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SIDE DOOR OPERATING AND HOLDING MECHANISM

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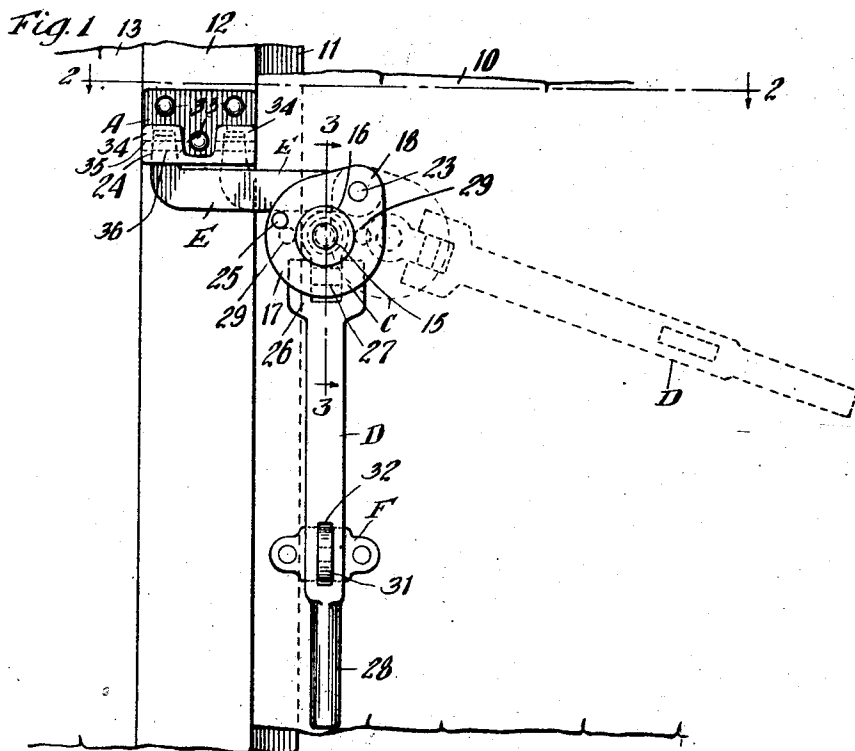


Fig. 2

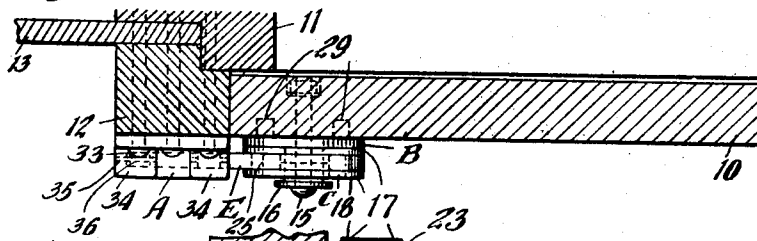
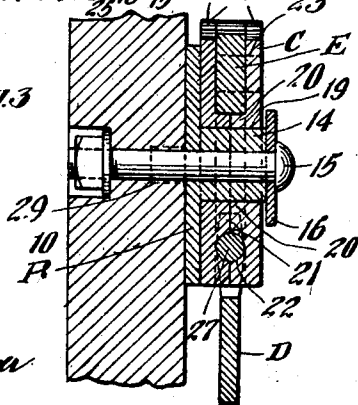


Fig. 3



Witnesses

Wm. Guign

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By George J. Haigh
His Atty.

UNITED STATES PATENT OFFICE.

JOHN F. O'CONNOR, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
W. H. MINER, INC., A CORPORATION OF DELAWARE.

SIDE-DOOR OPERATING AND HOLDING MECHANISM.

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To all whom it may concern:

Be it known that I, JOHN F. O'CONNOR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Side-Door Operating and Holding Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in door operating and locking devices.

The object of this invention is to provide a simple and relatively inexpensive device which may be applied to a door of the sliding type, and which will have effective means for either drawing the door tightly closed or starting the opening operation thereof, together with means for locking the device in a predetermined position to hold the door either in fully closed or partly opened position.

Other objects and advantages of the invention will more clearly appear from the description and claims hereinafter following.

In the drawing forming a part of this specification, Figure 1 is a side elevational view of a portion of a box car, showing a portion of the side door thereof with my improvements in connection therewith. Figure 2 is a horizontal, sectional view, corresponding substantially to the line 2—2 of Figure 1. And Figure 3 is a vertical, sectional view, corresponding substantially to the line 3—3 of Figure 1.

In said drawing, 10 designates a sliding door of a railway box car which may be either of the top or bottom hung type. One of the door posts is indicated at 11 in Figure 2, the post being provided with a door stop 12 against which the forward edge of the door is adapted to bear when the door is fully closed. A portion of the side wall of the car is indicated at 13.

The improved door operating and locking device, as shown, comprises broadly, a stop bracket A; a pivot plate B; a two-part head C; an operating lever D; a pull arm E; and a locking bracket F.

The pivot plate B, which is of circular outline, is provided on the outer side thereof with a central cylindrical boss 14 serving as a pivot member for the two-part head C. A bolt 15 extending axially through the boss

14 and the door serves to fix the plate to the door, a disc washer 16 being interposed between the head of the bolt 15 and the outer end of the boss, for a purpose hereinafter described.

The two-part head C comprises a pair of counter part discs 17—17. Each disc 17 is in the form of a circular flat plate having a radial enlargement at one side as indicated at 18. The discs 17 are each provided with a central, pivot-receiving opening 19, the opening being surrounded at the inner side of the plate by an annular flange 20 forming a hub section. Each disc is also provided with a radially disposed, relatively wide rib 21 extending from the flange 20 to the periphery of the disc, the rib corresponding in height to the flange 20. As clearly shown in Figures 1 and 3, the rib and the enlargement 18 are disposed on opposite sides of the hub, but are not at diametrically opposite points, the rib being offset to one side thereof. Each rib is also provided with a transversely extending, semi-cylindrical recess, forming a half bearing 22. The two discs forming the head C are mounted on the pivot 14 with the respective lugs 18 and ribs 19 thereof in registration and the hub sections 20 and the ribs 21 in abutment. When the parts are thus assembled, the half bearings are also registered and define a complete cylindrical bearing opening.

The washer 16, which is of larger diameter than the pivot member 14, serves to retain the two-part head on the pivot. To assure free rotation of the head, a slight clearance is provided between the washer 16 and the outer face of the two-part head C, the outer end of the pivot member being extended beyond the outer face of the head, as clearly shown in Figure 3. The hub sections 20 serve to space the plates 17 of the head C, provided an opening therebetween adapted to accommodate one end of the pull arm E.

The pull arm E is in the form of an elongated flat plate having one end pivoted between the plates 17, at the enlarged portions 18, by means of a pin 23 formed integral with the innermost plate and extending through the enlarged portion 18 of the other plate. The outer end of the pin is preferably upset to prevent separation of the plates. At the outer or free end, the arm E is bent upwardly, as seen in Figure 1, to

provide a tapered hook member 24. The parts are so proportioned that when the arm E is horizontally disposed, as shown in Figure 1, the lower edge of the same will
 5 bear on the hub of the head C and a stop pin 25 disposed adjacent the periphery of the head. The pin 25 is preferably formed integral with the innermost plate 17 and extends through the other plate, the outer end
 10 of the pin being also upset to prevent separation of the head sections.

The operating lever D is in the form of an elongated bar having a forked head 26 at one end thereof. Extending between the
 15 arms, adjacent the outer end of the forked head, is a transverse pivot pin 27, the same being preferably formed integral with the arms. The pivot pin 27, which is journaled in the semi-cylindrical bearing seats 22,
 20 serves to support the lever for limited swinging movement on the head C at right angles to the plane of the door. The head 26 has the front and rear faces thereof tapered in opposite directions from the
 25 pivot pin 27, as clearly shown in Figure 3, to permit the lever to be swung away from the door to a position where it will be disengaged from the locking bracket F where it may be conveniently operated and proper
 30 clearance provided for the operator's hand. At the free end, the lever is preferably rounded off to provide a hand grip portion 28.

In assembling the lever D, pull arm E and head C, the lever and pull arm are
 35 first applied to the inner section 17 which has the pins 23 and 24 integral therewith, by placing the pin 27 of the lever in the half bearing section 22 and mounting the
 40 arm E on the pin 23. The outer plate 17 is then applied and the ends of the pins 23 and 25 upset. After the parts have thus been assembled, the pivot member 14 of the
 45 plate B is passed through the opening 14 of the head C and the washer 16 and the bolt 15 applied. The plate B is then fixed to the door 10 by the bolt 15. To prevent
 50 accidental turning of the plate B with the head C when the latter is oscillated, a pair of dowel pins 29 are preferably provided on the rear face of the plate B seated in
 suitable openings formed in the door, the dowel pins being in the form of lugs formed
 integral with the plate.

The bracket F, which is in the form of a
 55 plate, is secured to the door by a pair of rivets or other suitable securing means extending through ears at the opposite sides of the plate. The plate F is provided with
 60 a vertically disposed, outwardly projecting perforated lug 31 adapted to be entered into and through a slot 32 provided in the lever adjacent the handle thereof, and retain
 65 the same in the full line position shown in Figure 1. A locking element such as a pad-

lock or car seal is adapted to be engaged within the perforation of the lug 31 to lock the lever to the bracket F in a well known manner.

The stop bracket A is in the form of a
 70 flat plate fixed to the outer side of the door stop 12 by a plurality of bolts 33, or other suitable securing means. A pair of out-
 75 standing, spaced, downwardly opening sockets 34—34 are provided at opposite ends of the lower side of the plate, the sockets
 being inwardly tapered and either of the same being adapted to receive the hook end
 80 of the arm E. The side walls of the sockets 34 have aligned slots therein as indicated at 35 and the end of the hook 24 is provided
 with an opening 36 adapted to be brought into alinement with the slots to receive the
 usual car seal.

Assuming that the parts are in the position
 85 shown in full lines in the drawing, when it is desired to open the door, the following sequence of operations takes place. The
 lead seal and the lock associated respectively with the bracket A and the lug 31 are
 90 first removed, after which the lever D is swung outwardly to disengage it from the lug 31. Thereupon the lever is swung in a
 counter-clockwise direction, as seen in Figure 1, to the dotted line position, rotating the
 95 head C therewith and through the medium of the pull arm E having the hook thereof engaged in the outermost socket 34, forcing
 the door open to the dotted line position. When the door has been thus partly opened,
 100 the hook portion of the arm E may be disengaged from the socket and the door fully opened by merely pushing the same in the
 usual manner. Upon the operator releasing his grip from the lever D, the latter will
 105 swing downwardly under the influence of gravity to the full line position shown in Figure 1.

When the door is in opened position, the
 110 pull arm E will ordinarily be swung clockwise about its pivot 23 so as to hang in a depending position at the right hand of the
 operating lever D, as viewed in Figure 1, to thereby eliminate danger of the pull arm E
 115 being broken or distorted should it be left projecting beyond the free edge of the door.

If for any reason, it is found that the door cannot be readily pushed open when it has
 been forced to the dotted line position shown, the hooked end of the arm E may
 120 be engaged within the innermost socket and the described operation of forcing the door to the right repeated, thereby obtaining a
 greater door opening. In other words, the
 125 hooked end of the bar may be successively engaged within the two sockets to force the door open.

When it is desired to close the door, the
 130 latter is moved as near the stop 12 as can be conveniently done by the operator without

the use of tools. The handle D is then brought to the dotted line position shown in Figure 1 and the hook end of the bar E engaged with one of the sockets 34, the same being shown as engaged with the outermost socket, as seen in Figure 1. Assuming that the hooked end of the arm is engaged within the outermost socket, upon swinging the handle downwardly to the full line position shown in Figure 1, the door will be positively pulled to the fully closed position. When this condition has been reached, the stop pin 25 will have been brought into abutting relation with the lower edge of the arm E, thereby positively holding the hooked end of the bar in the socket. To lock the parts, the lever D is engaged over the lug 31 and the padlock or other locking device applied. The car seal may then be passed through the aligned openings in the sockets and hooked portion of the arm E. It will be evident that, as movement of the lever is prevented by the lug 31 and the pin 25 positively prevents disengagement of the hooked end of the arm E, the door cannot be opened by unauthorized persons without leaving visual evidence thereof. If, for any reason, it is found that the door cannot be readily manually pushed far enough to the left as seen in Figure 1, to engage the hook of the arm E with the outer socket, the same may be first engaged with the innermost socket and the door pulled to partly closed position by swinging the handle downwardly. In other words, the hooked end of the lever may be successively engaged with the two sockets to bring the door to fully closed position.

My improved door operating and locking mechanism is also adapted to hold the door locked in partly opened position for ventilating purposes. To thus lock the door, the same is brought to the dotted line position in Figure 1 and the hook of the arm E engaged within the innermost socket 34. The lever D is then engaged over the lug 31 and the parts locked and sealed as hereinbefore described.

Although I have herein illustrated the bracket A as secured to the door post, and the lever mechanism together with the remaining associated parts as secured to the door, it will be evident that the positions of the parts may be interchanged without departing from the spirit of the invention.

I have herein shown and described what I now consider the preferred manner of carrying out my 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 an operating and locking mechanism for a sliding door, the combination with pivoted operating means for opening and closing said door including a lever; means

for locking the lever in a predetermined position; an abutment on the car structure; an engaging member swingably connected to said operating means; and an abutment element on said operating means for positively holding said member engaged with said abutment when the lever is in locked position.

2. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with means for opening and closing said door including a head rotatably journaled on one of said members; an operating lever for said head; a pull element pivotally connected to the head; a stop bracket fixed to the other member; means for locking said lever in a predetermined position; inter-engaging abutment means on said stop bracket and element; and coacting means on said head and element for holding said abutment means inter-engaged when the lever is held in locked position.

3. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with means for opening and closing said door including a socket fixed on one of said members; of a swingingly supported pull element mounted on the other member and adapted to co-operate with said socket; a lever mechanism for operating said element; means adapted to be brought into engagement with the pull member by the operation of said lever to positively hold the former in co-operative relation to said socket; and means for locking the lever in fixed position.

4. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with means for moving said door in opposite directions, including spaced abutment means on one of said members; of a pull element swingingly mounted on the other member, said element having a projection thereon adapted to interengage with said abutment means; a lever for operating said element; a device also operated by said lever for preventing disengagement of said pull element from said abutment means; and means for locking said lever in a predetermined position to hold the door tightly closed.

5. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with a lever mechanism pivotally mounted on one of said members; a pull element eccentrically pivoted on said lever mechanism; and spaced abutment means on the other member adapted to be successively engaged by said pull element for either forcing the door open or pulling the same to closed position upon operation of said lever.

6. In an operating and locking mechanism

nism for a sliding door member associated with a frame member, the combination with a lever mechanism pivotally mounted on one of said members; a pull element swing-
5 ingly supported by said lever mechanism, said pull element having an upwardly bent hooked end; a pair of spaced downwardly opening sockets on said other member adapted to have the other end of the lever
10 successively engaged therewith during the door opening and closing operations.

7. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with
15 a lever mechanism pivoted on one of said members; a pull element eccentrically mounted on said lever mechanism, said pull element having a hooked end; a socket on the other member with which the hooked
20 end of the lever is adapted to be engaged; an abutment on said lever mechanism adapted to engage said element to maintain the hooked end thereof engaged within said
25 socket when the lever mechanism is moved to a predetermined position; and means for locking the lever in said position to the member on which it is mounted.

8. In an operating and locking mechanism for a sliding door member associated
30 with a frame member, the combination with a lever mechanism pivoted on one of said members; a pull element eccentrically

mounted on said lever mechanism, said pull element having a hooked end; a bracket having a pair of sockets respectively spaced
35 different distances from the front edge of the door member, with each of which the hooked end of said element is adapted to be engaged; an abutment on said lever mechanism adapted to engage said element
40 to maintain the hooked end thereof engaged within either of said sockets when the lever is moved to a predetermined position; and means for locking the lever in said position to hold the door either partly opened or
45 tightly closed.

9. In an operating and locking mechanism for a sliding door member associated with a frame member, the combination with
50 a sectional head rotatably mounted on one of said members; a pull element pivotally mounted between the sections of said head; an operating lever having a pivot member formed rigid therewith for pivotally connecting the lever to the head; bearing means
55 on each head section adapted to embrace said pivot and prevent removal thereof when the head sections are assembled; and abutment means on the other member adapted to coact with said element.
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In witness that I claim the foregoing I have hereunto subscribed my name this 4th day of December, 1923.

JOHN F. O'CONNOR.