March 7, 1933. P. W. SULLIVAN 1,899,996

DOORLOCK HANDLE

Filed July 8, 1931

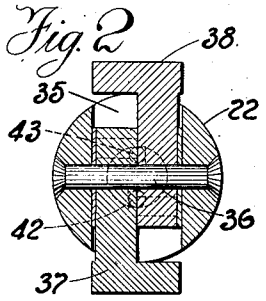


Fig. 2

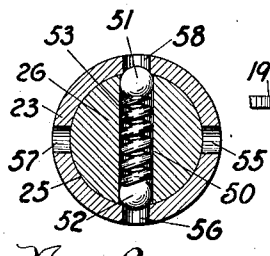


Fig. 3

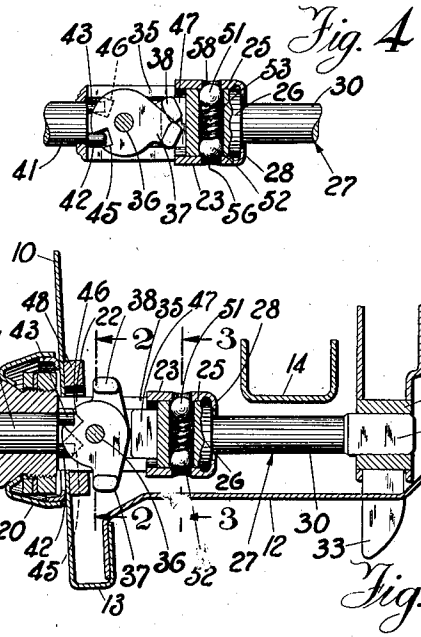


Fig. 4

Fig. 1

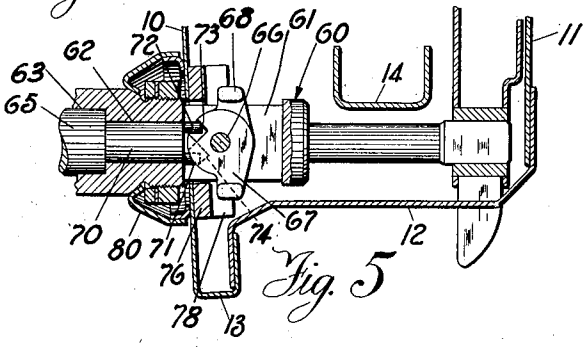


Fig. 5

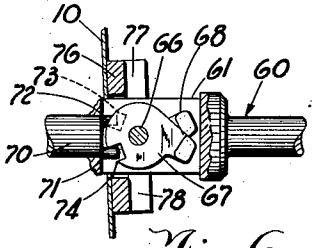


Fig. 6

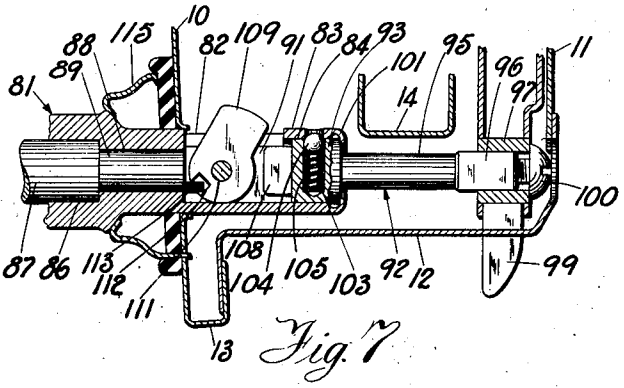


Fig. 7

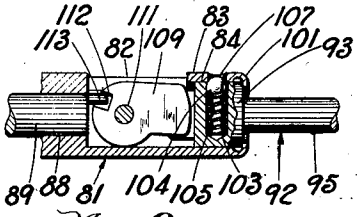


Fig. 8

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Patented Mar. 7, 1933 1,899,996

UNITED STATES PATENT OFFICE

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DOORLOCK HANDLE

Application filed July 8, 1931. Serial No. 549,392.

This invention relates to a vehicle door lock and has for its principal object the provision of a lock of such character that when the door is locked, the lock handle cannot be removed from the door. In two forms of the invention, when the door is locked the lock handle may be freely rotated without affecting the door latch. In the other form, when the door is locked the handle is held positively against both rotational and axial movement by the locking mechanism.

A further object is to provide a vehicle door lock that is strong and rugged in construction, which will not readily get out of order, and which it is almost impossible to manipulate for purpose of theft or trespass.

It is a further object to provide a lock of the character indicated which will be neat and attractive in appearance and to which the usual form of key control may be applied.

Formerly it has been the practice to provide vehicle door locks with a key operated stop member which prevents the rotation of the lock handle to unlock the door. The lock handle has been retained in its position in the door solely by means of a removable escutcheon plate screwed to the door. Upon removal of the escutcheon plate, it has generally been possible to remove the door handle and thereby obtain access to the locking mechanism in order to manipulate the lock with a suitably shaped instrument such as a screw driver. In the present invention since the lock handle cannot be removed from the door when the door is locked, there will be no possibility of removing the handle to manipulate the locking mechanism and in the first mentioned forms of the invention the handle cannot be forced or broken off by means of an additional leverage such as a piece of pipe, which is sometimes used in attempting to gain unlawful entry to a parked vehicle. In the second form of the invention, the handle may possibly be broken off if sufficient forces be applied thereto, but the locking mechanism is so rugged and so organized that the locking mechanism cannot be manipulated even though the handle should be broken off by the application of such excessive force.

It will therefore be seen that the application of my invention will greatly add to the safety of parked vehicles and will tend to discourage those intent upon forcing an unlawful entry into the same.

Having thus set forth the principal objects and advantages of my invention, the same will now be briefly described in order that others skilled in the art may make and use the same.

Three suitable methods by which my invention may be applied are shown in the accompanying drawing. This drawing, however, is to be considered as illustrative only and the invention is to be limited solely by the scope of the subjoined claims.

Referring to the accompanying drawing:

Figure 1 is a longitudinal sectional view of the preferred form of the invention, certain parts being broken away to better illustrate the construction thereof.

Figure 2 is a sectional view on a somewhat enlarged scale on the line 2—2 of Figure 1.

Figure 3 is a sectional view on an enlarged scale on the line 3—3 of Figure 1.

Figure 4 is a fragmentary view of a part of the mechanism illustrated in Figure 1 showing the position of the parts when the door is unlocked.

Figure 5 is a longitudinal sectional view of a modified form of the device, certain parts being broken away to better illustrate the construction thereof.

Figure 6 is a fragmentary view similar to Figure 5 but showing a different position of the operative elements of the locking mechanism.

Figure 7 is a longitudinal sectional view of a further modification of the device, certain parts being broken away to better illustrate the construction thereof, and

Figure 8 is a fragmentary view similar to Figure 7 but showing a different position of the operative elements of the locking mechanism.

Referring to Figures 1, 5 and 7, the numeral 10 indicates the outer panel of the door in which the lock is mounted. Numeral 11

indicates the usual lock plate secured at the inner side of the door, numeral 12 indicates the edge surface of the door, numeral 13 indicates the weatherbead and numeral 14 the channel for the sliding door glass. As this construction is usual and well known, a further description is not considered necessary for the purpose of this disclosure.

Referring particularly to Figure 1, the numeral 15 generally indicates a door lock handle, the exterior portion 16 of which is constructed in the usual manner and is provided with a handle portion and a well or bore 17 receiving a lock barrel 18 which is adapted to be actuated by a key 19.

Between the lock handle and the door panel 10 there is provided an escutcheon plate 20 of any preferred construction. The handle 15 is provided with a tubular stem 22 which extends into the door and terminates in a portion 23 provided with a bore 25 which rotatably receives an enlarged end 26 of a latch operating member generally indicated at 27. The portion 23 is beaded over the enlarged end 26 at 28 so that the parts 15 and 27 cannot be separated. The latch operating member 27 further comprises the spindle portion 30 and a squared end portion 31 receivable in a cam 32 to operate the latch tongue 33.

Between the door panel 10 and the end portion 23, the member 22 is provided with a transverse slot 35 illustrated in Figure 2. Within the slot 35 there are pivotally mounted upon the pin 36 a pair of rotatable lever members 37 and 38 shown in section in Figure 2.

Extending from the end of the slot 35 to the inner end of the well 17 is a bore 40 somewhat smaller in diameter than the well 17. Within this bore 40 is a rotatable member 41 which is secured to the lock barrel 18 and is rotatable therewith by means of the key 19. The member 41 at its inner end is provided with a pair of oppositely positioned cylindrical extensions 42 and 43 which engage in recesses 45 and 46 provided in the members 37 and 38 respectively.

From the construction just explained, it will be seen that a rotation of the member 41 will rotate the members 37 and 38 in opposite directions about the pin 36 to change their position from that illustrated in Figure 1 to that illustrated in Figure 4, or vice versa. It will be further observed that end portion 25 of the member 27 is provided with a transverse slot 47 in which the levers 37 and 38 extend when in the position illustrated in Figure 4 to secure the members 15 and 27 against relative rotation so that movement of the lock handle 16 will rotate the spindle 27 to operate the latch 33. This corresponds to the unlocked condition of the door. When the lever members are extended as in Figure 1, they do not engage the member 27 and the handle 16 may be freely rotated without affecting the latch operating spindle 27. This corresponds to the locked condition of the door. It will be seen that as illustrated in Figure 1, a heavy washer member 48 is secured to the door panel 10 surrounding the shaft 22 so that when the lever members 37 and 38 are in the extended position as illustrated in Figure 1, they will engage the inner surface of the washer member and thereby prevent removal of the handle 15 from the door.

The portion 26 of the member 27 is also provided with a second transverse bore 50, particularly illustrated in Figure 3. Within this bore are positioned a pair of balls 51 and 52 which are urged away from each other by the compression spring 53. The portion 23 of the handle member 15 which surrounds the portion 26 of the member 27 is provided with a series of spaced apertures 55, 56, 57 and 58, somewhat smaller in diameter than the balls 51 and 52.

From an inspection of Figure 3, it will be seen that the balls extend into these apertures to define certain limiting positions in the rotation of the member 15 relative to the member 27, and that one of these positions is such that the lever members 37 and 38 may be freely rotated into the slot 47.

From an inspection of Figure 2, it will be observed that the lever members 37 and 38 are each provided with an extension overlapping the thickness of the other lever so that the levers will fit snugly into the slot 47 and will prevent the handle member 15 from having any appreciable amount of lost motion relative to the latch operating spindle 27.

In the modification illustrated in Figure 5, the numeral 60 generally indicates a continuous member including the door lock handle and the latch operating spindle. This member is provided with a transverse slot 61, an axial bore 62, and a well 63 for the lock cylinder 65. Within the slot 61 and pivotally mounted about the pin 66, are a pair of rotatable lever members 67 and 68 the ends of which may lie wholly within the slot as illustrated in Figure 6, or may be extended out of the slot as illustrated in Figure 5. Within the bore 62 is a rotatable member 70 operatively connected with the lock cylinder 65 at one end provided at its other end with a pair of spaced cylindrical extensions 71 and 72 which engage in recesses 73 and 74 provided in the members 67 and 68 respectively.

Secured to the inner side of the panel 10 surrounding the member 60 is a washer member 76 which is provided with oppositely disposed slots 77 and 78 in which the ends of the lever members 67 and 68 engage when the lever members are in the position illustrated in Figure 5. This engagement of the

lever members 67 and 68 in the slots 77 and 78 will effectively prevent rotation of the handle to unlock the door, and at the same time will prevent removal of the handle from the door, even though the escutcheon plate 80 should be moval of the handle 81 from the door.

In the modification illustrated in Figures 7 and 8, the numeral 81 generally indicates a door lock handle provided with a cylindrical portion 82 extending into the door and terminating in an end portion 83 provided with an internal cylindrical bore 84. The handle member 81 is further provided with a well 86 in which is fitted a lock cylinder 87, a second bore 88 within which is a rotatable cylindrical member 89 and a transverse slot 91 between the end portion 83 and the inner end of the bore 88.

The numeral 92 generally indicates a lock operating spindle provided with an enlarged end portion 93 telescopically received in the end portion 83 of the member 82, a shank portion 95, and a squared end portion 96 nonrotatably received in the cam 97 which operates the door latch 99. The end portion 96 is further provided with a screw threaded bore to receive a screw 100, the head of which bears against the lock mechanism and restrains the spindle 92 from longitudinal movement.

It will be observed that the end portion 83 of the member 82 is beaded over a shoulder of the portion 93 of the member 92 at 101 to secure the members 81 and 92 together so that the screw 100 will effectively prevent removal of the handle 81 from the door.

The portion 93 is provided with a transverse bore 103 within which is a ball 104 urged outwardly of the bore by a compression spring 105. The member 83 is provided with an aperture 107 somewhat smaller than the ball and into which the ball extends to define a limiting position in the rotation of the member 81 relative to the member 92. The portion 93 is also provided with a pair of extensions, one of which is illustrated at 108 which provides between them a transverse slot for the reception of the end of a lever member 109 pivoted in the slot 91 about the pin 111.

The lever member 109 is provided with a recess 112 into which projects an extension 113 formed on the member 89 so that rotation of the member 89 by the key operated lock cylinder 87 will serve to move the lever 109 from the position shown in Figure 7 to the position shown in Figure 8 or vice versa.

Mounted between the handle 81 and outside of the door panel 10 is an escutcheon plate generally indicated at 115.

From this description, it will be seen that in this modification I have also provided a door lock in which the handle cannot be removed from the door and in which the handle may be freely rotated when the door is locked.

Having thus described my invention and the principal objects and advantages thereof, what I desire to secure by Letters Patent is as follows:

1. In a vehicle door lock, a lock handle having a slot therein, a separate latch operating spindle having a slot therein corresponding to the slot in said handle, a pair of rotatable levers mounted in the slot in said handle rotatable into the slot in said spindle, a key controlled rotatable member in said handle, extensions on said member engageable in recesses in said levers whereby said levers may be rotated into said slot in said spindle to connect said handle to said spindle, and a pair of spring pressed balls carried by said spindle engageable with said handle to resiliently define the position in the rotation of said handle relative to said spindle wherein the locking means in said handle may be engaged with said spindle.

2. In a vehicle door lock, a lock handle having a slot therein, a separate latch operating spindle having a slot therein corresponding to the slot in said handle, a pair of rotatable levers co-axially mounted in the slot in said handle and rotatable into the slot in said spindle, each of said levers being provided with a transverse extension over-lapping the thickness of the other lever to prevent lost motion between said levers and said spindle.

Signed by me at South Bend, Indiana, this 3 day of July, 1931.

PERRY W. SULLIVAN.

CERTIFICATE OF CORRECTION.

Patent No. 1,899,996. March 7, 1933.

PERRY W. SULLIVAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 6, for "moval of the handle 81" read "removed"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of May, A. D. 1933.

(Seal)

M. J. Moore.
Acting Commissioner of Patents.