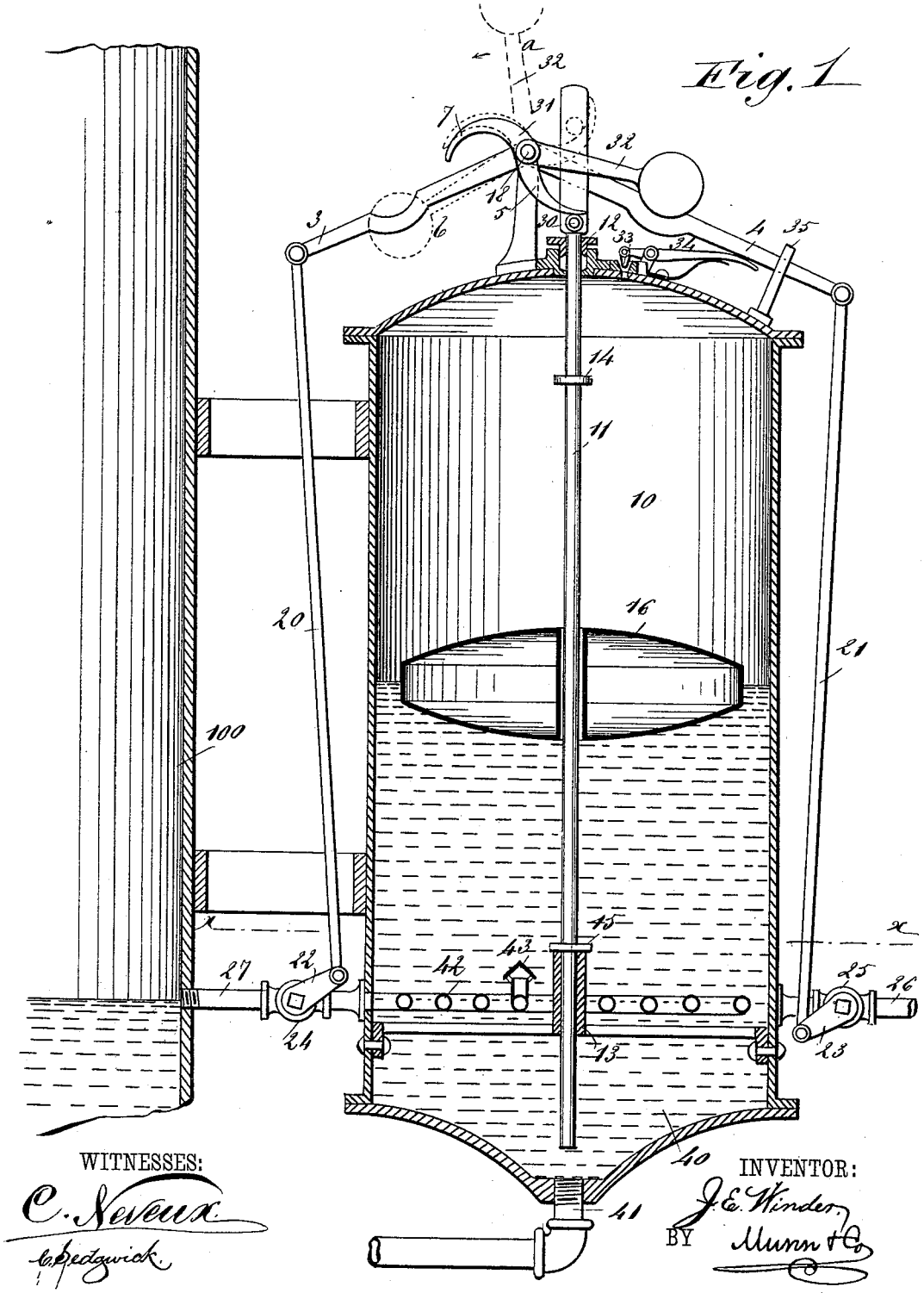
(No Model.) 2 Sheets—Sheet 1.

J. E. WINDER.

BOILER FEEDER.

No. 385,893. Patented July 10, 1888.

Fig. 1



WITNESSES:

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E. Pedgwick

INVENTOR:

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BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2

J. E. WINDER.

BOILER FEEDER.

No. 385,893. Patented July 10, 1888.

Fig. 2

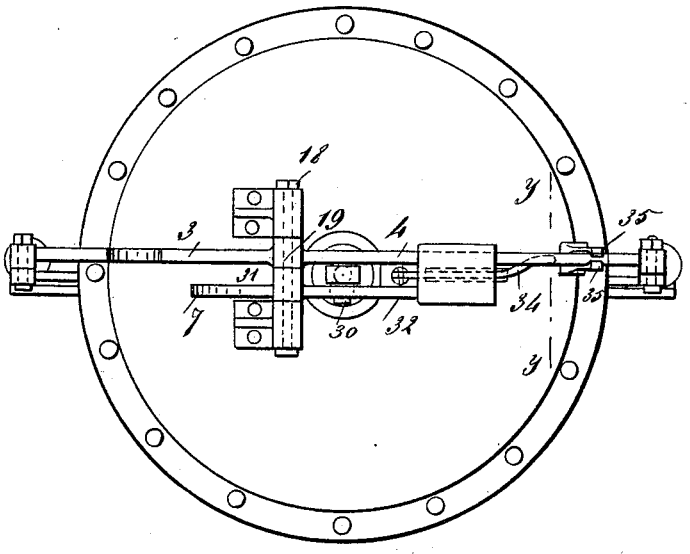
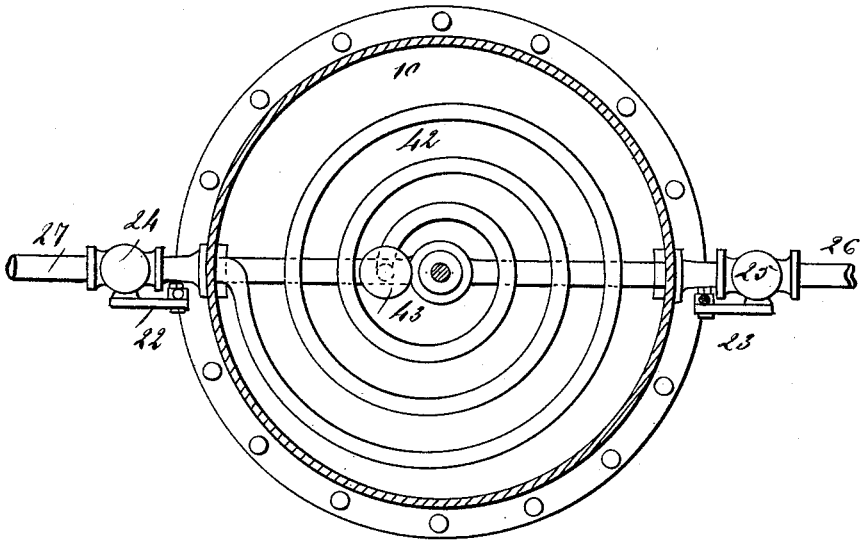


Fig. 3



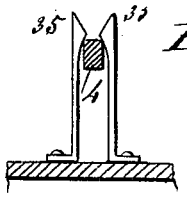


Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN E. WINDER, OF CINCINNATI, OHIO.

BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 385,893, dated July 10, 1888.

Application filed February 25, 1888. Serial No. 265,259. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WINDER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Boiler-Feeder, of which the following is a full, clear, and exact description.

This invention relates to boiler-feeders, the object of the invention being to provide for the automatic maintenance of the water within the boiler at a certain predetermined and required level; and to this end the invention consists of a novel apparatus, which will be hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central sectional elevation of my improved boiler-feeder. Fig. 2 is a plan view of the feeder. Fig. 3 is a sectional plan view on line *x x* of Fig. 1, and Fig. 4 is a detail view on line *y y* of Fig. 2.

In constructing such an apparatus as the one forming the subject-matter of this application I provide a receptacle, 10, which is preferably of cylindrical form, and so made as to withstand a steam-pressure equal to that of the boiler in connection with which it is to be employed. The receptacle 10 may be of any desired size; but in practice I prefer to employ a receptacle having a capacity of from one to two gallons.

Within the cylinder or receptacle 10 there is mounted a rod, 11, which extends out through a stuffing-box, and is guided below by a bracket, 13. This rod carries an upper collar, 14, and a lower collar, 15, and between the collars there is arranged a float, 16, which is free to move up and down upon the rod.

Upon the top of the cylinder 10 I mount a shaft, 18, which shaft serves as the support for a double-armed lever, 19, the two lever-arms 3 and 4 extending out beyond the top of the cylinder 10, there to be connected with rods 20 and 21, which rods are in turn connected to crank-arms 22 and 23, that are carried by the stems of valves 24 and 25, the connection being such that when the valve 24 is closed the valve 25 will be opened, and as the valve 25 is arranged in connection with a supply-pipe, 26, through which water is introduced to the chamber 10, and the valve 24 is arranged in connection with a discharge-pipe, 27, through which the water passes from the receptacle 10 to the boiler, which boiler is shown at 100, it follows that at times when water is being supplied to the receptacle 10 the valve 24 will be closed, and that when water is flowing from the receptacle 24 to the boiler 100 the valve 25 will be closed. The pipe 27 enters the boiler upon a level with the required water-level.

In the drawings the valve 24 is represented as it appears when closed and the valve 25 is supposed to be opened. If the parts are continued in this position, it will be understood that the float 16 will rise, and in rising will strike against the collar 14 and raise the rod 12. Now this rod 12 is provided with a stud, 30, which bears against the lower section, 5, of an S-shaped arm, 31, which arm is rigidly connected to a weighted lever, 32, the parts being supported by the shaft 18. As the float continues to rise, the stud 30, bearing upon the section 5 of the arm 31, will carry the arm upward and move the lever 32 to the position shown in dotted lines at *a* in Fig. 1—that is, to a position just past the center—from which position the lever will drop to the position shown at *b* in dotted lines in Fig. 1, and in so dropping the weighted end of the lever 32 will strike against the arm 3 of the lever 19, and will carry said lever-arm downward to a position such that the valve 24 will be opened, the valve 25 being at the same time closed by the rising of the lever-arm 4.

In order that the air may escape from above the entering water, when the parts are in the position shown in full lines in Fig. 1, I provide a vent-plug, 33, which is carried by a spring-pressed lever, 34, said lever being normally depressed by the lever-arm 4; and in order that the vent-plug may be held from its seat until the lever 32 has been moved to the position shown at *b*, I provide two spring catch-arms, 35, which bear upon and hold the lever-arm 4 until the weighted lever 32 has struck the lever-arm 3, the force of such blow, however, being sufficient to throw the lever 4 from engagement with its catch-arms 35.

In order that the impurities contained in the water delivered to the receptacle or cylinder 10 may be kept from entering the boiler, I provide a settling-chamber, 40, in the lower portion of the cylinder, the bottom of this

chamber being tapped by a blow-off, 41, and in order that the water within the cylinder 10 may be heated by live steam prior to its introduction to the boiler 100, I arrange a coil-pipe, 42, in connection with the pipe 27, the receiving end of this pipe being bent upward at a vertical line and being surmounted by a cap or housing, 43, which tends to diffuse steam issuing therefrom throughout quite an area of water, thus causing a precipitation of any lime that there may be in the water.

In operation, after the cylinder 10 has been filled and the valve 24 has been opened, if the water in the boiler be lower than the pipe 27 the steam will pass through said pipe, through the pipe 42, and out under the cap or housing 43, forming a hot spray which will seek a level in the boiler continually as the steam equalizes the pressure in the feeder and boiler, thereby putting a regular supply of hot water into the boiler automatically at the very instant that it goes below the proper level. When the water in the cylinder 10 has lowered to a point such that the float 16 will rest upon the collar or washer 15, the rod will be drawn downward, and in so moving downward will bear upon the concave face of the section 7 of the S-shaped lever 31, thus moving the weighted lever 32 upward until it overbalances and falls to the position shown in full lines in Fig. 1, it being understood that in so falling its action upon the lever 19 will bring about the closing of the valve 24 and the opening of the valve 25.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler-feeder, the combination, with a water-receptacle, of a discharge-pipe leading therefrom and arranged for connection with the boiler, a coil-pipe arranged within the receptacle and connected to the discharge-pipe, and a housing or cap arranged above the inner end of the coil-pipe, substantially as described.

2. In a boiler-feeder, the combination, with a cylinder, of a supply-pipe connected thereto, a pipe leading from the cylinder to the boiler, said pipe entering the boiler at the required water-level, valves arranged in connection with the pipes, a rod mounted within the cylinder and provided with upper and lower collars, a float loosely mounted upon the rod between the collars, a double-armed lever mounted above the cylinder, rods connected to the lever and to crank-arms carried by the stems of the valves in the supply and delivery pipes, a weighted lever, an S-shaped arm rigidly connected thereto, and a stud carried by the rod, substantially as described.

3. In a boiler-feeder, the combination, with a cylinder, of a vent-plug, a spring-pressed lever by which the plug is carried, a valve-shifting lever mounted to bear upon the plug-lever, and spring-catches arranged in connection with the valve-shifting lever, as and for the purpose stated.

JOHN E. WINDER.

Witnesses:
CASPER WESTMEIER,
W. W. WINDER.