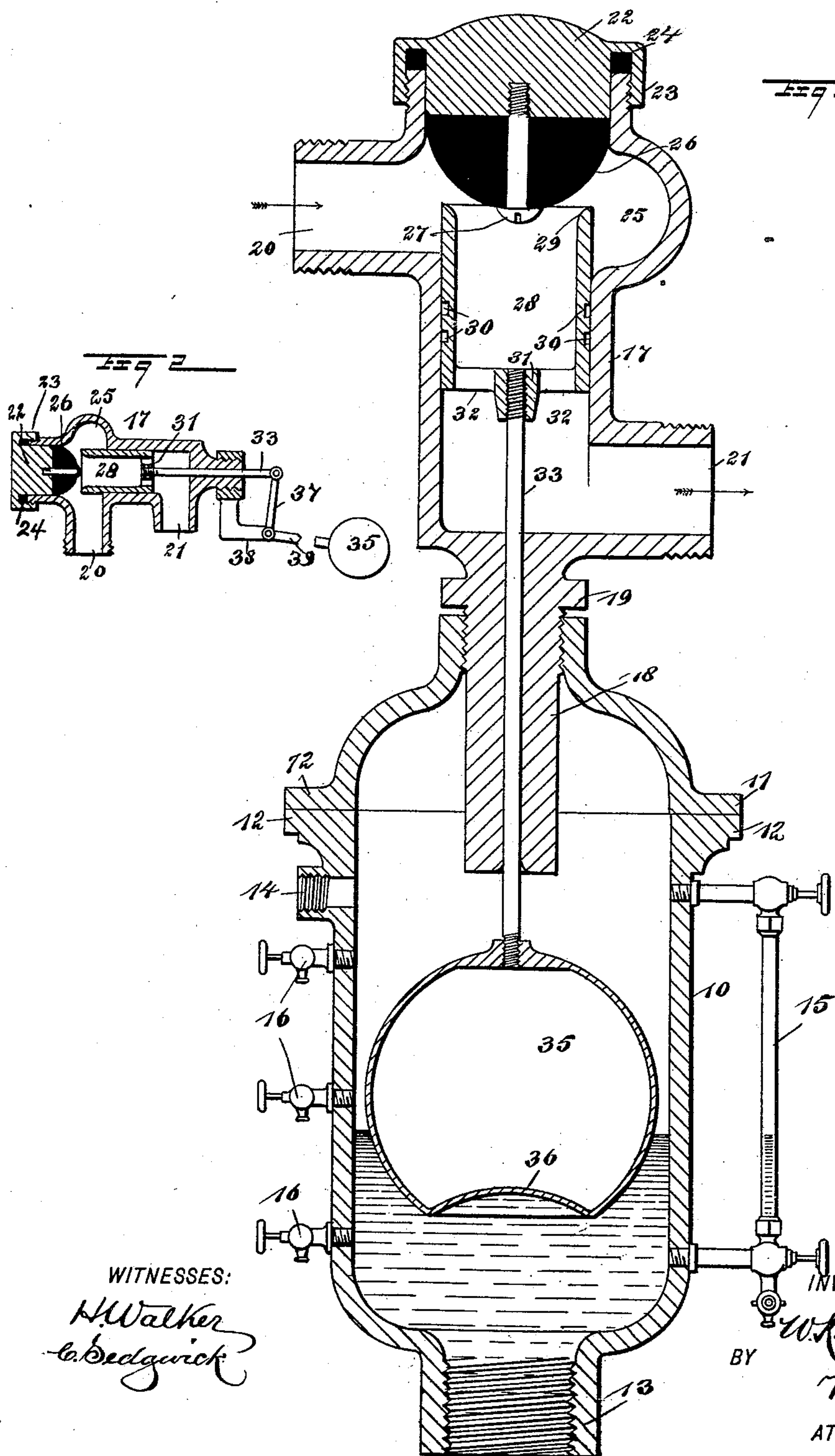


(No Model.)

W. K. FARRAND.
FEED REGULATING VALVE.

No. 486,398.

Patented Nov. 15, 1892.



WITNESSES:

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WILLIAM K. FARRAND, OF BROOKLYN, NEW YORK.

FEED-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 486,398, dated November 15, 1892.

Application filed June 15, 1892. Serial No. 436,808. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. FARRAND, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Feed-Regulating Valve, of which the following is a full, clear, and exact description.

My invention relates to improvements in feed-regulating valves such as are adapted to regulate the supply of water or other liquid to a boiler, water-closet tank, or other receptacles in which it is necessary to keep a certain predetermined height of water or liquid. The valve is especially adapted for use, however, in regulating the feed of low-pressure boilers in which the boiler-pressure is less than the street-pressure; and the object of the invention is to produce a simple valve which will not get out of repair, which is very positive in operation, and which will operate automatically to preserve the exact correct height of water in the boiler.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

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 both views.

Figure 1 is a central vertical section of the valve and connections embodying my invention, the valve being shown as adapted for use in connection with a low-pressure boiler; and Fig. 2 is a similar section, on a reduced scale, of a slightly-modified form of the apparatus adapted for use in connection with a water-closet tank.

As shown in Fig. 1, a water-column is provided, the body 10 of which is made in two parts for convenience, having abutting flanges 11 and 12, which may be fastened together, and the body has at the bottom a nipple 13, adapted to connect with the boiler beneath the water-line, and a similar nipple 14 is arranged in the upper portion of the body and is adapted to connect with the boiler above the water-line, so that an equilibrium of pressure will be maintained, and the body 10 is arranged so that the water from the boiler may flow into it, and of course the water in the body will be at the same height that it is in

the boiler. The body 10 is provided with the usual water-gage 15 and with a row of try-cocks 16.

Above the water-column is a valve-casing 17, which has a depending stem 18, adapted to screw into the top of the body 10, and the stem extends well downward into the body, so as to serve as a guide for the valve-stem, as hereinafter described. The stem 18 has also a flange 19 near its upper end, which is adapted to abut with the top of the body 10 or with suitable packing, which is placed between the body and flange. The valve-casing 17 has a water-inlet 20 at the top and an outlet 21 at the bottom, the former being adapted to connect with the street service-pipe or other supply-pipe and the latter being adapted to connect with the boiler below the water-line. At the top of the casing is a removable cap 22, having a threaded flange 23, adapted to screw upon the casing 17, and a packing 24 is held between the flange 23 and the body of the cap, so that a tight joint may be made. A chamber 25 is produced at the upper portion of the casing 17, the chamber extending around the casing at the same level as the inlet 20, so that the water may pass entirely around the valve, which is held centrally in the casing, and press equally upon all sides of the same. This arrangement also permits the water to run quickly through when necessary. A semispherical seat 26, preferably of rubber, is secured to the cap 22 and is held by a screw 27, which extends upward through a sleeve held centrally in the seat and screws into the cap. Beneath the seat is a cylindrical valve 28, which fits snugly in the valve-casing and is adapted to move vertically therein, the valve being preferably rounded off in its inner upper edge, as shown at 29, so as to fit smoothly and snugly upon the seat 26. On the outer side of the valve are annular grooves 30, which are filled with water and which enable the valve to slide very easily in the casing. The valve is open at both ends, and in the center of the valve bottom is a fixed nut 31, which is secured to the valve by means of cross-ribs 32, and into this nut is screwed the upper end of the valve-stem 33, which extends downward through the stem 18 of the valve-casing, and the lower end of the stem 33 is screwed into a float 35, which

is held to move in the water-column. The float 35 has a chamber 36 in its bottom, and the object of this chamber is to create an excessive suction, so that in case the valve 28 should stick by reason of long disuse or for any other reason and the water in the column should then drop the suction created on the float by reason of the chamber would cause the float to be pulled down with force, and the valve 28 would be started from its seat.

The operation of the apparatus is as follows: When the valve is in its lower position, the water flows in freely through the casing 17 and down through the valve 28 to the boiler. As the water rises in the boiler it also rises in the water-column, and the float 35 is gradually raised until finally the valve 28 is pushed firmly upon the seat 26, thus shutting off the water-supply. As soon as the water begins to lower in the boiler the float 35 will drop, taking with it the valve 28, and the water will again start. It will be noticed that the chamber 25 permits the water to start simultaneously from all sides of the valve 28, so that the supply is quickly turned on.

From the foregoing description it will be understood that by means of this valve the supply of water may be held evenly at a certain point within the boiler, and it will be understood that the valve may be used for regulating the supply of water in receptacles other than boilers. For use in connection with a water-closet tank the valve may be arranged as shown in Fig. 2. Here the inlet and outlet of the valve-casing are both on the lower side of the stem, and the stem 33 of the valve is in a horizontal position, being fitted to one

arm 37 of a bell-crank, which is fulcrumed at its elbow on a support 38, the lower arm 39 of the crank having a float 35 secured to its free end, and it will be seen that the rise and fall of the water will affect the float in the manner already described, thus moving the bell-crank and closing and opening the valve.

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

1. A feed-regulating valve comprising a casing 17, having an inlet 20 at its upper end and an outlet 21 at its lower end, a cap 22, arranged to close the top of the casing, a spherical valve-seat 26, secured to the under side of the cap and extending downward opposite the inlet, a sliding hollow valve 28, held to move between the inlet and outlet and to close upon the seat at a point opposite the inlet, a chamber 25, extending around within the casing at a point adjacent to the inlet, a water-column arranged beneath the valve and connected with the receptacle controlled by the valve, a float suspended in the water-column, and an operative connection between the float and valve, substantially as described.

2. The combination, with the float-actuating regulating-valve and the water-column held beneath the valve, of a float held within the water-column and connected with the valve-stem, the float having an air-chamber in its bottom, substantially as described.

WILLIAM K. FARRAND.

Witnesses:

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