

No. 763,588.

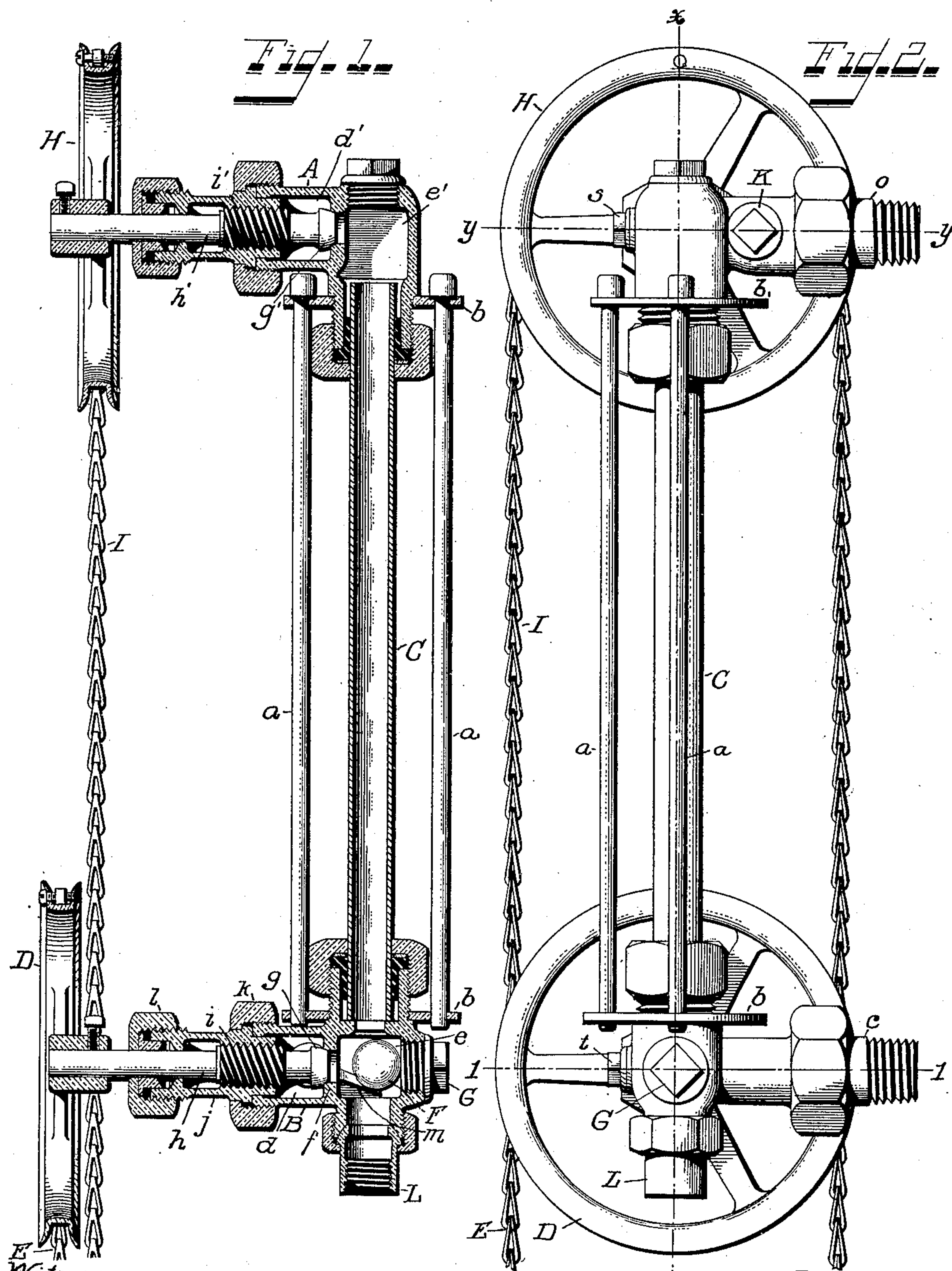
PATENTED JUNE 28, 1904.

J. J. AULL.
WATER GAGE.

APPLICATION FILED MAY 25, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

Bernard J. Haugfeldt.
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Inventor.
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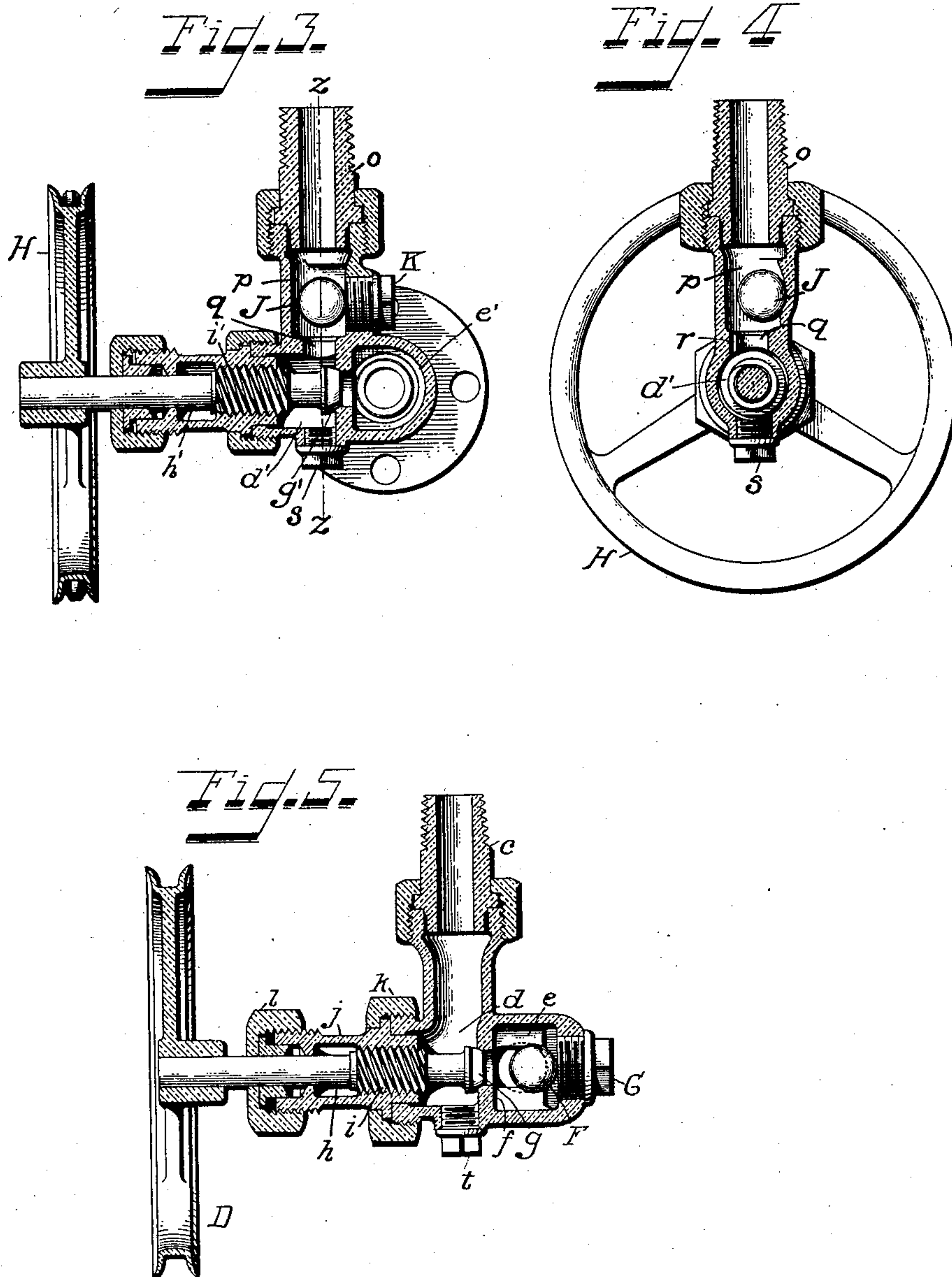
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2 SHEETS—SHEET 2.



Witnesses.

Bernard J. Hausfeld.

Edward Pick

Inventor.

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UNITED STATES PATENT OFFICE.

JEROME J. AULL, OF CINCINNATI, OHIO, ASSIGNOR TO THE LUNKENHEIMER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

WATER-GAGE.

SPECIFICATION forming part of Letters Patent No. 763,588, dated June 28, 1904.

Application filed May 25, 1903. Serial No. 158,752. (No model.)

To all whom it may concern:

Be it known that I, JEROME J. AULL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Water-Gages, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to water-gages for boilers which are set high and have their water-level a considerable distance above the floor and of that class wherein automatic valves are employed, which in the case of breakage of the gage-glass will immediately close the passages, and thus prevent the escape of water and steam. My invention is designed to increase the simplicity and efficiency of this class of water-gages and to add thereto extraneous quick-closing hand-valves to be operated by pulleys and chains, so that the attendant on the boiler-room floor may have perfect control of said quick-closing valves through the medium of said chains or cords, which depend from the pulleys on the valve-stems.

The novelty of my invention will be hereinafter more fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1, Sheet 1, is a sectional side elevation on the dotted line *xx* of Fig. 2, looking to the right, of my improved gage. Fig. 2, Sheet 1, is an elevation of the gage looking to the left of Fig. 1. Fig. 3, Sheet 2, is a sectional plan view on the dotted line *yy* of Fig. 2. Fig. 4, Sheet 2, is a sectional elevation on the dotted line *zz* of Fig. 3 looking to the left. Fig. 5, Sheet 2, is a sectional plan view on the dotted line 1 1 of Fig. 2.

The same letters of reference are used to indicate identical parts in all the figures.

Referring to Figs. 1 and 2, A is the upper or steam arm, and B the lower or water arm, of the gage, said arms being connected in the usual manner by the gage-glass C, which is protected from breakage by rods *a*, having their ends secured to disks *b* on the arms A

B, respectively. Referring now to the arm B, said arm has the usual tubular connection or union *c*, by which it is secured through the side of the boiler into the water-space, and this connection opens into a chamber *d*, Fig. 1, which is separated from a second chamber *e*, directly beneath the lower end of the gage-glass, by a diaphragm *f* with an opening there-through, the side of said opening next to the chamber *d* being formed into a valve-seat, against which a valve *g* works to open and close the communication between the chambers *d* and *e*, and consequently between the water-space of the boiler and the gage-glass. The stem *h* of the valve *g* has upon it a very quick thread *i*, engaging a threaded bore in a bonnet or hood *j*, connected by a ring-coupling *k* with the projecting end of the chamber *d*. The projecting end of the stem *h*, which passes through a stuffing-box *l* upon the end of the bonnet *h*, has secured upon it a grooved pulley D, to which is secured a chain or cord E, whose ends depend from both sides of the pulley, so that by catching hold of one end the pulley is turned in one direction to open the valve *g* and by catching hold of the other end the pulley is turned in the opposite direction to close the valve *g*, as will be readily understood. Within the chamber *e* is a ball-valve F, supported upon inclined ribs *m*, so as to normally lie against the inner side of a screw-plug G, closing an opening in the side of the chamber *e*, through which opening the ball-valve F is introduced and may be removed when desired.

I will now proceed to describe the steam-arm A, which is constructed very much like the water-arm B, except in the particulars to be herein pointed out. It has a chamber *d'* corresponding to the chamber *d* and communicating with a chamber *e'* directly over the gage-glass by a valve-controlled opening in a diaphragm separating these chambers. It also has a valve *g'* similar to the valve *g*, whose stem *h'* is provided quick thread *i'*, and upon the projecting end of which stem is a grooved pulley H, with a chain or cord I secured thereto with its ends depending from

both sides of the pulley, so that by grasping either end of said chain or cord the pulley may be turned to quickly open or close the valve g' .

5 Referring now to Figs. 3 and 4, the boiler connections and ball-valve mechanism for the steam-arm will be readily understood from the following description: o is the boiler-union, opening into a chamber p , containing
10 a ball-valve J, which normally lies in a depression in the lower side of the chamber, as seen in Fig. 4, but is adapted to close an opening q between the chamber p and the chamber d' . In other words, the upper ball-
15 valve is located between the boiler and the valve g' , while the lower ball-valve is located between the valve g and the gage-glass. K is a screw-plug closing an opening in the chamber p , through which the ball-valve J is
20 introduced and removed.

The operation of so much of the gage as has been described is as follows: The valves $g g'$ are normally open, thereby giving free access
25 of the water and steam in the boiler to the gage-glass, and the pressure being equalized the ball-valves J F occupy the positions shown in the drawings and do not close any of the passages; but should the gage-glass be broken
30 from any cause the quick rush of steam and water would at once take the ball-valves from their resting-places and force them against their seats to close the apertures and prevent further escape of steam and water. As seen
35 in Fig. 4, I provide a small vent-passage r at the side of the opening between the chambers $p d'$, so that even when the ball-valve J is closed a small amount of steam may escape through said passage or vent and in case of
40 breakage by its noise in escaping give notice to the attendant, who at once will manipulate the cords or chains to close the valves $g g'$, and thereby absolutely cut off further escape of steam or water from the boiler. This vent
45 also serves another useful purpose, and that is in case after breakage of a glass and a new glass has been inserted should the valves $g g'$ be opened too quickly the ball-valves might
50 be seated by such action; but the escape of steam through the vent would soon equalize the pressure in the gage-glass, and the ball-valves would fall back to their normal positions to permit the free admission of steam and water to the gage-glass, as will be readily understood.

55 The remaining features of my improved water-gage consist in the cleaning-out screw-plugs s for the steam-arm and t for the water-arm, these plugs being arranged in line with the openings into the boiler, so that a
60 wire or other suitable instrument may be passed through to remove any scale or other sediment. Of course when this is done the valves $g g'$ are opened to their fullest extent

and the ball-valve J is removed from its chamber, and this cleansing is done, of course, only
65 when the boiler is empty.

In Figs. 1 and 2 I have shown a drain-connection L, controlled by any suitable cock or stop-valve, (not shown,) which connection
70 leads from the chamber e , and it is to be observed that when it is desired to drain or cleanse the parts, the valves $g g'$ being opened and the stop-cock in the drain-pipe open, the passage of the water and steam out through
75 the drain-pipe will not be with sufficient force to close the ball-valve J, and it could not close the ball-valve F for reasons which are apparent.

The above-described water-gage is very simple in its construction, is thoroughly efficient and safe in action, as well as being
80 entirely automatic, and it provides for all of the requirements of the naval service as well as of domestic and foreign boiler regulations.

Having thus fully described my invention,
85 I claim—

1. In a water-gage, the combination of the gage-glass, the water-arm at the lower end thereof, a chamber in said water-arm just below the gage-glass and containing a ball-valve,
90 a second chamber communicating with the water-space of the boiler and with said first-named chamber, and a quick screw-valve within said second chamber controlling the passage between said two chambers, and so located
95 that the boiler-pressure is exerted upon the back side of said valve to hold the same tight when closed, substantially as described.

2. In a water-gage, the combination of the gage-glass, the water-arm at the lower end
100 thereof, a chamber in said water-arm containing a ball-valve, a second chamber communicating with the water-space of the boiler, a quick screw-valve controlling the passage between said two chambers and so located
105 that the boiler-pressure is exerted to hold said valve tight when closed, a pulley fast on the stem of said valve, and an operating flexible pull fast to said pulley and dependent from both sides thereof, substantially as described. 110

3. In a water-gage, the combination of the gage-glass, the steam-arm at the upper end thereof, a chamber communicating with the upper end of the gage-glass, a quick screw-valve controlling the passage between said
115 chamber and the upper end of the gage-glass, a pulley fast on the stem of said valve, an operating chain or cord fast to said pulley and dependent from both sides thereof, a second chamber between said first-named chamber
120 and the boiler connection, a ball-valve in said second chamber, and a seat or depression for said ball-valve to normally hold it open, substantially as described.

4. In a water-gage, the combination of the
125 gage-glass, the steam-arm at the upper end

thereof, the water-arm at the lower end thereof, quick-opening valves for both of said arms in chambers in line with the passages of said arms to the boiler and so located that the
5 boiler-pressure is carried to hold said valves tight when closed, and screw-plugs in the outer walls of said arms likewise in line with

said passages, whereby upon retracting said valves and opening said plugs free access is given to the boiler-passages to clean the same. 10

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Witnesses:

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