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AIR DISTRIBUTING SYSTEM AND APPARATUS FOR RAILROAD CARS

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Fig. 1.

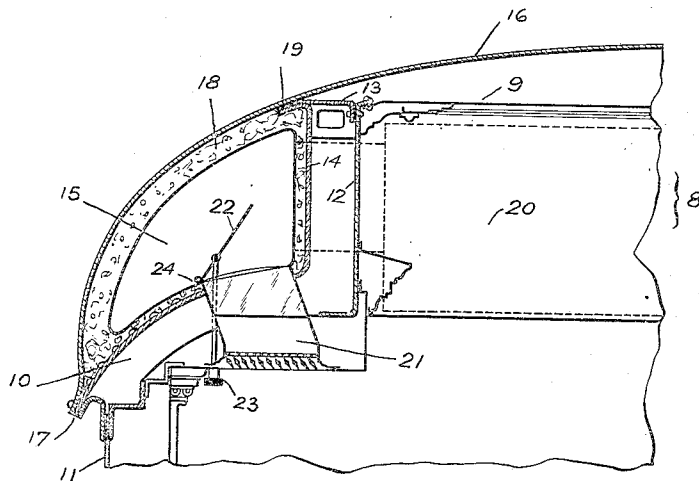


Fig. 2.

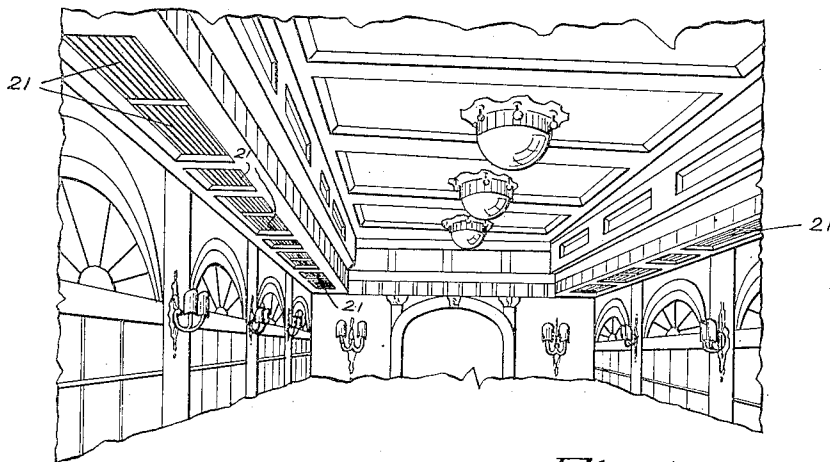


Fig. 3.

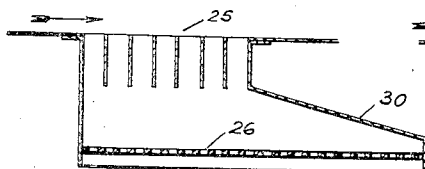
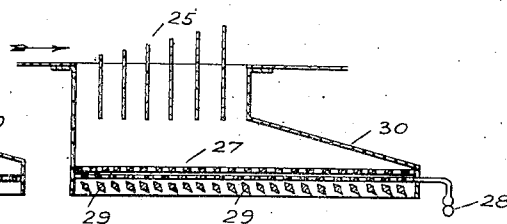


Fig. 4.



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AIR DISTRIBUTING SYSTEM AND APPARATUS FOR RAILROAD CARS

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9 Claims. (Cl. 98—13)

This invention relates to air conditioning systems, and more particularly to methods of and means for effecting the distribution of conditioned air in railroad cars.

5 The general object of the invention is to provide a system of ducts and outlets which may be readily installed in existing railway car equipment and whose use will not require substantial structural changes in car design and appearance. 10 Some types of railroad cars, such as diners, lounges and the like, are designed along artistic lines to follow a suitable scheme of interior decoration or to reflect period appointments and furnishings. The installation of a system of air conditioning in such cars must be carried out without interfering with the structural lines of the car interior, all of which blend in the artistic motif. Furthermore, since the public is accustomed to definite car designs of conventional appearance, it is desirable to preserve, to as great a degree as possible, the usual interior structural layout. Applicant therefore plans to incorporate an air conditioning distributing system for a car interior without making use, to any substantial degree, of the interior car area used for passenger accommodation. 25

A feature of the invention resides in the provision of a duct or series of ducts along the outside of a car, suitably arranged to discharge air at different points within the car. The duct work is designed to follow the car contour so that its addition to the car structure will not detract from the outer appearance of the car, and in fact, improve the appearance. 30

A further feature covers the method of equipping a car with outside duct work whereby economies in installation and efficiency in air distribution, with a minimum of conduction loss, are attained. 35

40 Another feature relates to the installation of air outlets suitably connected to main distributing ducts whereby effective distribution is accomplished throughout a car area and equable conditions produced without drafts or air streaks.

45 Other objects and features whose adoption results in advantages of design and in operating and installation efficiency and economy, will be more apparent from the following description of one form of the invention to be read in connection with the accompanying drawing in which 50

Fig. 1 is a fragmentary sectional view showing one way of installing an air distributing duct on the exterior of a car.

Fig. 2 is a perspective view of a car interior 55 showing a system of outlets adapted to function

in connection with outer distributing ducts, and Figs. 3 and 4 are detailed views of air distributing and diffusing means used for discharging desired air volumes from the main ducts at different points in the car.

Considering the drawing, similar designations referring to similar parts, numeral 8 refers generally to a railroad car having a top 9, shoulders 10 on each side of the car, and sides 11. Any suitable construction may be employed in building the car and the details of its conventional structure and assembly are of no moment except as they relate to the system employed for air conditioning the car. Thus, member 12 may be suitably fastened to top 9 and by means of structural element 13 be interconnected to member 14 whose extension forms the outer surface of shoulder 10. Duct 15 is suitably positioned in the manner illustrated along the outside of the car. Its curvature follows that of member 14 so that its contour will fit in with the shape of the shoulder of the car and the vertical part of member 14. Its upper surface is rounded in the manner illustrated so that crown 16 of the car will follow a smooth surface covering the top and duct work to point 17 where it is suitably fastened in any desirable manner. Insulating material 18 may be placed between the duct and the car and along its outer surface to the crown. This may be of cork or any other suitable substance and will not only tend to minimize conduction losses, but serve to preserve the outer appearance so that the crown will form a smooth top surface of maximum utility, and leak proof. Member 14 has its end 19 shaped downwardly to follow the crown of the car so that in case a leak does develop through the crown it will not enter the car but either be absorbed or follow the duct surface beyond the limit of the car interior. At the extremity 17 of the crown provision is also made, as illustrated, for insuring a leak proof installation of a protective nature. Since the inner structure is made leak proof in the first instance, this added arrangement serves as a double protective covering. 60 65 70 75 80 85 90 95 100 105 110

In existing car designs it is usual to have space 20 serve as a monitor arrangement at the upper part of the car, a series of windows or the like usually extending along the sides for ventilating purposes. By placing the duct work outside the car, the conventional interior appearance is preserved, while added utility is attained in that the interior is provided with conditioned air

always suitable for the maintenance of comfortable conditions.

As in Fig. 2, the interior area of the car, which in the illustration is of the diner type, retains its usual appearance and has all the free space ordinarily provided, no change in design being required except for the provision of discharge openings 21. These openings are provided along the sides of the car. The openings may be at any number of desired points and as shown in Fig. 1 connect with duct 15. The interior structure of the car is consequently not altered and the openings are relatively inconspicuous. It is obvious, of course, that the style and form of opening as well as its outer appearance may be changed to suit various requirements of interior design or engineering expediency. In the arrangement of Fig. 1 the opening 21 is equipped with a damper 22 which may be operated by handle 23. The damper is pivoted at 24 and by moving the handle up or down, may be fixed at any desired position.

Referring to Figs. 3 and 4, it may be noted that various means may be employed for directing the air from duct 15 for discharge within the car, the arrows indicating the direction of the air flow. In Fig. 3 it is seen that baffles 25 deflect the air current which is then diffused by perforated plate 26 prior to discharge. The perforated plate serves to dissipate the draft of air and prevent drafts and air streaks. In Fig. 4 the baffles are shown protruding within the duct at different levels. The air will therefore be deflected by the several baffles at different levels in the duct and then routed to diffusion plate 27. In this arrangement there are two perforated plates although any number may be used. By means of device 28 the plates may be interpositioned so that the blank portions of one plate cover the perforation of the other and prevent air discharge. Thus, the lower perforated plate may be used as a damper to control the volume of air discharge to any desired degree. Louvers 29 may further be provided for deflecting the diffused air in any desired direction. Thus, in a dining car it may be desirable to route the air toward the center of the area served instead of over the tables. Any desired combination of diffusing means and deflectors in combination with louvers and dampers may be employed to accomplish applicants' purpose. Applicants show the arrangement of Figs. 3 and 4 merely as illustrative. It may be noted that both in Figs. 3 and 4 the devices are equipped with extensions 30. These extensions project from the intake opening in the direction of air flow. It is found that, due to the velocity of the air, sufficient volume will reach within the extended portions to furnish a larger area than would be the case if only an outlet were employed equal in area to the inlet. No extension however is provided at the near end of the outlet, inasmuch as the air flow is in the reverse direction and little air would be discharged in such an extension, assuming it were provided.

While no conditioning means are shown, it is obvious, of course, that any conditioning source may be employed for furnishing air to the distribution system.

The manner of installing the ducts and the means for distributing air from the ducts within a car may be modified to suit different requirements. Applicants consider any analogous means wherein a duct is installed outside of a

car to form a crown portion with the top of a car, as within the purview of the invention.

Having described our invention what we claim as new and desire to secure by Letters Patent is:—

1. In combination with a railroad car having a monitor arrangement, a duct having enclosing sides independent of the sides of the car and spaced therefrom, the duct being positioned on the car exterior alongside the monitor, the roof of the car covering the monitor and extending to and over the duct to join the side of the car in a smooth, continuous surface, insulating material covering said duct and holding the duct in out of contact relation with the car, and outlets constituting independent units connecting with the duct and leading within the car, the discharge ends of said outlets terminating at the ceiling of the car adjacent the area covered by the monitor.

2. In combination with a railroad car, the car having a monitor arrangement, a duct, the duct constituting an air conduit having a structure independent of the outside surfaces of the car, insulating material covering the duct and holding the duct in out of contact relation with the car, the walls of the duct being formed substantially to follow the adjacent wall of the monitor and top of the car adjacent the monitor, so that the crown of the car may be formed in a continuous surface extending over the monitor and beyond the duct.

3. In a system of the character described, an outlet for discharging air from a duct serving a railroad car, said duct being positioned on the car exterior and constituting a complete enclosure for air passage of which the car exterior forms no part, the outlet comprising an independent unit adapted to be attached to said duct, the inlet end of said outlet communicating with an opening in the duct, the outlet end being larger in area than the inlet end and extending beyond the inlet opening in the direction of flow of air through the duct.

4. In combination with a duct of an air conditioning system an outlet, means in the outlet for deflecting a current of air from the duct to be discharged through the outlet and diffusing means within the outlet said diffusing means being adapted to control the volume of air discharged.

5. In a system of the character described an air duct extending lengthwise of a railroad car, a discharge outlet from the duct leading within the car, means for diffusing the air prior to discharge and means for discharging the air in a desired direction within the area served.

6. In combination with a railroad car, the car having a monitor arrangement, a duct, the duct constituting an air conduit independent of the exterior surfaces of the car, insulating material separating and spacing the duct from the surface of the car, the walls of the duct being formed substantially to follow the adjacent wall of the monitor and top of the car adjacent the monitor, so that the crown of the car may be formed in a continuous surface extending over the monitor and beyond the duct, and an outlet constituting an independent unit connecting with the duct and terminating substantially at the ceiling of the car.

7. A duct structure for distributing air within a railroad car, said duct being formed to fit lengthwise of and alongside of the roof of the car, the top of the duct extending no higher

than the roof of the car and meeting the plane of the side of the car, said duct constituting an independent unit forming no part of the car structure, insulating material separating and	
5 spacing the duct from the outside of the car, the top of the car extending over the roof and duct in a continuous surface terminating at the side of the car, said duct having a plurality of outlets, and distributing means leading from	
10 said outlets within the car.	
8. In combination with a railroad car having a monitor top, a duct, said duct comprising a complete enclosure for air passage, said duct being positioned on the outside of the car adjacent	
15 the monitor, insulating material covering the duct and holding the duct in out of contact relation with the surfaces of the car, an outlet	
connecting the duct to the inside of the car, and diffusing means at the discharge end of the outlet.	
9. In combination with a railroad car, a duct, said duct comprising an enclosure positioned on the outside of the car, a crown covering said	80
duct and forming a smooth surface over the top of said car, insulating material covering said	
duct and separating it from contact with the surfaces of the car and the crown, an outlet comprising an independent unit connecting the duct	85
to the interior of the car, means operable from within the car for controlling the volume of air discharged from the duct to the outlet, and	
diffusing means in combination with the outlet.	90
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