W. H. SMITH.

Car Lighting and Ventilating Apparatus.

No. 221,475. **Patented Nov. 11, 1879.**

Fig. 1.

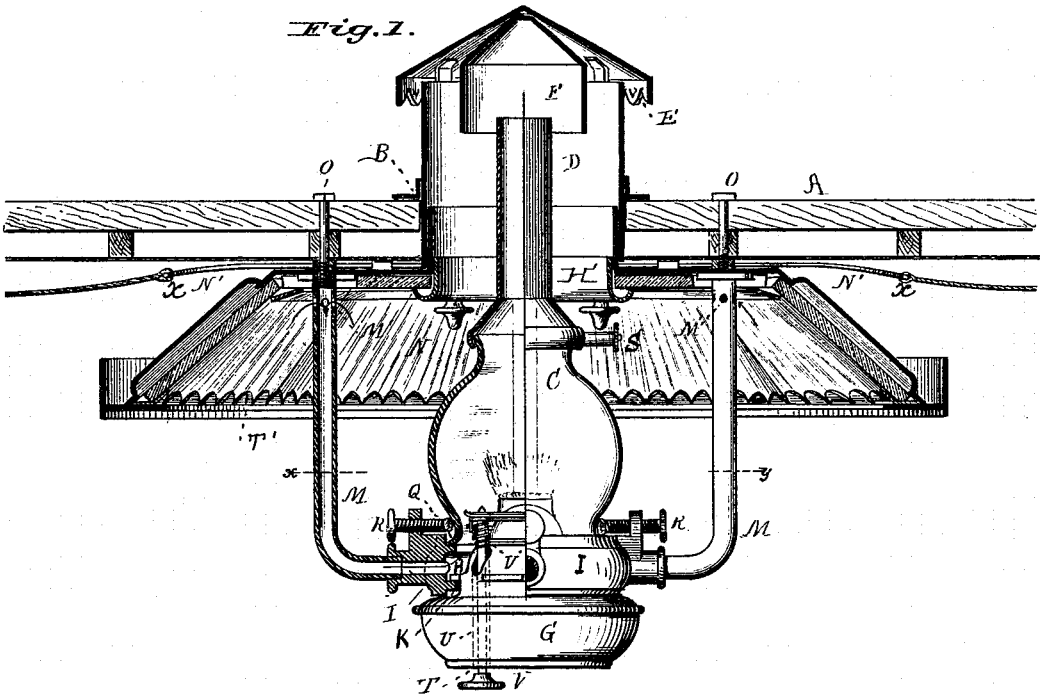
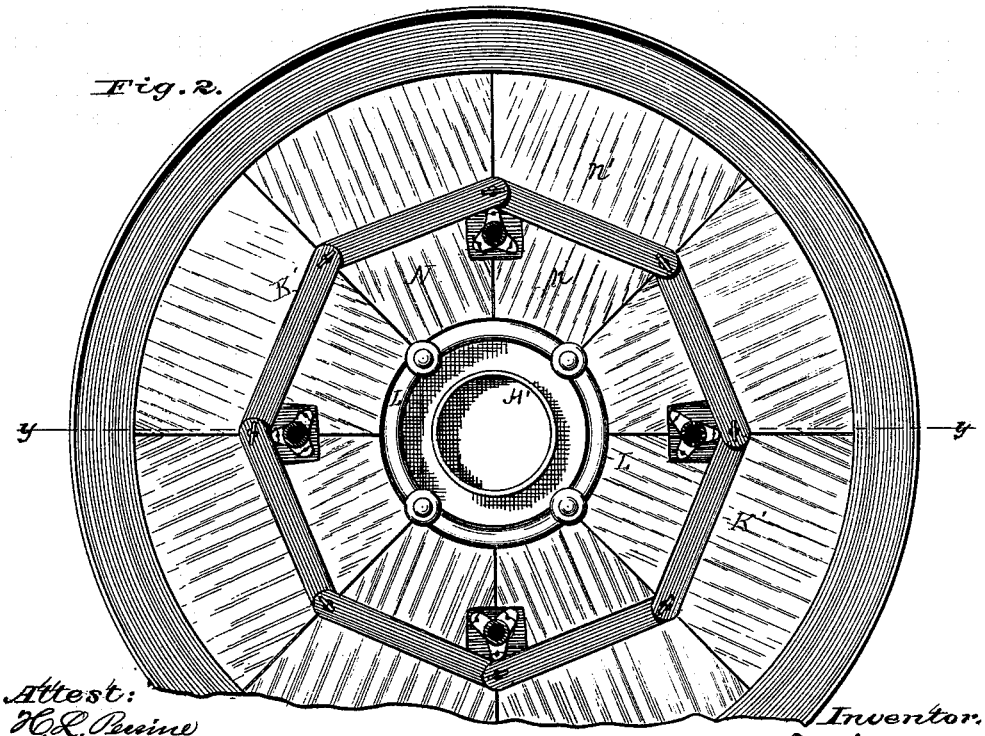


Fig. 2.



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WILLARD H. SMITH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN CAR LIGHTING AND VENTILATING APPARATUS.

Specification forming part of Letters Patent No. **221,475**, dated November 11, 1879; application filed November 13, 1878.

To all whom it may concern:

Be it known that I, WILLARD H. SMITH, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Lighting and Ventilating Cars and other Vehicles or Structures, of which the following is a specification.

This invention relates to certain improvements in apparatus for lighting and ventilating cars and other similar structures, being specially designed for street-cars.

Great difficulty has been experienced in the employment of the lamps of ordinary construction for lighting cars on account of the violent drafts attendant upon their exposed positions and the motions of the car, rendering the lamps liable to burn irregularly and smoke, causing disagreeable odors in the car, or to be extinguished entirely in stormy weather or by heavy winds.

With such lamps, also, in order to light the interior of the vehicle thoroughly, it has been found necessary to employ a reflector or reflectors to distribute the light and prevent a shadow or shadows from being cast by the body of the lamp or its supports in the center or other portions of the car.

Numerous difficulties have been found attendant upon the use of reflectors as ordinarily constructed on account of their defective shape, which renders it impossible to secure them in the upper part of the car of ordinary construction, owing to the limited "head room" in the same, rendering it necessary to make expensive alterations in the car, such as raising the roof and the employment of large rings to support the lamp at a sufficient height. Such reflectors are further objectionable, owing to the difficulty of repairing the glasses when injured or broken without taking down the reflector and laying up the car for the time. Besides, it is necessary to split the gong-strap and carry it around the reflector, necessitating such a weight of leather that the gong-hammer will fail to respond to the pull upon the strap or to return to its normal position after striking, all of which objections have contributed to lessen the usefulness of this class of lamps.

The object of my invention is to overcome the above-enumerated objections; and it consists, first, in providing the roof of a railroad-car, street-car, or other vehicle or structure, directly above the lamp, with an aperture of sufficient size to receive the smoke-chimney or upper part or section of the lamp-globe, and leave a sufficient space around the same for the escape of the foul air from the interior of the car, said aperture being provided with a covered hood having suitable ventilating-apertures near its top, and provided with a downwardly-projecting rim on its inside, which sits over the smoke-chimney when in place, dividing the draft from the lamp and that from the car into two independent currents, securing a thorough ventilation of the car without admitting rain or snow, and at the same time preventing the air from being exhausted from the lamp or the light from being blown out by backward or outward currents, as more fully hereinafter set forth; second, in a car-lamp reflector secured to the roof of the car, and formed with downwardly-projecting reflecting sides and a flat, or nearly flat, reflecting top having a central aperture, as hereinafter described, in combination with a flue or passage extending from said opening through the roof of the car, and an external cowl or hood, substantially as hereinafter set forth; third, in providing the reflector with removable or detachable trimmings adapted to be secured by means of screws, or their equivalents, for concealing and covering the metal clasps for confining the glasses of the reflector in place, which clasps are capable of being easily bent, allowing the glasses to be readily removed and replaced when broken or injured without taking down the reflector and lamp and laying up the car for the purpose; fourth, in the combination, with the reflector, of a bent-wire frame passing around the central aperture and secured in guides on the top of the reflector or inside of the car-roof, the ends being attached in any suitable manner to the gong-straps, as more fully hereinafter specified; fifth, in the combination, with a car-lamp, of a hood provided with an annular rim or ledge adapted to set over the upper end of the lamp-chimney, the hood having an escape-opening for the products of combustion less in area than the opening between the annular rim or ledge and the lamp-chimney, whereby any backward

draft caused by the motion of the car is prevented.

In the drawings, Figure 1 represents a longitudinal vertical section through the top of a car, showing my invention applied thereto. Fig. 2 represents a bottom view of the reflector and its attachments.

The letter A represents the roof of a street-car, railroad-car, or other similar vehicle or structure. Directly through the roof is formed an aperture, B. Said aperture is somewhat larger in diameter than the largest portion of the metallic or upper section of the globe C, so as to allow the chimney and upper portion of the globe to be lifted into the aperture for the purpose of removal, and also to allow sufficient space around the chimney and globe for the purpose of ventilation.

The letter D represents a hood or cap secured to the roof of the car above the aperture, said hood consisting of a metallic tubular shell provided with a cap or top extending or projecting over its upper edges, and supported slightly above the same, so as to leave suitable apertures E for the escape of the heated air from the interior of the car, and at the same time prevent the entrance of rain or snow in stormy weather. To the lower side of said top is secured a downwardly-projecting annular rim or ledge, F, smaller in diameter than the interior of the hood, but larger than the top of the metal chimney or top section of the lamp-globe C, which sits within it when in place. The said rim or ledge serves to divide the draft from the interior of the car and lamp into two currents and prevent the lamp from being effected by back drafts or violent outward drafts from the car, which would extinguish the light.

The aperture or apertures E at the top of the hood are preferably less in area than the annular ventilating passage or space, which is between the hood and the chimney, and communicates with the interior of the car to allow free passage of any volume of air passing inwardly through the aperture or apertures E and more surely prevent irregularities in the air-currents from injuriously affecting the flame of the lamp.

In the drawings the annular rim, ledge, or cap F, which sits over the chimney, is represented with sides of such length as to extend down considerably below the chimney-top. This, however, is not indispensable. All that is needed is that there should be a deflecting device so placed and of such size and proportions as to shield the top of the chimney from the direct action of the incoming air and to break up the cross-currents, which are apt to be created in the hood when the car is in rapid motion, and to break up and deflect the downward current into the ventilating passage or passages leading to the interior of the car. The deflector F performs these offices very effectually.

The letter G represents the lamp-body, which is supported by means of lugs H formed upon the same within an annular holder or gallery, I, by means of corresponding lugs K formed within the same, over which the lugs H may be engaged by slightly turning the lamp-body in the proper direction. The said holder or gallery I is suspended by means of one or more hollow tubes, M, which communicate with its interior at their lower ends above the point of attachment of the lamp-body, and at or near their upper ends with the atmosphere through suitable openings M′. Said tubes are secured at their upper ends to the top of the car or reflector N by means of screws O, or in any other convenient manner, and serve, besides supporting the holder I, to convey the air necessary for the purpose of supporting combustion to the flame through a circuitous passage, in order to get rid of direct drafts, which would cause the light to smoke or extinguish it entirely. By this means all violent gusts are prevented from finding access to the light, the currents being modified and equalized in their passage through the tubes, so as to be distributed uniformly to the flame.

The lamp is provided, as usual, with a globe, C, which is secured within an annular recess, Q, at the top of the holder or gallery by means of rubber-tipped screws or elastic bearings R, which prevent injury to the glass during its expansion, or from shocks or other causes.

The said globe is provided with a metallic top or chimney, which is secured by means of set-screws S, or otherwise.

The letter N represents the reflector, which is provided with an aperture, H′, corresponding with the aperture in the top of the car or other structure. The said reflector consists of an interior casing of metal or other suitable material constructed with a flat, or nearly flat, top, *n*, and inclined downwardly-projecting sides *n′*, and of a circular or polygonal shape, set at such an angle as to reflect the light under the body of the lamp and its supports, when the reflecting-glasses are in place, and prevent said body from casting shadows in the central or other portion of the car. The flat portion of the top of said reflector is secured directly to the roof of the car in any convenient manner, and by reason of its peculiar shape it occupies but a limited space, and can be secured or fitted in the cars of ordinary construction without requiring extra mountings above the roof, the metal lamp-chimney setting up through the central opening, out of the way, in the hood on top of the car.

The reflecting-surfaces may consist of polished metal, but are preferably constructed of suitably-shaped sections of glass, corrugated or plain, and silvered or coated with amalgam on their backs.

The lower edges of the casing of the reflector are bent inward and upward, as shown at T′, forming a recess for the lower edges of the side glasses or sections; or an annular flange may be formed around the lower edge of the casing for the purpose. The upper edges of the said side sections and the outer edges of the sections forming the reflecting-surface of the flat

top are secured by the same means, and are covered by detachable fittings K′, which are held in place by screws, pins, or other equivalent means, which will allow of their ready removal to permit the sections to be removed and replaced with facility without taking down the whole reflector, as is necessary when the glasses are secured by soldered fittings in the ordinary manner.

The edges of the sections around the central aperture are covered by an annular center-piece, L, secured in the same manner as the fittings K′.

The letter N′ represents a frame composed of metallic rods or wires, and extending around the central aperture of the reflector between the top of said reflector and the roof of the car. Said frame is secured so as to slide in ways attached either to the roof of the car or to the top of the reflector, and at its opposite ends is provided with loops or eyes *x*, by means of which the gong-straps may be attached to it, the said frame serving to connect the gong-straps, and thus prevent the necessity of splitting the same and carrying the parts around the reflector, as is ordinarily the case.

From the foregoing description it is evident that the objections ordinarily met with in hanging car-lamps will be obviated, and a lamp produced that will burn with regularity and without smoke, and which will aid in ventilating the car and will effectually light all portions thereof, and which can be readily applied to the cars in use at present without material alteration of the same.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The ventilating-hood communicating with the interior of the car, in combination with the lamp and lamp-chimney and a deflector which shields the top of the chimney from the direct action of the external air entering through the hood, and deflects said air into the air passage or space leading from the hood into the car, substantially as hereinbefore set forth.

2. A car-lamp reflector secured by its top to the roof of the car, and formed with downwardly-inclined reflecting sides and a flat, or nearly flat, reflecting top having a central aperture, as described, in combination with a flue or passage extending from said aperture through the car-roof, and an external cowl or hood, substantially as and for the purposes set forth.

3. The detachable fittings and center-piece for covering the edges of the reflector-sections and their fastenings, to allow said sections to be removed and replaced without taking down the reflector, substantially as set forth.

4. In combination with the reflector, the sliding frame for connecting the gong-straps, as and for the purposes specified.

5. In combination with a car-lamp, a hood communicating with the interior of the car through a space or passage around the lamp-chimney, and a deflector or cap adapted to sit over the upper end of the lamp-chimney, the hood having an escape-opening for the products of combustion less in area than the ventilating-passage in the hood, which communicates with the interior of the car, whereby any backward or outward draft from the motion of the car is prevented, substantially as specified.

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

WILLARD H. SMITH.

Witnesses:
CHAS. L. COOMBS,
J. W. HAMILTON JOHNSON.