

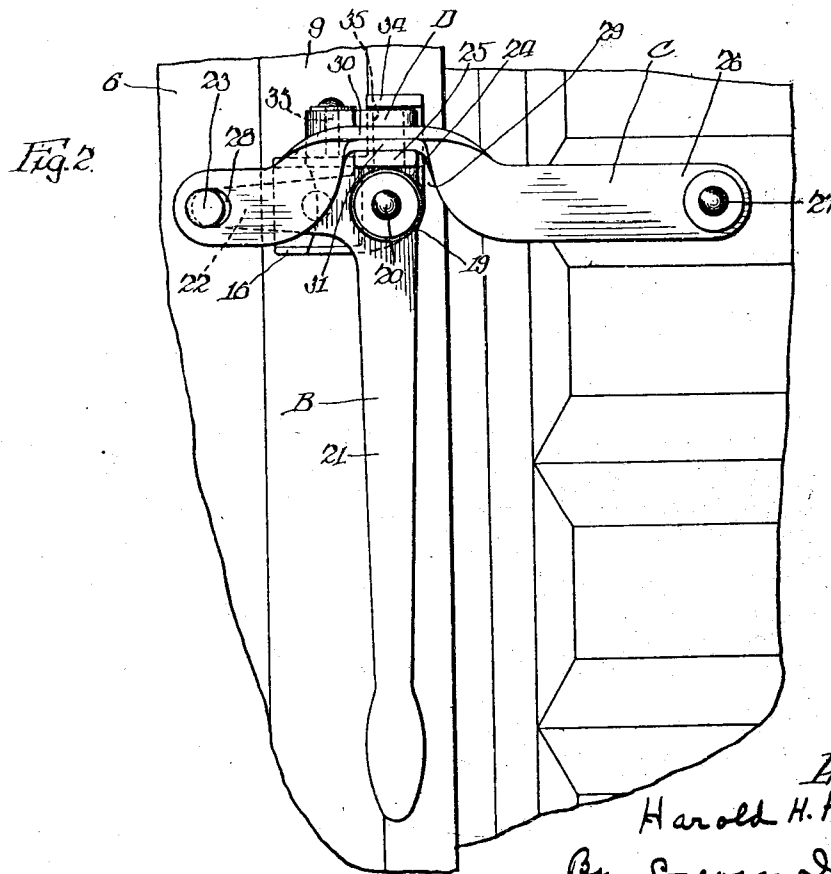
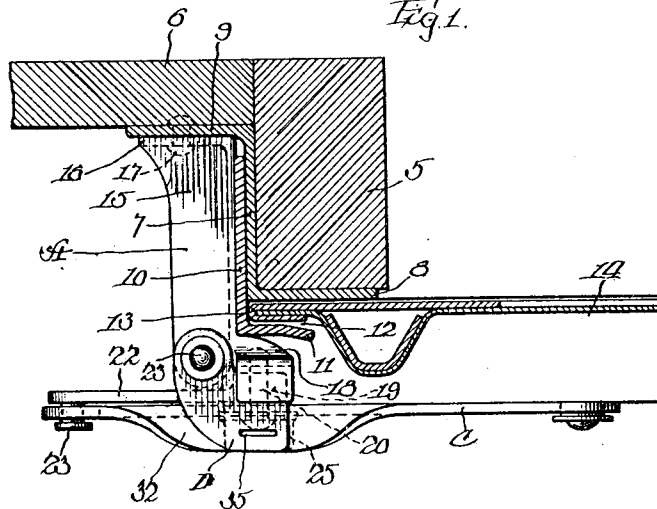
**Sept. 4, 1928.**

**1,683,464**

H. H. HENRICKS

## DOOR OPERATING MECHANISM

Filed March 27, 1925



*Introduction*  
 Harold H. Hennrichs  
 By George I. Haight  
 His *Country*

## UNITED STATES PATENT OFFICE.

HAROLD H. HENRICKS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE YOUNGSTOWN STEEL DOOR COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## DOOR-OPERATING MECHANISM.

Application filed March 27, 1925. Serial No. 18,791.

This invention relates to improvements in door operating mechanism.

Heretofore great difficulty has been experienced in opening and closing the sliding side doors of box and other types of cars, on account of the tendency of the doors to become jammed or stuck. This is especially the case where doors of heavy construction supported by either overhead or bottom tracks are used, the tracks and contacting bearings becoming corroded due to exposure to the weather during continued service, thereby offering undue resistance to the movement of the doors, making the opening and closing thereof extremely difficult. In practice, it often happens, therefore, that the men in charge of opening and closing the doors are compelled to use crowbars or other tools to start the opening thereof and to force the same to closed position, consequently seriously damaging the doors and necessitating frequent and expensive repairs.

One object of the invention is to provide a simple and relatively inexpensive device which can be applied to doors of the type above indicated and which will have effective and easily operative means for starting the opening movement of the door, and which will also draw the door to tightly closed position.

Another object of the invention is to provide a door operating mechanism of this character, including an actuating member, and a transmitting member pivotally associated with the door parts, and with each other, said actuating member being adapted to impart movement to said transmitting member to move one door part relatively to the other and being provided with means projecting into the path of movement of said transmitting member to limit the same in one direction, the transmitting member being provided with means for the reception of said projecting means whereby the various pivotal points are disposed in a common plane, together with a latch for locking the members against movement, the various parts being provided with means for the reception of a seal.

Other and further objects of the invention will more fully and clearly appear from

the description and claims hereinafter following.

In the drawings Figure 1 is a fragmentary horizontal sectional view of a door frame and door, showing my invention in connection therewith and Figure 2 is a fragmentary elevational view of a door frame and door, showing a front elevation of the invention when applied thereto.

As shown in the drawings, 5 represents a fragment of a door post, forming part of a door frame of the character ordinarily associated with freight or box cars of various types, and 6 represents a fragment of a side wall of such a car. The post 5 is provided with a wear member in the form of a Z member 7, one flange 8 of which is disposed upon the outer side of the post, the web and the other flange 9 of the Z member being secured to the door post 5 and the car wall 6 by any suitable means. An angular member 10 is secured to the door post, the angular flange 11 of which is disposed at a suitable distance outwardly from the flange 8 of the Z member so as to provide a recess or slot 12 for the reception of the forward edge 13 of the sliding door 14. The door 14 may be of metal and supported by overhead or bottom rollers and tracks in the usual manner.

My invention comprises broadly a supporting bracket A, an actuating member B, a power transmitting member C, and a latch D.

The bracket A comprises a base portion having angular flanges 15 and 16, the flange 16 being secured to the flange 9 of the Z member by suitable rivets 17. The outer portion of the bracket is provided with an intumed extension 18, adapted to form a horizontally disposed journal bearing 19 for the reception of a pivot pin 20 upon which is pivotally mounted the actuating lever or member B.

The actuating member B is preferably in the form of a bell crank lever, including a handle portion 21 and a crank or actuating portion 22, extending at right angles to the handle portion 21, and being provided with a fixed headed pin 23 at its outer extremity.

The actuating member B is also provided with an extension 24 upon the side of the

pivotal mounting opposite to the handle 21, such extension being provided with an out-turned flange 25 adapted to co-operate with the transmitting member C as hereinafter more fully described.

The transmitting member C is preferably in the form of a connecting link, one end 26 of which is pivotally mounted upon a headed pin 27 fixed to the body portion of the door, the head of said pin being spaced from the body portion of the door a sufficient distance to permit limited lateral movement of the transmitting member C. The forward portion of the member C is adapted for connection with the pin 23 upon the crank 22 of the actuating member B. The detachable connection includes an aperture 28 in the forward portion of the transmitting member C, which aperture is of sufficient size to permit insertion and removal of the pin 23, it being noted that the transmitting member C is of such a length that when the actuating member B is at the limit of its closing movement, the aperture 28 can not be disconnected from the pin by reason of engagement of the body portion of the transmitting member C with the head of the pin 23. Between its ends the transmitting member C is provided with a recess or notch 29, which is adapted for the reception of the flange 25 formed on the actuating member B, when the actuating member B is at the limit of its closing movement. The recess or notch 29 is formed in the link by drawing or bending the lower longitudinal edge 31 of the link toward the edge 30, and then pressing together the body portion of the link at this point so as to provide a folded portion 32 which extends laterally with reference to the link C, and which is somewhat offset with respect to the longitudinal axis of the link, the lateral portion being substantially co-extensive with, and adapted in certain positions of the parts to rest upon the flange 25 formed on the extension 24 of the actuating member B.

The bracket A, at a point above and to one side of the pivot pin 20, is provided with a vertically extending pivot pin 33 upon which is pivotally mounted the latch D, such latch being provided to swing to a position over the transmitting member C to hold the same against movement when in its door closing position. The bracket is also provided with an outwardly turned stop 34, disposed slightly above the plane of movement of the latch D, the stop 34 being extended outwardly sufficient to prevent lateral movement of the latch, but terminating at a point permitting free movement of the lateral portion 32 of the link C when the latch D is in inoperative position. The parts D, 32, and 25, are provided with openings 35 adapted to be aligned when the door is closed, and permitting the insertion of a car seal, by

which unauthorized tampering with the mechanism may be detected.

In operation, assuming the parts to be in the fully closed position illustrated in Figure 2, and assuming the seal to be in position in the openings 30, when it is desired to open the door, the seal is broken, and the latch D swung outwardly from engagement with the lateral portion 32 of the link C. The handle 21 of the actuating member is then swung in a clockwise direction, imparting a combined lateral and longitudinal movement to the transmitting member C, resulting in disengagement of the recess 29 from the flange 25 of the lever, and exerting great power in an opening direction upon the door 14. When the actuating portion 22 has reached the limit of its movement, the transmitting member C may be disengaged from the pin 23 on the portion 22, by reason of its loose connection with the pin 27 on the door, which permits the necessary lateral movement of the link for disconnecting the same from the pin. The door 14 is then manually opened to its full extent. When it is desired to close the door, the same is manually moved to a point where the link C may be reengaged with the pin 23, the actuating member B of course being swung in a clockwise direction to permit the attachment of the link therewith. The actuating member is then swung in an anti-clockwise direction of course exerting a powerful closing movement upon the door, and this action serves to again dispose the flange 25 of the actuating member B in the recess provided in the link C. The parts in this position are so arranged that the pivotal points 27, 20 and 23 are disposed in the same plane which is permitted by reason of the offset lateral portion 32, resulting in a toggle effect, the engagement of the flange 25 with the link also limiting the movement of the actuating member B in an anti-clockwise direction. In this position of the parts the latch D may be reengaged to prevent clockwise movement of the actuating member, and the seal may be inserted through the openings 35 in the various members.

I have herein shown and described what I now consider the preferred manner of carrying out the invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination with an actuating element pivotally mounted on one of said members; of a transmitting member pivotally associated with said actuating element and the other of said members, said actuating element being adapted to impart combined longitudinal

and lateral movement to the transmitting member, said actuating element being provided with means projecting into the path of movement of said transmitting member to  
 5 limit the movement thereof in one direction; and a latch mounted on one of said members and movable substantially at right angles to the plane of movement of said transmitting member and engageable with the  
 10 latter to prevent movement thereof in the opposite direction.

2. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination  
 15 with an actuating element pivotally mounted on one of said members; of an elongated transmitting member having its end portions longitudinally in line, one of said end portions being pivotally associated with said actuating element and the other of said members, said end portions being pivotally associated with the other of said actuating element being adapted to impart movement to the transmitting member, said actuating element being provided with means projecting  
 25 into the path of movement of said transmitting member to limit the movement thereof in one direction and said transmitting member having its body portion offset intermediate its ends for the reception of said projecting means to permit alignment of the points of pivotal connection.

3. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination  
 35 with an actuating element pivotally mounted on one of said members; of a transmitting member pivotally associated with said actuating element and the other of said members, said actuating element being adapted to impart combined longitudinal and lateral movement to the transmitting member, said actuating element being provided with means projecting into the path  
 40 of movement of said transmitting member to limit the movement thereof in one direction, and a locking element movably mounted on one of said members adapted to be disposed in the path of movement of said transmitting member to prevent movement  
 50 in the opposite direction.

4. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination with  
 55 an actuating element pivotally mounted on one of said members; of a transmitting member pivotally associated with said actuating element and the other of said members, said actuating element being adapted to impart movement to the transmitting member, said actuating element being provided with means projecting into the path of movement of said transmitting member to limit the movement thereof in one direction and said  
 60 transmitting member being provided with

an offset for the reception of said projecting means to permit alignment of the points of pivotal connection; and a locking element movable into the path of movement of said transmitting member to prevent movement of said transmitting member in the  
 70 opposite direction.

5. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination  
 75 with an actuating element pivotally mounted on one of said members; of a transmitting member pivotally associated with said actuating element and one of said members, said actuating element being adapted to impart  
 80 combined longitudinal and lateral movement to the transmitting member, said actuating element being provided with means projecting into the path of movement of said transmitting member to limit the  
 85 movement thereof in one direction, a locking element movable into the path of movement of said transmitting member to prevent movement of said transmitting member in the opposite direction, said locking member, transmitting member, and actuating member being provided with apertures arranged to register when the parts are in  
 90 locked position, said apertures being provided for the reception of a seal.

6. In a door operating mechanism of the character described, the combination with a transmitting element, the longitudinal edges of which are drawn together intermediate the ends of the element, and offset to  
 100 provide a recess; of means for operating said element, said means including portions adapted to be disposed within said recess.

7. In a door operating mechanism, the combination with a transmitting element,  
 105 the longitudinal edges of which are drawn together intermediate the ends of the element, and offset to provide a recess, said drawn portion being formed flat and disposed substantially at right angles to the  
 110 remaining body portion of said transmitting element; of means for imparting movement to said transmitting element, said means having portions adapted to project into said recess in certain positions of the parts.

8. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination with an actuating element pivotally mounted on one of said members, and a transmitting member connected to said actuating element and to the other of said members, said actuating element being provided with stop means projecting into the path of movement of the transmitting member, and said transmitting  
 120 member having its longitudinal edges drawn together intermediate its ends and offset to provide a recess for the reception of the stop means on said actuating member.

9. In a door operating mechanism for a 130

sliding door member having a frame member associated therewith, the combination with an actuating element pivotally mounted on one of said members, a transmitting member connected to said actuating element and to the other of said members, said actuating element being provided with stop means projecting into the path of movement of the transmitting member, and said transmitting member having its longitudinal edges drawn together intermediate its ends and offset to provide a recess for the reception of the stop means on said actuating member, and a locking member adapted to engage said transmitting member at the side thereof opposite said stop means.

10. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination with an actuating element pivotally mounted on one of said members, a transmitting member connected to said actuating element and to the other of said members, said actuating element being provided with stop means projecting into the path of movement of the transmitting member, and said transmitting member having its longitudinal edges drawn together intermediate its ends and offset to provide a recess for the reception of the stop means on said actuating member, a locking member adapted to engage said transmitting member at the side thereof opposite said stop means, said locking

member, transmitting element and stop means being provided with apertures adapted to be aligned when the parts are in closing position for the reception of a seal.

11. In a door operating mechanism for a sliding door member having a frame member associated therewith, the combination with an actuating element in the form of a bell crank lever pivotally mounted on one of said members, and a transmitting link having one end pivotally and detachably connected with the actuating portion of the bell crank lever and having its opposite end portion pivotally connected with the other member, said bell crank lever being provided with an outturned stop projecting into the path of movement of said link, and said link being provided with an offset portion adapted for the reception of said stop; a locking member mounted at an angle to the axis of said actuating member and arranged to be moved to engagement with the offset portion of said link, said locking member, said link, and said stop means being provided with apertures disposed in alignment when the parts are in closing position, said apertures providing means for the reception of a seal.

In witness that I claim the foregoing I have hereunto subscribed my name this 23 day of March, 1925.

HAROLD H. HENRICKS.