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ROCKER-TYPE SWITCH WITH INTEGRAL SPRING
AND C-SHAPED CONTACT CONSTRUCTION
Filed March 14, 1962

3,178,522

Fig. 1.

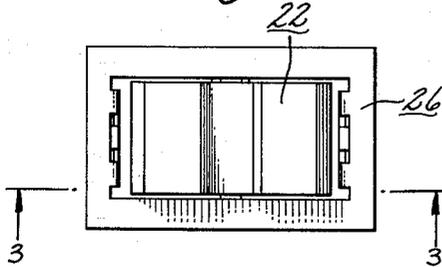


Fig. 2.

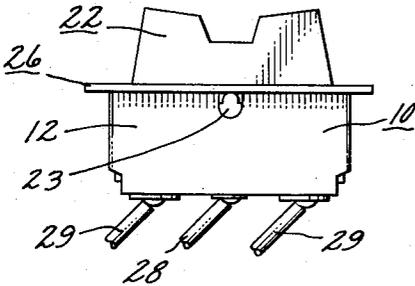


Fig. 3.

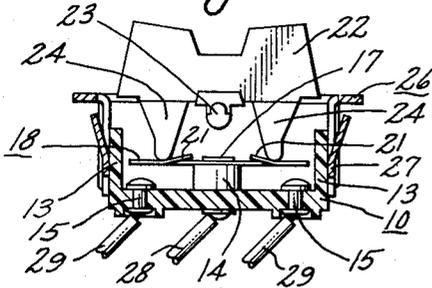


Fig. 5.

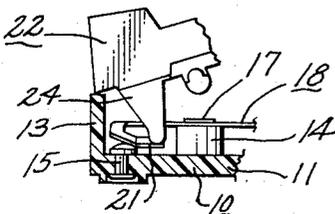
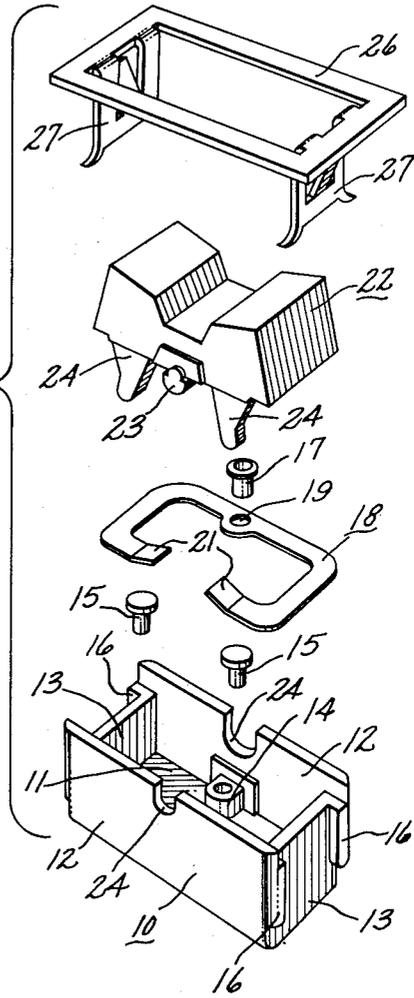


Fig. 4.



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ROCKER-TYPE SWITCH WITH INTEGRAL SPRING AND C-SHAPED CONTACT CONSTRUCTION

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3 Claims. (Cl. 200—6)

This invention relates to momentary-contact switches used in remote control wiring systems.

Remote control wiring systems utilize relays to operate high-voltage line circuits. Each relay has two coils, one of which when energized opens the relay contacts and the other of which when energized closes the relay contacts. An over-center mechanism holds the relay in either open or closed position after it has been moved to that position. Thus, it is necessary to energize the relay for only a very brief interval in order to change its contact setting.

Remote control relays are operated by low-voltage (24 volts) circuits under manual control from one or more momentary-contact switches. In view of the low voltage involved, these switches can have rather simple switch mechanisms. Nevertheless, the switches must possess reliability over a long period of time during which the switch will be operated many thousands of times.

It is an object of the present invention to provide a momentary-contact switch which is simple to construct and assemble and yet which will operate reliably for a number of years.

Another object of the invention is to provide a momentary-contact switch in which operation of the switch trigger insures firm contact between the contacting parts.

The above and other objects are accomplished by this invention as may be seen from the following specification and appended drawing wherein FIG. 1 is a view of the remote control switch of this invention as seen from the trigger side;

FIG. 2 is a side view of the switch illustrated in FIG. 1;

FIG. 3 is a view of the switch of FIG. 2 partially in section;

FIG. 4 is an exploded perspective view showing all the switch parts; and

FIG. 5 is a broken sectional view showing the switch in a closed position.

Briefly stated, in accordance with one of its aspects, the invention is directed to a momentary-contact switch comprising a molded housing of plastic material of rectangular base configuration with side and end walls, an integral pedestal positioned on the base at a midpoint along one sidewall thereof, a leaf spring contact having a C configuration fixedly mounted on the pedestal at the midpoint of the C, the ends of the spring being turned away from the base at an angle of about 20° with respect to the base surface, a fixed contact at each corner of the base on the side opposite the pedestal, the fixed contacts being spaced from, and in register with, the portion of the leaf spring immediately adjacent the turned ends, and a reciprocally movable trigger having trunnions pivotable in bearings on the midtop portions of the side walls of the housing, the trigger having two legs extending downward from the underside thereof, one of the legs being in contact with one of the portions of the leaf spring immediately adjacent a turned end and the other of the legs being in contact with the portion of the leaf spring immediately adjacent the other turned end whereby pivotal movement of the trigger produces a leg movement which first forces the portion of the leaf spring immediately adjacent a turned portion into engagement with a fixed contact and then allows the contact surface of the leg to slide onto the turned portion of the spring to exert additional force by the spring against the contact.

Referring to the drawing, the switch is composed of a molded plastic housing 10 consisting of a rectangular base 11, sides 12, and ends 13 composed of a phenolic or urea formaldehyde or similar polymer. The housing includes an integral pedestal 14 having an aperture through which electrical connection may be made. The corners of the base opposite the pedestal 14 have apertures in which are positioned fixed contacts 15, as best shown in FIG. 3. The end walls 13 of the housing 10 include integrally molded bosses 16 which are used as retaining elements during assembly of the switch.

Mounted upon the pedestal 14 as by a rivet 17 is a C-shaped leaf spring 18 which has a mounting aperture 19 at the midpoint thereof and ends 21 which are turned upward at an angle of about 20° with respect to the surface of the base 11.

A trigger 22, which may be a molded part as in the case of the housing 10, has integral trunnions 23 which are positioned in bearing surfaces 24 positioned in the middle of the top edge of the side walls 12. The bottom ends of the trigger 22 are set back slightly to give the trigger limited reciprocal pivotal movement with respect to the housing 10. On the underside of the trigger are two spaced legs 24 which contact the portion of the leaf spring 18 which is immediately adjacent the turned-up ends 21, as best shown in FIG. 3. This portion of the leaf spring 18 is in register with the fixed contacts 15 so that reciprocal movement of the trigger brings these portions of the leaf spring 18 alternately into contact with the fixed contacts 15.

The trigger 22 is maintained in position in the housing 10 by a metal retaining frame 26 having retaining legs 27 which mate with the bosses 16 of the housing 10. A complete switch includes a common lead 28 (FIGS. 2 and 3) which is connected to the contact blade 18 and leads 29 which are connected to the fixed contacts 15.

The operation of the switch will now be described with particular reference to FIGS. 3 and 5. In FIG. 3 the switch is shown in an at-rest or open-circuit position. If the trigger 22 is pressed to impart counterclockwise movement, one of the legs 24 will press the portion of the leaf spring 18 immediately adjacent one of the turned-up portions 21 into engagement with the radial surface of a fixed contact 15, as shown in FIG. 5. As pressure on the trigger 22 is continued, the leg 24 slides onto the turned-up end 21 of the leaf spring 18, as shown in FIG. 5, to deform the spring further and exert stronger pressure of the spring on the fixed contact. It should be noted that the rolling action of leg 21 on contact 15 causes the initial make and break of current to be made at the top surface of the radial portion of fixed contact 15, while the steady state condition is made on the side of the radial surface. It is to be noted in FIG. 5 that the turned-up end 21 is parallel with the surface of the base 10 whereas the adjacent portion of the spring 18 has been deformed out of a parallel plane. On release of the trigger 22, the leaf spring 18 can return to the position illustrated in FIG. 3 without risk of wedging the leg 24 so that the spring 18 remains in contact with the fixed contact 15. If the end of the leaf spring 18 is not turned up, as at 21, there is likelihood that the spring force tending to restore the trigger to the position illustrated in FIG. 3 will be at right angles to the direction of travel of the trigger and thus the switch will be held in circuit-closed position.

While the invention has been described with reference to a specific embodiment thereof, it is obvious that there may be variations which will fall within the proper scope of the invention. Therefore, the invention should be limited in scope only as may be necessitated by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A momentary-contact switch comprising a molded housing of plastic material of rectangular base configuration with side and end walls, an integral pedestal positioned on said base at a midpoint along a side wall thereof, a leaf spring contact having a C configuration in the plane of said leaf spring fixedly mounted on said pedestal parallel to the base and at the midpoint of the C, the ends of said leaf spring being turned away from said base at an angle of about 20° with respect to the base surface, a fixed contact in each corner of said base on the side opposite said pedestal, fixed contacts being spaced from, and in register with, the portion of said leaf spring immediately adjacent the turned ends, and a reciprocally movable trigger having trunnions pivotable in bearings on the midtop portions of the side walls of said housing, said trigger having two legs extending downward from the underside thereof, one of said legs being in contact with one of the portions of said leaf spring immediately adjacent a turned end and the other of said legs being in contact with the portion of said leaf spring immediately adjacent the other turned end whereby pivotal movement of said trigger produces a leg movement which first forces the portion of said leaf spring immediately adjacent a turned portion into engagement with a fixed contact and then allows the contact surface of the leg to slide onto the turned portion of said leaf spring to exert additional force by said leaf spring against said contact.

2. A momentary-contact switch comprising a molded plastic housing having a rectangular base with side and end walls, an integral pedestal positioned at a midpoint on said base near a side wall, said pedestal defining a central aperture for accommodation of a common lead, apertures through said base adjacent the corners of said side wall opposite said pedestal, said side walls defining

bearing surfaces at a midpoint on the top edge thereof, stationary contacts positioned in said corner apertures, a leaf spring of C configuration in the plane of said leaf spring fixedly mounted at its midpoint on said pedestal parallel to said base, said leaf spring extending around the ends of said housing with a portion toward each end in register with said fixed contacts, the end portions of said leaf spring immediately adjacent the portions in register with said fixed contacts being angled upward, and a trigger with trunnions positioned in said side wall bearings, said trigger being reciprocally pivotable in said bearings and having legs on the underside of each end in contact with the portion of said leaf spring immediately adjacent the upward angled ends whereby when an operating surface of said trigger is pressed the portion of said leaf spring in contact with the leg under the surface pressed is moved into contact with the fixed contact underneath after which the leg surface moves onto the upward turned end portion to exert additional force on the part of said leaf spring against said fixed contact.

3. A momentary-contact switch as claimed in claim 2 wherein the ends of the leaf spring are turned upward at an angle of about 20°.

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