J. H. IRWIN.
Lantern.

No. 205,648. Patented July 2, 1878.

Fig. 1.

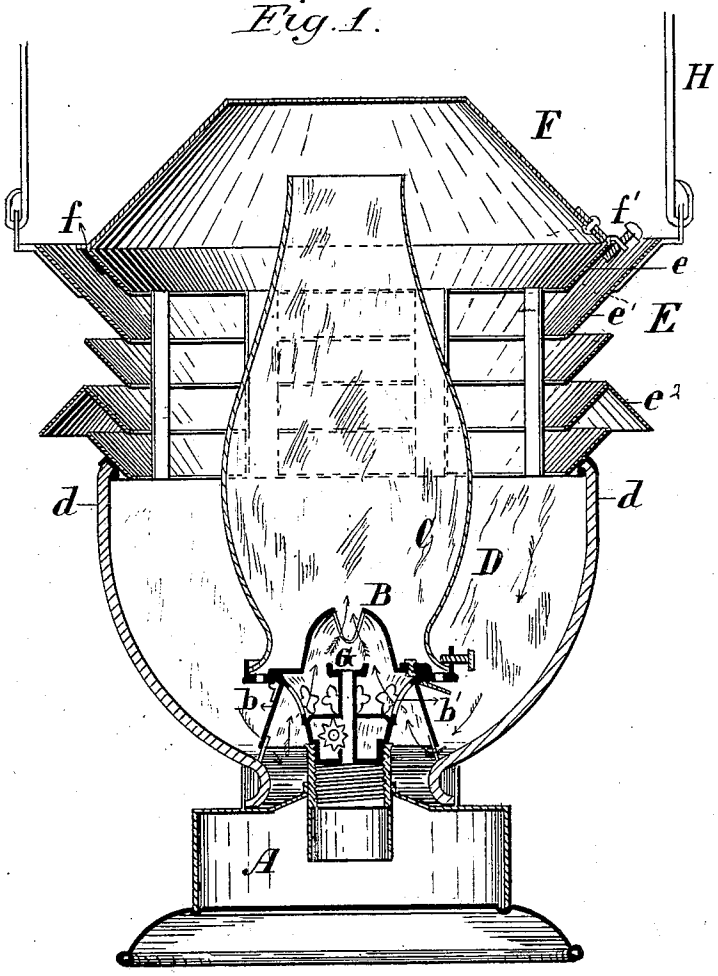
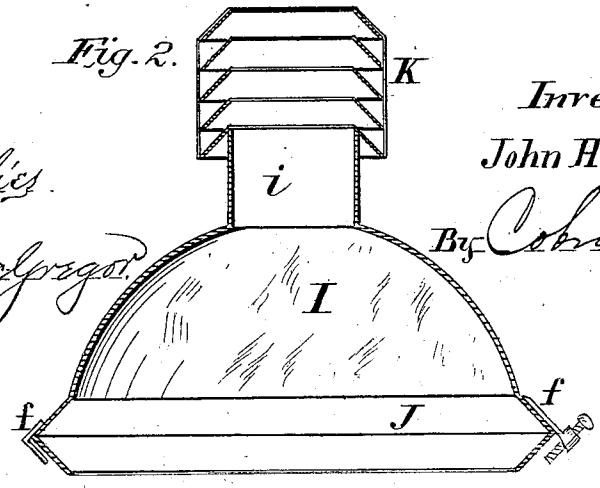


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **205,648**, dated July 2, 1878; application filed January 30, 1878.

To all whom it may concern:

Be it known that I, JOHN H. IRWIN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Lanterns, which is fully described and claimed in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical section of a lantern embodying my improvement, and Fig. 2 a similar section of a lantern-top, showing a modification in the construction of the top in Fig. 1.

My invention relates to an improvement in globe lanterns, whereby the continuity of the air-supply to the burner and the draft through the chimney is not interrupted by atmospheric currents without the lantern, or by movement of the latter in any direction whatever.

The invention consists in the combination, with a lantern, of an atmospheric injector composed of a series of deflecting-plates inclined inwardly and downwardly, constructed and arranged with reference to the chimney so as to constitute therewith a balanced atmospheric injector and ejector, by means of which the continuity of the circulation in the lantern is always preserved.

In the drawings, A represents the oil-pot of the lantern; B, the burner; C, the chimney, and D the globe, this improvement being applied to lanterns provided with both globes and chimneys.

The globe is hemispherical in form, or it may be in the shape of an elongated hemisphere, the upper portion thereof being straight, or nearly so, for a short distance, as shown at *d*, in Fig. 1 of the drawings.

An atmospheric injector, E, is arranged upon the top of the globe D, to the rim of which it is attached by any suitable means. This injector is composed of the conical plates *e*, e^1, and e^2, arranged as shown in the drawings; but the particular construction and arrangement it is not necessary here to specify with greater exactness, as this injector is fully described and shown in Letters Patent No. 150,958, heretofore granted to me, (May 19, 1874.)

The chimney C extends up within the injector even with the top of the latter, or slightly above it, and is covered by a conical cap or top, F, which is constructed of a size to fit the upper plate *e* of the injector, to which it is attached by suitable devices. The devices shown consist of clasps *f* attached to the top and arranged to slip over the outside of the plate *e*, while on one side of the top is a set-screw, *f'*, which is turned down to hold the top in place after the clasps are slipped over the injector-plate, as shown in Fig. 1 of the drawings.

It is evident that with these devices the top is removable, but it may be permanently attached to the injector, if desired, and if the globe is made removable; and the devices for securing it to the injector may be of any description suitable for the purpose, according as it is desired to have the top permanent or detachable.

In the drawings, the globe D is shown permanently attached to the bottom A; but it is evident that this construction is not necessary, as the globe can be readily made detachable in any of the well-known ways.

The air is admitted to the burner underneath the jacket or skirt *b* through holes *b'* in the cylindrical portion of the burner below the cone, and a deflector, G, is placed around the wick-tube at the top thereof in a manner and for the purpose well known and understood.

The top of the cap F is some little distance above the top of the chimney C, so as to leave a free space or chamber for the escape of the products of combustion from the latter. The lamp is provided with a bail, H, by which it is carried.

Now, if the lantern is subjected to the action of atmospheric currents, whether natural or produced by any sudden movement of the lantern itself, the air will be caught by the deflecting-plates of the injector and forced downward into the globe in the manner already described in my prior patent, mentioned above, and in another application of even date herewith. The air within the globe is turned into the burner, both on account of the shape of the globe and because of the rarefaction of the air within the chimney by heat from the burner.

The products of combustion rise through the chimney C and escape from the top thereof

into the chamber forward by the top F, whence they flow downward and outward through the openings in the injector E on the side opposite to that of the entering current of fresh air.

The chimney arranged as described in relation to the injector operates as an ejector, so that in connection with the former there is a combined balancing atmospheric injector and ejector operating upon the same principle and substantially in the manner described in my application of even date herewith for a "combined atmospheric injector and ejector."

The circulation within the lantern is thus kept up, even when subjected to changing currents, for as the injector is annular in form the air will be caught from whatever direction it comes, or whatever may be the movement of the lantern, and the operation being always as hereinbefore described, the atmospheric circuit can never be interrupted and the light put out.

The injector E, shown and described, is of special construction, but it may be modified somewhat without materially affecting the result hereinbefore set forth. The reversing-plates e^2 may be dispensed with, for instance; or the openings in the injector may be less in number than shown, and yet tolerably good results obtained.

In the construction shown the plate e^2 catches the air and drives it into the lantern when the latter is moved downward, or when a current blows from this direction; but when removed the induced current will be sufficient to keep up the exhaust from the top of the chimney, so as not to interrupt the circulation, fresh air being taken in at the sides by the action of the induced current sufficiently to keep up the necessary supply.

In the construction shown in Fig. 1 of the drawings, the top F is designed to be made of sheet metal; but a glass top may be preferable for some reasons, and in Fig. 2 I have shown such a top adapted to this style of lantern. The main portion I of the top is hemispherical in form, and the globe and top may be constructed so as to represent parts of the same sphere.

This glass top I is secured to a metallic fastening-ring, J, which is adapted to fit within the upper plate e of the injector like the top F, and is secured thereto by the devices shown in Fig. 1 of the drawings, or any others which will permit the top to be detached, this latter feature of construction being desirable with a glass top. It is also necessary to provide means for taking away the heated gases from the glass top I more speedily than with the metallic top F, so as to avoid any danger of cracking the top by overheating.

A short tube, i, is therefore inserted in the top of the glass portion I, and upon the upper end of this tube is arranged an atmospheric ejector, K, which is constructed like the ejector described and shown in Letters Patent No. 173,958, granted to me February 22, 1876.

The general operation with this style of top is the same as with the top F; but if the hot gases escaping from the top of the chimney are not quickly taken off, as heretofore described, a portion will be taken up through the tube i and carried out into the atmosphere by the action of the ejector K, thereby relieving the top from overheating.

I do not limit myself to the precise construction and arrangement of any of the parts here shown, as they may be modified as circumstances may require. It is necessary, however, in carrying out my invention, that the top of the chimney should be nearly on a level with the top of the injector, and that there should be a chamber above the top of the chimney; otherwise the balancing effect above described will be materially modified, and under certain conditions will entirely disappear.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a globe lantern, an annular atmospheric injector composed of a series of deflecting-plates inclined inwardly and downwardly, arranged above the globe, in combination with a chimney extending up within the injector to a point above the inlet-openings for the currents of air, and a closed top arranged above the chimney, substantially as described.

2. The annular injector E, in combination with the globe D, burner B, chimney C, and top F, arranged and operating substantially as described.

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Witnesses:
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