E. LINDSLEY.

Device for Lighting and Extinguishing Gas.

No. 197,151. **Patented Nov. 13, 1877.**

Fig. 1.

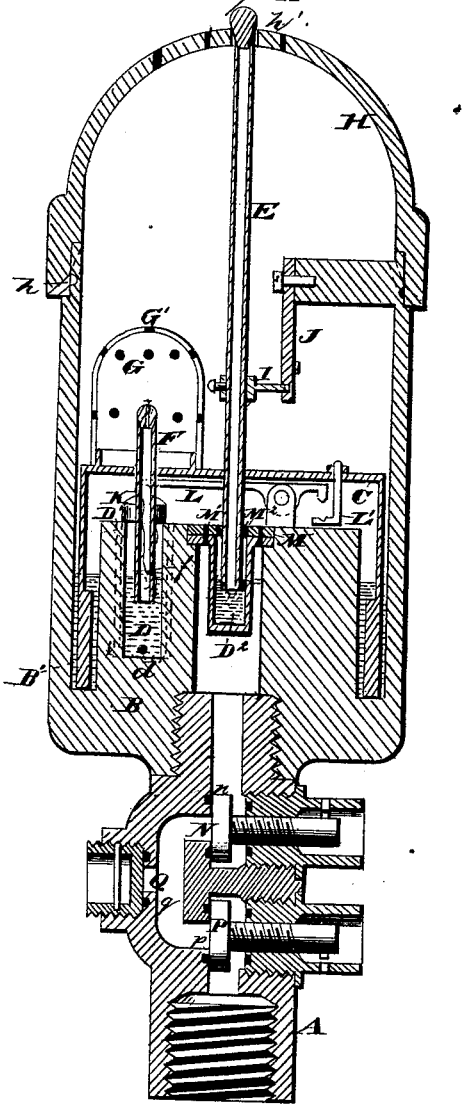


Fig. 2.

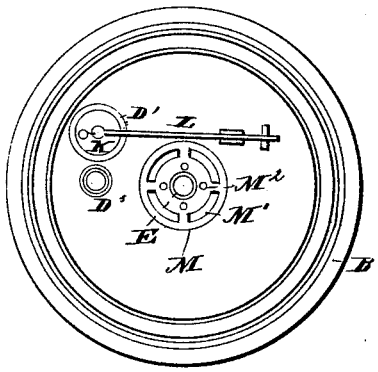
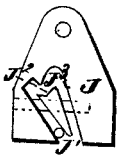


Fig. 3.



WITNESSES

Ed. L. Nottingham

A. W. Bright.

INVENTOR

Edward Lindsley.

By Leggett and Leggett.

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD LINDSLEY, OF CLEVELAND, OHIO.

IMPROVEMENT IN DEVICES FOR LIGHTING AND EXTINGUISHING GAS.

Specification forming part of Letters Patent No. **197,151**, dated November 13, 1877; application filed September 13, 1877.

To all whom it may concern:

Be it known that I, EDWARD LINDSLEY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Gas-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in gas-burners, designed more especially for burners wherein the gas is to be lighted and extinguished by varying the pressure within the main.

My invention consists in the combination, with a shell containing mercury, of a chamber the edges of which dip into the said mercury, said chamber bearing the main or night burner and the permanent or day burner, together with mercury-cells for the ends of the said pipes, and a float and lever for cutting off the supply of gas from the day-burner, and resupplying the same at the proper intervals, as will be hereinafter explained.

In the drawings, Figure 1 represents a longitudinal section of a burner embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a separate view of the cam which, with the pin, serves to fix the burners in the open condition when desired.

A is a feed-pipe, which, for the purpose of this description, I denominate the "main." B is a cup or case containing a charge of mercury within its cell B′. C is a movable dome or shell, with its edges resting in the mercury of the cell B′. D D^1 D^2 are three mercury-cells, D^2 operating to seal the lower end of the main burner during the day, while D D^1 communicate with each other, and operate in like manner at proper intervals to close or seal the end of the pipe of the day-burner. E is the main burner, and F the day-burner, and G a dome covering the day-burner. It is provided with an orifice at the top, and with perforations in its sides for igniting and for ventilation, whereby air may be supplied to its small flame. H is a dome or wind-cap, provided in like manner with ventilation holes or channels *h*, and with an orifice, *h′*, near the top adjacent to the main burner. I is a pin or stud attached to the main burner E. J is a vibratory cam, which, with its pin, fixes the main burner in its open condition when the pressure of gas shall have been increased and afterward diminished. K is a float resting on the mercury in the chamber D^1, which is considerably larger than the chamber D. Connected with the float K is a lever, L, which will at the proper time engage with a lug or arm, L′, attached to the movable shell or dome C. The chambers D D^1 are connected at *d′* with each other. M is a washer provided with orifices M^1, which communicate directly with the main and with the chamber C, and provided also with orifices M^2, which communicate between the chamber C and the mercury-cell D^2. This washer serves simply as a centerer or guide for the pipe of the main burner.

The operation of this device is as follows: There being mercury, as shown, in the different cells B′ D^1 D^2, the gas in the pipe A, passing through the orifices M^1 in the valve M, passes down into the cell D through the small orifice *f* into the burner F, and feeds to it just enough gas to keep up a very small flame during the day. Now, when it is desired to light the main burner—as, for instance, at night—the pressure is increased in the main A by any suitable contrivance or governor at the gas-works or other locality. This increased pressure causes the dome or shell C to rise, the lower end of the pipe F emerges from the mercury, and a strong flow of gas passes through the pipe, causing a long jet to pass up through the orifice G′, and out of the orifice adjacent to the main burner. At the same time the pipe of the main burner E lifts out of the mercury in the cup D^2, and in rising the pin I deflects the cam J. The rising motion unseats the pipe E, and permits gas to flow freely through the chamber C down through the mercury-cell D^2, and up through the pipe E to the main burner. Here its jet is ignited by the long jet from the day-burner F. It is desired, however, that the day-burner should now be shut off for this purpose. As the chamber C rises the lug or arm L′ engages with the lever L, thus forcing the float K down into the mercury-cell D^1. This expels the mercury into the smaller cell D, causing it to rise

rapidly therein, and soon closing off both the end of the tube and the small orifice *f*. By the operation of lifting the shell or dome C the pin I is brought into the notch J^1 of the cam J. Any slight diminution of the pressure will now leave the pin in the notch J^2 of the cam, and the chamber C will not be subject to rise and fall by the fluctuation of gas within the main.

When it is desired to extinguish the gas, the pressure is again, for a short time, increased. The pin I is thus caused to rise into the notch J^3 of the cam. A diminution of the pressure then causes it to descend. As it descends the arm L′ is disengaged from the lever L, the float K rises, and the mercury in the cell D^1 again drops below the mouth of the tube F. A sudden flow of gas through this tube causes a jet to project up through the pipe of the burner, adjacent to the flame of the main burner, where it is ignited. The further descent of the chamber or dome C causes the pipe E of the main burner to dip into the mercury below, thus cutting off the gas, while the pipe F also dips into the mercury below, thus cutting off a free supply, and leaving only a small supply through the small orifice *f*. The pin has again deflected the cam, so that when pressure is again increased and then diminished, the pin will return to its original position, thus closing off all except the day-burner, and leaving that supplied with gas for a very small flame.

The depending edges of the chamber C are enlarged along that portion which projects into the mercury, so that they will give a greater buoyancy to the structure. Moreover, as this enlarged portion is lifted out from the mercury, its buoyancy will diminish, thus preventing the gas from acting too suddenly in lifting the chamber C.

I will now describe a construction whereby water, steam, or vapor may be forced into the main or pipe A to drive away any obstruction—such as ice—without exerting the pressure in the burner above. For this purpose, N is a screw-valve, or other valve, tapped into the stem A. P is another similar plug or valve. Q is a plugged opening between the valves N and P, through which steam or vapor, &c., may be passed. *n*, *p*, and *q* are rings of packing. In order to prevent this pressure from communicating with the burner above, the plug N is forced down closely upon the packing *n*, closing up the communication with the burner. The plug P is then opened, thus communicating with the pipe A, and steam or vapor, &c., is forced in through the opening Q. After the obstruction is removed, the valve or opening Q is closed, and the plugs N and P are opened, thus furnishing free communication between the pipe A and the burner. The valve P serves simply to prevent escape of gas as the hose or other device is being connected at the opening governed by the valve Q.

These valves and plugs, it will be observed, are so constructed that the same key will fit all of them. This, of course, is a matter of preference; it is not essential.

Instead of making the cam vibratory about a pivot, and the pin rigidly attached to the pipe E, the order may be reversed, and the cam may be made stationary, and the pin be attached to the pipe E in such manner as to have a free motion around the pipe as a center. The operation would remain the same, except that the pin would be deflected by the cam instead of the cam by the pin.

The mercury-cell D^2 is inserted in the opening for the pipe A.

This construction will simplify and cheapen the device, and leave a free opening into the pipe, for any purpose, through the burner without removing the burner.

What I claim is—

1. The burner designed to be lighted and extinguished by varying the pressure within the main, consisting of the case containing the mercury-cells B′, D, D^1, and D^2, the lever and float mechanism K L L′, and pipes E and F, substantially as and for the purposes described.

2. The combination, with the day-burner pipe, of connecting mercury-cells D D^1, and float and lever mechanism K L L′, substantially as and for the purposes described.

3. The combination, with the day-burner pipe, provided with small orifice *f*, of connecting mercury-cells D D^1, and float and lever mechanism K L L′, substantially as and for the purposes described.

4. The combination, with the inverted dome C, provided with the pipe E and the mercury-cell B′, of the removable mercury-cell D^2, substantially as described.

5. The combination, with the pipe E, of a guide-washer, M^1, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD LINDSLEY.

Witnesses:
F. TOUMEY,
W. E. DONNELLY.