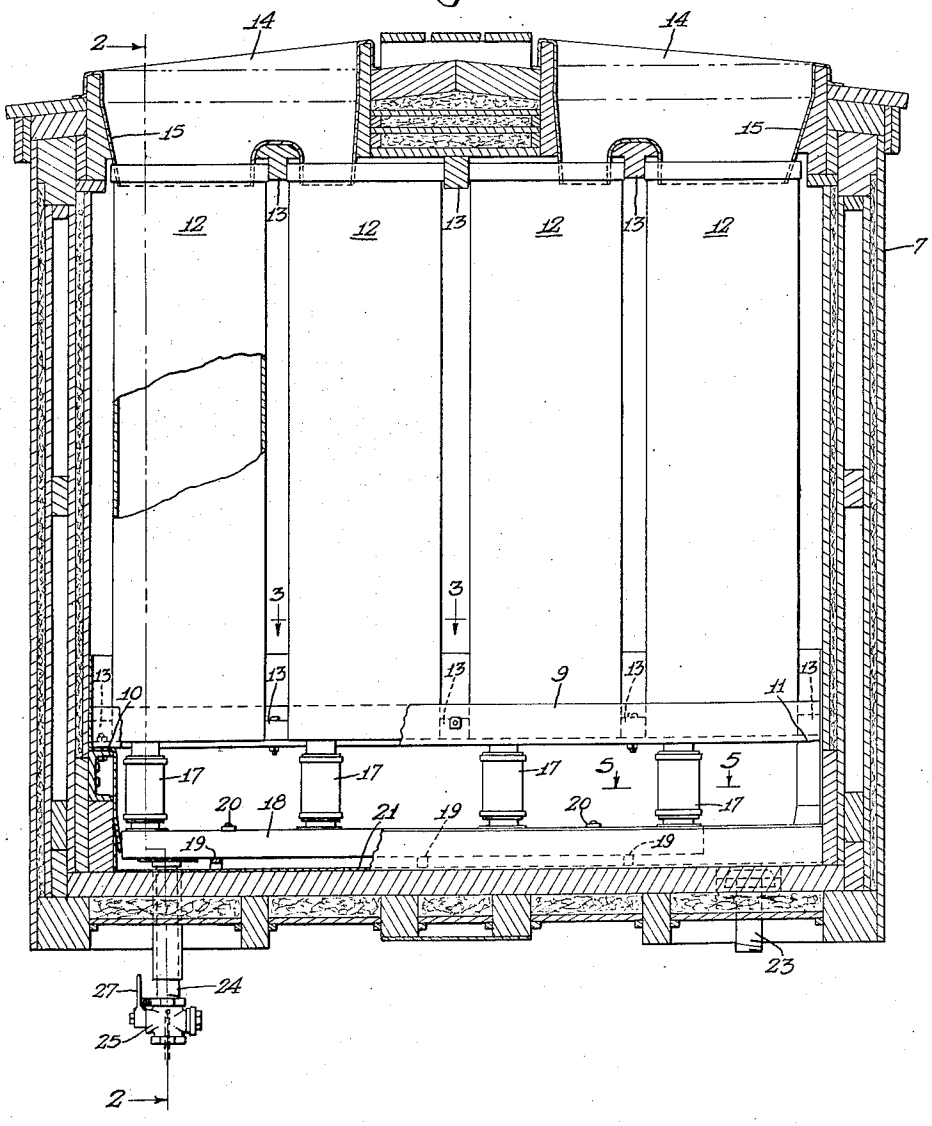
Jan. 19, 1937. L. S. DROMGOLD 2,068,401

REFRIGERATOR CAR

Filed Oct. 19, 1934 2 Sheets-Sheet 1

Fig. 1



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REFRIGERATOR CAR

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Fig. 2

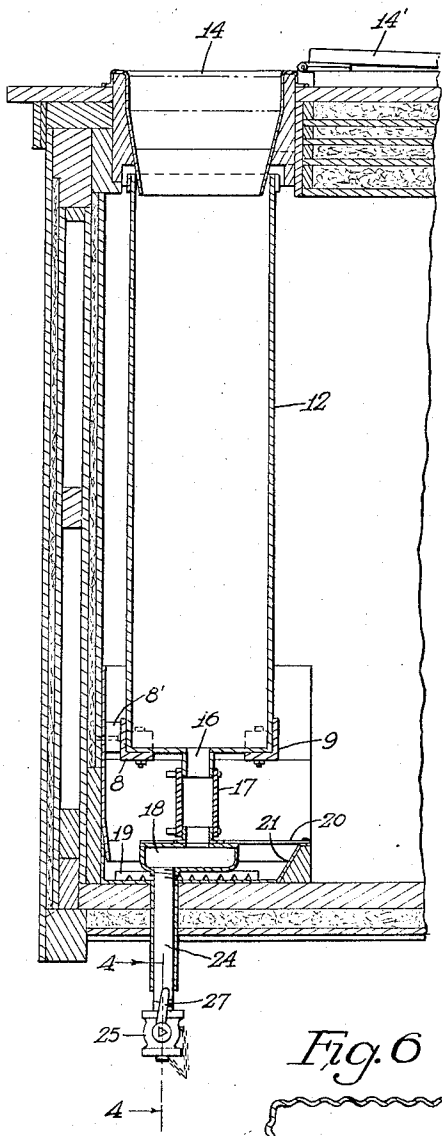


Fig. 3

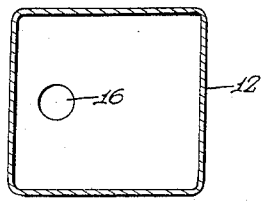


Fig. 4

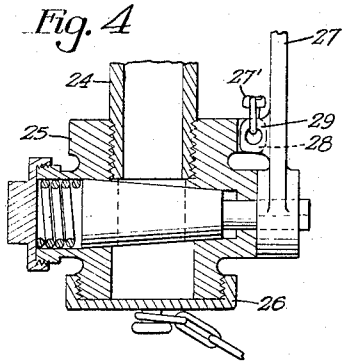


Fig. 5

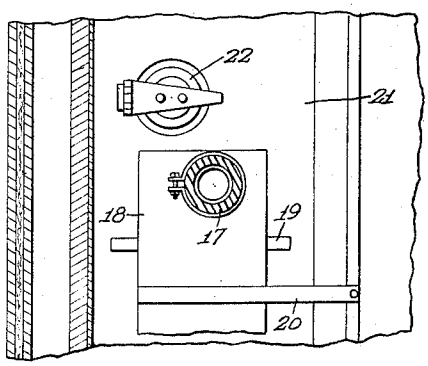
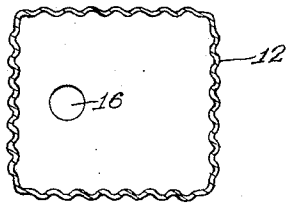


Fig. 6



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Patented Jan. 19, 1937 2,068,401

UNITED STATES PATENT OFFICE

2,068,401

REFRIGERATOR CAR

Loy S. Dromgold, Chicago, Ill.; Gertrude Dromgold, executrix of said Loy S. Dromgold, deceased, assignor, by mesne assignments, to Dromgold & Glenn, Chicago, Ill., a firm composed of Jack K. Dromgold and Howard A. Glenn

Application October 19, 1934, Serial No. 748,982

2 Claims. (Cl. 62—19)

This invention relates to that type of railroad rolling stock used in the transportation of perishable goods such as meats, fruits, vegetables, dairy products and the like and commonly known as refrigerator cars and it is equally applicable to other installations such as refrigerated motor vehicles and the like.

Refrigerator cars have been constructed with vertical tanks located in the cars at the ends thereof and around which the air in the car is permitted to circulate. The tanks have been open at the top and the roofs of the cars have had openings therein directly above the tanks. The tanks have been filled with crushed ice and brine introduced through the openings at the top and the air circulating around the tanks has cooled the cars and kept the perishable goods therein in prime condition. The tanks have not been interconnected but have constituted independent cooling units each of which has had a valve near the bottom thereof to permit the melted ice and brine to drain to an open pan beneath the tank. The drain pans have had well-traps therein through which the melted ice and brine have been discharged from the car in drain pipes extending through the floor. The well-traps have been constructed so that no air can enter the car through the drain pipes but the melted ice and brine are free to flow out therethrough at any time. The drain pans have also served to receive the melted frost accumulated on the outside of the tanks. The melted ice and brine flowing from the valves and tanks have splashed considerably and caused the cars to be messy and unclean and otherwise objectionable. The walls, roof and floors of the cars have been insulated to maintain a cold temperature within the car and the tanks have been spaced from the walls of the car to permit circulation of the air therein around the tanks whereby the car is kept in a cool state. The temperature aimed at is about 35° F. at the doors located midway between the ends of the car.

The procedure deemed necessary to transport perishable goods has been to first pre-cool the car and then ice the car at the time of loading by draining the tanks and filling them with a fresh supply of crushed ice and brine, and re-icing the car when necessary en route to destination. The pre-cooling has consisted of filling the tanks with crushed ice and pouring 5 to 25 percent salt brine solution in with the crushed ice leaving it there for from twelve to sixteen hours and then the melted ice and brine have been discharged and a new supply placed in the tanks at the time of loading the car. On an ordinary trip between Chicago and New York three and usually four re-icings have been necessary.

The primary object of this invention is to eliminate or at least to materially reduce the time and labor heretofore required for pre-cooling and re-icing refrigerator cars and thereby to avoid the delays incurred in such work and enable the cars to be run in shorter time and on continuous schedules and deliveries to be made at distant points in materially less time than has been possible heretofore.

Another object is to maintain a more uniform refrigeration of a car in its travel to a distant point by eliminating the necessity for re-icing at frequent intervals en route and thereby avoiding the changes in temperature which occur at the re-icing intervals due to delays, weather conditions or other causes.

Another object is to reduce the cost of maintaining a refrigerator car service by improving the pre-cooling operation and reducing the time involved and by avoiding the necessity for maintaining re-icing stations at frequent intervals and the cost and delay of re-icing.

Another object is to improve the refrigeration of a refrigerator car so that a refrigerating temperature will be maintained with substantial uniformity throughout a longer period of time than has been customary heretofore, whereby switchings and other delays, often amounting to several hours, at re-icing stations are eliminated and refrigerator cars may be forwarded at a greater choice of time and route and on faster schedules.

Another object is to provide a novel and simple means to enable a constant flow of refrigerant to be circulated through the refrigerating system in the car to pre-cool the car in a shorter period than has been possible heretofore.

A further object is to connect a battery or series of refrigerating tanks with a common header and drain so that the tanks may be emptied at any time and without exposing the brine or other refrigerant within the car.

A still further object is to improve the construction of refrigerating tanks in refrigerator cars so that the tank can be easily and quickly emptied and at the same time be thoroughly cleaned by the flow of the refrigerant.

Referring to the accompanying drawings wherein is illustrated a selected embodiment of the invention.

Fig. 1 is a sectional view of a refrigerator car

showing one end thereof having my invention embodied therein;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a sectional view on the line 5—5 of Fig. 1; and

Fig. 6 is a sectional view similar to Fig. 3 showing a modified form of a refrigerating tank.

The refrigerator car 7 has insulated walls, floor and roof to protect the inside of the car from temperature conditions outside of the car. At the ends of the car are the refrigerating tanks by means of which the inside of the car is kept in a refrigerated state. An angle iron support 8 spaced from the end wall of the car by spacing blocks 8' extends from side to side of the car and an angle iron support 9 in front of and spaced from the support 8 likewise extends from side to side of the car and both supports are placed somewhat above the floor. The supports 8 and 9 are mounted at their ends upon shoulders 10 and 11 on the car walls and built up from the floor. Refrigerating tanks 12 preferably four in number are mounted on the supports 8 and 9 and are spaced from the side walls of the car and from each other by spacing blocks 13. The tanks are open at the top and openings 14 are provided in the roof of the car over the tanks. These openings are closed by insulated plugs (not shown) and suitable roof doors 14'. The doors can be opened and the plugs removed for the purpose of introducing ice and brine to the tanks through the openings 14. Each opening 14 provides a passage for introduction of ice and brine to two tanks. The openings 14 are lined with a metal liner 15 which is tapered downwardly and extends a short distance inside the open top ends of the tanks so that during an icing operation no ice, brine or water will be spilled outside of the tanks and into the cars.

Each tank has an opening 16 at the bottom thereof connected by means of a flexible coupling 17 to a header 18. The header 18 constitutes, in effect, another tank lying horizontally beneath the vertical refrigerating tanks and resting on supports 19 on the drain pan 21. The header 18 is also additionally held in place by bars 20 fixed at one end to the header and at the other end to the front of the drain pan 21 which in turn is rigidly mounted on the floor of the car beneath the tanks. The supports 19 are serrated to permit flow of melted frost to an end of the drain pan wherein is located a well-trap 22. The well-trap effectively prevents air entering the car therethrough but at the same time permits water to flow out of the car. A drain pipe 23 extends downwardly from the well-trap 22 through the floor of the car to the outside. The header has a drain pipe 24 extending downwardly at one end thereof through the floor of the car to the outside. On the outer end of the drain pipe 24 is affixed a valve 25 which may be opened to drain the tanks and header. The valve is of the spring pressed type to insure close seating and a tight fit. Over the outlet port of the valve is a cap 26 so that in the event of accidental operation of the handle 27 the refrigerant will not be lost but will still be held in the tanks by the cap.

The handle 27 is adapted to be sealed or locked by the shipper so that all responsibility will be placed upon the carrier. The locking means comprises a lug 28 on the valve body and a lug 29 on the valve handle both of which lugs have openings therein adapted to register with each other when the valve is closed. A seal 27' or lock may then be secured in the openings. If the seal or lock is broken upon receipt of the car at its destination it will constitute evidence that the valve has been tampered with while in the hands of the carrier thereby placing full responsibility upon the carrier for damage done to the goods in the car due to lack of proper refrigeration.

The coupling 17 is preferably made of a flexible material inasmuch as when the tanks are filled with ice and brine they are of considerable weight and the treatment to which a railroad car is frequently subjected is such that a weaving frequently takes place between the tanks and the header and the provision of a flexible coupling at this point allows for such weaving.

A refrigerator car is prepared for shipment first by moving the car to position alongside of a building wherein is located a refrigerating device for circulating brine or other refrigerant. The valve 25 is then opened to drain the tanks of melted ice and brine remaining therein from the previous shipment and an intake pipe to the refrigerating device is affixed to the discharge opening of the valve. An outlet pipe from the refrigerating device is arranged in place in the openings 14 so that the refrigerant pumped from the refrigerating device through its outlet pipe is sprayed on the inside walls of the tanks 12 and flows down to the bottom of the tanks and through the couplings 17 in the header 18 and thence to the drain pipe 24, through the valve 25 and into the intake pipe of the refrigerating device. The flow of refrigerant is continued until the car is pre-cooled when the valve 25 is closed and the refrigerating device intake pipe is removed from the valve. Crushed ice is then put in the tanks through the openings 14 and the spaces between the pieces of ice are filled with brine from the refrigerating device. When the tanks are full the intake pipe of the refrigerating device is removed and the plug and roof door are arranged to close the openings 14 and the goods for shipment are placed in the car and the car is then shipped to its destination without a re-icing being required if the destination can be reached within about four days. This is due to the novel equipment described which permits efficient pre-cooling and maintaining of refrigerating temperature for a prolonged period. And because re-icing is not necessary the difficulties heretofore encountered in re-icing are avoided.

While I have illustrated and described a selected embodiment of my invention, I wish it to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the scope of the following claims.

I claim:

1. In a refrigerator car, a plurality of vertical refrigerating tanks, a horizontal header tank beneath said vertical tanks, means connecting said vertical tanks with said header tank, a drain pipe for said header tank extending therefrom through the car floor to the outside of the car whereby all of said tanks may be drained directly to the outside of the car, a drain pan beneath the header tank to receive melted frost from

the exterior of all of said tanks, a drain for said drain pan, and a single drain valve in said drain pipe outside of the car to control from the outside of the car the draining of all of said tanks.

2. In a refrigerator car, a plurality of vertical refrigerating tanks located within said car at the end thereof, said tanks being spaced from each other and from the end and side walls of said car, said car having openings in the roof thereof above said tanks and said tanks having open upper ends to receive a refrigerant introduced to said tanks through said roof openings, supports for the tanks extending from side to side of the car and spacing the bottoms of said tanks from the floor, a drain pan on the floor of the car beneath the tanks to receive melted frost from the exterior of the tanks, a drain for said drain pan and having a well-trap therein whereby the melted frost can pass through said drain out of said car but air from the outside of the car cannot pass thereinto, a horizontal header mounted on supports in said drain pan, said supports being serrated to permit flow of water in said drain pan, flexible hose couplings connecting said tanks with said header, a drain pipe for said header extending through the floor of the car, and a valve on said drain pipe adapted to be sealed for the purpose of indicating whether or not the valve has been tampered with.

LOY S. DROMGOLD.