

[54] **VEHICLE BODY DOOR LOCK**

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[22] Filed: **Aug. 31, 1970**

[21] Appl. No.: **68,123**

[52] U.S. Cl. **292/216, 292/DIG. 26, 292/DIG. 27**

[51] Int. Cl. **E05c 3/26**

[58] Field of Search **292/280, 216, DIG. 26, DIG. 27, 292/198**

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Richard E. Moore

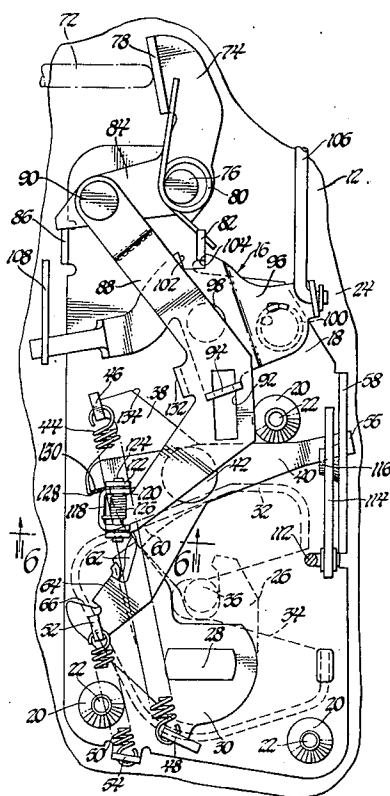
Attorney—W. E. Finken and Herbert Furman

[57] **ABSTRACT**

A vehicle body door lock includes a fork bolt and

toothed plate mounted on the frame for movement between latched and unlatched positions. Coaxially mounted primary and secondary detents engage a tooth of the plate to maintain the bolt in latched position. An outside push button lever is pivoted to an intermittent member. A locking lever is also coupled to the intermittent member to move the intermittent member about its pivot between coupled and uncoupled positions. An abutment lever is pivoted to the intermittent member and is normally spring biased to a position laterally of the intermittent member. When the intermittent member is in coupled position, shifting movement of the intermittent member by the push button lever engages the detents to release the detents from the plate. When the intermittent member is moved to uncoupled position, the abutment lever bypasses the detents when the push button lever is operated. Upon simultaneous actuation of the push button lever and locking lever when the intermittent member is in uncoupled position, the abutment lever engages the detents and swings past the detents against the action of the biasing spring to permit movement of the intermittent member to coupled position upon release of the push button lever.

5 Claims, 7 Drawing Figures



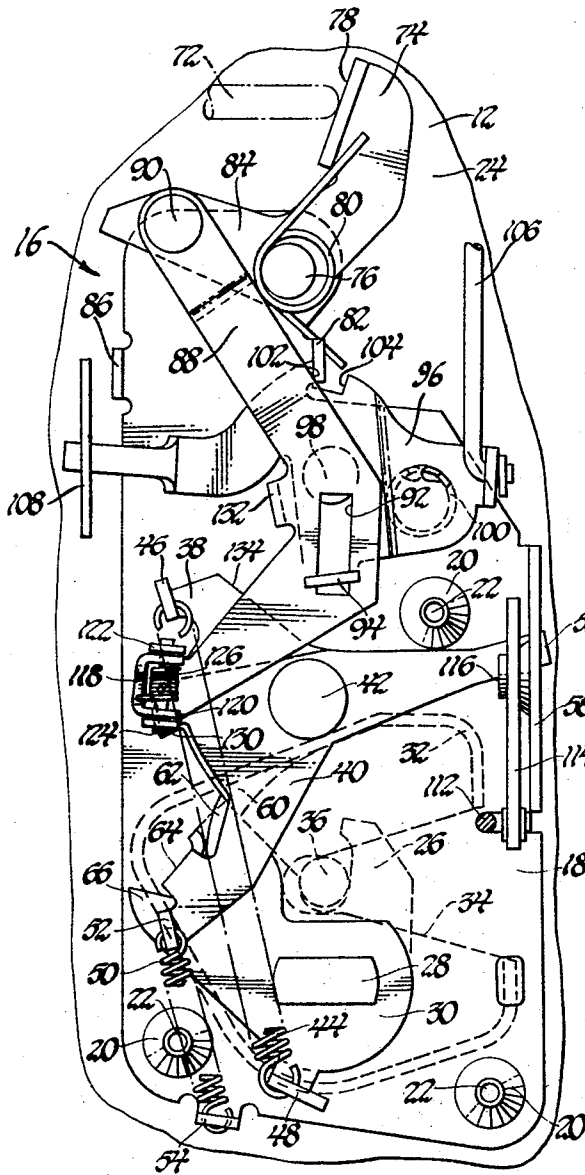


Fig. 4

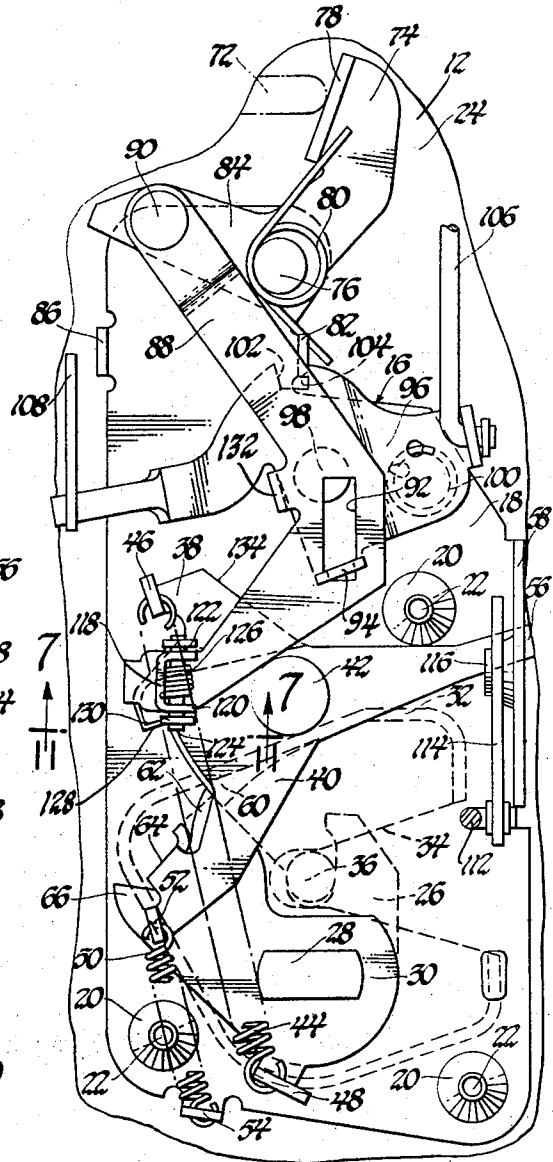


Fig. 5

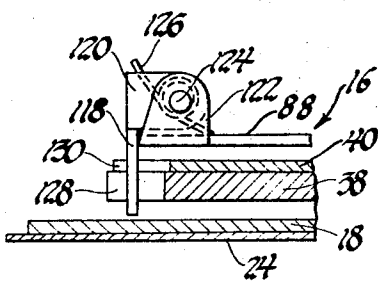


Fig. 6

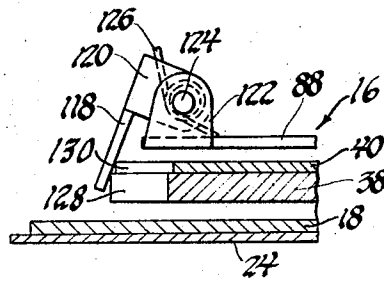


Fig. 7

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VEHICLE BODY DOOR LOCK

This invention relates generally to vehicle body door locks and more particularly to door locks of the type including a coupling member for selectively coupling and uncoupling the detent for the latch bolt and the operator for the detent.

It is known in vehicle body door locks to provide a coupling or intermittent member which is movable by a locking lever between coupled and uncoupled positions with respect to a detent. In coupled position, a lateral tab of the intermittent member underlies a shoulder of the detent to release the detent upon movement of the intermittent member by an operator. When the intermittent member is in uncoupled position, the tab bypasses the detent shoulder upon movement of the intermittent member by the operator.

It is possible for both the operator and the locking lever to be simultaneously actuated when the intermittent member is in uncoupled position. For example, a person inside the vehicle could pull up on the garnish button at the same time that a person outside the vehicle could push the push button. If this does occur, the tab of the intermittent member engages the detent and prevents full movement of the garnish button.

The door lock of this invention includes a swingable abutment lever for the intermittent member rather than a lateral tab. This permits the operator and the locking lever to be simultaneously actuated when the intermittent member is in uncoupled position and thereby return the intermittent member to coupled position when the operator is subsequently released. The abutment lever is normally located laterally of the intermittent member by a resilient bias and cooperating engageable stops. Upon simultaneous movement of the intermittent member by both the locking lever and the operating lever, the abutment lever swings relative to the intermittent member by engagement with the detent and subsequently returns to its normal position upon release of the operator.

The primary object of this invention is to provide an improved vehicle body door lock of the type including an intermittent member for coupling an operator with a detent, wherein the operator and a locking lever may be simultaneously actuated when the intermittent member is in uncoupled position to return the intermittent member to coupled position upon release of the operator.

This and other objects of the invention will be readily apparent from the following specification and drawings wherein:

FIG. 1 is a partial side elevational view of a vehicle body embodying a door lock according to this invention;

FIG. 2 is an enlarged view taken generally along the plane indicated by line 2—2 of FIG. 1 and showing the intermittent member in coupled position;

FIG. 3 is a view similar to FIG. 2 showing the intermittent member in uncoupled position;

FIG. 4 is a view showing movement of the intermittent member by the operator when in uncoupled position;

FIG. 5 is a view similar to FIG. 4 showing movement of the intermittent member by both the operator and the locking lever;

FIG. 6 is an enlarged sectional view taken generally along the plane indicated by line 6—6 of FIG. 2; and

FIG. 7 is a sectional view taken generally along the plane indicated by line 7—7 of FIG. 5.

Referring now to FIG. 1 of the drawings, a vehicle body designated generally 10 includes a front door 12 swingably mounted adjacent its forward edge 14 on the body for movement between a closed position as shown and an open position, not shown. A vehicle body door lock 16 according to this invention is mounted on the lock pillar wall of the door 12 to hold the door in closed position.

Referring now to FIGS. 2 through 5 of the drawings, the lock 16 includes a main frame 18 having a number of embossed tapped openings 20 which receive bolts 22 securing the frame 18 to the lock pillar wall 24 of door 12. A fork type bolt 26 is located outboard of frame 18. The shaft 28 of the bolt projects through the frame and has its inner end staked to a toothed or ratchet plate 30 so that the bolt and ratchet plate rotate as a unit. A housing 32 has its peripheral or side wall staked to the frame 18 and projects outwardly through an opening in wall 24. The outer wall of the housing rotatably supports the outer end of shaft 28 and includes a notch 34 permitting the shank of a striker pin 36 to be received within the housing and to engage the throat of bolt 26 when the bolt is in latched position as shown in FIGS. 2 through 5.

Primary and secondary detents 38 and 40 are coaxially pivoted at 42 to the frame 18. A tension spring 44 hooked between a notched lateral tab 46 of the primary detent and a like notched lateral tab 48 of the ratchet plate 30 continually biases the detent 38 counterclockwise of pivot 42 toward detented position and biases the ratchet plate clockwise to in turn continually bias the bolt 26 to unlatched position. A tension spring 50 hooked between a notched lateral tab 52 of the secondary detent and a notched lateral tab 54 of the frame 18 continually biases the secondary detent 40 counterclockwise of the pivot 42 and toward detented position. Both detents include arms or extensions 56 which extend outwardly through a closed elongated slot, not shown, in a lateral flange 58 of the frame 18. The engagement of the extensions 56 with the upper end of the slot limits the counterclockwise movement of the detents 38 and 40 when the detents are out of engagement with the ratchet plate 30 and the bolt 26 is in unlatched position.

When the bolt 26 is in fully latched position as shown in FIGS. 2 and 3, a foot or shoulder 60 of the primary detent 38 engages a like foot or shoulder 62 of the plate 30 to maintain the bolt in this position. A lateral tab or flange 64 of the secondary detent fits within a notch between the shoulder 62 and another shoulder 66 of the plate 30 for engagement with the latter should for any reason the shoulder 60 move out of engagement with the shoulder 62. When the detents 38 and 40 are moved to undetented position, clockwise of their position shown, the shoulder 60 and the tab 64 move respectively out of engagement with and out of the path of respective shoulders of the plate 30 to permit the plate 30 and the bolt 26 to rotate clockwise to unlatched position and permit opening movement of the door 12. The spring 44 is tensed when the detent 38 is moved to undetented position to increase the biasing force on the ratchet plate 30 and bolt 28 in a clockwise direction.

As shown in FIG. 1, the door 12 includes a conventional outside door handle 68 which includes a conventional push button assembly 70 having a push rod indicated schematically at 72 in FIGS. 2 through 5. An outside operating lever 74 is pivoted at 76 to the frame 18 and includes a lateral flange 78 for engagement by the push rod 72. A coil torsion spring 80 on the pivot 76 engages flange 78 and a notched lateral tab 82 of the frame 18 to continually bias the lever 74 in a counterclockwise direction and hold an arm 84 of the lever in engagement with a lateral tab 86 of the frame 18 to thereby locate the lever 74 with respect to the frame. An intermittent link or coupling member 88 has its upper end pivoted at 90 to the lever 84. An intermediate portion of the member 88 includes a slot 92 which receives a headed lateral tab 94 of a locking lever 96. Lever 96 is pivoted at 98 to the frame 18 for movement between an unlocked position as shown in FIGS. 2 and 5 and a locked position as shown in FIGS. 3 and 4. An overcenter type coil torsion spring 100 is hooked between the locking lever and the frame 18 to selectively and alternately bias the locking lever to either position. The engagement of opposite edges 102 and 104 of a notch in the locking lever with the tab 82 locates the locking lever in either position. The locking lever is movable to either position by either a conventional garnish button and rod assembly 106, FIG. 1, operable from inside the vehicle, or a conventional key cylinder assembly 108 operable from outside the vehicle.

A conventional inside door handle 110 is connected by a shiftable rod 112 with one leg of a bellcrank inside operating lever 114 pivoted at 116 to the flange 58. The other leg of the lever 114 overlies the extensions 56 of detents 38 and 40 for engagement therewith and clockwise movement of the detents to undetented position whenever handle 110 is moved in a counterclockwise direction as viewed in FIG. 1.

In accordance with this invention and as shown best in FIGS. 2, 6, and 7, an abutment lever 118 includes a yoke-shaped end 120 which fits within a yoke-shaped end 122 of the intermittent member 88 and is pivoted thereto at 124. A coil torsion spring 126 surrounds the pivot 124 and has one end thereof engaging the lever 118 and the other end thereof engaging the member 88 to continually bias the lever 118 counterclockwise as viewed in FIGS. 6 and 7 to hold the lever 118 in engagement with an end edge of the member 88 and thus normally position the lever 118 laterally of the member 88 as shown in FIG. 6. When the member 118 is so positioned, it laterally underlies shoulders 128 and 130, FIG. 6, of the primary and secondary detents 38 and 40, respectively, to couple the push button assembly 70 and the detents as will be further described.

The abutment member 118 underlies the shoulders 128 and 130 when the locking lever 96 is in unlocked position as shown in FIG. 2. Should the push button assembly 70 then be operated, the push rod 72 will move inwardly of the door 12 or to the right as viewed in FIG. 2 to rotate the lever 74 clockwise, shift the member 88 upwardly, and engage member 118 with shoulders 128 and 130 to move the detents 138 and 140 clockwise to undetented position and release the bolt and ratchet plate 26 and 30, respectively, for movement to unlatched position.

When the locking lever is in locked position as shown in FIG. 3, the abutment member 118 is moved to the left of the shoulders 128 and 130. The detents 38 and 40 are thus uncoupled from the member 88. The push button 70 freewheels when operated since the abutment member 118 bypasses the shoulders 128 and 130 when the push button is operated as shown in FIG. 4.

It is possible for the push button assembly 70 to be operated at the same time as the garnish button 106. Should this occur when the locking lever is in locked position, the abutment member 118 will tend to move to the right from its FIG. 4 position and across the detents 38 and 40. Inasmuch as the abutment member 118 is pivoted to the intermittent member 88, the engagement of the abutment member with the detents, as indicated in FIGS. 6 and 7, will swing the abutment member 118 clockwise of member 88 as shown and thereby permit simultaneous actuation of both the garnish button and the push button lever without jamming or bending of any parts of the lock. Subsequently, when the push button assembly 70 is released, the intermittent member 88 will shift downwardly to its position shown in FIG. 2 as the member 118 slides relative to the detents 38 and 40. As soon as it clears the detents, spring 126 will return it to its position shown in FIGS. 2 and 6.

The movable abutment member of this invention can be used with a lock which includes the features of automatic undogging and keyless locking and can be used with equal success with a lock which does not include these features. The subject lock includes these features which are conventionally provided by a lateral tab 132 of the member 88 which is engageable by a shoulder 134 of the detent 38 should the garnish button 106 be depressed to move the locking lever to locked position while the door is open and the door is then closed. This returns the intermittent member 88 to its position shown in FIG. 2 and returns the locking lever to its unlocked position. Likewise as is conventional, depression of the push button assembly 70 while the door is being closed will move tab 132 upwardly and out of the path of shoulder 134 to thereby maintain the locking lever in locked position and the intermittent member in uncoupled position when the door is closed.

Thus this invention provides an improved vehicle body door lock.

I claim:

1. In combination with a vehicle body door lock including bolt means movable between latched and unlatched positions, detent means maintaining the bolt means in latched position, operating means for the detent means, locking means, and coupling means swingable by the locking means between coupled and uncoupled positions with respect to the detent means and shiftable by the operating means in each position thereof, the improvement comprising, abutment means mounted on the coupling means for movement therewith and movement relative thereto between a first detent engaging position and a second detent bypass position, means normally locating the abutment means in the first position, shifting movement of the coupling means in coupled position by the operating means moving the abutment means therewith and into engagement with the detent means to release the bolt means, simultaneous shifting and swinging movement

of the coupling means by the locking means and the operating means when the coupling means is in uncoupled position engaging the abutment means with the detent means to move the abutment means to the second position and permit the abutment means to bypass the detent means and move with the coupling means to coupled position.

2. In combination with a vehicle body door lock including bolt means movable between latched and unlatched positions, detent means maintaining the bolt means in latched position, operating means for the detent means, locking means, and coupling means swingable by the locking means between coupled and uncoupled positions with respect to the detent means and shiftable by the operating means in each position thereof, the improvement comprising, an abutment lever mounted on the coupling means for movement therewith and movement relative thereto between a first detent engaging position and a second detent bypass position, means normally locating the lever in the first position relative to the coupling means, shifting movement of the coupling means in coupled position by the operating means moving the abutment lever therewith and into engagement with the detent means to release the bolt means, simultaneous shifting and swinging movement of the coupling means by the locking means and the operating means when the coupling means is in uncoupled position engaging the abutment lever with the detent means to move the abutment lever to the second position and permit the abutment lever to bypass the detent means and move with the coupling means to coupled position.

3. In combination with a vehicle body door lock including bolt means movable between latched and unlatched positions, detent means maintaining the bolt

means in latched position, operating means for the detent means, locking means, and coupling means swingable by the locking means between coupled and uncoupled positions with respect to the detent means and shiftable by the operating means in each position thereof, the improvement comprising, an abutment lever swingably mounted on the coupling means, means normally locating the lever laterally of the coupling means in a first position and resisting movement of the lever to a second bypass position generally longitudinally of the coupling means, shifting movement of the coupling means in coupled position by the operating means moving the abutment lever therewith and into engagement with the detent means to release the bolt means, simultaneous shifting and swinging movement of the coupling means by the locking means and the operating means when the coupling means is in uncoupled position engaging the abutment lever with the detent means to swing the abutment lever to the second position and permit the abutment lever to bypass the detent means and move with the coupling means to coupled position.

4. The combination recited in claim 3 wherein the locating means includes cooperating engageable portions on the lever and coupling means and resilient means normally holding the cooperating portions in engagement with each other.

5. The combination recited in claim 4 wherein the lever is an elongated member edgewise engageable with the detent means upon shifting movement of the coupling means in coupled position and bodywise engageable with the detent means upon simultaneous shifting and swinging movement of the coupling means by the locking means and the operating means.

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