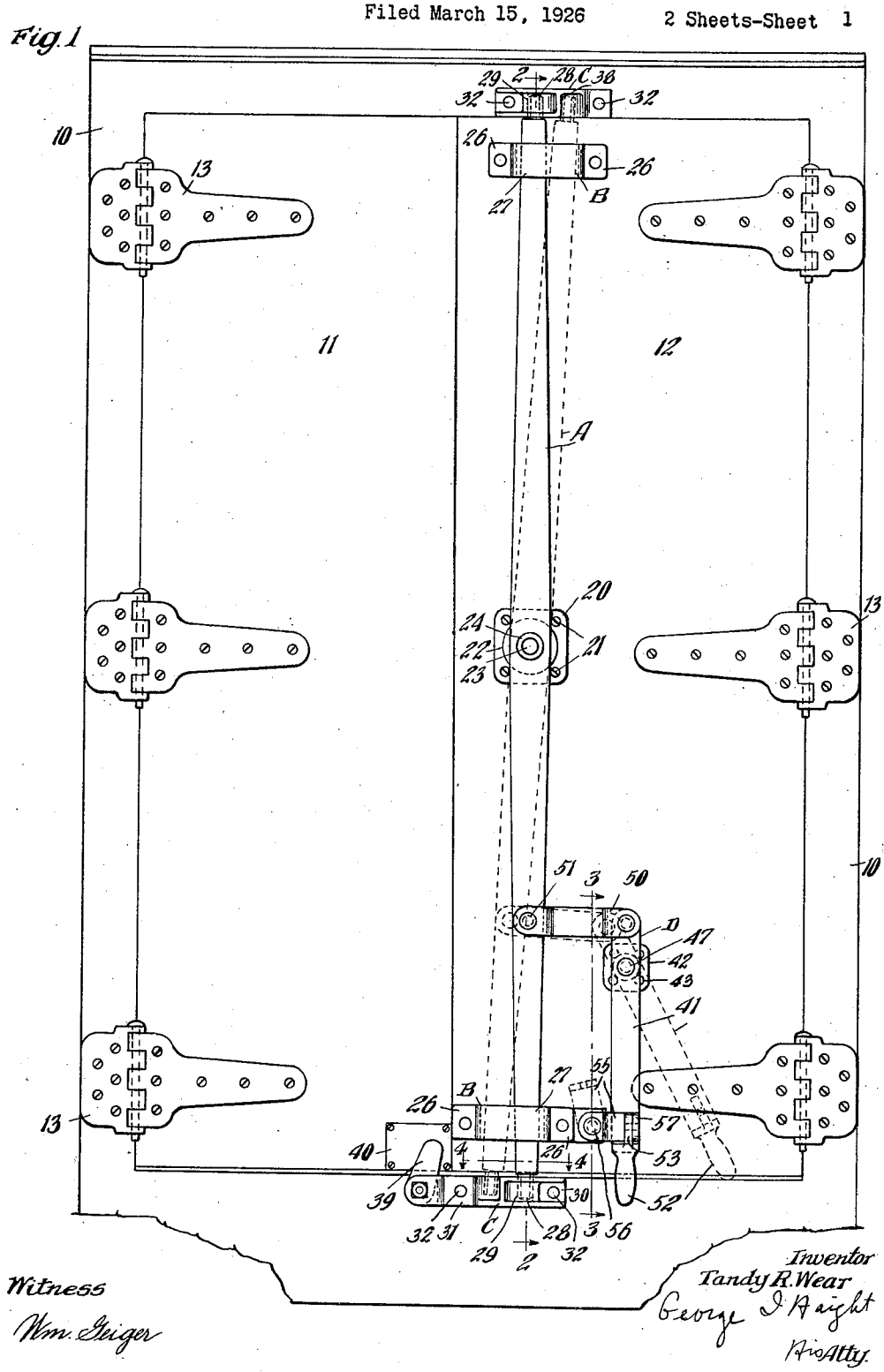
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REFRIGERATOR CAR DOOR OPERATING MECHANISM

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Fig. 1



Witness
Wm. Geiger

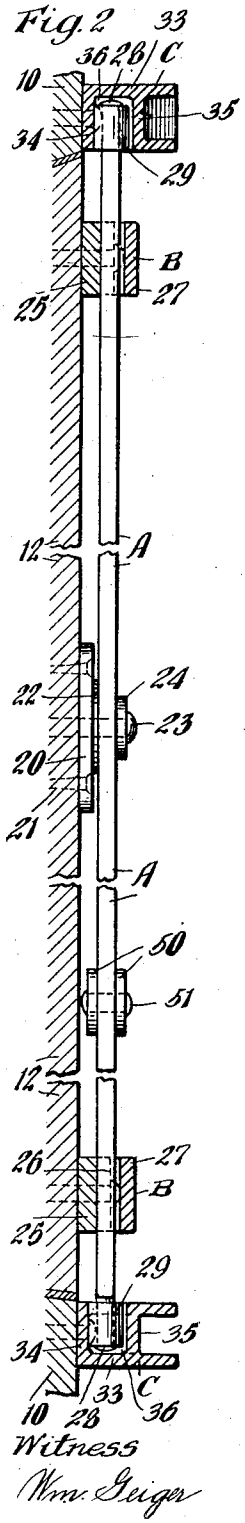
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REFRIGERATOR CAR DOOR OPERATING MECHANISM

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Fig. 2



Witness
Wm. Geiger

Fig. 4

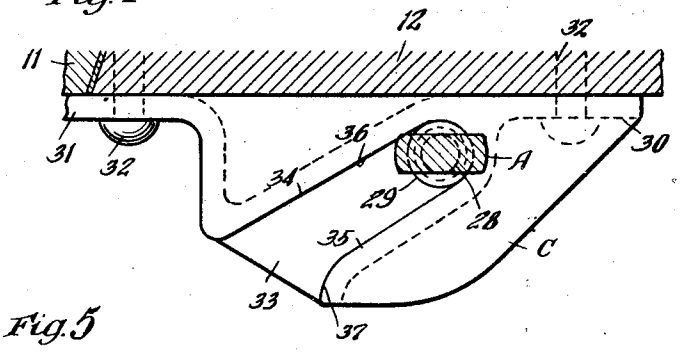


Fig. 5

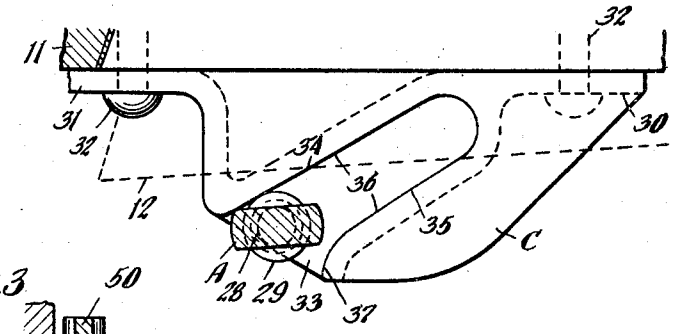
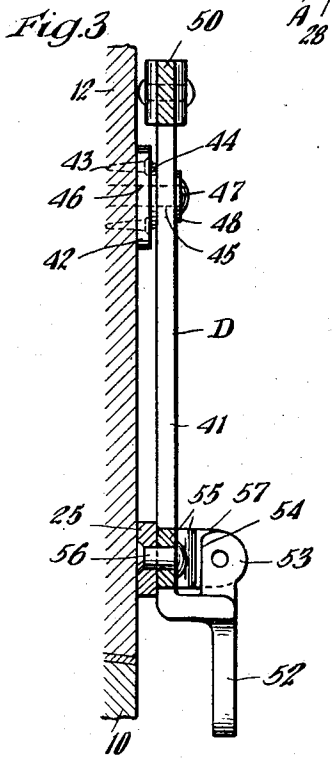


Fig. 3



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UNITED STATES PATENT OFFICE

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REFRIGERATOR-CAR-DOOR OPERATING MECHANISM

Application filed March 15, 1926. Serial No. 94,952.

This invention relates to improvements in refrigerator car door operating mechanisms.

One object of the invention is to provide a simple and efficient arrangement of door operating mechanism, especially adapted for refrigerator cars, for forcing the doors to tightly closed position, and for holding the same closed, and which will also be effective in starting the door opening operation.

A more specific object of the invention is to provide a mechanism of the character described, especially designed for operating doors of the swinging type, including an operating bar pivotally mounted intermediate its ends, said ends projecting beyond the upper and lower edges of the door upon which the bar is mounted, said ends being adapted to simultaneously engage keepers on the door frame, which keepers are provided with oppositely disposed cam surfaces which coact with the ends of the operating bar to force the door in opening and closing directions.

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

In the drawings forming a part of this specification, Fig. 1 is a side elevational view of a portion of a refrigerator car, showing my improvements in connection therewith. Fig. 2 is an enlarged, vertical, sectional view, partly broken away, corresponding substantially to the line 2—2 of Fig. 1. Fig. 3 is an enlarged transverse, sectional view taken on the line 3—3 of Fig. 1. Fig. 4 is a horizontal, sectional view, through one of the end portions of the operating bar taken along the lower edge of the right hand door, substantially on the line 4—4 of Fig. 1, and showing the lower keeper in top plan, the operating bar being shown at its innermost position with the door closed. Fig. 5 is a view similar to Fig. 4 showing the position of the end of the operating bar after the same has been moved to its outer position with respect to the keeper, and door being being indicated in dotted lines as having been partially opened, due to the movement of the operating bar along the cam surface of the keeper.

In said drawings, the car is shown as provided with a door frame 10 and two pivoted doors 11 and 12, said doors having beveled meeting edges in the usual manner. As is customary in refrigerator cars, insulation or packing is employed between the meeting edges of the doors themselves and around the sides and tops thereof. 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, a pivoted operating bar A, guide members B—B on the door, upper and lower keepers C—C, and lever means D for imparting swinging movement to the operating bar A. The operating bar A preferably is in the form of a flat member tapering from a central point outwardly. The bar A is pivotally secured at its center to the door 12 by the following arrangement. A rectangular plate 20 is secured to the door 12 at a central point, adjacent the edge thereof, by means of screws 21—21. The plate 20 is provided with a centrally disposed upstanding boss 22 provided with a flat outer face against which the under surface of the bar A bears, the boss 22 and plate 21 being provided with a central aperture, and the bar A being provided with an aperture, a bolt indicated at 23 being extended through the apertures in the bar and plate, said bolt being secured inwardly of the door, and a washer 24 being interposed between the head of the bolt 23 and the outer surface of the bar A. By this arrangement, the operating bar A is secured to the door 12 and spaced outwardly therefrom by the boss 22, thereby affording a substantial mounting for said bar.

The bar A is of a length somewhat greater than the vertical height of the door 12, and arranged adjacent the upper and lower ends of the bar A are the guide brackets B—B, said guide brackets being identical in construction, and laterally offset with respect to each other and to the bar A as shown. Each bracket comprises a base plate 25 upon which are formed flanges by which the bracket is

secured to the door. Each of said brackets is also provided with a strap having a centrally disposed looped portion 27 spaced outwardly from the plate 25, and upon which are formed flanges 26—26, the plate 25 and the outer wall of the looped portion 27 providing means for guiding the related end of the bar A in a plane substantially parallel to the plane of the face of the door 12, and thus relieving the pivotal mounting of excessive strain. The guide brackets B—B, as above stated, are offset with respect to each other and the end walls of the looped portions act as stops for limiting the swinging movement of the opposite ends of the bar A, the movement permitted being that necessary to effect traverse of the cam surfaces of the keeper C as will be understood. Each end of the bar A is provided with a cylindrical journal portion 28 which projects beyond the adjacent edge of the door, and mounted upon the journal section 28 is a roller 29, the rollers 29 being adapted for engagement with the cam surfaces of the keepers C—C, which now will be described.

The keepers C—C, are two in number, one being secured to the door frame above the top edge of the door 12, and the other being secured to the door frame below the bottom edge of the door 12. The lower keeper C comprises a member having flanges 30 and 31, through which are extended securing bolts indicated at 32. The lower keeper is also provided with a bottom wall 33 and with upstanding portions 34 and 35 which provide cam surfaces defining a cam slot 36, which is inclined at an angle to the plane of the door frame, the cam slot being adapted for the reception of the roller 29 of the operating bar. The cam surface 35 is rounded off as indicated at 37 to facilitate this connection of the operating bar from the cam slot 36. The upper keeper C is identically similar to the lower keeper thus far described, except that instead of the cam slot opening toward the edge of the door 12, as in the case of the lower keeper, the cam slot opens in the opposite direction, or away from the free edge of the door 12 as indicated at 38.

The flange portion 31 of the lower keeper C is extended to the left, as shown in Fig. 1, beyond the free edge of the door 12 and has pivotally mounted thereon a latch member 39, adapted to coact with a plate 40 secured to the door 11 adjacent the lower corner of the free edge thereof. A latch 39 serves to retain the door 11 in position when closed.

The lever means D are provided for the purpose of oscillating the bar A, and include a lever 41 adapted to be pivotally connected to the door 12. The pivotal connection is effected by means of a plate 42 secured to the door 12 by screws as indicated at 43, said plate being provided with an annular boss 44 against which the inner surface of the lever 41 bears, the lever 41 being provided with an aperture adjacent one end as indicated at 45, which registers with a central aperture indicated at 46, provided in the boss 44 and plate 42, the pivot bolt 47 being extended through the lever and plate, and secured to the door, a washer 48 being interposed between the head end of the bolt 47 and the outer surface of the lever 41. The upper end of the lever 41 has pivotally connected thereto the link 50, which link is pivotally connected to the lower end of the bar A as indicated at 51. The lower end of the lever 41 is provided with a handle portion 52, the handle portion being offset outwardly from the main plane of the lever 41, and the offset portion of the lever 41 is provided with an upstanding perforated lug 53 which is spaced from the outer surface of the handle 41 as indicated at 54 and clearly shown in Fig. 3. Cooperating with the handle to lock the same against movement is a latch 55, said latch being pivotally connected to an extension on the lower guide bracket B as indicated at 56. The outer end of the latch 55 is turned at right angles to the main plane of the latch to provide a holding portion 57, which is perforated so as to register with the perforation in the lug 53 on the handle, the latch 55 being of such length that the holding portion 57 engages upon the outer side of the lug 53 when the handle is in position to hold the locking bar A in the locking position, the perforations in the lug 53 and the holding member 57 being adapted for the reception of an ordinary sealing member, not shown.

In the operation of my improved device, assuming that the door operating mechanism is locked in closed position as illustrated in Fig. 1, the seal extending through the lug 53 and holding member 57 is first broken, and the latch 55 swung in a counterclockwise direction, thereby releasing the lever 41. Swinging movement of the lever 41 in a counter-clockwise direction effects movement of the link 50 toward the left, as viewed in Fig. 1, which swing the locking bar A in a clockwise direction, and during this movement the opposite ends of the locking bar A will ride along the oppositely inclined cam surfaces of the upper and lower keepers C—C, thereby forcing the door in an opening direction a sufficient distance to clear the insulation between the abutting edges of the doors, after which the door 12 may be swung freely to fully open position, and the latch 39 moved to inoperative position to permit swinging open of the door 11.

To close the doors, the door 11 is first swung to closed or nearly closed position, after which the door 12 is swung inwardly toward closed position until the opposite ends of the locking bar A are in position to enter the

cam slots in the keepers C—C, after which movement of the lever 41 in a clockwise direction imparts counter-clockwise movement to the locking bar A, causing travel of the opposite ends thereof along the cam surfaces of the keepers, thereby forcing the doors to fully closed position, after which the latch 55 is reengaged with the lug 53 on the lever 41, the parts then being in position to be sealed when necessary. The latch 39 is then turned to position to hold the door 11 against movement.

By the above described arrangement, it will be appreciated that a continuous locking bar is provided, the actuating ends of which have movement in a plane substantially parallel to the face of the door upon which it is mounted, permitting use of means for imparting movement to said bar which move in a plane substantially common with the plane of movement of the bar, the keepers being arranged in a particular manner to coact with the opposite ends of the bar A to effect opening and closing movements of the door 12.

While I have herein shown and described what I now consider the preferred manner of carrying out the invention, 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 door; of keeper means fixed to the door adjacent opposite edges of the door opening, said keeper means being provided with inclined guideways, said guideways being inclined in opposite directions away from the door frame; and an operating bar pivotally mounted intermediate of its ends upon said door, the ends of said bar being adapted to engage said keeper means to effect opening and closing movements of said door; and means for effecting pivotal movement of said bar.

2. In a door operating mechanism, the combination with a member having a door opening and provided with a door; of keeper means fixed to the door adjacent opposite edges of the door opening, said keepers being provided with inclined guide slots, the guide slots of said keepers being inclined away from the door frame in opposite directions; and operating means on said door having portions movable in unison in opposite directions, said portions being adapted to engage said keepers to effect opening and closing movements of said door when said operating means are actuated.

3. In a door operating mechanism, the combination with a frame member having a door opening and provided with a swinging door; of keepers fixed to said door way, said keepers having horizontally disposed guideways inclined away from the door frame in opposite directions; a pivoted operating member mounted on said door, the opposite ends of said member being adapted to simultaneously engage the guideways of said keepers; lever means connected to said operating member at one side of the pivoted connection thereof with said door and adapted to effect pivotal movement of said operating member; and means for locking said lever means against movement.

4. In a door operating mechanism, the combination with a door frame and a swinging door, of keepers mounted on the frame adjacent the opposite edges of the opening therein, said keepers having inclined guide faces, the guide face of one of said keepers extending in a direction opposite to the guide face of the other of said keepers; an operating bar pivotally mounted on said door and having its end portions adapted to coact with the guide faces of said keepers to effect opening and closing movement of said door when said bar is actuated; means for imparting pivotal movement to said operating bar, said means including a pivoted lever having one end portion connected to said operating bar by a link member, the portion of said lever opposite the pivotal connection providing a handle having a perforated lug mounted thereon in offset position; and a latch pivotally mounted on said door and provided with a holding portion adapted to engage the lug on said handle for holding said handle against movement, the perforations in said lug and holding portions being adapted for the reception of a sealing member.

5. In a door operating mechanism, the combination with a member having a door frame; of a door pivoted to said frame; keepers on said frame at opposite ends of the door; a locking bar located adjacent the free edge of said door and pivoted thereto intermediate its ends to swing in a plane substantially parallel with the face of the door, the ends of said bar projecting beyond the ends of the door and co-operating with said keepers; and means, disposed between said bar and the hinge edge of the door and mounted on the latter, for operating said bar.

In witness that I claim the foregoing I have hereunto subscribed my name this 8 day of March, 1926.

TANDY R. WEAR.