

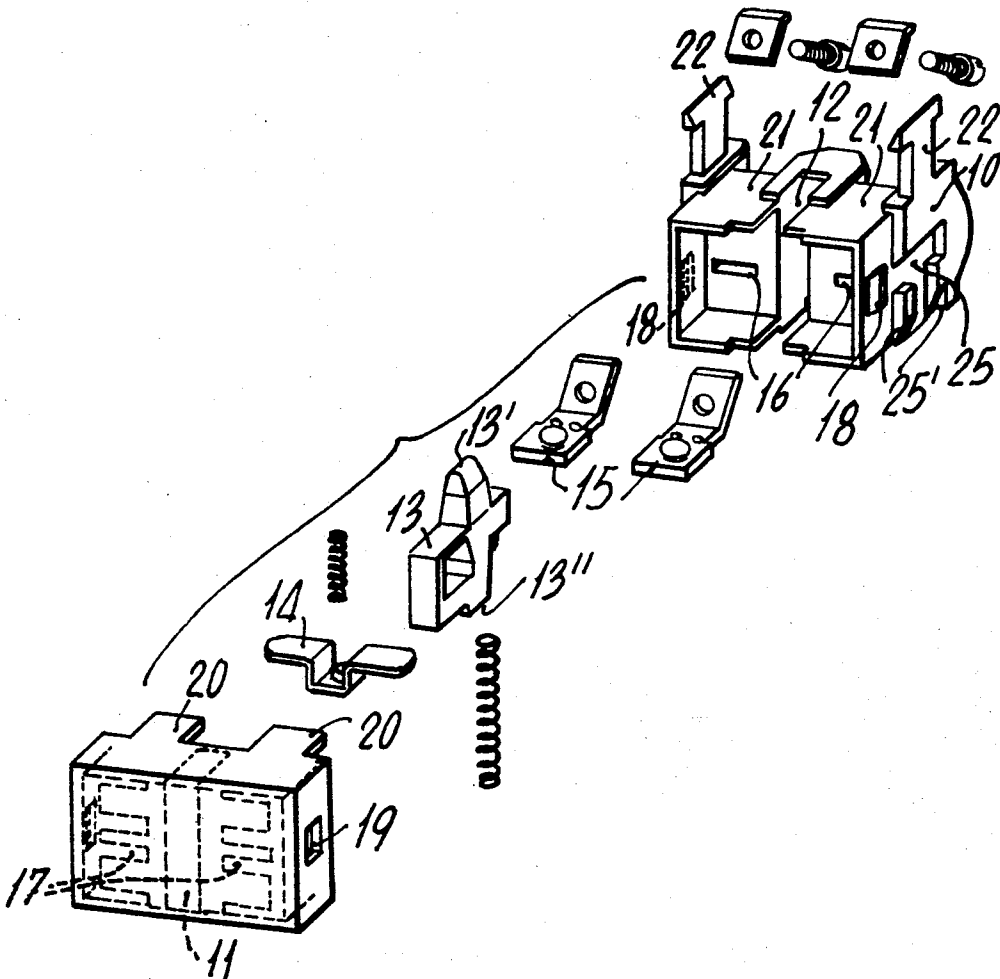
- [54] **COMPOSABLE SWITCH DEVICE**
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200/330; 174/53
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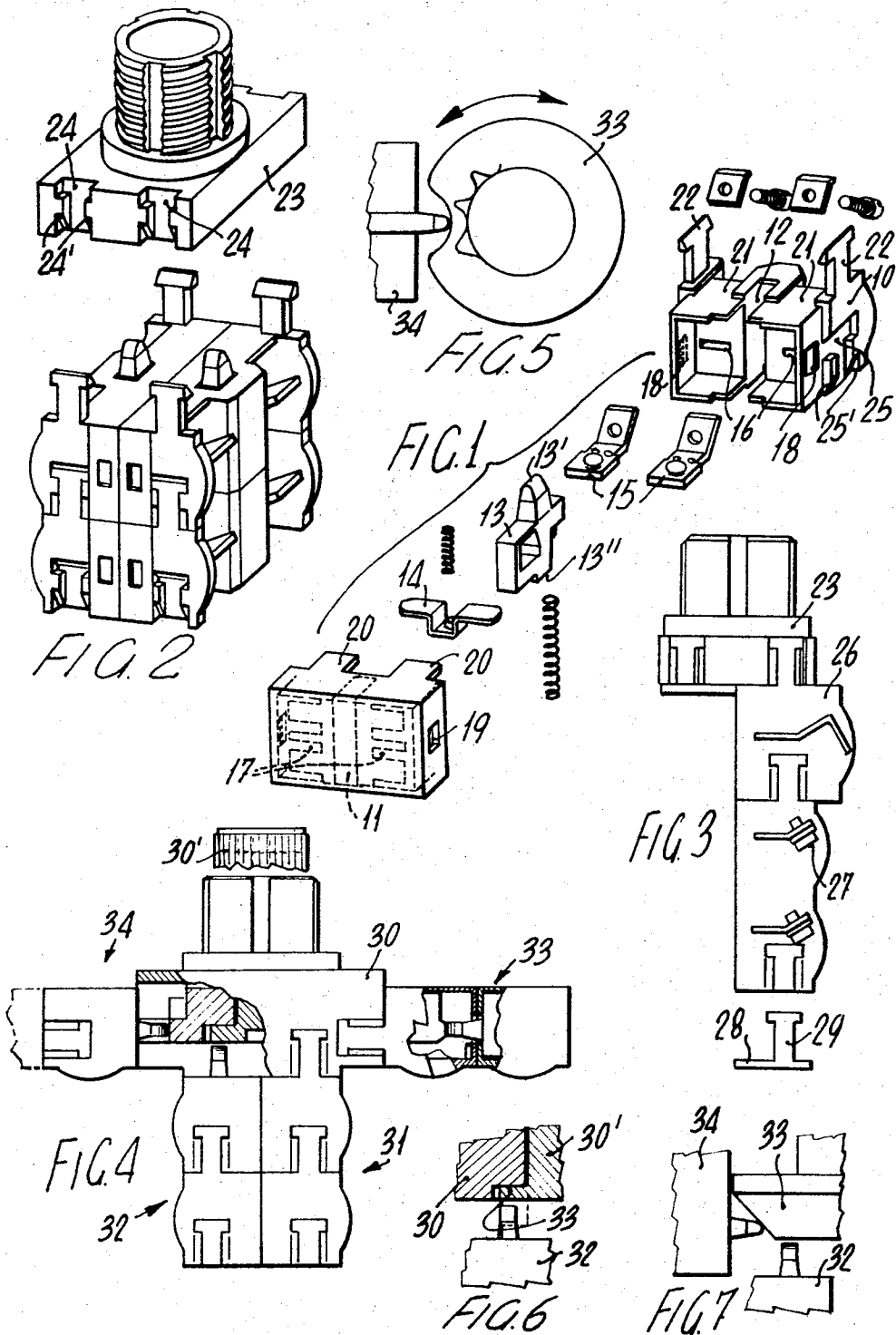
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[57] **ABSTRACT**
A switch device comprising a control member and a plurality of hollow bodies containing the electrical contact elements; said bodies being provided with resilient lugs or projections suitable for association in corresponding seats formed on the control member or on said bodies for successive connection thereof according to one or more predetermined directions.

11 Claims, 7 Drawing Figures





COMPOSABLE SWITCH DEVICE

In the main patent U.S. Pat. application Ser. No. 19,723 to the same Applicant there has been described and shown a particular snap fitting system between a switch body or casing and a control member to enable an extremely fast and easy assembling thereof, without any screws, rivets or other special means, for coupling the control member to any suitably preset switch device.

This patent application is for proposing an improvement in that switch device for more easily assembling the electrical contact parts in accordance with the particular construction and fabrication of the switch body.

It is another object of the present patent application to provide suitably improved switch devices of the above character for snap hooking two or more switch devices arranged after one another and to a common control member.

It is a further object of this invention to provide a set of switch devices of the above character associated with a control member according to any or more directions, as required.

These and other features of the invention will become apparent from the figures of the accompanying drawings, in which:

FIG. 1 is an exploded perspective view showing a switch device according to the present invention;

FIG. 2 is an exploded view showing four switch devices of FIG. 1 successively hooked to one another for a common actuation by a control member shown at the top;

FIG. 3 is a view showing a modified embodiment of the invention;

FIG. 4 is a view showing a set of switches hooked to a control member according to a plurality of directions; and

FIGS. 5, 6 and 7 are views showing details of FIG. 4 for indicating how the switch devices in the several rows can be actuated by the common control device.

Generally, a press type of switch device according to the invention, comprising a hollow body containing the electrical switch contact elements, the body being adjustable for association with a control member; said body is formed of two snap interassociable parts, of which a first part for carrying the fixed contacts and a second part for side closure, said first body part defining a central longitudinal guide for a slider carrying the movable contacts, at one end said first body part also having two resiliently yieldable opposite legs for snap engagement in corresponding seats on said control member.

Said switch body also has at the other end corresponding seats in alignment with said legs for successively snap connecting two or more switch devices for a common actuation thereof.

More particularly, and referring to FIG. 1, it will be seen that a switch device according to the invention substantially comprises a switch body of molded plastics material, which is formed of a first hollow body portion designated as a whole at 10, and a second body portion or cover designated as a whole at 11 and side-wise associable with the former.

The switch body portion 10 defines a central longitudinal guide 12 which is open at both ends and along which a slider 13 is slidable and guided, this slider 13 carrying movable contacts 14 for association with cor-

responding fixed contact elements 15 which can be inserted in apertures 16 provided in the body portion 10, laterally of said guide 12, and cooperating with corresponding seats 17 formed on the opposite wall of the body portion 11 for clamping in place the fixed contact elements 15 in the assembled condition of the switch device.

In the front and at the bottom said slider 13 has lugs or projections 13' and 13'' for transmitting the control of a common control member to one or more switch devices successively and mechanically connected with the lugs or projections 13', 13'' of the sliders of two adjoining devices contacting each other and aligned.

As above mentioned, said two switch body portions 10 and 11 are suitable for snap hooking to each other.

To this end, as shown for example in FIG. 1, the body portion 10 has side lugs or projections 18 provided with ramps or forwardly sloping guide surfaces suitable for snap joint owing to the resiliency of the material of which the switch body is made in corresponding seats or apertures 19, the latter being laterally formed on the switch body portion 11.

Furthermore, and still referring to FIG. 1, in order to correctly guide and position the two body portions 10 and 11 when assembling, at the top and bottom said body portion 11 has projecting tabs 20 which can be inserted in corresponding guides 21 formed on the upper and lower faces of the body portion 10 of the switch device laterally of the above mentioned longitudinal guide 12.

As shown in FIG. 1, these guides 21 for said tabs 20 are provided in faces arranged at right angles to resilient connecting legs 22 projecting at the top of an end of said body portion 10.

The connecting legs 22 are resiliently yieldable for slightly outwardly bending and enabling a snap engagement thereof in corresponding seats formed on a common control member designated at 23 in the exploded view of FIG. 2, or in corresponding seats formed on a switch device similar to the former.

In the embodiment shown, the legs 22 have a longitudinal central stem, having formed at the free end thereof cross lugs or projections for insertion in a corresponding T-shaped cavity 24 provided on the control member 23, or respectively a T-shaped cavity 25 provided laterally of a switch body 10 at a position in alignment with the associated legs 22.

Both of the seats or cavities 24, 25 initially have ramps or sloping surfaces 24' and 25', respectively, which on assembling the control member and a switch device, or on assembling two or more switch devices to one another, as schematically shown in the exploded view of FIG. 3, slightly outwardly bend the legs 22, then snap engaging by entering the corresponding cavities 24 or 25. As apparent, the legs 22 and corresponding engaging seats provided on each of the switch bodies and control member could be also formed differently than shown and described.

It should also be specified that in the example shown in FIG. 1 the contact elements are of the screw connection type, but, however, if desired, such contact elements could be of the spring plug connection type.

As mentioned and shown in FIGs. 1 and 2 of the appended drawings, it will be seen that combinations can be provided for successively interconnected switch devices for a common actuation by a control member. The switch devices can be successively interconnected

according to one or more parallel rows, such as in two parallel rows as shown in FIG. 2, by providing the suitable connections on the control member 23.

Moreover, as shown by way of example in FIG. 3, the press type of switch devices can be different from one another, not only as to construction and amount of contact elements therein contained, but also as to nominal values of the respective electrical magnitudes.

In the embodiment of FIG. 3 there has been schematically shown the control member 23, on which a simple type of switch device 26 has been initially assembled, that is to say a switch device having only one set of electrical contact elements, and beneath which a double type of switch device is hooked, that is to say a switch device having two superimposed sets of electrical contact elements. If desired, as above mentioned, the body of the switch device could however be provided, for example, with recesses or housings for accommodating auxiliary electrical devices, such as electrical resistances, transformers, coils and the like, suitably connected to screw or spring plug type of electrical contact elements projecting from the body of the switch device.

In FIG. 3 there is also shown a bottom closure element or plate 28 for a row of switch devices, which element or plate is provided with a corresponding resilient legs 29 quite similar to those previously mentioned, these legs snap engaging in the seats 25 of the last switch device in the row.

There is shown in FIG. 4 the embodiment for an assembly of switch devices associated with a single control member according to rows arranged in a plurality of different directions.

As shown in FIG. 4, two parallel vertical rows 31 and 32 of opposite switch devices, as well as two rows 33 and 34 of switch devices similar to the first mentioned devices, the latter rows being opposite to each other and arranged at right angles to the former, are associated with the control member 30. It will be apparent that according to the type of control member being used, such as lever, push-button, rotary or the like, the switch devices could be arranged in other directions different from those above mentioned.

Therefore, as stated in connection with FIG. 4, to provide for a distinct or simultaneous control of two or more rows of switch devices, independently of the assembling orientation thereof, the control member therein should be suitably adapted and designed.

One of the possible approaches is shown in FIGS. 5, 6 and 7. More particularly, said figures show a rotary press type of combined control member for actuating the switch devices arranged according to vertical and horizontal rows.

As shown in FIGS. 5, 6 and 7, the control device 30 comprises a push-button 30', only partially shown, which is resiliently returned by a spring (not shown) and may be longitudinally downwardly moved so as to actuate the switch devices of an underlying row 31 and/or 32. Correspondingly, the push-button 30' is provided with a control peripheral cam or flange 33 having a lower sloping or frusto-conical surface for simultaneously actuation of the switch device rows 33 and/or 34 arranged at right angles to the former.

In FIG. 5 there is also shown the provision of a recess in said cam 33 in order to disconnect or connect, for example, the control for the switch device row 34 by a

suitable rotation of said push-button 31, when required.

It is apparent that other approaches different from that shown could be provided, if desired.

What is claimed is:

1. A press type of switch device comprising a hollow body containing the electrical contact element of the switch, for association with a control member, wherein said body is formed of two snap interassociable parts, of which a first part is for carrying the fixed contacts and the second part is a side closure part, said first body part defining a central longitudinal guide open at both ends for a slider carrying the movable contacts of said contact elements, said first body part having at one end two resiliently yieldable opposite legs for snap engaging in corresponding seats provided on said control member; the switch body also having corresponding seats in aligned relationship with said legs and formed at the opposite end of the switch body for enabling two or more switch devices to be interassociated with the slider aligned for a common drive.

2. A switch device as claimed in claim 1, wherein each of said seats and/or each of said legs having sloping surface portions for spreading the legs of a switch body when being pushed to said control member or an adjoining switch body on assembling.

3. A switch device, as claimed in claim 1, wherein each of said legs has at the end thereof at least one lug or projection for insertion in a cavity similarly formed in each of said seats.

4. A switch device, as claimed in claim 3, wherein each of said legs are T-shaped with a longitudinal portion and a transverse portion at the end thereof, and each of the seats in the control member and said switch body have a similarly T-shaped cavity for accommodating one of said legs, each of the T-shaped cavities laterally having sloping ramp portions to outwardly bend the legs of a switch device on assembling.

5. A switch device, as claimed in claim 1, wherein one of said switch body parts has outwardly facing side lugs or projections for snap connection in corresponding seats laterally formed in said second body part.

6. A switch device as claimed in claim 5, wherein said lugs or projections have sloping surfaces for partially resiliently deforming one of said two body parts when the latter are pushed to each other for assembling.

7. A switch device, as claimed in claim 1, wherein one of said body parts has transverse guides and said other body part has corresponding projecting tabs suitable to be inserted in said guides.

8. A switch device, as claimed in claim 1, wherein said two body parts internally have seats suitable to automatically clamp in place said fixed contacts with the body parts assembled to each other.

9. A switch device, as claimed in claim 1, wherein said switch body contains one or more sets of electrical contact elements.

10. A switch device assembly as claimed in claim 1, wherein said switch devices are successively interconnected to said control member according to one or more parallel rows.

11. An assembly as claimed in claim 10, wherein said rows of switch devices are connected to said control member according to one or more directions different from one another.

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