

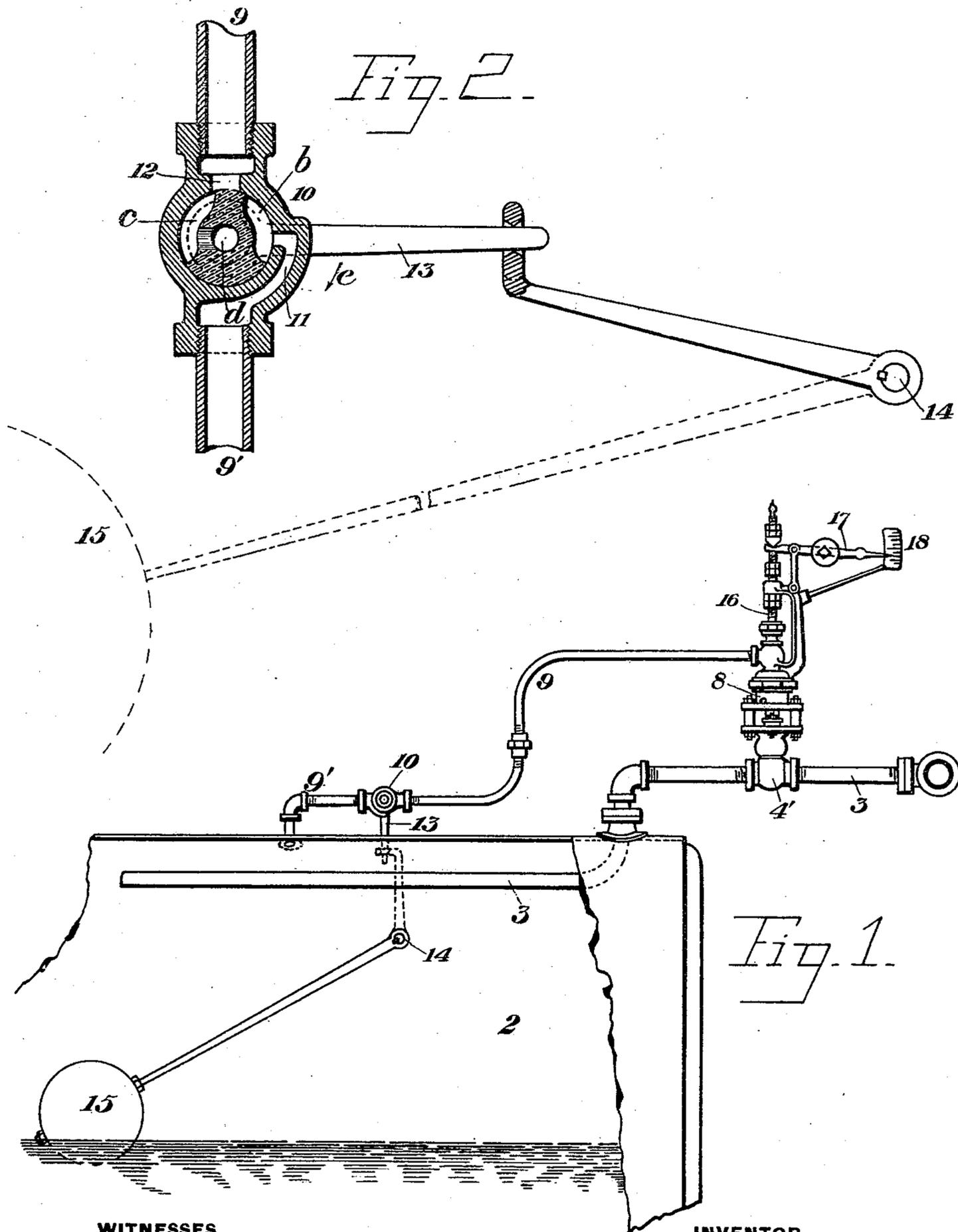
(No Model.)

2 Sheets—Sheet 1.

C. H. GERSTING.
FEED WATER REGULATOR.

No. 500,571.

Patented July 4, 1893.



WITNESSES
A. L. Gill.
A. M. Corwin.

INVENTOR
Charles H. Gersting
by W. Baxendale & Sons
his Attorneys.

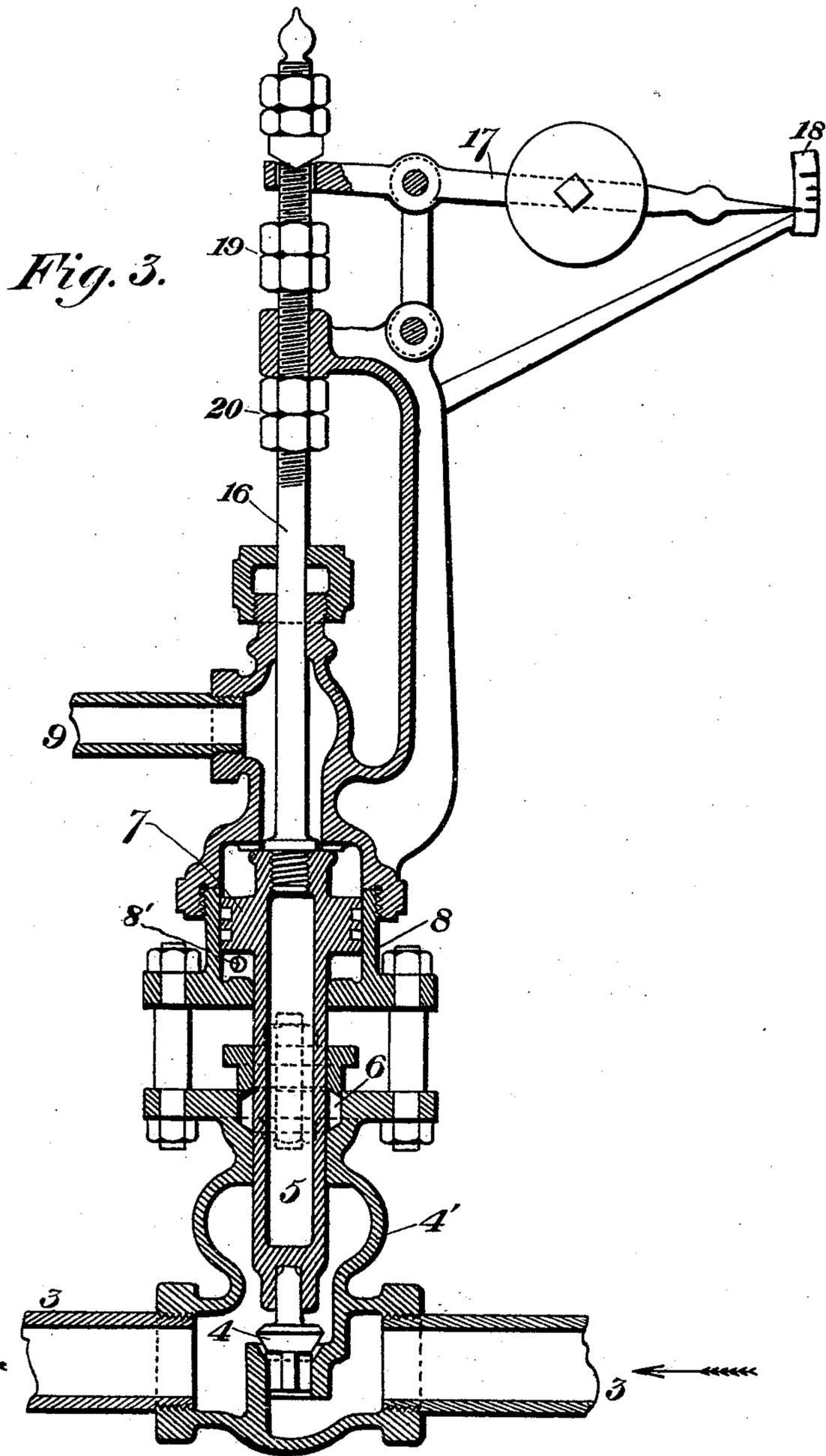
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INVENTOR

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his Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES H. GERSTING, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JAMES A. BURNS AND GEORGE GLADDEN, OF SAME PLACE.

FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 500,571, dated July 4, 1893.

Application filed August 22, 1892. Serial No. 443,723. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. GERSTING, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Regulators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a view in side elevation of my improved device, showing the same applied to a steam boiler. Fig. 2 is a vertical sectional view of one of the valves on a larger scale. Fig. 3 is a vertical sectional view of part of the apparatus also made on a larger scale than that on which Fig. 1 is drawn.

Like symbols of reference indicate like parts in each of the figures.

In the drawings, 2 represents a steam boiler.

3 is a feed-water supply pipe, having a check-valve 4 and valve-chamber 4' interposed therein, as shown in Fig. 3. The stem 5 of said valve passes through a stuffing-box 6 and is provided with a piston 7 working in a chamber or cylinder 8. When this piston moves longitudinally in the chamber 8, it operates the check-valve and forces the same against or removes it from its seat.

8' is a hole leading into the chamber below the piston and serves to prevent any cushioning action by reason of the imprisoned air.

9, 9', is a steam pipe which leads from the boiler, and communicates, as shown in Fig. 3, with the cylinder 8 above the piston 7.

10 is a valve, shown in Figs. 1 and 2, which is interposed in the pipe 9, and is provided with annular peripheral ports *b*, *c*, the latter communicating with an exhaust passage *d* in the plug or body of the valve. When the valve is in the position shown in Fig. 2, the communication with the boiler is cut off; while by means of the port *c* and passage *d*, the cylinder 8 is put in communication with the exhaust-port. If the valve be rotated partially to the left from the position shown in that figure, the port 1 of the valve chamber, which leads by way of the pipe 9 to the cylinder 8, is put in communication with the port 11, which communicates, through the other branch 9', with the boiler. The lever 13 of the valve 10 is connected with a shaft

14 which projects through the boiler-shell, and has projecting from it within the boiler a lever carrying a float 15. As the water-level in the boiler descends, the dropping of the float will turn the valve 10 in the direction of the arrow *e*, as shown in Fig. 2, and if the water-level should rise, the consequent lifting of the float will turn the valve in the reverse direction.

The operation is as follows:—The drawings show the parts of the apparatus as they are when the feed-water valve is open, the valve 10 being then turned so as to connect the cylinder 8 above the piston 7 with the exhaust port *d*; and the feed-water passing to the boiler through the pipe 3. As the water-level in the boiler rises by reason of the entrance of the feed-water, the lifting of the float turns the valve 10 so as to connect the port 11 with the branch of the pipe 9 leading to the valve-cylinder 8. Thereupon, steam from the boiler, entering the cylinder 8, forces down the piston 7, and closes the valve 4 against its seat, cutting off the flow of water to the boiler, and holding it in that position. When the water in the boiler falls, the float will again drop, turning back the valve 10 so as to shut off the connection of the valve-cylinder 8 with the boiler through the port 11, and connecting it with the atmosphere through the exhaust port *d*, and then the back pressure of steam from the boiler, acting on the valve-stem 5, together with the feed-water, acting on the check-valve 4, will lift this valve from its seat, permitting the flow of water to the boiler. In this manner a supply of water to the boiler is maintained and regulated automatically, and the certainty with which the water can be kept at a practically constant level adds very much to the safety and efficiency of the boiler.

In order that the working of the apparatus may be observed, I provide the piston 7 with an extended stem 16 and connect it to a pivoted index lever 17, which by moving over a dial 18 shows the position of the piston and check-valve.

19, 20, are nuts by which the limits of motion of the parts may be regulated. By proper adjustment of these nuts, it is possible to prevent the check-valve from closing tightly at

any time, and in this way a slight flow of water can be maintained constantly even during the closed position of the valve.

The advantages of my invention will be appreciated by those skilled in the art.

Without limiting myself with strictness to the preferred construction of the parts herein shown and described, what I claim, and desire to secure by Letters Patent, is—

- 10 1. In a feed-water regulator, the combination with a supply-pipe, of a check-valve therein arranged to be opened automatically by the pressure of the feed water, a piston connected therewith, a pipe supplying steam
- 15 to operate said piston, a valve controlling said pipe, and a float operated by the water-level in the boiler and connected with the valve; substantially as and for the purposes described.
- 20 2. In a feed-water regulator, the combination with a supply pipe, of a check-valve therein arranged to be opened automatically by the pressure of the feed-water, a piston connected therewith, a pipe supplying steam

to operate said piston, a valve controlling said pipe, and a float operated by the water-level in the boiler and connected with the valve; said last named valve controlling an exhaust-port and a steam-port, and being movable by said float to connect said ports with the piston; substantially as and for the purposes described.

3. In a feed-water regulator, the combination with a supply-pipe, of a check-valve therein arranged to be opened automatically by the pressure of the feed-water, a float operated by the water level in the boiler, and means connected with said float and arranged to force the valve to its seat when the water level rises in the boiler; substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 19th day of August, A. D. 1892.

CHARLES H. GERSTING.

Witnesses:

W. H. CORBETT,
H. H. HERVEY.