April 26, 1938. B. ARTHURS, JR 2,114,989

MULTIPLE SWITCH STRUCTURE

Filed Dec. 12, 1935

Fig. 1.

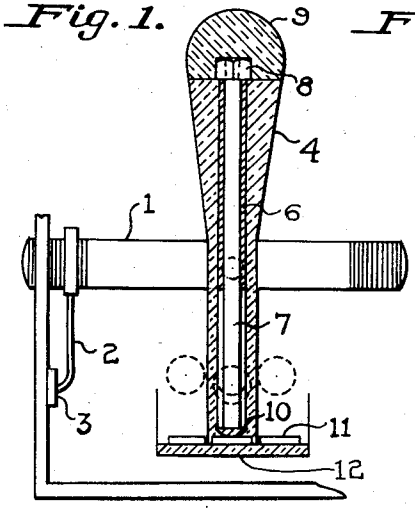


Fig. 2.

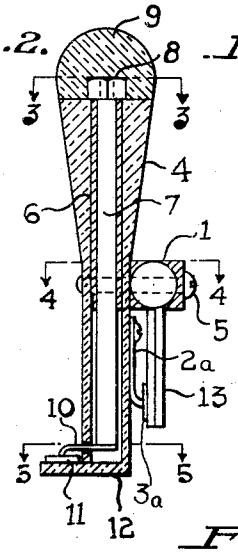


Fig. 3.

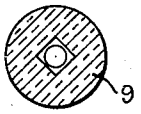


Fig. 4.

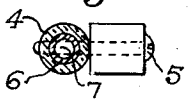


Fig. 5.

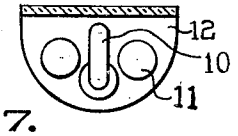


Fig. 6.

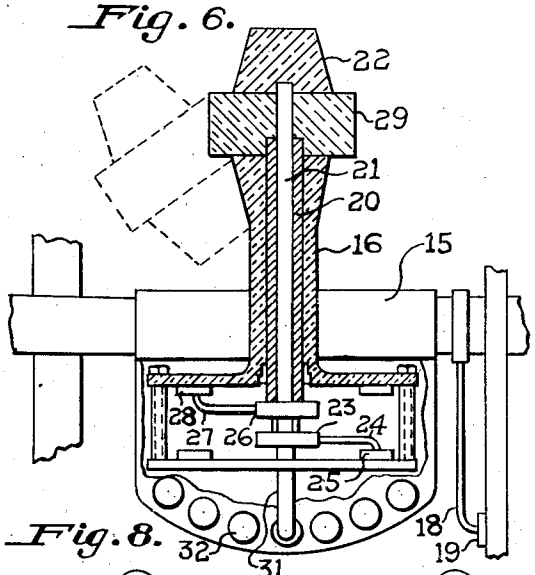


Fig. 7.

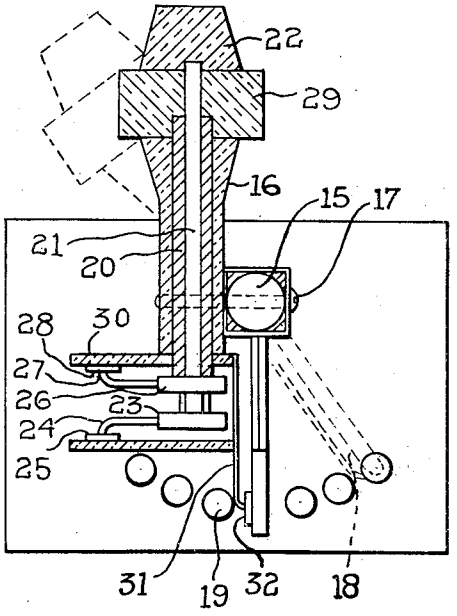


Fig. 8.

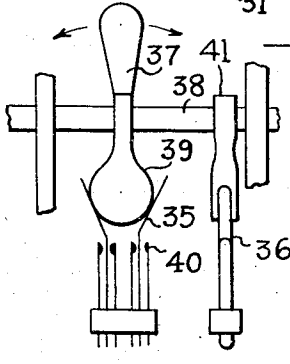
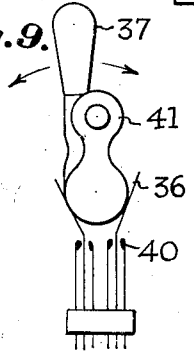


Fig. 9.



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UNITED STATES PATENT OFFICE

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MULTIPLE SWITCH STRUCTURE

Biddle Arthurs, Jr., Pittsburgh, Pa.

Application December 12, 1935, Serial No. 54,074

2 Claims. (Cl. 200—14)

This invention relates to switch control mechanism for enabling an operator to independently control multiple electrical circuits with one hand, leaving the other hand free for other uses, and it is among the objects thereof to provide switch mechanism of simple and efficient construction which shall be positive in its operation to control multiple electrical circuits.

The invention will become more apparent from a consideration and description of the accompanying drawing constituting a part hereof in which like reference characters designate like parts and in which:

Figure 1 is a front elevation partially in section of a multiple control switch embodying the principles of the invention;

Figure 2 a sectional elevational view taken at right angles to the structure shown in Figure 1;

Figure 3 a cross sectional view of the handle member taken on the line 3—3, Figure 2;

Figure 4 a section of the handle taken on the line 4—4, Figure 2;

Figure 5 a plan view of the movable arm and switch terminals taken on the line 5—5, Figure 2;

Figure 6 a side elevation partially in section of a multiple switch for controlling four independent circuits;

Figure 7 an end elevational view thereof; and

Figures 8 and 9 are side and end elevational views, respectively, illustrating the adaptation of the invention to anti-capacity switches for telephone work.

With reference to Figures 1 to 5 inclusive of the drawing, numeral 1 designates a shaft having a movable terminal arm 2 mounted to rotate therewith for contacting stationary terminals 3, the terminals 2 and 3 being connected across an electrical circuit to make and break said circuit. Shaft 1 is subjected to angular movement by a handle 4 which is secured thereto by a rivet or screw 5, Figure 2. The handle 4 is hollow and is provided with a bushing 6 for engaging a rod 7 having a square head 8 that is rotatable relative to the main body of the handle 4. By rotating the knob 9, the rod 7 is subjected to rotary movement and a switch arm 10 contacting terminals 11 is subjected to angular movement by the turning of knob 9 to make and break contact of an electrical circuit.

Terminals 11 are mounted on a bracket 12 which constitutes an extension of the handle 4. The extension of handle 4 also carries a terminal arm 2a that contacts terminals 3a mounted on an extension 13 which constitutes a third circuit controller operative by the handle 4.

In the construction shown in Figures 6 and 7, the multiple switch is adapted to control four independent electrical circuits and comprises a shaft element 15 to which is attached a handle 16 by a rivet or screw 17, the shaft 15 being provided with a contact arm 18 for contacting stationary terminals 19. The handle 16 is hollow for receiving a sleeve 20 through which a rod 21 projects upwardly to a knob 22 and downwardly to a ring 23 carrying a switch arm 24 that engages angularly spaced terminals 25. Similarly, one end of the sleeve 20 is provided with a ring 26 carrying the switch arm 27 that engages angularly spaced terminals 28, the upper end of sleeve 20 being secured to a rotatable portion 29 of the handle which is of enlarged diameter to adapt it for rotation independently of rotation of knob 22 superimposed thereon. The handle 16 is further provided with a bracket 30 that carries a switch arm 31 for contacting angularly spaced terminals 32.

The operation of the switch unit of Figures 6 and 7 is briefly as follows: By swinging the handle 16 as shown in dotted line construction in Figure 7, switch arm 18 traverses control terminals 19 to control the electrical circuit of said terminals. By moving the handle 16 as shown in dotted line construction in Figure 6, the switch arm 31 contacts terminals 32 to control the electrical circuit in which they are connected. By rotating the knob 22, switch arm 24 traverses and contacts terminals 25 and by rotating the enlarged portion 29 of the handle, switch arm 27 traverses and contacts terminals 28. The controller constituted by terminals 25 and 28 is constructed in a manner to be movable with the movements of the handle 16 in either direction shown in Figure 6 or Figure 7, so that the different movements can be effected independently of each other and without any interference of the switch movements for controlling the other three circuits.

In Figures 8 and 9 of the drawing, an anti-capacity switch is shown for controlling contacts 35 and 36 of independent circuits, the switch comprising a handle 37 mounted on an angularly movable support 38, the switch being also movable in the manner indicated by the arrows in which direction of movement the cylindrical body portion 39 of the handle displaces the contacts 35 against the terminals 40 to control their respective circuits. The same effect is obtained in controlling the contacts 36 by mounting a dumbbell-shaped lever 41 on the movable support 38, which, through manipulation of handle 37 in the direction of the arrows shown in Figure 9,

effects corresponding displacement of the contacts **36** to control their respective circuits.

It is evident from the foregoing description of the invention that by means of the multiple throw switch shown in Figures 1 to 5 inclusive of the drawing, three independent electrical circuits can be controlled by one hand at one time, leaving the other hand free for emergency or other uses, the construction for this purpose being simple and economical, positive and reliable in use.

In Figures 6 and 7 in addition to the control of the three circuits of the switch in Figures 1 to 5, an additional circuit may be controlled by providing two rotating parts to the handle element, one of which operates one controller, the other, another, while the switch element maintains its rotary and angularly movable functions to control two additional circuits in the manner of the switch of Figures 1 to 5 inclusive.

In the switch mechanism shown in Figures 8 and 9, control of a plurality of anti-capacity switches is effected by means of a single operating unit thereby simplifying switch board construction where such are in use.

It is also apparent that multiple control switches of the character hereinbefore described have a wide field of application in addition to those hereinbefore mentioned, as for example, their adaptation for use on overhead crane operations, electric railways and the operation of turret guns and the like.

Although several forms of the invention have been herein illustrated and described, it will be apparent to those skilled in the art that various modifications may be made in the details of construction, without departing from the principles herein set forth.

I claim:

1. A multiple control switch comprising a base, a shaft rotatably journalled for angular movement in said base, a handle pivotally mounted on said shaft and an arm rigidly mounted on said shaft extending in a plane parallel to said handle, a plurality of spaced terminals on said base, a plurality of spaced terminals on the extension of the shaft, and a plurality of spaced terminals at one end of the handle member, said terminals being connected to independently controllable electrical circuits, a contact arm mounted on said shaft adapted to engage the group of terminals on said base, a contact arm mounted on the handle adapted to engage the terminals on said shaft extension, said handle having a gripping portion, a rod mounted in said handle having a contact arm for engaging the group of terminals at one end of the handle, the gripping portion of the handle being adapted for rotary movement to actuate the rod, whereby the contact arm is adapted for engagement with the handle terminals.

2. A multiple control switch comprising a base, a shaft mounted for angular movement in said base, an extension extending from said shaft, electrical contact terminals in said base and in said extension, each group of terminals being adapted for connection in different electrical circuits, a handle pivotally mounted on said shaft, said shaft and handle having contact arms for engaging the terminals of said base and extension members, said handle being provided with a pair of parallel terminal brackets, each provided with a group of terminals and said handle having a hollow shaft with an enlarged gripping surface in the handle portion, a contact arm on said hollow shaft for engaging the terminals on one of said brackets, and a rod disposed in said hollow shaft rotatable by a knob at the top of the handle and being provided with a contact arm for engaging the terminals of the other of said extension brackets.

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