D. I. COOKE.

CAR VENTILATING SYSTEM.

APPLICATION FILED DEC. 16, 1908.

920,918.

Patented May 11, 1909.

4 SHEETS—SHEET 1.

Fig. 1.

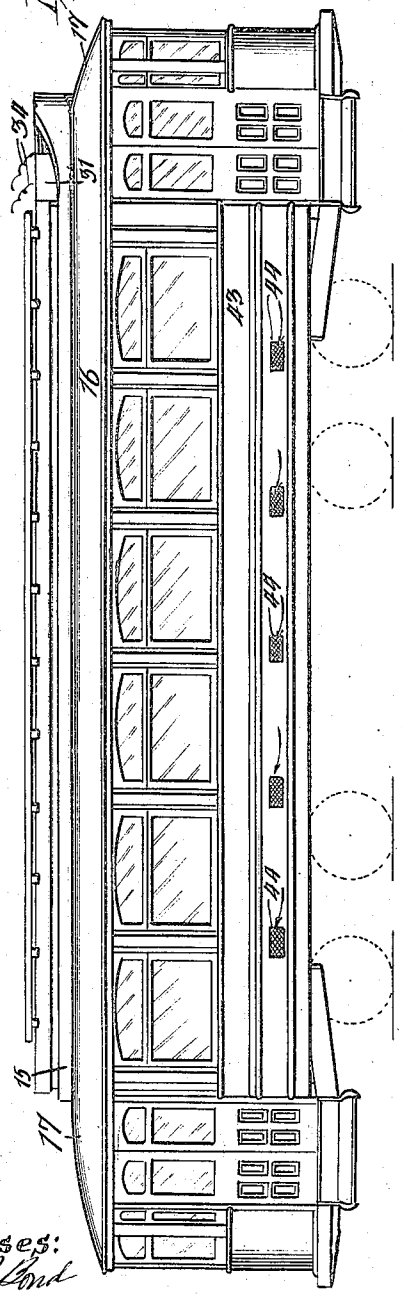
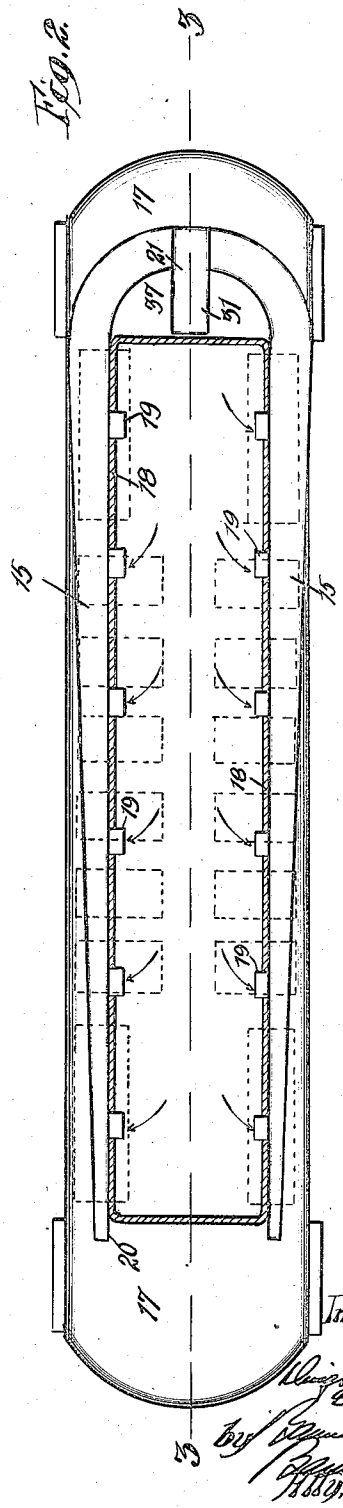


Fig. 2.



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4 SHEETS—SHEET 2.

Fig. 3.

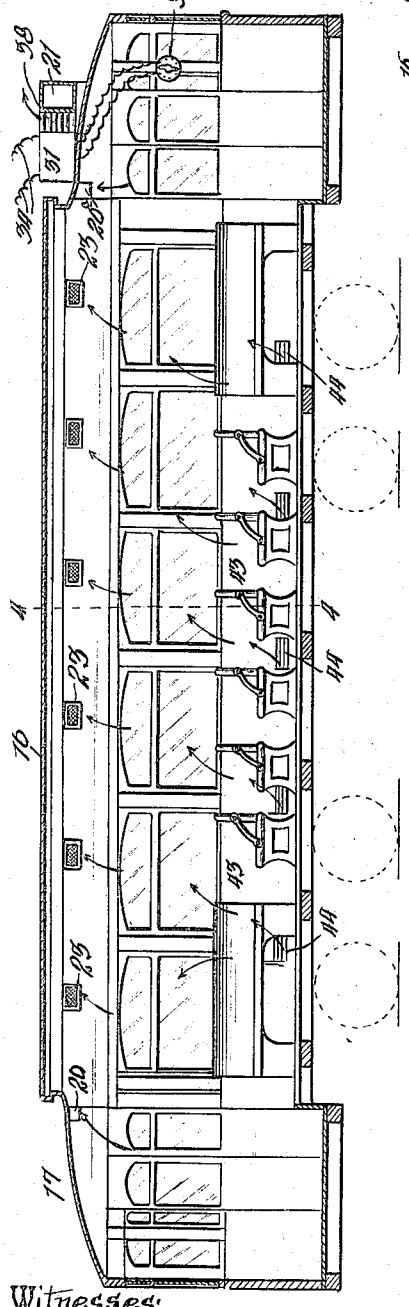


Fig. 6.

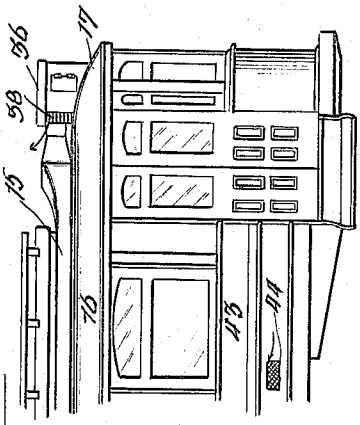


Fig. 7.

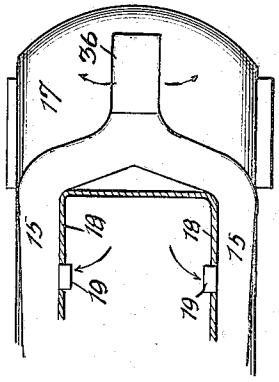


Fig. 4.

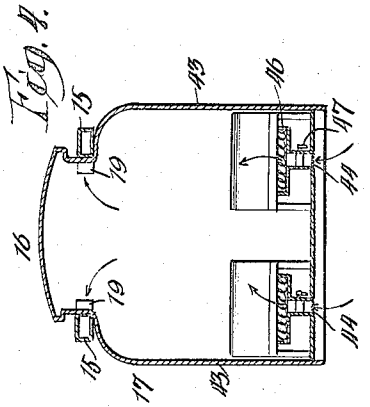
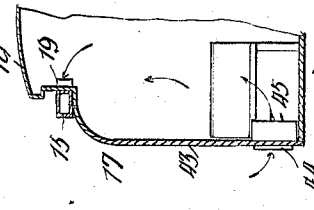


Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 8.

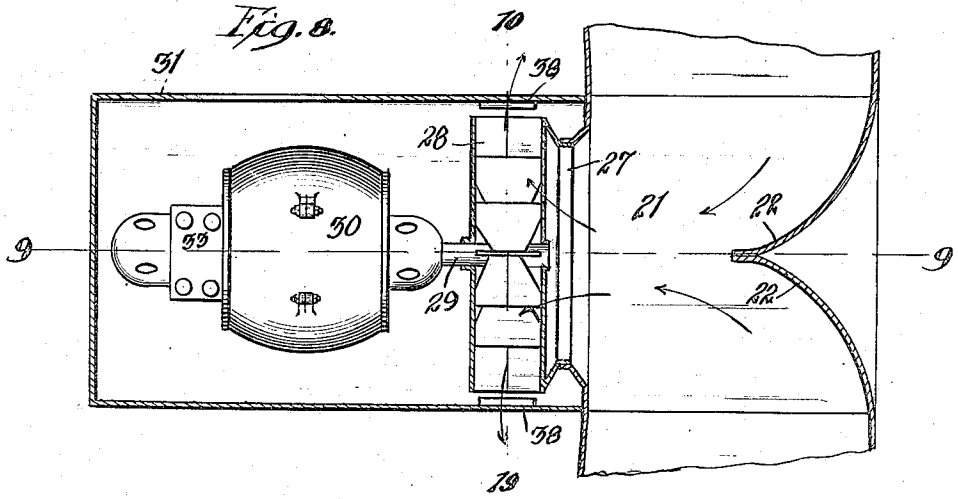


Fig. 9.

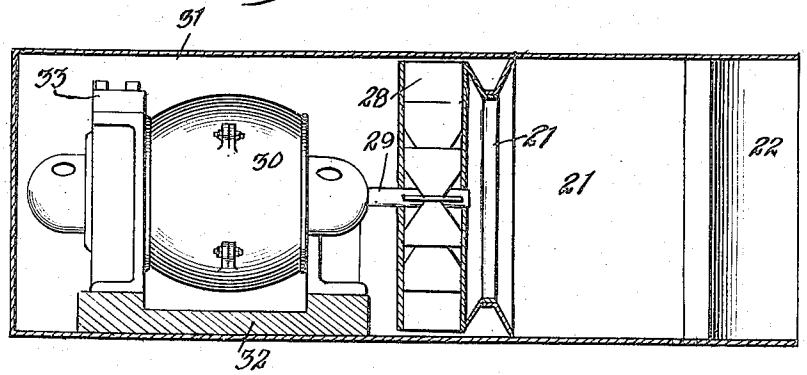
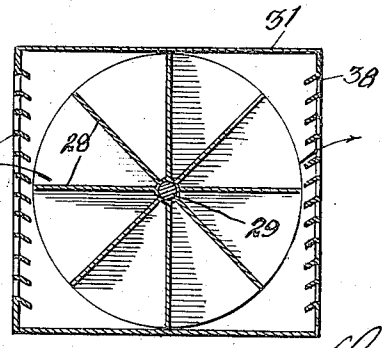


Fig. 10.



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4 SHEETS—SHEET 4.

Fig. 14.

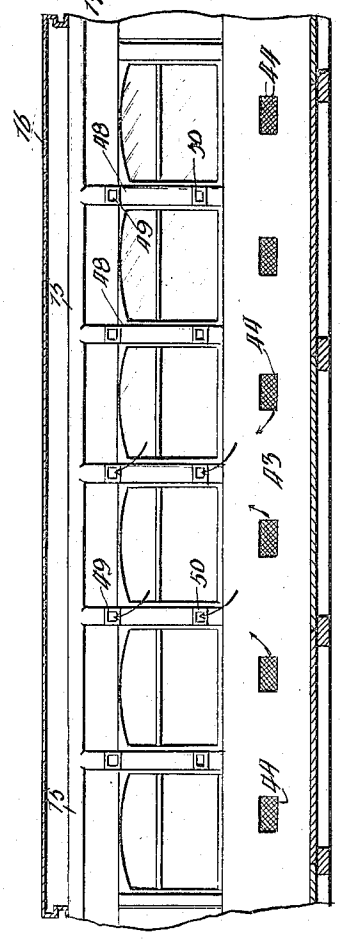


Fig. 12.



Fig. 13.

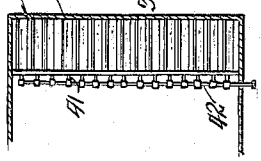
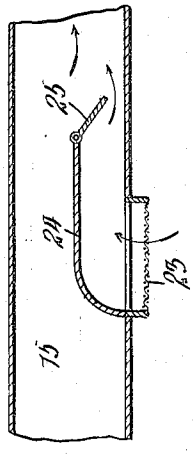


Fig. 11.



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UNITED STATES PATENT OFFICE.

DWIGHT I. COOKE, OF CHICAGO, ILLINOIS.

CAR-VENTILATING SYSTEM.

No. 920,918. Specification of Letters Patent. Patented May 11, 1909.

Application filed December 18, 1908. Serial No. 468,134.

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.

The present invention relates to an improved construction in car ventilating systems, applicable more especially for use in connection with Pullman, passenger and street cars.

One of the essential objects is to provide an effective ventilating system that will occupy a minimum of space, and arranged in such manner as not to interfere with nor impair the finish or operation of the car.

Another object is to arrange the ventilating apparatus so that when in use the foul air may be constantly exhausted from the car body, irrespective of the travel or motion of the car itself.

Another object is to provide a suitable ventilating construction that will exhaust the foul air from the various car compartments, such as smoking rooms and inclosed platforms, as well as upper and lower berths in Pullmans.

Other objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side view of an electric car, having this improved ventilating system used in connection therewith; Fig. 2 a top or plan view, with a portion of the roof sectioned away; Fig. 3 a longitudinal section, taken on line 3—3 of Fig. 2; Fig. 4 a transverse section, taken on line 4—4 of Fig. 3, showing the air intake located in the bottom of the car; Fig. 5 a view similar to Fig. 4, showing the air intakes located in the side of the car; Fig. 6 an elevation of one end of the car body, showing the exhausting apparatus in front of the exhaust air ducts; Fig. 7 a top or plan view of Fig. 6; Fig. 8 a sectional plan view of the exhaust fan and motor; Fig. 9 a longitudinal section, taken on line 9—9 of Fig. 8; Fig. 10 a transverse section, taken on line 10—10 of Fig. 8; Fig. 11 a sectional detail in plan of the damper mechanism in the exhaust ducts; Fig. 12 a side view of the detail shown in Fig. 11; Fig. 13 a detail showing a form of damper for regulating the discharge vent; and Fig. 14 a modification, showing the construction of exhaust air ducts as applied for use in Pullman sleepers.

This improved car ventilating system, in the form shown in Fig. 1, comprises a pair of elongated tapered exhaust air ducts 15, preferably positioned upon the roof 16 of a passenger or sleeping car 17, said exhaust air ducts having their inner side walls contacting and abutting against the upper ventilator deck sash 18. At suitable intervals these elongated exhaust air ducts have formed in their inner side walls inwardly projecting vent or exhaust openings 19, which are usually made of sheet metal and of any suitable formation, preferably inserted through the side of the ventilating deck, as best shown in Fig. 2. These elongated exhaust air ducts 15, as stated, are, for practical purposes, of tapered formation, their smaller ends usually having vent openings 20 in the top of the end car compartment, and the opposite or enlarged ends of the exhaust air ducts having similar openings 20^a projecting downwardly through the roof of the car, and said air ducts are merged together centrally upon the car roof and in communication with an exhaust chamber 21 having inwardly formed baffle walls 22 for directing the flow and travel of the exhausted air from the air ducts. These exhaust air ducts 15 have screens 23 secured upon the inner faces of the projected vent openings 19, and partition walls 24 are formed in the body of the exhaust air ducts, as illustrated in Fig. 11, and are provided, at their outer ends, with a movable damper 25 having a handle 26, or other suitable means for regulating the position of the damper therein. It is obvious that the damper 26 may be located directly in the opening and the baffle omitted. It will be understood that the openings in the end car compartments are of a similar construction.

The exhaust air chamber 21 opens into a contracted fan inlet 27 adjacent to an exhaust fan 28, which is keyed upon a movable fan shaft 29 actuated from any suitable source of power. As illustrated, said fan shaft is a part of the rotating motor shaft 29, which, in this instance, is actuated by a motor 30. The motor is protected by an air proof covering 31 and mounted upon a suitable insulating base 32 to prevent grounding of circuit on the car roof, and has frame brackets 33, as usual.

Where this improved ventilating system is used in connection with electric cars, as

shown in Figs. 1 and 3, suitable wires 34 are connected with the means for actuating the exhaust fan at one end, and at its opposite end with an electric regulator 35 for controlling the action and speed of the fan for exhausting the foul air from the car body. This electric regulator 35 is preferably positioned on the car platform in proximity to the car operator, so as to enable the system to be under his control at any and all times.

As shown in Figs. 6 and 7, the exhaust air chamber and fan are positioned in front of the exhaust air ducts, as at 36, although actual experience has demonstrated the advisability of having the same formed oppositely therefrom, as at 37, in Fig. 2, in order that the walls of the exhaust air ducts may serve to shield the exhaust fan and motor.

An improved construction of louvers 38, illustrated in detail in Fig. 13, is preferably positioned on opposite sides of the movable exhaust fan, as in Fig. 10, the same comprising a series of movable louvers 39, suitably mounted within a frame 40, having their respective ends 41 in engagement with a vertically disposed controlling rod 42 for regulating the louvers in any desired position. The car body 43 has fresh air intakes 44 formed either in the lower side walls, as shown in Figs. 1 and 5, or else in the bottom of the car body, as in Figs. 3 and 4, or in both, as desired. When the car bodies have fresh air intakes formed in their side walls, the car heaters 45 are usually positioned adjacent thereto for tempering the admitted air, and when fresh air intakes are formed in the bottom of the car body the car heaters 46 are positioned above the same. When it is advisable to connect the air intake openings directly with the car heater, as in Fig. 4, dampers 47 may be used for regulating the flow of admitted air. Under certain conditions it may be desirable to have the car body formed with fresh air intakes in its respective corners only, and to have the heating coils placed adjacent thereto.

When used with a Pullman sleeper, this system will provide an even and constant supply of fresh air to all the sleeping compartments thereof, whether the car be in motion or not. This result is obtained by the extension of the downwardly formed exhaust ducts 48 within the car wall, and having upper and lower openings 49 and 50, respectively, opening into the sleeping compartments. The closed compartments in the front and rear ends of the car, as in the case of the "Pay as you enter" type, are fully ventilated, insuring an even supply of fresh air thereto. Another advantage is that the efficiency of the heating systems as at present installed in the cars is greatly increased, because of the flow of fresh air over and through the heaters, thereby rendering it possible to heat the cars with less energy than is now done. In the car body proper, a constant and even supply of fresh air will be provided, and the vitiated or foul air exhaled will be exhausted therefrom without perceptible draft, whether the car is in motion or not. The flow of air through the car, and the amount of air exhausted from the same, is not affected in any way by the motion, speed, direction of the car, or pressure thereon, but is governed solely by the speed of the exhaust fan.

What I claim as new and desire to secure by Letters Patent is:

1. In a car ventilating system, a car body having a series of fresh air intakes formed in the lower portion of the car body, elongated exhaust ducts positioned on each side upon the car roof and against the upper ventilating deck sash and provided with a series of exhaust openings, the exhaust air ducts merging together on the front end of the car into an exhaust chamber, and an exhaust fan in communication with the exhaust chamber for withdrawing the foul air from the exhaust ducts, substantially as described.

2. In a car ventilating system, a car body provided with a series of fresh air intakes, an exhaust air duct on the body of the car, an electrically operated exhaust fan for drawing off the air within the car body, and an electric controlling regulator under the control of the car men at all times for regulating the speed of the exhaust fan, substantially as described.

3. In a car ventilating system, a car body having a series of fresh air intakes formed in the lower portion of the car body, elongated tapered exhaust ducts positioned upon the car roof and against the upper ventilator deck sash and provided with a series of inwardly projecting vent openings, the exhaust air ducts merging together on the front end of the car and opening into an exhaust chamber, and an exhaust fan for drawing out the foul air from the car body, substantially as described.

4. In a car ventilating system, a car body having a series of fresh air intakes formed in lower portion of the car body elongated exhaust ducts positioned upon the car roof and against the upper ventilator deck sash and provided with a series of inwardly projecting vent openings, the exhaust air ducts merging together on the front end of the car and opening rearwardly and centrally of the exhaust air ducts into an exhaust chamber, and an exhaust fan in communication with the exhaust chamber for withdrawing the foul air through the exhaust ducts from the car body, substantially as described.

5. In a car ventilating system, a car body having fresh air intakes in lower portion of the car body, exhaust air ducts positioned upon the car roof and having inwardly pro-

jecting vents formed on their inner side walls opening into the car, the exhaust air ducts merging together and in communication with an exhaust chamber, an exhaust fan in communication with the exhaust chamber, and a series of movable louvers positioned adjacent the exhaust fan, said louvers being mounted within frames and having their respective ends in engagement with controlling rods for regulating their positions, substantially as described.

6. In a car ventilating system, a car body having a series of fresh air intakes formed in lower portion of the car body elongated exhaust air ducts positioned upon the roof of the car and having inwardly projecting vent openings formed in its inner side walls, said vent openings being in communication both with the car body and front and rear platforms thereof, and a power driven exhaust fan for exhausting the foul air from the car, substantially as described.

7. In a car ventilating system, a car body having a series of fresh air intakes formed in lower portion of the car body elongated exhaust air ducts positioned upon the roof of the car and having inwardly projecting vent openings formed in their inner side walls, said vent openings being in communication both with the car body and front and rear platforms thereof, a power driven exhaust fan for exhausting the foul air from the car, and electrical controlling means enabling the car operator to control the action of the ventilating system at all times, substantially as described.

8. In a ventilating system for sleeping cars, a car body having a series of fresh air intakes formed in lower portion of car, an exhaust air duct adjacent the roof of the car and having downwardly formed exhaust ducts within the car walls, said ducts having upper and lower openings for exhausting the foul air from the upper and lower sleeping berths, an electrically operated exhaust fan for drawing off the air within the car body, and an electric controlled regulator under control of the car men at all times for regulating the speed of the exhaust fan, substantially as described.

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