C. M. GAY.

TEMPERATURE CHANGING DEVICE FOR CARS.

APPLICATION FILED OCT. 27, 1910.

**984,553.**

Patented Feb. 21, 1911.

4 SHEETS—SHEET 1.

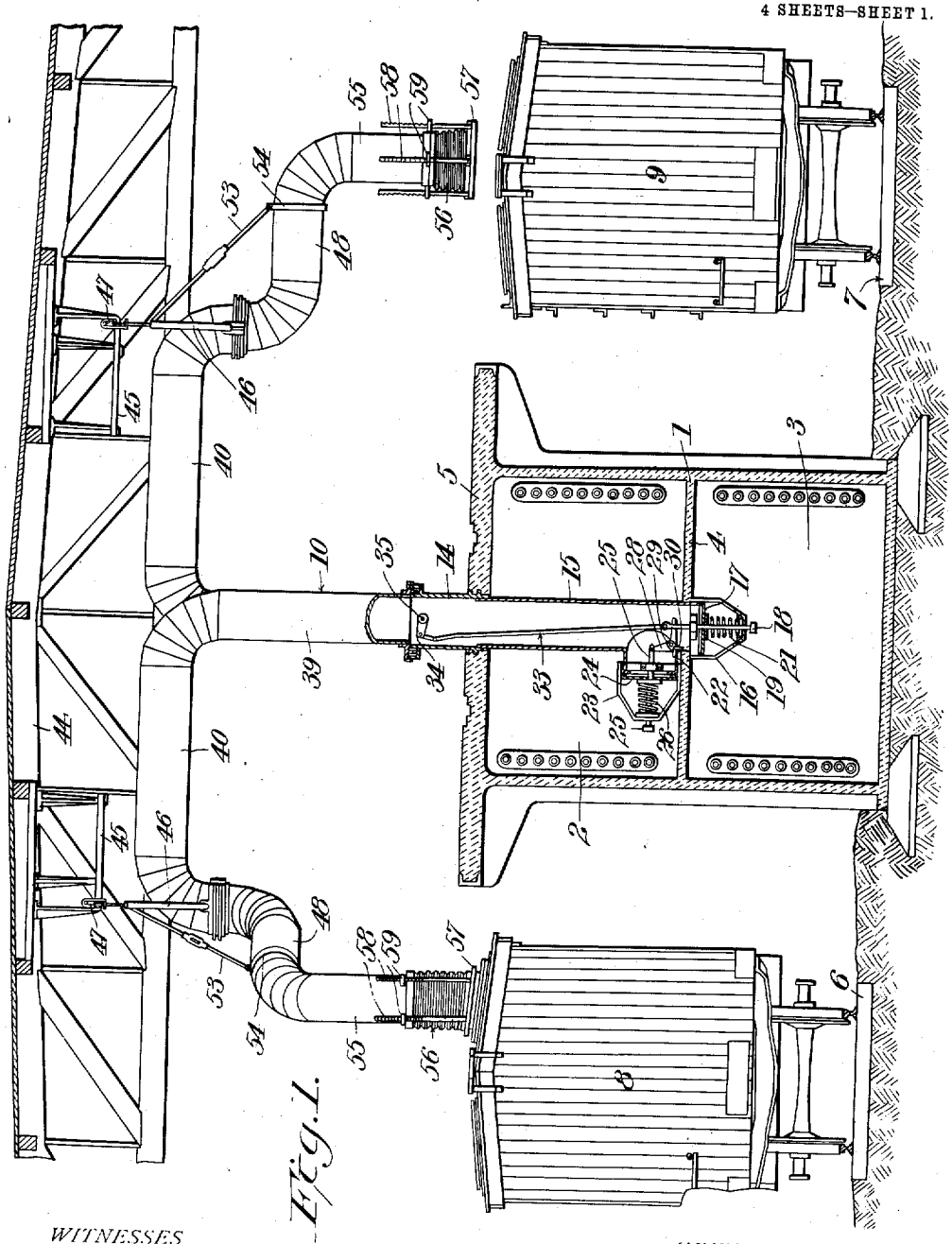

Fig. 1.

WITNESSES

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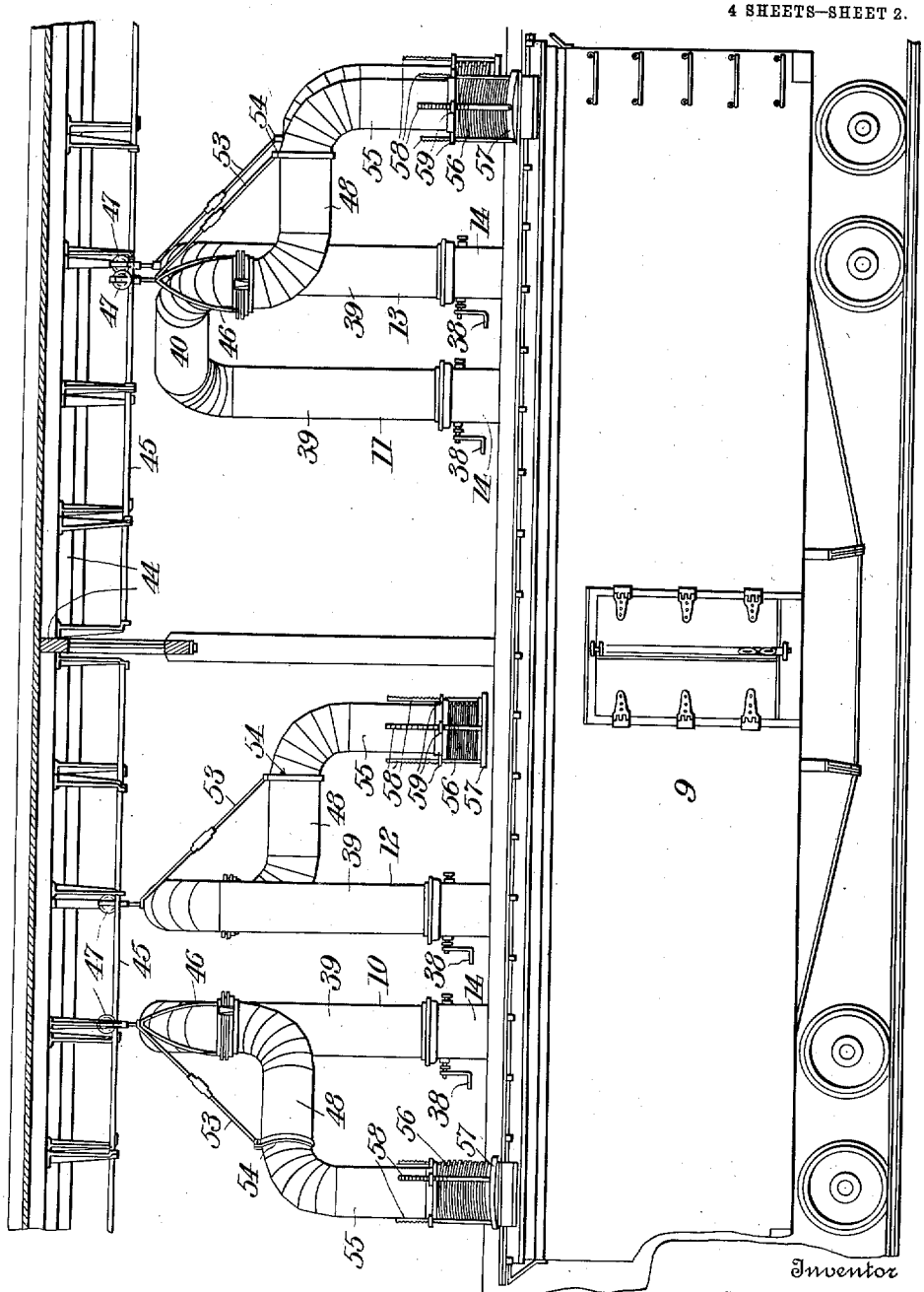


Fig. 2.

Witnesses

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4 SHEETS—SHEET 3.

Fig. 3.

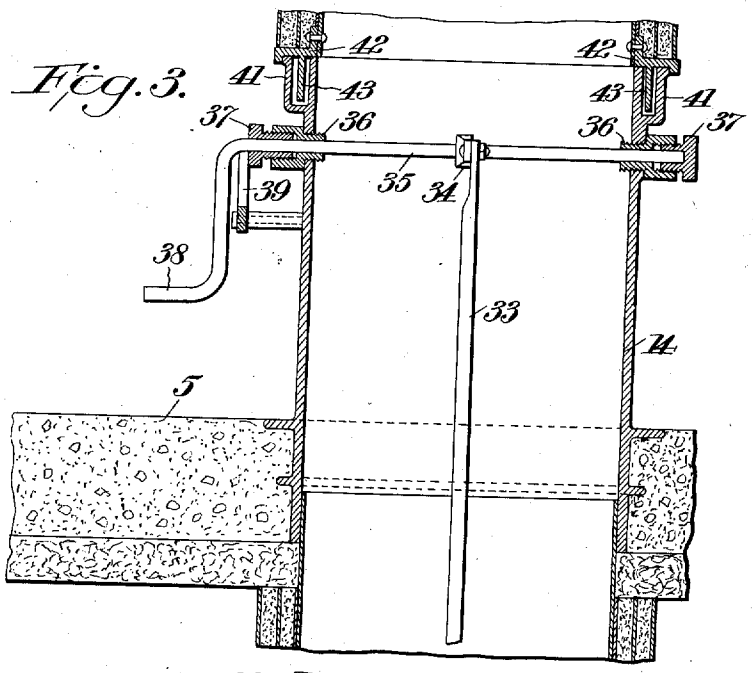
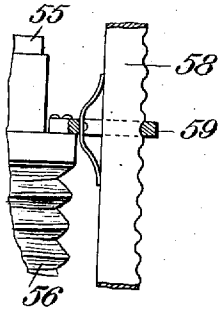
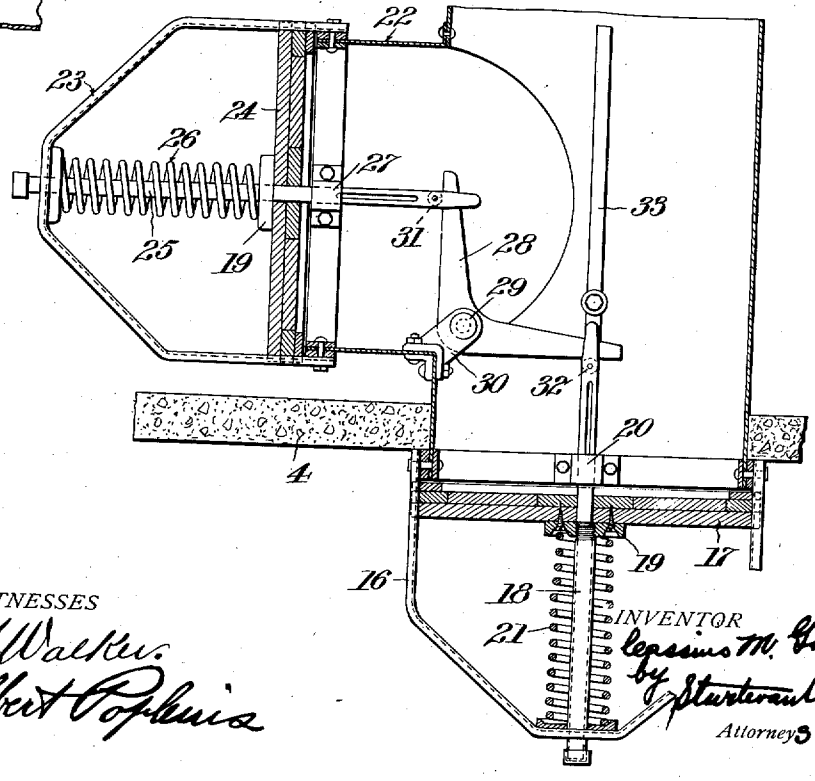



Fig. 6.

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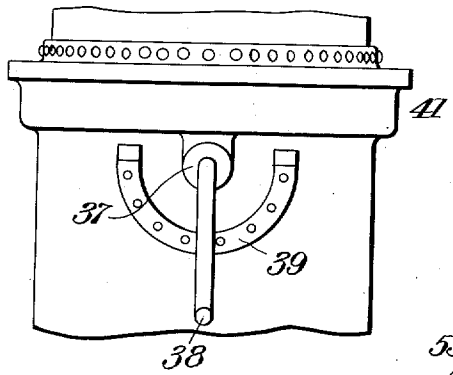
4 SHEETS—SHEET 4.

*Fig. 5.*



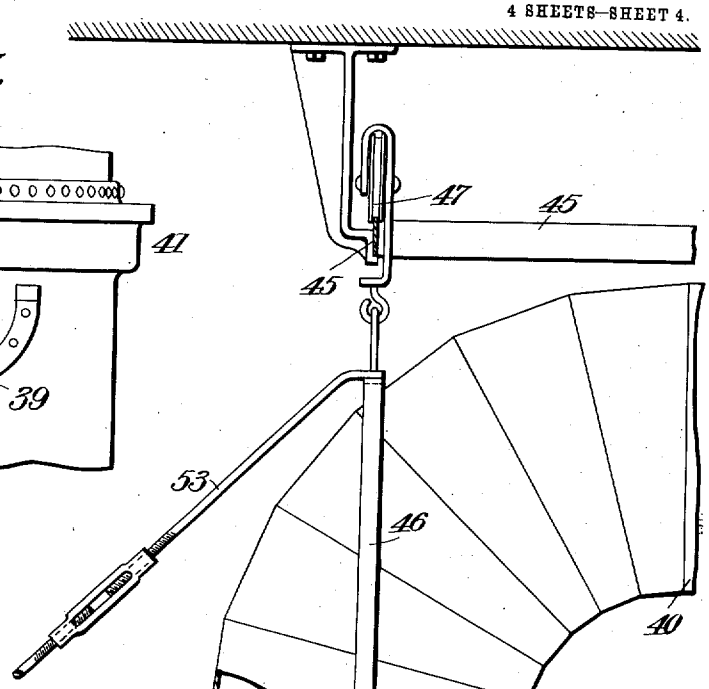
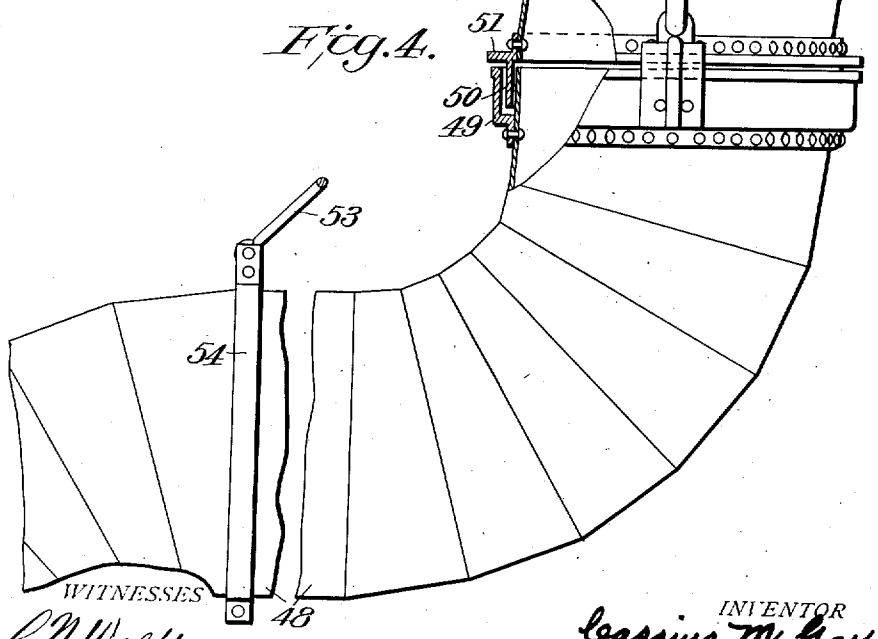




*Fig. 4.*

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# UNITED STATES PATENT OFFICE.

CASSIUS M. GAY, OF LOS ANGELES, CALIFORNIA.

## TEMPERATURE-CHANGING DEVICE FOR CARS.

984,553. Specification of Letters Patent. Patented Feb. 21, 1911.

Application filed October 27, 1910. Serial No. 589,485.

*To all whom it may concern:*

Be it known that I, CASSIUS M. GAY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented certain new and useful Improvements in Temperature-Changing Devices for Cars, of which the following is a description, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon.

The invention relates to new and useful improvements in temperature changing devices for fruit cars, and more especially to a refrigerating device or apparatus for pre-cooling the refrigerator cars, although it is obvious that from certain aspects, the invention is equally adapted for the pre-heating of the car.

An object of the invention is to provide devices connected to the chambers of the temperature changing device which may be quickly adjusted and connected to cars without requiring any special spotting of the cars relative to the temperature changing device.

A further object of the invention is to provide devices for connecting the temperature changing device or apparatus to the car wherein it is desired to change the temperature, which devices are so constructed that the air current through the car may be readily controlled and the direction thereof changed.

A further object of the invention is to provide air ducts for connecting the temperature changing device with the car, which air ducts include laterally extending parts, together with trolley mechanism for supporting the outer end of said laterally extending parts.

A further object of the invention is to provide air ducts for connecting a temperature changing device with a car, which air ducts are made in sections adapted to swing one relative to the other, together with a liquid seal for closing the pivotal connection.

A further object of the invention is to provide an air duct connecting the temperature changing device to the car, which air duct has at its outer end an extensible bellows connection for coupling the air duct with the car.

A further object of the invention is to provide a combined refrigerating device, icing platform and air ducts which lead from the refrigerating device to the car, which air ducts are provided with valves for reversing the current of air through the car and which valves are controlled by mechanism capable of being operated from the icing platform.

These and other objects will in part be obvious and will in part be hereinafter more fully described.

In the drawings which show by way of illustration one embodiment of the invention: Figure 1 is a sectional view through the refrigerating device and a portion of one of the air ducts, showing also the relation of the refrigerating device to the cars to be pre-cooled, the connecting air ducts and the supports for the same. Fig. 2 is a side view of my apparatus with the support for the air ducts in section. Fig. 3 is a sectional view through one of the air ducts and the icing platform showing the valves and the controlling mechanism therefor. Fig. 4 is a detail showing the pivotal connection between the laterally extending sections of the air duct, and the means for supporting the air duct. Fig. 5 is a detail showing the valve controlling crank. Fig. 6 is a detail showing the ratchet bar for holding the bellows in adjusted positions.

My invention is especially adapted for the pre-cooling of refrigerating cars, and I will therefore first, describe my apparatus as used for this purpose.

In carrying out my invention, I have provided as herein shown, a refrigerating device 1, which consists of a high pressure duct 2 and a low pressure duct 3, separated by a partition 4. On top of the refrigerating device, is an icing platform 5. These parts are fully shown and described in my prior Patent #940,590, dated November 16, 1909, and will not need further description in this connection. On each side of the refrigerating device and icing platform, is a track 6 and 7, on which cars 8 and 9 may be placed respectively for the purpose of pre-cooling.

My device is especially adapted for use in connection with the pre-cooling of refrigerator cars, of a well known construction, which are provided with ice bunkers at each end thereof, in which ice is to be stored after the car has been thoroughly pre-cooled.

As herein shown, I have provided my refrigerating apparatus with four air ducts 10, 11, 12 and 13 (see Fig. 2). It is obvious

however, that the refrigerating device may be extended and any number of air ducts used. The air ducts 10 and 11 extend down through both the pressure chamber and the vacuum chamber, and are adapted to be connected at their outer ends to each end of the car to be pre-cooled, whereby a circulation of the pre-cooled air may be caused to pass through the car. The air ducts 12 and 13 are adapted for a connection with each end of a car located on the other side of the refrigerating device. Each of the air ducts is similar in construction and therefore, a description of one of said air ducts will answer for all. The air duct 10 consists of a short section of cast iron pipe 14, which is mounted in the icing platform 5 (see Figs. 1 and 3) and projects a short distance above the same. The object of using a heavy cast iron pipe in this part of the air duct is to prevent said air duct from being broken or bent by the movement of blocks of ice on the icing platform.

An extension 15 extends down through the high pressure chamber 2 and through the partition 4 so that the air duct is connected with the vacuum chamber 3. At the lower end of the air duct 15, I have provided a bracket 16, which serves to guide and support a valve 17 which closes the lower end of the air duct.

A stem 18 is threaded in a nut 19 carried by the valve 17 and extends outwardly through the bracket 16 so as to guide the valve in its movements. The stem 18 also extends through the valve and through a supporting bearing 20 carried at the end of the air duct up into the air duct a short distance. A spring 21 surrounds the stem 18 and bears against the bracket 16 at one end, while at its other end said spring engages the nut 19. The spring normally holds the valve seated against the end of the air duct. The extension 15 of the air duct 10 is provided with a laterally extending portion 22, connecting with the pressure chamber 2, which carries a bracket 23 housing and guiding a valve 24 which is similar in construction to the valve 17. The stem 25 connected with the valve 24 is guided in the bracket 23 and the spring 26 surrounding the stem 25 normally holds the valve 24 closed. The stem 25 also passes through a bearing 27 carried by the end of the lateral extension 22, and extends a short distance into the air duct. As a means for operating the valves 17 and 24, I have provided a rock lever 28 which is pivoted at 29 to a bracket 30 mounted on the air duct. The stem 25 is provided with a roller 31 which is positioned so as to rest lightly against the rock lever 28 when the valve is closed. The valve stem 18 is also provided with a small roller adapted to rest lightly against the rock lever 28 when the valve 17 is closed. When the rock lever is in the position shown in Figs. 1 and 3, both of the valves 17 and 24 will be closed. The rock lever 28 is connected by a link 33 to a crank arm 34 carried by a crank shaft 35, mounted in bearings 36 threaded into the cast iron section 14 of the air duct. Packing sleeves 37 are threaded on to the rock shaft 35 in order to form an air tight connection between the bearings 36 and the rock shaft 35. The rock shaft 35 carries at its outer end a crank handle 38, by means of which the rock shaft 35 may be oscillated and through the link 33, the rock lever 28 moved about its fulcrum. The crank handle 38 is disposed above the icing platform so as to be conveniently operated by a person standing on the icing platform. A sector 39 (see Fig. 5) may be provided with any suitable locking device for holding the crank 38 in various adjusted positions.

It will be obvious that when the crank is in the position shown in Fig. 5, both the valves 17 and 24 will be closed. If however, the crank arm is moved to the right as shown in Fig. 5, the link 33 will be raised, swinging the rock lever 28 so as to bring the same into engagement with the roller 31, thus forcing the valve stem 25 and the valve 24 outward so as to open the air duct to the upper or high pressure chamber. The other arm of the rock lever 28 will move away from the roller carried by the valve stem 18 so that there will be no movement of the valve 17. When the crank handle 38 is moved in the opposite direction beyond the central position shown in Fig. 5, the valve 17 will be opened in a like manner, and the valve 24 closed, thus opening the air duct to the low pressure or vacuum chamber. The air duct 10 above the cast iron section 14, may be of any light pipe construction covered if desired with a suitable insulating material. Said air duct consists of a vertical section 39 which carries a lateral horizontal section 40 at its upper end. Said vertical section 39 is rotatably connected with the cast iron section 14. Said connection consists of a double flange 41 at the upper end of the cast iron section 14, which double flange forms a pocket extending entirely around the upper end of the section 14, and a collar 42 which is secured to the lower end of the vertical section 39. Said collar 39 rests on the upper edge of the cast iron section 14 and has a lip 43 which extends downwardly into the pocket formed by the double flange 41. This pocket is adapted to be filled with oil or any other suitable liquid seal, so as to prevent the air from escaping through the connection between the sections of the pipe 39 and 14. The weight of the upper section of the pipe will hold the sections together so that in practice I find that no other means is necessary for supporting the parts at this point.

As a means for supporting the outer end of the horizontal section 40, so that it may be freely swung about the axis of a vertical pipe 39, I have provided the overhead structure 44, which carries a track suspended therefrom, in any desirable way. The track 45 is curved about a center lying substantially in the axis of the vertical pipe 39. A yoke 46 is pivotally connected to the outer end of the horizontal extension 40, and has a universal connection at its upper end with a trolley wheel 47 adapted to engage the track 45. The air duct is provided with a second lateral extension 48, which is rotatably connected at its upper end with the horizontal section 40 above referred to. The horizontal section 40 is deflected downwardly at its outer end, and the horizontal section 48 is deflected or bent upwardly at its upper end, so that the pivotal connection between the parts is disposed so that said parts have a relative movement about a vertical axis. The section 48 is provided with a collar forming a pocket 49 at its upper end, which receives a projecting lip 50 carried by a collar 51 on the outer end of the section 40. The pocket 49 is adapted to be filled with oil or some similar liquid in order to provide a liquid seal to prevent the escape of air through the pivotal connection.

A bracket 52 is secured to the collar forming the pocket 49, and extends over the collar 51 carried by the horizontal section 40. The yoke 46 is pivoted to the bracket 52. Said bracket 52 serves as a means therefore, for supporting the section 48, and holding the same in contact with the section 40, and also as a means for supporting the outer end of the section 40. The outer end of the extension 48 is also supported by the trolley 47 and track 45 through the brace rod 53, which is pivotally connected to a collar 54 attached to the horizontal section 48, near its outer end. The horizontal section 48 of the air duct carries a downwardly extending vertical projection 55 to which is attached at its lower end a bellows or extensible connection 56. Said bellows carries a seating ring 57 at its lower end, which is adapted to fit tightly the opening in the top of the car leading to the ice bunker. Said bellows construction will allow the seating ring 57 to be tilted so as to conform to the inclination of the top of the car. Ratchet bars 58 are pivotally connected with the seating ring 57, and extend through eyes 59 carried by the supporting collar at the lower end of the vertical section 55. Said ratchet bars may be detachably connected with the supporting eyes 59 in any well known manner and will serve as means for holding the bellows in collapsed position when desired.

The operation of my device will be obvious from the above description. The cars are run along-side of the refrigerating device, and do not need any special spotting relative to the refrigerating device, owing to the swinging sections in the air duct. The air duct 10 is connected to one end of the car and the air duct 11 is connected to the other end of the car. In connecting the air ducts, the horizontal section 40 may be quickly swung about its pivotal section, with the section 14 and likewise the horizontal section 48 may be quickly swung about its pivotal connection with the section 40. It will readily be seen with the two connections, the vertical section 50 may be quickly placed over the opening in the ice bunker and adjusted to various positions, so as to register with said opening. By this swinging connection between the parts, I have avoided entirely the use of telescoping sections which are difficult to manipulate, and are liable to get out of order, and to leak. The seating ring is also very readily attached to the opening in the ice bunker. When the seating ring is detached from the car, the bellows may be collapsed and held in collapsed position by the ratchet bars, so that the vertical section 55 of the air duct will swing over the icing platform. After the air ducts have been connected with each end of the car, the controlling valves 17 and 24 are manipulated so as to connect the high pressure duct with one end of the car, and the vacuum duct with the other end of the car. If it is desired to reverse the air current through the car, when pre-cooling the same, the valves may be quickly manipulated by swinging the crank handle, so as to reverse the air current.

In order to prevent the valves from rotating, I have provided the valve stem with a slot which engages a pin carried by the supporting bearing in the air duct.

It will be obvious that from certain aspects of the invention, other refrigerating devices may be used than that herein shown. Also, that minor changes in the details of construction may be made without departing from the spirit of my invention.

While I have described my apparatus as especially adapted for refrigerating cars, it is equally adapted for the pre-heating of a car. In cold seasons it is often desirable to pre-heat a car in order to prevent the fruit contained therein from being chilled during transportation. In order that this may be accomplished, all that is necessary is to pass a heating medium through the pipes contained in the device 1, and the temperature of the air in said device will be raised above the normal temperature of the atmosphere and the circulation of air through the heating device and the car, will quickly preheat the contents of the car. It will readily be seen that this change in the use of my device may be made without in any way varying or altering the construction of my appa-

ratus. It will be understood therefore, that while I have described the main purpose of my device as a refrigerating apparatus for pre-cooling cars, that the claims are not limited to this use, but are sufficiently broad in scope to cover as well, the pre-heating of a car.

Having thus particularly described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An apparatus for changing the atmospheric temperature of cars, including in combination a temperature changing device having a pressure duct, and a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is to be changed, each of said air ducts having openings leading to the pressure duct, and to the vacuum duct, valves for controlling said openings and means for operating said valves.

2. An apparatus for changing the atmospheric temperature of cars including a temperature changing device having a pressure duct, a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is to be changed, each of said air ducts having openings leading to the pressure duct and to the vacuum duct, valves for controlling said openings, independent yielding means for closing the valves and common means for opening one of the other of said valves.

3. An apparatus for changing the atmospheric temperature of cars, including a temperature changing device having a pressure duct, and a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is changed, each of said air ducts having openings leading to the pressure duct and to the vacuum duct, valves for controlling said openings, independent yielding means for closing the valves, a rock lever adapted to engage one or the other of said valves for opening the same, and means for operating said rock lever.

4. An apparatus for pre-cooling cars, including in combination a refrigerating device, having a pressure duct, and a vacuum duct, an icing platform arranged above said refrigerating device, air ducts extending through said platform, and into said pressure duct, and said vacuum duct, said air ducts having means for connection with a car to be pre-cooled, each of said air ducts having openings leading to the pressure duct and the vacuum duct, valves for controlling said openings, and means operable from the icing platform for controlling said valves.

5. An apparatus for pre-cooling cars including in combination, a refrigerating device having a pressure duct and a vacuum duct, an icing platform arranged above said refrigerating device, air ducts extending through said platform, and into said pressure duct and said vacuum duct, said air ducts having means for connection with a car to be pre-cooled each of said air ducts having openings leading to the pressure duct, and the vacuum duct, valves for controlling said openings, springs for normally holding said valves closed, a rock lever adapted to open one or the other of said valves, means for operating said rock lever from the icing platform and for holding the same in various adjusted positions.

6. An apparatus for changing the atmospheric temperature of cars including in combination, a temperature changing device having a pressure duct and a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is to be changed, each of said air ducts having openings leading to the pressure duct, and to the vacuum duct, valves for controlling said openings, means for operating said valves, each of said air ducts also including a vertical sectional pipe constructed so that one section may rotate relative to the other, and a lateral extension adapted to be connected to the car.

7. An apparatus for changing the atmospheric temperature of cars including in combination, a temperature changing device having a pressure duct and a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is to be changed, each of said air ducts having openings leading to the pressure duct, and to the vacuum duct, valves for controlling said openings, means for operating said valves, each of said air ducts also including a vertical sectional pipe constructed so that one section may rotate relative to the other, said rotating section having a lateral extension adapted to be connected to the car, and means for supporting the outer end of said lateral extension.

8. An apparatus for changing the temperature of cars including in combination, a temperature changing device having a pressure duct, and a vacuum duct, air ducts adapted to connect said temperature changing device with the car wherein the temperature is to be changed, openings leading to the pressure duct and to the vacuum duct, valves for controlling said openings, means for operating said valves, each of said air ducts including a vertical section, a horizontal section rotatably attached to said vertical section, a second horizontal section rotatably attached to said first horizontal section so as to rotate relative thereto about a vertical axis, and means for supporting the outer ends of each of said horizontal sections.

9. An apparatus for changing the temperature of cars including in combination, a temperature changing device, air ducts

leading therefrom, each of said air ducts comprising a horizontal section adapted to swing in a horizontal plane, a track curved substantially about a center located in the axis around which said horizontal section swings, a trolley coöperating with said track, and means for connecting said trolley to the outer end of said horizontal section.

10. An apparatus for changing the temperature of cars, including in combination a temperature changing device, air ducts leading therefrom, comprising a vertical section, a horizontal section rotatably attached to said vertical section, a second horizontal section rotatably attached to said first horizontal section so as to rotate relative thereto about a vertical axis, a circular track mounted above said horizontal sections and curved about the center of said vertical section, a trolley adapted to coöperate with said track, a yoke for connecting said trolley to the outer end of said first horizontal section, and a brace rod for connecting the trolley with the outer end of said second horizontal section.

11. An apparatus for pre-cooling cars, including in combination a refrigerating device, an icing platform located above said refrigerating device, an air duct extending from said refrigerating device up through said platform, said air duct comprising a cast iron section mounted in the icing platform and extending above the same, a rotatable section secured to said cast iron section, said rotatable section including a horizontally extending portion, and means for connecting said horizontally extending portion to the car to be pre-cooled.

12. An apparatus for changing the temperature of cars, including in combination a temperature changing device, air ducts for connecting said temperature changing device with said car wherein the temperature is to be changed, each of said air ducts comprising a pipe formed in sections, one of which is rotatable relative to the other about a vertical axis, said lower section having spaced annular flanges at its upper end forming a pocket to receive a liquid, and said upper section having a depending flange adapted to extend into said pocket whereby a liquid seal is formed.

13. An apparatus for changing the temperature of cars including in combination a temperature changing device, an air duct adapted to connect said temperature changing device to the car wherein the temperature is to be changed, said air duct having at its outer end a collapsible bellows, a seating ring carried by said bellows and adapted to engage the opening leading to the ice bunker in the car.

14. An apparatus for changing the temperature of cars, including in combination a temperature changing device, an air duct adapted to connect said temperature changing device to the car wherein the temperature is changed, said air duct having at its outer end a collapsible bellows, a seating ring carried by said bellows and adapted to engage the opening leading to the ice bunker in the car, and means for holding said bellows in adjusted positions.

15. An apparatus for pre-cooling cars, including in combination a refrigerating device, an ice platform located above said refrigerating device, air ducts for connecting said refrigerating device to the cars to be precooled, said air ducts including a vertical section, horizontal sections, and a vertical section carried by the outer end of said horizontal end, a bellows adapted to connect said last named vertical section with the ice bunker of the car, and means for holding said bellows collapsed, whereby said last named vertical section may be swung over the icing platform.

In testimony whereof I affix my signature, in presence of two witnesses.

CASSIUS M. GAY.

Witnesses:

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J. M. BONNER.