Oct. 7, 1930. F. DIEHL 1,777,877

SNAP SWITCH

Filed March 22, 1928

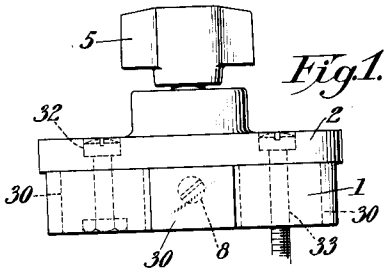


Fig.1.

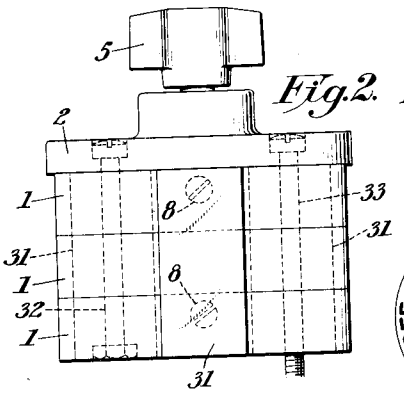


Fig.2.

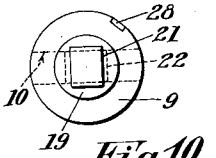


Fig.10.

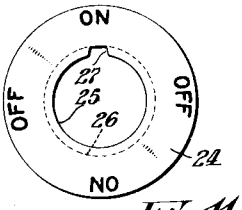


Fig.11.

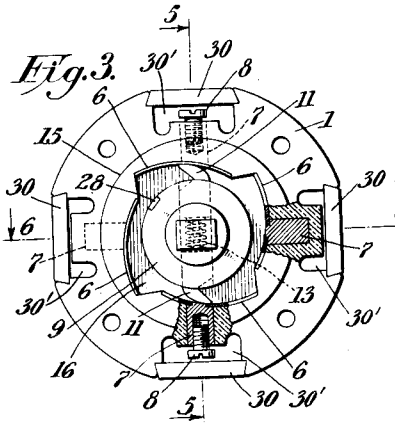


Fig.3.

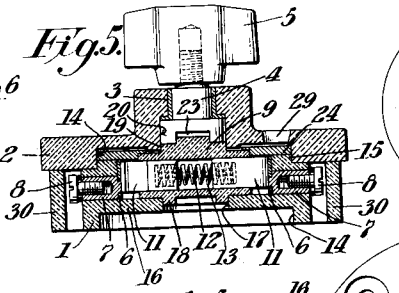


Fig.5.

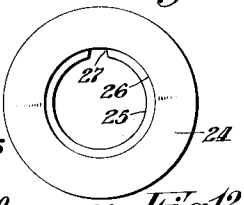


Fig.12.

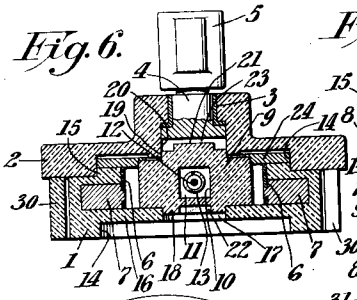


Fig.6.

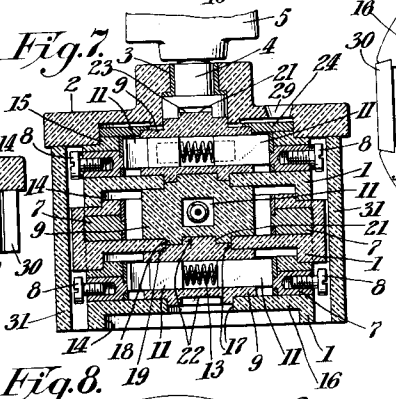


Fig.7.

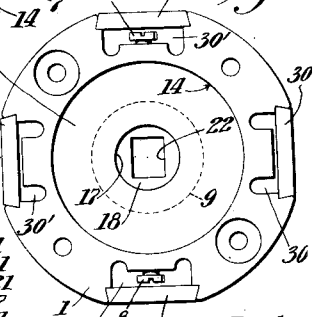
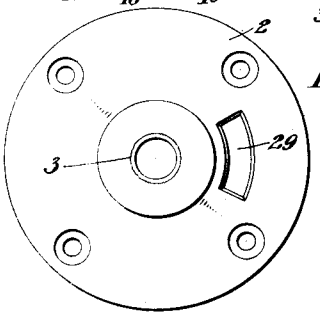


Fig.4.



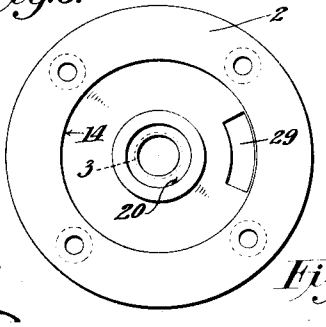


Fig.8.

Fig.9.

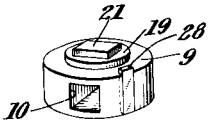


Fig.13.

WITNESSES

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UNITED STATES PATENT OFFICE

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SNAP SWITCH

Application filed March 22, 1928. Serial No. 263,889.

This invention relates to snap-switches for making and breaking electrical circuits. It has for an object to provide a switch-construction having a variable number of poles and readily adaptable for the control of various circuits. A further object of the invention is to provide a switch which is of simple construction and which is inexpensive to manufacture and assemble.

The objects of the invention are attained by providing a unit switch-section, preferably of molded construction, such that one or more of such sections may be assembled with a cover-section, in nested relation, to form a switch of the desired number of poles.

In the accompanying drawings, Fig. 1 is a side elevation of a single-section switch embodying the invention. Fig. 2 is a side elevation of a three-section switch. Figs. 3 and 4 are top and bottom face views of a unit switch-section. Fig. 5 is a sectional view of the switch shown in Fig. 1, the switch-section being cut on the line 5—5, Fig. 3. Fig. 6 is a similar view with the switch-section cut on the line 6—6, Fig. 3. Fig. 7 is a section view similar to Fig. 5 but showing a plurality of assembled switch units to form a multi-pole switch. Figs. 8 and 9 are top and bottom face views of the cover-section with the key removed. Fig. 10 is a top view of the rotary central member of the unit switch-section. Figs. 11 and 12 are top and reverse face views of the switch-indicator, and Fig. 13 is a perspective view of the rotary element of the unit switch-section.

In the preferred embodiment of the invention illustrated, 1 represents a unit switch-section and 2 the cover-section in which is journaled, in the metal bearing-insert 3, the shaft 4 of the key-member 5.

The unit switch-section 1 comprises a casing in the form of a flat disk having a cavity formed with an internal wall of the well known ratchet-tooth construction; such teeth being faced with the stationary contact-strips 6 connected to the contact terminal lugs 7, one diametrically opposed pair of which are tapped at their outer ends to receive the terminal-screws 8.

Journaled in the casing 1 is the rotary member 9 formed with a diametrically disposed slideway 10 for a movable contact-member including the contact-elements 11 connected together by a pig-tail 12 and urged apart by the coil-spring 13.

The casing 1 is formed in its bottom face with a circular recess 14 and at its top face with a circular projection 15 whereby a plurality of switch-sections may be nested together and centered relatively to one another; the projection 15 of one switch-section entering the recess 14 of an adjoining switch-section, as shown in Fig. 7. The bottom face of the cover-section 2, like the bottom face of the switch-section 1, is formed with a circular recess 14 to receive the projection 15 of the adjoining switch-section and relatively center the switch- and cover-sections.

The bottom wall 16 of the switch-casing 1 is formed with a central hole 17 which receives and constitutes a bearing for the central projection 18 at the bottom of the rotary member 9. The central projection 18 extends only half way through the hole 17. The rotary member 9 is formed at its top with a central projection 19 of the same diameter and length as the projection 18. The projection 19 is adapted to enter either the bearing hole 17 of an adjoining switch-section or the bearing hole 20, Fig. 5, in the cover-section 2. Thus each rotary member 9 of the complete switch has bearing supports at its opposite ends.

The upper end of the rotary member 9 is formed with a rectangular projection 21 and the bottom end of the rotary member 9 is formed with a rectangular recess 22 which is mechanically 90° out of phase with the rectangular projection 21, as shown in Fig. 10. The inner end of the switch-key shaft 4 is formed like the bottom end of the rotary member 9 with a recess 23 to receive the projection 21 of the adjoining rotary member 9; the projection 21 and recesses 22, 23 constituting interengaging means for coupling one or more rotary members 9 together and to the switch-key 5. Due to the mechanical phase displacement of the coupling means at the opposite ends of the rotary members 9,

such members, when assembled, will have their contact elements disposed transversely to one another, thereby widely separating the current carrying switch-terminals of adjoining switch-sections.

The switch is provided with an indicator disk 24 having a central aperture 25 with its periphery under-cut at 26 to fit over the rotary member 9. The aperture 25 is peripherally notched at 27 to receive the metal insert 28 carried by the rotary member 9 and serving to lock the indicator to the rotary switch elements. A window 29 is provided in the cover-section 2 through which the indicator may be viewed.

The terminal screws 8 are housed in peripheral recesses 30' in the switch-sections and the walls of such recesses are dovetailed to receive the cover-slides 30 or 31, the short cover-slides being used with a single-pole switch and other and longer cover-slides being used with the multi-pole switches.

The elements of the switch are held together by bolts 32. Screws 33 may be passed through registering holes in the switch-sections and cover to secure the switch to a support.

From the foregoing description it will be evident that one unit switch-section 1 may be assembled with a cover-section 2 to form a single-pole switch, such as shown in Figs. 1, 5 and 6. Two or more unit switch-sections 1 may be assembled with a cover-section to form a multi-pole switch, such as shown in Figs. 2 and 7. Thus, only a small variety of parts need be manufactured for assembly into a variety of switches for various uses in the trade. The cover and casing sections 2 and 1, as well as the rotary member 9, are preferably molded from a phenolic condensation or other heat-resisting insulation product, with the metal inserts molded in their respective positions.

Having thus set forth the nature of the invention, what I claim herein is:

1. A snap-switch comprising a cover-section and a unit switch-section, said switch-section including a casing and a rotary member journaled in said casing, stationary contacts carried by said casing, a movable contact carried by said rotary member, and a switch-key journaled in said cover-section, the bottom end of said switch-key and the top end of said rotary member having interengaging means for coupling them together when the cover-section is applied to the switch-section, the bottom end of said rotary member being formed like the bottom end of said switch-key, whereby any number of unit switch-sections may be assembled with a cover-section with the rotary members coupled together and to the switch-key.

2. The construction set forth in claim 1 in which the bottom of the cover-section and the top of the unit switch-section have interengaging means for relatively centering such sections, the bottom of said switch-section being formed like the bottom of the cover-section, whereby any number of unit switch-sections may be assembled with and centered relative to one another and to the cover-section with the rotary members coupled together and to the switch-key.

3. A snap-switch comprising a casing, a rotary member journaled in said casing, make-and-break contacts carried by said casing and rotary member, the lower end of said rotary member being exposed at the bottom of said casing and having coupling means adapting it for connection with the rotary member of an adjoining snap-switch.

4. A switch comprising a support, stationary contacts carried by said support, a movable contact journaled in said support, said support being so formed as to permit a plurality of such supports to be assembled in adjoining relation with the movable contacts operatively coupled together in electrically insulated relation.

5. A snap-switch comprising a cover-section and a unit switch-section, a key journaled in the cover-section and having coupling means exposed at the under side of said cover-section, said unit switch-section having an external recess, a stationary contact carried by said unit switch-section and having a terminal screw disposed in said recess, a movable contact journaled in said unit switch-section and having coupling means exposed at its top and bottom sides, and a cover slide closing said recess.

In testimony whereof, I have signed my name to this specification.

FREDERICK DIEHL.