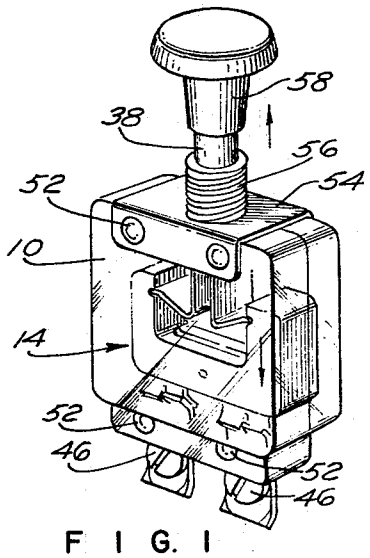
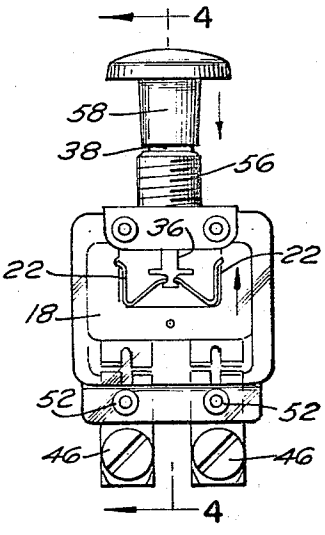
Sept. 27, 1966 K. J. BATCHELLER 3,275,768

SNAP-ACTION ELECTRIC SWITCH

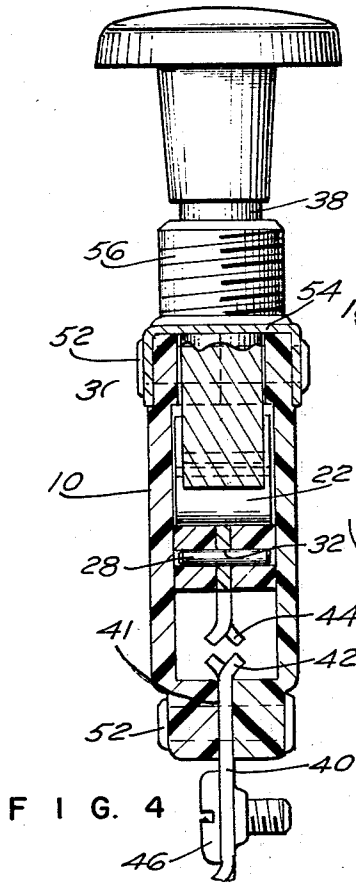
Filed April 13, 1964



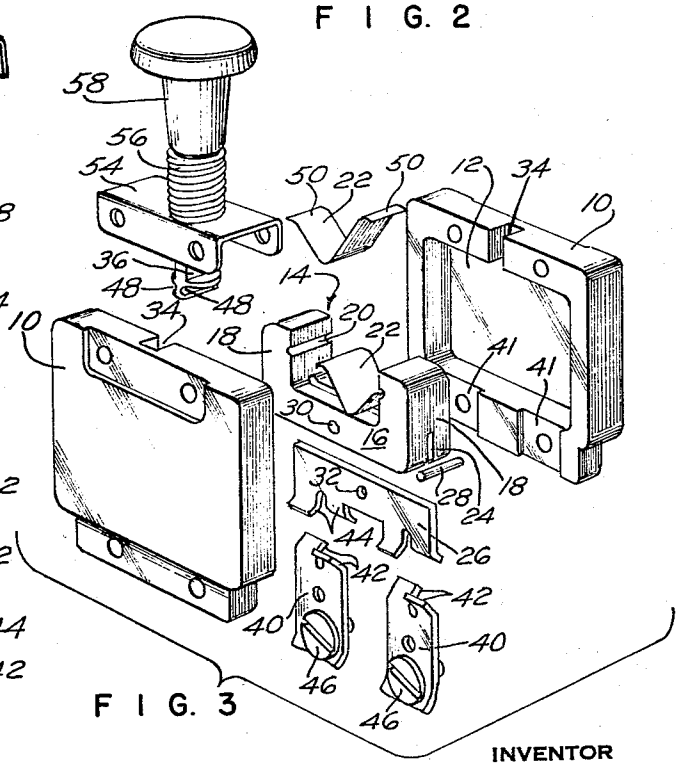
F I G. 1



F I G. 2



F I G. 4



F I G. 3

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SNAP-ACTION ELECTRIC SWITCH

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1 Claim. (Cl. 200—76)

This invention relates to an electric switch designed to carry relatively heavy currents and to have a fast make and break. It is also an object of the invention to provide a switch structure consisting of simple parts which can quickly and easily be assembled. The switch hereinafter described is of the push-pull type having a plunger which is pushed to open the switch and is pulled to close the switch, there being a spring toggle connection between the plunger and a contact blade which acts to snap the blade quickly to or from contact with a pair of fixed terminals.

For a more complete understanding of the invention, reference may be had to the following description thereof, and to the drawings, of which

FIGURE 1 is a perspective view of an embodiment of the invention, the structure being shown with a body or casing of transparent material so that the inner parts are visible;

FIGURE 2 is an elevational view of the same, the parts being in open-switch position;

FIGURE 3 is an exploded perspective view of the same, showing the individual parts; and

FIGURE 4 is a section, on an enlarged scale, taken on the line 4—4 of FIGURE 2.

The switch illustrated in FIGURES 1–4 comprises a housing or body consisting of two identically formed members **10** which are of insulating material, preferably a molded thermo-setting synthetic resin such as Bakelite. As shown in FIGURE 3, each member **10** is generally rectangular in shape and is provided with a recess **12**, the two recesses constituting a hollow or cavity when two of the members are put together face to face. The bottoms of these cavities are parallel inner walls of the hollow which confine and guide a U-shaped yoke **14**, this yoke being adapted to move up and down for the operation of the switch as hereinafter described. The U-shaped yoke has a horizontal base **16** and two vertical arms **18**. For convenience of description, the switch structure is described in the following specification and in the claims as being in the upright position shown in FIGURES 1 and 2, but it is evident that it can be used in any position. Extending horizontally across the inner wall of each arm **18** is a groove **20** adapted to receive an end of a leaf spring **22** as hereinafter described. The base **16** of the yoke is longitudinally slotted from the bottom up as at **24** to receive a planar contact blade **26** which is rockably retained in the slot **24** by a pin **28** which passes through a hole **30** in the base **16** and a hole **32** in the blade **26**.

The top of each body member **10** is notched as at **34**, these notches forming a rectangular passage when the two body members **10** are secured together. In this passage is slidably fitted a flat portion **36** of a push rod **38**, the flat portion preventing the push rod from turning on its own axis. Two terminal members **40** extend through and are fixed in the bottom of the body, each member **10** having shallow recesses **41** in which the terminal members **40** fit. As shown, the upper end portion

of each terminal member **40** is bifurcated to form two contact elements **42** which are inclined in opposite directions to make acute angles with a vertical plane. The contact blade **26** has downwardly projecting elements **44** at each end thereof which are similarly inclined from the vertical to engage the inclined end portions **42** of the terminal members **40**. The lower ends of the terminal members **40** which are outside of the body may be provided with the customary screws **46** by which wires can be attached to the terminal members.

The push rod **38** is provided with lateral notches or grooves **48** on opposite sides thereof at its lower end. An end of each of the two leaf springs **22** engages in one of these grooves **48**. The leaf springs **22** are made of short strips of spring steel which are suitably tempered. Each spring when unstressed is in the form of a V, the legs of which make an angle of 80 or 90 degrees with each other. The extremities of these legs are bent outwardly to form lips **50** for engagement in the grooves **20** in the yoke **14**, and the grooves **48** at the lower end of the push rod **38**, this being indicated in FIGURE 2. The dimensions of the yoke **14** and springs **22** are such that the springs must be distorted or sprung to a shape somewhat as illustrated in FIGURE 2, the legs of the V then making an angle of about 45 degrees with each other. FIGURE 2 shows the position of the parts when the switch is open, that is, when the yoke and the contact blade carried thereby is in its elevated position. At this time the push rod is in its lowermost position. To close the switch, the push rod is pulled up as indicated in FIGURE 1. When it has been pulled part way up, the springs **22** snap it strongly the rest of the way up, and at the same time snap the yoke down to its lowermost position, as indicated in FIGURE 1, in which position the tongues **44** of the contact blade are in engagement with the tongues **42** of the terminal members **40**. Since the contact blade is rockable about the pin **28**, it automatically equalizes the pressure between its several tongues **44** and the opposing tongues **42**. In like manner when the push rod is moved downward, the springs **22** snap the push rod through the latter part of its downward movement and at the same time snap the yoke and contact blade upward so that the latter is quickly separated from the terminal members **40**.

To hold the body members together in assembled relation, any suitable fasteners such as hollow rivets **52** may be employed. A cover member **54** may also be employed to extend over the top of the body and down on the faces of the body members **10** a sufficient distance to accommodate the upper rivets **52**. A throat **56** is secured to the cover member **54** to accommodate the push rod **38** which has a sliding fit therethrough. A finger piece or handle **58** is screw threaded or otherwise fastened to the upper end of the push rod **38** to facilitate the manipulation thereof.

A valuable feature of the construction hereinbefore described is that it is capable of quick and easy assembling. The inner walls of the hollow or cavity **12** confine and guide the movements of the yoke **14** and also keep the springs **22** in place. The push rod, springs, yoke, contact blade and terminal members can quickly and easily be assembled on one of the body members **10**. The other body member is simply placed on top and a cover member **54** is moved down over the end of the push rod **38** to embrace the upper parts of the body

members **10**. This holds the assembled switch in assembled condition until the rivets **52** are inserted and secured. The finger piece **58** is then mounted on the outer end of the push rod **38**, completing the assembling of the switch.

I claim:

A snap-action electric switch comprising a hollow body consisting of two members of insulating material fastened together, a push rod extending slidably through the top of said body, two terminal members extending through and fixed in the bottom of said body, a planar contact blade in said body movable in its own plane down into contact with said terminal members and up out of contact with said terminal members, and means responsive to a downward movement of said push rod to raise said contact blade out of contact with said terminal members and responsive to an upward movement of said push rod to move said contact blade down into contact with said terminal members, said means comprising a spring toggle mechanism operatively connecting said push rod and said

contact blade, said contact blade being mounted for limited rocking movement in its own plane for balanced engagement with the two said terminal members.

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