	266.9	905.7	0.1512	6.612	57.32
55	302.42	1174.2	271.9	902.3	0.1621	6.169	57.22
60	307.10	1175.6	276.6	899.0	0.1729	5.784	57.08
65	311.54	1176.9	281.1	895.8	0.1837	5.443	56.95
70	315.77	1178.2	285.6	892.7	0.1945	5.142	56.82
75	319.80	1179.5	289.8	889.8	0.2052	4.873	56.69
80	323.66	1180.6	293.8	886.9	0.2159	4.633	56.59
85	327.36	1181.8	297.7	884.2	0.2265	4.415	56.47
90	330.92	1182.8	301.5	881.5	0.2371	4.218	56.36
95	334.35	1183.9	305.0	879.0	0.2477	4.037	56.25
100	337.66	1184.9	308.5	876.5	0.2583	3.872	56.18
105	340.86	1185.9	311.8	874.1	0.2689	3.720	56.07
110	343.95	1186.8	315.0	871.8	0.2794	3.580	55.97
115	346.94	1187.7	318.2	869.6	0.2898	3.452	55.87
120	349.85	1188.6	321.2	867.4	0.3003	3.330	55.77
125	352.68	1189.5	324.2	865.3	0.3107	3.219	55.69
130	355.43	1190.3	327.0	863.3	0.3212	3.113	55.58
135	358.10	1191.1	329.8	861.3	0.3315	3.017	55.52
140	360.70	1191.9	332.5	859.4	0.3420	2.924	55.44
145	363.25	1192.8	335.2	857.5	0.3524	2.838	55.36
150	365.73	1193.5	337.8	855.7	0.3629	2.756	55.29
155	368.62	1194.3	340.3	853.9	0.3731	2.681	55.22
160	370.51	1195.0	342.8	852.1	0.3835	2.608	55.15
165	372.83	1195.7	345.2	850.4	0.3939	2.539	55.07
170	375.09	1196.3	347.6	848.7	0.4043	2.474	54.99
175	377.31	1197.0	349.9	847.1	0.4147	2.412	54.93
180	379.48	1197.7	352.2	845.4	0.4251	2.353	54.86
185	381.60	1198.3	354.4	843.9	0.4353	2.297	54.79
190	383.70	1199.0	356.6	842.3	0.4455	2.244	54.73
195	385.75	1199.6	358.8	840.8	0.4559	2.193	54.66
200	387.76	1200.2	360.9	839.2	0.4663	2.145	54.60
225	397.36	1203.1	370.9	832.2	0.5179	1.930	54.27
250	406.07	1205.8	380.1	825.7	0.5699	1.755	54.03
275	414.22	1208.3	388.5	819.8	0.621	1.609	53.77
300	421.83	1210.6	396.5	814.1	0.674	1.483	53.54

PROPERTIES OF METALS

Kind of Metal	Melting Point, Degrees Fahr.	Weight in pounds per cubic foot	Weight in pounds per cubic inch	Tensile Strength
Aluminum.....	1140	166.5	.0963	15,000– 30,000
Antimony....	810–1000	421.6	.2439	1,050
Brass, average	1500–1700	523.2	.3027	30,000– 45,000
Copper.....	1930	552.0	.3195	30,000– 40,000
Gold (pure)...	2100	1200.9	.6949	20,380
Iron, cast....	1900–2200	450.0	.2604	20,000– 35,000
Iron, wrought.	2700–2830	480.0	.2779	35,000– 60,000
Lead.....	618	709.7	.4106	1,000– 3,000
Mercury.....	—39	846.8	.4900	....
Nickel.....	3000	548.7	.3175	....
Silver.....	1800	655.1	.3791	40,000
Steel.....	2370–2685	489.6	.2834	50,000–120,000
Tin.....	475	458.3	.2652	5,000
Zinc.....	780	436.5	.2526	3,500

French or Metric Measures

The metric unit of length is the meter = 39.37 inches.
The metric unit of weight is the gram = 15.432 grains.

The following prefixes are used for subdivisions and multiples:

$$\text{Milli} = \frac{1}{1000},\ \text{Centi} = \frac{1}{100},\ \text{Deci} = \frac{1}{10},\ \text{Deca} = 10,$$

Hecto = 100, Kilo = 1,000, Myria = 10,000

French and British (and American) Equivalent Measures

MEASURES OF LENGTH

French		British and U. S.
1 meter	=	39.37 inches, or 3.28083 feet, 1.09361 yards.
.3048 meter	=	1 foot.
1 centimeter	=	.3937 inch.
2.54 centimeters	=	1 inch.
1 millimeter	=	.03937 inch, or 1-25 inch nearly.
25.4 millimeters	=	1 inch.
1 kilometer	=	1093.61 yards, or .62137 mile.

MEASURES OF WEIGHT

French		British and U. S.
1 gramme	=	15.432 grains.
.0648 gramme	=	1 grain.
28.35 grammes	=	1 ounce avoirdupois.
1 kilogramme	=	2.2046 pounds.
.4536 kilogramme	=	1 pound.
1 tonne or metric ton	=	.9842 ton of 2,240 pounds.
1000 kilogrammes	=	19.68 cwts.
	=	2204.6 pounds.
1.016 metric tons	=	1 ton of 2,240 pounds.
1016 kilogrammes	=	1 ton of 2,240 pounds.

MEASURES OF CAPACITY

French		British and U. S.
1 liter (= 1 cubic decimeter)	=	61.023 cubic inches.
	=	.03531 cubic foot.
	=	.2642 gallon (American).
	=	2.202 pounds of water at 62°F.
28.317 liters	=	1 cubic foot.
4.543 liters	=	1 gallon (British).
3.785 liters	=	1 gallon (American).

WEIGHT AND PRESSURE PER UNIT OF AREA

French		British and U. S.
1 gramme per square millimeter	=	1.422 lbs. per square inch
1 kilogramme per square millimeter	=	1422.32 " " " "
1 kilogramme per square centimeter	=	14.223 " " " "
1.0335 kilogrammes per square centimeter (1 atmosphere)	=	14.7 " " " "
0.070308 kilogramme per square centimeter	=	1 " " " "

Telegraph Cipher

CODE FOR THE ASHTON VALVE COMPANY

161 First Street, Cambridge "C," Boston, Mass., U. S. A.

Cable Address: "ASHTON," BOSTON

SPECIAL NOTICE

When ordering goods, use plain English words or figures for the NUMBER or QUANTITY WANTED.

Use "WESTERN UNION," A B C or "Bentley's Code" for general information, directions, and instructions.

PRELIMINARY

Revocable.	At what price, what quantity, and how soon can you ship?
Roofing.	Ship all you possibly can by quickest route.
Roofless.	Ship at first opportunity by cheapest route.
Roominess.	Ship at once by express.
Ropewalk.	Ship at once by fast freight.
Rotate.	Hold shipment Order No. —; await particulars by mail.
Restless.	Advise regarding shipment of our Order No.
Roving.	Trace shipment of our Order No.

Always order by NUMBER of Valve, give PRESSURE to set Valve, and state whether FLANGED or SCREW end.

			CODE WORD
Page 12	No. 20	Valve	Africa
" 14	" 4	"	America
" 15	" 5	Testing Clamps	Turkey
" 16	" 20A	Valve	Arabia
" 18	" 17	"	Alaska
" 22	" 17B	"	Algeria
" 23	" 11	Yoke	Chile
" 24	" 6	Valve	Asia
" 24	" 7	"	Austria
" 25	" 8	"	Belgium
" 25	" 9	"	Brazil
" 26	" 31	"	Persia
" 26	" 32	"	Poland
" 27	" 34	"	Caucasia
" 28	" 14	"	Costa
" 29	" 14B	"	Crete
" 32	" 16	"	Denmark
" 34	" 16A	"	Dahomey
" 36	" 16B	"	Danish
" 44	" 15	"	Cuba
" 45	" 15F	"	China
" 46	" 21	"	Gambia
" 47	" 22	"	Germany
" 50	" 18	"	England
" 51	" 24	"	Grenada
" 52	" 10	"	Canada
" 53	" 6B	"	Arctic
" 53	" 7B	"	Azore
" 54	" 18B	"	Egypt
" 55	" 19B	"	Guam
" 56	" 23	"	Greece
" 57	" 23M	"	Guinea
" 59	" 23D	Diffuser	Holland
" 60	" 25	Hyd. Relief Valve	Ireland

			CODE WORD
Page 61	No. 25B	Valve	Italy
" 64	" 28	"	Mexico
" 65	" 30	"	Peru
" 66	" 28M.M.	"	Malta
" 67	" 30M.M.	"	Monaco
" 68	" 28I.L.	"	Montenegro
" 69	" 30I.L.	"	Morocco
" 70	" 28U.S.	"	Madeira
" 78	" 37	Dome Connections	Panama
" 79	" 38	" "	Portugal
Screw Ends			Rome
Flanged Inlet			Russia
Flanged Outlet			Siberia
Nickel Seated			Spain

For Sizes and Pressures see page 172.

Style of Cases, Rings, Dials, etc., for Gages and Clocks

	CODE WORD
Iron Case, Brass Ring	Arthur
Iron Case, Nickel Plated Ring	Benny
Brass Case	Charlie
Nickel Plated Case	Jennie
Aluminum Case	Janet
Brass Deep Case, O. G. or Octagon Ring	Kate
Nickel Plated Deep Case, O. G. or Octagon Ring	Louise
Flush Ring	Sally
O. G. Ring	Susan
Black Dial	Mary
Silvered Dial	Nancy
White Enameled Dial	Sarah
Name on Dial	Monogram
Single Plain Dial	Theodosia
Double Plain Dial	Viola
Single Illuminated Dial	Vivian
Double Illuminated Dial	Winifred

Note.—When ordering Gages be particular to state Style of Case, Diameter of Dial, and Maximum Graduations.

			CODE WORD
Page 81	No. 52L.B.	Locomotive Gage	Avon
" 82	" 52	Standard Locomotive Gage	Athol
" 83	" 52	U. S. Locomotive Gage	Auburn
" 84	" 66	Vertical Reading Locomotive Gage	Eutaw
" 85	" 52	U. S. Locomotive Steam Heat Gage	Athens
" 86	" 52A.	Locomotive Steam Heat Gage	Akron
" 87	" 52C.	Locomotive Duplex and Steam Heat Gage	Bristol
" 88	" 62B.	High Speed Gage	Danbury
" 88	" 62B.	Standard Style Gage	Detroit
" 89	" 62C.	Duplex Air Brake Gage	Dennison
" 90	" 62A.	Triplex Air Brake and Train Signal Gage	Denver
" 91	" 51B.	Single Air Brake Gage	Deshler
" 92	" 51C.	Special Caboose Air Brake Pressure Gage	Dunbar
" 99	" 59B.	Protected Dial Pressure Gage	Dunkirk
" 100	" 68	Air Brake Insp. Test Gage	Fargo
" 101	" 59A.	Inspectors' Pocket Test Gage	Cincinnati
" 102	" 75	Three-Speed A. B. Recording Gage	Milton
" 103	" 45	Inspectors' Testing and Proving Outfit	Mansfield
" 104	" 79	Weight Tester	Macon
" 108-109	" 46	Wheel Press Recording Gage	Milan
" 110	" 90	Plain Whistle (Locomotive)	Malden
" 110	" 91	Chime Whistle (Locomotive)	Magnolia

				CODE WORD
Page 111	No. 47		Piston Swab	Naples
" 113	" 51		Single Spring Pressure Gage	Allegheny
" 114	" 52		Double Spring Pressure Gage	Austin
" 115	" 69		Illuminated Dial Pressure Gage	Galveston
" 116	" 100		Master Pressure Gage	Clifton
" 117	" 100A		Master Pilot Pressure Gage	Chatham
" 118	" 53		Improved Vacuum Gage	Boston
" 119	" 54		Compound Pressure and Vacuum Gage	Bangor
" 120	" 55		Hydraulic Pressure Gage	Baltimore
" 121	" 56		Combination Water Pressure Gage	Brunswick
" 122	" 57		Ammonia Gage	Braintree
" 123	" 58		Pyrometer Steam Gage	Chicago
" 124	" 59		Standard Test Gage	Columbia
" 125	" 59A		Standard Pocket Test Gage	Cincinnati
" 126	" 60		Altitude Gage	Concord
" 127	" 60A		Water Tank Indicator Gage	Madrid
" 128	" 61		Chemical Pressure Gage	Melrose
" 129	" 78		Alarm Gage	Hartford
" 130	" 95		Caisson Pressure Gage	Medway
" 131	" 95A.		Pocket Caisson Pressure Gage	Mineola
" 132	" 96		Oxy-Acetylene Gas Pressure Gage	Nashville
" 132	" 97		Oxy-Acetylene Gas Pressure Gage	Newburg
" 133	" 67		Single Automobile Gages	Freemont
" 133	" 67A		Duplex Automobile Gages	Fulton
" 134	" 73		Improved Pressure Recording Gages	Guthrie
" 135	" 74		Improved Pressure Rec. & Ind. Gages	Grafton
" 138	" 73A.		Inspectors' Portable Recording Gage	Gary
" 139	" 63		Engine Room and Marine Clocks	Decatur
" 140	" 64		Improved Engine Register	Elyria
" 141	" 65		Rectangular Counter	Erie
" 142	" 62D.		Improved Illuminated Dial Duplex Air Brake Gage	Enid
" 143	" 94		Gage Hand Pullers	New York
" 144	" Style E		Marble Tablets	Lowell
	Note.—Specify Marble, Slate, or Marbleized Slate and Size Dial.			
Page 146			Syphons and Cocks	Needham
" 149	No. 1		Standard Lever Test Pump	Meriden
" 150	" 3		Screw Test Pump	Medford
" 150	" 3A.		Screw Test Pump	Monterey
" 151	" 87		Vacuum Gage Testing Pump	Morton
" 152	" 85		Light Hydraulic Pressure Gage Test Pump	Manor
" 153	" 86		Hydraulic Dead-Weight Pressure Gage Tester	Millville
" 154	" 88		Portable Boiler Test Pump Outfit	Orleans
" 155	" 89		Improved Boiler Test Pump	Oxford
" 156	" 90		Plain Steam Whistle	Manchester
" 157	" 90A.		Plain Whistle, Extra Long Bell	Quincy
" 158	" 91		Single Bell Chime Whistle	Natick
" 159	" 91A.		Three-Bell Chime Whistle, Combination A	Richmond
" 159	" 91A.		Three-Bell Chime Whistle, Combination B	Roanoke
" 159	" 91A.		Three-Bell Chime Whistle, Combination C	Rochester
" 160	" 92		Organ Whistle	Natchez
" 161	" 90B.		Whistle Valve, Plain	Ridgeway
" 161	" 91B.		Whistle Valve, Balanced	Riverside
" 162	" 105		Non-Squirting Bubble	Winston
" 162	" 106		Bubble with Self-Closing Faucet	Winona
" 162	" 107		Bubble with Pipe and Coupling	Winfield
" 163	" 108		Sanitary Bubbling Drinking Fountains	York

Where Several Figures or Styles are mentioned in Catalogue.

CODE WORD	
Uno	Figure 1 or Style 1
Duo	Figure 2 or Style 2
Trio	Figure 3 or Style 3
Quarto	Figure 4 or Style 4

SIZE IN INCHES OF DIAMETER OF VALVES, OPENINGS, FLANGES, DIALS OF GAGES AND CLOCKS, BELL OF WHISTLE, AND INCHES OF VACUUM

	CODE WORD
1/8 in.	Adams
1/4 "	Buchanan
3/8 "	Cleveland
1/2 "	Fillmore
3/4 "	Grant
1 "	Garfield
1 1/4 "	Hayes
1 1/2 "	Harrison
2 "	Jackson
2 1/2 "	Johnson
3 "	Jefferson
3 1/2 "	Lincoln
4 "	Madison
4 1/2 "	Monroe
5 "	McKinley

	CODE WORD
5 1/2 in.	Polk
6 "	Roosevelt
6 3/4 "	Taylor
7 "	Tyler
8 "	Tilden
8 1/2 "	Van
9 "	Buren
10 "	Washington
12 "	Wilson
14 "	Webster
16 "	Walton
18 "	Wellington
20 "	Whittier
24 "	Watkins

PRESSURE IN POUNDS OF VALVES AND GAGES

5 lbs.	Antonio
10 "	Arkansas
15 "	Ausable
20 "	Bay
25 "	Champlain
30 "	Cheyenne
35 "	Chippewa
40 "	Colorado
45 "	Congo
50 "	Connecticut
55 "	Danube
60 "	Delta
65 "	Elba
70 "	Firth
75 "	Ganges
80 "	Housatonic
85 "	Hudson
90 "	Humber
95 "	Huron
100 "	Indus
105 "	Lena
110 "	Mackenzie
115 lbs.	Mackinaw
120 "	Maumee
125 "	Mississippi
130 "	Missouri
135 "	Mohawk
140 "	Nile
145 "	Ohio
150 "	Ontario
155 "	Ottawa
160 "	Potomac
165 "	Rhine
170 "	Rio
175 "	Rouge
180 "	Saranac
185 "	Savannah
190 "	Seine
195 "	Tennessee
200 "	Thames
225 "	Waco
250 "	Winnipeg
300 "	Wurtemburg

HYDRAULIC PRESSURE

400 lbs.	Cabinet
500 "	Cakes
600 "	Caldron
800 "	Camera
1,000 "	Dagger
1,200 "	Damage
1,500 "	Dandy
2,000 "	Danger
2,500 "	Dauphin
3,000 lbs.	Doctor
3,500 "	Donor
4,000 "	Doric
5,000 "	Dormer
10,000 "	Dowry
15,000 "	Drab
20,000 "	Drape
25,000 "	Draw

Specify tons and size of ram in plain English.

			CODE WORD
Page 61	No. 25B	Valve	Italy
" 64	" 28	"	Mexico
" 65	" 30	"	Peru
" 66	" 28M.M.	"	Malta
" 67	" 30M.M.	"	Monaco
" 68	" 28I.L.	"	Montenegro
" 69	" 30I.L.	"	Morocco
" 70	" 28U.S.	"	Madeira
" 78	" 37	Dome Connections	Panama
" 79	" 38	" "	Portugal
Screw Ends			Rome
Flanged Inlet			Russia
Flanged Outlet			Siberia
Nickel Seated			Spain

For Sizes and Pressures see page 172.

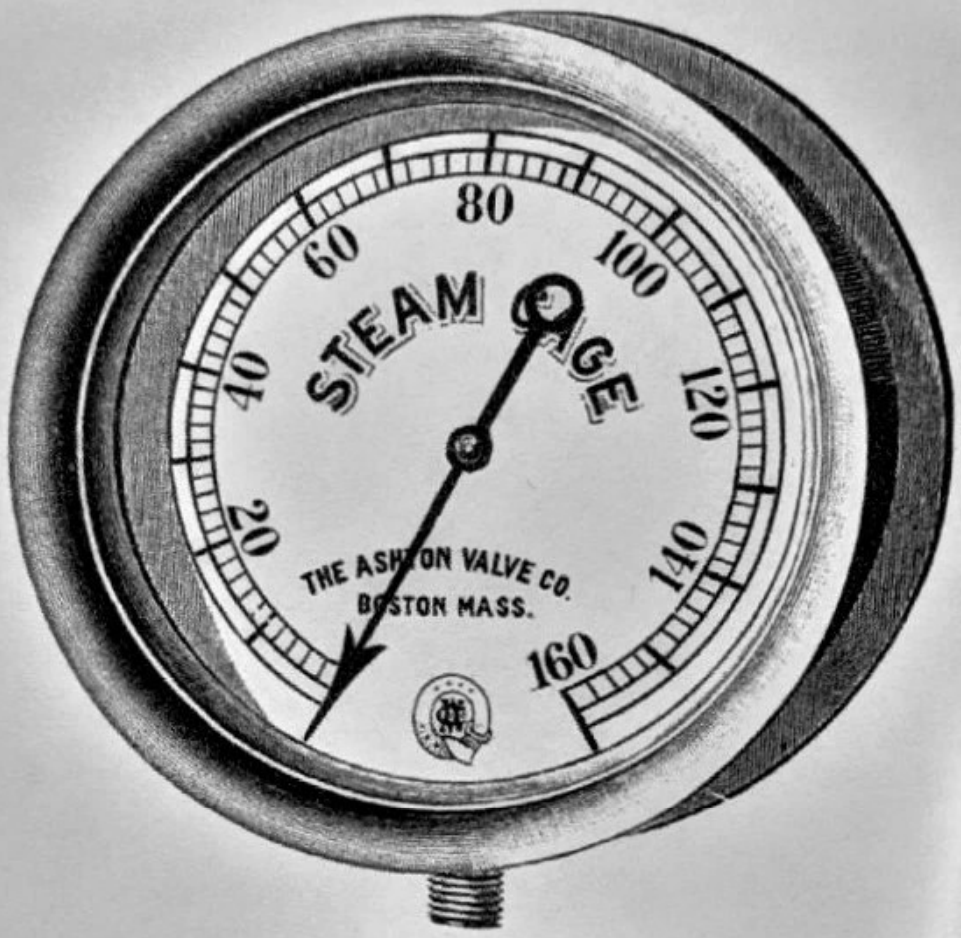
Style of Cases, Rings, Dials, etc., for Gages and Clocks

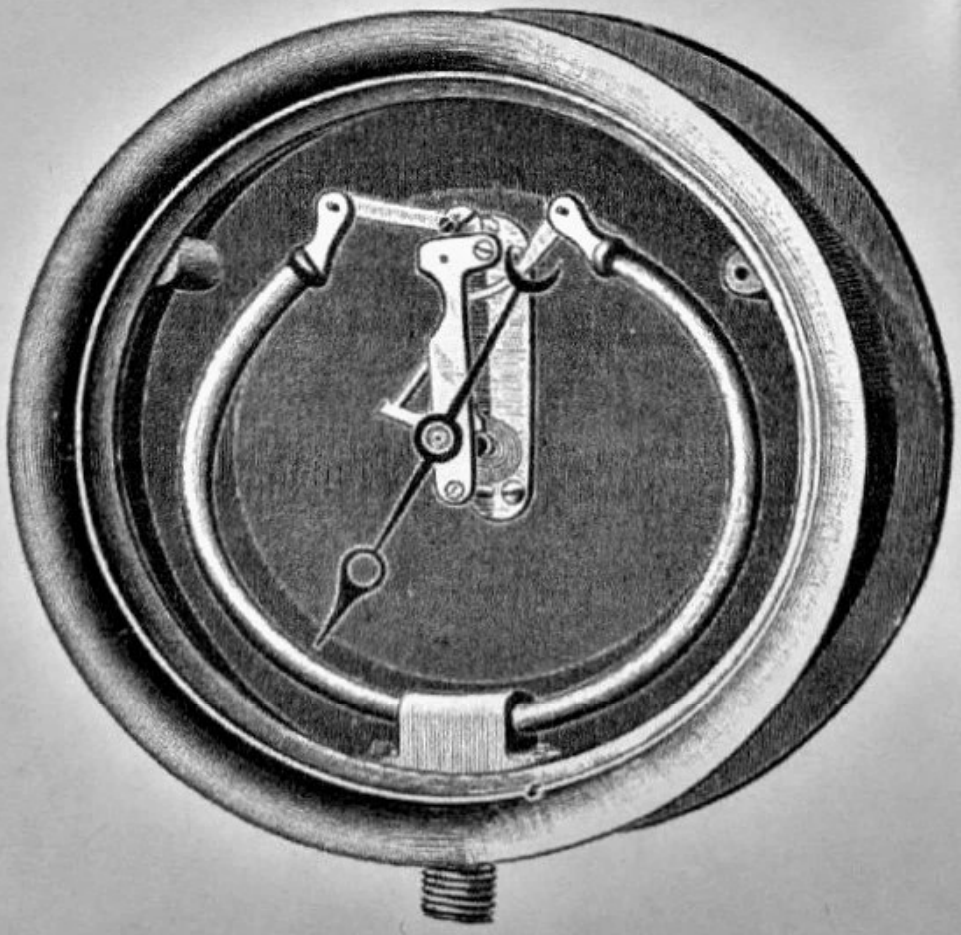
	CODE WORD
Iron Case, Brass Ring	Arthur
Iron Case, Nickel Plated Ring	Benny
Brass Case	Charlie
Nickel Plated Case	Jennie
Aluminum Case	Janet
Brass Deep Case, O. G. or Octagon Ring	Kate
Nickel Plated Deep Case, O. G. or Octagon Ring	Louise
Flush Ring	Sally
O. G. Ring	Susan
Black Dial	Mary
Silvered Dial	Nancy
White Enameled Dial	Sarah
Name on Dial	Monogram
Single Plain Dial	Theodosia
Double Plain Dial	Viola
Single Illuminated Dial	Vivian
Double Illuminated Dial	Winifred

Note.—When ordering Gages be particular to state Style of Case, Diameter of Dial, and Maximum Graduations.

				CODE WORD
Page 81	No. 52L.B.	Locomotive Gage		Avon
" 82	" 52	Standard Locomotive Gage		Athol
" 83	" 52	U. S. Locomotive Gage		Auburn
" 84	" 66	Vertical Reading Locomotive Gage		Eutaw
" 85	" 52	U. S. Locomotive Steam Heat Gage		Athens
" 86	" 52A.	Locomotive Steam Heat Gage		Akron
" 87	" 52C.	Locomotive Duplex and Steam Heat Gage		Bristol
" 88	" 62B.	High Speed Gage		Danbury
" 88	" 62B.	Standard Style Gage		Detroit
" 89	" 62C.	Duplex Air Brake Gage		Dennison
" 90	" 62A.	Triplex Air Brake and Train Signal Gage		Denver
" 91	" 51B.	Single Air Brake Gage		Deshler
" 92	" 51C.	Special Caboose Air Brake Pressure Gage		Dunbar
" 99	" 59B.	Protected Dial Pressure Gage		Dunkirk
" 100	" 68	Air Brake Insp. Test Gage		Fargo
" 101	" 59A.	Inspectors' Pocket Test Gage		Cincinnati
" 102	" 75	Three-Speed A. B. Recording Gage		Milton
" 103	" 45	Inspectors' Testing and Proving Outfit		Mansfield
" 104	" 79	Weight Tester		Macon
" 108-109	" 46	Wheel Press Recording Gage		Milan
" 110	" 90	Plain Whistle (Locomotive)		Malden
" 110	" 91	Chime Whistle (Locomotive)		Magnolia

e by Ashton Valve Co., 271 Franklin street, Boston, Mass.





THE ASHTON VALVE COMPANY

Ashton Pop Safety and Relief Valves

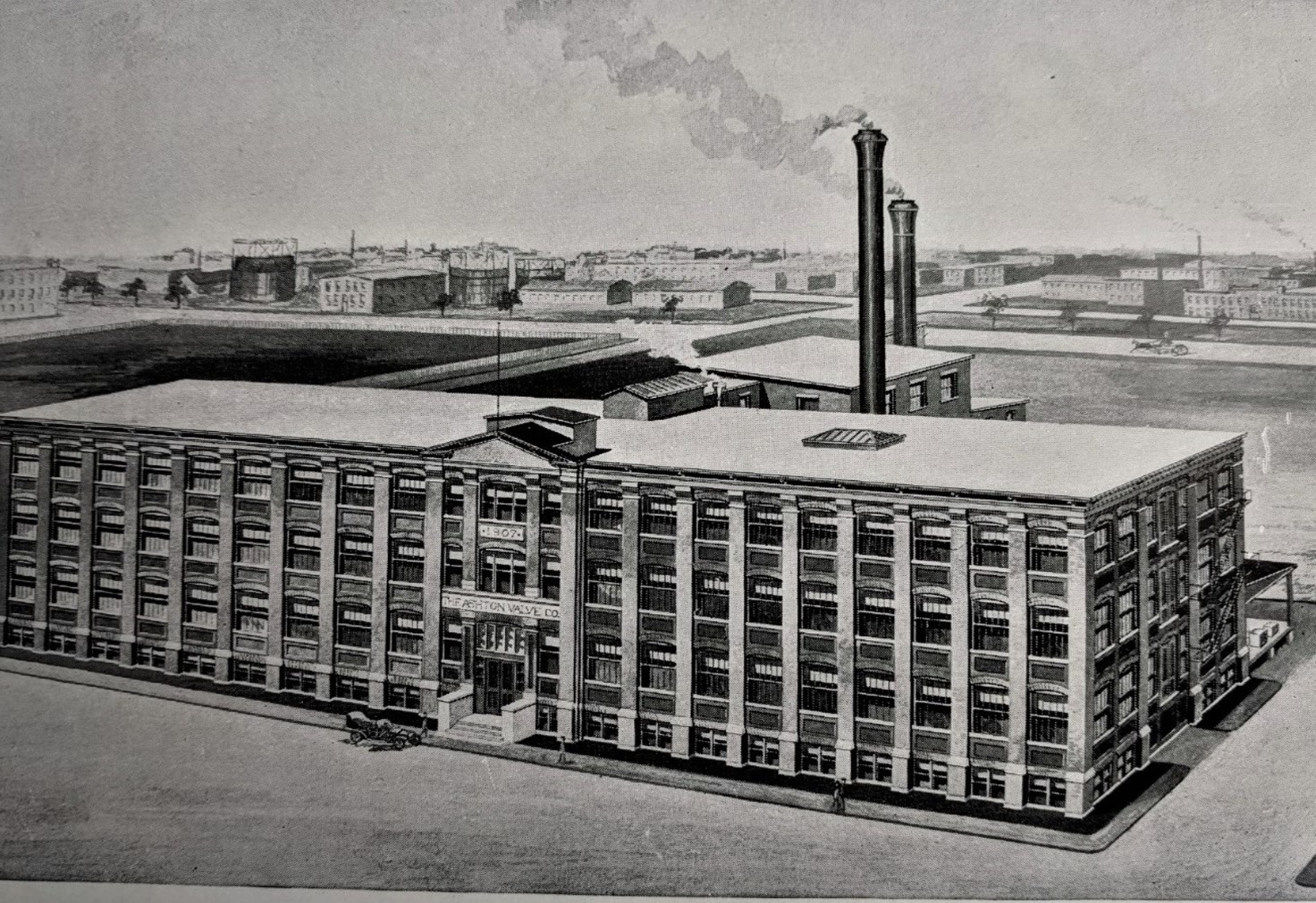
Pressure and Vacuum Gages

Locomotive and Power Plant Specialties

The Ashton Valve Company

MAIN OFFICE AND WORKS
161-179 First Street, Cambridge "C"
Boston, Mass.

BRANCHES
NEW YORK CHICAGO SAN FRANCISCO



Main Office and Works, 161-179 First Street, Cambridge, Mass.

The Ashton Valve Company

ESTABLISHED 1871 INCORPORATED 1877

REINCORPORATED 1916

ELLERY PEABODY, *President*

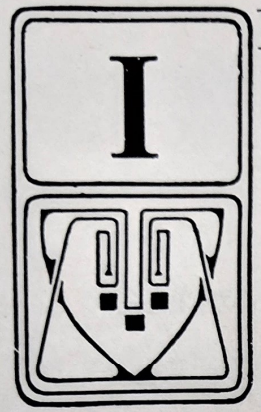
JOSEPH W. MOTHERWELL,
Vice President and Mgr. Railroad Dept.

ALBERT C. ASHTON,
Treasurer and General Manager

FRED H. ASHTON, *Assistant Treasurer*

ADRIAN D. PERRY, *Secretary*

Foreword



N PRESENTING Catalogue No. 18, we invite particular attention to those features which have been added to our long-established and well-known line of Ashton pop safety and relief valves, gages, and kindred locomotive and power-plant specialties.

We have carefully developed these improvements to insure the efficiency and durability demanded by the advance in steam engineering — increased pressure, higher superheat, etc.

For over forty-five years we have excelled in the manufacture of valves and gages, with the result that the Ashton product is recognized generally as of absolutely dependable quality. This high standard will be maintained.

A large new factory fully equipped with special machinery, a location suited to prompt delivery to railroad and steamship lines, and genuine co-operation of skilled workmen with those who have grown up in this business give us manufacturing facilities second to none.

We particularly desire to do business with those who discriminate for quality in preference to first cost.

THE ASHTON VALVE COMPANY.

Ashton Patents

ASHTON PATENTS already issued cover broadly the most valuable and desirable improvements on this line. To these we make additions from time to time as study and experiment prove advisable. Furthermore, we keep fully informed regarding the inventions of others and do not hesitate to strengthen our position by acquiring such as may be meritorious.

Believing the validity of our patents to be beyond question, we protect our customers by guaranteeing them against all loss, costs, damage, and expense arising from the use of our goods.

Ashton Copyright

As an additional protection against imitations, the name ASHTON has been registered as our trademark. We own the exclusive right to use it.

Ashton
Lock-up Pop Safety Valve

The mechanical principles upon which the Ashton Pop Safety Valve is constructed, with its carefully selected materials and superior workmanship, make it more efficient and more dependable than any other safety valve of which we have knowledge. Its great durability is established by the fact that it usually outlasts the boiler to which it is applied.

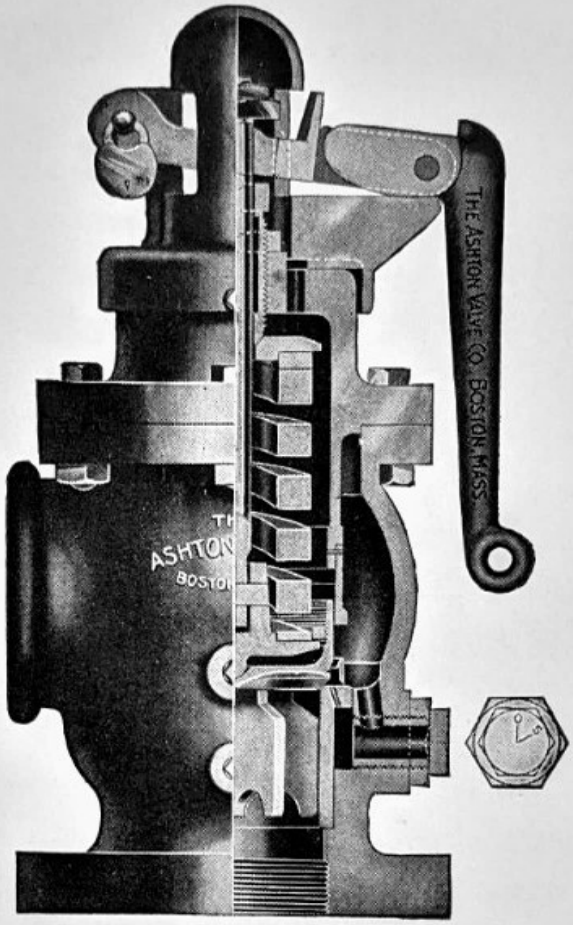
The safety is due primarily to the instant and adequate relief — instant because of sensitiveness. The almost utter absence of friction insures its blowing immediately when the given pressure is reached. Adequate relief, when of suitable size, is due to the increased lift which occurs as soon as it commences to blow; and the increased size of opening for the escape of steam renders it impossible to accumulate pressure above the point at which the valve is set. The lock-up attachment also adds to the safety by preventing tampering with the adjustment.

The convenience is due to its automatic action, the accessibility without disturbing piping, connections, or adjustments, and the ease with which the amount of pop can be regulated. It rises at a given pressure and cannot be stopped until it gives full relief, when it closes automatically after a drop of a few pounds pressure. There is nothing to disarrange or get out of order.

The economy of the Ashton Pop Safety Valve is due to the faultless design of the pop chamber, which insures the valve closing promptly, without undue waste of steam. Furthermore, the knife-edge lip maintains an unvarying pop for years without further adjustment. This feature, combined with the durable material of which all working parts are made, results in the lowest cost of maintenance.

The points of mechanical superiority are illustrated and described in detail on the following pages.

Points of Mechanical Superiority



No. 20

Valve Seats

Ashton Safety Valves are regularly made with bevel seats. The bevel is 45 degrees — the United States Government standard. Bevel seats remain tight and are easy to grind in or face off when long service renders repairs necessary. Flat seats are furnished when desired.

Composition or Nickel Seats

The standard Ashton Valve Seat is made of extra high quality composition metal equal to the United States Navy standard. It has great wearing qualities, and because of its freedom from corrosion it gives excellent service even with bad feed water. Nickel seats of the highest grade are furnished

Main Pop Chamber with Knife-Edge Lip

The pop chamber (patented) is of special design. It is the annular space above the seat bushing enclosed within the patented knife-edge lip. The lip wears down in proportion to the wear on the seat, thus keeping the outlet of the pop chamber of the same relative proportion to the inlet, giving steady and unvarying pop, which insures long service without adjustments or repairs.

Supplemental Pop Chamber

In most Ashton Safety Valves a SUPPLEMENTAL POP CHAMBER makes it possible to control the pop from the outside, regulating it to the finest adjustment, thereby reducing the waste of steam to a minimum. This supplemental pop chamber, into which the outside pop regulator is fitted, is an intermediate chamber below the main pop chamber and connected with it by a series of holes through the seat bushing.

Outside Pop Regulator

The patent screw plug pop regulator on the outside of Ashton Safety Valves (always accessible) affords convenient means for regulating the pop at all times without taking the valve apart, and when steam is on the boiler. This regulator, which is in the form of a hollow screw plug, serves as a bleeder. It regulates the pressure in the main pop chamber by changing the area of the outlet passage into the discharge chamber. The screw plug is of composition and the screw threads do not come in contact with the escaping steam; therefore there can be no corrosion to cause it to stick. Full explanation as to regulation is given on page 11.

Extra Quality Spring

All the springs used in our pop safety valves are made by hand in our own factory of special steel and have no superior. They are ground perfectly square on the ends, and before being accepted are subjected to the most thorough tests that can be given.

Pivoted Spring Discs

Although our springs are perfectly square on the ends, a true bearing on the valve is still further assured by using at the top and bottom a disc which is pivoted in the center.

Blow-Back Head and Spring Casing

Ashton Safety Valves are made with patented blow-back head which, by enclosing the spring, protects it from the main body of steam. This spring chamber is vented at the top, preventing the accumulation of back pressure on the valve, which might become dangerous by seriously reducing the safety valve capacity. Such an accumulation of pressure is impossible with the Ashton valve. The venting is an advantage also because it makes it perfectly safe to pipe together the discharge from any number of valves, even when the piping is long and with many elbows, for the valve cannot become loaded with back pressure. The blow-back head serves also as a top guide for the valve.

Base Outlet Construction

Both inlet and outlet are in the same base casting, permitting taking the valve apart for regrinding and repairs without breaking boiler connections or outlet pipe.

Through Bolts and Nuts

The bonnets of Ashton valves are usually secured to the body by through bolts and nuts which facilitate taking apart without the usual annoyance caused by the breaking of cap bolts or studs.

Lock-up Attachment

Ashton valves are furnished with lock-up attachment when desired, which prevents tampering with the set pressure adjustment.

Adjustable Cam Lever

With our patented cam lever it is easy to lift the valve from its seat one-eighth the diameter of the valve opening by hand regardless of the pressure in the boiler.

Adjustable Cap and Lever

The cap and trip lever can be made to operate in any position regardless of the location of the valve outlet.

Testing Clamps

Ashton valves are furnished with testing clamps when requested. These clamps are especially useful when the boilers are being tested, for they make it unnecessary to change the adjustment of the spring, thereby preventing excessive strain.

Valve Bodies

These are of high-grade cast iron, with the metal so distributed that there is ample strength at every point.

To Change Set Pressure

After unlocking the padlock, remove lock, pin, fork, and lever. Take off cap by loosening set screws, thus exposing the pressure screw. Slacken the check nut and turn screw downward for increased pressure or upward for less pressure. After adjustment is completed, set up check nut and replace other parts. To change set pressure it is not necessary to touch the through bolts in valve bonnet. This adjustment may be made while valve is under pressure.

In this manner spring tension may be changed for a variation of fifteen pounds above or below original set pressure. When a change more than fifteen pounds is desired, a new spring should be ordered, so that greatest efficiency may be had.

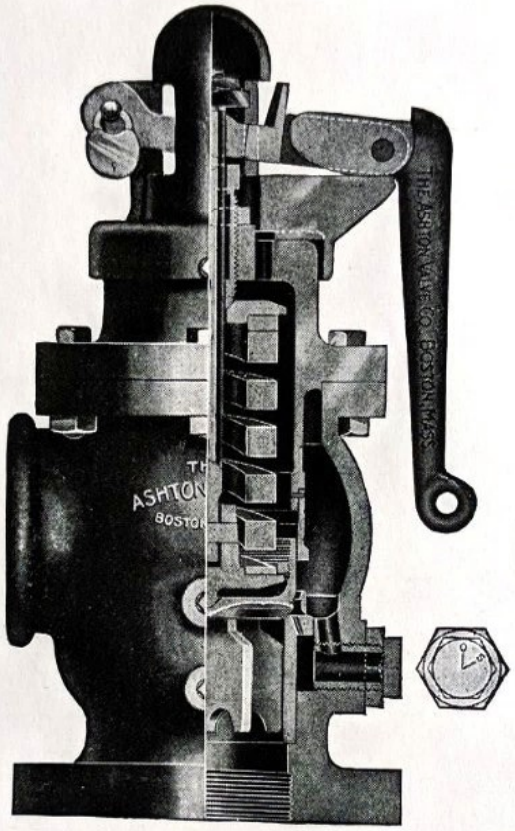
To Change "Pop"

To change "pop" or amount of reduction in pressure before the valve closes, it is not necessary to take the valve apart in any way. The "pop" is changed by turning the patented screw plug pop regulator on the outside of the valve. To get more "pop," that is, blow down more steam, slacken the check nut and turn plug regulator slightly to the left so that the letter S is nearer perpendicular. For less "pop" turn regulator to the right so that the letter O is nearer perpendicular.

The regulator needs very slight movement, for one-sixth of a complete turn gives the full range of adjustment.

Ashton Lock-up Pop Safety Valve

For large and moderate-sized Stationary Boilers in Mills, Factories, Electric Light and Power Stations, Pumping Stations, etc.



No. 20

Adopted by the United States Government, approved by State inspectors, recommended by prominent engineers and architects, and with a record of forty-five years of leadership, this valve with its many valuable patented improvements has a reputation not equaled by any other pop safety valve on the market.

This valve is regularly made with iron body and to conform to A. S. M. E. standard, and when specified, to comply with any State requirements, and is suitable for a maximum working pressure of 350 pounds.

LIST PRICES

Size Valve	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Composition Seat	$58.00	$72.00	$86.00	$100.00	$115.00	$135.00	$155.00	$175.00	$195.00
Nickel Seat	61.00	76.00	91.00	106.00	122.00	143.00	165.00	187.00	209.00
Diam. of Inlet Flange	6½ in.	7½ in.	8¼ in.	9 in.	10 in.	10½ in.	11 in.	12½ in.	12½ in.
Weight, pounds	54	70	112	130	153	184	195	230	290

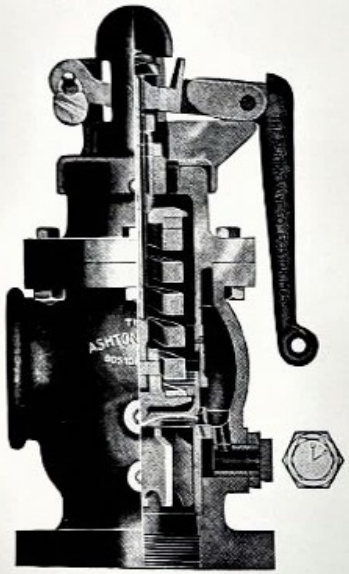
For directions to change set pressure or adjustment of pop or blow-back see page 11.

When ordering always state maximum working pressure and whether flanged or screwed inlets are desired.

For Sheet of Dimensions see page 13. For Price List of Parts see page 21.

Ashton Lock-up Pop Safety Valve

For large and moderate-sized Stationary Boilers in Mills, Factories, Electric Light and Power Stations, Pumping Stations, etc.



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Diam. of Inlet Flange	6½ in.	7½ in.	8½ in.	9 in.	10 in.	10½ in.	11 in.	12½ in.	12½ in.
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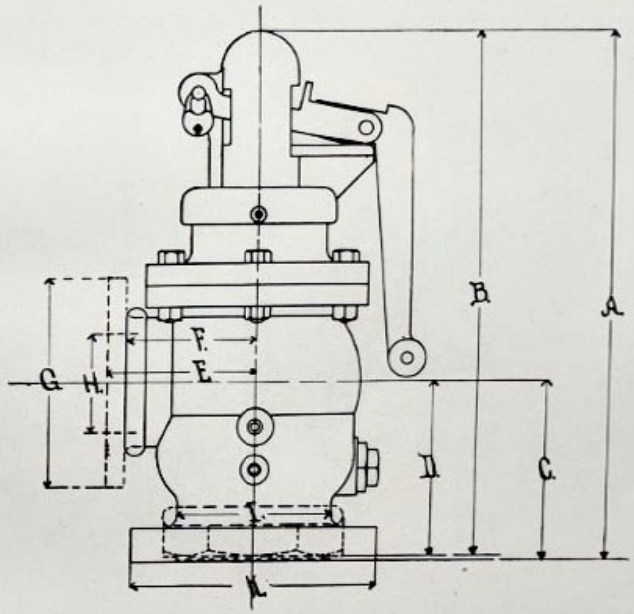
Ashton Lock-up Pop Safety Valve

No. 20 Style Dimension Sheet



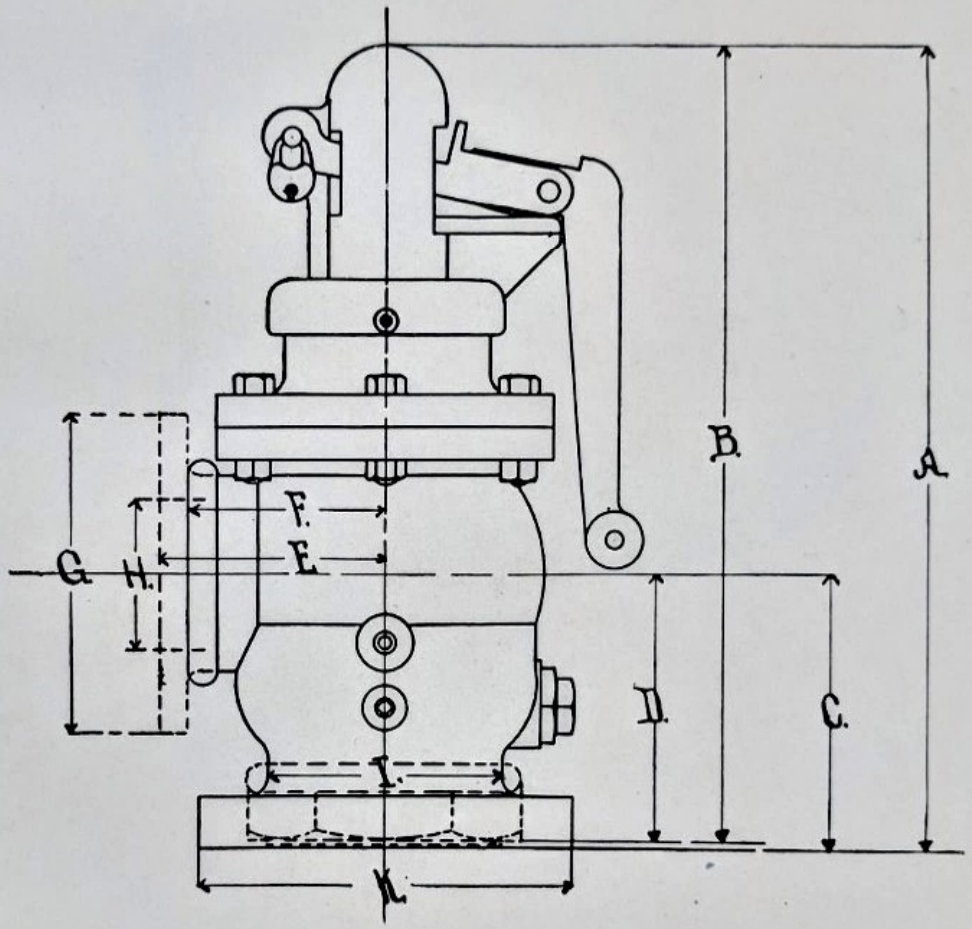
DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2	15	15	5 1/16	5 1/16	4 1/16	3 1/2	6	2	4	6 1/2
2½	16 1/4	16 1/4	6 1/16	6 1/16	4 1/16	4 1/8	7	2½	4 3/8	7 1/2
3	17 3/4	17 3/4	6 3/4	6 3/4	5 1/4	4 1/2	7 1/2	3	5 1/8	8 1/4
3½	20	20	7 1/16	7 1/16	6 1/16	5 1/4	8 1/2	3½	5 1/4	9
4	20 3/4	20 3/4	7 1/16	7 1/16	6 1/16	5 1/4	9	4	6 1/4	10
4½	22	22	7 5/8	7 5/8	6 1/16	5 5/8	9 1/4	4½	6 3/4	10 1/2
5	22	22	8 1/4	8 1/4	6 1/16	5 3/4	10	5	7 1/4	11
5½	24	24	8 1/2	8 1/2	7	6 1/2	11	*5 1/2	8 1/8	12 1/2
6	24 3/4	24 3/4	9 1/8	9 1/8	7	6 1/2	11	6	9	12 1/2

*When screw outlet is used it is cut for 5 inch pipe.

Ashton Lock-up Pop Safety Valve

No. 20 Style Dimension Sheet



DIMENSIONS IN INCHES

Sizes	A	B	C	D	E	F	G	H	I	K
2 . . .	15	15	5 3/16	5 3/16	4 1/8	3 1/2	6	2	4	6 1/2
2 1/2 . .	16 1/4	16 1/4	6 3/16	6 3/16	4 13/16	4 1/8	7	2 1/2	4 3/8	7 1/2
3 . . .	17 3/4	17 3/4	6 3/4	6 3/4	5 1/4	4 1/2	7 1/2	3	5 1/8	8 1/4
3 1/2 . .	20	20	7 9/16	7 9/16	6 1/16	5 1/4	8 1/2	3 1/2	5 1/4	9
4 . . .	20 3/4	20 3/4	7 11/16	7 11/16	6 3/16	5 1/4	9	4	6 1/4	10
4 1/2 . .	22	22	7 5/8	7 5/8	6 9/16	5 5/8	9 1/4	4 1/2	6 3/4	10 1/2
5 . . .	22	22	8 1/4	8 1/4	6 11/16	5 3/4	10	5	7 1/4	11
5 1/2 . .	24	24	8 1/2	8 1/2	7	6 1/2	11	*5 1/2	8 1/8	12 1/2
6 . . .	24 3/4	24 3/4	9 1/8	9 1/8	7	6 1/2	11	6	9	12 1/2

*When screw outlet is used it is cut for 5 inch pipe.

Ashton Muffler Attachment

No. 4

This muffler attachment effectively muffles the noise of escaping steam when the valve is blowing, yet without in any way impairing its efficiency. The above illustration shows the muffler on outlet of our No. 20 Stationary Valve. It is equally adapted to any other safety valve and may be applied direct to the outlet or at the end of the discharge pipe. Its use is not limited to safety valves, but may be used on any pipe from which there is a noisy escape of steam.

LIST PRICES

Size	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Price	$15.00	$16.00	$17.00	$18.00	$19.00	$21.00	$23.00	$25.00	$27.00
Weight, pounds	38	43	49	54	59	73	87	92	100

Ashton Valve Testing Clamps

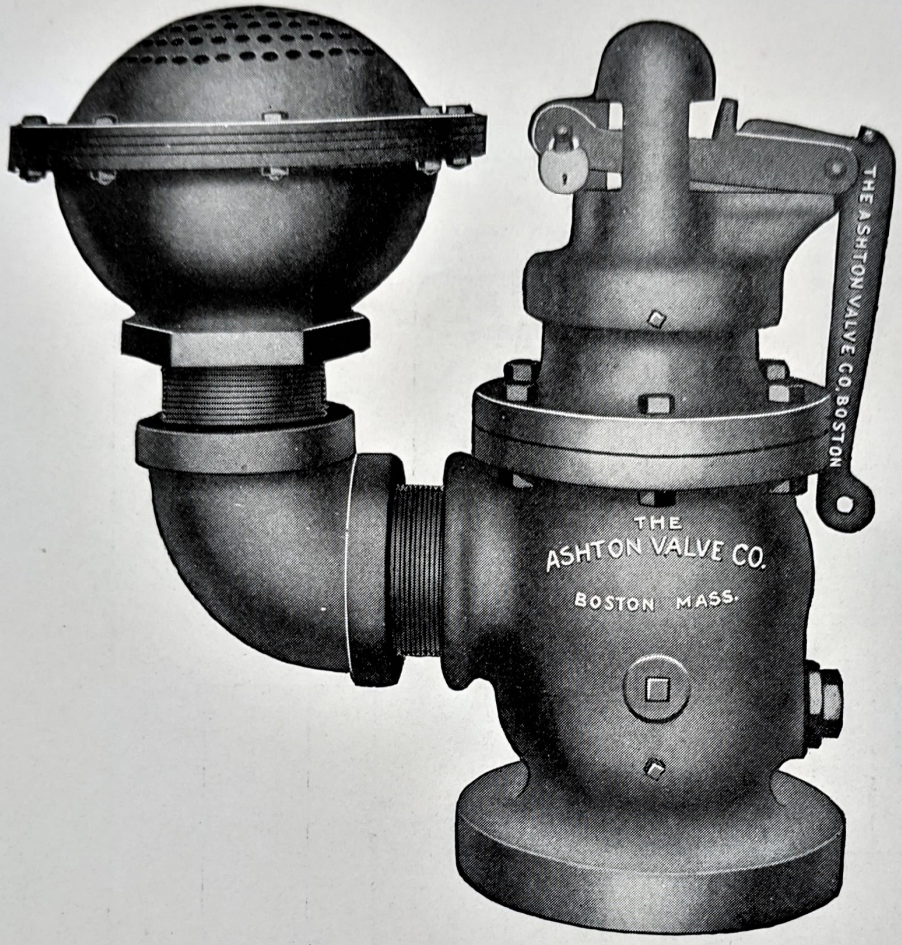
No. 5

With these testing clamps, the safety valve need not be taken off when a boiler is tested, nor is it necessary to change the set pressure of the valve. This saves the valve spring from excessive and undue strain. Testing clamps are furnished with our Stationary and Marine Pop Safety Valves when requested.

To apply the clamps, first remove the valve cap, then place the ends of the clamp arms beneath the flange as shown above. Setting down the clamp screw on the valve spindle will hold the valve rigidly on its seat. After the boiler test is over, remove clamp and replace valve cap, — the valve will then work perfectly at exactly the original set pressure.

Don't forget to remove clamp after test is over.

Ashton Muffler Attachment



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LIST PRICES

Size	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	5½ in.	6 in.
Price	$15.00	$16.00	$17.00	$18.00	$19.00	$21.00	$23.00	$25.00	$27.00
Weight, pounds	38	43	49	54	59	73	87	92	100