

J. H. IRWIN.

Lantern.

No. 89,770.

Patented May 4, 1869.

Fig. 1.

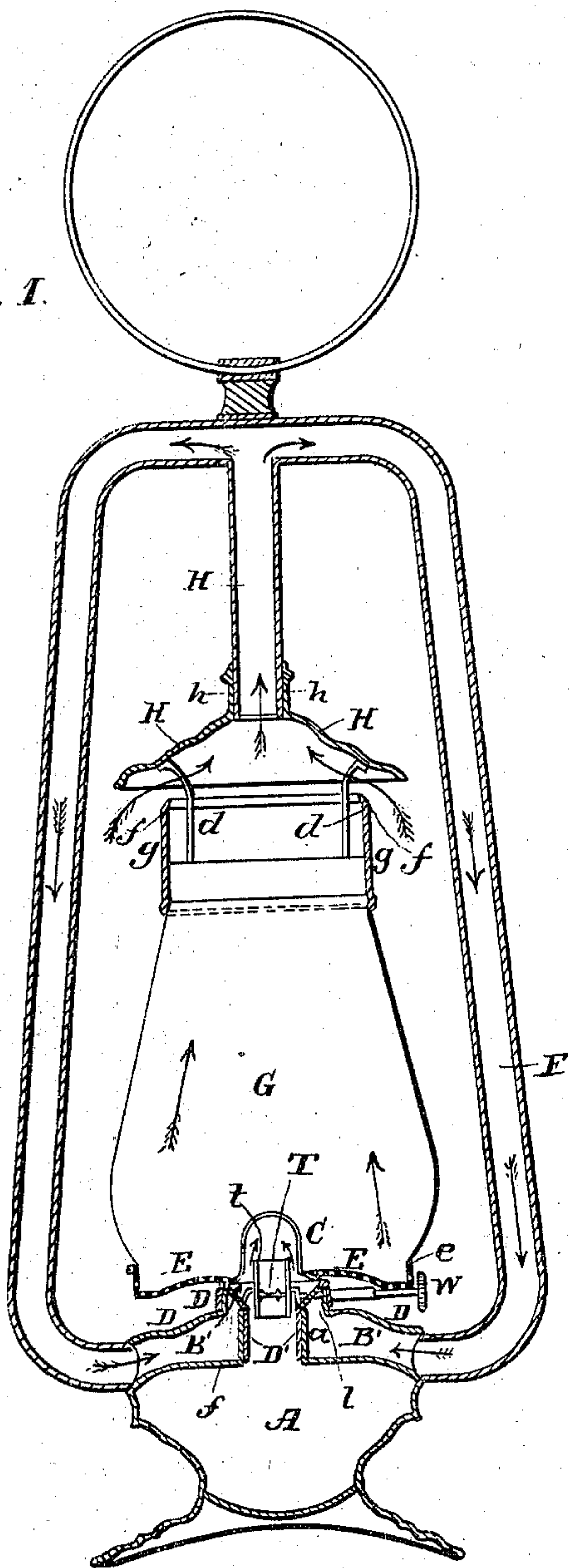


Fig. 2.

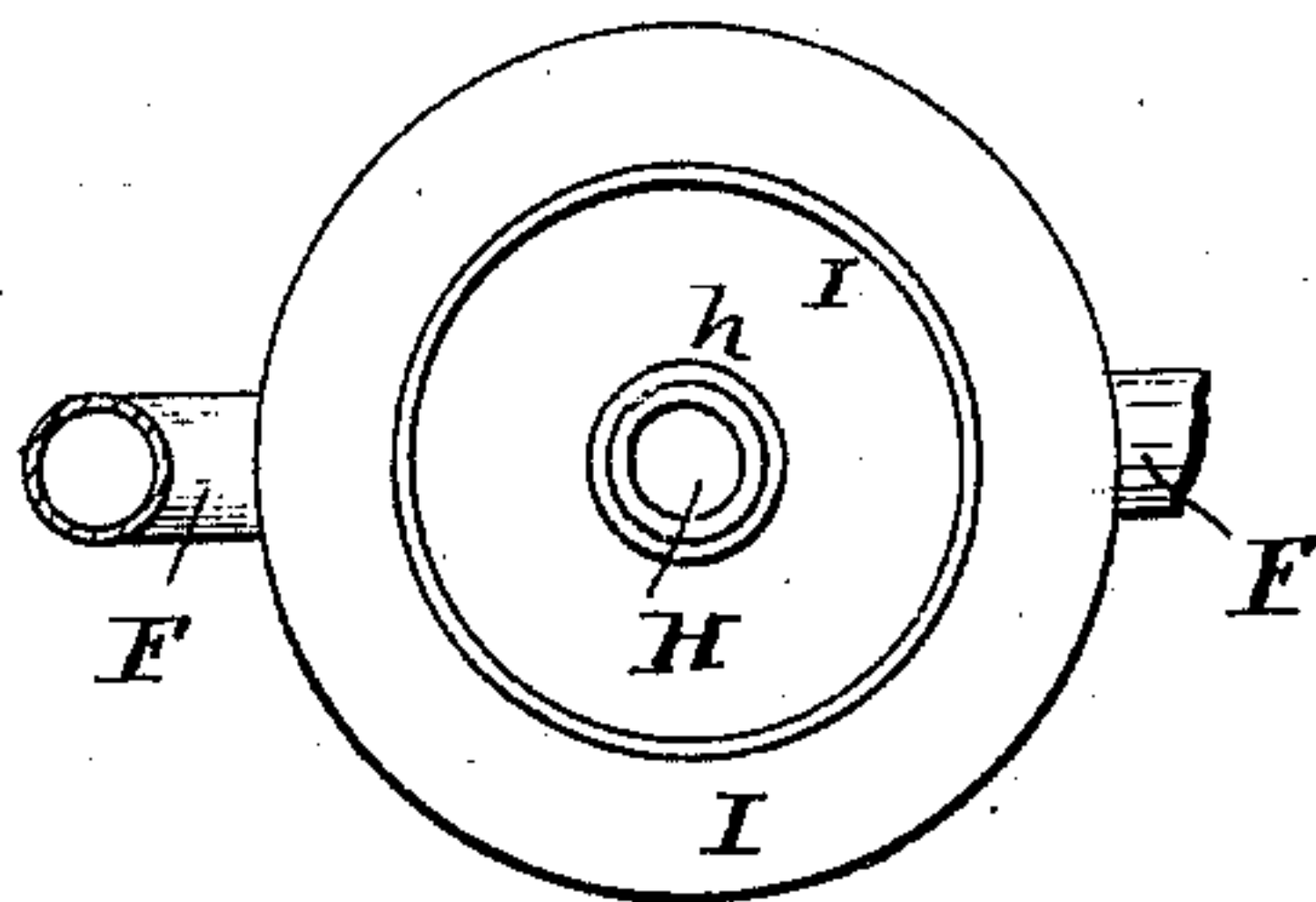
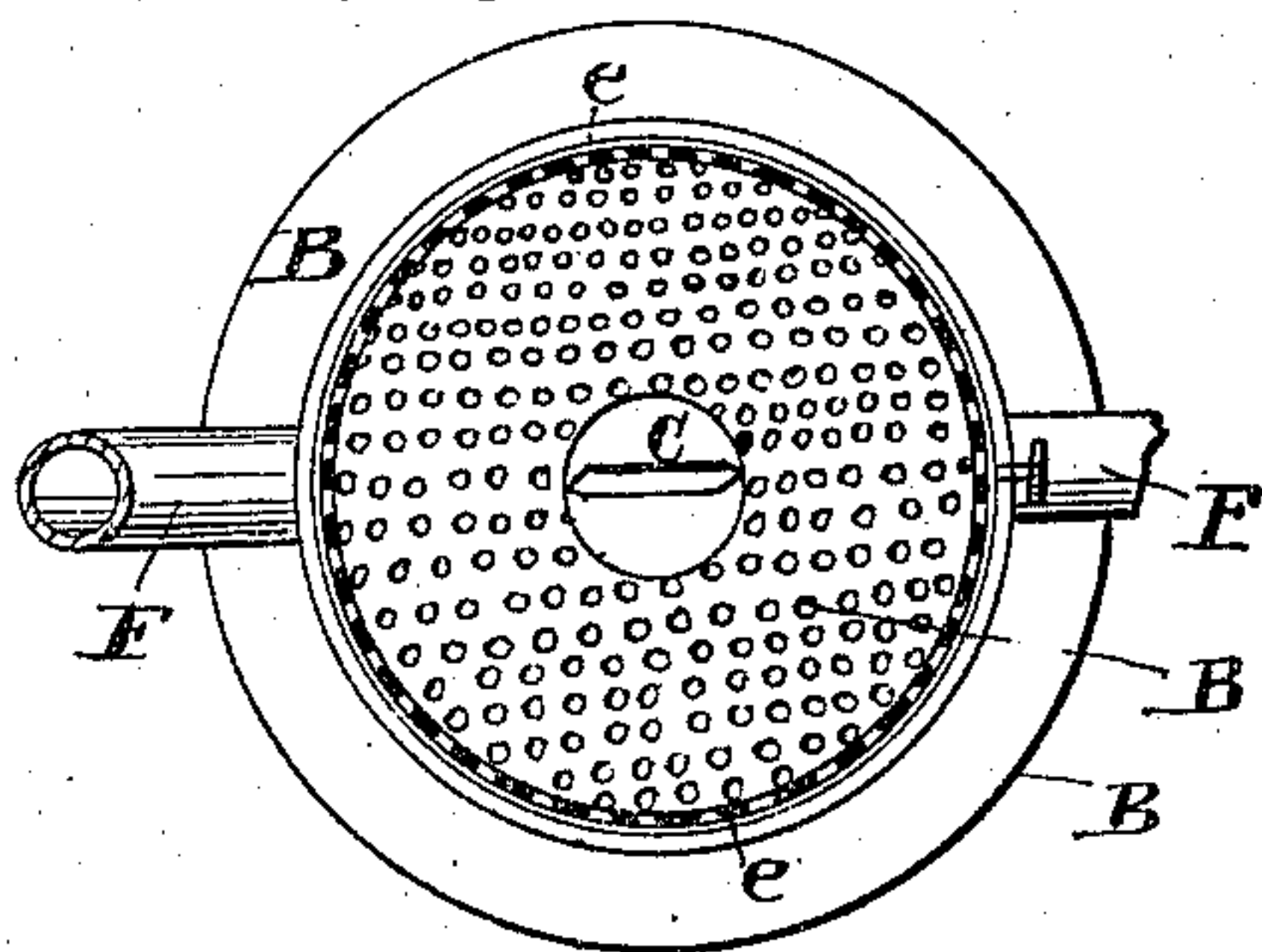


Fig. 3.



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UNITED STATES PATENT OFFICE.

J. H. IRWIN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. 89,770, dated May 4, 1869.

To all whom it may concern:

Be it known that I, JOHN H. IRWIN, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Lanterns; and I do hereby declare and make known that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

My said invention consists in a novel mode of constructing a lantern whereby the wind, instead of acting upon the flame in such a manner as to extinguish it, serves to support or sustain and prevent the extinguishment thereof.

To enable those skilled in the art to understand how to make and use my said invention, I will proceed to describe the construction and operation of the same, making reference in so doing to the aforesaid drawings, in which—

Figure 1 represents a vertical central section of my invention. Fig. 2 is a view of the under side of the flange marked I in Fig. 1, and Fig. 3 is a plan section taken at the line *x* in Fig. 1.

Similar letters of reference represent the same parts of my invention in the different figures.

A represents the oil-cup, which forms also the base of the lantern. There is no inclosure surrounding the same, and it is provided with a central tube, *a*, into which a removable burner is fitted, as shown.

B represents an annular plate arranged over the oil-cup, its edges turning down and fitting with the edge of the oil-cup, forming an air-chamber, B', said plate B being provided with a short central tube, *b*, over which an annular flange upon the burner fits, as shown in the drawings.

It will be observed that the burner is provided with two flanges, D D', the one fitting down upon the tube *b*, and the other fitting closely into the tube *a* of the oil-cup, said tubes sliding in the flanges simultaneously as the burner is secured.

A wick-tube, T, is arranged within the central flange of the burner D', which communicates with the oil-pot, while perforations in the burner form a communication opening from the annular air-chamber B' into the cone of the burner, as clearly indicated in Fig. 1.

Upon the top of the wick-tube is fixed a flange, *t*, which deflects the current of air passing into the burner, as hereinafter described, away from the root of the flame against the walls of the cone, by which the air is brought in contact with the flame at a short distance above the base of the flame, thus preventing the air-current from lifting the flame from the wick and extinguishing the light.

There is arranged upon the burner of the lantern a perforated plate or disk, E, of the same size as the bottom of the globe G, which may rest upon the same within a vertical rim, *c*, formed upon the circumference of said plate E, which thus admits the external air into the globe, through its perforations, freely and uniformly as desired.

Upon the top of the globe there is a metallic rim, *g*, sloping inward at the top, as shown, to which rim, and consequently to the globe, arms *d* are secured, whose upper ends are secured to an inverted saucer-like plate, I, which is thus held at a suitable distance above the top of the rim *g*, to allow the air and wind to pass freely in between the top of the globe and the said plate I.

The concave plate I is provided at its center with a flange, *h*, which fits closely upon a vertical tube, H, so as to slide up and down on said tube, to raise the globe G from the plate E when desired, said flange fitting to said tube closely, or being provided with a suitable spring or catch, to retain the globe at any required height, as may be desired.

At the top of the tube H two tubes, F F, are joined, which extend down, as shown, and open into the air-chamber B', upon opposite sides of the same.

Instead of two tubes F, arranged diametrically opposite each other, any other suitable even number of tubes F may be employed; but said tubes must be arranged in pairs directly opposite each other, and be arranged symmetrically at equal distances from each other, so that the force of the air-current, striking the flame on one side, shall be exactly counteracted by an equal force upon the opposite side, and thus keep the flame in an upright position, and prevent the extinguishment thereof when the lantern is swung or oscillated.

When the lantern is at rest and not blown upon by the wind, the air, heated by the flame at the burner, rises in the globe and passes

into the tubes H and F F. These tubes present a large radiating-surface, and the heated air is thereby rapidly deprived of its caloric, so that the slight upward pressure of hot air in the tube H will be sufficient to insure a downward current of cooled air through the vertical portions of the tubes F F into the air-chamber B' and interior of the burner-cone C to supply the flame with oxygen. Fresh air, in the meantime, passing up through the perforated plate E into the globe, tends to keep the glass cool, and mingles with the current from the tubes F F.

When the lantern is exposed to the wind the blast is distributed by passing through the perforated plate below; and, from the peculiar arrangement of the plate I over the globe, the wind passing into the space between the rim or flange *g* and said plate I is deflected upward into the tube H, where it mingles with the air heated within the globe, and so passes down the tubes F to supply the flame, while the flange *t* upon the wick-tube prevents the force of the blast from extinguishing it.

By making the rim *g* with its upper portion inclined inward, as shown, any current of air, entering between the plate I and rim *g*, would thereby be deflected upward toward the mouth of the tube H, and this deflection of a moving current of air would produce a current through the tubes F F in the absence of any other cause. Also, when the lantern is swung from side to side, or oscillated, the centrifugal tendency of the air in the tubes causes the air to rush into the mouth of the tube H from without, thus producing the required current at the burner.

From the above description it appears that there are three separate causes to produce a proper current through the tubes F F to the base of the flame, viz: the ascensive force of

the air heated by the burner-flame, and the cooling of said heated air within the tubes; the pressure of a moving current deflected toward the mouth of the tube H; and the centrifugal effect of swinging or oscillating the lantern. And it will be observed that either the second or third causes will always be cumulative with the first, to produce an increased current at exactly the time when an increased supply is demanded in consequence of atmospheric disturbances in the immediate vicinity of the lantern.

Movable rings may be placed upon the tubes, where only two tubes are employed, or even if more tubes are used, to serve as a guard for the globe.

Having described the construction and operation of my improvement, I will specify what I claim and desire to secure by Letters Patent:

1. The combination of the concave plate I, rim *g*, or its equivalent, tubes H and F F, and the base A B of the lantern, substantially in the manner specified and shown.
2. The combination of the globe G, concave plate I, tubes H and F, and base A B of the lantern, arranged and operating substantially as and for the purpose shown and set forth.
3. The combination of the plate I, tubes F, flange *t* upon the top of the wick-tube, and the globe G, arranged to operate as set forth.
4. The combination of the perforated plate E, plate I, tubes H F, and the base A B of the lantern, arranged to operate as described, and for the purpose set forth.

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Witnesses:

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