Feb. 1, 1966 H. E. COVERLEY ETAL 3,232,656

DOOR LATCHES FOR AUTOMOBILE DOORS

Original Filed May 16, 1962 5 Sheets-Sheet 1

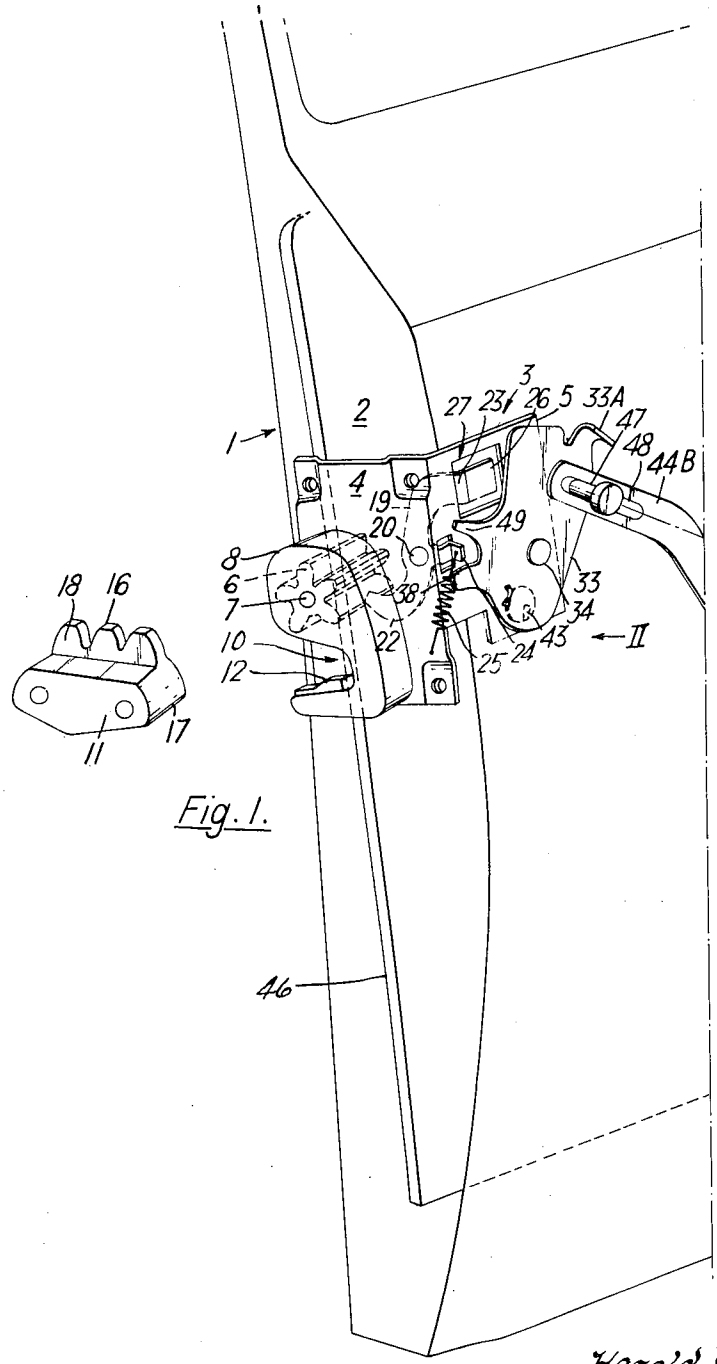


Fig. 1.

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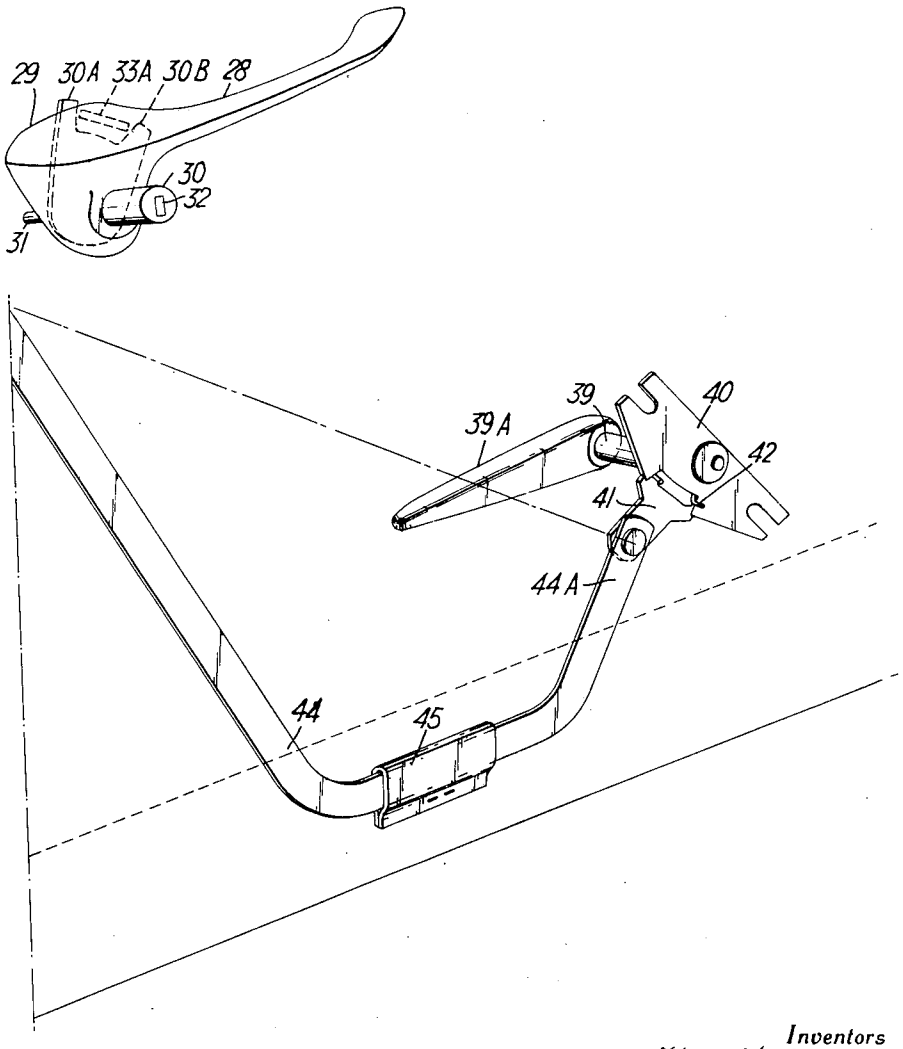
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Fig. 1A



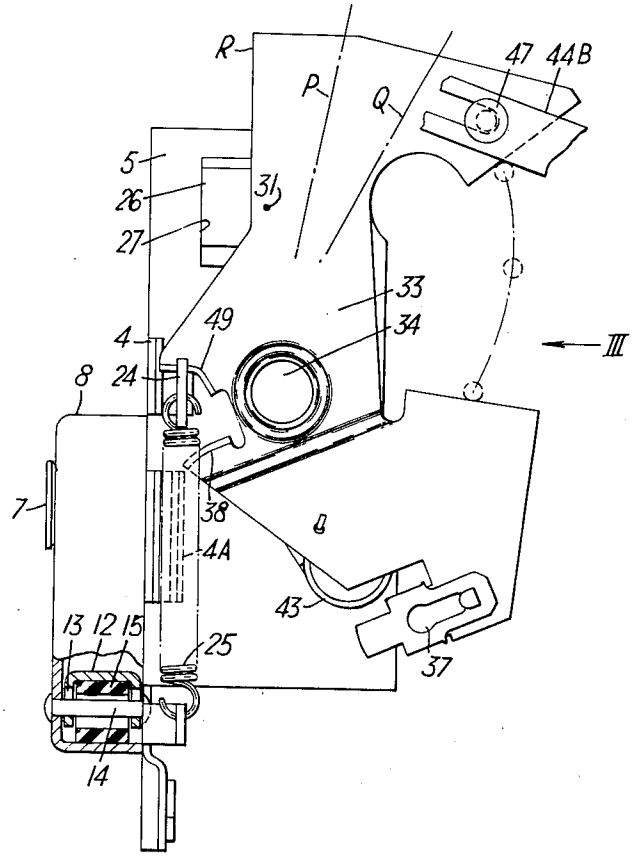
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Fig. 2



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Fig. 3.

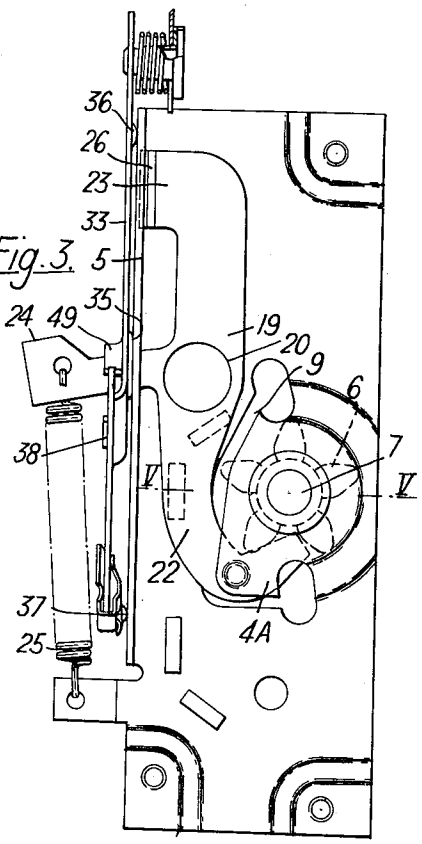


Fig. 4.

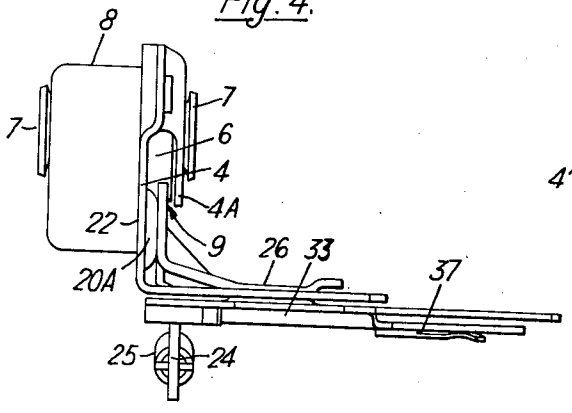
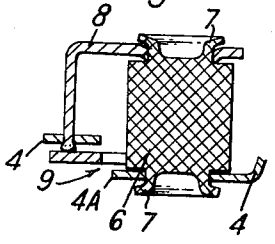


Fig. 5.



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Fig. 6.

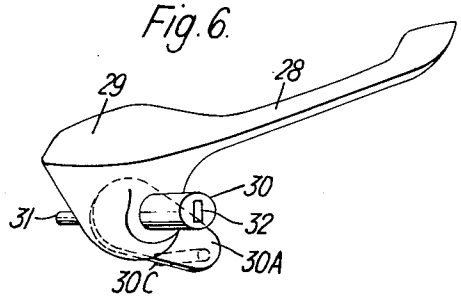
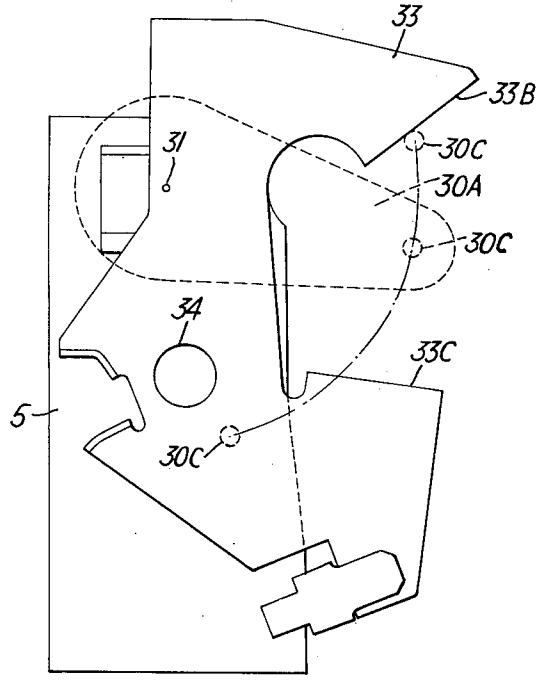


Fig. 7.



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DOOR LATCHES FOR AUTOMOBILE DOORS

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Continuation of application Ser. No. 195,154, May 16, 1962. This application Nov. 24, 1964, Ser. No. 415,859

Claims priority, application Great Britain, May 19, 1961, 18,263/61

16 Claims. (Cl. 292—280)

This is a continuation of our copending application Serial No. 195,154, filed May 16, 1962, now abandoned. This invention relates to door latches for automobile doors and the like.

By the invention latches can be produced which have few parts, and are therefore economical to produce in large quantities.

The scope of the invention is defined by the appended claims; how the invention may be performed is particularly described below with reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view of an automobile door provided with a door latch according to this invention;

FIGURE 1A is a diagrammatic perspective view illustrating the inside and outside actuating means for the door latch;

FIGURE 2 is an elevation of the latch removed from the door, and looking approximately in the direction of the arrow II in FIGURE 1;

FIGURE 3 is an elevation looking in the direction of the arrow III in FIGURE 2;

FIGURE 4 is a plan view of the latch as shown in FIGURE 2;

FIGURE 5 is a section on the line V—V in FIGURE 3; and

FIGURES 6 and 7 are views similar to a portion of FIGURE 1A and to FIGURE 2 showing a modification.

Referring now to the drawings, FIGURE 1 shows an automobile door 1 having a jamb or "shut-face" 2 and inside which is mounted a latch comprising a frame 3 made of two frame plates 4, 5 which are at right angles. The latch shown in greater detail in FIGURES 2–5 corresponds in all essentials to that of FIGURE 1. There are merely, in FIGURES 2–5, some changes in the shape of certain parts.

A rotatable latch bolt 6 in the form of a gear wheel is mounted to rotate freely by means of a spindle 7 as shown in FIGURE 1. In FIGURE 5 the spindle ends 7 are integral with the bolt wheel 6, which is journalled for free rotation by the plate 4 and by a bolt cover 8 secured to the plate 4. A tongue 4A is cut out of the frame plate 4 and turned inwards so as to leave a slot 9 through which a part of the bolt 6 is accessible on the inside of the plate 4. In this way this part of the bolt acts as a ratchet wheel for the purpose of preventing rotation of the bolt by means of a detent as explained below.

As an alternative however the tongue 4A may be omitted, so that the bolt 6 is then entirely on the outside of the plate 4 and is supplemented by a separate ratchet wheel fixed to the spindle on the inside of the plate 4.

Continuing with the description of the drawings, the bolt cover 8 has an opening 10 for the entry of a striker 11 which would be fixed to a door post (not shown). In the lower part of the cover 8 there is a metal wedge 12 of channel section carried by a pin 14 passing through slots 13. A rubber block 15 is placed under the metal wedge 12 so as to render the latter resilient.

The striker 11 has teeth 16 which are adapted to mesh with the teeth of the bolt 6 when the door is closed.

The underside of the striker is formed with a wedge surface 17 which engages with the resilient wedge 12 when the door is shut and so that when latched the door is firmly held against up or down movement by the striker being securely held between the bolt 6 above and the resilient wedge 12 below. To resist any tendency for the striker and bolt to separate in the fore-and-aft direction of the vehicle due for example to distortion of the body is an accident, there is an overlap between the surface 18 of the teeth 16 and the inner surface of the cover 8 just below the bolt 6.

A detent lever 19 is pivoted to the inside of the plate 4, the pivot 20 being located at a pressed-in part 20A of the plate 4 which holds the detent lever 19 clear of the rest of the plate 4. The detent lever 19 has three arms, consisting of a detent tooth 22, a second arm 23, and a third arm 24. The tooth 22 is engageable with the teeth of the bolt 6 to prevent it from rotating in the unlatching direction, which is clockwise in FIGURE 1. A spring 25 exerts a downward pull on the arm 24 so as to urge the detent lever 19 clockwise and thus press the tooth 22 against the bolt 6. By rotating the detent lever 19 counterclockwise as viewed in FIGURE 1 and clockwise as viewed in FIGURE 3 the tooth 22 is withdrawn, thus freeing the bolt, which rotates as the door is opened.

The arm 23 of the detent 19 has a detent release tab 26 which is turned at right angles and forms a surface on which thrust can be exerted by a push-button to rotate the detent lever 19 so as to free the bolt. The thrust surface of the tab 26 is opposite a square opening 27 in the frame plate 5 through which a push-button extension rod can pass to thrust its end against the tab 26.

The action of the push-button can be appreciated from FIGURE 1A which shows a door handle 28 which is intended to be fixed to the outside of the door. An enlarged end 29 of the handle 28 forms a mounting for a slidable push-button 30 having an extension rod 31 the end of which is opposite the thrust surface of the tab 26, at 90° thereto or some other convenient angle, and is at such distance thereform that, on inward pressure of the push-button 30, with the latch parts positioned as in FIGURE 1 the push-button rod 31 contacts the tab 26 and thrusts it inwards, thus turning the detent 19. The push-button 30 includes a key cylinder indicated at 32 for outside locking as further described below.

To the plate 5 of the latch is pivoted an actuator lever 33 by a pivot 34 passing through a pressed-out part 35 of the plate 5 which keeps the lever 33 generally clear of the plate 5. To prevent rocking of the actuator lever on its pivot, it has an inward pip 36, FIGURE 3, bearing against the plate 5 at the top, and at the bottom end carries a blade spring 37 which also contacts the plate 5. The spring 37 also imposes a light frictional load on the movement of the actuator lever 33.

The actuator lever 33 has three possible angular settings which can be understood by comparison of FIGURES 1 and 2. From a middle or unlocked position (shown by the position of lever 33 in FIGURE 1, and by the line P in FIGURE 2) the actuator lever can be turned clockwise to position Q (FIGURE 2) to effect unlatching by withdrawing the tooth 22 from the bolt and thus freeing the latter. By shifting the actuator lever counterclockwise to the position R as it is shown in full lines in FIGURE 2 the actuator lever is set in the position for locking the latch. In turning the lever 33 from P to this locked position R the lever 33 is interposed between the push-button rod 31 and the tab 26. Consequently, the rod 31 is blocked against inward travel by the lever 33, and the push-button 30

cannot be pressed inwards to release the latch. The relative position of the rod 31 is indicated in FIGURE 2.

Unlatching is effected by pivotal movement of the actuator lever 33 to the position Q. In shifting the lever to that position a projection or arm 38 on the lever 33 comes into contact with the botom edge of the third arm 24 of the detent lever and lifts it, thus turning the detent lever 19 so that the tooth 22 is freed from the bolt.

Pivotal movement of the actuator lever 33 in either direction from P from inside the vehicle is imparted by an inside handle 39A fixed to a shaft 39 mounted for rotation in a bracket 40 fixed to the door. The shaft 39 has fixed to it a crank arm 41 and is under the influence of a torsion spring 42. The actuator lever 33 is connected to a snap-over spring 43 which tends to retain it either in the unlocked position P or in the locked position R and helps to bias it towards either of these positions when the snap-over position of the spring 43 is passed.

The crank arm 41 is connected to the actuator lever 33 by a link 44 slidably supported in a bracket 45. Of the link 44 one end 44A is on the inside of the vertically-slidable window glass 46 (which is shown fully opened downwards) and the other end 44B is on the outside of the window glass and is connected to the actuator lever 33 by a headed pin 47 passing through a slot 48 in the end 44B. The pin and slot connection 47, 48 allows locking by key operation (as explained below) without moving the handle shaft 39, and permits other necessary independent movement as between the actuator lever 33 and the link 44. The strength and arrangement of the various springs is such that the lever 33 remains normally in the middle position (P in FIGURE 2). The clockwise unlatching movement of the actuator lever 33 is against the action of the detent spring 25, and is effected by turning the inside handle 39A on the shaft 39 in one direction. By turning the handle 39A in the other direction the opposite movement of the actuator lever 33 is effected, shifting it to the locking position R in FIGURE 2.

There is a projection or arm 49 on the actuator lever 33 above the projection 38, and suitably spaced from it. When the lever 33 is in the locked position R this projection 49 rests on top of the arm 24 of the detent. Should the lever 33 be placed in this locking position by the inside handle 39A when the door is open, the subsequent shutting of the door returns the lever 33 to its normal middle or unlocked position P. This is caused by the rotation of the bolt counterclockwise in FIGURE 1 as its teeth mesh with the striker teeth 16, which in turn causes counterclockwise movement of the detent lever 19, as the teeth of the bolt 6 ride over the detent tooth 22. Thus the arm 24 of the detent lifts against the projection 49 and pivots the actuator lever 33 back to its middle position. This action is called "automatic undogging."

Locking from outside the door is effected by inserting a key into the slot 32 (FIGURE 1A) and turning it counterclockwise, rotating with it the push-button 30 and a locking lever 30A having a fork 30B in which engages a tab 33A on the actuator lever 33, thus pivoting the latter into locking position as in FIGURE 2. Unlocking may be effected by turning the key in the opposite direction, whether locking has been effected by the key or by the inside handle 39A.

FIGURES 6–7 show a modification of the outside locking mechanism, in which the locking lever 30A has a pin 30C instead of being forked. This pin is capable of engaging with either the edge 33B or the edge 33C of the recessed portion of the actuator lever 33, according to the direction in which the key is turned.

We claim:

1. An automobile door latch assembly comprising a rotatable toothed bolt, a detent lever adapted to prevent rotation of said bolt, a manual push button rod adapted to thrust against said detent and thus rotate it to free the bolt, and an actuator lever which is pivotally movable in one direction into a locking position to interpose between the detent lever and the push button rod and is pivotally movable in the other direction into an unlatching position to rotate the detent lever in bolt-freeing direction.

2. A latch according to claim 1, wherein said detent lever has a projection which, if the actuator lever is in locking position and the bolt is then rotated to a latching position, contacts said actuator lever and shifts it out of locking position.

3. An automobile door latch assembly comprising a rotatable toothed bolt; a detent lever having three projections of which one is a detent tooth adapted to prevent rotation of said bolt; a manual push button rod adapted to thrust against the second of said projections to rotate the detent and free the bolt; and an actuator lever which is pivotally movable in one direction to interpose between said second projection and said push button rod and is pivotally movable in the other direction to contact the third of said projections and rotate the detent in bolt-freeing direction.

4. An automobile door latch assembly comprising a latch and a push button for unlatching said latch; said latch comprising the following combination; a rotatable toothed bolt wheel having gear teeth; a detent lever having three arms of which one is a detent tooth adapted to prevent rotation of said bolt, and the second can be thrust against by said push button and the detent thus rotated to free the bolt; and an actuator lever which by pivotal movement in one direction contacts the third arm of said detent lever and rotates it in bolt-freeing direction but which by pivotal movement in the other direction interposes between said second arm and said push button to thereby block the thrust of said push button.

5. An assembly according to claim 4, in which said push button is associated with a key-operable lock operable to pivot the actuator lever to interpose between said second arm and said push button.

6. An assembly according to claim 4, in which the latch comprises a frame having two plates at an angle; one side plate carrying said rotatable bolt and detent lever, and the other said plate carrying said actuator lever.

7. An assembly according to claim 6 in which said frame plate carrying the actuator lever has an opening to allow passage of said push button rod.

8. An automobile door latch assembly including a manual push button rod and a latch; said latch comprising the following combination: a frame having two plates at an angle; one of said plates including a slot, a rotatable gear wheel bolt pivoted to the outside of said one plate, a detent lever pivoted to the inside of said one plate and comprising three arms of which one is a detent tooth for preventing rotation of said bolt, said tooth projecting through said slot for engagement with said bolt, the second arm being engageable by the thrust of said push button so as thereby to rotate said detent in unlatch direction to free said bolt, the third arm projecting through an opening in said second frame plate; and an actuator lever pivoted to the outside of said second plate, the actuator lever being pivotally movable in one direction to contact said third arm and thereby rotate the detent lever to free the bolt, and being pivotally movable in the other direction to interpose between said second arm of the detent lever and said push button rod and thus block the thrust of said rod.

9. A vehicle door latch assembly comprising, latch means movable between latched and unlatched positions, detent means including a detent portion for holding said latch means in latched position, and a detent release por-

tion adapted to be engaged by manually operable means to release said detent portion, manually operable means engageable with said detent release portion for operation thereof, and a blocking member movable to a blocking position wherein said member is interposed between said manually operable means and said detent release portion to prevent engagement therebetween.

10. A vehicle door latch assembly comprising, latch means movable between latched and unlatched positions, detent means including a detent portion for holding said latch means in latched position, and a detent release portion operable to release said detent portion, push button actuating means spaced from said detent release portion and selectively movable into engagement therewith to operate said detent portion, and a blocking member movable to a blocking position wherein said member is interposed between said push button means and said detent release portion to prevent engagement therebetween.

11. A vehicle door latch assembly as recited in claim 9 wherein said detent means is operable upon movement of said latch means from unlatched to latched position to move said member out of said blocking position thereof.

12. A vehicle door latch assembly as recited in claim 9 including inside operating means operatively connected to said member for selectively moving said member into and out of said blocking position thereof.

13. A vehicle door latch assembly comprising, latch means movable between latched and unlatched positions, detent means including a detent portion for holding said latching means in latched position, and a detent release portion operable to release said detent portion, manually operable means spaced from said detent release portion and adapted for operative connection therewith, and a combined actuating and blocking member selectively and alternately movable between a first position wherein said member operates said detent release portion to release said latch means and a second position wherein said member is interposed between said manually operable means and said detent release portion to prevent operative connection therebetween.

14. A vehicle door latch assembly comprising: latch means movable between latched and unlatched positions; outside operating means located on the exterior of the door and including a member mounted for bodily shiftable movement inwardly therefrom; a first movable lever including detent means for holding said latch means in latched position, means on said lever directly engageable by said outside shiftable member to move the lever and release said detent means, and first automatic undogging means; and a second movable lever including locking means and second automatic undogging means, said second lever being movable to a locking position wherein said locking means prevents movement of said first lever by said outside shiftable member to prevent release of said detent means, said first and second automatic undogging means being engageable upon movement of said latch means from unlatched to latched positions to move said second lever out of said locking position.

15. A vehicle door latch assembly comprising: latch means movable between latched and unlatched positions; outside operating means located on the exterior of the door and including a member mounted for bodily shiftable movement inwardly therefrom; a movable detent lever including a detent portion for holding said latch means in latched position, means on said lever directly engageable by said outside shiftable member to move said detent lever and release said detent portion, and a first automatic undogging portion; and a combined locking and actuating lever including a locking portion, an actuating portion engageable with said detent lever, and a second automatic undogging portion, said combined lever being selectively and alternately movable to an actuating position wherein said actuating portion releases said detent portion or to a locking position wherein said locking portion prevents movement of said detent lever by said outside shiftable member, said first and second automatic undogging portions being engageable upon movement of said latch means from unlatched to latched positions to move said combined lever out of said locking position.

16. A vehicle door latch assembly comprising: latch means movable between latched and unlatched positions; outside operating means located on the exterior of the door; a first movable lever including a detent portion for holding said latch means in latched position, a detent release portion on said lever directly engageable by said outside operating means to release said detent portion, and a first automatic undogging portion; and a combined blocking and actuating lever including a blocking portion, an actuating portion engageable with said first lever, and a second automatic undogging portion, said combined lever being selectively and alternately movable to an actuating position wherein said actuating portion releases said detent portion or to a blocking position wherein said blocking portion overlies said detent release portion to prevent engagement therewith by said outside operating means, said first and second automatic undogging portions being engageable upon movement of said latch means from unlatched to latched positions to move said combined lever out of said locking position.

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