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SAFETY DEVICE FOR DOORKNOB LOCKS

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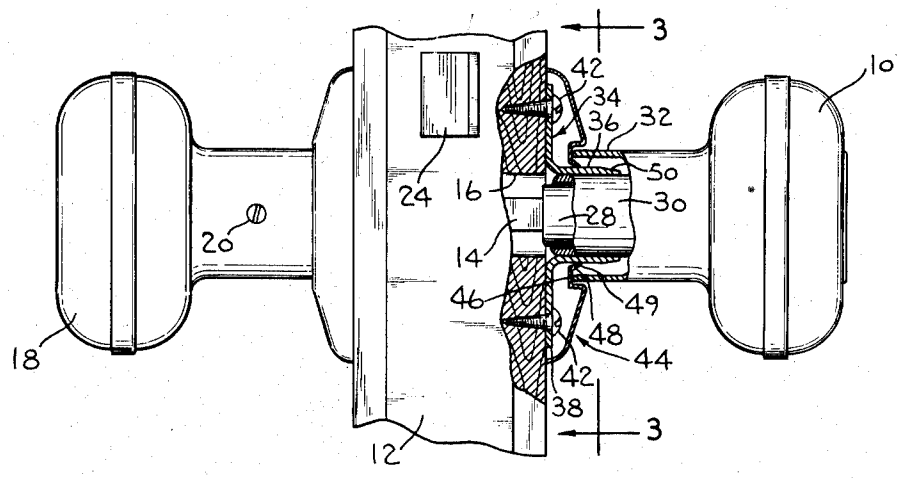


FIG. 1

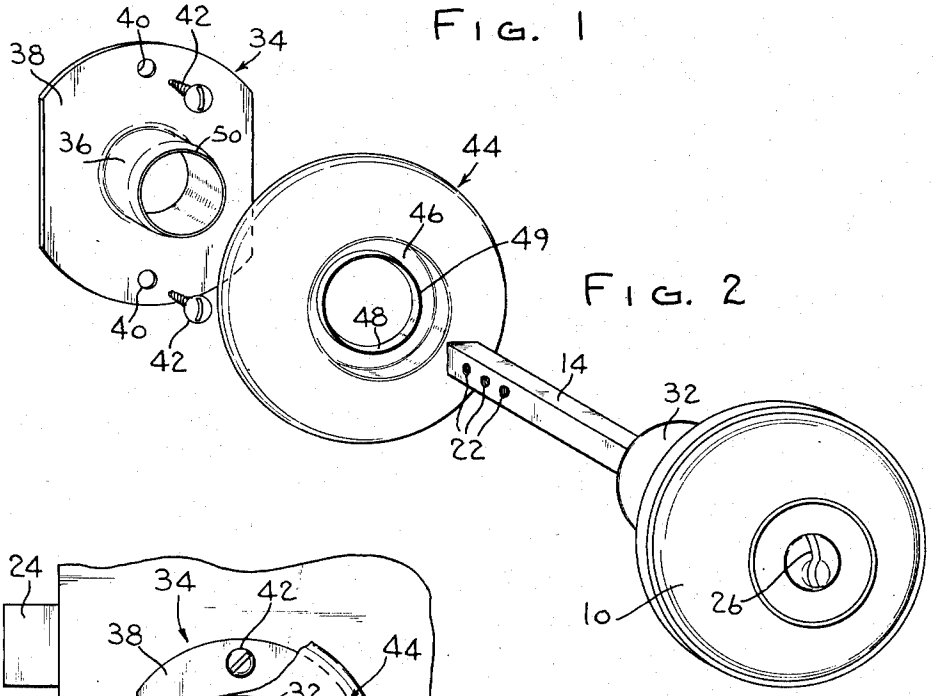


FIG. 2

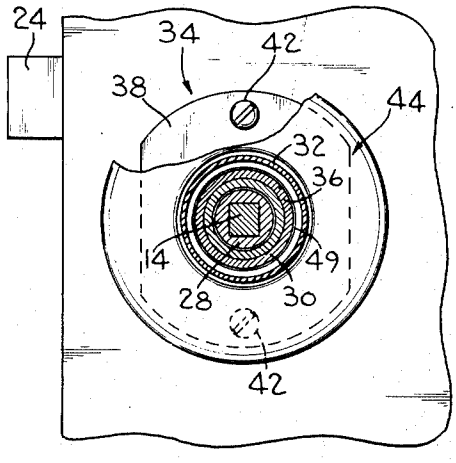


FIG. 3

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SAFETY DEVICE FOR DOORKNOB LOCKS

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5 Claims. (Cl. 292—356)

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This invention relates to a safety device which prevents opening a doorknob lock without a key.

Doorknob locks are well known devices wherein the lock mechanism is in the knob itself and selectively locks the knob with respect to the latch operating shaft or permits the knob to rotate with respect to the shaft. Thus, when the door is locked the knob rotates freely and does not actuate the shaft, thereby preventing operation of the latch to open the door. The knob incorporates a shaft sleeve to insure proper alignment of the shaft with the lock. The sleeve is rotatable (with the knob) with respect to the shaft. If the sleeve fits the shaft snugly, a slight transverse load on the knob will permit the sleeve to frictionally engage the shaft to allow the knob to rotate the shaft even though "locked." On the other hand, if the fit between the sleeve and the shaft is too loose, the shaft orientation to the lock mechanism is adversely affected. Therefore, a middle course allowing for some "play" in the fit is generally taken. It is possible, however, to load the knob sufficiently to frictionally engage the shaft under these conditions.

The principal object of this invention is to provide a safety device preventing operation of a door latch by turning a doorknob containing a lock mechanism when the door is locked.

Another object is to provide a device for a doorknob lock which prevents frictional engagement of the latch operating shaft.

Another object is to provide a device for a doorknob lock to transmit transverse forces to the door.

Still another object is to provide a tamperproof device for preventing non-rotational movement of a doorknob lock with respect to the door.

A still further object is to provide an attractive rose plate.

Other objects and advantages will be pointed out in, or be apparent from, the specification and claims, as will obvious modifications of the single embodiment shown in the drawings, in which:

Fig. 1 is a side elevation with parts broken away of a doorknob lock and a conventional doorknob mounted on a door and provided with safety means preventing frictional engagement of the latch operating shaft when actuating the doorknob lock;

Fig. 2 is an exploded perspective view of a conventional doorknob lock and the hub plate and rose plate employed to prevent sufficient movement of the knob to engage the shaft; and

Fig. 3 is a section taken as indicated in Fig. 1.

Referring to the drawings in detail, Fig. 1 illustrates a conventional doorknob 10 containing a lock mounted on a door 12 and having latch operating shaft 14 extending through the hole 16 in the door for connection to a conventional doorknob 18 by means of a screw 20 threaded into one of the holes 22 in the free end of the shaft. The

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shaft 14 operates the latch 24 in the conventional manner. The doorknob 10 contains a lock mechanism which when "locked" allows the knob to rotate freely with respect to the shaft 14 and thereby prevent operation of the latch. When the lock mechanism is "unlocked" the knob is locked with respect to the shaft 14 and may, therefore, be turned to actuate the shaft and operate the latch to open the door. The inside or conventional knob 18 is not provided with a lock mechanism and is always operative to turn the shaft 14 by virtue of its connection to the shaft by means of screw 20.

The well-known lock mechanism within knob 10 is not shown but may be of the type shown in Patent No. 1,903,190, to Stephen W. Neldner dated March 28, 1933, for example. As may be seen in Fig. 2, the center of the outside face of knob 10 is provided with a slot 26 adapted to receive the key operating the lock mechanism. As may be seen in Figs. 1 and 3, the latch operating shaft 14 is secured in a cylindrical member 28 which is rotatably supported in and guided by a sleeve 30. Sleeve 30 is fixed with respect to knob 10 and rotates therewith while keeping the shaft oriented with respect to the lock. As is conventional, neck 32 of knob 10 extends toward the door to abut rose plate 44. As will appear hereinafter, rose plate 44 is not of conventional design. Reference to the drawings shows that a slight clearance is provided between sleeve 30 and the cylindrical portion 28 of shaft 14. This follows preferred design practice in allowing slight play between the knob and the shaft to make it more difficult to load the knob transversely to cause the sleeve 30 to frictionally engage the cylindrical portion 28 of shaft 14 and thereby permit unauthorized operation of the latch.

The small annular space between the sleeve and the cylindrical portion of the shaft is not, however, sufficient to prevent frictional engagement of the shaft when the knob is severely loaded. To guard against such engagement of the shaft, the present structure incorporates a plate 34 having a cylindrical hub 36 adapted to snugly receive sleeve 30. The flat portion 38 of the hub plate is provided with holes 40 permitting the plate to be secured to the door by means of screws 42. When the hub plate is secured to the door, sleeve 30 can rotate within the hub. The close fit between the hub and the sleeve prevents wiggling the knob with respect to the door and with respect to the latch operating shaft. Any transverse force applied to knob 10 is transmitted to the door through the hub plate. Thus it is impossible to load the knob 10 to cause the sleeve 30 to frictionally engage the operating shaft 14.

Of course, the hub plate would afford little protection if the screws 42 were accessible. With this in mind I provide a novel rose plate 44 which presents a smooth surface and does not require the conventional mounting screws. This rose plate is provided with an annular seat portion

46 adapted to receive the end of neck 32. The inside wall 48 of the seat portion 46 is turned in slightly to present a generally frusto conical configuration. The inside diameter of the edge 49 of wall 48 is less than the outside diameter of hub 36. The outer end 50 of the hub is tapered to permit the rose plate to start onto the hub plate. The rose plate is of relatively light brass or other metal having good resilient qualities to allow the plate to be pushed onto the hub to obtain a press fit with edge 49 tightly engaging the hub. With the wall 48 of rose plate 44 sprung in this manner, any attempt to remove the rose plate tends to cause edge 49 to bite into the hub plate. Therefore, when the rose plate is mounted as illustrated in Fig. 1 with its outer periphery flush against the door, it is substantially impossible to remove the rose plate without complete destruction of the plate.

Of course, the inside doorknob may be removed by loosening screw 20. After the inside knob 18 has been removed, the doorknob 10 may be withdrawn, if necessary. Rose plate 44 cannot be removed under any condition without destroying the rose plate. It will be appreciated by those familiar with the psychology of those who tamper with locks that the necessity for such destruction substantially precludes tampering. The hub plate and the rose plate may be readily secured to the door by first removing the inside knob, withdrawing the outside knob (and replacing it with a doorknob lock if one is not already in use), centering the hub plate on the door and securing it thereto by means of screws 42, and then pressing rose plate 44 onto the hub. Shank 14 may now be inserted through the door and the inside knob secured thereto.

It will be appreciated that the hub plate prevents the frictional engagement of the latch operating shaft 14 with the doorknob by transmitting to the door any forces applied to the knob transversely of the shaft. The function of the rose plate is to prevent tampering with the hub plate while presenting an attractive exterior. The press fit employed between the rose plate and the hub plate renders it substantially impossible to tamper with the hub plate after it has been secured to the door. It will be appreciated that this simple sructure makes the doorknob lock tamper-proof.

Although but one embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. The combination with a doorknob of the type containing a lock mechanism for permitting rotation of the knob with or with respect to the latch operating shaft, said knob including a sleeve coaxial with and surrounding said shaft, of safety means for preventing frictional engagement of said shaft and said sleeve when the knob is subjected to a transverse load, said means comprising, a plate adapted to be secured to a door and including a cylindrical hub fitting snugly over said sleeve to transmit transverse forces from the knob to the door, and a dished centrally apertured rose plate engaging said hub by means of a press fit and having its outer periphery adapted to lie flush against the door to thereby prevent access to the hub plate.

2. The combination with a doorknob of the type containing a lock mechanism for permitting rotation of the knob with or with respect to the latch operating shaft, said knob including a sleeve coaxial with and surrounding said shaft for supporting the shaft, said knob also including a cylindrical neck portion coaxial with the sleeve and spaced outwardly from the sleeve, of safety means for preventing frictional engagement of said shaft and said sleeve when the knob is subjected to a transverse force, said means comprising, a plate adapted to be secured to a door and including a cylindrical hub fitting snugly over said sleeve to transmit transverse forces from the knob to the door, and a dished centrally apertured rose plate having a press fit with said hub, the outer periphery of said rose plate being adapted to lie flush against the door to enclose and prevent access to said hub plate, said rose plate including an annular seat adapted to receive the end of said neck portion of said knob.

3. The combination with a doorknob of the type containing a lock mechanism for permitting rotation of the knob with or with respect to the latch operating shaft, said knob including a sleeve surrounding and coaxial with said shaft, of safety means for preventing rotation of said shaft by said knob when the knob is loaded transverse the shaft axis while being rotated and thereby frictionally engaging the shaft, said safety means comprising, a plate including a cylindrical hub snugly fitting over said sleeve and a flange adapted to be secured to a door, so that a transverse force on said knob will be transmitted through said hub plate to the door, and a centrally apertured rose plate having a press fit with said hub and being adapted to abut the door to prevent access to the hub plate, the outer end of said hub being of generally frusto-conical form to facilitate assembly of the rose plate thereon in press fit relation.

4. The combination with a doorknob of the type containing a lock mechanism for permitting rotation of the knob with or with respect to the latch operating shaft, said knob including a sleeve surrounding and coaxial with said shaft, of means engaging said sleeve exteriorly and adapted to be secured to a door to transmit transverse forces applied to the knob to the door, and means preventing access to said engaging means.

5. Apparatus for preventing lateral movement of a doorknob having a cylindrical shank, comprising, a hub plate adapted to be secured to a door and having a cylindrical hub portion adapted to snugly fit over a substantial portion of said cylindrical shank to transmit lateral forces from the knob to the door, and a centrally apertured dished rose plate having a press fit on said cylindrical hub portion of said hub plate and abutting said door to cover the hub plate and the means securing the hub plate to the door.

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