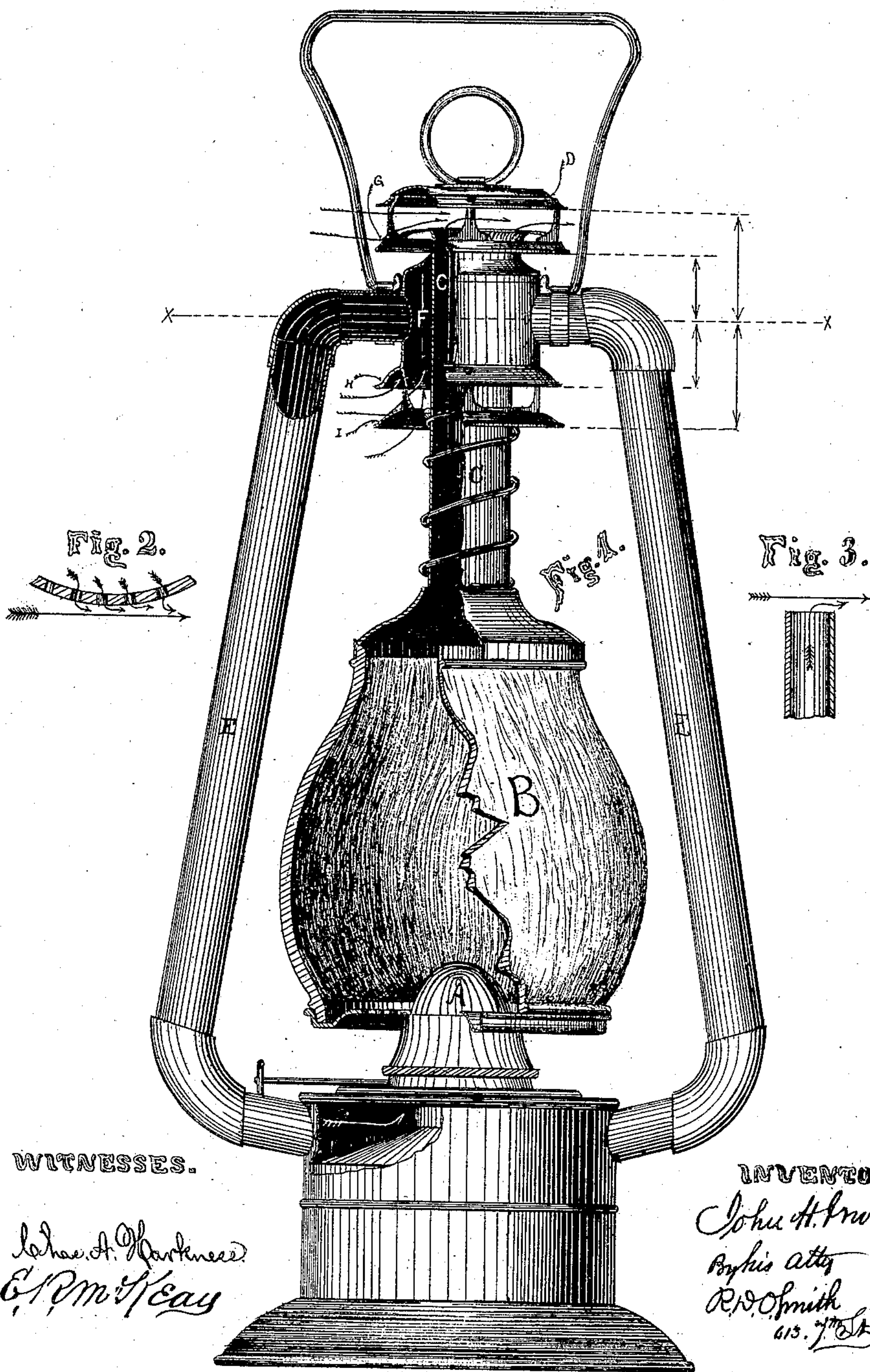


J. H. IRWIN.

Lantern.

No. 104,318.

Patented June 14, 1870.



UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF NEW YORK, N. Y.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **104,318**, dated June 14, 1870.

To all whom it may concern:

Be it known that I, JOHN H. IRWIN, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Lanterns; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my invention. Figs. 2 and 3 illustrate the effect of external moving currents of air.

This invention relates to an improvement in the manner of introducing atmospheric air to the illuminating flame in a lantern, (heretofore patented to me;) and it consists in the peculiar manner of arranging the deflecting-plates at the air-inlet and at the top of the chimney or outlet, so that a complete equilibrium of pressure will be secured when the lantern is exposed to wind or vertical or lateral motion, and none but fresh atmospheric air will be admitted to the feeding-tubes, as will be hereinafter more fully set forth. The air, rarefied by the flame at the burner A, rises through the globe B and chimney C and escapes at the top of the same beneath the cap D. A supply of fresh air equal to the quantity thus ascending and escaping from the chimney must be constantly supplied, or illuminating combustion will cease. In all ordinary lamps and lanterns the supply of air is admitted directly from the surrounding atmosphere to the burner beneath the cone. While the lamp is at rest in a quiet atmosphere the illumination is satisfactory, but it is sensitive to all atmospheric disturbances in the vicinity, and for these reasons: If a current of air blows across the open top of the chimney, the motion of the ascending column of hot air (products of combustion) within the same is accelerated, according to the well-known laws of pneumatics, and the flame is "lifted" and caused to smoke or is extinguished, because there is not a coincident and equal acceleration in the admission of fresh air at the base of the burner; and if the moving current of air strikes the perforated plate which always surrounds the base of the burner, the effect is to reverse the usual current and cause an outward flow through said orifices, in obedience to the same law of pneumatics.

The flame then smokes or is extinguished, because the supply of oxygen is diminished or entirely cut off. When the lamp or lantern is moved through the air, both the above-named effects are produced, and when the lantern is oscillated (being supported by its bail) the centrifugal action upon the column of air within the chimney, added to the effect of the currents induced by the movements of the lantern moving across the perforations at the base, cause the direction of the current through the burner to be reversed, and the lantern is extinguished. These effects are all well known, though their causes have been misunderstood.

To obviate the objectionable effects above referred to, I devised and have heretofore patented an arrangement of feeding-tubes, which receive air at the top of the lantern near the outlet of the chimney and conduct it to the burner, thereby neutralizing the effects of centrifugal forces, and obviating the effects of exterior moving currents of air, by causing them to insure an inflow at the base of the burner (through the feeding-tubes) equal to the outflow at the top of the chimney.

In the lantern above referred to, hitherto patented to me, a portion of the rarefied air from the burner is received into the feeding-tubes and reconducted to the burner. This portion does not assist combustion, but is beneficial in so much as it aids in inducing an increased flow of fresh air through the same channels. The present invention accomplishes the desired end without a return of any portion of the products of combustion to the burner, and this is accomplished in the following manner: The feeding-tubes E E open at their lower ends into an air-chamber located above the oil-pot and communicating with the interior of the burner-cone A. At their upper ends said tubes open into the air-chamber F, which surrounds the upper end of the chimney C. The chamber F is open at bottom and closed at top. The chimney C is surmounted by a deflecting-cap, D, and is surrounded by an annular deflecting-plate, G, separated from the chimney by an annular space. The purpose of the plate G is to give a slightly-upward deflection to a current of air moving against the chimney, so that it may exert to the largest extent the above-mentioned educ-

tion effect upon the ascending current within the chimney. At the bottom of the chamber F are two annular deflecting rings, H I, corresponding in diameter and relative disposition with the plates D G. The line *xx*, cutting through the centers of the upper orifices of the pipes E E, is equidistant from the plates D I and G H, respectively, so that the practical effective lengths of the chimney and feeding-tubes will be equal, and any effect of a current of air moving across the top of the chimney to accelerate the upward motion of rarefied air within the chimney, will be balanced by an equal effect to accelerate an inflow of air at the upper ends of the feeding-tubes, and thus the supply of fresh air to support the burner-flame is under all circumstances equal with the outflow of rarefied air at the top of the chimney. The deflecting devices arranged with the tubes, burner, and globe or chimney insure a current of fresh air to feed and support the flame at all times when the lantern is exposed to currents of air caused by wind, lateral or vertical motions, or oscillations of the lantern itself. In the case of vertical or oscillatory motion of the lantern the centrifugal tendency imparted to the currents of cool air moving through the feeders in the direction of said centrifugal

force will more than equal the effect of said force upon the warm air in the chimney moving in opposition to said force, because of the difference in specific gravity of cold and warm air, and also because of the momentum of the moving currents.

Having described my invention, what I claim as new is—

1. The annular chamber of fresh-air inlets F, arranged with a deflecting plate or plates, or their equivalents, in the manner substantially as shown and described.

2. The top of the chimney or outlet for the products of combustion, arranged with a deflecting plate or plates G, or their equivalents, separated from said chimney by an annular space, in combination with a lamp or lantern, substantially as shown and described.

3. The deflecting-plates D G H I, arranged relatively to each other, substantially in the manner and to secure the effect set forth.

4. The annular chamber F, combined with the feeding-tubes E E, substantially as specified and shown.

J. H. IRWIN.

Witnesses:

THOS. RICART,
FRED DIETZ.