

[54] **ELECTRIC SWITCHES**

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[63] Continuation of Ser. No. 315,498, Dec. 15, 1972, abandoned.

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[58] Field of Search 200/67 R, 67 A, 67 AA, 200/76

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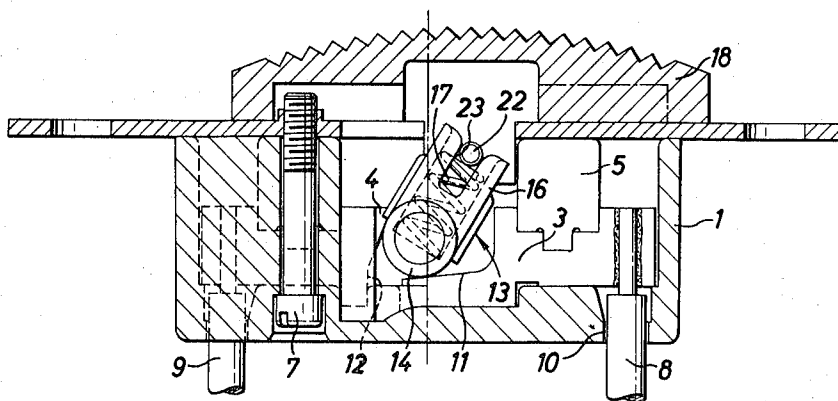
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[57] **ABSTRACT**

An electric switch in accordance with the invention has fixed contacts and a lever carrying the moving contact. The lever moves to open and close the switch with a locking and sliding movement. The lever is actuated by a slide or other member.

3 Claims, 4 Drawing Figures



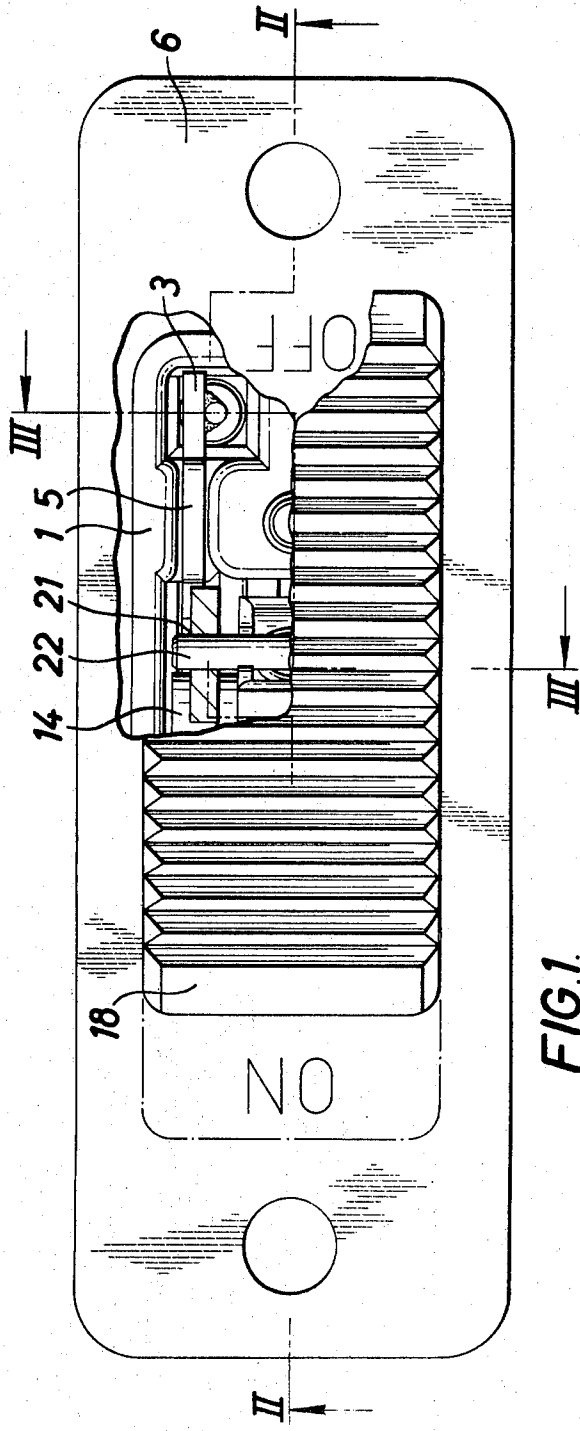
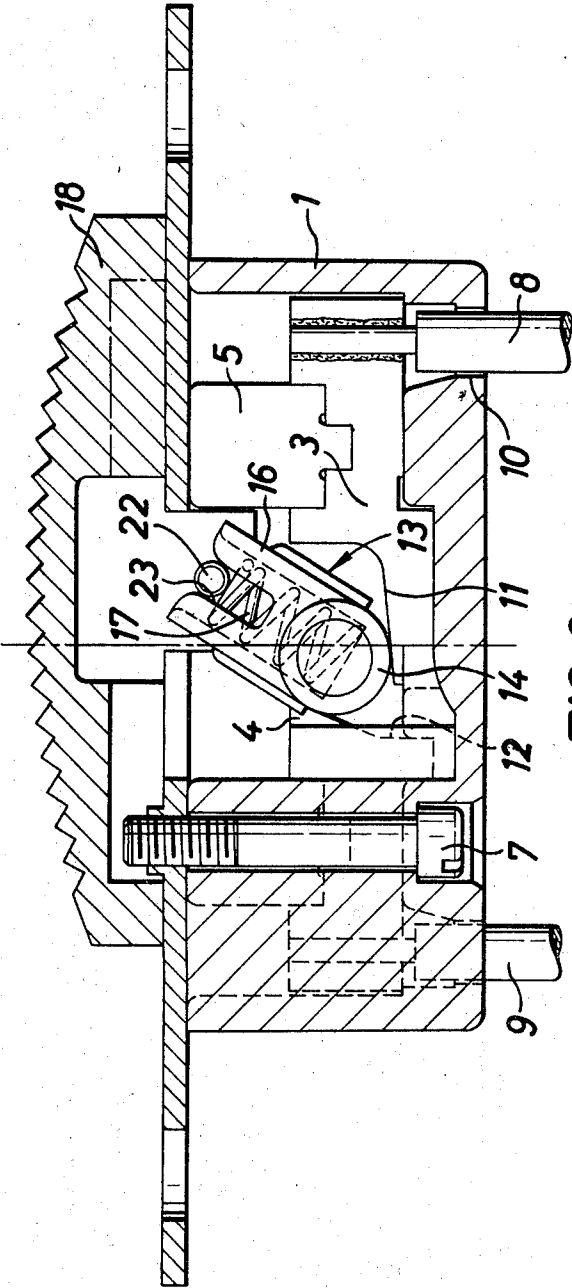


FIG. 1.



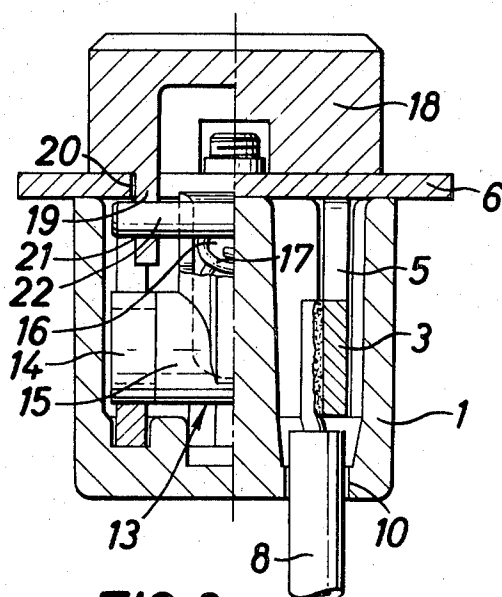
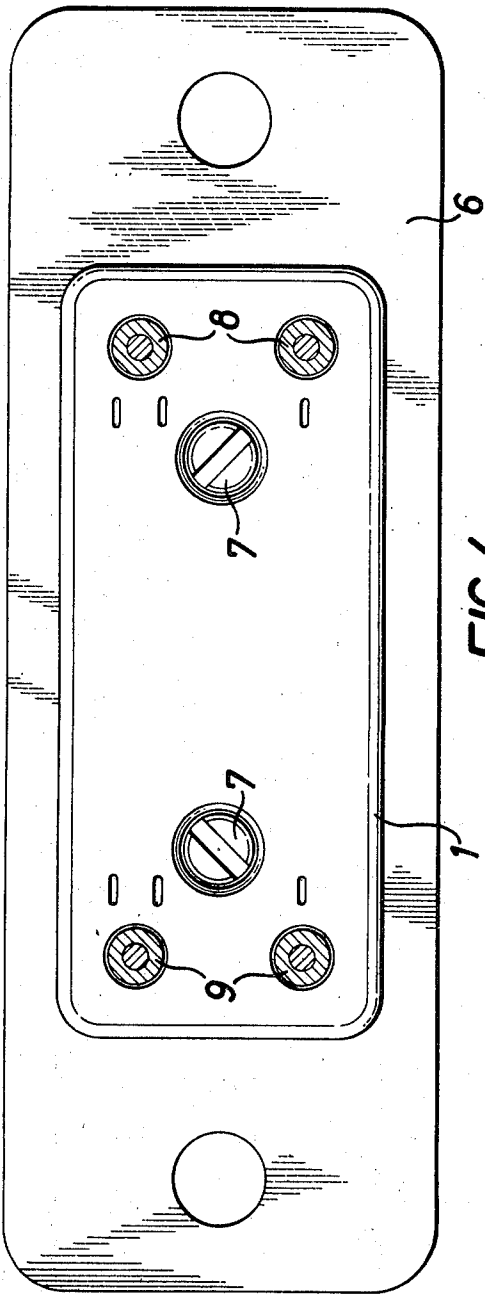


FIG. 3.



ELECTRIC SWITCHES

This is a continuation of application Ser. No. 315,498, filed Dec. 15, 1972, now abandoned.

This invention relates to electric switches and although particularly concerned with electric switches operated by means of a finger operated slide, is applicable to electric switches actuated by means of a rocking lever or toggle.

The chief object of the invention is to evolve an electric switch of robust construction having an improved quick-action make and break system, having a minimum number of parts which can be quickly and easily assembled by semi-skilled labour and which can be cheaply manufactured in quantities. The switch in accordance with the invention is of a compact construction and is suitable for mains use over a long period.

An electric switch in accordance with the present invention includes a casing, a pair of spaced fixed contacts mounted therein, a lever mounted within said casing and having a combined rocking and sliding movement, a moving contact in the form of a roller carried by said lever and in permanent rolling engagement with one of said fixed contacts and movable as a result of combined rocking and sliding movement of said lever into engagement with the other fixed contact to bridge said contacts and complete an electrical circuit, a spring associated with said lever urging said roller into engagement with its associated fixed contact, a cover or closure plate closing said casing and a slide, rocking lever or toggle associated therewith which as a result of its sliding or pivotal movement is adapted to impart a rocking movement to the lever carrying said roller and at the same time compress its associated spring and to move said lever through a dead centre position and permit the spring to impart a quick sliding and rocking movement to said lever and its associated roller and make or break the electrical circuit with a quick snap action.

Preferably the combined rocking and sliding lever includes a pair of oppositely arranged trunnion-like projections each carrying a metal roller type moving contact, the casing containing two pairs of fixed contacts, all four contacts being used when the switch is to be used as a double pole switch, the lever including an upwardly projecting tubular arm containing a helically wound biasing spring.

The invention will now be described in detail, with reference to the accompanying drawings, as applied to a double pole slide actuated electric switch intended for mains use but it will be appreciated that without departing from the scope of the invention, the switch may be easily modified to become a double pole change-over switch and actuated if desired by the usual rocking lever or toggle.

In the drawings:

FIG. 1 is a plan view of the switch with part of the operating slide and cover plate broken away;

FIG. 2 is a section on the line II—II of FIG. 1;

FIG. 3 is a section on the line III—III of FIG. 1; and

FIG. 4 is an underneath plan view of the switch.

The switch casing is in the form of an insulating moulding 1 of rectangular shape and formed with laterally spaced vertical slots 2 into each of which is dropped a pair of fixed pressed metal contacts 3 and 4 (see particularly FIG. 2). An insulating spacer 5 is interposed between each contact and a cover plate 6 and screws 7 pass through the casing 1 intermediate the

contacts to engage the plate 6 and to fix the casing 1 thereto. Leads 8 and 9 are solder-connected to the contacts and emerge through apertures 10 in the casing 1.

The contacts are held against accidental movement caused for example by pulling on the electrical leads 8 and 9.

The contact 3 of each pair of fixed contacts defines a track 11 along which the moving roller contact runs, the track 11 being inclined towards the other contact 4 to facilitate rolling movement of the roller along the track and into engagement with the other contact of the pair. The contact 4 has an undercut 12 to ensure efficient bridging contact between the moving and fixed contacts when closing the electrical circuit.

The lever 13 which is in the form of an insulating moulding is generally T-shaped (see particularly FIG. 3) and has a silver plated metal roller 14 revolvably mounted at each end of the cross piece 15 thereof.

The stem 16 of the lever upstands and is tubular housing a coiled compression spring 17.

The upper open end of the casing 1 is closed by the cover plate 6 or attachment bracket which carries a moulded operating slide 18 having a serrated upper surface and composed of insulating material, the cover plate being for example of metal.

The slide has two laterally spaced dependent lugs 19 which project through a rectangular slot 20 in the cover plate and guide the slide 18 lengthwise of the slot, the lugs being formed with oppositely positioned holes 21 for the reception of a transverse pin 22 which, when the switch is assembled enters diametrically arranged slots 23 in the stem 16 of the lever 13 and engages the upper end of the coil spring 17 to compress the latter when the slide 18 is moved lengthwise of the cover plate 6. The pin 22 projects laterally outwardly from the lugs 19 to locate the slide. On the cover plate 6 which is stamped with the usual "On", "OFF" indications which are alternately obscured by the cover plate.

In operation the slide 18 is moved lengthwise of the slot 20 in the cover plate 6. This compresses the spring 17 in the lever and rocks the lever about the rotational axis of the rollers 14. The lever 13 thus passes through a dead centre position allowing the spring 17 to take charge and impart a quick combined rocking and sliding movement in the opposite direction thus making or breaking the electrical connection with a quick snap action, the spring 17 being still in a state of partial compression holding the rollers 14 firmly in engagement with the fixed contacts 3 and 4. The assembly is illustrated in the closed condition with the roller 14 bridging the gap between contacts 4 and 5.

The interior of the casing is so shaped and dimensioned as to guide and retain the lever and its associated rollers whilst the slot in the cover plate guides the slide and limits its sliding movement.

I claim:

1. An electric switch including a casing; a pair of fixed contacts mounted therein in longitudinally spaced relationship; a lever having a stem and mounted within said casing, said lever having a combined longitudinal rocking and sliding movement; a slot at one end of said stem; a moving contact in the form of a roller carried by said lever and in permanent rolling engagement with one of said fixed contacts and longitudinally movable as a result of combined rocking and sliding movement of said lever into engagement with the other fixed

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contact to bridge said contacts and complete an electrical circuit; a spring engaged with said stem and urging said roller into engagement with its associated fixed contact; a plate closing said casing; a longitudinally movable actuating slide coupled with said plate; a cross pin carried by said slide cooperating with said slot and locking said slide in coupled relative sliding relationship with respect to said cover, said spring acting against said cross pin, said slide being adapted to impart the rocking movement to said lever carrying said roller and at the same time compress said spring and to move said lever longitudinally through a dead center position and permit said spring to impart a quick longitudinal

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sliding and rocking movement to said lever and its associated roller and make or break the electrical circuit with a quick snap action.

2. An electric switch according to claim 1 wherein said one fixed contact has the surface on which the roller rolls and slides inclined downwardly towards the other fixed contact.

3. An electric switch according to claim 1 wherein the combined rocking and sliding lever includes a cross piece carried by said stem and an electrically conductive roller at each end of the cross piece.

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