

May 23, 1939.

K. SCHWEBS
TEMPERATURE CONTROL
Filed Aug. 16, 1937

2,159,406

2 Sheets-Sheet 1

FIG. 1.

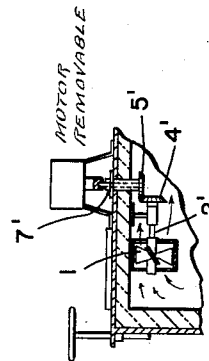
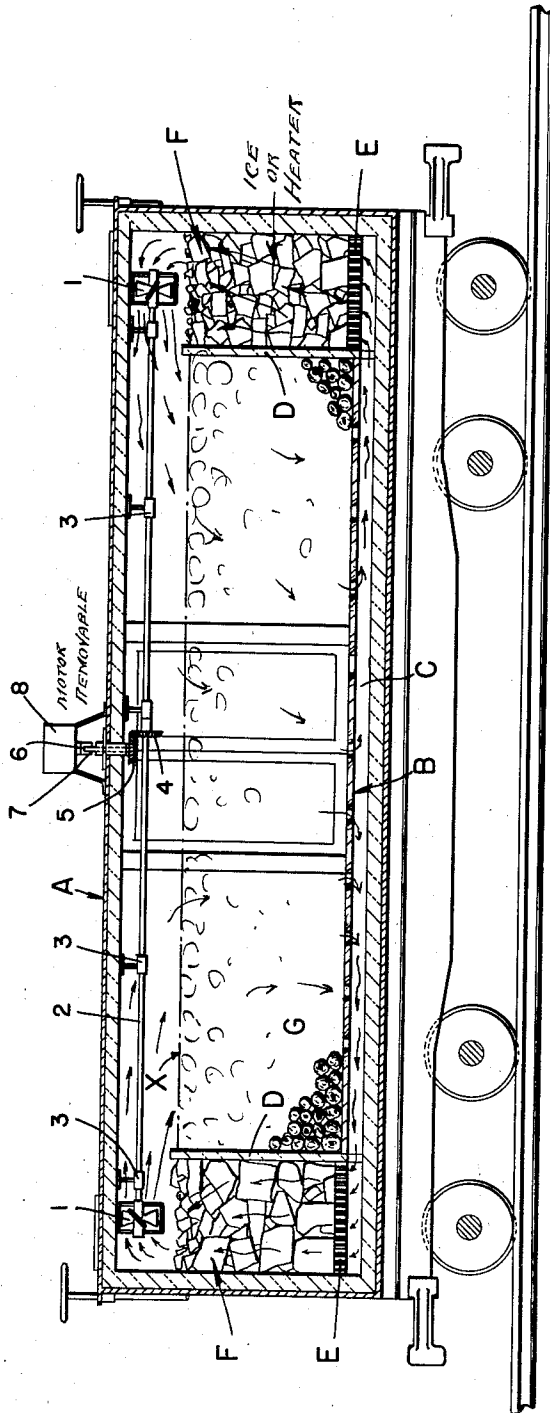


FIG. 2.

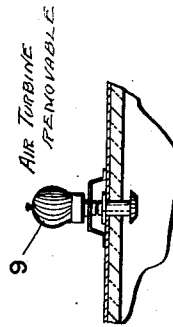


FIG. 3.

INVENTOR
KENT SCHWEBS

BY

Wm. H. H. H. H.

ATTORNEYS

May 23, 1939.

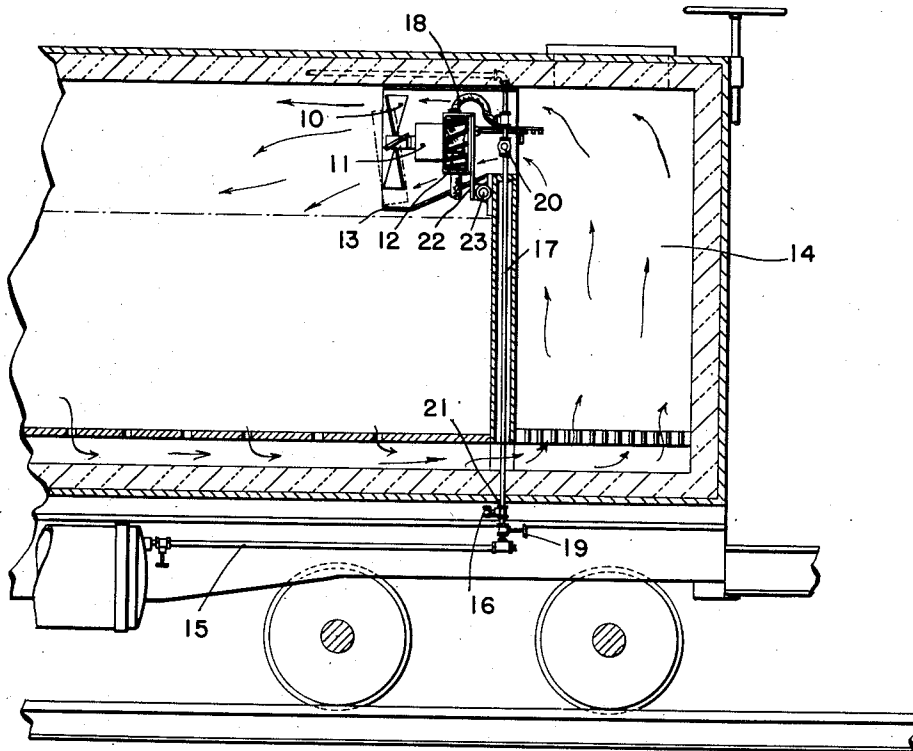
K. SCHWEBS
TEMPERATURE CONTROL

2,159,406

Filed Aug. 16, 1937

2 Sheets-Sheet 2

FIG. 4.



INVENTOR

KENT SCHWEBS

BY

ATTORNEYS

UNITED STATES PATENT OFFICE

2,159,406

TEMPERATURE CONTROL

Kent Schwebs, Hortonville, Wis.

Application August 16, 1937, Serial No. 159,363

2 Claims. (Cl. 62—19)

This invention appertains to refrigerator freight cars and trucks of the type utilized for transporting perishable articles.

One of the primary objects of my invention is to provide means for maintaining a constant current of air downwardly through the central portion of the car or other vehicle toward the opposite ends thereof, and up through ice bunkers or other heat transfer means, and from thence along the top surface of the car, and again down, thus creating, in effect, two continuous cycles of air at the desired temperature, which air will travel through the perishable articles during a loading or shipping operation to insure the proper keeping thereof.

Another object of my invention is to provide a portable motor or motors for quick attachment to a fan or fans, whereby the current of air is maintained while the car is standing or has just been loaded, whereby the temperature is immediately changed to meet shipping conditions.

Another object of my invention is to provide ready means for uncoupling the motor or motors, and attaching as a substitute any type of air driven turbine or motor, whereby a cycle of air currents is maintained during transit of the car, it being understood that the propellers or air turbines are positioned exteriorly of the car, whereby the power is developed by air rushing past the car and transmitted to the propellers inside the car by suitable gear connections.

A further important object of my invention is the provision of novel means for operating the air circulating fans either by electric motors or air motors, the air motors being adapted to be actuated by compressed air, either received direct from suitable compressors or from the main train line of the car air brakes.

With the above and other objects in view, the invention consists in certain peculiarities of construction and combination of parts, as will be hereinafter more fully set forth with reference to the accompanying drawings, and subsequently claimed.

In the drawings:

Figure 1 represents a diagrammatic sectional elevation of a freight car embodying the features of my invention, the same being illustrated with an electric or similar motor in gear connection with fans for creating the desired air circulation.

Figure 2 illustrates a detail sectional elevation of a modified form of my invention, wherein the fans at either end of a car are independent of one another and directly coupled to either an electric

motor or an air turbine or motor, depending upon whether or not the car is inert or in transit.

Figure 3 is a detail sectional elevation of a portion of the car, showing an air turbine coupled to a gear for driving the fan or fans, it being understood that the said air turbine is of any type whereby power from the outside air currents would cause the turbine to revolve at more or less high speed while the car is in transit.

Figure 4 is an enlarged, fragmentary longitudinal section through a refrigerator freight car, illustrating another form of my novel means for insuring the proper circulation of air throughout the car.

Referring by characters to the drawings, A represents a standard insulated refrigerator box car for shipping perishable goods, such as fruits and vegetables. B illustrates a perforated false car bottom forming an air channel C thereunder. The ends of the car are provided with partitions D—D, forming compartments or bunkers in conjunction with the ends of the car. The bottoms of these compartments are grilled at E, and the tops of said compartments, as shown, are open, said compartments in this particular instance being provided with batches of ice F—F, although it is understood that under certain conditions heaters may be substituted for the ice.

Mounted in suitable bearings directly over the tops of the compartments D are propellers or fans 1. As illustrated in Figure 1 of the drawings, the fans are suitably connected by a longitudinally extending shaft 2, which is mounted in anti-friction bearings 3. Centrally positioned and secured to this shaft is a beveled gear 4, which meshes with a beveled gear 5 carried by a shaft 6 that extends through the top wall of the car, as shown. The end of the shaft is squared or otherwise formed for detachable coupling connection to a socket 7, which socket is carried by the shaft (not shown) of a portable power-driven motor 8, the said motor being suitably fastened to the outer wall of the car.

This motor can be an electric motor and the current therefor can be obtained from the city supply lines when the car is standing still in a yard, or the motors can be light portable gasoline engines.

When the freight-carrying compartment G of the car is loaded with any perishable goods up to the point as indicated at the dotted line X, the car is ready for shipping and it is desirable to cool as quickly as possible the products contained therein, which may be any type of perishable article, either fruit or vegetables. It is understood

that the temperature of the fruit or vegetables is, under warm climatic conditions, more or less high when it is loaded, and hence it is desirable to reduce this temperature instantly.

5 With this in view, after the car is closed the power-driven motor is attached to the shaft of the driving gear 5, and the fans are immediately put into high speed, whereby two currents of air are caused to operate in cycles from the ice chambers D to thus force air currents low in temperature through the more or less heated fruit and vegetables.

After the temperature of the fruit or vegetables has been reduced to the desired degree, the car is locked for shipment and the power-driven motor is removed from its coupling connection with the shaft 7. Thereafter, an air turbine or motor 9 of any desired type, as, for example, that illustrated in Figure 3, is attached to the shaft 7, and when the car is put in motion or when air currents of sufficient speed travel past the car, this air motor will develop sufficient power and speed to maintain rotary drive to the propeller wheels 1, whereby the air currents previously developed by the power-driven motor will be kept up.

Particular attention is called to the fact that while the car is in motion, the air turbines or motors will be rapidly rotated by the rush of air past the same and thus develop the desired power to keep the air circulating fans in motion, whereby the currents of air in the car, which were originally reduced in temperature, will be maintained in their cycles as long as the car is in motion.

As illustrated in Figure 2, the fans 1 at each end of the car may have independent short drive shafts 2' terminating in beveled gears 4', and these beveled gears are in turn meshed with beveled gears 5', and the shafts 7' of which extend through the wall of the car for coupling connection with an air-driven motor, it being understood that the removable power-driven motor is used initially and the air turbine or motor 9 is attached to the shaft 7' when the car is in transit. Thus, each fan 1 is independently driven by its separate motor, which may be advisable in some instances.

By my invention, the temperature throughout the car is uniformly lowered, and thus the car can be packed very closely to the roof and all available space can be utilized.

Obviously, during the winter season or where the temperatures are low and it is desired to prevent freezing of the perishable articles contained in the car, the ice chambers may be utilized as compartments for any type of heater, whereby the temperature is heightened to the desired degree in order to prevent freezing of the perishable articles.

In Figure 4 I have illustrated means for maintaining the air in the car in constant motion without utilizing exterior air motors. As shown in the mentioned figure, I can provide an air circulating fan 10 mounted upon an armature shaft of an electric motor 11. This shaft is continued in rear of the electric motor casing and has attached thereto an air propeller wheel 12. If desired, the air circulating fan, the motor, and the air propeller wheel can be mounted within a suitable hood 13 communicating with the upper end of an ice bunker 14.

Means is provided for impinging a blast of air against the blades of the propeller wheel 12, whereby said wheel will be rapidly rotated to

cause the operation of the circulating air fan 10. The air for operating the propeller wheel can be obtained from a suitable compressor driven directly from the car wheels or from a motor, such as a small internal combustion engine.

However, I prefer to obtain the air for operating the propeller wheel from the main train line 15 of the car air brakes. Thus, a coupling 16 is utilized for connecting an air conducting pipe 17 with the train pipe, and the pipe 17 has in turn communicating therewith a lead-off pipe 18 extending to the propeller wheel. If desired, the pipe 17 can be extended to the other end of a car so as to bring about the operation of another fan in the car. The pipe 17 can also have incorporated in the length thereof a cut-off valve 19 and a pressure-reducing valve 20.

If desired, the pipe 17 can also be provided with a coupling 21 having a valve-controlled inlet nipple so that air can be fed into the pipe 17 from an air compressor located in a railroad yard when the car is standing still.

In operation of this form of my invention, when the car is standing still the electric motor 11 can be utilized for driving the fan 10, and the current for the electric motor can be obtained from the city supply lines. When the car is in motion, the valve 19 can be opened so that the air under pressure from the train line will be impinged against the blades of the air propeller 12, and thereby cause the operation of the air circulating fan 10.

I prefer to mount the fan, electric motor, and air propeller upon a suitable bracket 22, and this bracket can be hingedly mounted upon a suitable pivot 23. This will permit the tilting of the fan so that the path of travel of the air currents can be controlled. Any preferred means can be provided for holding the fan 10 in its desired position.

When a train-driven compressor is utilized for supplying air to the pipe 17, the inlet end of the compressor can be connected to the bottom of the car, and this would increase the circulation of air in the car.

If desired, the jet of air from the tube 18 can be led directly into the upper end of the car to create a circulation of air therein. In this instance, the fan 10 and the motor can be eliminated.

In some instances the fan could be driven from a car axle, and it is also proposed to utilize an air blower driven by the car wheels for creating a circulation of air in the car. Where an air blower is utilized, the inlet end of the blower can communicate with the interior of the car so as to cause a continuous movement of air. Obviously, the blower could be driven by an electric motor, an air motor on top of the car, or by any other suitable device.

Changes in details may be made without departing from the spirit or the scope of this invention, but what I claim as new is:

1. In a refrigerator car, a body having side walls, a roof, an end wall, a floor, and a false bottom for said floor, a partition extending across the body adjacent the end wall terminating short of the roof defining an ice bunker in conjunction with the side and end walls, an air fan, a fluid-driven motor for operating said fan, said fan and motor being disposed above the partition, means hingedly mounting the fan and motor on the partition as a unit, and means for impinging a blast of air against the blades of the air motor from an air train line of the car.

2. In a refrigerator car, a body having side walls, a roof, an end wall, a floor, and a false bottom for said floor, a partition extending across the body adjacent the end wall terminating short of the roof defining an ice bunker in conjunction with the side and end walls, an

air fan, a fluid-driven motor for operating said fan, said fan and motor being disposed directly above the partition, and means for impinging a blast of air against the blades of the air motor from an air train-line of the car.

KENT SCHWEBS.