

April 14, 1942.

H. Y. STEBBINS

2,279,847

REFRIGERATING CAR

Filed Oct. 21, 1940

2 Sheets-Sheet 1

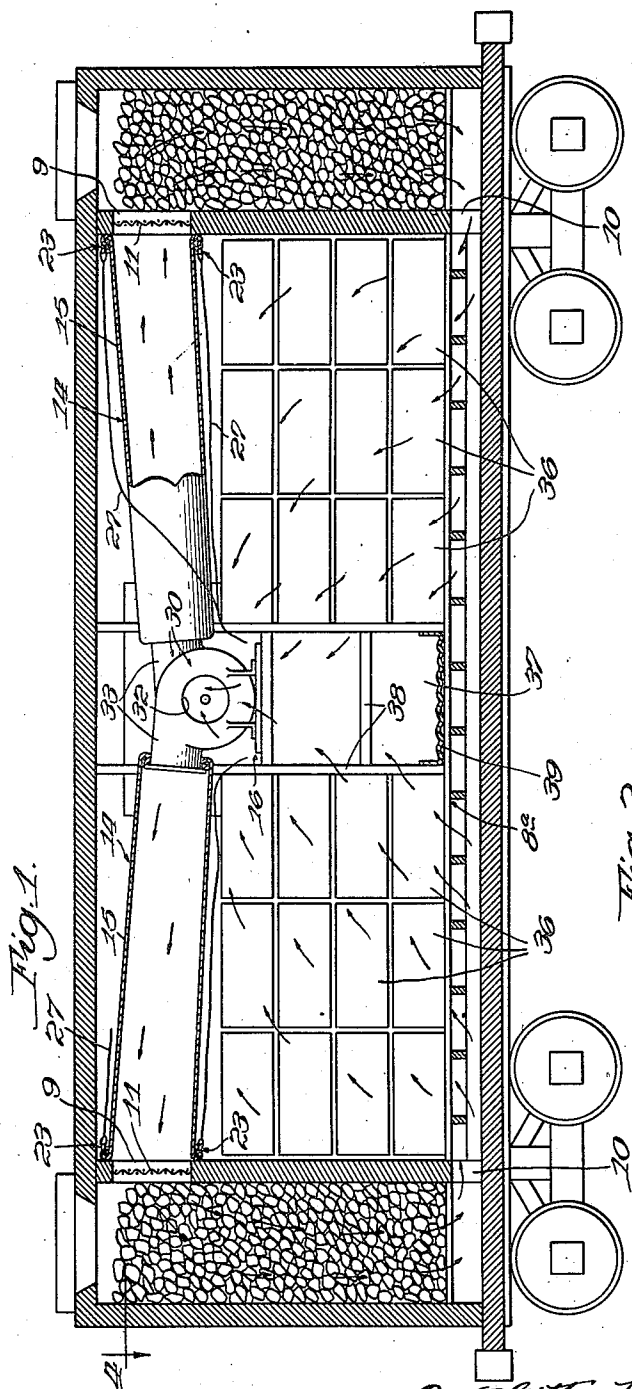
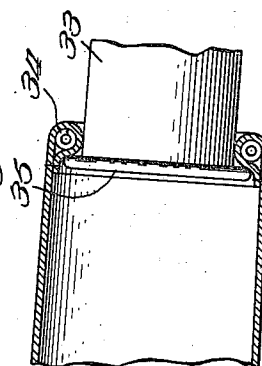
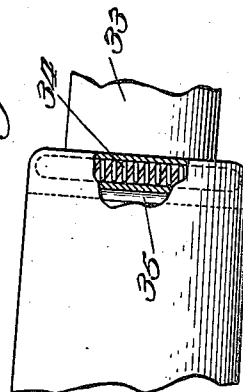


Fig. 2.



Inventor:
Harry Y. Stebbins.
By E. Hutton, Wills, Davis, Hirsch, Dawson,
Attys

April 14, 1942.

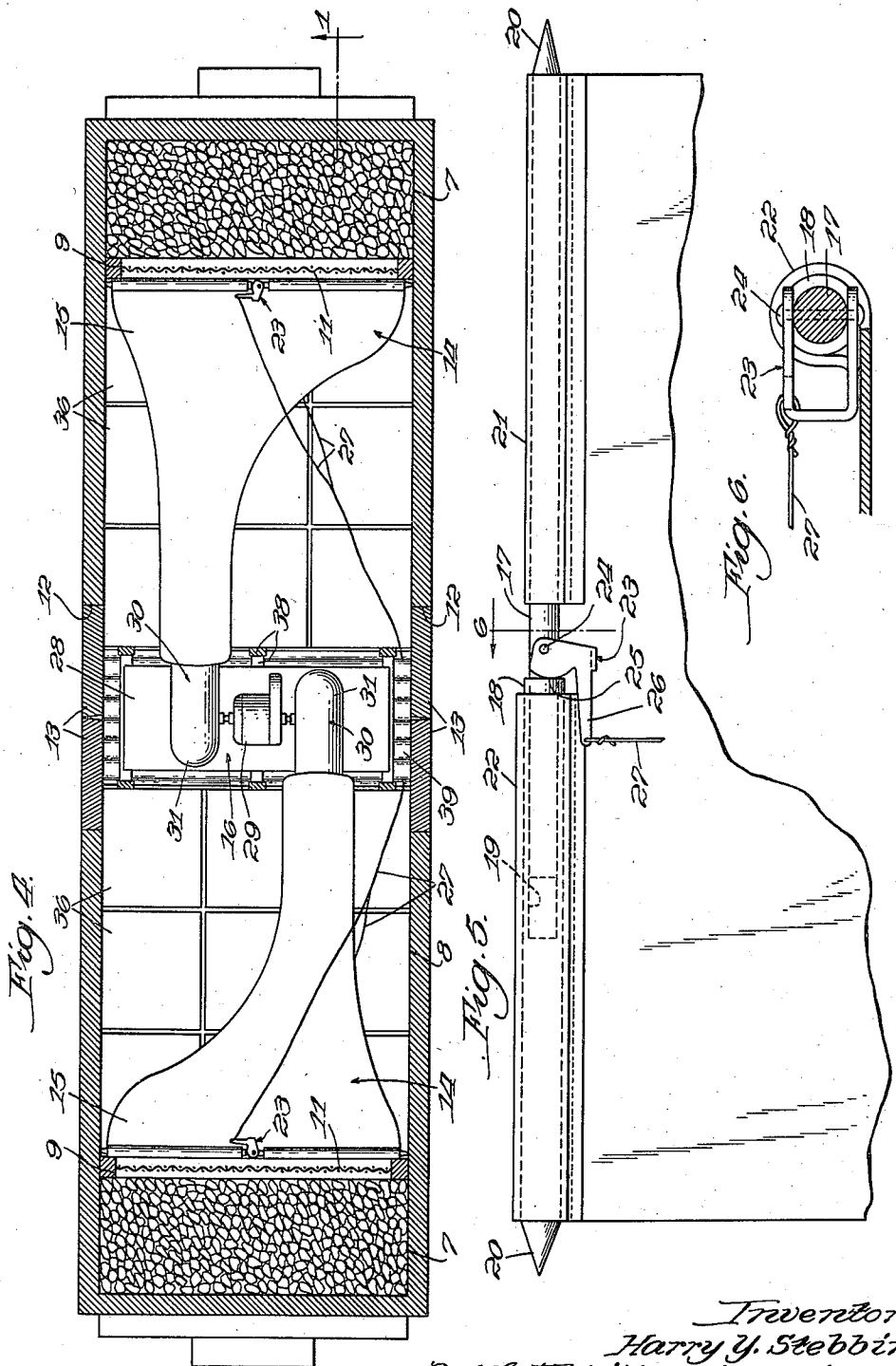
H. Y. STEBBINS

2,279,847

REFRIGERATING CAR

Filed Oct. 21, 1940

2 Sheets-Sheet 2



Inventor:
Harry Y. Stebbins.
By Chilton, Wiles, Davis, Hirsch, Dawson,
Attys.

UNITED STATES PATENT OFFICE

2,279,847

REFRIGERATING CAR

Harry Y. Stebbins, Los Angeles, Calif., assignor to
General American Precooling Corporation,
Chicago, Ill., a corporation of Delaware

Application October 21, 1940, Serial No. 362,132

10 Claims. (Cl. 62—24)

My invention relates to the refrigerating of cars involved the use of a duct or ducts, as for example of fabric, through which movement of air in the car is effected, the duct or ducts in operating position being disposed over the load in the car.

More particularly, though not exclusively, the invention relates to structures in which portable ducts lead from portable air circulating means to the upper inlet openings of the ice bunkers at the ends of the car and the air in the car is circulated from the air circulating means downwardly through the ice in the bunkers, thence through the load and back to the air circulating means, for the purpose of enhancing the cooling action of the ice in the bunkers prior to placing the car in transit, producing rapid precooling of the load.

Inasmuch as the ducts overlie the load in the car it is desirable that means be provided whereby the ducts, after the conclusion of the precooling operation, may be readily disconnected from operative position for removal from the car without requiring the operator to mount the load in the car, it being one of my objects to produce a construction whereby this desirable result may be effected. Other objects will be manifest from the following description.

Referring to the accompanying drawings, wherein I have illustrated my invention as embodied in a common form of refrigerator car having ice bunkers at its opposite ends communicating at the upper and lower ends of the bunkers with the load-receiving space between them:

Figure 1 is a view in longitudinal sectional elevation of the refrigerator car showing it equipped with air circulating apparatus in accordance with my invention; this view being taken at the line 1 on Fig. 4 and viewed in the direction of the arrow.

Figure 2 is an enlarged fragmentary sectional view showing the connection between the inlet end of one of the ducts and the outlet of the blower with which it is associated.

Figure 3 is an enlarged fragmentary view in side elevation of the parts shown in Fig. 2 a portion of the duct being broken away and shown in section, to illustrate an interior detail.

Figure 4 is a plan sectional view taken at the line 4 on Fig. 1 and viewed in the direction of the arrow.

Figure 5 is a broken plan sectional view of a portion of the structure shown at the right hand side of Fig. 4 illustrating the means for holding

the ducts in place adjacent the ice bunkers; and Figure 6, an enlarged fragmentary sectional view taken at the line 6 on Fig. 5 and viewed in the direction of the arrow.

The refrigerator car shown comprises ice bunkers 7 at its opposite ends each communicating at its upper and lower ends with the load receiving space 8, through openings 9 and 10, respectively, the upper openings 9 being shown as provided with gratings 11 and the load receiving space having side openings 12 equipped with doors 13. The load-receiving space 8 is provided, in accordance with common practice, with a false bottom 8a in the form of a grating spaced from the bottom proper of the car, the openings 10 communicating with the space 8 through the space below the grating 8a and through the openings in this grating.

In the particular arrangement shown my invention is utilized to enhance the cooling effect of the ice in the bunkers, with a view to quickly refrigerating the load placed in the storage space 8 before placing the car in transit; this particular embodiment of my invention comprising a pair of ducts 14 preferably of non-rigid material such as for example any suitable fabric, as for instance canvas, which extends from points adjacent the center of the car to the ends of the car in registration with the upper inlet openings 9 in the bunkers, the ends of the ducts at which they register with the openings being of enlarged cross sectional area as represented at 15 and of rectangular form to entirely surround the openings 9.

The inner ends of the ducts 14 connect with any suitable form of air-forcing means shown as in the form of a portable motor and blower unit 16 shown as positioned in the car as hereinafter described.

Means are provided for releasably holding the ducts 14 in registration with the bunker openings 9, these means, in the particular embodiment shown, comprising a pair of longitudinally aligned rods 17 and 18 of different diameters, the smaller one telescoping with the larger one at a socket 19 in the latter. These rods, which are pointed at their outer ends as represented at 20, are longitudinally slidable in loops 21 and 22 on the upper and lower edges of the expanded portions of the ducts 14, formed, as for example, by folding back these edges of the material from which the ducts are formed and sewing the turned back edges in place as shown.

The rods 17 and 18 are provided for embedding, at their pointed ends 20, in the longi-

tudinal sides of the car when forced outwardly, to hold the ducts 14 in place at the openings 9, and as a means for accomplishing this each set of rods is provided with a bifurcated cam device 23 which straddles the inner end of the rod 17 and is pivoted thereon at 24, the cam surfaces of the device, one of which is represented at 25, opposing the inner end of the rod 22 associated therewith; the cam devices 23 having arms 26 by which they may be operated to releasing position as hereinafter described, as through the medium of cords or the like 27 connected with these arms.

The air-forcing unit 16 is shown as comprising a base 28, a motor 29 supported on the base 28 and a pair of blowers 30 which may be, and preferably are, of the Sirocco type, also mounted on the base. The driven element of the motor 29 is connected at its opposite ends with the rotors of the blower 30. The casings of the blowers, which are represented at 31, have air inlet openings in their sides at their centers as represented of one of the blowers at 32, and outlet portions 33 at which they connect with the ducts 14, respectively.

Preferably the connections between the ducts 14 and the outlets 33 of the blowers 30 are of the quick detachable type, as for example and preferably that shown involving the equipping of the inner ends of the ducts with coil spring rings 34 confined on the ducts and adapted to be sprung over the outer ends of the blower outlets 33, annularly flanged as represented at 35, to the position shown in the drawings.

In the use of the apparatus the operator first applies the ducts 14 to the bunker openings 9 and forces the pointed ends of the rods 17 and 18 into the sides of the car by rocking the cam devices 23 to the position shown in the drawings. The ducts 14 thus attached to the car at their outer ends as stated are then deflected to one side to remove obstruction to the loading of the car with the articles to be refrigerated and conveyed in the car. The articles, shown as contained in crates 36 or other containers, are then stacked in the space 8 in the car preferably each in spaced relation throughout its surface area, to the ones next adjacent thereto, to form spaces through which the refrigerated air may circulate. The car may be loaded in accordance with the well known type of brace loading as shown, providing an aisle 37 extending crosswise of the car from side to side thereof at the doors 13, in which case bracing represented at 38 is used to prevent horizontal shifting of the load, or without providing the aisle referred to, in accordance with the well known squeeze type of loading.

The air-forcing unit 16 is then introduced into the car through one of its door openings 12 to the position shown in Figs. 1 and 4—the unit 16 in the case of a brace load as shown being supported on top of the bracing 38, and in the case of a squeeze load on top of the load itself—and the inner ends of the ducts 14 connected with the blower outlets 33 as above stated. The bunkers 7 having been charged with ice and the doors 13 closed, the motor 29 is started into operation, as for example in the case of an electric motor by current led thereto from a source outside the car, and the motor continued in operation until the load has been sufficiently precooled.

As will be understood from the foregoing, the blowers 30 serve to force air drawn into them through their inlets from the interior of the car, out through the blower outlets 33 and the ducts 14 into the upper portions of the bunkers 7,

thence downwardly through the ice in the bunkers from which the refrigerated air flows through the load to refrigerate it, and thence passes into the inlets of the blowers, thereby producing a continuous circulation of refrigerated air through the load.

After the desired precooling of the load has been effected, the operator stops the motor 29, disconnects the ducts 14 from the blower outlets 33, removes the air-forcing unit 16 from the car through one of its side openings and then pulls on the cords 27, which preferably extend to one of the openings 12 in the sides of the car, for withdrawing the rods 17 and 18 from embedment in the car sides, thereby releasing the ducts 14 for removal from the car through one of its side openings, thus avoiding the necessity of the operator mounting the load to effect such release; the cords 27 serving as a convenient means for pulling the ducts 14 to the center of the car.

Particularly in the case of a braced load as shown it is preferred that the grating at the bottom of the car directly beneath the bracing be covered by a baffle to prevent shortcircuiting of the air to the blowers, this baffle, represented at 39, and extending from one side to the other of the car, being shown as having upwardly turned edges at which it is secured to the bracing 38.

The use of a Sirocco type of blower is desirable inasmuch as it is much more effective than the blade type of fan, in overcoming the static created by forcing the air through the grill 11 at the bunker inlet, the grating along the bottom of the car and the spaces between the articles stacked in the load-receiving space 8 of the car.

While I have illustrated and described a particular embodiment of my invention, I do not wish to be understood as intending to limit the invention thereto, as the invention may be embodied in other forms of structure and the structure shown variously modified and altered without departing from the spirit of the invention.

What I claim as new and desire to secure by Letters Patent, is:

1. In combination with a refrigerator car having a refrigerant compartment at one end and a load-receiving space opening into said compartment, means for forcing air into said compartment comprising air-forcing means, a duct of non-rigid material communicating with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening, and means on said duct accessible for operation by the operator without mounting the load for actuating said third-named means to release said duct and serving as a means to move said duct along the load.

2. In combination with a refrigerator car having a refrigerant compartment at one end, a load-receiving space opening into said compartment and a door between which and said compartment at least a portion of said storage space is located, means for forcing air into said compartment comprising air-forcing means adjacent said door, a duct of non-rigid material communicating with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening, and means accessible for operation adjacent said door for actuating said third-named means to release said duct.

3. In combination with a refrigerator car having refrigerant compartments at its opposite ends,

a load-receiving space between said compartments and opening into said compartments, and a door opening into said load-receiving space, means for forcing air into said compartments comprising air-forcing means located adjacent said door, ducts of non-rigid material communicating with said air-forcing means and with the openings to said compartments, means releasably holding said ducts in communication with said openings, and means accessible for operation by the operator without mounting the load for actuating said third-named means to release said ducts.

4. In combination with a refrigerator car having a refrigerant compartment at one end and a load-receiving space opening into said compartment, means for forcing air into said compartment comprising air-forcing means, a duct of non-rigid material communicating with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening comprising members carried by said duct and adapted to engage the sides of the car, and means accessible for operation by the operator without mounting the load for releasing said members from engagement with the car.

5. In combination with a refrigerator car having a refrigerant compartment at one end and a load-receiving space opening into said compartment, means for forcing air into said compartment comprising air-forcing means, a duct communicating with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening comprising pointed members carried by said duct and adapted to be forced into the sides of the car, and means accessible for operation by the operator without mounting the load for releasing said members from engagement with the car.

6. In combination with a refrigerator car having refrigerant compartments at its opposite ends, a load-receiving space between said compartments opening into upper and lower ends of said compartments, the floor of said space being in the form of a grating and a door opening into said load-receiving space, bracing means, adjacent said door opening, for the load positioned at opposite sides of said bracing means, means for circulating air through said space and said compartments comprising air-forcing means positioned above said grating and ducts communicating with said air-forcing means and with certain of said openings to said compartments, and a baffle extending over said grating at said bracing means.

7. In combination with a refrigerator car hav-

ing refrigerant compartments at its opposite ends, a load-receiving space between said compartments opening into upper and lower ends of said compartments, the floor of said space being in the form of a grating and a door opening into said load-receiving space, bracing means, adjacent said door opening, for the load positioned at opposite sides of said bracing means, means for circulating air through said space and said compartments comprising air-forcing means positioned above said grating and ducts communicating with said air-forcing means and with certain of said openings to said compartments, and a baffle extending over said grating at said bracing means, those edges of said baffle which extend transversely of the car being upwardly flanged.

8. In combination with a refrigerator car having a refrigerant compartment at one end and a load-receiving space opening into said compartment, means for forcing air into said compartment comprising air-forcing means, and a duct communicating with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening comprising members carried by said duct and adapted to engage the vertical sides of the car, and means accessible for operation by the operator without mounting the load for releasing said members from engagement with the car.

9. In combination with a refrigerator car having a refrigerant compartment at one end and a load-receiving space opening into said compartment, means for forcing air into said compartment comprising air-forcing means, a duct communicating, and releasably connected, with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening, and means accessible for operation by the operator without mounting the load for actuating said third-named means to release said duct.

10. In combination with a refrigerator car having a refrigerant compartment at one end, a load-receiving space opening into said compartment and a door between which and said compartment at least a portion of said storage space is located, means for forcing air into said compartment comprising air-forcing means adjacent said door, a duct communicating, and releasably connected, with said air-forcing means and with the opening to said compartment, means releasably holding said duct in communication with said opening, and means accessible for operation adjacent said door for actuating said third-named means to release said duct.

HARRY Y. STEBBINS.