F. N. CONNET.

FEED WATER REGULATOR.

APPLICATION FILED APR. 26, 1910.

987,048.

Patented Mar. 14, 1911.

Fig. 1.

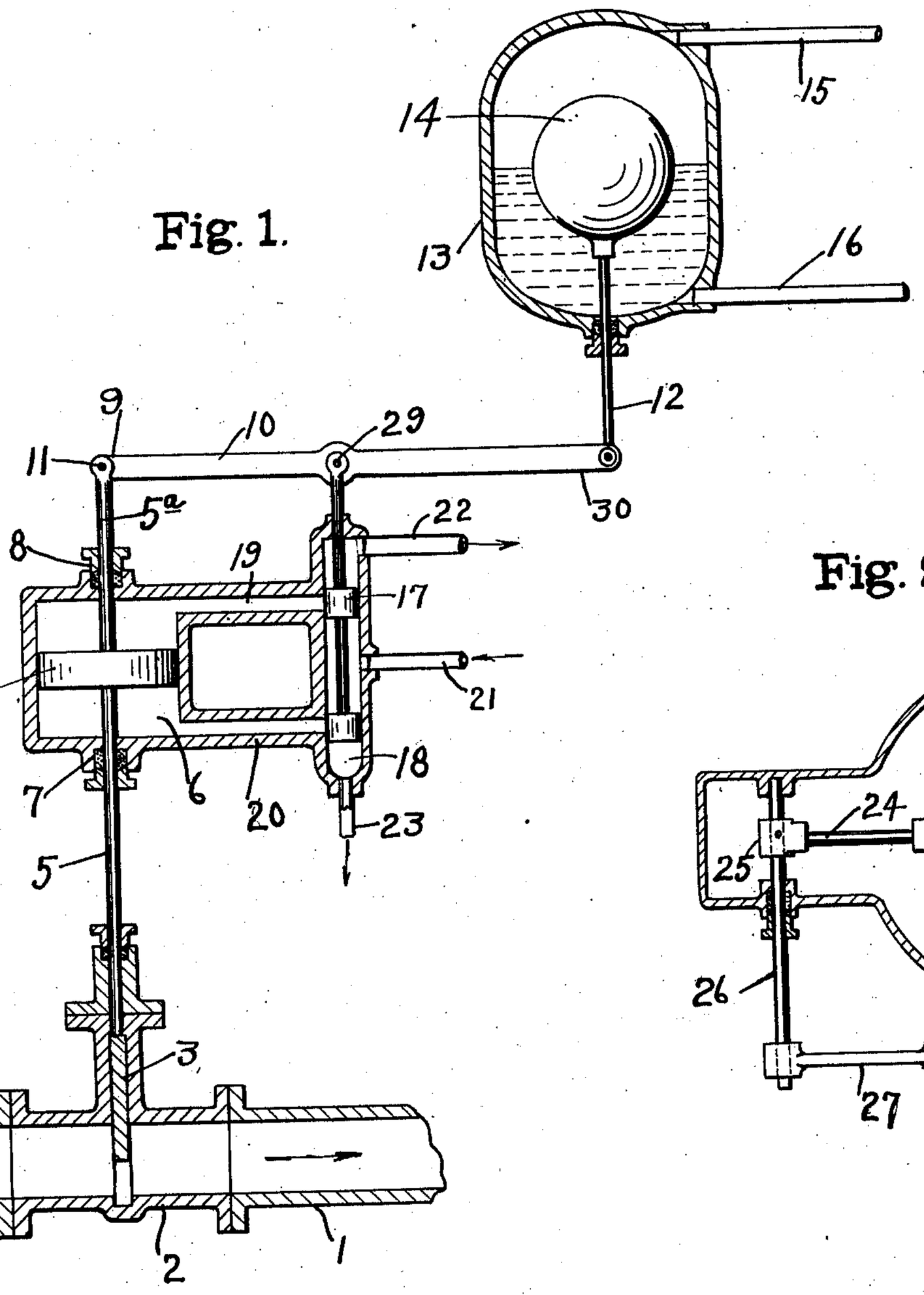

Fig. 2.

WITNESSES

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FEED-WATER REGULATOR.

987,048. Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed April 28, 1910. Serial No. 558,229.

To all whom it may concern:

Be it known that I, FREDERICK N. CONNET, a citizen of the United States, residing at the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Feed-Water Regulators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to feed water regulators for steam boilers and the like, and has for its object to provide a regulator for controlling the action of the inlet valve whereby said valve may be opened to any desired extent to nicely control the rate of feed to vary with that of the evaporation from the boiler, the movement and position of said valve being automatically controlled by the height of water in the boiler.

A further object of my invention is to provide means whereby the main valve is actuated by a float controlled piston through the medium of a pilot valve, said pilot being first opened by the float to admit the pressure to the piston and then closed by the movement of said piston.

The usual types of regulator feeds are intermittent, the rate during each feeding period being maximum and then entirely shut off. This manner of feeding is found in practice under some circumstances to be very disadvantageous, especially where instruments are employed for recording the rate of flow through the feed pipe.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1— is a diagrammatic view illustrating my improved regulating device partly in section. Fig. 2— is a plan view illustrating the preferred construction through which the float may operate the pilot valve.

Referring to the drawing 1 designates the main feed pipe to the boiler into which pipe is inserted the valve casing 2 which is provided with a gate valve 3, the same being operatively connected to the large piston 4 through the rod 5 which passes into the piston casing 6 through the bottom packing gland 7 through said piston and out of the casing again through the top gland 8. One end 9 of a floating lever 10 is pivoted at 11 to the upper end 5^a of this connecting rod, the opposite end of said lever being connected to the lower end of rod 12, which rod in turn is connected to the float 14 in the casing 13. This casing is arranged to communicate with the boiler, not shown, through the pipes 15 and 16 whereby the water in said receptacle is maintained at the same height as that in the boiler, the change in the level of which controls the movement of said float 14. A balanced pilot valve 17 is located in the chamber 18 and is arranged to control the ports 19 and 20 leading from said chamber to the main piston chamber 6. This pilot valve is provided with a stem extending out through the top of its chamber which is pivotally connected at 29 to the floating lever 10. Water pressure from the main, or other convenient source, is admitted to the pilot valve chamber through the pipe 21 and the exhaust passes out through pipes 22 and 23.

The preferred form of mechanism through which the float 14 is adapted to operate is illustrated in Fig. 2 in which the float is connected through the rod 24 and block 25 to the oscillatory shaft 26, which shaft is in turn connected through the lever 27 and rod 28, shown in dotted lines, with the outer end 30 of the floating lever 10.

In the operation of my improved feed water regulator, as the water falls in the boiler it also falls proportionally in the chamber 13 allowing the float 14 to drop and through the floating lever 10, whose outer end now forms the fulcrum point being pivoted to the piston rod 5^a, forces downward the pilot valve admitting the pressure from the middle of the chamber through the port 20 beneath the piston 4 forcing the same upward, the exhaust passing out through port 19 and pipe 22 thereby raising the gate 3 and admitting more water to the boiler. As the piston 4 rises it naturally carries upward the end 9 of the floating lever 10 now causing the float rod 12 to act as the fulcrum, whereby this upward movement raises and causes said pilot valve to close the ports. As the water now rises to the desired height in the boiler the pilot valve through the medium of the floating lever is raised admitting the pressure through port 19 to the upper side of the piston forcing the gate downward until the pilot valve, due to this downward

movement of the piston, closes said port 19 retaining the gate in its new position.

It will be seen by this construction that the position of the gate is controlled by the piston and that the piston is controlled through the medium of the pilot valve, and that the pilot valve is controlled by the combined movements of the float and piston, said valve being first opened to admit the pressure to the piston by a movement of the float and then closed again by the movement of the piston, whereby the main valve may be retained with any desired amount of opening through which the boiler is fed at a rate equal to the evaporation.

Where my improved method for controlling the flow is used to render the rate comparatively uniform, a measuring instrument may be employed for recording the flow. In practice the employment of such an instrument with the ordinary feed water regulator where the flow is intermittent, is quite impracticable, as in such systems the valve is first open wide, and then entirely closed at short intervals, causing the recording line on the chart to be so irregular that it is very difficult and in most cases impossible to read with any degree of accuracy.

Having thus described my invention, what I claim is:

1. A feed water regulator comprising a valve in the feed pipe, means for actuating said valve, a starting and stopping device for controlling said actuating means, a lever pivotally connected to the valve actuating means and to the starting and stopping device, and means controlled by the height of water admitted through said feed pipe and connected to said lever for positioning said starting and stopping device.

2. A feed water regulator comprising a valve in the feed pipe, pressure actuated means for operating said valve, a starting and stopping device for controlling the action of said operating means, a float controlled by the height of water admitted through said feed pipe, and a lever operatively connected with said float, starting and stopping device, and pressure actuated means.

3. A boiler feed water regulator comprising a valve in the feed pipe, a piston for actuating said valve, a pilot valve for controlling the actuating pressure to said piston, a float controlled by the height of water in the boiler, and a lever operatively connecting said piston, pilot and float whereby said piston and float coöperate for positioning the pilot.

4. A boiler feed water regulator comprising a valve in the feed pipe, a pressure actuated piston for operating said valve, an auxiliary valve for controlling the action of said piston, a float controlled by the height of water in the boiler and a lever connected at one end to the piston, at its opposite end to the float, and at an intermediate point to the auxiliary valve whereby said auxiliary valve is first opened by the movement of said float and then closed by the movement of said piston.

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

FREDERICK N. CONNET.

Witnesses:

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