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W. C. DEVEREAUX

LOCK SHAFT SECURING MEANS

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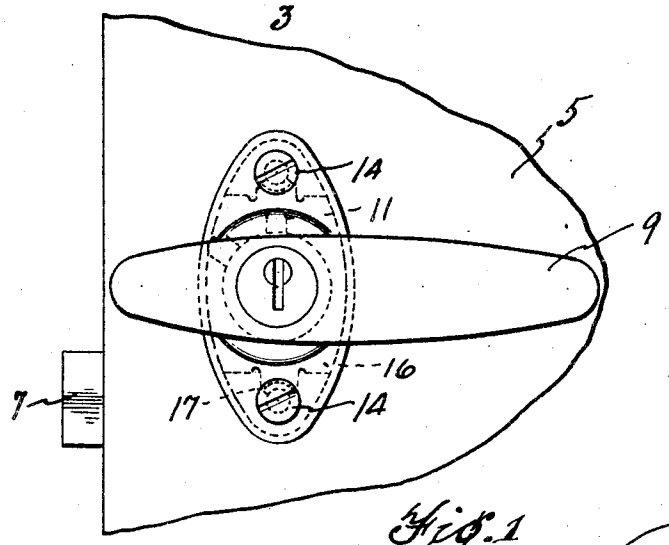



Fig. 1

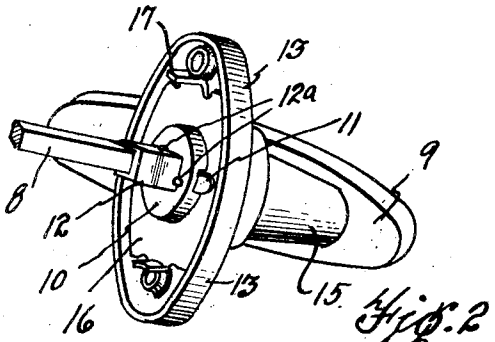



Fig. 2

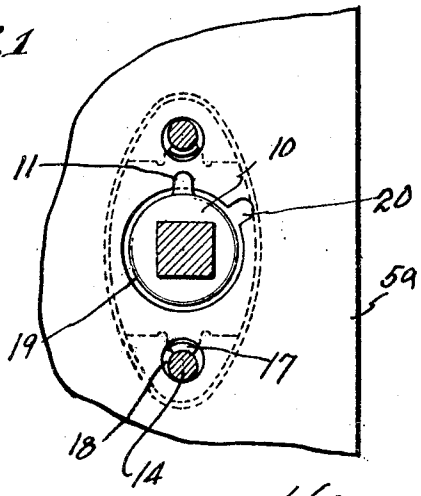



Fig. 4

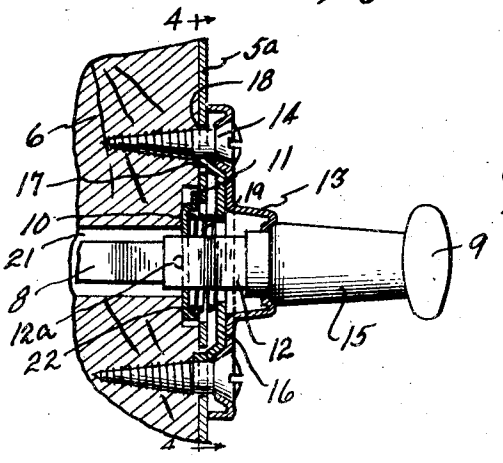



Fig. 3

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# UNITED STATES PATENT OFFICE.

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## LOCK-SHAFT-SECURING MEANS.

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This invention relates to means for securing the shafts of locks for vehicle doors and the like so that while the lock shaft can be freely rotated it cannot be accidentally moved longitudinally of its axis.

One of the objects of my invention is the provision of a lock shaft fastening means that will effectively prevent the accidental or malicious removal of the lock shaft and handle from the vehicle door or other place upon which they are mounted.

Another object of my invention is the arrangement of a locking plate upon the lock shaft with a radially projecting lug in position to contact the rear wall of the metallic face plate of the vehicle door carrying the lock, a notch being provided in the face plate to permit the passage of the lug while the lock is being assembled upon the door.

A further object of my invention is the provision of a simple and compact fastening means for lock shafts, which is comparatively inexpensive to manufacture and which can be readily installed or dismantled when desired.

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:

Fig. 1 is a front elevation of a lock shaft and associated parts mounted upon a vehicle door.

Fig. 2 is a perspective view of the lock shaft and associated parts removed from the door.

Fig. 3 is a central vertical section taken substantially on the line 3—3 of Fig. 1, and

Fig. 4 is a detail vertical sectional view taken substantially on the line 4—4 of Fig. 3.

Referring now to the drawings, the numeral 5 designates a portion of a vehicle door, herein shown as formed with a metallic face plate $5^a$ on its outer side covering a filler 6 of wood or the like (note Fig. 3). A lock casing (not shown) is suitably mounted upon the door 5 and carries a movable lock bolt 7 having a portion normally extended beyond the free edge of the door for engagement with a striker plate (not shown) carried by the door jamb. The lock bolt 7 is adapted to be retracted to free its extended portion from engagement with the striker plate by means of a cam or other suitable mechanism actuated upon oscillation of the lock shaft 8, which is suitably connected adjacent its rear extremity with the cam and carries at its forward extremity the handle 9. Since the construction and arrangement of the lock mechanism forms no part of the present invention, no attempt has been made to illustrate herein a completely operative lock mechanism, only so much of the lock shaft and associated parts being illustrated as to depict the construction and mounting of the lock shaft and such parts adjacent the face plate $5^a$ of the vehicle door.

The shank of the lock shaft 8 is preferably polygonal in cross section and carries intermediate its ends a locking plate 10 having one or more radial lugs 11 projecting from its periphery. The lock plate 10 is suitably secured upon the lock shaft so as to rotate therewith. As herein shown a sleeve 12 having a polygonal outer surface fits over the forward extremity of the lock shaft so as to reinforce same and provide a means of securely fastening the lock handle 9 upon the lock shaft, and the lock plate 10 is formed with a central aperture conforming in shape to the outer contour of the sleeve 12. Portions of the sleeve 12 may be peened or struck up to provide abutments $12^a$ limiting the rearward movement of the lock plate 10 upon the lock shaft, and, as hereinafter pointed, coact with the lock plate 10 in preventing surreptitious removal of the lock shaft and associated parts.

Surrounding the sleeve 12 is an escutcheon plate 13 adapted to be secured upon the door 5 by means of screws 14 or other suitable securing means and a spacer tube 15 adapted to cover that portion of the sleeve and lock shaft between the handle 9 and forward portion of the escutcheon plate 13. The escutcheon plate and spacer tube may be ornate in contour and nickeled or otherwise finished as desired to enhance the appearance of the vehicle upon which they are mounted. The rear extremity of the spacer tube 15 is preferably of lesser diameter than the main portion thereof and adapted to telescope within the central aperture of the escutcheon plate to enable the use of identical lock shaft assemblies upon doors of varying thicknesses. The rear portion of the escutcheon plate 13 is preferably reinforced by means of a backing plate 16

welded or otherwise suitably secured to the rear face of the escutcheon plate and provided with a pair of rearwardly bent tabs 17 adapted to enter suitably spaced apertures 18 in the cover plate 5ª of the door panel, substantially as shown in Fig. 3. The screws 14 also pass through the apertures 18 in the face plate 5ª, the shanks of the screws engaging the outer faces of the tabs 17 and aiding in holding the backing plate 16 and escutcheon plate 13 rigidly upon the door panel. The face plate 5ª of the door panel is also formed with an enlarged aperture 19 substantially centrally between the apertures 18 for the passage of the lock shaft 8, such aperture being of but slightly greater diameter than the diameter of the locking plate 10 (note Figs. 3 and 4). Accordingly, the body portion of the lock plate 10 can pass through the central aperture 19 but not the radially projecting lugs 11 of the lock plate. To permit the insertion of the lock plate from the outer side to within the door panel I provide one or more radial notches 20 in the face plate 5ª opening at their inner extremities into the central aperture 19. Such notches 20 are preferably located beyond the ordinary path of travel of the lugs 11 when the lock shaft 8 is oscillated to retract the lock bolt 7 or return it to normal position.

In operation, the sleeve 12, locking plate 10, escutcheon plate 13, spacer tube 15 and handle 9 are preliminarily assembled to substantially the positions shown in Fig. 2 preparatory to the installation of the lock shaft and associated parts upon the door panel 5. When it is desired to install the lock shaft the rear extremity of the lock shaft 8 is inserted into the central aperture 19 in the face plate 5ª and aligned opening 21 in the filler 6 to bring it into position for connection with the cam or other actuating elements within the lock casing. The rearward movement of the lock shaft and associated parts is continued until the rear face of the radial lug 11 engages the outer face of the cover plate 5ª of the door panel. The escutcheon plate is then set so that its tabs 17 will enter the apertures 18 in the cover plate, and the lock shaft is swung to bring the radial lug 11 into alignment with the notch 20 in the cover plate 5ª, whereupon the lock bolt and associated parts are thrust rearwardly until the lug 11 has passed through the notch 20 and beyond the cover plate 5ª. The handle 9 and lock shaft 8 is then swung to bring the radial lug 11 out of alignment with the notch 20 into position to contact the rear face of the cover plate 5ª whenever attempt is made to pull the lock shaft 8 and associated parts forwardly. The last rearward thrust of the lock bolt to correctly position the lock plate also brings the tabs 17 of the escutcheon plate 13 into the apertures 18 of the cover plate, and the tabs 17 together with the screws 14 then position the escutcheon plate so that it will retain its desired position despite vibrations of the vehicle or slamming of the door 5. A coil spring 22 preferably surrounds the sleeve 12 between the lock plate 10 and the rear extremity of the spacer tube 15, serving to maintain the lock plate 10 in engagement with the struck-up portions 12ª of the sleeve 12 and to maintain the spacer tube 15 in close engagement with the handle 9. This prevents accidental movement of the locking plate 10 from within the door panel, even though the lug 11 thereof should be swung into the alignment with the notch 20 in the cover plate 5ª. The rear extremity of the lock shaft 8 is suitably attached to the actuating mechanism within the lock casing, whereupon the oscillation of the lock shaft through the handle 9 will serve to retract the lock bolt 7 in the usual manner of door fasteners, the lock plate 10 rotating with the lock shaft during such movements. Inasmuch as only a partial revolution of the lock shaft 8 is ordinarily needed to retract the lock bolt 7 it is possible to preliminarily position the lug 11 so that it will not be swung into alignment with the notch 20 in the cover plate while the door is being locked or unlocked.

When it is desired to remove the lock bolt and associated parts from the door panel it is only necessary to remove the screws 14 and disconnect the lock shaft from the actuating parts within the lock casing, whereupon the lock shaft may be swung to bring the lug 11 into alignment with the notch 20 and then pull the lock shaft and associated parts forwardly.

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, I claim:

1. Securing means for lock shafts including a metallic plate having an aperture therein and a radial notch opening into the aperture, a lock shaft extending through the aperture and carrying a locking plate having a radial lug adapted to pass through said notch and engage the inner face of said plate, and means surrounding the lock shaft to cover the aperture including an escutcheon plate secured to said metallic plate, a handle mounted on the projecting extremity of the lock shaft, a spacer tube surrounding the lock shaft between the handle and escutcheon plate, and a spring arranged between the spacer tube and locking plate to press the locking plate inwardly.

2. The combination with a vehicle door provided with a metallic door panel having an aperture therein with a radial notch opening into the aperture, of a lock shaft extending through the aperture and carrying a locking plate having a radial lug adapted to pass through said notch and engage the inner face of said metallic panel, abutments for limiting movement of the locking plate longitudinally of the lock shaft in one direction, and means for pressing the locking plate into engagement with the abutments and close said aperture including an escutcheon plate fixed upon the door, a handle fixed upon the projecting extremity of the lock shaft, a spacer tube arranged between the escutcheon plate and handle, and a spring arranged between the spacer tube and locking plate.

In witness whereof I hereunto set my hand.

WILLIAM C. DEVEREAUX.