July 27, 1948. E. N. JACOBI 2,445,949

SWITCH TERMINAL GUARD

Filed April 29, 1946

Fig. 1.

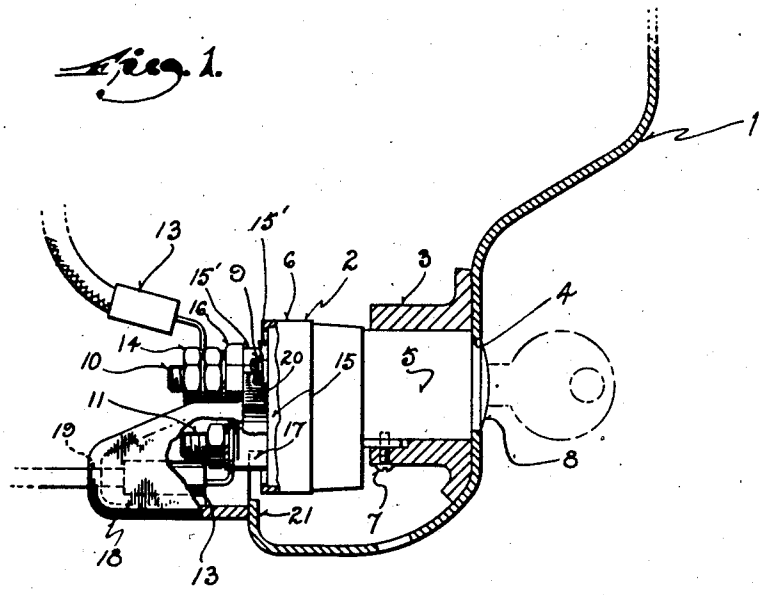
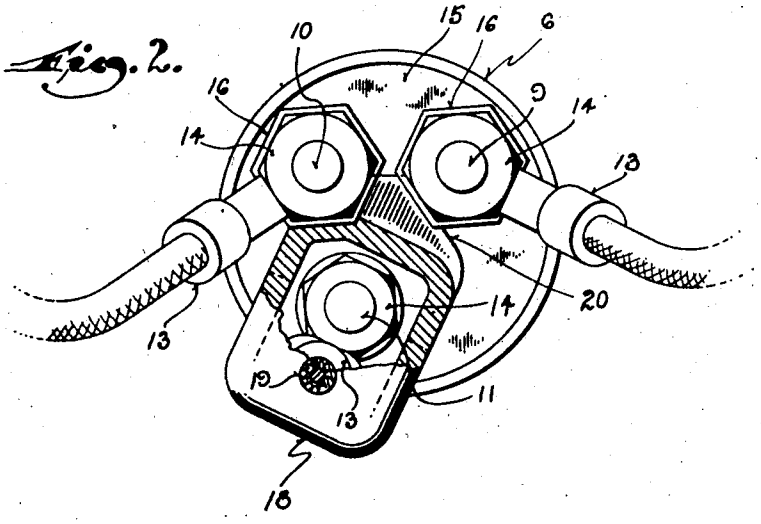


Fig. 2.



Inventor
Edward N. Jacobi
By Dr. Smith & Jones
Attorneys

Patented July 27, 1948

2,445,949

UNITED STATES PATENT OFFICE

2,445,949

SWITCH TERMINAL GUARD

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

Application April 29, 1946, Serial No. 665,880

4 Claims. (Cl. 174—138)

1

This invention relates to switches for controlling the ignition circuits of automotive and other vehicles and refers more particularly to ignition switches of the locking type.

Lock switches of this nature are generally mounted on the back of an instrument panel and have a key controlled cylinder lock rotatably journalled on the switch housing with the forward end of the lock projecting through a hole in the panel to be accessible at the front of the panel. The rotatable lock cylinder thus serves as a convenient actuator for the movable contactor of the switch.

Two or more terminal studs each connected with one of the stationary contacts of the switch project rearwardly from the back of the switch to receive wire connector lugs and nuts thereon by which the switch is connected in the ignition circuit for the vehicle and to enable the switch to control various other circuits.

One of the terminals of the switch constitutes a battery terminal and the other of the terminals constitutes a coil terminal to enable the vehicle to be started whenever the switch is turned to an "on" position by rotation of the cylinder with a proper key.

When the switch is turned to its "off" position and the key withdrawn the ignition is said to be locked and it is this feature of ignition switches of the locking type which provides a measure of protection against theft of the vehicle.

For increased protection against theft it has been customary to provide a heavily armored conductor for the coil terminal of locking ignition switches of the character described. The armor on such cables completely encloses all portions of the conductor leading to the coil terminal and encases the coil terminal itself so as to prevent "jumpering" of the ignition terminals to close the ignition circuit without key actuation of the lock cylinder in attempts at theft of the vehicle.

While these heavily armored cables rendered it impossible to "jumper" the ignition terminals they were nevertheless objectionable from the standpoint of high cost. In an effort to lower the cost of locking ignition switch installations, the heavily armored cable has been eliminated from some late ignition switch designs and a conventional insulated conductor or one having but light armor substituted therefor. Hence, the coil terminal and the connector lug thereon is left exposed on the back of the switch and it is a simple matter for unauthorized persons to reach behind the instrument panel upon which such a switch is mounted and connect a jumper between the battery and coil terminals to complete the ignition

2

circuit and thus enable the vehicle to be started and stolen.

With this objection to present switch constructions in mind, it is an object of the present invention to provide a simple and inexpensive guard for one of the terminals of an ignition switch of the character described which effectively interferes with attempts at "jumpering" the switch terminals.

A further object of this invention resides in the provision of an inexpensive shatterproof plastic guard for the coil terminal stud on an automobile or aircraft lock switch which may be quickly installed during assembly of the switch on the instrument panel and which will defeat attempts to jumper the ignition terminals of the switch.

Still another object of this invention resides in the provision of a guard of the character described which is adapted to be secured to the back of a lock switch by means of the nuts holding wire connector lugs to one or more of the unguarded terminals thereof and which will be so located as to obstruct access to such nuts for the purpose of rendering removal of the guard exceedingly difficult.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a sectional view through a portion of an instrument panel illustrating the application of the guard of this invention to one of the terminals of the lock switch on the panel; and

Fig. 2 is a rear view of the switch illustrating the manner in which the guard of this invention obstructs access to the exposed terminals of the switch.

Referring now more particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 1 designates generally the instrument panel of an automobile or other vehicle having a locking ignition switch 2 mounted thereon. The switch structure may be secured to the rear of the panel in any suitable manner

such as by a socket 3 welded on the back of the panel in registry with a hole 4 therein.

While the lock switch structure may be of any suitable design the switch shown comprises a lock barrel 5 extending forwardly of the switch housing 6 and received in the socket 3 in which it is secured by means of a screw 7 passing through the side of the socket and threading into the barrel with the forward end of the barrel abutting against the back of the panel.

The barrel 5 also serves to rotatably mount the lock cylinder 8 with its forward end projecting through the hole 4 in the panel to be accessible for key actuation at the front of the panel. It is to be understood, of course, that rotation of the cylinder by a proper key actuates the switch to "on" and "off" positions in the usual manner.

Two or more terminal studs electrically connected with the stationary contacts (not shown) of the switch project from the back of the housing to enable battery, coil and other leads for certain auxiliary circuits to be connected thereto.

In the present instance the switch is provided with a battery terminal stud 9, an electrical gage and radio terminal stud 10, and a coil terminal stud 11 positioned beneath the studs 9 and 10. Bridging of the stationary switch contacts connected with the battery and coil terminal studs 9 and 11 closes the ignition circuit to enable the automobile or other vehicle to be started.

The wire leads running to the terminal studs are connected thereto by means of conventional connector lugs 13, which are secured in place by nuts 14 threaded onto the terminal studs on top of the apertured portions of the connector lugs.

In the present instance the insulating terminal head 15 of the switch is provided with hexagonal bosses 15' on the back of the terminal head through which the terminal studs 9 and 10 project, and substantially cup-shaped hexagonal caps 16 are telescoped over the extremities of the bosses to protect the same when the nuts 14 are tightened down on the lug connectors.

A metallic terminal clip 17 is also provided for the terminal stud 11 so as to hold the nut 14 thereon substantially the same distance from the back of the switch as the nuts on the terminals 9 and 10.

In the absence of suitable armor on the coil lead capable of enclosing and protecting the coil terminal stud and connections thereto, it is a relatively simple matter to defeat the lock switch by connecting a "jumper" between the battery and coil terminals. This completes the ignition circuit in the same manner as key actuation of the switch and enables starting of the vehicle by unauthorized persons.

It is the purpose of the guard 18 of this invention to render access to the coil terminal stud 11 exceedingly difficult so as to delay attempts at theft of the vehicle.

The guard 18 is preferably molded of a non-shatterable plastic such as Tenite, Melmac, chopped fabric filled Bakelite or any other suitable insulating unbreakable material. The guard has a substantially cup-like shape and has sufficient depth to enable the same to be telescoped over the coil terminal stud to cover the same and the wire lug connector and nut 14 thereon and to bring the rim of the guard at the open end of the cup against the back of the terminal head.

A small aperture 19 in the bottom of the guard allows the coil lead to project therethrough and it is preferable that the aperture 19 be as small as possible so as to prevent insertion of jumper wires therethrough. Thus, it will be seen that the guard covers all of the uninsulated electrically conducting parts on the coil terminal stud 11 to prevent access thereto.

For the purpose of securing the guard in place covering the coil terminal stud and the parts thereon the guard is provided with a flange 20 projecting outwardly from its rim to overlie the terminal head at the back of the switch with the flange extending beneath the hexagonal caps 16 on the ends of the bosses 15' to be clamped by these caps against the back of the switch when the nuts 14 on the terminals 9 and 10 are tightened.

It is also to be noted that the flange 20 is shaped to project part way between the bosses 15' for the terminals 9 and 10 for engagement therewith so as to prevent shifting of the guard on the back of the switch.

It is to be observed, therefore, that the guard 18 is held in place enclosing the coil terminal stud and the uninsulated electrically conducting parts thereof by the fastening means which secure the lug connectors onto the adjacent terminals 9 and 10 of the switch.

Hence, access to the coil terminal in attempts at jumpering the switch is had only by removal of the guard from the switch so as to expose the coil terminal thereunder. This means that one or both of the nuts 14 on the terminal studs 9 and 10 must be backed off of their respective studs far enough to enable displacement of the guard for insertion of a jumper wire between the open end of the guard and the back of the switch, or that the nuts and guard must be removed altogether.

Removal or loosening of the guard, however, is a highly difficult undertaking especially in view of the limited space behind instrument panels for automobiles and other vehicles, and is rendered still more difficult by reason of the fact that the guard is mounted closely adjacent to and beneath the uncovered terminals on the switch so as to obstruct access to the fastening means or nuts thereon by which the guard is held in place.

The positioning of the guard relative to the battery terminal and the manner in which the guard is held in place on the back of the switch, therefore, provide increased protection against theft of the vehicle upon which the switch is mounted.

Further protection, of course, may be had by using relatively light and inexpensive armoring on the conductor leading from the coil terminal so as to render baring of the wire difficult.

It is to be understood that the guarded terminal may be either the battery or the coil terminal but in any case the terminal to be protected is one preferably positioned lowermost on the back of the lock switch so that the guard obstructs access to the means which hold the same in place.

Unauthorized persons are, therefore, forced to not only reach around the bottom of the instrument panel, which it will be noted may have an upstanding flange 21 extending up toward the back of the switch to cooperate with the terminal head in closing the open front of the guard, but must also reach around the guard itself in order to gain access to the nuts which secure it in place. Thieves are thus compelled to reveal their intentions by the awkward and time consuming maneuers in which they must engage to gain access to the protected terminal.

It will be readily understood that the switch

construction shown is merely by way of example and that in cases where the terminal studs project directly from the flat back of the terminal head, the flange **20** on the rim of the guard may project directly between the back of the switch and either the lug connectors or the nuts on the terminals by which the connectors are held in place.

During the installation of the wiring, the guard is slipped on over the coil lead prior to clinching the connector lug thereon. After the lug **13** is clinched in place on the end of the coil lead it is positioned on the coil terminal and secured in place thereon by the nut **14**, and the guard slipped forwardly on the coil lead into position telescoped over the coil terminal where it is secured by the nuts **14** on the adjacent uncovered terminals.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent that this invention provides an inexpensive guard for the uninsulated electrically conducting portions of one of the terminals of a lock switch to prevent jumpering of the switch terminals and which may be quickly installed at the time of wiring of the switch.

What I claim as my invention is:

1. A guard for an electrical instrumentality of the type having a wall with a plurality of terminal studs projecting therefrom and adapted to receive wire connectors and fastening means for said wire connectors, said guard comprising: a one-piece cup-shaped shell of insulative material adapted to telescope over and completely enclose the projecting portion of one of the terminal studs of the instrument and the fastening means associated with said stud; and an external flange integral with said shell and projecting to one side thereof to be engageable by the fastening means on an adjacent stud for securement of the guard in place on its terminal with the shell obstructing access to said fastening means on the adjacent stud from the side of the shell remote from the flange thereon.

2. A guard for an electrical instrumentality of the type having a wall with a plurality of terminal studs projecting therefrom and adapted to receive wire connectors and fastening means for said fire connectors, said guard comprising: a one-piece cup-shaped shell of insulative material adapted to telescope over one of the terminal studs of the instrument to have its open end abut against the wall from which the stud projects whereby said shell is enabled to completely enclose the projecting portion of said stud and the fastening means associated therewith; and a tab-like flange projecting outwardly from an exposed portion of the side of the shell for cooperation with the fastening means on an adjacent stud to provide for securement of the guard in place on the instrument.

3. A guard for an electric instrumentality of the type having a plurality of terminal studs projecting from a wall of the instrument and adapted to receive wire connectors and fastening means for said wire connectors, said guard comprising: a thimble-shaped shell of insulative material adapted to completely enclose the projecting portion of one of the terminal studs on the instrument and the wire connector and fastening means associated with said stud, said shell having a hole in its wall through which a wire connector for said terminal may pass; and a tab-like flange projecting outwardly away from the shell from a side portion thereof, and presenting a surface substantially normal to the axis of a terminal adjacent to that enclosed by the shell for engagement by a nut on said adjacent terminal for securement of the guard in place on said wall of the instrument.

4. A guard for a locking ignition switch of the type adapted to be mounted on the back of an instrument panel and having a plurality of terminal studs projecting substantially horizontally from its rear portion adapted to receive wire connectors and fastening means for said wire connectors, one of said studs being disposed at a lower elevation than the others, said guard comprising: a one-piece cup-shaped insulating shell adapted to enclose all of the uninsulated electrically conducting parts on the projecting portion of said lowermost terminal including the wire connector and the fastening means on said terminal; and an integral exterior flange on said shell projecting to one side thereof toward at least one of the uncovered terminals above the shell to be acted upon by the fastening means on said uncovered terminal whereby the flange provides for operative securement of the shell in place on the back of the instrument with the shell occupying a position obstructing access to said fastening means from the side of the shell remote from said flange thereon and from beneath the lower edge of the instrument panel.

EDWARD N. JACOBI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,937,715	Poplin et al.	Dec. 5, 1933
1,963,234	Harrison	June 19, 1934
2,263,319	Treanor	Nov. 18, 1941
2,409,042	Hermann	Oct. 8, 1946