4 Sheets—Sheet 1.

J. H. IRWIN.

Lamp.

No. 212,603. Patented Feb. 25, 1879.

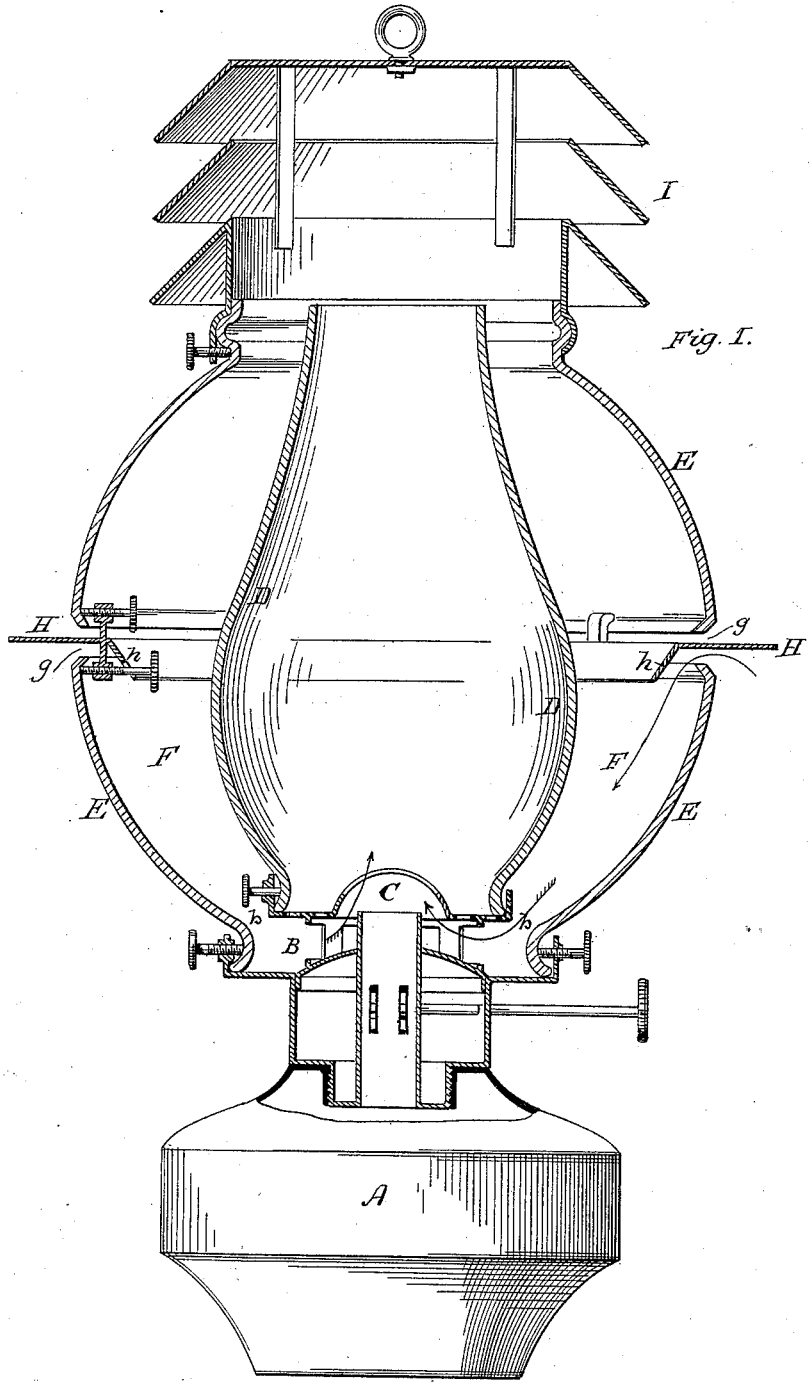

Fig. I.

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Inventor:

John H. Irwin

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Lamp.

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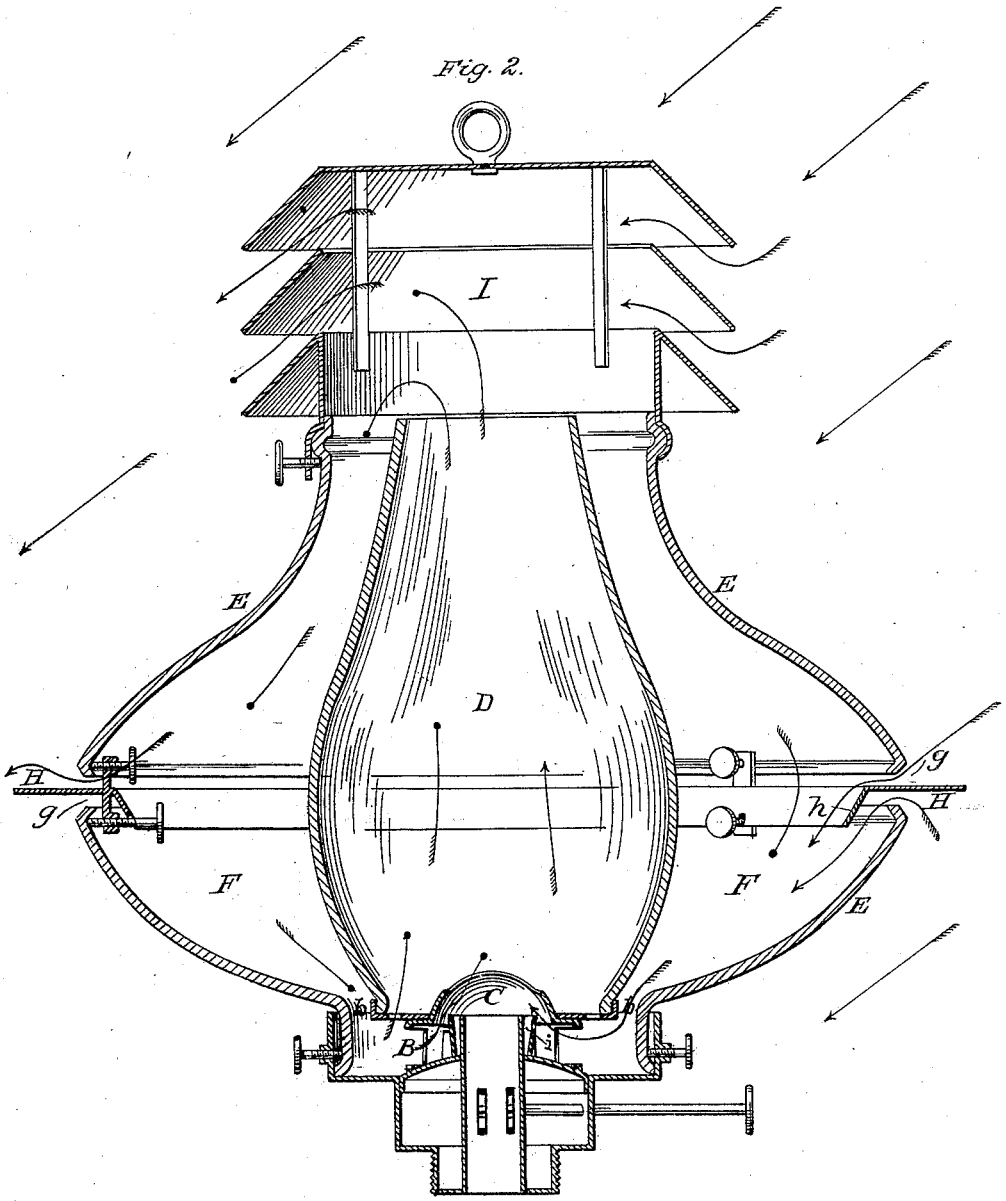
Fig. 2.



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Clarence Poole
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Inventor:

John H. Irwin

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J. H. IRWIN.

Lamp.

No. 212,603. Patented Feb. 25, 1879.

Fig. 3.

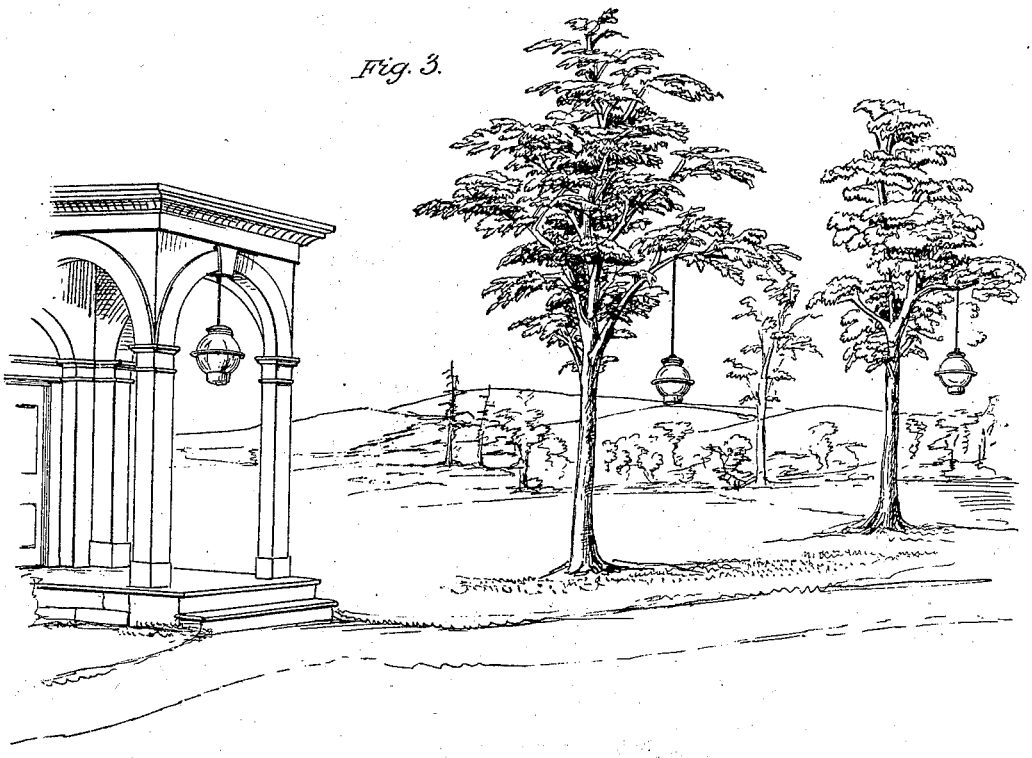
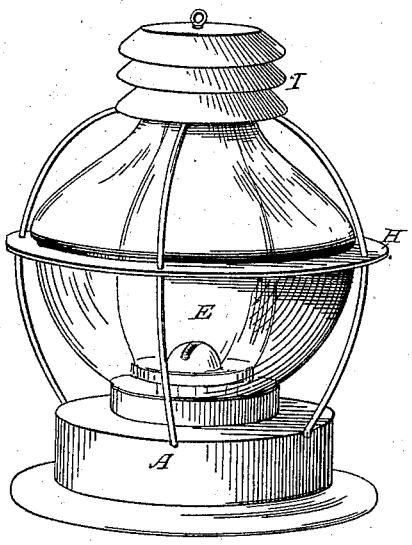


Fig. 7.



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John H. Irwin

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J. H. IRWIN.

Lamp.

No. 212,603. **Patented Feb. 25, 1879.**

Fig. 4.

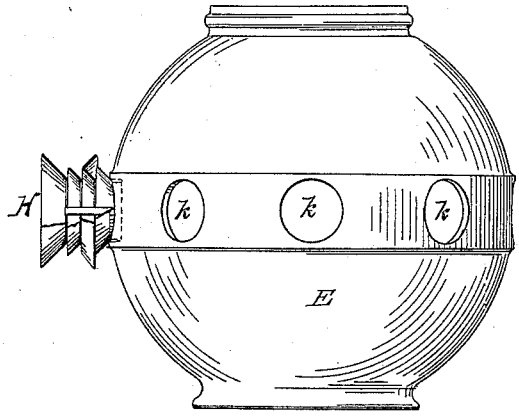


Fig. 6.

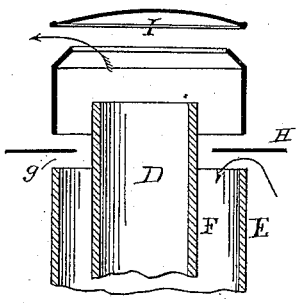
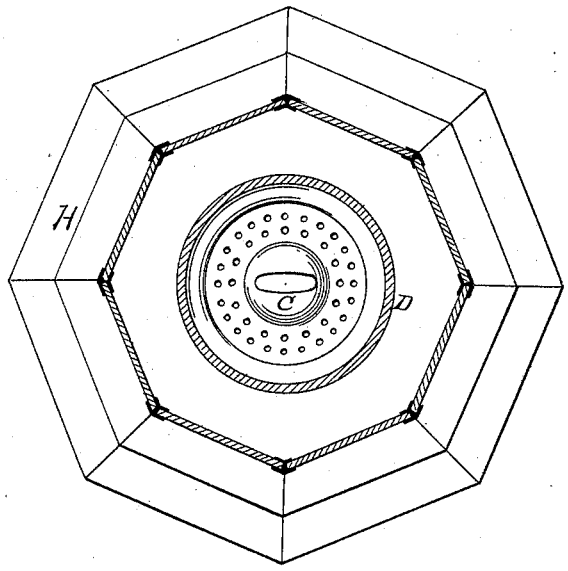


Fig. 5.



Attest:

Clarence Poole.
Victor Coombe

Inventor:

John H. Irwin

UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. **212,603**, dated February 25, 1879; application filed January 16, 1879.

To all whom it may concern:

Be it known that I, JOHN H. IRWIN, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Lamps and Lanterns; and that the following is a full and exact description of the same.

This invention relates to that class of lamps now known in the market as "tubular," and particularly to that kind wherein the side tubes are replaced by an annular chamber between an inner glass or chimney and an outer glass or globe, the air to feed the flame being discharged into the burner from the bottom of said chamber, and received at some point at a distance above the bottom.

In all lamps of this class the prime condition required is the supply of air to the burner to support combustion therein, and this may be secured by injection of air below the burner-cone, or by exhaustion at the top of the chimney.

In practice it is necessary to apply devices which effect these results simultaneously, and it is found that, under the great variety of disturbing effects due to movements of the lamp itself, or to the movements of air-currents in the vicinity, results most uniform and satisfactory are secured when a communication exists between the annular supply-chamber and the space within the chimney, so that there may exist an actual circuit of the air which passes through the burner, and uniformity of pressure at both sides be thereby secured in a measure independent of outside disturbances.

These features have been heretofore patented to me, and it is not designed to claim them broadly herein.

The particular object of this improvement is to produce a lamp the flame whereof shall be capable of withstanding all the disturbing effects incident to ordinary use of a portable lamp indoors or outdoors, and at the same time present an appearance esthetically unobjectionable.

That others may fully understand this invention, I will more particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a sectional view of my lantern. Fig. 2 is a sectional view of a modified form of the outer globe. Fig. 3 shows several of my lanterns suspended for use in a garden, &c. Fig. 4 shows a modified form, in which the globe is made in one piece. Fig. 5 shows a sectional plan of a lantern of angular form. Fig. 6 is a diagram of a modified form; and Fig. 7 shows lantern with wire guard.

A is the oil-pot, surmounted with an air-chamber, B, and a burner-cone, C, as usual with lamps of this class. Above the burner-cone there is a chimney, D, and surrounding the same there is an outer globe, E, and an air-chamber, F, inclosed between said globe and chimney. The air-chamber F is separated from the air-chamber B by a contracted passage at *b*, so that currents or eddies in the former will have less tendency to disturb the air in the latter. The chamber F constitutes the air-reservoir, from which air to support combustion is drawn, and the supply so exhausted must be constantly made good, or the flame will smoke or be extinguished.

In order to impart a tasteful appearance to the lamp, I prefer to make the globe of swelling or protuberant form, though such form will exert little or no influence upon the operation of the lamp.

The inlet for fresh air I prefer to locate in the surface of the globe E at the point farthest distant from the chimney; and I find it convenient to make the globe in two parts, slightly separated at their adjacent edges, as at *g*, to form an air-inlet.

In order to catch currents of air moving over the surface of the globe with an upward or downward inclination, and turn the same into the inlet, a plate, H, is located midway in the space *g*, and its outer edge is required to project rather farther from the chimney than any part of the globe. Without a provision of this character such air-currents would pass across that opening, and, according to the well-known law of pneumatics, air would be exhausted therefrom instead of being injected.

I find it desirable, also, that such currents shall enter the chamber F with a downward inclination, because they will thereby be directed toward the inlet to the burner, and the

formation of eddies within said chamber wil be discouraged. Air-currents entering from above the plate H will pass into said chamber with the desired inclination, and those entering from below will have it imparted to them by a slightly-drooping interior edge, *h*, of the plate H. The adjacent edges of the globe may also be turned inward to facilitate the injection of external air-currents.

The chimney D terminates within the chamber F; but an escape for the products of combustion is provided at the top of said chamber, and said escape is provided with an ejector, I, of some approved construction, whereby all air-currents from without are caused to pass over the outlet with a uniform direction. The plate H, I shall probably prefer to make of metal, but it may be made of other material; and the upper and lower parts of the globes I shall probably make of glass or porcelain, but they may also be made of other material, and they may be separately attached and secured to the plate by any proper appliances; or it will be possible to construct the whole of glass or other material in one piece.

I do not propose to limit myself in any way as to the materials employed or in the modes of attachment.

The entrance of air at the inlet *g* with a downward direction will tend to increase exhaustion at the top of the chimney, and a portion of the hot air therefrom, varying in quantity, will be ejected or drawn down and returned to the burner. This constitutes the circuit above mentioned, which renders the air-supply self-adjusting to all the variations of outside disturbance, and in this effect the injector acts as an ejector as well as an injector.

The above comprises the principles of structure which I wish to cover herein.

It is apparent, however, that they are susceptible of great variation in appearance without in any material degree changing their character or operation. A few such modifications I exhibit by way of illustration.

The base of the lamp may be fitted to rest in a basket on a bracket or stand, or may be fitted with a foot, as a table-lamp. It may also be provided with a bail or means for attaching a suspending device, so that it may be carried conveniently in the hand or suspended from some stationary support. It may also be provided with a wire-guard if intended for outdoor use.

In this connection it may be mentioned that it constitutes a very effective lamp for use in hall-ways, in entrance-porches, for garden use, &c., it being possible to dispense with the ordinary projecting brackets or supporting-posts. Fig. 3 shows several of these lamps so suspended.

In Fig. 4, I represent a modification in structure, the globe E being blown in one piece, and provided with openings *k*, more or less in number, arranged around its larger part. Each one of these openings will be provided with an injecting device of suitable structure. These injectors may then be sections of the annular injector herein shown, or as represented in patents heretofore granted to me; but no different operations will be thereby produced.

For some purposes it may be desirable to make the exterior part of the lamp angular, similar to Fig. 5, and the injector will then assume a similar shape, and may be continuous or sectional, and arranged on all faces or on alternate faces, as desired.

In practice it will be preferred, generally, to make the upper part of the globe translucent or opaque, with an internal reflecting-surface.

I claim—

1. The burner C, provided with an air-chamber, B, and a chimney, D, combined with a globe, E, inclosing the air-chamber F, and provided with the injector-plate H, substantially as and for the purpose set forth.

2. The burner C, provided with an air-chamber, B, and a chimney, D, combined with a globe, E, inclosing an air-chamber, F, and provided with an injector, H, and ejector-cap I, substantially as and for the purpose set forth.

3. The burner C, provided with an air-chamber, B, and a chimney, D, and a globe, E, provided with an air-inlet, *g*, or series of inlets, combined with an injector or series of injectors, sectional or otherwise, at said inlet or inlets, as set forth.

4. The burner C, provided with an air-chamber, B, and a chimney, D, combined with a globe, E, made in two parts, with an injector-plate, H, placed between the adjacent edges, and secured thereto by any suitable or convenient mechanism, as set forth.

5. A burner, C, provided with an air-chamber, B, chimney D, and globe E, combined with an injector-plate, H, the inner edge, *h*, whereof is made drooping or inclined downward, as shown, and for the purpose described.

6. A globe, E, blown in one piece, open at the top for the escape of the products of combustion, and with an opening or series of openings, arranged substantially as shown, whereby it is adapted to act in conjunction with the air-chamber B, burner C, and chimney D, in the manner set forth.

JOHN H. IRWIN.

Witnesses:
LEWIS F. BETTS,
REBECCA J. ELDER.