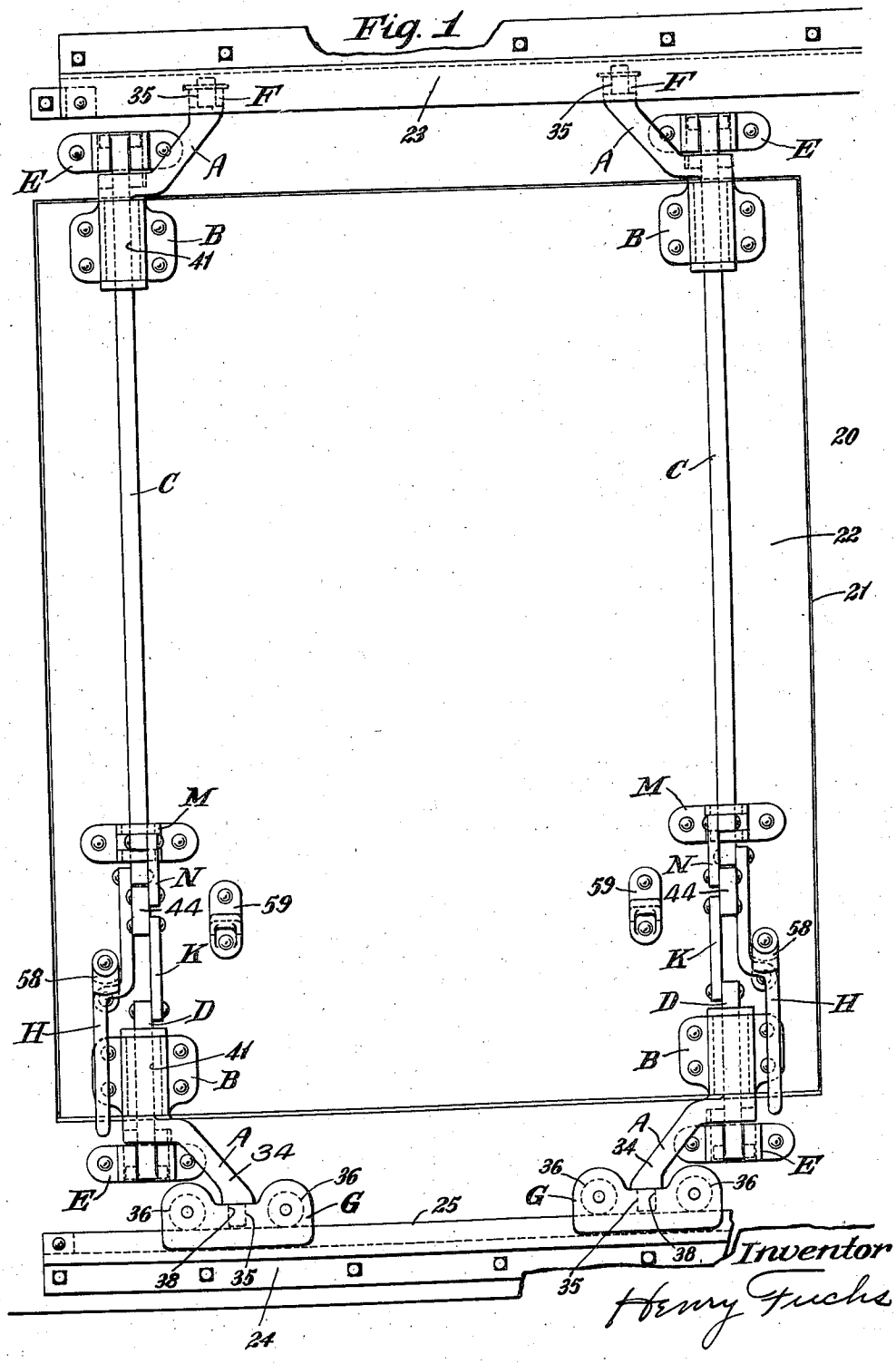
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REFRIGERATOR CAR DOOR

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Fig. 1

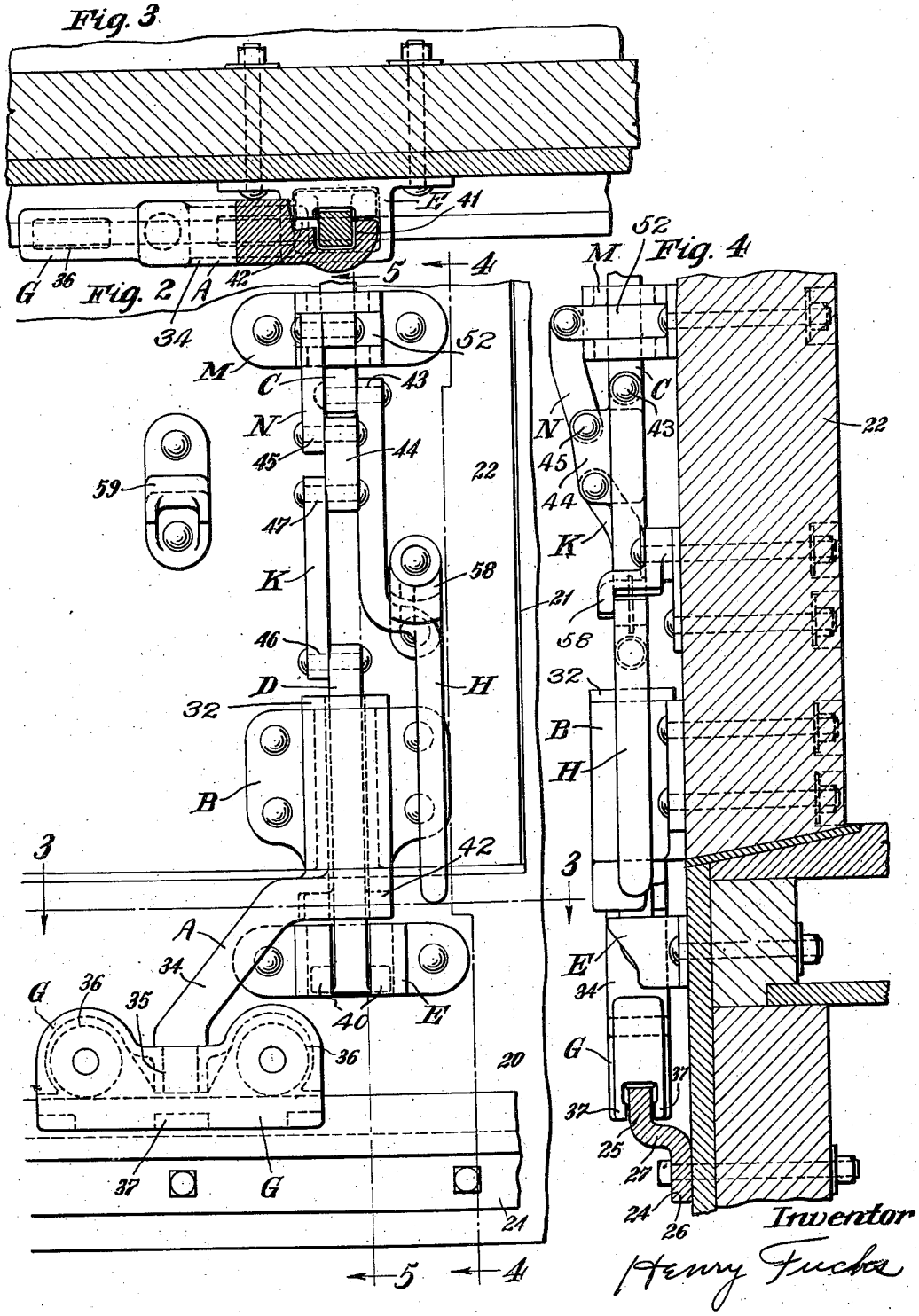


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Fig. 3



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Fig. 8

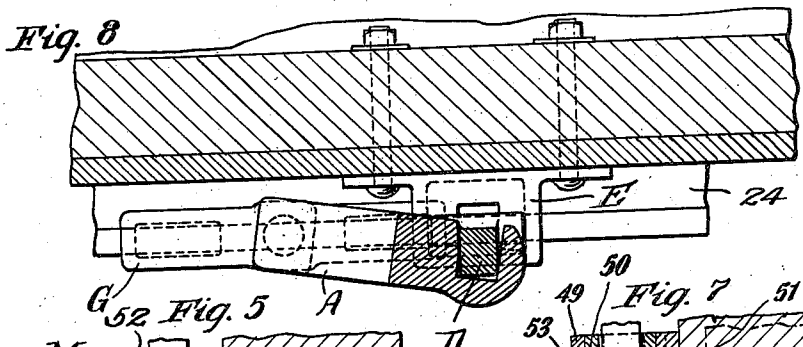


Fig. 5

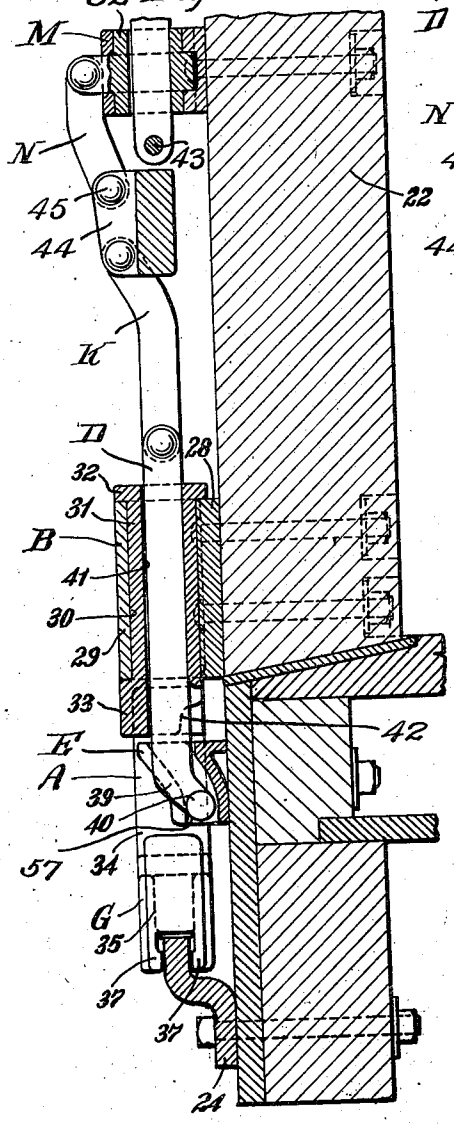
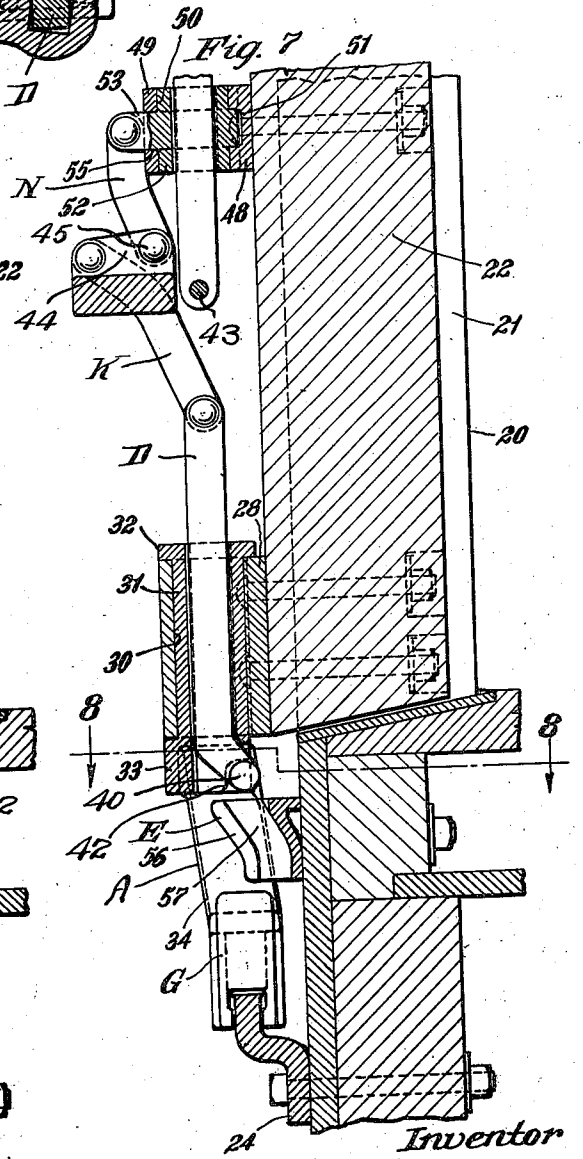


Fig. 7



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Fig. 6

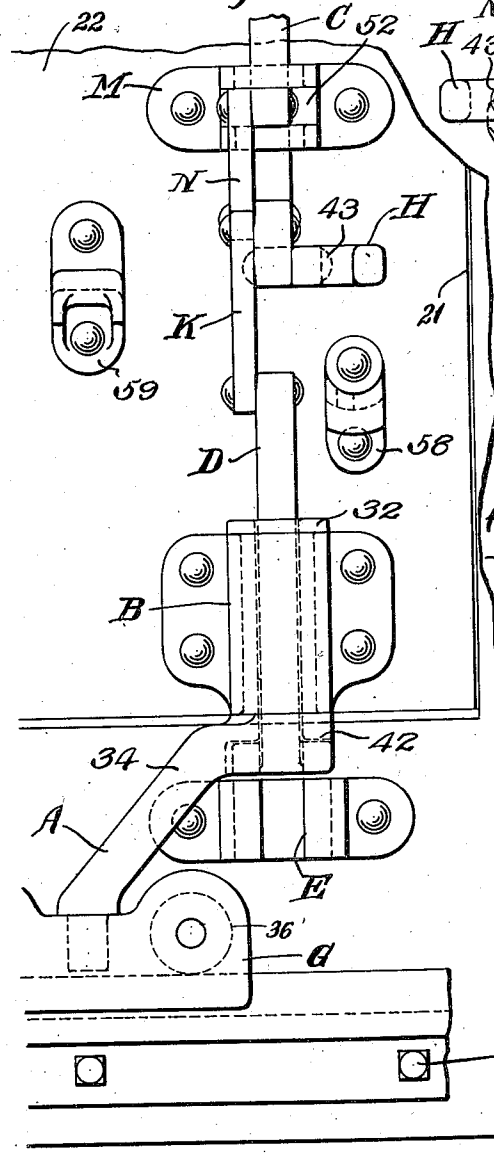
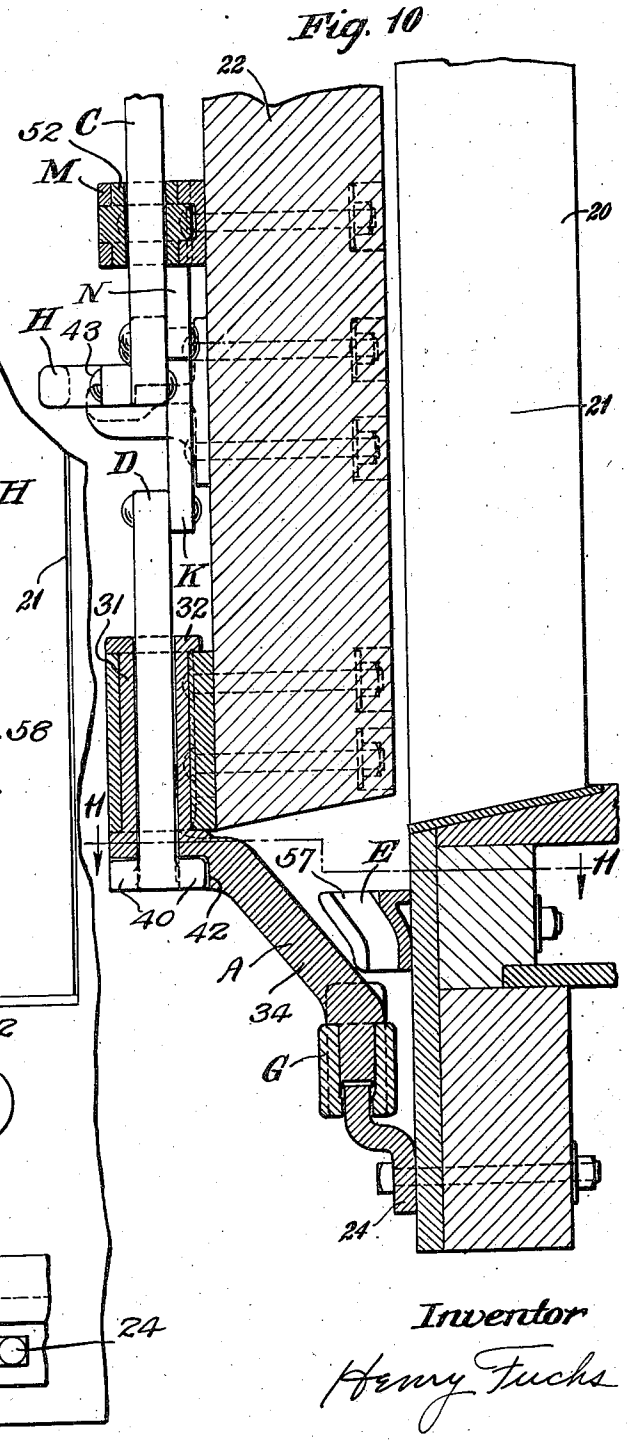


Fig. 10



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Fig. 11

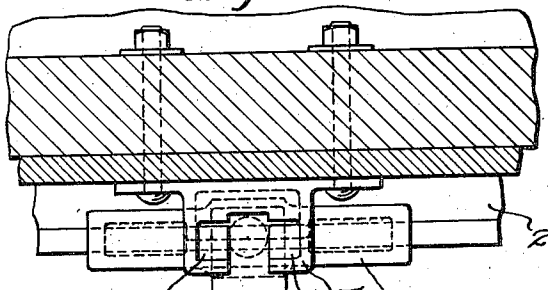
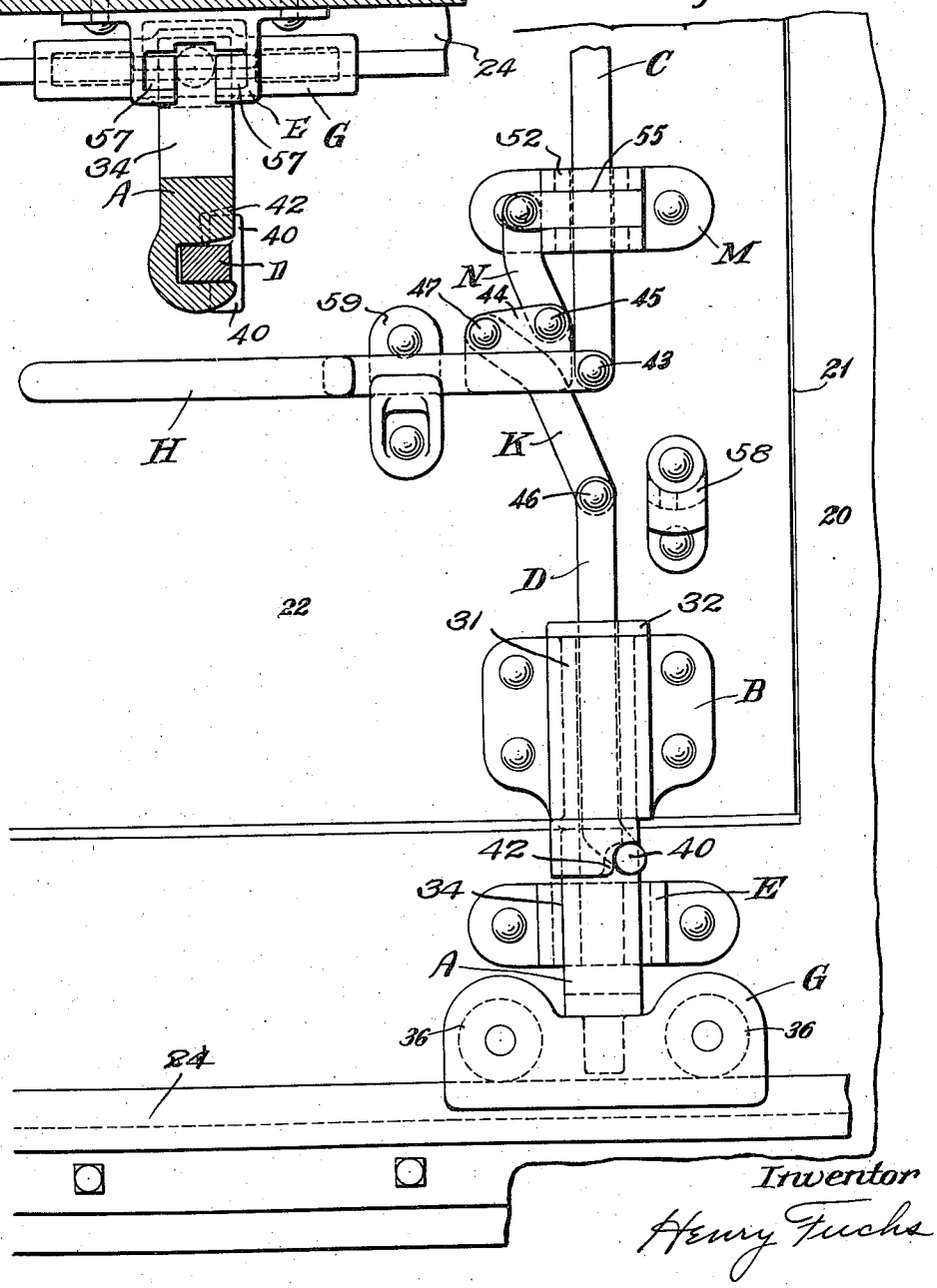


Fig. 9



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2,141,353

REFRIGERATOR CAR DOOR

Henry Fuchs, Chicago, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application November 18, 1936, Serial No. 111,371

19 Claims. (Cl. 20—23)

This invention relates to improvements in refrigerator car doors.

One object of the invention is to provide in a door construction for refrigerator cars comprising a single sliding door for closing the door opening of the car, simple and efficient, rugged means for supporting the door for movement into or out of the door opening, together with actuating means for either forcing the door tightly closed or prying the same partly open, the actuating means being so arranged and designed that it also serves to operate the door supporting means to move the latter to displace the door either toward or away from the door opening.

A further object of the invention is to provide means of the character described in the preceding paragraph, so arranged and designed that the projection of the parts thereof from the car will not exceed certain predescribed limits, so that the mechanism will clear the usual loading platform structures and all other obstructions encountered in standard railway practice.

Another and more specific object of the invention is to provide means for opening and closing doors of the sliding single type for refrigerator cars, which is manually actuated and controls movement of the door into and out of the door opening and also serves to either force the door tightly closed or pry the same partly open, and which includes keeper engaging means cooperating with fixed keepers mounted on the car wall, swinging crank members for supporting the door and guiding the same for movement into and out of the door opening, and actuating means common to said keeper engaging means and crank members for effecting swinging movement of the latter to displace the door, and sliding movement of the former to cooperate with the keepers to either force the door tightly closed or pry the same partly open.

Yet another object of the invention is to provide means of the character described in the preceding paragraph wherein the actuating means is operatively connected with the crank members to effect rotation of the latter, but is slidable with respect to the crank members to operate the keeper engaging means.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is an elevational view, broken away, of the side wall of a refrigerator car, illustrating my improvements in connection therewith, said view showing the door closed. Figure 2 is a view similar to Figure 1, on an enlarged scale, but broken away and showing the structure at the lower right hand portion of Figure 1. Figure 3 is a horizontal sectional view, corresponding substantially to the line 3—3 of Figure 2. Figure 4 is a vertical sectional view, corresponding substantially to the line 4—4 of Figure 2. Figure 5 is a vertical sectional view, corresponding substantially to the line 5—5 of Figure 2. Figure 6 is a view similar to Figure 2, but showing the parts in the position assumed when the door has been pried partly open. Figure 7 is a view similar to Figure 5, but showing the door pried partly open and illustrating the parts of the mechanism in the same position as Figure 6. Figure 8 is a horizontal sectional view, corresponding substantially to the line 8—8 of Figure 7. Figure 9 is a view similar to Figure 2, but showing the parts of the mechanism in the position assumed when the door is withdrawn from the door opening. Figure 10 is a view similar to Figure 5, but showing the parts in the position corresponding to that illustrated in Figure 9. Figure 11 is a horizontal sectional view, corresponding substantially to the line 11—11 of Figure 10.

In said drawings, 20 indicates the side wall of a refrigerator car, 21 the door opening, and 22 a single door for said opening. The door 22 is slidingly supported on top and bottom tracks 23 and 24 mounted on the side wall of the car, respectively above and below the door opening 21 and extending lengthwise of the car. The door may be of any well-known type and, as illustrated, has the edges thereof beveled to fit correspondingly beveled edges on the walls of the door opening 21, the beveled edge faces of the door being provided with the usual compressible insulation to produce a tight seal when the door is closed.

The tracks 23 and 24 may be of any well-known form. The bottom track 24, as shown most clearly in Figures 4, 5, 7, and 9, is in the form of an elongated bar of substantially Z-shaped cross section, having parallel, vertically disposed, upstanding top and depending bottom flanges 25 and 26 connected by a horizontal transverse central web 27. The bottom flange 26 of the track 24 is bolted to the car wall and the upstanding top flange is spaced outwardly from the side wall of the car and serves as the guide rail proper of the track. The top track 23 is preferably of channel-shaped cross section, having the opening of the channel directed downwardly.

My improvements comprise broadly pairs of

top and bottom crank members A—A and A—A; top and bottom sets of bearing brackets B—B and B—B fixed to the door and rotatably supporting the crank members; top and bottom sets of keeper engaging bars C—D and C—D operatively connected to said crank members to rotate the latter; top and bottom sets of keepers E—E and E—E mounted on the car wall with which the bars C—D and C—D cooperate; sliding carrier means F—F and G—G for supporting the outer ends of the crank members on the tracks 23 and 24; a pair of operating levers H—H operatively connected to the bars C—C; link members K—K connecting the levers H—H to the bars D—D; combined supporting and guide brackets M—M; and links N—N supporting the levers H—H from the brackets M—M.

The four crank members A—A—A—A are arranged in pairs at opposite sides of the door 22, the members of each pair being disposed respectively at the top and bottom of the door. These crank members serve to support the door 22 on the tracks 23 and 24 and are rotatably mounted in the bearing brackets B—B and B—B which are fixed to the door. The bearing brackets B—B and B—B are arranged in pairs at opposite sides of the door, the members of each pair being disposed in vertical alignment closely adjacent to the top and bottom edges of the door. Each bracket B comprises a base or back plate 28 and a cover plate 29 overlying the back plate and secured to the outer face of the door by bolts or similar securing elements. The back and cover plates are provided with complementary part bearing openings which together form a vertically disposed, susbtantially cylindrical bearing opening 30.

Each crank member A has a substantially cylindrical shaftlike bearing portion 31 journaled in the bearing opening 30 of the corresponding bracket B. At the inner end, the cylindrical bearing portion of the crank member A is provided with an annular flange 32 which has shouldered engagement with the inner end of the bearing bracket. At the outer end, the cylindrical sleeve portion 31 is laterally enlarged, as indicated at 33, said enlarged portion having shouldered engagement with the outer end of the bearing bracket B. As will be evident, the crank members A—A—A—A are thus held against endwise movement in the bearing brackets B—B and B—B. At the enlarged outer end 33 of the sleeve section 31, each crank member is provided with a laterally, outwardly projecting, downwardly inclined arm 34 which has a pivot or crank pin 35 at the outer end thereof. The crank pins 35 of the arms 34 of the top crank members A—A are journaled in the carriers F—F which are in the form of discs or rollers guided in the channel-shaped opening of the top rail 23. The crank pins 35—35 of the arms 34—34 of the bottom crank members A—A are journaled in the carriers G—G which are in the form of slides mounted on the track 24. Each slide G has a pair of antifriction rollers 36—36 rotatably mounted thereon at opposite ends, which ride on the top edge of the rail 25 of the track 24. Each carrier or slide G is preferably provided with depending spaced side portions 37—37 which embrace the rail of the track at opposite sides to thereby guide the slide lengthwise on said track. Between its ends each carrier G is provided with an upwardly opening bearing seat 38 in which the pivot or journal pin 35 of the corresponding lower crank member A is journaled. It will be evident that the four crank members are thus swingingly supported from the tracks and carry and guide the door 22 for movement into and out of the door opening 21.

The top and bottom keeper engaging bars C and D and C and D are arranged in pairs at opposite sides of the door, and the bars C and D of each pair are of similar design except as hereinafter pointed out. Each keeper engaging bar is of susbtantially square cross section and has an angularly offset outer end portion 39 provided with oppositely disposed, laterally projecting, transversely aligned, keeper engaging lugs 40—40. The keeper engaging lugs 40—40 are preferably of cylindrical cross section. Each keeper engaging bar is thus provided with a substantially T-shaped keeper engaging end. The bars C and D of each pair are verticaly aligned and are slidable respectively in vertically aligned, axial bearing openings 41—41, of square cross section, of the top and bottom crank members A—A at the corresponding side of the door. The top bars C—C, as clearly shown in Figure 1, are longer than the bottom bars D—D and have their lower ends guided in the brackets M—M, as hereinafter more fully described.

Although the sliding fit betwen the bars C and D and the square openings 41—41 of the corresponding crank members A—A provides for rotation of the crank members by the bars, the fit is rather loose so as to provide a sufficient amount of clearance to permit slight turning of the bars with respect to the crank members to allow for slight relative adjustment of the parts to compensate for the necessary relative movement of the keeper engaging locking bars and crank members A—A as hereinafter pointed out.

When the door 22 is seated in closed position within the door opening 21, the keeper engaging bars C and D and C and D are withdrawn to their innermost position and in order to accommodate the T-headed keeper engaging portions thereof in that position, the inner ends of the arms 35—35 of the crank members A—A are recessed or pocketed, as indicated at 42—42.

The operating levers H—H are respectively associated with the two sets of vertically aligned keeper engaging bars C—D and C—D. The two levers are of similar design and are connected in the same manner to the cooperating bars C and D, the arrangement differing only in that the levers are so disposed that the bars connected thereto will be rotated in reverse directions. The lever H associated with each set of bars C and D is pivotally connected at its inner end to the lower end of the bar C, as indicated at 43. Inwardly of the pivoted end 43, the lever H is provided with a laterally offset, outstanding portion 44 formed integral therewith. The lever is supported for pivotal movement by the link N which is carried by the bracket M and has its lower end pivotally connected to the offset portion 44 of the lever H, as indicated at 45, thereby supporting the lever for swinging pivotal movement. The lever H is also connected to the inner end of the bar D by a link K having its lower end pivotally connected to the inner end of the bar D, as indicated at 46, and having its upper end pivotally connected to the offset portion 44 of the lever H, as indicated at 47, the pivot 47 being a greater distance from the pivot 43 than the pivot 45.

The supporting brackets M—M of the bars C—C are fixed to the outer face of the door and each bracket M is in vertical alignment with the

top and bottom bearing brackets B—B at the corresponding side of the door. Each bracket M is of two part construction comprising a base or back plate section 48, abutting the outer face of the door, and a cover plate section 49 overlying the base section and bolted to the door. The base and cover plate sections are provided with complementary bearing seats providing a substantially cylindrical bearing opening 50 having an enlarged central section 51 in the form of an annular groove. A bearing sleeve 52 is rotatably mounted in the bearing opening 50 of each bracket M, the bearing sleeve having an enlarged central section in the form of an annular rib fitting the groove 51 of the opening 50, thereby holding the sleeve against endwise movement in the bearing bracket. The bearing sleeve 52 is rotatable in the bearing bracket M and has an outstanding lug 53 thereon to which the upper end of the corresponding link N is pivoted, as indicated at 54. The cover plate 49 of the bracket M is slotted, as indicated at 55, to accommodate the lug 53 for swinging movement with the sleeve 52 about the vertical axis of said sleeve. The sleeve 52 serves as a guide for the lower end of the corresponding bar C and is provided with an axial, vertical guide opening of substantially square cross section within which said bar slidingly fits. As will be evident, the bars C—C and the sleeves 52—52 are thus connected for rotation in unison while said bars are slidable endwise in said sleeves. As will be further evident, each operating lever H is operatively connected to the corresponding top bar C by the link N, which is pivoted to the sleeve 52, and to the corresponding bottom bar D by the link K, so that swinging movement of the lever in a horizontal plane about the vertical axes of said bars effects rotation of the latter and the connected crank members A—A, and so that swinging movement of the lever in a vertical plane on its pivot 45 forces the bars C and D of each set vertically apart and projects the same outwardly of the bearing brackets B—B to cooperate with the corresponding keepers E—E.

The keepers E—E and E—E are arranged in sets at opposite sides of the door opening 21, the two members of each set being disposed respectively above and below the door opening and secured to the side wall of the car. Each keeper E is in the form of a casting having laterally spaced, outstanding wing portions 56—56 provided with transversely aligned, opposed, interior cam slots 57—57 adapted to slidingly accommodate the lugs 40—40 of the corresponding keeper engaging bar. The inner end portion of the slot of each keeper, that is, that end portion of the slot which is nearest the door opening, is inclined inwardly toward the wall of the car to provide proper camming action to force the door closed or pry the same open when the cooperating keeper engaging bar is actuated. The outer end portions of the slots are substantially vertical, as shown, to hold the door locked when the lugs 40—40 of the cooperating keeper engaging bar are engaged therein.

The usual locking and sealing latch members 58—58 are provided for locking the actuating lever arms H—H in position when the door is closed. Locking means in the form of supporting hook brackets 59—59 are preferably also provided for latching the handle lever arms H—H in position when the door is completely withdrawn from the door opening or is in position to be moved along the tracks.

Although the keeper engaging bars C—D and C—D are herein disclosed as of square, transverse cross section and the shaftlike cylindrical bearing portions 31—31 and 31—31 of the crank members A—A and A—A as having square openings in which said bars are engaged to effect rotation of the crank members by the bars, these parts necessarily need not be so formed to effect rotation of the members A—A with the bars C and D, inasmuch as the T-headed keeper engaging ends of said bars, when withdrawn from the keepers E—E and E—E and seated in the pockets 42—42 and 42—42 of the members A—A and A—A lock said members to the bars C—D and C—D for rotation therewith. The locking bars C—D and C—D may thus be formed of round cross section and the openings of the cylindrical bearing portions or shafts of the crank members in which the bars slide may also be of circular cross section without in any way interfering with the proper operation of the mechanism.

The operation of my improved door mechanism, assuming that the door is in the closed position shown in Figures 1, 2, 3, 4, and 5, is as follows: After unlocking the latch members 58—58 in the usual way, each operating lever H is swung outwardly and upwardly from the pendant position shown in Figures 1 to 5 inclusive to a substantially horizontal position, thereby moving the parts to the position shown in Figures 6, 7, and 8. As will be evident, the levers H—H may be operated either simultaneously or successively. During the time that the lever H of each set of keeper engaging bars C—D is swung upwardly from the pendant to the horizontal position, the inner end portion of the lever swings on the pivot 45 at the lower end of the link N which is anchored against vertical displacement by its connection with the bearing sleeve 52 carried by the bracket M. As the lever H swings on the pivot 45, the top and bottom bars C and D will be pulled inwardly toward each other by the pivotal connection 43 of the bar C with the lever H and the link connection K of the lever with the bar D. The keeper engaging T-headed end of the bar C is thus moved downwardly while the T-headed end of the bar D is moved upwardly. Inasmuch as the keeper engaging lugs 40—40 of these bars travel respectively downwardly and upwardly in the slots of the top and bottom keepers E—E, the door 22 is cammed or pried outwardly from the position shown in Figure 5 to that shown in Figure 7. When the operating handle lever H reaches a substantially horizontal position, the keeper engaging T-headed ends of the bars C and D are completely withdrawn from the keepers E—E and are seated in the pockets 42 of the arms 34—34 of the crank members A—A. During outward movement of the door 22 from the position in Figures 1 to 5 inclusive to that shown in Figures 6, 7, and 8, there is necessarily a corresponding slight outward swinging movement of the arms of the crank members A—A. The looseness or clearance between the square bars C—D and C—D and the openings of square cross section in the cylindrical bearing portions 31—31 of the crank members A—A permits of the required slight amount of rotation of the arms of the crank members without binding action of the parts.

When the door has been freed from the door opening, as shown in Figures 6, 7, and 8, each operating handle lever H is rotated through an angle of 90°, thereby rotating the corresponding bars C and D and the crank members A—A con-

nected thereto from the position shown in Figures 6, 7, and 8 to the positions shown in Figures 9, 10, and 11. As will be evident upon reference to Figure 1, the operating lever H and the crank members A—A at the left hand side of the door will be rotated in a direction reverse to the corresponding parts at the right hand side of said door.

The door 22 is thus moved out of the door opening 21 clear of the side wall of the car so that the door may be slid along the tracks 23 and 24 to entirely clear the door opening. In order to prevent accidental movement of the crank arms of the crank members A—A and consequent displacement of the door inwardly or outwardly with respect to the tracks, while the door is being slid along the tracks, the handle levers H—H are preferably latched in position by the latch members 59—59. These latch members may be of any well-known character for the purpose, but, as hereinbefore described, are preferably of the hook type. In locking the handle levers H in position, these levers are swung upwardly to a sufficient extent to clear the hooks of the latch members 59 and are then dropped in back of the hook portions of said latch members, as indicated in Figure 9.

In closing the door, the operation is the reverse of that hereinbefore described. The door is slid along the tracks 23 and 24 into position in front of the door opening 21. The handle levers H—H are then disengaged from the latch members 59—59 and are swung through arcs of 90°, thereby rotating the crank members A—A and A—A and moving the door from the position shown in Figures 9, 10, and 11 to the position shown in Figures 6, 7, and 8. At the end of this part of the operation, the lever arms H—H are disposed in horizontal position, extending outwardly at right angles to the plane of the door. In moving the door 22 from the position shown in Figures 9, 10, and 11 to that shown in Figures 6, 7, and 8, the keeper engaging T-head end portions of the bars C—D and C—D are brought into substantial vertical alignment with the entrance openings of the slots 57—57 of the keepers E—E. When the parts are in this position, each operating lever H is swung downwardly to the pendant position shown in Figures 1 to 5 inclusive, thereby moving the bars C and D vertically apart and projecting the T-headed keeper engaging portions thereof into the slots 57—57 and moving the same along said slots to force the door tightly into the door opening. When the door 22 has been thus tightly closed, the lever arms H—H, which are at this time in the pendant position shown in Figure 1, are locked and sealed in the usual manner by the latch members 58—58.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of swingable means connected to said door for guiding the door into and out of the door opening; displaceable means for forcing said door into the door opening or prying the same out of said opening; and common operating means, operatively connected to both said displaceable means and swingable means, movable in one direction for actuating said displaceable means and movable in another direction for imparting movement to said swingable means.

2. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of supporting crank means connected to said door for guiding the same into and out of the door opening; rotary actuating means for said crank arms, said actuating means being slidably connected to said crank means; means engaged by said actuating means in sliding movement thereof for forcing said door tightly closed or prying the same partly open; and means for imparting rotary and sliding movement to said actuating means.

3. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of supporting crank arms connected to said door for guiding the same into and out of the door opening; keepers on the car; reciprocating keeper engaging members on said door engageable with the keepers for forcing the door tightly closed or prying the same partly open, said keeper engaging members being rotatably mounted on the door; actuating means for imparting rotary and reciprocating movement to said keeper engaging members; pivoted supporting arms for guiding the door into and out of the door opening; and means operatively connecting said arms to said keeper engaging members to impart rotary movement to said arms from said keeper engaging members to swing said arms and move said door into and out of the door opening.

4. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of swinging arms journaled on said door for guiding the door into and out of the door opening; operating bars connected to said arms for rotating the latter to move said door into and out of the door opening, said bars having a sliding connection with said arms; manually actuated means for imparting rotary and sliding movement to said bars; and keeper means on the car engaged by said bars during sliding movement thereof to either force said door tightly closed or pry the same partly open.

5. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of manually actuated operating means, said operating means being both rotatably and slidably mounted on the door; means actuated by rotation of said operating means for either moving the door into the door opening to partly closed position or withdrawing said door from the door opening from said partly closed position; and means actuated by sliding movement of said operating means for forcibly moving said door from said partly closed position to tightly closed position or prying said door to partly open position.

6. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of crank arms journaled on said door for supporting the door and guiding the same into and out of the door opening; keeper means on the car; bars supported on the door for both rotary and reciprocating sliding movement, said bars having shouldered engagement with the crank arms for imparting rotary movement to the

latter; fixed keeper engaging means on said bars engageable with said keeper means upon reciprocation of said bars for either forcing the door tightly closed or prying the same partly open; and means for imparting both rotary and reciprocating movement to said bars.

7. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of keeper means on the car; longitudinally slidable keeper engaging bars mounted on the door and cooperating with the keepers to either force the door tightly closed or pry the same partly open; manually actuated means for imparting either rotary or longitudinal sliding movement to said bars; and rotary means with which said bars have shouldered engagement for moving said door to move the same either to or from partly closed position.

8. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of crank arms for supporting said door for movement into and out of the door opening, said crank arms being journaled on the door; bars slidingly connected to said crank arms and having shouldered engagement therewith to impart rotary movement to said arms, said bars being rotatably and slidably supported on the door; means for imparting both rotary and sliding movement to said bars; and means with which said bars are slidably engageable for forcing the door into and out of the door opening.

9. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of crank members for supporting said door for movement into and out of the door opening, said crank members having journal sleeve portions rotatably mounted on the door; operating bars slidable lengthwise in said sleeve portions and having shouldered engagement with said crank members to impart rotation thereto; keepers on the car with which said bars are engageable; and manually actuated means for successively imparting rotary and sliding movement to said bars to successively impart rotary movement to the crank members to move the door partly closed and engage the bars with said keepers to force the door completely closed.

10. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of guide tracks on said wall member above and below said door opening; top and bottom crank members mounted on the door for rotation about vertically aligned axes; a crank arm on each crank member; means for pivotally and slidingly supporting the outer ends of said arms on the tracks; vertically disposed operating bars on the door connected to said crank members for rotation therewith, said bars being concentric with the axis of rotation of said crank members and being slidable lengthwise of said axis of rotation; keeper engaging means rigid with said bars; and keepers on the car having cam slots with which the keeper engaging means cooperates to either force the door tightly closed or pry the same partly open.

11. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of a guide track on said wall member; a carrier slidable on said track; a supporting arm pivoted at its outer end to the carrier; an actuating bar extending through the inner end of said arm in sliding engagement therewith, said arm and bar being rotatably supported on the door and said bar being in shouldered engagement with said arm to effect rotation of said arm with said bar; keeper means on the car; keeper engaging means on said bar; and means for actuating said bar to reciprocate the same while engaged with said keeper means and to rotate the same when disengaged from said keeper means to effect rotation of said arm.

12. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of keeper means on said wall; vertically disposed top and bottom bars on said door having fixed keeper engaging means thereon engageable with said keepers; an actuating lever swingable about horizontal and vertical axes; means connecting said actuating lever to the bars for reciprocating said bars to engage the same with said keeper means to force the door tightly closed upon swinging movement of said lever about said horizontal axis, said connecting means transmitting swinging movement of said lever about said vertical axis to said bars; supporting crank arms on the door for guiding said door into and out of the door opening; and sliding connections between said bars and crank arms providing shouldered engagement therebetween to effect rotation of said arms by said bars.

13. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of tracks on said wall above and below the door opening; crank arms having shaft portions at their inner ends rotatably supported on said door, the outer ends of said arms being slidingly and swingingly supported on said tracks; operating bars slidably engaged with said shaft portions; interengaging shouldered means on said bars and shafts to effect rotation of said shafts with said bars; keepers on the car wall; keeper engaging means on said bars engageable with said keepers to effect closing and opening movement of the door; and means for actuating said bars to effect rotary and sliding movement thereof to rotate the crank arms therewith and slide the bars with respect to said crank arms while said keeper engaging means of said bars is operatively engaged with said keepers.

14. In a door construction for regrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of tracks on said wall above and below said door opening; operating bars on said door, crank arms swingingly supported from said tracks and having slidable connection with said bars; means for rotatably supporting said crank arms on the door, said crank arms being rotatable with said bars; an actuating lever connected to said bars for rotation in unison therewith, said lever being movable with respect to said bars to effect sliding movement of the same with respect to said crank arms; keepers on the car wall with which said arms have cooperating sliding engagement to either force the door tightly closed or pry the same partly open.

15. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of tracks on said wall above and below said opening; carriers slidable lengthwise on said tracks; top and bottom crank arms pivoted at their outer ends on said carrier and having

fixed bearing sleeves at their inner ends in substantial vertical alignment; bearing members on the door in which said sleeves are journaled; top and bottom aligned keeper engaging bars on the door slidable lengthwise in said sleeves and having shouldered engagement with said sleeves to impart rotary movement to said crank arms, said bars extending entirely through said sleeves and having rigid keeper engaging means at the outer ends thereof engageable with said keepers to force the door tightly closed or pry the same partly open; and lever means for rotating said bars and for imparting reciprocatory sliding movement thereto.

16. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of tracks on said wall above and below said opening; top and bottom vertically aligned bearing brackets on said door; sleeve members rotatably mounted in said brackets, each sleeve having a supporting crank arm rigid therewith and swiveled at its outer end on the corresponding track; vertically disposed top and bottom bars slidably mounted within said sleeves in rotary driving engagement therewith; keeper means on the wall of the car having cam slots; fixed keeper engaging lugs on said bars engageable with said slots to actuate the door; and lever means for actuating said bars to impart rotary and reciprocating movement thereto.

17. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of tracks on said wall above and below the door opening; vertically arranged slidable top and bottom bars on the door mounted for both rotary and reciprocating movement; supporting means on said door rotatable on a vertical axis and held against vertical movement; an actuating lever pivoted on said support for swinging movement about a horizontal axis; motion transmitting means connecting said lever to said bars for effecting reciprocating movement thereof when said lever is swung on its horizontal axis, said motion transmitting means rigidly connecting said bars to the lever for rotary movement about a vertical axis; lever arms rotatable with said bars and swingingly connected to said tracks, said arms being journaled on the door to support and guide the door; and keeper means on said car wall with which said bars are engageable to force the door tightly closed or partly open.

18. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of top and bottom vertically disposed aligned operating bars having keeper engaging means thereon; top and bottom keepers fixed to the car wall; an operating lever pivoted on the door and connected to said bars for sliding the same vertically to engage the keeper engaging means thereof with the keepers and disengage the same therefrom; means for rotatably supporting said bars, lever and operating connections for movement in unison about a vertical axis; tracks on said wall; and supporting crank arms pivotally carried on said tracks, journaled on the door, and operatively connected to said bars for rotation therewith.

19. In a door construction for refrigerator cars having a wall member provided with a door opening, the combination with a door adapted to close said opening; of keepers on said wall; means for actuating the door for forcing the same tightly closed and prying the same partly open including top and bottom vertically disposed reciprocating bars engageable with said keepers, and an operating lever connected to said bars for reciprocating the same, said entire means for actuating being bodily rotatable about a vertical axis with said lever; tracks on the car wall; crank arms slidingly and swingingly supported on said tracks; shaft members rotatably supported on the door to which said crank arms are fixed; and slidable rotary driving connections between said bars and shafts.

HENRY FUCHS.