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1,489,675

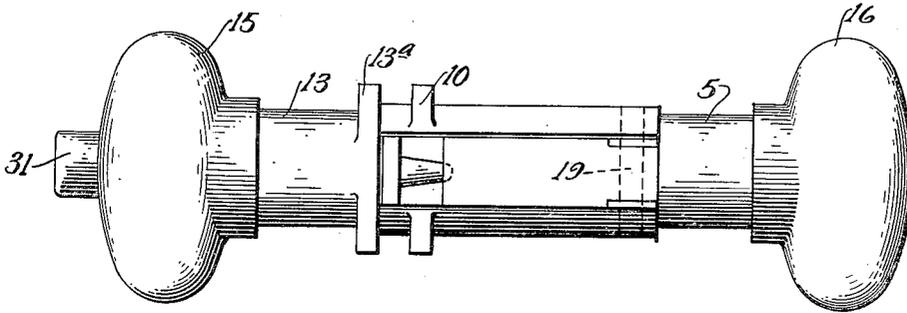
W. R. SCHLAGE

DOOR LOCK

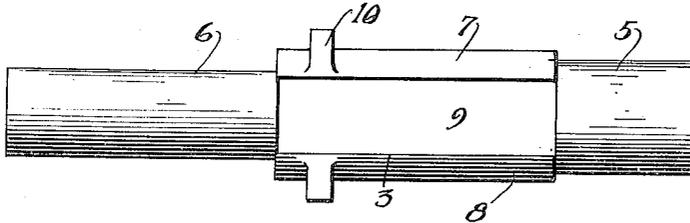
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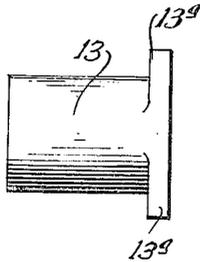
*Fig. 3*



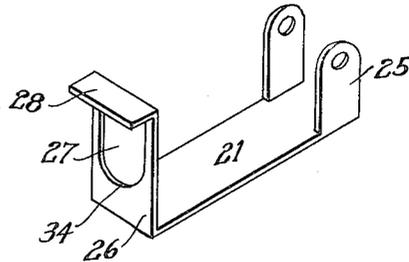
*Fig. 4*



*Fig. 5*



*Fig. 6*



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## DOOR LOCK.

Application filed October 5, 1920. Serial No. 414,779.

*To all whom it may concern:*

Be it known that I, WALTER R. SCHLAGE, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented a new and useful Improvement in Door Locks, of which the following is a specification.

This invention relates to a door lock, and especially to improvements over the structure shown in Patent No. 1,313,920, entitled "Door locks," issued to me May 26, 1919.

One of the objects of the present invention is to provide a simple, substantial and cheaply manufactured keyless locking mechanism turnable from the inside of a door only, and so constructed and applied that it will visibly indicate whether or not the door is locked.

Another object of the invention is to provide a locking mechanism of the character described which is adapted to be placed in the spindle of the lock and actuated by a push button carried by the inner knob; further a locking mechanism which will secure the exterior knob against turning movement and the latch or bolt against retraction.

Another object of the invention is to provide a locking mechanism which is locked by the mere depression of the push button, and which may be automatically restored to normal or unlocked position by turning the inner knob.

Further objects will hereinafter appear.

The invention consists of the parts and the construction, combination and arrangement of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Fig. 1 is a central vertical longitudinal section through the lock.

Fig. 2 is a section on line 2—2, Fig. 1.

Fig. 3 is a detail view of the spindle sections assembled.

Fig. 4 is a detail view of the outer spindle section.

Fig. 5 is a detail view of the inner spindle section.

Fig. 6 is a perspective view of the trip plate.

Referring to the drawings in detail, A indicates a standard form of lock housing, 2 a latch carried thereby, 3 a spindle journaled in the lock and extending there-through, and 4 a latch plate which is

adapted to be engaged by the spindle to retract the latch. The spindle proper consists of two sections, such as indicated in Figs. 4 and 5. The section shown in Fig. 4 will hereinafter be known as the outer spindle, and the section shown in Fig. 5 as the inner spindle. The outer spindle consists of a pair of tubular end sections 5 and 6 and an intermediate section which consists of a pair of plates 7 and 8. These plates are suitably secured between the tubular sections 5 and 6, and are interspaced to form a recess or pocket 9 for the reception of a locking mechanism hereinafter to be described. The plates 7 and 8 are each provided with a lug 10, which are adapted to engage lugs 11 formed on the latch plate 4; the lugs 11 being formed on arms 12 extending along each side of the lock housing as shown in Fig. 2. The inner spindle section consists of a tube 13, on which is formed a pair of lugs 13<sup>a</sup>. These lugs are also adapted to engage the latch plate lugs 11, and their function will hereinafter be described.

The inside diameter of the tube section 13, is sufficiently large to slip over the tubular section 6 on the outer spindle, and it is turnably mounted thereon; the knob 15 being secured however by a screw 14. The outer spindle also carries a knob as indicated at 16, which is secured to the tubular section 5 by means of a screw 17.

To provide sufficient room for the intermediate section of the outer spindle or that space occupied by the plates 7 and 8, a cylindrical enlargement 18 has been formed on the lock housing. Extending through the side plates 7 and 8, and secured therein is a pivot pin 19 upon which is mounted a locking bar 20 and a trip plate 21; the locking bar and tripping plate being connected by means of a spring 22. The locking bar merely consists of a flat plate which is adapted to be projected outwardly by means of a cone-shaped wedge member 23. The bar 20 when projected passes between a pair of lugs 24 formed on the cylindrical extension of the lock housing, and when so projected serves the function of locking the outer spindle and the knob carried thereby against rotation.

The trip plate consists of a pair of lugs 25 which are perforated at their upper ends to receive the pin 19. It further consists of

the plate 21, (see Figs. 1 and 6) and an upwardly extending plate 26, the front portion of which is cut away as at 27 to permit the cone shaped wedge to pass therethrough. It is furthermore provided with a shoulder 28, which is adapted to be engaged by a trip pin 29, carried by the latch.

The normal position assumed by the trip plate 21 and the locking bar 20, is that indicated in Fig. 1. This position is assumed when the cone-shaped wedge 23 is retracted. This wedge is secured to a pin 30 on the outer end of which is mounted a push button 31; the pin 30 being centrally disposed within the tubular extension 6 of the outer spindle and supported therein by a bearing plate 32. A spring 33 is interposed between this plate and the push button 31, and this serves the function of normally retaining the push button in projected position and the wedge 23 in retracted position.

It must be remembered that the present lock is a keyless lock and that it is operated from the interior only, hence the provision of the push button 31 on the inner knob. If a person enters a room and desires to lock the door so that no one may enter from the outside, it is only necessary to push inwardly on the button 31. This forces the wedge 23 forward until the rear end of the wedge passes beyond a shoulder 34 formed on the trip plate. The trip plate is depressed during the inward movement of the wedge, but it raises a sufficient distance to engage the rear side of the wedge when this has been projected, thus locking the wedge and push button against retraction. The locking bar 20 is at the same time projected between the lugs 24, due to the engagement of the wedge 23 with the lower inclined face 20<sup>a</sup> formed on the locking bar. Such projection immediately locks the outer spindle and the knob 16 carried thereby against rotation, and it will thus be impossible for any one on the outside of a door to open the same as no key mechanism is provided, and as it is impossible to turn either the knob or the spindle. If it is desired to unlock the door from the inside, it is only necessary to grasp the knob 15 and turn the same. This is possible as the tubular section 13 is freely turnable on the tubular section 6 of the outer spindle. Turning movement transmitted by means of the knob 15 to the tubular section 13 will cause the lugs 13<sup>a</sup> on the tube to engage the lugs 11. The latch 2 will in this manner be retracted and the tripping pin 29 carried by the latch will at the same time move inwardly and engage the shoulder 28 on the tripping plate, thereby depressing the tripping plate a sufficient distance to release the shoulder 34 with relation to the wedge. This when released will of course be immediately retracted by the action of the spring 33 and the push

button will be restored to normal position, the spring 22 will at the same time function as it will retract the locking bar and return the tripping plate 21 to normal position. The outer spindle is now released and turning movement may be transmitted thereto as the door may be opened from the outside by merely turning the knob; such turning movement will be transmitted through the tubular section 5 and the tubular section 6. They are connected with the first named tubular section by means of the side plates 7 and 8. These will therefore turn in unison and the lugs 10 formed on the side plates will then engage the lugs 11 and retract the latch; the latch being projected whenever the door knob is released, whether it be the inner knob or the outer knob, by a spring 40, surrounding the trip pin 29 and interposed between the latch and a bearing lug 41 formed in the lock housing.

The entire locking mechanism is mounted in the outer spindle section and that such may turn in unison with the same when the knob 16 is turned. This is due to the fact that the entire locking mechanism is centrally positioned with relation to the inner spindle, and also due to the fact that the wedge member 23 is cone-shaped and always projects part way through the opening 27 formed in the part 26 of the tripping plate 21.

From the foregoing it can first be seen that a keyless lock has been provided whereby retraction of the latch may be prevented, and similarly turning movement of the exterior knob and spindle; second, that the lock can only be actuated from the inner side of the door and that such can not be tampered with or opened from the exterior; third, that when the lock is in released position, the latch may be retracted by the operation of either spindle as they are turnable independent of each other and as each is provided with lugs engageable with the lugs 11 of the latch plate; fourth, that the push button 31 provides a means which visibly indicates whether or not the lock is locked, for instance when a person is within a room and wonders whether he or she forgot to lock the door, it is only necessary to look at the knob. If the push button stands in projected position, the person will know that the door is unlocked; conversely when the end of the button is flush with the knob or in other words depressed, it is obvious that the door is locked. A person may therefore readily determine by merely glancing at the knob whether or not the door is locked; fifth, the locking mechanism provided is simple, cheap to manufacture, may be readily installed in practically any form of lock, and is so substantial that the danger of breakage is very remote.

While certain features of the present in-

vention are more or less specifically illustrated, I wish it understood that various changes in form and proportion may be resorted to within the scope of the appended claims, similarly that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or varying uses may demand.

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

1. The combination with the latch in a lock and the spindle whereby it is actuated, of an inner and an outer knob on the spindle, and means carried by the inner knob for locking the outer knob against turning, said means leaving the inner knob free to turn.

2. The combination with the latch in a lock and the spindle whereby it is actuated, an inner and an outer knob on the spindle, a push button in the inner knob, and means actuated by said push button for locking the outer knob against turning and the latch against retraction, said locking means leaving the inner knob free to turn.

3. The combination with the latch in a lock and the spindle whereby it is actuated, an inner and an outer knob on the spindle, means carried by the inner knob for locking the outer knob against turning and the latch against retraction said means leaving the inner knob free to turn, and means actuated by a turning movement of the inner knob for releasing the locking mechanism, and means for releasing the locking mechanism by depression of the latch.

4. The combination with the latch in a lock and the spindle whereby it is actuated, of an inner and an outer knob on the spindle, a push button carried by the inner knob and adapted to be manually depressed, means actuated by said push button for locking the outer knob against turning, said push button and locking means leaving the inner knob free to turn, and means actuated by turning movement of the inner knob for releasing the locking mechanism.

5. The combination with the latch in a lock and the spindle whereby it is actuated, of an inner and an outer knob on the spindle, a push button carried by the inner knob and adapted to be manually depressed, means actuated by said push button for locking the outer knob against turning, said push button and locking means leaving the inner knob free to turn, means actuated by turning movement of the inner knob for releasing the locking mechanism, and means for automatically projecting the push button when the locking mechanism is released.

6. In a lock of the character described, a housing, a latch mounted therein, a divided spindle consisting of an inner and an outer section, a knob on each section, said sections

being turnable independent of each other, means on each spindle for retracting the latch, means on the inner spindle for locking the latch against retraction by means of the outer spindle, and for simultaneously locking the outer spindle against rotation, and means in the inner knob for actuating said locking mechanism, said means visibly indicating whether or not the latch is locked.

7. In a lock of the character described, a housing, a latch, a divided spindle consisting of an outer section and an inner section each turnable independent of the other, means on each spindle for retracting the latch, a locking bar carried by the outer spindle, lugs in the housing with which said bar is engageable to secure the outer spindle against turning movement and the latch against retraction thereby, and means for projecting the locking bar.

8. In a lock of the character described, a housing, a latch, a divided spindle consisting of an outer section and an inner section each turnable independent of the other, means on each spindle for retracting the latch, a locking bar carried by the outer spindle, lugs in the housing with which said bar is engageable to secure the outer spindle against turning movement and the latch against retraction thereby, means for projecting the locking bar, and means actuated by turning movement of the inner spindle for retracting the locking bar.

9. In a door lock the combination with the latch and the spindle whereby it is retracted, of a locking mechanism carried by the spindle, a knob on the spindle, and means in the knob for actuating the locking mechanism, said means adapted to be automatically released to unlock the locking mechanism by turning movement of the knob.

10. In a door lock a spindle consisting of two sections each turnable independent of the other, a locking mechanism carried by one of the spindle sections adapted to secure said spindle section against turning movement, and means actuated by the other spindle section for releasing the locking mechanism when locked.

11. In a door lock a spindle consisting of two sections each turnable independent of the other, a locking mechanism carried by one of the spindle sections adapted to secure said spindle section against turning movement, and means actuated by turning movement of the other spindle section for releasing the locking mechanism when locked.

12. In a door lock a spindle consisting of two sections each turntable independent of the other, a locking mechanism carried by one of the spindle sections adapted to secure said spindle section against turning movement, a knob on each spindle section, means on one knob for locking the locking

mechanism, and means actuated by turning movement of said knob and attached spindle section for releasing the lock.

8 13. In a lock of the character described, a  
 9 housing, a spindle turnably mounted in the  
 10 housing, said spindle consisting of two sec-  
 11 tions turnable independent of each other, a  
 12 latch adapted to be retracted by either  
 13 spindle section, a locking bar pivotally  
 14 mounted in one spindle section, lugs in the  
 15 lock housing between which the locking bar  
 16 enters when in locked position, a trip plate  
 17 also mounted in the same spindle section, a  
 18 wedge interposed between the locking bar  
 19 and the trip plate to separate the same,  
 20 means on the tripping plate for locking the  
 21 wedge against retraction when projected, a  
 22 knob on the other spindle section, and means  
 23 actuated by turning movement of said knob  
 24 and attached spindle for depressing the trip-  
 25 ping plate to release the wedge.

26 14. In a lock of the character described a  
 27 housing, a spindle turnably mounted in the  
 28 housing, said spindle consisting of two sec-  
 29 tions turnable independent of each other, a  
 30 latch adapted to be retracted by either  
 31 spindle section, a locking bar pivotally  
 32 mounted in one spindle section, lugs in the  
 33 lock housing between which the locking bar  
 34 enters when in locked position, a trip plate  
 35 also mounted in the same spindle section, a  
 36 wedge interposed between the locking bar  
 37 and the trip plate to separate the same, means  
 38 on the tripping plate for locking the wedge  
 39 against retraction when projected, a knob on  
 40 the other spindle, a push button projecting  
 41 through said knob, a rod on said push but-  
 42 ton to which the wedge is secured, a pin at-  
 43 tached to the latch and engageable with the  
 44 tripping plate to depress the same and to  
 45 release the wedge, and a spring connecting  
 46 the tripping plate and the locking bar.

15. The combination with the latch in a  
 47 lock and the spindle whereby it is actuated,  
 48 of an inner and an outer knob on the spindle,  
 49 a push button carried by the inner knob,  
 50 means actuated by said push button for lock-

ing the outer knob against turning, and  
 means actuated by depression of the latch  
 for releasing said locking means. 50

16. The combination with the latch in a  
 lock and the spindle whereby it is actuated,  
 of an inner and an outer knob on the spindle,  
 a push button carried by the inner knob,  
 means actuated by said push button for lock- 55  
 ing the outer knob against turning, means  
 actuated by depression of the latch for re-  
 leasing said locking means, said push button  
 adapted to be manually depressed, means for 60  
 retaining the push button in a depressed po-  
 sition after the locking mechanism has been  
 locked, and means for automatically pro-  
 jecting the push button when the locking  
 mechanism is released.

17. A lock comprising a rotatable spindle, 65  
 a latch normally projecting from the edge of  
 the door, and connecting means between the  
 spindle and the latch whereby rotation of  
 the spindle will retract the latch, means for  
 locking the spindle against rotation, and 70  
 means actuated by depression of the latch  
 for releasing said locking means.

18. The combination with the latch in a  
 lock and the spindle whereby it is actuated,  
 of an inner and an outer knob on the spindle, 75  
 a push button in the inner knob, means actu-  
 ated by depression of the push button for  
 locking the outer knob against turning and  
 the latch against retraction, means for pro-  
 jecting the push button, and means actuated 80  
 by turning movement of the inner knob re-  
 leasing the push button and to permit it to  
 be projected, said turning movement of the  
 inner knob also releasing the means where-  
 by the outer knob is locked against rotation 85  
 and the latch against retraction.

In testimony whereof I have hereunto  
 set my hand in the presence of two subscrib-  
 ing witnesses.

WALTER R. SCHLAGE.

Witnesses:

JOHN H. HERRING,  
 W. W. HEALEY.