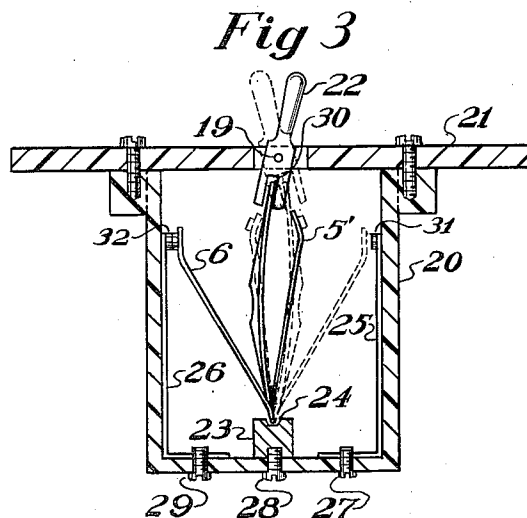
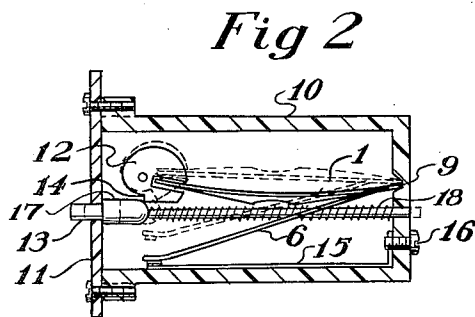
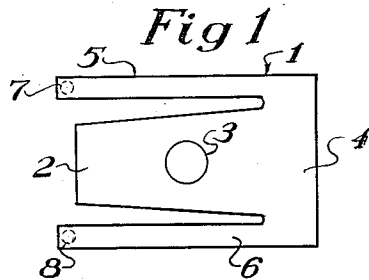


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F. J. TRAINOR
ELECTRIC SNAP SWITCH

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ELECTRIC SNAP SWITCH

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1 Claim. (Cl. 200—67)

1

My invention relates to an improved electric snap switch.

The object of my invention is to provide a novel switch of the snap action type which consists of a few parts so constructed that they may be readily assembled together, and when so assembled provide a smooth acting, compact, reliable and economical mechanism.

The following is a description of my invention, reference being had to the accompanying drawing in which:

Figure 1 is a plan view of a combined snap action and contactor element.

Figure 2 is a sectional view of a complete switch of a single action type.

Figure 3 is a sectional view of a complete switch of a double action type.

In the drawing, Figure 1, the numeral 1 indicates generally a combined snap action and contactor element. This element comprises a central snap action portion 2 of resilient metal having an aperture 3 therein.

The snap action portion is given a snap action characteristic by the application of pressure to the metal surrounding the aperture.

I have discovered that the snap action portion can be given the characteristic of having one condition of stability or two conditions of stability depending on the mode of formation.

A snap action portion having a single condition of stability is formed by pressing the metal around the aperture between two dies, one having a plane surface and one having a slight convexity. Such a snap action unit has the peculiar property of always assuming the off center phase towards the side where the convex tool is brought to bear.

A snap unit formed in accordance with the foregoing is particularly applicable to switches of the type which tend to maintain a selected open or closed condition and changes the condition only under and during the influence of an impressed force.

A snap action portion 2 having two conditions of stability is formed by pressing the metal surrounding the aperture 3 between two dies, each having a slight convexity.

In either case, the snap unit of this invention has an action quite distinct from the continuous sheet snap action devices of the prior art. The application of a turning moment having an axis parallel to an edge of the snap action portion results in a delayed consummation of the reversal in condition of the snap action portion. The reason for this is that at first only the por-

2

tion of the snap action unit to which the force is applied is distorted. Upon the further application of a turning moment, the distortion progresses until, by such a wave motion, the snap action portion consummates the change in condition.

It follows that a snap action unit having an aperture in the center of the distorted portion is quieter in action, smoother in operation and more reliable in action than solid center snap action devices.

One end of the snap action portion 2 merges into a base portion 4. The base portion is elongated in order to support contactor arms 5 and 6 which are preferably integral therewith.

It has been discovered that if means are provided for snapping the snap action portion first described as having a single stable phase to a distorted condition opposed to its stable phase or for snapping the last described embodiment from one stable phase to the other, the base portion 4 revolves through an angle and assumes an inclination similar to that of the snap action portion adjacent thereto. It follows that the contactor arms 5 and 6 and therefore the contacts 7 and 8 respectively swing through a similar angle.

The application of the combined snap action and contactor element of the single stable phase type to a complete switch is shown in Figure 2. The element 1 is pivotally supported at the base end in a slot 9 provided in the base of the switch housing 10. The free end of the snap action portion 2 is supported in a bifurcation in the pivotally supported rocker element 12. Adjacent the rocker element 12, a push-button element 13 is reciprocally supported at one end in the base of the switch housing 10 and at the other end in the aperture of the switch housing cover 11. The rocker element 12 is provided with a shoulder 14 for engagement with the enlarged portion 17 of the push-button element 13. A spring 18 is provided for urging the push-button to an inactive position.

The embodiment of Figure 2 is a switch of the push-to-break type. Therefore, both arms 5 and 6 of the combined snap action and contact element 1 are inclined to equal angles on the same side of the snap action portion 2. That is, the contact arm 5 is behind the contact arm 6 shown in the figure. Supported in the housing 10 are fixed conductors 15 provided with contacts so positioned as to establish contact with the contacts 7 and 8 on arms 5 and 6. Each of the stationary contacts supporting conductors 15 are provided

3

with terminals 16 in order to permit the connection of the switch in a circuit.

It is therefore seen that an extremely simple switch has been devised which opens its contacts with a snap action as a result of depressing the switch button 13, and closes the contacts with a snap action when the force is removed from switch button 13. It is to be noted that the shoulder 14 on the rocker element is so proportioned that the snap action portion 2 is urged past its dead-center position but that, due to the single phase stability of the snap action element, it is in readiness upon the removal of pressure applied to the switch button to return the contactor arms to the contact making condition.

The combined snap action device of the two stability phase type is readily applied to a switch of the double-throw type as shown in Figure 3. In this embodiment, one contactor arm 5' is provided with an inclination to the snap action portion which is opposite in direction to that of the switch arm 6. The snap action element is rotatably supported in a groove 24 in a conducting block 23 supported on the base of the housing 20. Supported on opposed internal surfaces of the housing 20 are a pair of fixed contacting elements 25 and 26. A switch handle 22 is pivotally supported on pivot 19 in the switch housing 21. The switch handle is provided with a bifurcated portion 30 for engagement with the free end of the snap action tongue 2.

The switch is shown in one condition of stability. The resilience of the snap action portion 2 is shown urging the contact arm 6 against the fixed contact arm 26. The switch is thrown to the alternate contact by a counter-clockwise motion of the switch handle 22. Pressure against the switch handle in the counter-clockwise direction causes the snap action portion to pass through a condition of dead-center, from which condition the snap action element with a wave motion snaps the switch arm 5' into contact with the fixed contact 31.

It is therefore seen that I have provided a very simple and rugged switch which is capable of great economy in manufacture and perfect reliability in use. It is apparent that the novel

4

arrangement of the snap action element and switch contactors may be used in many other embodiments than those shown in the drawings. It is to be understood therefore that the invention is to be restricted only by the appended claim as interpreted in view of the prior art.

What is claimed is:

In a snap action switch device, a snap action and contact element comprising an elongated, flat reed portion having an aperture centrally located therein and being embossed to a convex condition in the vicinity of said aperture, one end of said reed portion being integral with a co-linearly extending transversely elongated base portion, a contact arm affixed to the base portion adjacent the reed portion and inclined at an acute angle thereto, a dielectric housing having a groove in the bottom thereof for pivotally supporting the free end of the reed base portion, a cam member having a bifurcated portion for straddling the free end of the reed, a push-button supported for motion transverse to the axis of said cam and having a shoulder adapted to abut said cam member, a contact on the end of the contact arm and a fixed contact supported on a lateral wall of the housing, said movable contact being normally urged against the fixed contact by the convexity of said reed, and being deflected away from said fixed contact by rotation of the bifurcated portion of the cam due to inward motion of the push-button.

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