

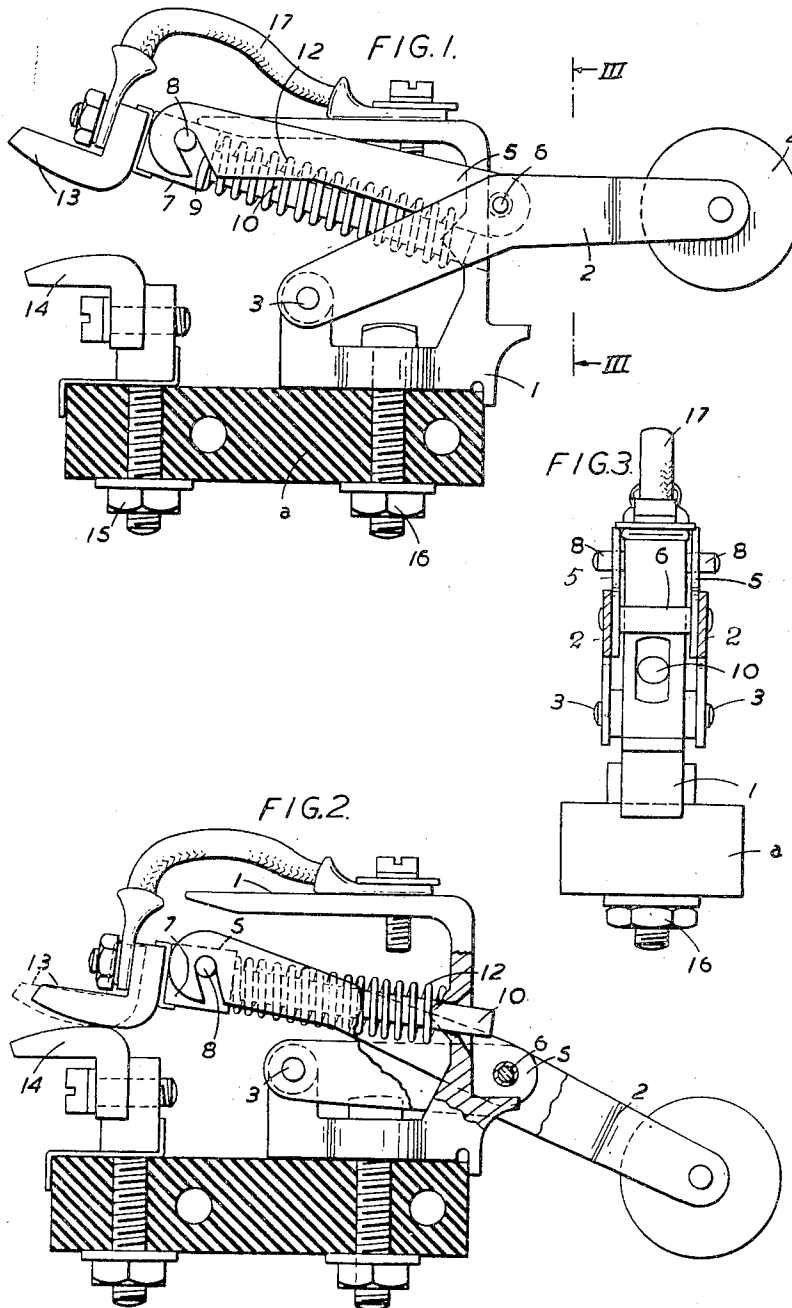
Dec. 12, 1950

W. SHARP

2,533,743

SNAP ACTION ELECTRIC SWITCH

Filed May 21, 1948



Inventor
WILLIAM SHARP
By *Leon M. Strauss*
ATT.

UNITED STATES PATENT OFFICE

2,533,743

SNAP ACTION ELECTRIC SWITCH

William Sharp, Birmingham, England

Application May 21, 1948, Serial No. 28,397
In Great Britain March 20, 1948

2 Claims. (Cl. 200—67)

1

This invention relates to snap-action electric switches of the type having a frame, a butt contact fixed in relation to the frame, a switch arm pivoted on the frame, a link pivotally mounted on the switch arm outwardly of the switch arm pivot, and particularly relates to cam operated switches for control gear. According to this invention the terminals of the switch are arranged on one side of the latter, thereby avoiding the need of having to carry a heavy conductor from one side of the switch to the other. By this invention also the switch is more conveniently fitted and is not liable to be distorted on its fixing base.

In the drawing, an embodiment of the invention is illustrated, of which

Figure 1 is a side elevation of a control switch in "off" position, parts of the frame being broken away for convenience of illustration.

Figure 2 is a cross-sectional elevation of the switch in "on" position, and

Figure 3 is a section taken on line III—III of Figure 1.

According to a convenient embodiment of this invention, the switch comprises a frame member 1 fixedly mounted on an insulating base *a*. The frame conveniently comprises an aluminium bronze casting to form an electric conductor for carrying a large current. The switch arm 2 is pivotally mounted on a pivot pin 3 passing transversely through the frame 1. The switch arm 2 is formed by two levers arranged on each side of the frame 1 and carrying the cam operated roller 4 at the rear of the arm. A lever or link 5 is pivotally mounted at 6 on the switch arm at the rear of said frame 1 and such lever or link 5 extends forwardly on each side of the frame 1 to project beyond the front of such frame. The lever pivotally carries a movable contact carrying member 7 which comprises a rectangular shaped metal block having trunnion pins 8 which engage slots 9 in the lever 5. A pin 10 is fixed to this block and projects rearwardly and slidably and pivotally engages a perforation 10*a* in the frame 1 and passing between the bifurcated arms of the lever 5 in front of the pin pivoting such lever 5 to the switch arm 2. A spiral spring 12 is located between the frame and block 7 or a nut, locking the pin 10 to said metal block or member 7. The movable switch contact comprises an L-shaped copper block 13 fixed to the end of the contact carrying member 7. The fixed switch contact 14 comprises a similar shaped copper block fixed to the insulating base *a* and forwardly of the switch frame 1. The faces of the blocks 13 and 14 are curved to permit of a slight roll

2

during switch movement. The spring 12 aforementioned normally holds the switch lever 2 and the link 5 in a raised position with the switch open. In order to close the switch, switch arm 2 is depressed about pivot 3 on the frame 1. As the switch arm pivots downwardly towards the insulating base (see Fig. 2), the link 5 is pulled bodily rearwardly until the pivot axis of the link and switch arm is beyond the dead centre of the spring actuated device, when the lever 5 and contact carrying member 13 will snap over to press the contacts 13, 14 together. The pivot axis 6 of the link 5 and switch arm 2 will now have moved from above the axis of the spring 12 to a position below the axis and on releasing the pressure on the switch arm 2, the switch will be moved into the "off" position by the action of the spring which re-acts by the pressure of the movable contact 13 on the fixed contact 14 to effect the opening movement and, whilst the contacts are thus spring pressed together, the upward movement of the switch arm 2 bodily moves the link 5 forward and consequently slides the movable contact 13 on the fixed contact (to the position shown by dotted lines Figure 2), thereby producing a shearing action which would break down any possible welding of the contacts together. The supply main is connected to the terminal 15 of the fixed contact 14 and to the terminal 16 which comprises a bolt holding the frame 1 on the insulating base *a*. The current thus passes through the frame 1 and through the flexible lead 17 to the moving contact 13. Thus the terminals 15 and 16 are positioned on the same side of the switch. As the frame 1 is formed of high conducting material, the need is avoided of having to connect the lead from the electric supply main to the inner end of the flexible conductor 17. The base of the frame 1 is slotted for easy assembly on the terminal bolt 16.

It can thus be seen that there has been provided according to the invention a snap action electric switch which is essentially characterized by a frame forming an electrical conductor, a butt contact fixed in relation to the frame, a pivot on said frame, a switch arm movable about said pivot on said frame, a pivot on said switch arm, a link pivotally mounted on said pivot of the switch arm, a movable contact member pivotally mounted on and connected to the link, said movable contact member including a slide rod, the outer end of said rod being slidably and pivotally mounted in relation to the frame, an abutment block on said rod, a spring on said rod bearing against said abutment block and said

3

frame to urge the rod away from the frame and to pivot the link away from the switch arm, so that when the switch arm is moved in either direction past the dead center of the spring, the movable contact will snap into or out of contact with the fixed contact, an insulating base on which said fixed contact is mounted, and terminal means on said base and connected to said fixed contact and said frame, respectively, and a flexible conductor connecting said frame to said movable contact, said pivot on said frame being located in one position of said spring below and in another position of said spring above said pivot on said switch arm from which said link extends to and pivotally engages said movable member.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. An electric switch comprising a frame forming an electrical conductor, a butt contact fixed in relation to the frame, a pivot on said frame, a switch arm movable about said pivot on said frame, a pivot on said switch arm, a link pivotally mounted on said pivot of the switch arm, a movable contact member pivotally mounted on and connected to the link, said movable contact member including a slide rod, the outer end of said rod being slidably and pivotally mounted in relation to the frame, an abutment block on said rod, a spring on said rod bearing against said abutment block and said frame to urge the rod away from the frame and to pivot the link away from the switch arm, so that when the switch arm is moved in either direction past the dead center of the spring, the movable contact will snap into or out of contact with the fixed contact, an insulating base on which said fixed contact is mounted, and terminal means on said base and connected to said fixed contact and said frame, respectively, and a flexible conductor connecting said frame to said movable contact, said pivot on said frame being located in one position of said spring below and in another position of said spring above said pivot on said switch arm from which said link extends to and pivotally engages said movable member.

4

2. A snap action electric switch comprising a base of electric insulating material, a fixed butt contact member including terminal connection therefor on said base, an electric conducting frame including terminal connection therefor on said base, a pivot on said frame, a switch arm swingable with one end about said pivot on the frame and extending in a direction away from said fixed contact, a pivot carried by said switch arm, a link movable about said pivot on said switch arm, a movable butt contact pivotally connected to said link and including a slide rod rigid with said movable butt contact, said slide rod pivotally and slidably engaging said frame at a point intermediate the position of said pivot connecting said link to said switch arm and the position of the said pivot connecting said switch arm to said frame, a spring on the rod urging the link to pivot away from the switch arm, said pivot connecting said switch arm to said frame lying intermediate said engaging point of said rod with said frame and said fixed contact and at a point intermediate said fixed contact and the pivot connecting said link with said switch arm, so that the said spring exerts a force urging the switch arm to slidably move said movable contact member away from said fixed contact member when pressure on said switch arm for closing the switch is released.

WILLIAM SHARP.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,368,228	Behrens	Feb. 8, 1921
2,307,946	Parker	Jan. 12, 1943

FOREIGN PATENTS

Number	Country	Date
263,291	Germany	Aug. 6, 1913