2 Sheets—Sheet 1.

E. K. HAYNES.

Lantern.

No. 197,217. **Patented Nov. 20, 1877.**

Fig. 1

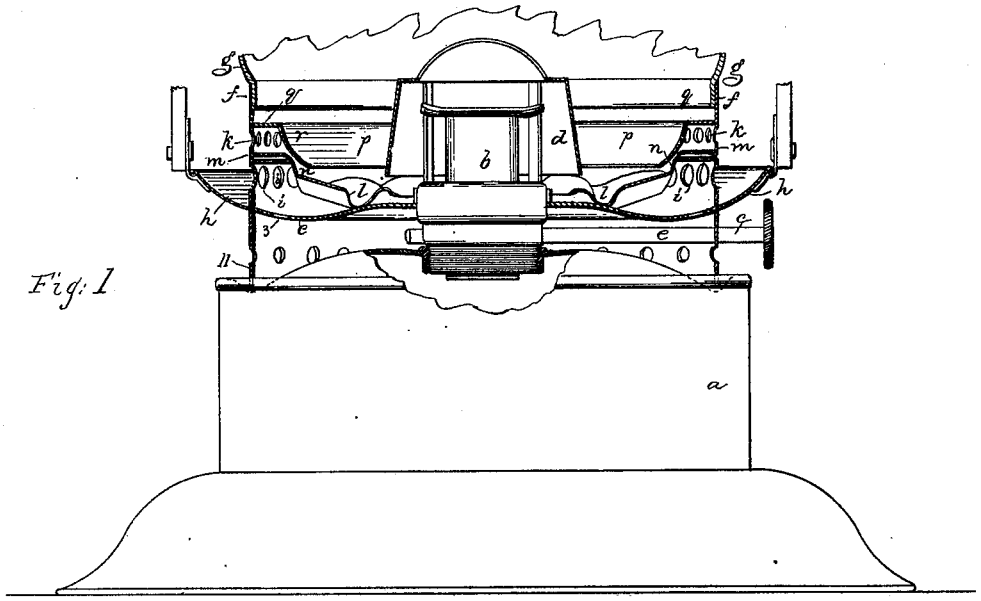
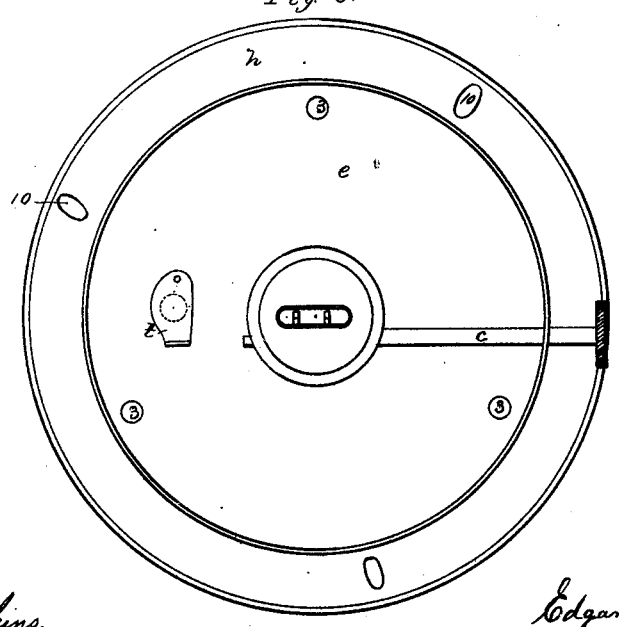


Fig. 2.



Witnesses,
E. C. Perkins.
W. J. Pratt.

Inventor
Edgar K. Haynes
per Crosby & Gregory Attys.

2 Sheets—Sheet 2.

E. K. HAYNES.

Lantern.

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Fig. 6.

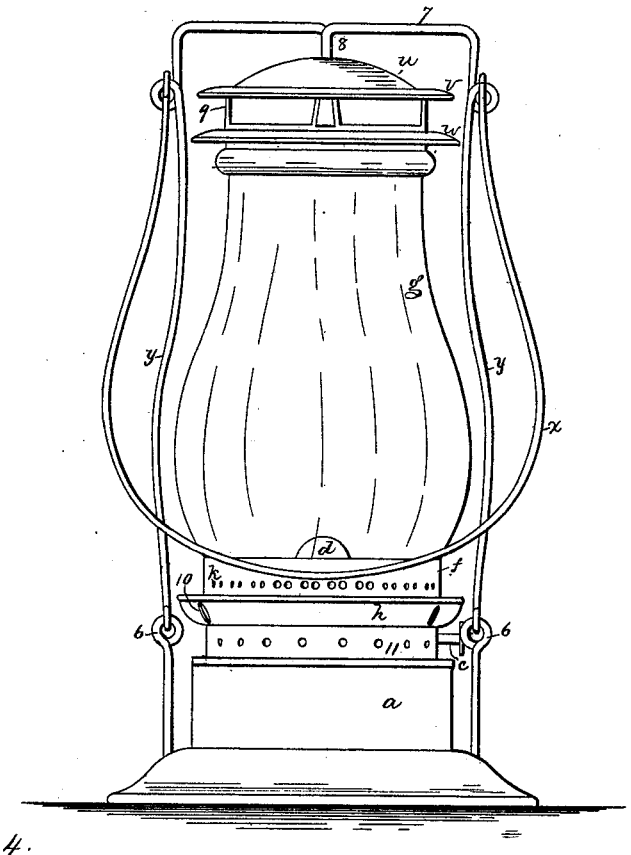


Fig. 4.

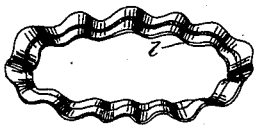


Fig. 7.

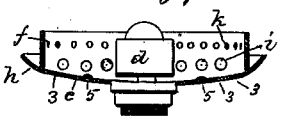


Fig. 3.

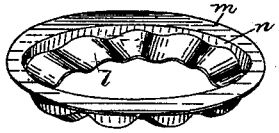
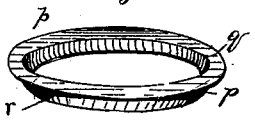


Fig. 5.



Witnesses.

E. C. Perkins

H. J. Pratt

Inventor.

Edgar K. Haynes.

per Crosby & Gregory Att'ys.

UNITED STATES PATENT OFFICE.

EDGAR K. HAYNES, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **197,217**, dated November 20, 1877; application filed May 7, 1877.

To all whom it may concern:

Be it known that I, EDGAR K. HAYNES, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Lanterns, of which the following is a specification:

This invention relates to improvements in lanterns to burn hydrocarbons or fluid productions from coal-oil; and has for its object such construction of a lantern that it will burn whether stationary or being moved, and under varying conditions and movements of the air outside the lantern.

In patents heretofore granted to me, No. 136,994 and No. 144,200, I have described certain devices to produce in the air entering the lantern a wave-like motion, in order that such air, entering at its base, might pass upward through the cone.

In this my present invention I desire to cause the air to move in these wave-like currents; but the direction of such currents and the quantity of air admitted to the burner through the base have been changed and regulated.

Instead of depending upon the excess of air when the current was too strong passing under and across the burner, I have adapted the holes for the admission of air to correspond with the quantity necessary to be admitted to keep the burner in flame, and have checked the force of its current and caused it to pass under a feed-ring adapted to conduct the air to the center of the burner.

I have also arranged in connection with the base a series of auxiliary openings to admit air to the interior of the lantern, to supply the loss of air drawn through the air-supplying openings in the bottom of the lantern, when currents of air impinge upon the deflector which guards and shields such openings, in such direction as to cause the lowermost air-supplying openings to act to exhaust the lantern, and in connection with these auxiliary openings I have arranged a smoke-preventing ring, it acting to check the current of such air and contract it toward the center of the globe, so that the current is maintained therein more central, thereby substantially preventing the smoke impinging against the globe. This smoke-preventing ring, if the current of air from the outside of the base through the auxiliary openings is strong, will act to so direct the current downward as to assist in feeding the burner, it co-operating with the feed-ring.

The sharpness of the curve in the feed-ring, and the area of the passages between it and the bottom plate, and the distance of the smoke-ring above the feed-ring, will be varied according to the size and shape of the globe and burner.

Figure 1 represents a partial section of the base of a lantern provided with my improvements; Fig. 2, an under-side view of the bottom plate above the oil-receptacle; Fig. 3, a view of the feed-ring detached; Fig. 4, a modified form thereof; Fig. 5, a view of the smoke-ring detached; and Fig. 6, a perspective view of the lantern, showing the form of frame about the globe which I prefer to employ. Fig. 7 is a modified form of bottom plate.

In the drawing, *a* designates the receptacle for the kerosene or other oil. *b* is the burner; *c*, the shaft to raise or lower the wick, and *d* the elevated cone surrounding the burner, all of usual construction. The curved bottom plate *e* extends laterally from near the base of the burner to a ring, *f*, within the upper end of which is placed the globe *g*. Outside this ring is placed a deflector, *h*, substantially such as shown in my Patent No. 144,200, to force the air into the openings *i* when the lantern is being swung or lifted, thereby counteracting the descending motion of the air within the globe, substantially such as shown in my Patent No. 144,200; but in this instance the air-feeding ring is differently constructed, and is not provided with holes, as therein shown.

In the construction shown in the patent, when the air-current outside the lantern is such as to suck the air from the interior of the lantern, such air is drawn therefrom too near the burner, and there is no outside communication with the atmosphere to furnish air to replace that drawn out, and the flame is liable to be smothered.

To obviate this I have made a series of auxiliary openings, *k*, in the ring *f*, immediately above the openings *i*. The feed-ring *l*, fitted within the ring *f*, separates these two series of openings *k i*. This feed-ring is shown bent or waved at its interior portion, to present al-

ternate elevations and depressions. At its outer end it has a flange, *m*, and between the flange and its inner edge it has a shoulder, *n*, to serve as a stop to break up and check the current of air entering at the holes *i*. The bottoms of the depressed inner portions of the ring rest upon the bottom plate, thereby leaving a series of radial passages opening toward the center of the burner. The air admitted at the openings *i* is led through the passages under the feed-ring to the interior of the burner to supply it with air. Should the wind blow into such openings, the current will be checked or retarded, and the air which does not pass up through the center of the burner will be forced across under the open cone *d*, and, impinging upon the upper curved faces of the feed-ring, will rise upward between the cone and the interior of the globe without impinging directly upon the outside of or blowing directly across the top of the burner. When the air outside the lantern has such a motion with relation to the deflector as to suck the air from the interior outward, then, to supply air to the interior of the lantern and support combustion at the burner, I have provided the ring with a series of auxiliary air-passages, *k*, which admit air from the outside as the air from the inner side is exhausted through holes *i*. This is a most important requisite of this my invention, as to the maintenance of combustion at the burner, and to keep at that point a proper supply of oxygen.

When, however, the atmosphere is considerably disturbed outside the lantern, air coming in at the openings *k* is apt to deflect the smoke or flame against the interior of the globe and blacken it. To obviate this I have placed above the feed-ring a smoke-preventing ring, *p*. The flange *g* of this ring rests against the ring *f* at its interior, above the passages *k*, and air entering such passages is checked by the depressed portion *r* of the ring *p*, and thence passes into the interior of the lantern at an intermediate position between the passages *k* and the burner, whereby the body of air so discharged is caused to ascend in a more central position, so that it does not deflect the flame and smoke against the interior of the globe opposite the burner, as would be the case, under some conditions of the air outside the lantern, if the ring *p* were omitted.

The bottom plate *e* is shown in Fig. 1 as concaved between its raised center and outer edge, and it is provided with suitable openings 3, for the discharge of water which may fall upon the bottom plate.

For small-sized lanterns, however, I prefer to omit the raising of the bottom plate at its center, and shape it as shown in Fig. 7, wherein the bottom plate is shaped substantially as the interior of a saucer, with the exception of a small annular bead or rim, 5, which acts with an excess of air to raise it, and cause part of it to pass upward within the globe outside of the cone. With this form of plate, I prefer to provide it at bottom with a greater number of holes than at Fig. 2, and the passages *i* will in such case be somewhat contracted. This bottom plate might be made flat, it being provided outside the cone with an elevated annular ring, to operate as before described of Fig. 7.

Fig. 4 represents a modified form of feed-ring, the flange being waved as the interior portion of the ring. Such a ring would only cover a portion of the holes of the lower series located as at *i*, and those not covered would admit air between the feed and smoke rings.

In Fig. 2 I have shown a device, *t*, to cover a hole which may be made through the bottom plate for the passage of a match or other light to ignite the burner.

The top of the lantern is composed of a plate, concaved at its side toward the top of the globe, as at *u;* and it is provided with a flange, *v*, and below it is an auxiliary flange, *w*, of greater diameter than flange *v*. Between this flanged plate *u* and the top of the globe and the flange *w* is an open space, 9, through which the air in the lantern rises and passes out. The plate *u* and the flanges *v* and *w* are so shaped with relation to each other as to prevent too much air passing into the globe from the top.

In Fig. 6 the bail *x* of the lantern is shown as connected with a frame, *y*, pivoted to eyes 6, sustained by the oil-reservoir or lantern-base. A portion, 7, of the frame extended across the top part of the lantern, and provided with a projection, 8, engages the top, a portion of the projection entering a depressed part of the cover, or vice versa, thereby holding the frame and top locked together. The openings 10 (see Fig. 2) in the deflector permit the passage of water down through them. The rim 11, between the bottom plate and the top of the receptacle *a*, adds to the strength or rigidity of the lantern. It may, however, be omitted.

The devices herein described for supplying and regulating the passage of air to the flame may be used in other apparatus wherein hydrocarbon oils are consumed.

I claim—

1. In a lantern, the combination, with the bottom plate, of an air controlling or feeding ring, having its interior rim waved or irregularly shaped, to operate substantially as described, in connection with openings for the passage of air under the ring.

2. The combination, in a lantern, of the deflector, the bottom plate, a series of air-openings, *i*, and an air-controlling feed-ring having its inner edge waved, to operate substantially as described.

3. The ring provided with two series of openings, *i k*, and the deflector, in combination with an air controlling and feeding ring, substantially as described, the series of auxiliary openings serving to supply air drawn from the interior of the lantern under the edge of the feed-ring, substantially as set forth.

4. The air-controlling feed-ring provided with a shoulder, *n*, and with an interior waved edge, to operate to break or check the current of air and discharge it, substantially as described.

5. The combination, with the auxiliary openings *k*, of a smoke-preventing ring, located above the air-controlling feed-ring, to operate substantially as described.

6. In a lantern, the series of air-openings *i k*, the bottom plate and deflector, in combination with an air-controlling feed-ring and a smoke-preventing ring, all adapted to operate substantially as described.

7. In combination, the deflector, the ring provided with main and auxiliary air-openings, the air-controlling feed-ring provided with a waved inner edge, a burner, an oil-receptacle, a globe, and a flanged top, and an auxiliary flange of greater diameter than the flange of the top, all to operate substantially as described.

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

EDGAR K. HAYNES.

Witnesses:
G. W. GREGORY,
W. J. PRATT.