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M. K. EUSTON

3,484,569

REMINDER AUTO IGNITION SWITCH

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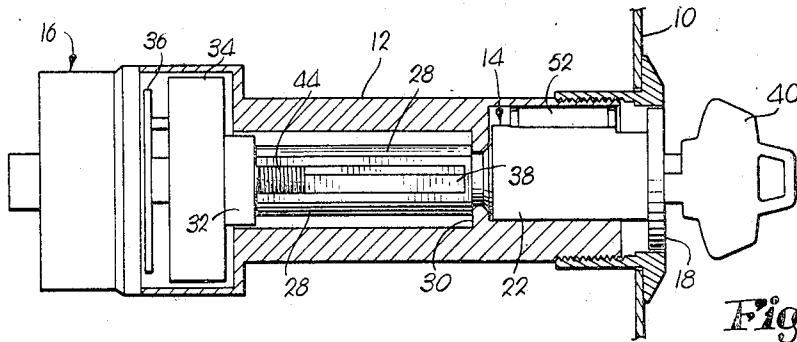


Fig. 1.

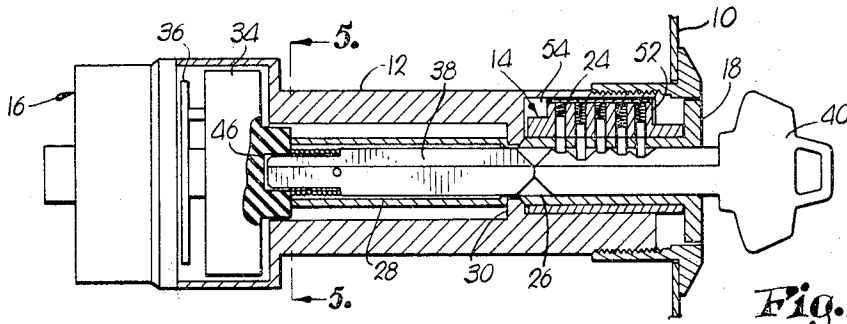


Fig. 2.

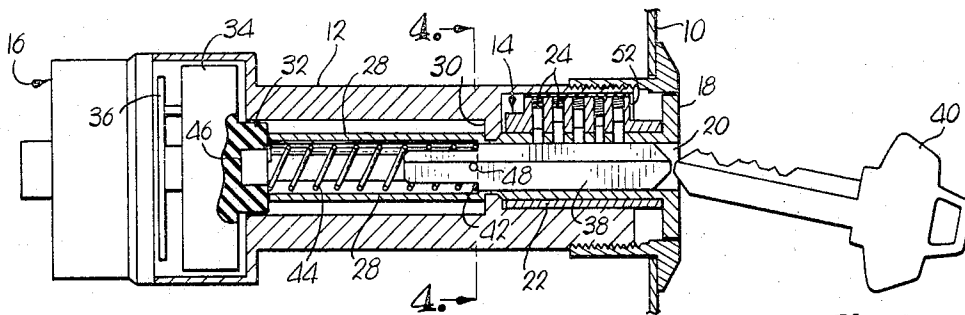


Fig. 3.

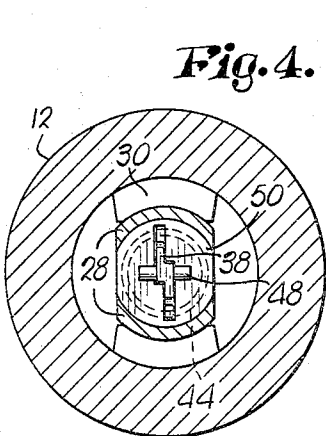


Fig. 4.

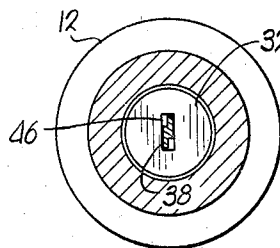


Fig. 5.

INVENTOR
Milton K. Euston

BY *Schmidt, Johnson, Nowey,*
Williams & Bradley.
ATTORNEYS.

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REMINDER AUTO IGNITION SWITCH

Milton K. Euston, 520 E. 57th St.,

Kansas City, Mo. 64110

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3 Claims

ABSTRACT OF THE DISCLOSURE

A spring-loaded plunger is disposed in the keyslot of a motor vehicle ignition switch and is depressed by the ignition key as the latter is inserted into the keyhole. Thus, the key is automatically ejected when the switch is subsequently returned to the "off" position and the key is released.

It is well known that a large percentage of motor vehicle thefts are occasioned by the driver inadvertently leaving the vehicle unattended with the ignition key inserted in the ignition switch. Manifestly, the incidence of theft could be reduced if vehicles were equipped with some means to prevent the key from remaining in the switch when the latter is turned to the "off" position.

It is, therefore, the primary object of this invention to provide a means of positively precluding the inadvertent leaving of an ignition key in a motor vehicle in order that the driver will be coerced to keep the key in his possession when the vehicle is unattended.

Furthermore, it is an important object of the instant invention to provide a means of ejecting a key from a lock when the key is released by the user thereof and, specifically, to provide a means of ejecting an ignition key from an ignition switch of a motor vehicle when such switch is returned to the "off" position and the key is released.

Still another object of this invention is to provide a key-ejecting plunger for an ignition switch which is actuated upon insertion of the key into the barrel of the lock and, in response to such insertion, causes the barrel to be rotatably interlocked with the rotary switching element of the ignition switch.

In the drawing:

FIGURE 1 is a side elevational view of an automotive ignition switch assembly showing a key inserted therein, the housing thereof being revealed in longitudinal section;

FIG. 2 is a longitudinal sectional view showing the various components of the assembly in the positions as in FIG. 1;

FIG. 3 is a longitudinal sectional view of the assembly illustrating ejection of the key by the plunger;

FIG. 4 is an enlarged, cross-sectional view taken along line 4—4 of FIG. 3; and

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 2.

The ignition switch assembly is shown mounted on a panel 10 forming a part of the dashboard of an automobile or other motor vehicle. The assembly includes a housing 12, a cylinder assembly 14, and an ignition switch 16. The cylinder assembly 14 has a rotatable lock barrel 18 defining a keyhole 20, an outer, stationary cylinder 22, and five 2-section tumblers 24 mounted in the stationary cylinder 22 and spring-biased into the keyslot 26 of barrel 18 which extends longitudinally thereinto from the keyhole 20.

The barrel 18 is provided with a pair of longitudinally extending barrel extensions 28 of arcuate cross-sectional configuration, as is clear in FIG. 4. The housing 12 has a pair of opposed, inwardly projecting lugs 30 which seat in front of extensions 28 in grooves provided for such

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purpose. Extensions 28 terminate in closely spaced relationship to a hub 32 forming a part of the rotor 34 of switch 16. The rotor 34 includes the usual return spring (not shown) utilized in ignition switches in which a turn of the ignition key past the "on" position energizes the starter motor, and also carries the rotary switching element 36 which selectively engages the stationary contacts (not shown) of ignition switch 16.

A plunger 38 is normally disposed in keyslot 26 (FIG. 3) and has the same cross-sectional configuration as a blank from which the key 40 is ground. The end portion of plunger 38 remote from keyhole 20 is reduced in width to present a pair of shoulders 42 which are engaged by one end of a coil spring 44. The opposite end of spring 44 seats against the face of hub 32, the latter having a rectangular opening 46 therein which receives the reduced end of plunger 38 when spring 44 is compressed by the insertion of key 40, as illustrated in FIGS. 2 and 5. A cross pin 48 limits the travel of plunger 38 toward keyhole 20 by engagement of cross pin 48 with the rear face 50 (FIG. 4) of barrel 18 from which barrel extensions 28 project.

It should be understood that the barrel 18 and the housing 12 are interlocked in the usual manner to prevent withdrawal of cylinder assembly 14, this being effected by the action of lugs 30 within housing 12. In this regard, it is customary to provide the front flange of barrel 18 with an arcuate slot which receives a detent (not shown) carried by the stationary, outer cylinder 22 to limit rotation of barrel 18 relative to cylinder 22. To install the cylinder assembly 14, however, the detent is released to permit barrel 18 to be rotated to a position such that the barrel extensions 28 will be displaced 90° from the orientation thereof illustrated in FIG. 4, permitting extensions 28 to slip past lugs 30 as assembly 14 is inserted into housing 12 with the projecting portion 52 thereof in register with a longitudinally extending slot 54 in housing 12. The barrel is then rotated until the detent falls into the arcuate slot in the barrel flange, at which time barrel extensions 28 no longer clear lugs 30.

In use, it will be appreciated in FIG. 3 that plunger 38 normally substantially fills the keyslot 26, the tumblers 24 being held in positions which lock barrel 18 against movement. Upon insertion of key 40, as illustrated in FIG. 2, plunger 38 is shifted to compress spring 44, full insertion of the proper key resulting in alignment of the tumblers 24 as shown to unlock barrel 18. The key 40 may then be rotated to turn barrel 18 and to also rotate the switch rotor 34, since the reduced end of plunger 38 is now seated within the opening 46 in hub 32.

In the unlocked position, key 40 cannot be withdrawn because of the presence of the inner tumbler sections which are sandwiched between the grooves of the key and the internal surface of the outer cylinder 22. However, when the device is unlocked to turn the ignition off, a mere releasing of key 40 will cause its ejection from keyhole 20 by virtue of the spring-biased plunger 38. Therefore, the driver will be reminded to keep key 40 on his person when the vehicle is unattended since the key will be automatically and positively ejected from the lock into his hand as the ignition switch is turned off.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a key-operated device:

a key-receiving, rotatable barrel having a keyhole therein;

tumbler structure normally locking said barrel against rotation and disposed for engagement by a key upon insertion of the latter into the barrel through the keyhole;

means in said barrel engageable by the key upon said

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insertion thereof for ejecting the key from the barrel through the keyhole when the barrel is locked by the tumbler structure and the key is released, said key-ejecting means including a reciprocable, key-engaging plunger in said barrel, said key-ejecting means further including yieldable means biasing said plunger toward the keyhole, said plunger being rotatable with said barrel and reciprocable in the barrel axially thereof, and being provided with a pair of opposed ends, one of said ends being engageable by the key; and an electrical switch having a rotatable switching element mounted in substantial axial alignment with said barrel and disposed in the path of travel of said plunger, the other of said ends of the plunger engaging said element to interconnect the latter and the plunger for rotation together when the plunger is shifted by the key against the action of said yieldable means.

2. The invention of claim 1, said plunger having shoulder means spaced from said other end thereof, said yieldable means comprising a coil spring normally telescoped over said other end and engaging said

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shoulder means, whereby said other end shifts within the spring during movement of the plunger.

3. The invention of claim 2, said spring engaging said element and being held in compression between the latter and the shoulder means when the key is inserted, said element having an opening therein for receiving said other end of the plunger to effect said rotational interconnection, said plunger being provided with stop means engageable with said barrel for limiting movement of the plunger toward the keyhole under the drive of the spring.

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ROBERT K. SCHAEFER, Primary Examiner

H. J. HOHAUSER, Assistant Examiner