J. W. Bishop,

Water-Closet Valve,

No. 47,184, Patented Apr. 11, 1865

Fig. 2.

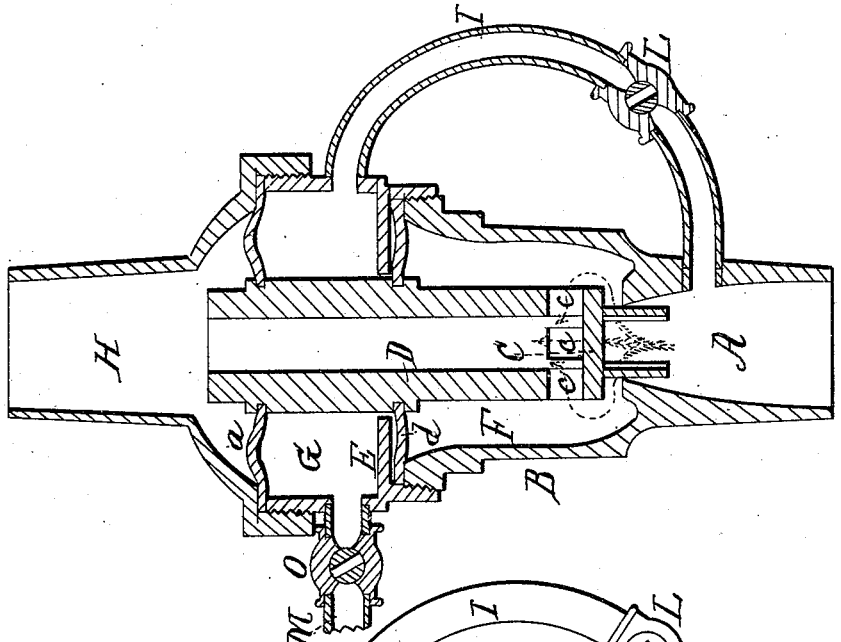
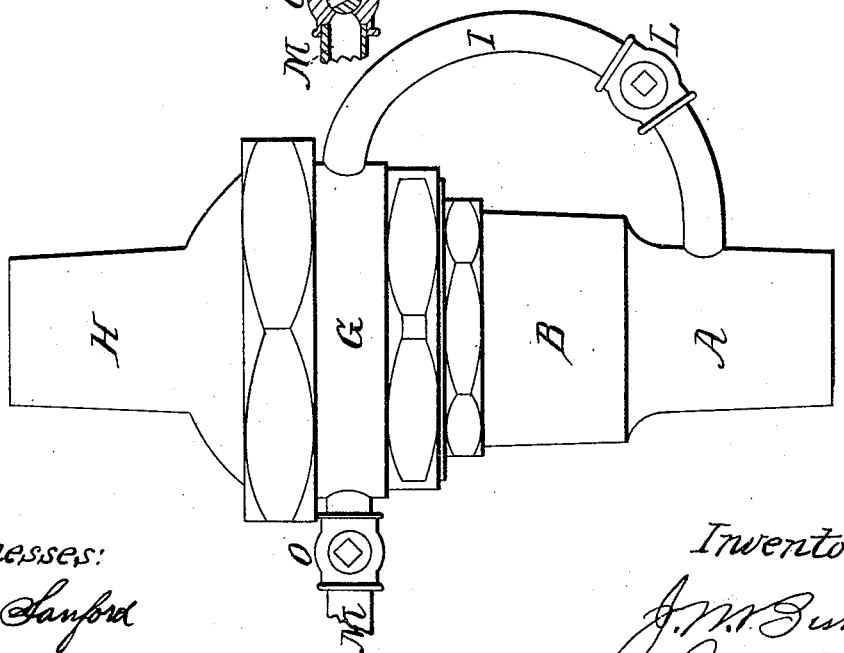


Fig. 1.



Witnesses:
Rufus Sanford
Chas. N. Babcock

Inventor:
J. W. Bishop
John E. Earle
Atty.

UNITED STATES PATENT OFFICE.

J. W. BISHOP, OF NEW HAVEN, CONNECTICUT.

IMPROVED WATER-REGULATOR.

Specification forming part of Letters Patent No. 47,184, dated April 11, 1865.

To all whom it may concern:

Be it known that I, J. W. BISHOP, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Water-Pressure Regulators; and I do hereby declare the following to be a full, clear, and exact description of the same, when taken in connection with the accompanying drawings and the letters of reference marked thereon, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view and in Fig. 2 a vertical central section.

My invention has for its object to regulate the pressure of water in pipes to be more or less, as required; and it consists in a mechanism whereby the pressure of the water in the supply-pipe may be counterbalanced to a greater or less extent at the pleasure of the consumers.

To enable those skilled in the art to construct and use my invention, I will proceed to fully describe the same, as illustrated in the accompanying drawings.

A is the supply-pipe; B, a case which forms a chamber, F, inclosing a valve, C. When the said valve is upon its seat, it closes the pipe A and cuts off the supply. The stem D of the valve C is made hollow, and extends up through a guide, E. When the said valve is open, as seen in Fig. 2, water flows into the chamber F and through openings *c* into the stem D, as denoted by arrows; thence away for use. The guide E divides the chamber F from a second chamber, G.

a is a diaphragm secured to the valve-stem D and the case of the chamber G, as seen in Fig. 2, forming the top of the said chamber G.

H is the outlet, through which the water passes to be drawn for use.

I is a pipe, communicating from the supply-pipe A to the chamber G, fitted with a cock, L.

M is a discharge-pipe from the chamber G, fitted with a cock, O.

a is a diaphragm, inserted as a packing between the two chambers F and G.

The operation of my regulator is as follows: Supposing the water in the supply-pipe A to be under a pressure of forty pounds upon the valve C, and the area of the diaphragm *a* four times the area of the valve C, consequently but one-fourth the pressure of the supply in the pipe A upon the same area on the diaphragm will be required to close the valve C—that is, forty pounds pressure upon the diaphragm will counterbalance the forty pounds pressure on the valve C, and the forty pounds on the diaphragm A is distributed over four times the area of the valve C, or ten pounds pressure per inch, the pressure under which water would be drawn from the pipes H, without making any allowance for the column of water beyond or above the diaphragm *a* in the pipe H. To compensate for this column is part of the design of the chamber G and its pipes and cocks, and their operation is as follows: Open the cock L and allow water from the supply-pipe to pass up into the chamber G until the diaphragm *a* is supported by a pressure equal to the column above it, and the one-fourth pressure would be maintained; or, should occasion require, a greater pressure in the pipe H than the one-fourth, as described, allows more water to pass into the chamber G until the required pressure is attained, then close the cock L. If the cock L be left open, the pressure would of course be the same above and below the diaphragm. The water would consequently flow through nearly unobstructed or under full head. If more water enter the chamber G than is required to accomplish the object, or if at any time it be required, reduce the pressure in the pipe H, open the cock O, and allow a portion of the water to pass out. Thus it will be seen by allowing more water to pass into the chamber G the force of the flow through the pipe H will be increased until it reaches the full head, or, by drawing therefrom, the pressure is reduced until the valve C would be nearly closed, and the pressure reduced to nearly nothing.

The proportions of the valve C and diaphragm may be varied to be more or less, as situation may require. The adjustment of the pressure would be the same, and at all times under the control of the consumer.

Having, therefore, fully described my invention, what I claim therein as new and useful, and desire to secure by Letters Patent, is—

1. The valve C, when constructed with a hollow stem and combined with chambers F and G, substantially as and for the purpose herein set forth.

2. Adjusting the pressure of water in pipes by means of the chamber G and cocks L and O, substantially as herein specified.

J. W. BISHOP.

Witnesses:
JOHN E. EARLE,
RUFUS SANFORD.