May 6, 1952 S. B. HASELTINE 2,595,357

HOLDING MEANS FOR OPERATING LEVER ARMS OF DOOR FASTENERS

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Fig. 1

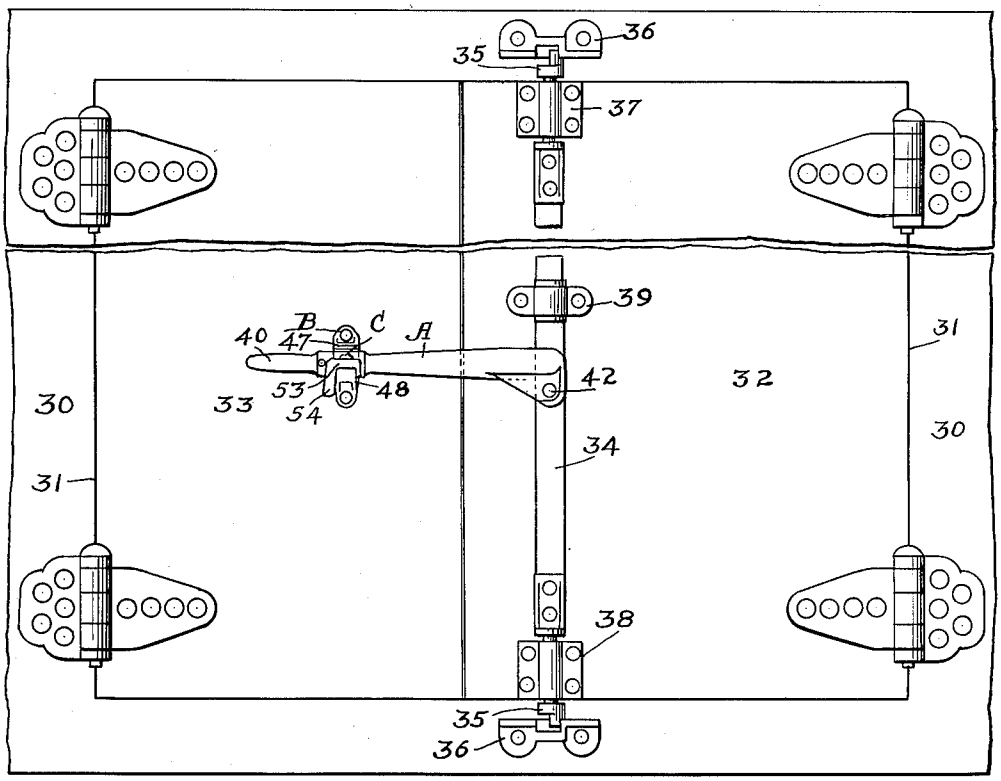
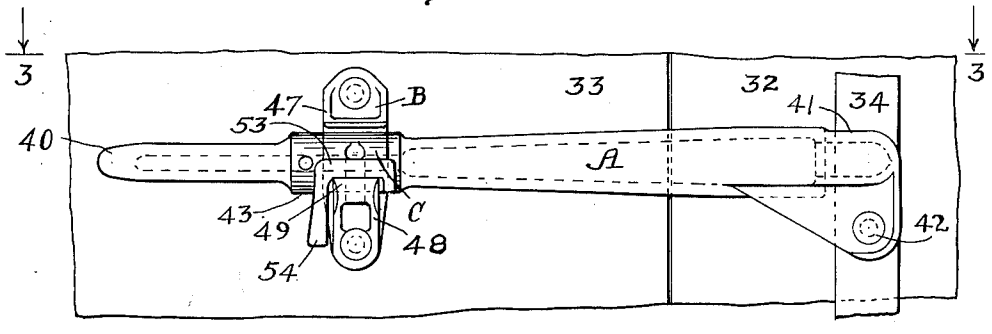


Fig. 2



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Fig. 3

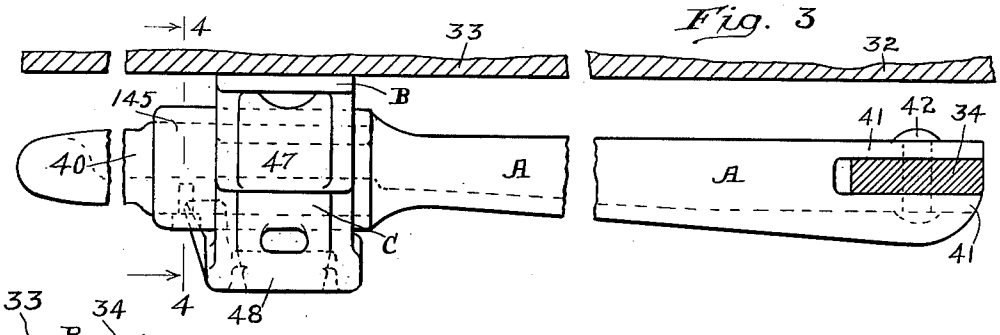


Fig. 4

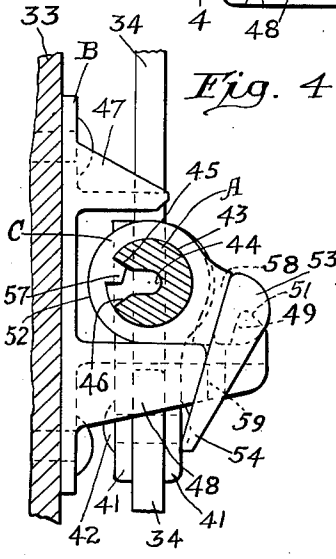


Fig. 5

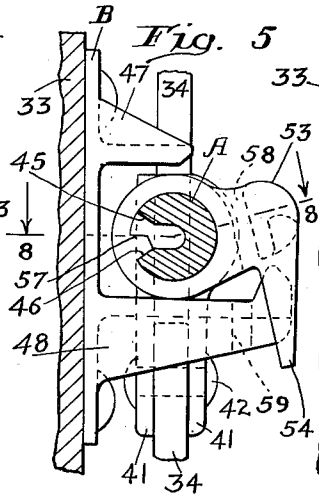


Fig. 6

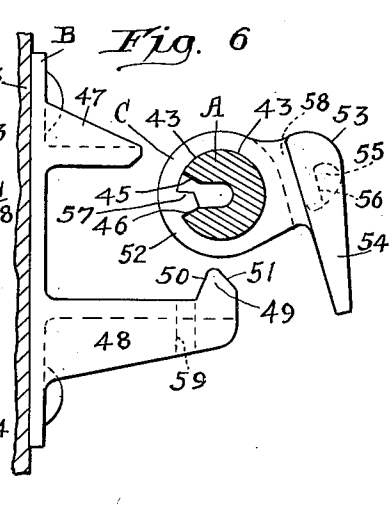
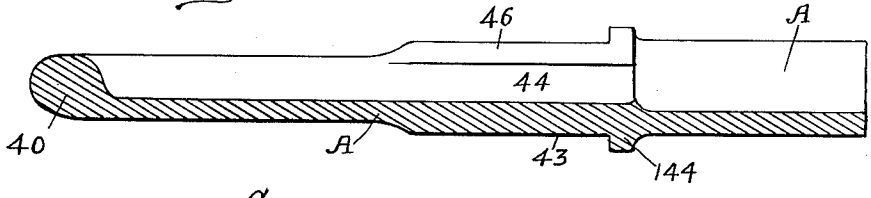


Fig. 7



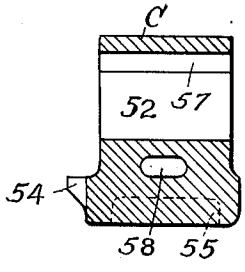


Fig. 8

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HOLDING MEANS FOR OPERATING LEVER ARMS OF DOOR FASTENERS

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Fig. 9

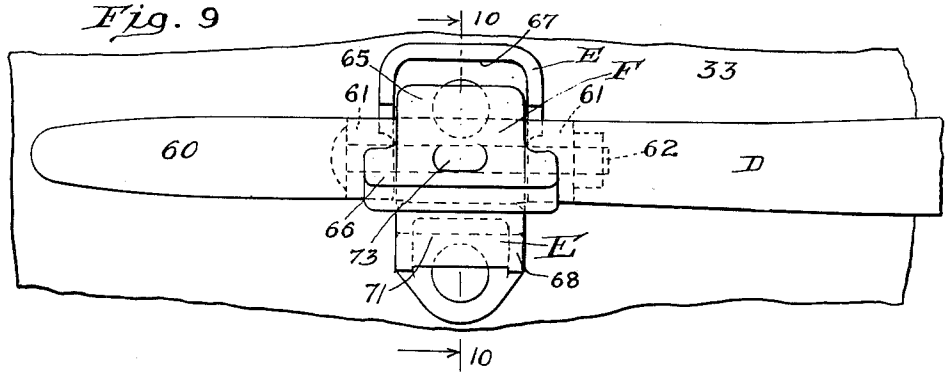


Fig. 10

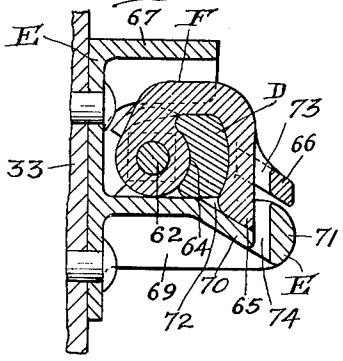


Fig. 11

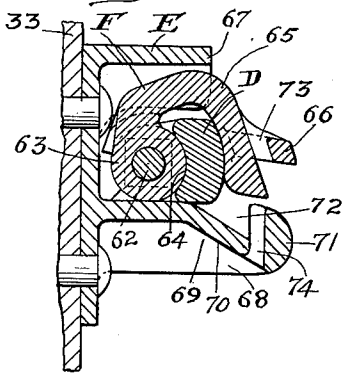


Fig. 12

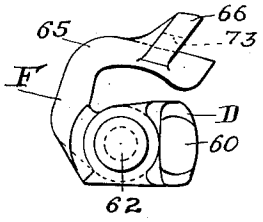
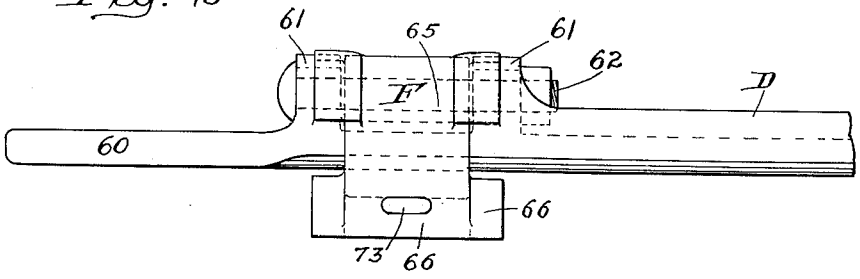


Fig. 13



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HOLDING MEANS FOR OPERATING LEVER ARMS OF DOOR FASTENERS

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Fig. 14

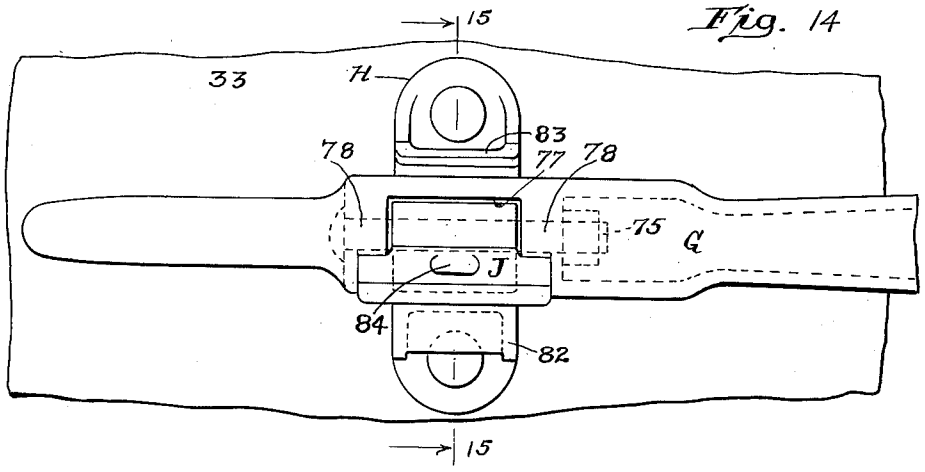


Fig. 16

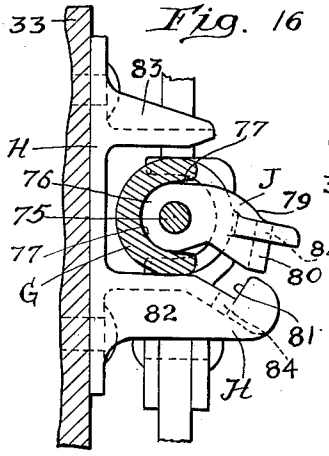


Fig. 15

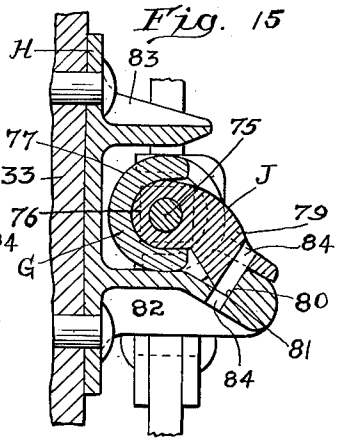


Fig. 17

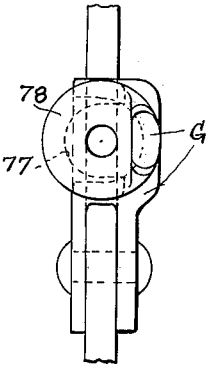
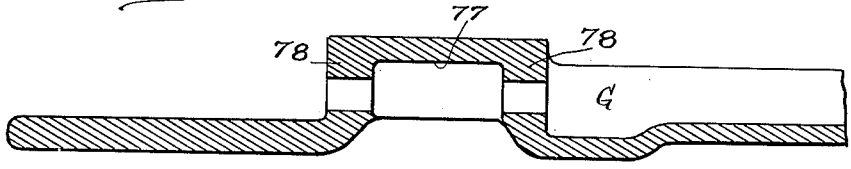


Fig. 18



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Fig. 19

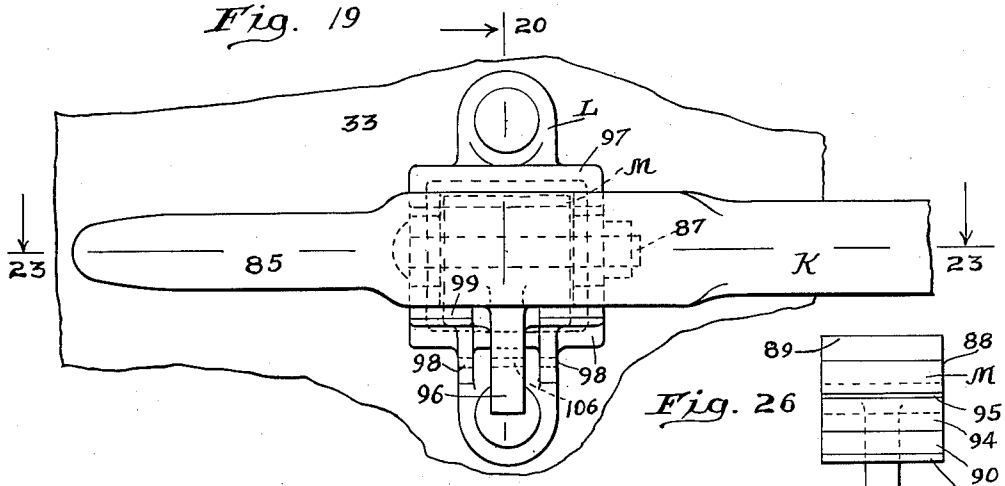


Fig. 26

Fig. 20

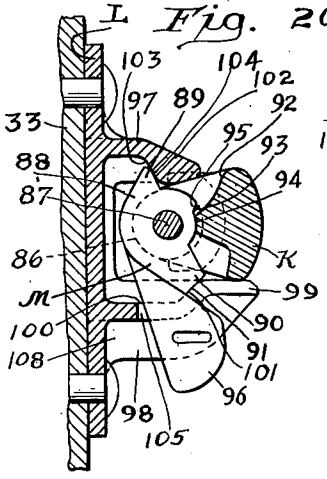


Fig. 21

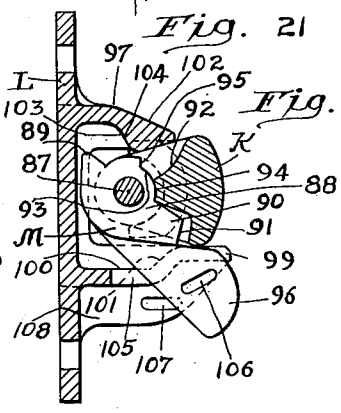


Fig. 22

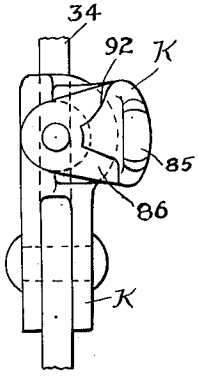


Fig. 23

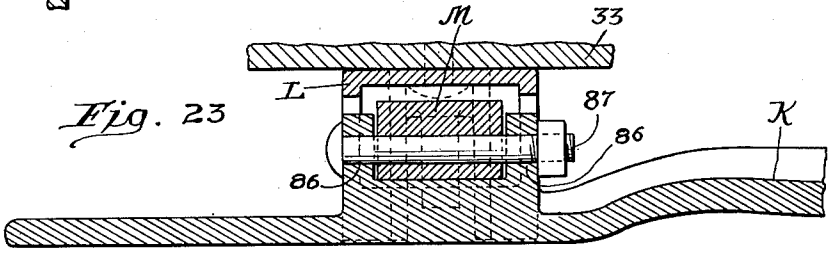
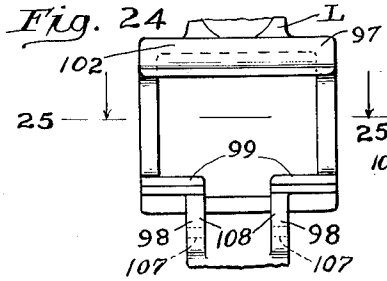


Fig. 24



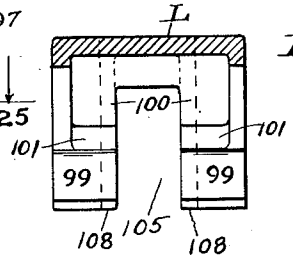


Fig. 25

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Patented May 6, 1952

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UNITED STATES PATENT OFFICE

2,595,357

HOLDING MEANS FOR OPERATING LEVER ARMS OF DOOR FASTENERS

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Application January 19, 1948, Serial No. 3,143

4 Claims. (Cl. 292—1)

1

This invention relates to improvements in means for holding the swinging operating lever of a rotary bar door fastener against movement in door opening direction.

One object of the invention is to provide in a door fastener of the lever actuated rotary bar type, simple and efficient means for latching the actuating lever against rotation in door opening direction.

A more specific object of the invention is to provide in a rotary bar door fastener, including an operating lever swingable about the axis of rotation of the bar to rotate the latter, means for latching the door in closed position, comprising a latch plate on the door and a cooperating latch member on the lever rotatable about the longitudinal axis of the lever and adapted to interlock with keeper means on the latch plate.

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

In the accompanying drawings forming a part of this specification, Figure 1 is a broken elevational view of one of the side walls of a container provided with hinged doors, illustrating my improvements in connection therewith. Figure 2 is a view similar to Figure 1, on an enlarged scale, of the mechanism at the central portions of the hinged doors. Figure 3 is a horizontal sectional view, on a still further enlarged scale, corresponding substantially to the line 3—3 of Figure 2. Figure 4 is a vertical sectional view, corresponding substantially to the line 4—4 of Figure 3. Figure 5 is a view similar to Figure 4, showing the latch member unlocked from the latch plate of my improved mechanism. Figure 6 is a view similar to Figure 5, showing the operating handle lever disengaged from the latch plate. Figure 7 is a transverse longitudinal sectional view of the operating handle lever of my improved mechanism, corresponding substantially to the line 8—8 of Figure 5, with the rotary latch member omitted. Figure 8 is a sectional view of the rotary latch member shown in Figure 5, corresponding substantially to the line 8—8 of Figure 5, with the operating handle lever omitted. Figure 9 is a view similar to Figure 2, on a still further enlarged scale, illustrating another embodiment of the invention. Figure 10 is a transverse vertical sectional view, corresponding substantially to the line 10—10 of Figure 9. Figure 11 is a view similar to Figure 10, showing the latch member in unlocked position. Figure 12 is an end view of the operating lever and latch member shown in Figure 9, looking from left to right in said figure,

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illustrating the latch member raised. Figure 13 is a top plan view of Figure 9 with the door omitted. Figure 14 is a view similar to Figure 9, illustrating still another embodiment of the invention. Figure 15 is a vertical sectional view, corresponding substantially to the line 15—15 of Figure 14. Figure 16 is a view similar to Figure 15, showing the latch member in elevation and in unlocked position. Figure 17 is a broken end view of the mechanism shown in Figure 14 with the door omitted, looking from left to right in said figure. Figure 18 is a horizontal longitudinal sectional view of the operating handle lever shown in Figure 14. Figure 19 is a view similar to Figure 14, showing still another embodiment of the invention. Figure 20 is a vertical sectional view, corresponding substantially to the line 20—20 of Figure 19. Figure 21 is a view similar to Figure 20, showing the latch member unlocked. Figure 22 is an end elevational view of Figure 19 with the door omitted, looking from left to right in said figure. Figure 23 is a horizontal sectional view, corresponding substantially to the line 23—23 of Figure 19. Figure 24 is a front elevational view of the latch plate shown in Figure 19. Figure 25 is a horizontal sectional view, corresponding substantially to the line 25—25 of Figure 24. Figure 26 is a front elevational view of the latch member shown in Figure 20.

In said drawings, referring first to the embodiment of the invention illustrated in Figures 1 to 8 inclusive, 30 indicates the side wall of a container provided with a door opening 31, closed by a pair of hinged doors 32 and 33. The inner meeting edges of the doors 32 and 33 are beveled, with the door 32 overlapping the door 33 to hold the latter closed. The door 32 is provided with a vertically disposed rotary operating bar 34, of well-known design, having keeper engaging crank members 35—35 at opposite ends engageable with the usual slotted keepers 36—36 to force the door 32 open and closed. The bar 34 is supported for rotation by top, bottom, and intermediate bearing brackets or guide members 37, 38, and 39, fixed to the outer side of the door 32.

My improved mechanism, as shown in Figures 1 to 8 inclusive, comprises broadly an operating handle lever A for rotating the bar 34, a latch plate B fixed to the door 33, and a rotary latch member C mounted on the lever A and engageable with the latch plate B.

The lever A is in the form of an elongated bar pivotally connected at its inner end to the rotary operating bar 34 and having a hand grip portion 40 at its outer end. The inner end of the

lever A is forked, as indicated at 41, to embrace the bar 34 on opposite sides, and is pivotally connected thereto for swinging movement in a vertical plane by a pin 42 extending through the arms of the fork and the bar 34. Inwardly of the hand grip portion, the handle lever has a section of cylindrical transverse cross section forming a cylindrical bearing portion 43 for supporting the latch member C. At the inner end of the bearing portion 43, the handle lever is provided with an annular flange 144, forming a stop for the latch member C. The cylindrical section or bearing portion 43 of the lever A is provided with a lengthwise extending, laterally opening slot 44, having a flaring mouth providing circumferentially spaced stop shoulders 45 and 46.

The latch plate B, as shown in Figure 1, is fixed to the outer side of the door 33 and in alignment with the lever A in its horizontal operative position at right angles to the bar 34.

The plate B has laterally outwardly extending, vertically spaced, horizontal arms 47 and 48, adapted to accommodate the lever A therebetween, as shown in Figures 1, 2, and 4. The upper arm 47 is considerably shorter than the lower arm 48 and the latter is provided with a transversely extending, upstanding lug 49 at its outer end. The lug 49 presents an outwardly and upwardly inclined locking face 50 on its inner side and is beveled off on the outer side, as indicated by 51. The lower arm 48 thus forms, in effect, a right angular supporting hook with which the latch member C is adapted to interlock.

The latch member C comprises a cylindrical sleeve section 52, journaled for rotation on the bearing portion 43 of the lever A, and a locking arm 53 extending radially outwardly from the sleeve section 52. The latch member C is confined against lengthwise displacement on the bearing portion 43 between the flange 144 and a collar 145 held by a set screw. The arm 53 carries a depending finger piece 54 at its outer end by which the latch member may be rotated. At the outer end thereof, the arm 53 is provided with a downwardly opening pocket 55 at its lower side adapted to engage over the lug 49 to lock the lever A against outward swinging movement, the pocket 55 having a substantially flat inner side wall 56 adapted to seat truly on the inclined locking face 50 of the arm 48 of the latch plate B. To restrict rotation of the latch member C about the longitudinal axis of the lever A, the sleeve 52 of the latch member is provided with an interior stop lug 57 operating between the stop shoulders 45 and 46 and engageable respectively therewith.

The operation of my improved holding means as shown in Figures 1 to 8 inclusive is as follows: In forcing the doors closed, the operating lever arm A is swung inwardly toward the door 33, thereby rotating the bar 34 and camming the door shut through engagement of the crank members 35 with the keepers 36. As the bar is being swung inwardly toward the position shown in Figure 4, between the arms 47 and 48 of the latch plate, the latch member C rides over the lug 49 and, turning on the lever A, automatically drops to the locking position shown in Figure 4 with the pocket 55 engaged over the lug 49. Inasmuch as the wall of the pocket 55 which engages the face 50 of the lug 49 is forwardly of the axis of swinging movement of the latch, outward pull on the lever A tends to wedge the latch more tightly against the lug 49, upward tilting of the pivotal axis of the latch being blocked by engagement of

the upper side of the lever with the arm 47 of the latch plate B. As will be noted, the height of the lug 49 is such that the latch must be manually rotated to disengage it from the lug to clear the upper arm 47 of the latch plate. Thus, with the parts in the latched position shown in Figure 4, the lever arm A is effectively held against outward swinging movement to hold the bar 34 against rotation in door opening direction.

To unlock the lever A, the latch is rotated by the finger piece 54, from the position shown in Figure 4 to that shown in Figure 5. The lever may then be swung outwardly, as indicated in Figure 6, rotate the bar 34 in door opening direction.

Provision is also made for sealing the latch member C in its latched position, the body of the latch member and the lower arm 48 of the latch plate B being provided with registering openings 58 and 59, as shown in Figure 4, to receive the usual car seal.

Referring next to the embodiment of the invention illustrated in Figures 9 to 13 inclusive, my improved mechanism comprises broadly an operating handle lever D for actuating the rotary operating bar of the door fastener, a latch plate E, and a rotary latch member F.

The lever D, which is similar to the lever A hereinbefore described, has a hand grip portion 60 and is swingingly connected to the operating bar of the door fastener in a manner similar to the lever A. Inwardly of the hand grip 60, the lever D is provided with longitudinally spaced, laterally inwardly projecting supporting lugs 61—61 between which the latch member F is rotatably supported by a pivot pin 62 extending through the lugs and the main body or head portion 63 of the latch member. The pivot pin 62 is preferably in the form of a bolt.

As shown in Figures 10 and 11, the head portion 63 of the latch member is rounded and the lever D is cut out, or recessed, on its inner side between the lugs 61—61, as indicated at 64, to form a bearing seat for the side of the rounded head portion of the latch member.

The latch member F includes a hook-shaped latch arm 65, which extends forwardly from the head 63 and is engageable with the latch plate E. As shown in Figures 10 and 11, the shape of the latch arm 65 is such that it closely fits over the corresponding portion of the lever when swung to latching position, as illustrated in Figure 10, and has its end projecting below the lever to interlock with the latch plate. Inwardly of the end thereof, the arm 65 is provided with an outstanding finger piece 66 by which the latch member may be rotated to unlock the same.

The latch plate E has laterally outwardly projecting, top and bottom arms 67 and 68, adapted to accommodate the lever D therebetween. The bottom arm 68 is longer than the arm 67 and comprises vertical side wall members 69—69 connected by a transverse web section 70 and a relatively heavy end wall 71. The web section 70 is downwardly inclined at its outer end to provide a locking seat or pocket 72 within which the extremity of the hooked arm 65 of the latch member is engageable. The top arm 67 is in the form of an outstanding channel-shaped flange, projecting from the top of the latch plate E. The finger piece 66 of the latch member F and the bottom of the pocket 72 of the latch plate E are provided with aligned seal receiving openings 73 and 74, which are arranged to register to receive the usual car seal, not shown, when the latch

member is in the locked position shown in Figure 10.

The operation of the latch means shown in Figures 9 to 13 inclusive is similar to that of the latch means illustrated in Figures 1 to 8 inclusive, the latch member F serving to lock the lever D to the latch plate E by engagement of the arm 65 within the pocket 72. When thus locked, disengagement of the latch member from the latch plate can be effected only by withdrawing the arm 65 from engagement with the latch plate through rotation thereof to the position shown in Figure 11, thereby completely withdrawing the same from the pocket 72, the depending side walls of the channel-shaped top arm 67 of the latch plate being effective to block upward swinging movement of the lever by engagement of the top side of the latter therewith, thereby limiting upward displacement of the axis of swinging movement of the latch to cause the same to be wedged more tightly into the pocket 72 through any outward pull on the lever, and preventing complete disengagement of the latch arm 65 from the pocket unless the latch member has first been rotated or lifted from the position shown in Figure 10 to that shown in Figure 11.

In this connection it is pointed out that in the locked position of the latch member F, the arm 65 thereof bears on the outer side of the lever D, the engaging portion of the latch arm being thus effectively braced against bending strains.

Referring next to the embodiment of the invention illustrated in Figures 14 to 18 inclusive, the construction is similar to that shown in Figures 9 to 13 inclusive, with the exception that the latch member, which is indicated by J, and cooperates with the latch plate H, is on the outer side of the operating lever, which is indicated by G.

The latch member J is supported for swinging movement about the longitudinal axis of the lever G by a pivot pin 75 extending through a bearing or head portion 76 of the latch member. The lever arm G is provided with an outwardly opening pocket 77 in which the bearing portion or head 76 of the latch member is rotatable, said pocket having transverse end walls 78—78 through which the pin 75, which is preferably in the form of a bolt, extends. The latch member J includes a locking arm 79, which extends radially outwardly from the head 76 and has a tooth 80 at its outer end engageable within a locking seat or pocket 81 at the outer end of the arm 82 of the latch plate H. The latch plate H also has an upper arm 83, which corresponds to the arm 47 of the latch plate B hereinbefore described and functions in a similar manner to prevent disengagement of the latch member J in its locking position, as seen in Figure 15, by restricting upward movement of the lever G.

To provide for sealing of the latch member J in its locked position, aligned car seal receiving openings 84 and 84 are provided in the arm 79 of the same and the arm 82 of the latch plate H.

Referring to the embodiment of the invention illustrated in Figures 19 to 26 inclusive, my improved mechanism comprises broadly an operating handle lever K for actuating the rotary operating bar of the door fastener, a latch plate L, and a rotary latch member M.

The lever K, which is similar to the lever A hereinbefore described, has a hand grip portion 85 and is swingingly connected to the operating bar of the door fastener in a manner similar to the lever A. Inwardly of the hand grip 85, the lever K is provided with longitudinally spaced, laterally inwardly projecting, supporting lugs 86—86 between which the latch member M is rotatably supported by a pivot pin 87 in the form of a bolt extending through the lugs and the main body or head portion 88 of the latch member. The head portion 88 of the latch member M has oppositely extending, radial lugs or fingers 89 and 90 projecting therefrom, the lug 89 being in the form of a pointed tooth and the lug 90 being in the form of a blunter or flatter tooth, presenting a flat end face 91. On the inner side thereof, between the lugs 86—86, the lever is cut away or recessed at the top and bottom sides, as shown in Figures 20 and 21, to provide a rearwardly or inwardly extending, longitudinal web or riblike section 92. The rib or web 92 extends into a cut out portion 93 at the inner side of the head 88 of the latch member M and has a concave end face, which is in bearing engagement with the wall 94 of the latch member at said cut out portion, which wall is rounded or cylindrical to fit said concave face. The cut out portion 93 of the latch member provides a stop shoulder 95 engageable with the upper side of the rib 92 of the lever K to limit rotation or swinging movement of the latch member M in one direction. Rotation of the latch member in a reverse direction is limited by engagement of the finger 90 with the lower side of the rib 92. The latch member M is also provided with a finger piece or arm 96 by which it may be manipulated, the arm 96 depending from the head 88 of the latch member and being closely adjacent the blunt ended finger 90.

The latch plate L has laterally outwardly projecting top and bottom arms 97 and 98, adapted to accommodate the lever K therebetween. The bottom arm 98 is longer than the arm 97 and has an elevated shelf or ledge portion 99 at its outer end, and a depressed latch seat or pocket 100 inwardly of said ledge portion, said pocket having an inclined outer or front wall 101 with which the blunt finger 90 of the latch member M is engageable. The top arm 97 of the latch plate has a depending heel portion 102 at its outer end and a downwardly opening latch seat or pocket 103 rearwardly or inwardly of the heel portion 102, said pocket having a downwardly and forwardly inclined wall 104 in back of which the pivoted toothlike finger 89 is engageable. The heel 102 and the ledge 99 of the latch plate are spaced to accommodate the lever arm K therebetween, with the latter resting on the ledge and engaging the underneath side of the heel. The bottom face of the heel 102 and the engaging upper side of the lever are preferably inclined, as shown in Figures 20 and 21, whereby movement of the lever inwardly of the latch plate will be restricted by being wedged between the arms 97 and 98. The lower arm 98 is slotted, as indicated at 105, to accommodate the finger piece of the latch member M for swinging movement.

When the latch member M is in the locked position shown in Figure 20, the finger 89 is engaged in back of the wall 104 of the pocket 103 and the blunt end face of the finger 90, which face is outwardly of the axis of rotation of the latch member, is engaged in back of the wall 101 of the lower pocket 100, thus holding the lever K against outward swinging movement with the door held closed by the locking bar of the door fastener, the top arm 97 of the latch plate blocking upward movement of the lever to limit lifting of the axis of rotation of the latter to cause the

same to be wedged more tightly locked by an outward pull on the lever.

To provide for sealing the parts in this position, the finger piece **96** and the latch plate L are provided with slots **106** and **107** therethrough, adapted to receive the usual car seal. These slots are formed respectively in the lower end portion of the finger piece **96** and a pair of depending flanges **108—108** on the lower arm of the latch plate L at opposite sides of the slot **105**.

As will be evident, the weight of the finger piece **96** urges the latch member M to its locking position and tends to maintain it in that position.

To free the handle lever K for swinging movement to effect rotation of the bar member of the rotary door fastener in door opening direction, the rotary latch member M is swung upwardly by the finger piece **96** from the position shown in Figure 20 to the unlocked position shown in Figure 21. As the lever K is swung outwardly in the operation of forcing the door open, and the upper finger **89** clears the outer end or heel of the upper arm **97** of the latch plate, the latch member M is freed to swing toward pendant position due to the force of gravity acting on the weight of the finger piece **96**. The swinging movement of the latch member toward pendant position is arrested by engagement of the stop shoulder **95** thereof with the web or rib **92** of the lever K, thereby holding the latch member in position, with the finger or lug **90** inclined at such an angle that it will ride upwardly on the lower arm **98** of the latch plate upon engagement therewith when the lever is swung inwardly toward the latch plate in the operation of forcing the door closed, thereby swinging the latch member to the position shown in Figure 21, with the upper finger or lug **89** thereof clear of the heel **102** at the outer end of the arm **97** of the latch plate. As the lever K is pushed further inwardly of the latch plate L, the lower finger or lug **90** passes beyond the end of the ledge **99**, and the weight of the finger piece **96** turns or rotates the latch member to the locked position shown in Figure 20.

I claim:

1. In a holding means for the operating handle lever of a rotary operating bar of a door fastener having the operating handle lever connected to said bar for effecting rotation of the same by swinging movement of said lever about the axis of rotation of said bar, the combination with a fixed latch plate having an outstanding arm over which said lever is engageable, said arm having a locking projection at the outer end thereof; of a swingable latch member journaled on said lever for rotation about an axis extending longitudinally of said lever, said latch member having a shoulder thereon engageable with said locking projection to lock said lever against swinging movement outwardly away from said latch plate; and a finger piece on said latch member urging the same to swing to its engaged position.

2. In a holding means for the operating handle lever of a rotary operating bar of a door fastener having the operating handle lever connected to said bar for effecting rotation of the same by swinging movement of said lever about the axis of rotation of said bar, the combination with a fixed latch plate having an outstanding arm over which said lever is engageable, said arm having a locking projection at the outer end thereof; of a swingable latch member journaled on said lever for rotation about the longitudinal axis of said lever, said latch member having a shoulder thereon engageable with said locking projection to lock said lever against swinging movement outwardly away from said latch plate; a finger piece on said latch member urging the same to swing to its engaged position; and cooperating stop means on said latch member and lever for limiting swinging movement of said latch member with respect to said lever.

3. In a holding means for a rotary operating bar, the combination with a lever pivoted at one end to said bar for swinging movement lengthwise with respect to said bar; of a fixed latch plate having outstanding top and bottom arms over the bottom arm of which said lever is engageable, said bottom arm having a locking projection at the outer end thereof; a swingable latch member journaled on said lever for rotation about an axis extending longitudinally of said lever, said latch member having a shoulder thereon engageable with said locking projection to lock said lever against swinging movement about the axis of said bar, said top arm of said latch plate restricting upward displacement of said lever to an extent to prevent disengagement of said latch member while in locking position.

4. In a holding means for a rotary operating bar, the combination with a lever pivoted at one end to said bar for swinging movement lengthwise with respect to said bar; of a fixed latch plate having outstanding top and bottom arms over the bottom arm of which said lever is engageable, said bottom arm having a locking projection at the outer end thereof, a cylindrical journal portion on said lever at the other end thereof, said journal portion extending lengthwise of said lever; a swingable latch member journaled on said cylindrical journal portion of said lever, said latch member having a shoulder thereon engageable with said locking projection to lock said lever against swinging movement about the axis of said bar, said top arm of said latch plate restricting upward displacement of said lever to an extent to prevent disengagement of said latch member while in locking position.

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