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SNAP SWITCH FOR PLUGS

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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by

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To all whom it may concern:

Be it known that I, CHARLES F. NOORDEN, a subject of the Republic of Germany, a resident of New York city, county and State of New York, have invented certain new and useful Snap Switches for Plugs, set forth in the specification.

This invention relates to snap switches and includes a new mechanical movement especially adapted for the embodiment in a snap switch for a plug connector for such heavy duty as connecting and supplying flat-irons with electric energy.

An object of the invention is to provide a mechanical movement which will insure both a positive and quick make and break and a wide separation of the switch contact parts all within a relatively confined space. A further object of the invention is to provide in a switch of character described a simple indicator-device to show whether the switch is open or closed.

To the above ends there is provided a thrust operative driver having a striker cooperating with two spaced abutments on a contact-bridge between which abutments the striker is located and which striker is snap operated through the medium of a leaf spring, the ends of which are constrained and which is buckled in such a way as to effect the snap movement of the bridge. A further object of the invention is to refine the combination of parts and switch elements so as to adapt them for the general purposes above.

These and further objects will better be understood by reference to the illustrative embodiment of the invention described in the following specification in connection with the accompanying drawings which form a part hereof and to which the following claims are directed merely for purposes of illustration and not limitation.

In the drawings Figure 1 is a perspective view of the switch embodied in a plug, with parts broken away; Figure 2 is a perspective view of the indicator; Figure 3 is a perspective view, with parts broken away, of the window portion of the casing; Figure 4 is a perspective view of the switch mechanism in open position; Figure 5 is a cross section showing the relation of the indicator to the casing; and Figure 6 is view individually illustrating the important parts of the switch mechanism in perspective.

A suitable casing of molded insulating material, such as porcelain, hard rubber or electroset, provides the housing A for the switch. This casing is formed in two substantially symmetrical parts 1 and 2 held together in the usual manner by screws 3 and 4. The conductor cord enters through the protector 5 and is connected with the conducting strips 6 and 7 which extend the circuit terminals to the usual plug connectors 8 and 9, it being understood that the gap between the switch contacts 10 and 11 is included in one of the branches of the conductors extending through the casing A so that the circuit is under the control of these contacts 10 and 11 according to the position of the conducting bridge B.

The driving member or driver B' comprises an S-shaped metal yoke 12, the ends of which are provided with push buttons 13 and 14. Mid-positioned on yoke 12 is a striker 15 provided with a slot 16 for the passage and engagement of the leaf-spring 17. The driver is suitably guided against lateral movement as by a guide way 18 formed transversely through the parting of the casing sections A and also in a detachable insulating base C designed to fit within the casing A.

In its present embodiment the bridge B is substantially of inverted V shape and oscillates about its acute end 20 in the notch 21 provided in the off set buttress wall 22. The legs 23 and 24 of the bridge form abutments cooperating with the striker 15 and are terminated with brush contacts 25 and 26 operatively to cooperate with the contacts 10 and 11 respectively.

Opposite to the buttress 22 is second buttress 30 providing a pocket 31 in which is housed a relief spring 32 extending parallel to the driver B'. Spring 32 is preferably turned down at the ends to insure solely end contact in the pocket 31. The V shaped notch 34 permits the end 35 of leaf-spring 17 to move endwise against the resistance of spring 32 but constrains it against lateral movement. The opposite end 37 of leaf-spring 17 is constrained against lateral movement by the V shaped pocket at the end 21 of the bridge B.
In Figure 1 the switch is shown closed. A thrust upon the push button 18 straightens out the leaf-spring 17, the end 35 being forced down against spring 32 which yields as the buckle of the spring is straightened out. When the spring passes dead center it snaps violently to the right, forcibly driving striker 15 against abutment 24 of the bridge piece which draws the contacts 25 and 26 out of contact with contacts 10 and 11 and into the position shown in Figure 4 which position is maintained by the sides of the leaf-spring 17 as indicated.

To close the switch a thrust upon push button 14 causes a reverse of these operations so that the striker 15 operating against abutment 23 closes the switch into the position shown in Figure 1.

To give a visible indication as to the position of the switch contact an indicator 40 is provided which is visible through a window 41 provided in the casing section 1. The indicator 40 is a slide bearing suitable designation for “on” and “off” such as the red 42 or the black 43. The indicator slide 40 is guided in the slide way 44 and is operated by a direct connection with the driver B’ which may be outward projection of the striker 15 taking into the notch 45 of the slide.

What I claim and desire to secure by United States Letters Patent is:—

1. In a mechanical movement, a reciprocatory driving member, a reciprocatory driven member mounted for movement in a direction in general parallel to that of said driving member, a leaf spring extending substantially at right angles to the direction of motion of said driving member and being engaged thereby between the ends of the said leaf spring being restrained against lateral movement at its ends and arranged to have its center move back and forth across the plane connecting its ends when the driving member is reciprocated, said driving member having a striker out of contact with the driven member when the driving member is at one end of its motion and arranged to contact with said driving member as the driving member is moved with a snap action by the central portion of said leaf spring passing across the plane connecting its ends.

2. In a snap-switch, a thrust operated driving member having push buttons at its ends; means for guiding said driver; a slotted striker mid-positioned on said driver; a pair of separated electric switch contacts; a conducting bridge for said contacts having two spaced legs on opposite sides of said striker and both snap operated thereby by striking contact with either, said legs also having feet to cooperate with said contacts; and a buckled leaf-spring constrained at its ends against lateral movement passing through said striker and extending transversely of said driver, whereby said feet may be thrown into and out of connection with one of said contacts by a thrust upon the respective push buttons.

3. In a snap switch, a leaf spring, means for restraining the ends of said spring against lateral movement, a reciprocatory member mounted for movement substantially at right angles to the length of the leaf spring and engaging said spring between its ends, said member and said spring being arranged to cause the central portion of the spring to move back and forth across the plane connecting the ends of the spring as the member is moved from a limit of its motion in one direction to the limit of motion in the opposite direction, and a switch adapted to be moved by said member in each direction of motion of said member and arranged to receive motion from said member only after the central portion of said leaf spring has been moved by said member beyond the plane connecting the ends of said leaf spring.

4. In a snap-switch, snap operating means comprising a leaf-spring; means for constraining the ends of said spring against lateral movement; and a spring arranged to exert pressure against an end of said leaf spring and endwise thereof.

5. In a snap-switch a pair of contacts; a forked conducting bridge for said contacts having a pivoting fold; a buttress having a notch to pivot said fold; and means tending to hold said fold seated in said notch.

6. In a snap-switch a pair of contacts; a forked conducting bridge for said contacts having a pivoting fold; a buttress having a notch to pivot said fold; and an end thrusting leaf-spring tending to hold said fold seated in said notch.

7. In a snap-switch, a pair of contacts; a forked conducting bridge for said contacts having a pivoting fold; a buttress having a notch to pivot said fold; and an end thrusting leaf-spring tending to hold said fold seated in said notch; and means tending to buckle said leaf-spring to produce a snap-oscillation.

8. In a snap-switch, a pair of contacts; a forked conducting bridge for said contacts having a pivoting fold; a buttress having a notch to pivot said fold; and an end thrusting leaf-spring tending to hold said fold seated in said notch; and means tending to buckle said leaf-spring to produce an oscillation; and a driver for operating said spring past dead-center in either direction.

9. In a snap-switch, a leaf spring, means for constraining the ends of said spring against lateral movement, a spring arranged to exert lengthwise pressure on said leaf spring and to permit lengthwise motion of an end of said leaf spring, a reciprocating driving member having push buttons at its ends; means for guiding said driver; a slotted striker mid-positioned on said driver; a pair of separated electric switch contacts; a conducting bridge for said contacts having two spaced legs on opposite sides of said striker and both snap operated thereby by striking contact with either, said legs also having feet to cooperate with said contacts; and a buckled leaf-spring constrained at its ends against lateral movement passing through said striker and extending transversely of said driver, whereby said feet may be thrown into and out of connection with one of said contacts by a thrust upon the respective push buttons.
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