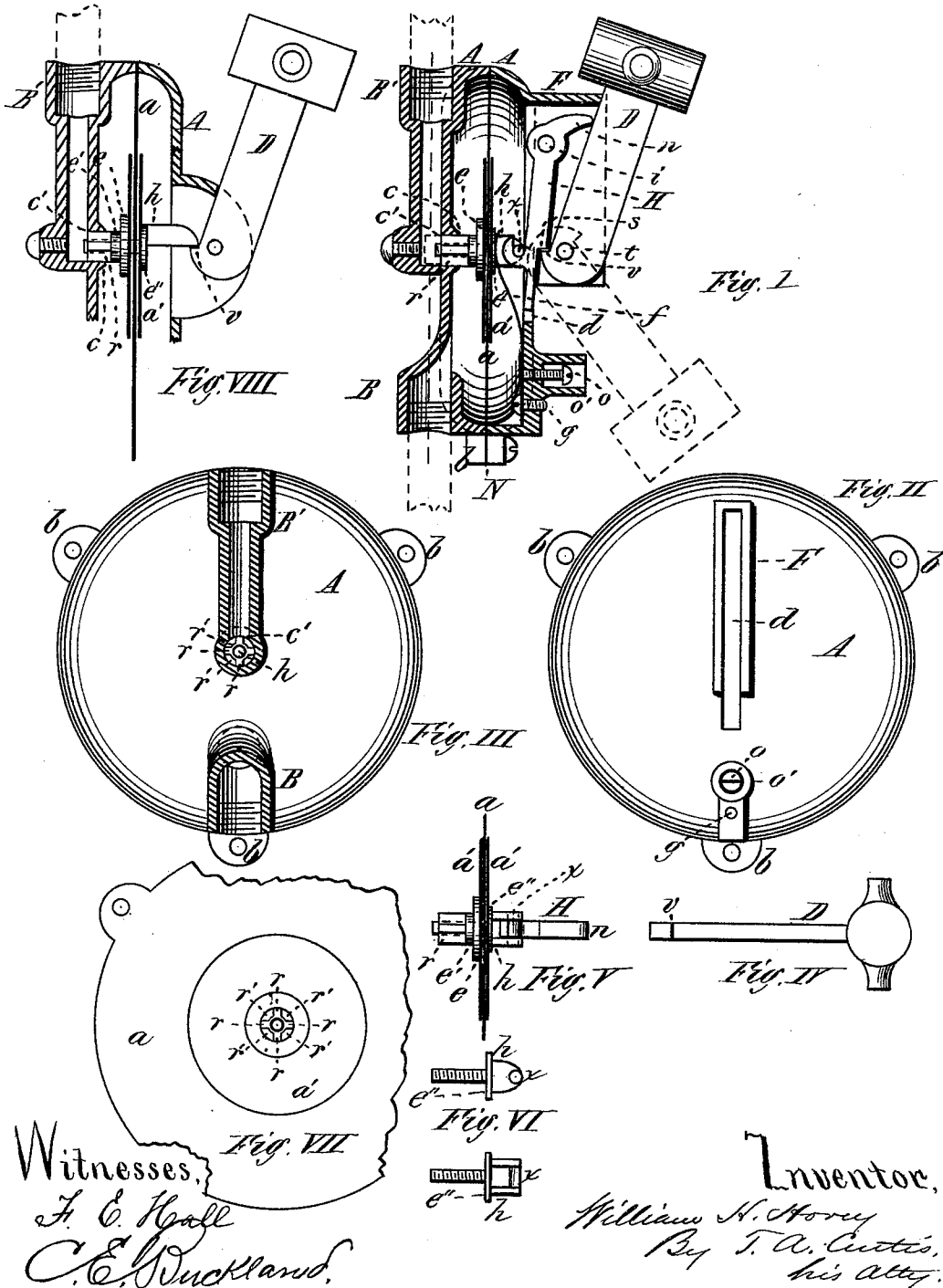


W. H. HOVEY.
GAS LIGHT EXTINGUISHER.

No. 176,312.

Patented April 18, 1876.



Witnesses,
H. C. Hall
C. E. Duckland.

Inventor,
William H. Hovey
By T. A. Curtis,
his atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. HOVEY, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN GAS-LIGHT EXTINGUISHERS.

Specification forming part of Letters Patent No. **176,312**, dated April 18, 1876; application filed March 23, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. HOVEY, of Springfield, in the State of Massachusetts, have invented a new and useful Gas-Light Extinguisher; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

The object of my invention is to extinguish a gas-light automatically by reducing the pressure of the gas in the pipe to any desired or determined point; and to this end my invention consists of a case or shell forming a chamber containing a diaphragm which divides said chamber into two compartments, and a valve-stem and valve connected with said diaphragm, which closes the orifice through which the gas escapes from one of the compartments of the chamber, and which is kept closed by a weight pressing against the valve or its stem. This weight is pivoted to the shell, and when raised sufficiently causes or permits the diaphragm and valve-stem to be forced outward, and the valve to be opened to allow the escape of gas to the burner. An adjustable spring pressing against the valve-stem tends to force the valve in a little, but after the valve is opened, if the pressure of the gas in the pipes and behind the diaphragm is sufficient to overcome the elasticity of the spring, the valve is held open, and if the weight is raised a shoulder upon the valve-stem or upon a lever interposed between the weight and valve-stem and connected to the latter engages with a shoulder upon the weight, and holds the latter up until the gas-pressure in the pipes is so reduced as to permit the spring to press in the valve and stem, permitting the weight to fall and force in the stem and effectually close the valve, and prevent any further escape of gas to the burner, as will be more fully hereinafter explained.

Figure I is a central vertical transverse section of my invention, showing the parts in place, and with a lever connected to the valve-stem, as a means of opening the valve. Fig. II is a front view of the shell, showing the projection upon its face, and opening therein, in which the weight is pivoted. Fig. III is a rear view of the shell and section through

the passages through which the gas enters and leaves the shell. Fig. IV is a top view of the weight. Fig. V is a top view of the lever, diaphragm-valve, and its stem, with a guide attached to guide the valve in its movements. Fig. VI is a view of the valve-stem in both top and side view. Fig. VII is a rear view of the valve, its guide, a part of the diaphragm, and valve-stem; and Fig. VIII is a sectional view, showing the same arrangement of parts as in Fig. I, but without the interposed lever connected with the valve-stem, and the latter elongated instead.

In the drawings, A represents the shell made in two parts, divided in the middle at N, and secured together by screws or bolts inserted in the lugs *b*, grasping the entire edge of the circular diaphragm *a* firmly between the two parts of the shell, thus dividing the chamber within into two compartments, one each side of the diaphragm. A valve-stem, *h*, having a collar or shoulder, *e''*, is inserted through the center of this diaphragm; and in order that the movements of the diaphragm may be true and uniform a thin metallic or hard-rubber disk, *a'*, may be placed upon the valve-stem each side of the diaphragm; and the valve *e*, which may be made of leather, or of any other suitable material, is placed against the diaphragm or metallic disk *a'*, and is secured by any suitable means, preferably by a nut, *e'*, turned up on the threaded end of the valve-stem *h* against the valve snugly.

I prefer to make the outer end of this nut with any desired number of wings, *r*, thereon, which shall fit the orifice *c'* in the back side of the shell, so as to slide freely therein, and serve as a guide to keep the valve true in its movements to and from its seat, the spaces *r'* between these wings serving to facilitate the escape of the gas, or, rather, to permit its escape through the orifice *c'* while the guide is therein.

It is, however, immaterial as to what the particular form of this guide is, because a bar, made across the aperture, with a small hole therein, through which slides a small wire or spindle attached to the valve-stem, would answer quite as well the purpose of a valve-guide. A threaded hole is made at B, communicating

with the rear compartment behind the diaphragm, and the valve-orifice c' , in the back side of the shell, communicates with a passage, B' , threaded at the upper end, into which the pipe or burner is secured. The front side of the shell has a vertical projecting part, F , which is made hollow or open at d , the opening extending entirely through the front of the shell, this projection forming a narrow hood closed at the top. In the upper part of this hood I pivot the lever H , having an upper arm or projection, n , and another arm extending downward and nearly filling the opening d , and this lever is hooked or connected to the valve-stem at x . The weight D is pivoted to the lower part of the hood F at t , and said weight is provided with a shoulder, v , and the lever H behind the weight is also provided with a corresponding shoulder, s , and the lever H extends a little below the pivot t , which secures the weight in place. The pivot is inserted through the weight D nearer one edge than the other, so that when the lower end of the lever is pressed in sufficiently to disengage the two shoulders s and v the weight will fall, and the edge of the weight opposite the pivot, which is rounded at the end, will press in the lever and valve-stem to close the valve. If the lever is not used the end of the valve-stem becomes disengaged from the shoulder v , and the weight, falling, presses in the valve-stem to close the valve in the same way. A spring, f , with its upper end pressing or bearing against the valve-stem, is secured to the shell inside, preferably by a small screw at g , and a little above this a screw, o , is turned into a threaded hole in the shell, so that the inner end of the screw may impinge against the spring a little above the point where it is secured, so that by turning this screw o either in or out the pressure of the upper end of the spring against the valve or valve-stem may be adjusted to any desired degree.

In practice I prefer that this adjusting-screw o shall be inclosed in a small tube, o' , secured to the shell, to protect it, and the head of the screw made prismatic, or of other convenient shape, so that a correspondingly-shaped key may be used to turn it.

Instead of the projecting hood F , ears might be made upon the face of the shell, to which to pivot the weight D and lever H , when the latter is used; but I prefer the hood F for the purpose of keeping out the snow and wet, which might otherwise get in and interfere with the perfect working of the valve.

The operation of my invention is as follows: The part B is screwed upon a gas-pipe, and a short pipe with the burner thereon screwed into the hole B' , and the adjusting-screw o turned in or out to adjust the spring to any determined pressure of gas in the pipe—that is to say, suppose the pressure in the pipe, at which it is desired that the light should be extinguished, is represented or indicated on the gage by three inches. The gas is allowed to

pass into the compartment behind the diaphragm, and the screw o is turned in, so that at that pressure the spring will prevent the gas from pressing the diaphragm and valve out sufficiently for the two shoulders s and v to catch one upon the other when the weight is lifted—in other words, just so that they will not catch.

Then every time the weight is lifted it will fall again and close the valve, as there is nothing to hold it up; but if the pressure of the gas in the pipes is increased to, say, three and a half or four inches, as indicated on the gage, the outward pressure of the gas behind the diaphragm will overcome the spring and hold the two shoulders s and v in contact when the weight is lifted.

As long as this pressure of gas in the pipes is maintained the gas will continue to burn at the burner; but if the pressure is again diminished to three inches the spring will push the valve stem in just enough to disengage the shoulders s and v , and the weight will drop and entirely close the valve; and as long as the weight remains in the position shown in dotted lines in Fig. I the valve will be held closed, the light being extinguished by the dropping of the weight and consequent closing of the valve.

The valve-seat c may be annular, and somewhat sharp in its cross-section, so that the valve may fit it perfectly and make it tight.

The particular form of the parts is, of course, immaterial, so long as the operation remains the same. For example: Instead of making the pivoted end of the weight D rounded and the pivot t nearer one edge than the other, it would operate precisely the same if the pivot were placed in the middle and a short projection were made on the lower edge near the end, which would strike the lever or valve-stem, and force in the valve to close it.

If the lever H was not used, and the valve-stem was elongated, as shown in Fig. VIII, the device would be just as operative to extinguish the light at a given pressure, because at that pressure, if the weight were raised, the pressure of the gas would not force the diaphragm and valve-stem sufficiently far in front to permit the end of the valve-stem to catch upon the shoulder v of the weight, and the latter would drop, forcing in the valve and closing it; but if the pressure was increased the diaphragm and valve-stem would be forced in front, to permit the valve-stem to catch upon the shoulder v , and the weight would be held up until the pressure was reduced again, when the spring would force the valve-stem off the shoulder, and the weight would fall and close the valve, as before.

It is well known that a sticky residuum or tar is formed in gas pipes, and the only reason for using the lever H , instead of elongating the valve-stem, as shown in Fig. VIII, is to give a positive power to pull the valve away from its seat c , if it should stick in opening, by raising the weight against the upper end

of the lever and forcing out the lower end, to which the valve-stem is attached. I prefer, therefore, to use the lever, in practice, as a means of opening the valve, but do not consider it essential, in closing the valve, to extinguish the light.

Having described my invention, what I claim as new is—

1. The diaphragm *a*, arranged within a chamber to form two compartments therein, in connection with a valve-stem and valve to close the escape-orifice *c*, the adjustable spring *f*, and the weight *D*, substantially as and for the purpose herein described.

2. The combination of the diaphragm *a*, arranged to form two compartments within a

chamber, a valve-stem and valve to close the escape-orifice *c*, the adjustable spring *f*, the lever *H*, and the weight *D*, all operating substantially as and for the purpose specified.

3. A pivoted weight, *D*, arranged in combination with a valve-stem and valve located in a chamber, whereby a gas-light is extinguished automatically by the fall of said weight, at any determined pressure of gas within the pipes, to shut the valve and close the escape-orifice, substantially as set forth.

WILLIAM H. HOVEY.

Witnesses:

T. A. CURTIS,

C. E. BUCKLAND.