

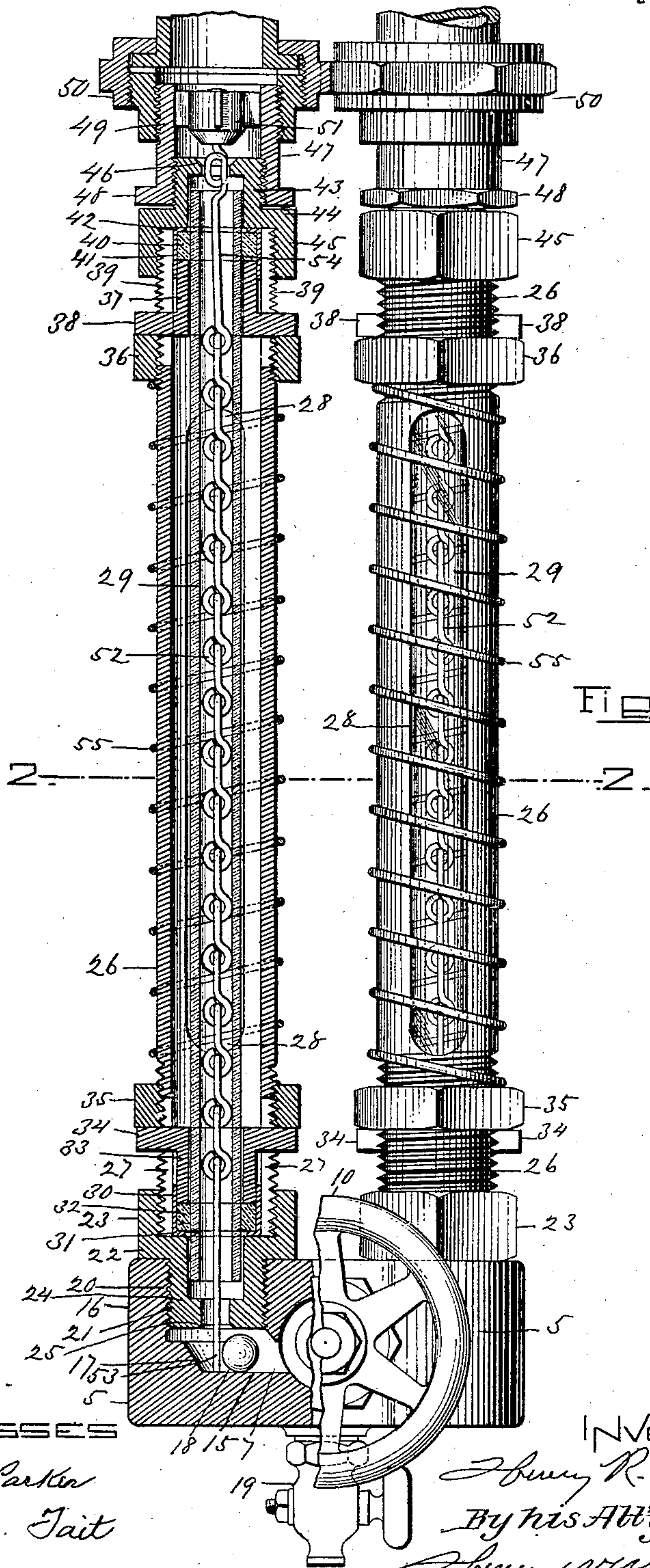
No. 870,026.

PATENTED NOV. 5, 1907.

H. R. FAY.
WATER GAGE.

APPLICATION FILED APR. 1, 1907.

2 SHEETS—SHEET 1.



WITNESSES
Frank G. Parker
A. M. Jait

INVENTOR
Henry R. Fay
By his Atty.
Henry Williams

No. 870,026.

PATENTED NOV. 5, 1907.

H. R. FAY.
WATER GAGE.

APPLICATION FILED APR. 1, 1907

2 SHEETS—SHEET 2.

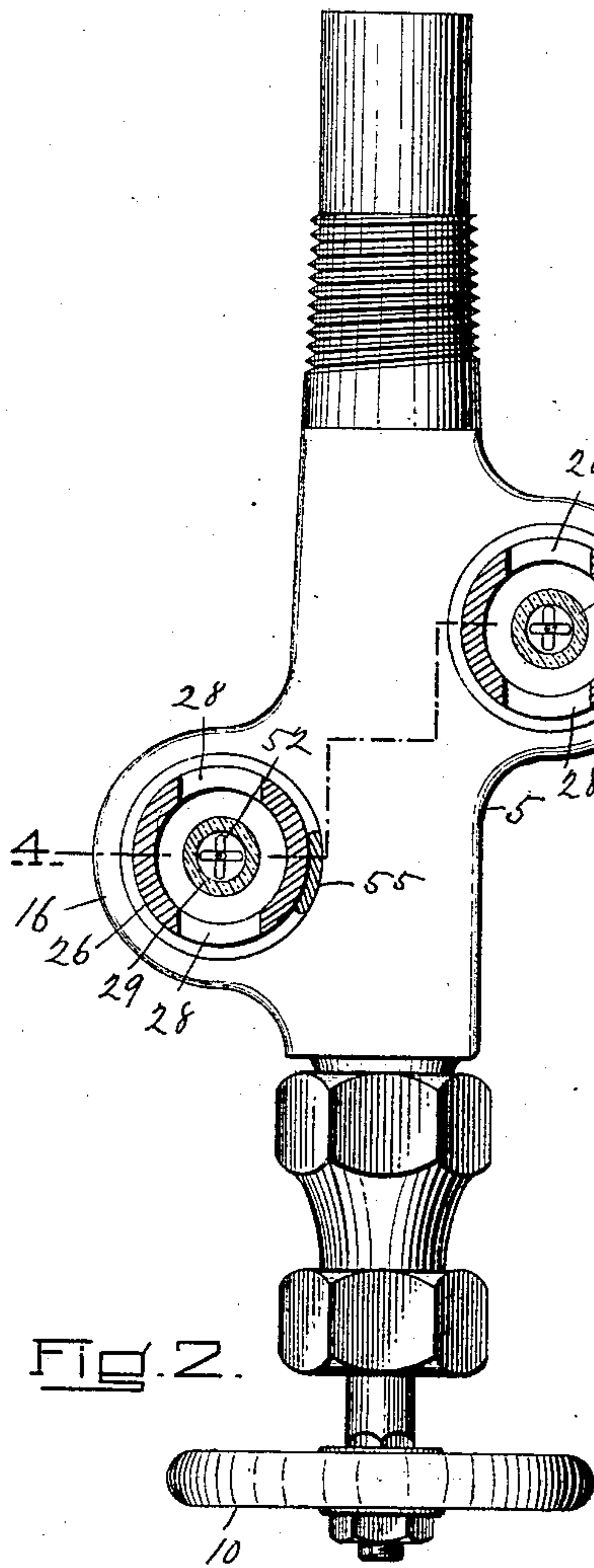


Fig. 2.

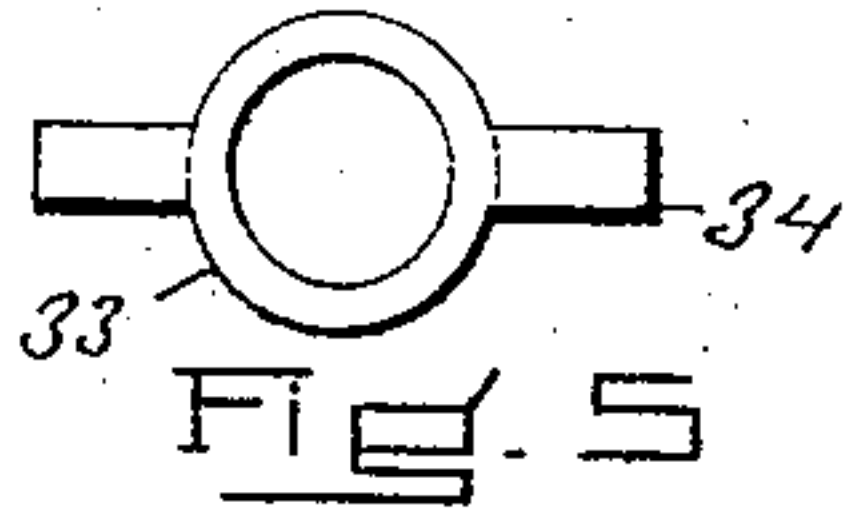


Fig. 5.

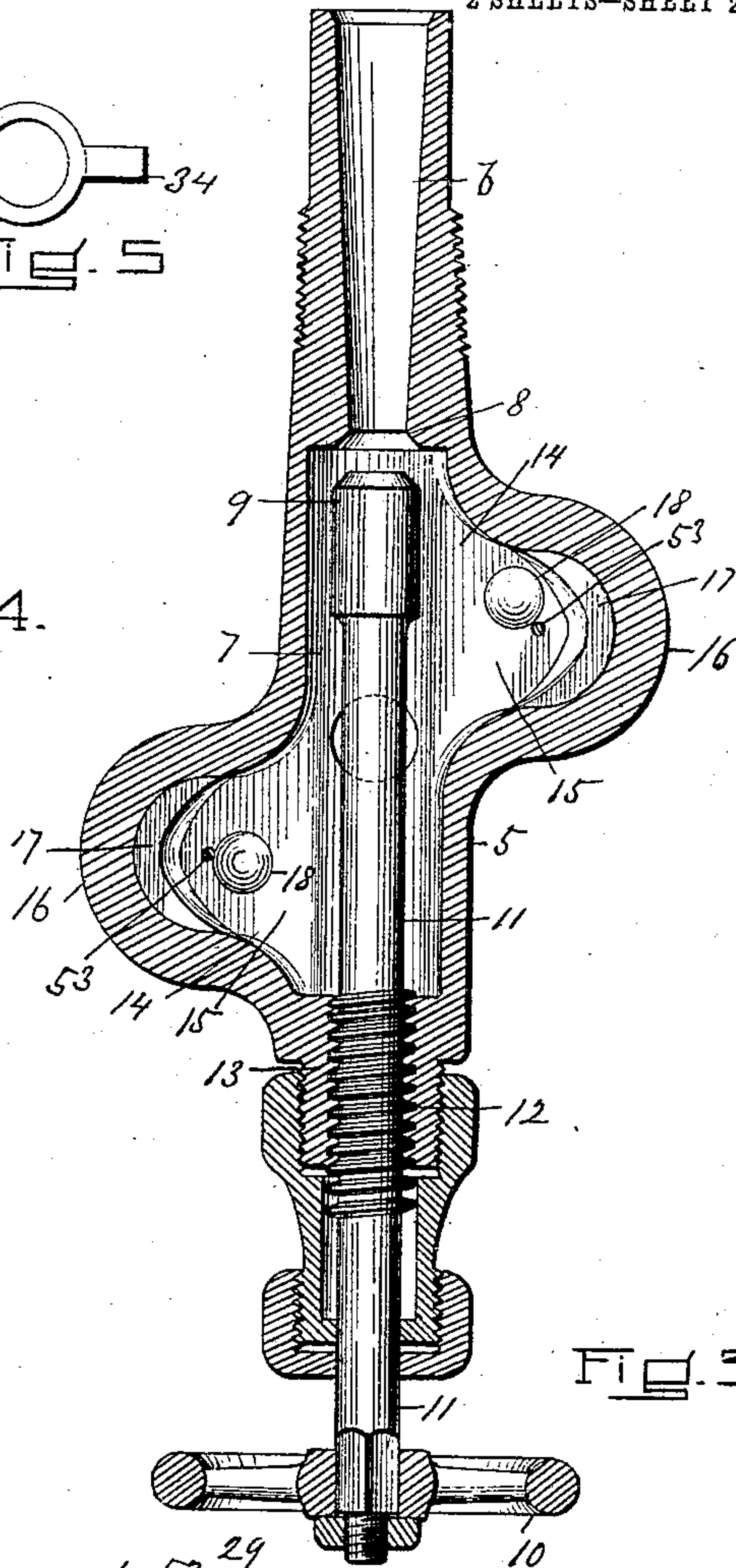


Fig. 3.

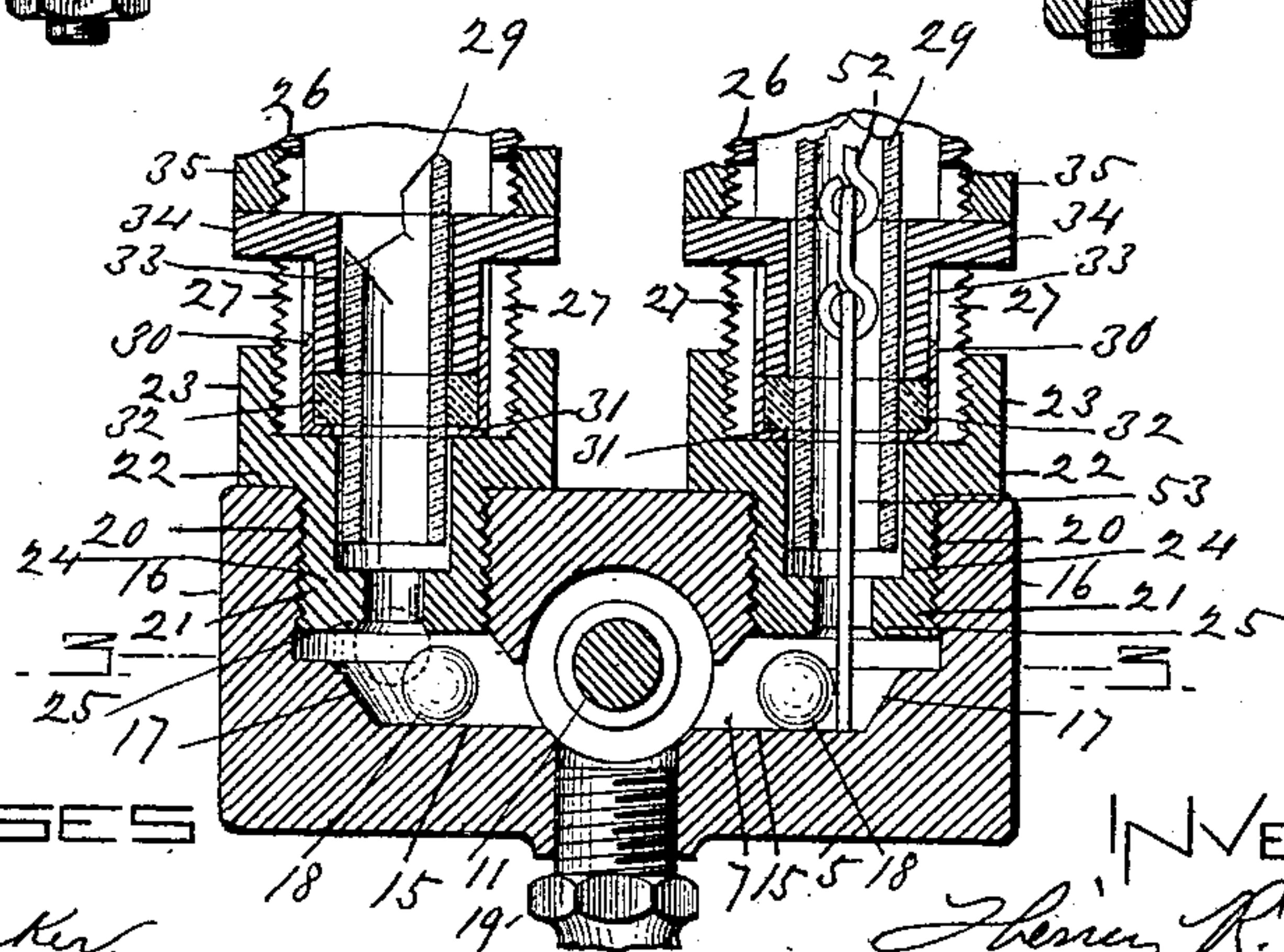


Fig. 4.

WITNESSES

Frank G. Parker
A. M. Tait.

INVENTOR

Henry R. Fay

By his Atty.
Henry Williams

UNITED STATES PATENT OFFICE.

HENRY R. FAY, OF BOSTON, MASSACHUSETTS.

WATER-GAGE.

No. 870,026.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed April 1, 1907. Serial No. 365,634.

To all whom it may concern:

Be it known that I, HENRY R. FAY, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Water-Gages, of which the following is a specification.

This invention relates to water-gages for application to steam-boilers, and it relates particularly to mechanism whereby when the glass becomes broken by accident or otherwise the valves admitting the steam and the water both automatically close, preventing the inrush of steam or water; a construction whereby a plurality of water-glasses are provided on a single base, and to certain other details of construction, all as fully described below, and illustrated in the accompanying drawings, in which:—

Figure 1 is a view of a double water-gage embodying my invention, one of the gages on the common base being shown in elevation, and the other in vertical section. Fig. 2 is a horizontal section taken on line 2—2, Fig. 1. Fig. 3 is a horizontal section taken on line 3—3, Fig. 4. Fig. 4 is a vertical section taken on line 4—4, Fig. 2, one of the gages being represented as with its glass broken. Fig. 5 is a plan view of one of the glands removed.

Similar characters of reference indicate corresponding parts.

Reference numeral 5 represents a base provided with a horizontal inlet-passage 6 for water, which leads to and connects with a chamber 7. At 8 (Fig. 3) there is a valve-seat against which a valve 9 may be forced by the hand-wheel 10 rigid on the outer end of the valve-stem 11 which is screw-threaded at 12 to engage with the internally threaded portion 13 of the hollow base 5. The chamber 7 is provided with two diagonally opposite extensions 14, exactly alike, each having a flat floor 15 and a curved outer wall 16. From the flat floor next said wall the bottom is beveled or sloped up, as indicated at 17 in Figs. 1, 4 and 3, in order to prevent a ball 18 which is free on the flat floor 15 from rolling against the curved wall and catching at any point, for the purpose explained below.

19 represents an ordinary drip-mechanism for removing the water from the chamber in the base when desired.

Directly over the two extension-chambers 14 are threaded vertical holes 20 into which are screwed the supports for the lower ends of two water-glasses or gages, exactly alike in every respect. As a description of one describes the other, their corresponding parts are provided with similar reference-numerals. Screwed into each threaded portion 20 is the lower externally threaded end 21 of a nut whose shoulder 22 rests on the base 5, and whose upper broadened portion 23 is internally screw-threaded. A second shoulder 24 reduces the vertical passage in the nut to a diameter less than that of the ball 18 whereby the lower end 25 of said passage constitutes a valve-seat for said ball.

Screwed into the upper end of the portion 23 of each nut is the lower oppositely slotted end of the metallic tube 26 (the vertical section in Figs. 1 and 4 being taken through the opposite vertical slots 27 therein) said tube 26 being provided with the usual vertical window 28 through which the water-glass or tube 29 can be seen. The lower end of this glass 29 extends into the portion 21 of the counterbored nut above the shoulder 24.

Resting on the shoulder 22 is a ferrule 30 which surrounds the glass and whose lower end is provided with an internal flange or step 31, and supported by this step is a rubber or elastic washer or bushing 32. The lower end of a gland 33 extends into the upper end of the ferrule 30, around the glass, and on the bushing, being held in position and pressed on said bushing by a lock-nut 35 on the threaded lower end of the metallic tube or case 26, said lock-nut pressing against lugs 34, which extend from the upper end of the gland through the slots 27.

The upper end of each tube 26 and glass 29 is provided with reversely placed parts similar to those above described, viz., a lock-nut 36 corresponding with the lock-nut 35, a gland 37, 38 corresponding with the gland 33, 34 and sliding in slots 39 in the upper end of the tube 26 corresponding with the slots 27 in the lower end, a bushing 40 and ferrule 41, 42 corresponding with the bushing 32 and ferrule 30, 31, and a counterbored nut 43, 44, 45 corresponding with the nut 21, 22, 23, the upper end of the nut 43, 44, 45 being provided with a port or valve-seat 46. The upper externally threaded end of the portion 43 of this nut is engaged by the internally threaded portion of a tube 47 provided with an annular flange 48 which rests on the outer shoulder 44 of the nut. The upper end of said tube 47 is externally threaded at 49 and thus connected by a suitable union 50 with the steam in the boiler.

Within each tube 47 is a winged valve 51 which is adapted by its radial wings to slide vertically in said tube. Inside the glass tube 26 is a chain 52, whose links are of such a size as to fit slidingly therein without doubling or crumpling up. The lowest link in the chain is provided with a metallic rod 53 of length to rest normally on the floor 15 of the extension chamber 14, said rod 53 extending through the lower end or port of the nut 21, 23. The highest link in the chain is connected to a rod 54 which extends up and connects at its upper end with the valve 51.

When the glass is whole and unbroken, the chain is held in line without its links doubling and hence without the chain contracting, because said links are large enough to fit slidingly in and practically fill the glass,

and hence the rod 54 holds the valve 51 up away from its seat 46, allowing the admission of steam, and the lower end of the rod 53 touches and rests on the floor 15, keeping the ball one side and away from the seat 25, and allowing the admission of water into the lower end of the glass. The normal position of these parts is illustrated in Figs. 1 and 3 and in full lines in Fig. 4. Should the glass tube 26 become broken, as illustrated in the left end of Fig. 4, the chain 52 crumples up by the rush of steam from above and the water from below when the walls of the tube break away from it, forcing the valve 51 to its seat 46 and closing the port at that point and preventing the admission of more steam, and the rod 53 is lifted by the in-rush of the water, allowing the ball to be forced by the water against its seat 25, closing the water-inlet, as illustrated in dotted lines in Fig. 4.

A coil of wire 55 is spirally disposed around each tube or case 26 for the purpose of preventing or limiting the flying of glass when the glass tube breaks.

The arrangement of the rubber bushing, the glands and the ferrules prevents strain on the glass and cramping of the packing.

It is evident that by providing the base with a plurality of water-gages, or rather with the vertical portions of water-gages, a perfectly working gage is left when one becomes broken.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is:

1. In a water-gage, a water-glass; a chain fitting slidably in and substantially filling said glass; a base provided with a chamber and having an inlet-passage leading to said chamber and a passage connected with the lower end of the glass; a wire or rod extending from the lower end of the chain normally to the floor of said chamber; and a ball on said floor held normally by the wire or rod away from the passage connected with the glass, whereby the breaking of the glass will allow the in-rush of water to raise the wire or rod, crumple up the chain and force the ball against the passage leading to the glass, closing said passage.

2. In a water-gage, a water-glass; a chain fitting slidably in and substantially filling said glass; a base provided with a chamber and having an inlet-passage leading

to said chamber; a case surrounding the glass; tubular connections intermediate of the case and base supporting the glass and connecting the glass and case with the chamber in the base; a wire or rod extending from the lower end of the chain through said connections normally to the floor of the chamber; and a ball on said floor held by the wire or rod normally away from the passage connecting with the glass, whereby the breaking of the glass will allow the in-rush of water to raise the wire or rod, crumple up the chain and force the ball against the passage leading to the glass, closing said passage.

3. In a water-gage, a water-glass; a chain fitting slidably in and substantially filling said glass; a base provided with a chamber and having an inlet-passage leading to said chamber and a passage connected with the lower end of the glass; a wire or rod extending from the lower end of the chain normally to the floor of the chamber; a ball on said floor held normally by the wire or rod away from the passage connecting with the lower end of the glass; a steam-inlet valve above and connected by a passage with the upper end of the glass; and a rod or wire connecting the upper end of the chain with said valve and holding it normally above and away from its seat, whereby the breaking of the glass will allow the chain to crumple up and the ball and upper valve to be driven to their seats by the water and steam, shutting off the supply thereof.

4. In a water-gage, a water-glass; a case surrounding the glass and provided at its ends with opposite longitudinal slots; a chain fitting slidably in and substantially filling said glass; a base provided with a water-inlet passage, a chamber, an outlet port and a valve; counterbored nuts at opposite ends of the glass and case and screwing into said base and connecting with the port therein at the lower ends of the glass and case; a suitable union connecting with the said nut at the upper ends of the glass and case and provided with a valve connected with the upper end of the chain; elastic bushings surrounding the glass at its opposite ends; ferrules surrounding the bushings within the counterbored nuts; and glands surrounding the glass and extending against the bushings, said glands being provided with lugs which are adapted to slide in the slots in the opposite ends of the case, the valves being forced to close automatically by the pressure of steam and water when the glass breaks and the chain is allowed to crumple up.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY R. FAY.

Witnesses:

HENRY W. WILLIAMS,
M. A. ATWOOD.