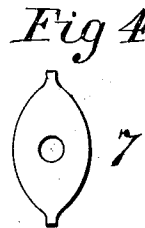
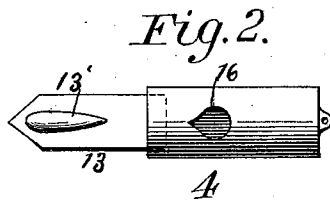
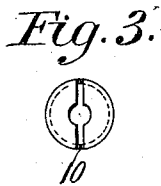
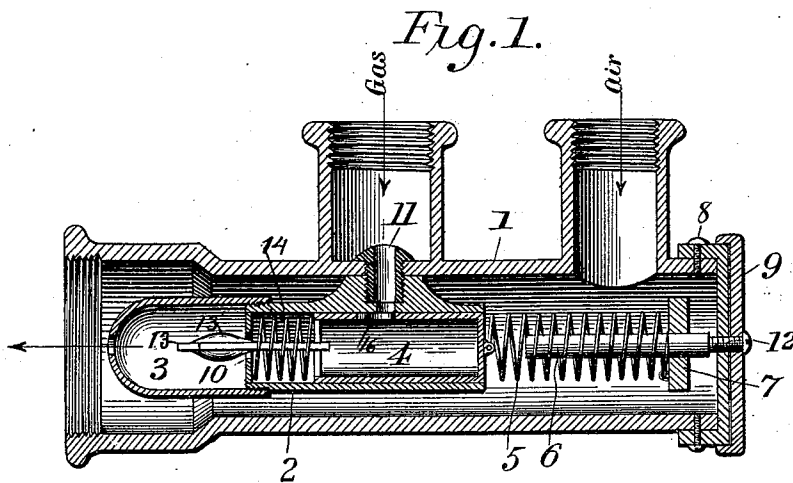


(No Model.)

T. C. McGRATH.
PRESSURE REGULATOR.

No. 545,714.

Patented Sept. 3, 1895.



Witnesses
J. W. O'Day
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UNITED STATES PATENT OFFICE.

THOMAS C. McGRATH, OF BOLIVAR, NEW YORK.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 545,714, dated September 3, 1895.

Application filed June 19, 1895. Serial No. 553,373. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. McGRATH, of Bolivar, in the county of Allegany and State of New York, have invented a new and Improved Pressure-Regulator, of which the following is a specification.

My invention is an improvement in the class of automatic gas-pressure regulators in which the flow of gas is controlled by a slidable spring-pressed hollow valve or cylinder having one or more lateral openings that serve as gas-passages. This valve slides and thus changes its position according to the gas-pressure, which results in governing the latter automatically.

My invention is embodied in the construction and combination of parts hereinafter described and shown in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of my regulator. Fig. 2 is a plan view of the slidable cylindrical valve and a guide and valve attachment thereof. Fig. 3 is an end view of such valve. Fig. 4 is a detail view hereinafter referred to.

The tubular body 1 of the regulator is screw-threaded interiorly at its open end to adapt it for attachment to a gas-pipe (not shown) and closed at the other end by a cap 8, having a backing 9. The said body 1 has two parallel lateral tubular offsets, which are also threaded interiorly at their outer ends and serve for admission of gas and air, respectively. Within such body 1 are arranged the devices constituting the gas-pressure regulator proper. These consist chiefly of a fixed hollow cylinder 2 and a slidable hollow valve 4, having a guide and valve attachment composed of parts 13 and 13'. The fixed cylinder 2 is supported in the center of the body 1 in line with its axis by means of a hollow screw 11. This cylinder 2 has at one end a transverse slot 10, Fig. 3, which is circularly enlarged at the middle of its length. A perforated conical cap 3 is screwed on such slotted end. The other end of the cylinder is open. The valve 4 slides easily in such fixed cylinder 2, and its guide and valve attachment consists of a flat bar 13, that projects from its open end, and is provided with lateral enlargements 13' on its opposite side. This bar 13 and its side enlargements 13' fit some-

what loosely in the slot 10 in the end of the fixed cylinder 2 and assist in regulating the flow of gas, as hereinafter more fully described, as well as prevent the valve 4 from rotating. A spiral spring 14 is interposed between the ends of the cylinder 2 and valve 4. The cylinder 2 has a lateral opening that coincides with the passage through the screw 11, and the slidable valve 4 has a pear-shaped lateral opening 16, that also registers with said opening in the cylinder. A spiral spring 5 and a screw 6 for regulating its tension are arranged in rear of the slidable valve 4, the spring 5 being attached to the latter and encircling the enlarged portion of the screw, while its outer end abuts an oval nut or disk 7, Figs. 1 and 4, that is mounted on the screw. The threaded portion 12 of the latter works in the double cap 8 9 of the regular body 1. It will be seen that by rotating the screw 6 the spring 5 will be compressed or allowed to expand more or less, thus regulating its tension and correspondingly altering its power of resistance to the backward thrust of the slidable valve 4. It will be further seen that the forward thrust of the valve 4 is resisted by the spring 14, before referred to.

The operation of my invention is as follows: The gas flows constantly through the hollow screw 11 into valve 4, and thence through the open end of the same and through the slot 10 in the fixed cylinder 2, escaping finally from the cap 3 into the gas conduit or pipe. The tension of the springs is so regulated that at normal gas-pressure the valve 4 is held in the position shown, in which the larger diameter of its lateral opening coincides with the lateral passage in the fixed cylinder 2. It will be seen, therefore, that if the gas-pressure rises above the normal, back pressure on the closed end of valve 4 will cause the latter to move a corresponding distance to the right, and that this will result in bringing the reduced or narrower portion of the pear-shaped opening 16 into coincidence with the passage in cylinder 2, and the gas-passage being thus contracted it is obvious the flow of gas will be hindered. It will be further seen that since the attachment moves with the valve 4 the shifting of the latter draws the tapered enlargements 13' into the circular portion of the slot 10 in cylinder 2, and thus closes the slot

more or less. The slot 10 being smaller than the opening in the adjacent end of valve 4, there is always a slight back pressure of gas on the latter, and when the enlargements 13' are drawn into the slot this pressure is necessarily increased. Thus the attachment is not only of material assistance in regulating the flow and pressure of gas in the conductor with which the body 1 may be connected, but it prevents rotation of the valve 4, so that its lateral opening is kept always in coincidence with the lateral gas-passage of cylinder 2. This latter function makes it a guide for the valve 4.

As indicated in the drawings, atmospheric air may be admitted to mingle with and dilute the gas, if desired, but my invention does not pertain to any improvement in respect to this feature.

It may be stated that the regulator is shown in Fig. 1 as inverted, since in use the tubular gas and air inlets are normally on the lower side of the tubular body 1.

What I claim is—

1. In a gas-pressure regulator, the combination, with a hollow guide, having a gas inlet and an end slot constituting a gas exit, of a hollow, spring-pressed valve adapted to slide in said guide, and an attachment of the valve which works in the gas exit and opens or closes it as the gas pressure varies, substantially as shown and described.

2. In a gas pressure regulator, the combination, with the tubular body, 1, of the internal gas regulator proper, composed of the fixed guide cylinder, having a lateral gas inlet and end gas exit, a hollow valve adapted to slide in such cylinder, and having a lateral and end gas inlet and exit, an attachment of the valve that works in the gas exit of the cylinder, springs arranged at the ends of the valve, and means for regulating the tension of one of them, as shown and described.

THOMAS C. McGRATH.

Witnesses:

C. M. WILLIAMS,
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