# F. STEELE.

## Pressure-Regulator for Water-Pipes.

No. 166,567. Patented Aug. 10, 1875.

Fig. 1.

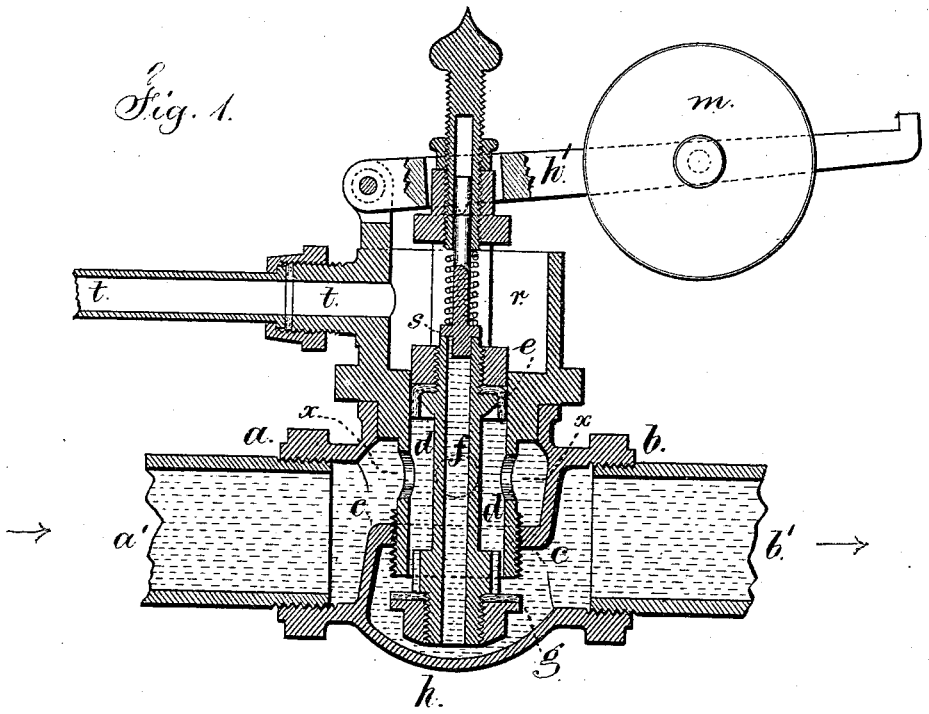
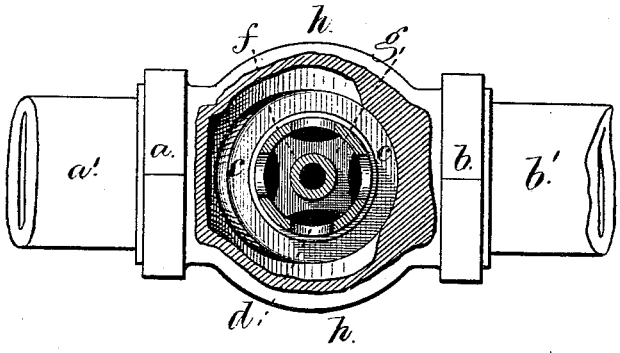



Fig. 2.




Witnesses

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# UNITED STATES PATENT OFFICE.

FERDINAND STEELE, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN PRESSURE-REGULATORS FOR WATER-PIPES.

Specification forming part of Letters Patent No. **166,567**, dated August 10, 1875; application filed May 31, 1875.

*To all whom it may concern:*

Be it known that I, FERDINAND STEELE, of the city of Brooklyn, Kings county, New York, have invented an Improvement in Pressure-Regulators for Water, &c., of which the following is a specification:

Numerous devices have been proposed for regulating the pressure of water in a delivery-pipe and maintaining therein a uniformity of pressure that is less than the varying pressure in the supply-pipe; but they are expensive and liable to derangement, or else inaccurate.

My improvement is made for accomplishing the object of regulating the pressure in the delivery-pipe, and for preventing the accumulation therein of more than a fixed or standard pressure, and that regardless of the pressure in the main or supply-pipe.

In the drawing, Figure 1 is a vertical section of my regulator, and Fig. 2 is a sectional plan at the line *x x*.

The body *h* of the regulator is similar to that of a globe-valve, with the coupling *a* for the inlet-pipe *a'*, and *b* for the delivery-pipe *b'*, and the intermediate diaphragm *c*, and in this diaphragm is an opening for the cylinder *d* to pass through. This cylinder is screwed into place, and by its removal all the parts of the regulator can be taken out for cleaning and then replaced, thereby greatly simplifying the construction and lessening the cost. In the cylinder *d* there is a piston, *e*, upon a stem, *f*, and at the inner end of this stem is the valve *g*, closing against the end of the cylinder *d*. There are openings through the cylinder *d*, so that the water or fluid from the inlet-pipe *a'* has free access to the piston *f* and valve *g*, and acts against the opposite faces; hence, as these opposite faces are of equal area, or nearly so, the pressure is balanced regardless of the pressure or head of water. In order to open the valve *g* I make use of a lever, *h'*, and weight *m*, that is adjusted to exert more or less force; hence the piston and valve will be moved endwise in the cylinder *d* by this weight and lever, to open the discharge water-way whenever the accumulation of pressure in the said pipe *b'* is not enough to raise this lever and weight; hence, whenever the water is drawn from the pipe *b'*, the pressure in the delivery side is lessened and the weight opens the valve, but when the discharge of water is stopped the pressure increases sufficiently to raise the piston, valve, and stem against the weight and close the valve, shutting off further pressure from the delivery-pipes.

If the means thus far described were used alone, a slight leakage, or the expansion of water in the water-back of a range or in the boiler, might increase the pressure to that of the supply, or even more. I prevent this by the valve *s* upon the upper end of the hollow stem *f*. This valve is acted upon by a spring or lever, and is set to open by any excess of pressure above that at which the apparatus is adapted to employ; hence all surplus water will pass off, and the pressure to which this valve is set can never be exceeded. The overflow-water is received in the cup *r* at the upper end of *d*, and a pipe, *t*, conveys the same to a sewer or other receptacle.

I claim as my invention—

1. The removable cylinder *d*, containing the sliding piston *e*, and forming a seat at its end for the valve *g*, in combination with the piston *e*, valve *g*, stem *f*, lever *h'*, and inlet water-way *a'*, opening into the cylinder *d* between the piston *e* and valve *g*, substantially as set forth.

2. In a pressure-regulator, the piston and valve upon one stem, between which the incoming pressure is balanced, in combination with a valve adjusted to open by an excess of pressure in the delivery-pipe, substantially as set forth.

Signed by me this 27th day of May, 1875.

F. STEELE.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.