

Sept. 8, 1942.

F. F. RATHBUN

2,295,356

KEY EJECTOR

Filed Oct. 5, 1939

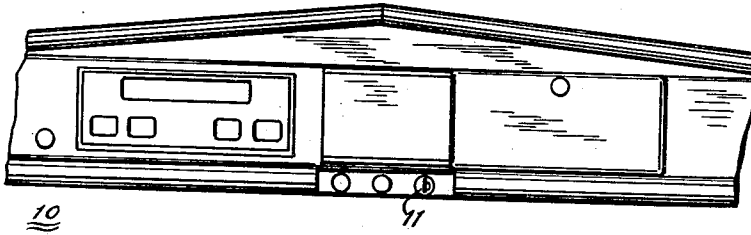
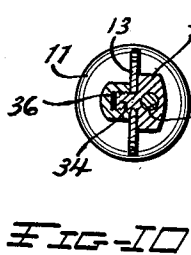
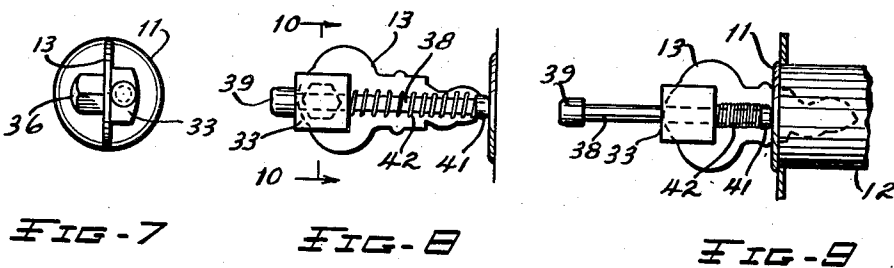
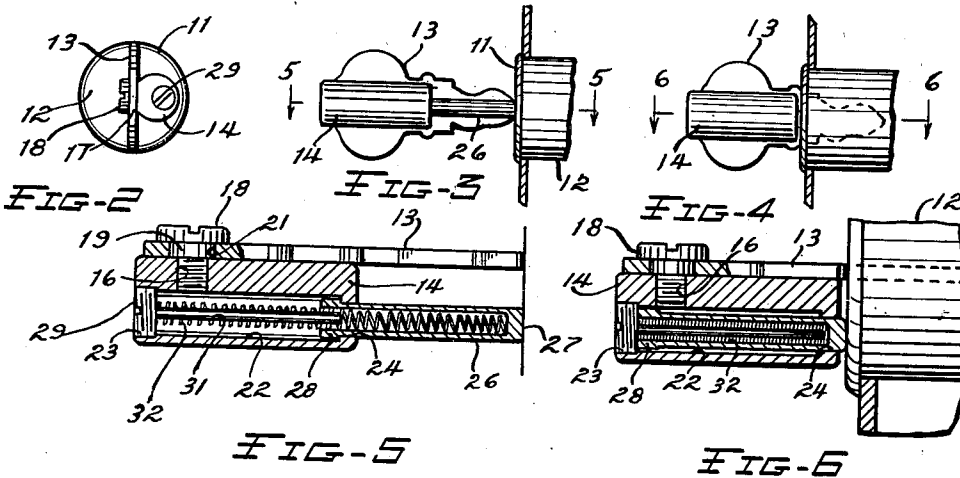


FIG-1



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2,295,356

KEY EJECTOR

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Application October 5, 1939, Serial No. 298,127

3 Claims. (Cl. 70—414)

This invention relates to an improvement in a device for ejecting a key from a lock.

In one form, the invention consists of a device attachable to a key and having a retractable member engageable under pressure with an adjacent portion of a lock or the surface of a lock enclosing casing. When a key is inserted into a lock sufficient pressure is built up by the retractable member to eject the key from the lock so long as said key is in any normally removable position.

The device in the illustrated form is applicable to the key of an automobile ignition lock and may materially aid in the prevention of theft by preventing the operator of the automobile from leaving the key in the lock when the ignition is turned off. The device is equally applicable to keys for locks of many other structures such as are commonly applied to building doors, chests, lockers, etc., and serves to prevent unauthorized locking or unlocking of these structures by the simple expedient of preventing the key from remaining in the lock when it is in a normally removable position. This is accomplished by the provision of means that constantly exerts an ejecting pressure on a key to which it is attached while the key remains in any unremovable position of engagement with a lock.

One of the objects of the invention lies in the provision of an ejecting device for use with keys of various types and purposes.

Another object of the invention lies in the provision of an ejecting device that is operable to automatically eject a key from a lock when the key is in any normal position of removal.

Another object of the invention lies in the provision of an ejecting device that is readily attachable, without alteration, to many types of keys.

Another object of the invention lies in the provision of an ejecting device that is readily attachable to many types of keys without alteration either to key or device.

Other and further objects and advantages of the invention will be more fully understood and appreciated from a consideration of the following specification taken in conjunction with the accompanying drawing, and in which

Fig. 1 is a front elevation of one form of the device applied to the key of an automobile ignition lock;

Fig. 2 is an enlarged end elevation of the device as applied in Figure 1;

Fig. 3 is a side elevation of the device prior to insertion of a key in a lock;

Fig. 4 is a view similar to Figure 3, showing the

position of the device when a key is inserted in a lock;

Fig. 5 is an enlarged longitudinal sectional view taken substantially on the line 5—5 of Figure 3;

Fig. 6 is an enlarged longitudinal sectional view taken substantially on the line 6—6 of Figure 4;

Fig. 7 is an end view of a modification of the device for use with a key and lock structure of the type illustrated in Figure 1;

Fig. 8 is a side elevation of the modification of Figure 7, prior to the key being inserted in a lock;

Fig. 9 is a view similar to Figure 8, showing the position of the parts of the modified device when the key is inserted in a lock; and

Fig. 10 is a vertical sectional view taken substantially on the line 10—10 of Figure 8.

Reference is now had to the drawing wherein the numeral 10 is employed to generally designate an instrument panel of an automobile. Included on the panel is an ignition switch 11 to which one form of the invention is applicable. As is common in switches of this type, a horizontally rotatable cylinder 12 is provided with an opening for receiving the ridged, grooved or otherwise formed part of a key 13. The key is generally inserted into the opening in the cylinder in a vertical position and rotated approximately forty-five degrees to turn on the ignition, in which position it is not removable.

The device consists of a member 14, that, in its disclosed form, is semi-cylindrical in cross section. A threaded opening 16 is made in the flat side 17 of the member. A suitable screw 18, engageable with the threads of the opening 16, is formed with an annular shoulder 19 of such proportions that it will project through a conventional opening 21 in the enlarged or handle end of the key 13. Through the use of the screw 18, it is possible to attach or detach, at will, any of a variety of keys to the member 14. It is preferable for best operation of the device that the key 13 be held rigid and in alignment with the member 14.

The member 14 may be formed with a longitudinally extending cylindrical compartment 22. At one end the compartment terminates in a threaded opening 23 of a diameter slightly greater than that of the compartment. The opposite end of the compartment terminates in a smaller diameter opening 24. Mounted in the compartment through the opening 23 is a pin 26. This pin is hollow and closed at the end 27. The other end of the pin is formed with a collar 28 that, when the pin is projected through the opening 24,

abuts the end wall of the compartment adjacent said opening. A screw plug 29 closes the opening 23 of the compartment 22. Projecting inwardly from the plug is a pin 31. This pin may be of a length to project into the open end of the hollow pin 26 when the elements of the device are in the position shown in Figure 5 of the drawing. Encircling the pin 31 is a compression spring 32. This spring is of sufficient length, under normal expansion, to extend from the plug 29 into the opening in the pin 26 and into abutment with the closed end 27. When the pin 26 is moved inwardly of the compartment 22 spring 32 is compressed. The spring is prevented lateral displacement by the pin 31. Pin 26 is properly located by reason of its engagement with the walls of opening 24 and with the walls of the compartment.

A further modification of the invention is shown in Figures 7 to 10 inclusive. In this instance, key 13 is attached to a block 33. The block is formed with a laterally directed screw 34 that may project through one of the openings in the key handle and be secured thereto by a nut 36. Perpendicular to the screw 34 is an opening 37 through which a pin 38 projects. Removal of this pin from the block 33 is prevented by end caps 39 and 41. Encircling the pin 38, between the block 33 and cap 41, is a compression spring 42. The operation of this modification of the device is identical with that above described.

Referring to Figure 5 of the drawing, it will be noted that the member 14 and pin 26 in normal extended position, are together substantially the length of key 13. This arrangement is primarily for illustration of the invention since the device will operate equally well with a shorter or longer key. In use a key is first aligned with the opening in the cylinder 12, substantially as indicated in Figure 3. When the key is moved into engagement with the cylinder, pin 26, by reason of contact with the cylinder adjacent the key opening, telescopes with member 14 substantially as shown in Figure 4. The key, having been fully inserted, is turned to the position to turn on the ignition and in such position is not removable. However, when the ignition is turned off and the key is in normally removable position, spring 32 expands causing member 14 and pin 26 to assume an extended position and key 13 to be forcefully ejected from the cylinder 12.

Although the ejecting device is shown applied to a key for an automobile ignition lock wherein there is only one normal position of removal, it is apparent the device is fully applicable to use with keys for locks of the type wherein the key is normally removable in either locking or unlocking position. It is not advisable to leave a key in the lock of a house entrance door and by

use of the present device it will be impossible for the key to be left in said lock whether the door is locked or unlocked. Furthermore, it is apparent the device is readily attachable to and usable with keys of different sizes, the only requirement being that the telescoping pin 26 must be moved to some extent to compress spring 32 and create pressure sufficient to eject the key when in normally removable position.

Although applicant has shown and described only two modifications of the invention, it will be apparent to those skilled in the art that the structure may be modified without departing from the spirit and scope of the invention as defined in the hereunto annexed claims.

Having thus set forth my invention what I claim as new and for which I desire protection by Letters Patent is:

1. A device for ejecting a key from a lock comprising a member adapted to be rigidly joined to the handle portion of a key, said member having a compartment open at opposite ends, a hollow pin in said compartment projecting through the opening in one of said ends, a cap closing the opening in the other of said ends, a pin joined to said cap and projecting into said hollow pin, a spring encircling the pin of said cap, said spring projecting into said hollow pin, the pins having telescoping engagement to compress said spring when said hollow pin is moved into said compartment.

2. A device for automatically ejecting a key from a lock comprising a member rigidly joined to the handle portion of the key, a pin carried by said member, said pin being movable in a direction parallel with and into and out of substantially coextensive position with respect to the lock engaging portion of said key, a spring normally urging said pin into coextensive position with the lock engaging portion of said key, said pin being movable out of said coextensive position against tension of said spring when said key is fitted into said lock, the spring tension being adapted to return said pin to its normally coextensive position and eject said key from said lock in any normally removable position of said key.

3. A device for automatically ejecting a key from a lock comprising a member rigidly joined to the handle portion of a key, a pin having slidable connection with respect to said member and movable into and out of position substantially coextensive with the lock engaging portion of said key, a spring normally urging said pin into said coextensive position, said pin being displaced under tension of said spring from said coextensive position when said key is fitted into said lock and rotated to a non-removable position.

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