Jan. 10, 1939. J. F. LONERGAN 2,143,226

CAR DOOR

Filed March 5, 1936 2 Sheets-Sheet 1

Fig. 1.

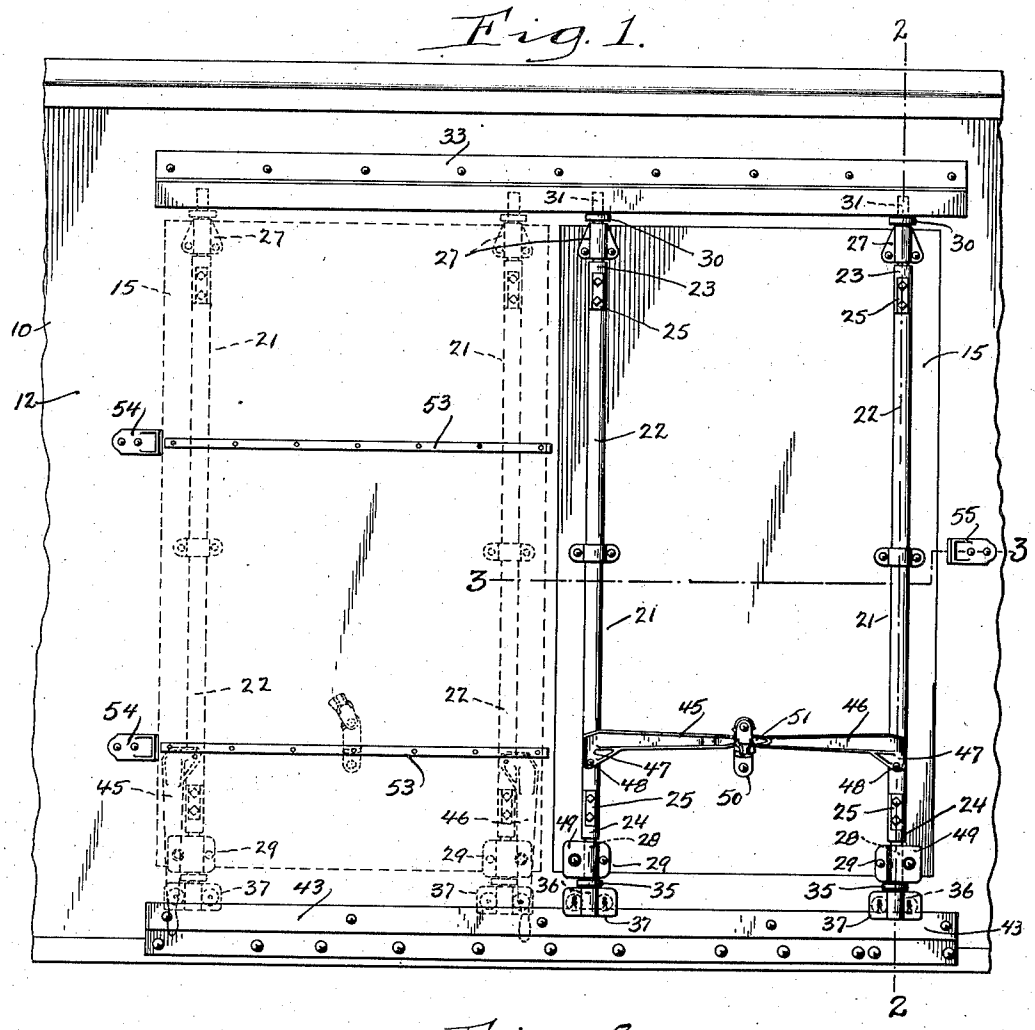

Fig. 3.

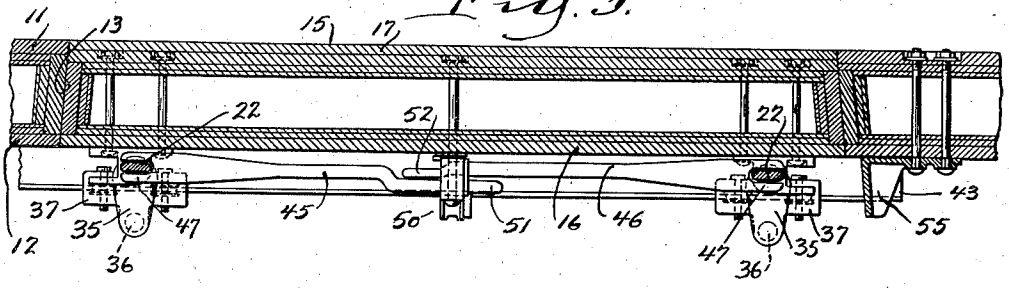

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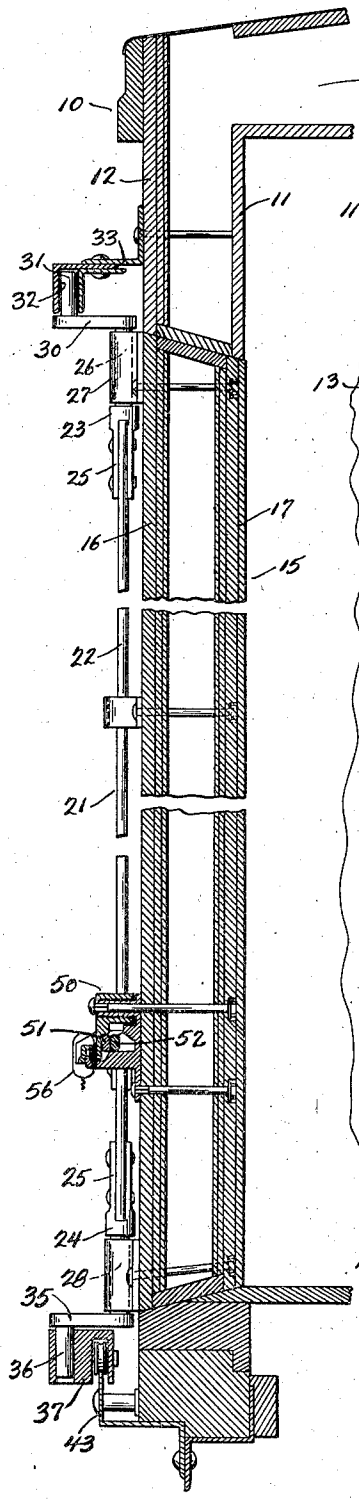
Fig. 2.



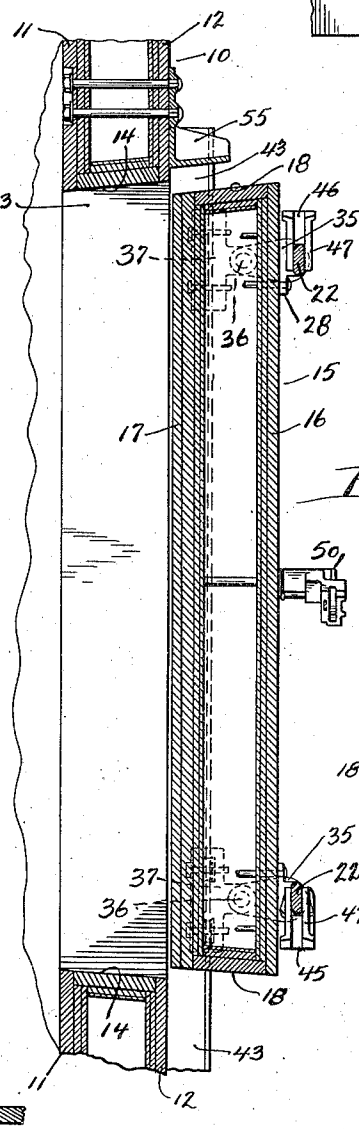


Fig. 5.

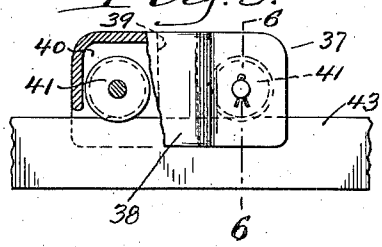


Fig. 6.

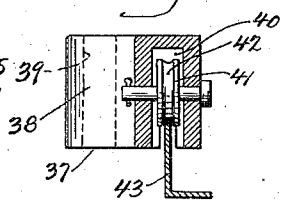
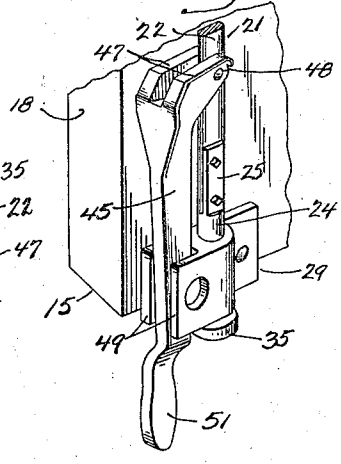


Fig. 4.

Fig. 7.



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Patented Jan. 10, 1939 2,143,226

UNITED STATES PATENT OFFICE

2,143,226

CAR DOOR

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Application March 5, 1936, Serial No. 67,315

1 Claim. (Cl. 20—23)

My invention relates in general to improvements in doors of railway house cars in which the doors are of sliding construction, and relates in particular to car doors for refrigerator cars of the class which are moved outwardly and inwardly out of and into the car door opening by suitable operating means; and which, when opened, may be moved along away from the door opening upon suitable track.

It is well known to those skilled in the art that the railroads specify the maximum overall dimensions of freight cars with the doors thereof in open positions. It is also well known that it is quite essential that the operating means be locked when said doors are in their open positions to prevent binding. Attempts have heretofore been made to accomplish these results, but in those cases where the door was of insulated construction and of substantially the same thickness as the depth of the opening, it was found that the locking means employed on such doors would project beyond the regulation distance.

It has been an object of my invention to provide an insulated door of such thickness that it shall come flush with the inside and outside of the car when in closed position, and also to provide locking means for the operating means thereof which shall retain the door in its open position so that the outside dimension of the car and fittings when the door is in such position shall not be greater than the standard width prescribed by the railroads.

Moreover, my invention is of such a nature that the door may be easily moved from its closed position to its open position; and, when being moved into its closed position in the door opening, the operating means will serve to enable the operator to readily close the door.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a fragmentary side elevation of a house car equipped with my invention, and shows the door in its closed position in full lines and in its open position in dotted lines.

Fig. 2 is an enlarged, longitudinal, sectional view, of my invention and is taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged, transverse, fragmentary, cross-sectional view of my invention and is taken on line 3—3 of Fig. 1, with the door in its closed position.

Fig. 4 is a similar view showing the door in its open position.

Fig. 5 is an enlarged, side elevation, partly in section, of the sliding block of my invention.

Fig. 6 is a cross-sectional view of the sliding block, and is taken on line 6—6 of Fig. 5.

Fig. 7 is an enlarged, fragmentary, perspective view of one of the lock bars of my invention with its actuating lever and the lock thereof.

In the drawings, 10 represents the house car to which my invention is applied. This car is of the refrigerator type having interspaced, insulated inner and outer walls 11 and 12, respectively. In the side walls 11 and 12 of the car is provided the door opening 13, the faces 14 of which being bevelled, as is customary.

A door 15 is provided for closing the opening 13. This door is formed with an outer wall 16 and an interspaced inner wall 17. The edge surfaces 18 of the door are bevelled to correspond with the bevel 14 of the edge surfaces of the opening, so that when the door is in its closed position as shown in Figs. 1, 2, and 3, it will tightly close the opening, and when closed, will have its inner wall 17 and its outer wall 16 substantially flush with the inner wall 11 and the outer wall 12 of the car, respectively. The yieldable surfaces usually provided may be formed either in the edge surfaces 18 of the door or in the faces 14 of the opening 13, but since these are well known they are not shown or further described.

Two operating bars 21 are arranged on the outside of the outer wall 16 of the door and are placed one near each vertical edge thereof. Each of these bars preferably comprises a flat rod section 22 at the upper end of which is a crank member 23, and at the lower end of which is a crank member 24. Each of these crank members 23 and 24 is provided with a bifurcated portion 25 with which the ends of the rods 22 are engageable and to which such ends are fastened by means of suitable bolts and rivets, as shown. Each of the crank members 23 is provided adjacent to the bifurcated end 25 with a bearing portion 26 which is rotatably mounted in a bearing plate 27, secured to the outer wall 16 of the door near its upper edge. Each of the lower crank members 24 is provided with a bearing portion 28 which is rotatably mounted in a combined bearing and retaining member 29. Each of the upper crank members 23 is provided with a crank arm 30 having an upwardly extending crank pin 31. The crank pins 31 are disposed in the groove 32 of an upper track member 33.

Each of the lower crank members 24 is provided with a crank arm 35 extending downwardly

from which is a crank pin 36. Each of these crank pins is rotatably mounted in a roller block 37. Each of these blocks is provided with a boss 38 having a bore 39 for the reception of the crank pin 36. The block is also povided with a recess 40 in which two rollers 41 are rotatably mounted. These rollers are formed with grooved peripheries 42 for engagement with a lower track 43, secured below the car door opening and extending outwardly from the outer wall 12.

One of the operating bars 21 is provided with an operating lever 45, and the other operating bar, with operating lever 46. Each of these levers is provided with an inner bifurcated and offset end 47 which straddles the rod section 22 of each of the bars and which is pivotally secured thereto by means of a pivot pin 48. By reason of the offset portions 47 of the levers, each will hang alongside the operating bar to which it is attached when the operating bar is in its outer position, as shown in Fig. 7. Obviously, when each of these levers are in the position shown in Fig. 7, the doors will have been moved to its outer position, as shown in Fig. 4, from which position it may be moved along the tracks 33 and 43 to its open position, as shown in dotted lines in Fig. 1.

Arranged in a central position and secured to the outside wall 16 of the door is a sealing mechanism 50 for receiving the ends 51 and 52 of the levers 45 and 46, respectively, when in their closed positions as shown in Figs. 1 and 3, in which positions they will be in overlapping relation, as shown in Fig. 3. Two bearing strips 53 are secured to the outside wall 12 of the car and they extend from the door opening across the path travelled by the door when it is being moved from its closed to its open position, or vice versa. Suitable stops 54 are provided for limiting the movement of the door when it has reached the position shown in dotted lines in Fig. 1. A stop 55 located at one side of the door opening is also preferably provided. This stop limits the movement of the door when it is moved to a position where it is in registration with the car opening so as to prevent the door being pushed beyond the ends of the tracks.

From the foregoing, it will be obvious that when the door is in its closed position, as shown in full lines in Figs. 1, 2, and 3, the crank arms will have been operated so as to move the operating bars 21 and the door carried thereby inwardly so as to place the door firmly and tightly into its opening 13. When in this position the levers 45 and 46 will be in engagement with the sealing device 50, and the car will be ready for transportation after passing a seal 56 (Fig. 2) through the sealing device 50, in the customary manner.

When it is desired to open the door equipped with my invention, the seal 56 is broken, the levers 45 and 46 are released from the sealing device, and the operating bars 21 are rotated by pulling the levers 45 and 46 outwardly toward the operator. As the levers are moved outwardly and the operating bars rotated thereby, the upper and lower crank members 23 and 24, respectively, will pull the door 15 out of the opening 13. When the levers have been operated so as to rotate the operating bars substantially 180°, the crank arms 30 and 35 of the crank member will have moved the door out of the opening sufficiently so that the inner surface of the inner wall 17 thereof will be slightly beyond the plane of the outer surface of the outer wall 12 of the car. The levers may now be allowed to rotate about their pivots 48 and assume a suspended position, as shown in Fig. 7. When the bars have been rotated to the positions just above described, the lower ends of the levers will be engaged between the flanges 49 of the combined bearing and retaining members 29 and thus serve, by such engagement, to retain the operating levers in their open positions or the positions which they occupy when the door is in its outer position, as shown in Fig. 4. When the door is in such outer position, it can be moved along on the lower track 43, supported by the upper track 33, away from door opening and to the dotted line position shown in Fig. 1. When the door is to be closed, it is moved along the tracks in reverse direction until the door is opposite the opening 13 in the side wall of the car. The levers 45 and 46 are disengaged from the flanges 49 of the members 29 and moved upwardly so that they will be in proper position for the convenient actuation of the operating bars 21. When these bars are rotated, the crank arms of the crank members will cause the door to be moved inwardly into the car opening. The parts are so proportioned that the final movements of the crank members, when the levers are brought to their positions adjacent the door, will force the door firmly into the opening and thereby effectively close the same. After the levers have been operated to the above mentioned positions, they are engaged with the sealing member 50 in overlapped relation and may then be sealed, as hereinbefore set forth.

Having thus described my invention, what I claim is:

The combination with a refrigerator car door, of operating bars, having cranks at their extremities, for moving the door into and out of the opening, a lever for each of said operating bars, said lever being pivotally carried by the bar and so positioned as to be movable in a plane parallel to the face of the door whenever the door is fully opened or fully closed, and a retaining member for each lever secured to the outer surface of the door, each of said members forming a lower bearing support for each of the operating rods, each of said retaining members having two interspaced flanges arranged substantially parallel with the outer face of the door, each of said levers being engageable with one of said retaining members and movable to a position between the flanges thereof, whereby the lever will be maintained in its open position and the outside dimensions of the car and fittings will be no greater than the standard width prescribed by the railroads.

JAMES F. LONERGAN.