May 5, 1953 J. H. ROETHEL 2,637,581

DOOR LATCH

Filed Jan. 11, 1945 4 Sheets-Sheet 1

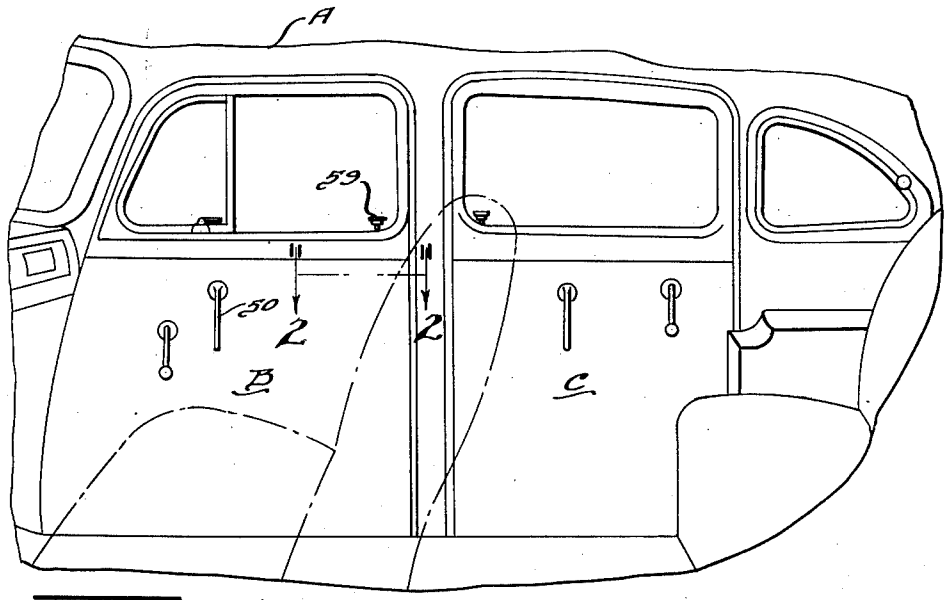


Fig. 1.

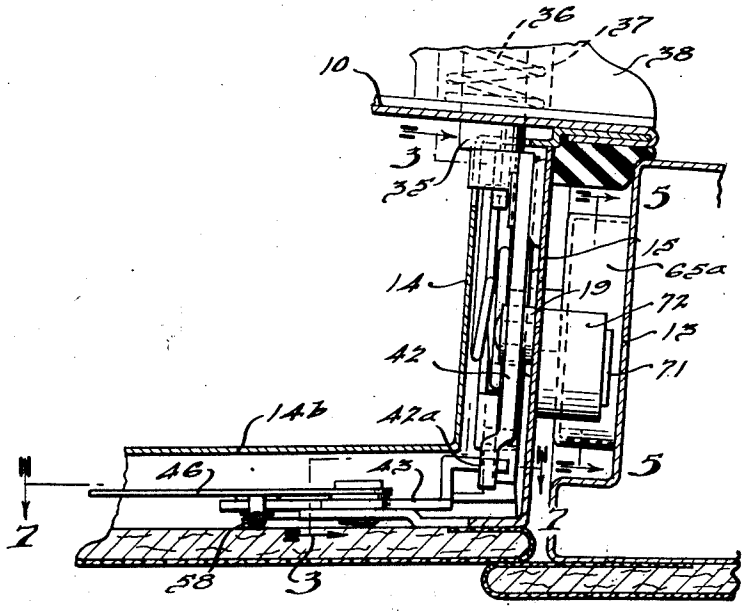


Fig. 2.

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May 5, 1953 J. H. ROETHEL 2,637,581

DOOR LATCH

Filed Jan. 11, 1945 4 Sheets-Sheet 2

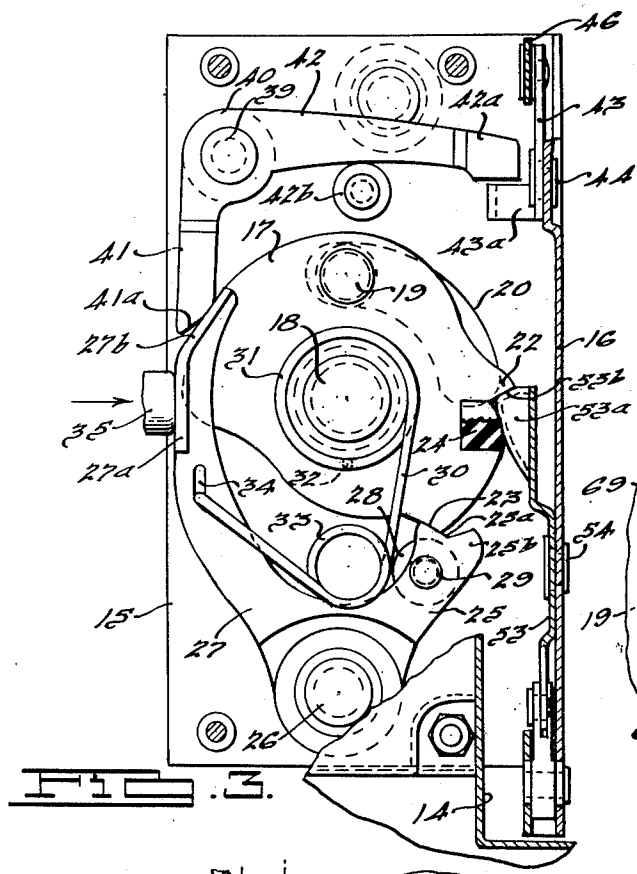


FIG. 3.

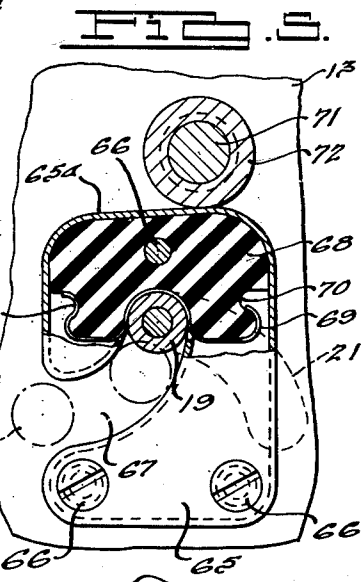


FIG. 5.

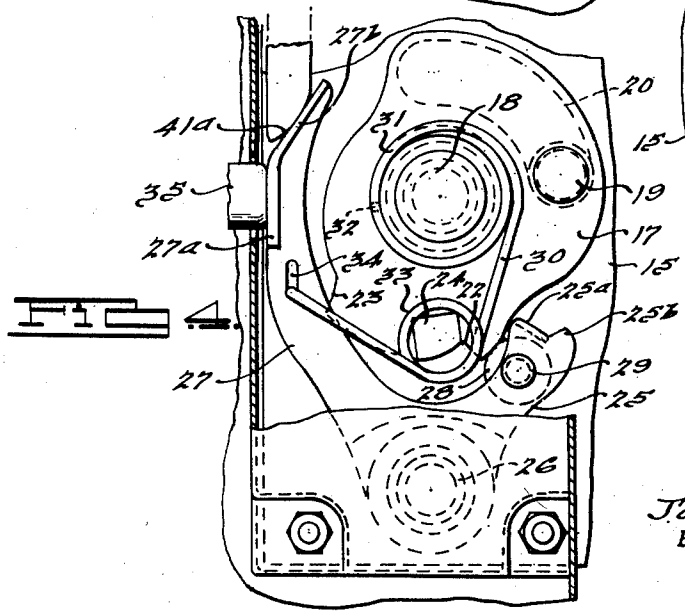


FIG. 4.

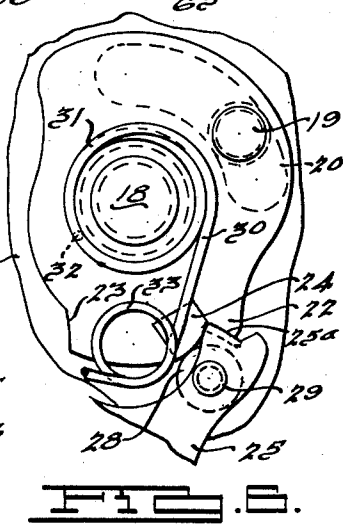


FIG. 6.

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May 5, 1953 J. H. ROETHEL 2,637,581

DOOR LATCH

Filed Jan. 11, 1945 4 Sheets-Sheet 3

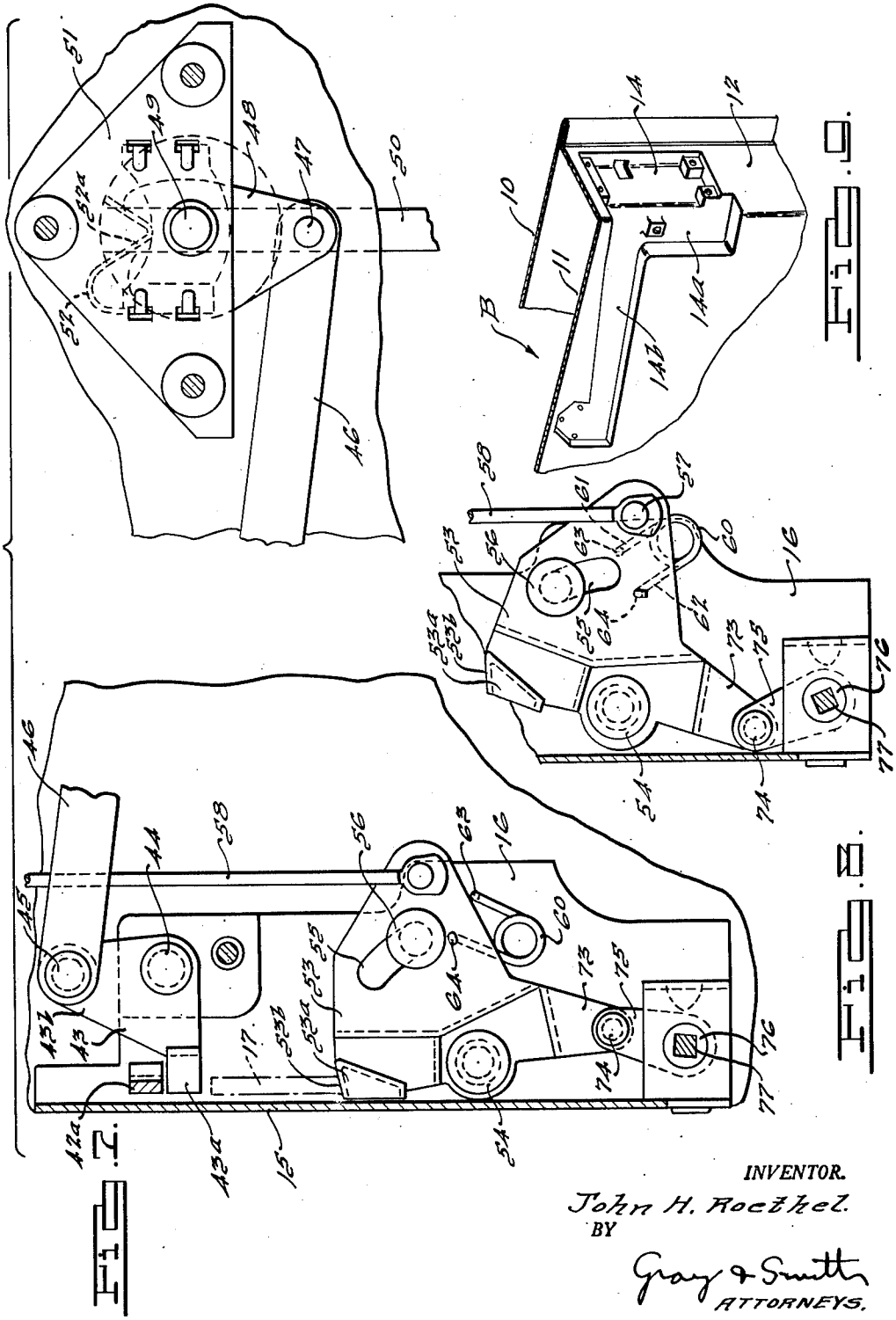


Fig. 1.

Fig. 3.

Fig. 2.

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May 5, 1953 J. H. ROETHEL 2,637,581

DOOR LATCH

Filed Jan. 11, 1945 4 Sheets-Sheet 4

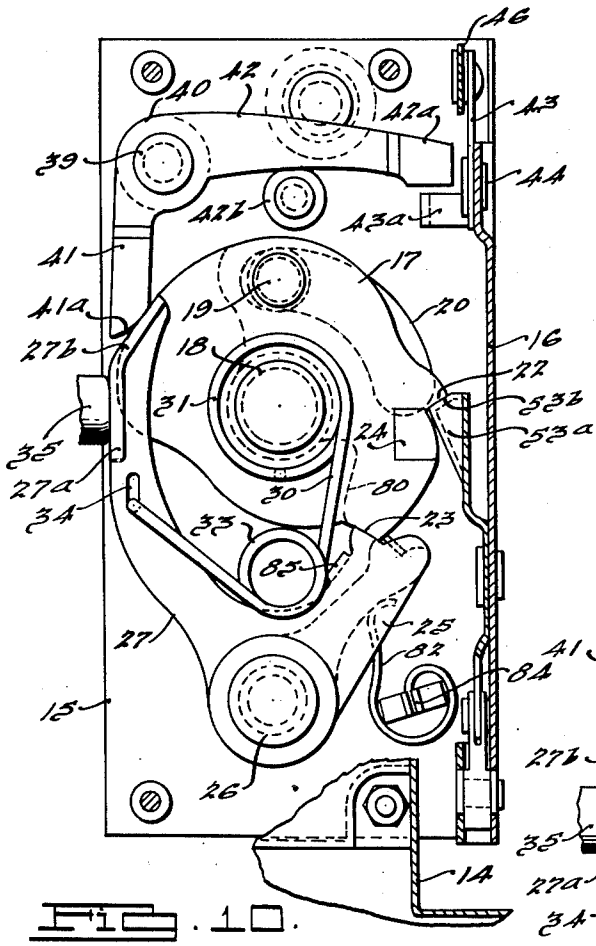


Fig. 10.

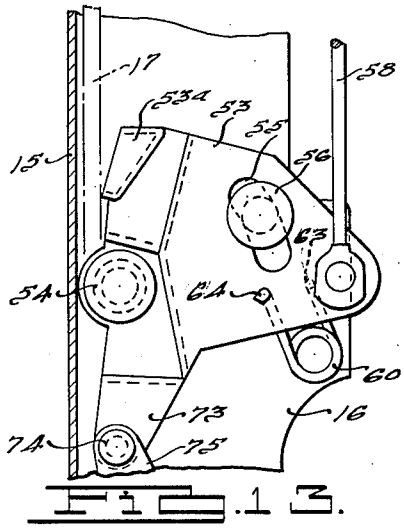


Fig. 13.

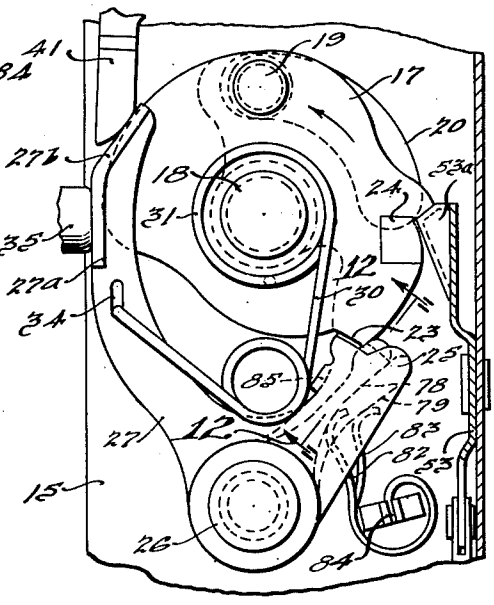


Fig. 11.

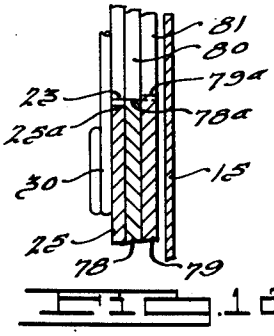


Fig. 12.

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UNITED STATES PATENT OFFICE

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DOOR LATCH

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Application January 11, 1945, Serial No. 572,360

7 Claims. (Cl. 292—229)

1

This invention relates to latch mechanism for swinging doors and particularly, although not exclusively, to latch mechanism which is especially adapted to be used in connection with the doors of vehicle bodies, such as automobile bodies. An object of the invention is to provide a door latch which combines in relatively simple and compact form such desirable features as quietness of operation when closing the door, simplicity in construction, operational efficiency and economy in manufacture.

In accordance with the embodiments of the invention, herein illustrated by way of example, there is provided a support on which a rotatably movable latch device is carried for movement between a door latched position and a door unlatched position. A pivotally movable detent is provided which is adapted releasably to maintain said latch device in door latched position, said detent having a latch release position and a latch holding position. Pivotally mounted on the support is an outer manually operable detent release lever which is operable to move said detent from its latch holding position to its latch release position. There is also provided a locking means which is engageable with the latch device for locking the same in door latched position.

More specifically, the present invention incorporates a construction wherein the rotatable latch device has spaced abutments. The detent is engageable with first one and then a second of said abutments upon the latch device being rotated in one direction to first and second predetermined positions. The locking means, which is pivotally mounted on the support, is engageable with the first one of said abutments for locking the latch device in its second predetermined position in which the detent is in engagement with the second abutment. Thus, when the locking means is in engagement with the first abutment and the detent is in engagement with the second abutment, the latch device is doubly held. Either the detent or the locking means may be moved out of engagement with the latch unit without permitting the same to move from door latched to door unlatched position. It is only when the locking means is first disengaged followed by disengagement of the detent means that the latch device is released.

A feature of construction of one of the embodiments of the invention herein illustrated is the provision of a means effective when the latch device is out of door latched positon for holding the locking means out of latch locked position in an intermediate position. A further means

2

is provided which is effective when the locking means is in said intermediate position for moving the locking means from said intermediate position into said locked position upon movement of the latch device into door latched position.

Other objects and features of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a fragmentary perspective view of the inside of an automobile body provided with swinging doors upon which latch devices made in accordance with the present invention are installed.

Fig. 2 is an enlarged horizontal section taken substantially through lines 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a vertical section taken substantially through lines 3—3 of Fig. 2 looking in the direction of the arrows and showing the mechanism in fully latched position.

Fig. 4 is a view, in part similar to Fig. 3, illustrating the mechanism in unlatched position.

Fig. 5 is a vertical section taken substantially through lines 5—5 of Fig. 2 looking in the direction of the arrows.

Fig. 6 is a view in part similar to Fig. 3 illustrating the mechanism in the safety latching position.

Fig. 7 is a side elevation, partly broken away, showing the remote control mechanism and inside locking devices.

Fig. 8 is a fragmentary view, in part similar to Fig. 7, illustrating a different position of the inside locking mechanism.

Fig. 9 is a fragmentary perspective view, partly in section, showing the recessed construction of the door for installation of the latch mechanism.

Fig. 10 is a view similar to Fig. 3 showing a modification utilizing a detent provided with take-up means.

Fig. 11 is a fragmentary view similar to Fig. 10 showing the operation of the take-up means.

Fig. 12 is a section taken through lines 12—12 of Fig. 11 looking in the direction of the arrows.

Fig. 13 is a view somewhat similar to Fig. 8 showing a modification.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its appilcation to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and

of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

In the drawings there is illustrated, by way of example, one embodiment of the present invention as applied to a door and door frame structure, such as that of an automobile body. As illustrated in Fig. 1, the automobile body is designated generally at A and is provided with front and rear doors B and C, respectively. Each swinging door is hinged at one edge so as to swing against a common door post or body pillar in accordance with conventional practice and comprises an outer metal door panel 10 and an inner metal door panel 11, see Fig. 9. The panel 11 terminates in a transverse jamb edge or portion 12 facing the fixed jamb face or edge 13 of one of the door frame posts or body pillars, see Fig. 2.

The latch mechanism embodying the present invention is shown in detail as applied to the front door B of the automobile. As shown in Fig. 9, the inner door panel 11 is provided at the jamb 12 of the door with a recess 14 communicating with recesses 14*a* and 14*b* pressed into the inner door panel and shaped to receive and house the latch mechanism. The latch mechanism comprises a case plate 15 having a transversely extending flange 16 which fit over and close the recess portions 14 and 14*a* and are rigidly secured in position by screws and suitable screw bosses formed in the recesses, as illustrated in Fig. 9. The latch mechanism is mounted on the inner side of the case plate and, hence, when the case plate is secured in position the latch mechanism is housed within the recesses 14 and 14*a* so as to be fully protected. The elongated recess 14*b* shown in Fig. 9 is constructed to receive and house the remote control mechanism as later described.

Mounted on the case plate 15 is a rotatably movable latch device comprising a bolt carrying plate or member 17 which is rotatable upon a pivot or stud 18 in the form of a shoulder rivet secured to the case plate. Rigidly fastened to the plate member 17 at a point spaced from the pivotal axis 18 of the plate is a cylindrical latch bolt 19. This bolt is thus carried by the plate 17 eccentrically thereof and projects outwardly in a longitudinal horizontal direction through an arcuate slot 20 in the case plate and also an arcuate slot 21 (Fig. 5) in the jamb face 13 of the door, the slots 20 and 21 registering with each other at all times and being covered and closed by the plate 17 when the door is open, as shown in Fig. 4. The bolt carrying plate 17 is formed on its periphery at the inner side of the pivot 18 with outwardly inclined curved abutments 22 and 23 terminating in flat inclined detent engaging shoulders or surfaces, the abutment 22 forming the safety locking position of the latch device and the abutment 23 forming the final locking position thereof. Immediately below the abutment or safety step 22, as shown in Figs. 3, 4 and 6, the plate 17 is notched or recessed to receive a rubber or resilient bumper 24 adapted to be engaged, as later described, by the detent so as to insure quiet operation when the door is closed.

Associated with the bolt carrying plate 17 is a detent or pawl 25 which is pivoted to swing up and down upon a pivot stud or shoulder rivet 26 secured to the case plate 15. It will be noted that the plate 17, as viewed from Figs. 3, 4 and 6, is rotatable in a counter-clockwise direction when the bolt moves from the unlatched position shown in Fig. 4 to the latching positions shown in Figs. 3 and 6. The detent is, therefore, pivoted at 26 below the locking plate 17 and at its end is notched to provide a dog or detent portion 25*a* engageable successively with the abutments 22 and 23 when the door is closed. The surface of the engaging portion 25*a* of the detent is arcuate and is formed on a radius having its center on the pivotal axis of the detent formed by the pivot stud 26. This construction enables the contacting portion 25*a* of the detent to swing freely into and out of position below the abutments 22 and 23. The portion 25*a* of the detent terminates in an upwardly extending shoulder 25*b* providing a stop limiting the distance that the detent may move inwardly on the abutment 23. The portion 25*a* of the detent may move inwardly against the inclined or cam surface 23 varying distances to provide a take-up action effective to hold the bolt tightly in final locking position.

It will be seen that the detent 25 forms one arm of an integral two-arm bell crank lever having at the opposite side of the pivot 26 a relatively long upwardly extending lever arm 27 of the desired length to furnish powerful leverage in the release of the detent such as by means of a push button control. The detent 25 is provided immediately below the working portion 25*a* thereof with an anti-friction roller 28 journalled at 29 on the detent. This roller is positioned so as to contact the contoured edge of the plate 17 and reduce frictional resistance to the rotation of the plate under the action of its spring from the locking position shown in Fig. 3 to the unlocking position shown in Fig. 4 at the time the door is opened. As will be readily seen from the drawings, the detent portion 25*a*, by virtue of the counter-clockwise movement of the bolt carrying plate 17, locks the plate against clockwise movement when in engagement with either of the abutments 22 or 23.

The bolt carrying plate 17 is constantly urged toward bolt unlatching position shown in Fig. 4 and the detent is constantly urged toward the plate 17 by means of a common spring means 30 which in the present instance is in the form of a compound coil spring. The spring 30 has a number of large diameter coils 31 concentric with the stud 18 and anchored at its end 32 to the plate 17. The spring also has a coiled portion 33 at a distance below the pivot stud 18. From this portion the spring wire is extended outwardly and upwardly and the end thereof is anchored at 34 to the detent lever arm 27. The lighter or weaker spring portion 31, having the larger coils, tends at all times to impart clockwise rotative movement to the plate 17 while the heavier or stronger coil portion 33 at all times exerts an effort outwardly on the lever arm 27 tending to impart rotative movement to the detent 25 in a counter-clockwise direction about its pivotal axis 26. It will be understood that when the spring 30 is installed it is loaded so as to exert constant rotative effort on the bolt carrying plate and detent lever in the manner above described. By virtue of the foregoing construction it will, therefore, be seen that a single spring means may be utilized to control the plate 17 and the detent lever 25, this spring providing a direct connection between these parts.

The lever arm 27 of the detent projects upwardly at the outer side of the pivot 18 well above the working portion 25*a* of the detent and is provided with a vertical offset portion 27*a* merging into an inclined cam portion 27*b*, these portions providing suitable flat bearing surfaces. The enlarged or widened portion 27*a* is disposed for en-

gagement by a push button plunger 35 manually operable from the outside of the door. The plunger is urged into retracted position by a compression spring 36 (Fig. 2), housed within a recess 37 in an outside fixed door handle or plunger housing 38. By pushing the plunger 35 inwardly against the action of the spring 36 in the direction of the arrow in Fig. 3 and against the bearing portion 27a the lever arm 27 will be swung inwardly, thereby rocking the detent and forcing its working portion 25a out of abutting relation with the final locking step 23 (Fig. 3) or the safety locking step 22 (Fig. 6). When this occurs the spring portion 31 will rotate the bolt carrying plate 17 clockwise to the position shown in Fig. 4.

Pivoted to the case plate 15 by means of a pivot stud or shoulder rivet 39 is a bell crank lever 40 having a depending short arm 41 terminating in a cam face 41a slidably engaging the cam portion 27b of the detent lever. The bell crank 40 also has an inwardly and horizontally extending long lever arm 42 terminating in a widened or offset bearing end 42a overlying and in engagement with the widened or embossed end 43a of a bell crank lever 43 pivoted to the case plate by means of a pivot stud or shoulder rivet 44 (see Figs. 3 and 7). The lever 43 has an upwardly extending arm 43b to which is pivoted at 45 the inner end of a remote control link 46. This link extends longitudinally through the elongated recessed portion 14b in the inner door panel 11 (Fig. 9) and the outer end of the link is pivoted at 47 to the lower end of a crank arm 48 fastened to the shaft 49 of the inner door handle 50. The shaft 49 is journalled in a bracket plate 51 secured to the inner door panel and the lever 48 as well as the remote control link 46 and the bell crank 43 are all urged or yieldingly held in their positions shown in Fig. 7 by means of a leaf spring 52 having a wedge shaped portion 52a normally extending into a V-shaped notch in the upper end of the lever 40.

The working end 43a of the bell crank 43 is yieldingly held by spring 52 slightly out of engagement with the end 42a of the lever 42, a slight clearance being normally provided at this point to permit take-up in the lever arm 42 due to turning effort exerted on the lever 40 by the detent lever arm 27 under the action of spring 33. Lever arm 42 is supported on a soft rubber bumper 42b which will yield sufficiently to permit take-up movement of the arm toward part 43a. It will be understood that by turning the inside door handle 50 to the right from its position shown in Fig. 7, the bell crank levers 43 and 42 will be rocked about their pivotal axes and the lower end 41 of the lever 42 will be moved inwardly thereby rocking the detent lever about its pivotal axis and thus forcing the detent out of abutting relation with either the safety locking step 22 or the final locking step 23.

In accordance with the present invention additional means is provided for locking the bolt carrying plate 17 in the position shown in Fig. 3 when the latch device has been moved to the final locking position. This additional locking means comprises a locking lever 53 pivoted at 54 to the case plate flange 16 at the inner side of the bolt carrying plate 17. The lever is embossed at 54a to provide a widened portion having an upper wedge shaped or tapering contacting face 53b adapted to engage beneath the safety locking step or abutment 22 when the latch device is in final locking position. The lever 53 is guided in its swinging motion about its fulcrum 54 by means of an arcuate slot 55 in the lever through which extends a guide pin or stud 56 secured to the case plate. Pivoted at 57 to the lever 53 is a vertically extending rod or plunger 58 adapted to project through the garnish molding at the lower edge of the window opening and carrying a knob or button 59 at its upper end, as shown in Fig. 1. The knob 59 is accessible at the inner side of the window glass of the door and when pushed down will shift the plunger 58 downwardly to swing the lever 53 from the position shown in Fig. 7 to the position shown in Fig. 8, thereby swinging the locking projection 53a of the lever out from beneath the safety locking shoulder 22 thus releasing or unlocking the plate 17. Upward movement of the plunger 58 will swing the lever 53 in the reverse direction thereby shifting the locking or detent portion 53a of the lever into position beneath the shoulder 22, thus locking the plate 17 against rotative movement toward unlatched position of the bolt. The operative locking position of the lever 53 is shown in Figs. 3 and 7. The inclined contacting portion 53b of the locking projection 53a will produce a wedging engagement with the face of the shoulder 22, thus causing the portion 53b to engage the locking shoulder 22 firmly and also provide a take-up to compensate for the take-up action of the detent portion 25a on the bolt carrying plate 17.

It is important to note from the foregoing construction that the locking lever 53, controlled by the push and pull plunger 58 from the inside of the door, is operated entirely independently of the detent 25 and will be effective to hold the latch device, that is, the plate 17 and latch bolt in the fully latched position thereof irrespective of operation of either the outside push button plunger 35 or the inside door handle 50 to release the detent 25 by operation of the detent lever arm 27. Hence, with the inside locking lever 53 in its locking position shown in Figs. 3 and 7, either the inside handle 50 or the outside push button or plunger 35 may be freely actuated to shift the detent 25 away from locking engagement with the final locking step 23 without, however, unlocking the door. With the plate 17 locked by the lever 53, therefore, the inside door handle 50 becomes a free turning handle which may be turned freely without unlocking the door and, in addition, the outside push button or plunger 35 becomes a free pushing plunger which may be pressed at will without unlocking the door. The locking lever 53 has the additional advantage of providing in conjunction with the detent 25 two separate means for locking the latch bolt in its final locking position, each independent of the other, thus ensuring greater safety in the use of the vehicle.

The plate forming the lever 53 is yieldingly controlled by means of a spring 60 having one or more intermediate coils terminating in arms 61 and 62 anchored at their ends 63 and 64, respectively, to the case plate flange 16 and the lever 53. As it will be understood that the locking projection 53a of the lever is only capable of moving into locking position with respect to the safety step 22 when the door is fully closed and plate 17 in the position of Fig. 3, this locking projection will engage the face of the plate 17 if the lever is swung to the left from the position of Fig. 8 by plunger 58 in any other position of the bolt carrying plate 17. Thus, the plate 17, when the door is open, stops the locking projection 53a from going fully home to the position of Fig. 7. It follows, therefore, that the relative positions of the spring connections 63

and 64 will determine whether the spring will pull or retract the lever 53 back to the position of Fig. 8 in case the locking projection 53a has not gone fully home after release of the button 59, or whether the spring will hold the locking projection against the plate 17 after release of the button 59 and thereafter will force the projection home to the positions of Figs. 3 and 8 when the door is closed. The point of connection 64 of the spring to the lever 53 will always travel above a dead center line extending through the point 63 and the pivotal axis 54 of the lever 53 when the lever goes fully home to the locking position of Figs. 3 and 7. This arrangement enables the spring 60 to hold the lever 53 in locked position. In the construction shown in Fig. 8 the point 64, although below the dead center line, is sufficiently close thereto so that it will pass above the dead center line when the locking projection 53a abuts against the face of the plate 17. Under this condition the spring will hold the lever in this position and when the plunger 58 is released the spring will force the lever into the locked position of Fig. 7 just as soon as plate 17 is rotated to the position of Fig. 3. Thus, in this embodiment the plunger 58 may be pulled up with the door open until the lever 53 is stopped by engagement with the face of plate 17, and since the spring at this time has passed dead center it will hold the lever against the plate and will force the lever into its locking position when the door is closed. In the modification shown in Fig. 13 the point of connection 64 of the spring 60 is a greater distance below the dead center line and this distance is such that the point 64 will not pass dead center when the lever is swung into engagement with the plate 17 with the door in open position. Thus, as soon as the plunger 58 is released the spring will return the lever to a position similar to that shown in Fig. 8 and the door will remain unlocked when closed.

It will be seen that the latch bolt 19 is movable between unlatching and latching positions in an arcuate path as defined by the arcuate slots 20 and 21. The bolt is actuated when the door is closed by means of a striker device which is preferably mounted on the jamb edge 13 of the pillar or fixed upright member of the door frame. In the present instance the striker device comprises a pressed metal plate 65 which is stamped into a hollow generally rectangular member adapted to be secured to the door jamb by screws 66. The striker plate is formed with a curved slot 67 open at its lower end and extending inwardly and upwardly as shown in Fig. 5. The upper end of the slot 67 is formed by a recess in a resilient rubber bumper 68 and the lower face of the bumper as well as this recess therein is lined or covered by means of a thin spring steel liner member 69 having its ends anchored in notches 70 in the sides of the bumper. The spring liner provides a metal wear resisting surface between the rubber bumper and the bolt while enabling the bolt to compress the bumper somewhat when the bolt is forced through the slot 67 into the upper end thereof. It will be noted that the upper end of the slot 67 has a generally vertically extending outer wall engaged by the bolt and which positively prevents outward movement of the bolt when in its final locking position shown in Fig. 5.

Secured to the jamb edge of the door and projecting outwardly and longitudinally thereof is a horizontally extending cylindrical stud 71 upon which is revolubly mounted a steel roller 72. This roller is adapted to engage and roll over the upper inclined or wedge face 65a of the striker casing 65 during closing movement of the door. The cooperation of the roller 72 and striker casing 65 ensures proper closing movement of the door, thus causing the bolt to enter properly the lower end of the slot 67 and also provides a substantially positive means for holding the door against downward movement as a result of vibrations incident to the operation of the vehicle. Thus, with the bolt 19 and roller 72 in their respective positions shown in Fig. 5, the door will be held against any substantial vertical movement by the cooperative action of the bolt and roller. Since the spring liner 70 covers the entire lower surface of the rubber bumper as well as the bolt recess therein, it will transmit the force of impact of the bolt throughout the cross-section of the bumper. This construction provides a very quiet closing door and also permits the bolt to occupy slightly different vertical positions, when the bolt is home, thereby compensating for variations or tolerances. The dovetail roller 72 is particularly advantageous not only in providing an easy closing action of the door by the elimination of frictional resistance but also in permitting the relatively light main spring portion 31 to move the bolt 19 out of the slot 67 when the push button or handle is operated to release the detent 25. Although the striker casing and bumper 68 are tightly clamped in the closed position of the door between the bolt 19 and roller 72, this action will not provide undue counter-resistance to the action of the spring 31 when the detent is released as the roller 72 will roll freely down the incline 65a, thus permitting the spring to pull the bolt out of the slot 67. Easy and quiet operation is also enhanced by the detent roller 28 and the rubber bumper 24 below the safety locking step. The roller 28 will roll with a minimum of frictional resistance over the contoured edge of the plate 17, both in closing and opening the door, and in particular will hold the detent away from the edge, thus relieving the spring 30 of frictional resistance which otherwise would occur by the detent riding on the edge of the plate. Objectionable noise normally occurring when the detent passes the safety step is minimized by causing the roller 28 and detent portion 25a to strike the bumper 24 at this locality.

In the embodiment of Figs. 10 to 12 inclusive the construction of the latch mechanism and striker mechanism is the same as in the previously described embodiment excepting that somewhat different means is provided for taking-up slight variations in bolt travel at the closed position of the door. These variations may not only be due to tolerances, wear or inaccuracies in production but also to variations in the resiliency of the usual rubber weatherstripping on the body around the margin of the door opening and against which the door contacts when closed. This weatherstripping will yield slightly under the closing impact of the door. When new the weatherstripping will rebound from the impact and force the door outwardly a slight amount, but after age and usage the weatherstripping will more and more take a set due to loss of resiliency. As a result of these factors it is important, in obtaining relatively tight closing of the door even after usage, that an efficient take-up means be provided, such as a take-up on the order of approximately three thirty seconds of an inch in

bolt travel. This is accomplished in the embodiment of Figs. 10 to 12 by improved detent means coacting with the bolt carrying plate 17.

Pivotally mounted on the stud 26 at one side of the detent member 25 and in mutually contacting relation are a pair of detent members 78 and 79 which correspond substantially to detent member 25 excepting that their working edges 78a and 79a are stepped successively further from the pivot 26 than the working edge 25a of detent 25, as clearly seen in Fig. 12. The plate member 17 is thickened to permit engagement thereof by the additional detents 78 and 79, this being accomplished by spot-welding pieces 80 and 81 to the face of the plate and contouring these pieces to conform exactly to the contour of the edge of the late. Accordingly the portions 80 and 81 are provided with detent steps or shoulders corresponding to shoulder 23 and registering with and terminating flush therewith. The detent members 78 and 79 are urged toward the plate portions 80 and 81 by leaf springs 82 and 83 anchored at 84 to the case plate.

From the foregoing it will be apparent that normally when closing the door the plate 17 will be rotated to a door closing position permitting the first detent member 25 to be projected beneath the locking step 23, thus holding the door in fully closed position as shown in Fig. 10. At this time the second and third detents 78 and 79 will contact the outer edges of pieces 80 and 81 and will not of course go home beneath the detent shoulders thereof. In the event the door when closed carries the bolt a slight distance further within slot 20 and correspondingly rotates the plate 17 a slight distance beyond the position of Fig. 10, then one or both of the detent members 78 and 79 will be forced by their springs beneath the detent shoulders of pieces 80 and 81. Figs. 10 and 11 show the position of the plate 17 when locked by detent member 78 which has been forced home by its spring 82 while the detent 79 is held out of locking position. Further rotation of the plate resulting from tighter closing of the door will permit spring 83 to force its detent 79 beneath the shoulder of piece 81. It will be apparent that the maximum take-up provided in the latch device will be determined by the distance between the planes of the working edges 25a and 79a of the first and third detents. This distance may vary as desired and furthermore the number of detents may vary depending upon the compensating or take-up action desired. The outer edge of detent member 25 is provided with a transverse tongue or projection 85 adapted to contact and overlie the corresponding edges of detents 78 and 79 when the latter are in working positions. Hence, when lever arm 27 is swung inwardly to release the bolt the tongue 85 will carry the detents 78 and 79 with the detent 25 out of locking position with respect to the plate 17 permitting spring 30 to rotate the plate clockwise to the position of Fig. 4 when the door is opened.

In each of the embodiments improved means is provided for rotating the plate 53 into and out of locking position by means of a key from the outside of the door. Accordingly, the plate 53 is formed with a depending crank extension or lever arm 73 to which is pivoted at 74 the upper end of a crank arm 75 secured to a shaft or stud 76 journalled in a bracket in the case plate and having a square opening or socket to receive a key actuated shaft 77. The shaft is connected to the cylinder mechanism of any conventional lock having the usual key control. By turning the key in the lock from the outside of the door the crank arm 75 may be swung to the right in Fig. 8 thereby rotating the plate 53 to the position of Fig. 7 in the same manner as the plate is rotated by raising plunger rod 58. Reverse turning of the key will of course move the locking projection out from beneath step 22 and unlock the door.

I claim:

1. In a door latch mechanism, a support having a plate portion for disposition at the free edge wall of the door and having a flange extending from the inner edge thereof, a rotatable latch device having spaced abutments, means mounting said latch device on said plate portion for movement about an axis normal to the plane of the plate portion, detent means pivotally mounted on said plate portion for movement about an axis substantially parallel to the axis of said latch device, said detent means being engageable with first one and then a second of said abutments upon said latch device being rotated in one direction to first and second predetermined positions, said detent means upon engagement with said abutments preventing rotation of said latch device in the opposite direction, locking means pivotally mounted on said support and engageable with said first one of said abutments for locking said latch device in said second predetermined position in which said detent means is in engagement with said second abutment, means for shifting said locking means into and out of engagement with said latch device, and manually operable means including a lever pivotally mounted on said plate portion for movement about an axis parallel to said latch device axis and connected to said detent means for disengaging the same from said latch device without disturbing said locking means.

2. In a door latch mechanism, a support having a plate portion for disposition at the free edge wall of the door and having a flange extending from the inner edge thereof, a rotatable latch device including a plate member having spaced abutments, means mounting said latch device on said plate portion for movement about an axis normal to the plane of the plate portion, detent means pivotally mounted on said plate portion for movement about an axis substantially parallel to the axis of said latch device, said detent means being engageable with first one and then a second of said abutments upon said latch device being rotated in one direction to first and second predetermined positions, said detent means upon engagement with said abutments preventing rotation of said latch device in the opposite direction, locking means pivotally mounted on said flange and engageable with said first one of said abutments for locking said latch device in said second predetermined position in which said detent means is in engagement with said second abutment, means for shifting said locking means into and out of engagement with said latch device, said latch device plate member having a portion thereof adapted to lie in the path of movement of said locking means except when said latch device is in said second predetermined position thereby preventing shifting of said locking means into locking position at any other time, and manually operable means including a lever pivotally mounted on said plate portion for movement about an axis parallel to said latch device axis and connected to said detent means for disengaging the same

from said latch device without disturbing said locking means.

3. In a door latch mechanism, a support having a plate portion for disposition at the free edge wall of the door and having a flange extending from the inner edge thereof, a rotatable latch device having spaced abutments, means mounting said latch device on said plate portion for movement about an axis normal to the plane of the plate portion, detent means pivotally mounted on said plate portion for movement about an axis substantially parallel to the axis of said latch device, said detent means being engageable with first one and then a second of said abutments upon said latch device being rotated in one direction to first and second predetermined positions, said detent means upon engagement with said abutments preventing rotation of said latch device in the opposite direction, locking means pivotally mounted on said support and engageable with said first one of said abutments for locking said latch device in said second predetermined position in which said detent means is in engagement with said second abutment, manually operable means including a lever pivotally mounted on said plate portion for movement about an axis parallel to said latch device axis and connected to said detent means for disengaging the same from said latch device, and manually operable means for disengaging said locking means from said latch member without disturbing said detent means.

4. In a door latch mechanism, a support having a plate portion for disposition at the free edge wall of the door and having a flange extending from the inner edge thereof, a rotatable latch device including a plate member having spaced abutments, means mounting said latch device on said plate portion for movement about an axis normal to the plane of the plate portion, detent means pivotally mounted on said plate portion for movement about an axis substantially parallel to the axis of said latch device, said detent means being engageable with first one and then a second of said abutments upon said latch device being rotated in one direction to first and second predetermined positions, said detent means upon engagement with said abutments preventing rotation of said latch device in the opposite direction, locking means pivotally mounted on said flange and engageable with said first one of said abutments for locking said latch device in said second predetermined position in which said detent means is in engagement with said second abutment, means for shifting said locking means into and out of engagement with said latch device, said latch device plate member having a portion thereof adapted to lie in the path of movement of said locking means except when said latch device is in said second predetermined position thereby preventing shifting of said locking means into locking position at any other time, and manually operable means including a lever pivotally mounted on said plate portion for movement about an axis parallel to said latch device axis and connected to said detent means for disengaging the same from said latch device without disturbing said locking means, said lever axis being coincident with said detent means axis.

5. In a door latch mechanism, a support having a plate portion for disposition at the free edge wall of the door and having a flange extending from the inner edge thereof, a rotatable latch device including a plate member having spaced abutments, means mounting said latch device on said plate portion for movement about an axis normal to the plane of the plate portion, detent means pivotally mounted on said plate portion for movement about an axis substantially parallel to the axis of said latch device, said detent means being engageable with first one and then a second of said abutments upon said latch device being rotated in one direction to first and second predetermined positions, said detent means upon engagement with said abutments preventing rotation of said latch device in the opposite direction, locking means pivotally mounted on said flange and engageable with said first one of said abutments for locking said latch device in said second predetermined position in which said detent means is in engagement with said second abutment, means for shifting said locking means into and out of engagement with said latch device, said latch device plate member having a portion thereof adapted to lie in the path of movement of said locking means except when said latch device is in said second predetermined position thereby preventing shifting of said locking means into locking position at any other time, and manually operable means including a lever pivotally mounted on said plate portion for movement about an axis parallel to said latch device axis and connected to said detent means for disengaging the same from said latch device without disturbing said locking means, said means for shifting said locking means including spring means, said spring means being effective upon said locking means being shifted a predetermined distance from non-locking position toward locking position to hold said locking means against said portion of the latch device until the latch device reaches said second predetermined position whereupon said spring means will urge said locking means into engagement with said first one of abutments.

6. In a door control mechanism, a support, a movable latch device carried by said support for movement between a door latched position and a door unlatched position, spring means for urging said latch device at all times toward said door unlatched position, a pivotally movable detent adapted releasably to maintain said latch device in door latched position and having a latch release position and a latch holding position, an outer manually operable detent release lever pivotally mounted on said support and operable to move said detent from said latch holding position to said latch release position, locking means engageable with said latch device for blocking the same and thereby preventing movement thereof by said spring means from door latched position to door unlatched position, said locking means having a latch unlocked position and a latch locked position, means effective when said latch device is out of door latched position for holding said locking means out of latch locked position in an intermediate position, and means effective when said locking means is in said intermediate position for moving said locking means from said intermediate position into said locked position upon movement of said latch device into door latched position.

7. In a door control mechanism, a support, a movable latch device carried by said support for movement between a door latched position and a door unlatched position, spring means for urging said latch device at all times toward said door unlatched position, a pivotally movable detent adapted releasably to maintain said latch device in door latched position and having a latch release position and a latch holding position, an

outer manually operable detent release lever pivotally mounted on said support and operable to move said detent from said latch holding position to said latch release position, said detent and release lever being pivotally mounted on said support to swing about a common pivotal axis, locking means engageable with said latch device for blocking the same and thereby preventing movement thereof by said spring means from door latched position to door unlatched position, said locking means having a latch unlocked position and a latch locked position, means effective when said latch device is out of door latched position for holding said locking means out of latch locked position in an intermediate position, and means effective when said locking means is in said intermediate position for moving said locking means from said intermediate position into said locked position upon movement of said latch device into door latched position.

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