W. A. GEIGER.

DOOR OPERATING MECHANISM FOR REFRIGERATOR CAR DOORS.

APPLICATION FILED JAN. 8, 1918.

1,303,880. Patented May 20, 1919.

Fig. 1

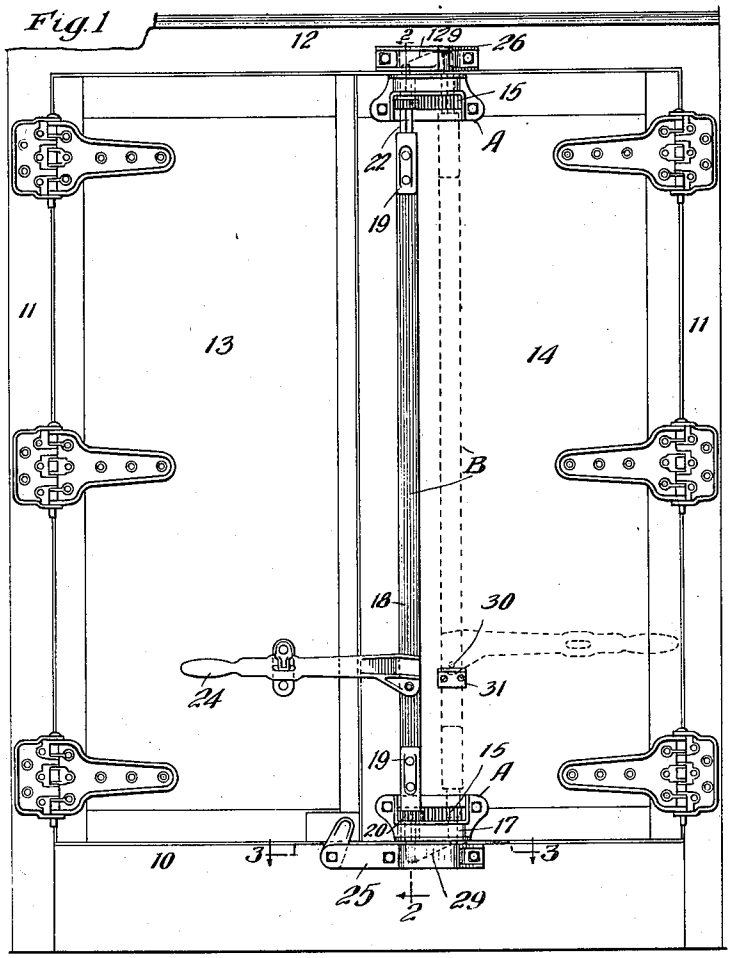


Fig. 2

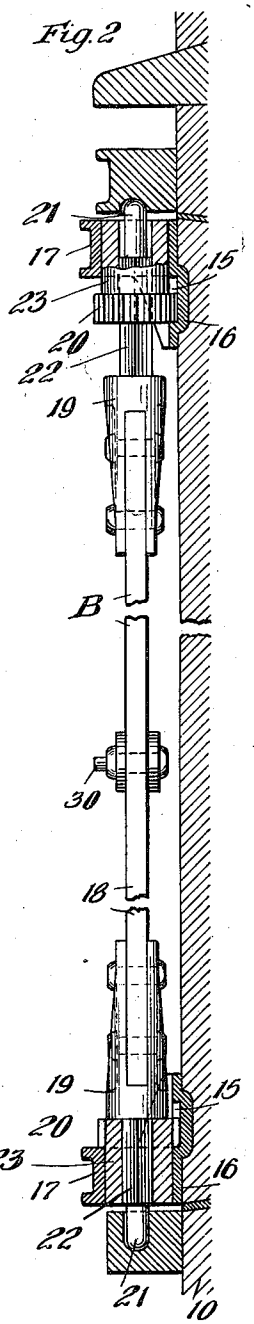
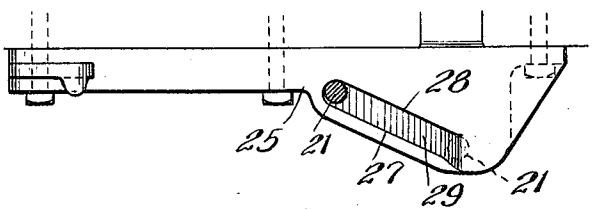


Fig. 3



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DOOR-OPERATING MECHANISM FOR REFRIGERATOR-CAR DOORS.

1,303,880. Specification of Letters Patent. Patented May 20, 1919.

Application filed January 8, 1918. Serial No. 210,954.

To all whom it may concern:

Be it known that I, WILLIAM A. GEIGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Door-Operating Mechanism for Refrigerator-Car Doors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in door operating mechanism for refrigerator car doors.

In the operation of refrigerator cars, great difficulty has heretofore been experienced in those cars where a door operating shaft is employed that extends above and below the door to engage with keepers on the side wall of the car due to the fact that, when the car is alongside a platform, the portion of the shaft depending below the lower edge of the door strikes the platform and often necessitates chopping away the latter to permit the door to swing fully open.

One object of my invention is to provide a door operating mechanism for refrigerator cars so arranged that the operating shaft can be elevated to a position flush or substantially flush with the lower edge of the refrigerator car door and thereby permit the latter to be easily swung out over an adjacent platform.

Another and more specific object of the invention is to provide a door operating mechanism wherein the shaft is elevated so as to be able to clear an adjacent platform simultaneously with the door opening movement of the shaft to thereby simplify the efforts of the operator.

In the drawing forming a part of this specification, Figure 1 is a side elevation of a portion of a refrigerator car showing my improvements in connection therewith. Fig. 2 is an enlarged vertical sectional view taken substantially on the line 2—2 of Fig. 1. And Fig. 3 is a horizontal, sectional view taken substantially on the line 3—3 of Fig. 1. In said drawing, the side door opening of the refrigerator car is shown as defined by a threshold 10, side posts 11—11 and lintel 12. The door opening is adapted to be closed in the usual manner by a pair of hinged doors 13 and 14, said doors 13 and 14 having beveled meeting edges and the door 14 being the last one to be forced to closed position, as will be understood.

For opening, closing and locking the doors, I employ the following mechanism: Mounted on the door 14 are upper and lower combined rack and bearing brackets A—A. Each of said brackets, which is rigidly secured to the door 14, has a horizontally extending rack 15 and an elongated bearing formed between inner and outer walls 16 and 17 of the bracket. Journaled in said brackets A—A is an operating shaft B, the latter having a central bar section 18, forked end castings 19—19 secured to the bar section, and upper and lower gears 20—20. Each end casting 19 is forked at its inner end so as to straddle the bar section 18 and be riveted thereto. At its extreme outer end, each end casting 19 is provided with a cylindrical end portion 21 and intermediate the end portion 21 and the forked portion, each end casting has a squared section, as indicated at 22. The gear 20 is arranged to mesh with the rack 15 and each gear has a sleeve 23 which rolls back and forth within the elongated bearing heretofore described and which is formed between the walls 16 and 17 of each bracket A. The shaft 15 is rotated by an operating handle 24 arranged as most clearly appears in Fig. 1.

Secured to the threshold 10 and to the lintel 12 are keepers 25 and 26, respectively. The keeper 25 is provided with a double-acting cam for coöperation with the lower end 21 of the shaft. Said double-acting cam includes a slot defined by the walls 27 and 28 and an inclined bottom surface 29. As will be apparent, as the lower end of the operating shaft rolls back and forth in the slot formed by the walls 27 and 28, the door 14 will be positively forced either inwardly or outwardly depending upon the direction of rotation of the shaft B. Similarly, when the shaft B is rotated from the position shown in full lines in Fig. 1 to the position shown in dotted lines, the lower end of the shaft will travel up the inclined surface 29 and thus elevate the shaft B as an entirety. The upper keeper 26 is similar to the lower keeper 25 except that the inclined surface 29 thereof for engaging the upper end of the shaft is reversed and is adapted to force the shaft B downwardly as it is rotated

from the position indicated by the dotted lines to the position indicated by full lines in Fig. 1.

From the preceding description, it will be seen that as the operator swings the handle 24 from the full line position to the dotted line position, the shaft B will roll bodily due to the meshing of the gears 20 with the racks 15 and simultaneously with this movement, the shaft B will be elevated, the squared sections 22 being slidable with respect to the gears 20. Also, the door member 14 will be positively opened during this movement since the shaft B is forced outwardly while traveling in the cam slots of the keepers 25 and 26. The inclined surface 29 is made such that the lower end of the shaft will be raised substantially flush with the lower edge of the door as the shaft clears the keeper 25 and to hold the shaft B in its elevated position, the operating lever 24 may be provided with a pin 30 so positioned as to rest upon a shelf bracket 31 carried by the door 14.

The arrangement herein shown and described is simple and overcomes the difficulties heretofore experienced in connection with refrigerator doors that are swung over adjacent platforms and the arrangement is such that the operator is not required to execute any movements other than those to which he is now accustomed, the elevating of the shaft being automatic during the opening movement of the door and the lowering of the shaft positive during the closing movement.

I claim:

1. In a refrigerator car having a pivoted, outwardly swinging side door, the combination with a rotatable operating shaft for opening and closing said door, of a keeper carried by the car below the door opening with which the lower end of said shaft is adapted to coöperate to effect the closing and opening movements of the door, and cam means on said keeper coöperating with the lower end of said shaft for elevating the shaft simultaneously with its opening rotative movement to thereby raise the lower end of the shaft sufficiently to clear an adjacent platform and permit the door to swing thereover.

2. In a refrigerator car having a pivoted, outwardly swinging side door, the combination with an operating shaft mounted on said door, said shaft being rotatable and bodily movable with respect to the door during its rotation, of a keeper carried by the car below the door opening and arranged to coöperate with the lower end of said shaft to effect the closing and opening movements of the door, and means on said keeper for positively elevating the shaft during the rotation of the latter to effect the opening of the door.

3. In a refrigerator car having a pivoted, outwardly swinging side door, the combination with an operating shaft rotatably mounted on said door, of upper and lower keepers carried by the car located above and below the upper and lower edges of the door, said keepers and ends of the shaft coöperating to force the door to closed or open position as the shaft is rotated, means on the lower keeper for elevating said shaft simultaneously with its rotative movement in opening the door, and means on the upper keeper for forcing the shaft downwardly simultaneously with its rotative movement in closing the door.

In witness that I claim the foregoing I have hereunto subscribed my name this 29th day of Dec., 1917.

WILLIAM A. GEIGER.