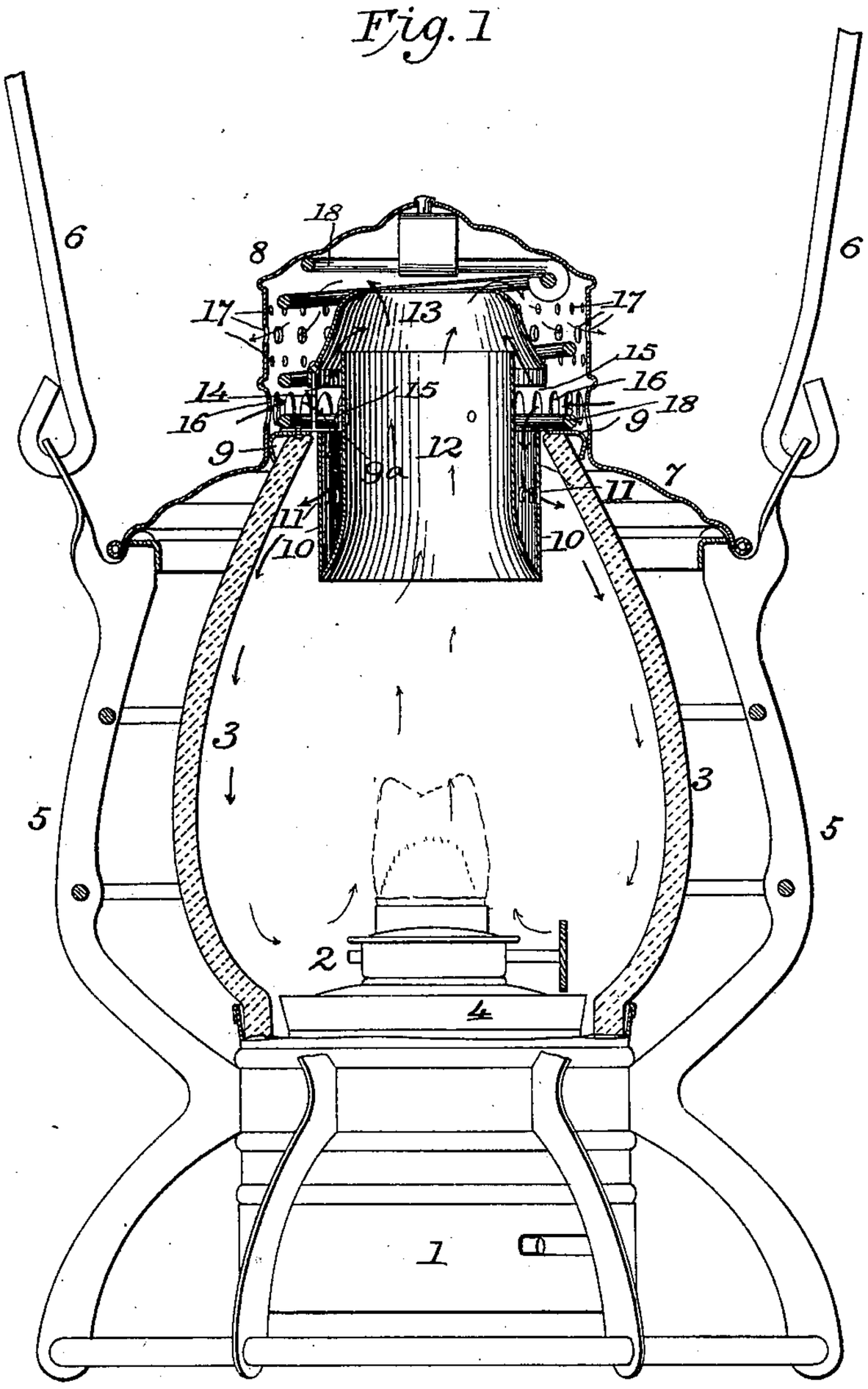
(No Model.) 2 Sheets—Sheet 1.

W. S. HAMM.

LANTERN.

No. 592,705. Patented Oct. 26, 1897.

Fig. 1



Witnesses;

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Arthur B. Seibold.

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William S. Hamm,

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Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

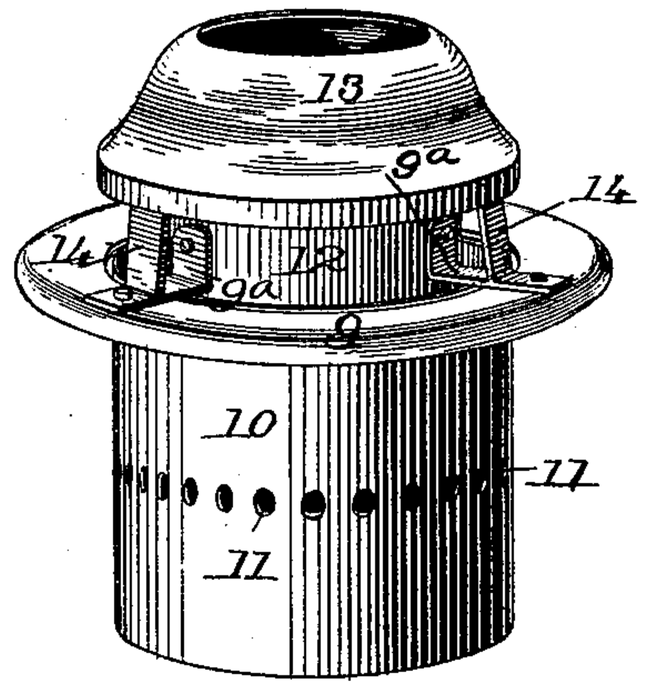


Fig. 3.

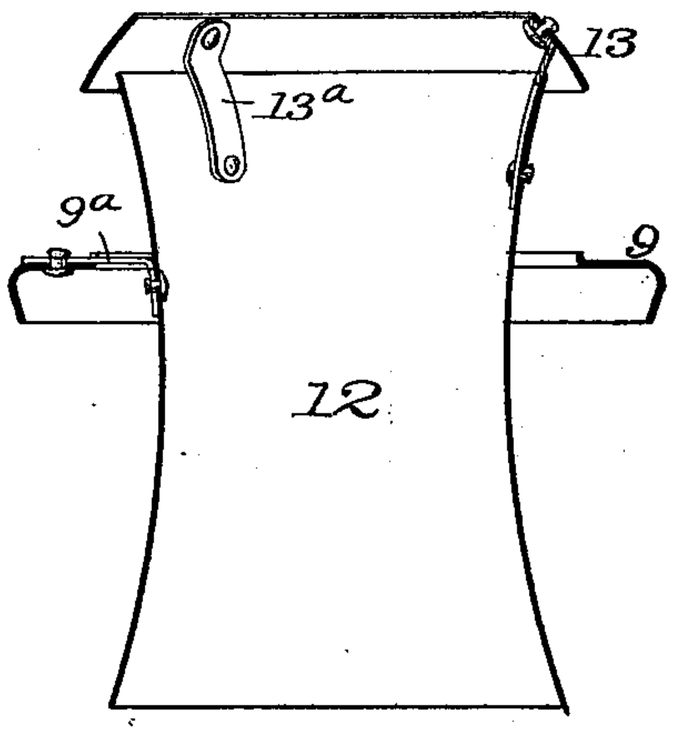


Fig. 4.

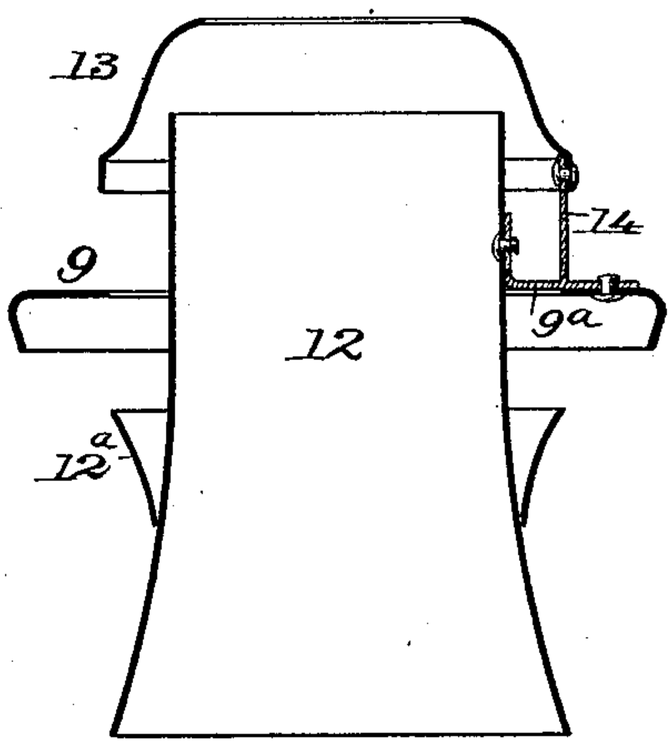
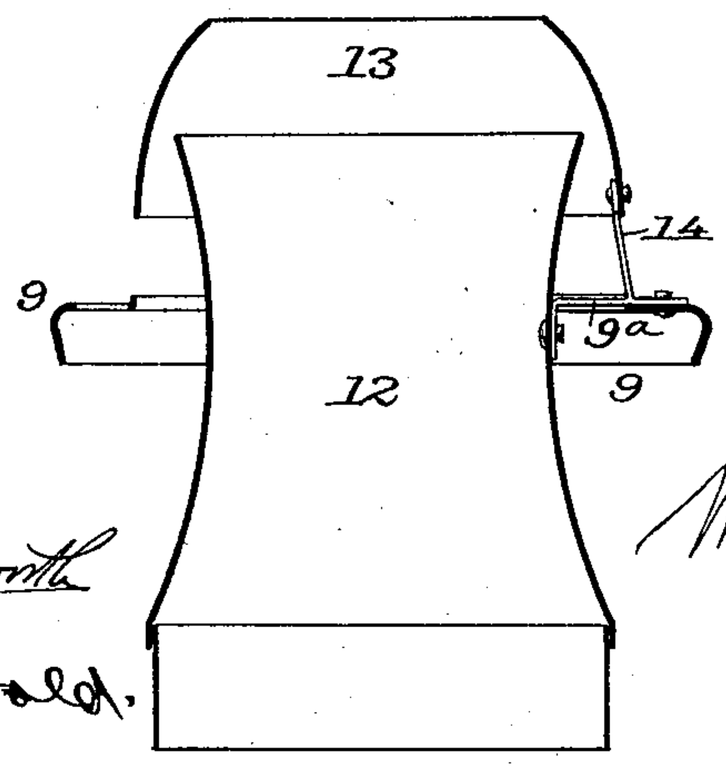


Fig. 5.



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Atty.

UNITED STATES PATENT OFFICE.

WILLIAM S. HAMM, OF CHICAGO, ILLINOIS.

LANTERN.

SPECIFICATION forming part of Letters Patent No. 592,705, dated October 26, 1897.

Application filed May 27, 1897. Serial No. 638,409. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. HAMM, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lanterns, of which the following is a specification, reference being had to the accompanying drawings, and to the numerals of reference marked thereon.

My invention has special reference to a trainman's hand-lantern, and more particularly to means employed for efficiently supplying fresh air to the burner in order that the brilliancy of the light may be increased, the products of combustion more quickly carried off, and the inner surface of the glass globe kept free from condensation of aqueous vapor. Heretofore in lanterns of this class, in consequence of insufficient methods of construction and ventilation, moisture has collected on the inside of the globe and what is commonly called "sweating" has occurred when the temperature of the glass has been lower than that of the air within the globe. Trainmen's lanterns as more generally constructed at the present time receive air below the flame for the support of combustion, the entering air being in consequence heated by coming in proximity with the burner, and upon its striking the cold glass the moisture thereon is condensed, producing the sweating, which interferes with the effective passage of the rays of light through the globe. I have overcome this defect by constructing a lantern having a top air-admission, the air descending within the globe, and to a certain extent in contact therewith, to the bottom of the globe and thence to the flame. Thus a current of air of the same temperature as that of the globe (which is that of the exterior air) is always in contact therewith, any deposition of moisture thereon being prevented, as will be readily understood. The construction, broadly, may be said to consist of a deflector adapted to project to a certain extent within the top of the globe and partly into the dome of the lantern, there being suitably-disposed openings in the dome to admit air, part of which passes downwardly and is directed against the interior of the globe, while the remainder does not descend into the globe, but passes upward and with the heated air and products of combustion makes its exit through perforations in the dome above the inlet-openings.

Referring to the drawings, Figure 1 is a vertical section of a lantern embodying my invention. Fig. 2 is a perspective view of one form of the air-deflector detached. Figs. 3, 4, and 5 are modifications of the deflector.

Similar numerals of reference indicate similar parts in the respective figures.

A ring or sleeve 1, which forms the lower part of the lantern proper, supports an oil-pot and burner 2 and a glass globe 3 of the usual form. An outwardly-flaring flange 4, secured to the upper edge of the oil-pot, serves to deflect any small current of air which may enter from below outwardly toward the globe and away from the burner. It is not the intention to admit any air from below; but it has been found difficult to make the base portions so tight as to entirely exclude air, and hence the use of the flange 4. The usual guard 5 surrounds the globe 3, to the upper part of which is hooked the bail 6, while hinged to the guard is the top 7, surmounted by a dome 8.

Resting on the upper edge of the globe 3 is a ring 9, the outer edge of which is turned downwardly in the form of a flange to embrace the upper edge of the globe. To this ring 9 are fastened, by brackets 9^a, two concentric tubes 10 and 12, which project into the globe, as shown. Around the outer tube 10, which is cylindrical, is a row of perforations 11, about midway of its length. The inner tube 12, which is in the main cylindrical, is flared outwardly at the bottom, where it is connected to the outer cylindrical tube 10, forming therewith an annular space, the lower outlet of which is through the perforations 11. The inner tube 12 extends into the dome 8 above the plane of the flanged ring 9 and the upper end of the cylindrical tube 10. A shield 13 surrounds the top of the cylinder 12 and extends a short distance above it, a space being left between the two. The shield 13, the purpose of which is to prevent currents of air from passing down the central tube, which would cause the flame to flicker or become extinguished, is raised on feet 14 above the ring 9, leaving a space 15 for air to pass downwardly between the cylindrical tubes 10 and 12 and upwardly between

the cylindrical tube 12 and shield 13. Large openings 16 are made through the dome 8 in the plane of the space 15 for the entrance of air. A number of smaller perforations 17 above the larger openings 16 are supplied for the exit of the heated air and products of combustion. A coiled spring 18 within the dome bears on the flanged ring 9 when the top is closed to keep the said ring 9 pressed firmly upon the upper edge of the globe 3 and the globe in turn against the ring or sleeve 1 at the bottom of the lantern.

When the lamp is burning, the heated air and products of combustion pass up through the inner cylindrical tube and out of the dome through the perforations 17. The base of the lantern being sufficiently tight to prevent the entrance of air for the support of the flame air is drawn in through the openings 16 in the dome, as shown by arrows, between the cylindrical tubes 10 and 12 and into the globe through the perforations 11 in the cylindrical tube 10. The air passes thence downwardly in contact with the glass globe, and, being of practically the same temperature as the globe, no condensation of vapor will take place on the glass. The air on reaching the bottom of the lantern is deflected toward the flame. Part of the air which enters the openings 16 passes upwardly and, mingling with the heated air and products of combustion, makes its exit through the perforations 17 in the dome.

While I have described what I consider the best form of deflector, I do not wish to limit myself to its exact construction. Various forms of deflectors (shown in Figs. 3, 4, and 5) can be used with advantage. In each of these forms what is termed hereinabove the "outer" tube 10, in which is the row of perforations 11, is omitted and the inner tube 12 only retained. In each case the ring 9, which fits over the upper edge of the globe, is used, as is also the shield 13, which surrounds the top of the cylinder 12 and extends above it, although in Fig. 3 the form of shield differs somewhat from that seen in the remaining figures, it being of less height and extending a shorter distance beyond the end of the top of the tube 12 and having an outlet of a diameter greater than is found in the shields of the other figures. The shield is, furthermore, secured by supports 13^a to the inside of said cylinder instead of being supported from or by the ring 9.

In Fig. 4 the cylindrical tube 12 is of the same shape as in the preferred form of construction already described, being cylindrical at its upper part and flaring outwardly below, whereas in Fig. 3 the tube 12 is not cylindrical throughout any part of its length, but flares outwardly both at its top and bottom, which is also the case with Fig. 5, except that in the latter instance a straight or cylindrical formation is found at the bottom of said cylinder. It is apparent that no change of function is effected by the omission of the outer cylindrical tube 10, for the air entering the upper portion of the lantern will without the employment of said outer tube be directed by the outwardly-flaring sides of the inner tube toward the walls of the globe and the results herein described accomplished, though in a less perfect degree than when the outer tube is employed, for when the latter is used the air entering the annular space between the two tubes is in a measure directed so as to find ready exit in a horizontal plane through the perforations 11 against the upper wall of the globe, the current being directed with some appreciable degree of force and being more readily and quickly deflected downwardly than where the entering current is gradually deflected by the curvature or flaring sides of the entire area of the inner ring. In Fig. 4 is shown an outwardly-flaring ring 12^a, surrounding the tube 12, said ring fitting the tube tightly at its lower edge, the purpose of said ring being to effect an abrupt retardation of the entering current and to throw it outwardly in the direction of the walls of the globe more suddenly than would be the case were the flaring sides of the cylinder 12 alone relied upon to effect this result. By use of the ring 12^a the air striking the upper portion of the outside of the cylinder 12 is deflected outwardly before it has traveled to any considerable extent on its downward course, and on being reverberated by contact with the globe will strike the portion of the cylinder below the ring and by its flaring construction will be again deflected outwardly.

My invention, in any of the forms in which it is herein shown and described, avoids evils which have been long encountered in lanterns of this class. The sweating referred to is particularly liable to occur in cold weather, greatly lessening the strength and efficiency of the signal, the light being dimmed to a considerable extent in its effort to penetrate the assembled moisture. This defect in lanterns of this class has been generally observed, and the railroad companies and other users of such lanterns have been obliged to accept this evil as a necessary one, and not only inconveniences, but many dangers, chiefly to the traveling public, have arisen because of the failure of the lantern at critical times to show the necessary signal through the accumulation of moisture gathered within its globe. This sweating or moisture is caused in cold weather by the unequal temperature within and without the lantern when the latter is lighted. In lanterns taking the supply of air for combustion below the top of the burner sweating is caused for the reason that the air becomes warm as it rises to the flame, and when it comes in contact with the cold surface of the globe, condensation rapidly taking place, moisture is deposited on the inner surface of the globe. Under either form of my invention, a top draft being used, a current of cold air of practically even temperature with that of the globe passes between

the inner surface of the globe and the rising central current of hot air, and even temperature on the inner and outer surfaces of the globe being maintained no condensation can occur.

The shield 13 is an important element in my invention, it effectually preventing currents of air from being deflected down the central or inner tube, which would cause the flame to flicker or be extinguished. To this end it is advisable that the upper opening of the shield shall be of smaller diameter than the opening at the upper end of the tube, but this is not imperative.

It is obvious that my invention need not be restricted to hand-lanterns, but that it is applicable to other forms, and also that it admits of changes in mechanical construction not involving invention. I do not therefore confine its adaptation to any particular type of lantern or limit myself to the precise details of constructions hereinbefore described and shown in the drawings.

Having described my invention, I claim—

1. In a lantern, the combination of a globe, a dome having perforations, a deflector consisting of a tube projecting within the top of the globe and partly within the dome, means for supporting the deflector on the dome, a frustum-shaped shield 13 surrounding the top of the tube 12, the said shield being open at the top and extending above the perforations in the dome, substantially as described.

2. In a lantern, the combination of a globe, a dome, a double-walled deflector consisting of concentric tubes joined below the perforations, the outer one of which is provided with perforations, said deflector being adapted to project within the top of the globe and partly within the dome, and a shield surrounding the top of the deflector and extending above and below its upper edge, said dome having perforations to admit fresh air and other perforations for the exit of heated air and products of combustion, substantially as set forth.

In testimony whereof I have hereunto set my hand and affixed my seal this 23d day of April, 1897.

WILLIAM S. HAMM. [L. S.]

Witnesses:

HENRY OSTROM MILLER,

R. F. BUNTING.