

**Dec. 9, 1941.**

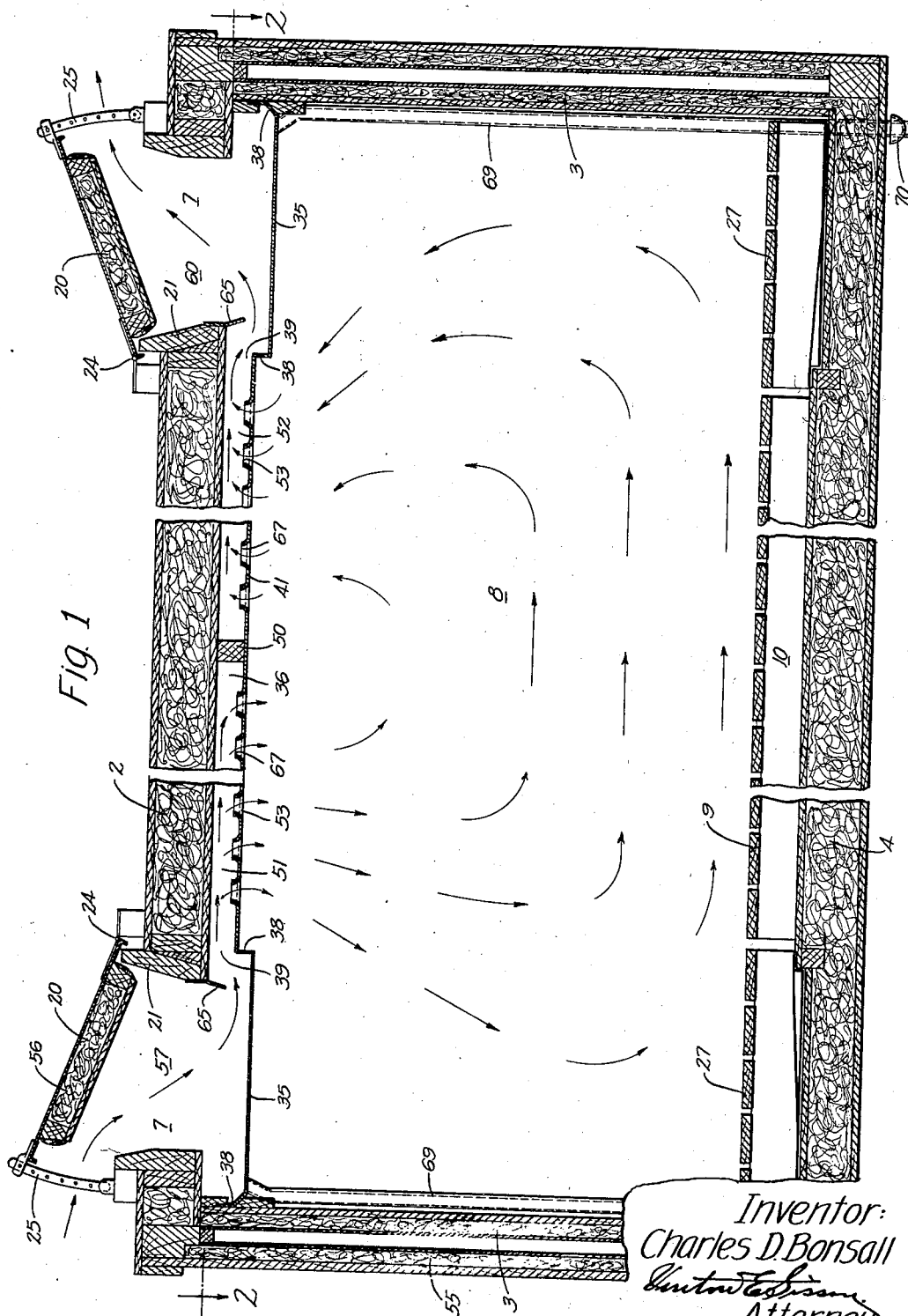
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**2,265,623**

RAILWAY CAR

Filed April 20, 1939

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

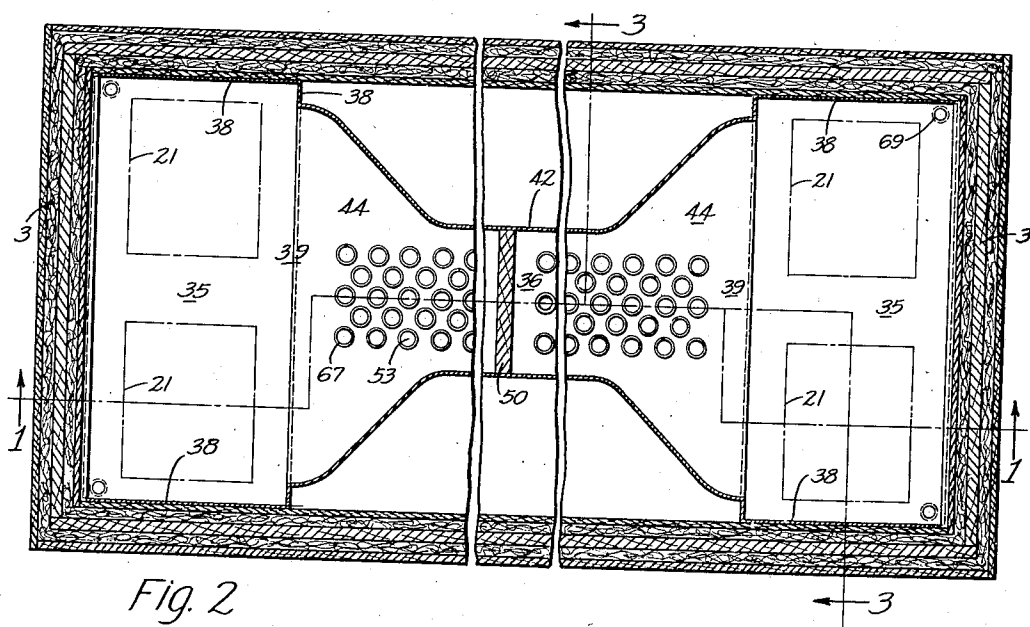


Fig. 2

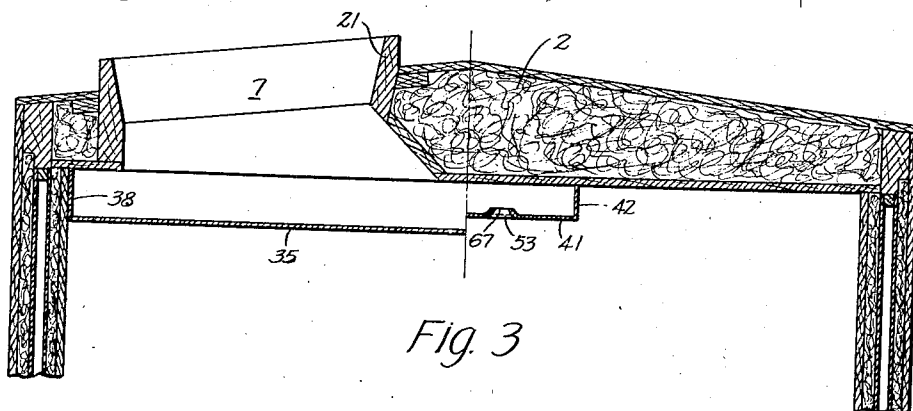


Fig. 3

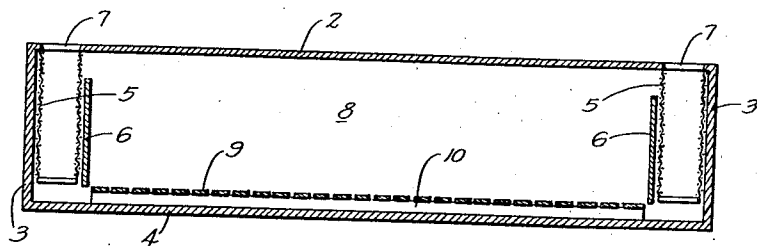


Fig. 4

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## UNITED STATES PATENT OFFICE

2,265,623

## RAILWAY CAR

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ware

Application April 20, 1939, Serial No. 269,004

5 Claims. (Cl. 98—6)

The invention relates to ventilated house cars and particularly to the conversion of refrigerator cars to cars adapted to be operated under ventilation.

A common type of refrigerator car which has been in general use for a period of many years has ice bunkers disposed adjacent opposite end walls of the car with hatches thereabove in the roof for loading refrigerant. The central portion of the car is the lading compartment; bulkheads are provided adjacent each ice bunker to define the ends of the lading compartment. The bulkheads have considerable strength to resist the thrusts of the lading caused by service movements of the car. The lading is commonly supported within the lading compartment by floor racks which provide a space between the lading and the floor of the car. The bulkheads are spaced from the floor and from the roof so that air, upon being cooled by the refrigerant in the bunker circulates under the bulkheads to the space below the lading. The air then circulates upwardly through the floor rack, which is foraminous for the purpose, through the lading compartment and over the bulkheads to the ice bunkers.

In recent years, more modern types of refrigerator cars have seen considerable service. There are mechanical refrigerator cars, dry ice cars, side bunker cars and particularly, overhead bunker cars. The last mentioned is becoming increasingly popular because it is more efficient due to the height of the refrigerant above the lading, making possible the maintaining of lower and more uniform temperatures. In addition, more space is available for the lading on account of the absence of ice bunkers at the ends of the cars.

The advent of the new types of refrigerator cars has presented the problem of disposing of the old cars. It is not economically sound to operate an old type of car when a new and more efficient type is available. Neither is it sound to scrap cars which are in good mechanical condition and have years of service remaining. It is an object of this invention to convert refrigerator cars to ventilated cars. Many fresh fruits and vegetables give off heat during storage or transportation. This heat results from chemical changes occurring within the fruit or vegetable, such as ripening. While many such products may be safely transported at any temperature within a relatively wide range it is important that fresh air be supplied continuously to carry away the heat which is constantly emitted. To allow the heat to remain within the lading compart-

ment is to increase the temperature excessively with a consequent acceleration of ripening and possible spoilage.

It is an object of this invention to convert a refrigerator car to a ventilated car by providing means for the air to enter through the hatches at one end of the car, permeate through the lading within the car and flow out of the car through hatches positioned at the opposite end of the car.

Another object of the invention is to provide means to prevent water from entering the hatches and reaching the lading. Many types of lading are damaged by moisture and since cars must be ventilated during rainy weather, means must be provided to trap the moisture which accompanies the ventilating air.

A further object is to adapt the car so that air may enter at either end and flow out at the opposite end, thereby permitting the car to be operated in either direction.

Other objects and advantages of my invention will be apparent from the following detailed description taken in reference to the accompanying drawings.

In the drawings:

Fig. 1 is a longitudinal section of a car embodying my invention.

Fig. 2 is a plan section on line 2—2 of Fig. 1.

Fig. 3 is a transverse section of the car as indicated by the line 3—3 in Fig. 2.

Fig. 4 is a longitudinal section to a reduced scale of an end bunker refrigerator car from which the car shown in Figs. 1 to 3 has been converted.

Fig. 4 shows a standard type of end bunker refrigerator car including the following parts: roof 2, end walls 3, floor 4, ice bunkers 5, bulkheads 6, hatches 7, lading compartment 8, floor rack 9 and space 10 between the floor rack and floor. The foregoing numerals refer to similar parts in Figs. 1 to 3.

The conversion of the refrigerator car of Fig. 4 to a ventilating car comprises removal of the bunkers 5 and bulkheads 6 and the addition of parts which will be hereinafter described. Insulating hatch covers 20 are commonly provided to prevent ingress of warm air to refrigerator cars. The covers ordinarily have no fixed relation to the hatch frames 21 but are attached thereto by means of a chain to prevent loss; in more modern cars, the covers are often hinged as shown in Fig. 1. The conversion of some types of cars requires no changes in hatch cover arrangement to conform to that shown in Fig. 1; in other types of cars, the hinges 24 and support-

ing pieces 25 must be added. The supporting pieces 25 are preferably adjustable so that the covers 20 may be opened varying distances. Additional sections of floor racks 27 should also be added to the portion of the car originally occupied by the ice bunkers 5.

The ventilating means comprises a pan 35 underneath the hatches 7 at each end of the car and a flue 36 extending between the pans 35. The pans have peripheral flanges 38 upstanding therefrom, which flanges extend substantially to the roof of the car so that the only openings in the chambers encompassed by the pans 35 are the hatches 7 and the openings 39 which lead to the flue 36. The flue 36 is preferably of less width than the car and comprises a bottom wall 41 and upstanding flanges 42 which engage the roof 2. Throat sections 44 preferably connect the flue 36 to the pans 35.

A partition 50 is positioned within the flue 36, preferably midway between the hatches 7, to divide the flue 36 into a pair of ducts 51, 52, each communicating with a hatch 7. Apertures 53 are provided, preferably in the bottom wall 41 to provide communication between the ducts 51, 52 and the lading compartment 8. Apertures may also be provided in the flanges 42 in addition to or in place of the apertures in the bottom wall 41.

The arrows in Fig. 1 show the path of the ventilating air when the car is moving in a direction such that the wall 55 is at the head or leading end. The hatch cover 56 traps the air adjacent the roof 2, the air being forced through the hatch 57 to the duct 51. The air then flows through the apertures 53 to the lading compartment where it circulates in contact with the lading. The pressure exerted by the continuous flow of air through the hatch 57 in addition to the aspirator effect of the hatch 60 causes the air to flow upwardly through the apertures 53 in the flue 52 and thence outwardly through the hatch 60.

Means are provided to prevent moisture entering the lading compartment 8. Baffle plates 65 are inserted in the path of the inflowing air to deflect moisture carried therewith into the pans 35. In addition, upstanding peripheral flanges 67 are associated with the apertures 53 so that water in the ducts 51, 52 cannot flow through the apertures 53 to the lading compartment. Drain pipes 69 are provided to drain liquid from the pans 35 to the exterior of the car preferably through the water sealed drains 70.

It is to be understood that the ventilating system herein described functions in a similar manner when the car moves in the opposite direction because both ends of the car are substantially identical.

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and de-

scribed, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

I claim:

1. In a refrigerator car having a hatch in the roof disposed adjacent each end of the car, the combination of a pair of non-communicating ducts adjacent the roof of the car, each communicating with one of said hatches, communicating means between the lading compartment of the car and both of said ducts, and a drip pan disposed below each of said hatches in substantial alignment with the bottom wall of said duct slightly below the level thereof.
2. In a refrigerator car having a hatch in the roof disposed adjacent each end of the car, the combination of a pair of non-communicating ducts adjacent the roof of the car, each communicating with one of said hatches, communicating means between the lading compartment of the car and both of said ducts comprising a plurality of distributed apertures in said duct, and a drip pan disposed below each of said hatches in substantial alignment with the bottom wall of said duct.
3. In a refrigerator car having a hatch in the roof disposed adjacent each end of the car, the combination of a pair of non-communicating ducts adjacent the roof of the car, each communicating with one of said hatches, communicating means between the lading compartment of the car and both of said ducts comprising a plurality of distributed apertures in the bottom wall of said duct, said apertures having upstanding peripheral flanges, and a drip pan disposed below each of said hatches in substantial alignment with the bottom wall of said duct slightly below the level thereof.
4. In a refrigerator car having a hatch in the roof disposed adjacent each end of the car, the combination of a pair of non-communicating ducts adjacent the roof of the car, each communicating with one of said hatches, communicating means between the lading compartment of the car and both of said ducts comprising a plurality of distributed apertures in said duct, and a substantially horizontal drip pan disposed below each of said hatches and slightly below the level of the bottom wall of said duct.
5. In a refrigerator car having a hatch in the roof disposed adjacent each end of the car, the combination of a pair of non-communicating ducts adjacent the roof of the car, each communicating with one of said hatches, communicating means between the lading compartment of the car and both of said ducts comprising a plurality of distributed apertures in said duct, a drip pan disposed below each of said hatches in substantial alignment with the bottom wall of said duct slightly below the level thereof, and means to drain liquid from said drip pans.

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