Jan. 30, 1940. C. L. MOORMAN 2,188,464

CIRCULATING MEANS FOR ROLLING STOCK

Filed Feb. 12, 1938

Fig. 1.

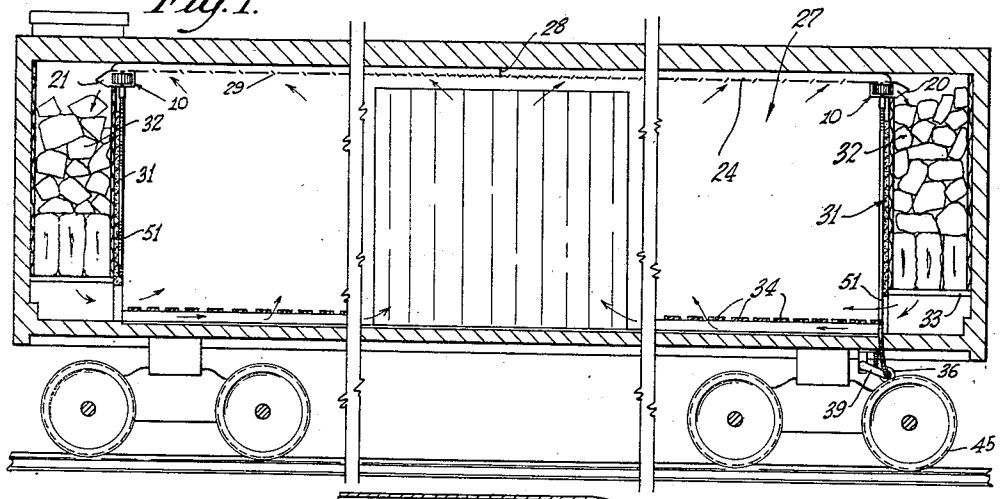


Fig. 3.

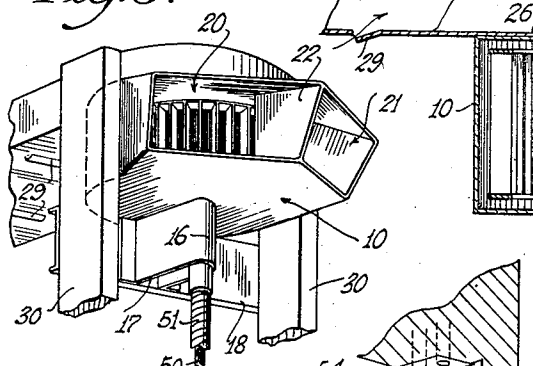


Fig. 4.

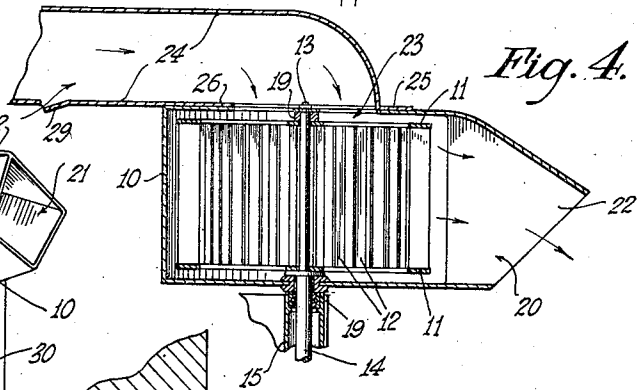


Fig. 5.

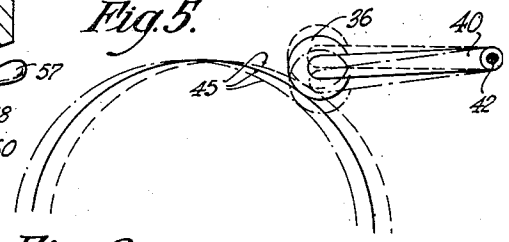


Fig. 2.

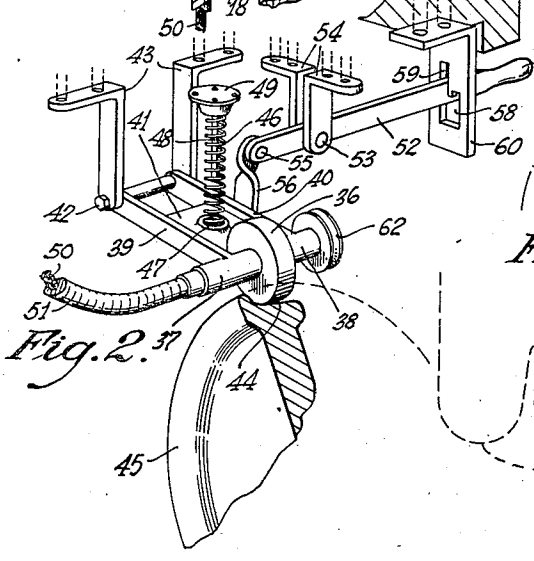
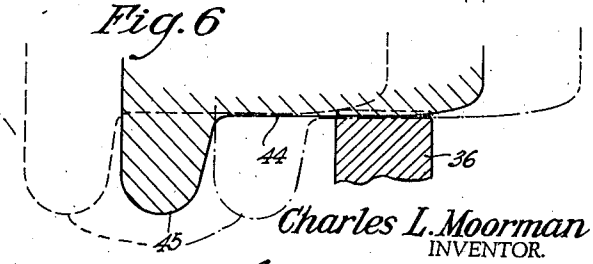


Fig. 6



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CIRCULATING MEANS FOR ROLLING STOCK

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13 Claims. (Cl. 62—24)

This invention relates to refrigerating apparatus of the type utilized in railway and other rolling stock, and has as its principal object the provision of improved means for circulating air in a refrigerator car, the means including a special blower having a driving connection with a wheel member of the car or other vehicle.

More particularly stated, it is an object of the invention to provide circulating means for a refrigerator car or other wheeled vehicle, whereby power may be taken off from a wheel to drive a blower and effect the desired circulation.

Another object is the provision of an improved blower in the form of a hood having a fan member mounted therein for rotation in a horizontal plane with an opening arranged peripherally relative to the fan, the hood being positioned near the upper portion of the ice compartment bulkhead and communicating with a duct member extended along the top of the car through the storage compartment.

It is a further object to provide a power take-off means in the form of a rider or roller mounted upon a yieldable rocker beneath the car for driving engagement with the riding periphery of a car wheel, the rocker being provided with manually operable means for effecting movement of the rider into and out of operative engagement with the wheel.

Another object is the provision of a flexible drive shaft for connecting the rider with the fan or blower.

Another object is the arrangement of the rider in its operative engagement with the wheel in such manner that it will remain in driving engagement with the wheel even though the trucks may turn through their pivotal limits in opposite directions.

Still another object is the provision in the aforesaid power take-off or driving means, of a driving connection with the fan or blower which may be connected with an auxiliary power driving means other than the car wheel to maintain circulation when the car is not moving.

Other novel aspects and objects of the invention reside in the particular form, as well as in the structural and functional arrangement of parts hereinafter to be described in view of the drawing, in which:

Fig. 1 is a vertical median section lengthwise through a refrigerator car;

Fig. 2 is an enlarged perspective detail of the power take-off or drive means;

Fig. 3 is an enlarged perspective of the circulating hood or blower and mounting therefor;

Fig. 4 is a vertical median section through the blower of Fig. 3;

Fig. 5 is an operating diagram showing the driving positions of the rider; while

Fig. 6 is an operating diagram showing the various driving contacts of the rider on the wheel as the latter pivots through its turning limits.

The importance of distributing air uniformly and constantly in refrigerator cars and similar means has long been recognized, and numerous arrangements have been devised to provide means for accomplishing such circulation.

As heretofore stated, a principal object of the present invention is the provision of a simple, effective, inexpensive and reliable circulating means which may be readily installed in any type of rolling stock and which may be driven from a wheel member thereof to effect circulation regardless of the direction in which the vehicle is moving.

To this end, there is provided an improved blower or circulator in the form of a somewhat cylindrical housing or hood 10 (Fig. 3) having mounted therein a cylindrical fan member arranged to rotate in a plane parallel to the axial ends, that is to say, the top and bottom of the housing 10. In the present embodiment, this blower comprises annular end members 11 (Fig. 4) between which are circumferentially arranged a plurality of spaced axially extending vanes 12, there being an axle member 13 extended through the assembly of blades and the end plates 11 and terminating at its lower end in a shank portion 14 extending into a sleeve portion 15 which in turn is securely embraced in the bight portion 16 (Fig. 3) of a bracket 17 attached to a mounting channel 18.

Suitable bearing members 19 are provided at opposite ends of the shaft 13 so that the blower unit 11—12 will rotate freely within the hood or housing.

Extending in a radial sense relative to the periphery of the blower unit in the housing 11, is a multi-channel cowl structure arranged as an integral part of the housing and including two exhaust openings 20 and 21 (Fig. 3) separated by a partition 22 and each providing a discharge path disposed radially of the blower or fan unit.

Communicating with the upper end of the housing 10 through the opening 23 in the latter, is an elongated duct 24 preferably attached as at 25 and 26 by welding or other suitable means to provide partial support for the blower assembly. This duct 24 may be said to extend through-

out the length of the storage compartment 27 in the car, although it may be observed that there is provided a partition 28 dividing this duct into half sections, one for each end of the storage compartment. Also provided in the under side of the longitudinally extensive duct 24 are a plurality of louvers or openings 29 (Figs. 1, 3 and 4) through which air may be taken into the duct for delivery through the opening 23 into the hood 10 and blower unit 11—12, the latter being effective to discharge such air through the openings 20 and 21.

In the type of car illustrated generally in Fig. 1, the cross support or channel 18 (Fig. 3) is preferably set between a pair of upright studs or supports 30 constituting a part of the ice chamber bulkhead 31, the cowl discharge openings 20 and 21 opening directly above the ice 32 arranged in the ice chamber so that air moved by the blower will be forced over the ice and down past the grating 33 beneath the floor grating 34 for distribution upwardly around the produce in the storage compartment, and back around the same circuit through the duct 24.

A novel form of driving means for the blower unit is shown in Fig. 2 and includes a roller or rider 36 mounted upon a stud shaft (not shown) in sleeve portions 37 and 38 of a special yoke casting including a pair of spaced yoke arms 39 and 40 joined by a flat intermediate webbing 41 and pivotally mounted at their opposite free ends on a sleeve bolt 42 attached to a mounting bracket 43 secured to the under side of the car or other vehicle in such manner that downward pivotal movement of the yoke about the bolt 42 as an axis will move the rider 36 into driving engagement with the riding periphery 44 of a standard car wheel having a flange 45 around its outer periphery.

Normally urging the rider mounting 39—40 downwardly to hold the rider in driving contact with the wheel, is a heavy coil spring 46 seated at its lower end in a boss 47 formed in the web 41, the upper end of this spring loosely embracing a guide rod 48 extending into the spring from a bracket 49 attached to the bottom of the car.

Means establishing a driving connection between the rider 36 and the shank 14 of the blower 13 includes a flexible shaft 50 attached at its lower end to the stud shaft on which the rider 36 is mounted and extending through a flexible cable 51 upwardly for connection in the sleeve 15 with the shank 14 of the blower shaft.

Means for moving the rider 36 into and out of driving engagement with the wheel rim 44 includes a lever 52 (Fig. 2) pivotally mounted as at 53 on bracket means 54 attached to the under side of the car near the bracket 53 and having a pivotal connection 55 at its inner end with a large offset lug 56 attached to the rocker structure 39—40. The opposite end of the lever 52 constitutes a handle portion 57 and may be manually moved up and down in slots 58 and 59 in a latching bracket 60 also secured to the under side of the car and effective to hold the lever 52 with the rider in or out of driving engagement with the wheel as desired, the lever being shown in the slot 59 in Fig. 2, with the rider in driving position.

The rider 36 normally engages the rim 44 of the wheel at a point on the far side of the center line of the rim 44 opposite the flange 45 so that when the wheel trucks turn in opposite directions and the rim 44 and flange 45 assume the several full and dotted line positions indicated in Fig. 6 (and schematically in Fig. 5), the rider 36 likewise will remain in driving engagement with the wheel.

At the inner end of the stud shaft on which the rider 36 is mounted, there is provided means in the form of a pulley wheel 62 for driving connection with an auxiliary power means, such as an electric motor or the like, whereby the blower may be driven when the car is standing still, the lever 52, of course, being moved into the slot 58 to disengage the rider 36 from the wheel when this arrangement is desired.

It is to be understood also that the blower units heretofore described are preferably mounted in pairs, one for each of the ice chambers at opposite ends of the car. Thus, the partition 28 in the overhead duct 24 divides the air streams into two portions for deflection into corresponding halves of the storage compartment.

While I have described in specific detail a preferred form of construction of the invention, it will be apparent that the objects and the benefits to be derived from the same may be accomplished by other means without departing from the spirit or scope of the appended claims.

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

1. In a refrigerating vehicle or the like including a storage compartment and an ice chamber, air circulating means in the form of a blower housing mounted near the upper part of said ice chamber and having therein a movable blower member of a type adapted to rotate in opposite directions to move air in only one direction, means in said housing for directing said air into the upper part of said ice chamber, duct means extended from said housing into said compartment to guide air from the latter to said blower, and means for rotating said blower member and including a power take-off drivingly engageable with a wheel of said car, and means including a flexible shaft drivingly connecting said power take-off with said blower member to effect rotation of the latter, together with manualy operable lever means arranged exteriorly of said car and operable to disengage said power take-off from operative engagement with said wheel.

2. In a refrigerator car including a storage compartment and an ice chamber, air circulating means including a blower housing mounted near the upper portion of said ice chamber and having an exhaust opening discharging into the upper portion of the latter, a reversible blower member in said housing and adapted for rotation in opposite directions to discharge air through said exhaust opening, duct means extending from said housing and the intake side of said rotatable blower into said storage compartment to guide air from the latter to the blower, and means for driving said blower in opposite directions from the wheels of said car, said means including a small riding wheel adapted for driving engagement with the rim portion of a wheel of said car, a rocker arm providing a bearing mounting for said riding wheel and pivotally mounted on said car radially at one side of a wheel thereof and having spring means normally urging the same to position said riding wheel in driving engagement with said car wheel, together with means drivingly connecting said riding wheel with said rotatable blower member.

3. In a refrigerator car including a storage compartment and an ice chamber, air circulating means including a blower housing mounted near

the upper portion of said ice chamber and having an exhaust opening discharging into the upper portion of the latter, a reversible blower member in said housing and adapted for rotation in opposite directions to discharge air through said exhaust opening, duct means extending from said housing and the intake side of said rotatable blower into said storage compartment to guide air from the latter to the blower, and means for driving said blower in opposite directions from the wheels of said car, said means including a small riding wheel adapted for driving engagement with the rim portion of a wheel of said car, a rocker arm providing a bearing mounting for said riding wheel and pivotally mounted on said car radially at one side of a wheel thereof and having spring means normally urging the same to position said riding wheel in driving engagement with said car wheel, together with flexible shaft means drivingly connected with said riding wheel and extended into said car for driving connection with said rotatable blower member.

4. In a refrigerator car including a storage compartment and an ice chamber, air circulating means including a blower housing mounted near the upper portion of said ice chamber and having an exhaust opening discharging into the upper portion of the latter, a reversible blower member in said housing and adapted for rotation in opposite directions to discharge air through said exhaust opening, duct means extending from said housing and the intake side of said rotatable blower into said storage compartment to guide air from the latter to the blower, and means for driving said blower in opposite directions from the wheels of said car, said means including a small riding wheel adapted for driving engagement with the rim portion of a wheel of said car, a rocker arm providing a bearing mounting for said riding wheel and pivotally mounted on said car radially at one side of a wheel thereof and having spring means normally urging the same to position said riding wheel in driving engagement with said car wheel, together with means drivingly connecting said riding wheel with said rotatable blower member, and manually operable means arranged exteriorly of said car for pivoting said rocker against said spring to effect operative disengagement of said riding wheel from said car wheel.

5. In a refrigerator car including a storage compartment and an ice chamber, air circulating means including a blower housing mounted near the upper portion of said ice chamber and having an exhaust opening discharging into the upper portion of the latter, a reversible blower member in said housing and adapted for rotation in opposite directions to discharge air through said exhaust opening, duct means extending from said housing and the intake side of said rotatable blower into said storage compartment to guide air from the latter to the blower, and means for driving said blower in opposite directions from the wheels of said car, said means including a small riding wheel adapted for driving engagement with the rim portion of a wheel of said car, a rocker arm providing a bearing mounting for said riding wheel and pivotally mounted on said car radially at one side of a wheel thereof and having spring means normally urging the same to position said riding wheel in driving engagement with said car wheel, together with flexible shaft means drivingly connected with said riding wheel and extended into said car for driving connection with said rotatable blower member, and means including a manually operable lever arranged for access exteriorly of said car and operatively connected with said rocker for movement of the latter into and out of position with said riding wheel in driving engagement with said car wheel.

6. In an air circulating device for use with refrigerator cars and the like including an ice chamber and storage compartment, blower means including a housing adapted to be mounted in said car adjacent said ice chamber and having therein a blower member mounted for rotation in a substantially horizontal plane and of a type adapted to draw air in at one axial end thereof and discharge said air in the same radial direction therefrom regardless of its direction of rotation, said housing having an exhaust opening disposed radially of said blower member and directed into the upper portion of said ice chamber, said housing having duct means communicating therewith at a point adjacent an axial end portion of said blower and leading into said storage compartment, and means for driving said blower member in opposite directions, said means including a rocker member mounted beneath said car near a wheel thereof and rotatably supporting a riding wheel, spring means normally urging said rocker in a direction to urge said wheel into driving engagement with said car wheel, and means drivingly connecting said riding wheel with said rotatable blower member.

7. In an air circulating device for use with refrigerator cars and the like including an ice chamber and storage compartment, blower means including a housing adapted to be mounted in said car adjacent said ice chamber and having therein a blower member mounted for rotation in a substantially horizontal plane and of a type adapted to draw air in at one axial end thereof and discharge said air in the same radial direction therefrom regardless of its direction of rotation, said housing having an exhaust opening disposed radially of said blower member and directed into the upper portion of said ice chamber, said housing having duct means communicating therewith at a point adjacent an axial end portion of said blower and leading into said storage compartment, and means for driving said blower member in opposite directions, said means including a rocker member mounted beneath said car near a wheel thereof and rotatably supporting a riding wheel, spring means normally urging said rocker in a direction to urge said wheel into driving engagement with said car wheel, and flexible shaft means drivingly connected with said riding wheel and extended through flexible conduit means into said car for driving connection with said rotatable blower member.

8. In an air circulating device for use with refrigerator cars and the like including an ice chamber and storage compartment, blower means including a housing adapted to be mounted in said car adjacent said ice chamber and having therein a blower member mounted for rotation in a substantially horizontal plane and of a type adapted to draw air in at one axial end thereof and discharge said air in the same radial direction therefrom regardless of its direction of rotation, said housing having an exhaust opening disposed radially of said blower member and directed into the upper portion of said ice chamber, said housing having duct means communicating therewith at a point adjacent an axial end portion of said blower and leading into said storage compartment, and means for driving said blower

member in opposite directions, said means including a rocker member mounted beneath said car near a wheel thereof and rotatably supporting a riding wheel, spring means normally urging said rocker in a direction to urge said wheel into driving engagement with said car wheel, and flexible shaft means drivingly connected with said riding wheel and extended through flexible conduit means into said car for driving connection with said rotable blower member, together with manually operable means constructed to be set in position to hold said rocker member in a position with said riding wheel out of operative engagement with said car wheel.

9. The device of claim 8 further characterized by the provision of auxiliary pulley means also supported coaxially with said riding wheel and adapted for connection to an auxiliary source of power to drive said blower when said car is at rest and said riding wheel disengaged as aforesaid from said car wheel.

10. A blower construction for use in air circulating devices for refrigerating cars and the like having a storage compartment and a cooling compartment, said blower means including a housing having a portion of substantially cylindrical contour and mounted in said car adjacent the upper region of said cooling chamber with the axial end portions of the housing disposed in substantially horizontal planes, a drum-like blower mounted in said housing for rotation about a vertical axis and being constructed to draw air into the region of an axial end thereof and discharge said air in a radial direction therefrom regardless of its direction of rotation, said housing having an exhaust opening arranged radially of said drum-like blower member to direct air therefrom into the upper portion of said cooling chamber, and means for drivingly connecting said blower member with a source of driving power.

11. In a refrigerating car, ice bunkers at opposite ends thereof, an intake duct extending along the length of the upper part of said car from each bunker, a blower for each bunker and having an intake connected with the corresponding end of said intake duct to draw air toward the opposite ends of the car from the upper regions of the car therebetween, each blower being arranged to discharge said air into the upper parts of the corresponding bunker for movement from the top toward the bottom thereof, and means leading from the bottom region of each bunker to guide cooled air driven from said bunkers by operation of said blowers along the bottom length of the car for distribution into the latter, said intake duct being provided with a partition situated therein in the central part of the car, and driving means including a manually operable coupling device for connecting and disconnecting each blower with the running gear of the car.

12. A blower for use in a refrigerating car, said blower comprising a housing and an air driving drum rotatable therein, said housing having an air intake therein opposite one axial end of said drum and the latter being constructed to draw air in from said axial end and discharge the same from the peripheral parts thereof radially of its axis of rotation, said housing having a discharge opening extending outwardly therefrom from the region of the periphery of said drum, said opening being of a width transverse to said axis substantially equal to the diameter of the drum, said opening having a partition midway between its opposite sides and lying in a plane extending radially of said axis, said drum being arranged and constructed for rotation in opposite directions to move air through said discharge opening.

13. In a refrigerating car, in combination, unidirectional blowers at opposite ends of the car and each including a unitary reversibly revoluble blower element arranged to move air always in the same direction relative to cooling means situated at said ends of the car regardless of the direction of rotation of the blower elements, and means providing driving connections through which each blower is coupled mechanically with the running gear of said car, and means for selectively connecting and disconnecting said driving connections for driving relation with said running gear.

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