Oct. 2, 1923. 1,469,352

H. T. ANDERSON

DOOR LOCKING MECHANISM

Filed April 18, 1922 2 Sheets-Sheet 1

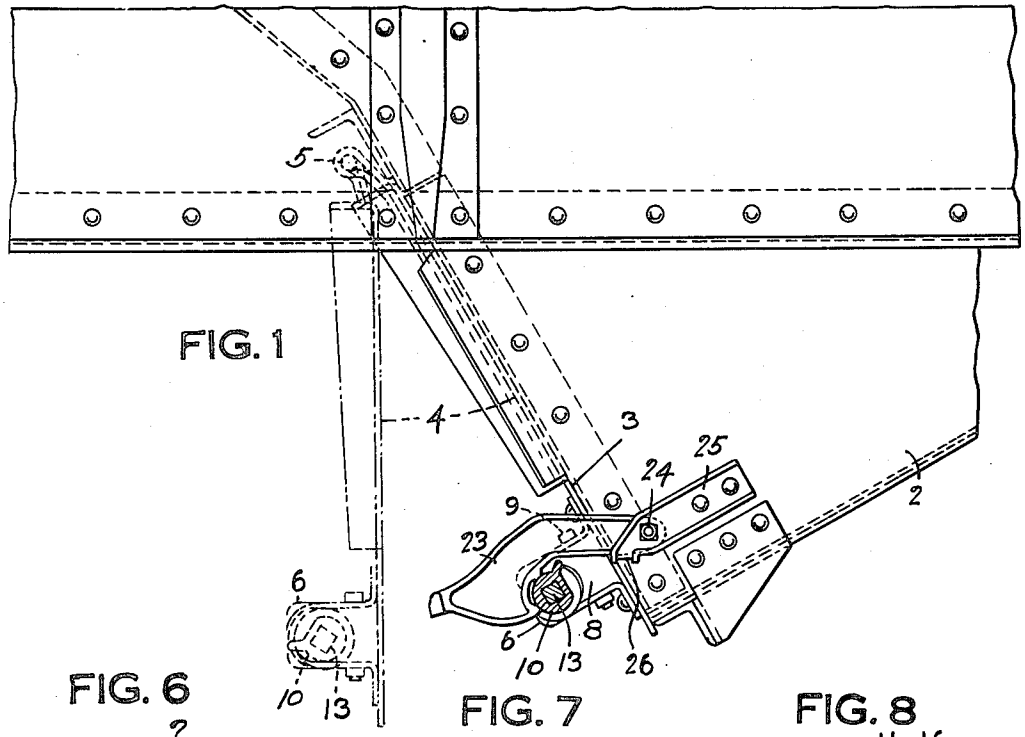


FIG. 1

FIG. 6

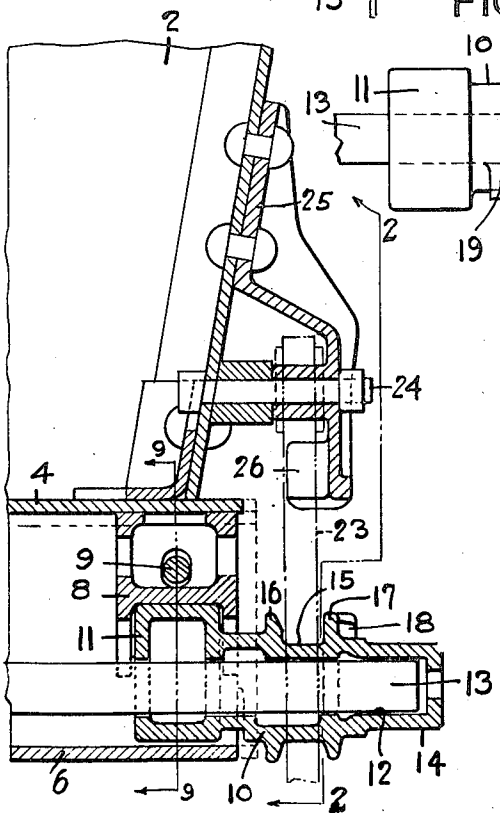


FIG. 7

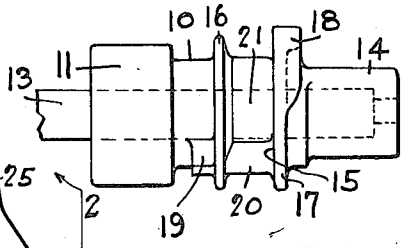


FIG. 8

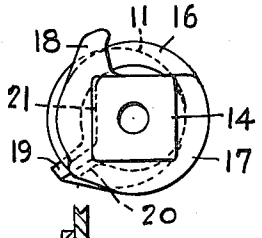
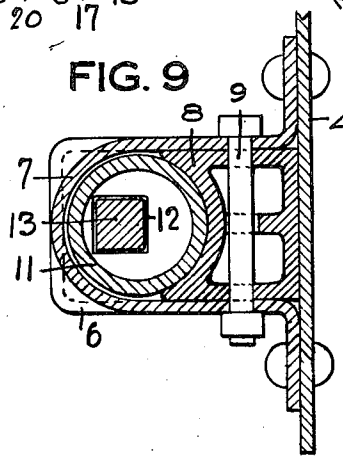


FIG. 9



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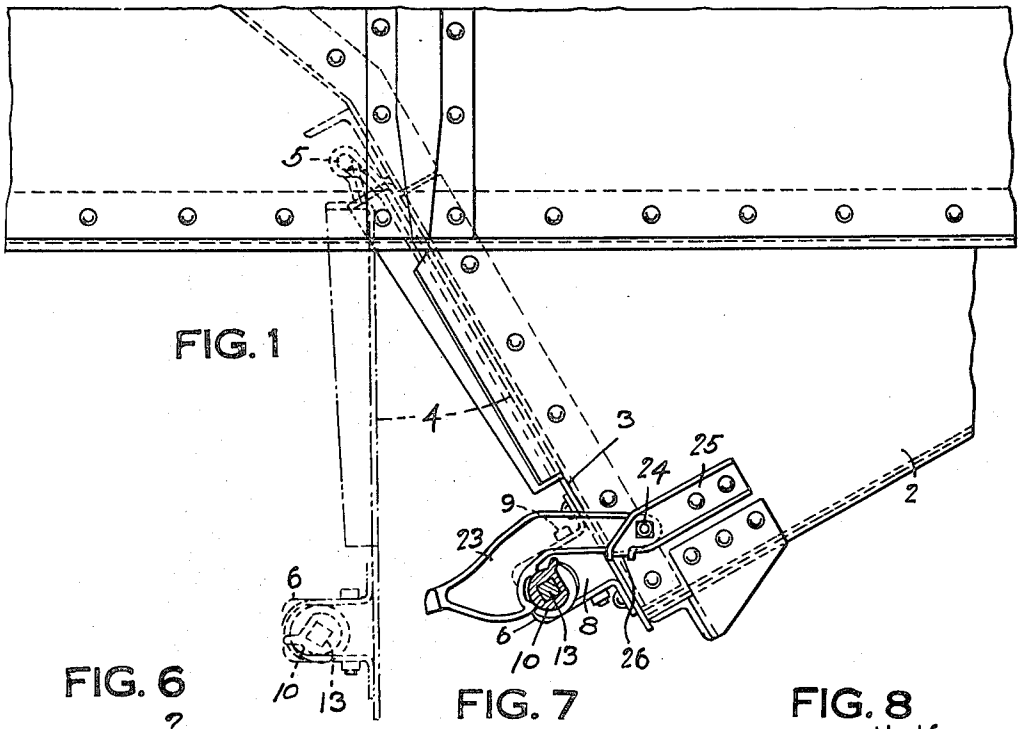


FIG. 1

FIG. 6

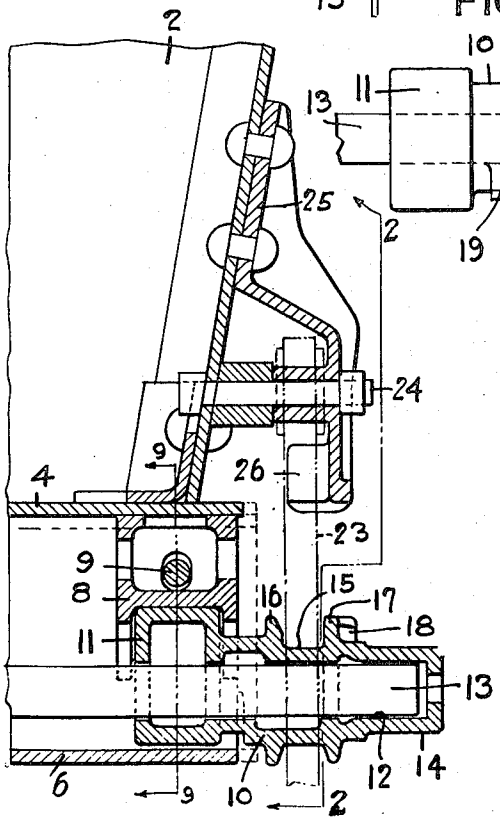


FIG. 7

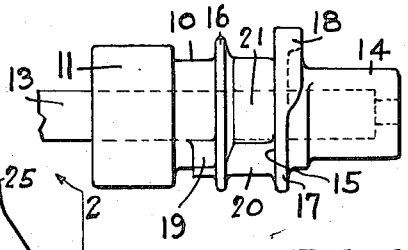


FIG. 8

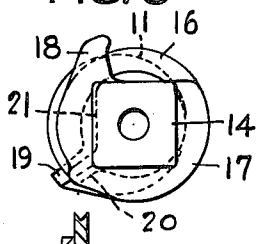
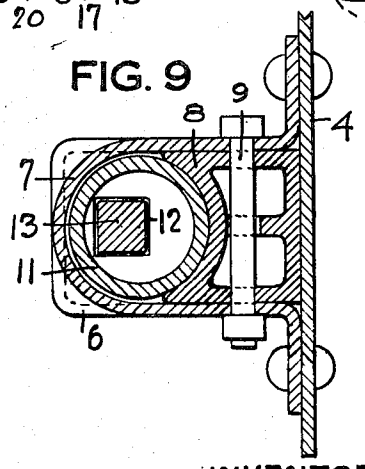


FIG. 9



INVENTOR

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Attys

Patented Oct. 2, 1923. 1,469,352

UNITED STATES PATENT OFFICE.

HARRY T. ANDERSON, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO STANDARD STEEL CAR COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DOOR-LOCKING MECHANISM.

Application filed April 18, 1922. Serial No. 554,364.

To all whom it may concern:

Be it known that I, HARRY T. ANDERSON, a citizen of the United States, and resident of Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Door-Locking Mechanism; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to door-locking mechanism, and while particularly adapted for the locking of doors for hopper-bottom cars in connection with which it will be illustrated and described, it will be apparent that it has a much broader application and it is not intended to limit the invention in any sense to doors of this particular character.

The object of my invention is to provide a locking mechanism which is strong and durable in construction, and in which chains or a system of levers are dispensed with in drawing up or releasing the doors, and furthermore to provide a locking mechanism by which the door may be swung by hand up into locking position, thereby doing away with the necessity of operating a shaft, it only being necessary to give the shaft a partial revolution in order to bring the door up into tight relation to the door frame.

In the drawings, Fig. 1 is a side elevation of a portion of a hopper-bottom car, showing my invention applied thereto; Fig. 2 is an enlarged section on the line 2—2, Fig. 6, looking in the direction of the arrows, showing the door in closed position; Fig. 3 is a like view showing the door in position to swing open; Fig. 4 is a like view showing the door in position before it is closed up tight against the door frame; Fig. 5 is a view showing the door swung partially up toward closed position; Fig. 6 is a longitudinal section at right angles to Fig. 1, showing the shaft and the operating sleeve; Fig. 7 is a side view of the operating sleeve; Fig. 8 is an end view of same; and Fig. 9 is a section on the line 9—9, Fig. 6.

In the drawings the numeral 2 designates a portion of a hopper of an ordinary hopper-bottom car provided with the door-frame 3 and the door 4 hinged to swing from the hinge 5. Riveted or otherwise secured to the door 4 at opposite ends thereof are the U-shaped brackets 6 with the rounded portions 7 which, with the bearing members 8 secured within said brackets by the bolts 9, form the bearings for the sleeve-members 10, and more especially for the cam-portion 11 of said sleeve-member.

The sleeve-member 10 has the square opening 12 formed therein to receive the square-shaft 13 which forms the operating shaft. The outer end of the sleeve-member 10 is provided with the square or angular wrench-seat 14 for the turning of the sleeve-member and the shaft 13 enclosed therein in the releasing of the door and the bringing of it up into closed position.

Intermediate the cam-portion 11 and the wrench-seat 14 the sleeve 10 is provided with the groove 15 which is formed by the flanges 16 and 17. Extending out from the flange 17 is the outer-lug 18, and extending out from the flange 16 is the inner-lug 19. Between the flanges 16 and 17 is the latch-raising lug 20. Within the groove 15 is the straight face 21 with which the lug 22 on the latch 23 is adapted to engage in certain positions of said latch, as will more fully hereinafter appear.

The latch 23 is pivotally mounted, as at 24, on the bracket 25 riveted or otherwise secured to the side hopper-sheets. The bracket 25 is provided with the shoulder 26 which acts as a stop to control the downward movement of the latch 23.

When the latch is closed the lugs on the hook-portion 27 engage the groove 15 of the sleeve member 10, as shown in Figs. 1 and 2, with the lug 22 below the center of the shaft 13 and the pivot 24, and the lug 29 above the center of said shaft engaging the sleeve-member 10. The outer end of the latch 23 is provided with the lug 30.

In order to open the door with the parts in the position shown in Figs. 1 and 2, the operator applies the wrench or crank to the seat 14 of the sleeve-member 10 and turns said sleeve in the direction of the arrow, Fig. 2, until the inner-lug 19 comes into contact with the shoulder 31 on the bracket 6. As the lug 22 is in the path of the movement of the latch-raising lug 20, the latch 23 will be moved to the position shown in Fig. 3, where the lug 22 is above the center line of the shaft 13. Furthermore, by the turning of the sleeve-member 14, the cam-portion 11 is moved around to relieve the pressure which held the door up in closed position.

Consequently, when by the turning of the sleeve-member 10 the parts are brought to the position shown in Fig. 3, the weight of the lading of the car will act to force the door open, and said door will swing back to the position indicated in dotted lines, Fig. 1, the latch 23, being completely disengaged from the sleeve-member 14, and taking the position shown in Fig. 5, supported by the shoulder 26 on bracket 25.

When the contents of the car have been discharged, and it is desired to close the door, the door is swung back and forth several times by hand until it gets the required momentum, whereupon it is pushed upwardly until the outer-lug 18 comes in contact with the lug 30 of the latch 23. This will rotate the sleeve-member 10 in the direction of the arrow, Fig. 5, bringing it to the position shown in Fig. 4, and at the same time the latch takes the position indicated in Fig. 4, engaging the groove 15 of the sleeve-member 10, the lug 22 passing down the straight face 21 of the sleeve member 10 to a point below the center of the shaft 13 and in engagement with the lug 20, as shown in Fig. 4. In order to bring the door up into tight closed position, the operator then turns the sleeve-member 10 in its bearings, the cam-portion 11 forcing the door up tight into the position indicated in Figs. 1 and 2.

By my invention I provide a very simple form of door-locking mechanism which only requires a partial turn of the shaft to allow the door to swing to open position, and which may be closed by swinging the door by hand up into position to be engaged by the latch, whereupon by a half turn of the shaft the door is brought up into tightly closed position. Furthermore, I dispense with the use of all chains and system of levers for bringing the door up into closed position, thereby greatly simplifying the construction as well as reducing the labor of operation.

What I claim is:

1. In door locking mechanism, the combination of a downwardly swinging door, a swinging latch, a rotary shaft on said door engaged by said latch, means for releasing the latch by the rotation of said shaft, means for supporting said latch in the path of said shaft when the door is moved towards closing position, means on the shaft for engaging said latch to rotate said shaft and bring said latch into engagement therewith to hold the door in partially closed position, and means operated by the further rotation of said shaft to bring the door up into complete closed position.

2. In a door locking mechanism, the combination of a downwardly swinging door, a rotary shaft mounted on said door, a swinging latch adapted to engage said shaft to hold the door in closed position, means for releasing said latch by the movement of said shaft, means for supporting said latch in the path of said shaft when the door is moved towards closing position, said shaft being turned to permit said latch to engage therewith to hold the door in a partially closed position, and a cam-portion on said shaft adapted to force said door into complete closed position by the further turning of said shaft.

3. In a door locking mechanism, the combination of a downwardly swinging door, a rotary shaft mounted thereon, a projection on said shaft, a hooked swinging latch adapted to engage said shaft at a point beyond the center thereof to hold the door in closed position, said latch being in the path of said projection when said shaft is turned, whereby said latch is released, a stop for said shaft, means for supporting said latch in position in the path of said shaft when the door is moved towards closing position, and a lug on said shaft adapted to engage said latch when the door is moved towards closing position, said shaft being turned by said latch, permitting said latch to engage said shaft to hold the door in partially closed position, and means operated by the turning of said shaft to bring the door into complete closed position.

4. In a door-locking mechanism, the combination of a downwardly swinging door, a rotary shaft mounted thereon, a projection on said shaft, a hooked swinging latch adapted to engage said shaft at a point beyond the center thereof to hold the door in closed position, said latch being in the path of said projection when said shaft is turned, whereby said latch is released, a stop for said shaft, means for supporting said latch in position in the path of said shaft when the door is moved towards closing position, and a second projection on said shaft adapted to engage said latch when the door is moved towards closing position, said shaft being turned by said latch permitting said latch to engage said shaft to hold the door in partially closed position, and a cam portion on said shaft adapted to force said door into complete closed position by the further turning of said shaft.

5. In a door-locking mechanism, the combination of a downwardly swinging door, a rotary shaft mounted thereon, a lug on said shaft, a hooked swinging latch adapted to engage said shaft at a point beyond the center thereof to hold the door in closed position, said latch being in the path of said lug when said shaft is turned, whereby said latch is released, a second lug on said shaft, a stop in the path of said lug, means for supporting said latch in position in the path of said shaft when the door is moved towards closing position, and a third lug on said

shaft adapted to engage said latch when the door is moving towards closing position, said shaft being turned by said latch, permitting said latch to engage said shaft to hold the door in partially closed position, and means operated by the further turning of said shaft to bring the door into complete closed position.

6. In a door-locking mechanism, the combination of a downwardly swinging door, a rotary shaft mounted thereon, a sleeve member secured on said shaft against rotation thereon, a groove formed in said sleeve, a hooked swinging latch engaging said groove at a point beyond the center of said shaft to hold the door in closed position, a lug on said sleeve adapted to engage said latch when the shaft is turned, whereby said latch is released, a second lug on said sleeve, a stop in the path of said last-named lug, means for supporting said latch in the path of said shaft when the door is moved towards closing position, a third lug on said sleeve adapted to engage said latch when the door is moving towards closing position, said shaft being turned by said latch permitting said latch to engage said shaft to hold the door in partially closed position, and a cam portion on said sleeve adapted to force said door into complete closed position by the further turning of said shaft.

In testimony whereof I, the said HARRY T. ANDERSON, have hereunto set my hand.

HARRY T. ANDERSON.