Nov. 19, 1940. E. M. MILLER 2,222,040

LOCK

Filed Jan. 12, 1940

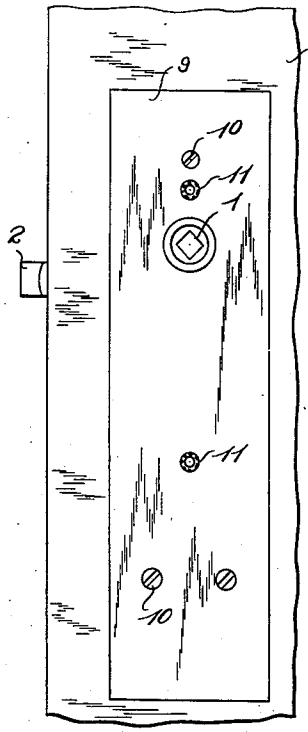


FIG. 1

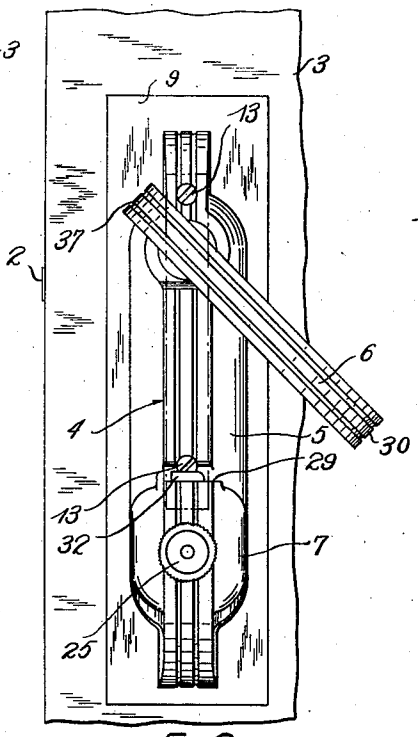


FIG. 2

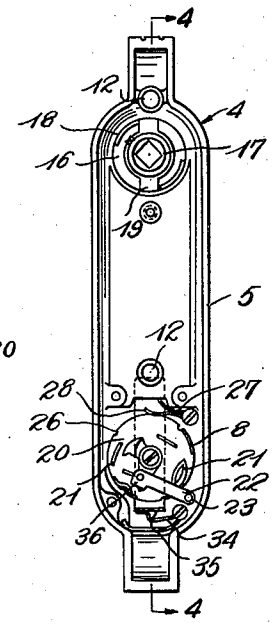


FIG. 3

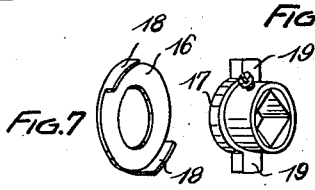


FIG. 7 FIG. 8

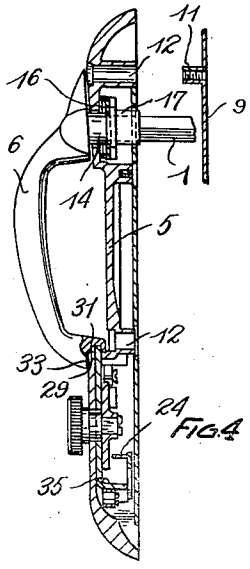


FIG. 4

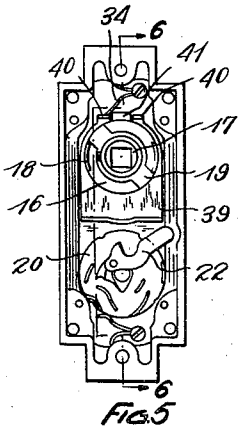


FIG. 5

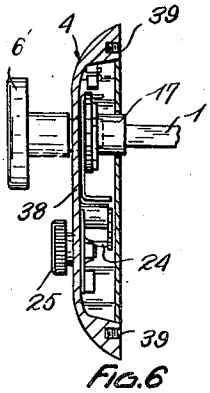


FIG. 6

INVENTOR.
Edward M. Miller

BY

Robbe Robb

ATTORNEYS

Patented Nov. 19, 1940 2,222,040

UNITED STATES PATENT OFFICE

2,222,040

LOCK

Edward M. Miller, Kent, Ohio, assignor to The J. B. Miller Keyless Lock Company, Kent, Ohio, a corporation

Application January 12, 1940, Serial No. 313,628

7 Claims. (Cl. 70—213)

This invention relates to a lock and more particularly to an improved type of lock which may be readily applied to a conventional type door.

Most door structures are provided with locks which require the use of a key to release the lock in order to open the door. In a great many cases, it is desirable to have a door structure provided with a combination type lock eliminating the necessity of carrying a key in order to open the door. However, the cost of dismantling a key operated lock in a door structure and substituting therefore a combination lock would be almost prohibitive. Moreover, in view of the various shapes and sizes of conventional key operated locks, it would be necessary to provide combination locks in units of innumerable sizes in order to be in a position to substitute a combination lock for a key operated lock without causing damage to the door in which the key operated lock is mounted.

Accordingly, the principal object of this invention is to provide a combination type lock which may be attached to a conventional latch operating spindle of a door without interfering with the locking and latching mechanism already mounted on the door.

A further object is the provision, in a lock of the character referred to, of securing instrumentalities which are adapted to be concealed by the body of the lock when the handle for operating the door latch mechanism is in locked position thereby preventing unauthorized removal of the lock.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawing:

Figure 1 is a side elevational view of the door, a part thereof being broken away, showing a latch operating spindle and a supporting plate in operative position with respect to the door structure.

Figure 2 is a side elevational view similar to Figure 1 and showing a lock attachment device in position on the supporting plate.

Figure 3 is a bottom plan view of the locking attachment shown in Figure 2.

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 3, a part of the supporting plate being shown in section.

Figure 5 is a bottom plan view of a modified form of lock and operating unit.

Figure 6 is a sectional view taken substantially on the line 6—6 of Figure 5.

Figures 7 and 8 respectively are perspective views of the members by which the handle is connected to the door latch operating spindle.

Referring to the drawing, the numeral 1 indicates a conventional type spindle for operating a latch 2 of a door 3. An operating unit, indicated as a whole by the numeral 4, is provided for operating and locking the spindle 1 and latch 2. The unit 4 comprises a unitary housing or body member 5 preferably in the form of a casting and is provided with a handle 6 and an enlarged portion 7 housing locking mechanism 8. The operating unit 4 is adapted to be secured to the door 3 in a manner to be described.

As best shown in Figure 1, a supporting plate 9 is secured to the door 3 by means of screw fastening elements 10. Internally threaded members 11 are rigidly or integrally secured to the supporting plate 9 and are receivable within openings 12 formed in the body member 5 of the unit 4. Threaded fastening devices 13 are passed through the openings 12 for engagement with the threaded members 11 for mounting the unit 4 on the supporting plate 9 and thereby securing the unit 4 to the door 3.

The handle 6 is secured to a shaft 14 rotatably mounted in the body member 5 and is provided with members 16 and 17 for operatively connecting the handle 6 to the spindle 1. The member 16 is rigidly secured to the shaft 14 and is provided with projections 18 extending outwardly therefrom. The member 17 is secured to the spindle 1 and is provided with lugs 19 adapted to be engaged by the projections 18 when a turning movement is imparted to the handle 6.

The members 16 and 17, and their associated projections 18 and lugs 19, cooperate to connect the handle 6 to the spindle 1 for operating the spindle 1, to actuate the latch 2 when a turning movement is imparted to the handle 6. It will be noted that the arrangement of the projections 18 and the lugs 19 provide a lost motion connection between the spindle 1 and the member 16 and the handle 6 permitting movement of the spindle 1 when the handle 6 and member 16 are in locked position.

The locking mechanism 8 is of the type shown and described in the James B. Miller Patent No. 755,907. This mechanism comprises a combination disc 20 having a plurality of cams 21 arranged on the face thereof. An operating lever 22 is pivotally connected to the casing 5, as at 23, and is provided with a pin 24 adapted to contact with the cam members 21. A handle 25 is provided for imparting a turning movement to the disc 20. Notches 26 are formed in the

periphery of the disc 20 and are engageable with a spring member 27 which moves into the notches 26 with an audible clicking noise to indicate the degree of turning movement imparted to the disc 20. The cams 21 are so arranged that upon turning of the disc 20 back and forth a proper number of times, the pin 24 and lever 22 will be moved outwardly.

The locking mechanism of the type referred to and disclosed in the aforementioned patent is believed to be particularly adapted to the purposes of this invention. The mechanism occupies a minimum of space and may be readily accommodated in the space provided in the housing 7 of the operating unit 4. Moreover, by reason of the spring 27, the lock may be operated by one knowing the combination without the need of light by merely counting through feel or sound the number of notches 26 passed over by the spring 27.

A latch member 28 is slidably mounted in the housing 5 and is adapted to extend outwardly through an opening formed in a vertical wall 29 of the enlarged portion 7, constituting a part of housing 5. The handle 6 is of the swivel type and the end 30 thereof is provided with a vertical wall 31 having a notch formed therein for the reception of the end 32 of the latch member 28. As best shown in Figure 4, wherein the handle 6 is shown in locked position, the walls 29 and 31 lie closely adjacent each other when the handle is in such position. The end 30 of the handle 6 is provided with a ledge 33 projecting outwardly from the vertical wall 31 over the housing 7 to prevent access to the end 32 of the latch 28 when the handle 6 is in locked position.

A spring 34 is engageable with a flange 35 for resiliently biasing the latching member 28 outwardly through the opening formed in the wall 29 of the housing 5 in to the notch formed in the wall 31 of the handle 6 in order to maintain the same in locking engagement with the handle 6. To release the handle 6, the combination of the locking disc 20 must be known in order to impart an outward movement to the operating lever 22. As the lever 22 is moved outwardly, the end 36 thereof will contact the flange 35 to effect the movement of the latch 28 against the bias of the spring 34 and withdraw end 32 from locking engagement with the handle 6.

It will be noted that the openings 12 in the housing 5 are so positioned that the fastening elements 13 will lie under the ends 30 and 37 of the handle 6 when the handle is in locked position. In this manner, unauthorized removal of the operating unit 4 when the handle 6 is in locked position is effectively prevented, the housing 5 being operative to cover the fastening elements 10 by which the supporting plate 9 is secured to the door 3.

In the modification shown in Figures 5 and 6, it will be noted that the shape of the operating unit 4 is substantially different and that the necessity of the supporting plate 9 is not required. In this construction, a casing 38 is provided with internally threaded openings 39 formed therein.

In order to secure the casing 38 to the door, fastening elements must be passed through the door from the inner side thereof into engagement with the openings 39. In this construction, unauthorized removal of the attachment 4 from the outside of the door is prevented at all times.

In the modification shown in Figures 5 and 6, it will be noted that the locking mechanism and means by which the handle 6' is connected to the spindle 1 is essentially the same as shown in Figures 1 to 4 and like numerals are used to designate like parts. However, it will be noted that the latch member 39 differs from the latch member 28 in that it is provided with a pair of spaced flanges 40 extending outwardly therefrom. The handle 6' is not locked directly by the latch 39 but indirectly through the connecting member 16 which is provided with a lug 41 receivable in the space between the flanges 40. The spring 34 is employed to bias the latch 39 to a position preventing movement of the connecting member 16 and the handle 6' to which it is secured. To release the handle 6' for movement, the combination disc 20 is turned back and forth to impart an upward movement to the lever 22 to cam the latch member 39 upwardly to move the flanges 40 out of engagement with the lug 41 in order to release the handle 6' for movement.

From the foregoing, it will be apparent that I have provided an attachment which may be readily applied to the conventional type of latch operating spindle provided on door structures without interfering with the locking and latching mechanism already provided. In this manner, it is possible in a few minutes' time to provide a new lock of the combination type for preventing unauthorized opening of the door. It will be apparent that the combination locking mechanism provides effective means for locking the door to which the attachment is applied through locking the operating handle supplied with the attachment. In addition, the structure of the attachment is such that removal of the attachment is prevented when the door is in locked position by reason of the fact that the attaching devices are covered by the body of the lock when in such locked position.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. An attachment for a door having a latch operating spindle comprising a casing, a handle turnably mounted on said casing and adapted to be operatively connected to the door latch spindle, and mechanism carried by said casing for locking said handle against movement comprising a latch member, a permutation locking disc, a lever intermediate said disc and said latch member operable by said disc to withdraw said latch member to permit movement of said handle, and a handle for rotating said disc to effect a movement of said lever.

2. An attachment for a door having a latch operating spindle comprising a casing, a swivel handle turnably mounted on said casing and adapted to be operatively connected to the door latch spindle, and locking mechanism carried by said casing including a latch member, said casing being provided with an opening through which said latch member may be moved into engagement with said handle for locking the same against movement, said handle having an end portion spaced from the axis of turning movement thereof and provided with a notch for receiving said latch member in interlocking engagement, and a ledge extending over said casing above said opening to prevent unauthorized tampering with said latch member when said handle is in locked position.

3. An attachment for a door having a latch operating spindle comprising a casing, a swivel handle turnably mounted on said casing and adapted to be operatively connected to the door

latch spindle, and locking mechanism carried by said casing including a latch member, said casing being provided with an opening through which said latch member may be moved into engagement with said handle for locking the same against movement and other openings through which fastening devices may extend for securing said casing to a door, said handle having an end portion spaced from the axis of turning movement thereof and provided with a notch for receiving said latch member in interlocking engagement and a ledge extending over said casing above said opening to prevent unauthorized tampering with said latch member when said handle is in locked position, parts of said handle being formed with surfaces adjacent the surface of said casing and adapted to cover said openings when said handle is in locked position.

4. An attachment for a door having a latch operating spindle comprising a casing, a handle turnably mounted on said casing, means for connecting the latch operating spindle to said handle comprising a member adapted to be secured to the spindle and having projections extending outwardly therefrom, and an operating member secured to said handle for movement therewith and having lugs projecting therefrom, said lugs being engageable with said projections for imparting a turning movement to said spindle upon turning of said handle, said lugs and projections being spaced from each other to provide a lost motion connection permitting turning movement of said first named member with the latch operating spindle, and means for locking said handle against movement.

5. An attachment for a door having a latch operating spindle comprising a casing, a handle turnably mounted on said casing, means for connecting the latch operating spindle to said handle comprising a member adapted to be secured to the spindle and having projections extending outwardly therefrom, and an operating member secured to said handle for movement therewith and having lugs projecting therefrom, said lugs being engageable with said projections for imparting a turning movement to said spindle upon turning of said handle, said lugs and projections being spaced from each other to provide a lost motion connection permitting turning movement of said first named member with the latch operating spindle, and means for locking said handle against movement comprising a latch member engageable with said first named member to prevent turning movement thereof, a permutation locking disc, a lever intermediate said disc and said latch member operable by said disc to withdraw said latch member to permit movement of said handle, and a handle for rotating said disc to effect a movement of said lever.

6. In apparatus of the character described, in combination, a door having latch mechanism and a spindle for operating said latch, an operating unit for said spindle comprising a housing, a swivel handle turnably mounted in said housing, means operatively connecting said spindle to said handle for operation thereby and locking mechanism mounted in said housing including a latching device, said housing being provided with a vertical wall having an opening therethrough, said swivel handle having an end provided with a vertical part having a notch therein and movable to a position adjacent said vertical wall, said latching device being adapted to be passed through said opening into said notch in interlocking engagement with said handle, said handle being further provided with a projecting part extending beyond said vertical part over said housing above said vertical wall for preventing access to said latching device when in interlocking relationship with said handle.

7. As a new article of manufacture, a detachable locking and operating unit for a door latch operating spindle comprising a casing, a handle mounted on said casing and adapted to be operatively connected to the door latch operating spindle, and locking mechanism carried by said casing for locking said handle against movement when the handle is moved to a predetermined position, said casing being provided with openings therein through which fastening devices may be passed for securing the casing to a door, said handle having parts operative to cover said openings when moved to its predetermined locking position to prevent access to the fastening devices and unauthorized removal of the unit, said parts being movable with said handle to uncover said openings and permit removal of said unit upon unlocking of said handle and movement thereof out of said predetermined locking position.

EDWARD M. MILLER.