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PATENTED OCT. 17, 1905.

E. V. ANDERSON.
PRESSURE REGULATOR.
APPLICATION FILED JAN. 21, 1904.

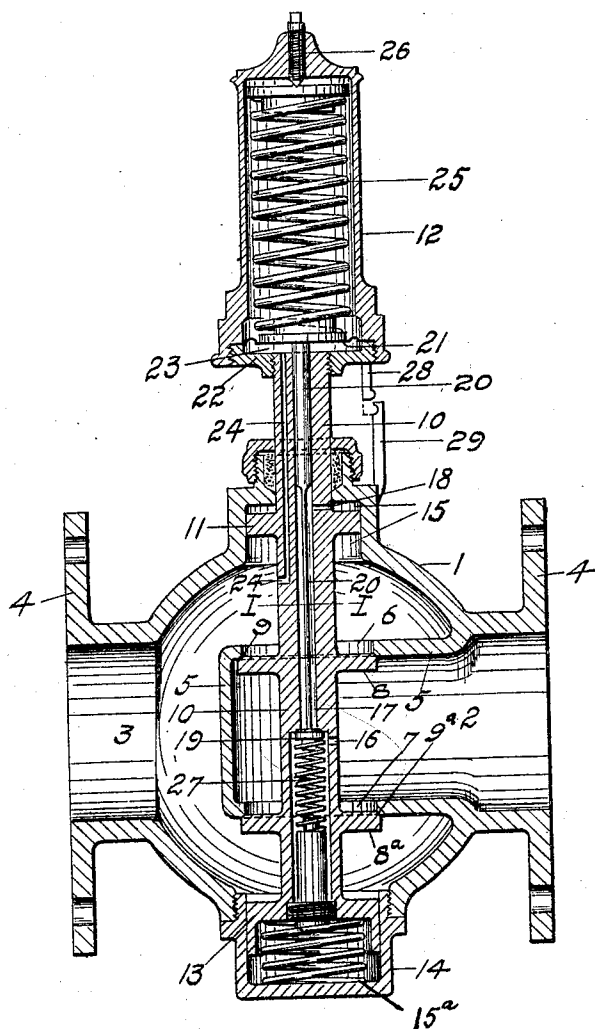


Fig. 1

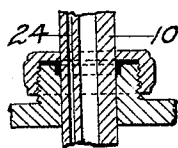


Fig. 2

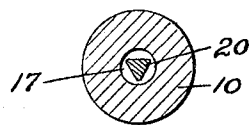


Fig. 3

Witnesses

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EDWARD V. ANDERSON, OF PITTSBURG, PENNSYLVANIA.

PRESSURE-REGULATOR.

No. 802,132.

Specification of Letters Patent.

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Application filed January 21, 1904. Serial No. 189,990.

To all whom it may concern:

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

The object of my invention is to provide a new and improved pressure-regulator; and to this end my invention consists of a pressure-regulator and in the construction and combination of parts, all as fully hereinafter described and claimed.

In the accompanying drawings, which illustrate an application of my invention, Figure 1 is a central vertical sectional view; Fig. 2, a detail view of a modified form of a portion of the regulator, particularly showing a cup-leather in place of the packing shown by Fig. 1; and Fig. 3, a cross-section of valve-stem, taken on line 1 1 of Fig. 1.

Referring to the drawings, 1 represents a valve casing or housing provided with an inlet-passage 2 and an outlet-passage 3, each passage being preferably provided with a flange 4, adapted to be connected up with fluid-pipes. The said inlet and outlet passages are separated by a partition 5, and partition 5 is provided with two openings 6 and 7, through which the fluid passes in its travel from the inlet to the outlet passage. The passage of the fluid from the inlet to the outlet is controlled by a double-headed regulating-valve, the heads 8 and 8^a of which are adapted to seat in valve-seats 9 and 9^a, formed on the partition. As illustrated and as preferred, heads 8 and 8^a are formed integral with a valve-stem 10, which latter also carries a piston-head 11 on adjusting-casing 12 and a flanged part 13. Flanged part 13 is not fluid-tight and, in connection with a cup 14, forms a dash-pot below the lower end of the valve-stem. The employment of dash-pots, as shown, is a characteristic feature of my invention. Their use in this connection, it is believed, will be readily appreciated by those skilled in the art to which my invention relates. Within the lower dash-pot and bearing against the part 13 and the cap 14 is a spring 15^a. This spring acts to return the regulating-valve to its seats. The piston-head 11 is arranged to travel in an open-ended chamber 15, and the construction shown acts as a dash-pot during the act of returning the regulating-valve to its seats. Fluid from the inlet passes to chamber 15 above the piston-head by way of port 16, passage 17 in valve-

stem 10, and port 18, and the passage of the fluid is controlled by a controlling-valve 19, having its stem 20 located in the opening or passage 17. Valve-stem 20 of valve 19 at its upper end is in contact with a diaphragm 21. This diaphragm is held in the desired position by the adjusting-casing and, in conjunction with a threaded plate 22, forms a fluid-chamber 23. Fluid-chamber 23 is in communication with outlet-passage 3 or with the low-pressure side of the valve by means of port 24, formed in valve-stem 10, and fluid is supplied to chamber 23 under the diaphragm from the outlet 3. A spring 25, located within casing 12, imparts a downward pressure upon the diaphragm, and the tension of said spring is regulated by means of an adjusting-screw 26. A spring 27 is employed to exert an upward pressure against controlling-valve 19.

For the purpose of permitting an uninterrupted passage of fluid through the valve I provide a hanger 28, attached to the adjusting-casing. This hanger is adapted to engage with an arm 29, extending upwardly from the main casing, and when engagement is effected by manually forcing casing 12 downwardly and turning it the double-headed main valve is maintained off its seats, thereby permitting a passage of fluid from the inlet to outlet without reducing the pressure.

In the detail view Fig. 2 I have shown a form of packing comprising a cup-leather, and this construction I prefer to use when the regulator is used in a water-line.

In the drawings the regulator is shown closed, and in order to permit fluid to pass from the high-pressure side to the lower-pressure side controlling-valve 19 is moved away from its seat by means of the pressure exerted by diaphragm 21 upon the upper end of valve-stem 20. The required amount of pressure necessary to move the controlling-valve 19 away from its seat is obtained by means of the regulating-spring 25, which bears upon the upper surface of diaphragm 21. Controlling-valve 19 being moved from its seat, fluid from the high-pressure side passes through port 16, thence through passage 17 and port 18 to space above piston-head 11. This high pressure acting upon piston-head 11 causes valve-stem 10, with its valves 8 and 8^a, to be lowered, thereby permitting fluid to pass from the inlet-supply to outlet. If the pressure on the low-pressure side is increased to more than the spring 25 is set for, such pressure will lift

the diaphragm 21 off of the upper end of valve-stem 20 and permit valve 19 to close. The high pressure now being removed from piston-head 11, valves 8 and 8^a are returned to their seats by spring 15^a.

What I claim is—

1. In a pressure-regulator, a casing having a high-pressure inlet and a low-pressure outlet, an apertured partition separating the inlet and outlet, a valve regulating the passage of fluid through the partition, a piston-chamber and piston, said regulating-valve having a valve-stem provided with ports respectively in communication with the inlet and piston-chamber and a fluid-passage connecting the ports, a valve controlling the passage of high-pressure fluid through the passage in the valve-stem, and pressure-adjusting mechanism carried on the valve-stem, substantially as set forth.

2. In a pressure-regulator, a casing having a high-pressure inlet and a low-pressure outlet, an apertured partition separating the inlet and outlet, a valve regulating the passage of fluid through the partition, a piston-chamber and piston, said regulating-valve having a valve-stem provided with ports respectively in communication with the inlet and piston-chamber and a fluid-passage connecting the ports, a valve controlling the passage of high-pressure fluid through the passage in the valve-stem, said controlling-valve having its valve-stem located in the passage in the regulating-valve stem, and pressure-adjusting mechanism carried on the regulating-valve stem comprising a spring and a diaphragm, said diaphragm arranged to bear against the controlling-valve stem, substantially as set forth.

3. In a pressure-regulator, a casing having a high-pressure inlet and a low-pressure outlet, a valve regulating the passage of fluid from the high-pressure side to the low-pressure side of the casing, a piston-chamber and piston, said regulating-valve having a valve-stem provided with ports in communication with the inlet and piston-chambers and having a fluid-passage connecting said ports, a valve controlling the passage of fluid from the inlet to the piston-chamber, a pressure-adjusting mechanism carried on the valve-stem of the regulating-valve comprising a fluid-chamber, said fluid-chamber in communication with the low-pressure side of the casing, substantially as set forth.

4. In a pressure-regulator, a casing having a high-pressure inlet and a low-pressure outlet, a valve for regulating the passage of fluid from the high-pressure side to the low-pressure side of the casing, a piston-chamber and piston on one side of the regulating-valve and a dash-pot on the opposite side, means for permitting the passage of high-pressure fluid from the inlet to the piston-chamber, a pressure-adjusting means carried on the stem of the regulating-valve comprising a fluid-chamber in communication with the low-pressure side of the casing, and a valve for controlling the passage of high-pressure fluid from the inlet to the piston-chamber, substantially as set forth.

5. In a pressure-regulator, a casing having a high-pressure inlet and a low-pressure outlet, a valve having a stem extending through the casing, a pressure-adjusting mechanism carried on the valve-stem, said valve regulating the passage of fluid from the high-pressure side to the low-pressure side of the casing, a piston-chamber and piston on one side of the regulating-valve and a dash-pot on its opposite side, a spring in the dash-pot, means for permitting the passage of high-pressure fluid from the inlet to the piston-chamber for the purpose of moving the regulating-valve from its seat, a valve for controlling the passage of the high-pressure fluid from the inlet to the piston-chamber, said pressure-adjusting mechanism comprising a fluid-chamber in communication with the low-pressure outlet, and a spring for returning the controlling-valve to its seat, substantially as set forth.

6. In a pressure-regulator, the combination, with a casing having a high-pressure inlet and a low-pressure outlet, of a valve for regulating the passage of fluid from the inlet to the outlet having its stem extending through the casing, a pressure-adjusting mechanism mounted on the stem and provided with means adapted to engage with means on the casing for maintaining the regulating-valve off its seat, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD V. ANDERSON.

Witnesses:

MARGARET HUGHES,
W. G. DOOLITTLE.