Feb. 10, 1970 L. N. LEA 3,495,054

SUPPLY PARTS FOR MAKING VARIOUS PLUG AND JACK BURGLAR ALARM SWITCH CONSTRUCTIONS

Filed Jan. 15, 1968

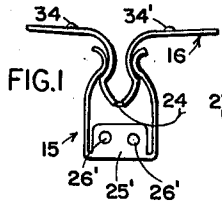


FIG. 1

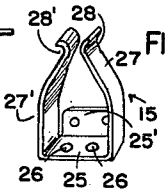


FIG. 2

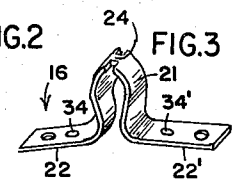


FIG. 3

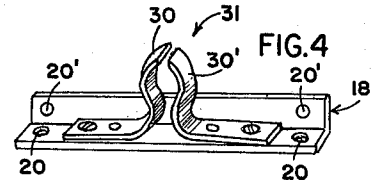


FIG. 4

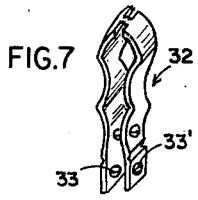


FIG. 7

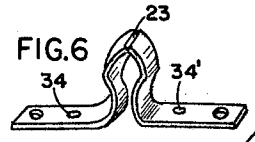


FIG. 6

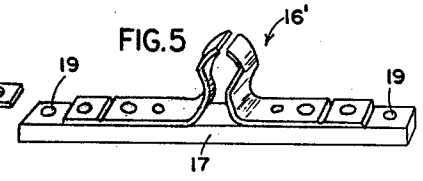


FIG. 5

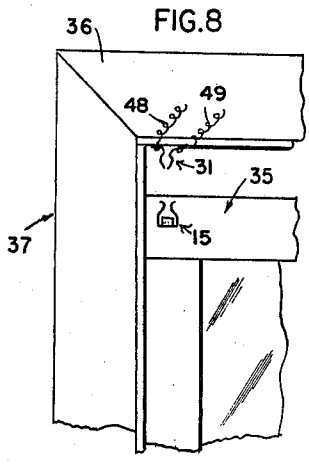


FIG. 8

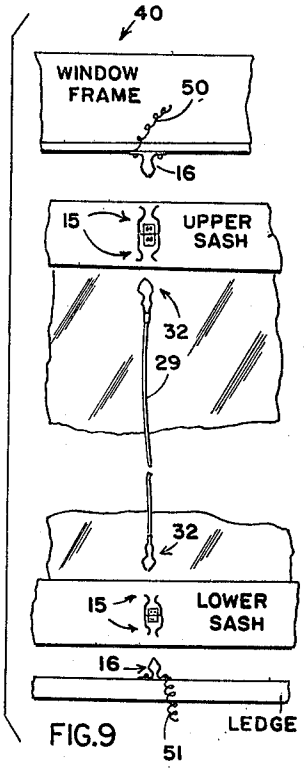


FIG. 9

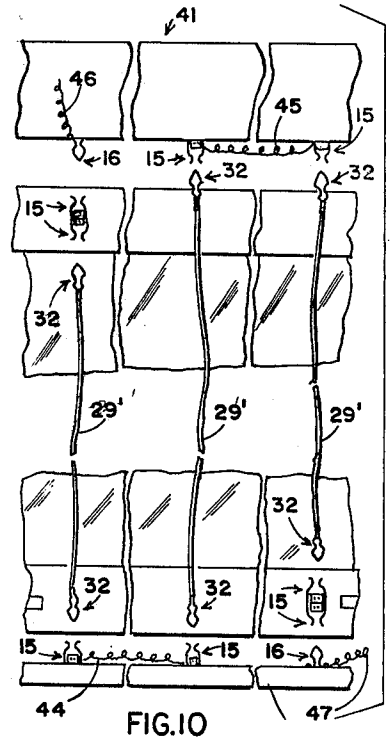


FIG. 10

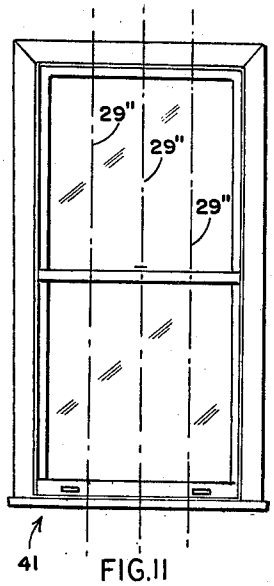


FIG. 11

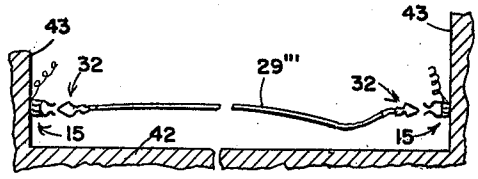


FIG. 12

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SUPPLY PARTS FOR MAKING VARIOUS PLUG AND JACK BURGLAR ALARM SWITCH CONSTRUCTIONS

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U.S. Cl. 200—61.93 7 Claims

ABSTRACT OF THE DISCLOSURE

The plug is made of springy metal strip bent to present an outwardly bellied crimp intermediate end arms having mounting holes for screws; the bight of said crimp being weakened, so it may be snipped apart when the switch construction requires it. The jack is also made of springy metal comprising a base, from the ends of which extend two opposite cantilever blades; the distal ends of said blades being inwardly bellied thus providing a flared entrance for the bellied crimp, bight first, whereupon the plug is clamped by the jack, and of course, can be pulled apart, the bight leaving last. The jack's base also has mounting holes. Various insulative strips are used where the switch parts are to be carried on conductive window frames, walls, and the like, or for initial assemblies. The end arms of a plug may extend coplanar in opposite directions from the crimp for mounting on a surface, or said arms may extend opposite one another in extension of the crimp to serve as a terminal at the end of a cable which is used for window pane protection. An installer having a supply of these parts can fashion them to suit various switch structures applicable in burglar alarm protective circuits.

The present invention relates to electrical switches, and more particularly to the type for use in normally closed protective circuits of burglar alarm systems.

The principal object of this invention is to provide a novel and improved normally closed switch supply made of two simple, cooperative parts, which is adaptable for use in many situations met in burglar alarm work. Heretofore, the installer had to keep in stock different kinds of switches to be chosen from, in accordance with the job requirements. The present invention requires two principal parts from which many switch constructions are easily made by combinations without change, or by some slight cut or bend, depending upon where the switch is to be mounted and what it is expected to do. For installation on metal structure, an insulative base is provided. This may be a strip or angle, for example.

Another object of this invention is to provide a novel and improved plug and jack combination for switch constructions of the character described, which consists of parts simple and reasonably cheap to manufacture, easy to install and made to suit various operational requirements, and which efficiently carry out the required functions for which such parts were designed.

Other objects and advantages will become apparent as this disclosure proceeds.

For the practice of this invention, the plug is made of a length of springy steel strip, transversely bent to form a central crimp of substantially rhombic form between substantially coplanar end arms extending in opposite directions from said crimp. The bight of said crimp is weakened so it can be easily cut or its halves swung to be broken apart, when need be. Each arm has a hole for a screw and preferably a dimple in a direction opposite to that of the crimp; each dimple being intermediate the crimp and one of the screw holes. A preferred form of jack, of spring steel stamped, comprises a short base

of angle, at the ends of one leaf of which extend opposite cantilever blades whose distal end portions are bellied towards each other to form a flared constricted entrance for the rhombic crimp of the plug, and when so associated, said crimp will be resiliently clamped by said cantilever blades. Each of the angle leaves has a pair of spaced screw holes. For switch constructions requiring the bight of such supply plug to be severed, the parts thereof need an insulative base to be mounted on. Other deformations are made in the supply plug to adapt it for various situations as will be explained.

In the accompanying drawing forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is an elevational rear view of a plug and jack switch device embodying this invention, shown in closed condition, that is the plug and jack are engaged. A supply of these plugs and jacks afford switch constructions, easily made therefrom, to suit different installation situations.

FIG. 2 is a perspective front view of the jack included in FIG. 1.

FIG. 3 is a perspective view of the plug included in FIG. 1.

FIGS. 4–7 are perspective views of plugs of differently modified constructions.

FIGS. 8–10 are fragmentary front views of windows equipped with different switch arrangements in the protective circuits of burglar alarm systems; the switch means being constructed of the basic parts shown in FIG. 1. These views are diagrammatic in part. Where cables are included, they are shown disconnected, in order to attain clarity of illustration.

FIG. 11 is the front view of the window frame shown in FIG. 10, shown in dash and dot lines, the positions of the cables associated in the switching system.

FIG. 12 shows switch means taught herein assoicated for use with a trip cord along the floor of a room, which when disturbed by the foot of an intruder, will operate the signal circuit of a burglar alarm system.

In the drawing, the numeral **15** denotes generally a jack, and the numeral **16** designates generally a plug therefor. These are the basic parts to be kept in stock with lengths of insulative strip and insulative angle, to make various switch constructions; a base of such strip material being shown at **17**, and one made of angle stock, being shown at **18**. The numerals **19** indicate screw holes in the base **17**, and the numerals **20**, **20'** indicate screw holes in the angle piece **18**.

The plug **16** is made of springy steel strip, transversely bent to form a central rhombic-form crimp **21** between coplanar end arms **22**, **22'**. The bight of said bellied crimp is weakened by being of thinner section along the line indicated by the numeral **23**, or said bight has notch cut-ins to leave a weak bridge as shown at **24**. The jack **15** which is stamped from spring steel, comprises a short angle base part, each of whose leaves **25**, **25'** has a pair of screw holes as shown respectively at the numerals **26** and **26'**. At the ends of the leaf **25**, there extend the opposite cantilever blades **27**, **27'** whose distal end portions are bellied as at **28**, **28'**, towards each other, to form a flared constricted entrance for the crimp **21** which is inserted bight first, and of course, said jack and plug can be pulled apart.

Supplied with the stock of parts **15**, **16**, an installer of burglar alarm systems can fashion different switches he needs, on the job, or he may prepare them in the shop from a planned layout for the system to be installed, using where required, the insulation pieces **17** and **18**.

It is evident that the parts **15** and **16** form a switch, and each is for connection to a terminal lead. When the

bight of the plug is severed, the resulting halves **30, 30'**, indicated as an aggregate by the numeral **31** generally, are mounted as in FIG. 4 on an angle piece **18**, or on strip material, or they may be mounted directly on wooden frame structure as shown in FIG. 8, where insulation pieces may be dispensed with. Of course, where the mounting is to be on metal structure, the plug in one piece or in two pieces as the case may be, is mounted on some insulative base as **17** or **18**.

Where the plug is to be at the end of a cable **29**, a part **16** is bent by bringing its arms **22, 22'** together as in FIG. 7, and thus make the form indicated generally by the numeral **32**. It may be desirable to originally make the plug as shown at **16'** with "break-off" end extensions, which are left intact in FIG. 7, to provide the aligned holes **33, 33'** for a second bolting means to the cable **29**.

The use of the angle-piece **18** for mounting the split plug **31**, allows installation of the assembly of FIG. 4, in various positions, depending upon the length direction of the angle piece and which leaf is against wall structure. Also, there is the advantage, that the parts **30, 30'** though held by one screw each, will not turn, for they bear against both leaves of the dihedral. The teats or dimples **34, 34'** aid to frictionally hold the plug halves, when installed as in FIG. 8.

The switch forms shown herein as examples of what can be made of the basic plug and jack, are indicated in use in a number of illustrative installations in the protective circuit of burglar alarm systems. As is well known, in protective circuits which are normally closed, all protective switches are connected in series, and where they are normally open, the switches are connected in parallel.

To protect a window, so that upon its opening, a switch shall open, the installation may be as shown in FIG. 8 for the upper window sash **35**, where such sash carries a jack **15**, for cooperation with the plug **31** mounted on the underside of the top rail **36** of the window frame **37**. The numerals **48, 49** indicate the connecting leads to the protective circuit from the separate crimp parts. A similar installation, not shown, is also provided for the lower sash. The severance of the crimp's bight may be done with electrician's snips, after installation of a part **16**, to form it into a part **31**. For the lower sash, the plug **31** would be mounted on window sill of the frame **37**.

As an example, to protect a window so an alarm would be actuated when either sash is moved, or on an attempt to enter upon breaking of a pane, conductive flexible wire cables are mounted taut with their ends releasable, so a circuit is broken when the window is opened either top or bottom, or by a person attempting to enter. For a very narrow window **40**, which is less than a foot wide, one cable **29** along the vertical center line, is sufficient. For wider windows as **41**, a plurality of cables **29'** are used as shown in FIG. 10, spaced about six inches apart as indicated diagrammatically along the lines **29''** in FIG. 11. Of course, the installations require switch parts as shown in FIGS. 9 and 10. Adjacent switch parts are set in engagement and the cables are taut when the windows are closed. In these FIGURES 9 and 10, the switch parts, are shown disengaged from the cables which are indicated separated as in an exploded view merely to attain clarity of illustration. Wherever a pair of jacks **15** are shown together, they are in contact. As another example of use, in FIG. 12, a cable **29'''** shown very near a floor **42**, has terminal plug ends **32** for engagement in jacks **15** mounted on opposite walls **43** of a room, so an intruder would release the cable which he might not notice in his hurry or in the dark. In all of the systems shown in FIGS. 8, 9, 10 and 12, it is evident that upon separation of any engaged plug and jack, an alarm circuit would be actuated, all of which are believed to require no further illustration or explanation to be readily understood by those versed in the art. In FIG. 10, the numerals **44** and **45** designate

connection wires so all the cables **29'** shall be in series, and the numerals **46** and **47** designate leads for connecting the installation in the protective circuit of the alarm system. In FIG. 8, such leads are shown at **48, 49**, while in FIG. 9, such leads are indicated at **50** and **51**.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein shall be deemed merely illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth.

I claim:

1. An electrical switch device comprising the combination of a plug consisting of a length of springy conductive strip transversely bent whereby its central part includes two opposite side elements joined by a bight; said side elements being outwardly bellied away from each other and said bight having a weakened section across the strip to be easily severable; said strip having end parts; the end parts of said strip being provided with at least one hole each to receive mounting screws; and a jack comprising a springy conductive piece including a mounting base element intermediate a pair of opposite cantilever blades; said blades being inwardly bellied towards each other whereby the entrance between their distal ends is flared, whereupon inserting of said central part of the plug into said flared entrance and thence further between said blades in a direction towards said base element, said central part of the plug will be releasably clamped by said blades of the jack; said switch device being adapted to be interposed in an electrical conductor, or by fixing the end parts of the plug on an insulative member, severing the weakened section, and interposing the plug in an electrical conductor.

2. A switch device as defined in claim **1**, wherein the weakened section is afforded by a comparatively narrow bridge connecting said outwardly bellied side elements.

3. A switch device as defined in claim **1**, wherein the end parts of the plug are substantially coplanar and extend in opposite directions from its central part.

4. A switch as defined in claim **3**, wherein each end part is provided with a teat extending away from the bight and intermediate the hole therein and the central part.

5. A switch device as defined in claim **1**, wherein said end parts of the plug extend opposite each other, substantially in extension of said side elements, whereby the holes in said end parts are in registry.

6. A switch device as defined in claim **1**, wherein the said weakened section is afforded by opposite notches in the strip, leaving a comparatively narrow bridge connecting said outwardly bellied side elements centrally of the plug.

7. A switch device as defined in claim **1**, including a piece integral with the base element and extending perpendicular thereto from an edge thereof; said integral piece being adapted to be mounted on a surface.

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U.S. Cl. X.R.

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