July 12, 1932. F. H. ANDREWS 1,867,244

LOCK

Filed Oct. 14, 1930

Fig. 1.

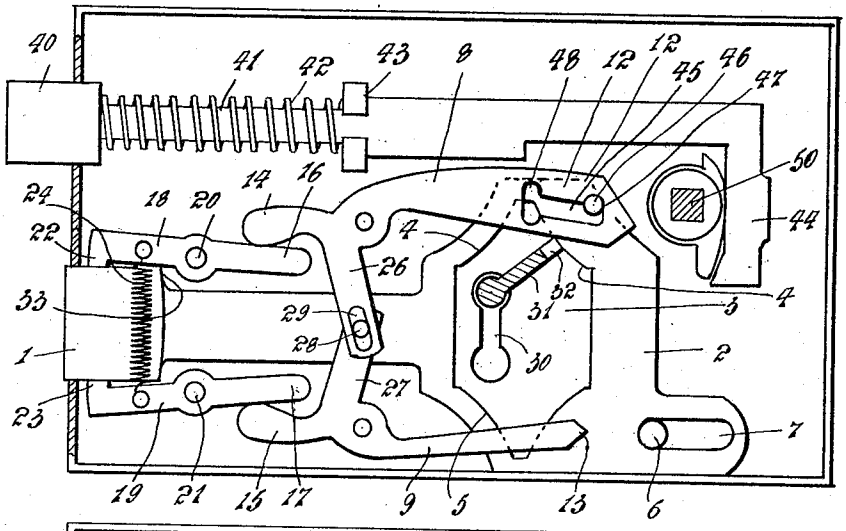
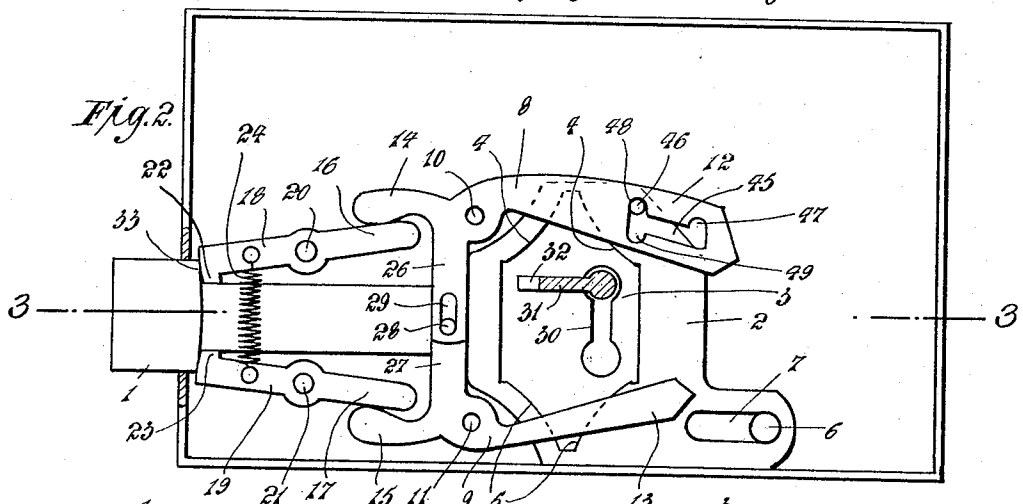



Fig. 2.



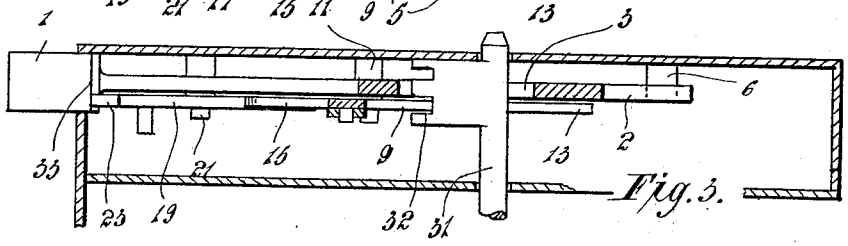




Fig. 3.

F. H. Andrews
INVENTOR

By: Marks & Clerk
Attys.

Patented July 12, 1932 1,867,244

# UNITED STATES PATENT OFFICE

FREDERICK HAROLD ANDREWS, OF TAIHAPE, NEW ZEALAND, ASSIGNOR TO LEO BROOKS, OF WELLINGTON, NEW ZEALAND

## LOCK

Application filed October 14, 1930. Serial No. 488,613.

This invention relates to locks for doors and the like and particularly to that type of lock in which a bolt is given a reciprocating movement by means of a key adapted to engage within an extended portion in which an opening is formed, and having inclined top and lower edges against which the key engages for moving the bolt.

The object of the present invention is to add greater security to such locks and at the same time to reduce the cost of manufacture thereof.

According to the present invention levers pivoted on pins in their casing have their rear ends extended to traverse the curved or inclined edges of the opening and their forward ends engaging the tails of locking pawls also pivoted on pins in the casing and adapted to be brought together by a spring so that their front ends will engage behind a shoulder on the bolt and normally retain the bolt in its locked or shot position. As the rear ends of the levers are operated by the key, their front ends will depress the locking pawls and bring them out of engagement with the bolt thereby permitting the bolt to return to its retracted position when the key engages an inclined edge of the opening.

The levers have extensions, one of which has a pin passing in the slot of the other extension so that if one lever is operated by the key the opposite lever will also be opened.

The invention will now be described with the aid of the accompanying drawing, wherein:—

Figure 1 is a view of the lock with the cover of the casing removed, and the locking bolt in its retracted position.

Figure 2 is a similar view showing the bolt in a shot or locked position. In this view for simplicity the latch is not included.

Figure 3 is a cross section along line 3—3 Figure 2.

Referring to the drawing, the usual locking bolt 1 is provided with its extended plate 2 having an opening 3 therein. The upper and lower edges of the opening have respectively inclined or curved edges 4 and 5 against which the key will be adapted to strike for the purpose of placing the bolt in a shot or retracted position. The sliding movement of the bolt is limited by a pin 6 fixed to the casing and passing through a slot 7 in the plate. Levers 8 and 9 pivoted on pins 10 and 11 respectively have their respective rear ends 12 and 13 extending across the inclined edges 4 and 5 of the plate 2. The front ends 14 and 15 of the levers 8 and 9 bear upon the tails 16 and 17 of the pawls 18 and 19 pivoted on pins 20 and 21 respectively and have their front ends 22 and 23 bearing upon the side of the bolt 1. A coil spring 24 connects these two pawls and normally retains the levers 8 and 9 in an inward position, as in Figure 1.

Arms 26 and 27 respectively on the levers 8 and 9 are connected by a pin 28 on the arm 27 passing through a slot 29 of the arm 26 so that movements of one lever are transmitted to the other lever.

The key hole 30 has two pivot holes, one at each end, so that when the key 31 is inserted in position in the upper pivot hole and rotated to the position shown in Figure 1, the end 12 of the lever 8 will enter the slot 32 of the key and, as the key is continued to be rotated, its outer edge will strike the curved edge 4 of the opening 3 and shoot the bolt forward in the usual manner to the position shown in Figure 2. Immediately this occurs the levers 18 and 19, being drawn towards each other by the spring 24, will cause the front ends 22 and 23 to engage behind the shoulder 33 of the bolt 1, thereby locking the bolt in its shot position. To bring the bolt to its retracted position, the key, being in the position shown in Figure 2, may now be turned in the opposite direction until the slots 32 of the key again engage the end 12 of the lever 8, pushing the lever back to the position shown in dotted lines in Figure 2, which corresponds to the position shown in Figure 1, and depressing the pawls 18 and 19, thereby disengaging the front end 22 and 23 from the shoulder of the bolt. By continued rotation the outer edge of the key will strike the curved edge 4 and return the bolt 1 to its retracted position, as shown in Figure 1. Similarly, if the key is inserted in the lower pivot hole, it would operate the lever 13 in a similar

manner, and the movements being transmitted to the opposite lever by means of the arms 26 and 27.

A latch member 40 has a spindle 41 on which is located a coil spring 42 in compression between the head of the member and a guide stop 43 fixed to the casing, the rod being extended and having a downwardly depending end 44 operable from the latch spindle 50.

The lever 8 is shown with a slot 45 into which projects a pin 46 from the plate 2. In the position shown in Figure 1 the pin lies in a notch 47 so that the bolt cannot be shot until the lever 8 is disengaged. When the position shown in Figure 2 is reached the pin enters a notch 48 which will prevent the bolt being retracted even although the pawls 18 and 19 are clear of the bolt. A further notch 49 from the slot 45 will engage the pin 46 should the lever be raised beyond the required position; thus, should any key be used that will raise the lever 8 so that the notch 49 engages the pin 46 the bolt cannot be retracted.

The opening 3 can be varied and also the width and thickness of the levers so that a different key is required to correspond to each variation of lock. Thus, if the levers 8 and 9 extend slightly more or less over the opening 3, then a key with a different depth of slot would be required, or the thickness of the levers may be varied, in which case the width of the key slot is also varied.

If the lever 8 above is used without the pawls 18 and 19, then the slot 45 and pin 46 will, provided the lever is under the tension of a spring, give an effective locking to the bolt. Since the lever 8 must be raised the required amount by a key of the correct depth any variation of the notch 48 prevents the lock being operated except by a key made for the particular variation. This arrangement makes the lock very difficult to "pick" since the lever must be lifted exactly clear of the notches 48 and 49 before the bolt can be retracted.

What I claim is:—

1. A lock including a casing, a locking bolt, a plate from said locking bolt having key contacting edges, levers pivoted to said casing and traversing the key contacting edges of said plate in order to be actuated by the key, spring operated pawls pivoted to said casing one upon each side of said locking bolt and normally resting thereon and controlled by the said levers, but when said bolt has been shot said pawls will under their spring tension engage and retain said locking bolt in its shot position.

2. In the lock as claimed in claim 1, levers pivoted on pins projecting from the lock casing, the rear end of said levers traversing the opening in said plate, the front end of said levers bearing upon the rear ends of said spring operated pawls, said levers arranged so that the key will first move said levers causing the front ends thereof to raise said pawls out of engagement with said locking bolt in order to permit the bolt to be moved to its retracted position.

3. A lock including a casing, a locking bolt, a plate from said locking bolt having key contacting edges, a lever pivoted to said casing and traversing the key contacting edges of said plate in order to be actuated by the key, said lever having its front end formed so as to pass over said locking bolt and having a slot formed in its front end, a pin fixed to said locking bolt and passing through the slot at the front end of said lever, the rear end of said lever having a slot with a notch forming part of the slot, a pin projecting from said plate and passing through the slot in the rear end of said lever, the said pin on the plate adapted to engage the notch when the bolt is in its shot position thereby retaining it in that position, and spring means controlling said lever to retain it in engagement on said pin.

4. In the lock as claimed in claim 3, the rear end of the said lever containing the slot formed with a further notch from the slot whereby should the said lever be operated beyond the required position by the key the said pin will engage the notch and prevent further movement of the lever and the locking bolt.

5. In the lock as claimed in claim 1, a coil spring attached to the said pawls to draw said pawls in engagement with the locking bolt and also retain said levers in their normal position across the key contacting edges of the plate from said locking bolt.

6. A lock including a casing, a locking bolt, a plate from said locking bolt having key contacting edges, a lever pivoted to said casing and traversing the key contacting edges of said plate in order to be actuated by the key, a pawl pivoted to said casing and normally resting upon the side of the locking bolt, a shoulder on said locking bolt, an end of said pawl adapted to engage said shoulder when the bolt is in its shot position, a spring normally to hold the said pawl in engagement with said shoulder, the other end of said pawl engaged by the end of said lever which when moved by the contact of the key said pawl is disengaged from said shoulder and the bolt enabled to be moved to a retracted position.

In testimony whereof I have signed my name to this specification.

FREDERICK HAROLD ANDREWS.