A. L. BARON, E. F. CASH & D. RANKIN.

Lantern.

No. 202,779. **Patented April 23, 1878.**

Fig. 1.

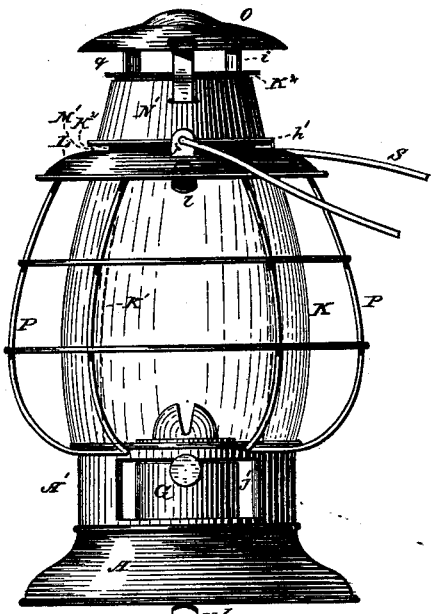

Fig. 2.

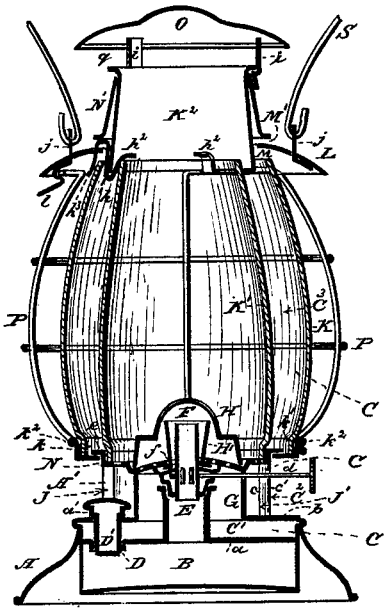

Fig. 3.

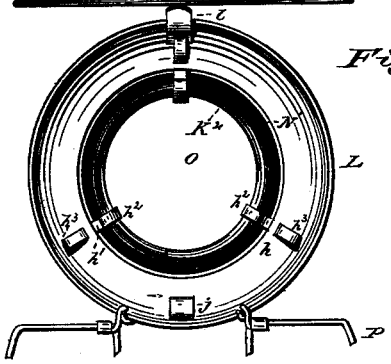

Fig 4.

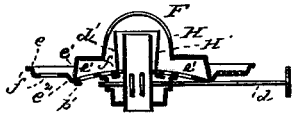

Fig. 5.

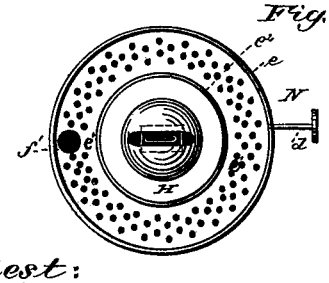

Fig. 6.

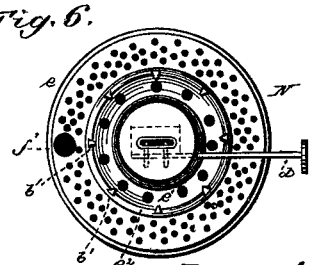

Fig 7.

Attest:
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Inventors
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David Rankin,
by Geo. W. Dyer & Bro.

UNITED STATES PATENT OFFICE.

ALFRED L. BARON, EVAN F. CASH, AND DAVID RANKIN, OF BELLAIRE, OHIO.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. **202,779**, dated April 23, 1878; application filed December 19, 1877.

To all whom it may concern:

Be it known that we, ALFRED L. BARON, EVAN F. CASH, and DAVID RANKIN, of Bellaire, in the county of Belmont and State of Ohio, have invented a new and useful Improvement in Lanterns; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The lantern described in this specification is one of the kind intended and used for burning mineral oils.

It is constructed so as to counterbalance the air, which enters it from various points, and thus produce and maintain an equilibrium of air-currents, and consequently of combustion, under all circumstances, whether of changed position of the lantern or of its exposure to atmospheric movements. It is also constructed to produce a proportionate and equal evolution of air-currents, counterbalancing and meeting at the proper focal point about the flame, feeding and protecting the flame, and aiding to conduct the products of combustion to the exit. This lantern is intended as an improvement upon the lantern described in Letters Patent No. 191,401, granted to Cash and Baron May 29, 1877.

The improvement above referred to, or hereinafter described, is intended to render this lantern more perfect and economical in construction, more convenient in use, and more uniform and complete in operation under all conditions of exposure.

The invention consists in the several novel combinations of the various parts, as fully hereinafter explained.

In order that those skilled in the art may know how to make and use this lantern, the same is now described, having reference to the drawings herewith belonging, in which—

Figure 1 is an elevation of the lantern; Fig. 2, a central vertical section of the same; Fig. 3, a bottom view of the top of the lantern; Fig. 4, a vertical section of the cone, deflector, and perforated annular base-plate combined; Figs. 5 and 6, top and bottom views of the same; and Fig. 7, a separate view of the hollow screw-plug.

Similar letters are used to designate corresponding parts in each figure.

A represents the lower base; A′, the upper base, constructed substantially as in Patent No. 191,401. B is the oil-reservoir, which, in this instance, is cylindrical, with a flat top and a slightly-concave bottom. C is the air-chamber as a whole, the parts of which, C^1 C^2 C^3, are air-chambers, the first of which is contained between the top *a* of the oil-reservoir B and the diaphragm *b* above it; the second, between the double walls and the end walls *c c′* of the upper base; and the third, between the two globes.

All these parts are constructed and arranged substantially like the similar parts in the patents above named, except that the air-chamber C^2 does not extend entirely around the base. The tubular connection in the patent aforesaid for filling the oil-reservoir is dispensed with, and instead thereof is used a screw-threaded opening, D, in the top of the oil-reservoir, which is securely closed by a hollow threaded plug, D′, with a shoulder, *a′*, so arranged that when the plug is screwed down tightly the shoulder *a′* makes a close air-tight joint upon the diaphragm *b*. The upper part of the plug rises but a little above such diaphragm, while the under part securely closes the opening D.

The advantage of using this screw-plug for the screw-threaded opening is that the escaping oil which will seep or make its way along the screw-threads is caught in the air-chamber, and will return to the reservoir when the lantern is at rest; whereas in the patent aforesaid, the oil which did so seep escaped to the outside of the lantern.

The tubular connection E, which springs from the center of the oil-reservoir; the burner F, which fits closely into it by frictional contact without screw-threads, so that the oil will not seep through, as it would do if screw-threads were used; the wick-tube of the burner; and the central tubular connection G, which springs from the diaphragm *b* and surrounds the tubular connection E, are all like the correspond

ing parts in the aforesaid patent, except that the burner fits into the tubular connection E, as explained, and provision is made for the ratchet-stem *d* to rest in a small slot upon the upper part of the tubular connection G.

The cone H is made of one piece, and is not provided with a jacket, as in said patent, but has projecting from its lower edge a series of ears, *b'*, by means of which this lower edge of the cone is firmly and securely fastened upon the central annular depression in the top of the perforated supporting-plate N. These ears, passing through the annular supporting-plate, and being bent back and upwardly, form a firm connection for the cone with such supporting-plate. Within the cone is a deflector, H', secured by two or more ears, or in any convenient way, upon the center of the supporting-plate N, and surrounding the entrance for the wick-tube, which deflector, in general form, is a quadrangular funnel, with walls *d'* diverging upward and ending at a proper point above the top of the wick-tube and below the top of the cone. This deflector has an open space at the bottom of its side walls, so that a small amount of cold air, entering through the perforations of the supporting-plate, passes up along the broad sides of the wick-tube, and serves to cool the same.

This deflector H' must be of the proper form and dimensions, and in the proper situation with reference to the cone, the wick-tube, and the supporting-plate N, and its office is to deflect the cold air entering the perforations through the center of the supporting-plate, between the walls of the cone and the outside of the deflector, so that such cold air, passing at all points over the top of the deflector, will have a focal point about and above the root of the flame, and about and above the end of the wick-tube, and will impinge upon the same nearly at right angles, thereby supporting combustion in an efficient manner without the risk of extinguishing the flame in any sudden dropping of the lantern.

As above explained, the air-chamber C^2 does not extend entirely around the upper part of the base, as in the patent before named, and so the wall I of that patent is dispensed with; but, instead, the perforated supporting-plate N rests upon the inner of the double walls to the chamber C^2, and upon the inwardly-projecting flange of the sheet, connected to the wire-protected rounded edge over the openings J J', which openings, in this instance, are on the two sides of the lantern, each having a length a little more than twice that of the depth, with the top of the diaphragm *b* for a base, and that part of the outer wall of the chamber C^2 which extends across the openings, together with an inner extended flange of the width of the radial side walls *c c'*, for the top, and the side walls *c c'* of such openings nearly radial to the center of the lantern, for its ends. The plug D' is preferably placed in one of these openings, and the ratchet in the other.

The outer globe K rests directly upon the top of the upper part of the base above the diaphragm *b*, the said upper part of the base being the outer walls of the air-chamber C^2 and the extension across the openings J J', the lower end of the said globe entering a short distance into the upper interior of the base, and having its lower portion *k* made slightly smaller, with a shoulder, k^1, which enables it to make a better and more secure fit within the interior of the top of the base, and permits the shoulder to rest upon the wire-protected rounded upper edge k^2 of the same. This wire-protected edge k^2 serves also to make more secure the lower parts of the guard P, which are secured immediately below it. This globe K extends up to within a short distance of the reflector L, between which and the top of this globe is a free open space, M, as in the former patent.

The bottom of the inner globe or chimney k^1 should be of a size nearly equal to that of the supporting-plate N, and should fit into and between the upturned flanges *e* of said supporting-plate; and this globe should be of a proper size so it can be conveniently taken out or replaced without disturbing the outer globe.

The supporting-plate N, besides the upturned flanges before mentioned, has its central interior upper surface e^1 depressed in a ring, e^2, into which the lower edge of the cone H is secured by its lugs *b'* passing through and clinched, as before described. From this ring e^2 the interior portion of the supporting-plate N is convexed in curved lines to the center, which has a slot, *f*, of a size and form to fit the wick-tube closely, and a small opening, *f'*, for the admission of a match for lighting.

The perforations in the convexity of the supporting-plate N within the ring are much larger than those in the portion outside of it.

The inner globe or chimney K^1, before mentioned, extends about as high as does the outer globe, terminating just within a metallic chimney, K^2, and leaving a clear space, M, all around between the outside of the top of said globe K^1 and the interior of the bottom of the metallic chimney K^2. This bottom of the metallic chimney is held in a central position in the interior of the reflector L by means of metallic clips *h*, which pass through the inner edge of the reflector L, bent up to a point, h^1, upon which the metallic air-deflector N' rests, and to which it is secured; then bent inwardly against the outside of the metallic chimney K^2, and passing down the outside of the same to the bottom thereof, and, secured to said outside, is bent under the bottom of said metallic chimney, and then bent up and back again, forming spring-hooks h^2, which receive and hold with an elastic pressure the top of the inner globe or chimney K^1. The outer ends h^3 of these metallic clips bend downwardly, and are curved outwardly a little, and receive and hold with an elastic pressure the upper outsides of the outer globe K. The top of the metallic chimney K^2 rises to the top of the

metallic air-deflector N′, the top edge of which is bent outside and over the upper edge of the metallic air-deflector N′, forming a kind of flange, the purpose of which is to help break the momentum of the air which may come in contact with space *q*. This metallic chimney K^2 fits closely to the upper edge of the air-deflector N′, and is there properly secured. Between the top of the portion N′ and the cap O is a clear open space, and this cap, which is considerably larger than the top of the part N^1, is held in position by metallic supports *i*. The metallic air-deflector N′ is, at its upper end, secured to the metallic chimney, slightly diverging downward at an angle of about ninety degrees. The lower edge is flanged and secured to the clips *h*, leaving space M′ of proper dimensions. This flange breaks the momentum of any downward current. The chimney K^1 breaks the momentum of any horizontal air-currents; and the space between the metallic chimney K^2 and this metallic air-deflector, being closed at its upper end, forming an A-shaped space, also acts in breaking the momentum, and all these combined permit just sufficient air to descend into the space between the glass globes.

The wire guard P is constructed and arranged as described in the former patent before referred to, and the bail or handle S is secured to metallic ears *j*, which pass through and are secured to the reflector L, one of which ears has its lower part bent outwardly to form the catch *l*, which passes over and to the under side of the upper portion of one of the guards P.

The advantages of the improvements described in this application may be briefly enumerated, as follows:

The change in the form of the oil-reservoir gives it greater capacity; and its concave bottom gives the same greater rigidity than a flat bottom, and consequently there is less agitation of the oil contained in it, and consequently a more stable flame.

Dispensing with that part of the air-chamber which, in the former patent, extended over the openings J J′ is a saving in expense.

The construction of the hollow plug D′, the screw-threaded opening D, and the diaphragm above it, is such that the small portion of oil seeping through the screw-threads is prevented from escaping to the exterior of the lantern, but is retained in the air-chamber, and, when the lantern is in a state of rest, will return to the oil-reservoir, leaving less obstruction in the opening J.

The peculiar construction of the perforated supporting plate N gives to the cone and the deflector a firm and fixed connection together, and holds the wick-tube and burner firmly in proper position. The inner globe or chimney rests upon this supporting-plate N, kept in its position by the annular flange, and holds this supporting-plate in its place; and the inner globe or chimney being in its turn held down by the clips *h* by a spring-pressure, it follows that all these parts are held securely in place by a spring-pressure acting throughout all parts, and no single part is liable to displacement by any sudden jar or motion.

The advantages of the deflector H′ have already been alluded to.

The advantages of the peculiar supporting-plate N, and the advantage of dispensing with the jacket of the cone described in the former patent, before referred to, consist in greater cheapness and a more perfect operation of the parts, and less liability to heating injuriously.

The advantages of the short inner globe and the metallic chimney consist in a better operation of the air-currents in this, that no descending currents of air can possibly enter the interior of the inner globe at its top; and this construction and arrangement are such that, among other things, the air-currents which may enter the space *q* will pass obliquely against the inner walls of the metallic chimney and downward into the air-chamber C^3; thence into the other air-chambers and into the cone, where they will serve for feeding combustion and assist in carrying the products thereof to an exit; and also in the greater economy of the use of the inner globes, which thereby are less liable to be broken in use by the heat or careless handling.

The advantages of the metallic air deflector K^2 have been described.

The advantages of the combination of the cone H, deflector H′, and the supporting-plate N are that the proper circumference of the cone permits the deflector H′ to deflect proper and proportionate volumes of air to and about the focal point above the top of the wick-tube; and the deflector, being separate and apart from the wick-tube, prevents the generation and conduction of heat, which would otherwise occur if the deflector was attached to the wick-tube; and, further, that the supporting-plate being convex in its center, with larger perforations than outside of the convex portion, the proportionate volumes of air are thereby maintained.

The advantages of other improvements will be apparent upon inspection by those skilled in the art, and, altogether, are believed to render the lantern more complete, more secure in use, and more effective in operation under all circumstances.

The object in view in this lantern is the same, substantially, as that stated in said patent above referred to, only these improvements are designed to accomplish that object much better; and the *modus operandi* of air-currents in said patent described are substantially herein retained, only that the improvements herein are designed to accomplish a perfect proportional evolution of counterbalancing air-currents, producing at all needed points an equilibrium of air-currents, and a focus of these currents at, about, and around the flame, and assisting the escape of the products of combustion to the exit.

We are aware that screw-threaded plugs, *per se*, are not new with us, and do not so claim; but we are convinced that we have employed the same in a new and operative combination.

We are also aware that air-deflectors within a cone or burner, *per se*, are not new with us; but we believe that the deflector which we describe is new in its construction, arrangement, and mode of operation.

Having described the invention and enumerated some of the advantages, what is claimed as new therein is—

1. In a lantern, the combination of an outer and an inner globe with a metallic chimney, whose bottom is supported on clips in the space between the tops of the globes, substantially as described.

2. In a lantern, the combination of the metallic chimney K^2, the metallic air-deflector N′, forming the A-shaped space between the same, and the clips *h*, substantially as and for the purpose set forth.

3. In a lantern, the combination of the metallic chimney K^2, having attached thereto the clips *h*, as described, and the inner globe or chimney, to form the adjusted space between the bottom of chimney K^2 and top of inner globe, substantially as and for the purposes described.

4. In a lantern, the combination of the metallic chimney K^2, the air-deflector N′, clips *h*, top O, reflector L, forming the spaces *q* and M, substantially as and for the purposes described.

5. In a lantern, the combination of the clips *h*, the guard-fastener, metallic ear *j*, the inner globe or chimney, and the supporting-plate N, for the purpose of holding the various parts in position, substantially as and for the purposes set forth.

6. In a lantern, the combination of the outer globe and inner globe or chimney, of about the same height, the clips *h*, and the metallic chimney K^2, substantially as described.

7. In a lantern, the combination of the threaded screw-plug D′, having shoulder *a*′, the screw-threaded opening D, the air-chamber *c*′, the diaphragm *b*, and the opening J, substantially as and for the purpose described.

8. In a lantern, the combination of the openings J J with the perforated annular supporting-plate N, substantially as described.

9. In a lantern, the perforated supporting-plate N, substantially as and for the purposes set forth.

10. In a lantern, the combination of the cone H, the deflector H′, and the perforated supporting-plate N, substantially as and for the purpose set forth.

11. In a lantern, the combination of the perforated supporting-plate N, the deflector H′, the cone H, the burner, and the opening G, substantially as described.

This specification signed and witnessed this 12th day of December, 1877.

ALFRED L. BARON.
EVAN F. CASH.
DAVID RANKIN.

Witnesses:
W. J. FERREN,
J. F. MERCER.