

No. 723,225.

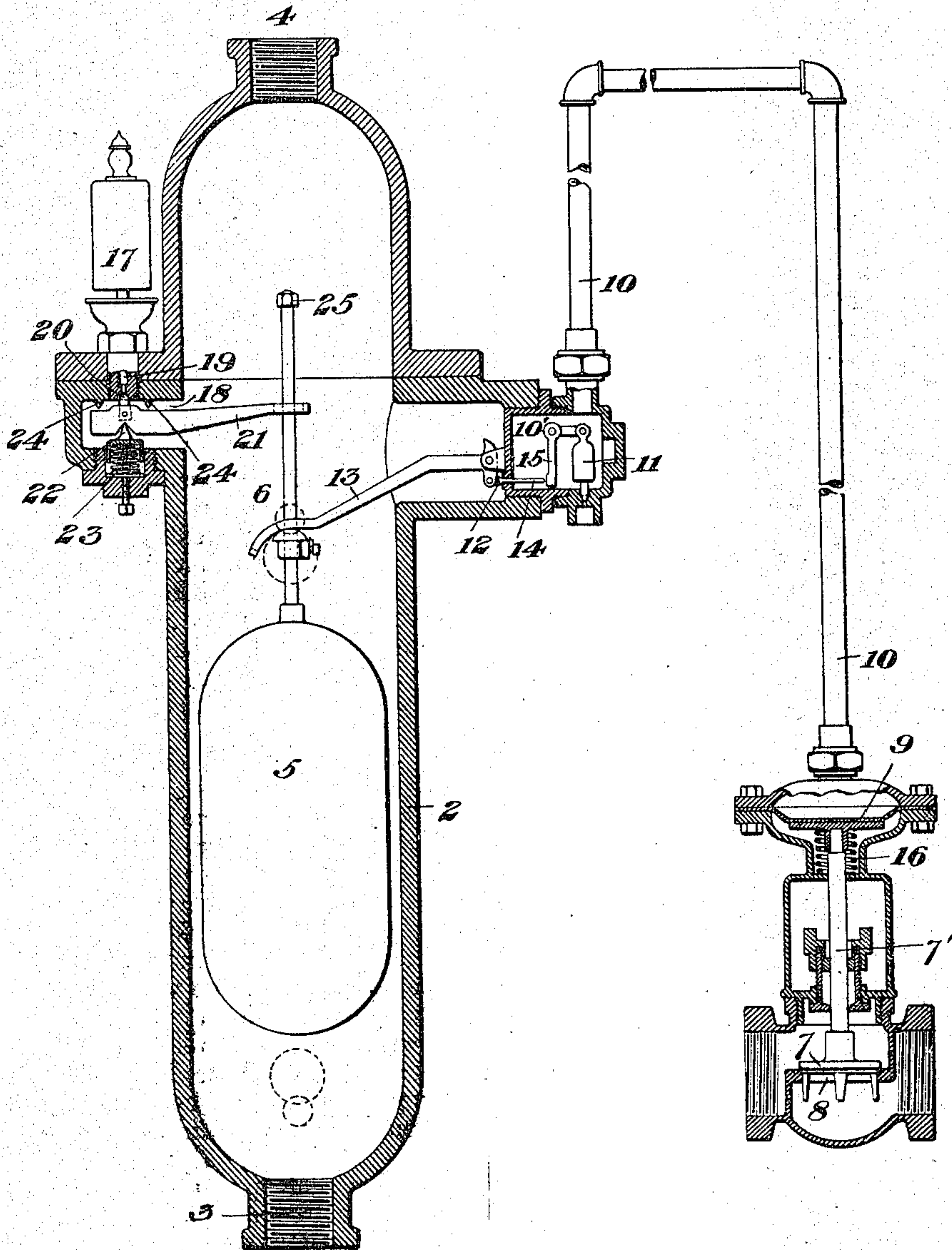
PATENTED MAR. 17, 1903.

J. M. WILLIAMS.
FEED WATER REGULATOR.
APPLICATION FILED AUG. 31, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

L. A. Conner
Geo B Blum

INVENTOR

John M Williams

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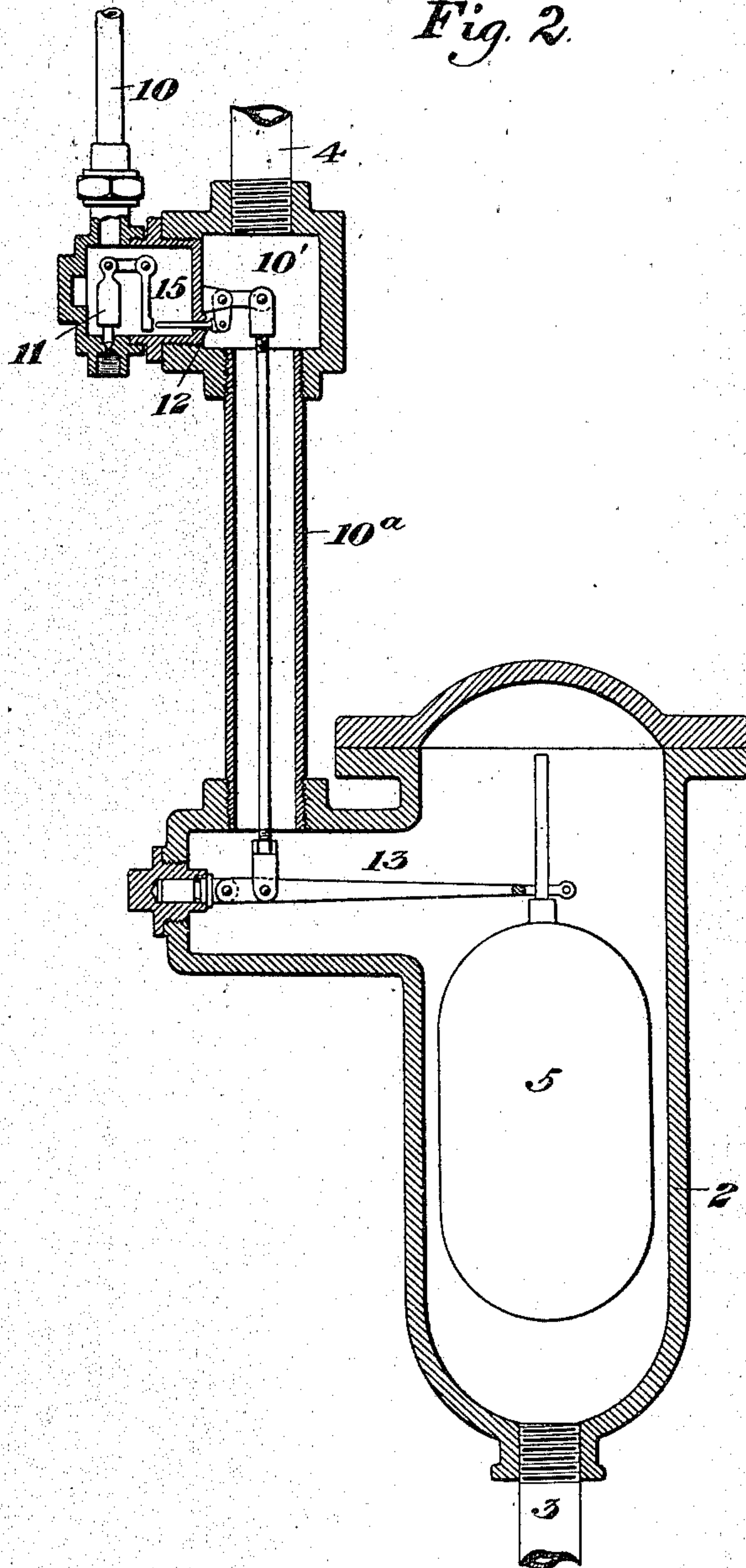
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NO MODEL.

2 SHEETS-SHEET 2.

Fig. 2.



WITNESSES

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JOHN M. WILLIAMS, OF KNOXVILLE, PENNSYLVANIA.

FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 723,225, dated March 17, 1903.

Application filed August 31, 1901. Serial No. 73,956. (No model.)

To all whom it may concern:

Be it known that I, JOHN MARCUS WILLIAMS, of Knoxville borough, Allegheny county, Pennsylvania, have invented a new and useful Feed-Water Regulator, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in vertical section one form of my apparatus, and Fig. 2 is a similar view of a modification.

My invention is designed to provide means for the safe regulation of the supply of feed-water to steam-boilers. The importance of having devices of this class altogether safe and reliable in their action is very great, and it is to accomplish these results that I have devised my invention.

In the drawings, 2 represents a water column or case which is connected below with the water-space of the boiler at 3 and above is connected at 4 with the steam-space, so that the water-level in the column may be the same as the water-level of the boiler.

5 is a float set within the column and having a stem 6, which as it rises and falls operates the valve mechanism in a manner which I will now describe.

7 is a valve which closes the port 8 in the water-pipe leading from the feed-pump to the boiler. This valve has a stem 7', connected with and operated by a diaphragm or piston 9, which is moved to close the valve by the pressure of steam entering a pipe or passage 10, which leads from a chamber 10'. This chamber 10' projects from the water-column 2 and is provided with an inlet-valve 12 for the admission of steam and an exhaust-valve 11 for its exhaust. The valve 12 is operated by an arm 13 from the stem 6 of the float, and a stem 14 is so placed that when the valve 12 is seated the stem will engage an arm 15, which is connected to the valve 11, and will unseat said valve, so as to connect the chamber 10' with the exhaust.

When the parts are in the position shown in Fig. 1, the exhaust-valve 11 is closed, and the valve 12 being open the steam-pressure acting on the diaphragm 9 keeps the valve 7 to its seat and prevents the flow of feed-water to the boiler. If, however, the level of

the water in the boiler should fall below the normal level, the sinking of the float 5 will permit the arm 13 to fall and to close the valve 12 and open the valve 11, thus cutting off the chamber 10' from the steam-pressure and connecting it with the exhaust. Such relief of pressure from the diaphragm 9 will permit the valve 7 to be opened by a spring 16 or otherwise and will cause the water to be fed from the pump to the boiler. The float will then rise as the water-level rises and by moving the arm 13 will open the valve 12 and cause the exhaust-valve 11 to close. The pressure is thus restored to the diaphragm 9 and will close the valve 7.

For the purpose of giving an alarm if for any reason the pump should fail to act and the water-level should sink to the danger-point I employ the following mechanism: 17 is a whistle connected with a projecting chamber 18 of the column and having an admission-port 19, controlled by a valve 20, mounted on an arm 21, which is mounted on a pivot 22, backed by a spring 23, for which a weight may be substituted. The arm 21 has also knife-edge bearings or fulcrums 24 opposite to and on both sides of the pivot 22. If the water should sink to the danger-level, the stop 25 of the stem 6 will engage the arm 21 and move it so as to unseat the valve 20 and cause the whistle to blow. In like manner if the regulator should be broken or disarranged and if the water should rise abnormally high in the boiler the elevation of the float will lift the arm 21 and depressing the pivot 22 will unseat the valve and sound the whistle. The whistle-valve will also be operated in case the water-level should fall abnormally low. The use of the spring or weight supported pivot for the arms 21 causes it to act with great efficiency, and the knife-edge bearings render the device very sensitive.

In Fig. 2 I show a modified construction of my feed-water-controlling device, in which the chamber 10' is placed at a higher level than the water-column and is connected therewith through an intermediate pipe or passage 10"; but otherwise the principle of operation is the same. The use of an elevated chamber, as here shown, is important, because it insures against danger of the deposit of mud

and sediment in the valve being caused by foaming of the water in the boiler and against the fouling and corrosion of the valve by overfilling of the boiler.

5 I claim as my invention—

1. A feed-water regulator having a water-column, chambers projecting therefrom, valve mechanism in each chamber and a device controlled by the water in the column having
10 connections arranged to act both valve mechanisms, one of said valve mechanisms being connected to the feed-water valve; substantially as described.

2. A feed-water regulator comprising in
15 combination a float, a feed-water valve having a pressure device adapted to close it, and an inlet-valve and an exhaust-valve for said pressure device, said valves being operated by the float; substantially as described.

20 3. A feed-water regulator comprising in combination a float, a feed-water valve having a pressure device adapted to close it, an inlet-valve adapted to admit pressure to the pressure device, and connected with the float,
25 an exhaust-valve, and a connection between the inlet-valve and the exhaust-valve adapt-

ed to open the latter when the inlet-valve is closed; substantially as described.

4. In a feed-water regulator, the combination with a water-column, of chambers projecting therefrom, one of said chambers containing an alarm-signal valve, and the other chamber communicating with the pressure device and containing valve mechanism adapted to admit and exhaust the pressure,
35 and connections between said valves and the float; substantially as described.

5. A feed-water regulator comprising an elevated steam-chamber above the water of the boiler and connected with the boiler by a
40 pipe, and inlet and exhaust valves in said chamber, a feed-water valve having a pressure device arranged to be operated by said valves, and a float arranged to operate said valves; substantially as described. 45

In testimony whereof I have hereunto set my hand.

JOHN M. WILLIAMS.

Witnesses:

JOHN MILLER,

GEO. B. BLEMING.