Jan. 7, 1936. H. T. WHYTE 2,026,855

APPARATUS FOR PRECOOLING REFRIGERATOR CARS

Filed Sept. 26, 1934 2 Sheets-Sheet 1

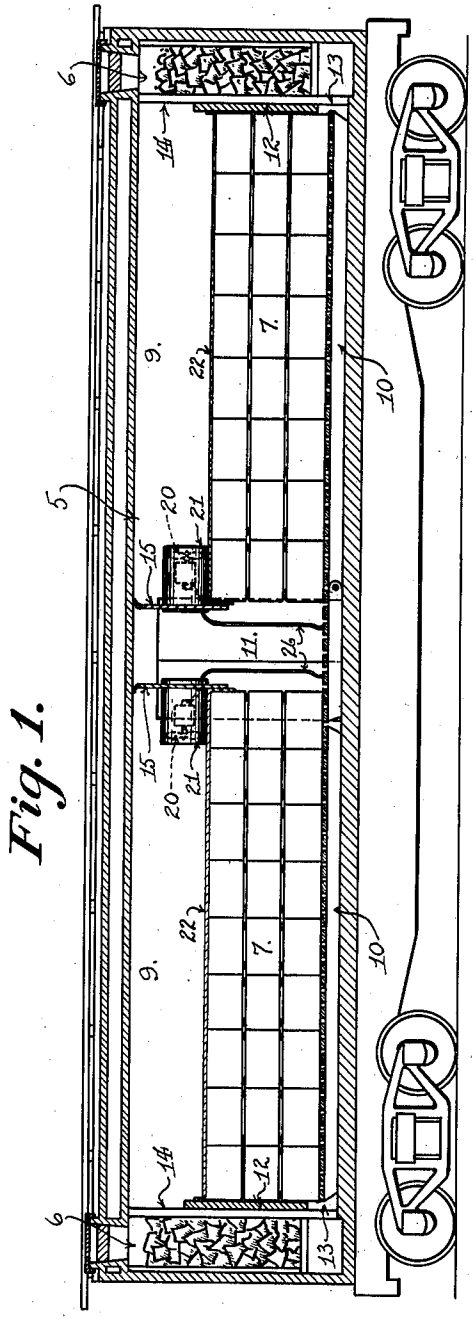


Fig. 1.

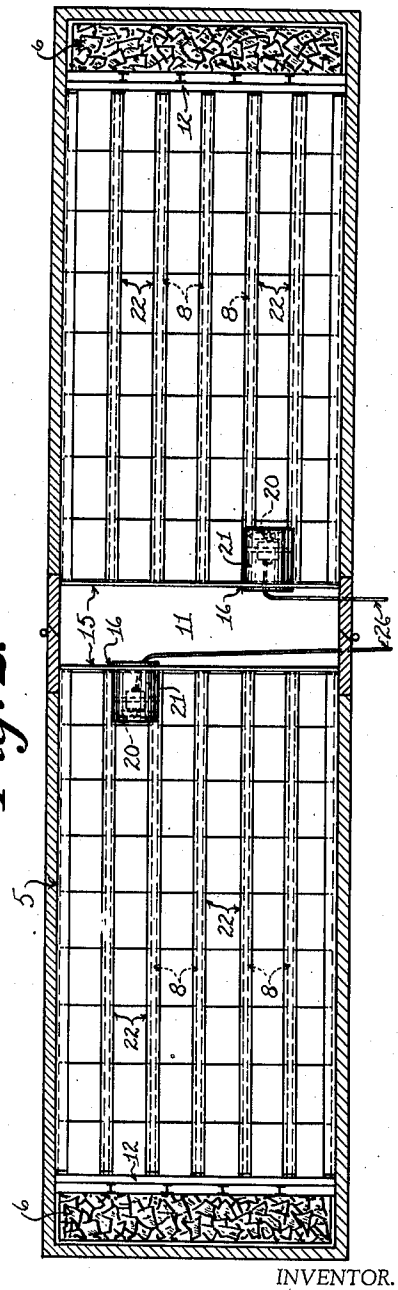


Fig. 2.

INVENTOR.

Henry T. Whyte

BY

Booth & Booth

ATTORNEY.

Jan. 7, 1936. H. T. WHYTE 2,026,855

APPARATUS FOR PRECOOLING REFRIGERATOR CARS

Filed Sept. 26, 1934 2 Sheets-Sheet 2



Fig. 4.

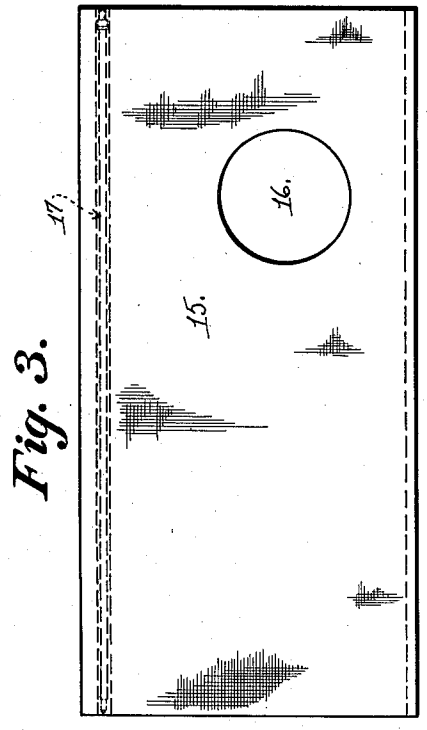


Fig. 3.

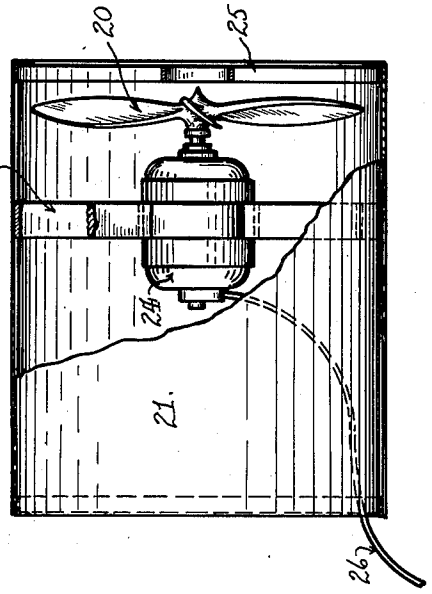


Fig. 6.

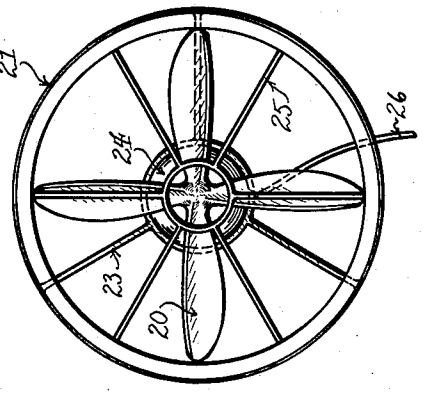


Fig. 5.

INVENTOR.
Henry T. Whyte
BY
Booth & Booth
ATTORNEY.

Patented Jan. 7, 1936 2,026,855

UNITED STATES PATENT OFFICE

2,026,855

APPARATUS FOR PRECOOLING REFRIGERATOR CARS

Henry T. Whyte, San Francisco, Calif.

Application September 26, 1934, Serial No. 745,571

1 Claim. (Cl. 62—24)

The present invention relates to apparatus for the initial or pre-cooling of a refrigerator car and its lading.

It is customary, in the shipment of such products as fresh fruits in boxes, to stack the boxes in a refrigerator car, and to immediately lower the temperature of the car, by a system of temporary forced air circulation, so that the products may be subjected to high atmospheric temperature for as short a time as possible after being picked. The essential characteristics of apparatus for this pre-cooling, of which a number of different kinds have been proposed and used, are that it shall be removable, so that it can be transferred from cars ready for the road to those in process of loading; that it shall not impede the loading operation unnecessarily; that it shall circulate a sufficient volume of air through the ice tanks of the car and through the lading to cool the latter in a short time; and that it shall not permit any portion of the circulated air to be short-circuited, so that the entire lading shall be cooled equally.

The present invention possesses all these desirable characteristics, and in addition, is inexpensive to construct and simple to operate. Moreover, it provides a forced circulation of air in the same direction as the natural circulation which continues after the pre-cooling is stopped. Other advantages of the invention will become apparent from the following description, which should be read with the understanding that the form, construction and arrangement of the several parts may be varied, within the limits of the appended claim, without departing from the spirit of the invention.

Reference will be made to the accompanying drawings, wherein

Fig. 1 is a longitudinal vertical section of a refrigerator car loaded with boxes of perishable goods, showing my apparatus in position for use.

Fig. 2 is a horizontal section of the interior of the car, the lading being shown in plan.

Fig. 3 is an elevation, enlarged, of one of the baffle curtains shown in Figs. 1 and 2.

Fig. 4 is a part sectional view of the supporting rod for the curtain shown in Fig. 3.

Fig. 5 is an end view of the fan and housing therefor.

Fig. 6 is a side view of the same, a portion of the housing being broken away to show the fan and its motor.

It is customary, in loading refrigerator cars with boxed perishable products, to stack the boxes in such a manner that air spaces are left between them, or between their rows or tiers, in order to permit free circulation. The spaces are usually longitudinal of the car, and vertical, to promote natural circulation of the air, which passes down through the ice tanks at the end of the car, and up through the lading. In Figs. 1 and 2, I have shown a conventional car having a lading compartment 5 and end ice tanks 6. The lading 7 is arranged in longitudinal rows separated by vertical air spaces 8. The boxes are usually stacked in three tiers one upon the other as shown, but in any arrangement of stacking there is a considerable free space 9 between the top of the lading and the ceiling of the car. There is also a false floor or rack providing an air space 10 beneath the lading. A vacant space 11 is left in the center of the car; opposite its doors. Suitable bracing and shoring, not shown, is employed to prevent shifting of the lading.

The bulkheads 12 between the lading compartment 5 and the ice tanks 6 are open near the floor and roof of the car, as shown at 13 and 14 respectively, to permit free circulation of air from the upper region of the lading compartment into the ice tanks and from said tanks into the lower region of the lading compartment.

My invention comprises a pair of removable curtains 15, made of canvas or other suitable material, which hang vertically across the entire width of the car between the ceiling and the top of the lading, there being one such curtain at the inner end of each stack of lading, serving as a baffle to cut off the central vacant space 11 from the spaces 9 above the lading. Each curtain or baffle 15 has an aperture 16 positioned some distance below and to one side of its center, as shown in Fig. 3. In hanging the curtains, the two apertures 16 are placed out of line, i. e. one is nearer one side of the car and the other nearer the other side. Each curtain is preferably hung from a rod 17 which has a spring extension 18 at one end and prongs 19 for engaging the sides of the car, as shown in Fig. 4, although any other removable means may be employed. When removed from the car, the curtain may be rolled up on the rod 17.

A portable electric fan 20, mounted in a protecting housing 21, is placed on top of the lading immediately behind the aperture 16 in each curtain 15. These fans draw warm air from the central space 11 through the apertures 16, thereby setting up a forced circulation in each end of the car, the air passing down through the ice tank, where it is cooled, thence longitudinally and horizontally through the space 10 beneath the

false floor and also through the spaces 8 of the lading to the central space 11, thence through the aperture 16 and fan 20 and back through the space 9 above the lading to the top of the ice tank. To prevent the warm air from short circuiting down through the lading without going to and through the ice tank, I provide a horizontal blanket or baffle 22 which lies upon the top of the lading. This baffle is preferably made of separate narrow strips of canvas or other suitable material, as shown in Fig. 2, each strip being about six inches wide and laid longitudinally over each space 8 between the rows of boxes. Such strips require much less material than a solid blanket covering the entire lading, and are easier to handle.

I prefer to make the fan housing 21, as shown in Figs. 5 and 6, of a cylindrical shell with a suitable spider 23 for supporting the fan motor 24 and a guard 25 at one end immediately in front of the fan. Electric power is supplied by a flexible cable 26, which may be led out through a door of the car.

Although it is preferable to operate the fans in such a manner as to circulate the air down through the ice tanks and up through the central vacant space 11, because this is the direction of natural circulation, nevertheless the forced circulation may be in the opposite direction with little difference in effect. The principal feature of the forced circulation, in either direction, is that it passes the air around and through the entire bodies of lading between the ice tanks and the central vacant space, thereby subjecting the entire lading to a rapid and equal cooling effect.

The apparatus may be installed either after the entire car has been loaded, or at any time during the loading. Suppose, for example, that when half the lading has been placed in each end of the car, the baffle strips 22 are laid thereupon, their unused ends being folded or rolled up. The curtain 15 is hung at the then outer end of the lading, i. e. the end nearest the door of the car, and the fan 20 placed upon said lading inside said curtain. Forced circulation thereupon begins, and may be continued while the rest of the load is being placed, at which time the curtains 15 and fans 20 are moved to their final positions as shown, and the baffle strips 22 are extended the entire length of the lading. The doors are then closed and the pre-cooling continued for sufficient time to chill the entire lading, whereupon the curtains 15, fans 20, and baffle strips 22 are removed and the car is sealed, after which the natural circulation will be sufficient to maintain the low temperature previously acquired.

It will be seen that my apparatus presents no interference to the normal loading of the car, even when its operation is begun before the loading is completed. Moreover, it is not necessary to climb over the lading, the curtains and fans being installed and removed from the central space 11, and the strips 22 being laid upon the top of the boxes as the latter are stacked, row by row, and removed by merely pulling them out, all of which can be done in a very short time.

I claim:—

Apparatus for pre-cooling a refrigerator car having a central lading compartment and a refrigerating compartment at each end thereof communicating therewith at the top and bottom, the lading being arranged in two stacks with a vacant space between them in the center of the car, each stack being of less height than the interior of the car and having longitudinal air spaces extending through it communicating at one end with the lower portion of the refrigerating compartment and at the other end with said central vacant space, comprising removable horizontal baffles closing off said longitudinal spaces from the free space above the lading; a removable apertured vertical baffle between the top of each stack of lading and the ceiling of the car; and removable fans positioned upon the lading, one in line with the aperture of each vertical baffle, said fans and said baffles causing air to circulate through closed paths in each end portion of the car, each path including the free space above one stack of lading, one refrigerating compartment, the longitudinal spaces extending through said lading, and the central vacant space.

HENRY T. WHYTE.