A. FULTON.

Automatic Gas-Light Extinguisher.

No. 211,983. Patented Feb. 4, 1879.

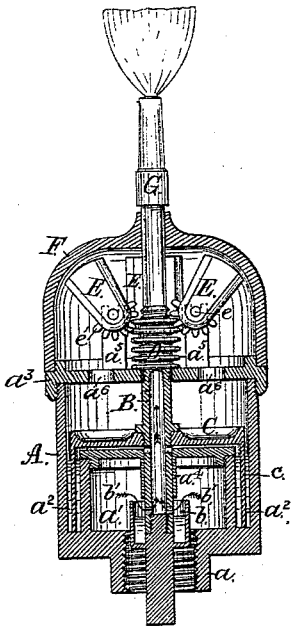

FIG. 1.

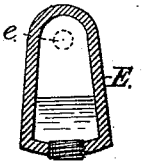

FIG. 7.

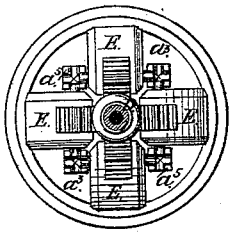

FIG. 3.

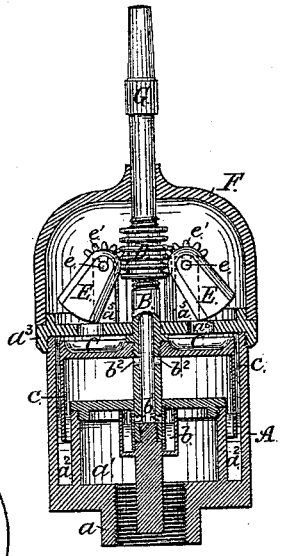

FIG. 2.

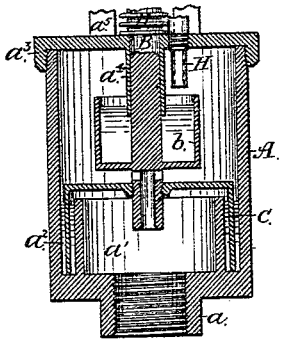

FIG. 4.

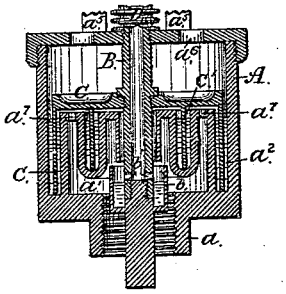

FIG. 5.

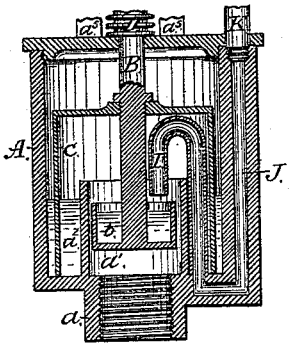

FIG. 6.

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ANDREW FULTON, OF ALBANY, NEW YORK.

IMPROVEMENT IN AUTOMATIC GAS-LIGHT EXTINGUISHERS.

Specification forming part of Letters Patent No. **211,983**, dated February 4, 1879; application filed January 2, 1879.

To all whom it may concern:

Be it known that I, ANDREW FULTON, of the city and county of Albany and State of New York, have invented certain new and useful Improvements in Automatic Extinguishers for Gas-Lights, of which the following is a full and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my device, showing the arrangement of parts during the uninterrupted flow of the gas; Fig. 2, the same with the parts in position for preventing the flow of gas; Fig. 3, a plan view of Fig. 2 with the dome removed, and Figs. 4, 5, and 6 are modifications of my invention.

My invention consists of a device for automatically extinguishing the gas-lights and stopping the flow of gas at each burner by increasing the pressure of the gas in the mains. For this purpose I place beneath each burner (attached to its supply-pipe) a chamber containing a float immersed in quicksilver or other suitable liquid, attached to a movable stem carrying a mercury-cup or other sealing device, the whole being adapted to operate by an increase of pressure beneath the float to elevate the stem to close the openings for the flow of gas, and to retain the movable stem and its attached parts to prevent them from dropping down to reopen the flow of gas.

As shown in the drawings, A is the metallic casing of the device, provided with a boss, *a*, at its bottom for attaching it in a vertical position to the gas-pipe for supplying the burner. At its lower end a chamber, a^1, is formed, so as to leave an annular space, a^2, for containing mercury. A cap-plate, a^3, screws upon the casing and forms its top. B is a movable tubular stem passing through openings in the top of the chamber a^1 and the cap-plate a^3. To the lower end of said stem is secured a metallic cup, *b*, for containing mercury, into which an annular collar, a^4, dependent from the top plate of the chamber a^1, dips when the stem is elevated, and forms a seal to prevent the flow of gas into the tubular stem B. C is a bell or float secured to the stem B, and having the lower edge of its annular flange *c* immersed in the mercury in the annular space a^2 to prevent the escape of gas at that point; D, a circular rack secured to the stem B above the cap-plate a^3; E, counter-weights, working on pivots *e* in the bearings a^5 on the top of the casing, and provided with gear-teeth e', which engage in the circular rack D. Said counter-weights should be made hollow, as shown in Fig. 7, and filled with mercury or other heavy material whose weight can shift from end to end of the counter-weight as the position of the counter-weight changes in turning on its pivotal centers. F is a dome or cap for protecting the mechanism of the device; G, a gas-burner, secured to the upper end of the tubular stem B.

The operation of my device is as follows: To light the gas the tubular stem must be depressed. In doing this the counter-weights E are elevated, and the various parts are carried into the positions shown in Fig. 1, thereby permitting the gas to flow into the tubular stem B through the induction-openings b^1, as indicated by the crooked arrows, and thence into the gas-burner G. When the device is thus opened the gas will continue to flow through it as long as the pressure of the gas in the pipes is maintained at or below the pressure to which the device is regulated. When the pressure in the pipes is increased a like increase of pressure occurs beneath the float C, whereby the float is forced upward, raising the stem B and its attached parts into the positions shown in Fig. 2. In doing this the counter-weights E are turned down, and their load runs into their outer ends, causing the weights to exert their greatest force, and maintaining the stem B in its elevated position against any accidental depression of it. When the parts are in the positions last described the cup *b* is raised, so that the mercury it contains forms, with the dependent annular collar a^4, a gas-tight seal that entirely cuts off the flow of gas to the burner G and extinguishes the light. While the gas flows through the tubular stem B it (the gas) passes through the outlet-openings b^2 and exerts its pressure beneath the float C, whose lower edge is sealed by the mercury in the annular space a^2.

When the parts are arranged in position for the flow of gas the counter-weights E are in an erect position, or nearly so, as shown

in Fig. 1. While in that position their shifting load is thrown close to their pivotal centers, thereby lessening the effect of the weights, and so nicely balancing the weights of the opposing parts that a slight increase of pressure will throw the counter-weights over.

The regulation of my device for operating at a lower pressure is effected by increasing the load in the counter weights, and for operating at an increase of pressure by placing mercury, shot, or other suitable weights on the top of the float C, which is made dishing for that purpose, and the cap a^3 is provided with openings a^6 for the introduction of such weights.

The increase of the pressure in the mains (which may be effected at the gas-works) only requires to be of a very brief duration to produce the proper effect on my device. When the pressure of the gas is again reduced to its standard, the stem and its attached parts are prevented by the resistance of the counter-weights E from dropping down to reopen the flow of gas, thereby averting all danger of any accidental escape of gas through the apparatus.

In the modification shown in Fig. 4 the cup *b* is fixed near the top of the stem B, through which the gas flows at all times into the chamber of the casing A. An independent tube, H, for receiving the burner, is fixed in the cap a^3 of the casing. The lower end of said tube projects downward into the chamber of the casing, and enters the mercury in the cup *b* when the stem is elevated by the pressure of the gas, thereby sealing the end of the tube, to prevent the flow of gas to the burner.

In Fig. 5 the float C is provided with two annular flanges, *c* and *c'*, which are immersed in separate annular spaces containing sealing-liquid. Openings a^7 are provided to admit the gas, so as to produce a constant pressure beneath the float between the flanges *c* and *c'*.

In Fig. 6 the stem B is made solid, and the cup *b* is attached to its lower end. The float C is made deeper to permit of the introduction of the siphon-pipe I, through which the gas flows into the passage J, and thence through the pipe K to the burner. When the stem B is forced up the open or short end of the pipe I enters the mercury in the cup *b* and seals the said pipe against the flow of gas through it.

It will readily be seen that in the modifications shown and described a constant pressure of the gas is maintained beneath the float C, while the flow of gas is shut off from the burner; but in the construction shown in Figs. 1 and 2 on shutting off the flow of gas to the burner the float C is entirely relieved from the pressure of the gas; and while my invention embraces in its scope the described modifications, I prefer the construction first shown and described herein.

I claim as my invention—

1. The casing A, provided with an annular space, a^1, for containing mercury or other sealing-liquid, in combination with a movable stem, B, provided with a float, C, for raising said stem, as herein described, and a mercury-cup, *b*, or other sealing device, adapted to be raised by and with the stem B, as and for the purpose herein specified.

2. An automatic gas-light extinguisher adapted to shut off the flow of gas to the burner by increasing the pressure of the gas in the mains or pipes, consisting of a chamber, A, provided with a sealing-chamber, as herein described, a movable stem, B, carrying a sealing-cup, *b*, float C, and rack D, in combination with one or more counter-weights, E, essentially as herein specified.

3. In an automatic gas-light extinguisher, the combination, with a movable stem, B, carrying a cup, *b*, containing mercury or other sealing-liquid, and a float, C, of the collar a^4, adapted to enter the sealing-liquid in the cup *b* when the stem B is raised, as herein specified.

4. In an automatic gas-light extinguisher operated by increasing the pressure of the gas in the mains or pipes, the combination, with a casing, A, of the mechanism, substantially as herein described, for imparting motion to a movable stem carrying a sealing device for shutting off the flow of gas, and the mechanism, substantially as described, for retaining the movable stem in position to prevent the reopening of the flow of gas, as herein specified.

5. The combination, with the movable stem of a gas-light extinguisher, of one or more counter-weights, E, adapted to retain said stem in its elevated position, as and for the purpose specified.

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