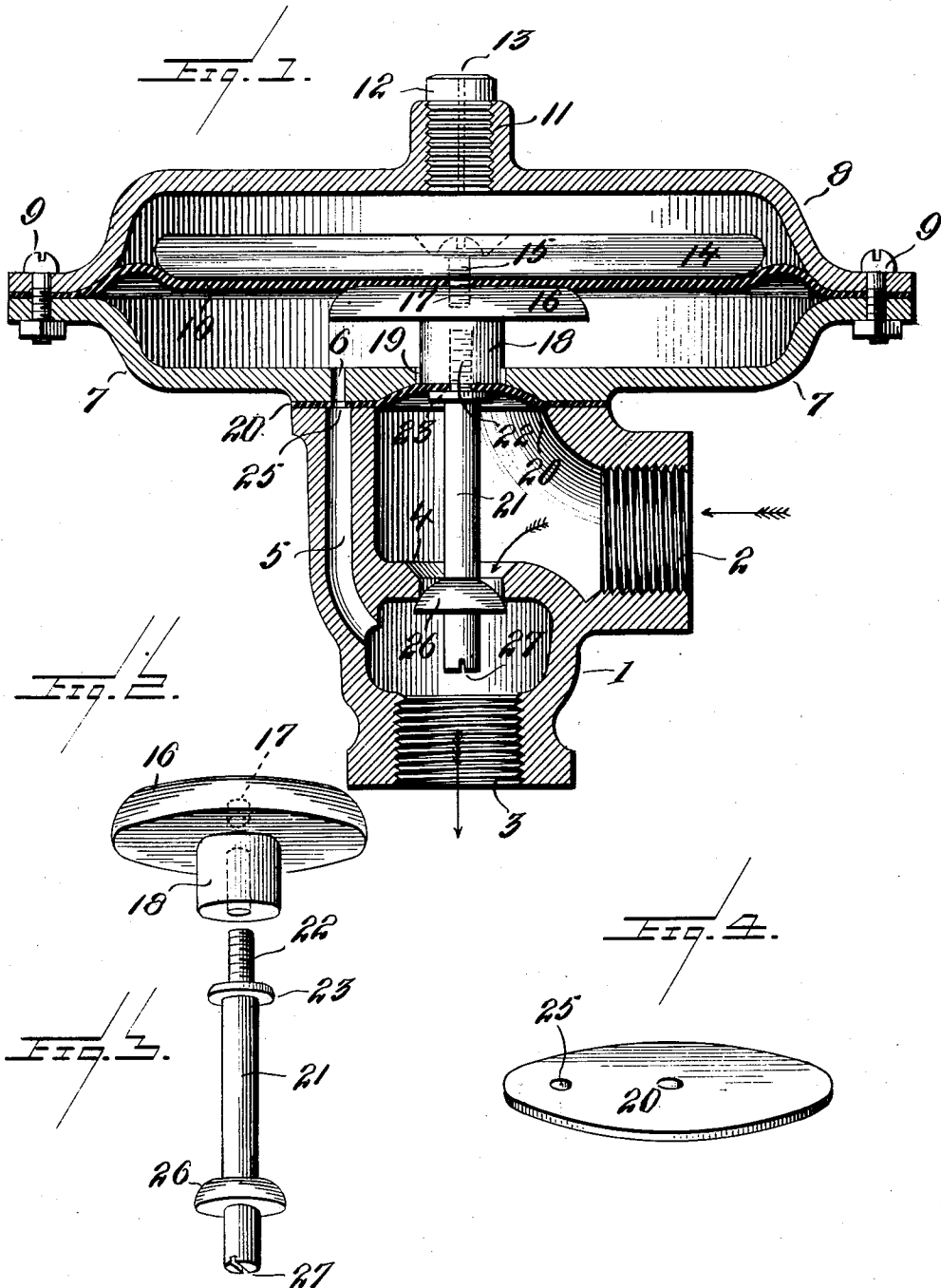


No. 880,402.

PATENTED FEB. 25, 1908.

M. G. REYNOLDS.
PRESSURE REGULATOR.
APPLICATION FILED SEPT. 23, 1907.



WITNESSES:

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MIRON G. REYNOLDS, OF ANDERSON, INDIANA.

PRESSURE-REGULATOR.

No. 880,402.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed September 23, 1907. Serial No. 394,151.

To all whom it may concern:

Be it known that I, MIRON G. REYNOLDS, citizen of the United States, residing at Anderson, county of Madison, and State of Indiana, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to a pressure regulator, and particularly to a construction adapted to maintain a uniform pressure in the service pipes independent of the fluctuation of the pressure in the main.

15 The invention has for an object to provide a construction of regulator embodying a controlling diaphragm in connection with a balancing diaphragm carried by a valved piston extending from the controlling diaphragm to an intake valve from the main to the service pipes.

20 Other and further objects and advantages of the invention will be hereinafter fully set forth and the novel features thereof defined 25 by the appended claims.

In the drawing:—Figure 1 is a vertical section through the regulator; Fig. 2 is a detail perspective of the lower diaphragm plate; Fig. 3 is a similar view of the valve stem and valve; Fig. 4 is a perspective of the lower diaphragm.

Like numerals refer to like parts in the several figures of the drawing.

35 Referring to the drawing, the numeral 1 designates the body of the valve casing which is provided with an inlet connection 2 and an outlet connection 3, these being in communication with each other through the port 4 having a valve seat therein. This 40 body is also provided with a passage 5 extending upward from the outlet port 3 and communicating with the opening or passage 6 through the bottom of the diaphragm case 7. This case is provided with a top plate 8 45 secured thereto by bolts or other similar fastenings 9, and between the top and bottom plates of this case the upper diaphragm 10 is secured in position. The top plate of the case is provided with the apertured collar 50 11 in which a threaded vent plug 12 is secured and has an aperture 13 extending therethrough. Above the diaphragm 10 is a pressure plate 14 secured thereto by means of the screw 15 extending through the 55 plate 14 into the lower diaphragm plate, 16

ture 17 to receive said screw and is disposed beneath the diaphragm 10. The lower diaphragm plate 16 is provided with a depending extension 18 which is slidingly 60 mounted in the aperture 19 through the bottom 7 of the diaphragm casing and is connected with the balancing diaphragm 20 by means of the valve stem 21. This stem is provided at its upper end with the 65 threaded portion 22 and a collar 23, said collar being adapted to clamp the balancing diaphragm in contact with the extension 18. This diaphragm is also provided with the aperture 25 in alinement with the pressure 70 passage 5 extending through the valve case to the diaphragm. The lower end of the valve stem 21 is provided with a valve 26 of any desired construction, preferably of convex conformation, to engage the edge 75 of the seat in the casing and provided at its extended end with a slot 27 by which it may be conveniently screwed into its connection with the lower diaphragm plate.

In the operation of the invention, when a 80 large volume of fluid is passing through the valve the flow or passage to the regulating diaphragm passes at an angle to the lower end of this passage producing a suction which reduces the pressure in the regulating 85 diaphragm chamber and effects a higher pressure at the outlet of the regulator. This increase in pressure when a large volume is being used overcomes the friction in any connected meter to the house piping thus giving 90 a more uniform pressure at all times to the burner. In order to prevent an increase of the inlet pressure from pushing the valve open and affecting the low pressure in the service pipe the valve is balanced by the 95 diaphragm connected to the stem thereof which is of the same area as the gas orifice so that the inlet pressure thereon will exert the same pressure that is exerted upon the valve to open it thus effecting an equalization of the 100 pressure through the regulating diaphragm. In order to prevent fluid from passing upward around the valve stem and into the upper diaphragm chamber the balancing diaphragm is used and the shouldered valve 105 stem provides means for effectually connecting this diaphragm with the regulating diaphragm. The upper and lower diaphragms are therefore connected together and with the valve, while the upper diaphragm is in 110 communication with the low pressure side of the valve so that an excess of pressure upon

this side can force upward the regulating diaphragm and close the valve, while under other conditions the valve is regulated automatically in its movement so as to produce a uniform pressure in the house service pipe and reduce it from the fluctuations of the street main connection therewith.

Having described my invention and set forth its merits, what I claim and desire to secure by Letters Patent is:—

1. A pressure regulator comprising a valve casing, a regulating diaphragm and casing communicating with the outlet of the valve casing, a valve within the valve casing connected to the regulating diaphragm, and a balancing diaphragm connected to the stem of said valve and to its casing to be exposed to the inlet pressure thereof.

2. In a pressure regulator, the combination with a diaphragm and its casing, of a valve connected to said diaphragm, and a valve casing having a seat for said valve and provided with a passage extended from the delivery side of said seat to said diaphragm casing.

3. In a pressure regulator, the combination with a diaphragm and its casing, of a valve connected with said diaphragm and having a spherical contact face, and a valve casing having a seat disposed above said face to contact therewith and provided with a passage extending from the delivery side of said seat to said diaphragm casing.

4. In a pressure regulator, a valve casing, an abutting diaphragm casing communicat-

ing with the outlet side thereof, a plate disposed upon the under face of the diaphragm, a valve having its stem connected to said plate, and a balancing diaphragm secured between the abutting faces of the valve and regulator casings and connected to said stem.

5. In a pressure regulator, a casing provided with a diaphragm therein, a valve casing connected to said regulator casing, a plate beneath said diaphragm and secured thereto, a guiding extension from said plate having a threaded aperture, a valve communicating with a port in the valve casing and provided with a shouldered stem having a threaded end, and a balancing diaphragm clamped to said valve stem between said extension and shoulder thereon.

6. In a pressure regulator, a valve casing provided with a seat, a downwardly opening valve in said casing and provided with a stem, a regulator diaphragm connected with said stem for actuating the same, a communicating passage from the outlet of said valve casing to the diaphragm chamber, and a balancing diaphragm extended across the top of the valve casing and secured to said stem and between the valve casing and casing of the regulator diaphragm to be exposed to the inlet pressure.

In testimony whereof I affix my signature in presence of two witnesses.

MIRON G. REYNOLDS.

Witnesses:

THOS. BAGOT,
CHAS. K. BAGOT.