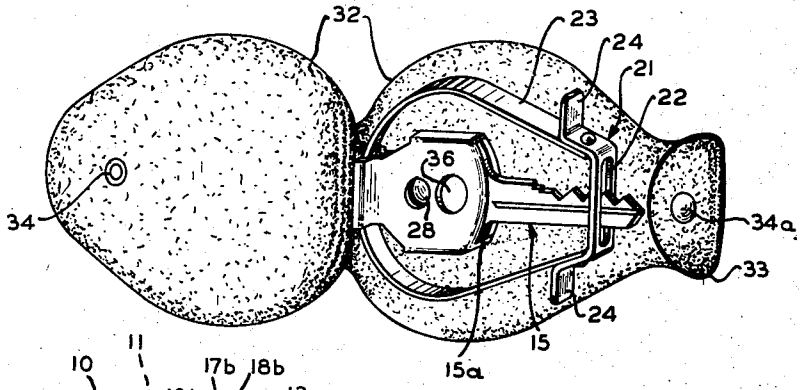
April 21, 1959 H. H. FURN 2,882,710

KEY WITH EJECTOR MEANS

Filed Aug. 26, 1955

FIG. 1



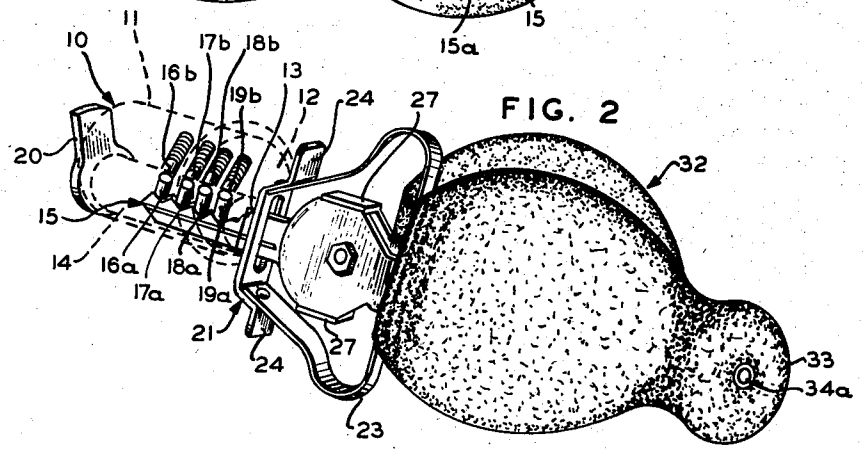


FIG. 2

FIG. 3

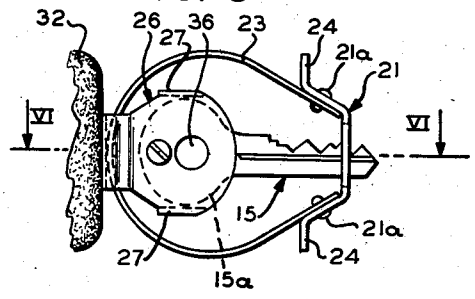
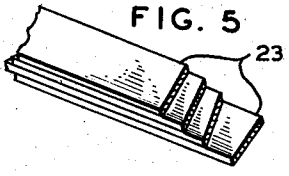


FIG. 5



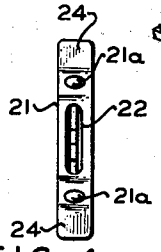


FIG. 4

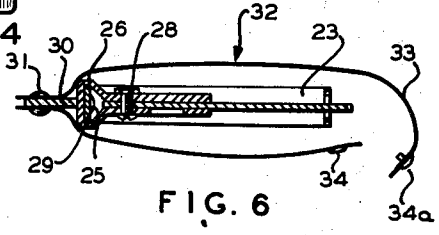


FIG. 6

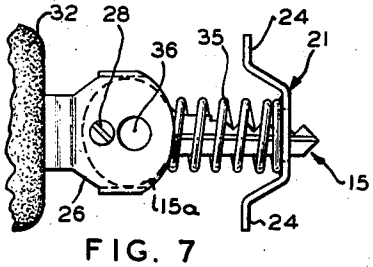


FIG. 7

INVENTOR.
HANS H. FURN

BY

George H. Fritzinger
Agt.

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KEY WITH EJECTOR MEANS

Hans H. Furn, Orange, N.J.

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3 Claims. (Cl. 70—414)

This invention relates to locks which are operable by inserting and turning a key, and more particularly it relates to a simple attachment for the removable key which is adapted to prevent the key from being left in the lock when the lock is turned off and which serves also to detent the lock more positively in on position to prevent accidental shifting of the lock to off position.

An object of the invention is to provide an improvement for the removable key for a lock which will provide assurance that the lock is used properly to fulfill better the purpose for which the lock is intended. Another object is to provide the key with a simple attachment which will safeguard against inadvertent or accidental handling of the key.

A lock by its very nature is intended to enable access to or operation of a device only by the person having the key fitting the particular lock. People often defeat this purpose by leaving the key in the lock after the lock is turned off. For instance, not infrequently people will leave the ignition key in a car after turning off the ignition lock, thereby inducing car thefts. Still further, when locks become loose from wear they may be jiggled into off position by vibration under conditions of use. An object of my invention is to prevent such inadvertences and misoperations from occurring by use of a simple and inexpensive attachment on the key of the lock.

Further objects are to provide a key with an attachment which will automatically eject the key from the lock and into the hand of the user as the key is turned off and which will exert outward thrust on the key to hold the lock mechanism firmly in position when the lock is in on position.

These and other objects and features of my invention will be apparent from the following description and the appended claims.

In the description of my invention, reference is had to the accompanying drawings, of which:

Figure 1 is a perspective view of a key device according to one embodiment of my invention;

Figure 2 is another perspective view of this key device showing the key inserted in a lock mechanism and turned to on position, parts of the lock mechanism being dottedly shown;

Figure 3 is a side view of this key device but with a foldable case for the device broken away;

Figure 4 is an end view of the key device;

Figure 5 is a fractional perspective showing to enlarged scale the spring member of the key device;

Figure 6 is a sectional view taken on the line 6—6 of Figure 3 and showing the foldable case in nearly closed position; and

Figure 7 is a side view similar to that of Figure 3 but showing a modified form of my key attachment.

The present invention is described by way of example in connection with a type of rotatable cylinder lock **10** shown in Figure 2, such as is commonly used, for example, as ignition locks. Such lock has a stationary housing **11**, dottedly shown, having a circular endface **12** provided with a key hole **13**. This key hole leads into a rotatable plug **14** adapted to receive the notched extending portion of a key **15**. Along the key hole there are wards for example in the form of a series of spring urged plungers for engaging the notches of the key. There are shown, for example, four plungers **16—19** each comprising inner and outer sections referred to by the reference numbers with the suffix letters *a* and *b* respectively. When the lock is in off position the plunger sections are aligned and extend well into the key space, thereby locking the plug **14** against being rotated. However, when a key is inserted which has the correct notches for the respective lock the plungers are pressed outwardly to points where the break lines between the plunger sections are just flush with the periphery of the plug; this condition allows the plug to be rotated by the key. As the plug is rotated the inner plunger sections are moved out of alignment with the outer plunger sections (Figure 2) and are locked by abutment of their outer ends against the surrounding wall of the housing. The interengagement of the inner ends of these locked plunger sections with the notches of the key serve to hold the key from being removed from the lock. A cam **20** on the end of the plug serves to operate the bolt or other mechanism as the key is turned.

In order to prevent accidental leaving of the key in the lock after the lock is turned off as well as to detent the lock more positively when the lock is turned on, I provide an improvement in the form of an attachment for the key. This attachment comprises a pressure bar **21** having a clearance slot **22** receiving the notched extending portion of the key, and a spring **23** which interconnects this bar with the head or fingerpiece **15***a* of the key and holds the pressure bar near the end of the key. Preferably, a flat spring comprising a plurality of thin spring members are employed as shown in Figure 5 in order to give the spring the necessary strength together with the desired "softness." The pressure bar is preferably provided with oppositely extending wings offset backwardly from the end of the key to provide it with fingerpieces **24**. The ends of the spring **23** are riveted to the offsetting portions of the pressure bar at **21***a*, and the spring is bowed arcuately around the fingerpiece **15***a* of the key. At its crown the spring is secured by a rivet **25** (Figure 6) to a bracket **26** having oppositely extending wings which are bent in U shape around the head of the rivet against the opposite sides of the fingerpiece of the key. The wings of the bracket are shaped to conform to the side edges of the fingerpiece, and one wing is provided with side flanges **27** to close the sides of the fingerpiece. A rivet **28** traverses the wings and fingerpiece to hold the bracket securely to the key.

Between the head of the rivet **25** and the bracket there is clamped a narrow plate **29** provided with a lug **30** which extends through a central apertured portion of the bracket outwardly from the key. Secured by an eyelet or rivet **31** to this ear is a flexible folder **32** having two oppositely extending wings for enveloping the key device to form a case therefor. One wing of this folder has an extending flap **33** for closing off the end of the key device and overlapping the other wing. This flap and the adjacent end portion of the other wing are provided with complementary press-type detent members **34** and **34***a* to enable the folder to be snapped closed as indicated in Figure 6.

To use the key device the folder is turned back as shown in Figure 2 and the end of the key extending beyond the pressure bar **21** is inserted into the keyhole. Thereupon, the key is inserted further through the distance of the notched portion with the pressure bar bearing against the face **12** of the lock, under influence of the resisting force of the spring **23**, and with the spring compressed in the manner shown in Figure 2. When

the key has been so inserted it is turned to operate the lock. Alternatively, the spring **23** may first be compressed by force of the fingers against the fingerpieces **24** and the thumb against the lug **30**, and while so holding the spring compressed the key is inserted and turned, and then the hand is removed.

When the hand is removed after turning the key to on position, the spring **23** acting through the pressure bar **21** serves to exert an outward thrust on the key. This is beneficial in preventing a lock from being accidentally turned off by jiggling of the lock such as may occur during use. Further, and of especial importance, when the lock is turned off this outward thrust serves to eject the key automatically into the hand of the user. This not only facilitates removal of the key but more importantly serves to safeguard against the user leaving the key accidentally in the lock and, thus, against the user accidentally allowing unauthorized operation of the lock.

In Figure 7 there is shown an alternative embodiment of my key attachment which differs from the foregoing in the use of a helical spring **35** instead of the flat spring **23** between the pressure bar **21** and the fingerpiece **15***a* of the key. This spring surrounds the notched portion of the key at a clearance spacing therefrom, and is secured at its ends, as by welding, to the pressure bar **21** and bracket **26** respectively.

In each of the foregoing embodiments a suitable opening **36** is provided in one or both of the wings of the bracket **26** to expose identifying marks or indicia on the fingerpiece of the key.

The embodiments of my invention shown in the accompanying drawings are intended as being illustrative and not necessarily limitative of my invention since the same are subject to changes and modifications without departure from the scope of my invention, which I endeavour to express according to the following claims.

I claim:

1. A key device for a rotatable lock having means for retaining the key when the lock is in on position, said key device comprising a key having a head portion and an extending notched portion adapted to be inserted in said lock for turning the same, a pressure member slidably embracing said notched portion, and a compression spring operatively interpsed between said pressure member and said head of the key comprising a plurality of superimposed flat resilient members bowed into a U form with the crown thereof connected to said head portion and the ends secured to said pressure member for yieldably holding said pressure member in position for pressure against said lock with movement thereof towards said head and with compression of said spring to provide an ejecting force on th key as the key is inserted.

2. A key device for a rotatable lock mechanism having an end face with a keyhole therein, comprising a key having a flat head and an extending flat notched portion adapted to be inserted in said keyhole for turning the lock, a pressure member at the end of the key having a central clearance hole loosely receiving said notched portion, and a plurality of superimposed leaf springs bowed into a U form and having their end portions connected to opposite sides of said pressure member and the crown portion connected to said head for exerting pressure against said end face tending to eject the key while the key is in the lock mechanism, said leaf springs and head lying in a common medial plane and said plurality of superimposed leaf springs being adapted to hold said pressure member firmly in sidewise directions while having a soft yieldability along said notched portion of the key enabling easy insertion of the key into a lock mechanism.

3. A key device for a rotatable lock, comprising a key having a head and an extending notched portion adapted to be inserted in said lock for turning the same, a single pressure member slidably embracing said notched portion of the key, a compression spring comprising a plurality of flat bowed resilient members superimposed on each other and connected at their ends to said pressure member and at their crown portion to said head for yieldably holding said pressure member in position wherein it will press against said lock and be moved towards said head of the key with compression of said spring as the key is inserted in the lock whereby a force is exerted on the key for ejecting it from the lock when the key is released from the lock, and fingerpieces at opposite sides of said pressure member offset therefrom towards said head for enabling said compression spring to be compressed prior to inserting the key by force exerted by the hand between said fingerpieces and said head of the key.

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