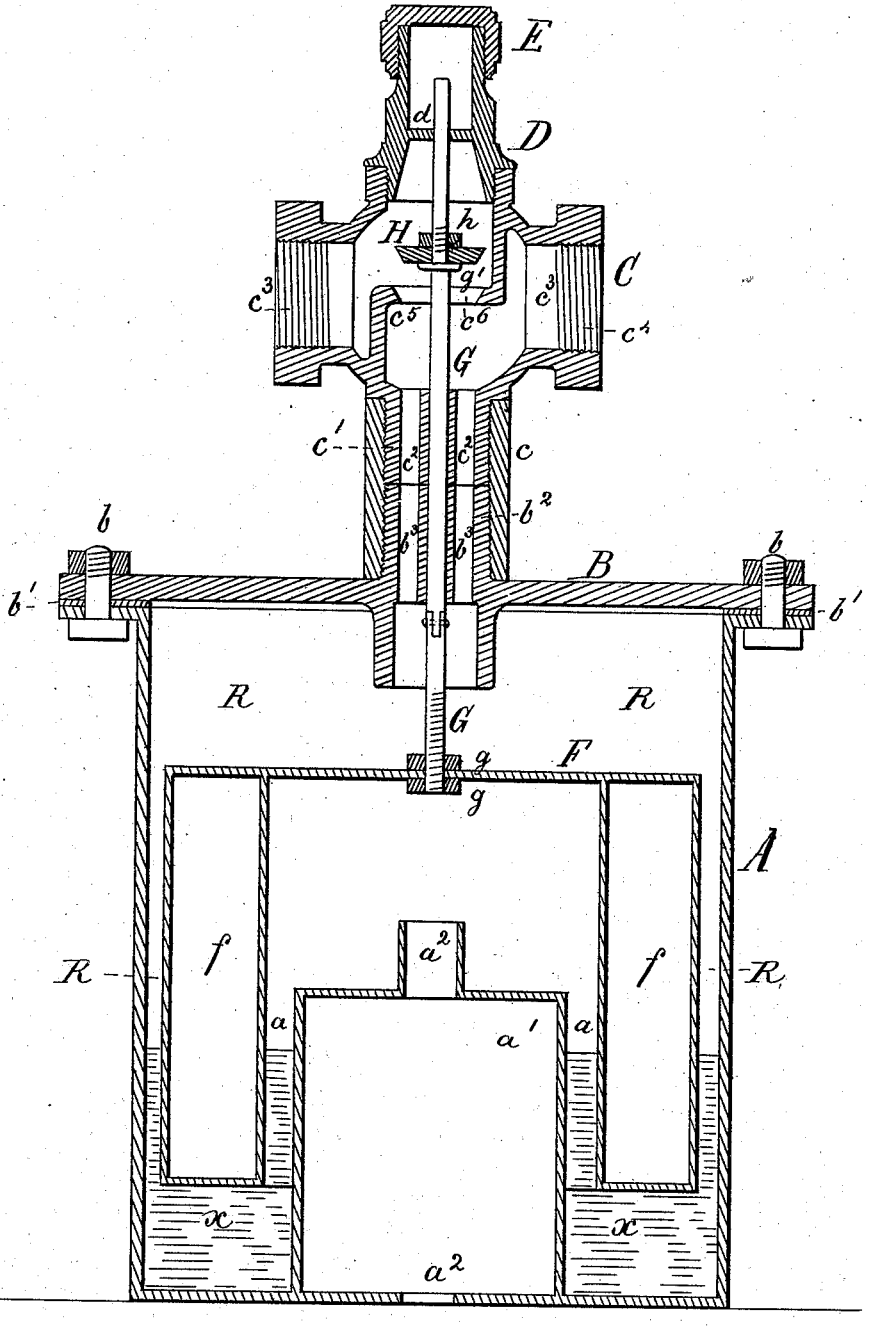
A. C. BLOUNT.
Gas-Regulator.

No. 211,216. Patented Jan. 7, 1879.



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IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **211,216**, dated January 7, 1879; application filed September 27, 1878.

To all whom it may concern:

Be it known that I, ALEXANDER C. BLOUNT, of Pensacola, in the county of Escambia and State of Florida, have invented a new and useful Improvement in Gas-Regulators, which improvement is fully described in the following specification and annexed drawing, wherein one of my improved gas-regulators is shown in vertical central section.

The object of my invention is, first, to provide a gas-regulator which is not subject to the objections urged against the use of flexible diaphragms for acting upon the valve which admits the gas from the meter to the gas-burners, which objections are uncertainty of operation and liability to be destroyed in a short time by the chemical action of the gas upon it; second, to make that description of regulator which employs a float, buoyed up by a heavy fluid, such as glycerine, capable of being attached to the gas-pipe in the house without the use of bends and elbows, and when thus attached its float shall be a considerable way out of the direct course in which the gas flows from the meter to the burners, and the float-chamber still be in communication with the said pipe by means of the valve-chamber and nearly central and long passages which form extensions of the valve-chamber, and lead down into the float-chamber of the regulator, so as to conduct the gas immediately upon the central portion of the top of the float instead of transversely across or over the same, and thus insure a straight movement of the float up and down, instead of causing a tipping irregular motion of the same; third, to provide means in the description of gas-regulator hereinafter described whereby the stem of the valve is centrally guided above and below its seat without interfering with the introduction of the gas upon the central portion of the top of the float from a valve-chamber which is on top of and outside the float-chamber and whereby the valve may be adjusted or operated by hand without removing any part except a screw-cap, or may be withdrawn by simply removing a screw-extension with the cap on it, and whereby, further, the float-chamber and float, if desired, can be removed without disconnecting the valve-chamber, and when such chamber is disconnected an automatic cut-off of the gas from the meter to the burners and the passages leading down into the float-chamber is instantly effected, and thus escape of gas into the building through said passages completely prevented; fourth, to provide such a gas-regulator as hereinafter described with means which will keep the valve always open when a given flow and pressure of gas is maintained in the pipe between the meter and the burners, and will gradually close the valve as soon as the pressure increases in said pipe, as will be the case when a portion of the burners are shut off, or when the pressure between the valve and the meter is greater than that at which the meter is set to supply when all the burners are in use, said means being such as will be hereinafter described.

In the accompanying drawings, A represents the float-chamber, C the valve-chamber, and F the float, of the gas-regulator.

The chamber A is provided with a hollow cylinder, a^1, of smaller diameter and less height than itself. This cylinder rises centrally from the bottom of the chamber A a suitable distance, as shown, and in its top an air-vent, a^2, corresponding to a vent, a^2, in the bottom of the chamber A, is provided. The external pressure of the air against the under side of the float is thus secured, and the weight of the float partially counterbalanced thereby. The float itself is in form of an inverted cylinder, open at its bottom and closed at its top. The vertical portion of the float is formed with a chamber, *f*, in order that lightness may be secured, and a sufficient superficial area presented at its lower end to the buoying-fluid, which is placed in the lower part of chamber A, as at *x*, to enable such fluid, together with the atmospheric pressure against the under side of its top, to buoy it up to the extent desired. The air-passages a^2 a^2 admit of the escape of the air from below the float when the float descends, and of the entrance of the same when the float ascends, and thus a free and perfect action is insured. The float is of less diameter than the interior of chamber A, and of less height than the same, and its internal diameter is greater than that of the cylinder a^1 of the chamber A, in order that it may fit loosely around said cylinder, as indicated at *a*.

When the float is in its adjusted operating position its lower end is immersed in the fluid *x* to a considerable extent, and the descent of gas or air below its immersed end is prevented by the fluid, which is either glycerine, mercury, or other proper fluid which is gas and air sealing in its nature.

The top or cap B of the vessel or chamber A is made separate from the chamber, and after being perfectly packed, as at b^1, is bolted to the flanged rim of the cylinder or chamber A by bolts *b*, on the ends of which are nuts, as shown. The center of this top or cap is perforated, and around the perforation an inner and outer long collar, b^2, is formed, and in the outer collar a central guide-passage for a valve-stem, G, to fit in, and side passages, b^3 b^3, for the gas to flow down through, are provided, as shown.

The valve-chamber C is constructed with an extension, c^1, having through it passages c^2 c^2 for the gas, and a central passage for the valve-stem to pass through.

The passages just mentioned correspond with those of the collar b^2, and are always in line with the same. A screw-coupling, *c*, unites the valve-chamber to the float-chamber, as shown. At right angles to the passages c^2 b^3 the valve-chamber is provided with a screw-threaded inlet, c^3, for gas, and a similar outlet for the same. Into one of these collars the pipe between the meter and the valve-chamber is screwed or fastened, and into the other the end of the pipe between the gas-burners and the valve-chamber is fastened. About midway of the valve-chamber a horizontal valve-seat, c^5, is provided, as shown, and above the valve-chamber a screw-collar is formed, and into this collar an extension, D, open at both ends, is screwed, as represented. This extension forms a continuation of the bore of the valve-chamber for a certain distance, and then is divided into two compartments by a diaphragm, *d*, which serves as an upper guide for the valve-stem G, as shown. A screw-cap, E, closes the end of the extension.

The extension with the screw-cap on it is for the purpose of allowing access to the valve, and, together with the screw-cap, can be removed; or the screw-cap separate from the extension can be removed when it is desired to get at the valve-stem.

The valve-stem is screwed into the float F and fastened by nuts *g g*, and above the valve-seat c^5 it is provided with a shoulder, *g'*, and between this shoulder and the nut *h* a tapering valve, H, corresponding to the valve-seat, is secured, as shown.

In order to get the valve-stem, with its valve in position on it, down through the passages which guide it when in operation, the extension D must be removed and the stem inserted through the collar at the top of the valve-chamber, and then the float fastened to its lower end, and the extension D again replaced, so that the upper end of the valve-stem passes through the guiding-diaphragm *d*.

To inspect the float, it is only necessary to unscrew the cap B from the chamber A and take away the chamber, and as soon as the chamber is removed the valve H will descend by its own gravity and that of the rod G and float F, and thus completely shut off the gas from the meter to the gas-burners, and thereby prevent the escape of gas into the building through the passages c^2 b^3 during the inspection of the regulator from a point below the cap B.

To adjust the valve in the event of any imperfect movement or action of the same, the cap E can be removed, and access to the valve-stem secured thereby; and to inspect the valve and its seat, the extension D can be unscrewed and access to the valve-chamber C obtained without disturbing the connections at the points c^3 c^4 between the gas-pipe and the valve-chamber.

It is essential with my gas-regulator that the valve shall form with its seat a "ground joint," inasmuch as the gas is to be effectually cut off by the valve when inspections from below the cap B are to be made.

The operation is as follows: The valve being adjusted for supplying gas to a given number of burners, and held open to that extent by the action of the agents employed below the float F in the chamber A, the gas flows through the open valve-passage c^6 of the seat c^5 to the burners, and at the same time descends into the gas-space R of the chamber A through the small and nearly central passages c^2 b^3. The pressure of the gas has now become equal throughout the apparatus, and that portion which flowed into the vessel or chamber A in its descent acted, first, in a direct line upon the central part of the top of the float, and tended to keep the float in a perfectly true position, instead of causing it to tilt or tip, as would have been the case had the gas been introduced at one side of the chamber A, and then traversed the top of the float horizontally.

In the continued use of the regulator, if the burners consume the gas as fast as the valve admits it, there will be but little, if any, change in the position of the movable parts of the regulator; but if the consumption of the gas is decreased by shutting off a portion of the burners, or turning the burner-cocks so as to lessen the flame, a back-pressure of the gas will take place, and the float F will be caused to descend and pull down the valve H to a suitable extent, and thereby decrease the size of the admission-passage c^5 for the gas from the meter in accordance with the amount of gas consumed; and when any additional number of burners are lighted the pressure on the top of the float will be decreased and the valve will reopen more or less, so as to supply the exact amount of gas consumed by the burners.

What I claim as my invention is—

1. The combination of the vessel A, provided with the cap B, having a collar or ex-

tension, b^2, in which passages b^3 are formed, air-chamber a^1, provided with air-vents a^2, float F, valve-rod G, valve H, and valve-chamber C, with an extension, c^1, passages c^2, a single seat, c^5 c^6, and inlet and outlets c^3 and c^4, in line with one another and at right angles to the passages c^2 b^3, substantially as and for the purpose described.

2. The combination of the cap E, extension D, valve-chamber C, valve-rod G, valve H, float F, and vessel A, whereby the valve, with float attached to its rod, can be operated through its rod by removal of the cap E, and can be inspected by removal of extension D, with cap E in position on it, substantially as described.

3. The valve-chamber provided with the opening in its top, screw-collars at c^3 c^4, and the extension c^1, with a central guide-passage and gas-passages c^2 through it, in combination with the extension D, provided with a guide and a screw-cap, E, and with the collar b^2 of the cap B, said collar having a guiding-passage and gas-passages b^3 through it, all substantially as and for the purpose described.

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In presence of—
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