J. H. IRWIN.

Lantern.

No. 205,749. Patented July 9, 1878.

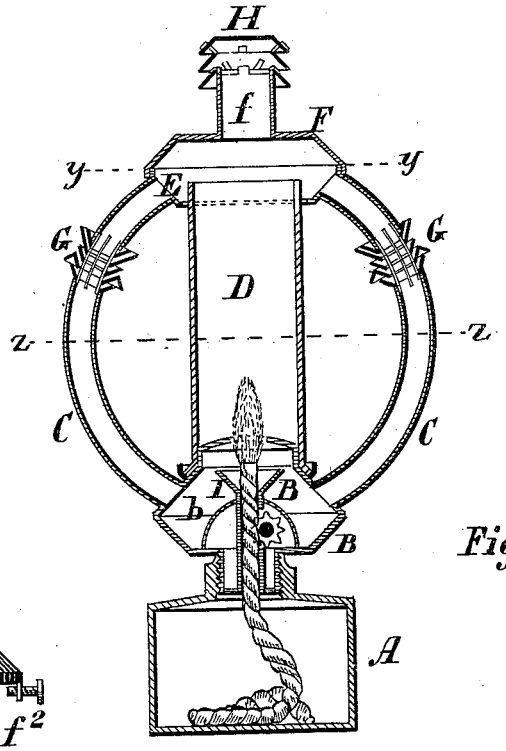

Fig 1

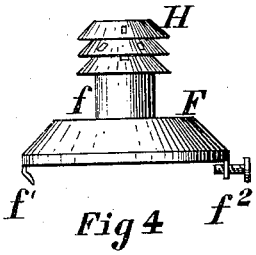

Fig 4

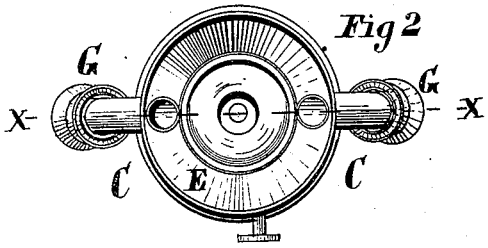

Fig 2

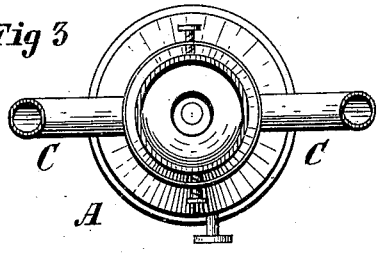

Fig 3

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **205,749**, dated July 9, 1878; application filed May 11, 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 improvements, taken on the line *x x*, Fig. 2; Fig. 2, a plan section taken on the line *y y*, Fig. 1; Fig. 3, a similar view taken on the line *z z*, Fig. 1; and Fig. 4, an elevation of the top.

My invention relates to that class of lanterns generally known as "tubular;" and the object of my present improvements is to combine with the air-conducting tubes atmospheric injectors and ejectors, whereby the circulation is improved and rendered continuous.

The invention consists in the combination of the air-tubes with injectors arranged within the tubes between the burner and the top.

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

In the drawings, A represents the oil-pot of the lantern, and B the burner, which is attached to the oil-pot by a screw-thread, in the usual way, as shown in Fig. 1 of the drawings. The burner is provided with an inclosed air space or chamber, *b*, below the top of the wick-tube, formed by the outer casing surrounding the burner. Air-tubes C are attached at their lower ends to the burner, being arranged to open directly into the air-chamber. These tubes extend upward outside of the globe or chimney D, which surmounts the burner, and are connected with a circular plate, E, at their upper ends, as shown in Fig. 2 of the drawings. This plate surrounds the upper edge of the chimney or globe, which is fitted thereto, and is represented in the drawings as inclined outward and upward, or flaring. A top, F, is fitted to the upper portion of the annular plate, so as to be readily attached to or removed from the latter.

It will thus be seen that a small air space or chamber is provided just above the chimney, into which the upper ends of the air-tubes C open, and also the upper end of the globe or chimney. In each of the tubes C an atmospheric injector, G, is inserted between the upper and lower chambers. This injector is preferably arranged nearer to the upper ends of the tubes than the lower, as shown in Fig. 1 of the drawings, for reasons which will be explained hereinafter.

The injector shown in the drawings is of the style described and illustrated in Letters Patent No. 150,958, granted to me May 19, 1874, to which reference is made for a particular description of its construction. The top F is provided with a short tubular opening, *f*, which is surmounted by an atmospheric ejector, H, the construction of which is set forth in Letters Patent No. 173,958, granted to me February 22, 1876, to which reference is made for a more full description.

Now, a constant current of air will be supplied to the lower chamber around the burner through the injectors G and tubes C, and when exposed to currents of air, either natural or artificial, caused by swinging or moving the lantern, the operation of the injector will cause the flow of air through the tubes to the burner to be continuous. The heated products of combustion pass up through the chimney, escaping from the top thereof into the space below the lantern-top, and thence discharged through the opening *f* by the operation of the ejector H, surmounting the top. This circulation will be continuous under all circumstances, so that combustion at the burner will be uninterrupted and the light of the lantern constant. Under some conditions a small portion of the chimney-discharge will be drawn into the tubes; but it will pass out at the injectors. As the air-tubes open into both the upper and lower chambers, it is evident that the well-known balancing effect incident to my tubular lanterns is also here obtained. If the injectors G are placed at the middle of the tubes C, or nearer to the lower ends than the upper, under some conditions the balance of the currents would become deranged, and the air and gases would flow up through the openings in the upper ends of the tubes, the current would be down the chimney, and of course the light would be extinguished.

For this reason I prefer to arrange the injectors above the middle of the tubes, as shown in Fig. 1 of the drawings, so as to increase the column of air in the tubes between them and the burner, and thereby obviate the danger of the balance being overcome and the direction of the currents reversed. The tubes in the drawings are given a bent or curved form; but this is a mere matter of taste, and their form may be changed without affecting the principle of operation.

The globe or chimney sits loosely upon the burner, to which it may be secured by any of the well-known devices for this purpose.

The top F may be attached to the annular plate E by a catch, f^1, on one side fitting the plate, and a set-screw, f^2, on the other side, as shown in Fig. 4 of the drawings, or by hinge or any other suitable device, by which it is rendered removable, so that the chimney may be removed by raising it up through the plate within which it is held.

It will be noticed that the tubes are attached to the burner or casing thereof, and not to the oil-pot, so that by unscrewing the burner, both it and the tubes are separated from the oil-pot or lantern-bottom. In fact, the tubes, burner, and chimney may be removed from the bottom together as though in one piece.

The burner is supplied with an inclined deflecting-plate, I, surrounding the wick-tube, the operation of which in directing the air to the flame will be readily understood.

The air-injector G and ejector H (shown in the drawings) are above referred to as of particular construction; but my invention is not limited to any particular construction of these devices, as any injector or ejector suitable, which will operate satisfactorily in the described positions may be employed instead of the special ones patented by me, although I have found the latter very efficient and desirable.

I do not limit myself to the particular construction, arrangement, and design of the several parts of the lantern herein shown and described, for these may be varied in a great number of ways without materially affecting the function and operation of the devices, and so long as these remain the gist of my improvement is still retained.

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

1. In a tubular lantern, the burner B, provided with an air-chamber, *b*, in combination with the tubes C and air-injectors G, inserted in the tubes between their upper and lower ends, substantially as described.

2. In a lantern provided with an air-space around the burner and at the top of the chimney, the tubes C, connecting the two air spaces or chambers, in combination with the injectors G, arranged within the tubes between their extremities and the chimney D, substantially as described.

3. The burner B, provided with an air-chamber, *b*, in combination with the tubes C, provided with air-injectors G, the chimnney D, and the top F, provided with an ejector, H, substantially as described.

JOHN H. IRWIN.

Witnesses:
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