

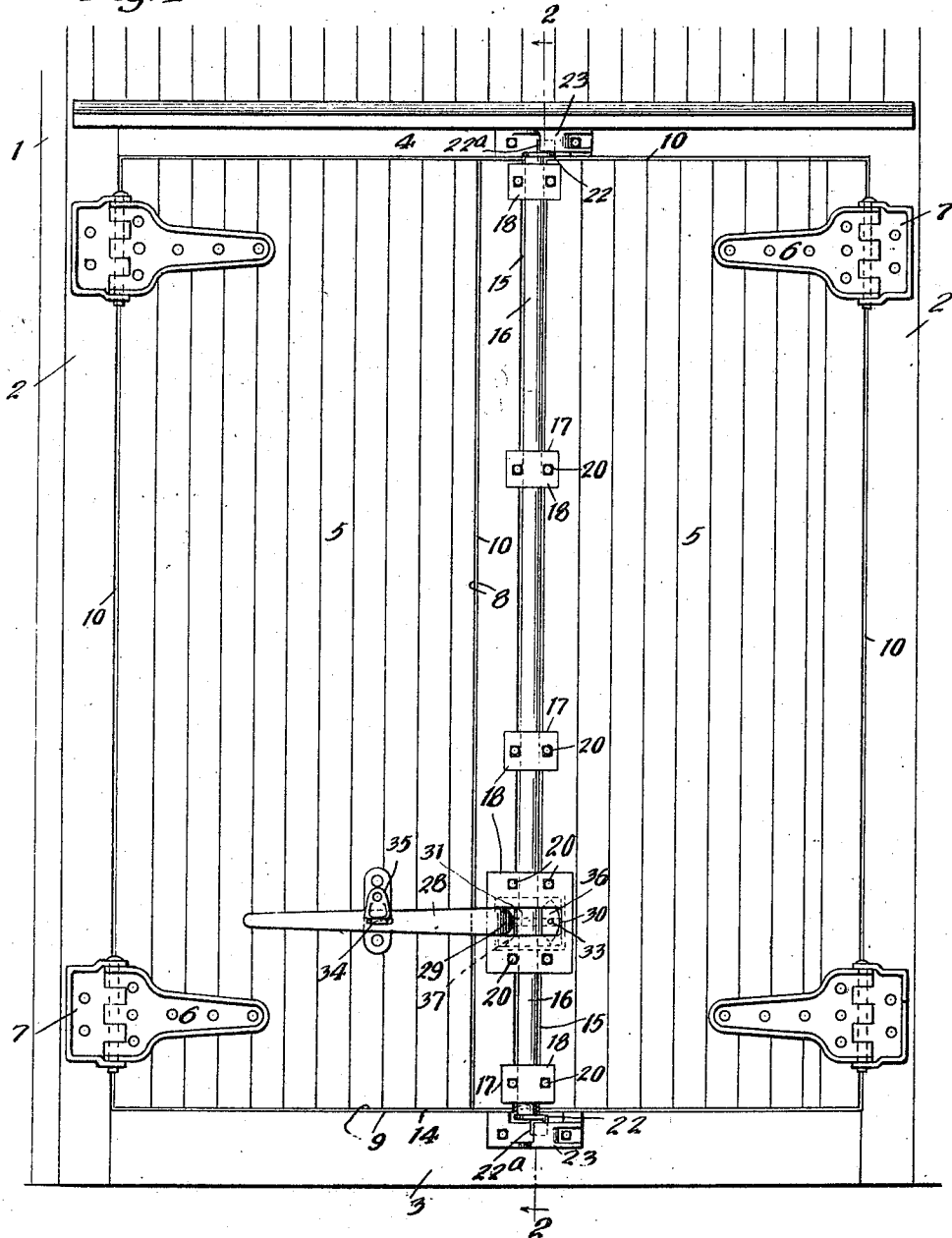
J. F. O'CONNOR.
FASTENING MECHANISM FOR REFRIGERATOR CAR DOORS.
APPLICATION FILED MAY 26, 1910.

982,087.

Patented Jan. 17, 1911.

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2

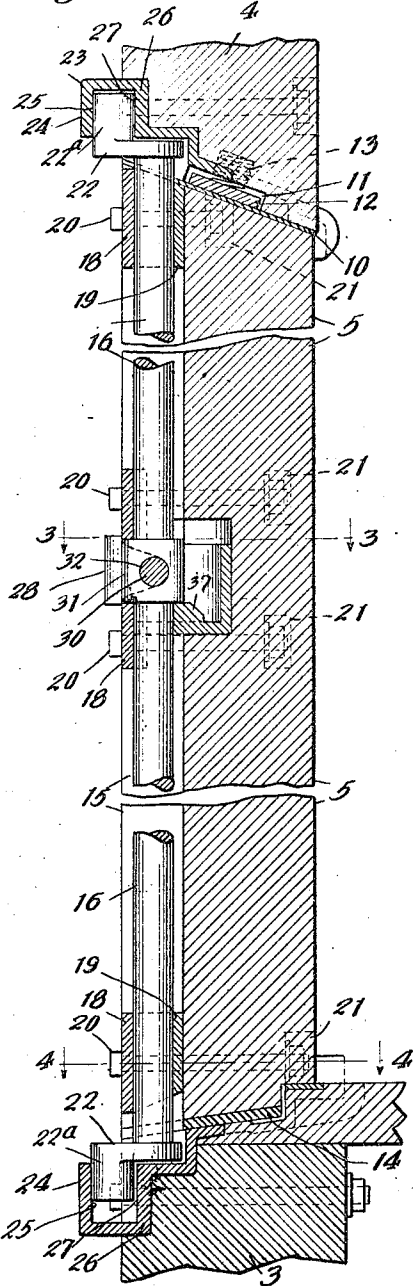


Fig. 3

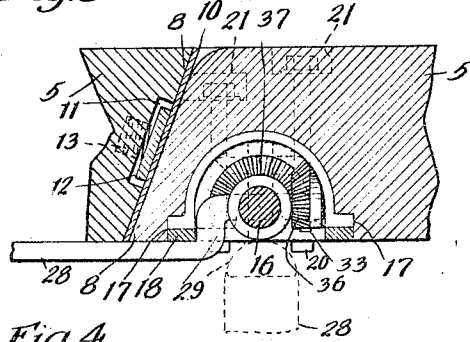


Fig. 4

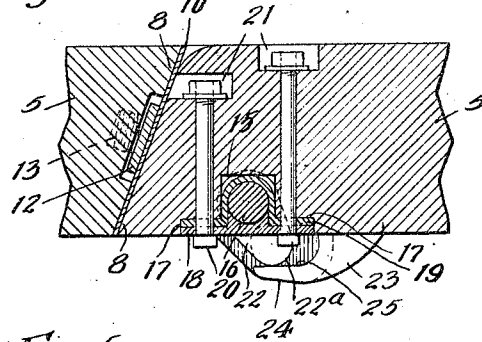


Fig. 5

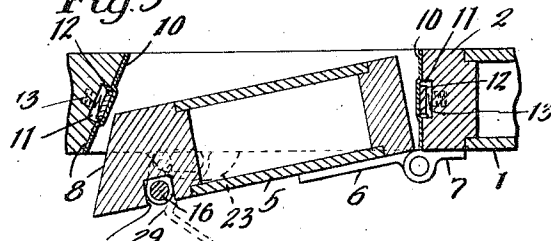
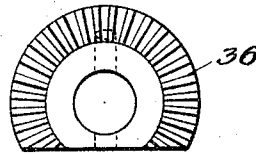


Fig. 6



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FASTENING MECHANISM FOR REFRIGERATOR-CAR DOORS.

982,087.

Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed May 26, 1910. Serial No. 563,546.

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 Fastening Mechanism for Refrigerator-Car Doors, 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, while at the same time the operating lever may be applied to the shaft at its middle portion, and also adapted to swing through an arc of 180 degrees, and thus fit flat against the doors when they are closed or opened, and operate effectively in opening and closing the doors.

To accomplish this object or result, and herein my invention consists, I provide the overlapping door or the one upon which the operating shaft is mounted, with a channel to receive the operating shaft substantially flush therewith, and provide the operating shaft with a bend or offset and a swivel connection with the operating shaft, so that by giving the lever a half turn about its own axis, it will fit snugly against the doors when they are closed, as well as when the operating shaft is given a full half turn through an arc of 180 degrees to force the doors open; the operating shaft at its lever being provided with a connecting mechanism, preferably intermeshing gears for automatically imparting to the operating lever the necessary axial rotation as the operating shaft is being turned thereby.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices 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. Fig. 5 is a detail horizontal section, similar to Fig. 4, showing the parts in a different position, and Fig. 6 is a detail view of the bevel gear on the operating shaft.

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 of 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 door 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 overlapping door 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 doors 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 16 is provided at its upper and lower extremities with crank arms or eccentric ends 22, the wrist pin portions 22^a of which are adapted to engage keepers 23 on the door frame. Each of the keepers 23 has an outer jaw 24 with a wedge face 25 coacting with the crank arm 22, or its wrist pin or eccentric portion 22^a, to force the door closed under great pressure when the operating shaft is turned in the direction to force the doors closed. Each of the keepers 23 also has a co-operating 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 operating 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 coöperating 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 the inter-engaging 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 jaw 24 when the operating shaft is turned sufficiently to completely close the doors.

The operating shaft 16 is furnished at its

middle portion with an operating lever 28 having a bend or offset 29 therein and a swivel connection 30 with the operating shaft, the operating shaft 16 preferably having an enlargement 31 furnished with a hole 32 to receive the swivel or pivot end 30 of the bent operating lever. The bend or offset 29 in the lever 28 enables its swivel end 30 to enter the hole in the operating shaft, although the operating shaft is mounted in the upright channel 15 of the door. A cotter 33 in the swivel end of the lever serves to retain it in position on the operating lever. When the doors are in their closed position, the operating lever is secured or locked to the inner door by the lever fastener devices 34, 35 and fits snugly against the outer faces of the doors, as will be readily understood from Fig. 3. To open the doors, the operating lever is swung around to the position indicated by the dotted lines in Fig. 3, the bend or offset 29 in the lever enabling the operating shaft to be given a full half turn by simply axially rotating the lever 28 a half turn in its axial bearing on the operating shaft. As in my invention, the lever 28 has a bend or offset, it is adapted to fit snugly against the outer face of the doors, while at the same time it is also adapted for connection with the operating shaft which fits within the outer face of the door in which it is mounted, the swivel connection of the lever with the shaft enabling the lever to be given a half turn as required to bring the bend or offset into coöperative relation with the recessed shaft into whatever position the shaft may be turned.

To cause the lever 28 to be given the necessary axial half turn as the operating shaft is turned by the lever to open the doors, I provide the operating shaft and lever with connecting means to cause the lever to axially turn as the operating shaft is turned thereby. The connecting means which I prefer to employ between the lever and operating shaft are intermeshing beveled gears 36, 37 on the operating shaft and lever respectively, the same being preferably segment gears.

As in my invention, the upright operating shaft and its bearings are mounted in a channel or recesses provided for their reception in the outer face of the door, and as the crank arms at the upper and lower ends of the operating shaft and the coöperating keepers project only very slightly beyond the outer face of the door frame, and as the operating lever projects or extends from an operating shaft recessed into the doors and is provided with an outward 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 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. This enables the refrigerator car, furnished with my doors and operating mechanism therefor to be built of the full width of other cars, and materially enlarges the carrying room or space and capacity of the refrigerator car.

I do not herein claim broadly the combination of an operating shaft adapted to be mounted in a channel near the edge of a swinging door and provided with crank arms at its upper and lower extremities adapted to engage keepers on the door frame with an axially rotatable lever connected to said operating shaft, and having a bend therein to adapt it to fit parallel to the outer face of the door when the operating shaft is turned into either operative or inoperative position, as that forms the subject of my companion copending application 563545, filed May 26, 1910.

I claim:—

1. The combination with an operating shaft adapted to be mounted in a channel near the edge of a swinging door, said shaft being provided with crank arms at its upper and lower extremities adapted to engage keepers on a door frame, of an operating lever provided with an offset end having a

swivel connection with said shaft, whereby said lever is adapted to turn axially and lie parallel with the face of the door without interference from the walls of said channel when said operating shaft is turned into either operative or inoperative position, said lever and operating shaft having coacting means to cause the lever to rotate as the shaft is turned by said lever.

2. The combination with an operating shaft adapted to be mounted in a channel near the edge of a swinging door, said shaft being provided with crank arms at its upper and lower extremities adapted to engage keepers on a door frame, of an operating lever provided with an offset and having a swivel connection with said shaft, whereby said lever is adapted to turn axially and lie parallel with the face of the door without interference from the walls of said channel when said operating shaft is turned into either operative, or inoperative position, said lever and operating shaft having intermeshing gears to cause the lever to rotate as the shaft is turned by said lever.

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