

A. G. BECKMAN.
 FLUID PRESSURE REGULATOR.
 APPLICATION FILED MAY 17, 1909.

954,072.

Patented Apr. 5, 1910.

Fig 1

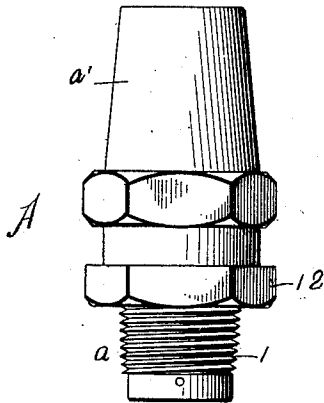


Fig 2

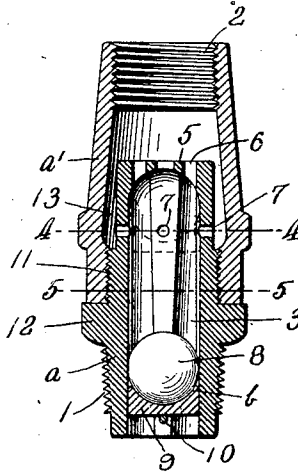


Fig 3

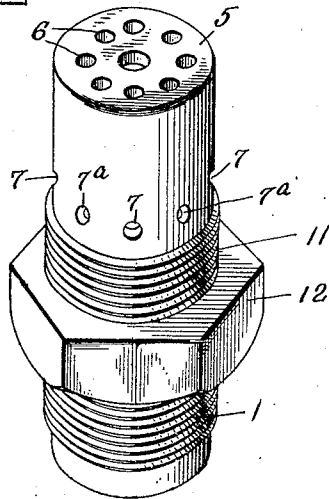


Fig 4

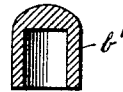
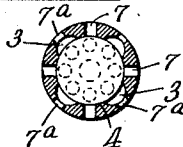


Fig 6

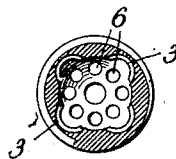


Fig 8

Witnesses
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UNITED STATES PATENT OFFICE.

ADOLPH G. BECKMAN, OF BALTIMORE, MARYLAND, ASSIGNOR TO ECONOMY GAS REGULATOR COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF DELAWARE.

FLUID-PRESSURE REGULATOR.

954,072.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed May 17, 1909. Serial No. 496,345.

To all whom it may concern:

Be it known that I, ADOLPH G. BECKMAN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Fluid-Pressure Regulators, of which the following is a specification.

My invention relates to fluid pressure regulators particularly adapted for regulating the pressure in dwellings and other buildings.

In the accompanying drawing which illustrates my invention, Figure 1 is a side elevation of the regulator; Fig. 2 is a central vertical section through the same; Fig. 3 is a perspective view of the inner member of the regulator; Fig. 4 is a section through said member, on the line 4-4 of Fig. 3, the valve being shown against its seat; Fig. 5 is a section through the inner member on the line 5-5 of Fig. 2; and, Fig. 6 is a modified form of valve.

Referring to the drawing A indicates the regulator, as a whole, which comprises the tapering members *a* and *a'* and the valve *b*. The regulator is adapted to stand vertically, as shown, and to be connected in the piping between the meter and the main supply pipes. For this purpose the member *a*, which forms the valve casing, has an exterior pipe-thread 1 and the part *a'* is provided with an interior pipe-thread 2 for connection with the supply pipe and the pipe leading to the meter, respectively. The valve casing or member *a* has a series of internal longitudinal flutes or grooves 3, with intervening ridges 4, these grooves tapering from the lower to the upper end of the casing. The upper end of the casing *a* has a head 5 provided with vents 6 of sufficient size to permit the gas to flow freely through to the meter when the pressure is normal and the valve *b* is in its lower position. As shown in the drawing the head 5 is provided with a central vent and a series of surrounding vents, and this is the preferred arrangement. The underside of the head 5 is suitably formed to serve as a valve seat, 5^a, for the valve *b*, which, in its upper position, closes the vents 6 and prevents the gas from flowing through said vents. At a suitable distance below the head 5 the member *a* has a circular series of vents or perforations, 7, 7^a, extending through its wall, the vents 7^a meeting the longitudinal flutes

or grooves 3 and the vents 7 extending through the ridges 4.

The ridges 4 form guides for the valve. This valve may be a simple cylindrical valve *b'* (Fig. 6) with its upper end suitably formed to fit against the valve seat 5^a, but preferably the valve, as shown in Fig. 2, comprises a ball or sphere 8 and a follower 9 arranged beneath the ball. This follower as shown, is hollowed out on its upper side to receive the ball and its lower side is flat. A pin 10 extending across the member 2 normally supports the valve. When the pressure exceeds a certain amount the ball and follower are lifted to the dotted position shown in Fig. 2, the ball closing the vents 6 and the cylindrical follower 9, which fits against the ribs or ridges 4 closes the openings 7. The flow of gas through the regulator is thus cut off at all points except through the vents 7^a which are connected with the flutes or grooves 3. When the pressure drops to about the normal, the valve also drops back on to the pin 10 and thus leaves all of the vents open. As the grooves 3 taper toward their upper ends, it will be seen that when the valve is in its upper position, there is less room for the passage of gas past the valve than when the latter is in its lower position and that in the upper position of the valve the flow of gas is restricted by reason of this tapering arrangement of the grooves.

The two tubular members *a* and *a'*, of the regulator, are connected by a threaded joint 11 and the lower end of the member *a'* fits, gas tight, against the upper face of a nut 12 integral with the lower member. Above the joint 11 the member *a'* is conical in shape and is separated from the upper perforated portion of the member *a* thus providing an annular space or chamber 13 between said members which is narrower or more restricted at the top of the member *a'* than at the openings 7, 7^a. When the valve is against its seat, the gas flowing through the openings 7^a will be baffled somewhat by the surrounding wall of the member *a'*, in the space or chamber 13, and in passing upward out of said chamber the gas is further restricted in flowing out between the upper end of the member *a* and the converging wall of the member *a'*.

While the valve is in its lower position the gas, at normal pressure, will flow freely up

past the valve and mainly through the vents 6, but when the valve is in its upper position, it will be seen, from the foregoing, that all of the vents except the vents 7^a will be closed and that the flow of gas through these openings will be restricted and baffled in such a way as to reduce the pressure, but the flow of gas will never be entirely cut off.

What I claim is:—

1. In a fluid pressure regulator, a tubular member, constituting a valve-casing, having at one end one or more vents and a valve seat, and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through its wall, and a valve adapted to fit against said valve seat and also to close some, but not all, of said lateral vent openings.

2. In a fluid pressure regulator, a tubular member, constituting a valve casing, having at one end one or more ports or vents and a valve seat and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through said ribs and grooves, and a valve adapted to fit against said valve seat and to close certain of the lateral vents.

3. In a fluid pressure regulator, a tubular member, constituting a valve casing, having at one end one or more ports or vents and a valve seat and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through said ribs and grooves, and a valve adapted to fit against said valve seat and close the end port and the lateral vents extending through the ribs.

4. In a fluid pressure regulator, a tubular member, constituting a valve casing, having at one end one or more ports or vents and a valve seat and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through its wall and a valve adapted to fit against said valve seat, and a second tubular

member secured to said casing below said lateral vent openings, and having a wall separated from the perforated portion of the casing and converging toward the upper end of the latter.

5. In a fluid pressure regulator, a tubular member, constituting a valve casing, having at one end one or more ports or vents and a valve seat and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through said ribs and grooves, and a valve adapted to fit against said valve seat and close the end port and the lateral vents extending through the ribs, and a second tubular member secured to said casing below said lateral vent openings, and having a wall separated from the perforated portion of the casing and converging toward the upper end of the latter.

6. In a fluid pressure regulator, a tubular casing having at one end one or more ports or vents and a valve seat, and having internal longitudinal ribs with intervening grooves and a series of lateral vent openings extending through said ribs and grooves, and a valve in said casing comprising a ball adapted to fit against said seat and a cylindrical follower adapted to close the vent openings in said ridges.

7. In a fluid pressure regulator, a tubular member, constituting a valve casing, having near one end a series of lateral vent openings extending through its wall, a valve within said casing, and a second tubular member secured to said casing, below said lateral vent openings, and having a wall separated from the perforated portion of the casing and converging toward the upper end of the latter.

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

ADOLPH G. BECKMAN.

Witnesses:

EDW. J. STORCK,

C. ROLLINS ROGERS.