H. N. MACOMBER.

Vapor Lamp.

No. 20,283. Patented May 18, 1858.

Fig: 3.

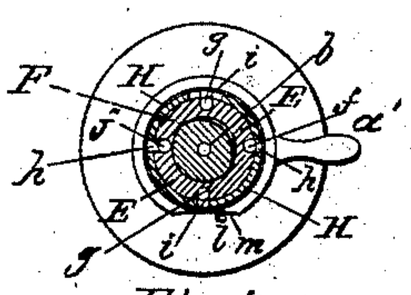


Fig: 1.

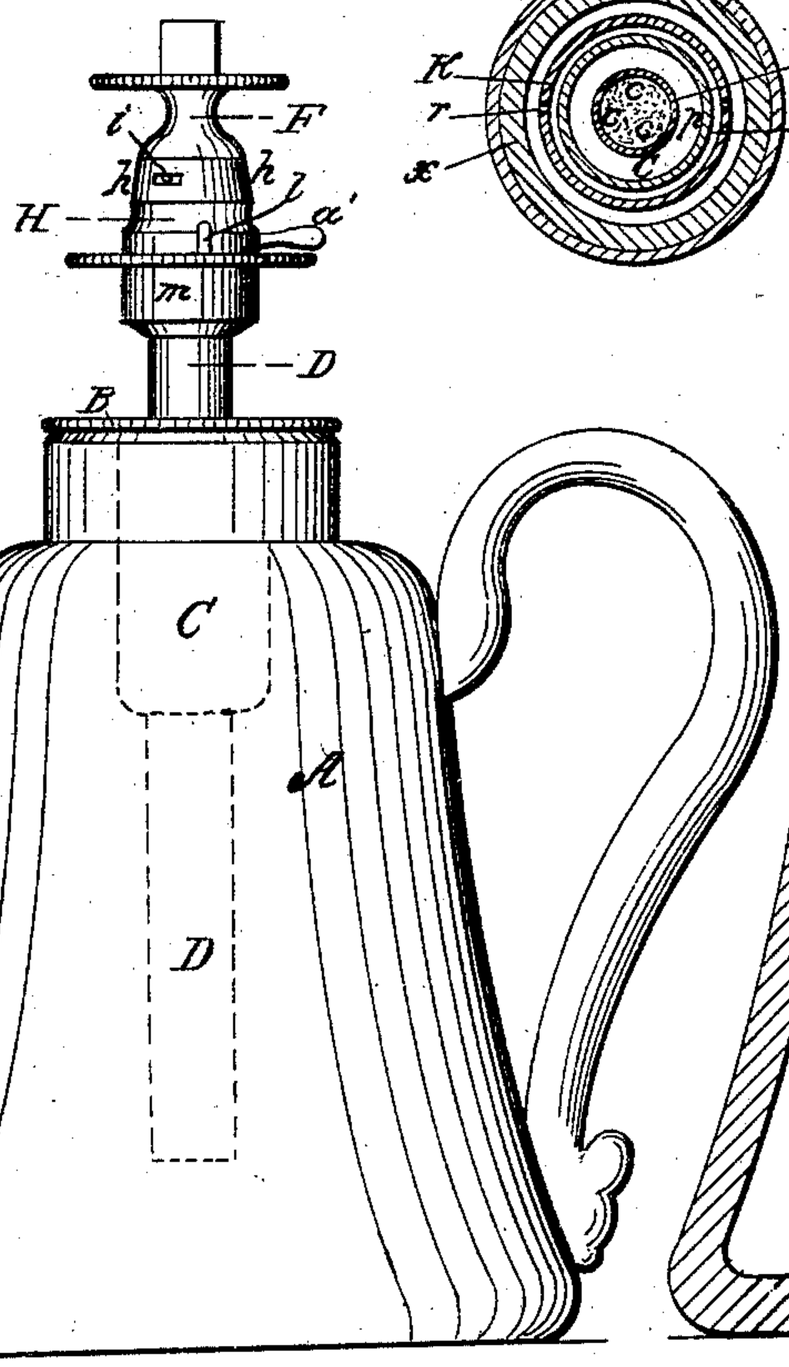
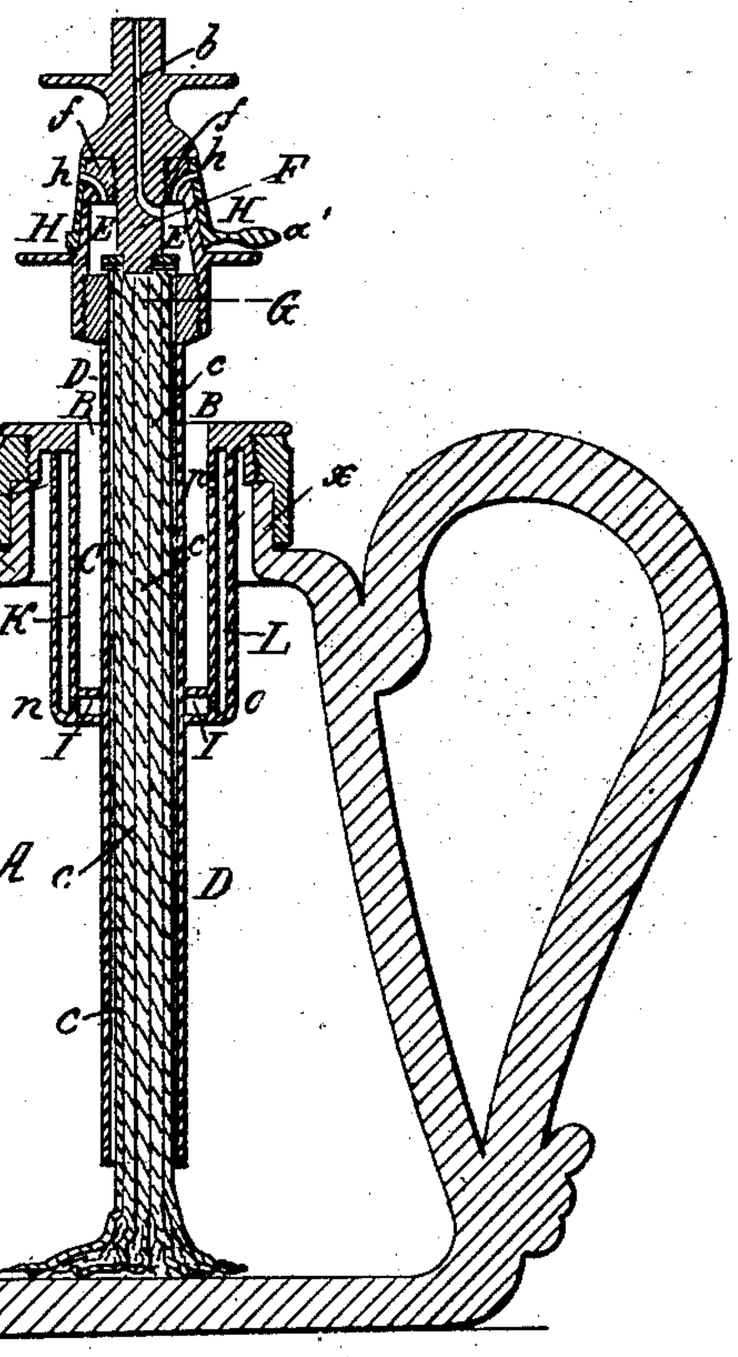


Fig: 4.

Fig: 2.



UNITED STATES PATENT OFFICE.

H. N. MACOMBER, OF LYNN, MASSACHUSETTS.

VAPOR-LAMP.

Specification of Letters Patent No. 20,283, dated May 18, 1858.

To all whom it may concern:

Be it known that I, HORATIO N. MACOMBER, of Lynn, in the county of Essex and State of Massachusetts, have invented an Improved Hydrocarbon-Vapor Lamp; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1, denotes a side elevation of one of my improved vapor lamps: Fig. 2, a central, vertical and longitudinal section of the same. Fig. 3, a horizontal section taken through the flame jet openings and their encircling tube. Fig. 4, is a horizontal section of the vertical air passages and the cup of the lamp cap.

In such drawings, A, represents the body or fluid reservoir of the lamp, such body being furnished with a screw cap, B, from which a cup, C, extends downward and surrounds a long wick tube D, projecting both above and below the cap as shown in the drawings. This wick tube is surmounted by a burner, E, which is screwed upon the wick tube and has a female screw, *a*, made in its upper part for the reception of an adjustable heater, F, formed as shown in the drawings and made either with or without a central jet hole, *b*, extending axially out of it as shown in Fig. 2. The heater, F, when screwed closely down upon the burner comes in contact with the top of the wick, G, and the upper end or ends of one or more metallic wires *c*, *c*, *c*, extending through the wick or down into the wick tube as shown in Fig. 2. Furthermore, the burner E, is furnished with four lateral jet holes, *f*, *f*, and, *g*, *g*, arranged as shown in Fig. 3, which is a section of the burner. In this section, each jet hole is exhibited as arranged at an angle of about ninety degrees from that next adjacent to it. This burner so provided with lateral holes, has an encircling tube H, placed and made to fit and turn upon it. This encircling tube is furnished with two round holes *h*, *h*, arranged in such manner, that when the axis of one is brought in line with that of one of the jet holes *f*, the axis of the other hole *h*, shall also be in line with the axis of the other jet hole *f*, and this in order that both the jet holes may be uncovered so that hydrocarbon vapor, when the lamp is in operation may freely flow from the two jet holes *f*, *f*. Besides the holes *h*, *h*, of the encircling tube H, such tube is furnished with two slots *i*, *i*, arranged horizontally and operating respectively with the two jet holes *g*, *g*, that is to say, they uncover the jet holes, *g*, *g*, not only when the jet holes, *f*, *f*, are uncovered, but also when the encircling tube is turned around so as to cover these latter jet holes. The slots are also made so that in case the encircling tube is turned around a little farther the slots may be carried entirely by the jet holes *g*, *g*, in order that they may be covered by the tube in which case all the jet holes *f*, *f*, and *g*, *g*, will be covered so that no vapor may escape from them.

A small arm or projection *a'* extends from the encircling tube, H, as shown in the drawings, the same being to enable a person to turn the tube on the burner by pressing his finger against said arm. The extent of movement of the tube in either direction is determined by means of a stationary stud *l*, projecting from the burner and extending into a recess *m*, made in the encircling tube H. When the tube H, is turned around sufficiently, one side or other of the recess will bring up against the stud. The cup, C, extends down into the reservoir and to some distance below the neck thereof, the tub D, being fastened to the bottom of the cup. This allows the burner to be brought down very near to the screw cap, and so insulate the said burner from the glass neck *x*, of the reservoir as to prevent the latter from becoming injuriously heated while the lamp is in operation. If overheated, the neck is liable to become cracked or to so expand and contract as to loosen the cement by which the screw cap is confined to it.

Underneath the cup, C, is a chamber or space, I, surrounding the wick tube D, and opening by minute orifices, *n*, *o*, into two vertical tubes or chambers K, L, arranged with respect to the cup, C, as shown in the drawings. A minute hole, *p*, leads from the cup into the upper part of the chamber, L. Another minute hole, *r*, leads out of the upper part of the chamber K, and into the reservoir of the lamp.

From the above, it will be seen, that the chambers I, K, L, and minute orifices, *n*, *o*, *p*, *r*, constitute a passage through which air can pass into the reservoir of the lamp. They also serve another purpose, viz., that of preventing the escape of fluid and its running down upon the wick tube when the

lamp is upset or overturned, for it will be seen that in order to escape, the fluid must pass through the chambers K, I, and, L. When the orifices, *r*, *n*, *o*, *p*, are so minute as to be only sufficiently large to supply the necessary quantity of air to the reservoir, little or no fluid will pass through either of them when the lamp is inverted, and should a small amount escape into the chamber, K, the chance is that it would not pass into the chamber, I. On the lamp being everted, such small quantity of fluid in a short time would be evaporated, and carried back into the reservoir by the in-rushing current of air.

A lamp constructed on the above principles will be found peculiarly safe and efficient for burning those liquid hydro-carbons which are dangerous or liable to explode or easily take fire when in the proximity of flame. By means of the adjustable heater F, heat from the inflamed jets of vapor will be transmitted to the wick and its wires, such wires serving to conduct the heat down into the wick for the purpose of vaporizing the fluid which may be taken up therein by capillary attraction.

The adjustable heater also affords a means of regulating the transmission of heat into the wick and of course the amount of vapor produced within the burner, as by turning back or unscrewing the adjustable heater we raise it off the upper end of the wick and the wires thereof, and the more we raise it above the latter, the less will be the amount of heat transmitted from it into the wick.

By means of the encircling tube H having holes and slots arranged in it as described we can maintain in operation at any time or in a state of inflammation, two or four jets of vapor.

I am aware of the devices represented in Letters Patent of the United States, dated May 10th, 1844, and numbered 3582, and therefore, I do not claim the same, but

What I do claim as my invention is as follows.

I claim—

Making the ascending and descending air passage of the lamp of a series of chambers each connected with the other, and the whole opening out of and into the reservoir of the lamp substantially as set forth.

In testimony whereof, I have hereunto set my signature.

H. N. MACOMBER.

Witnesses:

R. H. EDDY,

F. R. HALE, Jr.