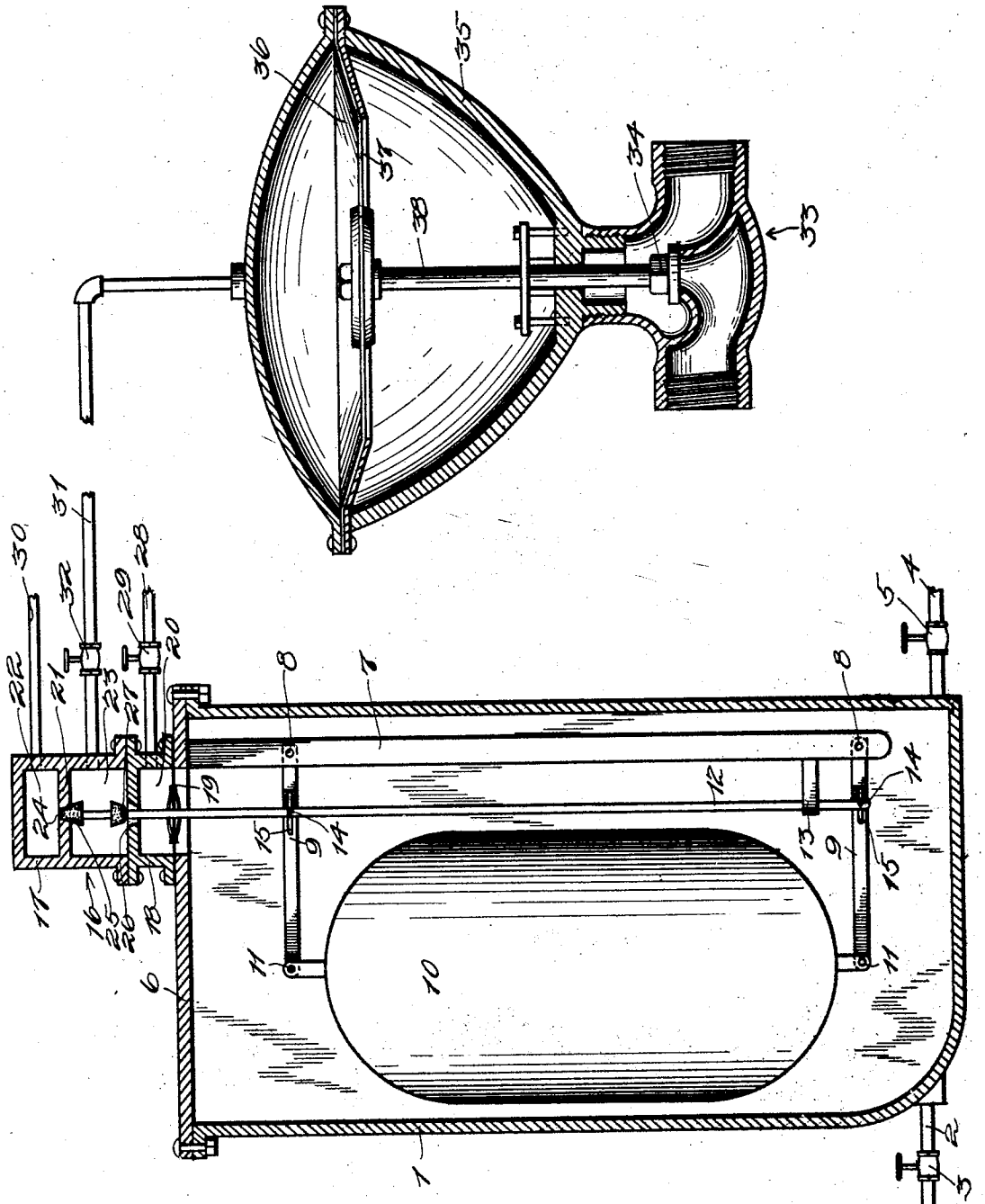
A. C. MILLER.

FEED WATER REGULATOR.

APPLICATION FILED AUG. 4, 1913.

1,100,601.

Patented June 16, 1914.



Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR C. MILLER, OF AKRON, OHIO.

FEED-WATER REGULATOR.

1,100,601. Specification of Letters Patent. Patented June 16, 1914.

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To all whom it may concern:

Be it known that I, ARTHUR C. MILLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Feed-Water Regulators, of which the following is a specification.

My invention relates to improvements in automatic feed water regulators of the type wherein a float is employed to control the passage of steam or other pressure to an apparatus which in turn operates a valve, such valve being either connected in the water feed line or pipe leading to the boiler or boilers or in a steam supply pipe leading to a pump, which forces the water to the boiler or boilers.

An important object of my invention is to provide apparatus of the above mentioned character, which is simple in construction, wholly automatic in operation, reliable in such operation, and not liable to derangements.

Other objects and advantages of this invention will be apparent during the course of the following description.

In the accompanying drawing forming a part of this specification, the figure is a central vertical sectional view through the complete apparatus.

In the drawings wherein is shown a preferred embodiment of my invention, the numeral 1 designates a closed casing or shell, having connection at its lower end with a water supply pipe 2, which has communication with the water lever in the boiler or boilers, such communication being had in the side of the water column or through the boiler shell to the water line. The pipe 2 may preferably be provided with a valve 3. Connected with the lower end of the shell 1 is a blow-off pipe 4, having a valve 5. The shell 1 constitutes the body portion of a float-regulator. The upper end of the shell 1 is closed by a removable head 6 depending from which is a stationary rod-support 7, rigidly connected and preferably formed integral therewith. Pivotally connected with the rod-support 7, as shown at 8, are vertically swinging arms 9, which are in turn pivotally connected with the opposite ends of a vertically movable float 10, as shown at 11.

The numeral 12 designates a reciprocatory operating rod, the lower end of which passes through a guide 13. The rod 12 is pivotally connected with the vertically swinging arms 9 by bolts 14, operating within elongated slots 15, formed through the arms 9.

Mounted upon the head 6 is a pilot valve structure 16, including upper and lower casings 17 and 18. The lower casing 18 has its lower end formed entirely open, the same being spanned by a flexible diaphragm 19, having a steam tight connection with the rod 12, as shown. The lower casing 18 affords a steam inlet chamber 20. The upper casing 17 is provided with a horizontal partition or web 21, dividing the same into exhaust and distributing chambers 22 and 23. The partition 21 is provided with a conical opening 24, the wall of which forms a seat for a downwardly opening valve 25. The upper end of the lower casing 18 is provided with a conical opening 26, the wall of which serves as a seat for an upwardly opening valve 27. The valves 25 and 27 are rigidly mounted upon the operating rod 12. It is obvious that when one valve is seated the other is opened or unseated.

The numeral 28 designates a steam or pressure supply pipe, which leads into the steam inlet chamber 20, such pipe being preferably provided with a valve 29. The pipe 28 has communication with the steam pressure within the boiler.

The numeral 30 designates an exhaust pipe, leading into the exhaust chamber 22. Leading into the steam or pressure distributing chamber 23 is a pipe 31, preferably provided with a valve 32.

The numeral 33 designates a feed water control valve structure or a water line valve, which is located in any desired position with relation to the float-regulator and is ordinarily placed below the same. The valve structure 33 may be connected in the water feed line when there are a plurality of boilers connected to form a battery, or when there is only one boiler it may be connected in the steam supply pipe to the feed pump, which supplies the water to the boiler. The valve structure 33 includes a downwardly seating valve 34, which is moved by a pressure operated device. This pressure operated device comprises an upstanding casing 35 connected with the valve structure 33. Arranged within the casing 35 is a suitably elastic and flexible diaphragm 36, dividing the same into two chambers or compartments. The downward movement of the

diaphragm 36 is limited by an annular flange 37, as shown. Connected with the diaphragm 36 is a rod or stem 38 which is connected with the valve 34. The diaphragm 36 is adapted, when relieved of steam pressure to automatically open or unseat the valve 34. The pipe 31 is connected with the upper end of the casing 35, to supply steam or pressure upon the upper side of the diaphragm.

The operation of the apparatus is as follows: When the water level rises in the boiler above the desired or predetermined point, the float 10 is elevated, whereby the rod 12 is moved upwardly, to seat valve 25 and unseat valve 27, as shown. The steam pressure will now pass through pipe 28, chamber 20, opening 26, pipe 31, and into the casing 35 above the diaphragm 36. The diaphragm is accordingly passed downwardly to close or seat valve 34. When the water lever is lowered the float 10 moves downwardly, seating or closing valve 27 and opening valve 25. The steam passing through the pipe 28 is cut off from the chamber 23, while communication is established between pipes 30 and 31, through chambers 22 and 23, whereby the steam within the casing 35 upon the upper side of the diaphragm is exhausted to the atmosphere. The pressure being removed from the diaphragm 36 the same will automatically unseat the valve 34.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:—

1. In apparatus of the character described, the combination with an upstanding casing having communication with the water in a boiler or the like, of a float mounted therein to move vertically, a rod-support disposed within the upstanding casing and extending longitudinally thereof for the greater portion of its length with the opposite ends thereof arranged near the opposite ends of the float, arms pivotally connected with the rod-support and with the opposite ends of the float, a rod arranged between the float and rod-support and having pivotal connection with the arms, a pilot valve structure including a plurality of superposed valves mounted upon the rod, means to supply pressure to the pilot valve structure, and pressure operated means connected with the pilot valve structure.

2. The combination with a pilot valve structure including a substantially vertical casing divided into upper and lower inlet and exhaust chambers with a distributing chamber arranged therebetween, all of said chambers being arranged in superposed relation, movable valves to control the communication between the inlet chamber and the distributing chamber and the exhaust chamber and the distributing chamber, and a rod extending longitudinally through the substantially vertical casing and upon which the valves are mounted; of a vertical float casing having the valve structure casing mounted upon the upper end thereof; a float mounted within the vertical float casing; vertically swinging rods connected with the opposite ends of the float; means connecting the vertically swinging rods with the valve rod; a pressure supply pipe leading into the inlet chamber; a second pipe leading into the distributing chamber; and pressure operated apparatus connected with the second named pipe.

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

ARTHUR C. MILLER.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."