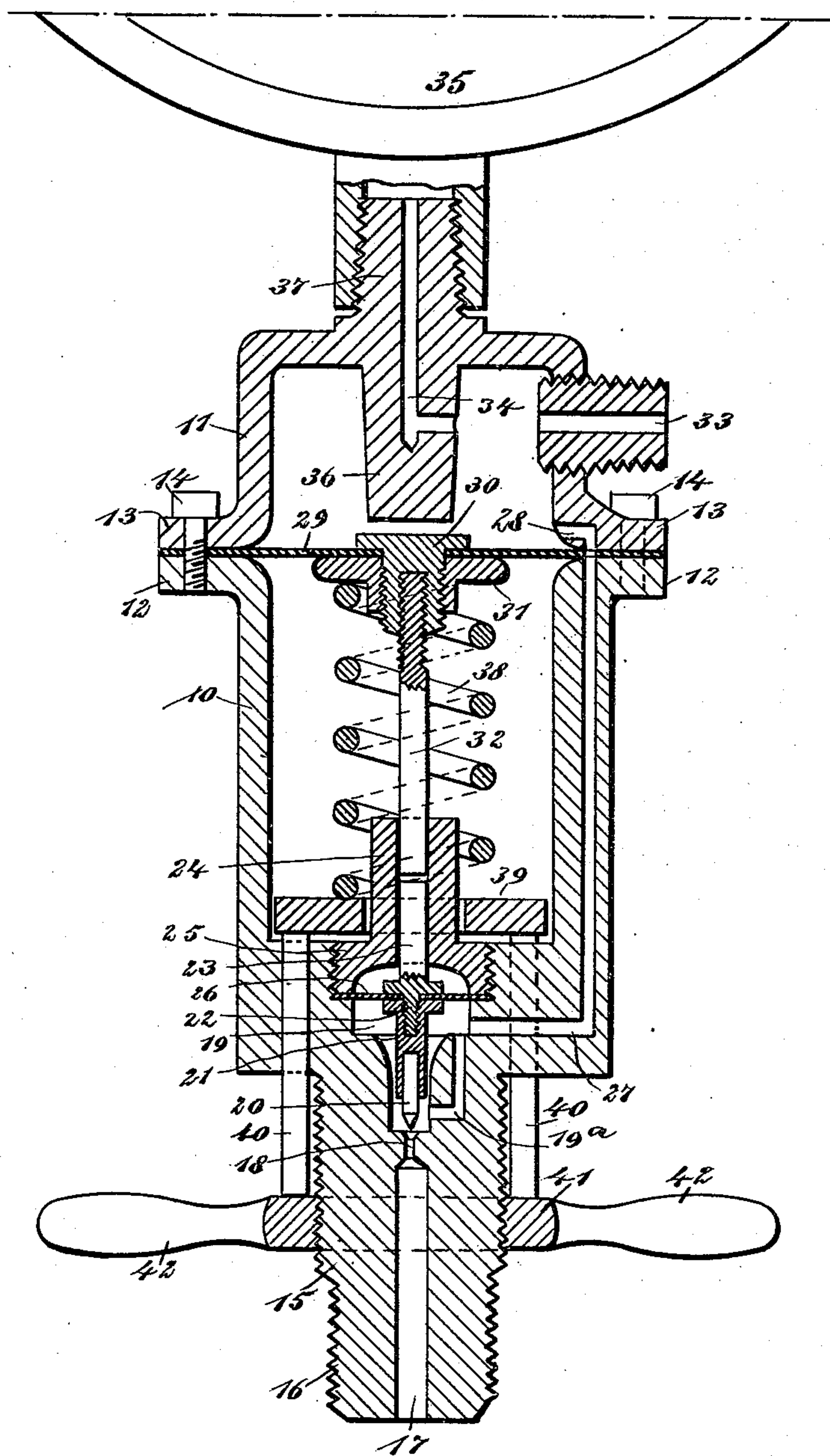


(No Model.)

A. HEITHECKER.
PRESSURE REGULATING VALVE.

No. 475,217.

Patented May 17, 1892.



WITNESSES:

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AUGUST HEITHECKER, OF LONG ISLAND CITY, NEW YORK.

PRESSURE-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 475,217, dated May 17, 1892.

Application filed February 8, 1892. Serial No. 420,749. (No model.)

To all whom it may concern:

Be it known that I, AUGUST HEITHECKER, of Astoria, (Long Island City,) Queens county, and State of New York, have invented a new and Improved Pressure-Regulating Valve, of which the following is a full, clear, and exact description.

My invention relates to improvements in pressure-regulating valves, such as are adapted to be connected with a high-pressure gas-main and cause the gas to flow therefrom at a reduced and uniform pressure; and the object of my invention is to produce a cheap and extremely simple valve of this character which may be nicely and positively adjusted, so that the gas will flow through it at the exact pressure desired.

A further object of my invention is to construct the valve so that it will not easily clog up and get out of repair.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a longitudinal section of the entire valve.

The valve-casing is made up of two parts, the lower part 10 being adapted to contain the regulating-spring and the upper part 11 to serve as a gas reservoir or chamber, and the parts have flanges 12 and 13, adapted to be united by screws 14, and to hold a diaphragm between them, as hereinafter described. The valve-casing has at its lower end a stem 15, which is exteriorly screw-threaded to receive an adjusting-nut and which is reduced at its lower end, as shown at 16, to enable it to be conveniently coupled to a gas-pipe. Extending through the stem 15 is a central longitudinal bore 17, which is reduced at its upper end, as shown at 18, and this reduced portion has a funnel-shaped seat at the top and opens into a gas-chamber 19. A conoidal valve 20, which is preferably of hard rubber, is adapted to seat itself in the reduced portion 18 of the stem-bore, and this valve is held in a socket formed in the lower end of a rod 21, which rod connects by means of a screw-coupling 22 with the rod 23, which is held to

slide loosely in the bore of the wrench-head 24, formed upon the plug 25, which plug is adapted to screw into the lower inner portion of the valve-casing and to close the chamber 19. A flexible diaphragm 26 extends across the chamber 19 and is held between the plug 25 and the casing, the inner portion of the diaphragm being secured to the rod 21 23 and held in the coupling 22. This diaphragm prevents any escape of gas above the plug and also permits the necessary movement of the rod 21 23 and the valve 20. The gas which enters through the bore 17 passes upward through the lower portion of the chamber 19 to the upper end thereof, and as the lower portion of the chamber is reduced a branch bore 19^a is arranged to extend from the lower portion of the chamber to the upper part, so that the gas may flow freely upward. From the chamber 19 the gas passes out through a bore 27, which extends upward through the wall of the valve-casing and enters the upper portion of the casing, as shown at 28, the inlet to the upper part of the casing being above the flexible diaphragm 29, which extends transversely across the casing and is held between the flanges 12 and 13. The diaphragm is secured centrally to a collared plug 30, the collar of which rests upon the upper side of the diaphragm, and a flanged nut 31 is screwed to the lower portion of the plug so as to clamp the diaphragm firmly between the plug and nut. A rod 32 is screwed into the lower end of the plug 30, and extends downward into the head 24 of the plug 25, so as to nearly touch the upper end of the rod 23. It will thus be seen that the diaphragm 29 may move slightly without affecting the diaphragm 26, and the latter may move slightly without affecting the diaphragm 29; but any violent movement of the diaphragm 29 will cause the rod 32 to strike upon the rod 23 and force the latter downward, thus closing the valve 20 upon its seat in the reduced bore 18, and shutting off the inlet to the valve.

The valve has an outlet 33 from the upper portion 11 of the casing, and it has also a vent 34, leading upward through the case top and into a common form of gage 35, which is screwed to the valve top so as to indicate the pressure. The vent 34 leads through a lug

36 on the interior of the casing, and through a stem 37 on the top of the casing, the lug 36 extending downward from the casing top in the path of the plug 30, so as to limit the upward movement of the plug and of the diaphragm 29, and the stem 32 being screw-threaded exteriorly so that the gage 35 may be easily coupled to it.

In the lower portion 10 of the valve-casing is a spiral spring 38, which is coiled around the rod 32, the upper end of the spring abutting with the flange of the nut 31, and the lower end of the spring resting upon the collar 39, which has adjusting-arms 40 extending downward through the case bottom, and abutting with the nut 41, which is held to turn on the threaded stem 15 of the valve, and is provided with handles 42 to enable it to be easily turned.

The valve is applied to a gas-pipe in the usual way, by screwing the reduced end 16 of the stem 15 into the pipe, and the operation of the valve is as follows: The gas enters through the bore 17, and passes upward through the reduced bore 18, the upward pressure acting on the valve 20 and diaphragm 26, so as to hold the valve in an elevated position and permit the gas to pass up through the bore 27 and enter the gas-chamber in the upper end of the valve-casing. As the gas enters the chamber in the upper portion 11 of the valve-casing it will exert a downward pressure on the diaphragm 29, but the diaphragm will not affect the lower valve until the pressure is greater than the resistance of the spring 38, and when the pressure overbalances the resistance of the spring the diaphragm 29 will be depressed sufficiently to push the rod 32 upon the rod 23, thus forcing downward the valve 20 and closing the inlet. The valve will only be shut off temporarily, however, as the escape of gas will soon equalize the pressure, and the resistance of the spring will raise the diaphragm so as to permit the gas to flow freely into and through the valve.

It will be readily seen from the above description that the pressure of gas in the valve will correspond to the resistance of the spring 38, and by adjusting the collar 39 by means of the nut 41 the resistance of the spring may be either increased or diminished, and consequently the valve may be adjusted so as to exactly regulate the gas-pressure.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A pressure-regulating valve comprising a valve-casing having an inlet at the bottom and an outlet at the top, a flexible diaphragm extending horizontally across the casing, a chamber 19, produced in the lower portion of

the casing and connected with the inlet, a bore leading from the chamber and entering the casing above its diaphragm, a lower diaphragm extending across the chamber 19, a valve carried by the lower diaphragm and adapted to close the inlet, the valve having a downwardly-extending stem, a depending rod secured to the upper diaphragm and adapted to contact with the valve-stem, and an adjustable spring held to press upward upon the upper diaphragm, substantially as described.

2. The combination, with the valve-casing having a threaded stem at its lower end and the equalizing-diaphragm 29, extending across the casing, of a collar 39, held in the lower portion of the casing and provided with depending arms to project through the bottom of the casing, a nut screwed to the stem and adapted to contact with the arms, and a spring held between the collar 39 and the diaphragm, substantially as described.

3. The combination of the valve-casing, the flexible diaphragm 29, extending across the casing, the chamber 19, produced in the lower portion of the casing, an inlet leading to the chamber; a bore leading from the chamber to a point above the diaphragm 29, a plug adapted to close the top of the chamber 19 and having a hollow wrench-head thereon, the lower diaphragm extending across the chamber 19, the valve secured to the lower diaphragm and adapted to close the inlet, the valve having a stem extending into the bore of the plug-head, and a rod secured to the under side of the upper diaphragm and extending into the bore of the plug-head, substantially as described.

4. A pressure-regulating valve comprising a two-part casing having a flexible diaphragm 29, extending across it, and having an outlet above the diaphragm, a threaded stem on the lower portion of the casing, a chamber 19, produced in the lower part of the casing, an inlet-bore entering the chamber 19, a bore leading from the chamber 19 to the part of the casing above the diaphragm 29, a hollow plug screwed into the upper portion of the chamber 19, a diaphragm 26, extending across the chamber 19 above its outlet, a valve secured to the diaphragm 26 and adapted to close the inlet-bore, a stem secured to the diaphragm 26 and extending into the hollow plug, a rod secured to the diaphragm 29 and extending downward into the hollow plug, a longitudinally-adjustable collar arranged in the lower end of the casing, and a spiral spring held between the collar and the diaphragm 29, substantially as described.

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Witnesses:

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