May 16, 1933. A. C. BROWN, 3D 1,909,453

LOCKING MECHANISM

Filed Feb. 15, 1932

Fig. 2

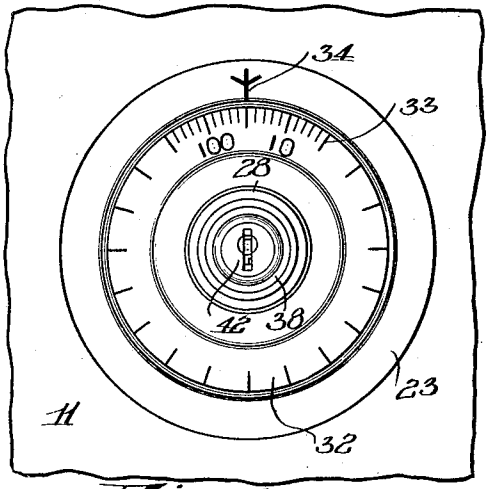


Fig. 3

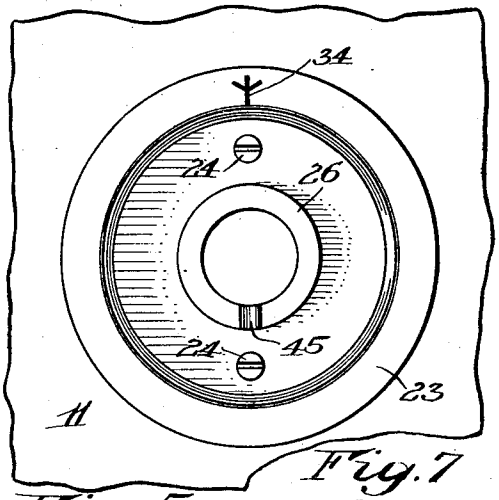


Fig. 7

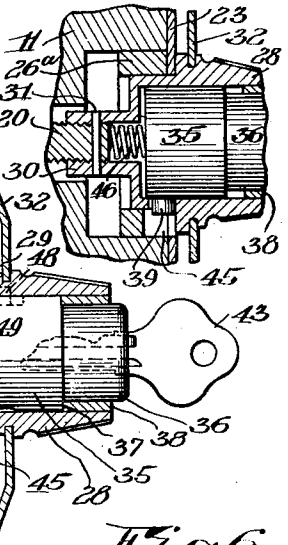


Fig. 4

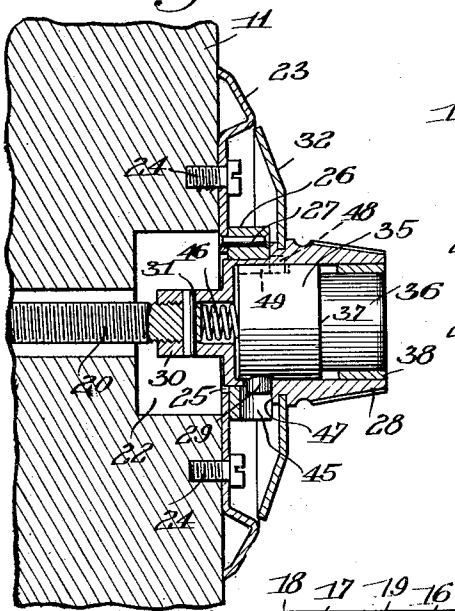


Fig. 5

Fig. 6

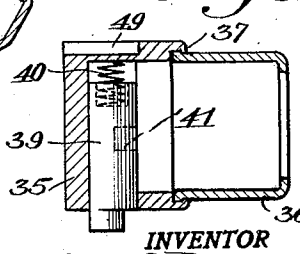
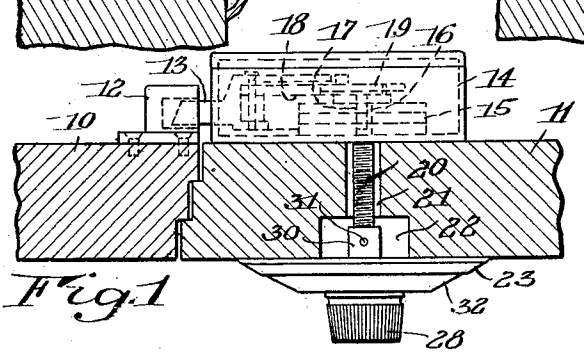


Fig. 1



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UNITED STATES PATENT OFFICE

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LOCKING MECHANISM

Application filed February 15, 1932. Serial No. 592,978.

The present invention relates to locking mechanism for protecting various types of doors, closures and the like and has for one object to provide improved mechanism of this class which can be conveniently controlled and operated and which is designed to insure a high degree of protection while at the same time affording a simple, comparatively inexpensive and efficient arrangement of locking parts.

A further object of the invention is to provide locking mechanism for securing a combination or other type of lock against operation which is designed to be locked without the use of a key.

A further object of the invention is to provide a combined key lock and operating device for a combination or other type of lock for protecting the doors or closures of safes and the like designed to economize in the number of parts employed and to permit the parts to be assembled relatively close together in order to reduce to a minimum the space occupied by the same upon the wall of the closure as well as to make it difficult to obtain access to the safe by attempting to break off the operating device.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawing:

Fig. 1 is a fragmentary sectional plan embodying the invention;

Fig. 2 is a front elevation of the operating dial and associated parts shown in Fig. 1;

Fig. 3 is a view similar to Fig. 2 with the operating dial removed;

Fig. 4 is a fragmentary section drawn to an enlarged scale and taken on the axis of the spindle with the key lock shown in locking position;

Fig. 5 is a similar view with the key lock shown moved to release position;

Fig. 6 is a longitudinal section through the key lock housing showing the bolt with the operating parts therefor removed, and

Fig. 7 is a fragmentary sectional elevation of a modified mounting for the dial.

The same reference numerals throughout the several views indicate the same parts.

Referring to the drawing, 10 represents the side wall of a receptacle or container such, for example, as a safe or the like and 11 a door or closure therefor. On the inner wall of the receptacle is provided a keeper 12 for the door-locking bolt 13 which is suitably supported and guided preferably in a casing 14 mounted on the inner face of the door or closure. The lock within the casing may be of any well known type such as a combination lock and in the present embodiment includes a plurality of tumblers 15 having the usual notches 16 for receiving the pin 17 of the lever 18 which is pivotally connected with the bolt and arranged to operate the same. The lever is operated to release position by a cam disk 19 or other suitable means on a spindle 20 extending through an opening 21 within the door which terminates in an enlarged recess or pocket 22 provided for a purpose hereinafter described. The casing is suitably secured to the door by means, not shown, which is accessible only when the door is open.

A dial ring in the form of a suitable plate member 23 is connected with the closure by means of the screws 24 or otherwise as preferred. The plate member has a central opening 25 and includes a bearing 26 which may be integral with the plate or in the form of a separate annular ring rigidly secured to the plate in any suitable manner as, for example, by a plurality of rivets 27 whereby the bearing is made a permanent part of the plate.

The spindle operating member may be formed in any desired manner but is preferably in the form of a dial having a knob-like portion 28 the inner end of which is rotatably received within the bearing 26 as shown in Figs. 4 and 5. The dial is provided with a shoulder 29 seated on the outer face of the bearing to hold the dial and spindle against inward movement. The dial has an extension 30 which projects into the re-

cess 22 of the closure and the spindle is inserted within said extension and secured against turning therein by a pin 31. It will be understood that outward movement of the dial is prevented by the connection between the inner end of the spindle and the tumbler operating disk 19 of the combination lock shown by dotted lines within the casing 14 attached to the closure 11, Fig. 1. The operating dial preferably includes the usual plate member 32 having thereon any suitable scale 33 for cooperation with the index 34 on the bearing plate 23 as shown in Fig. 2.

The key lock may be of any preferred type such for example as a pin tumbler lock, the operating parts of which, not shown, are mounted in a suitable housing comprising in the present instance the inner and outer sections 35 and 36, the former having a shoulder 37 arranged when the key lock is in its outermost or unlocked position to engage a ring 38 suitably anchored in the recessed portion of the dial, Fig. 5. The section 35 of the housing carries a bolt 39 normally held in the locking position shown in Figs. 4 and 6 by a spring 40. The bolt is recessed at 41 to receive an operating portion of the key lock, not shown, which may be in the form of a stud eccentrically mounted on a rotary part of the lock such as the cylinder 42, shown in Fig. 2, arranged to be rotated by the key 43 inserted therein. The bolt when in locking position extends through an opening 44 in the wall of the dial and projects into a notch or recess 45 in the bearing 26, the sides of the notch forming abutments for engagement by the bolt to prevent rotation of the dial in either direction in order to prevent operation of the spindle and the combination lock associated therewith.

When the bolt is retracted by successful operation of the key lock it lies entirely within the dial and the lock, including the bolt, is then moved bodily to the outer position shown in Fig. 5 by a spring 46 preferably disposed within the extension 30 of the dial and having its inner end seated on the end of the spindle as shown in Figs. 4 and 5. The key lock is limited in its outward movement by the ring 38 anchored within the dial knob. When it is desired to lock the closure this can be done without the use of the key by pushing the key-lock inwardly against the action of the spring 46 until the bolt is moved to a position opposite the slot 44 in the dial at which time the spring 40 will shift the bolt to the locking position shown in Fig. 4 in which the bolt and the lock are prevented from moving outwardly by an abutment 47 on the dial.

It will thus be seen that by turning the dial while in the position shown in Fig. 5 to destroy the combination that the spindle can be quickly locked against rotation merely by pushing the key lock inwardly following which the bolt 39 will be moved automatically to locking engagement with the ring or bearing 26 so that the combination cannot again be operated until the key 43 is used to release the bolt 39.

The housing of the key lock, which is cylindrical in form, is prevented from turning within the dial by means of a pin or stud 48 carried by the dial and projecting within a slot 49 formed in the portion 35 of the key lock housing. The pin is preferably applied by inserting it through the dial and within a recess formed therein which is done before placing the key lock within the dial.

The modification shown in Fig. 7 embodies substantially the same parts as that shown in Figs. 4 and 5 except that the combined bearing and locking ring 26 is placed at the inner side of the plate 23 and within the pocket 22 of the closure. This arrangement permits the dial or other spindle operating member to be further extended within the closure so that any lateral thrust upon the dial resulting from an attempt to break it off will be taken directly and principally by the wall of the closure and independently of the plate 23. In this construction the combined locking ring and bearing 26*a* can either be attached to the dial by rivets as shown in Fig. 5 or be otherwise secured within the pocket 22, as by the welding or shrinking process, whereby it becomes substantially an integral part of the closure. With this arrangement the shoulder 29 of the dial is shown seated on the plate 23, but if preferred the plate may be cut away to permit the shoulder to seat directly on the bearing member 26*a*. The remaining parts of the modified arrangement are substantially the same as those shown in Fig. 4 and have therefore been given the same reference characters.

In either arrangement the recess or pocket 22 in the wall of the closure permits a considerable portion of the operating member to be enclosed therein thus reducing the extent to which said member projects beyond the outer face of the closure which results in a compact and efficient arrangement and one which is extremely difficult if not impossible to break off by the usual method employed by burglars in attempting to gain access to the safe.

The mounting of the bolt and the key lock within the dial and the utilization of the bearing both as means for receiving the dial and the bolt, together with the extension of the dial within the wall of the door constitutes certain of the advantages of the present construction, not to mention the convenience of having the key lock moved automatically to the outer or release position when unlocked and the bolt moved auto-

matically to locking position upon pushing inwardly on the key lock to return it to locking position.

To lock the dial it is only necessary to push the key lock to the innermost position and then turn the dial until the bolt is snapped into the recess of the bearing by the spring acting upon the bolt.

I claim:

1. In apparatus of the class described, a closure, a combination lock connected with one side of the closure, a dial plate secured to the opposite side of the closure and having a bearing formed thereon and provided with a recess in its walls, a spindle for operating the lock mounted within the wall of the closure, a recessed dial knob on the outer end of the spindle rotatably received in said bearing and operatively connected with the spindle, a key lock mounted within the recessed portion of the dial and free to move between predetermined securing and release positions therein, a bolt within the dial responsive to the key lock and arranged to extend into the recess of said bearing when the key lock is in securing position whereby to hold the spindle against operation, means arranged to automatically shift the key lock to release position upon retracting the bolt, and means for automatically moving the bolt to locking engagement with said bearing upon returning the key lock to securing position within the knob.

2. In apparatus of the class described, a closure, a combination lock connected with the inner side of the closure, a dial ring on the opposite side of the closure having a bearing provided with an abutment, a spindle for operating the lock extending within the wall of the closure, a recessed dial knob rotatably received in said bearing and having an extension projecting within the closure and connected with the outer end of the spindle, a key lock movable longitudinally within the knob between inner and outer locking and non-locking positions, spring means within the extension of the knob tending to urge the key lock to said outer position, a bolt located within and responsive to the key lock arranged to extend through the wall of the knob into locking engagement with the abutment of the bearing to hold the knob and spindle against rotation when the key lock is at said inner position, the key lock when the bolt is retracted being shifted by said spring means to said outer position, and means for automatically moving the bolt into locking engagement with the abutment upon returning the key lock to the inner locking position.

3. In apparatus of the class described, a closure, a combination lock connected with one side of the closure, a dial ring secured upon the opposite side of the closure and having an annular bearing thereon, a spindle for operating the lock mounted within the wall of the closure, a recessed knob on the outer end of the spindle including a dial, the inner end of the knob being extended within the bearing for rotation therein, a key lock mounted within the recess of the knob and arranged to be shifted between predetermined inner and outer positions therein, a bolt carried by the key lock movable through the wall of the knob into locking engagement with the bearing when the key lock is adjusted to said inner position and arranged to be retracted within the knob by successful operation of the key lock, means within the knob arranged to move the key lock to said outer position upon retracting the bolt, and means arranged to move the bolt to locking engagement with the bearing when the key lock is returned to said inner position.

4. Locking mechanism comprising a dial plate arranged for connection with a closure provided with an opening and having a bearing surrounding the opening, a spindle arranged at one side of the dial plate for the operation of a lock adapted for connection with the closure, a dial knob rotatably received within the bearing and having an extended portion projecting through the opening in the dial plate and connected with the spindle, a key lock mounted within the knob for movement between securing and release positions, a bolt within the knob arranged to project through the wall thereof into locking engagement with said bearing when the key lock is in securing position, spring means within the extended portion of the knob arranged to move the key lock to release position when the bolt is withdrawn from locking engagement with the bearing, and means for returning the bolt to locking position upon moving the key lock to securing position.

5. In apparatus of the class described, a closure having a pocket formed in the wall thereof, a bearing member anchored within the pocket and provided with an abutment, a recessed dial knob extending within the pocket and rotatably received within the bearing, a dial plate associated with the dial knob, a spindle connected with the knob and extending within the closure, a key lock movable within the knob between predetermined securing and release positions, means arranged when the key lock is unlocked to move it to said release position, a bolt within the knob associated with the key lock for engaging the abutment to hold the knob against rotation when the key lock is at securing position, and means for moving the bolt into locking engagement with the abutment when the key lock is returned to securing position.

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