(No Model.)

C. L. ROWLAND.

GAS PRESSURE REGULATOR.

No. 384,284. Patented June 12, 1888.

Fig: 1.

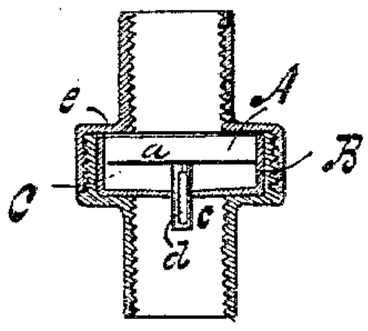


Fig: 2.

Fig: 5.

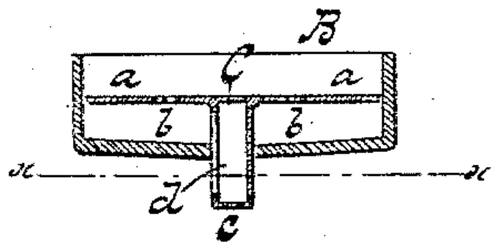


Fig: 3.

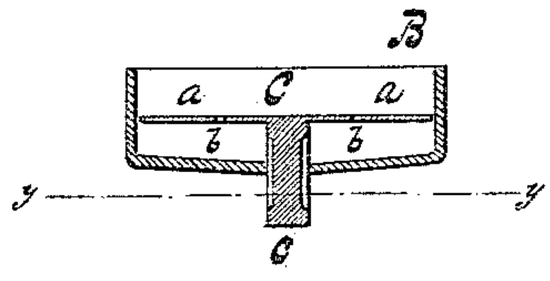
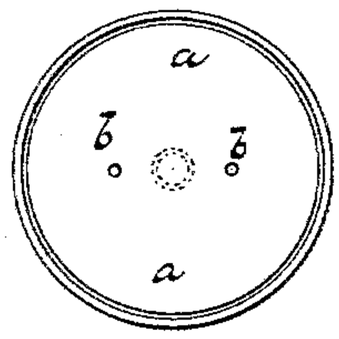


Fig: 6.



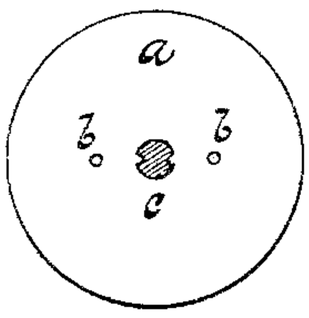
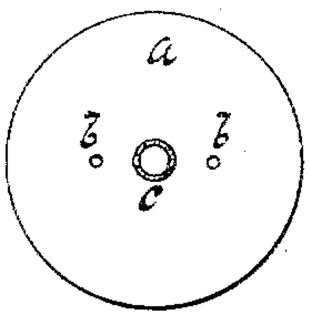


Fig: 4.



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UNITED STATES PATENT OFFICE.

CHARLES L. ROWLAND, OF BROOKLYN, NEW YORK.

GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 384,284, dated June 12, 1888.

Application filed December 7, 1887. Serial No. 257,215. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. ROWLAND, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Gas-Pressure Regulators, of which I declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part thereof.

This invention relates to improvements in devices which are employed in connection with gas pipes and burners to cause the gas to flow in a constant quantity and under a uniform pressure; and the invention consists of a gas-pressure regulating device having its various parts constructed and combined substantially in the manner herein shown, described, and claimed.

In the accompanying sheet of drawings, Figure 1 is a part-sectional view showing the device applied to a gas-pipe. Fig. 2 is a section on an enlarged scale of the device removed from the pipe. Fig. 3 is a plan view of the same. Fig. 4 is an under side view of the float, showing a cross-section of its stem in the plane *x x*, Fig. 2. Fig. 5 is a section showing a float having a corrugated instead of a slotted stem. Fig. 6 is an under side view of this float, showing a cross-section of its stem in the plane *y y*, Fig. 5.

Similar letters of reference indicate like parts in the several figures.

The chief purpose of this invention is to simplify the construction of gas regulators of the kind above mentioned, with a view to the improvement of their form and the reduction of their cost.

The device herein described may be applied with equal advantage to a pipe and to a burner. Within the pipe or burner is formed a chamber, A. A space is provided by screwing the parts together, as illustrated in Fig. 1, or in any other suitable manner, and in this space is tightly fitted a cup, B, which has a circular hole in the center of its bottom, the sides and bottom of this cup constituting, respectively, the walls and bottom of the chamber. This cup receives a float, C, the top of which consists of a thin circular plate-diaphragm, *a*, provided with small perforations *b b*, as shown in the drawings, and of a diameter slightly less than that of the cup, only space enough being left around the edge of the diaphragm to allow it to slide freely up and down within the cup, while the lower part of the float consists of a stem, *c*, which is preferably hollow and may have a slot, *d*, in its side, as shown in Figs. 1 and 2; or it may have a corrugation instead of a slot; or the stem may be solid and corrugated, as shown in Fig. 5. The stem of the float passes through the perforation in the bottom of the cup B. The length of the stem should be somewhat greater than the depth of the cup; but the slot or corrugation in the stem should be so located that when the float is in its highest position the lower end of the slot or corrugation will not extend below the bottom of the cup. The walls of the chamber A are contracted at the top of the cup, so that a stop, *e*, is formed, above which the disk of the float cannot pass.

The operation of the regulator above described is as follows: The gas flows up through the slot *d* in the stem of the float and into the cup below the disk *a*. To get above the disk, it must pass through the perforations *b b* therein and around the edge of the disk, and since the device is so constructed that the quantity of gas which can pass the disk in this way is smaller than that which can be admitted to the cup through the slot *d*, the pressure below the disk causes the float to rise, and as the float rises the portion of the slot which projects below the bottom of the cup becomes smaller, and the quantity of gas admitted to the cup is correspondingly diminished, so that the pressure on the lower side of the disk decreases. If the float is forced upward as far as possible—that is, till it meets its limit, the stop *e*—no passage whatever will be left into the cup from below, and the only pressure then exerted on the float from that direction will be that of the gas confined in the cup beneath the disk and the gas below the cup on the small area of the bottom of the stem, and even this will diminish as the gas in the cup passes upward through and around the disk. The float therefore falls by gravity when the pressure on it from below is sufficiently reduced, and more gas is then admitted through the slot, when the operation continues, as described. The disk *a* vibrates constantly in the chamber,

and the stem of the float, in connection with the perforated bottom of the chamber, forms a guide to keep the float in a proper position.

Since the float is extremely sensitive to the action of the gas, the instant the pressure on the under side of the diaphragm overbalances the float it ascends and the pressure against the diaphragm immediately diminishes, and the instant the weight of the float overbalances the pressure the float falls, when the pressure at once increases, so that while the pressure against the diaphragm may fluctuate, it is practically constant with respect to the openings *b b* and the space around the edge of the diaphragm, and, inasmuch as these passages are always of the same size and the pressure effective to force the gas through them is without variation, the flow of gas above the float is steady, and in a stated time a certain quantity of gas passes the float. In other words, the regulator is volumetric as well as pressure-regulating. Accordingly, by making the float of a particular weight and the passage-ways for the gas each of a particular size, a regulator may be constructed to deliver a stated quantity of gas per hour.

This device also works satisfactorily when it is inverted.

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

In a gas pressure regulator, the combination of a chamber, A, having a centrally-perforated bottom, and a float, C, consisting of a diaphragm, *a*, fitting closely in said chamber, and a stem, *c*, said stem being recessed longitudinally along its side and fitting closely in the perforation in the bottom of the chamber, substantially as and for the purpose described.

CHAS. L. ROWLAND.

In presence of—
D. A. CARPENTER,
GEO. M. FIELD.