# United States Patent

**Schwendeman, Jr.**

[15] **3,705,369**

[45] **Dec. 5, 1972**


[54] **KEY ACTUATED SWITCH**


[72] Inventor: **Wayne C. Schwendeman, Jr.,** 4708 Garfield, Lisle, Ill. 60532



[22] Filed: **Nov. 1, 1971**

[21] Appl. No.: **194,372**

[52] **U.S. Cl.** .....**335/206,** 70/413, 200/61.66

[51] **Int. Cl.**.....**H01h 27/00,** H01h 27/06

[58] **Field of Search** .....335/205, 206, 207; 200/44, 200/61.64, 61.66; 70/276, 413



[56] **References Cited**

UNITED STATES PATENTS

2,767,278 10/1956 Collins .....335/206



*Primary Examiner*—Roy N. Envall, Jr.

*Attorney*—Elmer L. Zwickel



[57] **ABSTRACT**

Switch means incorporating means to energize an electric circuit upon use of a key of predetermined characteristics but which will energize an alarm system upon use of an improper key, or fail to work at all.


**4 Claims, 5 Drawing Figures**

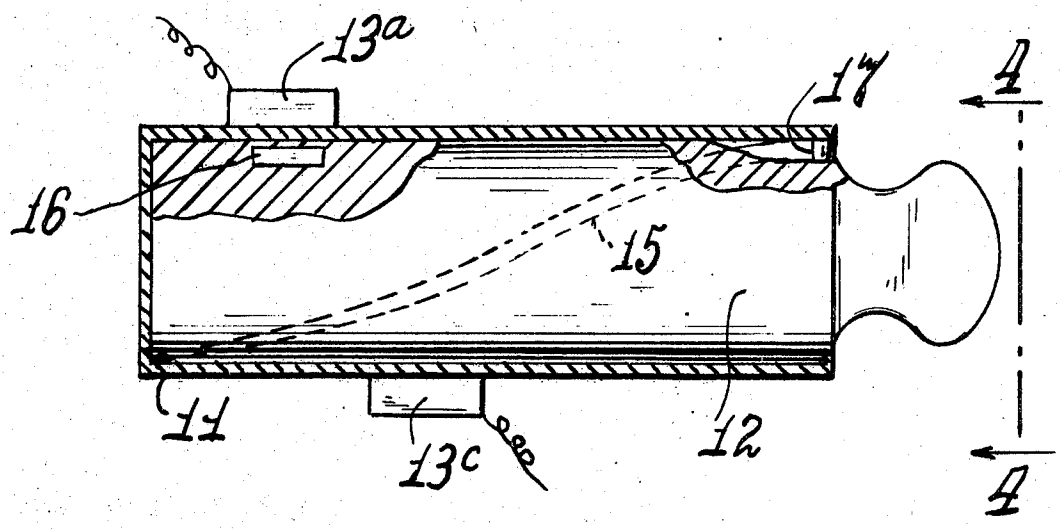


Fig. 1.

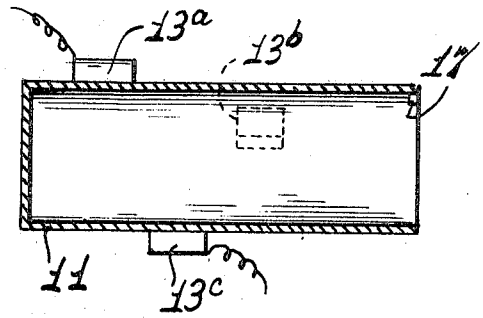



Fig. 2.

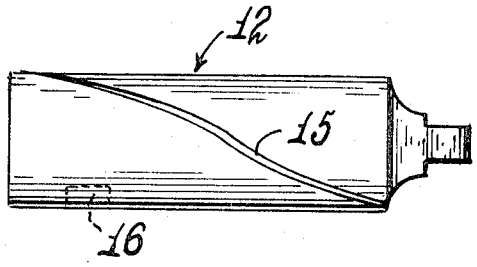



Fig. 3.

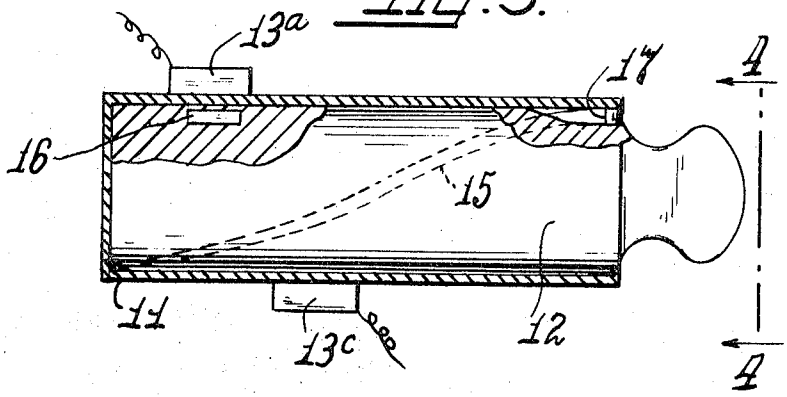



Fig. 4.

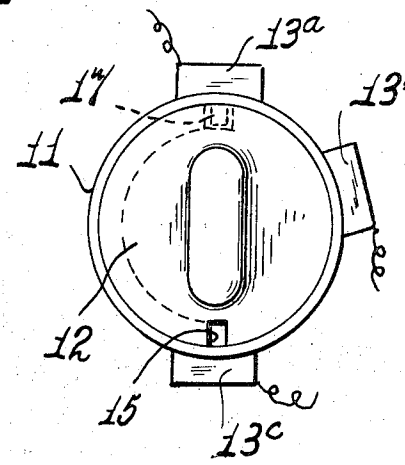
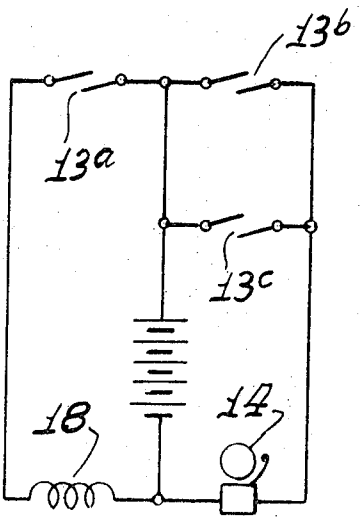



Fig. 5.



# KEY ACTUATED SWITCH

The invention relates to improvements in a key actuated switch and is more particularly concerned with the novel construction and operation of means responsible to the insertion of a selected key to close a switch or switches in an electric circuit and which, when a key of a non-selected type is inserted into the device, closes a switch operable to set off a visual or audible alarm signal and won't come within operating range of the switch connected to the coil.

More specifically, the switch comprises a hollow body, herein called "lock cylinder," having mounted about its cylindrical wall a plurality of magnetically actuated reed switches, one or more of which is electrically connected, for example, to the ignition circuit of an automobile and the others to an alarm system which may be visible or audible.

The key is comprised of a non-magnetic dowel having embedded in it, at a predetermined location, a permanent magnet. The key has a spiral groove extending along its length which cooperates with an internal pin or stud in the lock cylinder. When a proper key is used, the spiral groove and stud cause the key to rotate and in such manner that the switches for the alarm are bypassed by the magnet which is ultimately brought into register with the switch or switches for the ignition circuit.

It is therefore an object of the invention to provide an assembly of the character referred to.

Another object is to provide a magnetic key for selective association with an electric switch.

Another object is to provide a key fabricated from material non-magnetic and having a permanent magnet fixed therein.

Another object is to provide a key that is cylindrical in cross section and has means therein to cause it to rotate while being inserted into a lock cylinder.

Another object is to provide a lock cylinder and an associated key incorporating cooperative means to cause the key to rotate while being inserted into the lock cylinder.

Another object is to provide a lock cylinder with a plurality of electric switches some of which are operable to activate an alarm when an improper key is inserted into the lock cylinder.

Other objects and advantages of the invention will become apparent with reference to the following description and accompanying drawing.

In the drawing:

FIG. 1 is an axial sectional view of the lock cylinder.

FIG. 2 is a side elevational view of the key.

FIG. 3 is a view showing the key inserted into the lock cylinder.

FIG. 4 is an end elevational view of the assembly viewed along line 4—4 of FIG. 3.

FIG. 5 is a schematic of an electric circuit including the lock, a starter ignition coil and an alarm device.

Referring to the exemplary embodiment of the invention as shown in the accompanying drawings, the lock assembly includes a lock cylinder 11 and a key 12. The lock cylinder preferably is comprised of a hollow cylindrical body open at one end and having a plurality



of magnetically actuated normally open reed switches 13 mounted firmly on its outside surface. One or more of these switches, for example, the switch 13*a*, is connected in the electrical circuit to the starter-ignition system of a vehicle whereas, the remaining switches 13*b* and 13*c* are connected in parallel in the electrical circuit to an alarm device such as the buzzer 14 shown. This is best illustrated in FIG. 5.

The key 12 is fabricated from non-magnetic material in cylindrical form and of a size to fit snugly but slidably in the lock cylinder 11. It has formed in its surface from end to end, a spiral groove or key-way 15. It also carries adjacent its lead-in end a permanent magnet 16 that is embedded in its body.

When the key 12 is to be inserted into the lock cylinder 11, the key-way 15 is placed in register with a stud, or pin 17, on the inside surface of the entrance end of the lock cylinder so that as the key is pushed into the lock cylinder it is rotated. The magnet 16 is so located circumferentially on a proper key that when the key is thrust totally into the lock cylinder the magnet will be brought into register with the switch 13*a* so as to cause same to close and energize the circuit to the ignition coil 18. The remaining switches 13*b* and 13*c* are so located circumferentially that the magnet never registers with either of them during key insertion or withdrawal hence the alarm system is not actuated. Should an improper key be inserted, one or the other of said switches 13*b* or 13*c* will be closed by the magnet and the alarm 14 activated or the magnet will not register with 13*a*.

The structure has been described as applicable to the ignition system of a motor vehicle, but it should be understood that the switch can be used in any electrical circuit, such as an alarm system for a door, or the ignition or starter system for other types of vehicles or motors.

Although I have described a preferred embodiment of the invention, in considerable detail, it will be understood that the description thereof is intended to be illustrative, rather than restrictive, as details of the structure may be modified or changed without department from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact construction described.

I claim:

1. An electric switch comprising a lock cylinder, a plurality of normally open magnetic switches spaced along and surrounding said lock cylinder, a key, a permanent magnet carried by said key, a spiral key-way slot in said key, and a pin on said lock cylinder engaged in said key-way and effective to cause the key to rotate during its insertion into the lock cylinder to carry the magnet into close association with a selected one of the switches for closing same when the key is fully positioned in said lock cylinder.

2. The switch recited in claim 1, in which the switches are mounted on the lock cylinder.

3. The switch recited in claim 1, in which the key comprises a solid cylindrical body.

4. The switch recited in claim 3, in which the magnet is embedded in the cylindrical body.

* * * * *