(No Model.)

J. M. PALMER.

AUTOMATIC GAS REGULATOR.

No. 344,131. Patented June 22, 1886.

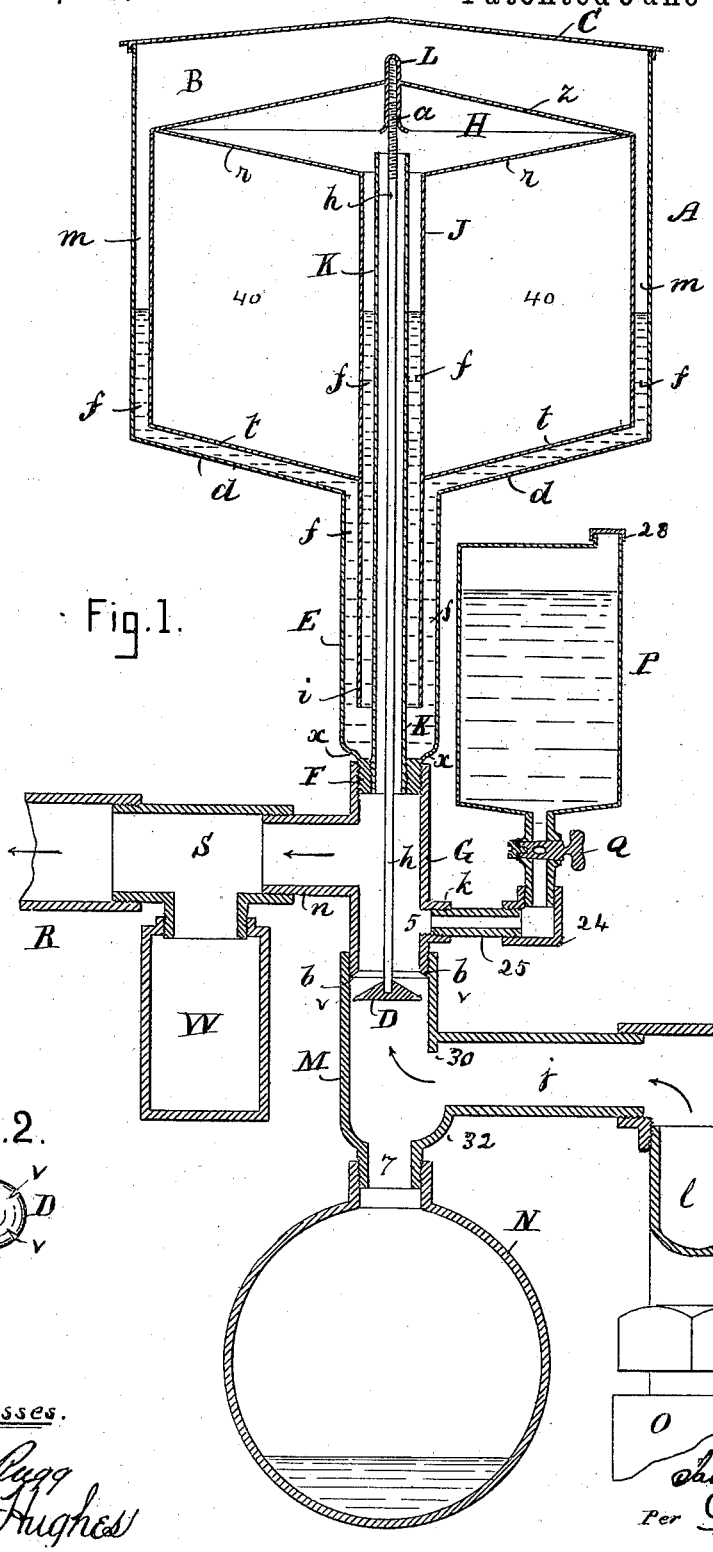

Fig. 1.

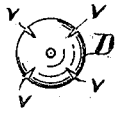

Fig. 2.

Witnesses.

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JAMES M. PALMER, OF BOSTON, MASSACHUSETTS.

AUTOMATIC GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 344,131, dated June 22, 1886.

Application filed September 10, 1885. Renewed May 3, 1886. Serial No. 201,028. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. PALMER, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Automatic Gas-Regulators, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of my improved regulator, and Fig. 2 a plan view of the valve detached.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of automatic gas-regulators which are provided with floats and valves; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the body, and B the float. The body, which is hollow and preferably composed of sheet metal, is round in horizontal section, but may be square, hexagonal, or of any other suitable form. It is provided with a cover, C, which is not fitted air-tight, and its bottom *d* is downwardly-inclined from the periphery to the center; but the bottom may be arranged horizontally, or at any other suitable angle to the sides, if desired. A centrally-arranged tube, E, projects from the bottom *d*, its upper end opening into the body A, and its lower end being bent inwardly, as shown at *x*, and secured to a bushing, F, which is screwed into the upper end of a pipe, G. The tube E may, however, be connected directly with the pipe G, if preferred, or otherwise suitably supported and the bent portion *x* omitted.

The body of the float B is preferably composed of sheet metal, and is so constructed as to conform approximately in its shape with the shape of the body A, in which it is disposed, but is of course less in size, a space, *m*, being left between the walls of the float and the walls of the body A, for the reception of glycerine *f*, or any other suitable liquid.

The bottom *t* of the float is downwardly inclined from its periphery to its center, its top *r* being correspondingly inclined, or arranged in parallelism therewith; but the top and bottom may be arranged horizontally, or at any other suitable angle to the bottom. The float is also provided with an auxiliary top, *z*, which is preferably conical in form, or inclined upwardly from its periphery to its center, the auxiliary top being connected by an air-tight joint to the walls of the float to form the gas-chamber H.

Disposed at the center of the float there is a vertically-arranged tube, J, connected by air-tight joints with the top *r* and bottom *t*. This tube is open at both ends, its upper end being flush with the top *r*, and its lower end elongated or extended below the bottom *t* into the tube E, as shown at *i*. A tube, K, is arranged vertically within the tube J, its lower end being screwed into the bushing F and opening into the pipe G, and its upper end extending above the top *r* of the float B and opening into the chamber H. A conical valve, D, provided with a valve stem or rod, *h*, is fitted to a valve-seat, *b*, formed at the lower end of the pipe G, the stem extending upwardly through the tube K, and being screwed into an inverted thimble, L, arranged vertically at the center of the auxiliary top, *z*, of the float B, said thimble being connected by an air-tight joint to said top and provided with a flaring mouth, *a*, to enable the stem to be readily inserted therein. A pipe, M, is screwed onto the lower end of the pipe G, and attached to the lower end of the pipe M there is a tank or receiver, N. This tank may, however, be formed integral with the pipe M, if desired, and provided with a suitable opening, and plug or cap for closing said opening, thereby enabling its contents to be drawn off. The pipe M is provided with an induction or branch pipe, *j*, which is connected with the gas-meter O by the pipe *l*, coupling 22, and union-coupling 23. The pipe G is provided with an induction or branch

pipe, *k*, and eduction or branch pipe *n*. A tank or reservoir, P, for containing naphtha, alcohol, benzine, or some other solvent of coal-tar, and provided with a capped filling-tube, 28, and stop-cock Q, is connected with the pipe *k* by means of the coupling 24 and small pipe 25. The stop-cock may, however, be placed in the pipe 25, if preferred, or located in any suitable position between the tank and pipe G. A main eduction-pipe, R, is connected to the pipe *n* by a T-coupling, S, and attached to said last-named coupling there is a receiver or drip-cup, W, for catching the coal-tar which forms in the pipe R and its connected pipes, and preventing it from entering the pipe G.

In regulators of this character as heretofore constructed much difficulty has been experienced on account of the valves becoming clogged with coal-tar, and thereby prevented from working properly. The valves have also been made and arranged in such a manner as to close tightly, and thus shut off the entire supply of gas from the burners whenever a sudden increase occurs in the pressure.

The method of constructing and arranging the floats in some regulators of this class is also objectionable, the pressure of the gas being depended upon to raise the floats and close the valves, and hence they are less sensitive than they should be to attain the best results.

My invention is designed to obviate these and other objections; and to that end I make use, first, of means for introducing a solvent for the coal-tar directly to the valve and valve-seat without shutting off the gas, detaching the regulator from the meter or taking it apart; secondly, I provide the valve with a groove or grooves, *v*, so that when it is closed sufficient gas will pass it to prevent the lights from being entirely extinguished; and, thirdly, I provide the float with a closed air-chamber, 40, and an open gas-chamber, H, the air-chamber being of such size as to support or balance the float and its appendages, thereby rendering it very sensitive, or easily affected by the pressure of the gas.

In the use of my improvement the body A is first partially filled with glycerine *f*, the glycerine filling the tube E and rising around the tube K within the tube J, as shown, a sufficient quantity of glycerine being employed to prevent the bottom *t* of the float from coming into contact with the bottom *d* of the body when the gas is not turned on. The float is then raised by the thimble L until the valve D is wedged into its seat to prevent it from turning, and the thimble and float turned to the right or left, as the case may be, to screw the valve-stem into or unscrew it from the thimble, and thereby adjust the valve. When the valve is properly adjusted, the tank P is filled with alcohol, or the solvent of coal-tar to be used, and the gas turned on through the meter O. As the gas passes through the regulator it will enter the chamber H and act upon the float B in such a manner as to close or open the valve D, in accordance with the pressure of the gas, and thereby equalize or regulate the supply furnished to the burners in a manner which will be readily understood without a more explicit description. In case the pressure is so great as to close the valve entirely, a sufficient quantity of gas will pass through the grooves *v* to prevent the burners from being fully extinguished until the valve can be lowered or adjusted to afford an additional supply. If the valve D becomes clogged or coated with coal-tar to such an extent as to work imperfectly, the stop-cock of the tank P is opened, and a small quantity of the solvent contained in said tank permitted to flow into the regulator through the opening 5, where it will be discharged onto the valve and its seat, and rapidly cleanse them by dissolving the tar, the solvent and dissolved tar passing the valve and falling into the receiver N, from which it may be readily removed whenever desired by taking off the receiver.

In order to prevent the solvent from getting into the meter after it passes the valve, I provide the pipe M with a guard or downwardly-projecting flange, 30, and enlarge said pipe at 32, as shown in Fig. 1, so that when the solvent passes down the pipe M over the guard it will fall onto or be caught by the enlarged portion 32 of the pipe and directed into the receiver N.

The object of extending the tube K above the top *r* of the float is to prevent the glycerine from entering said tube, should it overflow or accidentally find its way into the gas-chamber H; and the object of inclining the top *r*, as shown, is to enable the glycerine to be poured from said chamber readily. It will be obvious, however, that in case the glycerine should enter said tube it will pass through the valve and be caught in the receiver N.

The pipes M G form a case for the valve D; but they may be made integral, if desired, or constructed in any other suitable manner to perform the same functions. It is, however, preferable to make them as shown, for convenience in inserting the valve and taking the regulator apart, and also for connecting it with the meter and main eduction-pipe.

I do not confine myself to using the tank or reservoir P or pipe 25, as the solvent may be poured through the opening 5 in the pipe G by means of a can or other suitable means, said opening being plugged or otherwise properly closed after the solvent has been introduced. When the tank P and pipe 25 are dispensed with, the pipe *k* may be used for passing the solvent into the regulator through the opening 5, and a cap, plug, or stop-cock employed to close said pipe. I however deem it preferable to employ the tank, as the valve may then be cleansed without shutting off the gas at the meter. Neither do I confine myself to the use of the receiver N, as the solvent may be allowed to pass out of the regulator through the opening 7 in the pipe M, said opening being plugged or properly closed after the valve is cleansed; nor to

providing the float with an air-chamber; nor to the use of the receiver W; nor to making the valve with the groove *v;* nor to extending the tube K above the top *r*, although I deem each of these features of importance.

Having thus explained my invention, what I claim is—

1. In a gas-regulator of the character described, and having an induction-pipe, an eduction-pipe, a suitable valve-case, and a valve-seat, the combination of the following instrumentalities, to wit: a body, a float, and a valve connected with said float and adapted to be operated by the pressure of the gas to regulate or equalize the supply of gas to the burners, said regulator being provided with an opening for the introduction of alcohol, naphtha, or other solvent of coal-tar to cleanse the valve, and with a stop-cock or means for closing said opening, substantially as described.

2. A gas-regulator of the character described, having an induction and eduction pipe, a valve-case, a valve-seat, a body, a float, a valve connected with said float and adapted to be operated automatically by the pressure of the gas, an opening or pipe for the introduction of a solvent of coal-tar to the valve, and a stop-cock or means for closing said opening or pipe, in combination with a tank or reservoir for containing alcohol, naphtha, or other solvent of coal-tar, and with a pipe for conducting the solvent from said tank into the regulator, substantially as set forth.

3. In a gas-regulator of the character described, the tank P and stop-cock Q, in combination with the pipe G, valve D, and a pipe connecting said tank with the pipe G, substantially as described.

4. A gas-regulator having a valve adapted to be operated automatically by the pressure of the gas, and provided with means, as shown, for introducing a solvent for coal-tar into the valve-case to cleanse the valve, substantially as described.

5. In a gas-regulator of the character described, the thimble L, in combination with the float B, stem *h*, and valve D, substantially as described.

6. In a gas-regulator of the character described, the body A, provided with the cover C and tube E, and the valve D, provided with the stem *h*, in combination with the pipe G, provided with the tube K, and float B, provided with the tube J, an air-chamber, a gas-chamber, and the thimble L, or means for adjusting said valve, substantially as set forth.

7. In a gas-regulator of the character described, the receiver N, for receiving the dissolved gas-tar, in combination with the valve D, and a pipe for conducting the gas from the meter to said valve, said regulator being provided with an opening for introducing a solvent for gas-tar to said valve, and means for closing said opening, substantially as described.

8. In a gas-regulator of the character described, the pipe G, provided with the pipe *n* and opening 5, in combination with the valve D and pipe M, provided with the opening 7, and pipe *j*, substantially as set forth.

9. The improved gas-regulator herein described, the same consisting of the pipes G M, tank P, pipe 25, stop-cock Q, valve D, stem *h*, body A, float B, tubes K E, and receiver N, constructed, combined, and arranged to operate substantially as described.

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Witnesses:
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