J. F. O'CONNOR.

REFRIGERATOR DOOR MECHANISM.

APPLICATION FILED APR. 27, 1918.

1,300,475. Patented Apr. 15, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

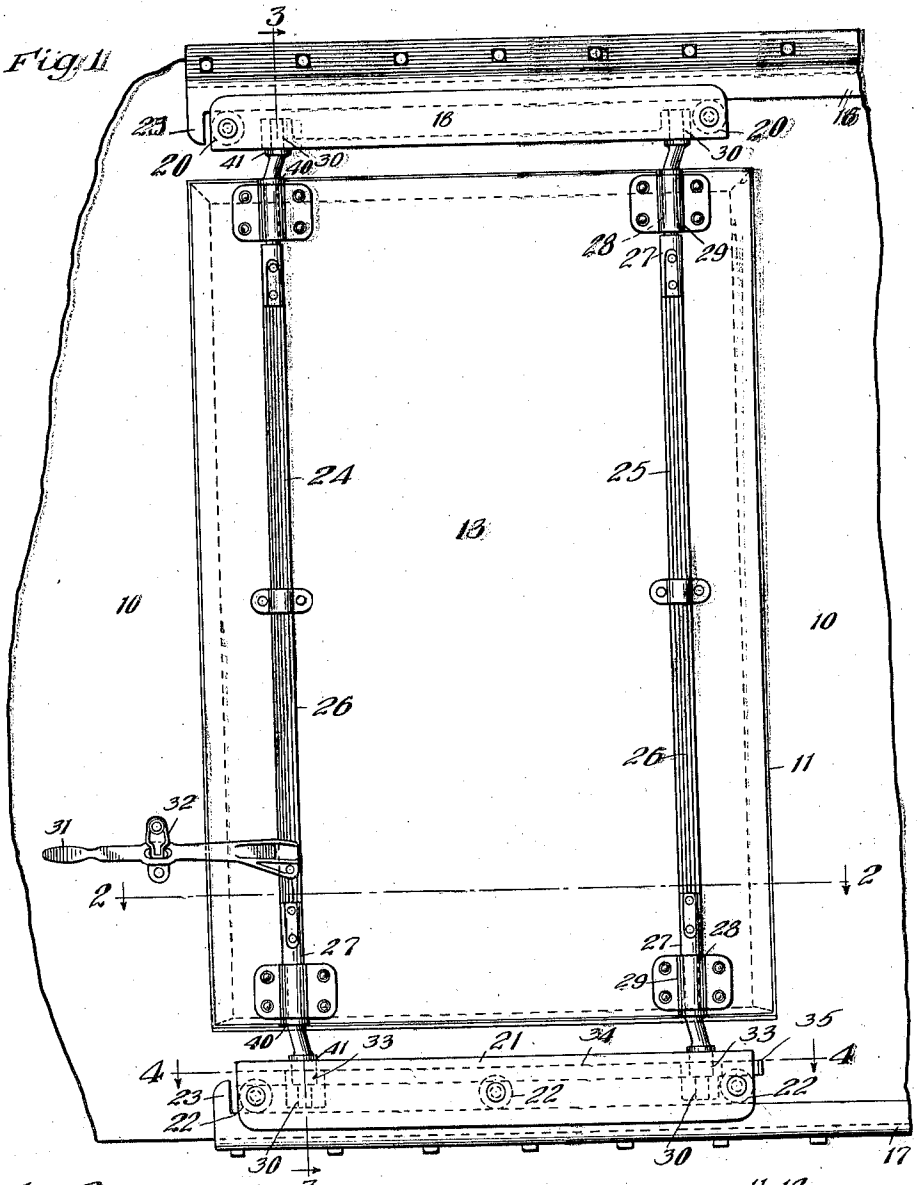
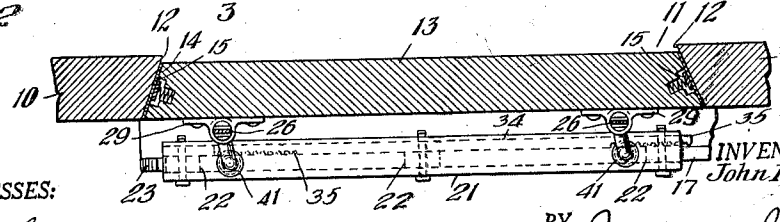


Fig. 2.



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Fig. 3

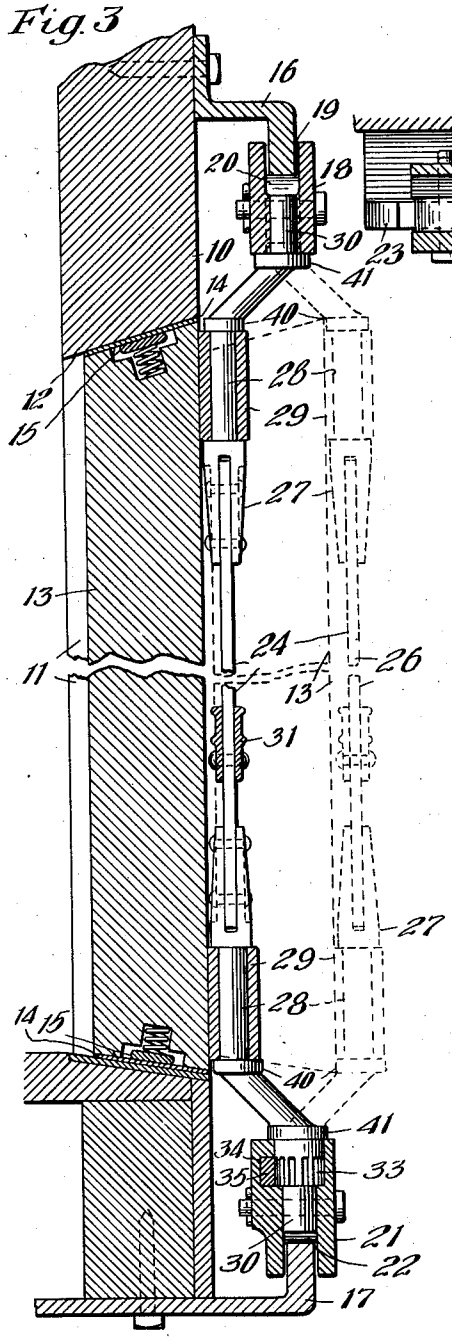
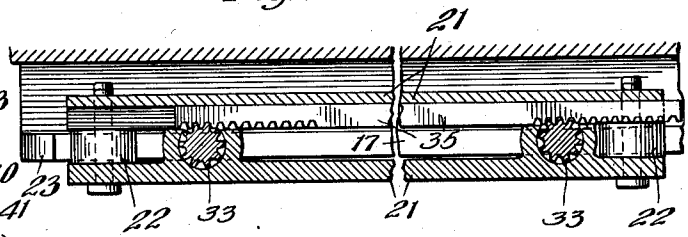


Fig. 4



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REFRIGERATOR-DOOR MECHANISM.

1,300,475. Specification of Letters Patent. Patented Apr. 15, 1919.

Application filed April 27, 1918. Serial No. 231,102.

To all whom it may concern:

Be it known that I, JOHN F. O'CONNOR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Refrigerator-Door Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in refrigerator door mechanism.

One object of the invention is to provide a door and door operating mechanism particularly adapted for refrigerator cars which mechanism is arranged to positively force a single member door to and from closed position.

Another and more specific object of the invention is to provide a single member, flush refrigerator door and simple operating mechanism for positively forcing the door to and from closed flush position, the mechanism being such that when the door is in open or outer position, it can be shifted lengthwise so as to leave the door opening clear.

In the drawing forming a part of this specification, Figure 1 is a side elevational view of a portion of a refrigerator car showing my improvements in connection therewith. Fig. 2 is a horizontal, sectional view, taken on the line 2—2 of Fig. 1. Fig. 3 is an enlarged, vertical, sectional view, taken substantially on the line 3—3 of Fig. 1. The dotted lines in this figure indicate the position occupied by the parts when the door is thrown out and ready to be shifted lengthwise. And Fig. 4 is a detail, horizontal, sectional view, taken substantially on the line 4—4 of Fig. 1.

In said drawing, 10 denotes the side wall of a refrigerator car or other structure having a door opening 11 formed therein. All the surrounding edges of said door opening are inwardly beveled, as indicated at 12. Adapted to close the said door opening is what I may term a single-piece door 13. The term "single-piece" is employed to distinguish the door from the usual type of refrigerator door which comprises two oppositely swinging hinged door members. The said door 13 has its edges also beveled, as indicated at 14, and in order to form a seal, the door is provided with any usual or suitable spring-pressed packing 15. The door opening and door are so designed that the door will assume an approximately flush position with the outer surface of the car wall.

For the purpose of both supporting the door and the operating mechanism, I provide an upper, longitudinally extending rail 16 preferably in the form of a Z-bar and a lower longitudinally extending rail 17, both of said rails being secured to the car in any suitable manner. Slidable on the upper rail 16 is a carriage 18 having a suitable longitudinally extending groove or recess 19 to accommodate the down-turned flange of the rail, as shown in Fig. 3. In order to minimize friction, the carriage 18 is provided with a pair of rollers 20—20 at its ends which bear directly on the edge of the rail.

Mounted on the lower rail 17 is a corresponding carriage 21 having anti-friction rollers 22—22. The carriages 18 and 21 are limited in their movement toward the left, as viewed in Fig. 1, by suitable stops or shoulders 23 formed at the ends of the rails 16 and 17.

Journaled on the door 13 are two similar operating shafts 24 and 25. Each of these shafts preferably consists of a central section 26 formed of a rectangular bar and to which is attached at its ends upper and lower crank members 27—27. The crank members 27 are each provided with journal portions 28—28 rotatably mounted in suitable bearings 29—29 carried by the door. At their outer ends, the crank members 27 have offset crank pins 30—30 journaled in the corresponding carriages 18 and 21. Said crank members 27 are provided with suitable collars 40 and 41 to properly support the door from the shafts, as will be understood from inspection of Fig. 3. The shaft 26 is provided with a pivoted operating lever 31 by which the shaft is adapted to be rotated. Said lever is arranged to be latched and sealed in the usual manner, as indicated at 32.

Each of the lower crank members 27 of the shafts 24 and 25 is formed with a gear or pinion 33 extending into suitable journal bearings provided therefor in the carriage 21. The carriage 21 is provided with a longitudinally extending groove 34 in which is slidably mounted a rack bar 35 coöperable with the gears or pinions 33—33.

Assuming the parts is in the position

shown by the full lines of the drawing, the door is opened by the operator swinging the shaft 24 by means of the lever 31. As the shaft 24 rotates with the crank pins in relatively fixed position, it is evident that the door 13 will be positively swung outwardly to the position indicated by the dotted lines in Fig. 4. While the rotation of the shaft 24 would, without any direct connection, cause the simultaneous rotation of the shaft 25, nevertheless it is desirable to insure positive simultaneous and uniform rotation of the shafts 24 and 25. For this reason, the rack and gear element above described is provided so that, as the shaft 24 is rotated its rotative movement will be positively communicated to the shaft 25 so that both shafts will rotate uniformly and simultaneously. With the door 13 swung outwardly as above described, it is evident that the entire arrangement,—door, shafts and carriages, can then be moved to one side of the door opening.

With the arrangement shown and described, I obtain a very powerful action in forcing the door to and from closed position which is highly essential when employed on a refrigerator requiring the usual spring-pressed packing around the meeting edges of the door. The arrangement is also simple and can be operated as readily as the door mechanisms now most generally in use. Furthermore, the door is always held in a definite position with respect to the car and all danger of the door being thrown outwardly and "side-swiped" is avoided, an important improvement when compared with the usual type of hinged refrigerator doors.

I claim:

In a refrigerator car having a door opening and a single element door adapted to be positioned within the door opening flush with the side wall of the car, the combination of upper and lower tracks secured to the car, of a carriage slidably mounted on each of said tracks, a pair of shafts journaled on said door, each shaft having crank arms at its ends, the upper crank arms of both shafts being journaled in the carriage slidable on the upper track and the lower crank arms of the two shafts being journaled in the carriage slidable on the lower track, two of said crank arms being provided with gears disposed within the corresponding carriage, a rack bar longitudinally slidably mounted within said carriage and coöperable with said gears, and means for directly rotating one of said shafts whereby, rotative movement of said shaft directly actuated will be positively communicated to the other shaft through said rack bar and gears.

In witness that I claim the foregoing I have hereunto subscribed my name this 10th day of April, 1918.

JOHN F. O'CONNOR.