

No. 652,474.

Patented June 26, 1900.

S. COOK.
WATER GAGE GLASS VALVE.

(Application filed June 23, 1899.)

(No Model.)

Fig. 1.

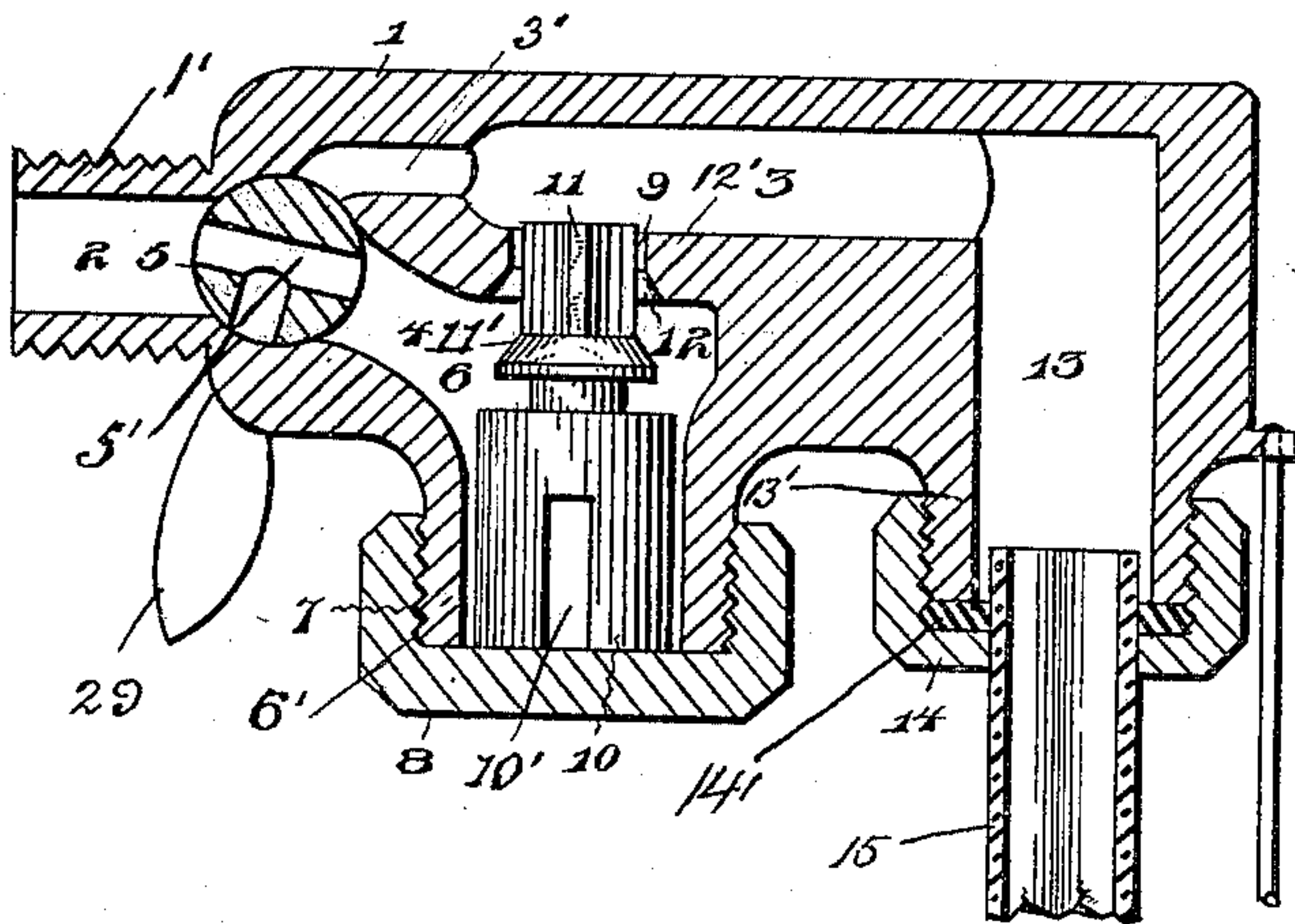


Fig. 2.

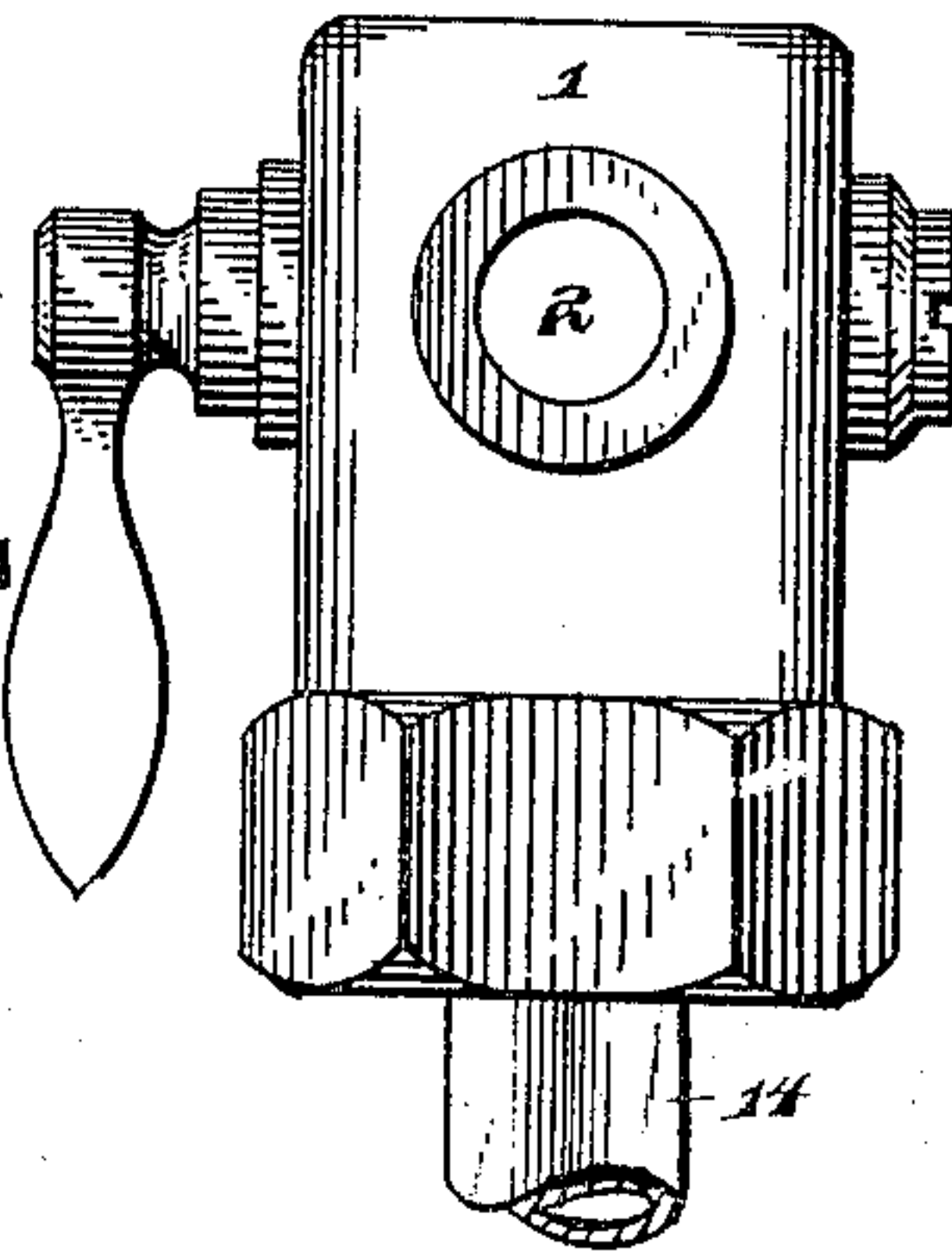


Fig. 3.

Fig. 4.

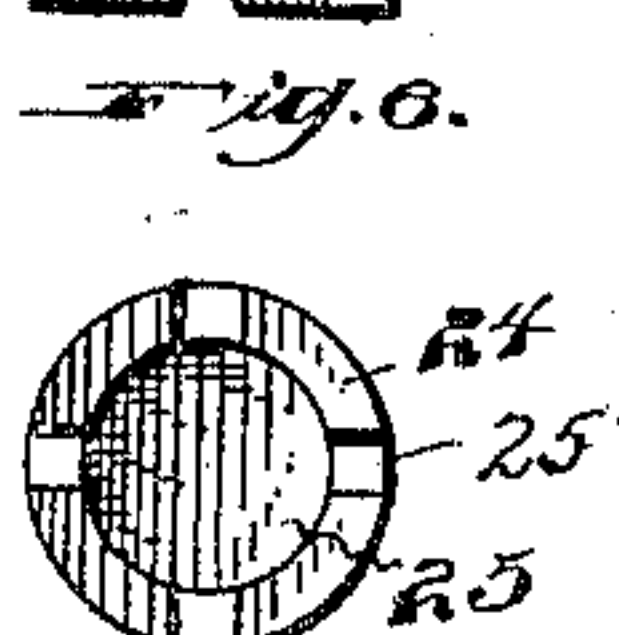
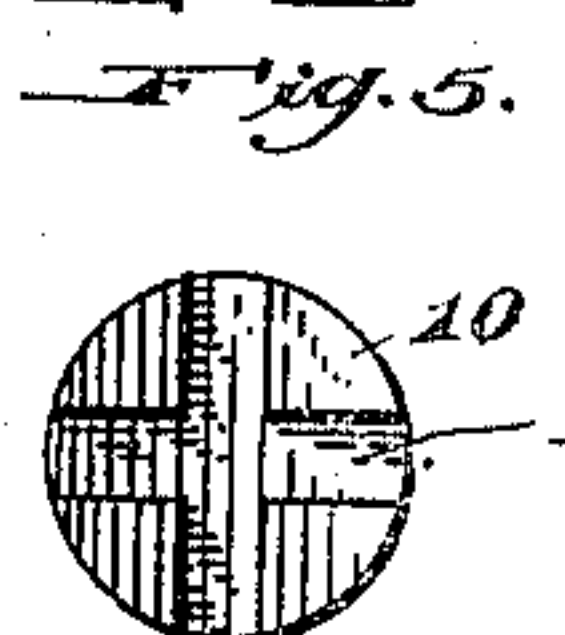
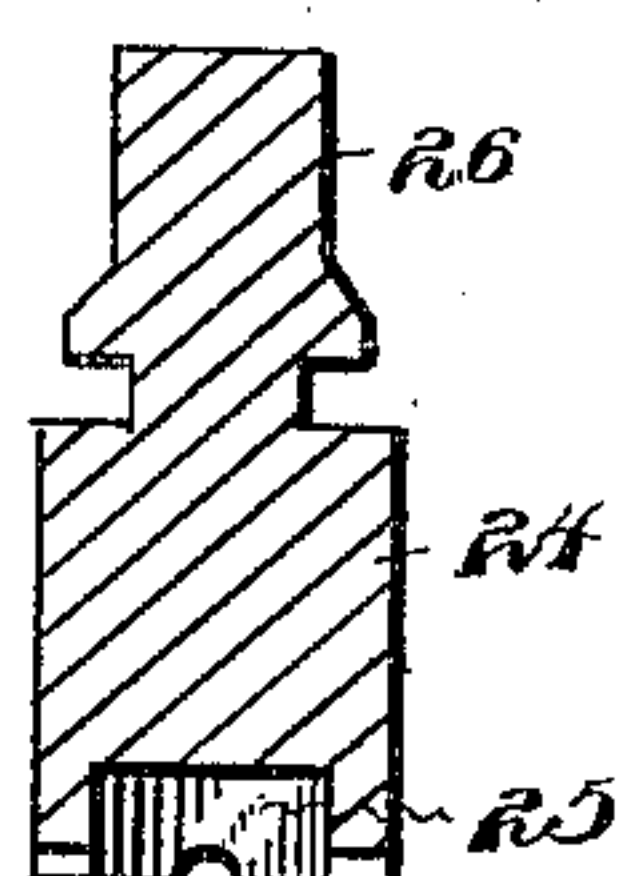
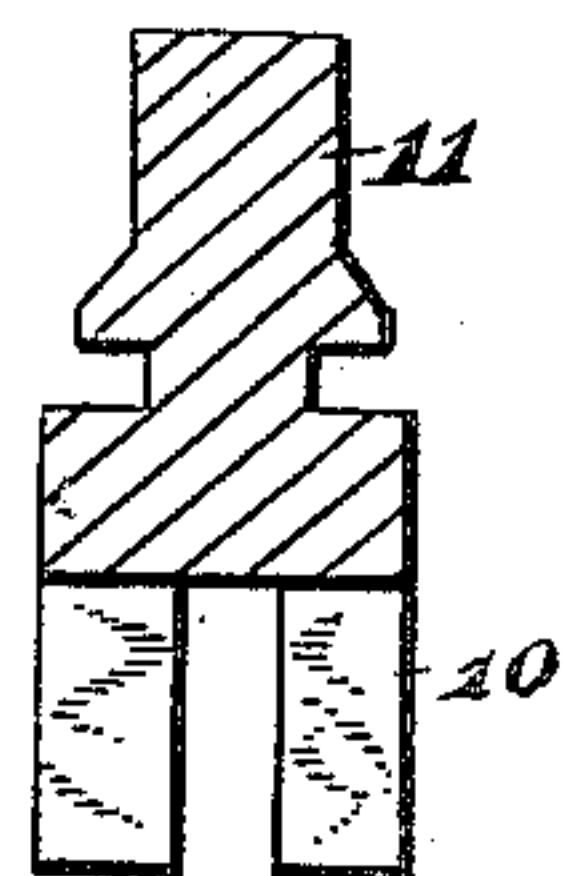
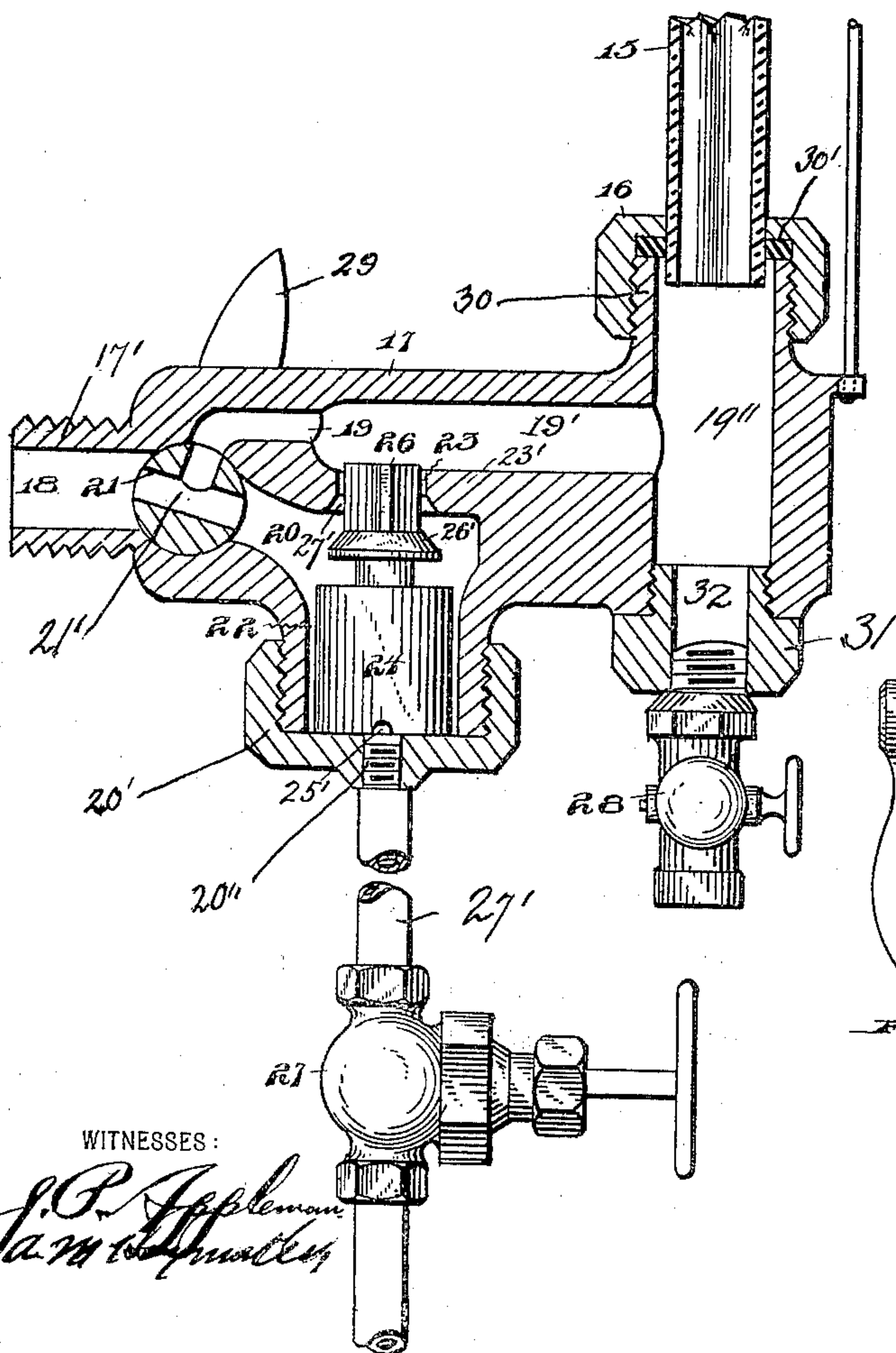


Fig. 9.

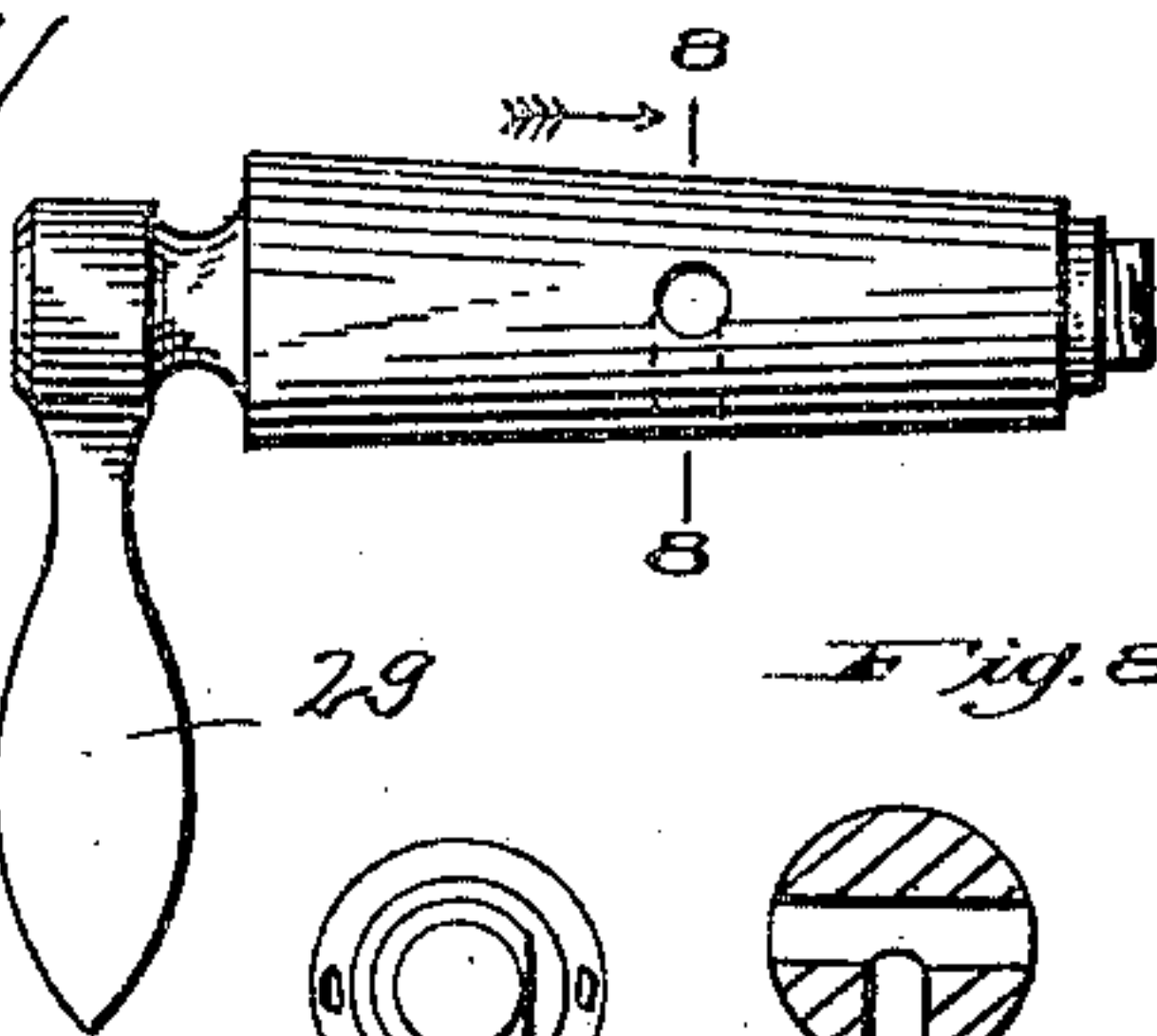
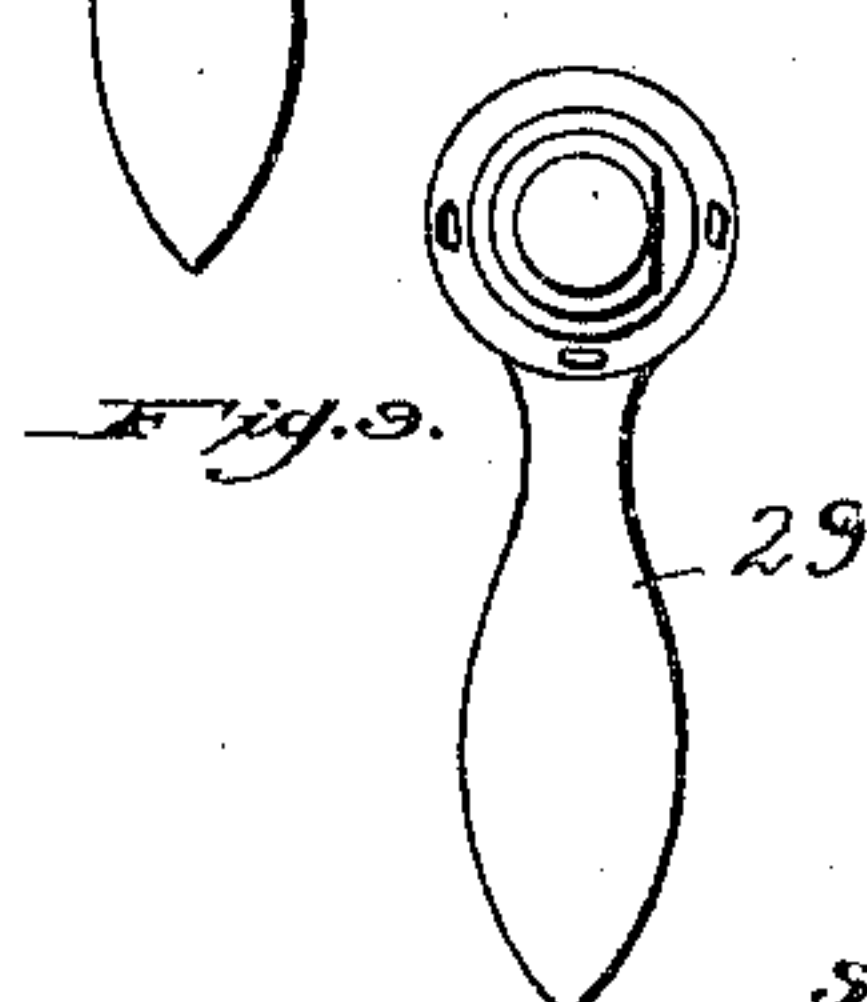


Fig. 10.



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UNITED STATES PATENT OFFICE.

SAMUEL COOK, OF WILMERDING, PENNSYLVANIA.

WATER-GAGE-GLASS VALVE.

SPECIFICATION forming part of Letters Patent No. 652,474, dated June 26, 1900.

Application filed June 23, 1899. Serial No. 721,562. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL COOK, a citizen of the United States of America, residing at Wilmerding, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Water-Gage-Glass Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in water-gages.

One object of the invention is to provide a device of this class with means that will automatically cut off the flow of water and the escape of steam from the boiler when the gage-glass is broken.

A further object of the invention is to construct the gage with a pair of valves that can readily be cleaned and to arrange the same in such a manner that when operated it will readily admit of the cleaning of the gage-glass.

The present application must be considered as an improvement upon Letters Patent granted to me for a water-gage-glass valve May 2, 1899, No. 624,184.

Briefly described, the invention consists in providing the upper connections between the gage-glass and the boiler with a gage-cock and a bifurcated piston carrying a valve and the lower connection with a similar gage-cock and a grooved piston carrying a valve, both pistons being adapted to operate simultaneously with the gage-glass when the gage-glass is broken or when the gage-cock is opened.

My invention finally consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claim.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a vertical sectional view of my improved water-gage. Fig. 2 is a side elevation of the upper connection between the glass and boiler. Fig. 3 is a vertical sectional view of the bifurcated piston and steam-valve. Fig. 4 is a like view of the grooved piston and the water-valve. Fig. 5 is an inverted plan view of the bifurcated piston. Fig. 6 is a

similar view of the grooved piston. Fig. 7 is a side elevation of the gage-cock or cut-off. Fig. 8 is a vertical sectional view taken on the line *xx* of Fig. 7. Fig. 9 is a detail plan view of the handle.

Referring to the drawings by reference-numerals, 1 indicates a casing or upper connection between the gage-glass and boiler and which I term the "steam-casing" 1. This casing 1 is provided at its inner end with a screw-threaded nipple 1' for securing the same to the boiler and is formed with the steam-inlet 2. The steam-inlet 2 at its inner end communicates with the boiler (not shown) and at its outer end with the steam-port 3' and lower steam-channel 4. The steam-port 3' communicates with the upper steam-channel 3, arranged in the upper part of the steam-casing and formed by the partition 12', while the lower steam-channel 4 communicates with a steam-chamber 6, which is also formed by the partition 12' and the downwardly-extending screw-threaded collar 6', which is closed by means of the cap 8, provided with the interior screw-threads 7.

Arranged within the steam-casing 2 at the end of the steam-inlet 1 is the two-way gage-cock or cut-off 5, the ports or openings 5' therein being adapted to register either with the steam-port 3', steam-channel 4, with the steam-inlet port 2, or with the lower channel 4 and steam-inlet 2. The gage-cock 5 is further adapted to cut off communication between the steam channel or port 3' with the steam-inlet 2.

Arranged within the steam-chamber 6 is the steam-piston 10, having its lower end bifurcated, as at 10', and the piston 10 is further provided on its upper end with the valve 11', having the fluted spindle or valve-stem 11 formed integral with its upper face. The spindle or stem 11 is adapted to operate through the opening 9, formed in the partition 12', and carries the valve 11' into engagement with the valve-seat 12, arranged upon the lower face of the partition 12' and surrounding the opening 9.

The upper steam-channel 3 at its outer end communicates with the vertical steam-channel 13, to the lower extremity of which the gage-glass is secured.

The steam-casing 1 at its outer end and

upon the under face thereof has an exteriorly-screw-threaded flange 13' formed integral therewith. This flange is adapted to have connected thereto the retaining-cap 14
5 for the gage-glass 15. The cap 14 is interiorly screw-threaded, as shown, and is provided centrally with an opening to allow the gage-glass 15 to project into the vertical channel 13, and mounted upon the inner face of the
10 cap and lower end of the flange 13' is a gasket 14', formed of suitable elastic material.

The lower connection or casing 17 between the gage-glass and boiler, which I term the "water-casing," is of the same construction
15 as the steam-casing 1, and it consists of the screw-threaded nipple 17', formed on its inner end for securing the casing to the boiler, and is provided with the water-inlet 18. The water-inlet 18 at its inner end communicates
20 with the boiler (not shown) and at its outer end with the port 19 and the channel 20. The port 19 communicates with the upper water-channel 19', arranged in the upper part of the water-casing 18 and formed by the partition 23',
25 while the channel 20 communicates with the water-chamber 22, which is also formed by the partition 23' and the downwardly-extending screw-threaded collar 22', which is closed by means of the screw-threaded cap 20', provided with the exhaust-opening 20'', to which
30 the exhaust-valve 27 is connected by means of the pipe member 27'. Arranged within the water-casing 17 at the end of the water-inlet 18 is the two-way gage-cock or cut-off 21, the
35 ports or openings 21' therein being adapted to register either with the port 19, channel 20, and water-inlet 18 or with the channel 20 and water-inlet 18. The cock 21 is further adapted to cut off communication between the water
40 channel or port 19 with the water-inlet 2.

Arranged within the water-chamber 22 is the water-piston 24, having the lower end thereof formed with a recess 25, having the series of grooves 25' registering therewith.
45 The piston 24 is further provided on its upper end with a valve 26', having the fluted spindle or valve-stem 26 formed integral with its upper face. The spindle or stem 26 operates through the opening 23, formed in the
50 partition 23', and carries the valve 26' into engagement with the valve-seat 27', arranged upon the lower face of the partition 23' and surrounding the opening 23.

The upper water-channel 19' at its outer
55 end communicates with the vertical water-channel 19'', to the upper end of which the gage-glass 15 is connected.

The water-casing 17 at its outer end and upon the upper face thereof has an exteriorly-screw-threaded flange 30 formed therewith.
60 This flange is adapted to have connected thereto the retaining-cap 16 for the gage-glass 15. The cap 16 is interiorly screw-threaded, as shown, and is provided centrally
65 with an opening to allow the gage-glass 15 to project into the channel 19, and mounted upon the inner face of the cap 16 and upper

end of the flange 30 is a gasket 30', formed of suitable elastic material.

The lower end of the channel 19'' is closed
70 by the screw-threaded plug 31, having an opening 32 arranged therein, in which is secured the upper end of the discharge-cock 28.

29 indicates the handles for operating the gage-cocks 5 and 21.
75

The operation of my improved water-gage is as follows: Assuming that both the upper and lower gage-cocks or cut-offs are in the position as shown by the cut-off valve 5—i. e., the steam-inlet 2 communicating with the
80 lower steam-channel, steam-port 3' closed, the water-inlet 18 communicating with the channel 20, the port 19 closed—in case the gage-glass is broken the steam entering the steam-chamber 6 and into the bifurcated end
85 10' of the piston 10 and the water entering the water-chamber 22 and through the grooves 25' into the recess 25 of the piston 24 will elevate the pistons 10 and 24 and cause the valves 11' and 26' to engage their seats, closing
90 the openings 9 and 23 in the partitions 12' and 23' and shut off the flow of water and steam to the gage-glass. When the necessary repairs have been made, the gage-cocks 5 and 21 are turned in the position as shown by the
95 cock 21 in the water-casing, allowing the steam and water to pass through the ports 3' and 19 into the channels 3 and 19, equalizing and allowing the circulation to take place. Any sediment that may be formed in the
100 chambers 6 and 22 or in the bifurcated end of the piston 10 or the recess of the piston 24 can be removed therefrom by detaching the caps 8 and 20' therefrom. In connection with the removal of any foreign substance
105 from the water-chamber 22 or the recessed end of the piston 24 without detaching the cap 20' the substance can be easily removed by opening the exhaust-valve 27, the same being carried off by the flow of the water
110 through the pipe connection between the valve 27 and cap 20'.

Particular attention is called to the fact that my gage-glass can be easily cleaned by turning the gage-cocks to the position as shown
115 in the upper portion of Fig. 1, preventing the circulation of the steam and water and allowing for the removal of the glass. When the glass is placed in position again, the cocks are reversed, and the circulation of the steam and
120 water through the ports 3' 19 and channels 3 and 19', as heretofore stated, equalize the pressure upon the valve 11' and 26'.

Attention is called to the arrangement of the steam-casing with the inlet 3', upper channel 3 communicating with the vertical channel 13, and the arrangement of the water-casing with the port 19, upper channel 19' communicating with the vertical channel 19'' for equalizing the pressure upon the valves 11' and 26' from the position in the upper part
125 of Fig. 1 to the position as shown in the lower part of Fig. 1.
130

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

5 In a water-gage, the combination with the gage-glass, of a steam and water casing suitably connected thereto and each provided with a partition having an opening extending therethrough and a valve-seat surrounding the lower end of said opening, a steam-chamber arranged below the partition in the steam-casing and connected by the steam-channel 4
10 to a suitable steam-supply, a steam-channel 3 arranged above the said partition in the steam-casing and connected by the steam-port 3' to a source of steam-supply, a steam-channel ar-
15 ranged in said steam-casing and registering at one end with the steam-channel 3 and at its opposite end with said gage-glass, a water-chamber arranged below the partition of the water-casing and connected by the water-
20 channel 20 to a source of water-supply, a water-channel 19' arranged above said partition in the water-casing and connected by the port 19 to a suitable source of water-supply, a wa-

ter-channel 19'' arranged in said water-casing and registering at one side with the chan- 25
nel 19' and at its upper end with said gage-glass, a piston mounted in said water-chamber, a piston mounted in said steam-chamber, a valve carried by each of the said pistons, a spindle formed integral with each of the said 30
valves and adapted to operate through the opening in the partitions for seating each valve against its proper valve-seat, and a two-way cock or cut-off mounted in each of the casings and arranged at one end of the said 35
port 3' and steam-channel 4 and at one end of said port 19 and water-channel 20 for equalizing the pressure upon the said valves, substantially as set forth.

In testimony whereof I affix my signature 40
in presence of two witnesses.

SAMUEL COOK.

Witnesses:

JOHN NOLAND,
WILLIAM E. MINOR.