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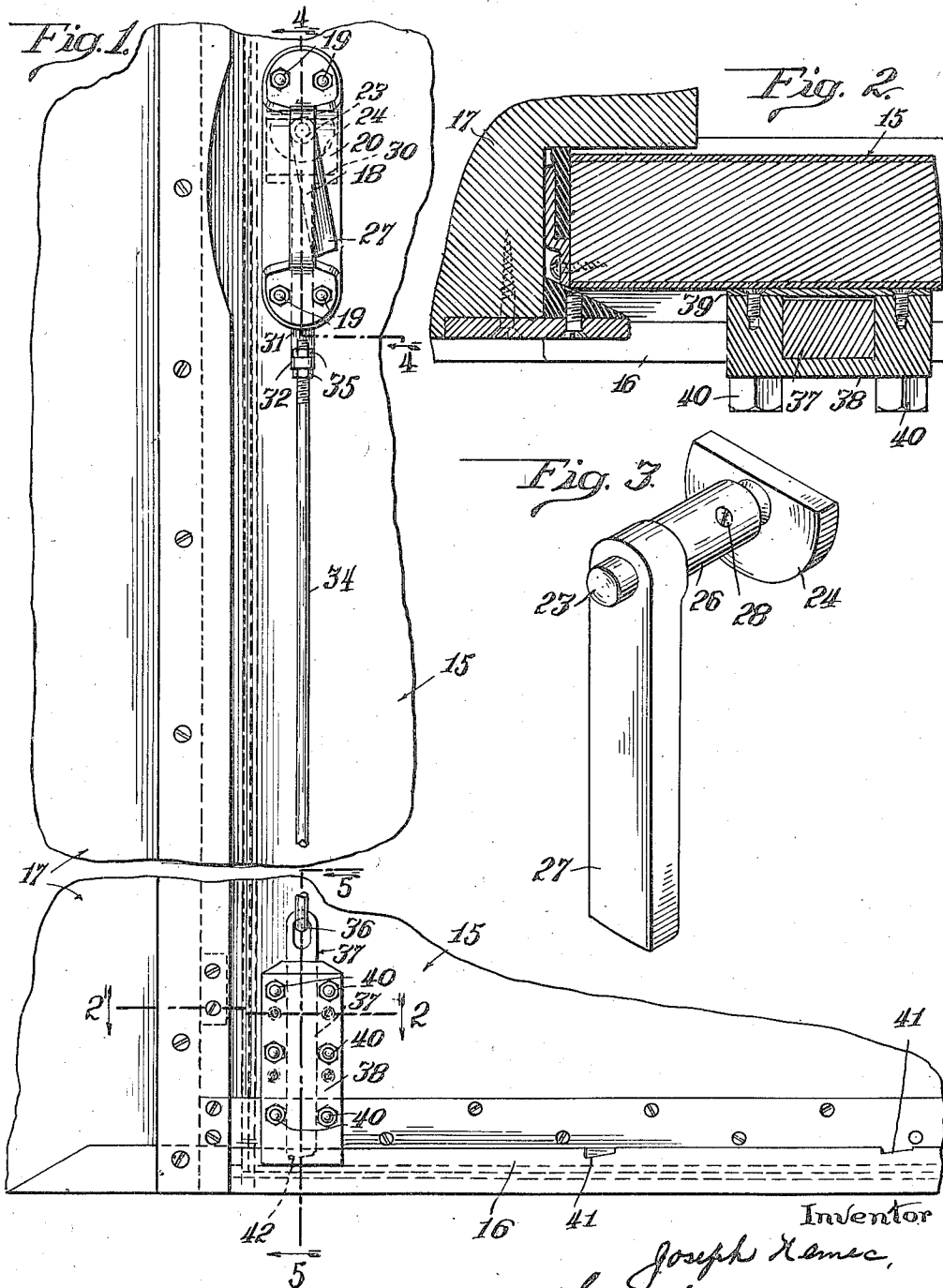
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DOOR HAND GRASP AND LATCHING MECHANISM

Filed May 8, 1936

2 Sheets-Sheet 1



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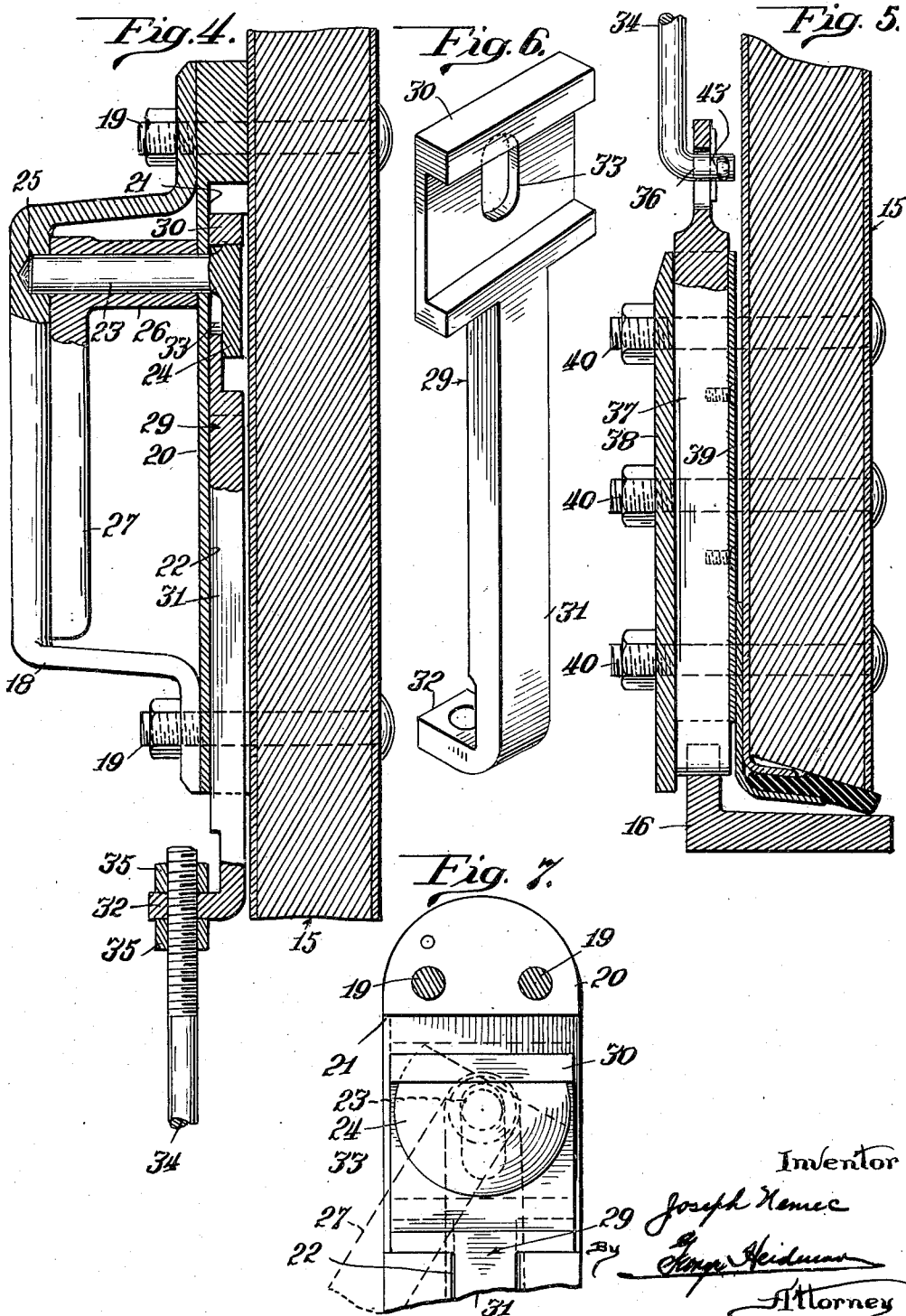
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UNITED STATES PATENT OFFICE

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DOOR HAND GRASP AND LATCHING
MECHANISM

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a corporation of Wisconsin

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7 Claims. (Cl. 292—187)

My invention relates to a hand grasp and associated latching mechanism especially intended for the slidably mounted doors of railroad baggage and mail cars and has for its object the provision of a construction which not only may be easily operated but will also ensure the door being held in the desired positions and hence eliminates the possibility of injury to a trainman or other employee through the accidental shifting or closing of the door due to the swaying movement of the car during train operation.

The objects and advantages of my invention will be comprehended from the following detailed description of the accompanying drawings wherein:

Figure 1 illustrates my improved hand grasp and latching mechanism in elevation and applied to a door in conjunction with a bottom rail; only portions of the door and bottom rail being shown.

Figure 2 is a cross sectional view taken on the line 2—2 of Figure 1, looking downwardly.

Figure 3 is a detail perspective view of the latch mechanism control element.

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 1 as viewed by the arrows.

Figure 5 is an enlarged vertical sectional view taken substantially on the line 5—5 of Figure 1, looking in the direction of the arrows.

Figure 6 is a detail perspective view of an element of the latching mechanism.

Figure 7 is an enlarged rear elevation of the upper end of the door plate and the element shown in Figure 6 and of the element shown in Figure 3 in assembled relation and also illustrating an operated position of the control element in dotted lines.

My invention is especially intended for use on the type of sliding doors generally employed on the baggage and mail cars of railroads and which doors are suspended from suitable rails or trackways above the door opening by means of roller carrying brackets.

As heretofore constructed, these doors have been merely provided with the ordinary well known hand grasp, without means whereby the door would be held either in closed, partially open or complete open position.

In addition to the necessity of opening the doors for the loading and unloading of baggage or mail, it also is frequently necessary to at least partly open the door for purposes of ventilation or observation.

When the car is in motion the door is sub-

jected to considerable vibration and as a result the heavy door very frequently is violently shifted to closed position causing injury to the unprepared trainmen or employee.

My improved mechanism is designed to eliminate this hazard and to automatically lock the door in the desired position; and in the exemplification disclosed in the drawings is shown in conjunction with a top hung type of sliding door of which only a portion is shown at 15, whose lower end is usually guided and held in position by a bottom rail 16; the door 15 in Figure 1 being in complete closed position against the door post 17.

The inner or car side of the door 15 at a suitable point intermediate of the top and bottom and adjacent to what may be termed the forward end is provided with a hand grasp 18 disposed vertically and with the enlarged upper and lower ends bolted or otherwise suitably secured in place as shown at 19, 19. The hand grasp 18 is not directly secured to the door but rests on a door or housing plate 20 of considerable thickness and which is also secured to the door by the bolts 19, 19. The rear or door facing side of the plate 20 is provided with a transverse channel at 21 and with a longitudinal channel 22; the channel 22 extending along the longitudinal center line and uniting with the transverse channel 21, see Figures 4 and 7.

The housing plate 20 coincident with the channel 21 is apertured to receive the trunnion or stem 23 of a cam member 24; the end of the stem 23 being trunnioned in a socket 25 in the hand grasp 18. The stem 23 passes through the elongated hub 26 of a handle 27 which is secured to stem 23 in any suitable manner as by set screw 28 (see Figure 3) so as to induce movement of the cam member 24 when the handle 27 is oscillated. The cam 24 is in the nature of a segmental disc with the straight edge substantially flush with the hub portion 26 and normally intended to face upwardly while the handle 27 depends downwardly and preferably slightly out of perpendicular and hence toward one side of the intermediate portion of the hand grasp 18, as shown in Figure 1. The sockets 21, 22 of the housing plate 20 are intended to receive the latch controlling member 29 consisting of a transversely channeled head portion 30 arranged at the upper end of the elongated stem portion 31 whose lower end is bent laterally as shown at 32. The channeled head 30 is provided with a vertically disposed slot 33; and the flat side of member 29 is intended to rest against the socketed side of

the housing plate 20, with the channel side of the head 30 disposed toward the door.

The stem 23 of the cam is intended to extend through the slot 33 while the cam 24 is arranged in the channel of the head 30 as shown in Figure 4, with the upper wall of the channel in head 30 normally resting on the straight edge of the cam 24; the latch controlling member 29 being dependently supported by the cam 24 and hence being compelled to move vertically when the cam is oscillated.

The stem portion 31 of member 29 may be of any desired length, being preferably of length sufficient to have the lower bent end 32 extend a distance beneath the lower end of housing plate 20 somewhat greater than the degree of vertical movement imparted to the member 29 by the oscillations of cam 24.

The lower bent end 32 is shown apertured to receive the upper end of a connecting link 34 whose upper end is shown preferably threaded to receive the nuts 35 above and below the bent end 32 of member 29 as shown in Figures 1 and 4; the nuts permitting adjustments to be made.

The lower end of link 34 is bent laterally as shown at 36, see Figure 5, and extends through a suitable opening in the upper end of latch-bolt member 37. This member 37 is loosely or slidably mounted in the housing arranged at the bottom of the door and shown consisting of the vertically channeled block or member 38 and the rear plate 39 which is preferably removably secured to the rear or channeled side of the block as shown in Figure 5; the two-piece housing in turn being rigidly secured against the inner or car side of the door, as by means of bolts 40.

As previously stated, the door travels intermediate of the bottom rail 16 and the car wall having the door opening, as shown in Figure 5, and the latch-bolt 37 is therefore disposed in vertical alignment with the upstanding flange of the bottom rail.

The various elements, to wit member 29 and latch-bolt 37 are freely slidable in their respective housings and hence the latch-bolt 37, due to the weight of members 29, 34 and 37, normally moves into engagement with the upstanding flange of the bottom rail 16 when the handle 27 is released and the cam 24 has been oscillated so as to present the arcuate surface downwardly as shown in Figure 4.

The upstanding flange of the bottom rail 16 at preselected points, intermediate of its ends, is cut away or notched as at 41 to receive the lower end of latch-bolt 37. These intermediate notches 41 are preferably made sloping toward the rear end of the door as shown in Figure 1 and the lower end of latch-bolt 37 is preferably likewise tapered. With this arrangement, it would be possible to force the door to further open position without necessarily operating the latch-bolt. The notches at the ends of the rail, namely the notches coincident with the latch-bolt 37 when the door either is in complete open position or completely closed, are of somewhat greater depth so as to completely receive the lower end of the latch-bolt 37 as shown in dotted lines at 42 in Figure 1, thus preventing the latch-bolt riding up and out of the notches 42 without proper operation of the latch mechanism through the required oscillation of the handle 27 and the cam 24. With this construction, the door will be positively locked in either complete closed position or in complete open position and the possibility of injury to an employee is eliminated.

In order to enable and obtain the desired amount of ventilation, the upstanding flange of the bottom rail 16, intermediate of the deep locking notches 42 at opposite ends, may be provided with notches 41 say every ten inches apart; and as the deep ends of notches 41 are disposed in the closing direction of the door, it is apparent that accidental closing of the door, through jars and vibration of the car is impossible. Of course, if desired, notches 41 may be made like notches 42 so that movement of the door toward complete open position would only be possible by operating the latch mechanism, namely by properly rocking cam 24 so it will lift member 29, connecting link 34 and latch-bolt 37.

In assembling the mechanism, the latch-bolt housing 38—39, with the latch bolt 37, is secured at the bottom of the door with latch-bolt 37 in complete register with the end notch 42 in the flange of the bottom rail and the lower end 36 of the connecting link 34 is then inserted through the aperture in the upper end of the latch-bolt 37 and a cotter-pin then inserted in the aperture 43 in connecting link 34, see Figure 5. The upper end of link 34 is then provided with latch controlling member 29 which latter is placed in the recessed or socketed face of housing plate 20, and the stem 23 of cam 24 inserted from the rear through the slot 33 in controlling member 29 and the aperture in the housing plate 20.

The hub portion 26 of operating handle 27 is then inserted over the stem 23 whose protruding end is inserted in the socket 25 on the rear side of the hand grasp 18; the apertures in the ends of the housing plate 20 and of the hand grasp 18 being brought to register for passage of the fastening bolts 19 therethrough.

It is apparent that in order to release and open the door, the operator grasps handle 27 and grasp 18 thereby oscillating handle 27 into alignment with the hand grasp 18 which causes the eccentric portion of cam 24 to engage the upper wall of the transverse channel in the head portion 30 of member 29, thereby forcing the latter vertically upward; such upward movement being permitted by slot 33 and the fact that the transverse socket or recess 21 in housing member or door plate 20 is of vertical dimensions greater than the vertical width of head portion 30 of member 29, see Figure 4.

As is readily apparent, the invention is adapted to either right or left hand doors and may also operate equally as well in conjunction with the upper rail and the invention may have expression in somewhat different form without, however, departing from the spirit of my invention as expressed in the appended claims.

What I claim is:—

1. In a latch and handle mechanism for sliding doors, a slidably mounted latch-bolt carried by the door, a guide-way for said latch-bolt whereby the latter is secured to the door, a hand grasp secured to the door at a distance from and in alignment with the latch-bolt, a control member slidably mounted between the hand grasp and the door; an oscillatingly mounted cam member arranged in operative engagement with said control member; and means whereby said cam member may be oscillated.

2. In a latch and handle mechanism for sliding doors, a latch-bolt slidably secured to the door, a hand grasp secured to the door in alignment with the latch-bolt, a housing plate secured to the door, a control member slidably mounted in the housing plate and provided with a trans-

verse channel, a cam seated in the channel of said control member and trunnioned in the housing plate and the hand grasp, an operative connection between the control member and the latch-bolt, and a lever secured to the trunnion of the cam whereby the latter may be oscillated and the latch-bolt thereby operated.

3. In a latch and handle mechanism for sliding doors, a latch-bolt vertically slidable on the door, a hand grasp secured to the door in vertical alignment with the latch-bolt, a housing plate intermediate of the door and the hand grasp, a control member vertically slidable between the housing plate and the door and provided with a transversely disposed channel, said member having operative relation with the latch-bolt, a cam rotatably seated in the transverse channel of said control member and adapted to reciprocate the latter when the cam is rotated, and a lever swingingly mounted between the hand grasp and the housing and operatively connected with the cam to rotate the latter.

4. In a door hand grasp and latch mechanism for slidingly mounted doors, a latch-bolt vertically slidable on the door, a hand grasp vertically aligned with the latch-bolt and secured to the door above the latch-bolt, a housing providing plate intermediate of the door and the hand grasp, a slotted member vertically slidable in the housing plate, a rotatable cam seated in the slot of said member with the perimeter of the cam in lifting engagement with the upper wall of the slot, an adjustable connection between said slotted member and the latch-bolt, and means oscillatingly mounted between the hand grasp and the housing plate and operatively connected with said cam whereby the latter may be rotated and the slotted member and latch-bolt reciprocated.

5. In a door hand grasp and latch mechanism for sliding doors, a latch-bolt slidably mounted on the door, a control plate slidingly mounted on the door above the latch-bolt means whereby a regulable operative connection between the con-

trol plate and the latch-bolt is provided, an oscillatably mounted hand lever, and a cam-and-slot connection between the control plate and the lever whereby oscillation of the lever induces vertical reciprocation of the control plate and said means and movement of the latch-bolt out of latching position.

6. In a door hand grasp and latch mechanism for sliding doors, a latch-bolt slidably mounted on the door, a hand grasp secured to the door, a housing-plate intermediate of the hand grasp and the door chambered on its rear side and having an aperture therethrough, a control plate vertically slidable in the chamber of the housing-plate and provided with a transversely extending channel, a regulable connection between the control plate and the latch-bolt, a cam seated in the channel of the control plate and provided with a trunnion disposed through the aperture in the housing plate and journaled in the hand grasp, and a hand lever arranged between the hand grasp and the housing plate and secured to the trunnion of the cam whereby the latter may be oscillated, the control plate moved vertically and the latch-bolt lifted.

7. In a latch and handle mechanism for sliding doors, a latch-bolt slidably secured to the door; a latch-bolt control member slidably mounted on the door in alignment with the latch-bolt and provided at one end with a transversely disposed channel; a segmental disc rotatably mounted on the door and arranged in said channel with the flat perimeter of the disc normally in contact with one wall of said channel and adapted to hold said control member, while rotation of the segmental disc will cause the control member to be reciprocated and thereby actuate the latch-bolt; and an operating member operatively secured to the segmental disc whereby the latter may be rotated and the control member with the latch-bolt reciprocated.

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