July 9, 1935. W. R. SCHLAGE 2,007,350

DEMOUNTABLE KNOB AND CYLINDER LOCK

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Fig. 1.

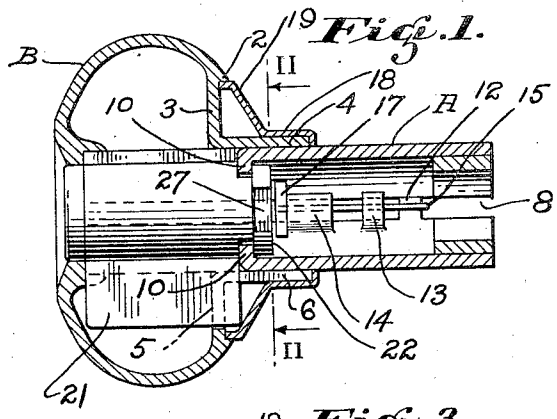


Fig. 2.

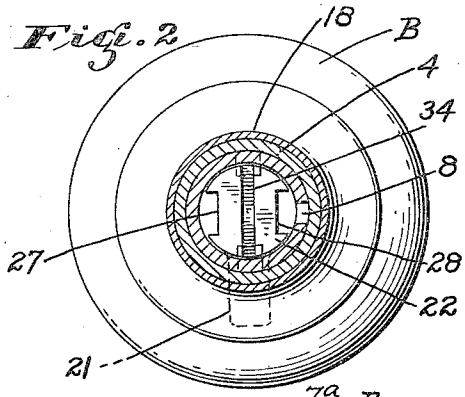


Fig. 3.

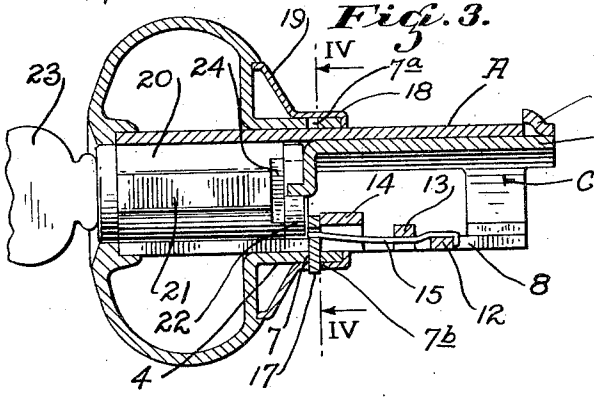


Fig. 4.

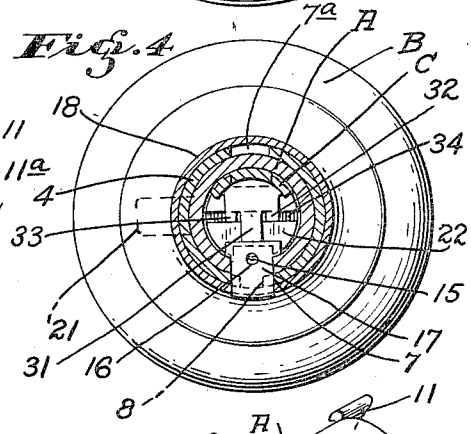


Fig. 5.

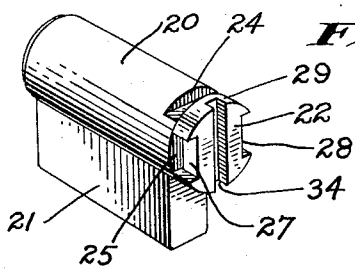


Fig. 6.

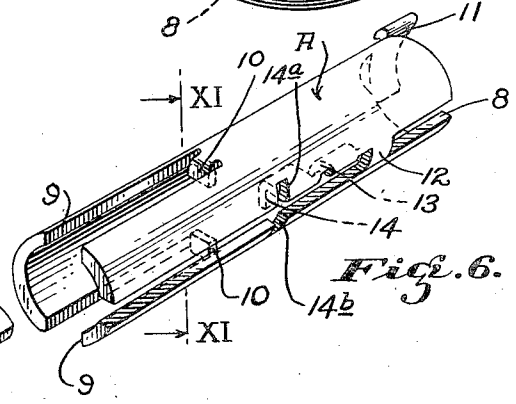


Fig. 7.

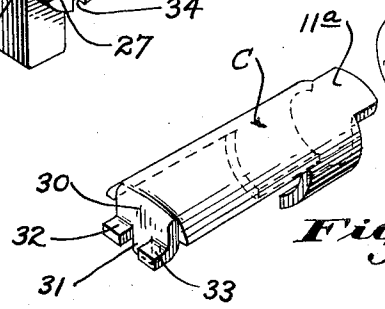
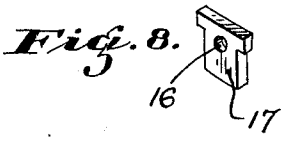


Fig. 8.



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Fig. 9.

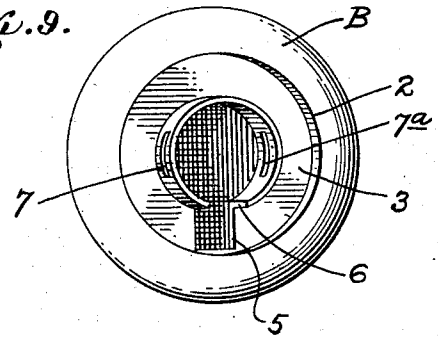


Fig. 10.

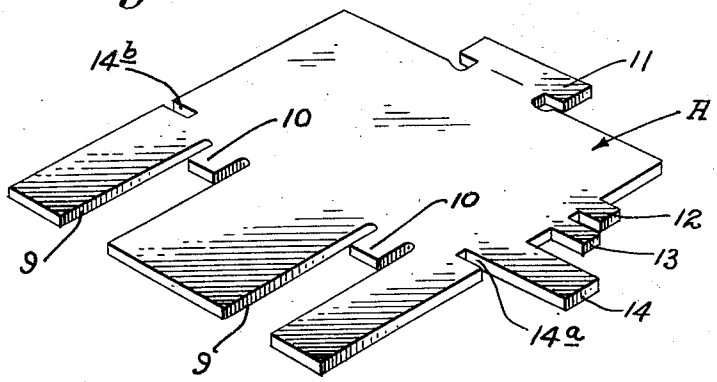
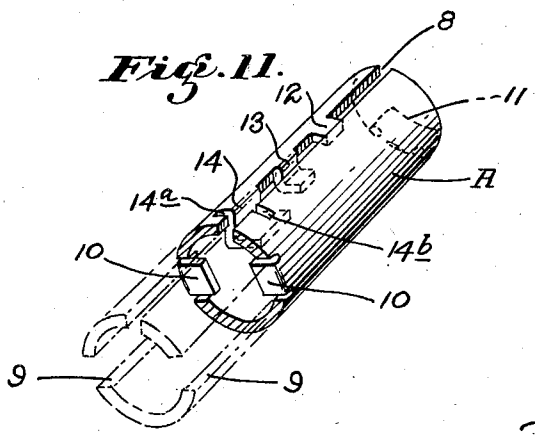


Fig. 11.



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UNITED STATES PATENT OFFICE

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DEMOUNTABLE KNOB AND CYLINDER LOCK

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Application January 9, 1929, Serial No. 331,322

10 Claims. (Cl. 70—91)

This invention relates to a demountable knob and cylinder lock for doorlocks and the like, and especially to a structure whereby the cylinder lock and the knob are removably secured and locked by key actuated mechanism with relation to the spindle of a door lock.

The object of the present invention is to generally improve and simplify the construction and operation of door locks; to provide a key actuated locking cylinder which is adapted to be secured and locked in the outer end of a spindle by means of a key actuated mechanism; to provide a key actuated locking cylinder which is reversible with relation to the spindle to fit right and left hand doors, and which is adapted to be locked against removal in either position by means of the key actuated mechanism; to provide a demountable knob for housing and enclosing the cylinder lock; to provide means for securing the knob against accidental removal, and further to provide means whereby said knob securing means may be locked by key actuated mechanism to prevent removal of the knob.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a central vertical longitudinal section of a door knob and spindle, said view showing a cylinder lock within the spindle,

Fig. 2 is a cross section taken on line II—II of Fig. 1,

Fig. 3 is a section similar to Fig. 1 but taken at right angles thereto,

Fig. 4 is a cross section taken on line IV—IV of Fig. 3,

Fig. 5 is a perspective view of the cylinder lock,

Fig. 6 is a perspective view of the main spindle,

Fig. 7 is a perspective view of the auxiliary spindle,

Fig. 8 is a perspective view of the knob securing latch member,

Fig. 9 is a perspective view of the inner end of the knob,

Fig. 10 is a perspective view of the blank from which the main spindle is formed,

Fig. 11 is a perspective view of the main spindle, said view being partially in section, and the section being taken on line XI—XI, Fig. 6.

Referring to the drawings in detail, particularly Figs. 1, 5, 6 and 7, A indicates a tubular spindle upon which is mounted a knob B. The knob may be cast, or otherwise formed. On the inner face of the knob is an annular recess or shoulder 2, and a vertical disc shaped face 3 which terminates in the hub member 4. The disc is slotted, as indicated at 5 and the hub is slotted longitudinally, as indicated at 6. The hub is also provided with a pair of circumferential or oppositely disposed slots, indicated at 7 and 7a, for purposes hereinafter to be described. The spindle is formed from a blank, such as shown in Fig. 10. This blank is rolled or formed into a tubular spindle such as shown in Figs. 6 and 11, and when so rolled, a longitudinal slot is formed, as indicated at 8. A second pair of slots are formed, as indicated at 9 and the inner ends of these slots terminate in inwardly projecting lugs 10. The inner end of the spindle is provided with a roll-back member 11, and one edge of the blank is provided with three lugs, such as indicated at 12, 13 and 14. These lugs are clearly shown in Figs. 6, 10 and 11.

When the plate, or blank shown in Fig. 10 is rolled or formed, the longitudinal slot 8 is first produced and the lugs 12, 13 and 14 are then bent to assume the position shown in Fig. 11, the lugs forming a support and retainer for a spring wire 15. This wire is hook-shaped at one end, as shown at 16 to engage the under surface of the lug 12. It passes over or on top of the lug 13 and the opposite end of the spring is then passed through a perforation 16, which is formed on the latch member 17. This latch member is guided by the forward surface of the lug 14 and by slots 14a and 14b formed in opposite sides of the slot 8, the latch member being best illustrated in Fig. 8.

The latch member serves the function of securing the knob against endwise movement on the spindle, and for this reason normally projects through one or another of the slots 7 or 7a formed in the hub of the knob, and which also projects through a slot 7b formed in the hub portion 18 of an inner cover plate 19. If it is desired to release the inner cover plate and the knob so as to permit removal of the knob with relation to the spindle it is only necessary to depress the latch member 17, by means of a screw driver or the like. When the latch member is so depressed the knob and inner cover may be removed by sliding them longitudinally on the spindle.

The main spindle also serves as a support and retainer for a cylinder lock, such as shown in Fig. 5. The cylinder lock illustrated may be one or another of the pin tumbler types. It consists of a cylindrical housing 20, provided with a rectangular extension 21 which houses the spring actuated pin tumblers. It is also provided with the usual cylinder plug, not shown, and a cam plate 22 which is adapted to be rotated thereby.

The front end of the plug is provided with the usual key opening, through which the key may be inserted, such as shown at 23, and when the key is inserted and rotated, cam plate 22 will also be rotated as it is attached to the plug. The exterior diameter of the cylinder lock 20 is equal to the interior diameter of the tubular spindle A, hence it may be inserted endwise in the outer end of the spindle. When so inserted the housing extension 21 will project through one or another of the longitudinal slots 9 formed in the spindle, and as there are two slots 9 it is possible to reverse the cylinder lock so as to fit right or left hand doors.

In order to secure the cylinder lock against removal with relation to the spindle, the lugs 10 are provided. These lugs abut the inner shoulder 24 of the cylinder lock, and the end 25 of the housing extension 21 when the cylinder lock is inserted, and the lugs form an interlock with the shoulders of the cam plate 22 when this is rotated to assume the position shown in Figs. 1 and 5. That is, the cam plate 22 is provided with two opposite recesses or slots, such as shown at 27 and 28. When these slots align with the shoulder 24 and the end 25 of the housing, lugs 10 will pass through the slots 27 and 28 and will abut the shoulders 24 and 25 and when the cam plate is rotated 90°, the portions of the cam plate indicated at 29 will engage the lugs 10 and the cylinder lock is thus secured against endwise removal with relation to the spindle.

The cylinder lock, as previously stated, is key actuated and it serves three main functions, first that of locking the cylinder lock against removal with relation to the spindle A, secondly that of locking the spring actuated latch member 17 against depression, and third that of actuating an auxiliary spindle such as shown at C in Fig. 7. This spindle is mounted within the main spindle and it is provided with a roll back 11*a* at one end which functions in the same manner as the roll back 11. The inner end of the auxiliary spindle is provided with a down-turned end 30 on which is formed a down-turned central lug 31 and a pair of right angular lugs 32 and 33. The lugs 32 and 33 project into a slot 34 formed in the cam plate 22, while the lug 31 normally assumes a position in alignment with the inner end of the spring latch member 17. Hence, when the key actuated mechanism in the cylinder lock and the cam plate 22 assumes a locked position lug 31 aligns with the spring latch member 17, thereby securing said latch against depression, and the knob against removal. At this time the lugs 10 are also locked, and key actuated means have hence been provided whereby the cylinder lock and the knob are locked against removal with relation to the spindle. If the key is inserted and the cam plate rotated, a rotary motion will be transmitted through the slot 34, and lugs 32 and 33 to rotate the auxiliary spindle C, hence making it possible to open the door by means of the key and the rollback 11*a*.

The locking mechanism illustrated is particularly intended for apartment houses, office buildings, flat apartments and the like where it is desirable to facilitate changes in the keying of a single lock or a group of locks, when tenant changes occur. To provide for such changes, the janitor or the superintendent may be provided with an extra supply of cylinder locks, at small expense, which may be interchanged from time to time, or he may merely remove a cylinder lock and change the combination.

When an apartment is rented to a new tenant he naturally wants to feel sure that the door cannot be opened by a key that a former tenant or one of his employees has carried away with him. He receives this assurance when the superintendent or janitor detaches the knob and either replaces the cylinder lock, or changes the combination thereof and then gives the tenant a new key which will only operate the new combination.

The method of accomplishing the change will be as follows:

The building superintendent inserts the key 23 and rotates the cam plate until the lug 31 moves out of alignment with the spring latch member 17. He then depresses the spring latch 17 by means of a screwdriver or the like, thus making it possible to remove the knob and the inner cover 19. After the knob has been removed, he again inserts the key and rotates the cam plate until the notches 27 and 28 register with the lugs 10. He then pulls outwardly on the key and as the interlock between the cylinder and the lugs 10 has been broken, the cylinder will be removed from the spindle. He may replace the cylinder with a new one, or he may change the combination of the tumblers. When this is accomplished it is reinserted and locked in position with relation to the lugs 10 by slightly turning the cam plate 22. He next applies the inner plate 19 and the knob and when the slots 7 and 7*b* register with the spring latch member, this will be automatically projected and will secure the knob and inner plate against endwise movement. Further rotation of the cam plate will bring the lug 31 into alignment with the spring latch member, and it is then key locked against depression. Hence, it will be impossible for any one unauthorized to either remove the knob or the cylinder lock without possession of the proper key. It will furthermore be noted that a master key becomes entirely unnecessary and may be dispensed with.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims, similarly, that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination with the spindle in a lock of a knob on the spindle, a depressible latch member for securing the knob on the spindle, and rotatable key actuated means for locking the latch member against release.

2. The combination with the spindle in a lock of a knob on the spindle, a releasable latch carried by the spindle and extending radially through a shank on the knob to secure the knob against endwise removal from the spindle, and means securing the latch against release.

3. The combination with the spindle in a lock of an endwise removable knob on the spindle, a releasable latch member securing the knob against endwise removal from the spindle and key actuated means for locking the latch member against release.

4. The combination with a spindle in a lock of a lock housing insertible in the spindle, and key actuated means in said housing for locking the housing against removal with relation to the spindle.

5. The combination with a spindle in a lock of

a lock housing insertible in the spindle, said housing being reversible with relation to the spindle, and key actuated means in said housing for locking the housing against removal with relation to the spindle in either of its positions.

6. The combination with a spindle in a lock of a lock housing insertible in the spindle, a demountable knob on the spindle and enclosing the spindle and the lock housing, releasable means securing the knob against removal from the spindle and key actuated means in the lock housing for locking the releasable means against release.

7. The combination with a spindle in a lock of a lock housing insertible in the spindle, a demountable knob on the spindle and enclosing the spindle and the lock housing, releasable means securing the knob against removal from the spindle, key actuated means in the lock housing for locking the releasable means against release, and the lock housing against removal with relation to the spindle.

8. In a device of the character described a tubular spindle, a cylinder lock insertible in one end of the spindle, a cam member on the cylinder, a lug on the spindle with which the cam is adapted to be interlocked, and key actuated means in the cylinder for turning the cam into or out of engagement with relation to the lug to lock or release the cylinder lock with relation to the spindle.

9. The combination with a spindle and a lock and a knob on the spindle, of a lock housing disposed within the knob, a radially depressible latch member normally engaging the knob and securing the knob and the lock housing against endwise removal from the spindle, said latch member being accessible from the exterior of the knob, and key actuated means whereby rotation of the key to a predetermined position will render the latch member depressible from the exterior of the knob and the knob and lock housing removable.

10. The combination with a tubular spindle in a lock, of an endwise removable knob on the spindle, a depressible latch member normally securing the knob against endwise removal from the spindle, said latch member being depressible from the exterior of the knob, and selective means in the spindle cooperating with the latch member whereby manipulation of said selective means will render the latch member either depressible or not depressible.

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