

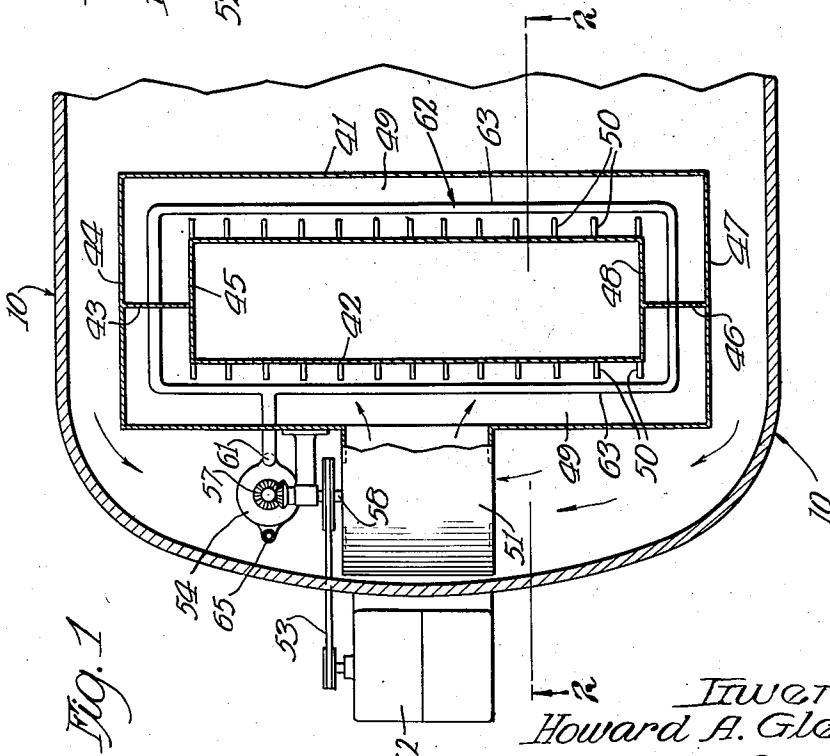
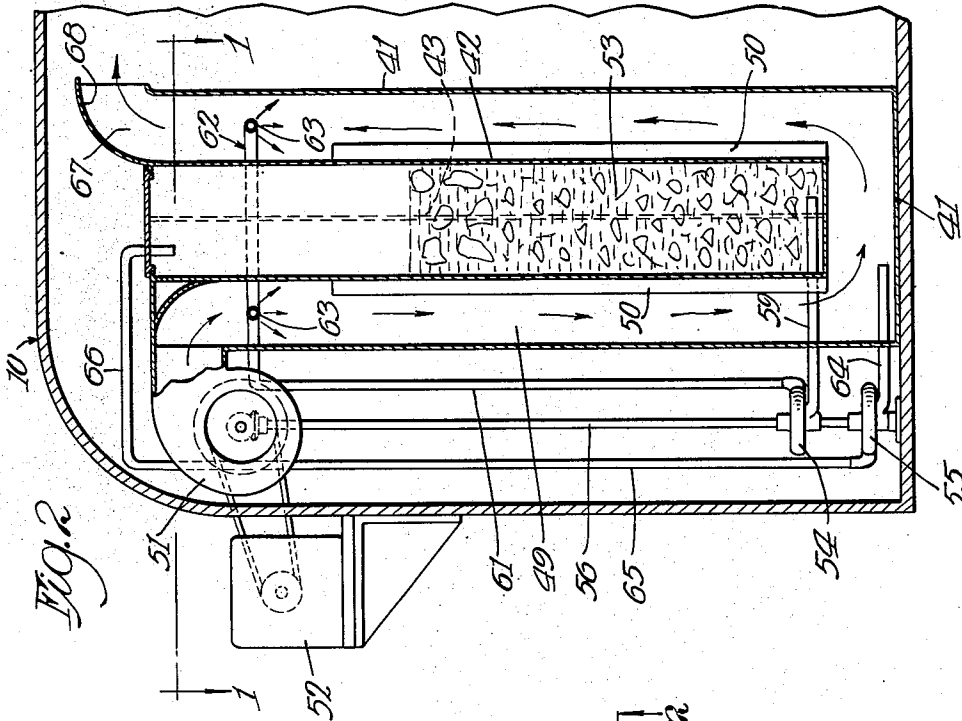
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H. A. GLENN

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REFRIGERATING UNIT

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Inventor  
Howard A. Glenn

By Mann, Brown & Co. Attys.

## UNITED STATES PATENT OFFICE

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## REFRIGERATING UNIT

Howard A. Glenn, Chicago, Ill.

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1 Claim. (Cl. 261—11)

This invention relates to refrigerating apparatuses and more particularly to the type employing ice cooled brine as the cooling medium.

One of the objects of the invention is the provision of new and improved means for preventing the collecting and frosting of moisture on the heat exchanger or refrigerating coils or cooling surfaces of the air cooling or refrigerating apparatus.

Another object of the invention is the provision of a new and improved refrigerator adapted for use in motor trucks, railway cars and the like, having novel means for cooling the air recirculated over the lading.

A further object of the invention is the provision of a new and improved refrigerator for use in trucks, railway cars and the like that is simple in construction, operates at maximum efficiency, and that may be easily and readily installed.

Other and further objects and advantages of the invention will appear from the following description, taken in connection with the accompanying drawing, in which—

Fig. 1 is a horizontal section of one form of the device substantially on line 1—1 of Fig. 2, with parts broken away for the sake of clearness; and

Fig. 2 is a vertical section on the line 2—2 of Fig. 1, with parts broken away.

It is common practice, in cooling shipping conveyances, to employ ice cooled brine circulated through radiator coils or over other cooling surfaces and recirculating the air within the conveyance through those coils or across those surfaces for cooling the air. But serious difficulties arise if the shipment requires an extended time due to the frosting of the refrigerator coils or other cooling surfaces and the consequent lowering of the efficiency of the equipment.

It has also been proposed to cool the air recirculated within the conveyance by passing it through an ice cooled spray but this too is objectionable because the temperature of the air cannot be sufficiently reduced without the use of an elaborate device whose dimensions render its use prohibitive in shipping conveyances where space is of prime importance.

The present invention seeks to remedy these defects by the provision of a refrigerating apparatus provided with refrigerating coils or other cooling surfaces having means for preventing frosting of those surfaces or coils. In other words, means are provided for continuously and

automatically defrosting the coils or cooling surfaces.

Referring now to the drawings, the reference character 10 designates a truck body or trailer portion of a motor truck of the conventional form. The refrigerating apparatus, in the form of a removable unit and designated generally by the reference character 41, is preferably, though not necessarily, mounted in the forward end of the truck as shown in Fig. 2.

In Figs. 1 and 2 is shown a form of construction in which the container for the ice and brine is utilized as a heat exchange device. In the form of the construction shown, which is by way of example only, the cabinet 41 has suspended therein, the ice and brine receptacle 42. The walls of the receptacle 42 are spaced from those of the cabinet 41 so as to provide a passageway for the air as will presently be described. The walls of the receptacle 42 may be of any suitable heat conducting material so that its outer surface will cool the air as it contacts the same.

A partition 43 extends between the side walls 44 and 45 of the cabinet and receptacle 42, respectively, at one side of the apparatus, and likewise, a partition 46 extends between the side walls 47 and 48 of the cabinet and receptacle at the other side of the apparatus. The partitions 43 and 46 do not extend beneath the receptacle 42 so that a continuous passage 49 is formed along the front, bottom and rear walls of the receptacle within the cabinet, as indicated by the arrows in Fig. 2, and constitutes an air passage for conducting the air around the receptacle 42, as will presently appear.

Suitable means are provided for recirculating the air in the truck body through the passage 49. As shown, a fan or blower 51 is provided for this purpose. The fan is mounted at the upper end of the cabinet within the truck body 10 and has its discharge in communication with the interior of the truck body. The fan is adapted to be operated by suitable motor 52 through the medium of a belt and pulley mechanism 53, see Fig. 1.

The receptacle 42 is adapted to be filled with ice and brine as shown at 54 and the air, in passing downward through the passage 49, is adapted to be cooled by coming in contact with the front, rear, side and bottom walls of the container 42 which constitutes what may be termed a heat exchange device.

Suitable means are provided for preventing frosting of the heat exchange device during the operation of the apparatus. As shown, this means comprises mechanism for discharging a

spray of cold brine onto the surface of the heat exchange device. The mechanism shown for accomplishing this object comprises a pair of liquid pumps 54 and 55 which may be operated by the same power shaft 56 which in turn is operated by beveled gears 57, Fig. 1, one of which is mounted on the fan shaft 58 which in turn is operated by the motor 52. The intake of the pipe 54 is in communication with the lower portion of the container 42 as by means of the pipe 59 for withdrawing the cold brine from the receptacle. A pipe 61 is connected to the discharge side of the pump 54 and has its upper end in communication with a rectangular spray head 62 extending about the upper portion of the receptacle 42.

The head 62 is provided with a plurality of nozzles 63 in each of the vertical portions of the passage 49. The nozzles 63 are adapted to spray cold brine on the heat exchange device, that is, on the exterior of the front and rear walls of the receptacle. Preferably, though not necessarily, the front and back walls of the cabinet are of heat conducting material also and the cold brine is adapted to be sprayed on the interior of these walls for cooling the same and for preventing frosting thereof. The cold brine sprayed on the interior of the walls of the cabinet will also increase the efficiency of the mechanism for cooling the air since it increases the conducting surfaces of the passage across which the air flows.

In order to further increase the radiating surfaces of the passage 49, one or both of the walls defining each vertical portion of the passage 49 may be provided with radiating fins. As shown, the front and rear walls of the receptacle 42 are provided with fins 50 extending vertically, as shown in Fig. 2. These fins being kept cool by the cold brine and ice within the receptacle and by the cold brine sprayed on the same, will assist in cooling the air circulated through the passage 49.

The brine from the sprays collects in the bottom of the cabinet 41 and is pumped back into the receptacle 42 by the pump 55. As shown, the intake of the pump 55 has connected thereto a

pipe 64 which extends into the bottom portion of the cabinet and a pipe 65 connected to the discharge side of the pump is adapted to deliver the brine into the top portion of the receptacle 42 through a laterally extending pipe 66.

In the operation of the device, cold brine is continuously sprayed onto the surfaces defining the passage 49 and the radiating fins 50 for cooling the same. Air from the truck body 10 enters the fan axially thereof and is discharged into the upper end of the forward portion of the passage 49 and in passing through the spray and in contact with the walls of the cabinet and receptacle and the radiating fins has its temperature greatly reduced and passes outwardly through an opening 67 in the upper end of the cabinet. The opening is provided with a deflector 68 which directs the air laterally into the car body. If desired, baffles may be provided between the spray head in the rear portion of the passage 49 and the opening 67 similar to those already described.

It is thought from the foregoing, taken in connection with the accompanying drawing, that the construction and operation of my device will be apparent to those skilled in the art and that changes in size, shape, proportion and detail may be made without departing from the spirit and scope of the appended claim.

I claim as my invention:

In a refrigerator unit, a cabinet having walls of heat conducting material, a receptacle for containing a cooling medium, said receptacle having walls of heat conducting material, means for mounting said receptacle within said cabinet with the walls of the two spaced apart, vertical partitions forming a U-passage around said container, a fan for circulating air through said passage for cooling the same, radiating fins on the walls of said passage, a spray head in the upper portion of said passage, and means for supplying brine from said receptacle to said spray head and for discharging brine spray onto the defining walls of said passage for preventing frosting thereof.

HOWARD A. GLENN.