July 14, 1931. M. FALK 1,814,302

MORTISE BOLT LOCK

Filed April 10, 1930 2 Sheets-Sheet 1

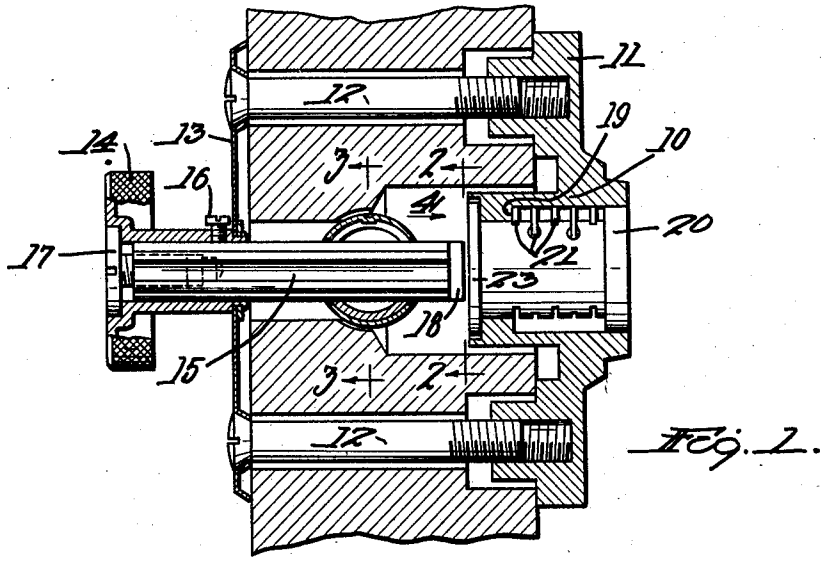


Fig. 1.

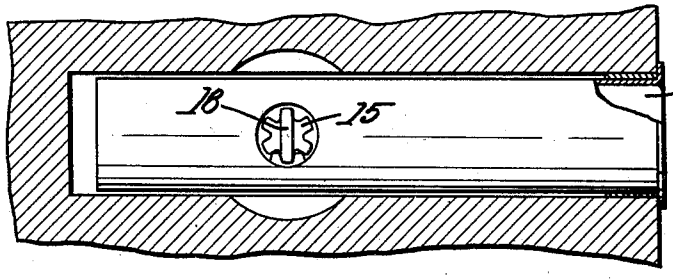


Fig. 2.

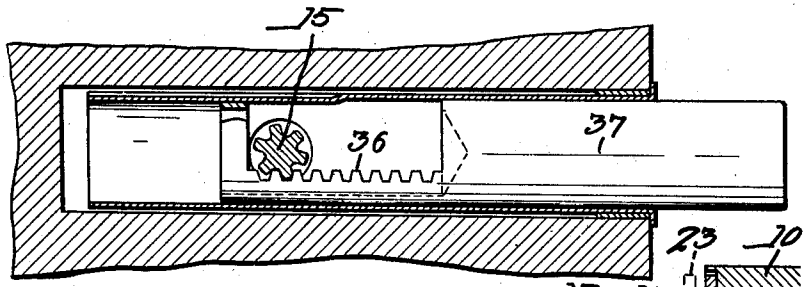


Fig. 3.

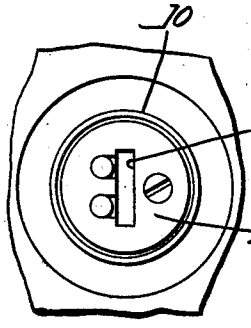


Fig. 4.

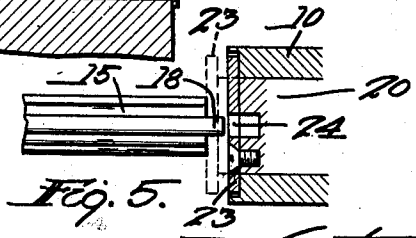


Fig. 5.

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July 14, 1931. M. FALK 1,814,302

MORTISE BOLT LOCK

Filed April 10, 1930 2 Sheets-Sheet 2

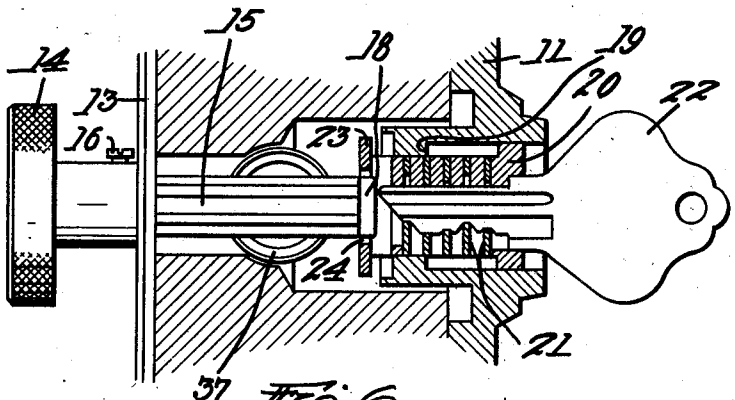


Fig. 6.

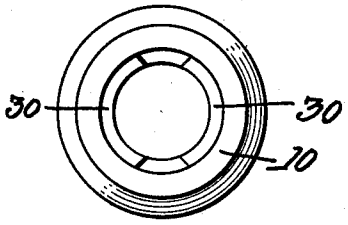


Fig. 8.

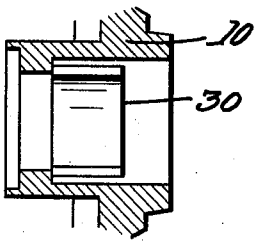


Fig. 7.

Fig. 9.

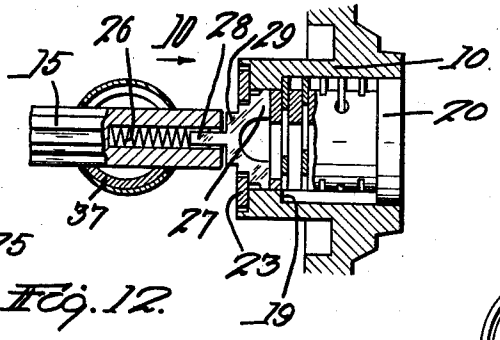




Fig. 12.

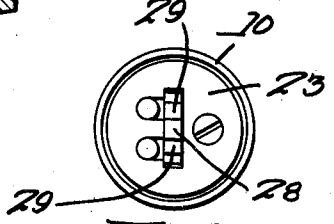


Fig. 10.

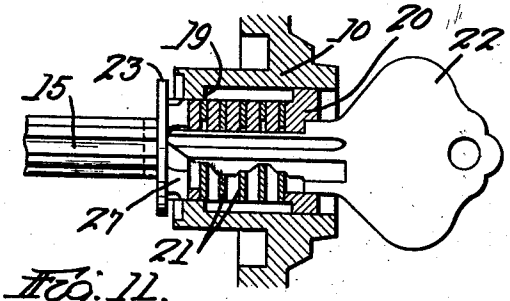


Fig. 11.

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UNITED STATES PATENT OFFICE

MORRIS FALK, OF FITCHBURG, MASSACHUSETTS

MORTISE BOLT LOCK

Application filed April 10, 1930. Serial No. 443,200.

This invention relates to a lock provided with a knob on the inside of the door and the key is insertable from the outside for operating the bolt and locking and unlocking it.

The principal object of the inventon is to provide means whereby the bolt can be operated by the knob at all times when the key is not inserted and pushed in, thus giving a person inside the house control over the door even if locked on the outside.

Other objects of the invention are to provide means whereby when the key is inserted the plug can be pushed in thereby and means for connecting the plug with the bolt operating means when the plug is pushed in so that the bolt can be operated by turning the key; to provide means whereby the bolt cannot be operated from the outside unless the key and plug are pushed in a short distance and to provide a convenient separable connection between the plug and the pinion for that purpose.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a diametrical sectional view of a lock constructed in accordance with this invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is an end view of the plug and retainer, taken from the end indicated by the arrow 4 in Fig. 1;

Fig. 5 is a side view of the adjacent ends of the plug and pinion showing in dotted lines how they are connected together;

Fig. 6 is a view similar to Fig. 1 but showing the key in position and the plug pushed in;

Fig. 7 is a similar view of the cylinder with the plug removed;

Fig. 8 is an end view of Fig. 7;

Fig. 9 is a view similar to Fig. 1 but showing a modified construction;

Fig. 10 is an end view of the plug and retainer, looking in the direction of the arrow 10 in Fig. 8;

Fig. 11 is a view similar to Fig. 8 but at right angles thereto showing the key in position and the plug pushed in, and

Fig. 12 is a side view of the pinion used in this form.

In the form shown in the first seven figures, the lock is made in a general way like the locks of this type now on the market. A cylinder 10 is provided integral with a face plate 11 which is secured to the door by bolts 12 having their heads located in conical openings in a plate 13 on the inside of the door. On this plate 13 is swiveled a knob 14 and the end of the elongated pinion 15 is held in the knob in adjusted position by a screw 16 and a bolt 17. This pinion will turn always with the knob and the knob can be adjusted along the pinion when the lock is assembled to provide for doors of different thicknesses. The bolt 17 has a head resting in a recess at the front of the knob. It screws into the end of the pinion for adjustment. The screw 16 holds the pinion in adjusted position.

This pinion 15 engages a rack 36 on the bolt 37 in the usual way to operate this bolt from the knob. In this form of the invention, the pinion is provided with a tongue 18 on its end. This is shown in the present case as diametrical.

In the cylinder 10 is located the usual plug 20 provided with locking tumblers 21 operated by key 22. This plug is provided with a retainer 23 at its outer end which is provided with a slot 24. This retainer extends beyond the circumference of the plug and is received in a recess in the end of the cylinder. The retainer therefore, which may be integral with the plug or secured thereto, prevents the withdrawal of the plug outwardly but does no prevent its movement inwardly. The inward movement of the plug in the condition shown in Fig. 1 is prevented by the last one of the levers 21 abutting against a shoulder 19 in the cylinder, so that in this position the plug cannot be pushed in. This is the locked condition and the bolt can be operated freely by the knob 14 inside.

Now, if it is desired to unlock the door from

the outside, the key has to be inserted as shown in Fig. 6 to push all the locking tumblers 21 inwardly and there is now nothing to prevent the pressure of the key inwardly, forcing the plug inwardly into the position shown in that figure, except of course that until the slot 24 registers with the tongue 18. This tongue will prevent such motion. When the plug is turned by the key so that these two parts register, the plug can be moved in by pressure of the key to the position shown in Fig. 6. Now the tongue and slot form a positive connection between the plug and the pinion so the turning of the plug further will operate the pinion and the bolt. The parts of course are arranged so that the key cannot be removed unless the bolt is either all the way in or all the way out.

Figs. 7 and 8 show the inside of the cylinder having a shoulder 30 located at a short distance back of the place where it is usually located. This is to allow a little motion of the plug inwardly.

In the form shown in Figs. 8, 9, 10 and 11 the parts are very similar to those shown in the first seven figures, but the pinion 15, instead of having a tongue in the end, is provided with a diametrical slot 25 across its end and with a recess extending in axially from that end in which is located a coil spring 26.

On the plug 20 is located a projection 27 having a stud 28 adapted to enter the recess and engage the spring 26 and a cross bar 29 which constitutes a tongue for entering the slot 25 when the tongue is turned to the right position. The result is the same as in the other case and the action is the same, the only difference being that the slot and tongue are reversed and in this latter case the spring presses the plug back whenever it is free to do so. In the preferred form shown, the key has to be pulled back and the plug with it but, of course, the key cannot be removed without pulling the plug back into proper position.

In either case, this constitutes a very simple way of providing for full freedom of control of the bolt by the knob inside, whether the door is locked on the outside or not, and it gives full latitude in locking and unlocking the lock from the outside.

Although I have illustrated and described only a single form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited in this respect but what I do claim is:—

1. In a lock, the combination with a cylinder, a plug rotatably and slidably mounted therein, locking tumblers in the plug, the cylinder having a shoulder against which the last locking lever on the plug engages when the levers are in locking position, to prevent the sliding of the plug inwardly, a retainer on the inner end of the plug, said cylinder having a shoulder against which said retainer engages when the plug is moved out to its outermost position, and a bolt operating device rotatably mounted, the retainer and bolt operating device having inter-engaging means for positively connecting together so that the turning of the plug by its key will operate the bolt.

2. In a lock, the combination with a cylinder and a plug therein, said plug having a transverse tongue extending from the inner end thereof, of a bolt operating device comprising a rotatable member having a transverse slot into which said tongue is adapted to project when the plug is forced inwardly, so that the bolt operating member and the plug are positively connected for operating the lock and a spring in the slot for normally pushing said tongue outwardly.

3. In a lock, the combination with a cylinder and a plug therein, said plug having extending from the inner end thereof a transverse tongue and a central stud, of a bolt operating device comprising a rotatable member having a central recess in its free end into which said stud projects at all times, a spring in said recess for engaging said stud and pushing the tongue outwardly, the end of said bolt operating member having a transverse slot into which said tongue is adapted to project when the plug is forced inwardly, so that the bolt operating member and the plug are positively connected for operating the lock.

4. In a lock, the combination with a bolt, a knob and a pinion adjustably connected with the knob for operating the bolt, of a lock comprising a plug rotatably and slidably mounted on the side of the door opposite the knob, and means whereby the plug will be positively connected with the pinion for reciprocating the bolt by the key of the lock when the key is inserted and pressed inwardly to move the plug in toward the bolt operating means.

5. In a lock, the combination with a bolt having a rack, of an elongated pinion meshing with the rack, a knob into which the end of the pinion extends, said knob having a recess in the end and a bolt extending axially into the knob and having its head resting in said recess, the corresponding end of the pinion having a screw-threaded opening therein for receiving the bolt, whereby the bolt can be turned to adjust the position of the pinion longitudinally with respect to said knob to accommodate the lock to doors of different thicknesses.

In testimony whereof I have hereunto affixed my signature.

MORRIS FALK.