April 12, 1955 B. J. CRAIG 2,705,882

VEHICLE DOOR LOCK

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Fig. 1.

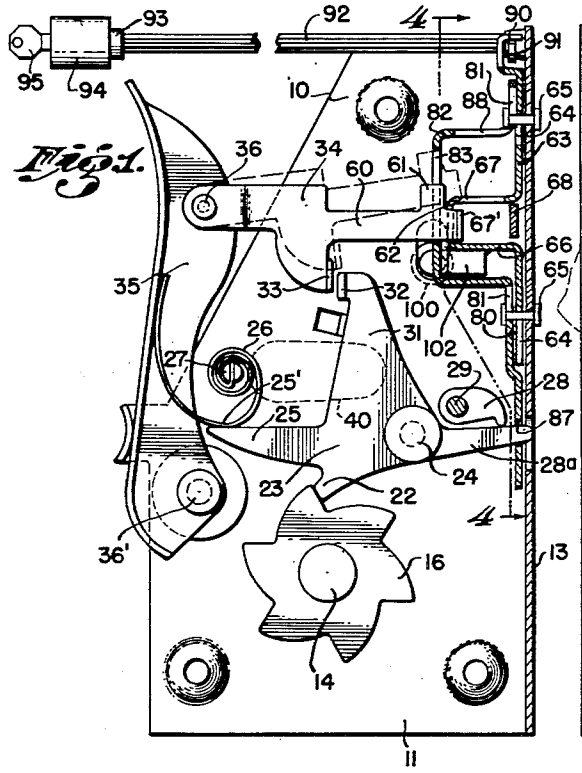



Fig. 2.

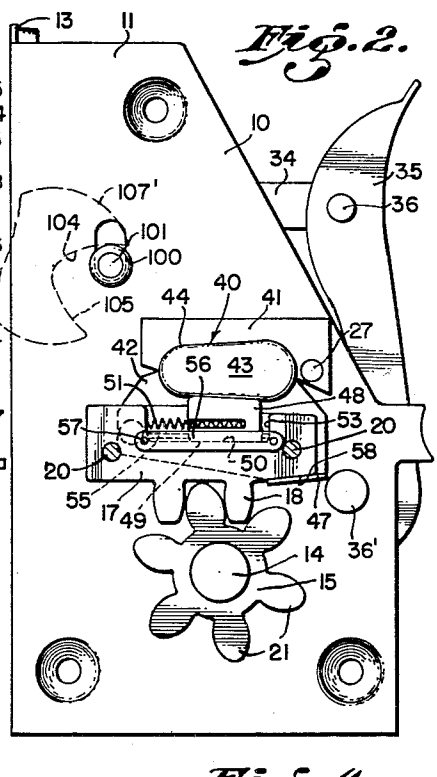



Fig. 3.

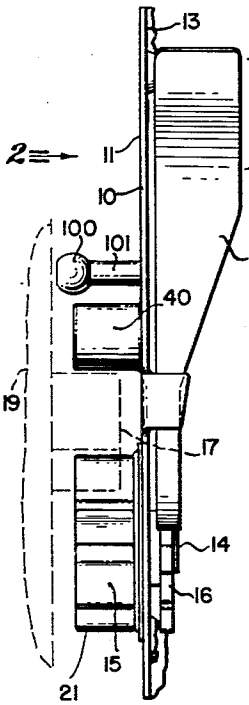



Fig. 4a.

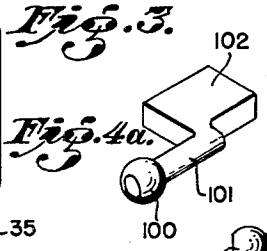



Fig. 4.

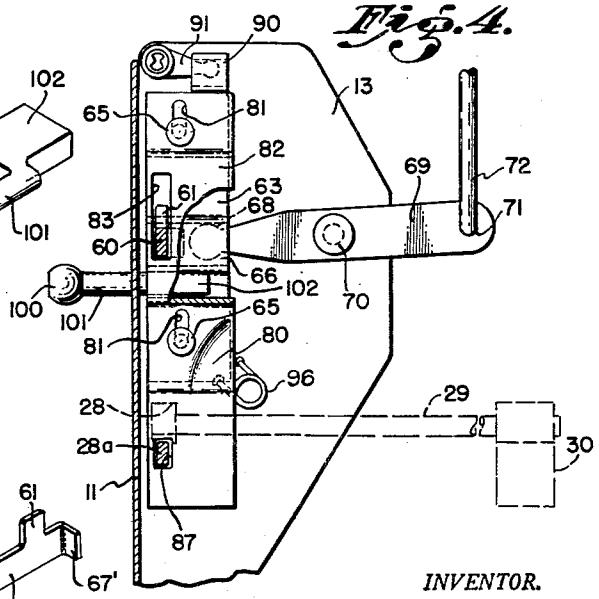
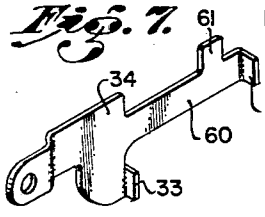



Fig. 7.




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Fig. 5.

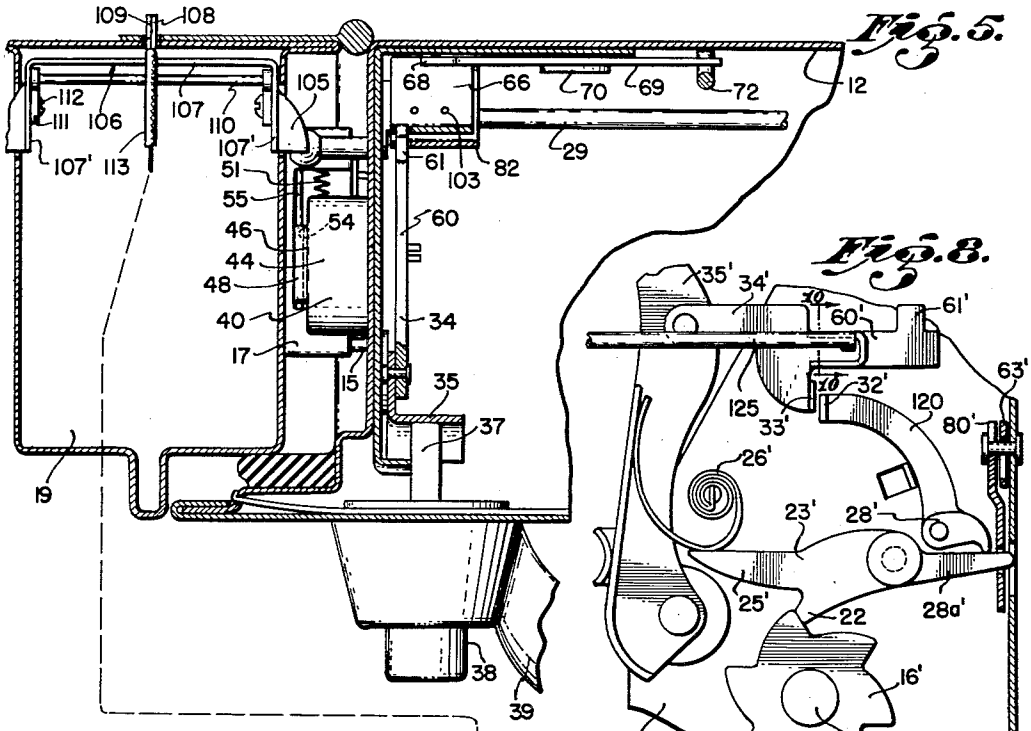
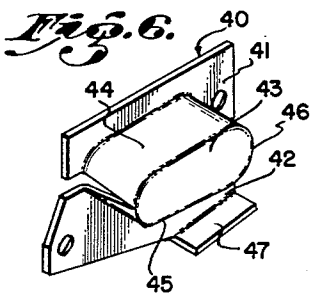



Fig. 8.




Fig. 6.



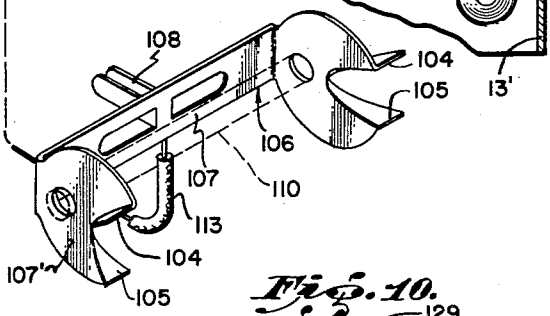




Fig. 10.

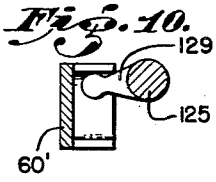
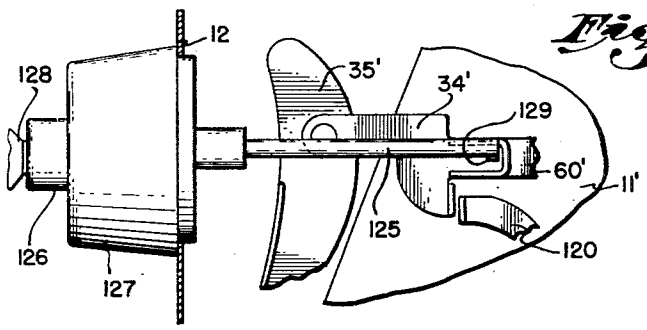



Fig. 9.




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2,705,882

# VEHICLE DOOR LOCK

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4 Claims. (Cl. 70—135)

This invention relates to a vehicle door lock.

The general object of the invention is to provide an improved vehicle door lock by means of which one or more of the doors of a motor vehicle may be held securely in locked position.

A more specific object of the invention is to provide a coincidental door locking system for locking a plurality of doors and wherein novel lock members are employed.

A further object of the invention is to provide a novel door lock wherein a reciprocating lock member is employed and wherein a coincidental locking member is mounted on the reciprocating lock member.

Another object of the invention is to provide a door latch wherein a release member is movable to locked and unlocked position by operating a reciprocating lock member and wherein means is provided by means of which closing of the door will either unlock the door or permit the door to remain locked if it is closed while the parts are locked.

Another object of the invention is to provide a door lock including a base and a flange and wherein the flange has a reciprocating lock member thereon which is movable to locked and unlocked position and which may be selectively—when the door is closed while the lock is locked—become unlocked or remain locked and wherein the locking member performing these functions includes a coincidental locking member which cooperates with means on the vehicle body whereby all the door locks may be simultaneously locked or unlocked.

Another object of the invention is to provide a novel dovetail construction for locks.

Another object of the invention is to provide a novel strike for locks.

Another object of the invention is to provide a novel operating member for coincidental door locks.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a side elevation, partly in section, looking in the direction of the arrow 1 of Fig. 3;

Fig. 2 is a view similar to Fig. 1, looking in the direction of the arrow 2 in Fig. 3 and showing the opposite side of the door lock;

Fig. 3 is a front elevation of the door lock;

Fig. 4 is a section taken on line 4—4, Fig 1;

Fig. 4A is an isometric view, showing the coincidental lock member;

Fig. 5 is a horizontal, sectional view showing the door lock and associated door and pillar;

Fig. 6 is an isometric view of the dovetail member;

Fig. 7 is an isometric view of the actuating member;

Fig. 8 is a fragmentary view similar to Fig. 1, showing a modification;

Fig. 9 is a fragmentary top plan view showing the modification, and

Fig. 10 is a section taken on line 10—10, Fig. 8.

Referring to the drawing by reference characters, the invention is shown as embodied in a vehicle door latch which is indicated generally at **10**. As shown the latch includes a body **11** adapted to be secured to a vehicle door **12**. The body **11** includes a flange **13**.

The body **11** supports a rotatable shaft **14** which, on the outer face of the body has a bolt **15** fixed thereon and at the inner face has a ratchet member **16** fixed thereon.

The rotary bolt **15** projects beyond the end of the door **12** and coacts with a strike member **17** which has teeth



**18** thereon and is secured to the door pillar **19** by fastening members **20**. The rotary bolt includes teeth **21** which engage the teeth **18**.

The ratchet **16** is adapted to be engaged by an ear **22** on a dog **23** which is shown as pivoted at **24** to the body **11**. The dog has another ear **25** which is engaged by an intermediate portion **25'** of a spring **26**, mounted on a fastening member **27**. The dog is thus normally urged to engaged position.

The dog **23** is shown as adapted to be rocked by an arm **28** fixed on a shaft **29**. The arm **28** engages an arm **28a** on the dog **23**. The arm **28a** is adapted to be rocked by a crank **30**, which is adapted to be actuated by a remote control member on the inside of a door. The remote control member may be similar to the remote control member shown in Craig Patent 2,450,372, granted September 28, 1948.

The dog **23** also includes an upwardly extending arm **31** which has a bent end tongue **32** which is adapted to be engaged by a tongue portion **33** on an actuating member **34**, which is shown as mounted on a release arm **35** by means of a pivot pin **36**. The release arm **35** is pivoted on the body member **11** at **36'** and is engaged and urged to non-releasing position by the free end of the spring **26**.

The construction is such that when the release arm **35** is pushed inwardly (to the right in Fig. 1) as by a push member **37**, which is operated by a push button **38** on a door handle **39**, the actuating member **34** will be moved to the right in Fig. 1, causing the portion **33** to engage the portion **32** of the dog **23** to rock the dog so that the ear **22** will be shifted to clear the ratchet **16** and to allow the shaft **14** to rotate to thus free the bolt **15**.

The strike **17** coacts with a wedge member **40** which preferably consists of a one-piece stamping bent up to form an upper base portion **41** and a lower base portion **42** from which a wedge **43** is punched up. This wedge member includes an upper portion **44** and a lower portion **45** as well as a top **46**. Through the upper portion **41** the fastening member **27** extends. The pivot member **24** extends through the lower portion **42**. The wedge member includes an inclined flange **47** which is perpendicular to the lower portion **42**.

The bottom portion of the wedge member **40** is engageable by a dovetail wedge **48** on the strike. The wedge **48** has a planar lower face **49**, slidably engaging a face **50** on the strike **17**. A spring **51** partly disposed in a hole in the wedge member, normally urges the dovetail wedge member to the right in Fig. 2 towards a shoulder **53** on the strike. The strike **17** has a groove **54** which engages a bead **55** on the dovetail wedge. A cover member **56**, which may be spot welded to the strike as at **57**, prevents removal of the dovetail wedge but allows it to slide. The wedge member flange **47**, which is inclined, engages a similarly inclined face **58** on the strike **17**.

As the door is closed the strike member teeth **18** engage the teeth **21** on the rotary bolt and as a result the rotary bolt **15** will be rotated to the position shown in Fig. 2 so that the ear **22** on the dog **23** engages one of the ratchet teeth **16** and is held in engagement therewith by the spring portion **25'** previously described.

While the parts are moving to the position in Fig. 2, the dovetail wedge member **48** will be first forced to the left in Fig. 2 by engagement with the lower face **45** of the wedge member **40** until the door is closed, whereupon the spring **51** will gradually urge the dovetail wedge **48** forwardly as the parts "settle" to position wherein the inclined face **53** on the strike **17** engages the flange **47** in wedging relation. This wedging action will cause the teeth **18** to engage the teeth **21** firmly, with no up or down play, thus holding the door securely in closed position.

When closed, the door may be opened by pushing on the button **38** to rock the release arm **35** and to thereby shift the actuating member **34** to the right in Fig. 1. This will cause the portions **33** and **32** to engage to rock the dog **23** and thereby free the ratchet **16**.

To lock the latch against opening from without the vehicle, the actuating member **34** is moved from the full line position in Fig. 1 to the broken line position in this figure and in doing this the portion **33** on the actuating member will be raised above the portion **32** on the dog

so that movement of the actuating member by the push button 38 will not release the ratchet.

To effect the locking operation the actuating member 34 is provided with a forwardly extending portion 60, from which a tongue 61 extends upwardly. The end of the portion 60 fits in a slot 62 in a lock member 63 which includes slots 64 which receive guide pins 65 fastened on flange 13 to reciprocatingly mount the lock member.

The lock member 63 includes a U-shaped portion 66 which projects forwardly and in which the slot 62 previously mentioned is arranged. The upper wall of the U-shaped portion 66 has a slot 67 through which the tongue 61 slides. The end of the portion 60 is bent over to form a tongue 67' which prevents upward movement of the portion 60 into the slot 67.

The U-shaped portion 66 is engaged by an enlarged rounded portion 68 on a locking arm 69 which is pivoted as at 70 on the flange 13. The locking arm 69 includes an aperture 71 which receives a push member 72 which extends to the window moulding of the door, thus permitting the arm 69 to be rocked.

When the member 72 is pushed downwardly, the portion 68 will be raised, thus raising the U-shaped portion 66 and raising the lock member 63. This will cause the actuating member 34 to be raised so that the portions 32 and 33 will be out of alignment, whereupon when the actuating member 34 is moved to the right in Fig. 1, the dog 23 will not be rocked, in other words, there will be a locking action.

In order to prevent the user from accidentally locking himself out of the vehicle and also to provide means for readily locking the vehicle door when it is so desired, the present construction includes a lock operating member 80 which has slots 81 slidable on the pins 65 previously mentioned. The member 80 includes a U-shaped outstanding portion 82 which is disposed about the U-shaped portion 66 but is spaced therefrom. This U-shaped portion 82 includes a slot 83 in which the forwardly extending portion 60 on the actuating member 34 is disposed.

The slot 83 is longer than the combined length of the tongue 61 and the portion 60 of the actuating member 34 so that there is a space above the upper end of the tongue 61, as shown in Fig. 1 when the parts are unlocked. When the actuating member 34 is moved to the locked position, the upper end of the tongue 61 will be adjacent to the upper end of the slot 83.

When the actuating member is in locked position and the lock operating member 80 is moved downwardly, the lock operating member will engage the tongue 61 and will rock the actuating member 34 downwardly to unlocked position.

In order to move the lock operating member 80 downwardly to unlocked position whenever a door is closed, the free end of the arm $28^a$ on the dog 23 fits in a slot 87 in the lower end of the lock operating member 80. Thus when the door is closed the bolt 15 will be rotated and the ratchet 16 will also be rotated so that the dog 23 will be rocked about its pivot 24, thus moving the arm $28^a$ downwardly, thereby causing the upper wall of the slot 83 to engage and pull down the tongue 61 to thereby pull the actuating member 34 downwardly to unlocked position.

If, however, when the actuating member 34 is in locked position, that is in the broken line position in Fig. 1, and is held inwardly by pushing on the push button 38 as the door is being closed, the dog arm $28^a$ will move the lock operating member 80 downwardly but since the tongue 61 will have been moved inwardly beyond the slot 83 and into the path of a slot 88 is the top wall of the U-shaped portion 82 so that downward movement of the member 80, when tongue 61 and slot 88 are aligned, will not cause movement of the actuating member 34, and the latter will be left in broken line-locked-position.

Thus it will be seen that by placing the latch in locked position and shutting the door while the actuating member 34 is in the dotted line-locked position shown in Fig. 1, there will be an unlocking action, but if while this member 34 is in locked position and is pushed inwardly, as by its operating push button while the door is being closed, the parts will remain locked.

From the foregoing description it will be apparent that the actuating member 34 may be moved up and down from unlocked to locked position and vice versa without moving the lock operating member 80 and that when the actuating member 34 moves, the lock member 63 will be moved up and down.



To move the lock member up or down from without the vehicle a U-shaped upper end 90 of the lock member 63 is engaged by a crank member 91 mounted on the flange 13. This crank member 91 is adapted to be rocked by a lock bar 92 which is rotatable with the core 93 in a barrel 94 of a lock when the proper key 95 is inserted and turned. The key hole for the key 95 is accessible from without the vehicle door so that access is afforded to the user who has the proper key.

The lock member 63 is held in either its up or its down position by means of a snap-over spring 96 (Fig. 4) which engages the lock member and the flange 13.

To provide for coincidental locking of doors on the same side of the vehicle a coincidental locking roller 100 is arranged on a shaft 101, which latter includes an offset body portion 102, shown as secured as by welding at 103 to the lower face of the U-shaped portion 66. The rollers 100 are adapted to engage the upper or lower wings 104 and 105, respectively, of a coincidental locking control member which is indicated generally at 106 and which includes a body 107 from which a pair of tongues 108 extend.

The tongues 108 pass through a slot 109 in the pillar and are accessible within the vehicle for movement up and down to effect the locking and unlocking action. The body 107 includes tongues 107' from which the wings 104 and 105, previously mentioned, are bent. The control member 106 is mounted on a shaft 110 which is supported in brackets 111 removably secured to the inside of the pillar as by suitable screws 112. The wings with the integral connecting body 107 serve to coincidentally lock adjacent doors.

Doors on opposite sides of the vehicle may be coincidentally locked as by a Bowden wire 113 which is suitably secured to the control members 106. To cause simultaneous action the Bowden wire is coupled to the control member 106 at the upper left hand portion of Fig. 5 to the upper side of the control member. The other end of the Bowden wire is connected to the opposite control member at the lower side thereof. Thus control members on opposite sides of the vehicle both simultaneously move in the same direction.

The coincidental locking control members 106 on the pillar take the position of the shafts 101 on closed doors. The control members 106 move to locked or unlocked position as each door is closed. The snap over springs 96 serve to hold the coincidental locking control members in position. Inertia of the moving parts carries coincidental control members 106 over center so that the springs 96 take over and pull the parts to fully locked or unlocked position.

In Figs. 8 and 9, a modification of the invention is shown. In the modification parts similar to those previously described are designated by single primed reference numerals. In the modification the arm 31 is omitted and an arm 120 is arranged integral with the arm 28' so that when the arm 120 is rocked in the manner heretofore described it will rock the arm 28' and thus rock the arm $28^{a'}$ to release the latch. In the modification also the release arm 35' merely supports the actuating member 34'. The actuating member 34' is moved to bolt releasing position by a push member 125 which is pushed inwardly by a push member 126 on a handle 127. A key 128, when inserted and turned, will rotate the push member 125 so that a projection 129 on the push member will shift the member 34' to locked or unlocked position. Parts 125 to 128 may be similar to the construction shown in applicant's co-pending application Ser. No. 185,416, filed September 18, 1950.

In the modification the lock bar 92 and its associated parts are omitted.

Having thus described my invention, I claim:

1. In a door lock, a bolt, means for holding the bolt in engagement with a strike, an actuating member movable in one path to release the holding means, said actuating member being also movable in another path to and from a locked position, a lock member for moving the actuating member to and from its locked position, said actuating member being effective to free the bolt holding means when it is moved while the lock member is in unlocked position and said actuating member being ineffective to release the bolt holding means when it is moved while the lock member is in locked position, a lock

operating member operable to move the lock member from locked to unlocked position, and restoring means operated by the lock operating member and actuated upon a closing movement of the door, when the lock member is in locked position, for restoring said lock member to unlocked position.

2. In a door latch, a movable bolt, a strike, holding means for holding the bolt in engagement with the strike, an actuating member movable between an effective position in which it is operatively associated with said holding means and an ineffective position in which said operative association is interrupted, release means movable to release position and operative when the actuating member is in its effective position to cause the actuating member to free the bold holding means and being inoperative when moved to release position while the actuating member is in its ineffective position to cause the actuating member to free the bolt, a linearly movable lock member movable from a locked position to an unlocked position and vice versa and operable to move said actuating member between its effective position and its ineffective position, a linearly movable lock operating member, restoring means operated by the lock operating member upon a closing movement of the door, while the actuating member is in its ineffective position, for restoring said lock member to its unlocked position, and means effective when the actuating member is in its ineffective position and the release means is moved to its release position to prevent the closing movement of the door from causing the lock operating member to restore said actuating member to its effective condition.

3. In a door lock, a bolt, means for holding the bolt in engagement with a strike, a pivoted actuating member movable to release the holding means, said actuating member being also movable to and from locked position, a linearly movable lock member for moving the actuating member to and from locked position, said actuating member being effective to free the bolt holding means when it is moved while the lock member is in unlocked position and said actuating member being ineffective to release the bolt holding means when it is moved while the lock member is in locked position, a lock operating member mounted to reciprocate in a plane parallel to the axis of the pivot of the actuating member and operable to move the lock member from locked to unlocked position, and restoring means operated by the lock operating member and actuated upon a closing movement of the door, when the lock member is in locked position, for restoring said lock member to unlocked position.

4. In a door lock, a base having a flange thereon, a bolt pivoted on the base, a ratchet on the bolt, holding and releasing means engaging the ratchet to normally prevent



release of the bolt, a release member pivotally mounted near one of its ends on the base for movement to and from bolt releasing position, a spring normally urging the release member to non-releasing position, an actuating member pivoted to the release member near the other end of the release member, said actuating member being movable to locked and unlocked positions, means whereby said actuating member causes release of the holding and releasing means when the release member is moved to releasing position while the actuating member is in unlocked position, said last mentioned means being ineffective to cause release of the holding and releasing means when the release member is moved while the actuating member is in locked position, a locking member movably mounted on the flange for movement to and from locking position, means to limit movement of the locking member in each direction, means to hold the locking member in either locking or in unlocking position, means including a pivoted arm which has an upper finger engaging portion accessible from within the vehicle for moving the locking member from locked to unlocked position and vice versa, the actuating member having a tongue adjacent to its free end, said locking member having a slot receiving said tongue for moving the actuating member to and from locked position, said actuating member having a shoulder thereon, said holding and releasing means having a shoulder normally disposed in the path of and adjacent to said shoulder on the actuating member when the actuating member is in its unlocked position, said holding and releasing means shoulder being disposed out of the path of said actuating member shoulder when the actuating member is in locked position, an outside secret lock, a pivoted member rocked by said secret lock, and means whereby said pivoted member moves said locking member to unlocked position.

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