March 7, 1933. P. W. SULLIVAN 1,899,997

DOORLOCK HANDLE

Filed July 8, 1931

Fig. 1

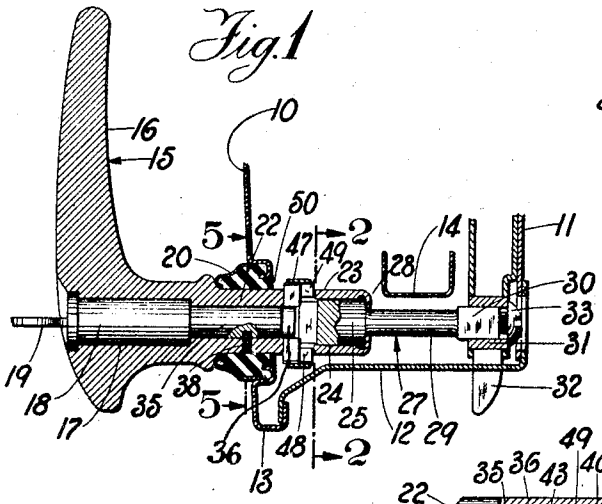


Fig. 2

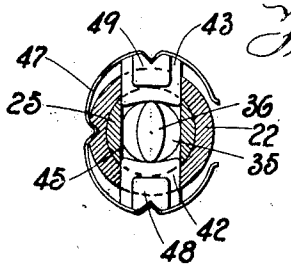
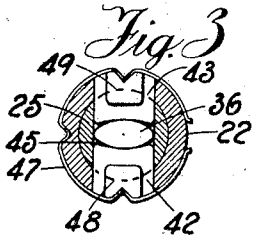


Fig. 3



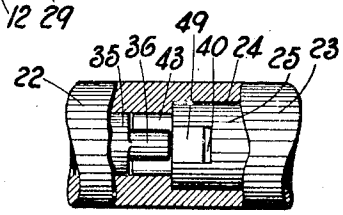


Fig. 4

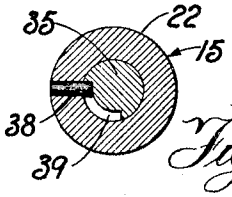
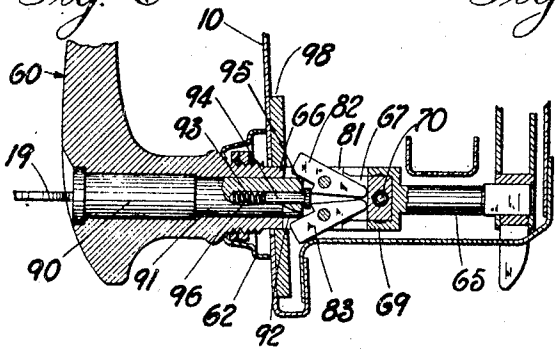


Fig. 5

Fig. 6



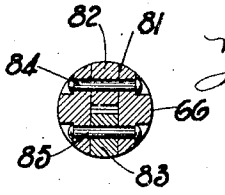


Fig. 8

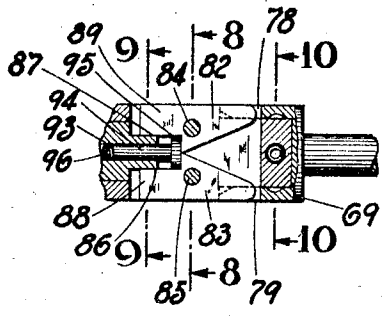


Fig. 7

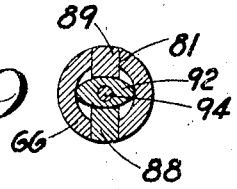


Fig. 9

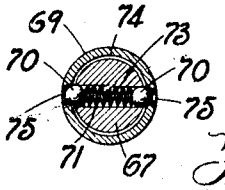


Fig. 10

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Patented Mar. 7, 1933

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UNITED STATES PATENT OFFICE

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DOORLOCK HANDLE

Application filed July 8, 1931. Serial No. 549,393.

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 may be freely rotated without unlatching the door, and at the same time the lock handle cannot be removed from the lock.

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 practise to provide vehicle door locks with a key operated stop member which prevents rotation of the lock handle to unlock the door. It has been a common practise among those desiring to commit trespass upon unattended vehicles to which such locks apply, to attempt to force the lock handle by means of a piece of pipe or other additional leverage, thereby either forcing the door open or breaking off the lock handle with consequent trouble and expense to the owner of the vehicle. In such locks, it has also been possible to entirely remove the handle by removing the escutcheon plate from the door after which it is a comparatively simple matter to insert a properly shaped instrument such as a screw driver into the lock and unlatch the door.

In the two forms of locking mechanism which I have here shown, the lock handle rotates freely when the door is locked and therefore since there is no resistance, it is not probable that the handle will be broken off by anyone attempting a felonious entry of the vehicle, and further since the handle cannot be removed from the door when the door is locked, it will not be possible to remove the handle and unlock the door by inserting an instrument in the lock.

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. Two 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 limited solely by the scope of the sub-joined 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 the line 2—2 of Figure 1 showing the mechanism in locked position.

Figure 3 is a sectional view on the line 2—2 of Figure 1 showing the mechanism in unlocked position.

Figure 4 is a sectional view on an enlarged scale showing the locking mechanism of the device.

Figure 5 is a sectional view on the line 5—5 of Figure 1.

Figure 6 is a longitudinal cross sectional view of a modified form of the device.

Figure 7 is a sectional view on an enlarged scale showing the locking mechanism of the device.

Figure 8 is a cross sectional view on the line 8—8 of Figure 7.

Figure 9 is a cross sectional view on the line 9—9 of Figure 7, and

Figure 10 is a cross sectional view on the line 10—10 of Figure 7.

Referring to Figure 1, 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 is the edge surface of the door; numeral 13 indicates the weather bead; and numeral 14 the channel for the sliding door glass. As this construction is common and well known, a further description is not considered necessary for the purpose of this invention.

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 well or bore 17 receiving the 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 an enlarged bore 24 which rotatably receives an enlarged end 25 of a latch operating member generally indicated at 27. The portion 23 is beaded over the enlarged end 25 at 28 so that the parts 15 and 27 cannot be separated. The latch operating member 27 further comprises the spindle portion 29 and an enlarged squared end portion 30 receivable in a cam 31 to operate the latch tongue 32. The end portion 30 is further provided with an axial bore, screw threaded to receive a screw 33, the head of which bears against the inner surface of the latch mechanism and prevents withdrawal of the members 15 and 27 from the door.

The interior rotatable portion of the lock barrel 18 is provided with an extension 35 which terminates in a rotatable cam 36 illustrated in Figures 2 and 3, the angle of rotation of the cam 36 being limited by a pin and groove construction illustrated in Figure 5, wherein the pin 38 mounted in the stem 22 is shown extending into an arcuate groove 39 in the extension 35.

Referring to Figure 4, it will be observed that the enlarged end 25 of the member 27 is provided in the extremity thereof with a diametrical slot 40, and referring to Figures 2 and 3 it will be seen that on either side of the cam 36, are mounted slidable jaw members 42 and 43 respectively. These jaw members 42 and 43 are inserted in each end of a diametrical slot 45 provided in the stem 22 and are urged against the cam 36 by a spring member 47. Referring to Figure 1, it will be observed that each of the jaw members 42 and 43 is provided with an extension 48 and 49 respectively, adapted to cooperate with the slot 40 in the member 25 when the cam 36 is rotated to the position shown in Figure 3 which corresponds to the unlocked condition of the door, that is, that condition of the locking mechanism in which the latch 32 is operable by the handle 16.

From a consideration of this description, it will be observed that when the door is locked, in which case the mechanism assumes the relation illustrated in Figure 2, the stem 22 may be rotated without affecting the latch operating spindle 27, and at the same time the extension of the jaw members 42 and 43 beyond the circumference of the stem 22, will effectively prevent the removal of the stem 22 through the aperture 50 provided therefor in the door panel 10.

It will be further observed that when the locking mechanism is in the unlocked relation illustrated in Figure 3, the beaded flange 28 and the screw 33 will prevent removal of the lock handle 15 and latch operating spindle 27 from the door and it is no longer necessary to depend on the escutcheon plate 20 to retain these members in the door.

It will be noted that the jaw operating cam 36 has only two positions, namely, the position illustrated in Figure 2 and that illustrated in Figure 3, and that these two positions are limited by the length of the groove 39 illustrated in Figure 5, so that there will be no difficulty in properly positioning the cam 36 by means of the key 19 to render the handle 15 effective or ineffective to operate the latch 31.

In the form of mechanism illustrated in Figure 6, the construction of the door is substantially the same as that illustrated in Figure 1 and conforms to the usual construction for this purpose. In this case, however, when the door is unlocked, the lock handle 60 is retained in the door by the escutcheon plate 62 which is secured by screws or other usual means to the door panel 10, and the lock handle 60 and the latch operating spindle 65 are not permanently secured together.

Referring particularly to Figure 6, it will be seen that in the locking mechanism utilized in this form of invention, the lock handle 60 is provided with a tubular extension 66 which extends into the door and terminates in a reduced cylindrical portion 67. The latch operating spindle 65 terminates in an enlarged hollow cylindrical end 69 in which the reduced end 67 of the lock handle 60 is rotatably received. Mounted between the portions 67 and 69 are the spring pressed balls 70 which are mounted in a diametrical bore 71, Figure 10, in the member 67 and are urged by the compression spring 73 into a groove 74 provided in the member 69. The engagement of the balls 70 in the groove 74 resiliently retains the members 67 and 69 in properly telescoped relation to each other. From a further inspection of Figure 10, it will be noted that the member 69 is also provided with holes 75 which are smaller in diameter than the balls 70 and into which the balls 70 are urged to define certain limiting positions in the rotation of the member 67 relative to the member 69.

Referring particularly to Figure 7, it will be observed that the member 69 extends beyond the balls 70 and that in the extension there are provided two oppositely disposed slots 78 and 79, for a purpose which will presently appear.

Referring to Figures 6 and 8, it will be seen that the stem 66 of the handle 60 is provided with an elongated aperture 81, and that in the aperture 81 two lever members 82 and 83 are pivoted by the pins 84 and 85. Referring to Figure 7, it will be seen that the lever members 82 and 83 are so tapered that the inwardly extending ends thereof may be swung close together, and that on the opposite side of the pins 84 and 85 from this

tapered portion, these lever members are provided with shoulders 86 and 87 and stems 88 and 89.

Again referring to Figure 6, it will be seen that the inner rotatable portion of the lock barrel 90 is provided with an extension 91 which terminates in a cam portion 92 particularly illustrated in Figure 9, and that this extension 91 is further provided with an axial well or bore 93, within which is received a slidable plunger member 94 having a head 95 adapted to bear against the shoulders 86 and 87, the plunger member 94 being urged outwardly of the bore 93 by a compression spring 96 to normally retain the lever members 82 and 83 in the position shown in Figure 7.

From an inspection of Figure 9, it will be seen that the cam portion 92, of the member 91, lies between the stem portions 88 and 89 of the lever members 82 and 83 so that upon rotation of the cam, the stems 88 and 89 may be forced outwardly against the action of the spring 96 to cause the lever members to assume the position illustrated in Figure 6, in which relation of the parts, the door is locked as the inner ends of the lever members do not engage in the slots 78 and 79 in the member 69. When the cam is rotated to the position illustrated in Figure 9, the lever members assume the position illustrated in Figure 7 in which position the inwardly extending ends thereof extend into the slots 78 and 79 and lock the members 60 and 65 together to rotate as a unit.

From a further inspection of Figure 6, it will be observed that a heavy washer member 98 surrounds the stem 66 of the handle 60. This washer member is secured to the door panel 10 by welding or brazing or other suitable means, and when the lever members 82 and 83 are in the extended position corresponding to locking of the door as illustrated in Figure 6, they will engage the washer 98 and effectively prevent the removal of the lock handle from the door.

As explained above, it will be seen that in the form of the invention illustrated in Figure 6, I have also provided a door lock in which the lock handle is freely rotatable when the door is locked so that the handle will not be broken off in an attempt to open the door while the door is locked, and also in which the handle cannot be removed from the door when the door is locked.

Having now fully described my invention, the method of making and using the same, what I desire to secure by Letters Patent is as follows:

1. In a vehicle door lock, a lock handle and a separate latch operating spindle telescopically associated against axial separation, means preventing axial movement of said spindle, means carried by said lock handle engageable with said spindle for operatively connecting said handle and said spindle for unitary rotation, a leaf spring surrounding said handle for urging said second means into spindle engaging position, and key operated means for moving said second means to render said handle freely rotatable relative to said spindle.

2. In a door lock, the combination with an escutcheon plate of a lock handle and a latch operating spindle telescopically associated against axial separation, means connected to said spindle independent of said escutcheon plate for preventing removal of said handle from the door, spring pressed means for operatively connecting said handle to said spindle for unitary rotation, and key operated means for moving said last named means to render said handle freely rotatable relative to said spindle.

3. In a vehicle door lock, a lock handle and a separate latch operating spindle telescopically associated against axial separation, and provided in their telescopically associated portions with corresponding slots, a pair of oppositely disposed plungers carried by said handle engageable with said spindle for locking said spindle to said handle for unitary rotation, a key operated cam rotatable into one or the other of two operative positions to permit said plungers to engage said spindle or to hold said plungers clear of said spindle to permit free rotation of said handle relative to said spindle, a spring surrounding said handle and said plungers to resiliently urge said plungers into engagement with said spindle, and concave inner ends on said plungers adapted to fit about said cam and assist in retaining said cam in either of its two operating positions.

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

PERRY W. SULLIVAN.