

J. H. IRWIN.
Lantern.

No. 205,649.

Patented July 2, 1878.

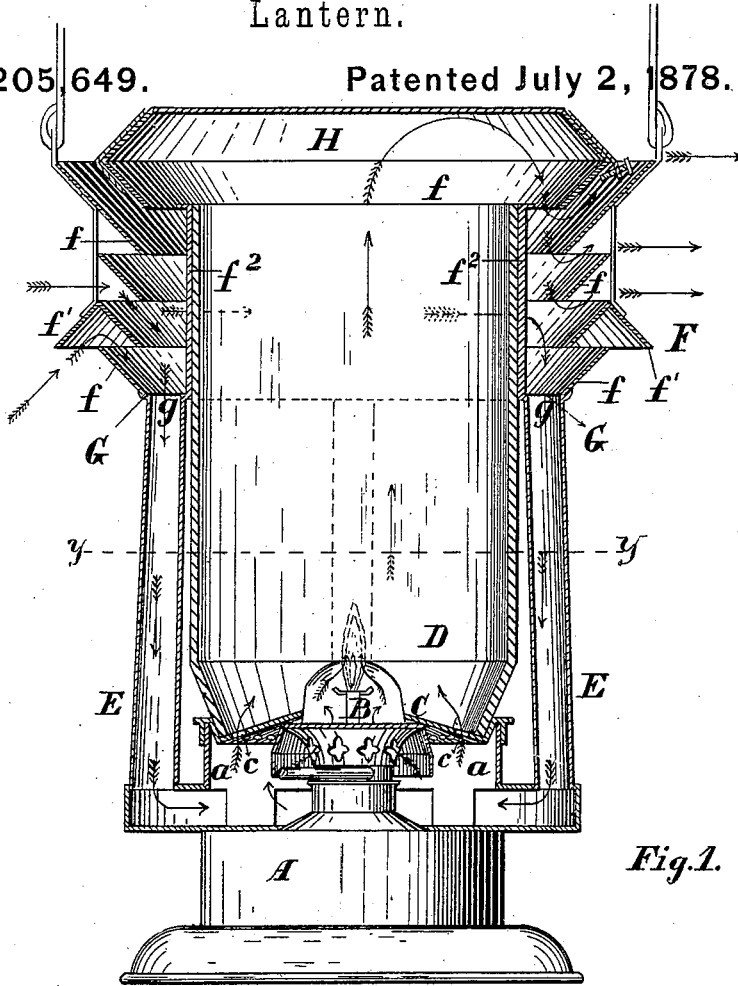


Fig. 1.

Fig 2

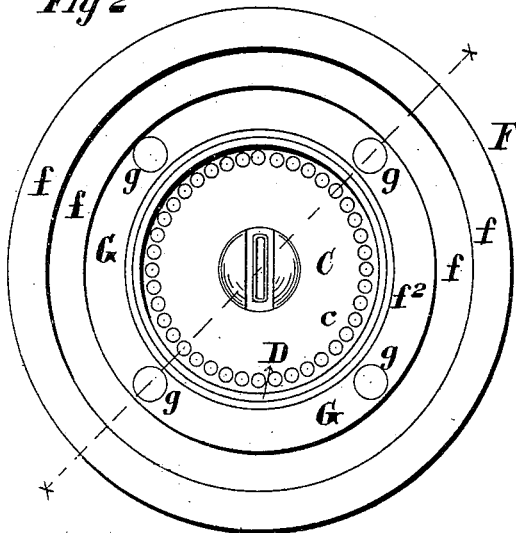
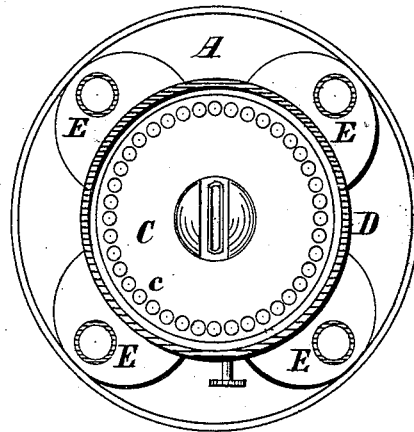


Fig. 3.



Witnesses

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IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **205,649**, dated July 2, 1878; application filed March 14, 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 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, taken on the line *x x*, Fig. 2. Fig. 2 is a plan view of the same with the top removed; and Fig. 3, a plan section taken on the line *y y*, Fig. 1.

My invention relates to a chimney-lantern constructed upon the general principle of the lantern shown and described in Letters Patent No. 104,318, heretofore granted to me, June 14, 1870; and the object of the present improvement is to apply my improved combined atmospheric injector and ejector to a lantern constructed upon the principle therein set forth.

In the lantern described and shown in the Letters Patent above mentioned, the atmospheric injector and ejector are independent devices, and are separate from each other in their arrangement in the lantern.

The present invention consists in the combination of an air injector and ejector combined in a single device, with tubes through which air is supplied to the burner, and a chimney from which the products of combustion are exhausted.

It also consists in special devices and combinations of devices, all of which will be hereinafter more fully set forth.

When the air injector and ejector are made independent devices and are separated from each other, not only is the arrangement less compact and convenient, but, also, there is more or less imperfection in the balancing effect of one upon the other.

I have invented a combined atmospheric ejector and injector, in which the two devices are arranged so as to constitute but a single device, and in which the balancing effects of the currents are reached almost perfectly.

This improvement as an independent device, however, constitutes the subject-matter

of a separate application for patent, and is not included in the present invention, except in combination with other devices.

In the drawings, A represents the oil-pot of the lantern, and B the burner, which are of ordinary construction, and do not require special description.

The burner is surrounded by a plate, C, resting upon a flange, *a*, above the oil-pot, and provided with a series of holes, *c*, extending around it, near its outer extremity, the number of which is adapted to supply the necessary amount of fresh air to the slot in the cone above the plate.

The chimney D rests upon the plate C, as shown in Fig. 1 of the drawings, and below the plate there will be a chamber, between it and the oil-pot. Upright tubes E are arranged upon the outside of the chimney, the lower ends of which open into the air-chamber below the plate C. These tubes may be of any number desired. In a lamp one tube is sufficient to secure practical results; in a lantern or heating device the number may be increased according to the supply of air demanded.

In the drawings I have shown four of these tubes, arranged in pairs opposite to each other; but a single pair may be employed with good results.

The chimney D extends some distance above the upper ends of the tubes E, and around the upper end thereof, above the tubes, I arrange my improved combined air injector and ejector.

This injector and ejector F is composed of the series of plates *f*, inclined upward and outward, and arranged one above the other, as shown in Fig. 1 of the drawings, and an outside plate, *f*¹, attached to the upper edge of the second plate from the bottom, and inclined downward and outward; and in connection with these plates there is a band or ring, *f*², arranged within the plates, as shown in the drawings. The second plate from the top also extends outward farther than the others, so that the upper edge is flush with the upper edge of the top plate.

The top of the band *f*² is preferably a little lower than the top of the plates, and the up-

per end of the chimney is fitted therein, as shown in Fig. 1 of the drawings.

At the bottom of the band f^2 is a flange or horizontal annular plate, G, joined to the lower edges of the band and the lower plate f , so as to close the space between the tubes. This bottom plate is provided with apertures g , into which the upper ends of the tubes E are fitted, so that they open into the annular space around the lower end of the band, thus forming passages from the latter to the air-chamber around the burner.

A cover or top, H, is fitted to the upper plate f , and may be secured thereto by any suitable devices.

In the construction herein described and shown, this top should be hinged or made removable, however, so that the chimney may be reached, which is not fastened to any part of the lantern, and may be removed by slipping it up through the ring f^2 and out at the top of the lantern, when the top H is removed or turned back.

As shown in Fig. 1 of the drawings, a chamber is provided above the chimney, below the lantern-top H, into which the products of combustion escape. This top may extend straight across from one edge of the injector to the other, or may be turned up slightly, so as to stand above the level of the injector.

When the lantern is exposed to the action of currents of air, either natural or produced by the quick movement of the lantern in any direction, the air is caught by the plates of the injector on the side exposed to the current, conducted in between them, and a portion is forced down through the tubes into the air-chamber about the burner, as shown by arrows in Fig. 1, thereby keeping up a continuous supply of air to the latter.

If the supply is greater than required, the superfluous air escapes through the perforations in the plate C, and rises through the chimney, mixed with the products of combustion, flowing out at the top of the chimney. A portion of the air entering the spaces between the plates will pass around the band on the outside of the chimney, and be ejected at the opposite side of the device, as indicated by the arrows in Fig. 1 of the drawings, and the hot air and gases escaping from the chimney will be carried out by this ejector-current.

A part of the air passing around the chimney will also dive down through the tubes as it reaches them, so that the supply is not limited to one when more are provided. But the size of the tubes should be regulated so that together they will not supply much more air to the burner than is necessary. The plate f^1 catches the air if it comes from below, or if the lantern is moved suddenly downward and directs it in between the plates f , when the action is as described above.

The supply of air to the burner will be con-

tinuous, as the circuit can never be broken, and the lantern may, therefore, be exposed to high winds or swung and moved in any direction without the possibility of putting out the light.

I have shown one method of carrying out my invention; but I do not confine myself to the construction and arrangement of devices herein shown and set forth, for the improved atmospheric injector and ejector may be applied under substantially the same arrangement to lanterns of the class named above, the construction of which in other respects may be very different from that herein described.

The essential feature of the invention is the relative arrangement of the combined injector and ejector and the chimney, in connection with supply-tubes of some kind to conduct air to the burner, and so long as this feature is retained the embodiment of my improvement remains; and in carrying out this invention it is not necessary to use in the injector and ejector the precise number of plates shown in the drawings, or to arrange them in relation to each other exactly as specified. Some modification may be made in both these particulars without destroying the combination of the injector and ejector in a single device, substantially annular in form, which is the principle of construction controlling this part of my improvement.

It is possible that, with some kinds of chimney, the band or collar f^2 may be dispensed with, leaving the plate G fitting closely about the chimney, to hold it in place and prevent the air from passing down outside thereof.

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

1. In a chimney-lantern, a combined annular atmospheric injector and ejector, arranged around the upper end of the chimney, in combination with one or more conducting-tubes leading from the injector to an air-chamber around the burner and below the chimney, a chimney extending from the burner up through the injector and ejector to the top thereof, or nearly so, and an air-space above the chimney opening into the injector, and covered with a close top, whereby the gases escaping from the chimney are turned downward into the injector, and discharged thence between the inclined plates at one side, substantially as described.

2. An annular air injector and ejector composed of inclined plates f and ring f^2 , in combination with the annular plate G, closing the space between the plates and chimney at the bottom of the device, and one or more tubes, E, inserted in the plate G, and connecting with an air-space around the burner, substantially as described.

3. The annular air injector and ejector composed of the plates f and f^2 , in combina-

tion with the chimney D, the upper end of which is fitted within the band, substantially as described.

4. The air-tubes E, opening into the air-space below the chimney, in combination with the chimney D, annular injector and ejector F, constructed substantially as specified, and top H, substantially as described.

5. The removable chimney D, in combination with the air injector and ejector F, within which it is held, and the removable top H, substantially as described.

JOHN H. IRWIN.

Witnesses:

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