May 21, 1935. A. WASBERG 2,002,304

REFRIGERATOR CAR DOORLOCK

Filed Aug. 7, 1933 3 Sheets-Sheet 1

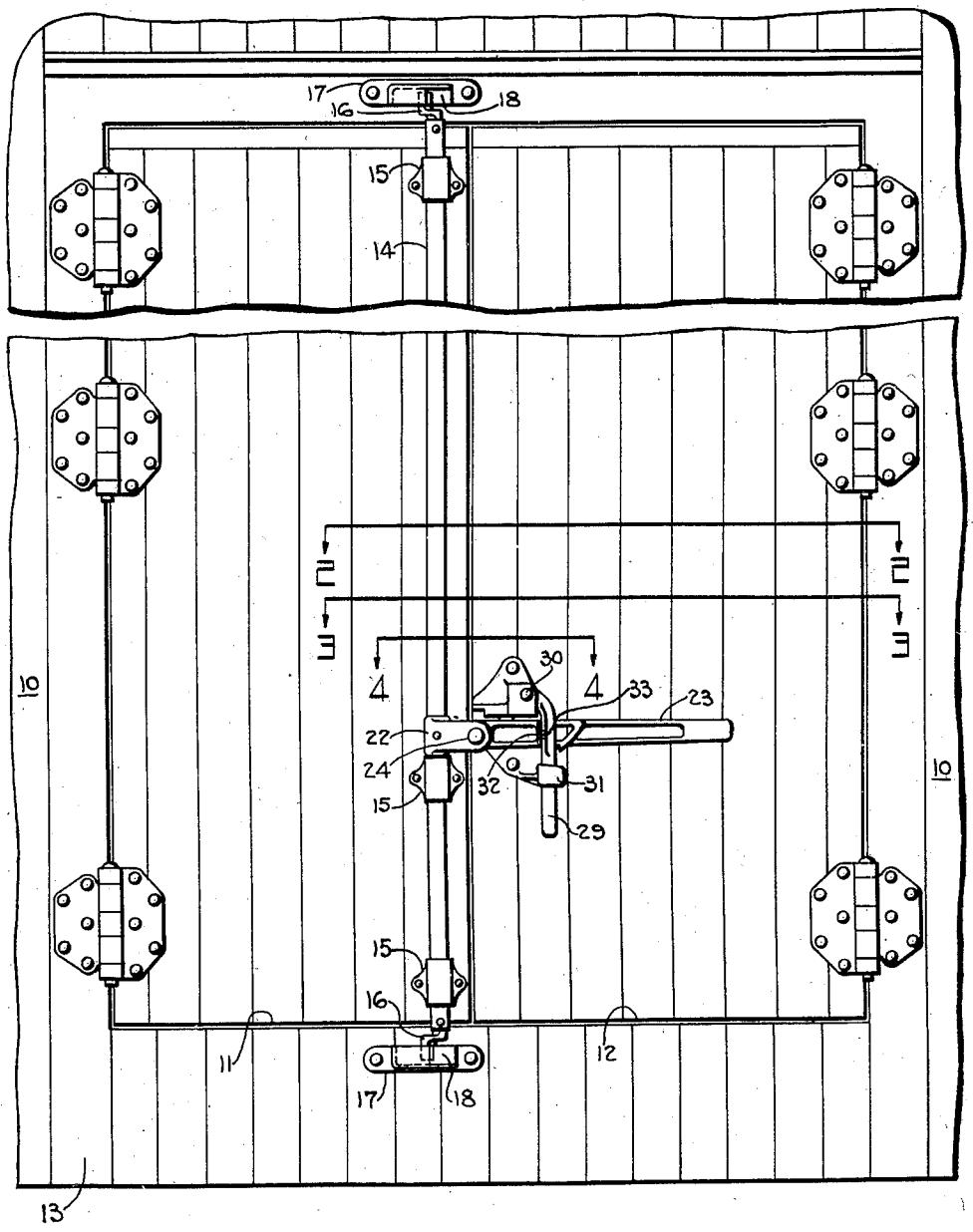


Fig. 1

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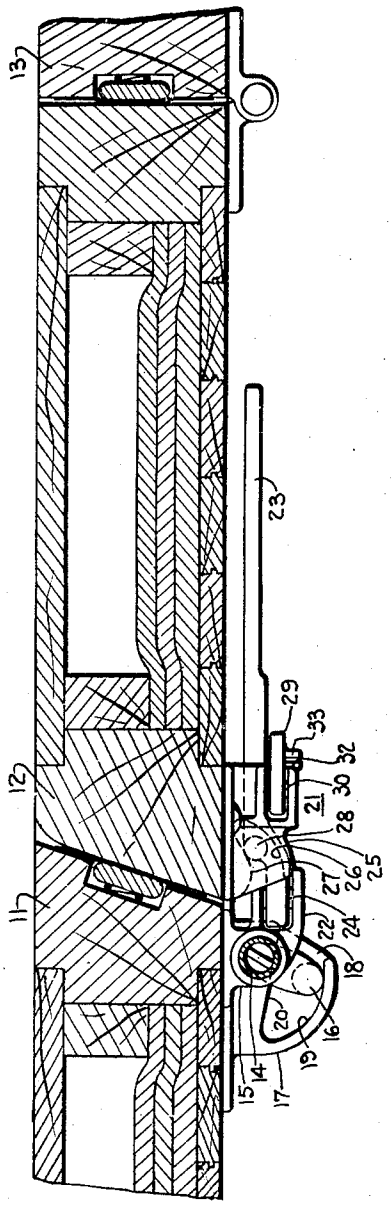


Fig. 4

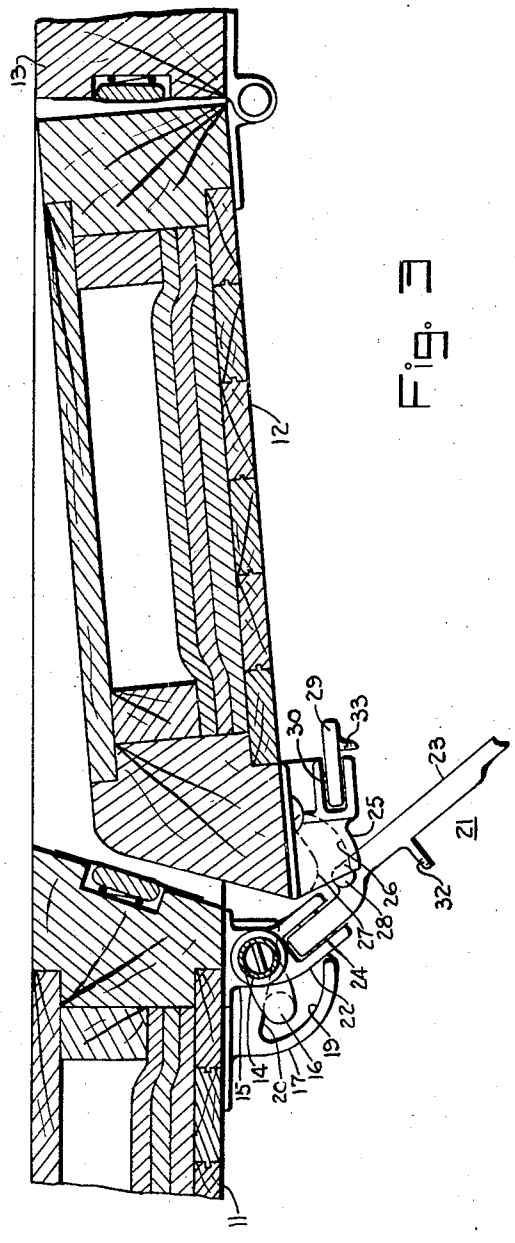


Fig. 5

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REFRIGERATOR CAR DOORLOCK

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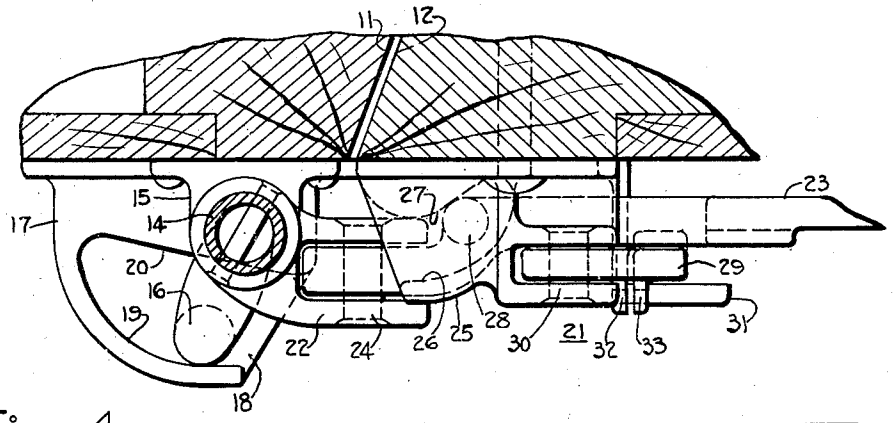


Fig. 4

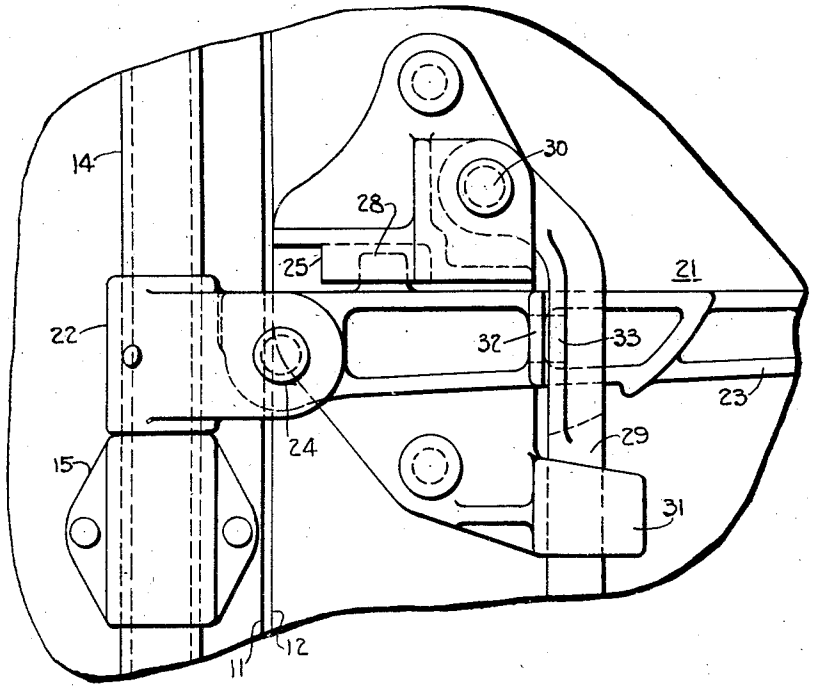


Fig. 5

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Patented May 21, 1935 2,002,304

UNITED STATES PATENT OFFICE

2,002,304

REFRIGERATOR CAR DOORLOCK

Axel Wasberg, Chicago, Ill., assignor to Allen E. Ostrander, Larchmont, N. Y.

Application August 7, 1933, Serial No. 683,957

11 Claims. (Cl. 268—72)

This invention relates generally to operating and locking mechanism for doors, and more particularly to operating and locking mechanism for refrigerator car doors.

It has been found that in refrigerator cars and other similar structures the doors often freeze in their closed positions. The opening of frozen doors is quite a problem for the ordinary laborer and he does not apply scientific methods. Instead he hammers them with anything available, jams crowbars and the like in at the sides, with the result that when he has gained entry the doors are mutiliated and damaged. In many instances the doors have to be repaired before they are ready for further service. In time this involves a large expenditure for repairs.

An object of the invention is to provide means for exerting great operating pressures in either direction on doors to shut or open them.

Another object of the invention is to provide for utilizing one actuating lever to exert pressure on either door of a double door installation in either direction to shut or open them.

For a fuller understanding of the nature and objects of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings, in which

Figure 1 is a view in side elevation of the doors of a refrigerator car provided with an operating and locking mechanism constructed in accordance with this invention.

Figure 2 is a view in section taken along the line 2—2 of Figure 1 showing the operating mechanism in top plan after it has been actuated to close the doors.

Figure 3 is a view in section taken along the line 3—3 of Figure 1 showing the operating mechanism in top plan after it has been actuated to open one door.

Figure 4 is a view taken along the line 4—4 of Figure 1 showing an enlarged plan of the operating mechanism; and

Figure 5 is a view taken along the line 5—5 of Figure 4 showing an enlarged side elevation of the locking mechanism.

Referring to the drawings, and Figure 1 in particular, the wall of a refrigerator car shown generally at 10 is provided with double doors 11 and 12 hinged in a frame 13. As illustrated in Figures 2 and 3, the edges of the doors are inclined at an angle to the wall of the car when in their closed positions to give a wedging action in closing them to force all vertical meeting surfaces into tight engagement.

The operating and locking mechanism comprises a shaft 14 rotatably mounted in straps 15 which are attached to the door 11 near the edge. The shaft 14 may be hollow, but if not, openings are provided in its ends for receiving latches 16.

The general shape of the latches 16 is that of the well-known automobile crank. In fabricating a latch 16 one end portion is shaped to fit into the openings provided in the ends of the shaft 14 while the other end portion is made arcuate in section to provide an operating face for engaging the working faces of other elements of the mechanism to be described hereinafter.

In the embodiment of the invention illustrated, the latches are pinned to the shaft. When the latches 16 are mounted, the resulting structure is a shaft with two cranks, one at each end.

Keepers 17 are mounted above and below the doors in alignment with the shaft 14. The keepers are dome-shaped and are provided with notches cut in the sides, as shown at 18, to receive the latches 16. Each keeper is provided with two oppositely disposed cam surfaces 19 and 20, as best illustrated in Figures 2, 3 and 4, shaped to coact with the operating faces of the latches 16 to swing the door 11 about the axis of its hinges to its final closed position or initially withdraw it from its closed position respectively.

In order to oscillate the shaft 14 to actuate the latches 16, an articulated lever shown generally at 21 is provided. The lever comprises a clevis 22 pinned to the shaft 14 at a convenient height from the bottom to facilitate operation, and a handle 23 pivotally mounted in the clevis as shown at 24.

As will be observed, the clevis 22 is short and in this embodiment of the invention extends only a short distance beyond the edge of the door carrying the actuating shaft 14. Further, when the door 11 stands open by rotating the shaft 14 the clevis 22 may be swung to a position where it stands substantially normal to the plane of the door and where both the clevis and handle 23 are clear of the edge of the door.

The length of the handle will depend on the lever action that it is desired to obtain. Since the lever is articulated, the handle when not in use may be rotated about its pivot point to a position extending parallel to the edge of the door where it is out of the way.

In order to utilize the lever 21 to operate the door 12, a keeper 25 is mounted on the door 12 just above the clevis 22. This keeper 25 is dome-shaped and provided with oppositely disposed cam faces 26 and 27. As best shown in Figures

2, 3 and 4, the keeper is open at the side next the door 11.

A boss 28 is provided on the handle 23 and extends upwardly to engage in the keeper 25. The oppositely disposed cam faces 26 and 27 are part of the casting 25 and form a pocket which is deep enough to permit the handle 23 to be swung into a position parallel to the doors 11 and 12.

On arm 29, Figure 1, is provided to lock the articulated lever 21 in a position parallel to the plane of the doors 11 and 12, as shown in Figure 2. This arm is pivotally mounted at 30 in a bracket carried by the keeper 25.

In mounting the arm 29 it is spaced far enough from the door to permit it to swing outside of the handle 23 of the articulated lever 21. A keeper 31 is provided on the door 12 and disposed below the handle 23 when the latter stands in its horizontal position. This keeper receives the handle 29 when it is swung downwardly into its locking position. In the form illustrated, the keepers 25 and 31 and the mounting for the handle 29 are all parts of the same casting.

Eyes 32 and 33 are provided on the members 23 and 29 respectively for receiving a lock or seal, not shown, since such devices are in common use.

Successful operating mechanisms have been fabricated by casting all the elements with the exception of the shaft 14.

In closing the doors 11 and 12 they are swung inwardly engaging the latches 16 in the keepers 17. The handle 23 is raised to its horizontal position and force applied to press the doors inwardly. When the lever 21 is oscillated about its axis, the outer ends of the latches 16 engage the cam faces 19 of the keeper 17 and as they ride outwardly on these cam faces pressure is applied to the door 11 forcing it home. At the same time the boss 28 enters the keeper 25 and rides on the cam face 27 forcing the door 12 home. Since the edges of the doors are inclined to the plane of the car wall, a wedging action takes place forcing all the vertical meeting edges of the doors and frame into tight engagement.

When the doors have been tightly closed the handle 29 is swung downwardly to engage in the keeper 31. A lock or seal may now be engaged in the eyes 32 and 33 provided in the members 23 and 29 respectively.

Assuming that it is desired to open the doors, then the lock or seal is removed and the handle 29 swung to a horizontal position. A pull is exerted on the lever 21 and the boss 28 engages the cam face 26 of the keeper 25 and a pull is exerted on door 12 to withdraw it from its closed position. If the door is frozen and difficult to open, great pressure may be applied by means of the lever 21 which is fulcrumed on the door 11.

After the door 12 has been partially opened, the latches 16 are oscillated into engagement with the cam faces 20 and pressure may be applied to the door 11 to release it if it is frozen or otherwise held in its closed position.

From the foregoing description it will be apparent to those skilled in the art that the present construction is one in which the lever 21, fulcrumed on door 11 is operable in one direction to actuate the shaft 14 whereby door 11 is forced to full closed position simultaneously with the forcing of door 12 to fully closed position by reason of the cooperation of said lever and more specifically the lug 28 thereon with the keeper mounted on said door 12. It will also be apparent that reversal of actuation of the lever will effect opening movement of the doors 12 and 11 sequentially.

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

1. Operating and locking mechanism for double doors hinged in a frame comprising, in combination, a keeper carried by the frame, a latch carried by one door for engaging the keeper, the latch and keeper being disposed to cooperate to apply pressure to the door on which said latch is carried, means for actuating the latch including a shaft journalled on said door for rotation on a vertical axis, a keeper provided on the other door and disposed to be engaged by the actuating means as the first door is being closed to exert a continued pressure on the second door to effect its full closure.

2. Operating and locking mechanism for double doors hinged in a frame comprising, in combination, a keeper carried by the frame, a latch carried by one door for engaging the keeper, the latch and keeper being disposed to function in the manner of a cam when actuated to operate the door, a lever for actuating the latch pivotally supported by said door for swinging movement in a horizontal plane, a cam provided on the other door and disposed to be engaged by the actuating lever as the first door is being closed to exert a continued closing pressure on the second door to effect simultaneous complete closing of the doors, and means for locking the lever in a predetermined position to retain the doors closed.

3. In operating mechanism for double doors hinged in a frame, in combination, a keeper carried by the frame, means disposed on one door including a lever overlying the adjacent door when the doors are in closed position, said means being cooperative with the keeper to exert force on the first named door in either direction to shut or open it, and means carried by the adjacent door cooperative with the lever for exerting pressure on said other door in either direction to shut or open it.

4. In an operating mechanism for double doors hinged in a frame, keepers mounted on the frame above and below one of the doors and each having oppositely disposed cam faces, a shaft pivotally mounted on one door, latches carried by the shaft and eccentrically mounted relative to the center of the shaft for cooperating with the cam faces of the keepers to exert pressure on the door to operate it, a lever for oscillating the shaft to actuate the latches, a keeper having oppositely disposed cam faces carried by the other door, a boss provided on the lever for cooperating with the cam faces of the keeper carried by the door for exerting pressure on the said other door in either direction to operate it.

5. In operating and locking mechanism for double doors hinged in a frame, a keeper having oppositely disposed cam faces carried by the frame above one of the doors, a shaft pivotally mounted on said door, a latch carried by the shaft and eccentrically mounted relative to the center of the shaft for cooperating with the cam faces of the keeper to exert pressure on the door to close or open it, a lever for oscillating the shaft to actuate the latch, said lever overlying the adjacent door when the doors are in fully closed position, a keeper having oppositely disposed cam faces carried by the adjacent door, a boss provided on the lever for cooperating with the cam faces of the keeper carried by the adjacent door for exerting pressure on the adjacent door in either direction to close or open it, and means carried by said adjacent door for locking the

actuating lever in a predetermined position to retain the doors in their closed position.

6. In an operating and locking mechanism for double doors hinged in a frame, in combination, a keeper carried by the frame above one of the doors, the keeper having oppositely disposed cam faces, a rotatably mounted shaft carried by said door, a latch disposed to cooperate with the oppositely disposed cam faces of the keeper eccentrically mounted on the shaft, an articulated lever for oscillating the shaft to actuate the latch to exert pressure on the door in either direction to shut or open it, a keeper provided on the adjacent door, the keeper having oppositely disposed cam faces, a boss provided on the articulated lever intermediate the ends thereof cooperative with the keeper on the adjacent door for exerting pressure in either direction on said adjacent door to shut or open it when the lever is actuated, and means for locking the lever in a predetermined position to retain the doors in their closed positions.

7. Operating mechanism for double doors comprising cammed keepers secured above and below said doors, a rotatable shaft carried by one of the doors, a cammed keeper secured to the adjacent door, and means on said shaft engageable simultaneously with all of said keepers and so formed as to apply pressure to both doors to simultaneously effect full closure thereof.

8. Operating mechanism for double doors comprising cammed keepers secured above and below said doors, a rotatable shaft carried by one of the doors, a cammed keeper secured to the adjacent door, a lever for actuating said shaft, and means on the shaft and lever engageable simultaneously with all of said keepers and so formed as to effect simultaneous closing of the doors during movement of the shaft and lever in one direction and sequential opening movement of the doors during movement of the shaft and lever in the opposite direction.

9. Operating mechanism for double doors comprising, in combination, a shaft rotatably mounted on one of the doors, cammed keepers above and below said door and on the adjacent door, latch elements on the shaft for engaging the keepers above and below the first named door, said latches being adapted to apply pressure to the first named door during actuation of the shaft, and a lever for actuating said shaft, said lever overlying the adjacent door when the doors are in closed position and having means thereon so formed as to cooperate with the keeper on the adjacent door to exert closing pressure on said adjacent door simultaneously with closing pressure applied to the first named door and to exert a pull on said adjacent door to open the same prior to application of opening pressure on the first named door.

10. Operating mechanism for double doors, comprising a shaft rotatably mounted on one of the doors, an operating lever on the shaft normally overlying the adjacent door, cammed keepers above and below the first named door and on the adjacent door, and means on said shaft and on said lever cooperable with said keepers and so formed as to simultaneously effect full closure of and sequential opening of said doors.

11. Operating mechanism for double doors comprising a shaft mounted on one of the doors, a cam shaped keeper above said door adapted to be engaged by said shaft, a cam shaped keeper secured to the adjacent door, a lever connected to the shaft and normally overlying the adjacent door and adapted to actuate the shaft into and out of engagement with the keeper above the first named door whereby the door is started to and from fully closed position, and means on the lever adapted to engage the keeper on the adjacent door during actuation of the shaft to start said adjacent door to and from fully closed position; the keepers, shaft and means on said lever being relatively so arranged that the doors are simultaneously moved to closed position and sequentially moved to open position.

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