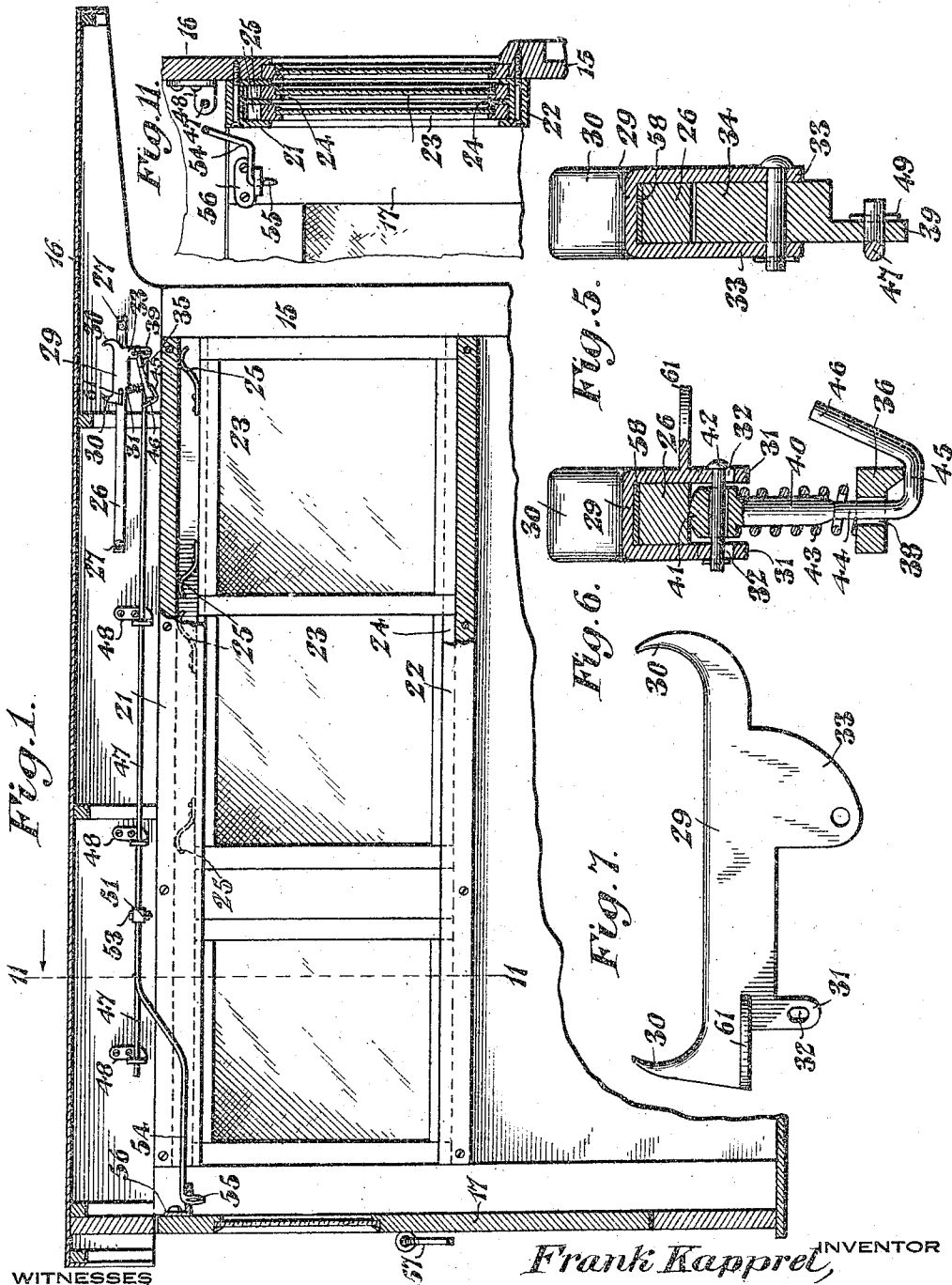


F. KAPPEL.
DOOR OR WINDOW OPERATING DEVICE.
APPLICATION FILED JUNE 19, 1916.

1,237,650.

Patented Aug. 21, 1917.

2 SHEETS—SHEET 1.



WITNESSES

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Frank Kappel, INVENTOR

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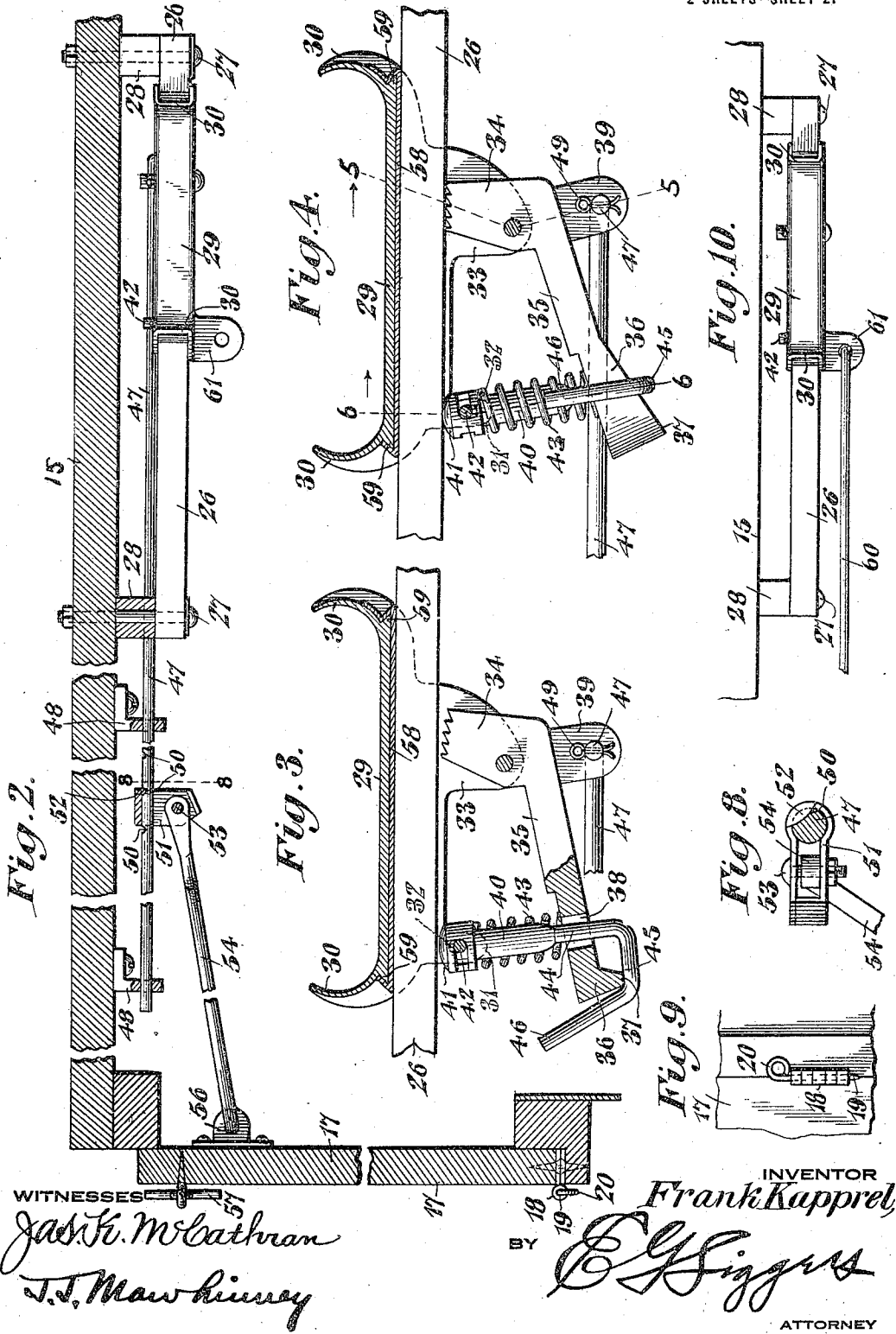
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UNITED STATES PATENT OFFICE.

FRANK KAPPREL, OF KANSAS CITY, MISSOURI.

DOOR OR WINDOW OPERATING DEVICE.

1,237,650.

Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed June 19, 1916. Serial No. 104,539.

To all whom it may concern:

Be it known that I, FRANK KAPPREL, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Door or Window Operating Device, of which the following is a specification.

The present invention relates to an improved device for operating doors, windows, transoms, and the like, from a distance.

The invention has for an object to provide an operating device of this character which, when applied to the door, or the like, permits of the opening and closing of the door to any desired extent, and the locking and releasing of the device by one hand, and which holds the door in adjusted position.

Another object of the invention is to provide a device of this character which is especially adapted to doors of cabs on locomotives; to permit the control of the door from the engineer's seat; and to provide a structure which is yieldable in one direction, and which is so connected to the door that should it become necessary to leave the cab without operating the device, the door may be opened by slight pressure thereagainst from the inside; and also to permit entrance through the front end of the cab, when the door is closed, by pulling the door open against the tension of the device.

Other objects and advantages of this invention will be brought out in the following specific description of the present preferred embodiment of this invention, the same being illustrated in the accompanying drawings, wherein—

Figure 1 is an inside elevation of the right side of a locomotive cab, showing the improved door and window operating device of this invention applied thereto, and connected to the front door of the cab.

Fig. 2 is an enlarged top plan view of the device, shown as applied in Fig. 1, the cab being in section, and the distant parts being omitted for the purpose of clearness.

Fig. 3 is a further enlarged detail view, in longitudinal section, showing the hand grip of the device released from the guide bar.

Fig. 4 is a similar view, showing the hand grip locked upon the guide bar.

Fig. 5 is a transverse section on the line 5—5 of Fig. 4, showing the pivotal mounting of the combined locking and connecting lever.

Fig. 6 is a similar view, taken on the line 6—6 of Fig. 4, showing the pivotal mounting of the thumb latch and its connection with the locking lever, the distant parts being omitted.

Fig. 7 is a detail side elevation of the hand grip saddle, which straddles the guide bar.

Fig. 8 is a detail longitudinal section, taken on the line 8—8 of Fig. 2, showing the connection between the connecting rod and the link, which latter, in the present instance, is connected to the cab door.

Fig. 9 is a detail fragmentary view of the outer side of the cab door, showing one of its supporting hinges.

Fig. 10 is a top plan view of a slight modification, showing the connecting rod connected directly to the saddle plate.

Fig. 11 is a transverse section on the line 11—11 of Fig. 1, looking toward the front door of the cab and showing the side of the cab and the mounting for the device thereon.

Referring to these drawings, wherein like numerals indicate similar parts throughout the several views, the invention is shown as applied to a locomotive cab for controlling the front door of the cab from the engineer's seat. The numeral 15 designates the side or body of the cab which is of the usual construction and provided with a roof 16. The front of the cab 15 has the usual door 17, which is mounted upon hinges 18, which, as shown particularly in Figs. 2 and 9, have pintles 19 with enlarged eyes or loops 20 at their upper ends to permit the easy grasping of the pintles to withdraw them from the hinges and release the door 17.

The inner side of the cab 15 is preferably provided with upper and lower guide rails 21 and 22, which are channeled to receive therein the tops and bottoms of sliding sash frames 23. From Figs. 1 and 11, it will be noted that the sash frames 23 are separated in the grooves of the guide rails 21 and 22 by means of a parting strip 24, which divides each guide rail. The upper guide rail 21 has a channel or slot which is of a depth more than twice the depth of the slot in the lower guide rail 22. The sash frames 23 carry upon their upper edges leaf springs 25, which yieldingly hold the sashes 23 down in the channels of the lower guide rail against displacement by vibration of the locomotive.

Arranged immediately over the engineer's seat, which in most cases is located beneath

the rearmost window 23, is a guide rail 26. As may be best seen from Fig. 2, this rail 26 stands in spaced relation from the side of the cab 15, or from the lower portion of the roof 16, to provide a space between the rail 26 and the side of the cab. The rail 26 is held in place by bolts 27, or the like, which also pass through spacing blocks 28 surrounding the bolts 27 between the side of the cab and the rail 26. It will be noted that the rail is spaced above the upper window guide rail 21, so as to clear the same.

Mounted to slide longitudinally on this rail 26 is a hand grip. The hand grip comprises a saddle plate 29, having horns 30 upstanding from its opposite ends and being suitably curved to fit the fingers of the hand, so that the saddle plate 29 may be easily grasped by the fingers when the same are placed over the plate between the horns 30. The forward end of the saddle plate 29 has a pair of depending lugs 31 provided with registering vertical slots 32. The rear end of the saddle plate 29 is provided with a pair of depending ears 33 suitably apertured near their lower ends. Both the lugs 32 and the ears 33 extend below the guide rail 26, which latter passes through the saddle plate.

Arranged beneath the guide rail 26 and pivoted between the ears 33 is a combined locking and connecting lever of bell crank form having one arm 34 extending upwardly between the ears 33 and having serrations or teeth in its upper edge adapted to bite against the lower side of the guide rail 26.

The opposite arm of this operating lever extends longitudinally beneath the saddle plate 29 to provide an operating arm 35, and is flattened and enlarged at its outer end to provide a head 36 for the locking lever.

The head 36 has a lower cam face 37, and has an upper flat face and a vertical substantially central opening 38. The inner end of the operating lever 35 is provided with a depending lug 39, which is apertured.

The forward end of the saddle plate 29 is provided with a thumb latch. The thumb latch comprises a bolt 40 having a head 41, provided in opposite sides with peripherally extending slots through which extends a transverse pivot pin 42 secured through the lugs 31. The peripheral slots in the head 41 admit of the turning of the bolt 40 through nearly 180 degrees. The pivot pin 42 is movable in the vertically extending slots 32 to engage the upper rounded top of the head 41 against the lower side of the guide rail 26, when the saddle plate 29 is locked to the guide rail.

Surrounding the bolt 40 is a coiled spring 43 bearing at one end against the head 41 and at its opposite end against the flat face of the head 36 of the operating arm. The

lower end of the bolt 40 terminates in a stem 44, which passes down through the opening 38 in the head 36, and is bent laterally beneath the head, as shown to advantage in Figs. 3 and 6, to provide a bearing arm 45 adapted to ride over the lower cam face 37 of the head 36, draw the bolt 40 downwardly, and lift the operating arm 35. The stem 44 is bent upwardly from the outer end of the arm 45 to provide a projection or finger 46 adapted for engagement by the thumb of the hand when the latter rests upon the saddle plate 29. When the projection 46 is turned to extend beyond the forward end of the hand grip, the bearing arm 45 engages the highest point of the cam face 37, so as to compress the spring 43, swing the operating lever out of engagement with the guide rail 26, and withdraw the head 41 from engagement with the guide rail.

A connecting rod 47 is slidably mounted in brackets 48, which are secured against the inner side of the cab 15. The connecting rod 47 is bent at right angles at its rear end and passed through the aperture in the lug 39 of the combined locking and connecting lever. The rod 47 is held to the lug by means of a cotter pin 49, or the like, as shown to advantage in Fig. 4. The connecting rod 47 is also provided near its forward end with a plurality of longitudinally spaced apart notches 50, which are preferably arranged in the upper side of the connecting rod adjacent the side of the cab 15, as shown in Fig. 2. A clip 51, in the form of a U-shaped strap, engages about the connecting rod 47, and has, at its inner end, an inwardly projecting tooth 52, for engagement in one of the notches 50, to hold the clip 51 from sliding longitudinally upon the rod 47.

A clamping bolt 53 passes through the outer ends of the clip 51 to contract the same upon the rod 47, and to also hingedly connect one end of a link 54 to the clip, and to admit of the free swinging of the link toward and from the connecting rod 47. The opposite end of the link 54 is provided with a split end 55, the parts of which are bowed outwardly from each other to form a spring head adapted to be forced downwardly through an opening in the outstanding lug of a bracket plate 56, secured to the inner side of the door 17. The head or split end 55 expands after passing through the bracket plate to yieldingly hold the link 54 in hinged connection with the door. The door 17 has secured to its outer side a hinged handle 57 adapted to normally hang down flat against the outer side of the door, and which may be raised for pulling the door open against the tension of the hand grip.

To open the door, the engineer engages his fingers over the saddle plate 29 between

the horns 30, with the thumb in position to engage the projection 46. To open the door, the projection 46 is swung forwardly toward the door, which movement turns the bearing arm 45 over the cam face 37 and draws the bolt 40 downwardly between the lugs 31, compresses the spring 43, and swings the operating lever to withdraw the toothed arm 34 out of contact with the guide rails 26.

The head 41 of the bolt is thus also retracted from engagement with the guide rail 26. Pressure of the fingers against the forward horn 30 slides the saddle plate 29 toward the door, shifts the connecting rod 47 forwardly through the brackets 48, and thrusts the link 54 forwardly to swing the door 17 open to the desired extent.

The engineer may now, by drawing the projection 46 backwardly by the thumb, release the spring 43. The spring 43 forces the operating arm 35 downwardly to raise the toothed arm 34 into contact with the guide rail 26, and then exerts pressure against the head 41 to move it upwardly between the lugs 31 and bind the head against the guide rail 26. Thus, both the head 41 and the toothed arm 34 engage against the under side of the guide rail 26, and lock it to the hand grip. Pressure against the outer side of the door 17 by wind, or the like, tends to force the link 54 and connecting rod 47 backwardly. The backward movement of the connecting rod 47 swings the locking lever to bind the toothed arm 34 thereof harder against the under side of the guide rail, so that the hand grip cannot move backwardly.

However, should a person in front of the cab desire to enter the same, and the hand grip be locked, as above described, it is only necessary to grasp the handle 57 and draw it forwardly to open the door. The outward movement of the door pulls the link 54 and connecting rod 47 forwardly. This action tends to swing the locking lever and release its toothed arm 34 from contact with the guide rail. It is, therefore, only necessary to slightly overcome the tension of the spring 43 in opening the door. This arrangement is also provided for the purpose of permitting the escape of the engineer from the cab, should a burst steam pipe, or a collision prevent access to the hand grip. It is only necessary that the engineer push against the inner side of the door 17 to overcome the tension of the spring 43 and thus permit the ready opening of the door.

To prevent undue wear upon the lower side of the saddle plate 29, a liner 58 is positioned against the under side of the saddle plate, and has its ends bent upwardly around shoulders 59 to hold the liner in position. This liner may be readily renewed from time to time as it is worn down by the

constant shifting of the hand grip in opening and closing the door.

In Fig. 10, the connecting rod 60 is attached to the ear 61. The ear 61 projects laterally from the forward end of the saddle plate 29, and has no direct connection with the operating lever as does the connecting rod 47 of the preferred form.

The arrangement shown in Fig. 10 is particularly applicable to the front cab doors of switching engines, by its use, as it is much harder to release or open the door by pressing thereagainst. When the engine is traveling backward, the wind blows in through the back of the cab and exerts a pressure upon the front door which, when the preferred form is used, is sufficient to retract the operating lever against tension of the spring 43, and permit the door to fly open.

Under such condition, when the modified arrangement is resorted to, the movement of the rod 60, in either direction, does not swing the operating lever as it has no connection therewith, and the latter is held in contact with the guide bar 26 by the spring 43 until manually released by the thumb-latch 46. Considerable pressure upon the rod 60 is, therefore, necessary to overcome the tension of the spring 43, as the operating lever is moved only by overcoming the frictional contact of the arm 34 with the inner side of the bar.

When the rod is connected to the lower ear 39, it positively swings the operating lever and causes the same to grip hard when moved in one direction, and to release with ease when moved in the opposite direction. When the rod is connected to the upper ear 61, the device must always be moved against the tension of the spring 43 and the frictional engagement of the toothed arm 34 with the bar 26.

It is, of course, understood that the above described device is for the right hand side of a locomotive cab. The device may be made left handed by apparent changes in its structure, so that it may be used on the opposite side of the cab also. It is also understood that the device may be employed for shifting windows, transoms, or any other movable objects to which the device may be applied, and wherein it is desirable to have a one-way yielding locking device.

The door 17 may be easily removed by forcing the outer end of the link 54 upwardly to disengage its spring head 55 from the bracket plate 56 of the door. The pintles 19 may now be removed by engaging a finger through the eyes or loops 20 and drawing the same upwardly. Thus, the door may be quickly and easily removed from the cab. The window frames 23 may also be easily removed by forcing the same upwardly against the tension of the leaf springs 25 until the lower ends of the frames

23 are free from the lower guide rails 22. The frames 23 are now swung outwardly and drawn down to engage the frames from the guide rails.

5 The guide rod 26 is preferably given some angular form, such as rectangular, as shown in the present instance, and the saddle plate 29 is bent to conform thereto, so that the saddle plate will remain in upright position
10 at all times and will not turn or twist upon the guide rod.

The teeth on the upper end of the short arm 34 of the locking lever preferably extend in one direction, as shown, in the direction in which the arm 34 is swung to release
15 the same from the guide rail. Such provision insures the binding of the teeth against the rail when the door or window is swung in one direction, such as for instance into
20 closed position, as shown in the drawings.

What is claimed is:—

1. A door or window operating device including a guide rail, a hand operated member slidably mounted on said rail, a locking
25 lever pivoted on said member, a spring engaging the locking lever to normally hold the same against the guide rail and lock said member from movement thereon, a
30 latch mounted on said member and adapted to be actuated to compress the spring and swing the lever out of contact with the guide rail and release said member, and a connecting rod pivoted to said lever and adapted
35 lever against the tension of the spring and permit the sliding of said member on said guide rail.

2. A door or window operating device having a guide rail, a saddle plate slidable
40 along the guide rail, a locking lever hinged upon the saddle plate and having a toothed arm, a spring actuated latch carried by the saddle plate and having engagement with the opposite arm of the locking lever to
45 move the toothed arm toward and from the guide rail, and a connecting rod between the locking lever and the door or window adapted, when the latter is moved in one
50 latch in binding the locking lever against the guide rail and securing the member from movement, said connecting rod being also adapted, when the door is moved in an
55 lever from the guide rail against the tension of said spring latch and permit the movement of the member on the guide rail.

3. A door or window operating device including a guide rail, a saddle plate slidably
60 mounted on the rail and adapted to support the hand, a locking lever pivoted to the saddle plate and having a toothed arm for biting engagement with the guide rail to lock the saddle plate thereto, a thumb latch carried by the saddle plate and having connec-

tion with said pivoted lever, said thumb latch having a projection lying adjacent to the thumb of said hand on the saddle plate, and adapted to be actuated by the thumb to swing said locking lever out of and into
70 contact with said guide rail and means for yieldingly holding the thumb-latch in its opposite positions.

4. In a door or window operating device, a guide rail, a saddle plate engaging over the
75 guide rail for sliding movement thereon, a locking lever hinged to the saddle plate and having a toothed end for engagement with said rail to lock the saddle plate thereon, a latch bolt pivotally and loosely connected to
80 the saddle plate immediately beneath the rail, a spring between the opposite end of said locking lever and said bolt to force the toothed end of the lever and the inner end of the bolt against said rail, and means for
85 contracting said spring to release the lever and the bolt from the rail.

5. A door or window operating device comprising a guide rail, a hand grip slidably
90 mounted on the rail and having means to lock and release the grip to and from the rail, a connecting rod secured at one end to the hand grip and adapted to be moved
95 thereby, said rod having longitudinally spaced apart notches, a link for engagement at one end with the door or window, and a clip on the opposite end of said link and engaging about said connecting rod, said clip having an inwardly extending tooth at one
100 side for engagement in any one of said notches to hold the clip from longitudinal displacement on the connecting rod.

6. In a door or window operating device, a guide rail, a saddle plate engaging over
105 the rail to slide thereon, a locking lever hinged at one end of the saddle plate beneath the rail and having a toothed arm extending toward the rail and an operating arm depending from said toothed arm, said operating arm having an apertured head at
110 its outer end with a cam face on its under side, a bolt loosely pivoted at one end in the opposite end of the saddle plate and having a depending stem projecting through the opening in said head and adapted to be
115 turned outwardly against said cam face, and a spring mounted on the bolt and having connection therewith at one end and bearing against said head at its opposite end to urge the operating arm of the lever downwardly
120 and bind the teeth against the rail, and to urge said bolt upwardly into contact with the rail, said stem being adapted to be turned against said cam face to draw the bolt downwardly and raise said operating arm to re-
125 lease the bolt and the teeth from the rail.

7. A door or window operating device including a guide rail, a hand operated member mounted on the guide rail, a locking lever pivoted to the hand operated member
130

and adapted to engage the guide rail to lock the member against movement, a latch attached to the member and loosely engaging said lever at a point remote from that which
5 engages the guide rail, a spring interposed between said latch and lever, and a connecting rod attached to said lever and adapted to be connected to said door.

8. A door or window operating device including a guide rail, a hand operated member mounted on the guide rail, a locking lever pivoted to the member and having a portion adapted to engage the guide rail to lock the member against movement and a portion
10 having a cam, a latch movably attached at one end to said member and loosely engaging at its opposite end said lever at a point

adjacent said cam, a spring interposed between said lever and said latch, said latch being provided with a projection adapted to
20 be actuated to move the latch into engagement with the cam of the lever whereby the portion of the lever engaging the guide rail will be disengaged therefrom, said spring holding said latch in its various adjust-
25 ments.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK KAPPREL.

Witnesses:

WILLIAM WALSH,
WALTER J. WALSH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."