No. 863,299. PATENTED AUG. 13, 1907.

R. MANNING.

FEED WATER REGULATOR.

APPLICATION FILED MAY 4, 1906.

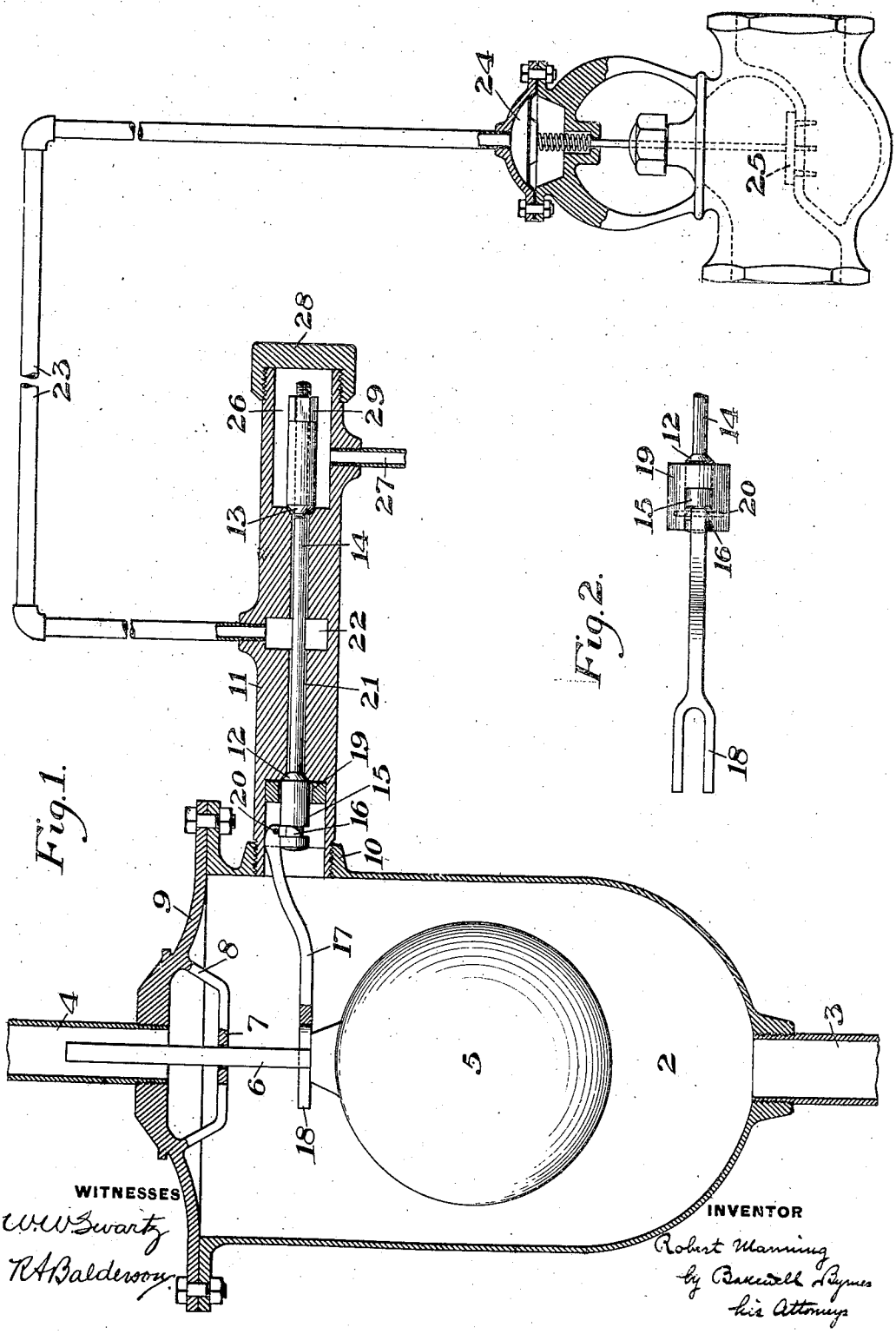

Fig. 1.

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT MANNING, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO WILLIAM P. CHAMPNEY, OF CLEVELAND, OHIO.

FEED-WATER REGULATOR.

No. 863,299. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed May 4, 1906. Serial No. 315,160.

To all whom it may concern:

Be it known that I, ROBERT MANNING, of Cleveland, Cuyahoga county, Ohio, 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 is a sectional side elevation of an apparatus constructed in accordance with my invention; and Fig. 2 is a detail view of the connection between the float-lever and the valve rod.

My invention relates to the class of feed-water regulators for boilers, wherein a float is employed which controls a valve governing the feed-pump.

The object of the invention is to provide a cheap and simple device which may be readily removed and cleaned, and which will not be liable to get out of order.

In the drawings, 2 represents a float-chamber which is connected with the water space of the boiler by the pipe 3, and with its steam space by the pipe 4. 5 is a float of ordinary type having a stem 6 extending through a guide 7 secured to a cross-bar 8 on the removable cover 9 of the float-chamber.

Into a boss 10 in the side of the float-chamber, is screwed a tubular valve casing 11 containing the oppositely-acting valves 12 and 13 on the valve rod 14. The inner end of the valve casing has an enlarged bore to receive the head 15 on the sliding valve rod, this head having an annular groove receiving the forked portion 16 of the float-lever 17. The float end of this lever is forked as shown at 18, and it is fulcrumed to a loose block 19 within the enlarged bore of the valve chamber. This fulcrum is shown as consisting of a pin 20 which extends through a hole in the elbow part of the float-lever and through similar holes in the side lugs of the block 19. This block 19 preferably consists of a cylinder provided with a central hole for the head 15 and also with a vertical slot which receives the forked head 16 of the float-lever. The bore 21 of the valve casing is slightly larger than the stem 14 and from the intermediate chamber 22 leads the steam pipe 23 which is connected to the top of the diaphragm chamber 24. 25 is the valve which is placed in the pipe leading from the feed-pump to the boiler. This diaphragm valve arrangement may be of any desirable type, and I do not claim any novelty for it. The outer end of the valve casing is provided with a steam chamber 26 from which steam may escape to the atmosphere through the port 27. The end of this chamber is closed by the screw cap 28, and the valve 13 for this end of the valve stem, is preferably of screw-threaded tubular form and screws on the end portion of the valve stem. It may be locked by a nut 29 when in proper adjusted position. The valves 12 and 13 are so arranged that as one is moved away from its seat, the other will be moved to its seat.

In the use of the apparatus when the water rises above a certain level in the float-chamber, it will act through the float and float-lever to draw the valve rod endwise in such a manner as to close the valve 13 and open the valve 12. Steam will then flow through the float-chamber to the diaphragm chamber 24 and thus shut off the water supply of the boiler. As the water level lowers in the boiler, the float will lower and tend to close the valve 12 and open the valve 13. In actual practice the apparatus will be in an intermediate position for the majority of the time, so that both valves 12 and 13 will be slightly open, and steam will blow through from the float-chamber into the open air. This small escape of steam shows proper working condition, and indicates a substantially constant water level, which is the condition desired. In case the apparatus becomes clogged, or needs repairing or cleaning, the valve casing may be unscrewed from the float-chamber and pulled out therefrom, the forked float-lever being withdrawn from the float-chamber. The cap 28 will then be removed, the valve 13 and nut 29 unscrewed, and the block 19 with the valve 12 and float-lever may then be pulled endwise out of the casing.

The advantages of my invention result from the cheapness and simplicity of the device, and also from its easy accessibility and efficient operation. In actual practice, it is found that the apparatus gives a substantially constant water level, and is sensitive, while at the same time durable and long-lived. The parts are simple and strong, and the device may be taken apart and re-assembled by any mechanic. No stuffing boxes or packing of valve stems is required, and consequently the device is easily maintained in proper working condition. In case of damage of the float or its getting out of order, the valve will immediately act to shut off steam from the diaphragm valve, and open the exhaust, thus relieving the pressure from the diaphragm, and allowing the valve 25 to open without the use of any by-pass valve.

Many changes may be made in the form and arrangement of the float-chamber, the float, the diaphragm valve, etc., without departing from my invention.

I claim:—

1. In a feed-water regulator, a valve chamber containing a reciprocating valve stem, with oppositely-acting valves at or near its ends, an intermediate outlet port in the valve casing, and a float-lever or bell crank lever loosely engaging the inner end of the valve rod; substantially as described.

2. In a feed-water regulator, a valve casing containing a reciprocating valve rod or stem with oppositely-acting

valves, and a float-lever having a forked end surrounding the float-stem, and loosely engaging the inner end portion of the valve stem; substantially as described.

3. In a feed-water regulator, a valve casing arranged to to be secured to the side of a float-chamber, a reciprocating stem therein having oppositely-acting valves, and a float-lever fulcrumed in the casing and having forks or lugs engaging a groove on the valve stem; substantially as described.

4. In a feed-water regulator, a valve casing having a reciprocating valve rod with oppositely-acting valves, a removable block at the inner end of the valve casing, and a float-lever fulcrumed on said block and engaging the valve rod; substantially as described.

5. In a feed-water regulator, a valve casing arranged to be secured to the side of a float-chamber, and containing a reciprocating valve rod, oppositely-acting valves mounted on said rod, a loose block surrounding the inner portion of the valve rod, and a float-lever having forked ends, one of which engages the valve rod, said lever being fulcrumed in said block; substantially as described.

6. In a feed-water regulator, a valve casing arranged to be secured to the side of a float-chamber, and containing a reciprocating valve rod, oppositely-acting valves mounted on said rod, a loose block surrounding the inner portion of the valve rod, and a float-lever having forked ends, one of which engages the valve rod, said lever being fulcrumed in said block, at least one of the valves being adjustable on said rod; substantially as described.

In testimony whereof, I have hereunto set my hand.

ROBERT MANNING.

Witnesses:
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T. R. BECKWITH.