

R. NUTTING.
Lanterns.

No. 148,842.

Patented March 24, 1874.

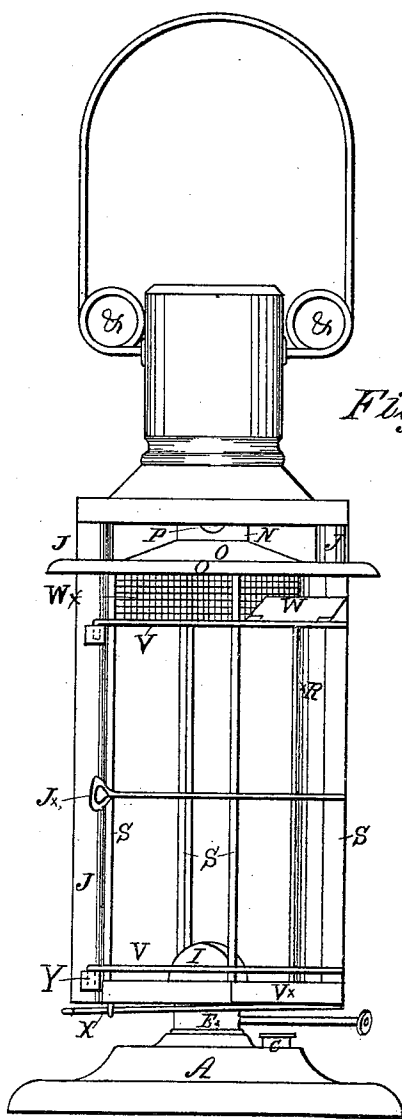
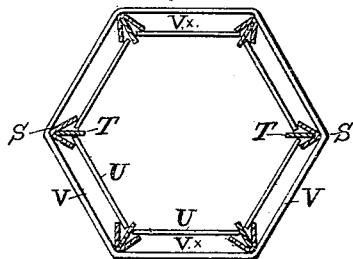


Fig. 1.

Fig. 8.



Fig. 6.



Witnesses,

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Inventor

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Fig. 5.

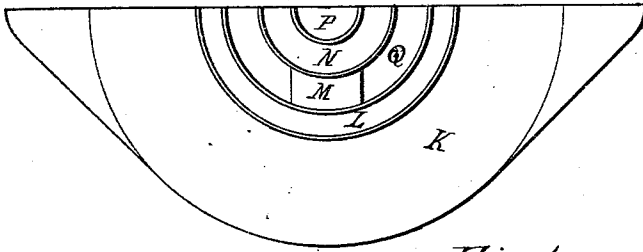


Fig. 4.

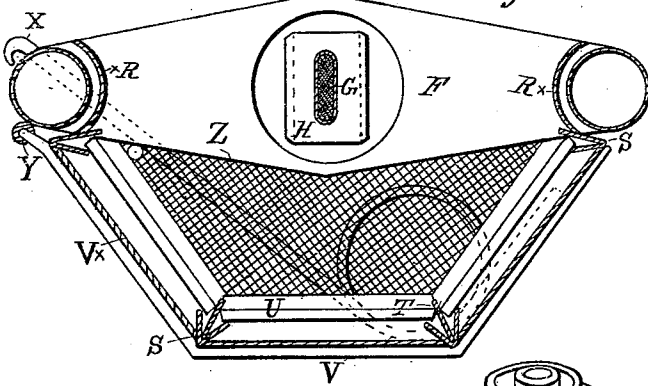


Fig. 2.

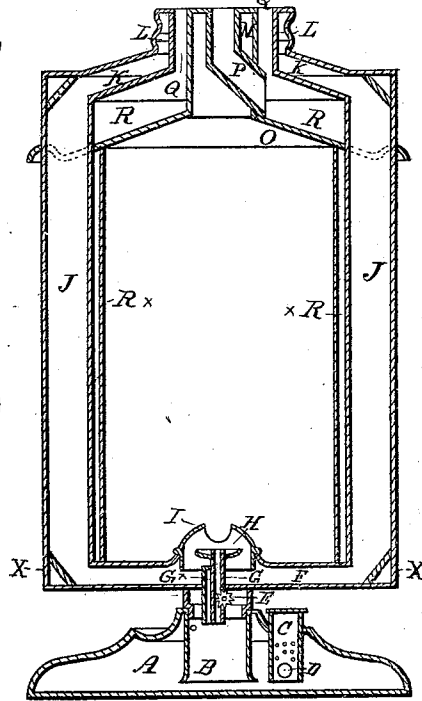


Fig. 3.

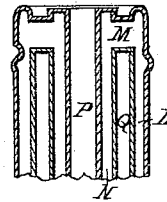
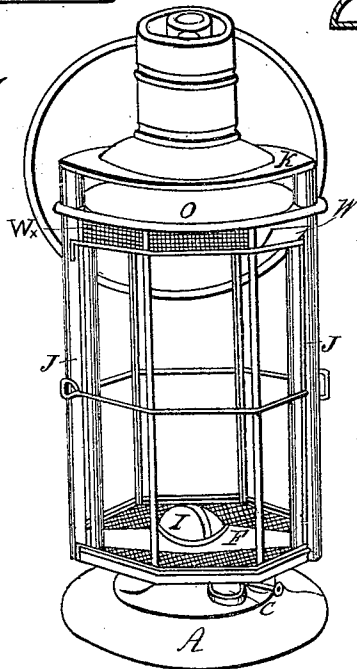


Fig. 1.



Witnesses.

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UNITED STATES PATENT OFFICE.

RUFUS NUTTING, OF WHEATON, ILLINOIS.

IMPROVEMENT IN LANTERNS.

Specification forming part of Letters Patent No. 148,842, dated March 24, 1874; application filed February 10, 1873.

To all whom it may concern:

Be it known that I, RUFUS NUTTING, of Wheaton, Du Page county, Illinois, have invented certain Improvements in Lanterns, of which the following is a specification:

My invention consists in the construction of force and suction or complex draft lanterns in such manner, with alternate passages and chambers for hot and cold air, that the required gravity or coldness for its rapid descent to feed the flame may be secured in less space, and a more symmetrical and compact form, and more substantial and durable construction than the ordinary "tubular" lantern and others of like principle, and so be better adapted to hand use, carriage, or other purposes, and also be better adapted to close packing in large quantities for transportation; also, so that they shall be more safe, reliable, and convenient for use, more easily lighted, extinguished, filled, trimmed, and cleaned, without the possibility of the air-chamber being obstructed by oil leaking out around the collar or carelessness in filling; also, so that plate-glass can be used instead of a globe for a flame-protector, equally neat and tasty, and a less cost and greater utility, and thus utilize the now worthless trimmings constantly accumulating in glaziers' shops.

From the resemblance of my invention to a miniature light-house, I call it "the light-house lantern," especially designed for burning kerosene oil.

Figure 1 is a side elevation. Fig. 2 is a vertical transverse section. Fig. 3 is a vertical transverse section of the upper part divided through the center at right angles with the previous division. Fig. 4 is a horizontal transverse section, as if Fig. 2 was divided from X to X, with one door left off, full size. Fig. 5 is a vertical view of one-half of the upper part of the lantern. Fig. 6 is a horizontal transverse section of my whole flame-protector without doors. Fig. 7 is a perspective view. Fig. 8 is a transverse vertical section of the automatic draft-regulators.

Like letters indicate corresponding parts in all the figures.

The flame-protector may be constructed whole, as represented by Fig. 6, or in sections, as shown by the other figures, the sections be-

ing hung by hinges to solid or hollow upright studs. The frame of the protector is made of narrow strips of sheet metal, S, straight vertically, but V-shaped laterally, having three holes in the angle of the V, one near each end and one in the center, in which the guards V are adjusted and soldered, the solder also passing through the holes, and firmly connecting the guards V and uprights S with the vertical plane strip T in its center, which answers for both guide to the panels U and diagonal brace for the frame, as seen at V T S in Figs. 4 and 6, together forming a groove, into which the panels U slide. The inducts Z, for properly admitting air into the protector, and staying the opposite sides of the door or uprights S and T (when the protector is made in sections) from spreading, are soldered to the bottom piece V^x, and that is soldered to the uprights S and T, the whole constituting a neat, symmetrical, durable, and convenient lantern-protector, the uprights S and T rendering it firm vertically and braced diagonally, while the guards V, base-piece V^x, and inducts Z gird, brace, and stay it horizontally, transversely, and laterally. The upper and lower guards V, when the protector is made in sections or doors, are extended at one end, and bent down to form the male part of the hinges, and play in the socket attached to the studs J. The central guard may be extended at one end, and formed into a loop or thumb piece, projecting at about a right angle from the door, by pressing upon which the door or section may be opened for lighting, extinguishing, &c.

The peculiar form and connection of the vertical pieces T and S, and the manner of their combination with the guards V, panels U, base-piece V^x, and inducts Z are essential features in the protector, whether made whole, as in Fig. 6, or in sections or doors, especially the latter, whereby it is rendered the most thoroughly braced in all directions, firm, and durable, possible with so small an amount of stock and labor, causing little obstruction to the light, and affording great convenience in lighting, extinguishing, cleaning, removing, or renewing the panels, which are free to expand or contract without cracking, and fully protected from external injury, while yet it is not

less attractive or symmetrical in style than the globe, which is much more liable to break by unequal expansion and contraction, and much more inconvenient and expensive to replace when broken, especially by those living in the country.

The panels U are made of common plate-glass (usually of glaziers' trimmings) or mica, and slide in freely from the top when the door is open; or, if the protector is made whole, it is taken out for replacing panels. The duplex gauze inducts Z are made of my patent (No. 25,578) smooth and fixed-mesh wire-cloth, which, while firm, like perforated sheet metal, has a much greater proportion of aperture, and lets air in more abundantly and yet in less direct currents, and by having two or more thicknesses a little distance apart the direct currents of air which disturb the flame are still more effectually prevented; and, while the compressed wire-cloth acts more efficiently than perforated sheet metal, it is much less expensive. The springs X, for closing the doors, may be made of spring-wire, of the form represented, their short ends being soldered to the base-piece of the door V^x, while its other end plays behind a pin in the edge of the air-chamber F, and running thereunder, as represented by the dotted lines, Fig. 4, and X, Fig. 1, the arrangement being such as to press the most as the door is nearest shut, and still allow the door to stand open wide when desired, for trimming, &c. When preferred, sheet-metal springs may be used, and adjusted to operate in like manner, or in any more desirable style.

The draft-regulators W^x, at the top of the protector, (for preventing the too strong ingress of wind,) may be made of the same material as the inducts Z, so bent or doubled as to be of the same length as the width of the panels U, and fit into the space above them, or soldered to the outside of the frame S above the upper guard V. These regulators are sufficient for ordinary hand use of lanterns, but for carriage use or exposure in violent gales the automatic regulators W are more satisfactory, as when the wind blows too hard it closes them entirely on the side of the lantern toward which the wind approaches. They are made as represented in form, of thin metal, and so hinged to a wire which slides into the panel guides above the panel U that, ordinarily, they fall down to about an angle of forty-five degrees, and rest upon the upper guard-wire V, but are instantly closed against the under side of the concentrator O, on the side toward the wind, when it blows too hard. When the lanterns are put upon the market it is designed that some of them be fitted with the former kind of regulator, W^x, and some with the latter, W, so that customers may have which they prefer. The guards V answer the triple objects of guards to protect the glass, girders or braces connecting the uprights T and S, and extending hinges, by which the doors turn or are connected to the studs J.

The air-chamber F is arranged entirely above the ratchet and screw of the burner E, (which is firmly soldered to its under side,) so that the ordinary leakage at these points can in no manner get into it, and produce the common obstruction to the free passage of air required by the flame or take fire and produce explosion. The side tubes J answer the triple objects of studs or supports to which the doors of the protector, when made in sections, are hung, connecting links or ties between the air-chamber F and the upper parts of the lantern, and air-passages from the cooler K to the burner E.

It has heretofore been found impracticable to construct a well-operating duplex-draft lantern in a symmetrical compact form, as air going from the top of the lantern downward to feed the flame with oxygen requires to be rapidly cooled or condensed, and hence some of the chief objects of the peculiar construction of the upper parts of my invention. The several alternate hot and cold air chambers, passages, &c., cool or condense the air most rapidly, while yet being in a compact, durable, and tasteful form, and also prevent any part of the lantern from heating injuriously.

The reflecting-concentrator O performs the quadruple offices of a protector or guard for the automatic draft-regulators W, a deflector of heat from the horizontal cooling-chamber K, a downward reflector of light, and a concentrator of the air or oxygen (which feeds the flame) to the pipe N, from whence it (the air) is forced through the coupling-tubes M; thence through the outer annular cooler L, spreading it to the horizontal cooler K; and thence through the studs or side tubes J, it is drawn through the air-chamber F and dome I to the flame.

The space R between the horizontal cooler K and the concentrator O (the hottest part of the lantern) operates as an inductor, and draws in external air, which, being rarefied by the heat radiating from the upper surface of the concentrator O, forms an ascending current through the vertical cold-air conduit Q and central cooling-tube P, and out at the apex or top of the lantern.

The coupling-tubes M are put at right angles with a direct line from the side tubes J for the purpose of spreading the heated air more evenly through the annular cooling-chamber L, thus subjecting it to more cooling-surface. The semicircular vertical strips R^x constitute semi-annular vertical coolers, in connection with the tubes J, through which a current of cool air is constantly ascending when the lantern is used in a still room, and deflect the direct heat of the flame from the tubes J.

On account of the common adulteration of kerosene, rendering it liable to explode when heated, I so construct my lantern as to have the least possible heat-conducting connection (the screw connecting the burner and collar being all) between the oil-fount and those parts of the lantern naturally heated by the flame, giving a free circulation of cold air between

the fount and air-chamber, and thus keeping the oil almost as entirely free from the heat of the flame as if there were no connection at all, and rendering explosion at least very improbable, if not impossible.

By soldering the burner above the joint or screw directly and firmly to the air-chamber, the most simple and efficient connection between the lantern-body and oil-fount possible is secured, without the usual incasing of metal inclosing a heated chamber, and both tending to the heating of the oil in the fount.

I claim as my invention—

1. The vertical upright S, in combination with the guide-braces T, base-piece V^x, and guards V for holding the panels U, substantially as shown and described.

2. The inducts Z, base-piece V^x, uprights S, guide-braces T, and guards V, combined, arranged, and operating substantially as and for the purposes described and shown.

3. The regulators W^x, in combination with the concentrator O, substantially as described.

4. The automatic regulators W, in combination with the concentrator O, operating substantially as shown and described.

5. The springs X, in combination with the base-piece V^x and air-chamber F, operating substantially as shown and described.

6. The air-chamber F, in combination with the burner E and tubes J, located between the screw of the burner and dome I, to operate substantially as shown and described.

7. The concentrator O, in combination with the automatic regulators W or regulators W^x, substantially as described, and for the purposes set forth.

8. The horizontal cold-air conduit R, in combination with the concentrator O and cooler K, substantially as and for the purposes herein described and shown.

9. The central cooling-tube P, in combination with tube N and cold-air conduit R, substantially as described.

10. The annular draft pipe or tube N, in combination with the concentrator O and tube P, substantially as set forth and described.

11. The coupling-tubes M, in combination with pipe N and tubes J, substantially as described.

12. The vertical cooling-chamber L, in combination with the concentrator O and tubes J, substantially as shown and described.

13. The horizontal cooling-chamber K, in combination with pipe N and tubes J, substantially as described.

14. The protector door-studs J, in combination with the uprights S and guards V, substantially as shown and described.

15. The semicircular cooler R^x, in combination with the burner E and tubes J, substantially as and for the purposes described.

16. The side tubes J, horizontal and vertical coolers P, K, and L, couplers M, pipe N, concentrator O, and conduits Q and R, combined substantially as and for the purposes described, with a globe or other flame-protector.

RUFUS NUTTING.

Witnesses:

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