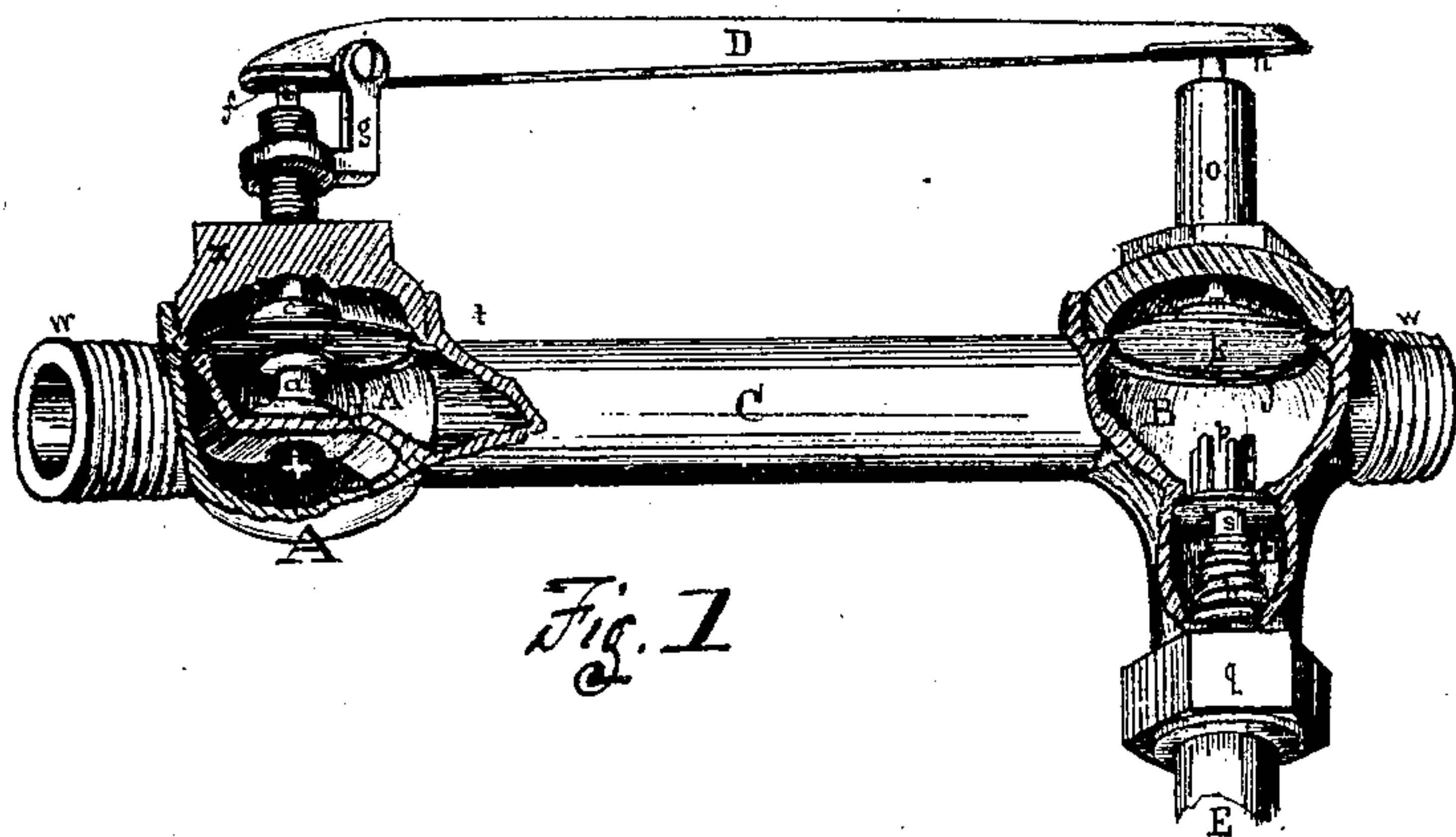


*J. J. Steiger,*

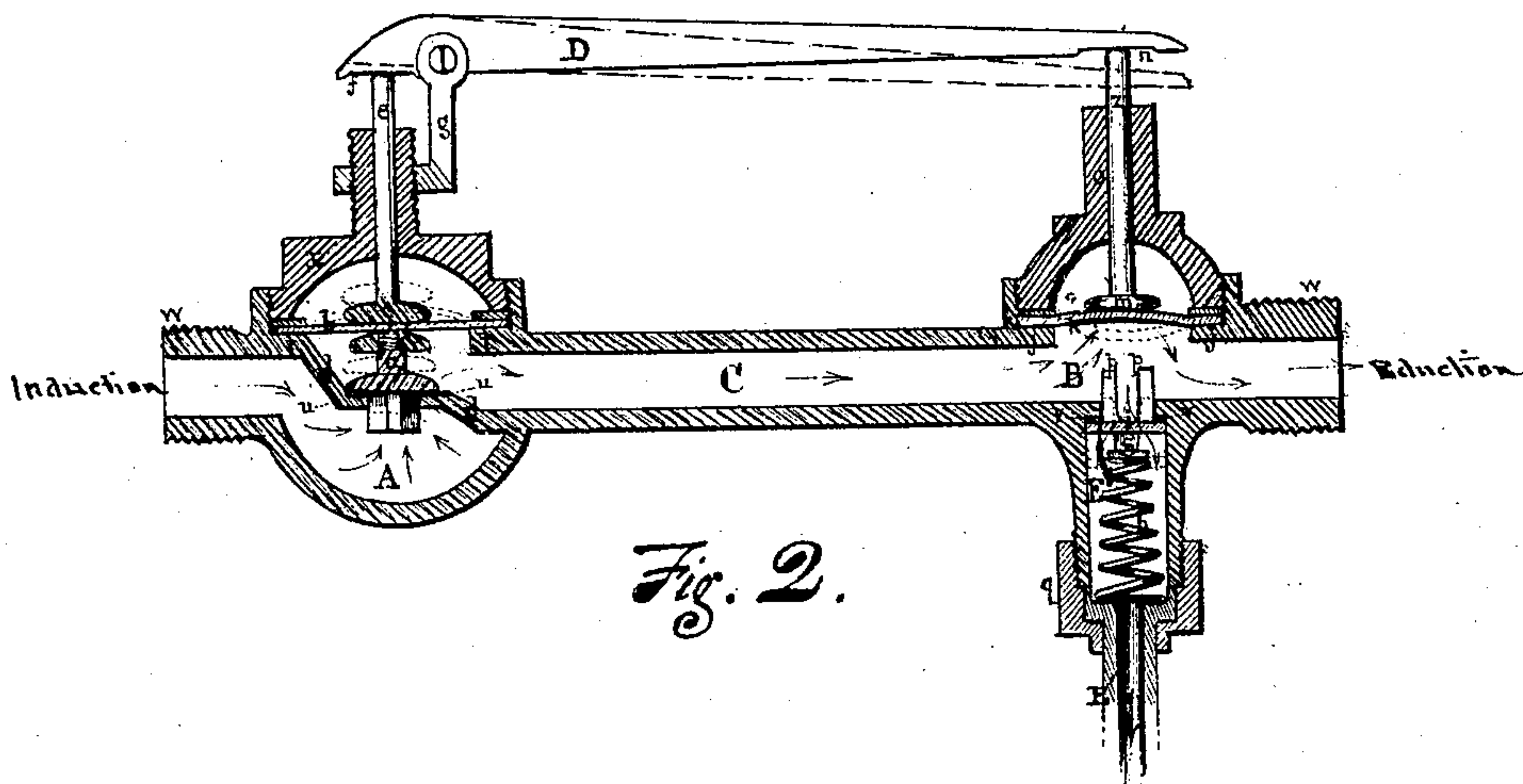
*Governor.*

*No. 102,176.*

*Patented Apr. 19, 1870.*



*Fig. 1*



*Fig. 2.*

*John O. Steiger*

*Witnesses  
Henry H. Hall  
Edmund Thurston*

*Inventor*



# United States Patent Office.

JOHN J. STEIGER, OF PEORIA, ILLINOIS.

Letters Patent No. 102,176, dated April 19, 1870.

## IMPROVEMENT IN SELF-ACTING EQUALIZING-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN J. STEIGER, of the city of Peoria, in the county of Peoria and in the State of Illinois, have invented a new and useful Self-acting Equalizing-Valve; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a perspective view.

Figure 2, a longitudinal section, the arrows indicating the course and pressure of the water or other liquid or fluid.

This invention relates to the application, at points opposite the proper valve-openings in water or other pipes, of two elastic diaphragms at separate valve-openings, which, by the pressure at such points, react on proper pistons and lever, to open a valve to relieve pressure and get rid of the same in pipes to dwelling-houses or pipes to bath-boilers, &c., by letting the water off automatically.

A represents a valve-chamber in a pipe, C, with closing partition, *d*, having an opening, a valve, *a*, resting thereon, with an elastic seat, *u*, for valve, which is kept in place by proper guides.

The valve A has a tabular top, which touches the under side of the elastic diaphragm *b*, lying on proper seat, *t t*, and closing the valve in this direction, and fastened down by a leather ring and screw-cap, *x*, under which there is room for vertical play of spindle-head *c*, whose stem *e* slides in the upper neck of the cap *x*.

The apex of the spindle *e* is in constant contact with the shorter arm of a lever, D, whose longer arm connects with the co-operating spindle *z*, hereafter described.

Around the neck or stem of the cap *x* is a thread, on which the ring supporting the fulcrum, *g*, support for lever is screwed, and by which the lever D is adjusted to the length of the spindles.

B represents a chamber, partitioned horizontally across the middle by another diaphragm, *k*, resting on the seat *j j*, and secured above by leather ring and vaulted cap *o*, in which the spindle *z* of the spindle-head *m* slides vertically, its upper end constantly maintaining contact with the longer arm of the lever D, a hollow being made in the under surface of the arm for this purpose and to retain the lever. The head *m* of the spindle *z* rests on the upper surface of the diaphragm.

C is the water-pipe connecting these two chambers, and represents any section of supply-pipe, say from four to five inches in length, and connecting the two co-operating chambers A and B.

E is another valve-chamber at the entrance of a waste-pipe, E', for carrying off water to relieve pressure in the pipes.

The valve *i* closing this exit immediately opposite the diaphragm *k* above, is kept against the seat at the top of the chamber E by means of a spiral spring, *h*, which rests on a proper seat at the bottom of the chamber, and may be hollowed out of the upper part of the waste-pipe E', a cap, *q*, sliding onto it, covering the joint and screwing tight onto the threaded end on the lower part of the valve-chamber E, which is cast with the pipe C.

The valve *i* has proper guides to keep it in place, and rests by the point of its nipple, *s*, in a recess in the surface of a disk fastened to the top of spiral spring *h*.

The operation of this invention is as follows:

Paying attention to the arrows, as representing the course of the liquid or fluid, and premising that the object of this device is to reduce or rather equalize the pressure, (more particularly in water-pipes, in supplying boilers in dwelling-houses, baths, factories, and other places,) when the pipes may be unavoidably subjected to great pressure in time of fires when the engines at water-works are forcing forward great volumes of water. In the latter case the water thus forced forward raises the valve *a* in chamber A, and with it the piston *c*, (the diaphragm *b* in this case cutting off the upward escape of the water,) the spindle head *e*, pressing the lever D upward, depresses the longer arm of the latter, and causing the piston *m*, by pressure on the other diaphragm, *k*, to contract the passage for water between the latter and the valve *i* at entrance of waste-pipe E', and throwing the extra force of the water against the valve *i*, which is accordingly forced to give way, and thus relieve such extra pressure from the pipes, thereby relieving both the induction-pipes and the boilers in houses from extraneous pressure from main pipes or from a contrary source, *i. e.*, from expansion of the water by heat in bath-boilers into which such pipes lead.

It will be seen that a balancing action place at ordinary pressures between the two chambers A and B and the valve *i* or waste-valve, nicely regulating the hydrostatic pressure.

Having thus fully described my invention,

What I claim therein as new, and desire to secure by Letters Patent, is—

1. The chambers A and B, provided with the diaphragms *b k*, connected with the two spindles *e* and *z*, reacting on a connecting-lever, D, by which one of the diaphragms contracts the passage in pipe over a discharge or relieving-valve, *i*, substantially as and for the purpose set forth.

2. The valve *a*, diaphragm *b*, piston-head *c*, with its spindle *e*, and lever *D*, in combination with spindle *z*, with its piston-head *m*, diaphragm *k*, valve *i*, and spring *h*, substantially as set forth.

3. The lever *D*, supported by an adjustable screw-threaded fulcrum *g*, in combination with spindles *e* *z*, diaphragms *b* *k*, and valves *a* *i*, substantially as set forth.

4. The arrangement of the chambers *A* *B*, pipe *C*, partition *d*, valve *a*, diaphragm *b*, spindle *e*, screw-cap *x*, fulcrum *g*, lever *D*, spindle *z*, vaulted cap *o*, dia-

phragm *k*, valve *i*, spiral spring *h*, and screw cap *q*, substantially in the manner and for the purpose as herein set forth.

In testimony that I claim the foregoing self-acting equalizing-valve, I have hereunto set my hand this 24th day of December, A. D. 1869.

JOHN J. STEIGER.

Witnesses:

HENRY W. WELLS,  
E. THURLOW.