D. I. COOKE.

CAR VENTILATING SYSTEM.

APPLICATION FILED JULY 16, 1912.

1,051,312. Patented Jan. 21, 1913.

Fig. 1.

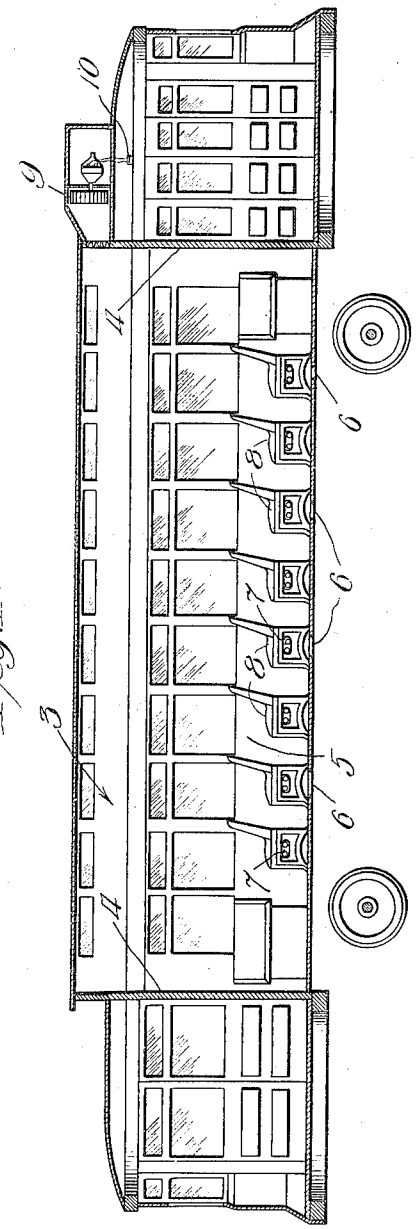
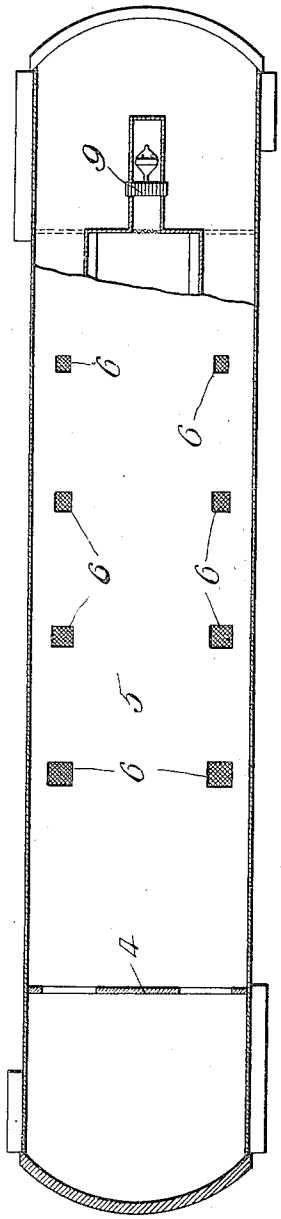


Fig. 2.



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UNITED STATES PATENT OFFICE.

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CAR-VENTILATING SYSTEM.

1,051,312. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed July 16, 1912. Serial No. 709,703.

To all whom it may concern:

Be it known that I, DWIGHT I. COOKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Ventilating Systems, of which the following is a specification.

This invention relates to means for automatically predetermining an even and uniform exhaust of foul or vitiated air from every portion of the interior of a car.

In the present invention, it is sought to arrange a series of fresh air intakes to be operated in conjunction with means for exhausting the vitiated air, by which the flow of foul air withdrawn from within a car is maintained even and constant at every point therein; and to accomplish this end with the simplest possible construction, and with a minimum of expense.

The invention further consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawing, Figure 1 is a longitudinal vertical section through a car body; and Fig. 2 is a horizontal section therethrough taken on two different levels.

The ventilating system utilized in my invention is applicable particularly to cars of the closed or vestibule type having bulkheads at either end thereof. Although shown and described in connection with the usual type of street car with the monitor deck roof, the ventilating system is equally applicable to other cars, whether constructed with the arch roof, or designed for general railway service.

The invention is particularly useful and adaptable to cars having little or inadequate ventilating facilities, because of its simplicity and the readiness with which it may be installed in old cars.

Referring to the drawing, there is shown a car 3 having bulkheads 4 at either end thereof to provide an interior passenger compartment 5. A series of fresh air intakes 6 are provided adjacent to the floor of the car and preferably in position to bring the entering air close to heaters 7, located in proximity to seats 8. At such times as it may be necessary to operate the heaters, the entering air will be warmed, thereby conducing to the greater comfort of the passengers, and to the rising of the air toward the ceiling of the car.

There is provided at one end of the car suitable exhaust means 9, such as the fan and electrically operated motor shown, which means may be controlled as by means of a switch 10 located conveniently within reach of one of the car crew. In the type of car provided with the monitor deck roof, this exhaust means may be placed, as shown over the bow of the car vestibule roof, but where the car is provided with the arch type of roof, said means may be positioned adjacent the ceiling of the car within the vestibule. The air entering through the intakes is drawn by the action of the exhaust means to that portion of the car where the said means is located, and is thereby exhausted to the outside atmosphere.

In order to bring about an even and constant flow of air through the intake openings without the use of any dampers or other regulating means, I have designed the intakes with different capacities for the flow of air therethrough, so as to predetermine the velocity of air entering through each. Those intakes which are located closest to the point of exhaust are designed to admit therethrough but a certain predetermined amount of air; those farthest from the point of exhaust to admit therethrough a considerably greater amount of air; while those intermediately placed to have inlet capacities proportioned accordingly. By this means, fresh air is admitted to the car at every point in proper quantities to insure of an even and constant flow therethrough to the point of exhaust, obviating thereby a condition of inequality of ventilation in different portions of the car. The principle upon which this action depends is that when the exhaust fan is operated at a predetermined speed, the suction effect resulting therefrom is constant. The speed at which the fan is operated should, of course, be predetermined, so as to handle the necessary quantity of air entering the car, and to insure a change thereof taking place within the car body at a predetermined rate. By the provision of a series of intakes proportioned in the manner described, a practically equal and constant flow of air is insured through each of the openings. The loss in pressure which

ordinarily would result in the case of intakes which are farthest removed from the fan is compensated for by the increased capacity of such intakes.

The simplest manner in which the speed of the air entering each of the intakes may be predetermined is by providing openings of different areas at such points, these areas being graduated increasingly as they are positioned farther away from the point of exhaust. It is also possible to provide intakes designed to admit but a certain predetermined quantity of air in other ways than by graduating the area of the openings through which the air enters, but the method outlined is the one which I prefer to adopt. It should be borne in mind that in a car of the vestibule type, such as is particularly adapted for the installation of this system of ventilation, that the flow of air through the passenger compartment, due to the motion of the car itself, is practically negligible. It, therefore, follows that the point of exhaust may be located in any convenient portion of the car, and to work with equal efficiency regardless of the direction of movement of the car.

The ventilating system which I have described is such as to admit into a car at every point fresh air in adequate and uniform quantities, and to exhaust the same therefrom without the provision of any duct specially arranged and constructed for the purpose of drawing off vitiated air.

I claim:

In a car ventilating system, the combination with a car body of mechanically operated means for exhausting vitiated air therefrom, said exhaust means operating to remove vitiated air through a single exhaust port communicating directly with the main car body, and a plurality of fresh air intakes adjacent to the car floor, having inlet capacities graduated increasingly in size according to their distance from the point of exhaust.

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