A. W. PAULL.
Lantern.

No. 209,188. Patented Oct. 22, 1878.

Fig. 1.

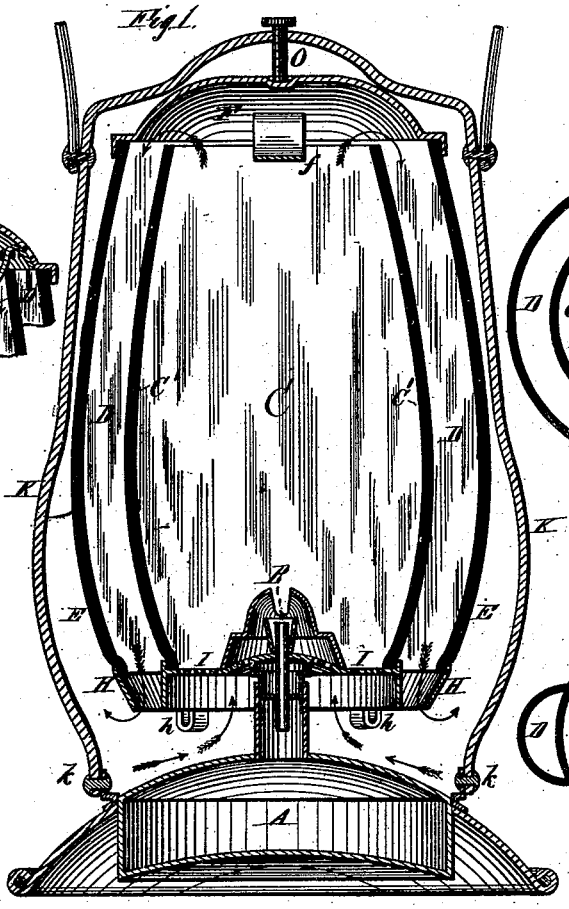


Fig. 2.

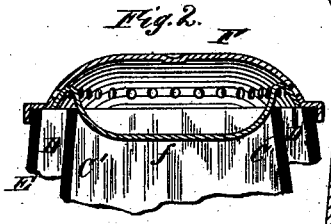


Fig. 3.

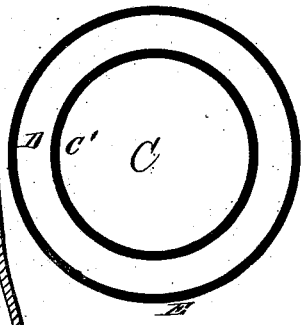


Fig. 4.

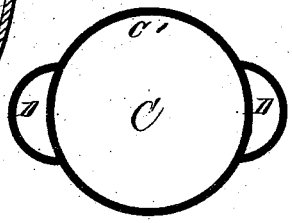


Fig. 5.

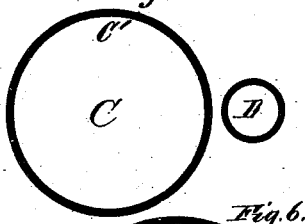


Fig. 6.

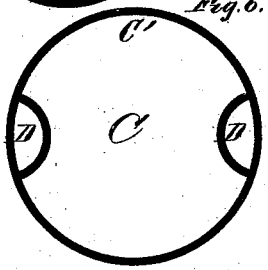


Fig. 7.

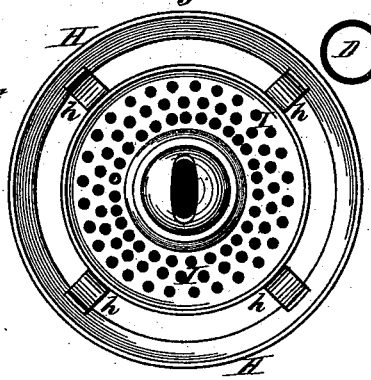
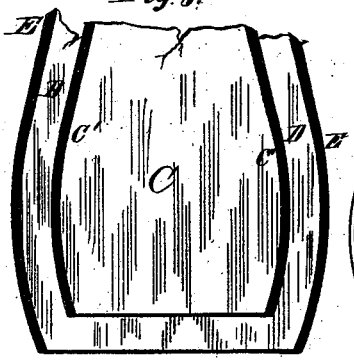


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARCHIBALD W. PAULL, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **209,188**, dated October 22, 1878; application filed October 4, 1878.

To all whom it may concern:

Be it known that I, ARCHIBALD W. PAULL, of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Lanterns, Lamps, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is an axial section of a lantern, showing the several parts arranged in accordance with my improvements. Fig. 2 is a section of a lantern top or dome upon a plane perpendicular to that of Fig. 1, showing the method of securing the double globes in place, and a row of perforations which may be made in the top. Figs. 3, 4, 5, and 6 are imaginary sections, indicating a few of the multitude of ways in which my air-conducting tubes may be arranged. Fig. 7 is a plan view, illustrating the method of uniting the two wings or supports for the double globe. Fig. 8 is a sectional view, showing the outer globe as extended down below the inner one, and indicating that the air-conductors, of whatever form made, may be so arranged as to discharge at any desired point with reference to the base of the inner globe or flame-chamber.

Like letters in all the figures indicate corresponding parts.

My invention has relation to that class of illuminating apparatus wherein the ascending and descending currents of air within the flame-chamber are counterbalanced by currents outside of such chamber; and the object of my improvements is to so arrange the necessary air-conducting channels as that the desired effects shall be thoroughly and completely accomplished without necessitating the construction of various tubes at or near the burner or in the dome, which construction has heretofore been somewhat expensive and difficult to accomplish.

To this end my invention consists, essentially, in discharging the draft from the flame-chamber at a point in the region of the base of said chamber, and in a downward direction, as will be hereinafter first fully described, and then pointed out in the claims.

A is the oil-reservoir; B, the burner, and C the flame-chamber. The air for the support of the flame is carried to the base of the flame-chamber and beneath the burner-cone in a manner common in nearly all lamps, lanterns, &c. Exterior to the flame-chamber is the air-conduit D, which, as in Fig. 1, is formed by surrounding the globe C′ by a second globe, E, leaving a space between the two, and surrounding the pair by a dome, F, calculated to deflect all, or nearly all, the air from chamber C down into space D.

If conduit D be of the same length as chamber C, and if it be open or free at bottom for escape of air, the two columns—viz., that in D and that in C—will, in accordance with the natural laws of fluid in equilibrium, be counterbalanced independently of their respective volumes; and it is apparent, from the construction indicated, that whatever causes an ascending current in chamber C will likewise cause a similar current in D. So also any descending current in C will be followed by a corresponding one in D.

Chambers C and D being connected at top, any descending current in D must tend to draw air from C, and this in a contrary direction to the tendency of the current in C. There must result, then, a complete counterbalancing of the two currents, one being checked by the other, and consequently there can be no violent or unusually strong descending current within the flame-chamber. Any ascending currents are counterbalanced in the same manner. The operation of the two currents upon each other may be likened to that of two portions of a line passing over a pulley, being of equal length, and affected by equal forces in like directions. No downward strain bearing equally upon the two portions will cause them to move, nor can any upwardly-acting force disturb their equilibrium.

By the method adopted the air-currents within the flame-chamber are rendered remarkably steady and uniform, and the flame is therefore less liable to flicker, and is practically incapable of being extinguished by any accident of ordinary usage.

It is not my purpose to feed the air from the flame-chamber back to the flame again. What little may happen to find its way back through the open air-passage will be enriched by a quantity of fresh air, and will in no way in-

terfere with the proper illuminating qualities of the improved device.

Instead of having the exterior air-conduit annular, as in Figs. 1 and 2, it may be made in the shape of a tube, or divided into two or more tubes, located in close proximity to the globe, or more or less removed therefrom, as indicated in Figs. 4 and 5. The air-conduit might be located within the flame-chamber, as indicated in Fig. 6. The purpose of these figures (4, 5, and 6,) is to indicate that the particular form, size, location, or arrangement of the air-conduits are not essential to the successful operation of the invention, which latter is by no means to be limited by such matters so long as they are of such a nature as to permit the desired counterbalancing effects upon the principles herein explained.

The double-globe form is, perhaps, preferable to any other; but I propose to use any or all of the forms substantially indicated.

The dome F may, if desired, be perforated slightly, as shown in Fig. 2, without detracting from the efficient working qualities of the lamp or lantern; and I have also found that the ordinary foraminated plate I may be dispensed with.

The base of conduit D should be protected in some manner, so that sudden gusts of wind or violent currents of air cannot enter at this point. This protection can be afforded by extending the outside globe a little beyond the base of the inner globe, as shown in Fig. 8; or it may be accomplished by extending ring H, substantially as in Fig. 1, or by the use or foraminated guards, and in a number of other ways, which will readily suggest themselves.

The provision for counterbalancing in accordance with the foregoing description enables me to assemble the necessary parts to form the illuminating apparatus in a very cheap, substantial, convenient, and attractive form. The two globes are supported upon their respective rings, which are united by narrow strips *h*, as shown in Figs. 1 and 7. The dome F is provided with a simple strap, *f*, which fits within the mouth of globe C, and the whole device united by the hinged barrel K (hinges at *k k*) and the screw O, which bears down upon the dome.

I have illustrated my improvements as applied to an ordinary hand-lantern, in which class of devices they are specially serviceable and advantageous; but manifestly they may be applied to house-lamps and all manner of illuminating contrivances.

I am fully aware of numerous previously-existing forms of lanterns wherein the air-currents are counterbalanced; and I am also aware that the hinged band, with its binding-screw, has heretofore been applied to ordinary lanterns. To these features, broadly, I desire it understood that I make no claim; but,

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

1. In an illuminating apparatus, the combination, with the flame-chamber, of an air conduit or passage, connected with said chamber at top, and adapted to discharge air from this chamber at a point in the region of the base thereof and exterior thereto, for the purpose of counterbalancing the air-currents, substantially as explained.

2. In an illuminating apparatus, the combination, with the flame-chamber, of an air conduit or passage, connected with said chamber at or near the top by means of a dome, said conduit discharging air at a point in the region of the base of the flame-chamber and exterior thereto, substantially as and for the purposes set forth.

3. In an illuminating apparatus, the combination, with the flame-chamber, of an exterior globe or chimney, the two being connected at top and forming an air-passage, through which air from the flame-chamber may be conducted downwardly and discharged at a point outside of said chamber, but near the base thereof, substantially as shown and described.

4. In an illuminating apparatus, the combination, with the two globes forming an air-space between them, of the connected supporting-rings, the removable dome affording a support at the top, and the hinged band with its binding-screw, substantially as shown and described.

5. In combination with the dome adapted to cover the two globes and to unite the inner one with the outer one, the strap *f*, fitting in the mouth of the inner globe and adapted to maintain it in proper position, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

ARCHIBALD W. PAULL.

Witnesses:
R. H. PRATT,
JAMES CUSSESUIRES.