

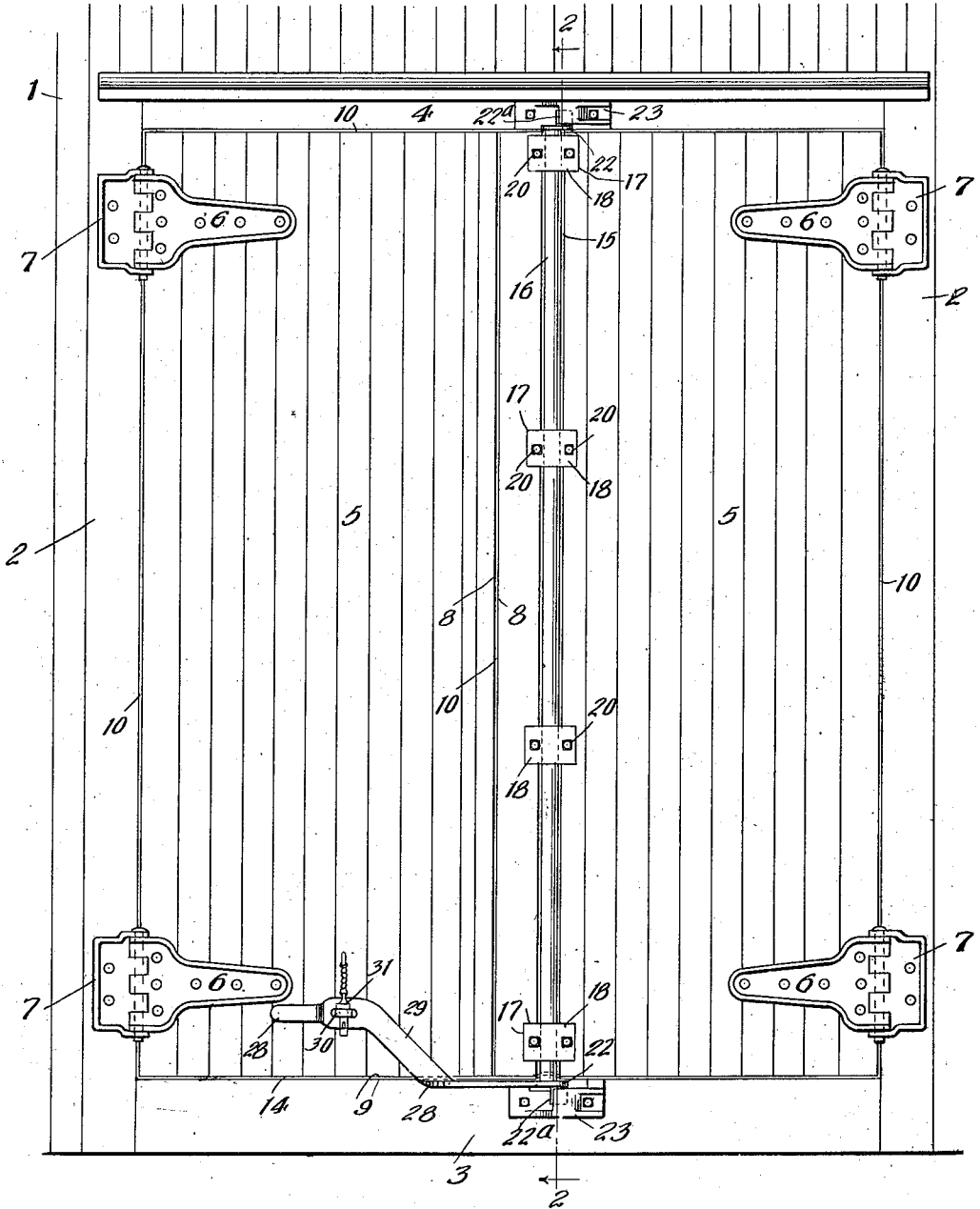
J. F. O'CONNOR.  
 REFRIGERATOR CAR DOOR AND MEANS FOR OPERATING SAME.  
 APPLICATION FILED MAY 26, 1910.

1,023,164.

Patented Apr. 16, 1912.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:

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2 SHEETS—SHEET 2.

Fig. 2

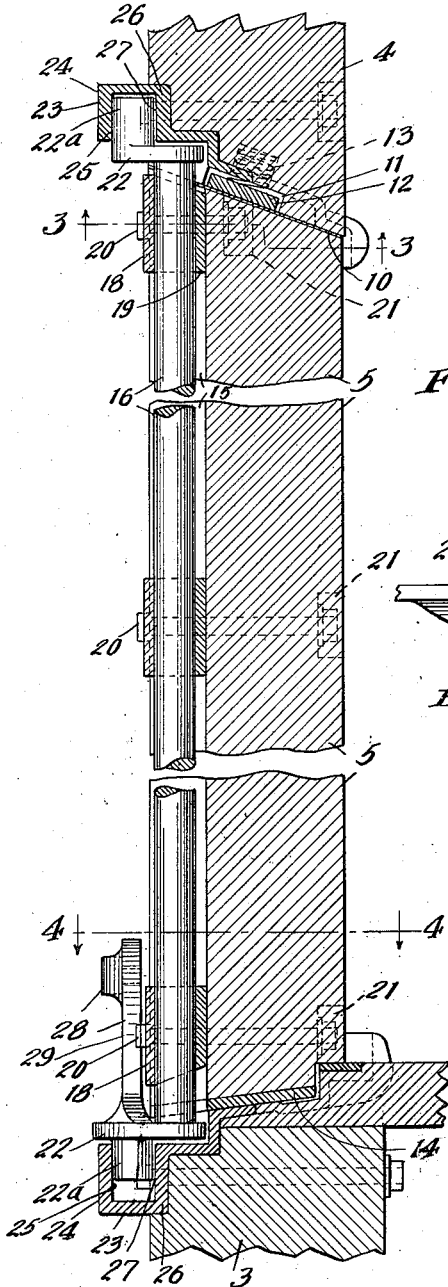


Fig. 3

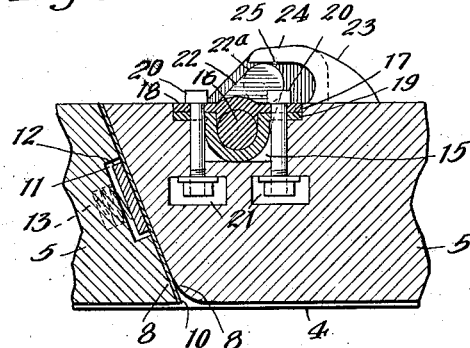


Fig. 4

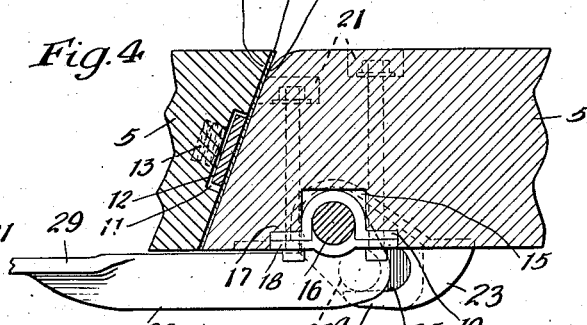
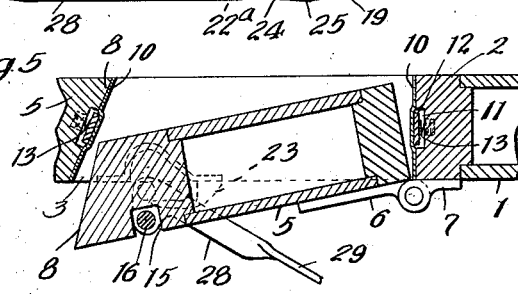


Fig. 5



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# UNITED STATES PATENT OFFICE.

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REFRIGERATOR-CAR DOOR AND MEANS FOR OPERATING SAME.

1,023,164.

Specification of Letters Patent.

Patented Apr. 16, 1912.

Application filed May 26, 1910. Serial No. 563,544.

*To all whom it may concern:*

Be it known that I, JOHN F. O'CONNOR, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Refrigerator-Car Doors and Means for Operating Same, of which the following is a specification.

My invention relates to refrigerator car doors, the meeting faces of which with each other or with the surrounding door frame are provided with a yielding or compressible packing backed up by springs mounted in suitable recesses formed either in the doors or door frame, and which packing is compressed by the closing of the doors to cause them to fit very tightly and produce effective heat insulation, the meeting faces of the doors with each other or with the surrounding door frame being beveled or wedging to cause the packing to be compressed by the door closing operation.

Heretofore in practical operation, great difficulty has been experienced, both in forcing the doors snugly closed so as to properly compress the packing between the meeting or surrounding faces of the doors and door frame, and also in forcing the doors open, and especially in cases where from exposure to wet or moisture either from the inside of the refrigerator car or from the outside, the door frame or doors become swollen. And frequently in opening the doors they are very greatly injured by prying with crow-bars or hammering with sledges.

The object of my invention is to provide and combine with the doors an improved construction of operating mechanism therefor which will serve not only to forcibly close the doors under great pressure at the final or closing movement when the doors are forced home, but also serve at the initial portion of the opening movement to apply a very great power or leverage in starting the doors open, however tightly the doors may stick or however greatly the packing may be compressed between the beveled or wedging meeting faces of the doors with each other or with the door frame, in order that the doors may be both opened and closed without injury or hammering, and which will enable the compressible packing to be always so tightly compressed as to afford effective heat insulation, and in which at the same time the mechanism employed for forcibly closing

the doors and for forcibly prying them open may be mounted and practically combined with the doors and door frame with but relatively very slight projection beyond the outside face of the car or of the door frame.

My invention consists in the means I employ to practically accomplish this object or result as herein shown and described and more particularly specified in the claims.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of refrigerator car doors embodying my invention, and showing a portion of the upright side wall of the car. Fig. 2 is a vertical, cross section on line 2-2 of Fig. 1. Figs. 3 and 4 are horizontal sections on lines 3-3 and 4-4 respectively of Fig. 2 and Fig. 5 is a detail horizontal section, similar to Fig. 4, showing the parts in a different position.

In the drawing, 1 represents a portion of the upright side wall of a refrigerator car, 2 the uprights of the door frame, 3, the sill and 4 the lintel or upper horizontal member of the door frame.

5, 5 are refrigerator car doors connected by hinges 6, 7 at their outer edges with the uprights of the door frame, and having beveled or meeting wedging faces 8 for engagement with each other and for engagement with the corresponding wedging faces 9 of the door frame. At the meeting faces of the doors with each other and with the door frame, a yielding or compressible packing 10 is employed, mounted in a suitable packing recess 11, and preferably having a rigid supporting strip 12, backed up by springs 13. The packing 10 at the outer faces of the doors which meet or close together is formed in one of the doors. At the meeting faces of the doors and door frame, the packing recess is preferably formed in the door frame. The doors are preferably furnished at their lower end faces with a metal wear plate 14 secured to the lower wedging face of the doors.

The outermost of the two doors is provided near its free upright edge with a longitudinal channel 15 to receive the operating shaft 16 flush within its outer face, and also with recesses or sockets 17 to receive the bearings 18, 19 in which the operating shaft is journaled, said bearings being secured to the door by bolts 20, the nuts of which fit in slots or recesses 21 formed in the door for that

purpose. The operating shaft 16 and its bearings, 18, 19, thus project very slightly, if at all, beyond the outer face or line of the doors or door frame. The operating shaft 5 16 is provided at its upper and lower extremities with crank arms or eccentric ends 22, the wrist pin portions 22<sup>a</sup> of which are adapted to engage keepers 23 on the door frame. Each of the keepers 23 has an outer 10 jaw 24 with a wedge face 25 coacting with the crank arm 22 or its wrist pin or eccentric portion 22<sup>a</sup>, of the operating shaft to force the door closed under great pressure when the operating shaft is turned in the direction 15 to force the doors closed. Each of the keepers 23 also has a cooperating jaw 26, having a wedge or operating face 27 which engages the crank arm 22 of the operating shaft, and serves to force the door open when the oper- 20 ating shaft is turned in direction to open the door, a very powerful leverage being exerted at the initial portion of the opening movement, owing to the nearly tangential position or arrangement of the engaging or co- 25 operating faces of the jaws and crank arm or the wrist pin portion of the latter. And for the same reason, the doors are forced closed under very powerful leverage and the packing forcibly compressed by reason of 30 the interengaging wedge faces of the doors with each other and with the door frame as the crank arm of the operating shaft or the wrist pin portion thereof approaches the tangential relation to the face of the outer 35 jaw 24 when the operating shaft is turned sufficiently to completely close the doors.

The operating shaft 16 is furnished with an operating lever 28 extending from the crank arm portion 22 of the operating shaft 40 below the doors and having an upward bend 29 therein to bring the operating shaft against the outer face of the inner door to enable the same to be fastened or locked thereto by the interengaging door lever fastener devices 30 and 31 on the door and lever 45 respectively.

As in my invention, the upright operating shaft and its bearings are mounted in channels or recesses provided for their reception 50 in the outer face of the door, and as the crank arms at the upper and lower ends of the operating shaft and the cooperating keepers project only very slightly beyond the outer face of the door frame, and as the 55 operating lever projects or extends from the crank arm below the doors and provided with an upward bend to bring it against the outer face of the inner door, the door operating mechanism, as a whole, has substantially no external projection on the outside 60 of the car, while at the same time provision is made for exerting a very powerful pressure or leverage in both closing and opening the doors, since the axis of the shaft 65 is brought well in toward the middle of the

thickness of the heavy door the thrust of the shaft is exerted within the outer face of the door and as near as possible to a perpendicular direction from the bearing faces of the spring-pressed yielding packing that seals 70 the edges of the doors. This particularly appears from Figs. 3, 4 and 5 of the drawings.

By mounting the operating shafts in the manner which I have shown flush with the outer surface of the refrigerator car doors and securing the operating lever at a point 75 below the lower edge of the car door and extending the same upwardly so that it lies flat against the car door whenever the door is closed or opened, I am enabled to 80 mount the same on refrigerator cars which are substantially four inches wider than has been customary in refrigerator cars employing an operating shaft of the general type which I have shown. Hitherto 85 in the common construction of refrigerator cars employing an operating shaft projecting beyond the outer face of the door, the door has been held away from the sides of the car whenever the door has been swung 90 back, and has thus been liable to be engaged by projections on station platforms or adjacent cars, thereby ripping the operating shafts or the doors from the cars.

As the lever 28 extends from the crank 95 arm 22 beyond the outer faces of the doors and door frame and below the lower ends of the doors, the lever may be swung in opening and closing the doors through an arc of 180 degrees, as will be readily understood from Figs. 1, 2, 4 and 5 of the 100 drawing, thus enabling the crank arms or wrist pins thereof and the interengaging jaws of the keepers to act effectively in opening and closing the doors. 105

I claim:—

1. The combination with a door, of an operating shaft flush with the outer face of the door and provided with a crank arm at its lower end, a keeper engaging said crank arm and a lever extending from said crank arm and having a portion adapted to fit against the outer face of the door and lie flat thereagainst when the door is in its open position, substantially as specified. 110 115
2. The combination with a door, of an operating shaft having its axis located below the outer face of the door, and provided with a crank arm at its lower end, a keeper engaging said crank arm, and an operating 120 lever extending from said crank and adapted to fit against the outer face of the door, said operating shaft being adapted to be given a half turn by said lever, said lever comprising an upwardly extending portion adapted to lie flat against the door when the latter is swung back. 125
3. The combination with a car door frame, of a door hinged thereto, and provided on its outer face with a channel, an operating 130

shaft located within said channel and provided with crank arms at its extremities projecting beyond the upper and lower ends of the door, keepers secured to said door frame and having jaw faces for engagement with said crank arms and a lever secured to the lower of said crank arms, said lever having horizontal and upwardly extending portions, the upwardly extending portion being adapted to lie flat against the door when swung back thereagainst, and the crank arms and

horizontal portion of the lever assuming positions below the level of said outer face of the door when the lever is swung back against the door, whereby the door is adapted to lie snugly against the car side, substantially as and for the purpose described.

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