Dec. 26, 1967 V. E. GROCOTT ET AL 3,360,619

KEY EJECTING VEHICLE IGNITION SWITCH

Filed Nov. 8, 1966

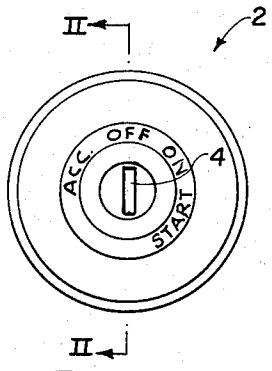


Fig. 1

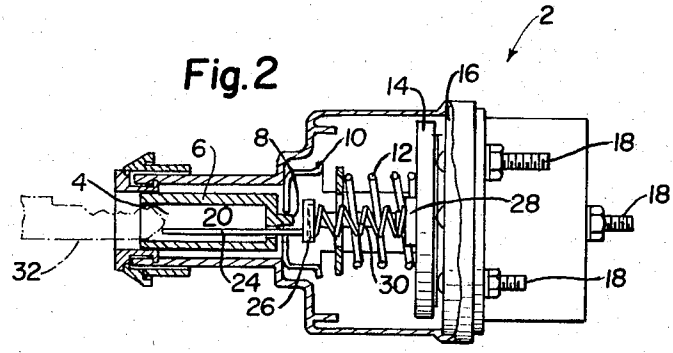


Fig. 2

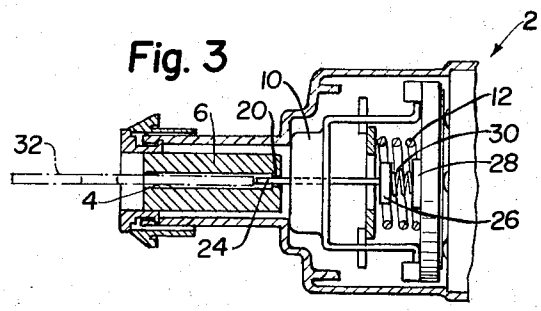


Fig. 3

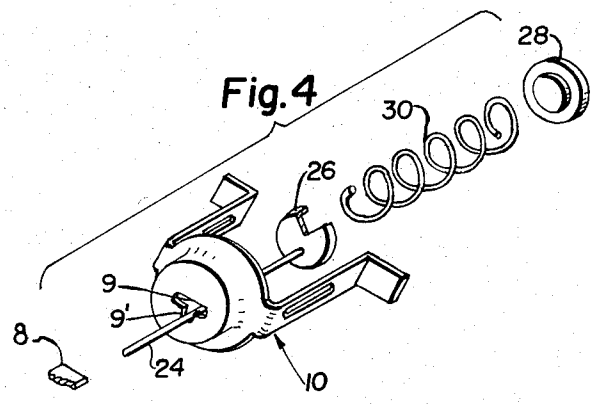


Fig. 4

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3,360,619

Patented Dec. 26, 1967

3,360,619

KEY EJECTING VEHICLE IGNITION SWITCH

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Filed Nov. 8, 1966, Ser. No. 592,913

2 Claims. (Cl. 200—44)

ABSTRACT OF THE DISCLOSURE

A key ejector ignition switch having a rotatable switching element with a substantially cup-shaped end portion that has a central slot and an eccentrically positioned second slot; the second slot therein arranged to eject the switch key when the key is turned to the "off" position.

This invention relates to a novel key-operated ignition switch for vehicles. More particularly, the invention relates to a key ejection device in an ignition switch which automatically ejects the key when turned to the "off" position.

A common cause of automobile theft is the habit of leaving a key in an ignition switch while the vehicle is parked. It is very easy to forget to remove the key if a firm habit has not been established. A key left in a parked vehicle presents a temptation and an invitation to car thieves.

An important object of this invention is to provide a device which will automaticatlly eject the key into the operator's hand when the ignition is turned off thereby forcibly reminding him to take the key.

Another important object of the invention is to provide a device which can readily be installed in an ignition switch with some modification during the manufacture of the same.

Other important objects and advantages will become more apparent from a study of the following description taken with the accompanying drawings wherein:

FIG. 1 is a front view of an ignition switch;

FIG. 2 is a longitudinal cross-sectional view taken along line II—II of FIG. 1 and showing the ignition switch of the present invention in the "off" position;

FIG. 3 is a cross-sectional view similar to FIG. 2 except that the switch is shown in the "on" position with the key shown in a rotated position; and

FIG. 4 is an exploded view of the key ejecting plunger and spring means embodying the principal features of the present invention.

Referring more particularly to the drawing, an ignition switch for vehicles, generally denoted by numeral **2**, has a slot **4** for the insertion of key **32**. Tumbler **6**, which is under tension by a helical spring **12**, is positioned in switch **2** to receive key **32**. Lug **8** of tumbler **6** fits into slot **9** of bracket **10**, which is rigidly attached to switching plate **14**. When tumbler **6** is rotated by the turning of the key, lug **8** locks in slot **9** and causes switching plate **14** to rotate to various switching positions.

A stationary element **16** has a plurality of terminals **18** which are connected to various electrical circuits in the vehicle, such as ignition, starting circuits and accessory circuit. As the switch plate **14** rotates, it forms an electrical connection with the various circuits connected to element **16**, thereby selectively completing the desired electrical circuits.

The abovementioned ignition switch and its principal components shown are not claimed as new. However, when combined with the following additional elements (best shown in FIG. 4), they constitute a highly useful improvement from the standpoint of safety.

Plunger **24**, which comprises an essential part of the invention, is disposed in a groove **9'**, offset from slot **9** in the center of bracket **10**. One end of plunger **24** is disposed in slot **4** and in line with the path of key **32**. The other end of the plunger **24** is attached to the spring receiving cup **26** in offset relation to its center so that the center of cup **26** is coaxial with slot **9** and spring **30**.

Spring **30** is a helical spring which is supported, at one end, in cup **26** and at its other end on washer **28** which, in turn, is attached to the switch plate **14**.

In operation, key **32** is inserted into slot **4** thereby moving plunger **24** longitudinally with compressed spring **30**. The key is then turned to one of the desired electrical switching positions. While in that position, the key is locked in place by the locking action of tumbler **6** so as to prevent the key from moving out of the selected position. When the key is returned to the "off" position, spring **30** is free to expand, thereby pushing plunger **24** against key **32** so as to eject it forcibly from slot **4** and into the hand of the operator. In this way, it becomes impossible to leave the key in the ignition switch when the engine and the electrical system are turned "'off."

Thus it can be seen that we have invented a novel device for automatically ejecting an ignition key when the switch is turned to the "off" position; we have also provided a device that is simple in construction and operation and is readily adaptable to ignition switches for use in all types of vehicles.

While we have illustrated and described a single embodiment of our invention, it will be understood that this is by way of illustration only, and that various changes and modifications may be made within the contemplation of our invention and within the scope of the following claims.

We claim:

1. In an ignition switch for vehicles having a fixed cylinder, a tumbler rotatable therein by a key from the "off" position to different electrical switching positions, a rotatable switching element having a substantially cup-shaped end portion with a central slot into which a projection from said tumbler is detachably inserted for turning the switching element to selected positions, a stationary switch element cooperating therewith, spring means in said fixed cylinder between said stationary switch element and said rotary switching element, a second slot eccentrically positioned in said end portion of said switching element, a plunger rod extending through said second slot in offset relationship to said projection and in the path of said key and arranged to be ejected by said spring means when said tumbler is rotated by the key to the "off" position.

2. An ignition switch as recited in claim **1** wherein said second slot is continuous with said first slot and wherein said spring means includes a helical spring, a cup shaped element for receiving one end of said helical spring and being eccentrically connected to said plunger rod, the other end of said helical spring being connected to said stationary switch element to provide the key ejecting force.

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