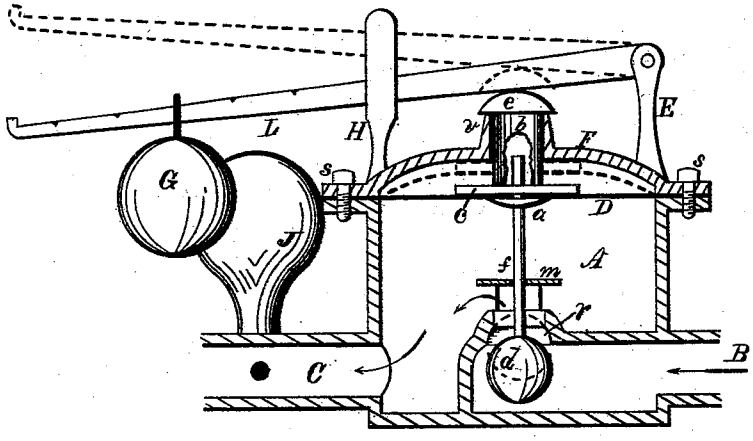
E. HAYS.

WATER-PRESSURE REGULATOR.

No. 172,877. Patented Feb. 1, 1876.



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UNITED STATES PATENT OFFICE.

EDWARD HAYS, OF ROCHESTER, NEW YORK, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO R. E. SHERLOCK AND SAMUEL SLOAN, OF SAME PLACE.

IMPROVEMENT IN WATER-PRESSURE REGULATORS.

Specification forming part of Letters Patent No. **172,877**, dated February 1, 1876; application filed May 3, 1875.

To all whom it may concern:

Be it known that I, EDWARD HAYS, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Water-Pressure Regulator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification, in which the figure is a vertical central section of my invention.

The object of my invention is to provide a simple, cheap, and efficient governor to reduce and regulate the pressure of the water received into service-pipes in buildings, &c., from the street-mains. It consists in the employment of a fixed cap arranged over the inlet-opening to the valve-chamber, so as to act as a protector to the flexible diaphragm.

In carrying out my invention in practice I provide a chamber, A, of any desired size. At the bottom of this chamber, on one side, is arranged the inlet opening or pipe B, which is so formed as to constitute a separate compartment, as shown, to the center of the main chamber, where it opens upward. This opening is preferably provided with a spherical valve, though any other form might be employed. This valve *d* is connected by a stem, *f*, to a flexible diaphragm, D, by suitable clamping-collars, *a* and *c*. Said diaphragm may be formed of rubber or of a thin metal plate. It is held in position by being clamped between the upper edge of the chamber A and the convex cap or head F, which is secured to the chamber by the clamping-bolts *s*. The cap F has a raised neck, *v*, to act as a guide for the hollow follower *b* to move in vertically. The lever L is pivoted to the standard E fixed to the cap F, and rests across the spherical head *e* of the follower. The opposite end of the lever passes through the bifurcated standard H, also fixed to the head or cap F, and is provided with an adjustable poise or weight, G. The lower end of the follower or hollow stem *b*, it will be seen, rests upon the metal washer *c* on the upper side of the diaphragm.

Instead of this construction, however, the stem *f*, if desired, might be extended up to the lever L, and thus dispense with the follower. In such a case the projecting bearing *v* should be reduced in diameter to correspond with that of the spindle.

The inlet and outlet pipes may be made of equal size, or either may be larger than the other, if desired.

The pipe leading from the street-main, or other supply-pipe, is attached to the inlet-pipe B, and the outlet-pipe C to the distributing-pipe.

When the cock in the supply-pipe is opened the water flows into the chamber, and not being allowed to discharge therefrom it becomes filled, and by the pressure through the supply-pipe the diaphragm and weighted lever are forced toward the position indicated by the dotted lines, which change also lifts the valve *d* up into its seat *r*, thus cutting off any further supply into the chamber until a discharge-cock may be opened. This at once reduces the pressure in the chamber, and the valve is thereby more or less opened, thus permitting a constant supply to the opened cock; but as soon as that is closed the reaction occurs, and the valve is again forced into its seat, and held there by the extra pressure in the supply-pipe.

The valve *d* may be made of rubber, or other suitable material, and it may be made in any suitable form.

It will be seen that the greater the pressure required in the house, or the supply-pipes, the further the weight G should be placed from the fulcrum of the lever, and vice versa—that is, the notches on the lever should be numbered from the case A outward—the position of the poise or weight being adjusted with reference to the pressure required in the distributing-pipes, and without any reference to the pressure in the street-mains, which is varying.

The sudden reactionary force or strain upon the working portions of the regulator, especially upon the diaphragm, is almost wholly relieved by the employment of the air-chamber applied to the discharge-pipe C, as indicated by the full lines J; or, if desired, one might be applied to the inlet-pipe, or to both the inlet and outlet pipes.

The cap *m* is designed to break the force of the upward flow of the water, and act as a guard to protect the diaphragm from such force.

What I claim as my invention is—

In combination with the flexible diaphragm D, follower *e*, and weighted lever L, the cap *m* fixed to the case A directly over the inlet-port, substantially as and for the purposes set forth.

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