

M. A. MORTON.
VENTILATING APPARATUS FOR CARS.

No. 193,270.

Patented July 17, 1877.

FIG. 1.

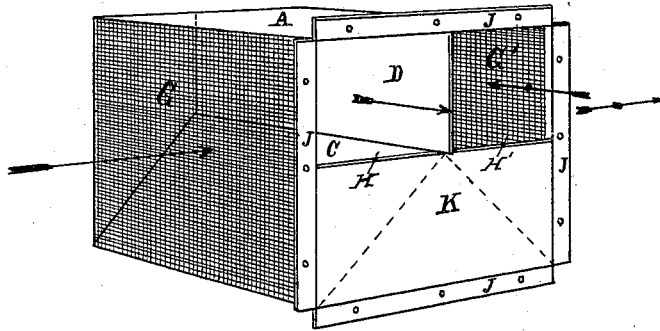


FIG. 2.

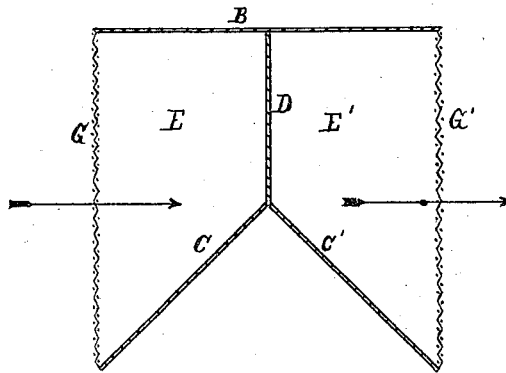
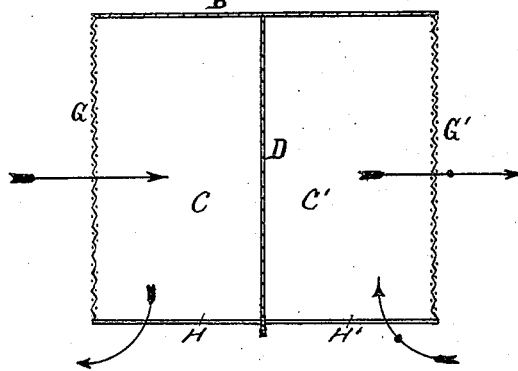


FIG. 3.



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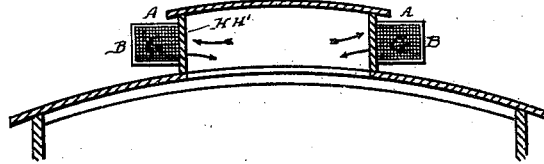
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FIG. 4.



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MANDRED A. MORTON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN VENTILATING APPARATUS FOR CARS.

Specification forming part of Letters Patent No. **193,270**, dated July 17, 1877; application filed June 15, 1877.

To all whom it may concern:

Be it known that I, MANDRED A. MORTON, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Ventilating Apparatus for Railroad-Cars, &c., of which the following is a specification:

In using this improved ventilator upon the railroad passenger-car, I propose to place a series of several of them, usually, upon the roof of the car, to inclose the common ventilating-windows which are pierced through the sides of the raised central portion of the roof or "deck," as it is sometimes called, of the car. The ventilator to be applied to these or similar openings consists of a box provided with two gauze sides and a central partition, forming two gauze-covered chambers, one facing toward one end of the car, and the other toward the other end of the car. This box is applied to the exterior of the car, and projects out into the air, so that the movement of the car causes it to catch the air at the gauze mouth facing the front end of the car, in the direction in which the car is moving, and to force the air thus caught into the car, while at the same time the same cause produces an exhaust of air from the car through the other gauze opening facing the rear of the car. Thus a constant circulation of the air is kept up while the car is in motion, forcing fresh air into the car, and drawing foul air therefrom.

The air entering the car strikes forcibly against the sheet of gauze, and is purified thereby of all smoke, dust, or cinders. Wire-gauze screens do not always prevent the passage of dust and cinders and smoke even when the gauze is very fine; for instance, if an opening in the end of a car, where the opening is surrounded at all sides by a flat surface of wall impervious to air, be covered with gauze, it will be found that the dust, &c., will pass through the gauze to a considerable extent. I explain this fact theoretically as follows: The air rushes forcibly against the end of the car in motion, and is condensed to some extent by the impervious portion of the wall, and condensed to a less extent upon the gauzed surface, forming thus a sort of funnel of condensed air around the gauzed openings, which

acts to direct and concentrate the dust, &c., into the opening and through the gauze. Now, again, and also for illustration, if a piece of fine gauze-wire screen be held up in a current of air; with no impervious wall around it, there will be an entirely different kind of a result produced. The gauze will offer a considerable resistance to the passage of air through it, and will thus cause a concentration of air upon the gauze surface, which concentrated portion will take a conical or pyramidal form, the gauze being the base, while the apex points against the current. This cone of condensed air will cause heavy particles, like smoke, dust, and cinders, to glance off, and pass to the sides of the screen, and not through it.

From these illustrations it will be clearly understood, without further comment, why I cover the entire surface of the sides of my ventilating-box with a gauze opening, and also why I cause it to project clear into the current and at right angles thereto. It will also serve to explain why I put no rim or hood or mouth around the gauze in front of it, which, while it might serve to gather the air to some extent, would also to some extent hinder the glancing off of the heavy particles above alluded to, and would also tend to produce eddies and revolving or cross-currents at the edges of the opening, which would interfere to a greater or less extent with the perfect operation of the screen.

In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective view of my improved ventilator detached from the car. Fig. 2 is a vertical central section of the same from gauze to gauze. Fig. 3 is a horizontal section of the same. Fig. 4 is cross-section of a car-roof with the ventilators applied.

Like letters of reference are made use of to denote like parts in the several figures.

In the said drawing is shown a sheet-metal box, closed at the top A, and at one end, B, by the metal of which it is made, and closed in like manner at the bottom by two inclined metal surfaces, C C', forming a ridge, from the top of which to the top of the box extends a vertical partition, D, dividing the box into

two compartments, E E', both of which are furnished with a wire-gauze screen, G G', covering the entire opening as nearly as practicable. This construction leaves two openings, H H', one from each compartment, entirely unobstructed. The flange J is for the purpose of affording a means for securing the box to the side of the car or deck over the ventilating-windows, and the plate K is to cut off the openings H H' to bring them to the size of the ventilating-windows. This plate, however, is not absolutely necessary, being a mere convenience. The partition D should, preferably, extend into the window, in order, as far as possible, to separate the incoming and outgoing currents.

Wood or other material may be used where metal is employed in the box, if desired, but sheet metal will be the best material. The gauze used should be quite fine in mesh, and preferably what is commercially known as seventy to the inch.

If we may suppose the apparatus above described applied to a car as indicated, and that the gauze surface G to the front or facing toward the direction in which the car is moving, then the air-currents into and out of the box will be indicated by the arrows, the incoming or pure air by the plain arrows, the outgoing or vitiated air by the arrows with a black blot upon the shaft. If the car runs the other way the action will be precisely reversed.

The inclined bottom has several functions. It directs the air upward toward the exit, drains off any spray or moisture which may by accident penetrate the gauze from the outside, and permits any dust which may get into the box from the car and settle upon the incline, to be blown back into the car at the first puff of current which enters the box from the outside.

In order to control these incoming and outgoing currents, valves may be placed in the ventilating-window, either to open and close both openings H H' more or less, or so constructed as to close or open either one more or less.

This apparatus will do the work of ventilation very thoroughly and effectually and cleanly, and may be made and applied to new or old cars at a very small cost; and while no dust, &c., can enter through the ventilator into the car, any dust that may get into the car through the doors or windows is perfectly free to pass out through the ventilator. This latter peculiarity will be understood from the explanation given at the commencement of this specification.

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

1. The ventilator for railroad-cars, consisting of a box divided into two compartments by a permanent partition, both compartments opening through gauze screens to the outside air, and opening into the car through apertures which are provided, or which are not provided, with a valve or valves, said box being attached in such manner to the car as to project clear into the air at all sides except that which connects it to the car, substantially as specified.

2. The ventilator having the double compartment permanently divided, gauze-covered ends, and a double inclined bottom, substantially as specified.

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Witnesses:

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