The invention relates to refrigerator cars for handling perishable commodities and more particularly to what is known as the top bunker type of refrigerant car wherein an ice or liquid refrigerant container is positioned adjacent the roof of the car and provided with a drip pan therebelow and spaced therefrom to provide a substantially horizontally disposed flue which communicates with a vertical flue associated with the vertical wall of the car, whereby air in the horizontally disposed flue being cooled and densified by the ice in the refrigerant container is caused to descend through the vertical flue from whence it rises through the foraminous floor and then through the lading and being warmed thereby, reenters the horizontally disposed flue and repeats the cycle.

One of the objects of the invention is to form the ice container so that a part of the melted ice will pass through the bottom thereof to the drip pan and a part of the melted ice will be temporarily retained in the container so that the melted ice so temporarily retained will help cool the air circulating through the horizontally disposed flue.

Another object is to provide means in the lower parts of the container so as to allow the melted ice to gradually escape from the container into the horizontally disposed flue over the drip pan so as to help cool the air circulating in the flue.

Another object is to form the lower parts of the container so as to retard the service movements of the car from swishing melted ice over the bottom of the container.

In the drawing:
Fig. 1 shows part of a cross section of a railway refrigerator car incorporating some of my inventions.
Figs. 2, 3, 4 and 5 show the container and parts thereof in detail.

In the form of the invention illustrated one or more refrigerant chambers or containers 2 are preferably positioned on each side of the center line 3 of the car adjacent the roof 4 of the car and also preferably adjacent the side or other vertical wall 5 of the car. Hatchways 6 are provided in the roof above the container 2 for loading it with ice or other refrigerant. The usual hatch plus 7 and hatchway lid 8 are used. The partition 10 is held in spaced relation to the side wall 5 by a series of vertical pieces 12 to form vertical flues 13 associated with the side wall 5. The insulated horizontally disposed partition or drip pan 15 is positioned below the refrigerant container 2 and spaced therefrom to provide a substantially horizontally disposed flue 16, which flue, however, inclines downwardly toward and communicates with the vertical flue 13. A partition or member 17 extends upwardly from the inner margin of the drip pan 15 and is spaced from the refrigerant container 2 to provide a short vertical flue 18. The vertically disposed members 17 on opposite sides of the center line 3 of the car are spaced apart to provide an air channel or passageway 21. A floor rack or foraminous false floor 23 rests upon the insulated floor 24 and is spaced therefrom to provide a horizontal flue 25 which communicates with the vertical flue 13.

In such a refrigerator car air in the horizontally disposed flue 15 being cooled and densified by a refrigerant in the refrigerant container 2 moves down the downwardly and outwardsly inclined drip pan 15 into the vertical flue 13, thence into the space 25 below the lading and rising through the apertures 29 in the foraminous floor 23, passes through or between the lading and being warmed and rarified by the lading, rises and passes upwardly through the passageway 21 and vertical flue 18 into the horizontally disposed flue 16 from whence the cycle is repeated.

Fig. 2 shows a container wherein the bottom thereof comprises upper and lower parts with the lower part comprising a plurality of spaced apart channel shape members 10 and the upper part comprising a solid member 71 having apertures 72 therein above the channels 73 of the channel shaped members 70 so that the melted ice passes through said apertures 72 and is temporarily retained in the channels 73 until it overflows into the spaces 75 between the channel shaped members. It may be desirable to use an ordinary wire mesh fabric or grilled member for the upper part 71 so that some of the melted ice may pass directly through the spaces 75 between the channel shaped members.

Fig. 3 shows a modification wherein the upper part of the double bottom of the container comprises a plurality of spaced apart inverted channel shape members 60 with the spaces 81 therebetween over the channels 82 of the channel member 83 forming the lower part of the bottom. The flanges 14 of the lower channels 83 preferably overlap the flanges 85 of the channels 86 of the upper part to provide a water seal.

When a two part bottom is used for the container I preferably provide means therebetween so that they will cooperate as tension and compression members, respectively, beams between
the side walls of the container increasing the strength of the bottom of the container.

A plurality of receptacles for the melted ice to form the lower part of the double bottom may be placed in said and still come within the scope of this invention.

The construction shown in Figs. 4 and 5 show the bottom of the container comprising an upper part (80) and lower part (91) provided with non-registrating apertures 92–93 therein and hollow members 94 registering with the apertures 93 in the lower part 91 but not registering with apertures 92 in the upper part 90. These members 94 have perforated (95) vertical walls. In this construction the melted ice passes through the apertures 92 in the upper part 90 and is retained by the lower part 91 until the water is high enough to pass through the perforations 96 in the side walls of member 94.

The accompanying drawing illustrates 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 described, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

This is a division of my co-pending application Serial No. 193,762, filed November 22, 1937, now matured into Patent No. 2,168,567.

I claim:

1. In a refrigerator car comprising a wall having a vertical flue associated therewith, a liquid refrigerant container and a drip pan positioned below and spaced from said container which drains liquid refrigerant from said container into said vertical flue and also forms a duct for circulation of air from under the refrigerant container to said flue, the bottom of said container comprising metallic plates in spaced substantially horizontal planes, each of said plates being provided with apertures which do not register with the apertures in the other plate.

2. A structure as defined in claim 1 including hollow members registering with the apertures in the lower part only, which members have perforated walls.

3. In a refrigerator car comprising a wall having a vertical flue associated therewith, a liquid refrigerant container and a drip pan positioned below and spaced from said container which drains liquid refrigerant from said container into said vertical flue and also forms a duct for circulation of air from under the refrigerant container to said flue, the bottom of said container comprising upper and lower plates in spaced substantially horizontal planes, each of said plates being provided with apertures which do not register with the apertures in the other plate, said lower plate provided with means positioned below the apertures in the upper plate to temporarily retain the refrigerant.

4. In a refrigerator car comprising a wall having a vertical flue associated therewith, a liquid refrigerant container and a drip pan positioned below and spaced from said container which drains liquid refrigerant from said container into said vertical flue and also forms a duct for circulation of air from under the refrigerant container to said flue, the bottom of said container forming a support for a refrigerant and comprising upper and lower parts associated and arranged so that part of the liquid refrigerant will pass through said bottom to the drip pan and part of the melted ice will be retained in the container, said upper and lower parts also being associated and arranged to provide a water-seal.

5. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means for directing air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

6. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means to direct a flow of air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

7. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means to direct a flow of air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

8. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means to direct a flow of air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

9. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means to direct a flow of air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

10. In a refrigerator car, the combination of a refrigerant container, a duct adjacent the bottom of the container, and means to direct a flow of air through said duct, said bottom comprising upper and lower parts arranged so that part of a liquid refrigerant is retained within the container and part is deposited in said duct, said lower part comprising a plurality of spaced apart channel shaped members and said upper part comprising a solid member having apertures therein above the channels of the channel shaped members.

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