June 2, 1931. C. B. LOWE 1,808,048

AUTOMOBILE DOOR HANDLE

Filed Oct. 17, 1928

Fig. 1

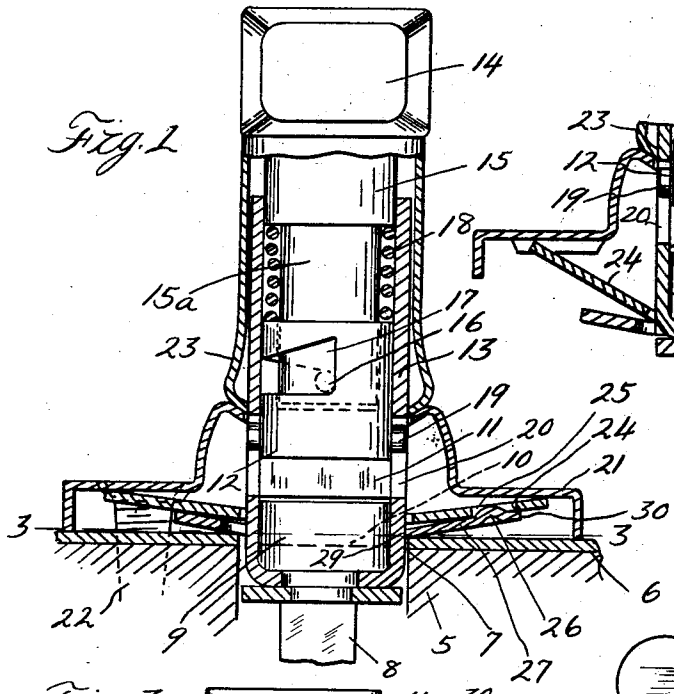


Fig. 2.

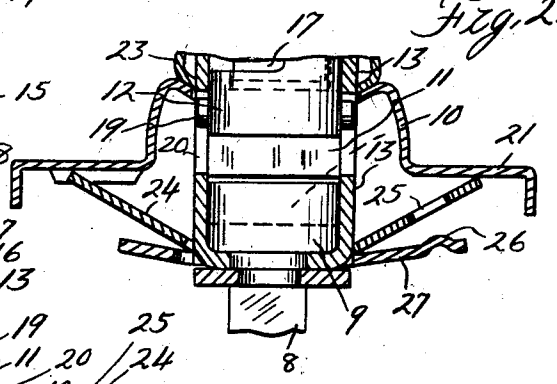


Fig. 3.

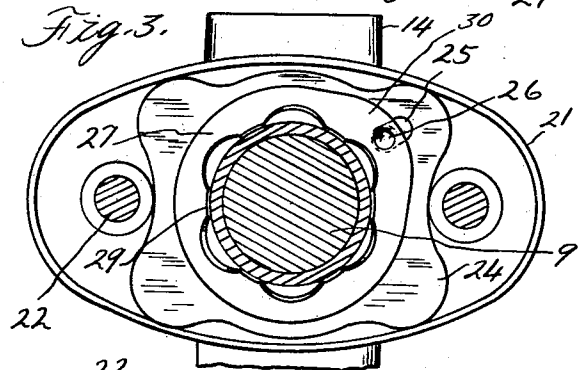


Fig. 4.

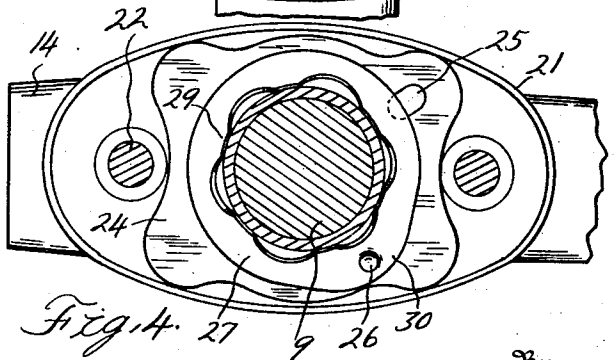


Fig. 5.

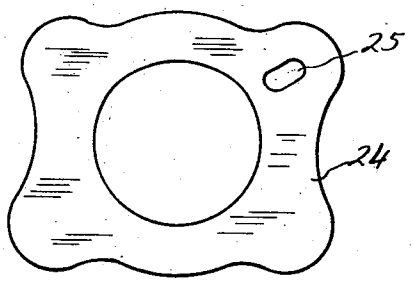
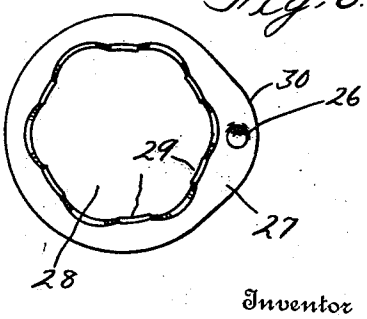


Fig. 6.



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UNITED STATES PATENT OFFICE

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AUTOMOBILE DOOR HANDLE

Application filed October 17, 1928. Serial No. 313,113.

This invention relates to door handles for automobiles and the like, and more particularly to improvements upon the automobile door handles shown and described in my companion application, Serial No. 300,031, filed August 16, 1928.

One of the objects of the present invention is the provision of a door handle of the "free" handle type, i. e. a door handle that, in its unlocked position, will operate to move the lock bolt into and out of operative position with the striker plate carried by the door jamb, but which, when in locked position, will be freely rotatable without influencing the movement of such lock bolt.

Another object of this invention is the arrangement in a door handle of the free handle type of means to retain the handle when locked against swinging movement because of vibrations or impacts imparted to the vehicle on which the door handle is mounted.

A further object of this invention is the provision of means for normally maintaining the door handle when locked or unlocked, in a desired angular position, whereby, for example, all the door handles on a vehicle will be pointing in the same direction.

Other objects and advantages will be apparent from the following description, wherein reference is made to the accompanying drawings illustrating a preferred embodiment of my invention, and wherein similar reference numerals designate similar parts throughout the several views.

In the drawings:

Figure 1 is a vertical section through a door handle constructed in accordance with this invention, the handle being shown in its locked position.

Figure 2 is an enlarged detail section showing parts of the door handle before they are completely assembled into their positions of use.

Figure 3 is a cross-section taken substantially on the line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3, but showing the handle rotated through a quarter revolution from the showing of Figure 3.

Figure 5 is a detail elevation of the outer spring tension plate utilized with my improved handle, and

Figure 6 is a detail elevation of the inner spring tension plate cooperating with the outer tension plate shown in Figure 5.

Referring now to the drawings, the numeral 5 designates a portion of a vehicle door having a metallic cover plate 6 apertured, as at 7, for the reception of the operating handle. A lock shaft 8 extends through the door and is fastened at its inner extremity in any desired manner to means for moving the usual lock bolt or the like.

It is to be understood that any desired form of lock may be utilized with my improved door handle. The outer extremity of the door handle 8 is formed with a cylindrical portion 9 in the face of which is formed a slot 10 for the reception of a lug 11 carried by a connecting member 12. The rounded outer extremity 9 of the shaft 8 fits within and forms a bearing for the inner extremity of an elongated hollow cylinder 13, the rear portion of which is inturned substantially as shown to form a stop for the rounded extremity of the shaft during assembly, while the outer extremity of the cylinder 13 is connected in any suitable manner to the knob or lever portion 14 of the door handle. This lever portion of the door handle may be of any suitable construction, and only so much thereof as is needed to show the positioning of the shank or cylinder portion 13, and its associated parts, is illustrated herein. Within the outer portion of the cylinder 13 is adapted to be mounted a key-controlled tumbler lock 15, the rotatable portion 15^a of which carries a pin 16 adapted to extend within a cam slot 17 in the connecting member 12, and the rotatable portion 15^a is of lesser diameter than the barrel 15 of the tumbler lock to provide a support for the connecting member 12 and space for the lateral extension of the pin 16 between the periphery of the rotating portion 15^a of the lock and wall of the cylinder 13. Between the shoulder formed by the larger barrel portion 15 of the lock and the outer extremity of the

connecting member 12, is arranged a coiled spring 18 to normally force the connecting member 12 toward the inner extremity of the cylinder 13 and into engagement with the slotted rounded extremity 9 of the lock shaft 8. The connecting member 12 comprises a hollow cylindrical forward portion in the wall of which is formed the cam slot 17 and a solid rear portion terminating in the lug 11 and provided with an aperture for the reception of a laterally extending pin 19. The hollow cylindrical portion of the connecting member 12 loosely fits over the reduced portion 15ª of the tumbler lock 15, substantially as shown in Figure 1, with the pin 19 extending through aligned slots 20 in the wall of the cylinder 13. The slots 20 are preferably arranged longitudinally of the cylinder 13 and the pin 19 is guided by the walls of the slots 20 during the sliding movements of the connecting member 12 while serving to prevent rotation of the connecting member except with the cylinder 13 and attached portions of the door handle.

In use, the connecting member 12 is slid into and out of engagement with the lock shaft 8 by rotating the key-controlled tumbler lock 15 as desired. When in its unlocked position, the driving lug 11 of the connecting member is pressed by the coiled spring 18 into the cross-slot 10 in the rounded portion 9 of the lock shaft. In such position, rotation of the lever portion 14 of the door handle to open or close the door will simultaneously rotate the lock shaft 8 and through it move the lock bolt as desired. In its locked position, as shown in Figure 1, the lug 11 of the connecting member 12 is completely withdrawn from the cross-slot 10 of the lock shaft, and in such position the door handle is freely rotatable without serving to move the lock shaft 8, the cylinder 13 and associated parts rotating on the rounded portion 9 of the lock shaft, and within the escutcheon hereinafter described. The movement of the connecting member from its unlocked position to its withdrawn or locked position as shown in Figure 1, is accomplished by partially rotating the key-controlled tumbler lock 15 relatively to the cylinder 13. This rotary movement of the tumbler lock 15 serves to swing the pin 16 fixed in the reduced portion 15ª of the tumbler lock, and since the inclined wall of the cam slot 17 of the connecting member is maintained in contact with the pin 16 through the pressure exerted by the coiled spring 18, such movement of the pin 16 will serve to effect the sliding of the connecting member 12 along the reduced portion 15ª of the tumbler lock.

The above described portions of the locking handle are substantially identical with those disclosed and claimed in my companion application, and no attempt has been made herein to portray such parts in their entirety. Instead, only sufficient of the locking handle parts are shown and described herein as are necessary to completely disclose the positioning and operation of the claimed disclosure herein.

The claimed disclosure herein relates to the provision of means for frictionally resisting angular movement of the door handle when disconnected from the lock shaft 8, and for latching it in a desired angular position, as well as a combination of such means with the door handle assemblies such as hereinbefore described. An escutcheon 21, preferably of ornate appearance, is secured upon the door 5, as by screws 22, and is provided with a central raised portion extending outwardly from the door a sufficient distance to permit the insertion of the pin 19 through the slots 20 and aperture in the connecting member 12 after the escutcheon has been placed over the inner extremity of the cylinder 13. The forward part of this central portion of the escutcheon is preferably inturned to form an abutting surface for the inner extremity of a spacer sleeve 23, also preferably of ornate appearance, which surrounds the cylinder 13 between the lever portion 14 of the handle and the central portion of the escutcheon 21, the contacting portions of the spacer sleeve and escutcheon being shaped to provide ready rotation of the sleeve on the escutcheon. The end portions of the escutcheon 21 are spaced outwardly from the metallic sheath 6 of the door a sufficient distance to provide clearance for a pair of spring tension plates, one of which is rotatable with the door handle and the other of which is held against rotative movement by the escutcheon 21. The outer spring tension plate 24 is best shown in Figure 5 and comprises a dished sheet metal plate of spring steel or other suitable metal formed so that its corners are adapted to substantially abut against the wall of the escutcheon 21 when the plate 24 is positioned for use to thereby limit or prevent oscillating movements of the plate 24 relatively to the escutcheon. Between the corners, the metal of the plate 24 may be cut away to clear the screws 22, or the like. Adjacent one corner, the plate 24 is apertured, as at 25, for the reception of an indented portion 26 of the inner spring tension plate 27 (note Figure 1) when the door handle is in its desired angular position. The plate 24 is provided with a central aperture of slightly greater diameter than the diameter of the cylinder 13, whereby the plate 24 may be readily inserted over the rear extremity of the cylinder during assembly. The spring tension plate 27 may be shaped substantially as shown in Figure 6, and comprises a slightly dished plate of spring steel or other

suitable material having a central aperture 28 therein, the wall of which is provided with a plurality of spaced teeth or lugs 29 shaped and positioned so that they will slide forwardly over the cylinder 13 but will bite into the periphery of the cylinder 13 so that the plate 27 cannot be slid rearwardly on the cylinder 13. In other words, the shape and arrangement of the inwardly directed teeth 29 of the plate 27 will serve to retain the plate 27 upon the periphery of the cylinder 13 after it has once been driven forwardly to the desired position of use, rearward movement of the plate 27 being prevented without deformation of the plate or cylinder. A radially projecting finger 30 is formed with the indented portion 26, which is positioned a suitable distance from the center of the aperture 28 to swing in an orbit that traverses the center of the aperture 25 in the plate 24.

In assembling the door handle illustrated herein, all parts, except the tension plates 24 and 27, may be assembled and arranged within the escutcheon 21, whereupon they may be held in such assembled relation by the tension plates. Thus, the outer tension plate 24 is first placed over the rear extremity of the cylinder 13 until its outer edge engages the escutcheon 21, at which time it will be in substantially the position shown in Figure 2. Then the inner tension plate 27 is placed over the inner extremity of the cylinder 13 until its teeth 29 engage the periphery of the cylinder. The inner tension plate 27 is then driven forwardly by a suitable tool, and in its forward movement presses upon the outer tension plate 24 to reduce the extent of dish in the outer tension plate, i. e. flex the outer tension plate toward a plane surface. The teeth 29 of the tension plate 27 permit such forward movement, but as soon as the pressure exerted against the plate 27 to drive it forward is removed, the teeth 29 will bite into the periphery of the cylinder 13 and prevent return movement of the plate 27, despite the fact that such return movement is urged by the flexing of the outer tension plate 24. Since the tension plate 27 will not move rearwardly, the tension of the outer plate 24 will be exerted in a forward direction and so press the escutcheon 21 forwardly into firm contact with the spacer sleeve 23, and in turn press the spacer sleeve into engagement with the foremost portions of the door handle.

In addition to this function of maintaining the ornate exterior portions of the door handle in desired positions, my tension plate arrangement will serve to resist accidental oscillating movements of the door handle when disconnected from the lock shaft, and by virtue of the interfitting dent 26 and aperture 25 will serve to latch the handle against accidental movement from a desired angular position after it has been placed in such angular position. Thus, the tendency to straighten the outer tension plate 24 during the positioning of the tension plates serves to maintain the rear face of the outer tension plate in firm engagement with the forward face of the inner tension plate 27, and so exerts pressure upon the inner plate 27 that cannot be overcome except by the application of force to the turning of the handle. The handle, however, can be swung when it is desired to turn the lock shaft 8, or through a complete revolution when the connecting member 12 thereof is disconnected from the lock shaft 8, but such turning movement must be made against the frictional resistance offered by the abutting tension plates. Accordingly, the lever portion 14 of the door handle will remain in any angular position it happens to be after the application of the force has ceased. To maintain it in a desired angular position, I provide the aperture 25 in the forward tension plate and the cooperating dent 26 in the rear tension plate. In assembling the tension plates, the indented finger 30 of the rear tension plate 27 is angularly positioned relatively to the cylinder 13 so that the dent 26 will engage in the aperture 25 when the lever portion 14 of the handle is pointing in the desired angular position of such lever portion. The rear tension plate 27 will then retain this position upon the cylinder 13 because of its clamping teeth 29, such teeth biting into the surface of the cylinder, at circumferentially spaced intervals and so preventing rotative movement of the tension plate 27 relatively to the cylinder.

When it is desired to secure the door handle upon a vehicle door it is only necessary to insert the lock shaft 8 and rear extremity of the cylinder 13 through the aperture 7 in the door and then secure the lock shaft within the control element for the movement of the lock bolt. Such insertion within the aperture 7 of the door brings the escutcheon 21 into engagement with the outer face of the metallic cover plate 6, and it is fixed in such position by the screws 22. The door handle and associated parts are now firmly secured upon the door so that the handle can rotate but cannot be removed longitudinally to extricate it from the door until the lock shaft 8 is freed from engagement with the control element of the door lock. Removal of the screws 22 from the escutcheon plate will not suffice to permit withdrawal of the door handle from the door lock, and the rear extremities of the cylinder 13 and the squared portion of the shaft 8 extend within the aperture 7 of the door beyond the reach of a malicious or mischievous person even though the escutcheon be completely removed.

In use, the connecting member 12 is slid

into and out of engagement with the lock shaft 8 by rotating the key-controlled tumbler lock 15 as desired. When in its unlocked position, the driving lug 11 of the connecting member is pressed by the coil spring 18 into the cross-slot 10 in the rounded portion 9 of the lock shaft. In such position, rotation of the lever portion 14 of the door handle to open or close the door will simultaneously rotate the lock shaft 8 and through it move the lock bolt as desired. In its locked position, as shown in Figure 1, the lug 11 of the connecting member 12 is completely withdrawn from the cross-slot 10 of the lock shaft, and in such position, the door handle is freely rotatable without serving to move the lock shaft 8, the cylinder 13 and associated parts rotating on the rounded portion 9 of the lock shaft and within the escutcheon 21. When in such free position, however, resistance to rotation of the door handle is offered by the abutting tension plates 24 and 27, they serving by frictional resistance to prevent oscillation of the door handle during vibrations imparted to the car, as during driving. Also when the lever portion 14 of the door handle has been turned to a desired angular position, the dent 26 of the rear tension plate will snap into the aperture 25 in the forward tension plate, and serve to latch the door handle against oscillation until sufficient force is applied to the door handle to flex the finger 30 of the rear tension plate to permit the removal of the dent 26 therein from the aperture 25. The movement of the connecting member 12 from its unlocked position to its withdrawn or locked position as shown in Figure 1 is accomplished by partially rotating the key-controlled tumbler lock 15 relatively to the cylinder 13. This rotary movement of the tumbler lock 15 serves to swing the pin 16 fixed in the reduced portion 15^a of the tumbler lock, and since the inclined rear wall of the cam slot 17 of the connecting member is maintained in contact with the pin 16 through the pressure exerted by the coil spring 18, such movement of the pin 16 will serve to slide the connecting member 12 along the reduced portion 15^a of the tumbler lock. To again connect the door handle with the lock shaft, it is only necessary to rotate the tumbler lock 15 in the reverse direction, thereby moving the pin 16 into the wide portion of the slot 17, and permitting the spring 18 to slide the connecting member 12 toward the lock shaft.

While it will be apparent that the illustrated embodiment of my invention herein disclosed is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

Having described my invention, what I claim is:

1. The combination with a rotatable door handle and an escutcheon therefor, of means for resisting rotary movement of the door handle comprising a tension plate fixedly engaging the escutcheon and a rotatable tension plate secured upon the door handle to rotate therewith and slidably contacting the fixed tension plate.

2. The combination with a rotatable door handle and an escutcheon therefor, of means for resisting rotary movement of the door handle comprising, a tension plate engaging the escutcheon and a rotatable tension plate secured upon the door handle and contacting the fixed tension plate, one of said plates being provided with an aperture and the other with a raised portion adapted to fit in said aperture when the door handle is in a desired angular position.

3. The combination with a rotatable door handle and an escutcheon therefor, of means for resisting rotary movement of the door handle comprising a tension plate engaging the escutcheon and a rotatable tension plate secured upon the door handle and contacting the fixed tension plate, the fixed tension plate being provided with an elongated slot and the rotatable tension plate with a raised portion adapted to fit into said slot when the door handle has been swung to a desired angular position.

4. The combination with a rotatable door handle and an escutcheon therefor, of means for resisting rotary movement of the door handle comprising a tension plate engaging the escutcheon and a rotatable tension plate secured upon the door handle and contacting the fixed tension plate, said tension plates being dished in the same direction but to different extents.

5. The combination with a rotatable door handle, and an escutcheon therefor, of means for resisting rotary movement of the door handle comprising a dished tension plate fixedly engaging the escutcheon, and a co-operating tension plate rotatably secured upon the door handle to rotate therewith and in position to impart initial tension to the first-mentioned tension plate.

6. The combination with an apertured escutcheon and a relatively rotatable cylindrical door handle member extending through said aperture, of means for resisting relative rotary movement of the door handle member comprising an apertured tension plate loosely surrounding the door handle member and fixedly engaging the escutcheon, and a cooperating apertured tension plate, snugly fitting over and rotatable with said door handle member, and slidably engaging the first mentioned tension plate.

7. The combination with an apertured

escutcheon and a relatively rotatable cylindrical door handle member extending through said aperture, of means for resisting relative rotary movement of the door handle member comprising an apertured tension plate loosely surrounding the door handle member and engaging the escutcheon and a cooperating apertured tension plate, provided with spaced teeth arranged to slide over the periphery of the cylindrical door handle member in one direction, but bite into said member to prevent movement in the reverse direction, the tension plates abutting each other under initial tension whereby the said teeth of the second mentioned tension plate will remain secured in said door handle member.

8. In combination, an apertured escutcheon, a door handle member including a hand engaging portion and a shank portion extending through the aperture in the escutcheon, a spacer sleeve loosely surrounding the shank portion between the hand engaging portion and the escutcheon, and a pair of contacting dished tension plates carried by the escutcheon and shank portion respectively, whereby the extremities of the spacer sleeve will be maintained in engagement with the hand engaging portion of the door handle and the escutcheon respectively, and provide means for resisting rotary movement of the door handle relatively to the escutcheon, said tension plates having interfitting parts for latching the plates in desired angular positions.

In testimony whereof I sign this specification.

CHARLES B. LOWE.