

- [54] **CAR DOOR OPERATING STRUCTURE**
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1,575,086	3/1926	Ashleman et al.	49/362
3,255,714	6/1966	Dorey	49/262 X
3,257,756	6/1966	Mealer	49/358 X
3,468,062	9/1969	Custer	49/362
3,636,658	1/1972	Bollinger	49/362
3,775,906	12/1973	Dougherty	49/360
3,796,007	3/1974	Bollinger et al.	49/362

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Related U.S. Application Data

[63] Continuation of Ser. No. 276,671, July 31, 1972, abandoned.

[52] U.S. Cl. **49/362; 49/219**

[51] Int. Cl. **E05f 11/34**

[58] Field of Search..... 49/209, 216, 219, 358-362

[56] References Cited

UNITED STATES PATENTS

1,212,043 1/1917 Freeman 49/362 X

Primary Examiner—J. Karl Bell

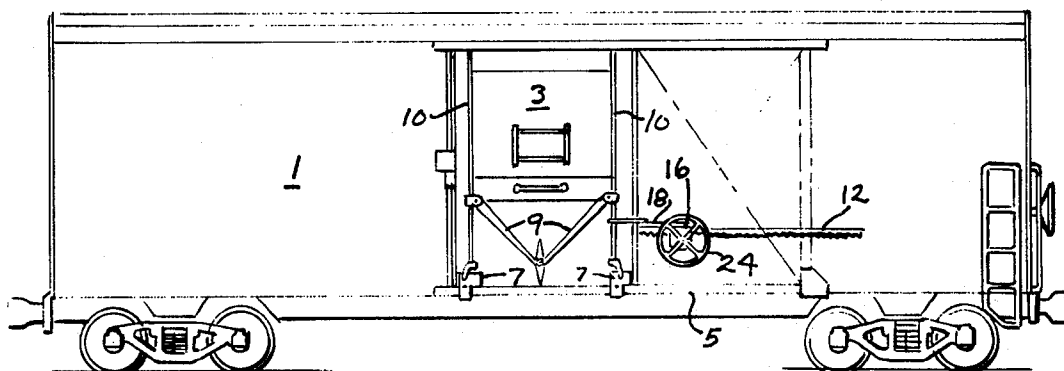
Attorney, Agent, or Firm—Bedell and Burgess

[57]

ABSTRACT

Railway car side door operating structure comprises a rack extending lengthwise of and secured to the car side wall, and a pinion journaled on the door or on a housing connected to the door and movable therewith, and means for rotating the pinion to move the door along the rack between closed and open positions.

3 Claims, 6 Drawing Figures



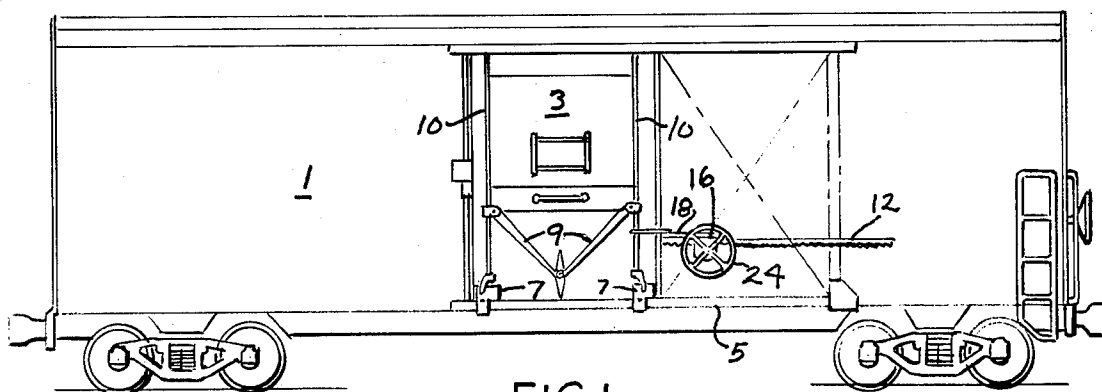


FIG. 1

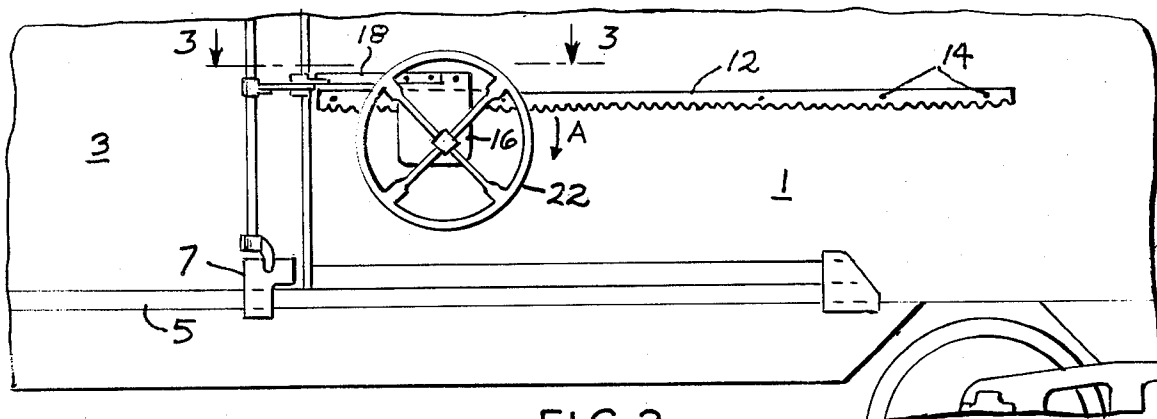


FIG. 2

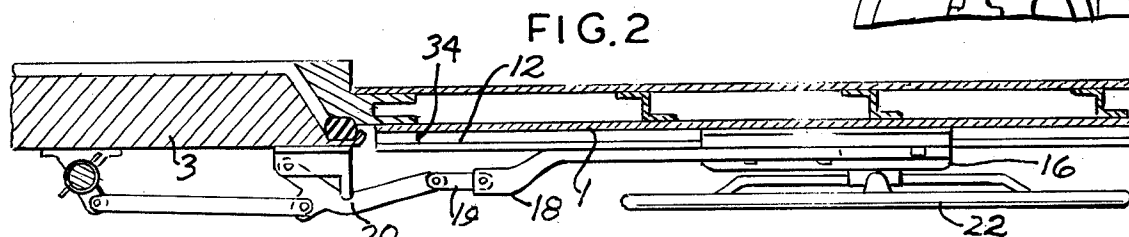


FIG. 3

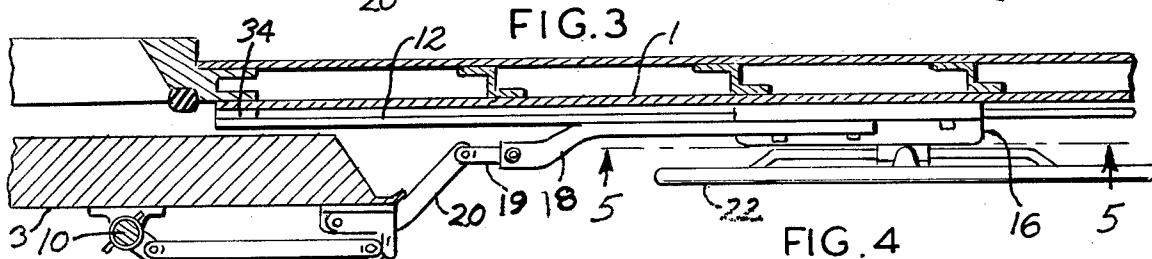


FIG. 4

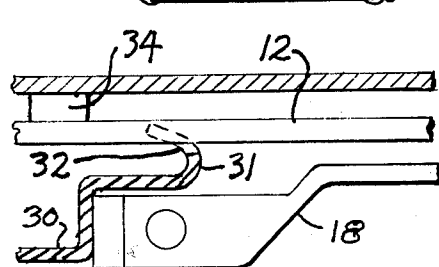


FIG. 6

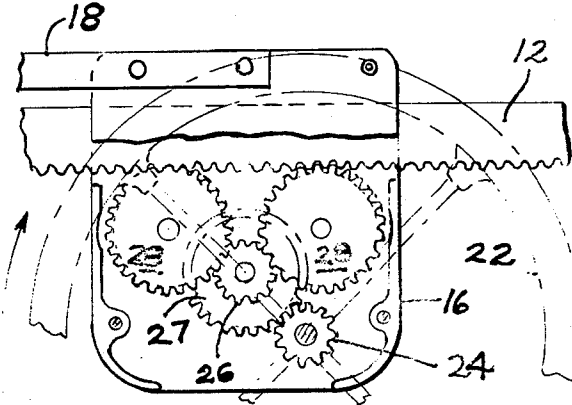


FIG. 5

CAR DOOR OPERATING STRUCTURE

This is a continuation of application Ser. No. 276,671, filed July 31, 1972 and now abandoned.

BACKGROUND OF THE INVENTION

The invention facilitates the use of a wider side door than possible with previous door moving rack and pinion mechanisms, such as shown for example in Custer U.S. Pat. No. 3,468,062 in which the pinion is mounted on the car wall and engages a rack slidable with the door. The present mechanism is a better mechanical arrangement for railway cars, since it avoids the safety hazard of a movable rack vibrating and loosening and enables a workman to remain adjacent to the door throughout the door opening and closing operations.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a railway house car embodying the invention as applied to a plug door.

FIG. 2 is an enlarged view of a portion of the car side shown in FIG. 1.

FIGS. 3 and 4 are horizontal sections along line 3—3 of FIG. 2 and shown the mechanism in door-closed and door-open positions respectively.

FIG. 5 is a vertical sectional view along line 5—5 of FIG. 4 showing the pinion drive mechanism.

FIG. 6 is a fragmentary horizontal sectional view showing application of the invention to an outside hung sliding car door.

DETAILED DESCRIPTION

The car side wall 1 has a door opening normally closed by a sliding door 3 mounted on a track 5 by rollers journaled in housings 7 and shiftable transversely of the car wall by lever handles 9 on upright shafts 10 as commonly used with plug doors.

A horizontal rack 12 is secured to the door by bolts or rivets 14 and extends from the rear end of the door toward the adjacent end of the car for a distance approximately the width of the door. Rack 12 comprises a flat bar toothed along its lower edge and having a smooth upper edge. A housing 16 overlies the rack and is slidable on the smooth upper surface rack (FIG. 5) and is attached to the rear portion of the door by a connecting linkage, including a clevis bar 18 rigidly secured to housing 16, and links 19 and 20, which accommodates movement of the door transversely of the car wall into and out of the door opening. Journaled in housing 16 is a hand-wheel 22 and a plurality of reduction gears 24, 26, 27 and a pair of driver pinions 28 which underlie and mesh with the teeth of rack 12 and

balance the forces applied to the rack and improve the power drive.

Upon rotation of handwheel 22 in the direction of arrow A, housing 16, linkage 18, 19, 20 and door 3 are moved to the right lengthwise of the car in front of the rack to expose the door opening. Reverse movement of the handwheel will move the door to the left to close the opening.

In FIG. 6, the numeral 30 denotes the rear framing member of an outside-hung sliding door, to which clevis bar 18 is pivotally secured directly, without the interposition of links 19 and 20. The spark seal portion 31 of the rear framing member is notched about 3½ inches at 32 to receive the rack when the door is slid to open position. Spacers 34 hold the rack from the car side which is stiffened by the rack. The rack is not attached to the door and is connected to the door only through the gearing.

The details of the structure may be varied substantially without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

I claim:

1. In a railway car, a side wall with a door opening, a door movable along said wall to overlie or to expose said opening, an elongated rack extending lengthwise of said wall and secured thereto, said rack having teeth along its lower edge and a smooth upper edge, a housing offset from said door lengthwise of the car and slidable along the upper edge of said rack, link means forming the sole connection between said housing and said door whereby they move together lengthwise of the car, a first pinion journaled in said housing and engaging the toothed lower edge of said rack, means for manually rotating said pinion to move said door along said rack, and a second pinion journaled in said housing and engaging the toothed lower edge of said rack, said second pinion being spaced longitudinally of said rack from said first pinion whereby to oppose tilting of said housing about a transverse axis and its consequent binding on said rack.

2. A railway car as described in claim 1 in which said link means comprises an elongated link which pivots transversely of the wall and door and accommodates movement of the latter transversely of the wall into and out of the door opening.

3. A railway car as described in claim 1 in which the housing includes reduction gearing between the pinion and its rotating means.

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