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Torii

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[54] **CLOSURE LATCH**

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

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

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

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[57] **ABSTRACT**

A closure latch having a latch bolt movable between latched and unlatched positions, a detent for holding the bolt against movement to the unlatched position, inside release means, outside release means, an intermittent member movable to any one of at least two positions for selectively coupling both the inside and outside release means to the detent in the first position of the intermittent member and coupling only the outside release means to the detent in the second position of the intermittent member. The detent includes a member to shift the intermittent member upon shifting of the bolt caused by movement of the bolt toward the latched position whereby the intermittent member is automatically shifted to its second position without requiring the operator to exert any conscious effort when the door is closed.

5 Claims, 4 Drawing Figures

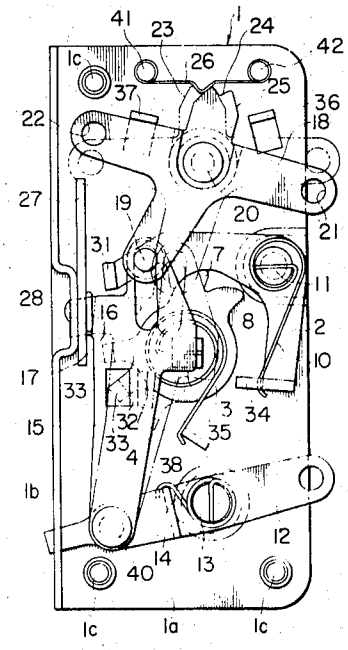


FIG. 1

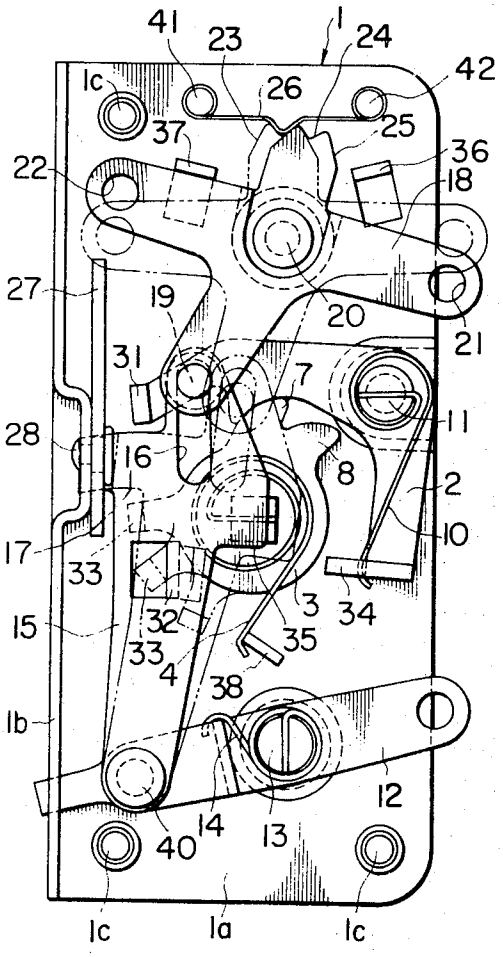

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FIG. 2

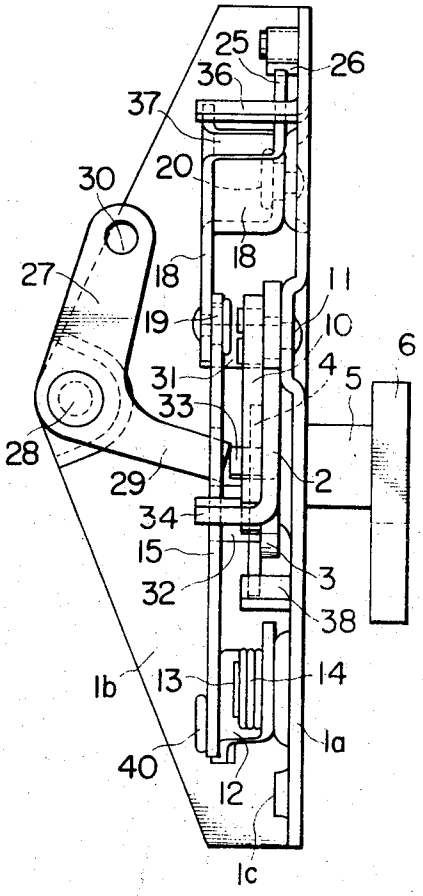

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FIG. 3

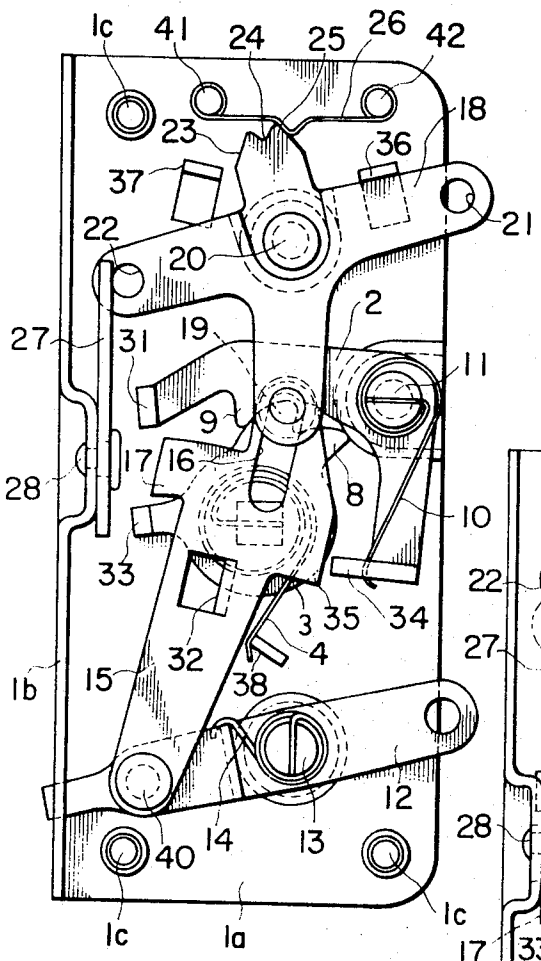
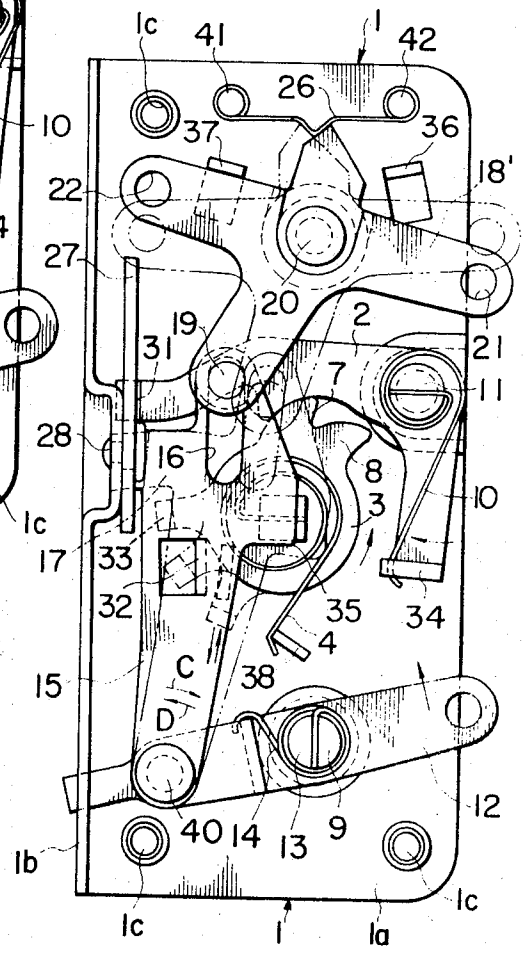

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1b
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1c
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FIG. 4


1c
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18'
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CLOSURE LATCH

BACKGROUND OF THE INVENTION

This invention relates to closure latches and more particularly to vehicle body closure latches.

There is known in the art a closure latch having a bolt and bolt operated means for automatically disconnecting inside release means from the detent each time that the venicle door is closed without requiring the operator to exert any conscious effort.

The conventional closure latches are generally complicated in structure and none of them has proven to be satisfactory in substantially reducing the manufacturing cost. Further, none of them has proven to be able to automatically couple at least the outside release means to the detent in the case where the vehicle door is inadvertently closed with the individual parts thereof held by error in their positions to provide the keyless locking.

SUMMARY OF THE INVENTION

A principal object of the present invention is to provide a closure latch having improved means for automatically disconnecting the inside release means from the detent each time that the vehicle door is closed without requiring that the operator exert any conscious effort.

Such object and others are attained according to at least one aspect of the present invention through the provision of intermittent means to automatically disconnect the inside release means from the detent without requiring the operator to exert any conscious effort.

Thus, in a disclosed embodiment, ratchet teeth are provided in cooperation with a door latch in engagement with the door strike plate on the door jamb to lock or unlock the vehicle door. The closure latch of the invention includes the conventional outside key cylinder and conventional inside garnish button or the like which permits the operator to manually select any one of its three positions. Further, the latch is still provided on the detent with means to shift the intermittent member to such second position upon shifting of the ratchet teeth when the vehicle door is closed with the individual parts of the latch held by error in their posions to provide the keyless locking.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational view of a latch according to the invention;

FIG. 2 is a side view of the latch of FIG. 1;

FIG. 3 is a view similar to FIG. 1 with the intermittent member in the third position, said member being in the first position in FIG. 1; and

FIG. 4 is an elevational view of another embodiment of the present invention.

PREFERRED EMBODIMENT OF THE INVENTION

Referring now to FIGS. 1 to 3, a latch frame 1*a* is adapted to be fastened to the door of the vehicle by means of bolts screwed through holes 1*c*. A ratchet wheel 3 is mounted on shaft 5 on which is coaxially secured door latch or bolt 6 in engagement with the door strike plate (not shown) on the door jamb to lock or unlock the vehicle door. Pawl or detent 2 is of bell

crank form and is pivotally mounted on plate 1*a* by pin 11 so as to engage its tooth 9 with the teeth 7 and 8 of the ratchet wheel 3 under the bias action of coiled torsion spring 10 encircling the pin 11 and having one end anchored on pin 11 and its other end anchored on a tab 34 formed at the end of the pawl 2 as best shown in FIG. 1. The ratchet wheel 3 is also normally biased in the clockwise direction tending to engage the teeth 7 and 8 by the bias of coiled torsion spring 4 encircling the shaft 5 and having one end anchored on the shaft and the other end anchored on a tab 38 formed on the base plate 1*a*.

When the door is closed, the latch 6 engages the strike plate on the door jamb so that the latch is rotated through an angle and therefore the ratchet wheel 3 is rotated together with the latch, in the counterclockwise direction in FIG. 1 of the drawing. This closing movement cams the tooth 9 of the pawl 2 out of engagement with the back faces of the teeth 7 and 8 of the ratchet wheel 3. It will be understood that the pawl permits the ratchet wheel to rotate each time that the door is moved from the open to closed position. Further it should be noted that the pawl should be moved so as to have its tooth 9 positioned out of engagement with the front faces of the teeth 7 and 8, when the door is moved from the closed position to its open position, as hereinbelow described further in detail. In other words, in order to hold the pawl or detent 2 in the disconnected position from the outside of the vehicle, the pawl should be disengaged from the outside release means while the connected position of the outside release means to the pawl 2 is attained by engaging the pawl with the outside release means as will be described later.

An open lever 12 is pivotable at pin 13 fast on the base plate 1*a* and is spring biased in the counterclockwise direction by coiled torsion spring 14 encircling the pin 13 as shown in FIGS. 1 and 3. The lever provides outside release means as will be further described hereinafter. Pivotally connected at 40 is a link or connecting rod 15 a tab 32 of which is engageable with tab 33 of the ratchet wheel each time that the ratchet wheel is rotated through an angle in the closure movement of the door. The link 15 further includes a foot 17 as best shown in FIG. 3 and a closed end slot 16 within which a pin 19 of a locking lever 18 is free to slide. The rod 15 is moved between an unlocked position shown in full lines in FIG. 1 and a locked position shown in FIG. 3, being held in either position by the locking lever 18 in cooperation with a spring 26 having both its ends anchored by means of two pins 41 and 42 fast on the base plate 1*a*. The locking lever 18 is connected to the conventional outside key cylinder (not shown) through the hole 21 and further connected to the conventional inside garnish button (not shown) through the hole 22. A series of two shoulders 23 and 24 is provided at the upper end of the locking lever 18 as seen in FIG. 1. Three positions of the lever are selectively ensured by the spring 26, in cooperation with two stopper tabs 36 and 37 formed in the base plate 1*a*. Another bell crank lever 27 is pivotable at pin 28 fast on flange 1*b* of the base plate 1*a*. One foot 29 of the lever 27 is adapted to engage the foot 17 of the link 15 when the link is in its unlocked position as shown in FIG. 1, the foot 29 being unable to engage the foot 17 when the link is in locked position as shown in FIG. 3. The lever 27 is connected to the conventional inside

release means through hole **30.** The link **15** has another foot **35** arranged in a manner such that the tab **34** of the detent or pawl **2** faces the foot **35** so that clockwise rotation of the pawl will push the foot **35** and cause rotation of the link **15** in the same direction.

In FIG. **1,** the individual parts of the closure latch are shown in their position immediately before opening or closing of the door. In the closing movement of the door, from such opened position, the latch or fork **6** engages the strike plate on the door jamb to lock the vehicle door. The ratchet wheel **3** is therefore shifted counter-clockwise about the shaft **5.** When the tooth **7** engages the tooth **9** of the detent or pawl **2,** the door is held in its intermediate latched position, and the door is held in its fully latched position with the tooth **8** engaged with the tooth **9** of the detent **2.** In such movement, the tab **33** abuts the tab **32** of the link **15** to pivot the link clockwise as viewed in FIG. **1** and in turn to pivot the locking lever **18** counter-clockwise so that the foot **17** of the link **15** moves to its dash line position out of juxtaposition with the foot **29** of the bell crank lever **27,** but still remaining in juxtaposition to the tab **31** of the detent **2** as shown in dot and dash line in FIG. **1.** This position of the link **15** is ensured by the locking lever **18** and its leaf spring **26** as shown in dot and dash line in FIG. **1.** It will be noted that the bell crank lever **27** therefore cannot move the link **15** upwardly to release the detent **2** from the ratchet wheel **3.** In other words, the inside release means is disconnected from the detent each time that the door is closed, without any troublesome manual operation thereby eliminating the danger of accidental opening of the door during the vehicle travel. Although the inside release means is in such disconnected position, the outside release means is still connected to the detent as will be seen, since the foot **17** is still in its dash line position in FIG. **1** and remains in juxtaposition with the tab **31** of the pawl so that clockwise movement of the lever **12** will cause the link **15** to move the pawl **2** upwardly to disengage the pawl from the ratchet wheel **3.** The outside release means therefore still remains in the connected position to the detent.

When the locking lever **18** is manually operated through a conventional key cylinder (not shown) from the outside of the vehicle, the lever **18** is shifted counter-clockwise as viewed in FIG. **3.** This in turn shifts the lever **15** clockwise about the shaft **40** so that the foot **17** of the link **15** is out of juxtaposition with the tab **31.** Thus, clockwise shifting of the lever **12** has no effect on clockwise shifting of the detent to disengage the detent from the ratchet wheel **3.** Accordingly, the outside release means is now disconnected from the detent.

In the case where the vehicle door is closed with the individual parts of the closure latch inadvertently held in their position as viewed in FIG. **3,** the ratchet wheel rotation causes the detent to shift counter-clockwise. This in turn causes its tab **34** to abut the foot **35** of the link **15** so that the link is shifted counter-clockwise about the pin **40** to locate the foot **17** in the dash line position shown in FIG. **1.** In such position, the open lever **12** still has the capability to clockwise shift the pawl **2** to release the pawl from the ratchet wheel **3.** Thus, the outside release means is connected to the detent and the vehicle door is ready for opening from the outside of the vehicle even though the key may have been inadvertently left within the vehicle when the driver leaves the vehicle. None of the conventional closure latches has proven to be satisfactory to overcome such difficiency.

The latch according to the invention includes the feature of keyless locking as hereinbelow described. For the keyless locking, the individual parts of the closure latch should be positioned, at the start of the door closure movement, as shown in FIG. **3** and the lever **12** is held in clockwise shifted position at an angle sufficient to have the foot **35** shifted upwardly out of juxtaposition with the tab **34** of the detent. This causes the link **15** to remain in its full line position in FIG. **1** even though the detent **2** is shifted clockwise about the pin **11** by the ratchet wheel **3** during the closing movement of the vehicle door. In such locked position of the closure latch, both the outside and inside release means are disconnected from the detent and the vehicle door can not be opened unless the lever **18** shifts clockwise about the pin **20** to move the foot **17** of the link **15** into the left in FIG. **3** with juxtaposition to the foot **29** of the bell crank lever **27.** The lever **27** has the effect of shifting the detent clockwise only in the case when the foot **17** is interposed between the foot **29** and the tab **31** of the detent in a manner such that the foot **29** underlies the foot **17** and in turn the foot **17** underlies the tab **31** of the detent.

In FIG. **4,** there is shown another embodiment of the present invention. The embodiment is almost identical in construction to the first embodiment in FIGS. **1** to **3** except that the intermittent member **15,** which is referred to as a link or lever in the foregoing may selectively occupy any one of two positions other than the three positions in the first embodiment. It will be noted that the outside release means in this embodiment is always coupled to or uncoupled from the detent together with the inside release means. Such difference may be apparent from the locking lever **18'** which is different in shape from that of the first embodiment.

Since the construction and operation of the similar parts of the second embodiment are readily understood by those skilled in the art, no detailed description of the construction and operation is necessary.

What is claimed is:

1. A closure latch for a vehicle door comprising, in combination, a latch bolt movable between latched and unlatched positions, detent means for holding the bolt against movement to the unlatched position, inside release means, outside release means, an intermittent member movable to one of at least two positions for selectively coupling both the inside and outside release means to the detent means in a first position of the intermittent member and coupling only the outside release means to the detent means in a second position of the intermittent member, said detent means comprising a member to shift the intermittent member upon shifting of the latch bolt caused by movement of the bolt toward latched position whereby the intermittent member is automatically shifted to its second position without requiring the operator to exert any conscious effort when the vehicle door is closed.

2. A closure latch as set forth in claim **1** wherein the intermittent member is movable to a third position for uncoupling both the inside and outside release means from the detent means.

3. A closure latch as set forth in claim **2** wherein, the detent means comprises a second member to shift the intermittent member from its third position to the sec-

ond position upon shifting of the detent means caused by latching movement of the bolt thereby to automatically shift the intermittent member from the third position to the second position so that the outside release means is coupled to the detent means to prevent the closure latch from keyless locking.

4. A closure latch as set forth in claim **2** wherein, the outside release means includes a first lever, the inside release means includes a second lever, and the intermittent member includes a third lever pivotably connected to said first lever and including a foot and a tab, said foot being so secured on said third lever that it may occupy three positions and may selectively be in juxtaposition with both the detent means and said second lever, with only said detent means, and out of juxtaposition with both said second lever and the detent means, said tab being so secured on the said third lever that the detent means abuts against the tab upon its shifting to latched position.

5. A closure latch for a vehicle door comprising, in combination, a latch bolt movable between latched and unlatched positions, detent means for holding the bolt against movement to the unlatched position, inside release means, outside release means, an intermittent member, movable to one of two positions for selectively coupling both the inside and outside release means to the detent means in the first position of the intermittent member and uncoupling both the inside and outside release means from the detent means in the second position of the intermittent member, said detent means comprising a member to shift the intermittent member upon shifting of the latch bolt caused by movement of the bolt toward latched position whereby the intermittent member is automatically shifted to the second position without requiring the operator to exert any conscious effort when the vehicle door is closed.

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