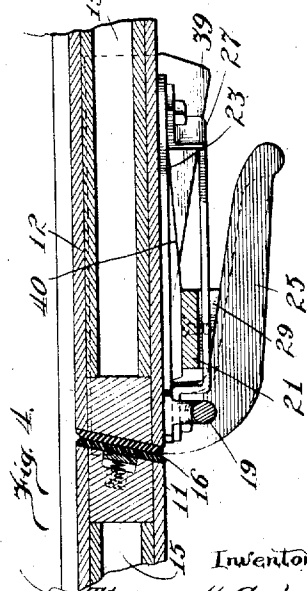
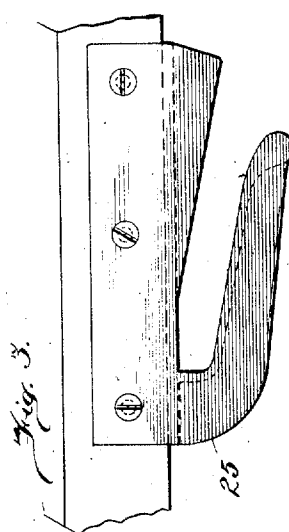
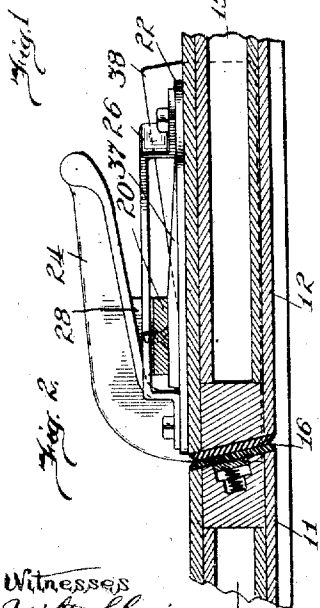
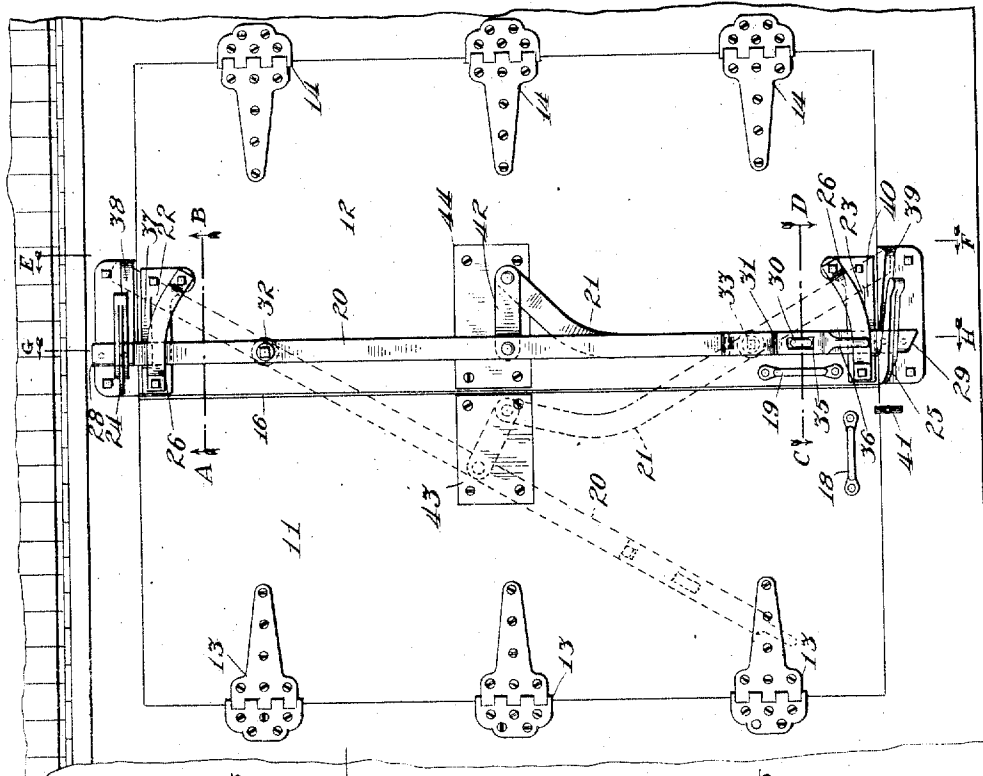


T. H. GARLAND.
CLOSING AND OPENING DEVICE FOR REFRIGERATOR CAR DOORS.
APPLICATION FILED SEPT. 20, 1911.

Patented Sept. 10, 1912.

1,037,892.

2 SHEETS—SHEET 1.



Witnesses
Milton Lenoir
C. M. Andrew

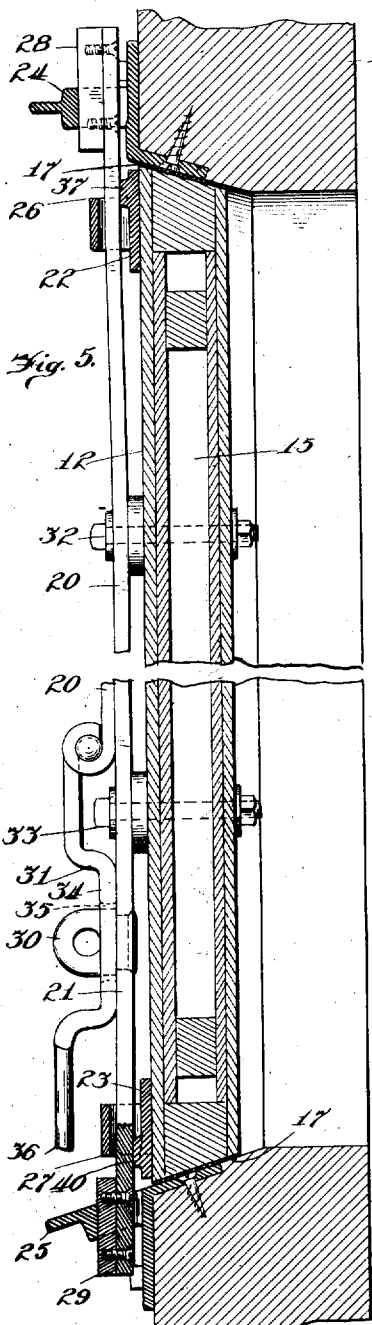
Inventor
Thomas H. Garland
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Attorney

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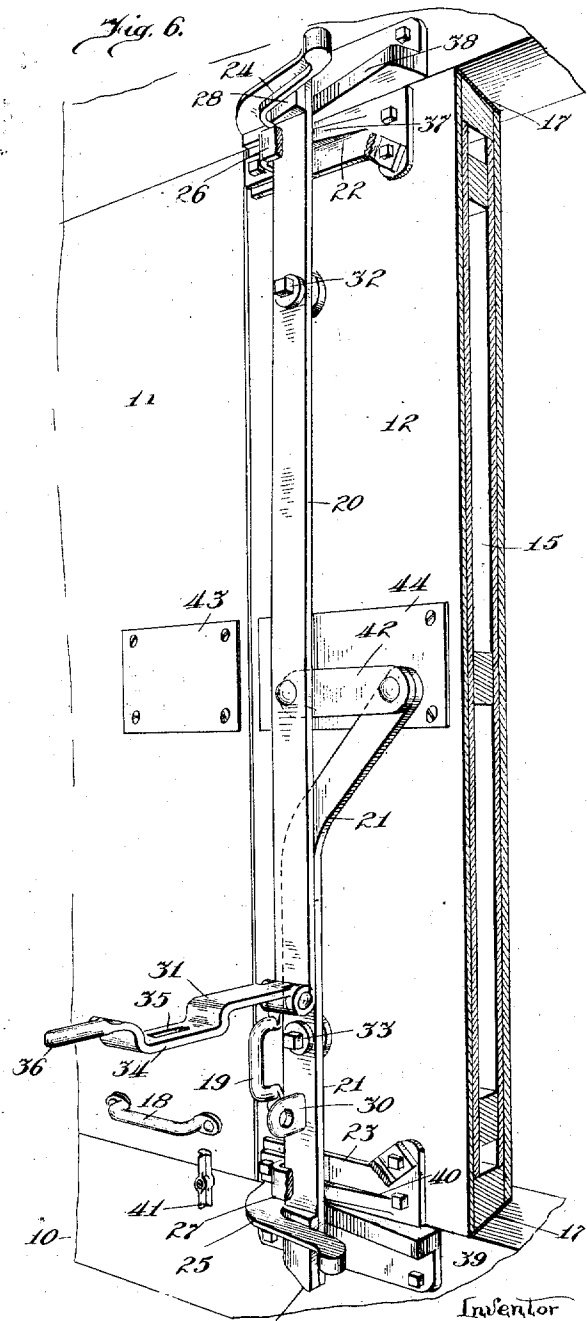
1,037,892.

Patented Sept. 10, 1912.

2 SHEETS—SHEET 2.



Witnesses
Hulton Lenoir
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Attorney.

UNITED STATES PATENT OFFICE.

THOMAS H. GARLAND, OF CHICAGO, ILLINOIS.

CLOSING AND OPENING DEVICE FOR REFRIGERATOR-CAR DOORS.

1,037,892.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed September 20, 1911. Serial No. 650,448.

To all whom it may concern:

Be it known that I, THOMAS H. GARLAND, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Closing and Opening Devices for Refrigerator-Car Doors, of which the following is a specification.

The present invention relates to closing and opening devices for doors and is especially applicable to refrigerator car doors. The latter, being constructed with padded edges in order to prevent the escape of the cold air and the entry of warm air, require a close fit between the car door and its frame whenever the door is closed, in order to maintain the efficiency of the car. But, in practice, the padding becomes damp and often torn, so that it requires considerable force both to close the door and open it.

In my prior application, Serial No. 637,814, filed July 10, 1911, I have disclosed a closing device designed to effect a tight closure, even though the doors may bind on account of the poor condition of the padding on their edges, or for other reasons. In that device, as in the present, I provide two levers pivoted, respectively, upon the upper and lower portions of the door and adapted to overlap at their inner ends to be secured in locking position and cooperating at their outer ends with cam bearing surfaces located upon the adjacent edges of the door and the frame to bring about an effective closure whenever the levers are moved to locking position—and this even though the door be some distance from being closed at the time the levers are brought into play.

The present invention is an improvement on that disclosed in my prior application and includes an improved arrangement of the levers by which a single act on the part of the user will move the levers from open to closed position, thereby preventing improper manipulation of the levers.

The present improvements also include means by which the opening movement of the levers will force the door open. This is quite necessary in instances where the padding is in poor condition and the doors stick or set in closed position.

These and other features of the invention, together with their advantages, will be more fully understood upon reference to the following detailed description taken in connection with the accompanying drawings, and the scope of the invention will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a front elevation of a portion of a refrigerator car having a door provided with a closing and opening device, constructed in accordance with the present invention; Fig. 2 illustrates the retaining means associated with the upper edge of the car door, parts being shown in section taken on a plane indicated by the line A—B of Fig. 1; Fig. 3 is a plan view of the cam lug located upon the sill at the lower edge of the car door and forming a portion of the retaining means located at that point; Fig. 4 is a view similar to Fig. 2, illustrating the retaining means at the lower edge of the car door, the section being taken on a plane indicated by the line C—D of Fig. 1; Fig. 5 is a vertical section of the device and the car door and frame, taken on a plane indicated by the line G—H of Fig. 1; and Fig. 6 is a perspective view of the device, the car doors and the frame, the section of the door being taken on a plane indicated by the line E—F of Fig. 1.

Throughout these views, like characters refer to like parts.

Referring to the drawing in detail, 10 designates the body of the car provided with the usual doors 11 and 12, mounted upon the hinges 13 and 14, respectively. The construction of the body of the car and of the doors is the usual construction and forms no part of my invention. As illustrated, the doors are formed with dead air spaces 15 and, for convenience, I have termed the portion of the car wall, into which the doors fit, the door frame, although I have not illustrated any special frame construction. As illustrated, the engaging portions of the doors 11 and 12 are also beveled and provided with the usual padding 16 upon their engaging edges, and the padding 17 upon their upper and lower edges, the latter being illustrated particu-

larly in Fig. 6, and the former in Figs. 2 and 1. The left-hand door 11 is provided with a handle 18, and the right-hand door with a handle 19. The structure thus far described is well known and, as previously stated, constitutes no part of the present invention.

In applying my invention to this car structure, I preferably locate the device upon the right-hand door 12. This device includes the upper lever or bar 20, the lower lever or bar 21, the upper bearing plate 22, the lower bearing plate 23, the upper lug 24, the lower lug 25, the upper guide 26, the lower guide 27, the upper wedge block 28, the lower wedge block 29, the staple or eye-bolt 30, and the cooperating apertured jointed end 31 of the upper lever 20. The lever 20 is pivoted near its upper end upon the upper portion of the door 12 by a pivot bolt 32. The lower lever 21 is similarly pivoted by a bolt 33 to the lower portion of the same door. These bolts 32 and 33 are located near the free edge of the door and are preferably in vertical alignment. The jointed end 31 of the lever 20 is provided with an off-set portion 34 which bears against the face of the lower lever 21 when the parts are in locking position. The off-set is provided with a slot 35 through which the eye-bolt 30 passes. The latter is provided with an opening for the passage of a lock, seal or other securing device. The lower end of this extension of the lever is provided with a hand-held 36 in order that the levers may be readily manipulated from the ground or from a loading platform. The upper end of the lever 20 co-acts with the rigid bearing plate 22 and the cam lug 24 to force the upper end of the door into closed position upon the proper movement of the lever. This result is brought about by constructing the plate 22 with a cam ridge 37, and the lug 24 with an overhanging cam face. As the lever 20 is moved toward its closed position, the wedge block 28 engages the cam face on the lug 24 and the upper end of the lever is thereby moved toward the body of the car. At the same time, the cam ridge 37 is engaged by the opposite side of the lever 20 and, consequently, the upper end of the door is forced toward the car body with reference to the lever. This combined action forces the door to its final closed position. Now, in this application, I also provide for forcing the door open by the movement of the lever 20 in the opposite direction. This is brought about by a cam ridge 38 upon the base of the lug 24. It will be seen that as the lever 20 is moved from its closed to its open position, the inner side of its outer end will engage this ridge 38, and, as it rides over it, the lever, and with it the door, will be moved outward from the body of the car.

The action at the lower end of the lever 21 is similar to that at the upper end of the lever 20. Here, the lug 25 is provided with a similar overhanging cam face which co-operates with the wedge block 39, and the base of the lug 29 is provided with a cam ridge 39, which, together with the cam ridge 40 upon the bearing plate 23, co-operates with the opposite side of the lever. Thus, the movement of the lever to its closed position similarly forces the lower portion of the door to its final closed position, and its movement in the opposite direction forces the lower portion of the door open. It may be here pointed out that the lower leaf of lug 24 and the upper leaf of lug 25 are countersunk or set into the frame so as to be flush with its surface and allow the proper closing of the door. It will also be noted that the plane of the projecting portion of the lug 24 is at right angles to the face of the car door, while the corresponding plane of the lug 25 is in line with the inclined edge of the sill of the door frame. This latter construction is provided so that the lug will not interfere with a run-way placed between the car and the loading platform. The wedge blocks 28 and 29 are given an inclination with reference to that of the cam faces upon the overhanging portions of the lugs 24 and 25, such that a good bearing is maintained between the levers and the retaining lugs when the door is being closed and after it is closed. The upper guide 26 is secured at its ends to the plate 22 and incloses the upper end of the lever 20. The lower guide 27 is similarly positioned upon the lower plate 23 and similarly incloses the lower end of the lever 21. The function of each of these guides is to limit the opening movement of the lever associated with it; to prevent the latter from being bent out of shape in case an attempt should be made to close the door without holding the levers in open position; and to take up the strain upon the end of the lever as it is pushed outward by the cam ridge 38 or 39 during the opening of the door. In case the door should be closed without holding the levers in open position, their ends would strike the outside of the cam lugs, but, in such event, the strain put upon them would be taken up by the guides. Similarly, the strain put upon the outer ends of the levers by the cam ridges when forcing the door open, would also be taken up by the guides. A button 41, pivoted to the frame or sill of the car, constitutes an additional means for holding the left-hand door 11 closed. This may be used or not, as desired, but, by its use, one door may be kept closed while the other is open, or being opened.

When the levers 20 and 21 are in closed position, they overlap and are in substantial alignment, as clearly illustrated. The

upper end of the lower lever, however, is at an angle to this alinement and is connected at its outer end by the link 42 to an intermediate point of the lever 20. The bend, or angular extension at the upper end of the lever 21, enables the force applied by hand to the lower end of the upper lever 20 to be properly transmitted to the lower lever. This arrangement enables the door to be closed or opened by a simple movement of the lever 20, and there is, therefore, no opportunity for mistake in bringing the parts to their closed position.

In operation, assuming that the doors are open and it is desired to close them, the left-hand door 11 is first closed, or approximately closed, and the right-hand door is then closed upon it. Because of the beveled edges of these doors, the closing of the latter will close the former. When the two doors have been brought to their approximately closed position by hand, then, although the right-hand door may be three or four inches from being closed, the movement of the levers 20 and 21 from their dotted line position of Fig. 1 to their full line position will cause the doors to be forced shut so as to provide a tight closure, the right-hand door closing in response to the action of the lever upon the cam faces, and the left-hand door responding to the closing of the right-hand door. When the levers have been brought to their full line position, the jointed end 31 of lever 20 may be slipped over the eye-bolt 30 and the doors sealed, locked or otherwise secured. In opening the doors, the reverse operation is performed. The movement of the levers to their dotted line position causes their outer ends to engage the cam ridges 38 and 39 and to forcibly open the right-hand door. With the latter open, the left-hand door may be readily opened by means of the handle 18, after moving the button 41 to open position in case it is used. In order to protect the doors of the car against wear at the point where the levers 20 and 21 are connected by the link 42, I preferably provide each door with a wear plate, the plate of door 11 being designated 43, and that of door 12 being designated 44.

It will, of course, be understood that in carrying out my invention, certain alterations and modifications may be made without departing from its spirit and scope. It will also be apparent that the invention is applicable to a single door as well as to two doors, as illustrated. Likewise, the cam bearing faces at the upper and lower edges of the door may be varied. Thus, inclined faces on the door may cooperate with flat faces on the frame, or vice versa, instead of having the faces on both door and frame inclined, as illustrated. I have however, sought to cover all such alterations and modifications, as come within the spirit and

scope of the invention, by the terms of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. The combination with a door frame and a door hinged thereon, of a locking lever pivoted at an intermediate point in its length near the free edge of the door and adapted, when in closed position, to extend beyond the door over the adjacent portion of the frame, a lug member secured to said adjacent portion of the frame and having an open-ended slot for the reception of one end of said lever, said slot having similarly inclined bearing faces for engaging the opposite sides of the lever, the one to force said door shut as the lever is being moved from open to closed position, and the other to force the door open as the lever is being moved from closed to open position, a bearing plate on the door adjacent to said lug member having a cam face inclined oppositely to the bearing faces of said lug member and adapted to engage the inner side of said lever and means acting on the other end of said lever to hold it in locking position.

2. The combination with a door frame and a door hinged thereon, of a locking lever pivoted at an intermediate point in its length near the free edge of the door and adapted, when in closed position, to extend beyond the door over the adjacent portion of the frame, a lug member secured to said adjacent portion of the frame and having an open-ended slot for the reception of one end of the lever, said slot having similarly inclined bearing faces for engaging the opposite sides of the lever, the one to force said door shut as the lever is being moved from open to closed position, and the other to force the door open as the lever is being moved from closed to open position, a bearing plate on the door adjacent to said lug member having a cam face inclined oppositely to the bearing faces of said lug member and adapted to engage the inner side of said lever, a guide upon the door adjacent to said cam face operating to take the strain from said lever in case it is improperly forced into engagement with said lug member by the closing of the door with the lever in the wrong position and means acting on the other end of said lever to hold it in locking position.

3. The combination with a door frame and a door hinged thereon, of a locking lever pivoted near the free edge of the door and adapted, when in closed position, to extend beyond the door over the adjacent portion of the frame, a wedge block on the outer end of said lever, and a lug member secured to said adjacent portion of the frame and having an open-ended slot for the reception of said wedge member and the

portion of the lever to which it is attached, said slot having similarly inclined bearing faces, the one to engage said bearing block to force said door shut as the lever is being
 5 moved from open to closed position, and the other to engage the inner side of the outer end of said lever to force the door open as the lever is being moved from closed to open position, the inclination of the outer face of
 10 the wedge block being the same as that of the inclined faces of the lug member when the parts are in closed position, whereby a good bearing is maintained between the said lever and lug member when the door is closed.

4. The combination with a door frame and a door hinged thereon, of locking levers pivoted to the upper and lower portions of the door respectively, means cooperating
 20 with the outer ends of said levers to force the door shut upon the closing movement of said levers, a handle at the lower end of said upper lever, and a link connecting the upper end of said lower lever to said upper
 25 lever at a point below the latter's pivotal connection to the door.

5. The combination with a door frame and a door hinged thereon, of locking levers pivoted to the upper and lower portions of the door respectively, means cooperating
 30 with the outer ends of said levers to force the door shut upon the closing movement of said levers, said levers overlapping each other when in closed position and the upper lever having a jointed end, a staple on the
 35 lower lever adapted to pass through an opening in said jointed end to enable the levers to be locked together, a handle at the lower end of said upper lever, and a link
 40 connecting the upper end of said lower lever to said upper lever at a point below the latter's pivotal connection to the door.

6. The combination with a door frame and a door hinged thereon, of locking levers pivoted to the upper and lower portions of the door respectively, means cooperating
 45 with the outer ends of said levers to force the door shut upon the closing movement of said levers, the lower lever having its lower portion adapted to lie in line with the upper lever when the parts are in closed position and its upper portion inclined thereto, and a link connecting the inclined
 50 portion of said lower lever to an intermediate point in said upper lever.

7. The combination with a door frame and a door hinged thereon, of locking levers pivoted to the upper and lower portions of the door respectively, means cooperating
 60 with the outer ends of said levers to force the door shut upon the closing movement of said levers, the inner portions of said levers overlapping each other when in closed position and the lower lever having its up-

per end bent out of such alinement, a link 65 connecting the upper end of said lower lever to an intermediate point of said upper lever, a jointed end on the lower end of the upper lever, and a staple on the lower lever adapted to pass through an
 70 opening in said jointed end to enable the levers to be locked together.

8. The combination with a door frame and a door hinged thereon, of a locking lever 20 pivoted near the upper edge of the door, a locking lever 21 pivoted near the lower edge of the door, said levers 20 and 21 being adapted, when in closed position, to extend respectively beyond the upper and lower edges of the door over the adjacent
 80 portions of the frame, a jointed end 31 and a cooperating staple 30 and slot 35 for holding the inner ends of said levers 20 and 21 in locking position, wedge blocks 28 and 29 on the outer ends of said levers 20 and 21, 85 respectively, an upper lug 24 having similarly inclined bearing faces adapted the one to engage said bearing block 28 to force said door shut as the lever is being moved from open to closed position, and the other 90 to engage the inner side of the outer end of said lever 20 to force the door open as the lever is being moved from closed to open position, and a similar lower lug 25 having inclined bearing faces for cooperating 95 in the same way with the wedge block 29 and the inner side of the lower end of lever 21.

9. The combination with a door frame and a door hinged thereon, of locking levers 100 20 and 21 pivoted to the upper and lower portions of the door respectively, lugs 24 and 25 having inclined bearing faces cooperating with the outer ends of said levers to force the door shut upon the closing of 105 said levers, said levers overlapping each other when in closed position and lever 20 having a jointed end 31 and lever 21 having an angularly disposed upper end, a staple 30 on lever 21 adapted to pass 110 through an opening 35 in jointed end 31 to enable the levers to be locked together, a handle 36, and a link 42 connecting the upper end of lever 21 to an intermediate point of lever 20.

10. The combination with a door frame and a door hinged thereon, of locking levers 20 and 21 pivoted to the upper and lower portions of the door respectively, lugs 24 and 25 upon the upper and lower edges of 120 the frame having inclined bearing faces cooperating with the outer ends of the levers 20 and 21 respectively to force the door shut upon the closing movement of said levers and open upon their opening movement, the 125 inner portions of said levers being in alinement and overlapping each other when in closed position and lever 21 having its up-

per end bent out of such alinement, a link 42 connecting the upper end of lever 21 to an intermediate point on lever 20, a jointed end 31 forming the lower end of lever 20, a handle 36 and a staple 30 upon lever 21 adapted to extend through an opening 35 in said jointed end 31 to enable the levers 20 and 21 to be locked together.

In witness whereof, I hereunto subscribe my name this 18th day of September, 1911. 10

THOMAS H. GARLAND.

Witnesses:

J. S. HUNTER,
L. M. ANDREW.

Corrections in Letters Patent No. 1,037,892.

It is hereby certified that in Letters Patent No. 1,037,892, granted September 10, 1912, upon the application of Thomas H. Garland, of Chicago, Illinois, for an improvement in "Closing and Opening Devices for Refrigerator-Car Doors," errors appear in the printed specification requiring correction as follows: Page 2, line 29, for the word "The" read *This*; same page, line 70, for the reference-numeral "39" read 29; page 4, line 19, for the word "floor" read *door*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of October, A. D., 1912.

[S. AL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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