May 6, 1930. E. MOXTER ET AL 1,757,054

ELECTRIC SWITCH

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Fig. 1.

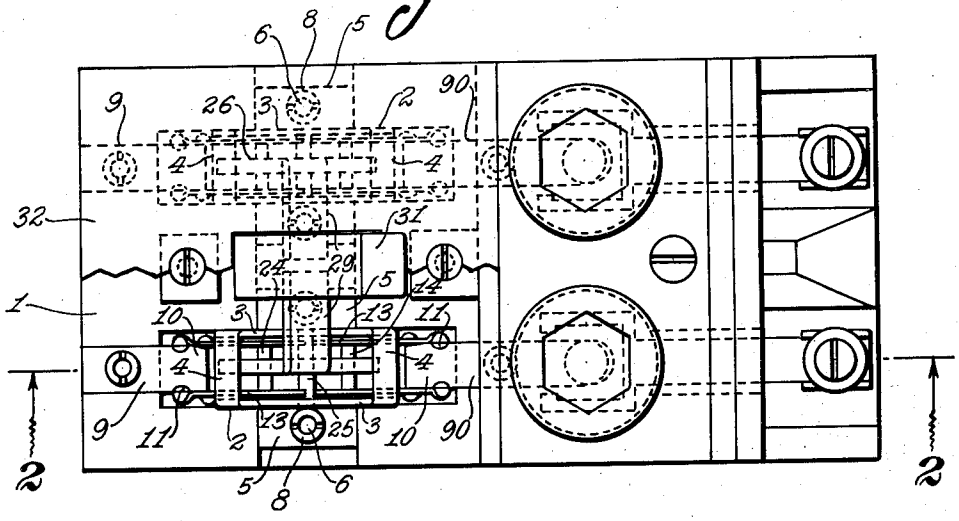


Fig. 2.

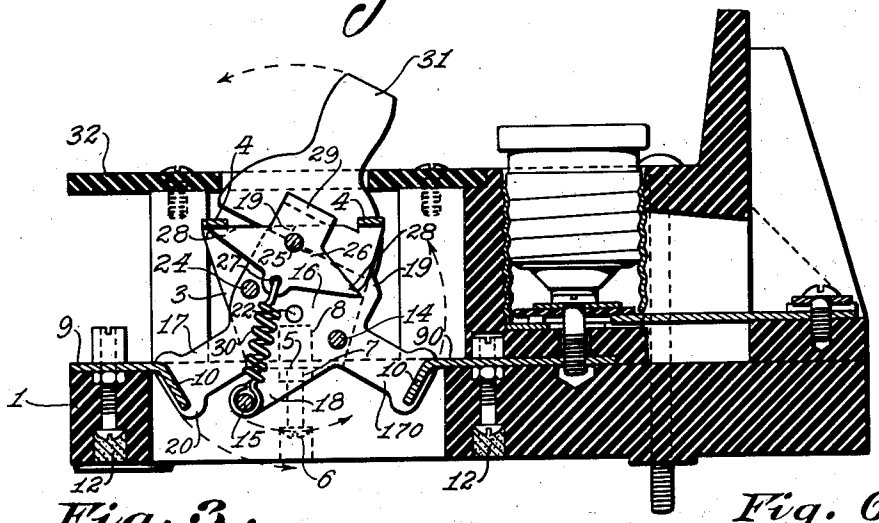


Fig. 3.

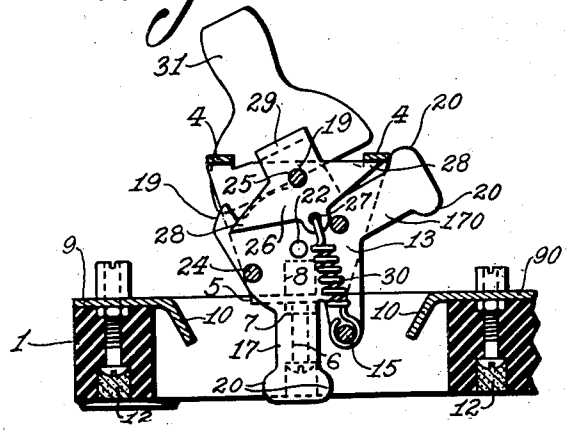
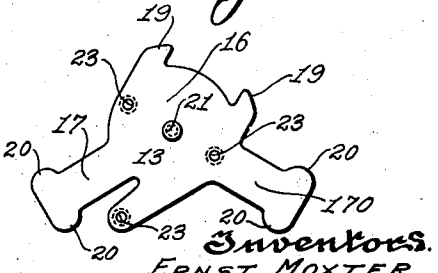


Fig. 6



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Fig. 4.

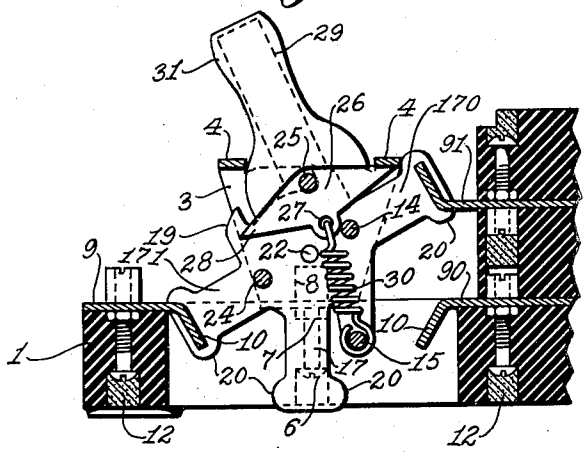


Fig. 5.

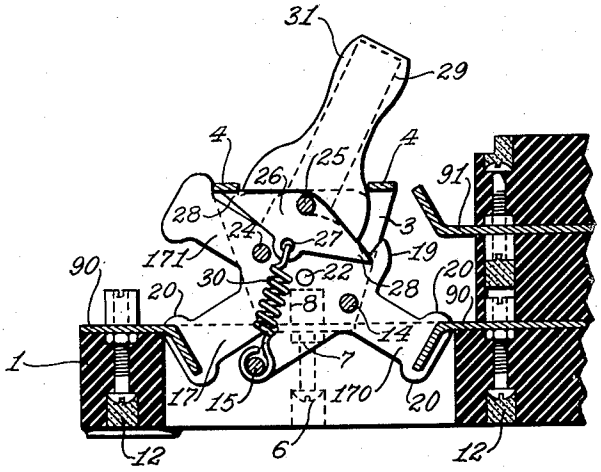
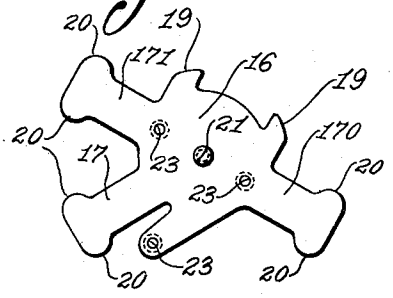


Fig. 7.



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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

Application filed September 19, 1927. Serial No. 220,314.

This invention relates to electric switches.

The object of the invention is to provide a switch having a positive snap action, safe and reliable in operation, simple and economical in construction, durable, and accessible and easy of repair.

Other objects will hereafter appear from the detailed description taken in connection with the drawings, in which—

Fig. 1, is a plan view of an embodiment of this invention in a double pole switch;

Fig. 2, is a sectional view on line 2—2, Fig. 1;

Fig. 3, is a partial view similar to Fig. 2, with the switch in off position;

Fig. 4, is a view similar to Fig. 3, showing an embodiment in a three-point switch;

Fig. 5, is a view similar to Fig. 4, with the switch in alternative position;

Fig. 6, is a view of the blade in a single way switch;

Fig. 7, is a view of the blade in a three-point switch.

The drawings, particularly Figs. 2 and 3, show a section of a switch cabinet with the switch included therein, but the invention is not limited to such an arrangement.

Upon a base 1, is mounted a frame 2 adapted to carry the moving parts. The frame comprises side pieces 3, connected by top straps 4 and having flanges 5 adapted to rest upon the base 1. The frame is held in place by bolts 6 passing through the base 1 and the flanges 5, secured by nut 7 socketed within the base, and slotted nut 8.

Mounted upon the base on either side of the frame is main terminal 9 and branch terminal 90. These terminals comprise flat bars, and each has downward extensions 10, and relieved at the shoulders as shown at 11. The cutting away of the metal at the shoulders prevents buckling and spreading when the flat bars are bent in manufacture and also adds materially to the quickness of snap in operation. These terminals may be made from commercial flat bars of drawn copper. They are held in place by bolts and nuts as clearly shown, similar in all respects to bolts 6 and nuts 7 and 8. The sockets of all such bolts are after assembly filled with a non-conductor such as sealing wax, as shown at 12.

Rotatably mounted in the frame is the movable conductor comprising two similar parallel blades 13 adapted to contact on either side of the terminals. The blades 13 are fastened together by pins 14 and 15. The blade 13 has a central portion 16, projecting contact legs 17 and 170, spring-carrying projection 18 and stops 19, 19. Each contact leg has outwardly extending ears 20, 20. In the center of rotation, each blade has a hole 21 to accommodate a pin 22 for rotatable mounting upon the frame. It also has holes 23, 23 to accommodate fastening pins 14 and 15, and a roller 24 journaled at either end in the blades.

Pivotally mounted on the frame perpendicularly above the pins 22, by an axis pin 25, is a cam 26 having an eye 27, cam elements 28, 28, and a handle portion 29.

Connecting the pin 15 and the eye 27 is a coiled spring 30.

Mounted on the handle portion 29 is a handle 31 of non-conductive material. Where embodied in a double-pole switch, each handle portion 28 may be bent over and the handle mounted therein as shown in Figure 1. Where the embodiment is in a single pole switch, the handle is moulded over the handle portion 29, as shown in Figs. 4 and 5.

In a three-point switch, an additional terminal 91 is provided above the branch terminal 90, as indicated in Figs. 4 and 5, and an additional leg 171 is provided on each blade.

A cover plate 32 shown in Fig. 1, partially broken away, of non-conductive material is mounted on the base.

In Fig. 2, the switch is shown in on-position. To move the switch to off-position, the handle is moved in the direction of the arrow; the spring 30 is brought in tension, the cam comes in contact with the roller 24, moving the conductor comprising the blades 13 also in the direction of the arrows. Before contact is broken, the spring 30 has been brought into tension, the edge 27 moved over center and the blades are thereby snapped over until stops 19 come in contact with pin

25, the position shown in Fig. 3. To move the switch from off-position to on-position, the same procedure in reverse direction prevails. It is important that the snap action be particularly positive at the beginning of the movement from on-position to off-position. For this reason the roller 24 is provided and is thus utilized in movement from on-position to off-position, while the fixed pin 14 is utilized in movement from off-position to on-position. It will be noted that the cam is so positioned in the frame that its movement is limited by the frame straps 4, 4.

The two-pole switch is substantially two complete switches connected together for movement simultaneously with one handle.

In a three-point switch, it is desired to have the circuit connected selectively with one of two branch circuits. In the embodiment shown in Figs. 4 and 5, it will be seen that the conductor will be in contact in both positions with the main terminal, either through leg 17 or leg 171, and that it will also be in contact by leg 170 with one of the branch terminals, 90 or 91.

Since the terminals comprise bars placed in prone position with the blades contacting with the edges or sides thereof, sufficient clearance is permitted between the two blades to accommodate the cam and spring therebetween, and also give sufficient tension between the parallel contact legs to insure good contact.

It will be noted that the base may be readily moulded out of any of several non-conductive materials well known in the art. The frame 2, blades 13, cam 26 and terminals 17, 170, 171 are such as may be stamped and formed from sheet metal, this being an economical method of manufacture.

By putting the switch in off-position, taking off the cover plate, removing nuts 8, without disturbing the terminals, the frame with all the moving parts may be removed for repair or replacement.

It will thus be seen that the invention accomplishes its purposes. It has a positive snap action, is safe and reliable in operation, simple and economical in construction, durable, and accessible and easy of repair.

It is to be understood that the invention is not limited to the details illustrated and described, since various changes may be made therein without departing from the spirit of this invention.

Having thus described the invention, what is claimed is:

1. An electric switch comprising, a base, a pair of terminals consisting of flat bars, a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, and means for operating said conductor.

2. An electric switch comprising, a base, a pair of terminals consisting of flat bars, a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, a cam and spring mounted between said blades adapted to move said conductor, and a handle attached to said cam.

3. A double pole electric switch, each side comprising, a pair of terminals consisting of flat bars, and a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, and means for simultaneously operating each side.

4. A double pole electric switch having a base, each side comprising, a pair of terminals consisting of flat bars, a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, and a cam and spring mounted between said blades adapted to move said conductor, and a handle attached to each cam for simultaneous operation thereof,

5. A three-point electric switch comprising, a base, a main terminal and two branch terminals, each of said terminals consisting of flat bars, a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, and means for operating said conductor.

6. A three-point electric switch comprising, a base, a main terminal and two branch terminals, each of said terminals consisting of flat bars, a movable conductor comprising a pair of parallel blades in spaced relation positioned and adapted to contact with the narrower sides of said terminals, a cam and spring mounted between said blades adapted to move said conductor, and a handle attached to said cam.

7. A three-point electric switch comprising, a base, a main terminal and two branch terminals, each of said terminals consisting of flat bars, a movable conductor comprising two parallel blades in spaced relation, each of said blades having two depending legs adapted to selectively contact with the main terminal, and one depending leg adapted to selectively contact with the two branch terminals, and means for moving said conductor, the contact between the conductor and the bars being made on the narrower side of said bars.

8. In an electric snap switch, the terminal comprising a flat bar having the end bent downward and relieved at the shoulders of such bend, adapted to contact with a movable conductor on the narrower side of said bar.

9. An electric snap switch comprising, a pair of oppositely positioned terminals consisting of flat bars, a movable conductor con-

sisting of parallel blades in spaced relation connected by links and adapted to contact with said bars on their narrower sides, a cam having a handle and having faces adapted to contact with said links to move said conductor, and a spring between said cam and said conductor adapted to complete the movement of said conductor.

10. An electric snap switch comprising a base, terminals, a frame, a movable conductor rotatably mounted in said frame, a cam for moving said conductor rotatably mounted in said frame perpendicularly above the axis of said conductor, said cam comprising a plate having external engaging faces on either side of its axis, and a spring connected at its one end to the cam plate below and perpendicular to the axis of the cam plate and at its other end to said conductor, adapted and arranged so that the faces of said cam initiates the movement of said conductor and the spring completes the movement.

In testimony whereof I affix my signature this 13th day of Sept., 1927.

ERNST MOXTER.

In testimony whereof I affix my signature this 13th day of Sept., 1927.

HERMAN MOXTER.