June 27, 1950 G. B. SOLOVIEFF ET AL 2,512,814

DOOR LOCK

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Fig. 1

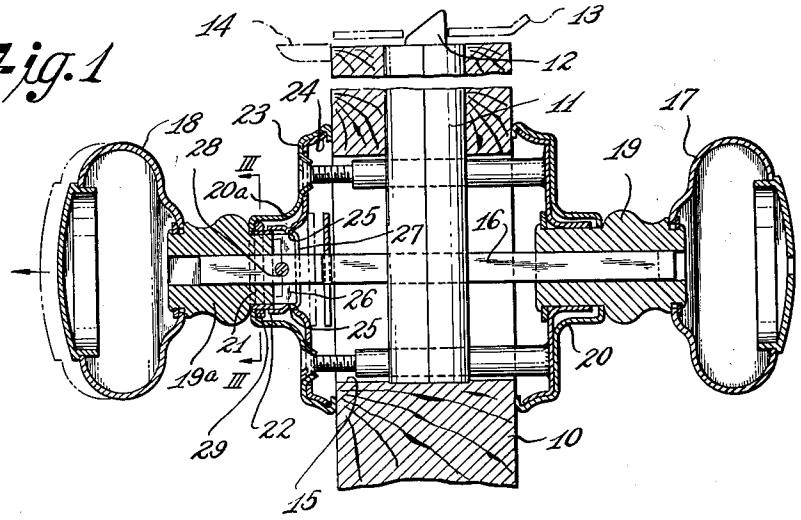


Fig. 2

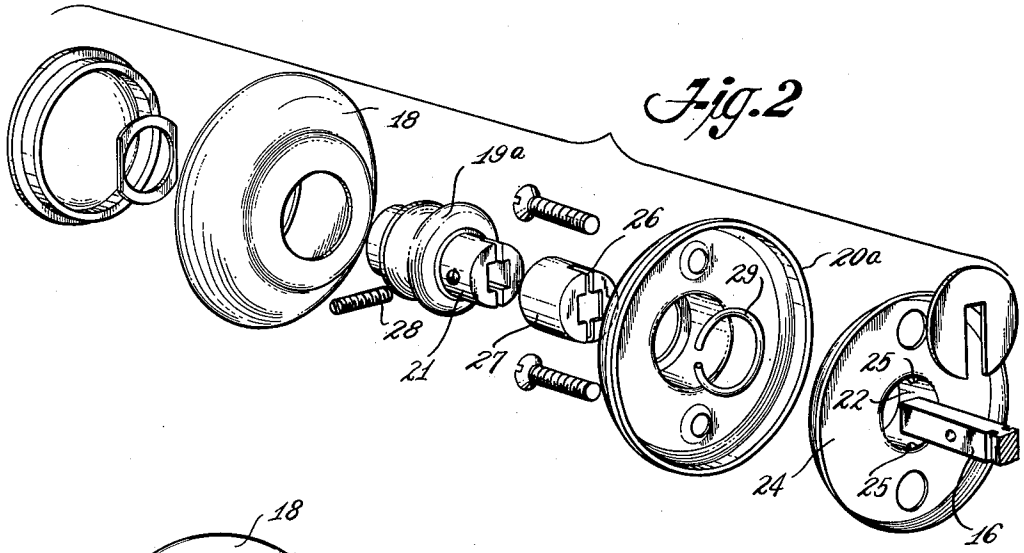
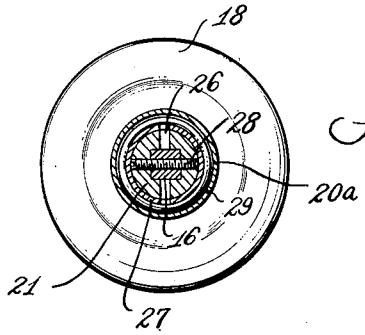


Fig. 3



INVENTORS
GEORGE B. SOLOVIEFF
FRED J. RUSSELL
BY Harold W. Mattingly
Attorney

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DOOR LOCK

George B. Solovieff, South Gate, and Fred J. Russell, Beverly Hills, Calif., assignors to Weiser Company, South Gate, Calif., a corporation of California

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2 Claims. (Cl. 292—359)

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Our invention relates to door locks, and has particular reference to the type of door lock in which a longitudinal shifting of one or both of the doorknobs is employed for the purpose of locking and unlocking the lock.

Heretofore door locks have been generally of the type employing a spindle extending transversely through the doorway and having a doorknob attached to opposite ends thereof for the purpose of operating a door latch bolt upon rotation of the spindle by either of the knobs. To lock such door locks, various mechanisms have been employed operable by a person using the door lock to selectively prevent rotation of the spindle and knobs or to permit rotation of the spindle and knobs. One of the familiar types of locking mechanisms employs a longitudinal movement of the doorknob spindle and at least one of the knobs in the direction of the axis of rotation of the spindle and knobs between a locked position and an unlocked position, the locking being accomplished by the interengagement of slots and projections on the knobs and fairings or roses secured to the door.

Heretofore the knob and spindle have been retained in either the door locking or the door unlocking position by means of rather complicated detents, spring pressed balls, or similar detent mechanisms which are relatively expensive to manufacture and assemble.

It is an object of our invention to provide a door lock of the character described wherein the longitudinal positioning of the doorknob and spindle is maintained in either its door locking or unlocking position by means of a simple frictional device.

Another object of our invention is to provide a construction of the character set forth in the preceding paragraph wherein the friction mechanism comprises a simple split ring adapted to be rotatably mounted with respect to a rose or fairing associated with the lock mechanism and adapted to frictionally grasp the doorknob or spindle in such fashion as to resist inadvertent longitudinal movement of the spindle or knob.

Particularly an object of our invention is to provide a frictional retaining mechanism of the character set forth which will frictionally interengage the doorknob and spindle with its associated rose or fairing in such fashion as to prevent the inadvertent longitudinal movement of the doorknob and spindle as the result of vibration, slamming the door, or other movements imparted to the door and door lock, except a positive, intentional longitudinal motion intended to lock or unlock the door latch.

Other objects and advantages of our invention will be apparent in the following description and claims, considered together with the accompanying drawings, in which:

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Fig. 1 is a sectional view taken along a generally horizontal plane through a door and knob and locking mechanism;

Fig. 2 is an exploded view of the components of the inner locking knob of Fig. 1; and

Fig. 3 is a sectional view taken along the line III—III of Fig. 1.

Referring to the drawings, we have illustrated a door 10 of typical construction which may be bored, slotted, or otherwise cut to receive a door latch operating mechanism 11 for retracting or extending a door latch bolt 12. The latch bolt is ordinarily adapted to extend to and fit within a suitable aperture in a striker or keeper 13 attached to the doorjamb when the latch 12 is aligned therewith, as for example when the door abuts a stop strip 14 attached to the doorjamb.

Any suitable operating assembly for operating the mechanism 11 may be provided extending through a transverse aperture in the door as indicated at 15 to intersect the slot or opening through which the operating mechanism 11 extends.

The operating assembly preferably comprises a doorknob spindle 16 adapted to extend transversely through the door 10 and to have applied at opposite ends thereof doorknobs 17 and 18. The spindle 16 may be of the standard type of rectangular or square cross section to provide a positive interengagement between the spindle 16 and the operating mechanism 11 and to permit the positive interengagement between the doorknobs and the spindle to prevent relative rotation between them so that rotation of either of the doorknobs will result in a positive rotation of the spindle 16.

The doorknobs may be of any suitable construction, including a shank 19 which extends a considerable length along the spindle 16 and has its inner end of circular cross section to constitute a bearing which will engage a suitable journal in a rose or fairing 20 secured to the door 10 in juxtaposition with the associated knob.

For purposes of illustrating the invention herein, the left-hand knob 18 is illustrated as having its shank 19a formed with a circular cross sectioned portion 21 constituting a bearing to be received within a journal 22 formed on the associated rose 20a. While the rose 20a may be of any suitable construction, we prefer to employ a construction which includes an outer shell or escutcheon plate 23 of suitable material finished to conform with the finish on the associated knobs, while an inner member 24 is preferably formed of any suitable wear-resistant material and preferably corrosion-resistant material permanently secured within the shell 23.

For the purpose of permitting the locking of the spindle 16 against rotary movement when it is desired to lock the spindle and the latch oper-

ating mechanism, we provide interengaging members on the inner rose member 24 and the shank 19a of the knob 18 adapted to interengage each other when the doorknob 18 and the shank 19a are moved inwardly toward the face of the door to the position shown in full lines in Fig. 1, though it will be understood by those skilled in this art that other types of interengaging locking mechanisms may readily be employed, so long as the interengagement occurs as the result of a longitudinal movement of the knob 18 along its axis of rotation, and so long as the interengagement of the locking members prevents rotation of the spindle 16 and the knob 18 relative to the door or the rose associated with the knob and attached to the door. Such interengaging mechanisms are old and well known, and need no further explanation here.

As illustrated in Figs. 1 and 2, the interengaging members comprise dimples or detents 25 pressed inwardly from the bearing 22 on the rose 20a adapted to interengage slots 26 on a shell 27 which is adapted to be press fitted onto the shank 19a, the inner end of the shell 27 being provided with a rectangular or square opening adapted to interengage the square or rectangular cross section of the spindle 16 so as to prevent relative rotation between the shell 27 and the spindle 16. Again this construction is old and needs no further elaboration here, except perhaps to point out that the shell 27 is preferably formed of wear-resistant hard and non-corrosive material so as to insure long life in operation of the door lock.

By referring particularly to Figs. 1 and 2, it will be observed that the knob 18 is positively secured to the spindle 16 as by means of a screw 23 extending through the shank 19a and through the spindle 16, while the doorknob 17 is preferably secured for rotation within its associated rose 20, but permitting the longitudinal sliding movement of the spindle 16 relative thereto to permit the shank 19a to be moved between two positions, one interengaging the detents 25 and slots 26 to lock the knobs 18 and 17 against rotation, and a second position in which the detents and slots are free of each other and in which the knobs 18 and 17 and spindle 16 may be freely rotated to actuate the latch bolt.

As will be understood by those skilled in this art, with this type of locking mechanism some insurance must be provided against inadvertent movement of the spindle 16 and the shank 19a between its locking and unlocking positions in case the door is slammed or in case the door is moved to closed position by a longitudinal thrust exerted upon the knob 18 when there is no intention of locking the lock.

To accomplish this result, we provide a simple mechanism which comprises a ring 29 having an internal diameter considerably less than the external diameter of the shank 19a or its shell 27 so that when the ring 29 is in engagement with the shell 27, there will be sufficient friction exerted between the ring and the shell as to prevent inadvertent longitudinal movement of the shank 19a, but which will permit a positive intentional movement to occur.

The ring 29 is preferably formed of suitable spring steel or other resilient material, and the ring is prevented from longitudinal movement within the rose 20a by interposing the ring between the outer shell 23 and the inner rose member 24, as illustrated in Fig. 1.

Thus by reason of the extremely simple expedient of providing a spring ring frictionally engaging the shell 27, a positive intentional movement must be imparted to the knob 18 to move it between its locking and unlocking positions.

While it will be understood by those skilled in this art that if desired, the shell 27 may be omitted and the ring 29 engaged directly with the metal of the shank 19a, the employment of the shell 27 permits the utilization of only a small quantity of wear-resistant material, while the shank 19a may be made of any other inexpensive material.

It will be apparent, therefore, that by providing the simple spring construction as illustrated and described herein, a yielding holding of the doorknob in either its locking or unlocking position is provided without requiring either expensive detent-spring mechanisms or other intricate apparatus which is expensive to manufacture and difficult to maintain.

While we have shown and described a preferred embodiment of our invention, we do not desire to be limited by any of the details illustrated or described herein, except as defined in the appended claims.

We claim:

1. In a door locking mechanism wherein a latch bolt may be locked or unlocked by sliding movement of the shank of a doorknob along the rotative axis of the knob, a restraining mechanism for holding the knob against inadvertent sliding movement comprising: an escutcheon plate adapted to be secured to the door and having an opening therethrough for receiving the doorknob shank; a spring extending around and frictionally engaging the shank of the knob under said escutcheon plate; and means fixed to the door and cooperating with said escutcheon plate for preventing longitudinal movement of the spring relative to the door, while permitting free rotational movement relative to the door, whereby the friction between the ring and the shank will retain the doorknob in any position to which it is positively manually moved.

2. In a door locking mechanism wherein a latch bolt may be locked or unlocked by sliding movement of the shank of a doorknob along the rotative axis of the knob, a restraining mechanism for holding the knob against inadvertent sliding movement comprising: an escutcheon plate adapted to be secured to the door and having an opening therethrough for receiving the doorknob shank; a spring extending around and frictionally engaging the shank of the knob under said escutcheon plate; and an inner member surrounding the shank and fixed to the door for cooperating with said escutcheon plate for preventing longitudinal movement of the spring relative to the door, while permitting free rotational movement relative to the door, whereby the friction between the ring and the shank will retain the doorknob in any position to which it is positively manually moved.

GEORGE B. SOLOVIEFF.
FRED J. RUSSELL.

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