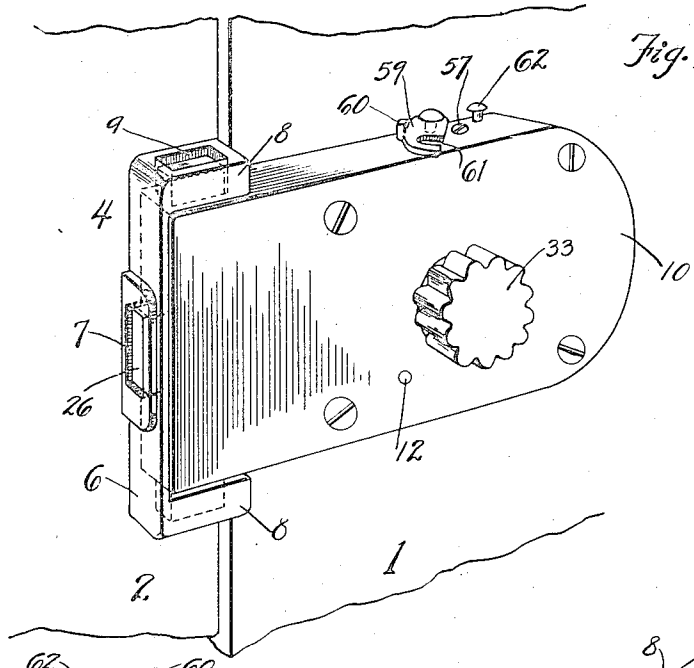
Jan. 8, 1924. 1,480,181

W. A. MUELLER

LOCK

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Fig. 1



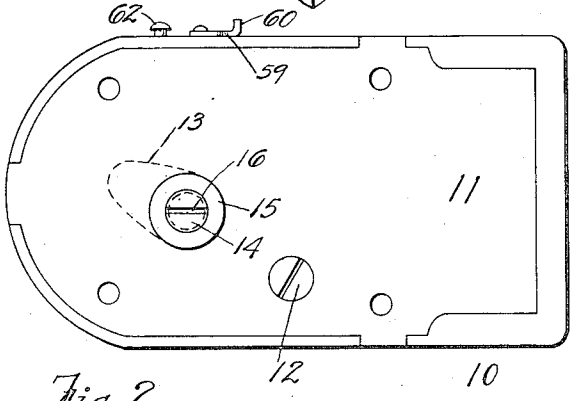


Fig. 2

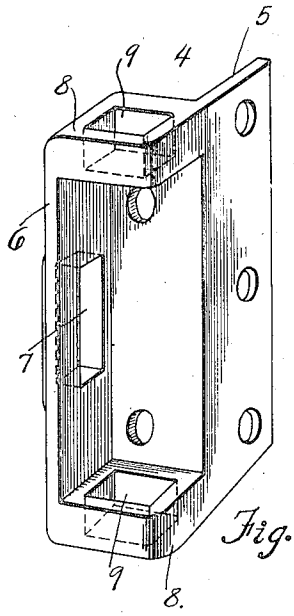


Fig. 6

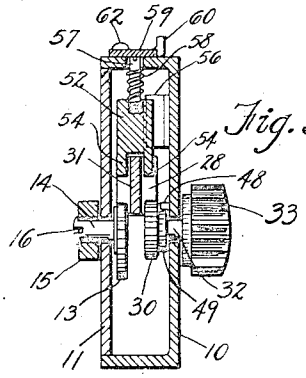


Fig. 5

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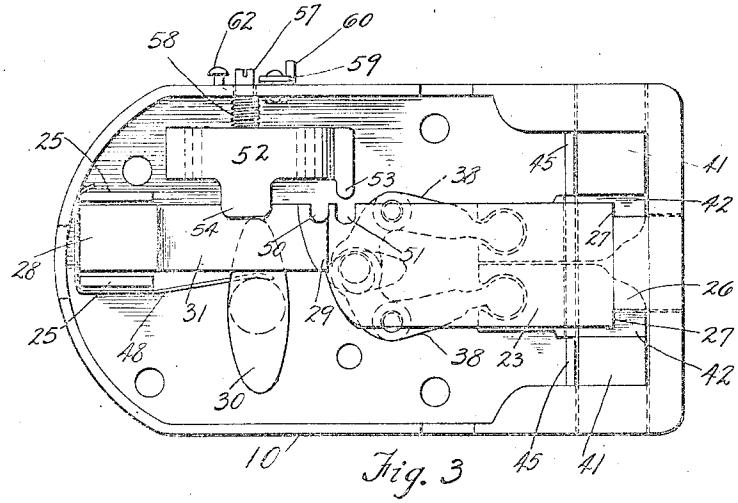


Fig. 3

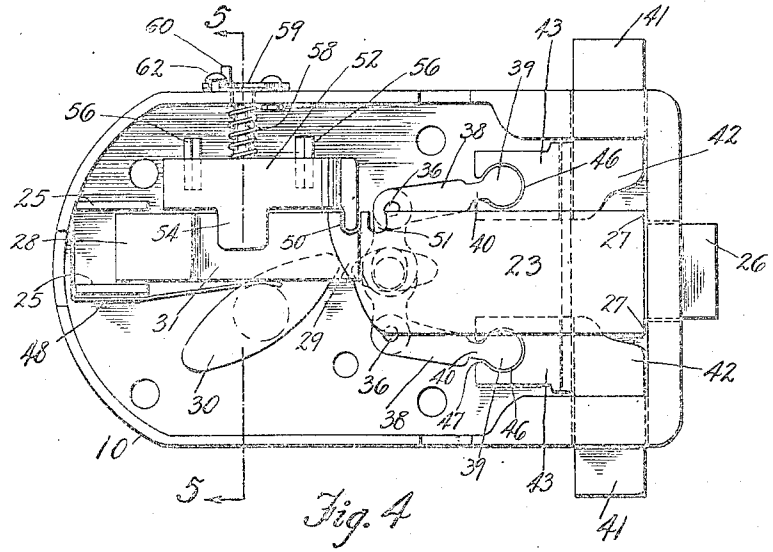


Fig. 4

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BY Lacey & Lacey, ATTORNEYS

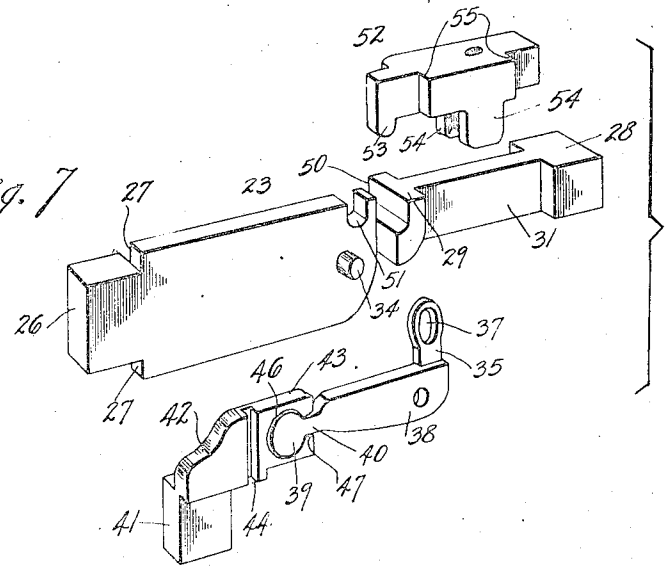
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Fig. 7



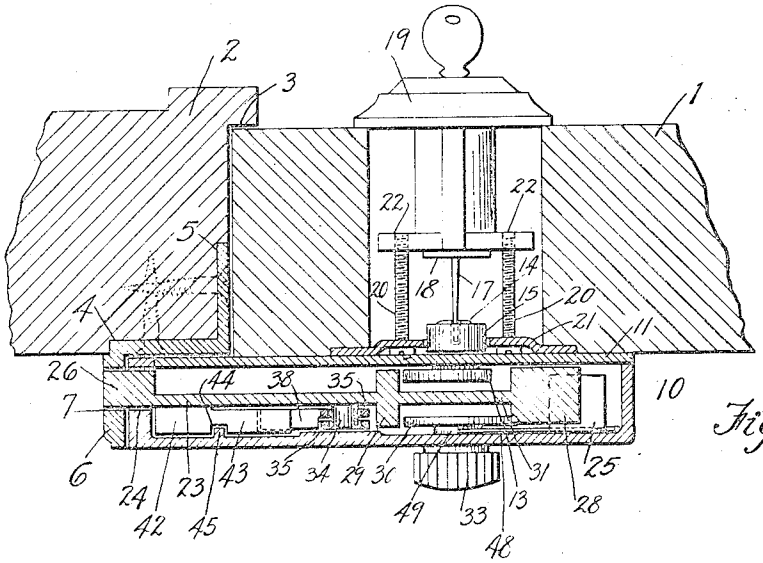


Fig. 8

W. A. Mueller. INVENTOR.

BY Lacey & Lacey,

ATTORNEYS

Patented Jan. 8, 1924. 1,480,181

UNITED STATES PATENT OFFICE.

WILLIAM A. MUELLER, OF WASHINGTON, DISTRICT OF COLUMBIA.

LOCK.

Application filed July 24, 1920. Serial No. 398,621.

To all whom it may concern:

Be it known that I, WILLIAM A. MUELLER, citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Locks, of which the following is a specification.

The object of this invention is to provide a door lock which will be burglar-proof, which may be operated from either side of the door by authorized persons and which may be so set that it cannot be operated from the outside of the door even by the application of a key which may properly fit. The invention seeks to provide a lock having the stated characteristics which will comprise a plurality of bolts simultaneously operated and also comprise a tumbler actuated by the bolt-operating means to engage one of the bolts and hold them in a set position. The invention further seeks to provide a lock having the described characteristics which will be inexpensive to construct, readily applied to a door and compact so as to occupy but very little space upon the door. The several stated objects and other objects which will incidentally appear in the course of the following description are attained in the mechanism illustrated in the accompanying drawings and the invention resides in certain novel features which will be particularly pointed out in the appended claims.

In the drawings—

Figure 1 is a perspective view of my improved lock in its operative position and showing it adjusted to permit its operation;

Fig. 2 is an elevation of the lock viewed from the side which is applied to the door;

Fig. 3 is an elevation with the face plate removed showing the bolts withdrawn and the tumbler in position to permit the projection of the bolts;

Fig. 4 is a similar view showing the bolts projected and locked against withdrawal by the tumbler;

Fig. 5 is a transverse section on the line 5—5 of Fig. 4;

Fig. 6 is a detail perspective view of the keeper;

Fig. 7 is a group perspective view of two of the bolts and the tumbler;

Fig. 8 is a horizontal section through the lock and a portion of the door and door frame.

The door 1 may be of any well-known form mounted to swing in a horizontal plane but the door jamb 2 in the application of my invention is obstructed with a rabbet, as shown at 3, whereby when the door is closed the jamb will project over the outer side of the door beyong the free edge thereof to resist the insertion of a jimmy or other forcing tool. To the inner corner of the jamb, I secure the keeper 4 which is constructed with a wing or lip 5 seating in the edge of the door jamb, as clearly shown in Fig. 8. The said wing obviously extends at a right angle to the main portion of the keeper and the back of the keeper is also seated in a mortise provided therefor in the door jamb, as clearly shown in Fig. 8. A second wing or lip 6 projects forwardly from the main plate of the keeper and this forwardly projecting wing is provided with a vertical slot 7 which receives the end of a horizontal bolt as will be presently more fully set forth. At the upper and lower ends of the keeper are forwardly projecting lugs 8 which are integral with the main portion of the keeper and the wing 6 and are each provided with a slot 9 extending vertically therethrough to receive the ends of bolts.

The lock comprises a casing 10 which is secured upon the inner side of the door in such position that one end thereof will project beyond the edge of the door and fit between the lugs 8 of the keeper and against the wing 6 thereof, as clearly shown in Figs. 1 and 8. This lock case comprises a shell which encloses the bolts and operating parts and a face plate 11 which fits within one side of the shell and is disposed against the door when the lock is applied. The face plate is secured to the lock by a screw 12 inserted therethrough into a suitable opening in the shell and a cam or lever 13 has its stem or shaft 14 journaled in the said plate 11 and reinforced and sustained against endwise movement by a collar or boss 15 fitted around its projecting end. In the extremity of the stem 14, I provide a slot or notch 16 which is engaged by a tongue 17 carried by the inner end of a barrel 18 forming the working member of an ordinary barrel lock 19 fitted in the door from the outer side thereof. This lock 19 is held in the chamber provided therefor in the door by bolts 20 inserted through a backing plate or escutcheon 21 and engaging lugs 22 on the casing of the lock, as shown in Fig. 8. The

internal mechanism of the barrel lock forms no part of my invention and may be of any well-known type, the lock being illustrated in elevation only and more detailed description is deemed unnecessary.

That end of the lock casing which fits between the lugs 8 of the keeper is constructed with openings in its end flange and in its top and bottom flanges to permit the play of bolts which are simultaneously operated from the outside of the door by the cam or lever 13. One of these bolts is shown at 23 and is the master bolt of the lock, playing horizontally in the lock case and having its outer end supported by the opening 24 in the end of the case and its inner end supported and guided by ribs or lugs 25 formed on the inner side of the case at the inner end thereof. The extremity or head 26 of the bolt is reduced vertically but enlarged laterally relative to the main body of the bolt so as to provide shoulders 27 which are adapted to abut the end wall of the lock case and thereby limit the extent to which the bolt may be projected and, as a result, prevent the working parts becoming jammed. At the inner end of the bolt and at about the center thereof are crossheads 28 and 29 which present shoulders or abutments against which the cam or lever 13 may ride when the door is to be locked or unlocked from the outside, and also present similar shoulders or abutments upon which a cam or lever 30 may ride when the door is to be locked or unlocked from the inside. The web 31 connecting the crossheads 28 and 29 may be of the same thickness as the main portion 23 of the bolt but is preferably of less extent vertically so as to avoid the liability of interference with the assembling or operation of either operating member as will be readily understood. The cam or lever 30 is formed on or secured to the inner end of a stem or shank 32 which is equipped at its outer end with a knob 33 which is preferably provided with a milled or corrugated periphery so that it may be readily and firmly grasped.

Upon one side of the bolt 23 adjacent the crosshead 29 is a lateral stud 34 upon which is loosely fitted the shorter arm 35 of an angle lever which is fulcrumed upon a pin or stud 36 formed on the inner side of the lock case. The said arm 35 is provided with an elliptical opening 37 which receives the stud 34 and accommodates the relative angular movement of the lever and the bolt when the lock is operated. The longer arm 38 of the angle lever extends within the lock case approximately parallel with the bolt 23 and toward the head 26 of said bolt, being provided at its extremity with a circular enlargement or head 39 connected with the main portion of the arm by a reduced neck 40. The vertically movable bolt comprises a locking head 41 which is disposed vertically within the casing and is adapted to play through the opening provided therefor in the top or bottom of the same. This locking head 41 is connected by a web 42 with an inwardly projecting arm 43 provided on one side with a groove 44 adapted to slidably engage a guiding rib 45 on the lock case so that the head 41 will be caused to move in a rectilinear vertical path, it being noted upon reference to Figs. 3 and 4 of the drawings that the said head fits closely between the said rib 45 and the end of the lock case but may move freely in the operation of the lock. The arm 43 is provided with a circular opening 46 in which the head 39 of the angle lever fits and is also provided with a notch or slot 47 to accommodate the reduced neck 40. The described angle lever and vertically movable bolt are duplicated, as clearly shown in Figs. 3 and 4, one bolt and lever being provided above the plane of the horizontally moving bolt 23 and the other bolt and angle lever being disposed below said plane, both angle levers being operatively engaged upon the pin or stud 34, as shown and as will be readily understood. It is thought to be clear that horizontal movement imparted to the bolt 23 will cause the angle levers to swing about their respective fulcrums and consequently impart vertical movement to the ends of their longer arms which movement is transmitted directly to the bolts cooperating therewith so that the three bolts will be simultaneously projected or withdrawn. A spring 48 is secured at the inner end of the lock case and has its free end arranged to bear upon the hub 49 of the cam or lever 30 so that it will act as a brake to hold the said cam or lever in the position to which it may be moved and thereby prevent shifting of the same to a position in which it will not properly perform its allotted functions.

Upon reference to Fig. 7, it will be noted that the crosshead 29 is reduced on its side facing the stud 34, as shown at 50, so that a recess is provided between the said side of the crosshead and the adjacent end of the main body of the bolt 23. A notch 51 of similar form is provided in the upper edge of the bolt immediately adjacent the groove or notch 50 and either of these notches may be engaged by the tumbler accordingly as the bolt is projected or withdrawn. The tumbler 52 is disposed within the case above the web 31 of the bolt and consists of a block provided on its under side at one end with a tooth 53 adapted to engage the notch 50 or the notch 51 and further provided intermediate its ends with the depending lugs 54 adapted to pass on opposite sides of the web 31 and thereby serve to maintain the

operative relation of the tumbler and the bolt. These lugs also constitute strikers against which the cam 13 or the cam 30 may impinge so as to lift the tumbler from its engagement with the bolt when the bolt is to be shifted. Upon one side, the tumbler is provided with the spaced vertical shoulders 55 which fit closely but slidably between and against the guide ribs 56 on the lock casing so that the tumbler will be held in its movement to a true rectilinear path. A pin 57 rises from the tumbler through the upper side of the lock case and a spring 58 is coiled around the said pin between the tumbler and the top of the case so that by its expansion it will normally force the tumbler to the bolt. The pin 57 is of such length or so adjusted in the tumbler that when the tumbler is in its operative position, shown in Fig. 4, the upper extremity of the pin will be flush with or below the top surface of the lock casing, and upon the top of the lock case I pivotally mount the latch 59 which may conveniently be a small plate provided with a thumb piece 60, whereby it may be easily manipulated, and having a notch 61 in one edge adapted to engage a headed stud 62 on the lock case adjacent the opening through which the pin 57 plays whereby when the dead latch is swung into engagement with said headed stud it will cover the end of the pin 57 and thereby prevent movement of the pin and the tumbler.

It is thought the operation of the lock will be readily understood from the foregoing description, taken in connection with the accompanying drawings. When the door is closed, as shown more clearly in Fig. 8, the edge of the door will be covered by the rabbeted portion of the door jamb and the lock case will project beyond the edge of the door so as to bridge the inner end of the joint or space between the door and the jamb. It will thus be seen that forcing of the door by evil disposed persons will be prevented inasmuch as even if the projecting portion of the rabbeted jamb should be cut-off the insertion of a tool between the door and the door frame so as to force the lock would be prevented inasmuch as even if the end of the tool should reach to the inner side of the door it would strike against the side of the lock casing and could not enter between the same and the keeper. Moreover, the keeper fits around two sides of the door jamb so as to protect the jamb and resist efforts to cut-away the same and also furnishes means whereby the keeper may be very effectually secured to the jamb inasmuch as fastening screws may be inserted through the outwardly extending wing thereof as well as through the main portion of the same, as will be readily understood on reference to Figs. 6 and 8. The door having been closed, the bolts may be projected from either side of the door by manipulating the knob 33 or the lock 19 as the case may be. When either the cam 13 or the cam 30 is moved pivotally the end thereof will ride against and under the adjacent lug 54 of the tumbler and will lift the tumbler against the tension of the spring 58 so that the tooth 53 will be released from the bolt. The continued movement of the cam will then bring it into engagement with and cause it to ride upon the crosshead 28 or the crosshead 29 and move the bolt 23 horizontally, a movement of the end of the cam toward the keeper projecting the bolt into engagement with the keeper so as to lock the door. Simultaneously with the movement of the bolt 23, the bolts 41 will be moved into engagement with the keeper so that the keeper will be engaged upon three sides and the door very securely locked. Of course, movement of the cam in the reverse direction will withdraw the bolts and permit the door to be opened. The upward movement of the tumbler obviously causes the pin 57 to play through the top of the lock case. Therefore, if the latch 59 be swung over the pin vertical movement thereof and of the tumbler will be prevented and the bolts cannot be withdrawn. It is thus possible to set the lock from the inside of a room so that the door cannot be opened from the outside even though the person attempting to open the door be supplied with a key which will fit the barrel lock 19. It is also possible for a person occupying the room to set the lock so that the bolts cannot be projected and thus permit free passage through the doorway in day light or within authorized hours.

My improved lock is simple in the construction and arrangement of its parts and may be readily applied to a door and easily manipulated by a person occupying the room access to or egress from which is obtained through the doorway. Inasmuch as the lock may be so set that it cannot be opened even by the insertion of a key, it is obvious that the occupant of a room is secure against all intrusion.

Having thus described the invention, what is claimed as new is:

1. In a lock, the combination of a keeper having an end extension, a lock case adapted to overlap the door jamb and be overlapped by the extension on the keeper, a longitudinally movable bolt mounted in the lock case and adapted to engage the keeper, a vertically movable bolt in the case adapted to engage the extension of the keeper, an angle lever fulcrumed at its angle upon the case and having a pin and slot connection with the first-mentioned bolt, the vertically movable bolt being provided with a circular opening and a slot leading from said opening and

the angle lever being provided at the end of its longitudinal arm with a head engaging in said opening and a reduced neck extending through said slot, and means acting upon one of the bolts to project or withdraw the same.

2. In a lock, the combination of a keeper having end extensions, a lock case adapted to overlap the door jamb and be overlapped by the extensions on the keeper, a horizontally movable bolt mounted in the lock case and adapted to engage the keeper, a vertically movable bolt mounted in the lock case to engage an extension of the keeper and having a laterally extending arm arranged adjacent and parallel with the horizontal movable bolt, a lateral stud on the horizontally movable bolt, an angle lever fulcrumed on the lock case adjacent the bolts and provided with a slot at one end engaging said stud and provided at its other end with a circular head fitting within a corresponding opening in the lateral arm of the vertically movable bolt, and means to actuate the bolts.

3. In a lock, the combination of a lock case, a bolt slidably mounted therein, a tumbler mounted adjacent the bolt and adapted to engage the same to hold it against movement in either direction, a pin extending from the tumbler into the top wall of the lock case and adapted to project beyond the case, yieldable means acting on the tumbler to hold it in engagement with the bolt, means to release the bolt from the tumbler and actuate the bolt, and a latch mounted on the exterior of the lock case and adapted to extend across the end of the pin projecting from the tumbler to prevent movement of the tumbler.

4. In a lock, the combination of a lock case, a bolt mounted therein for sliding movement and provided with spaced vertically disposed shoulders on its sides and with spaced notches in its upper edge in advance of said shoulders, a tumbler mounted in the lock case above the bolt for rectilinear movement transverse to the bolt, a tooth at one end of the tumbler to engage any of the notches in the bolt, lugs depending from the tumbler at the sides of the bolt between the shoulders thereon, cams rotatably mounted in the walls of the lock case at the sides of the bolt to engage the respective depending lugs on the tumbler and the shoulders on the bolt whereby to release the tumbler from the bolt and project or retract the latter, and means for operating said cams.

5. The combination of a keeper having end extensions and a lock adapted to overlap the door jamb and be overlapped by the extensions on the keeper, the said lock having a main bolt adapted to engage the keeper and two bolts at right angles to the main bolt to engage recessed seats in the said extensions of the keeper, the said two bolts at right angles to the main bolt being positively actuated in both directions by the movements of the said main bolt.

6. The combination of a keeper having an end extension and a lock adapted to overlap the door jamb and be overlapped at one end by the said extension on the keeper, the said lock having a main bolt adapted to engage the keeper and a supplemental bolt connected directly with and positively actuated in its two movements by the main bolt and adapted to engage a recessed seat in the extension of the keeper.

In testimony whereof I affix my signature.

WILLIAM A. MUELLER. [L. S.]