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J. F. O'CONNOR

DOOR OPERATING MECHANISM

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Fig. 1

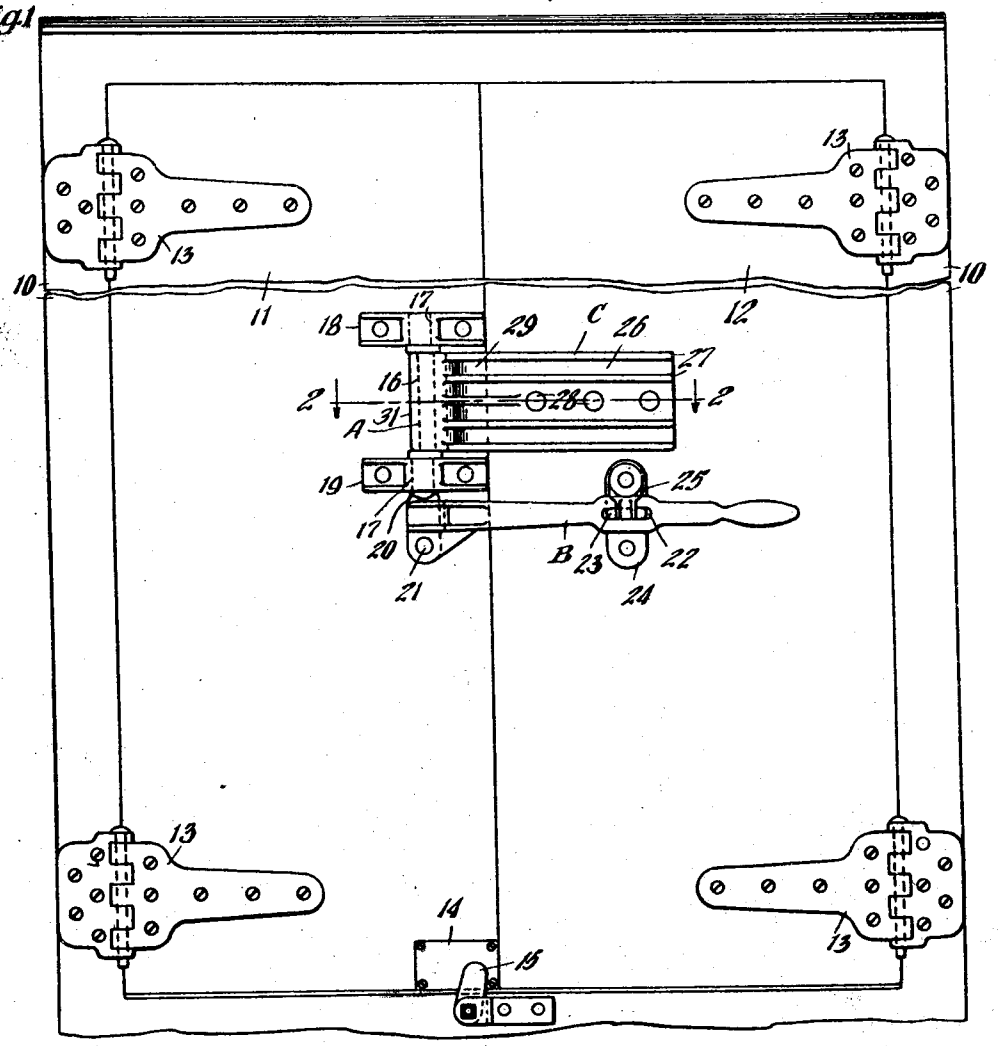
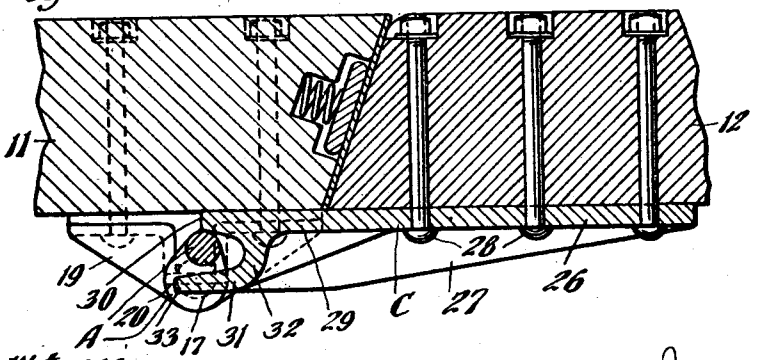


Fig. 2



Witness
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DOOR-OPERATING MECHANISM.

Application filed January 16, 1926. Serial No. 81,648.

This invention relates to door operating mechanisms.

An object of the invention is to provide a door operating mechanism comprising a rotatable crank member adapted to be mounted upon a relatively fixed supporting member, and arranged to cooperate with suitable keeper means mounted upon a swinging door, whereby rotation of said crank in opposite directions effects opening and closing movement of said door.

A more specific object of the invention is to provide an operating mechanism for a pair of refrigerator car doors in which one of said doors is adapted to be held in closed position by suitable locking means, and the other door opened and closed while the first door is held closed, wherein a rotatable crank member is mounted upon the door adapted to be first closed, which crank member is arranged to be disposed between the forked end portions of a keeper bracket mounted upon the other door, so that said latter door is levered open by rotation of the crank in one direction, and pushed toward closed position when the crank is rotated in the opposite direction.

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 drawing. And Figure 2 is a horizontal, sectional view, corresponding substantially to the line 2—2, 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, the door 11 being provided with a wear plate 14 at the lower right hand corner thereof against which the pivoted latch 15, mounted on the door frame 10, is adapted to be turned, so that the door 11 may be locked in closed position prior to the door 12.

As shown, the improved door operating mechanism comprises broadly an operating crank member or shaft A, an operating handle B for actuating said crank member; and a keeper C adapted to be engaged by the crank member for effecting opening and closing movements of the door.

The operating shaft A is mounted upon the door 11, and comprises an intermediate crank portion 16, the opposite ends of which are offset to provide journal sections 17—17, which are rotatably mounted in upper and lower supporting brackets 18 and 19, which are affixed adjacent the swinging edge of the door 11 at a point intermediate the top and bottom edges of said door. The lower end of the cylindrical journal section 17 is flattened out as indicated at 20 and extends some distance below the bracket 19, and to the flattened portion 20 is pivotally connected the operating lever B by means of a pivot pin 21, the operating handle B being arranged to lie flat against the door 12 when the same is in closed position. Said handle is provided with an elongated slot 22 adapted for the reception of the projecting lug 23 forming part of the bracket 24 secured upon the door 12, said bracket having pivotally associated therewith the retaining element 25 by which the handle B may be locked to the door 12 when the same is closed.

Secured to the forward edge of the door 12 is the keeper bracket C. Said bracket comprises a base portion 26 suitably reinforced by longitudinally extending ribs 27, the central rib being interrupted and the base plate provided with apertures for the reception of the securing bolts 28. The forward portion of the bracket C extends beyond the swinging edge of the door 12 so as to overlap the edge portion of the door 11, as indicated at 29, and the forward extension 29 of said bracket is provided with spaced abutments 30 and 31, the abutment 30 lying substantially in the plane of the base member, and the abutment 31 being formed by a laterally extending curved portion 32, and an angularly disposed forwardly extending portion 33, the abutments 30 and 31 being of a width substantially

co-extensive with the distance between the offset journal portions of the crank shaft A, the intermediate portion 16 of the crank shaft being adapted to be disposed between the abutments 30 and 31, whereby rotation of said crank shaft will cause the same to engage one or the other of said abutments and effect opening or closing movements of the door 12, depending upon the direction of rotation of the shaft through manipulation of the handle B.

In operation, assuming that it is desired to open the doors when the same are closed as illustrated in Figure 1, the handle B is first disengaged from the locking and sealing mechanism upon the door 12, and is then swung radially outwardly from the face of the door 12, causing the intermediate portion 16 of the crank shaft to come into contact with the inner surface of the abutment 31, which movement will serve to lever the door 12 in an opening direction a sufficient distance to clear the insulation between the edges of the door, after which the door 12 may be fully opened by hand. The door 11 is then free to be opened by disengaging latch 15 and swinging the door to fully open position. In closing the doors, the door 11 is first swung nearly closed and then the latch 15 thrown into place. The door 12 is then moved in a closing direction until the crank member 16 may be disposed between the abutments 30 and 31, after which swinging of the handle B toward the door 12 will cause the crank shaft to bear upon the abutment 30 and thus force both doors to fully closed position tightly compressing the insulation, and leaving latch 15 free, the handle B being then re-engaged with the locking mechanism upon the door 12.

By the above described arrangement it will be noted that both the bracket and the operating handle extend across the meeting edges of the doors, and that the handle is carried entirely by the door 11, so that the same may be swung clear of the door 12 when the same is being fully opened. Attention is also directed to the fact that by mounting the crank upon the door which is practically stationary, a prying action of the crank against the abutment 31 is permitted, affording great power which is useful in opening the doors as the same frequently bind and require considerable power to separate the meeting edges thereof and breaking all edges free of door frame. Outward movement of door 11 being limited by the latch 15. Another important feature of the invention resides in the fact that the entire mechanism is mounted entirely within the boundaries of the doors, and hence there is no likelihood of the shaft interfering with loading platforms, which occurs in operation of mechanism wherein the crank portions for opening and closing the door extend beyond the top and bottom edges of the door.

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 relatively fixed member and a swinging door member; of a rotatable shaft including an elongated crank portion provided with offset cylindrical journal sections at opposite ends thereof, and one of said ends having a flattened extension thereon; means on said fixed member in which the journal sections of said shaft are rotatably mounted; a handle mounted on the flattened extension of said journal section, said handle being arranged to be secured to said door member when the same is closed; and a keeper bracket secured to said door member, said bracket having means providing spaced abutments co-extensive with said crank center and adapted to receive the crank member between said abutments.

2. In a door operating mechanism, the combination with a supporting member and a door member; of an elongated crank portion provided with offset journal sections at opposite ends, said sections being rotatively mounted on one of said members; an operating handle for effecting rotation of said crank, said handle and crank portion being disposed within the confines of the top and bottom edges of the supporting member and door; and means secured to the other of said members, said means providing spaced abutments between which the crank member is adapted to be disposed, and said means being arranged within the confines of the top and bottom edges of said supporting member and door.

3. In a door operating mechanism, the combination with a pair of pivoted doors having free edges adapted to being placed in abutting relation; one of said doors being the first to be closed; an elongated crank member provided with offset journal sections at opposite ends, one of said ends having a flattened extension thereon, said crank member being rotatively mounted upon the door adapted to be first closed; a handle mounted upon the flattened extension of said journal section and adapted to be secured to the other door when said doors are closed; and a keeper bracket secured to said other door, said bracket having means providing a forked portion co-extensive with said crank member and adapted to receive said crank member between the furcations thereof.

4. In a door operating mechanism, the combination with a pair of doors, one of said doors being adapted to be first closed and secured in position; of a crank member rotatably mounted adjacent the free edge of the

door first closed, and disposed within said free edge, and its vertical dimensions being confined within the boundaries defined by the top and bottom edges of the door, said crank member being provided with a handle for operating the same, said handle being adapted to span the meeting edges of the two doors when both are closed, and having means cooperating with means on the other door whereby said handle may be locked in this position, said handle in the extreme opening position of the crank member being disposable entirely within the boundaries of the door first closed; and keeper means secured to said other door, said keeper means being in the form of a casting, having a projecting portion extending beyond the free edge of the other door, so as to overlap the meeting edges of the two doors when both are closed, said projecting portion being provided with spaced abutments between which the crank member is adapted to be disposed, whereby movement of said handle to a position adjacent the first door effects movement of the other door in an opening direction, while movement of the handle toward the other door effects movement of the other door in a closing direction, said keeper means being disposed well within the top and bottom boundaries of the two doors.

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

JOHN F. O'CONNOR.