(No Model.)

N. SLEEMAN.

GAS REGULATOR.

No. 335,156. Patented Feb. 2, 1886.

Fig 1

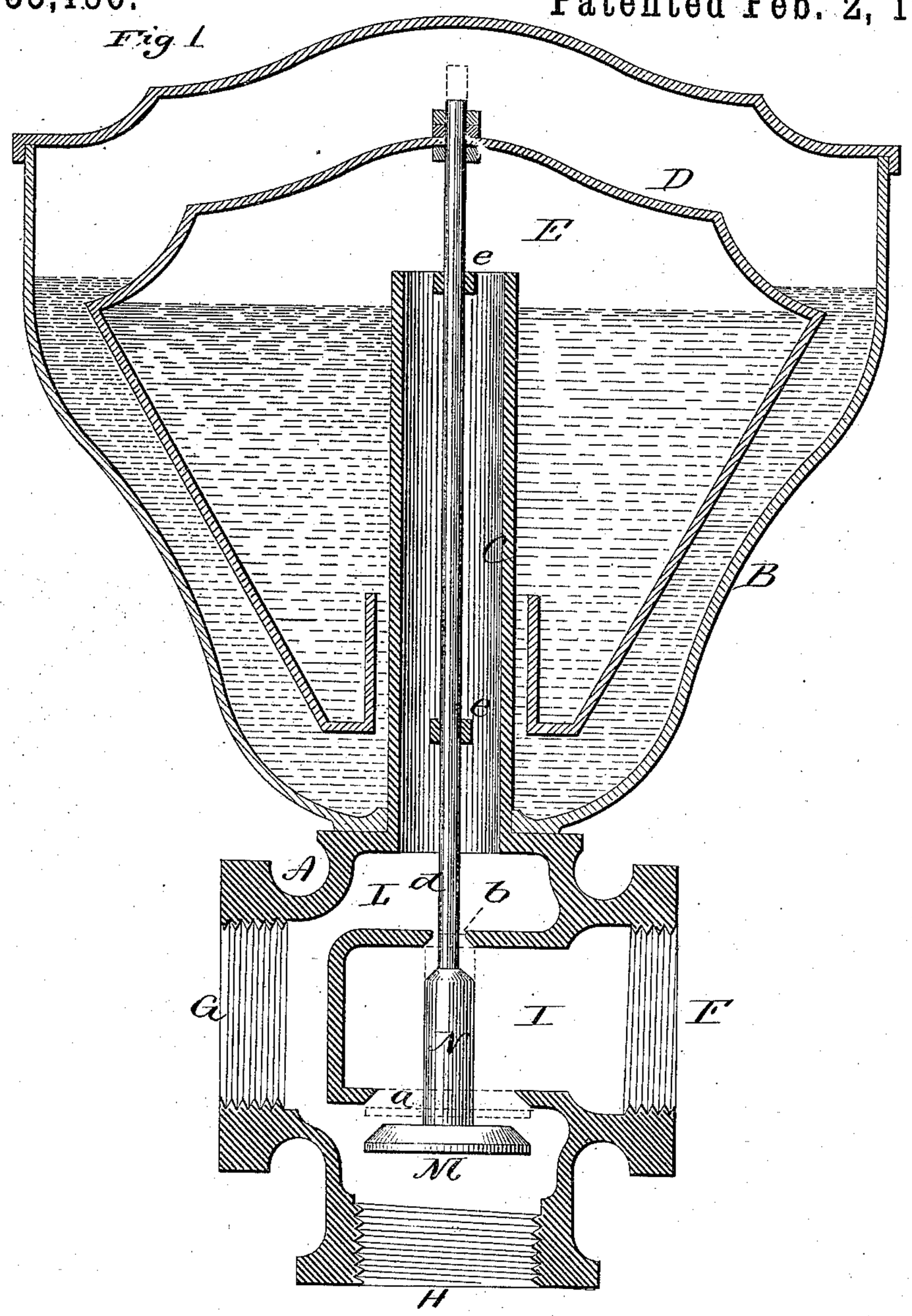
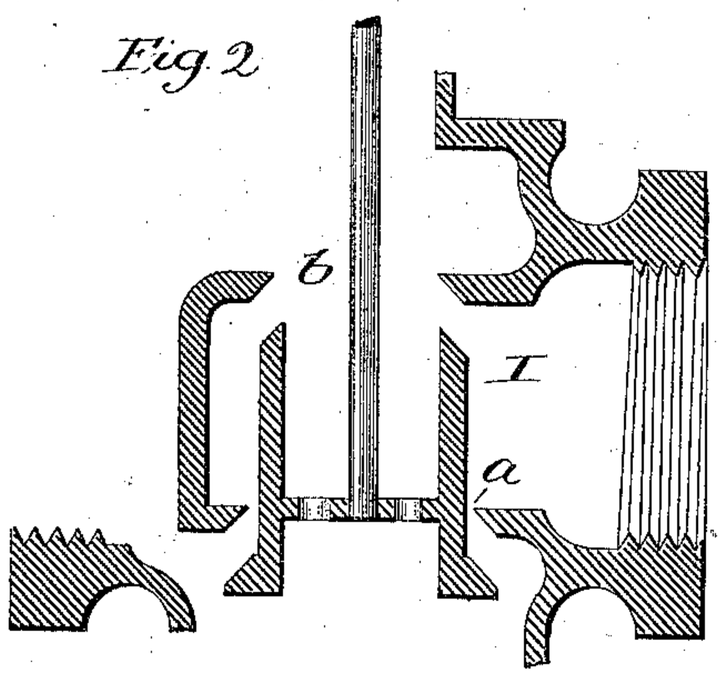


Fig 2



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NATHANIEL SLEEMAN, OF BIRMINGHAM, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SLEEMAN GAS SAVING COMPANY, OF WATERBURY, CONNECTICUT.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 335,156, dated February 2, 1886.

Application filed June 8, 1885. Serial No. 167,944. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL SLEEMAN, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new Improvement in Gas-Regulators; and I do hereby declare the following, when taken in connection with accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a vertical central section through the regulator complete, as in the working condition; Fig. 2, a modification in the construction of the valve.

This invention relates to an improvement in regulators or governors adapted to regulate the pressure of illuminating-gas, so that set at a given pressure that pressure only can be attained at the burner, irrespective of any increased pressure upon the body of the gas directly, and is an improvement upon the regulators heretofore invented by me, one of which, for illustration, was patented September 23, 1879, No. 219,990. In such inventions the regulating-valve stands above the inlet and works in a vertical guideway, the outlet or escape for the gas being above the guideway of the valve, the valve being suspended by a regulating-float, open to the influence of the flowing gas, so that as the pressure of gas increases the float rises and correspondingly contracts the passage of the gas. While the regulator thus constructed operates to great advantage in some positions, a difficulty is experienced from the fact that the drip from above the valve must run back through the valve-guideway, and this flow of the drip over the guideway is liable to clog the valve, so that it may not attain all the advantages which it otherwise would do.

The object of my present invention is to construct the valve to avoid such possible clogging; and it consists in the construction as hereinafter described, and particularly recited in the claims.

A represents the valve-casing, which is attached to or formed as a part of a float-tank, B. From the valve-chamber a tube, C, leads upward into the tank to a considerable distance, and the tank is supplied with glycerine or other suitable fluid to an elevation somewhat short of the upper end of the said tube. Within the tank and around the tube the float D is arranged, of a balloon-like character, so as to set into the glycerine to a considerable extent, but leave a clear space, E, in its upper portion, and into which space the tube C opens, and so that gas under pressure passing through the tube C into the space E will raise or lower the float accordingly. The weight of the float may be adjusted by applying a counter-balance or weights thereto, as occasion or position may require. The regulating-valve is attached to this float and so as to move with it. In the normal condition and in the lowest position of the float the valve stands wide open. This arrangement of float and tank with relation to the valve-chamber is the same as in my patent before referred to.

The valve-casing is constructed with an inlet, F, in a horizontal direction, and with an outlet, G, preferably in a horizontal position and opposite the inlet, and I also preferably construct it with a similar opening, H, below. The inlet F opens into a chamber, I, within the casing, and from the bottom of this chamber I is a large valve-opening, *a*, downward, and a smaller opening, *b*, through the top of the chamber upward, the walls of the chamber being shaped so that there is a passage, L, around the chamber above and below communicating with the outlet G. A valve, M, is provided and arranged so that it may close the opening *a*, and from the valve a stem, N, extends upward, its upper end adapted to close the opening *b* in the top of the chamber I, the stem and valve being in such relation to each other that both will come to their seat at the same time, as indicated in broken lines. From the valve-stem N a spindle, *d*, extends up through suitable guides, *e*, in the tube C, and is connected directly to the float, as shown, so that the valve is guided entirely by the spindle *d*. The opening around the valve M, when the float is down, is of very considerable extent.

In operation, suppose the gas to be received

through the inlet F, and to be discharged through the outlet G, the opening H serving only as communication with a suitable drip-receiver, and the float adjusted to give the proper pressure thereto to hold the valve in a suitable open condition for that particular pressure. Under this condition the flow of gas through the inlet F into the chamber I passes freely through the opening *a* downward and into the surrounding space, thence up through the tube C into the float, and also on through the outlet G to consumption. The passage *b* also affords exit for the gas from the chamber I. So long as the pressure of the gas is constant the valve will remain in that standard extent of opening; but should the pressure increase, then that increased pressure will be communicated to the float, causing it to rise, and in so rising to raise the valve, and correspondingly contract the passage through the valve-openings. On the contrary, should the pressure of the gas diminish the float will correspondingly fall and the valves increase the opening. Thus the supply of gas will be constant under a regulated pressure.

By the construction of the chamber I within the valve-casing, and the downward outlet therefrom, and the guide of the valve above the chamber, it follows that the drip may pass freely from the chamber I, or from whatever source it may come, without contact with the guides of the valve or possibility of clogging the same.

I have illustrated the valve M as having its stem N, or the extension therefrom, which closes the upper opening, of much less diameter than that of the valve itself; but the extension may be made nearly the diameter of the valve itself, and the upper opening, *b*, accordingly, as seen in Fig. 2, and the valve thus constructed may be opened from top to bottom, so as to form a passage downward through the valve for the free passage of gas, as indicated in Fig. 2; but in this case the valve has the same independent guide, and avoids clogging by the drip hereinbefore referred to.

While I prefer to construct the shell with the outlet H vertically below the valve, which adapts it as a second outlet-gas passage, as well as for a drip, it may be employed as the principal outlet for the gas and the outlet G omitted.

The outlet G, while preferable as a convenience in construction in a direct line and opposite the inlet-passage F, may be otherwise arranged without departing from my invention.

It will be observed that the drip, which naturally comes from the pipes in the building, will pass from the passage G down to the drip-passage H without possible contact with the valve, the space being a clear and free one and nothing movable in that passage, so that clogging by the drip is impossible.

Another advantage of my construction of the valve-casing having the opening at the bottom, and that opening larger than the diameter of the valve, as shown, is that that opening H may be closed by a plug or drip-receiver; and if at any time it is desirable to clean the valve or valve-seats, the plug may be removed, and then the valve withdrawn down through that opening without disconnecting the governor from the supply-pipe, and leave the valve seats exposed for convenient cleaning.

While I prefer to make the opening in the top of the chamber, through which the spindle extends, of larger diameter than the spindle, and construct the valve so as to be able to close that upper opening, the upper opening may be made to fit the spindle, and so that that opening will serve as a guide for the spindle, working gas-tight through that opening. I therefore do not wish to be understood as limiting my invention to the two openings, with the valve having corresponding seats.

I am aware of Patent No. 281,449, and do not wish to be understood as claiming anything shown or described in the said patent, my invention differing essentially from what is shown in that patent: first, in that the valves and valve-opening are differential; and, second, in that the valve-rod is supported in guides above the valves.

I claim—

1. In a gas-regulator, the valve-casing constructed with an internal chamber, with an inlet-opening to said internal chamber, a passage surrounding said chamber with an exit-opening therefrom, an opening from the bottom of said chamber into said surrounding space, and an opening of smaller diameter in the top of the chamber, a valve arranged through said chamber, adapted to close or open both said openings, a tank in substantial connection with said valve-casing, a tube leading from the passage surrounding the inlet-chamber into said tank, said tank provided with a suitable fluid surrounding said tube, a float in said tank and into which said tube opens, the valve connected to said float by a spindle supported in guides above the inlet-chamber, substantially as described.

2. A valve-casing constructed with an inlet, F, chamber I within the casing, into which said inlet opens, the shell constructed with a space, L, surrounding said inlet-chamber and from which the exit G opens, the said inlet and outlet openings being in a horizontal plane, a third opening, H, in a vertical plane and into the space surrounding the inlet-chamber, the bottom of the said chamber provided with a valve-opening and the top with a valve-opening of smaller diameter than that in the bottom, a tank adapted to contain a fluid, a tube leading from said surrounding chamber up into said tank and above the fluid, a float in said tank, and into which the said tube opens from the surrounding chamber, a valve supported in guides above the inlet-chamber and connected to the float, the said valve constructed with two differential surfaces corresponding to the differential openings in the bottom and top of the

inlet-chamber and arranged in line therewith, substantially as described.

3. A valve-casing constructed with an inlet, F, chamber I within the casing, into which said inlet opens, the shell constructed with a space, L, surrounding said inlet-chamber and from which the exit G opens, the said inlet and outlet openings being in a horizontal plane, a third opening, H, below the chamber in a vertical plane and into the space surrounding the inlet-chamber, the bottom of the said chamber provided with a valve-opening less in diameter than said opening H in the shell and the top with a valve-opening of smaller diameter than that in the bottom of the chamber, a tank adapted to contain fluid, a tube leading from said surrounding chamber up into said tank and above the fluid, a float in said tank and into which the said tube opens from the surrounding chamber, a valve supported in guides above the inlet-chamber and connected to the float, the said valve constructed with two differential surfaces corresponding to the differential openings in the bottom and top of the inlet-chamber, substantially as described.

4. In a gas-regulator, the valve-casing constructed with an internal chamber, with an inlet-opening to said internal chamber, a passage surrounding said chamber with an exit-opening therefrom, an opening from the bottom of said chamber into said surrounding space, a valve arranged to move toward and from said opening in the bottom of the chamber, a tank in substantial connection with said valve-casing, a tube leading from the passage surrounding the inlet-chamber into said tank, said tank provided with a suitable fluid surrounding said tube, a float in said tank and into which said tube opens, a spindle extending from said valve through the top of the inlet-chamber and connected to said float, substantially as described, and whereby the guide for the movement of said valve is made above the gas-inlet.

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