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DOOR OPERATING MECHANISM

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Fig. 1

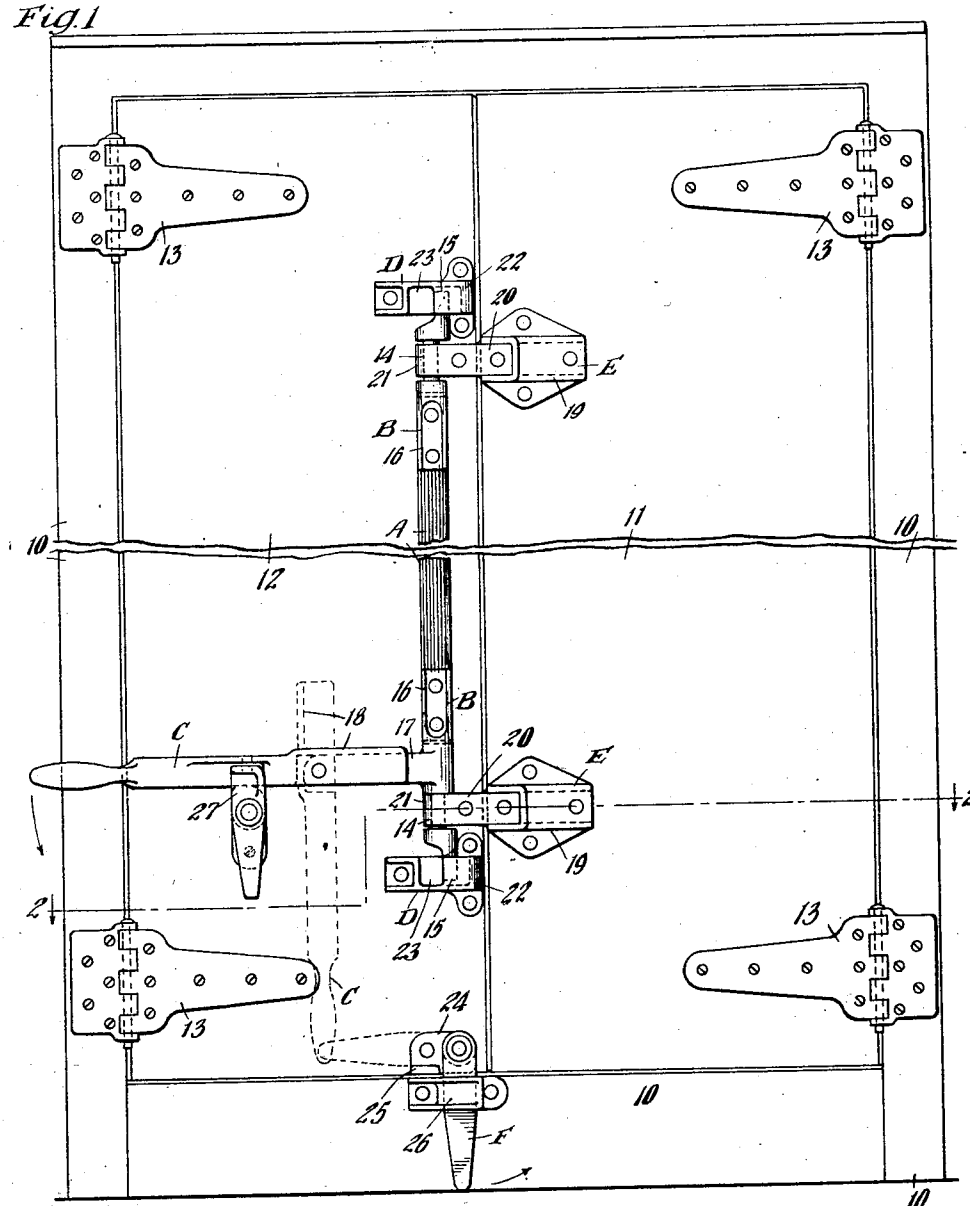
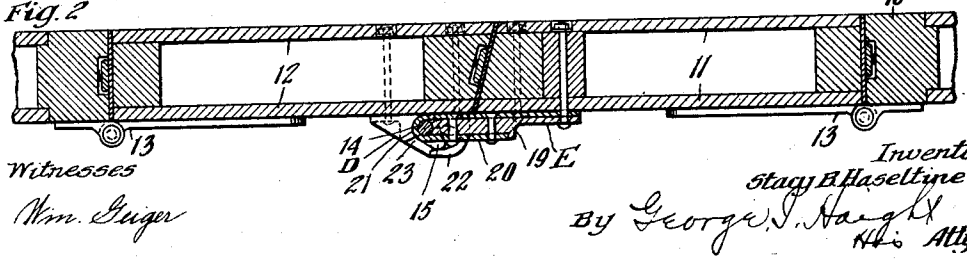


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

STACY B. HASELTINE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO W. H. MINER, INC., A CORPORATION OF DELAWARE.

DOOR-OPERATING MECHANISM.

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This invention relates to improvements in door operating mechanisms.

In the operation of refrigerator cars having swinging side doors, it is frequently found impossible to open or close the doors when the car is at the loading platform due to the platform interfering with the free operation of the doors on account of the obstruction offered by the usual door operating mechanism, the most common form of which includes a vertically disposed shaft rotatably mounted on one of the doors and having its opposite ends projecting beyond the top and bottom of the doors and coacting with keepers on the door frame. This difficulty is due to the fact that, even though the usual loading platforms are made of uniform standard height, the amount of clearance for the door operating mechanism actually provided is insufficient to take care of unavoidable variations in height of the side doors above the road bed. Under normal working conditions, the spacing of the car doors above the road-bed varies considerably on account of the unequal height above the top of the rails of the bodies of the different cars under varying load conditions, it being evident that the car body when the car is loaded, will be spaced a lesser distance above the tops of the rails than when empty, due to the compression of the truck springs.

The principal object of this invention is to overcome the defects hereinbefore pointed out, by providing an operating mechanism for swinging doors, which is disposed entirely above the plane of the lower edges of the doors.

Another object of the invention is to provide a door operating mechanism especially adapted for pivoted doors of refrigerator cars, comprising an operating mechanism disposed entirely between the planes of the upper and lower edges of the doors.

A more specific object of the invention is to provide an operating mechanism of the character indicated, adapted to be applied to a pair of pivoted doors, wherein the operating mechanism includes a shaft of lesser height than the height of the doors, the same being pivotally mounted on one of the doors and coacting with a pair of keepers mounted on the other door.

Other objects and advantages of the invention will more clearly appear from the description and claims hereinafter following.

In the drawing, forming a part of this specification, Figure 1 is a side elevational view of a portion of a refrigerator car showing my improvements in connection therewith, the view being partly broken away to better accommodate the figure to the sheet of the drawing. And Figure 2 is a horizontal, sectional view, corresponding substantially to the line 2—2 of Figure 1.

In said drawing, the car is shown as provided with a door frame 10 and two pivoted doors 11 and 12, having meeting beveled edges in the usual manner. As is customary in refrigerator cars, insulation or packing is employed between the meeting edges of the door and door frame and between the meeting edges of the doors themselves. The doors 11 and 12 are mounted to swing about vertical axes, being supported by suitable hinges 13.

As shown, the improved door operating mechanism comprises broadly, an operating shaft A, provided with two end castings B—B, and an operating handle C; upper and lower keepers D—D; and a pair of upper and lower bearing brackets E—E.

The operating shaft is in the form of a flat bar of substantially rectangular cross section having the castings B fixed to the upper and lower ends thereof.

Each of the castings B, as shown, is preferably in the form of a crank member, having a cylindrical journal portion 14 and an offset cylindrical end portion 15 forming a crank arm. Each of the castings B is formed with a head portion 16 which is vertically slotted to receive the corresponding end of the shaft A, to which it is fixed by rivets or any other suitable securing devices. The journal portion of each of the castings B is disposed in substantial alinement with the axis of the shaft A. The casting B which is secured to the lower end of the shaft A is of greater length than the upper casting and has an arm 17 laterally projecting therefrom to which the operating handle or lever C is pivoted, the arm 17 being so disposed as to be located substantially diametrically opposite to the offset crank arms 15. The handle C is preferably provided with a flange 18 along its top edge

to limit the upward swinging movement of the same by engagement with the upper edge of the arm 17.

The bearing brackets E—E, which are of like construction, are secured to the door 11 adjacent the free edge thereof, the same being disposed at an appreciable distance form the upper and lower edges of the door respectively. Each of the brackets E comprises a casting 19 fixed to the door 11 by rivets or any other suitable securing devices and a U-shaped strap 20, the arms of which embrace and are riveted to the main body portion of the casting 19. Each of the castings 19 extends beyond the free edge of the door 11 and is provided along its free edge with a semi-cylindrical bearing portion forming half of a bearing member 21 adapted to receive the journal portion 14 of the corresponding casting B, the other half of the bearing being formed by the curved connecting section of the U-shaped strap 20.

The upper and lower keepers D are of well known form and of substantially like construction, each comprising a casting having an outwardly offset portion 22 at one end thereof provided with an inclined slot or double acting cam groove 23. The upper and lower keepers D are reversely arranged and are rigidly fixed to the door 12 adjacent the free edge thereof, being so disposed as to cooperate respectively with the upper and lower crank arms 15 of the operating shaft A.

The door 12 is the one which is first closed and to retain the same in the closed position while the door operating mechanism is operated, a latch member F is preferably provided. The latch member F is pivotally mounted on a bracket 24 disposed at the lower, outer corner of the door 12, the bracket being provided with a ledge 25 along the lower edge thereof adapted to support the latch F when in the dotted line position shown in Figure 1. The latch F is adapted to cooperate with a locking bracket 26 fixed to the door frame 10 and disposed adjacent the lower edge of the door 12. The bracket having a beveled face co-acting with the latch to force the door shut.

The handle or lever C is adapted to be locked as shown in Figure 1, by any suitable locking device, as indicated at 27 and sealed in any suitable manner usual in railroad practice.

The operation of the improved door operating mechanism is as follows: The door 12 will be first moved to an approximately closed position and forced to a tightly closed position and secured by the latch F. The door 11 is then swung inwardly, the shaft A being first moved to a position where the crank arms 15 at the opposite ends of the same will be disposed in a plane substantially at right angles to the plane of the door and 180° from the position shown in Figure 1. As the door 11 is moved toward the closed position, the crank arms 15 will enter the slots 23 of the keepers D. After the crank arms have been engaged within the slots, the shaft A is rotated by swinging the handle to the left as seen in Figure 1 until it reaches the full line position shown. During rotation of the shaft A, the portions 15 of the crank arms will be guided by the keepers D and the door 11 forced to tightly closed position by the pulling action of the crank acting members. When the door has been tightly closed, the handle C is locked by the device 27 and sealed in the usual manner. It will be evident that, with the parts of the mechanism in this final closed position, the meeting edges of the two doors 11 and 12 must be in perfect alinement, and the outer faces thereof must lie in a single plane with no outward bulging of either. To open the door 11, the handle C is swung outwardly away from the door 12 and to the right as seen in Figure 1, thereby rotating the shaft A in a direction the reverse of that just described, the crank arms of the shaft A forcing the door outwardly. Rotation of the shaft A continues until the members 15 clear the slots 23, whereupon the close contact between the edges of the doors is broken and the door 11 may be swung fully open. Upon releasing the handle C, the same will drop to the pendant position indicated in dotted lines in Figure 1, the end of the handle remaining above the lower edge of door when in the pendant position.

From the preceding description, taken in connection with the drawing, it will be evident that I have provided a door operating mechanism of exceedingly simple construction, no part of which projects beyond the top or bottom edges of doors at any time, and which may be applied to doors of different sizes without changing the dimensions of the operating mechanism. In other words, in view of the fact that the spacing of the keepers does not in any way depend upon the height of the door, but is determined by the overall length of the operating means, the latter may be standardized so that one size will suffice for all standard sizes of doors.

I have herein shown and described what I now consider the preferred manner of carrying out my invention but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a door operating mechanism, the combination with a member having a door opening and provided with a pair of pivoted doors; of a pair of keepers, one of

which is secured to one of said doors within the confines thereof; and an operating shaft carried by the other door within the confines thereof and cooperating with said keepers to operate said doors.

2. In a door operating mechanism, the combination with a member having a door opening and provided with a pair of pivoted doors; of a pair of keepers secured to one of said doors, supporting means mounted on the other of said doors and overlapping said first door; and an operating shaft rotatably carried by said supporting means including elements and cooperating with said keepers to force said last named door either closed or open.

3. In a door operating mechanism, the combination with a member having a door opening and a pair of pivoted doors; of a pair of keepers secured to one of said doors; and an operating element carried by the other door, said element having means in bearing relation with said keepers to move one of said doors with reference to the other.

4. In a door operating mechanism, the combination with a member having a door opening and a pair of pivoted doors, one of which is adapted to be first closed; of a rotary operating shaft supported on one of said doors, said shaft having crank arms at the opposite ends thereof; and means fixed to the other door adjacent the top and bottom ends thereof adapted to coact with said crank arms upon rotation of said shaft whereby the door last closed is operated.

5. In a door operating mechanism, the combination with a member having a door opening and a pair of swinging doors, one of which is adapted to be first closed; of a rotary operating shaft supported on one of said doors, said shaft having crank members at the opposite ends thereof; and a pair of spaced keepers fixed to the other door, said keepers being each provided with a slot adapted to co-act with one of said cranks, whereby, upon rotation of the shaft, the door last closed is operated.

6. In a door operating mechanism, the combination with a member having a door opening and a pair of swinging doors, one of which is adapted to be first closed; of a rotary operating shaft supported on one of said doors, said shaft having crank members at the opposite ends thereof; a pair of spaced keepers fixed to the other door, said keepers co-acting in bearing relation with said crank members, whereby upon rotation of said shaft, the door last closed is operated; an operating handle pivoted to said rotary shaft; and a pivoted latch member for locking said handle, said latch and handle having means for receiving a car seal.

7. In a door operating mechanism, the combination with co-operating swingable door members having free edges adapted to abut each other; of operating means for moving one of said door members relatively to the other in opposite directions, said operating means being mounted on one of said doors and having elements bearing directly against the other of said doors for forcing one door toward or away from the other.

8. In a door operating mechanism, the combination with swingable doors arranged to have the free edges in abutting relation when closed; means for opening and closing said doors, said means comprising a shaft mounted on one of said doors, and keepers on the other of said doors, said shaft having cranks adapted to bear directly against said keepers for forcing one door away from the other.

9. In a door operating mechanism, the combination with swingable door members arranged to have their free edges tightly abutted in closed position; of means for operating said doors, said means comprising elements movably connected to one of said doors, and arranged to bear against the other of said doors, whereby movement of said element exerts pressure to move one door with reference to the other in a direction opposite to the direction of pressure upon the latter.

In witness that I claim the foregoing I have hereunto subscribed my name this 4th day of February 1924.

STACY B. HASELTINE.