Jan. 14, 1941. G. A. STEUBER 2,228,711

REFRIGERATOR CAR DOOR

Filed Jan. 24, 1939 4 Sheets-Sheet 1

FIG. 1

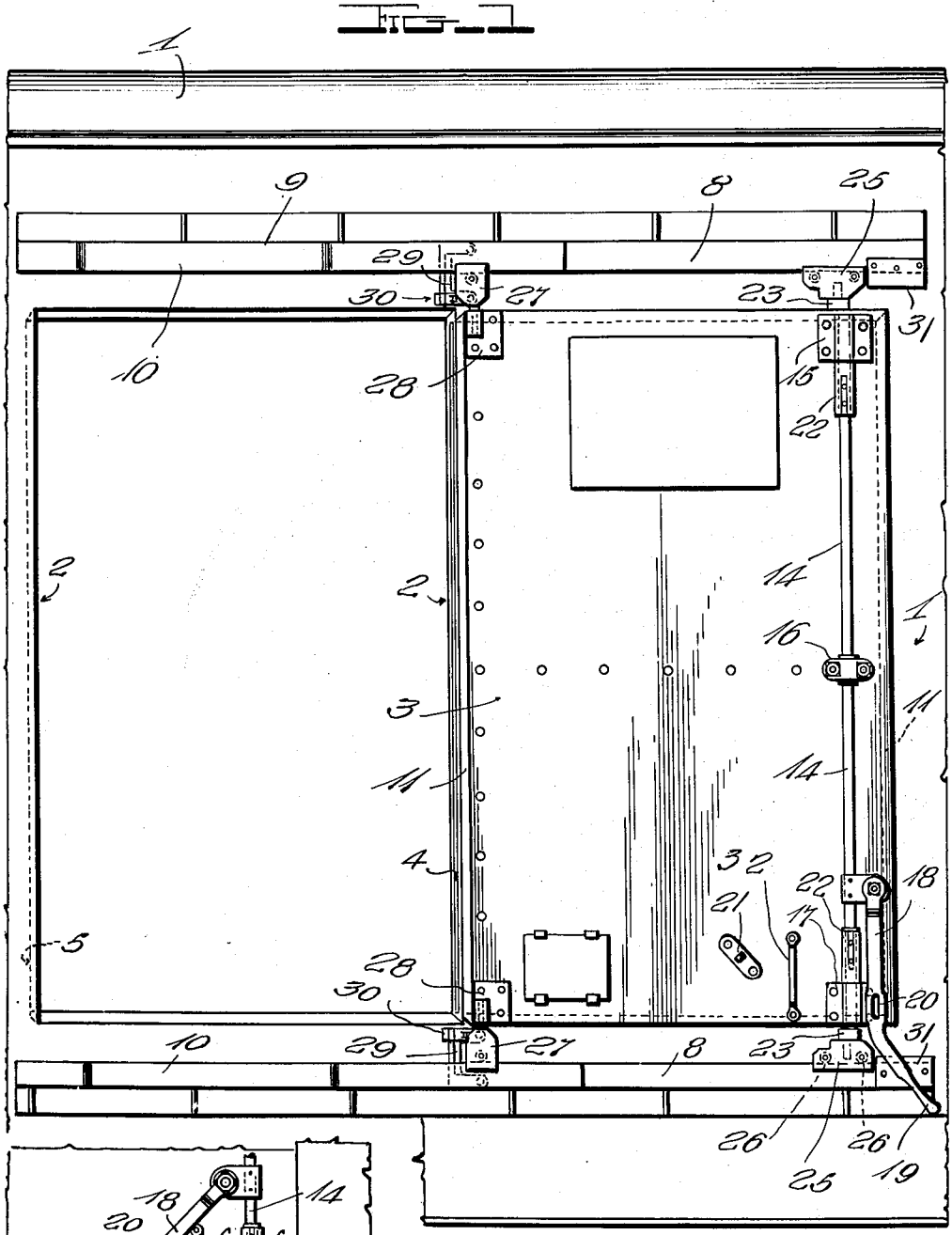
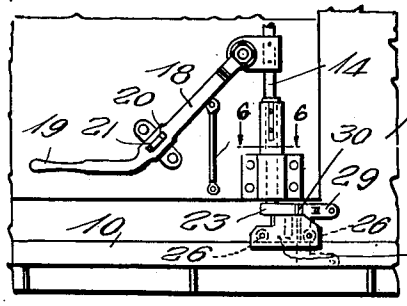


FIG. 2

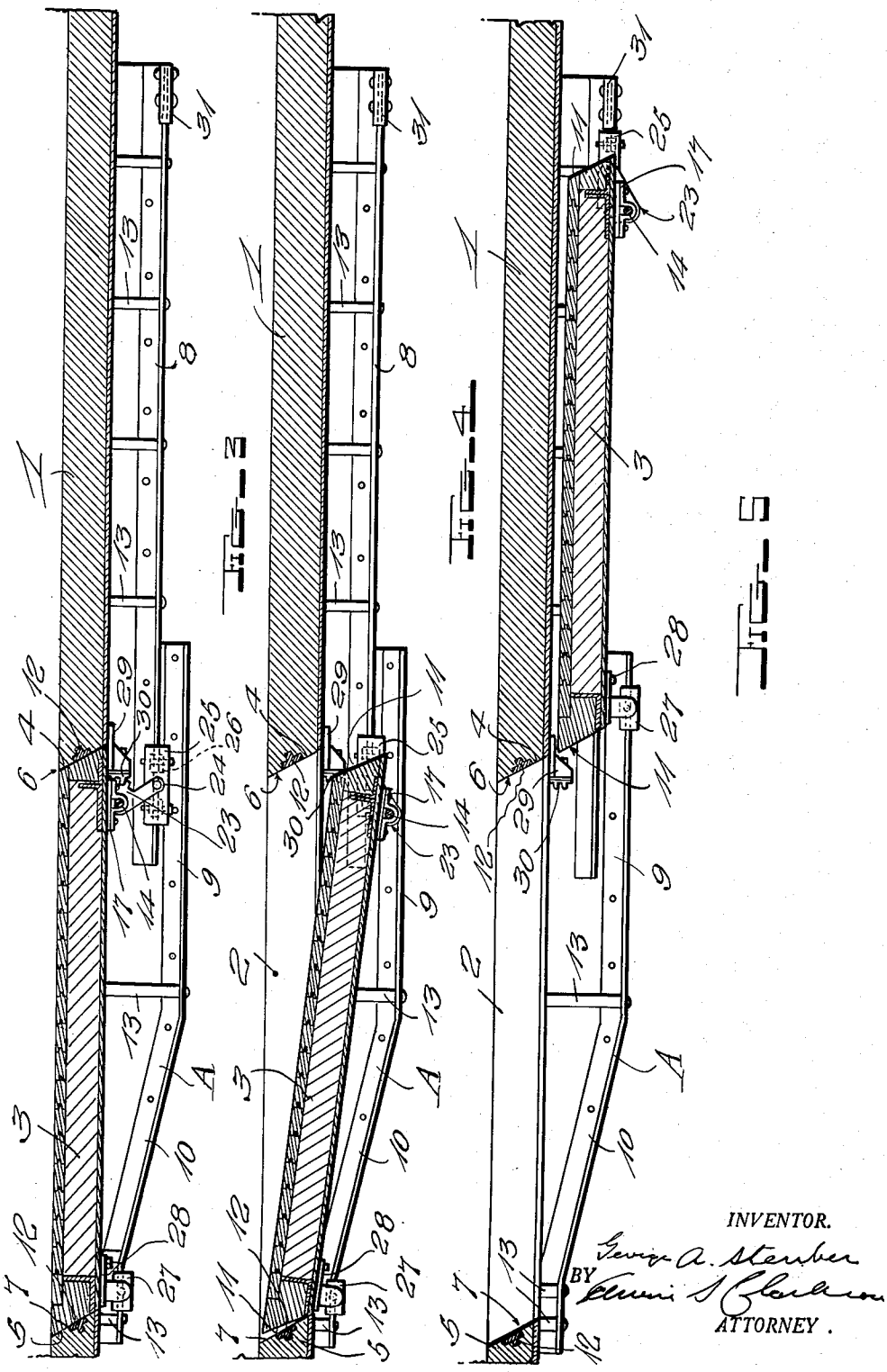


INVENTOR.
George A. Steuber
BY
Edwin S. Clarkson
ATTORNEY.

Jan. 14, 1941. G. A. STEUBER 2,228,711

REFRIGERATOR CAR DOOR

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INVENTOR.
George A. Steuber
BY Edwin S. Gladson
ATTORNEY.

Jan. 14, 1941. G. A. STEUBER 2,228,711

REFRIGERATOR CAR DOOR

Filed Jan. 24, 1939 4 Sheets-Sheet 3

FIG. 6

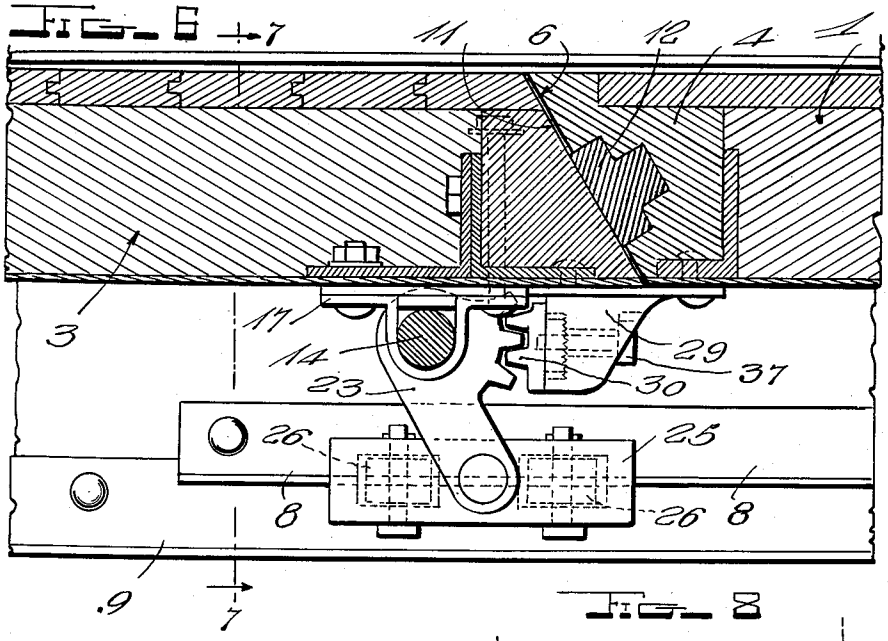


FIG. 8

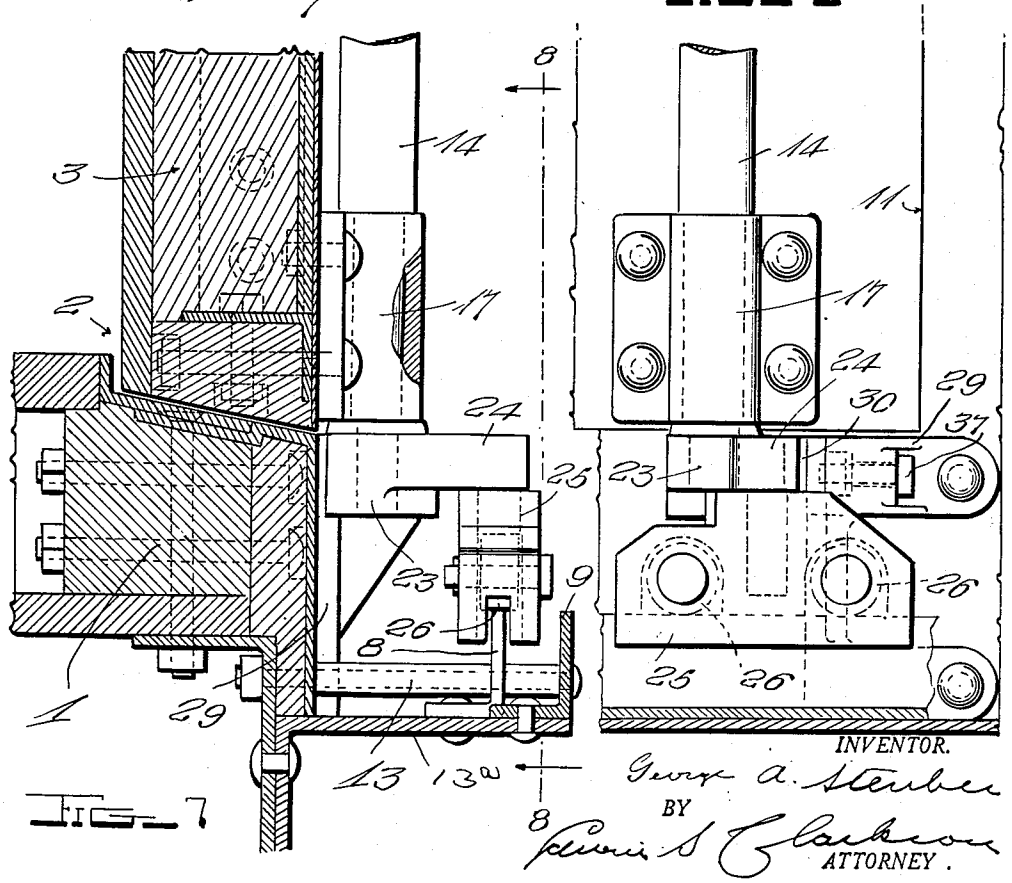


FIG. 7

INVENTOR.
George A. Steuber
BY
Louis S. Clarkson
ATTORNEY.

Jan. 14, 1941. G. A. STEUBER 2,228,711

REFRIGERATOR CAR DOOR

Filed Jan. 24, 1939 4 Sheets-Sheet 4

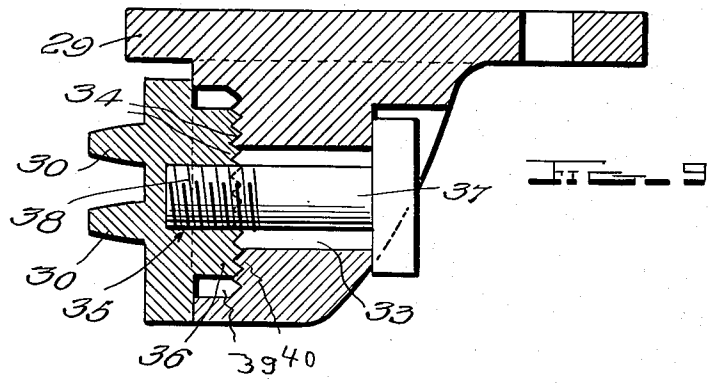


Fig. 9

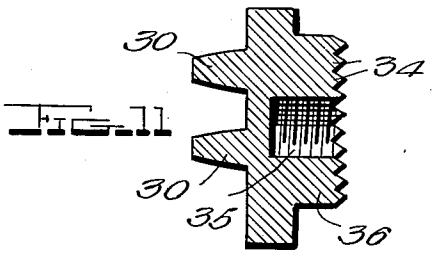


Fig. 11

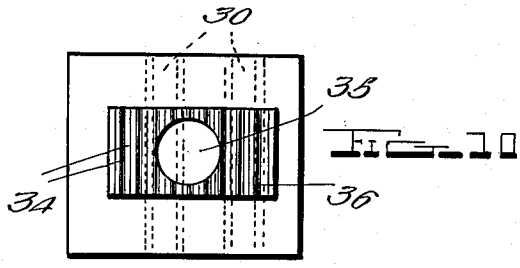


Fig. 10

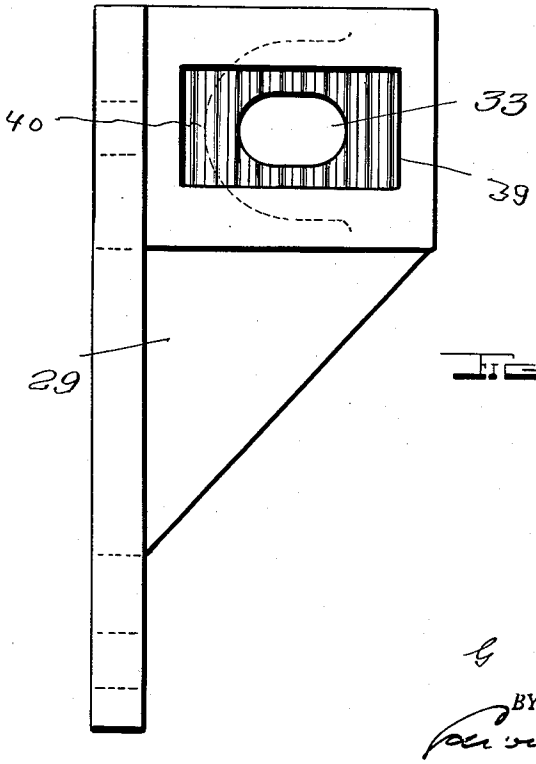


Fig. 12

INVENTOR.
G. A. Steuber
BY
Marvin S. Glasbrenner
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,228,711

REFRIGERATOR CAR DOOR

George A. Steuber, Penfield, N. Y., assignor to Despatch Shops, Inc., a corporation of New York

Application January 24, 1939, Serial No. 252,700

5 Claims. (Cl. 20—23)

One of the objects of my invention is to provide a door and its operating mechanism for a refrigerator car with means to eliminate all thrust and strain from the door tracks.

Another object of my invention is to center all thrust and strain in the operation of the door on the means for operating the door.

Another object of my invention is to so mount the door whereby it will be held in position on the car and its sealing effect maintained in the event of the tracks being torn from the car.

Another object of my invention is to provide means independent of the door tracks to hold the door against flapping relative to the side of the car thereby adding a safety factor; and with these and other objects in view my invention consists of the parts and combination of parts hereinafter set forth.

In the drawings:

Figure 1 is a side elevation of a portion of a refrigerator car in the vicinity of the door showing the door in open position.

Figure 2 is a fragmentary similar view showing the door in closed position.

Figure 3 is a horizontal section through a portion of the freight car, the door, and the adjacent parts, the door being shown in closed position.

Figure 4 is a similar view but showing the door in the act of being opened and rolled aside to clear its opening.

Figure 5 is a similar view but showing the door completely opened.

Figure 6 is a horizontal section on an enlarged scale taken substantially on line 6—6 of Figure 2, and showing more particularly the actuating mechanism for closing the door.

Figure 7 is a transverse vertical section taken substantially on line 7—7 of Figure 6, looking in the direction of the arrows.

Figure 8 is a sectional view taken substantially on line 8—8 looking in the direction of the arrows.

Figure 9 is an enlarged detail view of the door operating racks.

Figure 10 is a detail rear elevation of the adjustable rack detached.

Figure 11 is a detail cross section of the adjustable rack detached.

Figure 12 is a detail front elevation of the rack bracket.

The reference numeral 1 designates a refrigerator car of any approved type having a door opening 2 and door 3. The side posts or stiles 4 and 5 of the doorway have beveled door bearing faces 6 and 7, the bevel 6 being inward and forward, while the bevel 7 is inward and rearward; in other words, the door bearing or sealing contact with the stiles are parallel, as clearly shown in Figures 3, 4 and 5.

Attached to the side of the car is a door track 8 parallel throughout its length with the side of the car and suitably spaced therefrom. A second track is also attached to the side of the car, the portion 9 of which is parallel with the side of the car and spaced outwardly from the track 8, while the portion 10 of this second track is curved inwardly toward the left hand door stile, as shown in Figures 3, 4 and 5, but does not enter the doorway.

The door 3 may be of any suitable insulated type for refrigerator cars, but differs from the prior art in that the side edges 11 are beveled, and these beveled side edges are parallel one with the other and on the same angle as beveled faces 6 and 7 of the door posts or stiles, as shown in Figure 3.

Any suitable sealing medium, indicated by the numeral 12, may be placed in the joint between the door and door frame.

The two tracks are supported from the side of the car by means of suitable supports 13 and 13a.

Tracks similar to the two tracks just described are attached to the car above the doorway.

The door is provided with a shaft 14 vertically disposed and held thereon by means of brackets 15, 16 and 17, and is revoluble in said brackets, the shaft being revoluble by means of the operating handle 18 which has a handle portion 19 arranged at an angle to the body of the handle, said handle being provided with a slot 20 which is adapted to engage the keeper 21 when the handle is in the position shown in Figure 2 of the drawings with the door closed.

Rigidly attached to the top and bottom portion of the shaft 14 are castings 22. Segmental gears 23 are rigidly connected with the top and bottom ends of the shaft 14 from each of which extends an integral arm 24 on which is pivotally mounted a carriage 25 provided with wheels 26 to roll on the adjacent track 8.

At the left hand, or other side, of the door a carriage 27 is pivotally mounted to a casting 28 on the door, said carriage 27 being provided with a wheel similar to the wheels 26 of the carriage 25. The wheel of the carriage 27 is adapted to roll on the track portions 9 and 10. Said track portions 9 and 10 being designated as a whole

by the reference letter A. 32 is a hand grab iron near the bottom of the door.

Secured to the side of the car is a casting 29 having a horizontal tooth rack 30 which is adapted to mesh with the segmental rack 23, as clearly shown in Figure 6.

In operation, assuming that the door is in the closed position shown in Figure 3, the operating handle 19 is detached from its keeper 21 and moved toward the right or away from the door opening whereupon the shaft 14 is revolved, which, in turn, revolves the segmental rack 23, and that, in turn, moves the arm 24 away from the door opening which results in right hand edge of the door, as shown in Figure 3, being pulled out clear of the doorway opening, as shown in Figure 4. The grab iron 32 is then taken hold of by the operator and the door is then slid to the open position shown in Figure 5, the left hand side edge of the door in Figure 4, by reason of its roller carriage 27, following the track A, is likewise advanced to a position with the door parallel to the side of the car and, as above described, the entire door is then moved on its tracks to the position shown in Figure 5.

In closing the door it is moved to the position shown in Figure 4 whereupon the segmental racks 23, through the rod 14, is again revolved in the reverse direction which through the intermeshing with the teeth 30 pulls the door into closed position, shown in Figure 3.

As will be seen by using the double tracks, the door in open position is positioned parallel with the side of the car, while the curved portion of the track A functions to move the other end of the door outwardly from the doorway in the act of opening the door and inwardly in the act of closing the door.

The door in its closed position by reason of the racks 30 and segmental racks 23 and beveled edge 7 is held in closed position to the car independent of the tracks whereby all thrust and strain is removed from the door tracks and entirely absorbed by the racks 30 and 23, from which it will be seen that should the track and the shoes be torn from the car this would not effect the position or the sealing effect of the door, or the locking arrangement as the door would still be securely held in place by said racks and bevel. This arrangement has a very great safety factor and prevents the door from flapping relative to the side of the car in the event of the tracks being torn from the car.

31 are door stops.

The angle of the operating handle 19 is such that anyone of average heighth can reach the handle from the ground readily.

The sides of the car are merely shown schematic in Figures 3, 4 and 5, hence no effort has been made to detail the stiles.

The left hand door stile contacting parallel bevel on post 7, provides a fulcrum in which case the greatest leverage is acomplished when door closing bar near the right hand door stile and door post is operated.

The stationary rack 30 used for developing pressure for closing and opening the door is adjustably secured to the bracket 29 to compensate for tooth wear on either, or both, the segmental gear and rack, said bracket having an elongated bolt opening 33. The casting 29 is provided with a recess 39 in the bottom wall of which I form teeth 40. Extending rearwardly and in communication with the recess is a bolt opening 35 which is provided with screw threads. The rack 30 is provided with a lug 36 having teeth 34 formed on the bottom face thereof; the shape of the lug 36 is such that it will fit in the recess 39 of the casting 29 whereby its teeth may mesh with the teeth 40 of the recess. The lug 36 is smaller than the recess so that it may be adjusted back and forth in the recess whereby the rack 30 may be moved relatively to the segment 23 to compensate for tooth wear on either the segment or the rack. The rack is securely held to the casting 29 by means of a stud bolt 37, which is positioned in the opening 33 of the casting 29 with its inner end in threaded engagement with the opening 35 in the lug 36. It will be seen that the opening 35 extends somewhat into the body of the rack as at 38.

What I claim is:

1. In a refrigerator car having a side door opening, a door designed to fit within said opening, a set of upper and lower tracks for one side edge of the door, another set of upper and lower tracks for the opposite side edge of the door, a set of carriages mounted on the door adjacent one side edge thereof to travel on one set of tracks, a rotary shaft mounted on the door adjacent to its opposite side edge, a set of carriages for supporting said edge of the door on which the shaft is mounted arranged to travel on the other set of tracks, arms carried by the shaft and pivotally engaging the second-named set of carriages, and intermeshing gear elements on the car and shaft for moving the side edge of the door on which the shaft is mounted outwardly from the doorway.

2. In a refrigerator car having a door opening, a door to close said opening, tracks for said door on the side of the car, a rotary shaft on the door, racks on the car adjacent to the top and bottom of the door opening, segmental pinions on the shaft and adapted for engagement with the racks to move the door out of the opening, carriages for the door mounted to run on said tracks, and crank arms carried by the pinions and pivotally connected to said carriages.

3. In a refrigerator car having a side door opening, a door designed to fit bodily within said opening, a track on the car, a carriage mounted to travel on the track, a revoluble shaft vertically mounted near one side of the door, a segmental gear rigidly secured to said shaft, a rack adjustably secured to the car and designed to intermesh with the first-named gear for moving said side of the door outwardly and inwardly with relation to the door opening, means for adjusting said rack and locking the same in adjusted position, means to revolve said shaft, and a crank arm carried by the gear and pivotally connected to the carriage.

4. In a refrigerator car having a side door opening, a door designed to fit bodily within said opening, a revoluble shaft vertically mounted on the door near one side thereof, segmental gears rigidly secured to said shaft, racks mounted on the car and designed to intermesh with said gears, means to revolve said shaft, whereby one side edge portion of the door is adapted to be moved outward from said door opening in advance of the other side edge portion of the door, a set of carriages mounted for travel on the car to support said side edge of the door, a set of carriages on said door adjacent its opposite side edges and mounted for travel on the car, and crank arms on the gears pivotally engaging the first-named carriages.

5. In a refrigerator car having a side door opening, a door designed to fit bodily within said

opening, a revoluble shaft vertically mounted on the door near one side thereof, segmental gears rigidly secured to said shaft, racks mounted on the car and designed to intermesh with said segmental gears, means for adjusting each rack and coactively locking it in its adjusted positions, means to revolve said shaft and segmental gear, whereby one side edge portion of the door is adapted to be moved outward from the said door opening in advance of the opposite edge of the door, a set of roller carriages on the door adjacent to its second-named edge, a second set of roller carriages, crank arms on the gears pivotally connected with the second set of roller carriages, a door track parallel with the side of the car for the second-named set of roller carriages, and a substantially curved track secured to the side of the car and leading inward for a portion of its length toward the doorway for the first-named set of roller carriages.

GEORGE A. STEUBER.