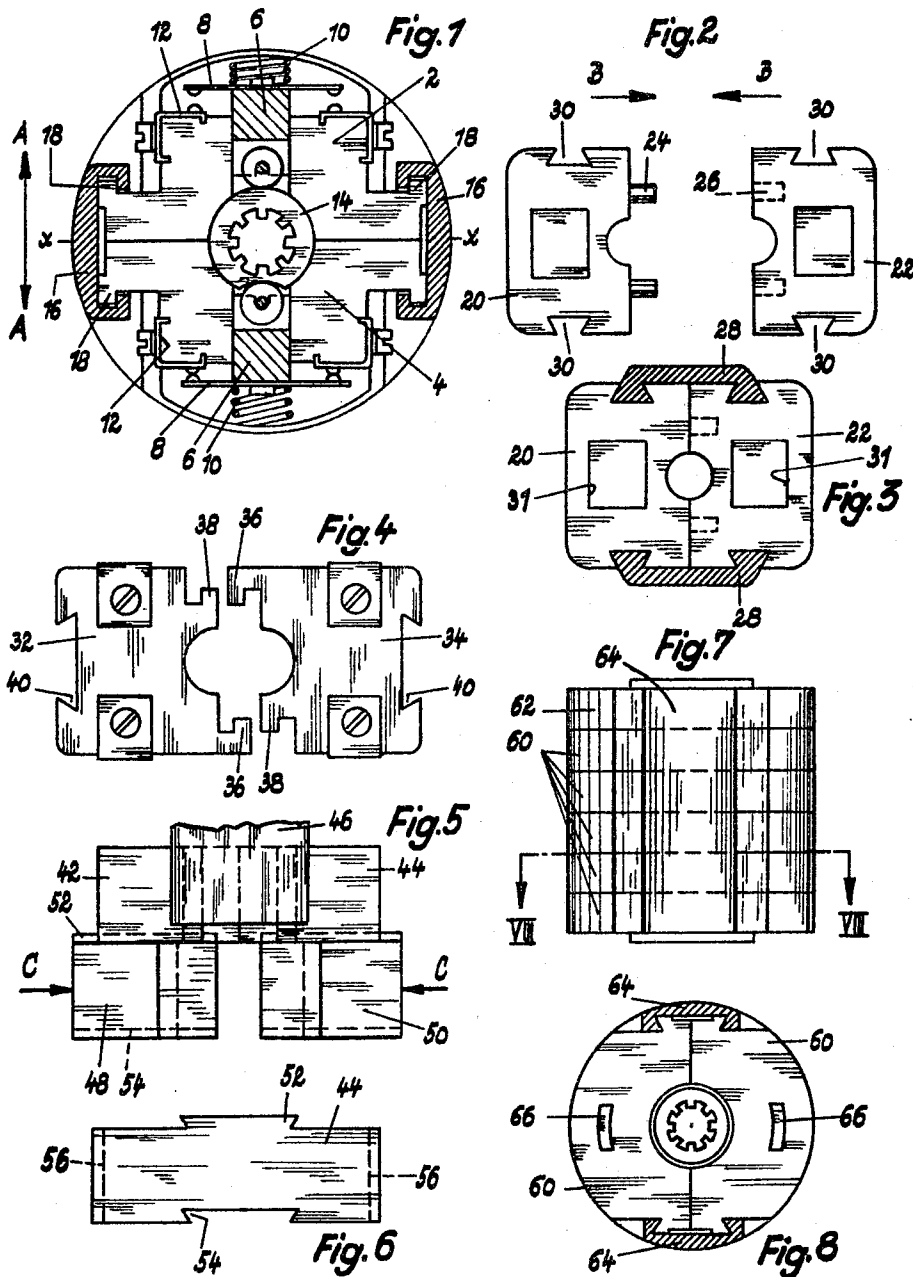


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SWITCH ASSEMBLY HAVING STACKED UNITS WITH
SPLIT INSULATING HOUSINGS
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3,286,070 SWITCH ASSEMBLY HAVING STACKED UNITS WITH SPLIT INSULATING HOUSINGS

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The invention relates to electrical switch assemblies and particularly to an assembly which consists of a plurality of units superimposed in the direction of a common axis.

It has now been found that the installation and securing of metal parts in the housing of each switch unit which consists of insulating material are simplified when the housing is split.

The invention, in one of its aspects, thus resides in an electrical switch assembly the several switch units of which have a common axis and are axially superimposed in each other. Each unit includes a housing of electrically insulating material on which the switch contacts are mounted so that they may be moved relative to each other toward and away from a position of engagement. Each housing includes two parts which are offset transversely of the afore-mentioned axis and have respective axially extending faces which are held in abutting engagement by locking means releasably locking the two housing parts or elements to each other. A coupling device couples the several units to each other. The locking means may include a slide which engages the two housing parts by means of projections and recesses, preferably dovetailed and axially elongated, which are interengaged for guiding simultaneous axial movement of the slide relative to both housing parts.

Embodiments of the invention are illustrated in the accompanying drawings, in which

FIG. 1 is a plan view of a cam operated switch unit in accordance with the invention without its cover,

FIG. 2 shows disassembled elements of another switch unit, and FIG. 3 shows these elements in the locked condition,

FIG. 4 shows parts of the housing of yet another switch unit,

FIG. 5 is a fragmentary front-elevational view of a switch assembly of the invention,

FIG. 6 shows an element of the assembly of FIG. 5 in side elevation,

FIG. 7 shows a switch assembly according to the invention in elevation and

FIG. 8 is a section on the line VIII-VIII of FIG. 7.

In FIG. 1, there is illustrated the housing of a switch unit in a switch assembly of the invention which is divided along a plane x-x passing through the switch axis into two parts 2 and 4. A tappet 6 is guided in each part and actuates a contact bridge 8 biased by a spring 10 toward a position of simultaneous engagement with two fixed contact members 12. A cam 14 is rotatably mounted in the two housing parts 2 and 4 of each unit. The cams each have internal teeth adapted to engage with corresponding external teeth on the cam of an adjacent switch unit.

The two parts 2 and 4 are held together by channel-shaped slides 16 which engage axially elongated locking rails 18 on the housing parts 2 and 4. The axial length of each slide 16 is such that it can couple together at least two axially adjacent switch units. It will be appreciated that the parts 2 and 4 can be separated from one another in the direction of the arrow A when the slides 16 are removed, and that the switch assembly then comes apart also in the direction of its axis.

In the embodiment shown in FIGS. 2 and 3, the two elements 20 and 22 of a switch unit are assembled by relative movement in the direction of the arrows B, whereby dowel-like projections 24 on element 20 engage corresponding recesses 26 on element 22. Channel-shaped slides 28 fit corresponding dovetail grooves 30 in the elements 20 and 22 for locking the same to each other. Recesses 31 receive the conductive switch parts (not shown) and the elements required for actuation of the switch.

In the embodiments of FIGS. 1 to 3, the housing parts or elements 2, 4, 20, and 22 are held in aligned engagement by the slides 18, 28, which also axially interconnect several switch units. In the embodiment shown in FIG. 4 the two housing elements 32 and 34 of a switch unit are coupled by interengaging rails 36, 38 and grooves to form the housing of a switch unit capable of being combined with other units of the same type into a switch assembly by means of slides (not shown) which engage dovetail recesses 40.

Whereas the switch units shown in FIGS. 1 to 4 are axially held together by frictional engagement with slides 18, 28, FIG. 5 shows switch units axially locked by interengaging housing elements.

FIG. 5 shows two elements 42 and 44 which constitute the housing of one switch unit and are already held together by a slide 46, and two identical elements 48 and 50 of an axially adjacent unit which are about to be pushed together in the direction of the arrow C. FIG. 6 shows the element 48 to have ribs 52 and dovetail grooves 54 by which the elements 42 and 44 are connected to the elements 48 and 50. The apparatus of FIG. 6 is assembled by sliding the two elements 48 and 50 on the pre-assembled element 42, 44 from both sides in the direction C until they abut against each other, whereupon the slide 46 is axially introduced into the conforming grooves 56 of the elements 48, 50.

FIGS. 7 and 8 show a switch assembly consisting of five axially superimposed switch units 60 and a click device 62. The units 60 are of the type shown in FIG. 1 and are held together by two channel-shaped slides 64. The several cams of the switch units are axially interlocked, so that a continuous shaft passing through the switch is obviated. The individual elements of each switch unit are provided with dowel-like, axial projections and corresponding recesses 66 to increase the torsional strength of the assembly.

The housing elements of each switch unit preferably consist of thermoplastic synthetic resin compositions, such as super-polyamides. The sub-division of the housings of the several units in accordance with the invention greatly simplifies the necessary molds.

What is claimed is:

1. An electrical switch assembly comprising, in combination:

(a) a plurality of switch units having a common axis and axially superimposed on each other,

(1) each unit including housing means of electrically insulating material, a plurality of contacts mounted on said housing means, and actuating means for moving said contacts relative to each other toward and away from a position of engagement,

(2) the housing means of each unit including two housing parts offset transversely of said axis and having respective axially extending faces, and locking means releasably locking said parts to each other in abutting engagement of said faces thereof; and

(b) coupling means axially coupling said units to each other.

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2. An assembly as set forth in claim 1, wherein said faces extend in a common plane passing through said axis.

3. An assembly as set forth in claim 1, wherein said locking means include a slide member, said slide member and said parts of the housing means being formed with recesses and projections, said slide member forming a pair of elements with each of said housing parts, a recess of one member of each pair receiving a projection of the other member of the pair of guiding simultaneous axial movement of said slide member relative to said housing parts.

4. An assembly as set forth in claim 3, wherein said projections and recesses are dovetailed and axially elongated.

5. An assembly as set forth in claim 1, wherein said locking means include an axially elongated projection on one of said housing parts, and a recess on the other housing part conformingly receiving said projection.

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6. An assembly as set forth in claim 1, wherein said coupling means include a projection on a housing part of one of said units, a housing part of an axially adjacent unit being formed with a recess conformingly receiving said projection.

7. An assembly as set forth in claim 6, wherein said recess is elongated transversely of said axis, and dovetailed.

References Cited by the Examiner

FOREIGN PATENTS

228,567 6/1960 Australia.

ROBERT K. SCHAEFER, *Primary Examiner*.

ROBERT S. MACON, *Examiner*.

H. O. JONES, *Assistant Examiner*.