This invention relates to a novel electrical switch and more specifically relates to a push-pull type of switch of very inexpensive construction, particularly adapted for use with educational kits and the like.

A primary object of this invention is to provide a novel electrical switch which is extremely inexpensive in construction and can be operated by those having no experience with electrical equipment.

Another object of this invention is to provide a novel electrical switch which is simple to assemble and disassemble.

A further object of this invention is to provide a novel electrical switch which is inexpensive in manufacture.

A still further object of this invention is to provide a novel electrical switch which is inexpensive to manufacture and simple to install by those inexperienced in the electrical field.

These and other objects of this invention will become apparent from the following description when taken in conjunction with the drawings, in which:

FIGURE 1 shows a side cross-sectional view of a switch built in accordance with the present invention where the switch is in a closed position.

FIGURE 2 is similar to FIGURE 1 and illustrates the switch in an open position.

FIGURE 3 is an exploded perspective diagram showing the operating plunger contact springs and support panel for the switch of FIGURES 1 and 2.

Referring now to the figures, we have illustrated therein a switch particularly applicable for use with educational kits and which serves as a push-pull type of switch.

The switch is more specifically formed of a support board 10 of insulating material which has square openings such as opening 11 of FIGURE 3 therein. The opening 11 receives the elongated section 12 of an operating plunger 13. The operating plunger 13 is a unitary member and includes a necked down portion 15 which terminates in an enlarged plate surface 16.

The switch contacts are then formed of spring clips 17 and 18 which can be formed from a flat strip brass. The brass stock used for forming the clips for contact arms 17 and 18 may, for example, have a thickness of 0.016 inch, a width of 0.200 inch and a length of 1.60 inches.

The clips 17 and 18 are generally shaped with extending contact portions 19 and 20 respectively, at their upper ends. Clips 17 and 18 may be secured to extending portions 21 and 22 of the panel 10 by screws such as wood screws 23 and 24 which pass through pre-formed openings in the lower legs of clips 17 and 18 and then into portions 21 and 22.

When installed in this manner, the spring clips will normally have their contact portions 19 and 20 in relatively high pressure contact engagement.

The plunger 13 is then assembled by passing the elongated section 12 through openings such as opening 11 and pushing the head plate 16 of the plunger 13 through opposing reentrant sections 25 and 26 of springs 17 and 18, causing the springs 17 and 18 to open until necked-down portion 15 of plunger 13 is placed adjacent sections 25 and 26. The necked-down portion 15 has a sufficiently small diameter to permit contact portions 19 and 20 to be closed as illustrated in FIGURE 1.

In order to open the switch, it is only necessary to pull section 14 of plunger 13 outwardly to move the plunger downwardly and bring the larger diameter portion adjacent necked-down region 15 adjacent reentrant sections 25 and 26 of spring clips 17 and 18 respectively. This will, as shown in FIGURE 2, bias springs 17 and 18 away from one another to open the contact at contacting portions 19 and 20.

In operation, it will be apparent that an electrical circuit can be connected to the spring clips 17 and 18, for example, by using screws 23 and 24 as terminal members.

The switch is a push-pull switch which is in the engaged position when the plunger 13 is in, as shown in FIGURE 1, the disengaged position when the plunger is out as shown in FIGURE 2. The plunger is retained within clips 17 and 18 by the locking of plate 16 and reentrant portions 25 and 26.

In order to disassemble the switch, the contact springs 17 and 18 can be spread by hand until plate 16 clears reentrant portions 25 and 26.

Although we have described preferred embodiments of our novel invention, many variations and modifications will now be obvious to those skilled in the art, and we prefer therefore to be limited not by the specific disclosure herein but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. An integral electrical switch comprising a base, an operating plunger, and a pair of conductive spring members; one end of each of said spring members being secured to said base; the opposite end of each of said spring members being normally in engagement with one another; each of said spring members having a centrally located reentrant shaped portion; said plunger extending through said base and having a first portion adjacent said reentrant shaped portions of said spring members and a second portion on the side of said base opposite said side receiving said spring members; said portion of said plunger adjacent said reentrant shaped portions having a necked down region defined by a small diameter portion axially interposed between adjacent relatively large diameter portions of said plunger; said plunger being axially movable between a first position and a second position to interpose a small diameter portion or large diameter portion respectively of said necked down region between said reentrant shaped portions of said spring members; said opposite end of each of said spring members being engaged when said plunger is in said first position; said opposite end of each of said spring members being disengaged when said plunger is in said second position; said reentrant shaped portion of each of said spring members spaced from the contacting end of their respective spring members and intermediate the ends of their said respective spring members.

2. An integral electrical switch comprising a base, an operating plunger, and a pair of conductive spring members; one end of each of said spring members being secured to said base; the opposite end of each of said spring members being normally in engagement with one another; each of said spring members having a centrally located reentrant shaped portion; said plunger extending through said base and having a first portion adjacent said reentrant shaped portions of said spring members and a second portion on the side of said base opposite said side receiving said spring members; said portion of said plunger adjacent said reentrant shaped portions having a necked down region defined by a small diameter portion axially interposed between adjacent relatively large diameter portions of said plunger; said plunger being axially movable between a first position and a second position to interpose
a small diameter portion or large diameter portion respectively of said necked down region between said reentrant shaped portions of said spring members; said opposite end of each of said spring members being engaged when said plunger is in said first position; said opposite end of each of said spring members being disengaged when said plunger is in said second position; said reentrant shaped portion of each of said spring members spaced from the contacting end of their said respective spring members and intermediate the ends of their said respective spring members; the end of said plunger adjacent said necked down portion being enlarged whereby said plunger is trapped by said reentrant shaped portions of said spring members.

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