

June 20, 1933.

J. R. BLACK ALL ET AL

1,915,149

RAILWAY CAR

Original Filed May 1, 1929

3 Sheets-Sheet 1

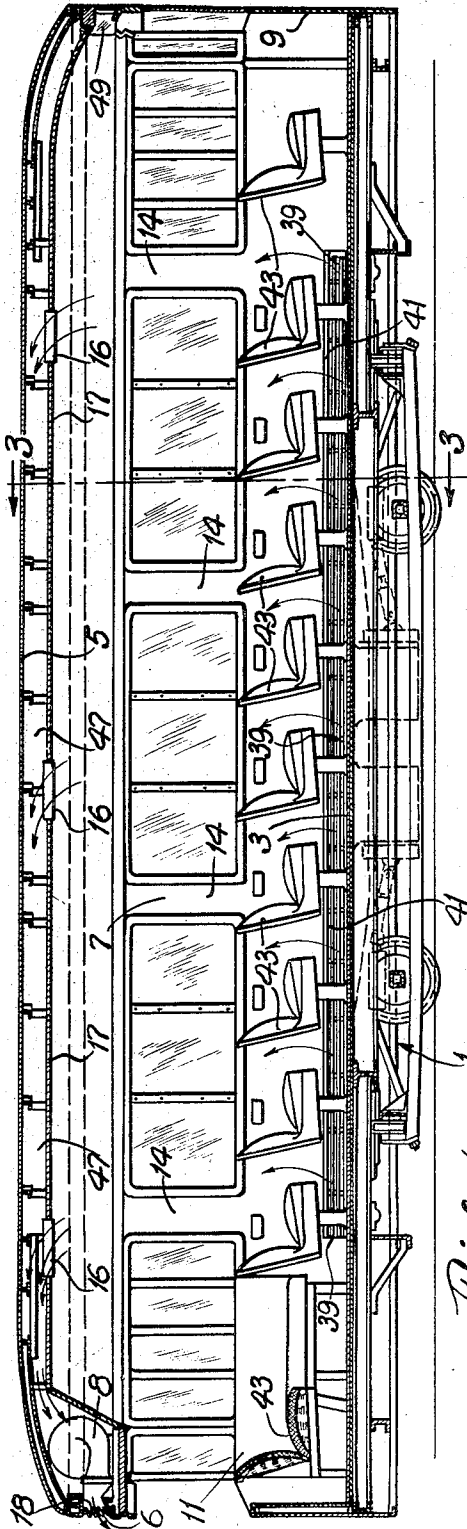


Fig. 1.

Fig. 3.

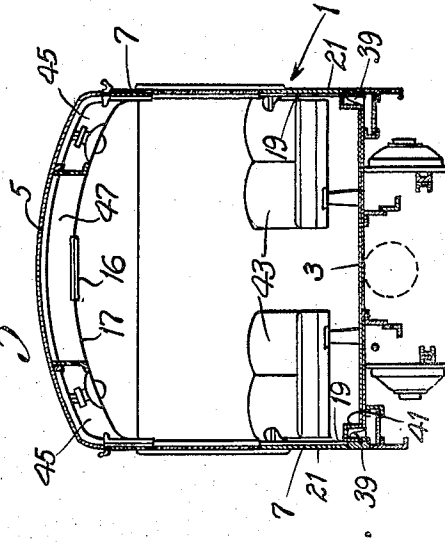
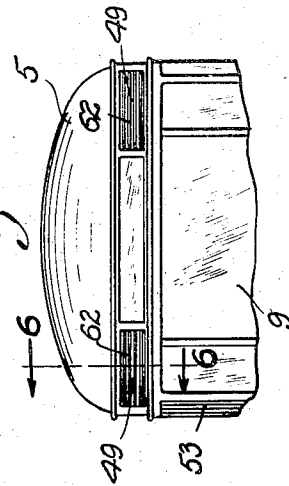


Fig. 2.



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Fig. 4.

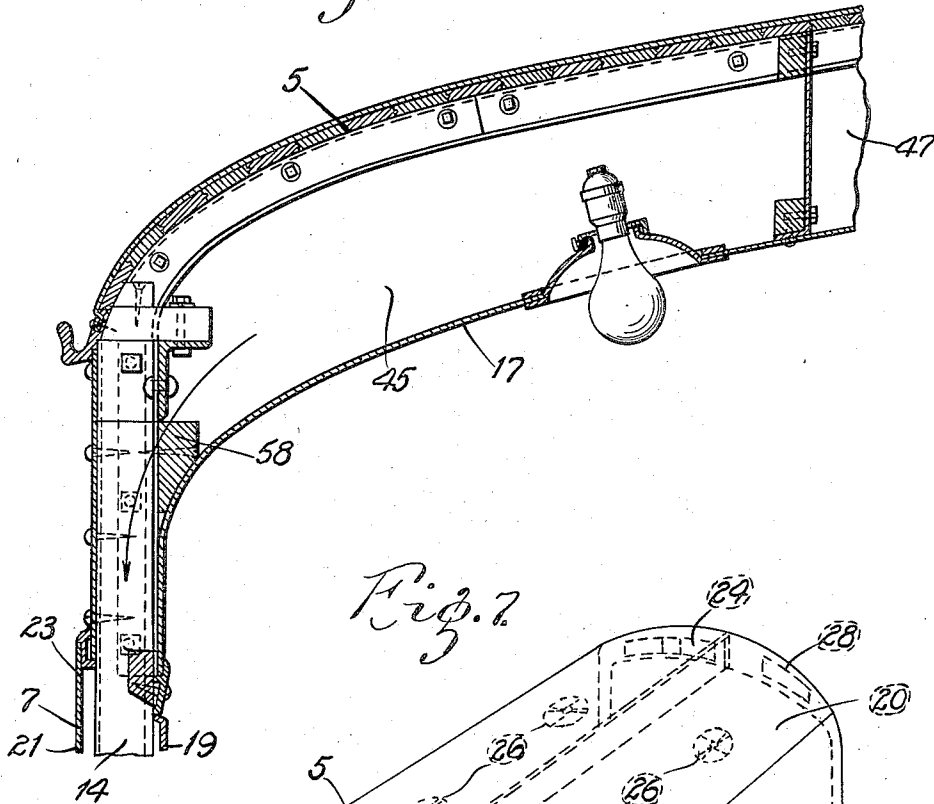
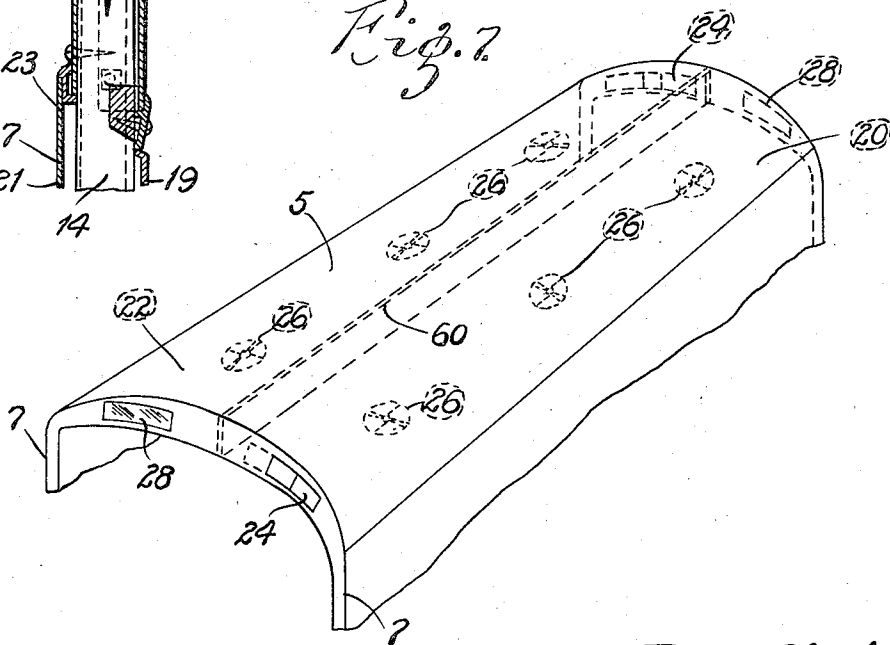


Fig. 7.



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Fig. 5.

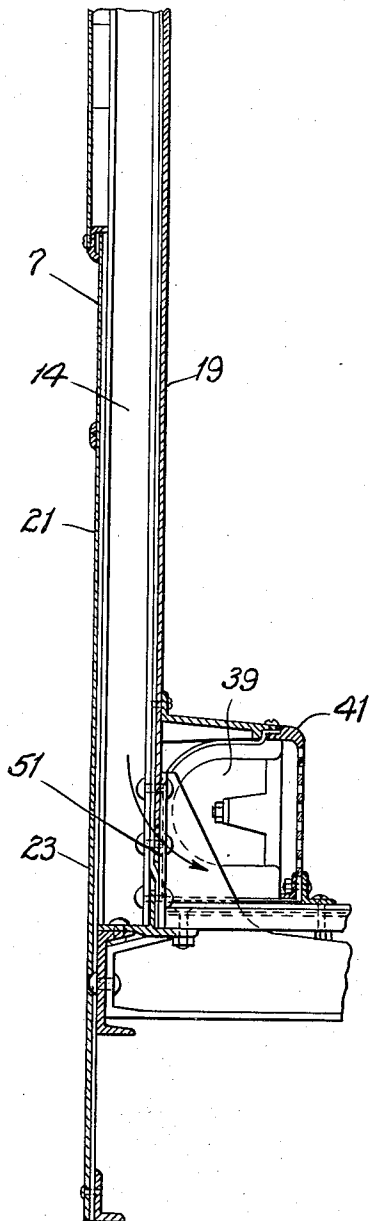
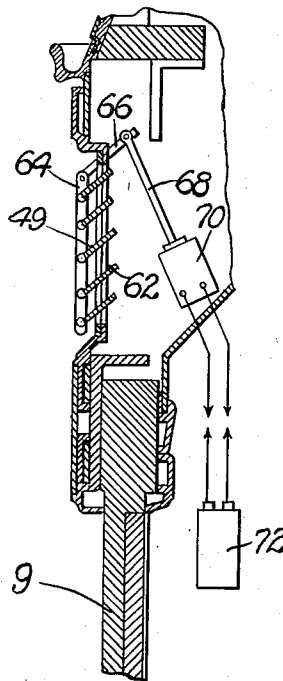


Fig. 6.



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UNITED STATES PATENT OFFICE

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RAILWAY CAR

Original application filed May 1, 1929, Serial No. 359,480. Divided and this application filed May 29, 1930. Serial No. 456,866.

This invention relates to railway cars, and with regard to certain more specific features, to electric railway cars.

This invention is a division of the invention set forth in our application for patent, Serial Number 359,480, filed May 1, 1929, for railway car, Patent No. 1,870,227.

Among the several objects of the invention may be noted the provision of an improved heating and ventilating system for cars; the provision of means of the class described in which the ventilation is effected by the motion of the car; the provision of means of the class described which will be operable during movement of the car in either direction; and the provision of means of the class described which will effect complete and thorough heating and ventilation evenly throughout said car.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a longitudinal section of the car;

Fig. 2 is a front elevation, portions being broken away for purposes of simplification;

Fig. 3 is a cross section taken substantially along line 3—3 of Fig. 1;

Fig. 4 is a fragmentary lateral section, being an enlarged portion of Fig. 3, showing a roof detail;

Fig. 5 is a vertical section taken at a side pier and also showing a heater arrangement;

Fig. 6 is a vertical section taken along lines 6—6 of Fig. 2, being taken through a window mullion at the end of the car; and,

Fig. 7 is a diagrammatic perspective, illustrating a modified ventilating method.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Figs. 1 to 3, there is illustrated at numeral 1 a car body having a floor 3 and a roof 5, with suitable sides 7 and front and rear ends 9 and 11 respectively.

The inside ceiling 17 of the car is spaced downwardly from said roof 5, the roof being supported by suitable carlines

The sides 7 of the body 1 are composed of inner walls 19 and outer walls 21, the for-

mer having the necessary thickness and strength for effecting rigidity and the latter comprising a lighter paneled covering 23, easily unscrewed if dented or otherwise damaged, as in an accident (see Figs. 4 and 5).

The car is interiorly heated by electric resistors 39 (see Fig. 5) placed along the sides of the car at the floor line, next to, and under the seats 43 which are also placed along the sides of the car. The heaters themselves comprise suitable coils placed on edge within a longitudinal guard 41 being energized from the electric circuits of the car. They are removable, which is an advantage.

Between the ceiling 17 and the roof 5 are provided sideward, longitudinal spaces 45 running the length of the car and divided from a central, longitudinal space 47 (see Figs. 1, 3 and 4). Communicating with these longitudinal side spaces 45 are ventilation intakes 49, provided at the top front of the car, as illustrated in Fig. 2. The air which enters these intakes, because of the motion of the car, is conducted rearwardly and then forced down between the outer and inner walls 21 and 19 respectively (hollow sides of the car), and thence to openings 51 contiguous to the heaters 39 and out through the guards 41 to heat the interior of the car. The passage between the side walls 19 and 21 is effected by way of spaces 14 between car windows (see Figs. 1, 4, and 5) these spaces communicating with the longitudinal spaces 45 at the top of the car. The air is then drawn out through openings 16 communicating the interior of the car with the central passage 47. The air is drawn by an exhaust fan 8 located rearwardly in the central passage 47. The exhaust fan throws the air out rearwardly through a central opening 18. The arrows indicate the circulation.

As illustrated in Fig. 6, the ventilation intakes 49 are provided with louvres 62 which are rotatable on a horizontal axis and controllable from a single bar 64 by means of a lever 66, the latter being operated by a rod 68 from a suitable solenoid mechanism 70 which is under control of a thermostat 72. The thermostat is located within the car at or near the passenger compartment so that

the temperature which is controlling of the action of the louvres is that of the passenger compartment.

Referring to Fig. 4, it will be seen that the connection between the roof and the side of the car permits the passage of air downwardly to the heaters. The longitudinal wooden member 58 is discontinuous, leaving openings above the passages 14.

It is to be understood that although a single-entrance one-man car is herein referred to, yet the same broad principle of ventilation may be applied to a double-end or any other car.

Fig. 7 illustrates the modifications desirable, wherein the space between roof 5 and ceiling 17 is divided longitudinally by a separator 60 into longitudinal circulating ducts 20 and 22 with externally communicating openings 24, placed diagonally front and rear. Adjustable ventilators 26 communicate between the ducts 20, 22 and the interior of the car. It will be noted from Fig. 7, that the front of one duct is open and the front of the other shut, while the rear of the one is shut and the rear of the other open. Hence when the car moves, air is forced into the forwardly located opening 24 along the duct 20, through the ventilators of duct 20, through duct 22 and out through the rear openings 24. When the direction of movement of the car is reversed, the circulation is reversed but with the same effect. As illustrated diagrammatically, the openings 24 and 28 are adapted to be adjustably opened and/or closed. With this modification no exhaust fan need be used. Neither need it be used in the preferred form where frictional effects at the various openings can be reduced.

It is clear that a number of possible arrangements and/or adjustments for circulation may be multiplied by placing other openable outlets and/or inlets 28 in the ends of the passages 20, and 22, as shown in Fig. 7. However, in the present embodiment the devices 28 are merely blinds.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. A vehicle comprising hollow sides, a roof, a ceiling spaced downwardly from said roof, means communicating between the hollow sides and the space between the ceiling and roof, openings communicating between the hollow sides and the interior of the vehicle at the floor thereof, externally communicat-

ing ventilators leading forwardly from said space above the ceiling so that the motion of the car forces air downwardly between said sides, and through said openings, heaters located contiguously to said openings, so that said air is made to pass thereover and a fan for removing air from the interior and moving it exteriorly of the vehicle.

2. A vehicle comprising hollow sides, heating means in the vehicle, a roof, a ceiling spaced downwardly from said roof to form sideward passages and a central passage, said hollow sides communicating with said sideward passages and the space between said hollow sides also communicating with the interior of the vehicle near the floor thereof, said sideward passages communicating with the front end of said car and said central passage communicating with the rear exterior end thereof and with the interior of said car, whereby fresh air under pressure by reason of the movement of said vehicle is forced through said sideward passages, down said spaces between said hollow sides, out into said interior where it rises by reason of heat received from said heating means, enters the central passage and is exhausted at the rear of the car by reason of the partial vacuum created at the rear of the car as it moves forward.

3. A vehicle comprising hollow sides, a roof, a ceiling spaced downwardly from said roof to form sideward passages and a central passage, said hollow sides communicating with said sideward passages and the space between said hollow sides also communicating with the interior of the vehicle near the floor thereof, heaters associated with the outlets of the spaces between said hollow sides, said sideward passages communicating with the front end of said car and said central passage communicating with the rear exterior end thereof and with the interior of said car, an exhaust fan placed at the rear end of said central passage, whereby fresh air under pressure by reason of the movement of said vehicle is forced through said sideward passages, down said spaces between said hollow sides, out into said interior whereby the heated air rises to the top of said vehicle and is withdrawn into said central passage under the action of said fan.

4. A vehicle having passages in the ceiling thereof adapted to conduct air under pressure from the front exterior of vehicle, the side walls of said vehicle being adapted to conduct said air under pressure to the interior and in proximity of the floor of said vehicle, a passage for removing air from the top interior of said vehicle and an air exhausting fan connected therewith, whereby air is delivered to said interior under pressure and removed therefrom under a created partial vacuum.

5. A vehicle having passages in the ceiling

thereof adapted to conduct air under pressure from the front exterior of vehicle, side walls of said vehicle being adapted to conduct said air under pressure to the interior and in
5 proximity of the floor of said vehicle, a passage for removing air from the top interior of said vehicle and an air exhausting fan connected therewith, whereby air is delivered to said interior under pressure and removed
10 therefrom under a created partial vacuum, and means in said first named passage adapted to control the flow of air there-through, said means being thermostatically controlled.

15 In testimony whereof, we have signed our names to this specification this 23rd day of May, 1930.

JOHN ROBERT BLACKHALL.
HARVEY S. PARDEE.

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