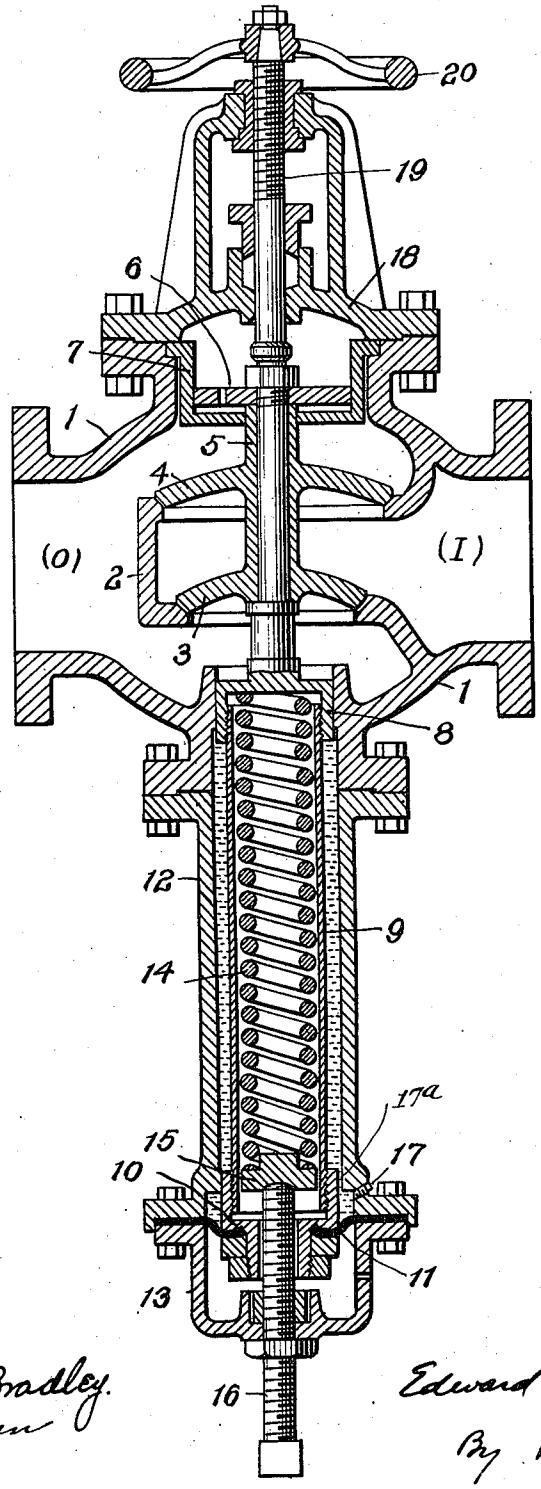
E. V. ANDERSON.

PRESSURE REDUCING VALVE.

APPLICATION FILED SEPT. 1, 1914.

1,173,913.

Patented Feb. 29, 1916.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD V. ANDERSON, OF MONESSEN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHARLES E. GOLDEN, OF CRAFTON, PENNSYLVANIA.

PRESSURE-REDUCING VALVE.

1,173,913. Specification of Letters Patent. Patented Feb. 29, 1916.

Application filed September 1, 1914. Serial No. 859,643.

To all whom it may concern:

Be it known that I, EDWARD V. ANDERSON, a citizen of the United States, residing at Monessen, in the State of Pennsylvania, have invented certain new and useful Improvements in Pressure-Reducing Valves, of which the following is a specification.

My invention relates generally to valves for regulating and maintaining a pressure lower than the pressure in the source of a fluid supply; and its primary objects are to simplify, and render more exact, efficient and regular, the operation of such valves.

The invention is illustrated in the accompanying drawing, which is a central vertical section of the valve casing and its appurtenances.

In the casing 1, I provide a double partition 2 between the inlet (I) and the outlet (O), and the two openings in the partition 2 are closed by the two valves 3 and 4 made integral on a stem 5 which at the top carries a piston 6 working in a cylinder 7 set in the casing, and at the bottom is provided with a head 8 into which there is screwed a cylinder 9 carrying at the bottom a plug 10, which is attached to a flexible diaphragm 11. For supporting these parts the valve casing 1 has attached to it a supplementary casing 12 provided at the bottom with a cap 13 holding the diaphragm 11. The valve, valve stem, piston 6 and tube 9, are all normally pressed upward by compression spring 14, carried on a traveling block 15, which rests on a screw 16 threaded through the bottom of the cap 13. The bottom of the casing 12 has a small screw-plugged port 17 and a port 17^a for introducing a liquid into the space between tubular casing 12 and the spring containing tube 9; it being understood that this liquid fills in around the plug 10 and covers the diaphragm 11.

On top of the valve casing 1, I provide a hood 18, a screw 19, and handwheel 20, for forcibly closing the valve manually, by contact of screw 19 with stem 5.

With this construction it is apparent that when the stem 19 is raised, the valve disk 3 being smaller than disk 4, the valve will be opened by the high pressure of the inlet (I); and that, although the pressure in chamber (O) will take effect upon the head 8, by cylinder 9 and plug 10 also on the diaphragm 11, tending to close the valve, the valve will be maintained open by the assistance of spring 14, as long as the pressure in the outlet (O) is below a certain maximum point at which the valve is balanced by adjusting screw 16. When the pressure on the outlet side (O) has reached the limit at which the spring is set, further increasing pressure on the diaphragm 11 will depress it and tube 9 against the spring 14, and seat the valve disks 3 and 4. This action is automatic.

The diaphragm 11 is protected from contact with the steam by the liquid in the casing 12, and meanwhile the spring 14 is entirely protected from both steam and water. The piston 6 cushions the movement of the valve in both directions, preventing any water hammer in either opening or closing. It will be evident that the valve is accurate, and sensitive and constant, and that although normally automatic, it may be operated by hand when desired. All parts of the mechanism are entirely inclosed in the casing and protected from injury by steam or water or mal-adjustment.

The many advantages of such construction and operation will occur to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim is the following:

1. A pressure reducing valve comprising a casing having a double apertured diaphragm, two valves seating thereon and carrying on their stem a dash-pot piston and a movable cylinder, a stationary cylinder for said piston, an adjustable spring inclosed in the movable cylinder and a flexible diaphragm attached to the cylinder and exposed to the low pressure, whereby the valve may be set to close at a certain maximum of pressure on the low side, substantially as described.

2. A pressure reducing valve comprising a casing with an apertured diaphragm, a valve closing said aperture and carrying on its stem a movable tube, a supplementary casing containing said tube and closed at the bottom by the tube and a diaphragm connected thereto, a spring in the tube adapted for regulating the effective pressure on said diaphragm, and means providing a liquid seal for the diaphragm and

the tube containing the spring, substantially as described.

3. A pressure reducing valve comprising a casing, a valve, springs normally holding the valve open, a dashpot attached to the valve, a diaphragm arranged to overcome the spring pressure by fluid pressure on the low side of the valve casing, and a hand operated closing device for the valve.

4. In a pressure reducing valve, the combination of a casing having an apertured diaphragm, a valve and a stem carrying the valve and also a fluid tight cylinder, a supplementary casing surrounding the cylinder, a flexible diaphragm closing the supplementary chamber and fixed to the cylinder, a spring in the cylinder seated on a support independent thereof, whereby the pressure of the spring effective to open the valve is opposed to pressure on the diaphragm from the outlet side of the main valve.

5. In a pressure reducing valve, the combination of a casing having an apertured diaphragm, a balanced stem valve adapted to seat on said diaphragm, a supplementary casing, the valve stem extending into the supplementary casing and bearing on a flexible diaphragm closing said supplementary casing, a spring bearing on the valve stem and adapted to force the valve open in opposition to fluid pressure on the diaphragm from the outlet side thereof.

In testimony whereof I have hereunto signed my name in the presence of a subscribed witness.

EDWARD V. ANDERSON.

Witness:

FRED'K STAUB.