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2,614,294

DOOR FOR REFRIGERATOR CARS

Filed June 7, 1946

3 Sheets-Sheet 1

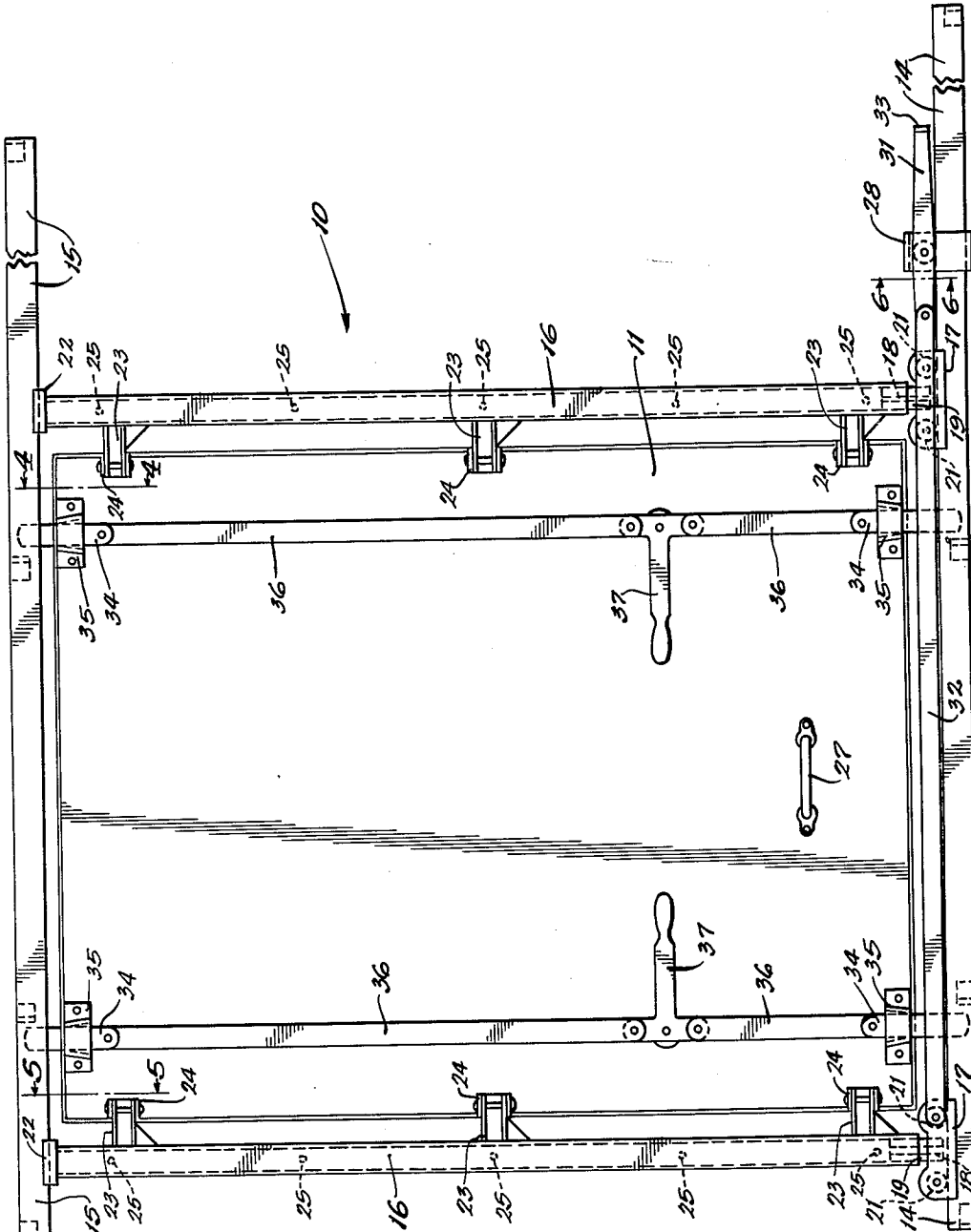


Fig. 1

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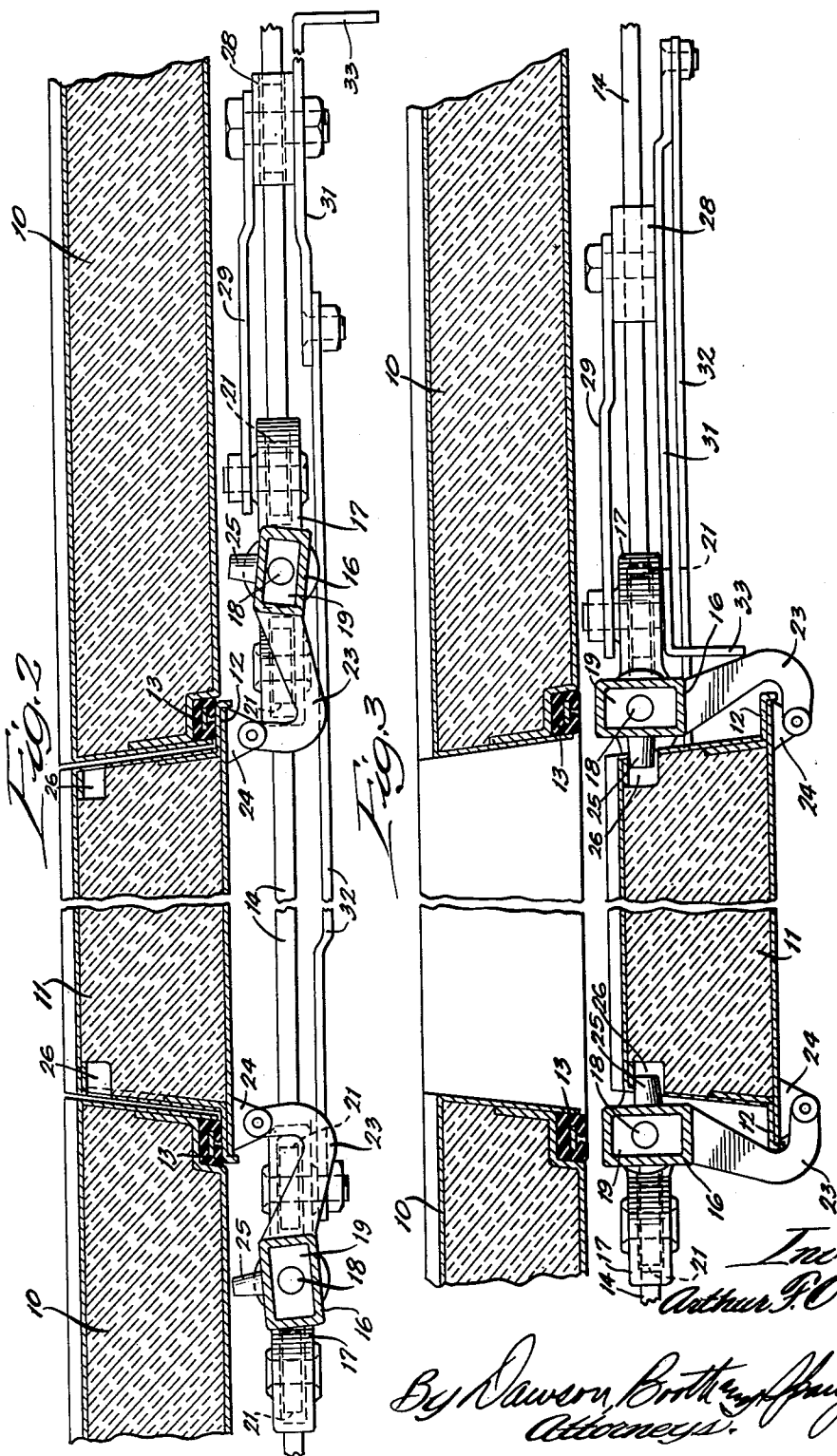
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Fig. 4

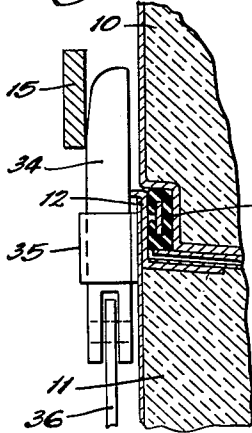


Fig. 5

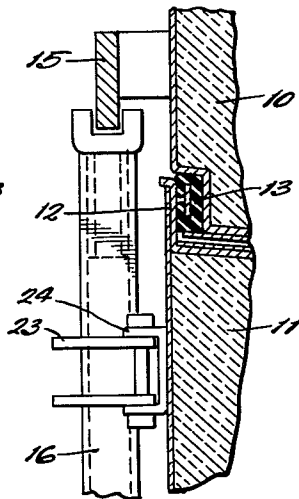


Fig. 6

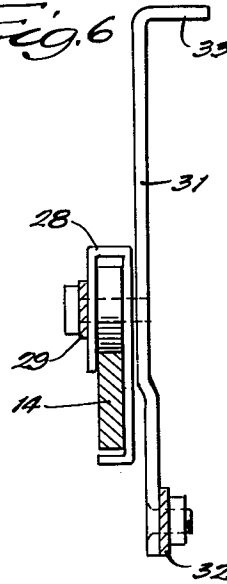
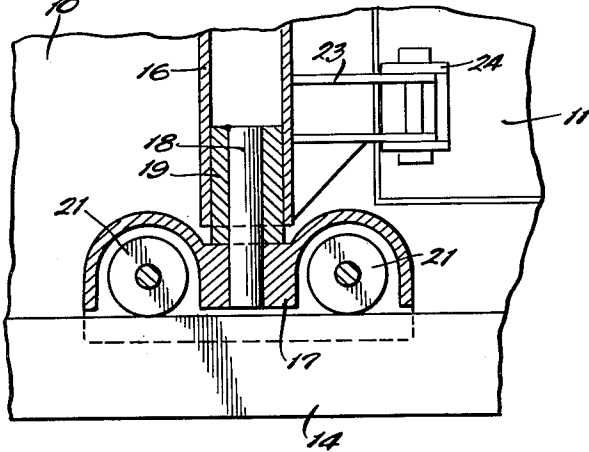


Fig. 7



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UNITED STATES PATENT OFFICE

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DOOR FOR REFRIGERATOR CARS

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4 Claims. (Cl. 20-23)

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This invention relates to doors for refrigerator cars and more particularly to the mounting and control of such doors.

It has heretofore been proposed to support refrigerator car doors on crank arms carried by bars or levers which are slidably supported on tracks on the car. Since the door panels are quite heavy, difficulty has been encountered in providing crank arms of sufficient strength to support the panels when they are in open position. The result has been that after a relatively short period of use the crank arms tend to sag so that the doors will not operate properly.

It is one of the objects of the present invention to provide a door carried by crank arms for movement toward and away from the door opening in which the door panel is supported independently of the crank arms in its open position. In a preferred construction the edges of the door panel and the bars or beams which carry the crank arms are formed with interengaging parts which directly carry the weight of the panel when it is out of the opening.

Another object is to provide a door for refrigerator cars in which the bars or beams carrying the crank arms are positively moved toward and away from the door to move it toward and away from its opening. In one desirable construction a locking toggle linkage is employed which will positively hold the door in either its open or its closed position.

The above and other objects and advantages of the invention will be more readily apparent from the following description when read in connection with the accompanying drawings, in which—

Figure 1 is a partial elevation of a refrigerator car equipped with a door embodying the present invention;

Figures 2 and 3 are horizontal sections showing the door in closed and open position, respectively;

Figures 4, 5, and 6 are partial sections on the lines 4—4, 5—5, and 6—6, respectively, of Figure 1; and

Figure 7 is a partial section illustrating the connection of the lower end of a supporting bar to the lower track.

As shown, the door is adapted to close a door opening in the side wall 10 of a refrigerator car which may be insulated to form a relatively thick wall. The opening is adapted to be closed by a door panel 11 of the same thickness as the wall 10 and which is shaped to fit within the door opening. Preferably, the panel and the opening are formed with tapering sides as best seen in

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Figures 2 and 3 so that the panel may move easily into and out of the opening. The panel is formed around its edges with a projecting flange 12 flush with the outer surface of the door and which is adapted to seat against a resilient seal 13 carried by the side wall 10 around the door opening to form an air tight seal when the door is closed.

The door is adapted to be slidably supported on a lower track 14 and an upper track 15 which extend horizontally above and below the door opening. The tracks 14 and 15 may be in the form of generally rectangular bars supported on the car side wall by suitable types of brackets which leave the edges of the bars adjacent the door opening free. The door is carried by bars or beams 16 adjacent its opposite edges and which may be formed as shown of hollow box beam section. The beams 16 are supported on the lower track by a wheeled carriage indicated generally at 17 and which has an upwardly extending cylindrical post 18 journaled in a bushing 19 carried by the beam 16. The carriage 17 also carries wheels or rollers 21 which rest on the track 14 to support the beams thereon. At their upper ends the beams 16 rotatably carry yokes 22 which straddle the edge of the upper track 15.

The door panel 11 is carried by crank arms 23 which are attached to and project from the beams 16. As best seen in Figures 2 and 3, the crank arms 23 extend outward from the beams 16 and are pivotally connected to brackets 24 carried on the outer surface of the door panel. Preferably the arms 23 are offset as shown to extend around the flanges 12 on the door and to permit the beams 16 to move into close proximity to the side edges of the door panel when it is open.

In order to carry the weight of the panel independently of the crank arms 23 when the panel is moved away from the door opening, the beams 16 are formed with projecting lugs 25 extending outward from the sides thereof. The lugs 25 are adapted to fit into openings or recesses 26 formed in the side edges of the door panel and of a size snugly to receive the lugs 25.

When the door is closed, as shown in Figure 2, the weight of the panel is carried directly by the car side wall, and the beams and crank arms lie in the position shown with the beams spaced from the edges of the door panel. When the door is pulled open as, for example, by means of a handle 27 on the front of the door panel, the beams 16 will swing in toward the side edges of the panel and will rotate about their own axes. When the panel is fully away from the opening, as shown

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in Figure 3, the lugs 25 will enter the recesses 26 and will directly support the weight of the panel independently of the crank arms 23. It will be noted that in this position the door panel has been swung out beyond the side wall of the car so that it can be slid along the tracks away from the opening to permit entry to the car. With this construction the strain is removed from the crank arms so that they will not tend to sag during use. In order to move the beams 16 positively toward the side edges of the door panel, means are provided connecting the beams to move them together and apart. As shown, this means comprises a toggle linkage including a block 23 slidably supported on the lower track 14 and connected to the adjacent carriage 17 by a link 29. A lever 31 is pivoted on the block with its free end connected through a link 32 to the opposite carriage 17. When the lever 31 is in the position shown in Figures 1 and 2, the link 32 and lever 31 will be aligned to separate the beams 16 so that the door will be moved in to its closed position. When it is desired to open the door, the door will be pulled outward from the opening by the handle 27 and at the same time the link 31 will be turned counter-clockwise, as seen in Figure 1 to pull the beams 16 together with the lugs 25 projecting into the recesses 26. An outwardly turned projection 33 on the end of the lever 31 will engage the link 32 so that the linkage will form in effect a locking toggle to hold the parts in the position shown in Figure 3. Thus the door can be slid to any desired position along the tracks without danger of having the beams separate to move the door against the side of the car.

When the door is closed, it is preferably held in tightly closed position by a separate latching means including latching plungers 34 slidably carried by brackets 35 on the door panel and adapted to move behind the tracks 14 and 15. As shown in Figure 4, the plungers 34 preferably have tapered ends so that they will cam the door toward tightly closed position. The plungers are connected to links 36 which in turn are connected to the ends of double bell crank levers 37. When the levers 37 are turned to the position shown in Figure 1, the plungers will be forced out to engage beneath the tracks and hold the door panel tightly closed. When the levers 37 are turned through approximately 90° they will draw the plungers in to disengage the tracks so that the door can be opened.

To open the door from its closed position the operator first turns the handles 37 to release the latches and then pulls the door slightly away from the opening by the handle 27. He then swings the lever 31 counter-clockwise to move the beams 16 together. As the beams move together they will rotate to the position shown in Figure 3 to move the door to its maximum distance away from the opening. Toward the end of this movement the pins 25 will enter the openings 26 directly to support the door on the beams 16 and to relieve strain on the arms 23. At the end of the movement the toggle linkage will lock to hold the beams 16 in against the door.

To close the door the process is reversed, the operator first swinging the lever 31 clockwise to withdraw the pins 25 from openings 26 and to move the door inward. He may then force the door fully into its opening and latch it by turning

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the handles 37 to the position shown in Figure 1.

While one embodiment of the invention has been shown and described in detail herein, it will be understood that this is illustrative only and is not intended as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. A door for refrigerator cars and the like having a door opening in a side wall and tracks extending above and below the door opening comprising a door panel adapted to fit in the door opening, bars adjacent the opposite edges of the door panel mounted on the tracks for sliding and rotating movement, crank arms carried by the bars and pivotally connected to the door panel to move the door away from the opening when the bars are turned, projecting lugs on the bars and parts of the edge portions of the door to engage the lugs so that they will support the door panel when it is moved away from the opening.

2. A door for refrigerator cars and the like having a door opening in the side wall and tracks extending above and below the door opening comprising a door panel adapted to fit in the door opening, bars adjacent the opposite edges of the door panel mounted on the tracks for sliding and rotating movement, crank arms carried by the bars and pivotally connected to the door panel to move the door away from the opening when the bars are turned, the door panel having openings in its side edges at vertically spaced points, and vertically spaced lugs projecting horizontally from the bars to enter the openings and support the panel when the panel is moved away from the door opening.

3. A door for refrigerator cars and the like having a door opening in a side wall and horizontal tracks above and below the door opening comprising a door panel adapted to fit in the door opening, vertical bars adjacent the edges of the panel, crank arms on the bars pivotally connected to the panel at its outer surface, means rotatably connected to the bars and slidably supported on the tracks, the bars moving toward the side edges of the door panel when the panel is moved away from the door opening, interengaging parts on the side edges of the panel and on the bars directly engageable with each other when the bars move toward the side edges of the panel to support the panel on the bars, and a locking toggle linkage connecting the bars to move them toward the edges of the panel and to hold them adjacent the panel with said parts in engagement.

4. The construction of claim 3 in which said engaging parts comprise vertically spaced openings in the side edges of the door and vertically spaced lugs projecting horizontally from the bars to enter the openings.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
665,412	Dill	Jan. 8, 1901
1,237,731	Wheeler	Aug. 21, 1917
1,482,841	Crook	Feb. 5, 1924
2,083,708	Haseltine	June 15, 1937