April 28, 1953 E. D. DALL 2,636,765

AUTOMOBILE DOOR LATCH

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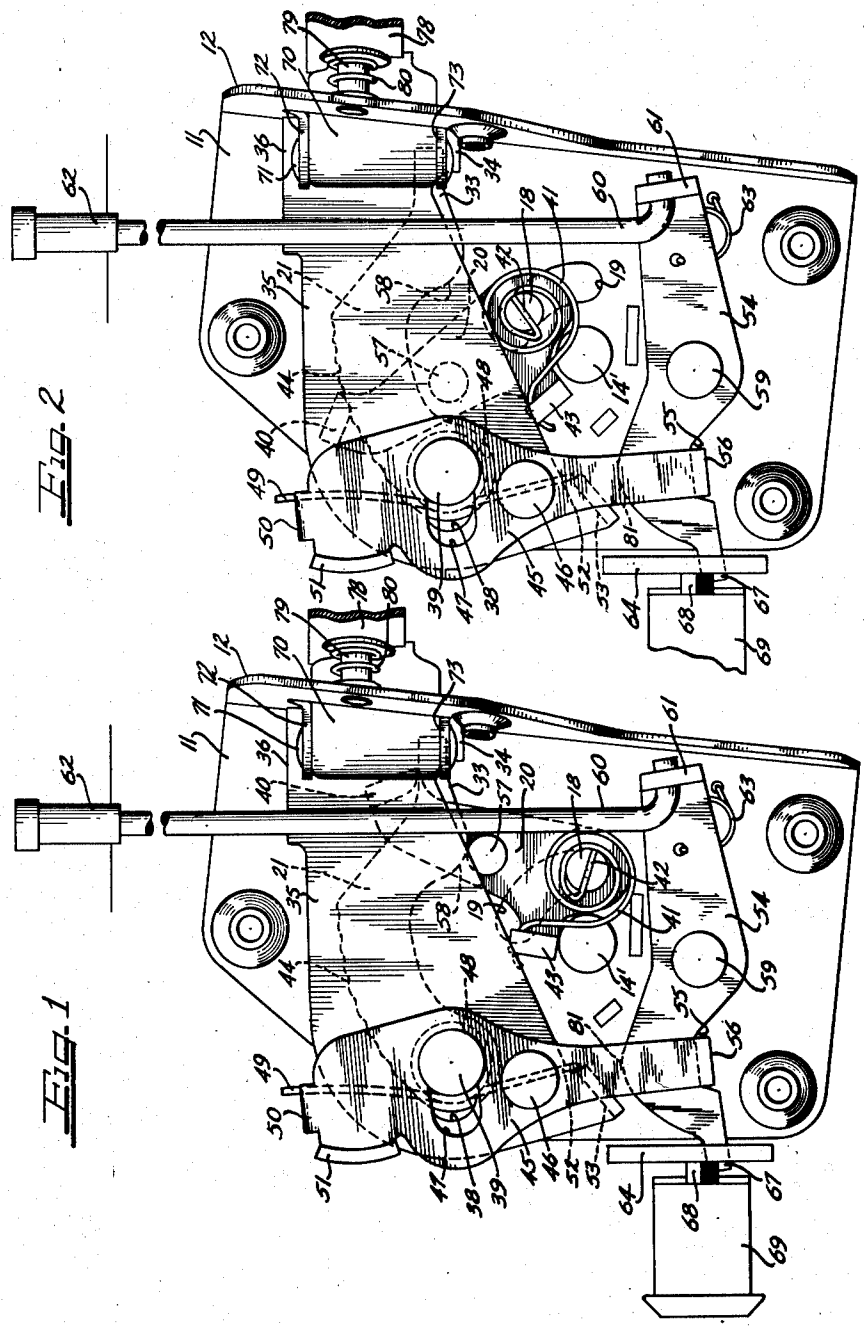


Fig. 2

Fig. 1

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April 28, 1953 E. D. DALL 2,636,765

AUTOMOBILE DOOR LATCH

Filed May 26, 1949 5 Sheets-Sheet 2

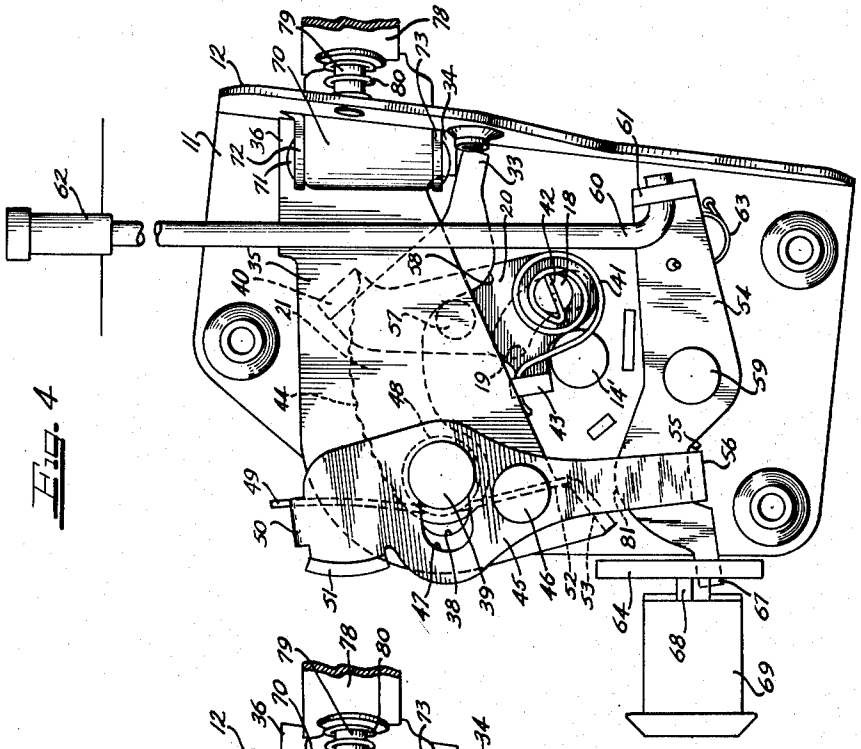


Fig. 4

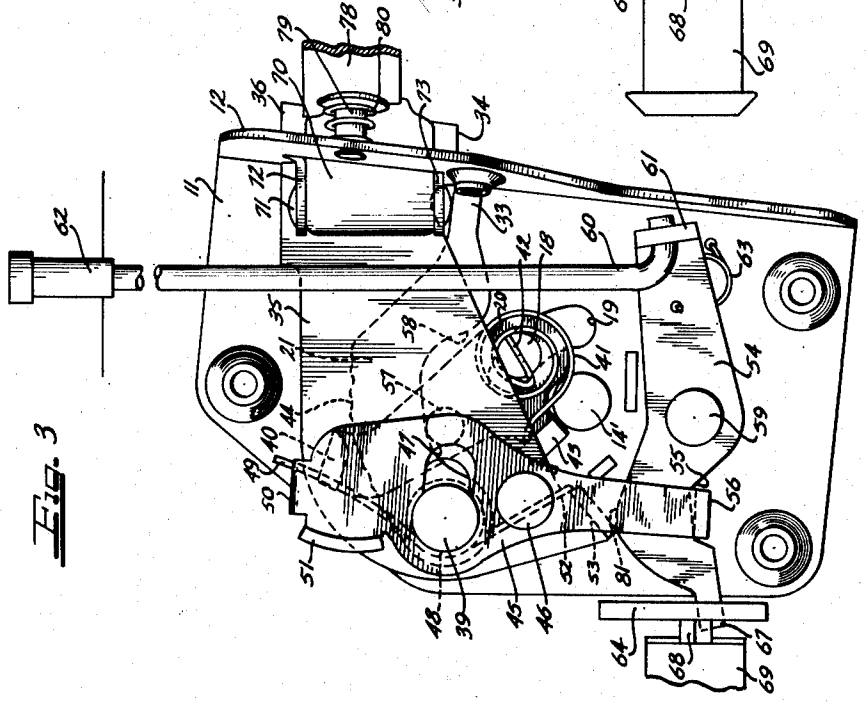


Fig. 3

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April 28, 1953 E. D. DALL 2,636,765

AUTOMOBILE DOOR LATCH

Filed May 26, 1949 5 Sheets-Sheet 3

Fig. 6

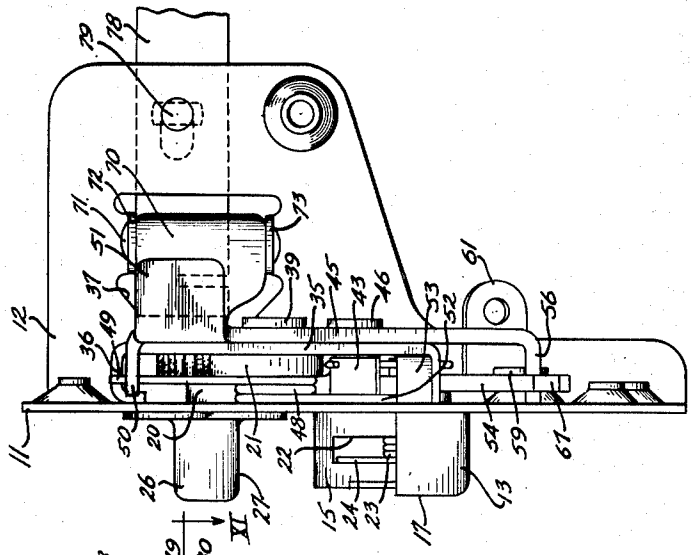
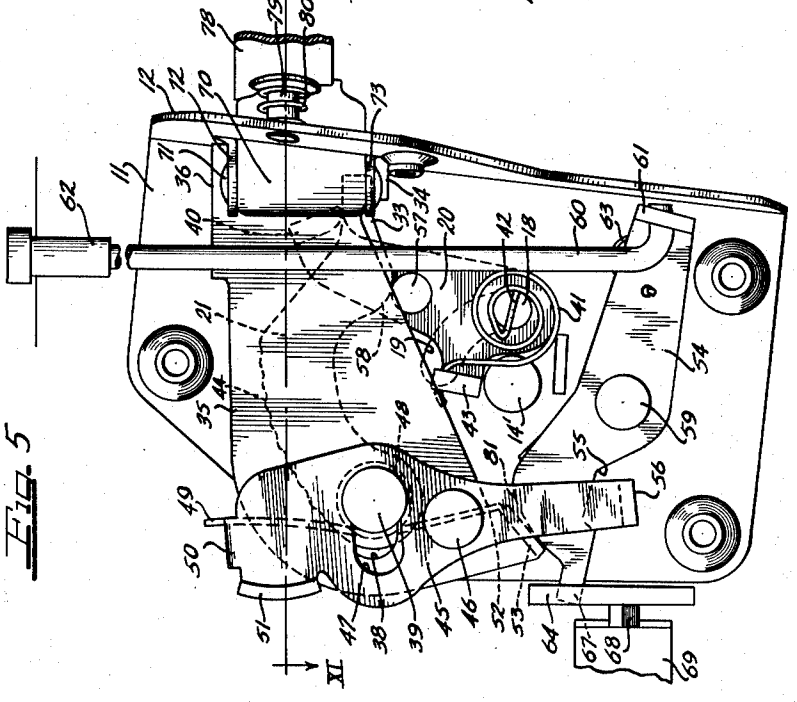


Fig. 5



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April 28, 1953 E. D. DALL 2,636,765

AUTOMOBILE DOOR LATCH

Filed May 26, 1949 5 Sheets-Sheet 4

Fig. 7

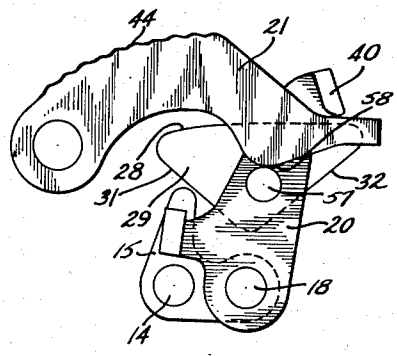


Fig. 8

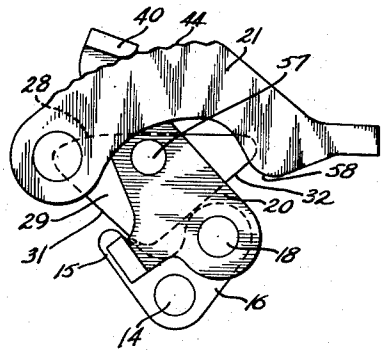


Fig. 9

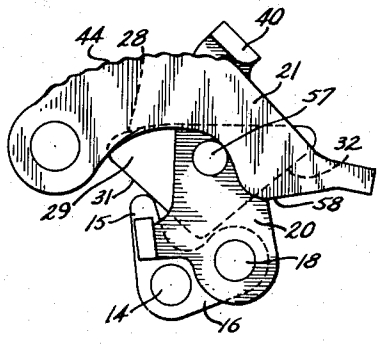


Fig. 10

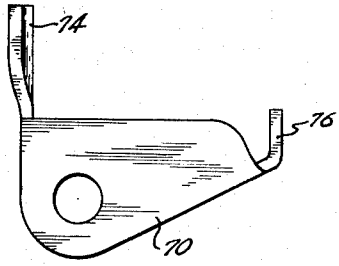
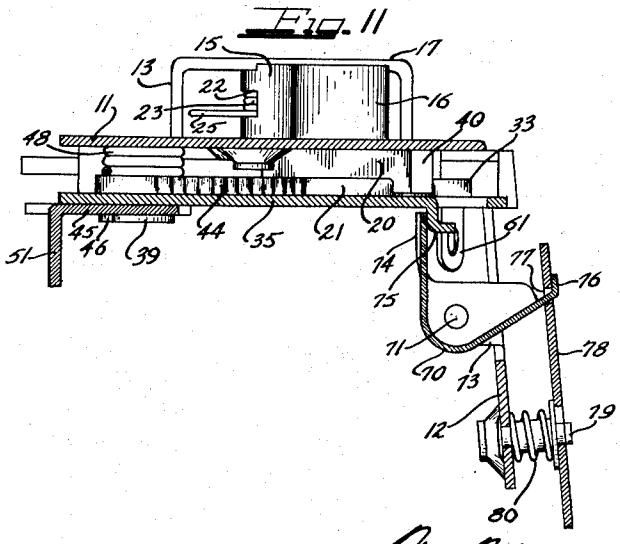


Fig. 11



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April 28, 1953 E. D. DALL 2,636,765

AUTOMOBILE DOOR LATCH

Filed May 26, 1949 5 Sheets-Sheet 5

Fig. 17

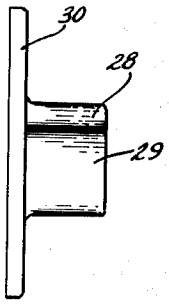


Fig. 12

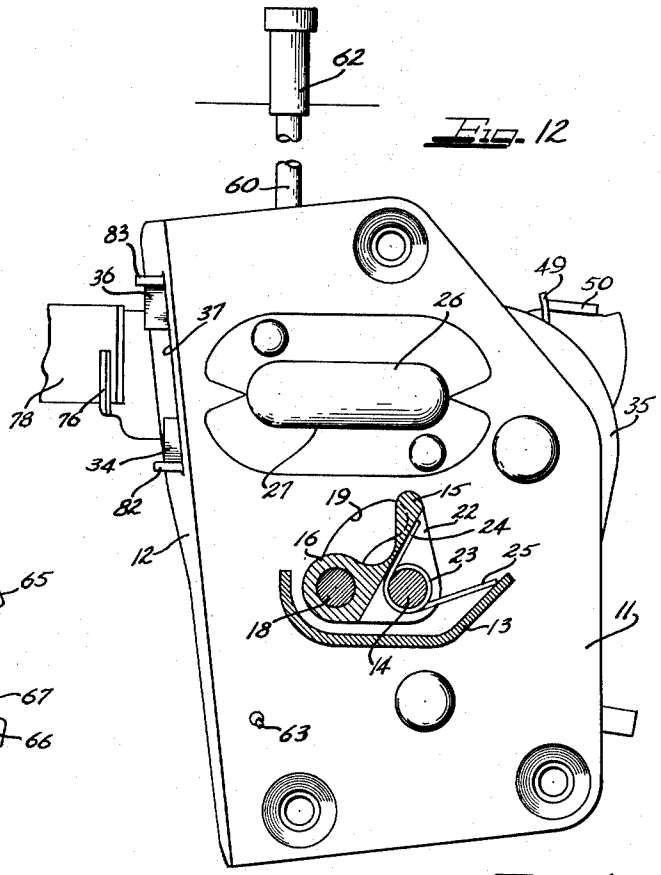


Fig. 16

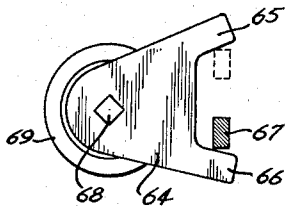


Fig. 13

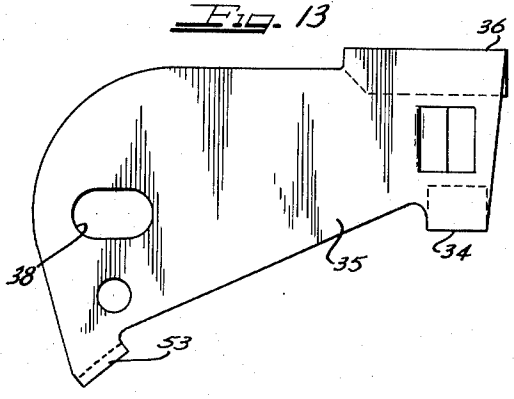


Fig. 14

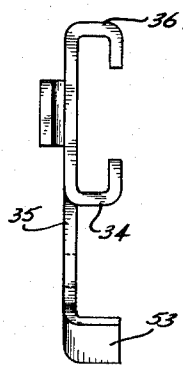
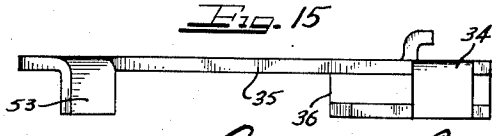


Fig. 15



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Patented Apr. 28, 1953 2,636,765

UNITED STATES PATENT OFFICE

2,636,765

AUTOMOBILE DOOR LATCH

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Application May 26, 1949, Serial No. 95,472

5 Claims. (Cl. 292—216)

1

This invention relates to a latch mechanism for automobile doors and to certain improvements therein providing a latch having a rotary bolt constructed to hold a door very securely in latched position yet capable of being released with little effort even though the door be very tightly latched.

One of the objects of the invention is to provide in a latch mechanism an improved outside latch release mechanism which can be rendered ineffective to release the latch bolt even though the outside release mechanism is conditioned to appear to operate freely in its normal manner.

Another object is to provide a latch release mechanism rendered effective or ineffective in its mechanical action by controllable positioning of a locking mechanism.

A further object is to provide a latching and locking mechanism comprising a small number of metal stampings readily assembled into a durable economical device.

Other objects will become apparent upon perusal of this specification.

In the drawings:

Figure 1 is a side elevation of the latch mechanism showing it in the normal inoperative position which it occupies when the door is open.

Figure 2 is a side elevation showing the latch mechanism in the position it occupies when the door is latched but not locked.

Figure 3 is a side elevation showing the latch mechanism at the instant it is released by an inward thrust on the outside latch control.

Figure 4 is a side elevation showing the latch mechanism in a partly latched or safety latch position.

Figure 5 is a side elevation showing the locking mechanism in a locking position to which it can be set while the door is open so that upon slamming of the door the door will then be locked against release from the outside.

Figure 6 is an end elevation showing the latch mechanism in the position which is illustrated in Figure 1, but with the key-controlled lock portions removed for the sake of clarity.

Figure 7 is a diagrammatic illustration or phantom view, showing the rotary bolt and its associated ratchet and pawl mechanism in the position which they occupy as the rotary bolt is approaching the keeper in a door closing operation.

Figure 8 is another diagrammatic illustration showing the same parts in the position which they occupy after the rotary bolt has engaged keeper and attained a latched position.

Figure 9 is another diagrammatic illustration of these same parts as shown in the safety position illustrated in Figure 4.

Figure 10 is a plan view of a portion of the inside latch releasing mechanism.

2

Figure 11 is a sectional view of the latch mechanism on the line XI—XI of Figure 5.

Figure 12 is a side elevation viewing the latch mechanism from the outside of the latch casing.

Figure 13 is a side elevation of the slidable dogging plate.

Figure 14 is an end elevation of the part shown in Figure 13.

Figure 15 is a bottom plan view of the part shown in Figure 13.

Figure 16 is an end elevation of the key-controlled locking mechanism; and

Figure 17 is a side elevation of the keeper.

Referring further to the drawings, the latch mechanism comprising this invention includes a latch casing formed from a single sheet of metal bent to provide an edge plate 11 for mounting at and parallel to the edge of a door, and a side plate 12, integral with the plate 11 to be mounted in the door more or less parallel to the inside wall thereof.

Supported on the outside face of the edge plate 11 is a rotary bolt housing 13, which partly houses a rotary bolt pivoted on the pin 14. The rotary bolt includes a striker arm 15 and a latching arm 16. The pin 14 is non-rotatably supported on the edge plate 11 and upon the outer vertical wall 17 of the bolt housing 13, the housing being rigidly secured to plate 11 in any suitable manner. The latching arm 16 carries a pin 18 fixed therein which extends through an arcuate slot 19 and pivotally carries on its inner end a pawl arm 20, the latter coacting with a ratchet arm 21 which will be more fully described later.

The bolt has a recess 22 through which extends the pin 14 and wrapped around that pin is a spring 23 one end 24 of which presses against the bolt, as shown in Figure 12 while the other end 25 presses against the inside of the bolt housing. This spring, therefore, tends to restore the bolt to unlatched position and yieldingly hold it there.

Rigidly mounted above the bolt and welded or riveted to the outer face of the plate 11 is a lug 26 whose bottom surface 27 will ride upon the top surface 28 of the keeper lug 29, when the door is closed. The keeper includes a securing plate 30 for attachment to the door post, a striker surface 31 and a holding surface 32.

Figure 1 shows the latch in the position it occupies when the door is open. At such a time the movable end 33 of the ratchet arm 21 rests upon the bottom flange 34 of a reciprocable dogging plate generally indicated as 35, the upper flange 36 of which together with lower flange 34 extend through and are guided by an appropriate slot 37 embracing them cut in the casing plate 12. The other end portion of the dogging plate is guided by slot 38 upon post 39 which is fixed on casing plate 11 and which post also furnishes

pivotal support for one end of the ratchet lever 21.

When the door is open, the laterally projecting head 40 at the top of pawl 20 is inoperative, as shown in Figure 1, being held there by reason of the retracted position of the rotary bolt, and spring 41, the latter having one end anchored in a crimped kerf 42 cut in the end of pin 16 and its other end hooked over the arm 43 integral with pawl 20. The spring causes the area to thrust against the enlarged inner end 14' of the pin 14.

As the door is being closed the latching arm 15 of the rotary bolt contacts striker surface 31 of the keeper and further closing movement will rotate latching arm 15 to a position where surface 32 of the keeper would be engaged thereby on opening pressure of the door. Meanwhile, pin 16 and spring 41 will cause the head of the pawl to ride up onto and along the serrations 44 on the ratchet. When the closing movement ceases spring 41 causes the pawl to bite down on the ratchet and unlatching movement of the bolt is prevented as long as the dogging plate supports the movable end of the ratchet.

For releasing the bolt to permit its unlatching rotation is an outside release lever, generally indicated as 45, pivotally connected to the dogging plate by a rivet 46 and having an elongated slot 47 riding on post 39. A spring 48 is coiled about post 39 (see Figure 6) and its upper end 49 presses against a flange 50 struck out from the release lever. An enlarged flange 51 laterally extending from the lever affords a surface against which may operate a push button (not shown), mounted in or operated by an outside door handle (also not shown, as such mechanisms are already well known in the art). The lower end 52 of the spring 48 hooks over a laterally extending inclined flange 53 integral with the dogging plate. Thus, the spring 48 serves to urge the dogging plate toward the outer surface of the door and the top of the release lever in a counter-clockwise direction. The outside push button or handle will, of course, prevent undue clockwise rotation of the flange, as such mechanism should contact that flange to prevent rattling of the outside push button or handle.

A locking lever 54, when in unlocked position as shown in Figure 1, provides a notch 55 engaged by a lateral flange 56, formed on the bottom end of lever 45, this notch when so located being a stationary pivot point for lever 45.

Hence, an inward thrust on flange 51 will rock the lever about that pivot and the floating pivot pin 46 will cause the dogging lever to slide inwardly as far as permitted by slot 38, if it be the purpose to unlatch the door. This movement will cause flange 34 to move out from under end 33 of the ratchet, permitting the spring 41 to pull the ratchet down and be freed from the pawl as the pawl arm drops down onto the pin head 14'. The door may then be freely unlatched, and if the outside handle be not too promptly released the condition shown in Figure 1 will again be attained.

However, should the outside handle, or push button, be released before the pawl has been retracted to the position shown in Figures 4 and 9, the flange 34 will be blocking the final rise of the ratchet end and the bolt will still remain engaged with the lower portion of the latching surface 32 (see Figure 9) and the door will be held in a "safety position," and cannot further open unless the dogging plate be again moved fully to the right. During the final restoring movement of the pawl, if the dogging plate is manually held fully to the right, a short pin 57, protruding laterally from the pawl, will move right along the cam surface 58 of the ratchet and lift the free end of the ratchet to its normal position (Figure 1 or Figure 7) when it can again be supported by flange 34 when the dogging plate goes back to normal when the outside handle or push button is released.

The locking lever 54 is pivoted on post 59 supported on casing plate 11. A push rod 60 is pivotally connected to flange 61 of the locking lever and extends, preferably, through the selvage of the window of the door on which it is mounted, and is provided with the customary button 62. A downward thrust on this rod rocks lever 54 to the position shown in Figure 5, after which an inward thrust on release lever flange 51 will merely rock that lever about pivot 46 and no motion will be transmitted to the dogging plate. Thus the door may be locked from the inside of the car against release by the outside handle. The over-center spring 63 connected to the lever 54 and casing plate 11 helps to retain the lever in either locked or unlocked position.

The locking lever 54 is, however, readily controlled by a key. A key lock plate 64 (Figure 16) has two spaced fingers 65 and 66 which always straddle the end 67 of the locking lever. This plate is secured to and is rotatable by shaft 68 of an ordinary cylinder lock 69 mountable in the outside surface of the door some distance below the handle.

It will be apparent that the locking lever 54 may be moved to or from locking position either by the key rotatable shaft 68 or by the push rod 60.

The inside latch release mechanism includes a bell crank 70 supported on a vertical pivot pin 71 between upper and lower ears 72 and 73 struck out from casing plate 12. One end 74 of the bell crank engages a flange 75 struck out from the body of the dogging plate 35, while the other end 76 is hooked into a slot 77 near the end of a reciprocating link 78 which is slidably supported on post 79, held by an anti-rattling spring 80, and connected to an inside door handle (not shown). The spring loading of the door handle, as is customary, will maintain the end 74 in contact with flange 75. Thus the link 78 may be used to rotate bell crank 70 and operate the dogging plate to release the rotary bolt pawl and ratchet.

Turning now to Figure 5, which shows the locking lever in locked position, if the door be slammed shut this locked condition will not be disturbed. Thereafter, if the inside door handle be operated to release and open the door, the releasing movement of the slidable dog will cause its flange 53 to wipe over the cam surface 81 on the top edge of the locking lever 54 and restore that lever to unlocked position, which is a desirable function.

It should be observed that if a door equipped with this latch be tightly closed against rubber bumpers and weather stripping, the reaction pressure of the pawl on the ratchet may be very great, which is, of course, wholly desirable. However, the more tightly the door is closed, the closer does the pawl head move toward the pivotal support of the ratchet and the further from the dogging flange which supports the free or movable end of the ratchet. To release the ratchet lever it requires only a sliding move-

ment of the dogging plate which is slidably supported between ample flanges 82 and 83 struck out from plate 12. If desired, lubricant may be applied to these flanges and to the inside surface of the flange 34 of the dogging plate. Hence, the amount of force required to move the dogging plate to releasing position will never become objectionable.

When the latch is in locked condition, force applied to the outside release mechanism cannot damage the latch as the outside release lever moves freely, but ineffectively.

While a preferred embodiment of this invention has been shown and described in detail, it should be understood clearly that variations and modifications of the invention may be employed without departing from the scope of the invention defined in the appended claims.

I claim as my invention:

1. A latch mechanism comprising a latch casing, a rotary bolt mounted on said casing, a ratchet lever pivoted on said casing adjacent one of its ends, a dogging member slidably supported on said casing and having a flange portion having supporting engagement with the free end of said ratchet lever, a pawl pivotally carried by said rotary bolt and extending therefrom into position to engage said ratchet and hold the bolt against unlatching movement, and means for releasing said dogging member from said ratchet comprising an outside latch releasing operator pivotally mounted on said dog, a pivoted locking lever, said dog having a depending end portion extending into position to be engaged by said locking lever, and said locking lever having means thereon engaging said depending end portion of said dog and forming a fulcrum for said outside latch releasing operator when in engagement therewith, and means moving said locking lever out of position to engage said depending end of said releasing operator, to render said operator ineffective to release the latch.

2. A door latch mechanism comprising a latch casing and a rotary bolt pivotally mounted thereon, a ratchet member pivotally mounted on said casing adjacent one of its ends, a slidable dogging member engageable with the free end of said ratchet member to hold said ratchet member stationary, a pawl pivotally carried by the bolt for bodily movement therewith, a spring effective for urging said pawl into bolt-holding engagement with the ratchet member, a rockable locking member, an outside latch operator pivotally mounted on said dogging lever and rockable for moving the same out of engagement with said ratchet, said latch operator being pivotally connected to said dogging member intermediate its ends and having a free end portion extending from the pivot thereof, and said lock control member having engagement with the free end portion of said latch operator and forming a fulcrum therefor, and means for moving said lock control member out of engagement with said free end of said outside latch operator and rendering said latch operator ineffective to operate said dogging lever.

3. In a door latch mechanism, a latch casing, a rotary bolt pivotally mounted thereon, a ratchet member pivotally mounted on said casing adjacent one of its ends, a pawl pivotally carried by said bolt for bodily movement therewith, a spring engaging said pawl and effective for urging said pawl into engagement with said ratchet member, a dogging member slidably mounted on said casing and having supporting engagement with the free end of said ratchet, to hold said ratchet stationary, and releasable therefrom to release said ratchet and unlatch the door, a shiftable locking lever pivoted on said casing, an outside latch operator connected with said dogging member and having a free end portion having interengagement with said latch operator and pivoting thereabout, to shift said dogging lever to release said ratchet, and a pivoted member having operative engagement with said locking lever, for moving the same out of engagement with said operator.

4. In a door latch mechanism, a latch casing plate and a rotary bolt pivotally mounted on said plate for positioning at the edge of a door, a ratchet member pivotally mounted on said casing plate, a pawl pivotally carried by the bolt for bodily movement therewith, spring means for urging said pawl to engage said ratchet, a dogging member slidably mounted on said casing plate and having engagement with said ratchet member to hold the same stationary, but shiftable to a position to free said ratchet member to pivot away from said pawl, a shiftable locking lever supported on said casing plate and having a recess therein, and an outside operator rockably supported on said dogging member and extending in overlying relation with respect to said locking lever and having an end portion having engagement with and fulcruming about said recess, to release the latch when said locking lever is in one position, and means shifting said locking lever and the recess thereof out of engagement with said operator, to lock the door.

5. A latch mechanism comprising a latch casing, a rotary bolt pivotally mounted thereon, a ratchet member pivotally mounted on said casing, a pawl pivotally carried by said rotary bolt and having an engaging end portion engageable with said ratchet member for holding said bolt against unlatching movement, a dog slidably supported on said casing and having means thereon engaging the movable end of said ratchet to hold said ratchet from pivotal movement, and reciprocable to free said ratchet, an outside latch release operator pivoted on said dog, a manually shiftable locking lever shiftably mounted on said latch casing and having a recess therein, said outside operator having an engaging end portion engageable with said recess and fulcruming thereabout to move said dog to released position when said locking lever is in one position, and means to shift said locking lever into another position to disengage said recess from said engaging end portion of said outside operator, to render said operator ineffective to release the latch.

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