May 16, 1933. W. F. DIESEL 1,909,393

LOCK

Filed April 9, 1930

Fig. 1

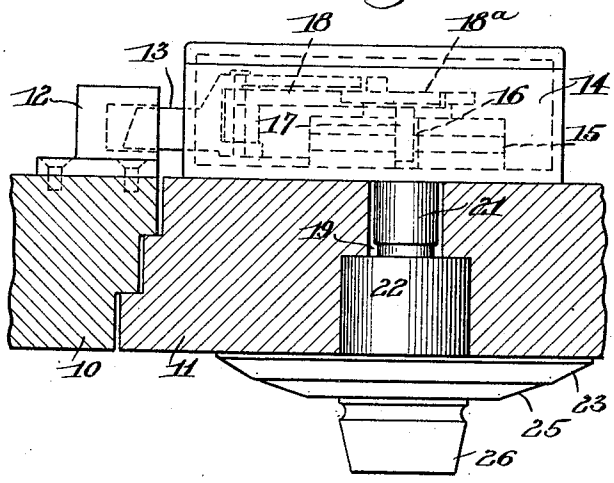


Fig. 2

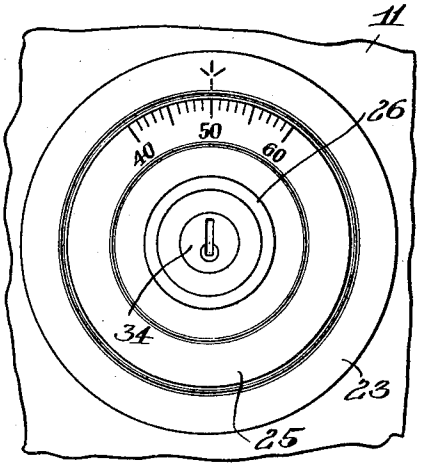


Fig. 3

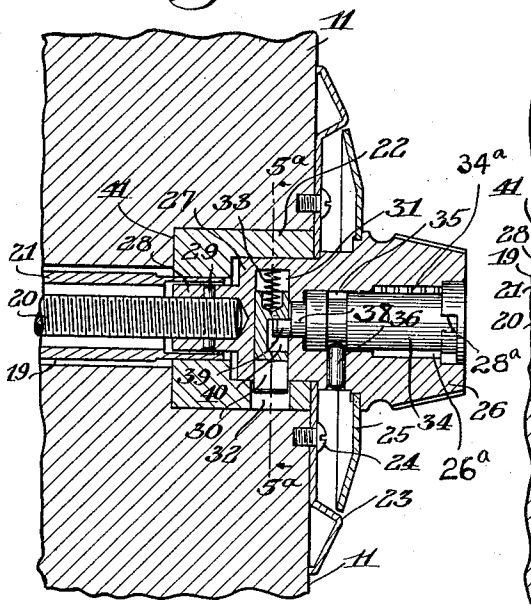


Fig. 4

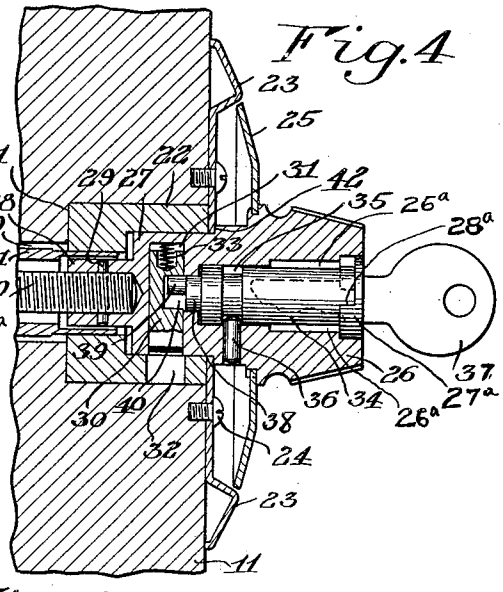


Fig. 5

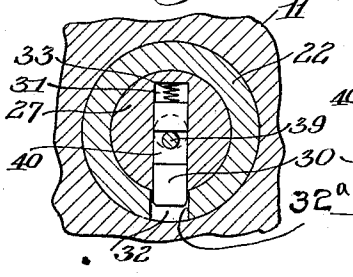
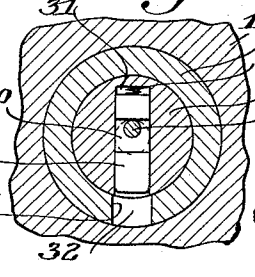


Fig. 6



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UNITED STATES PATENT OFFICE

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LOCK

Application filed April 9, 1930. Serial No. 442,929.

The present invention relates to locks for safe doors and the like and has for its object to provide an improved mechanism by which the lock is guarded or held against release by means requiring the use of a control element detachably associated with said means and which can be placed in the hands of a person entrusted with the control of the safe to prevent unauthorized persons from obtaining access to the contents thereof.

A further object of the invention is to provide in conjunction with a combination or other lock for safes, containers, and the like, an improved arrangement of parts by which access to the safe through an attempt to manipulate the combination is frustrated by preventing operation of the actuating element of the combination lock.

A further object of the invention is to provide an improved key controlled lock for guarding the combination locks of safe doors and the like and in which the locking element for protecting the combination lock and its keeper are isolated and anchored in such a manner as to make removal of the same extremely difficult.

A further object of the invention is to provide a locking element for the spindle or other operating part of a combination lock for safes and the like and to apply the same to the safe in such a manner that it will remain in locking position should the key lock for controlling the same be removed from its casing.

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 one form of the invention;

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

Fig. 3 is a fragmentary section drawn to an enlarged scale taken centrally through the lock and showing the spindle locking bolt in operative position;

Fig. 4 is a similar view showing the bolt released;

Fig. 5 is a transverse section taken on line 5*a*—5*a* of Fig. 3 with the bolt shown in locking position, and

Fig. 6 is a similar view showing the bolt moved to release position.

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

In the embodiment of the invention illustrated in the drawing, 10 represents a portion of a safe or other container and 11 the door or closure therefor. On the inner wall of the safe 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. The permutation or combination lock within the casing may be of any well known type and in the present embodiment includes a plurality of tumblers 15 having the usual notches 16 therein for receiving the pin 17 on the gate 18, which is pivotally connected with the bolt and arranged to operate the same, the gate being operated to release position by a cam disc 18*a* or other suitable means on the spindle. However, if preferred, separate means independent of the combination lock may be provided for shifting the bolt after the combination has been successfully operated. The casing is suitably secured to the door by means which is accessible only when the door is open. The door is provided with an opening 19 for accommodating the tumbler operating spindle 20 and a sleeve-like member 21 surrounding the spindle and projecting forwardly from the casing and having its front end held within one end of a bushing or recessed member 22 forming a keeper for a locking element, the keeper being preferably fixed permanently to the door in a manner hereinafter described.

The usual dial ring 23 is mounted on the outer face of the door and is preferably secured thereto by means of screws 24 as shown in Fig. 3. The dial plate 25 is secured to the spindle operating knob 26 and

is rotated by the latter within the ring in the usual manner when turning the knob to operate the combination. The knob has an inwardly extending cylindrical portion 27 journaled in a cylindrical pocket formed in the bushing 22, said extension having a reduced portion 28 projecting within the sleeve or tubular member 21 and arranged to receive the outer end of the spindle 20 which is threaded therein and held against turning by a pin 29, as shown in Fig. 4.

The means for locking the operating knob and spindle against rotation to prevent successful operation of the combination comprises a locking element 30 preferably in the form of a bolt slidable in a transversely extending pocket 31 formed in the extension 27 of the knob which is rotatably mounted in the bushing or recessed member 22. The locking element when in securing position projects into a recess 32 formed in the wall of the bushing, said wall having one or more abutments 32*a* for engaging the locking element to prevent rotation thereof. A spring 33 tends at all times to urge the bolt or locking element into the recess 32.

Any suitable type of locking means may be used for controlling the bolt, such, for example, as one of the rotary cylinder type indicated at 34, the key 37 of which controls the tumblers 34*a*, Fig. 3. The lock is mounted within the knob 26 which constitutes a casing therefor and has a groove 35 for receiving a pin 36 projecting through the wall of the knob casing at a point behind the dial plate and operating to prevent removal of the lock, which cannot be withdrawn until the inner end of the spindle 20 is released from engagement with the means for actuating the tumblers of the combination lock. The rotary cylinder is operated by the key in the usual manner and its inner end 38 has an eccentrically arranged stud or projection 39 extending within the recess 40 formed in the bolt so that in rotating the cylinder from the locking position shown in Fig. 3 the stud will withdraw the bolt from the recess 32 of the bushing. When the cylinder is rotated in a reverse direction by means of the key to release the bolt the latter will be moved by the spring 33 into locking position as shown in Fig. 3.

Since the stud 39 merely projects loosely into the recess 40 of the bolt it will be obvious that if by any means, unauthorized persons should succeed in removing the cylinder from its casing that the spring will automatically advance the bolt into locking position so that any attempt to gain access to the contents of the safe in this manner will be frustrated.

The casing 26 is provided with oppositely arranged slots 26*a* in one of which the tumblers 34*a* project when the cylinder is locked within the casing. The enlarged end 27*a* of the cylinder is cut away to form spaced shoulders 28*a* which are arranged to engage a lug on the casing, not shown, which projects into the path of said shoulders whereby to limit rotation of the cylinder when moving it to and from bolt release position.

One of the important features of the present invention resides in the lock controlled bolt and keeper construction and the manner of mounting and securing the same upon the safe closure. In the present illustration the bushing or keeper 22 is positioned within a relatively deep pocket formed within the door or closure and is rigidly secured therein by any suitable method such, for example, as by electric welding or by the well-known shrinking process of heating the surrounding walls of the pocket and forcing the bushing within the latter under pressure. This element, therefore, for all practical purposes, becomes a part of the door or closure and is so attached thereto as to make it practically impossible to remove it therefrom. This method of attaching the keeper also applies in cases where the safe door is formed of front and rear spaced plates or walls with a filler therebetween, in which event the keeper projects rearwardly of the front wall and may be either welded thereto or shrunk within an opening formed therein or otherwise rigidly attached to said wall in rear of the front portion thereof.

There is also a decided advantage in mounting the keeper in rear of the front face of the closure for in this position it cannot be knocked off by the use of a hammer or other tool. Furthermore, it cannot be driven in since its inner end rests on the shouldered portion 41 of the closure surrounding the recess 19 therein. Likewise the knob 26 and spindle 20 attached thereto cannot be driven in since the knob is provided with an annular shoulder 42 resting on the dial ring 23, as shown in Fig. 4.

The sleeve 21 and bushing 22 constitute a tubular member anchored within the wall of the closure and in which the cylinder lock casing 26 is rotatably mounted to control the bolt or locking element 30 which cooperates with the tubular member or that part thereof constituting the bushing to lock the spindle and casing against rotation whereby to prevent operation of the combination or other type of lock for the closure secured on the inner face thereof. While the sleeve 21 is shown connected with the bushing or tubular member 22 forming the keeper for the bolt 30, it will be understood that the sleeve 21 may, if preferred, be used only in certain forms of door construction, where it is necessary to provide a member surrounding the spindle to protect the same, as in cases where the door is constructed of

front and rear plates with a filler therebetween. On the other hand, if deemed advisable, the bushing and sleeve may be rigidly connected one with another, as by welding or otherwise and may be extended either partially or entirely through the safe door as preferred.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive idea is not limited to the precise details disclosed, but is intended to cover all variations and modifications thereof falling within the spirit of the invention or the scope of the appended claims.

I claim as my invention:

1. In combination, a protecting wall comprising a closure having a bore formed therein, a bushing rigidly secured within the bore of said wall, the bushing having a cylindrical pocket formed therein and also having an abutment located at one side of the pocket within the bore, a combination lock on the inner face of the closure, a spindle extending within the closure and operatively connected with the lock, a dial knob having its inner end rotatably seated within the pocket of the bushing and receiving the outer end of the spindle, the latter serving to hold the knob against axial movement in an outward direction, said knob having a shoulder with which the bushing cooperates to prevent inward movement of the knob and spindle, a locking bolt for the knob mounted in a recess formed within the portion of the knob extending within the bushing, a spring within the knob for moving the bolt into locking engagement with the abutment of the bushing, and a key lock secured within the knob against axial movement and having a part for moving the locking bolt to release position against the action of the spring.

2. In combination, a wall forming a closure for a receptacle, said wall having a transversely extending opening and also having a pocket formed therein and communicating with the opening, a lock for the closure at the inner side thereof, a rigidly connected dial knob and spindle, the latter extending through the opening and operatively connected with the lock, the knob having its inner end rotatably received within the pocket and also having a shoulder cooperating with said wall whereby the knob and spindle are held against axial movement in the direction of the lock, said wall having a recess extending transversely of the pocket and communicating therewith, a bolt slidably engaging the knob and movable into said recess to hold the knob against rotation, spring means within the knob for moving the bolt to said position, and a key lock secured within the knob against axial movement and arranged upon operation to release the bolt.

3. In combination, a wall forming a closure for a receptacle provided with an opening terminating at one side of the wall in an enlarged pocket, a bushing anchored within said pocket and having an opening communicating with the opening in said wall, said bushing having a recess in its wall communicating with the interior of the bushing, a rigidly connected dial knob and spindle, the latter extending through said opening, and the knob having its inner end rotatably received within the bushing, said bushing serving to hold the knob and spindle against axial movement inwardly of the closure, a bolt slidably engaging the wall of the knob within that portion thereof disposed within the bushing, a spring within the knob for moving the bolt into the recess of the bushing to hold the knob against rotation, a lock within the knob for releasing the bolt, and a dial plate associated with the knob and secured on the closure between the bushing and the dial of the knob.

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