Jan. 25, 1955 G. A. BESAW ET AL 2,700,291

DOOR LOCKING ASSEMBLY

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Fig. 1

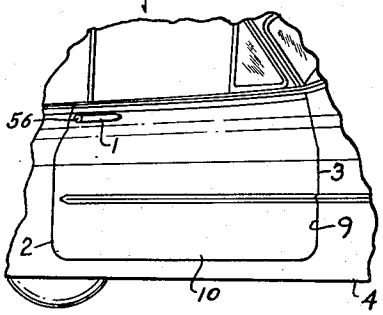


Fig. 2

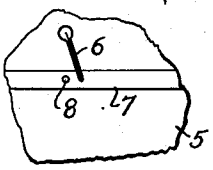
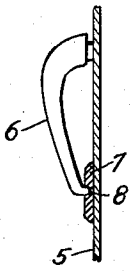


Fig. 3



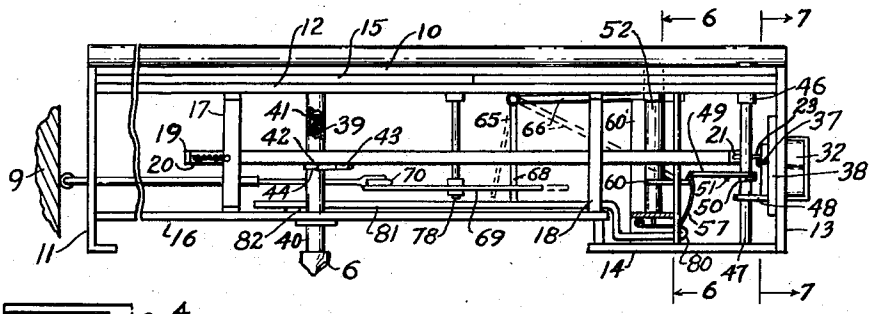


Fig. 4

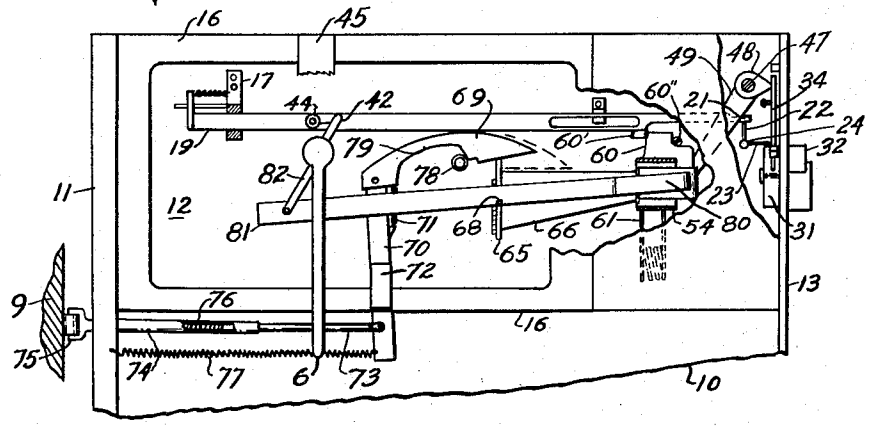


Fig. 5

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DOOR LOCKING ASSEMBLY

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Fig. 6

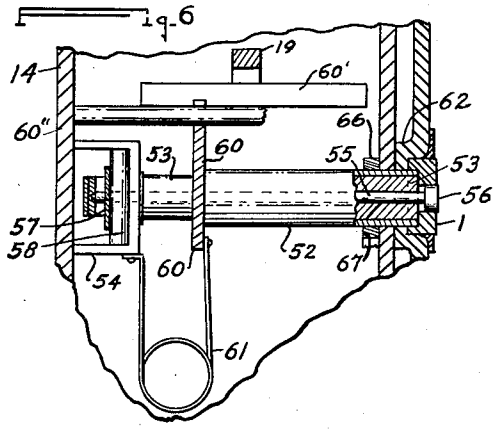


Fig. 7

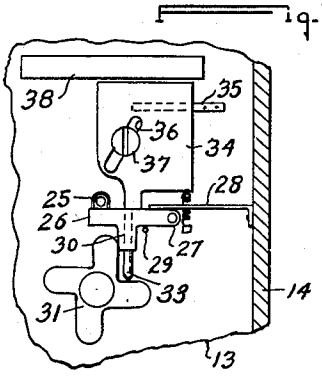


Fig. 8

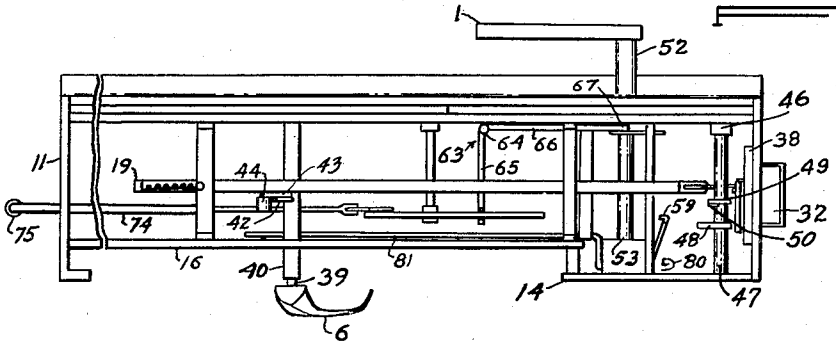
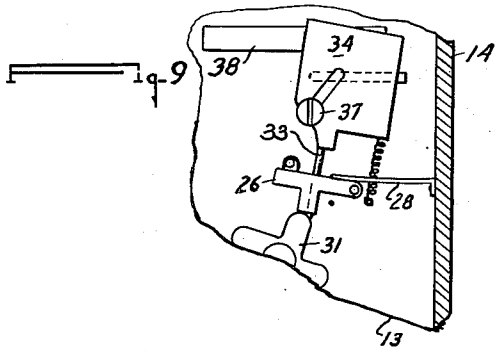


Fig. 9



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DOOR LOCKING ASSEMBLY

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Fig. 10

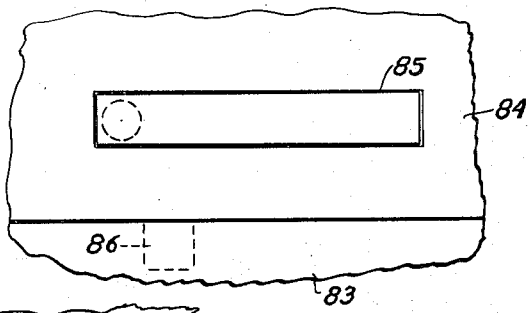


Fig. 11

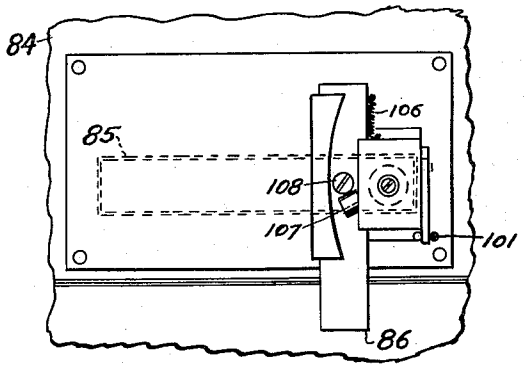


Fig. 12

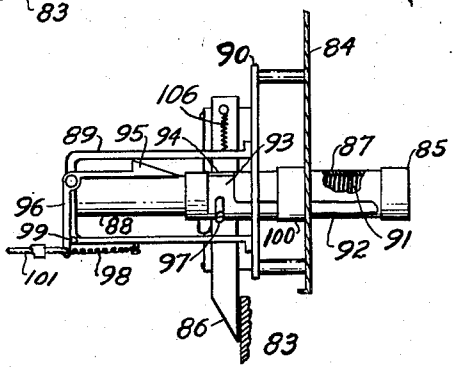
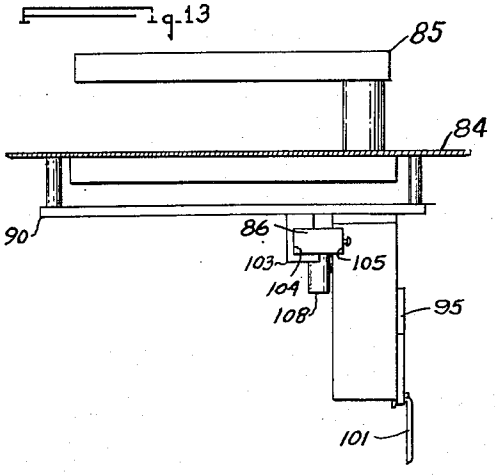


Fig. 13



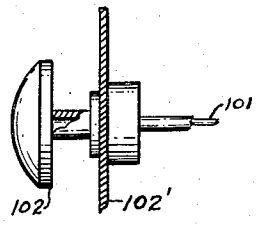


Fig. 14

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DOOR LOCKING ASSEMBLY

George A. Besaw and Harold H. Welsh, Los Angeles, Calif.

Application March 17, 1951, Serial No. 216,208

7 Claims. (Cl. 70—135)

This invention is a continuation in part of application Serial Number 33,326, filed June 16, 1948, now Patent No. 2,592,774, issued April 15, 1952, entitled "Door Latching and Locking Unit," and relates particularly to latching and locking means for automobile doors and trunk covers and the like.

The invention has among its objects the production of a means of the kind described, or similar means, that is simple, durable and compact in structure, inexpensive to make and manufacture and install, dependable and efficient in use and service, and made convenient to employ with pleasing and attractive appearances.

One of the principal objects of this invention is to provide doors and covers with latches and locks that have retracting handles which automatically retract into a pocket when the door or cover is closed. This feature makes it impossible to force the lock by prying the handle and the streamline effect of an automobile is materially enhanced.

Other objects, advantages and features of this particular invention will appear from a careful perusal of the accompanying drawings, the subjoined and detailed description, the preamble of these specifications, and the claims appended hereto.

Below, applicants describe two preferable forms of the invention in order to teach the art thereof and show how to make and use the same, but it is to be understood that the drawings and description thereof are not to limit the invention in any sense whatsoever.

In the drawings:

Figure 1 is a side elevational view of an automobile middle portion having the door thereof equipped with the latch and lock of this invention;

Figure 2 is an elevational view of the inner side of a portion of the door showing the inner handle for operation of the latch and lock;

Figure 3 is an enlarged elevational view taken at right angles to that shown in Fig. 2;

Figure 4 is an enlarged plan view of the automobile door with structural portions removed so as to clearly show the internal working parts of the door and latch-lock unit;

Figure 5 is an elevational view of the inner side of the door, the top portion thereof, showing the latch-lock unit locked and handle retracted as in Fig. 4;

Figure 6 is a greatly enlarged view taken substantially along the line 6—6 of Fig. 4;

Figure 7 is also a greatly enlarged view taken substantially along the line 7—7 of Fig. 4;

Figure 8 is a view similar to that of Fig. 4, same scale, showing the door open and the handle protracted;

Figure 9 is a view similar to that of Fig. 7, same scale, showing working parts in different positions;

Figure 10 is an outer view, elevational view, of an automobile trunk door or cover portion showing the invention applied thereto, but somewhat modified so as to be adapted to this new use;

Figure 11 is a rear elevational view of that illustrated in Fig. 10;

Figure 12 is an elevational view, partly in section, taken at right angles to that shown in Fig. 11;

Figure 13 is a plan view of Figs. 11 and 12;

Figure 14 is an elevational view, partly in section, greatly enlarged, showing handle control button means.

The particular form of the invention as shown in Figs. 1 to 9, comprises a latch-lock unit with a reciprocable handle 1 installed on an automobile door 2 which is

hinged along the edge 3 to the body of the automobile 4. The inner side of this door is indicated by the reference character 5 and this side has the inner control handle 6 which has a somewhat pointed end that is adapted to enter a depression or hole 8 in a metal band or trim piece 7 as shown in Figs. 2 and 3; in Fig. 2, the handle point or end is not in the hole 8, but in Fig. 3, this handle point is in the hole 8 and cannot be removed or swung until the handle is first pulled away from the door side 5 to a predetermined limit. This feature will be more apparent upon further progress in these specifications. The hinge side of the door jamb is indicated by the numeral 9.

The outer shell or finish plate of the automobile is indicated at 10 and the supporting plates for the latch-lock mechanism by 11, 12, 13 and 14 which form a box-like housing and which housing is spaced from the outer shell of the automobile to provide room for the glass panel 15; the plate or wall means 14 having the inward offset wall or plate 16. The structural cross members 17 and 18 strengthen the box-like housing and provide guides for the elongated latchbar 19 for sliding operation to a limited degree. A coiled tension spring 20 constantly urges the latchbar toward the keeper side of the latch-lock unit. The other end of the latchbar has a slotted plate or portion 21 which engages a leg 22 of an L-shaped bar that is pivoted at 24 to a suitable bracket extending from the wall 13. The other leg 23 of this L-shaped bar passes through a loop 25 on the top of a latch-finger 26 (Fig. 7) so as to lift the latch-finger at this end thereof as the other end is pivoted at 27 to the wall 13. The latch-finger is held downwardly by the ribbon spring 28 against a stop pin 29 which extends from the wall 13. A protruded portion 30 depends from the latch-finger and is designed to block clockwise rotation of a toothed wheel 31 which is integral with a similar toothed wheel 32 that is exterior and which is adapted to engage the toothed keeper or the like in the door jamb, not shown. The two toothed wheels 31 and 32 are integral and move in unison and have their mutual bearing in the wall 13 of the housing.

The latch-finger portion 30 has a bore therethrough which accommodates the rounded tine or pin 33 in sliding relationship, this tine being integral with a latchplate 34 which is constantly urged away from the wall 13 by a ribbon spring 35. The latchplate has a slanted slot 36 which rides along a fixed stud 37 to allow for a limited movement of the latchplate; this stud 37 has a long shank, see Fig. 4, so as to let the latchplate be forced away from the wall 13 in order for the latchplate to leave its position under the stop-bar 38. When the latchplate clears the stop-bar, it is free to rise and thus release the wheel 31 for anti-clockwise rotation, but the wheel cannot have clockwise rotation until the latchbar 19 is forced away from the wall 13 by operation of either the inner handle 6 or the outer handle 1. It should now be apparent that when the handle 1 is in its outward position, it can be turned downwardly and thus rotate the plate 60 which has a flat edge at its top (see Fig. 5) and which engages the cross bar 60′ that is fixed to the latchbar 19. Note, that when the locking plate 49 (Fig. 8) is not against the plate 34, that this plate 34 is pushed away from the wall 13. Plate 34 then easily clears the bar 38 so that it can take the position shown in Figure 9; the arm 24 lifting to such a position when the latchbar is shifted. When the tine 33 is released, there is nothing to prevent the wheel 31 rotating in a counterclockwise direction.

The inner handle 6 is keyed to a shaft 39 which has its distal bearing in a fixed sleeve 40 that is anchored to the wall 12 and its near bearing in the same sleeve, the near portion of the sleeve being supported by the wall 16. Within the sleeve there is a tension spring 41 having its distal end fixed to the wall 12 and the other end fixed to the distal end of the shaft 39 so as to constantly urge the shaft 39 and its handle 6 toward the wall 12. A peripheral slot is provided in the sleeve to accommodate a push pin 42 which is fixed to the shaft 39 and rests against a stop 43 that is secured against the side of the latchbar 19. Journalled to a side of the latchbar there is a roller 44 upon which the push pin acts in order to move the latchbar to the left as clearly shown in Fig. 5 of the drawings. The sleeve 40 is supported by the wall 12 and

the strap 45. Obviously, the handle 6 cannot be operated so as to move the latchbar when it is pushed inward because of the wedging effect mentioned and also because the point of the handle is within the hole 8 as aforementioned.

The device is provided with the well known tubular type of lock 46 which is key controlled and which rotates the shaft 47 within certain limits when the proper key is employed. This shaft has the locking cam member 48 fixed thereto and a journalled free riding stop plate element 49 which is under control of the abreasted dog means 50; this dog means being fixed to the shaft 47 and having opposed dogs which work against the pin 51 that is fixed to the side of the stop plate 49. This construction allows the dog means 50 to shift the stop plate 49 either clockwise or anticlockwise depending upon the rotation of the shaft 47; and rotation of this shaft can force the plate 34 against the wall 13 and beneath the stop bar 38 (where it is locked) or be rotated in the opposite direction and release this plate 34. The stop plate 49 holds plate 60 in position, as shown in Fig. 4, and thus prevents the handle 1 from being released, however, when the shaft 47 is rotated so as to remove or change the position of the dog means 50, the stop plate 49 falls away from the plate 60 by gravity action and thus frees the plate 60 so that the handle 1 can be released when the button 56 is pressed. The latchbar 19 is shifted to the left (Figs. 4 and 5) when the plate 60 is forced against the cross-bar 60' as this cross-bar is fixed to the under portion of the latchbar and this operation occurs when the handle 1 is turned so as to rotate the hollow shaft 52 to which the plate 60 is attached. The said leftward movement of the latchbar works the L-shaped bar about its pivot and the end of leg 23 lifts the plate 34 via of the action of latch-finger 26. There is sufficient free play between the parts 26, 30 and 34 so that the toothed wheel 31 is free to rotate.

The outside handle 1 is fixed to a hollow shaft 52 and this shaft slides in telescoping relationship upon another hollow shaft 53 which has its inner end firmly secured to a side of a U-shaped plate 54 which is in turn firmly secured to the wall 14, thus the hollow shaft 53 is supported in cantilever fashion and is a bearing for the outer shaft 52. The bore of the inner shaft 53 is a bearing means for a push rod 55 which has a thumb operable button or push head 56 which is normally positioned, as shown, in Fig. 6 of the drawings, but the handle is provided with an accommodating bore for the head of the push rod so that the distal end of the rod can be moved inwardly a limited distance against the flat dog spring member 57; the inner end of the push rod being secured to the dog spring member.

The dog spring member 57 has one end thereof secured to a post 58 which is fixed to the legs of the U-shaped plate 54. This wide ribbon type spring 57 is shaped as shown clearly in Fig. 4 and has the dog edge 59 which is adapted to engage the edge of a lock plate or push plate 60, this lock plate being secured to the inner end of the hollow shaft 52 and provided with a suitable bore to accommodate the hollow shaft 53. When the dog edge 59 is released from the plate 60, a coiled wire spring 61 forces the lock plate outwardly away from the U-shaped plate 54 so as to eject the handle 1 from its recessed housing 62; the ends of the spring 61 being fixed to the lock plate of push plate 60 and the U-shaped plate 54.

The lock plate or push plate 60 is returned to its inner position and locked there by the dog 59 of spring 57 when it is forced there by a push operation of the handle 1, or when an L-shaped element 63 (Fig. 8) is operated in order to return the handle into its pocket or housing 62. This element 63 has a pivot support 64 which is welded or otherwise fixed to the wall 12 and the two right angularly arranged arms 65 and 66; the longer arm 66 having an open slot at its end indicated at 67 and this slot embraces the shaft 52 so that when the arm 66 is forced toward the wall 14, it forces the push plate 60, if already released, rearwardly and into locked position with the dog spring 57, note Figs. 4 and 8 which show the two positions of the push plate. The short arm 65 has an open slot also which is directed upwardly and indicated at 68, this slot embracing the catch element 69 which has one end pivoted to the swing arm 70 at the top end thereof. A tension spring 71 constantly pulls the catch element downwardly. The swing arm is pivoted at 72 to the wall 16 and its lower end is pivotly attached to the end of a push rod 73 and this rod telescopes a hollow rod 74 which extends through the wall 11 and terminates into a roller element 75 which is adapted to ride along the jamb of the doorway indicated at 9. A compression spring 76 within the hollow rod 74 maintains the two rods 73 and 74 in extended positions, but a tension spring 77 attached to the swing arm and the wall 11 urges the swing arm in a direction so as to make the catch element 69 engage the short arm 65, see Figs. 4 and 5, however, the catch element 69 is shown raised over a roller means 78 because the door is closed and the push rods 73 and 74 have forced the catch element into this position. The catch element has a cam surface 79 which is designed to raise the catch element and release the short arm 65 after the door is closed so that other parts will freely operate.

So that the door can be locked from within, a wedge member 80 is employed. This member prevents the dog spring 57 from being released so as to free the push plate 60, that is, the push rod 55 from the handle button cannot be operated because the dog spring cannot be moved. A bar 81 is integral with the wedge member and operates in two directions through suitable guides. The other end of this bar is pivoted to a pin 82 and this pin has its other end fixed to the shaft 39 and moves with it so that the handle 6 can be employed to place the wedge member 80 behind the dog spring 57.

The other form of the invention is a remote control lock designed principally for automobile trunks. The base of the trunk proper that is fixed is indicated at 83 and the movable lid or cover is indicated at 84, the upper portion of the cover having the hinge means common to such trunk covers. The handle of the lock is shown at 85 and the latch bolt at 86.

The handle is fixed to one end of a hollow shaft 87 which has its bearing on a stud 88 which has its inner end secured to the web of a U-shaped yoke member 89; this yoke member having its legs firmly fixed, as by welding, to an inner spaced supporting plate 90 which is secured to the trunk cover 84. A compression spring 91 is provided within the hollow shaft 87 in order to constantly urge the handle 85 away from the wall 84. The shaft 87 has an elongated slot 92 which opens into a short peripheral slot 93, the material peeled away to form this latter slot extending outwardly to form a finger 94 which is adapted to be engaged by the dog member 95 of a bellcrank 96 that is pivoted to one side of the yoke 89, as shown. The stud 88 has a stop and guide pin 97 which works in the slots 92 and 93.

The bellcrank 96 has its lower leg attached to one end of a tension spring 98 to constantly urge the lower leg against the stop pin 99. When the handle 85 is pushed all the way into its pocket or recessed housing 100, the finger 94 rides along the cam surface of the dog 95 until this dog latches the finger, and this action causes the stop and guide pin 97 to ride to the outer end of the slot 92. To release the handle 85, a wire or rod 101 is provided and the other end of this rod leads to a suitable place on the dashboard 102' of the automobile where a guide and button means 102 is provided for its control. Instead of a rod, a flexible cable with an encased wire is preferred in many cases.

The latch-bolt 86 is arranged for vertical reciprocation in a guide member 103 having the vertically positioned slot 104 which provides just enough clearance for easy slit operation of the bolt; this guide member being secured to the supporting plate 90. A portion of the bolt passes through a cutaway portion or portions 105 of the yoke 89 which complete the guide means. The bolt is constantly urged downwardly by the tension spring 106 which has its ends fixed to the bolt and yoke as shown. A stud extends from the shaft 87 and has a roller 107 thereon which makes contact with a similar roller 108 on a stud which is fixed to the side of the bolt as shown. When the handle 85 is lifted, the roller 107 forces the roller 108 upwardly and thus forces the bolt to retract from its keeper which is indicated at 83. Thus, it can now be readily seen that a remote control means is provided for releasing a lock handle from a recessed housing so that it can be employed for gaining access to a trunk or any other closure.

It is, of course, understood that various changes and modifications may be made in the details of form, style, design, materials and construction of the whole or any part of the specifically described embodiment of this in-

vention without departing from the spirit thereof; such changes and modifications are considered as being within the scope of the following claims.

We claim:

1. In a handle operating assembly having a frame means for supporting it in a hollow portion of a door, a shiftable latchbar supported by the frame and which has means for guiding the latchbar, an end wall in the frame supporting a toothed rotary keeper engaging means that has portions on both sides of the end wall, a latchplate means supported by the end wall and provided with guide means allowing the latchplate to be diagonally shifted, stop means extending from the latchplate and engaging a tooth on the keeper engaging means, pivoted guide means for the stop means and provided with coupling means to the latchbar so that the stop means can be released from the keeper engaging means, a stop means fixed to the end wall above the latchplate to prevent its upward movement, spring means constantly urging the latchplate from the end wall to free it from the stop means, and a handle means supported by the frame having a portion thereof in abutment with a portion of the latchbar for shifting it.

2. The handle operating assembly recited in claim 1 wherein the handle means consists of a hollow shaft with a hand grip means fixed to one end thereof, an inner hollow shaft telescoping the other one and having an end thereof fixed to a bracket which extends from a side wall of the frame, the first mentioned shaft having a plate fixed to the end thereof opposite the hand grip, means for latching the plate when the hand grip means is in an inward position, and a rod extending through the inner hollow shaft that can be shifted to release the means for latching the plate.

3. The handle operating assembly recited in claim 1 wherein the handle means consists of a hollow shaft with a hand grip means fixed to one end thereof and a latchbar operating plate fixed to the other end thereof, a hollow stud means extending from a wall of the frame and telescoping the hollow shaft, means for latching the plate to prevent the hand grip means being shifted away from the frame, means extending from the hand grip means through the hollow stud for releasing the plate, and key controlled means including a shaft with a locking plate which prevents movement of the latchbar operating plate.

4. In a lock assembly adapted for use on automobile doors, a supporting frame adapted to be fixed in a hollow portion of a door, a keeper engaging means supported by an end wall of the frame and which keeper engaging means protrudes on both sides of the end wall and adapted to protrude through the jamb portion of a door, a loose fitting latchplate attached to a guide means that is fixed to an end wall of the frame, a stop bar fixed to the end wall just above the latchplate to prevent its upward movement when in the same vertical plane, a rotary shaft having bearing in the frame and lock means to prevent its rotation, a locking cam fixed to the shaft and adapted to force the latchplate beneath the stop bar, a shiftable latchbar having guides supported by the frame, spring means constantly urging the latchplate from beneath the stop bar, link means attached to the end of the latchbar for lifting the latchplate when free of the stop bar, means extending from the latchplate which holds a portion of the keeper engaging means from rotation when the latchplate is beneath the stop bar, an outer handle shaft supported by the frame and having means for shifting the latchbar, and an inner handle shaft supported by the frame having means for shifting the latchbar.

5. The assembly recited in claim 4 wherein the outer handle shaft is shiftable along a stud means, a latchbar shifting plate fixed to the outer handle shaft, spring means constantly urging the outer handle shaft toward the outer side of the frame, and link means connecting the inner handle shaft with the latchbar shifting plate so that the inner handle shaft can move the outer handle shaft against the action of the said spring means.

6. In an assembly for latching and locking vehicular doors and the like, the assembly comprising a frame structure which supports an outer rotary shaft with an outer handle thereon and an inner rotary shaft with an inner handle thereon, a latchbar supported by the frame which has guide means to allow the latchbar to be shifted, means extending from the inner and outer handle shafts for independently operating the latchbar, cantilever bearing means extending from a portion of the frame and telescoping the outer rotary shaft, a plate fixed to the last mentioned shaft having means for shifting the latchbar and means for receiving a dog, spring means extending from a portion of the frame and having a dog thereon which engages the said means for receiving a dog, shaft operating spring means positioned for constantly urging the outer rotary shaft toward the outer handle, rod means passing through the outer rotary shaft which presses against the said spring means and which can be forced to move said spring means so as to release the dog thereof from the said plate, and link means connecting the inner rotary shaft with said spring having the dog to prevent release of the dog.

7. The assembly recited in claim 6 wherein link means connects the two shafts so that one can shift the other, and rod means extending from the said link means to a locus outside of the frame structure which is adapted to be shifted and thus shift the outer rotary shaft.

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