

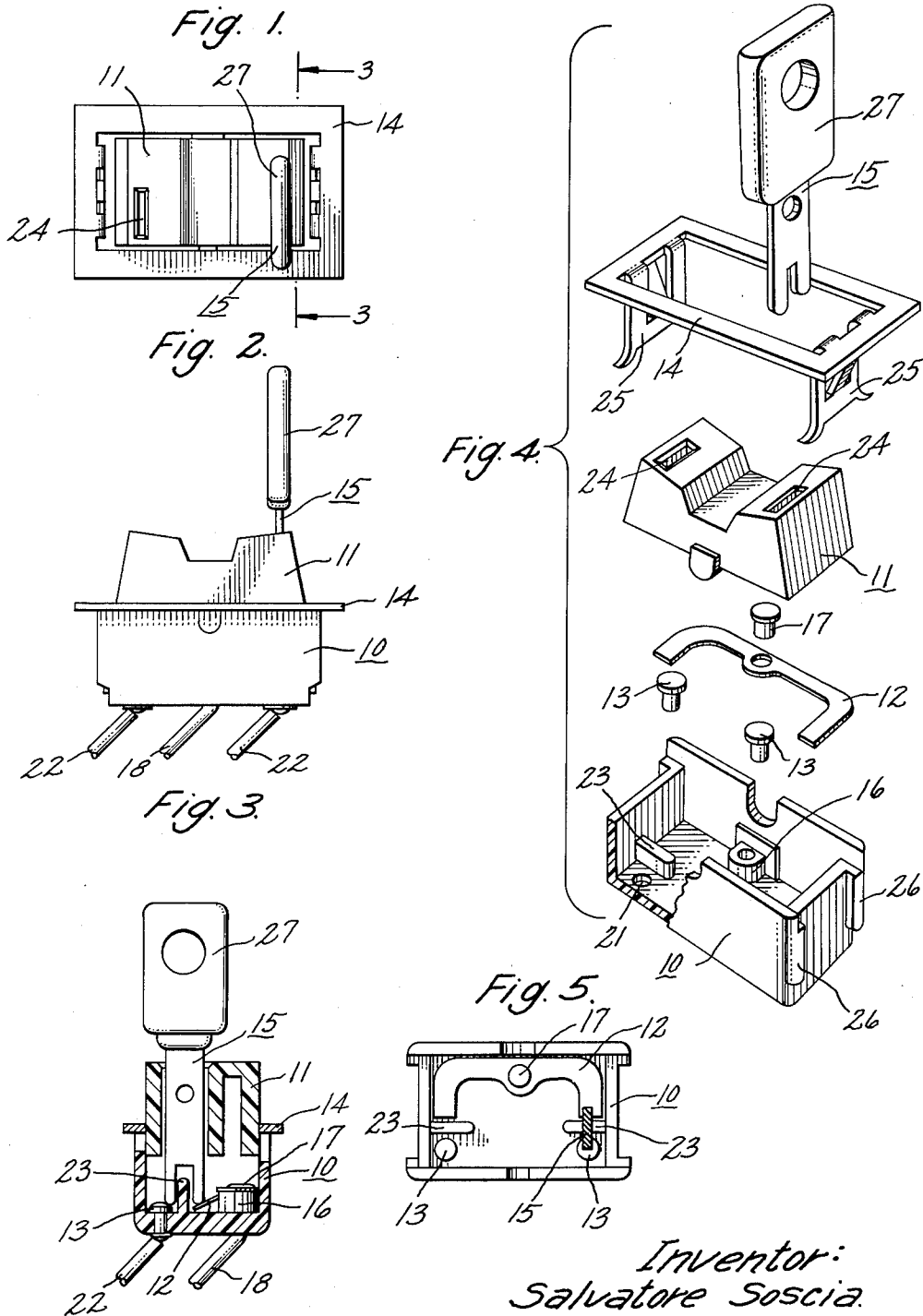
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REMOTE CONTROL KEY SWITCH

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REMOTE CONTROL KEY SWITCH

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This invention relates to a remote control key switch; more particularly, the invention relates to a remote control key switch having two key-insertion apertures.

Remote control wiring installations utilize relays to control the opening and closing of high-voltage circuits. The relays are operated by low-voltage control circuits. Generally the low-voltage is at the level of 24 volts obtained by transforming the line voltage to the 24-volt level. The relays have two coils which are selectively energized to set the relay to an "On" or "Off" position. A relay position once set is retained upon de-energization of the coil and, therefore, the relay may be operated by a momentary contact switch. Since any number of switches may be used to control a single relay, a remote control system provides maximum flexibility from a control standpoint.

Remote control switches which may be locked to prevent tampering by unauthorized personnel are sometimes needed in remote control systems—particularly commercial installations. Such a switch was disclosed in Cressman et al. Patent No. 2,771,521 which is assigned to the same assignee as the present application. The Cressman switch has a single key-insertion slot and it was necessary to turn the key in one direction to energize the circuit-closing coil of the relay and in the reverse direction to energize the circuit-opening coil of the relay. The use of a single key-insertion slot to turn the switch both "On" and "Off" is the cause of confusion—particularly when the key switch is not used very frequently. Accordingly, it is one of the objects of the present invention to provide a remote control key switch which has one key-insertion slot for the "On" position and a different key-insertion slot for the "Off" position.

Another object of the invention is to provide a remote control key switch which does not require rotation of the key after insertion in the switch.

A further object of the invention is to provide a remote control switch in which insertion of the key provides wiping contact with one of the contacts and in which a barrier between contacts prevents operation of the switch by a key or other mechanism which does not have a forked end.

The above and other objects of the invention are accomplished in accordance with the following specification and appended drawing in which FIG. 1 is a plan view of a switch in accordance with this invention;

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

FIG. 3 is a sectional view of the switch of FIG. 1 looking along the lines 3—3 of FIG. 1;

FIG. 4 is an exploded perspective view of the parts utilized in assembling the switch of this invention; and

FIG. 5 is a plan view partially in section of the switch of FIG. 1 with the cover removed.

Briefly stated, in accordance with one of its aspects, the invention is directed to a low-voltage momentary contact key switch comprising a molded plastic housing, a pedestal positioned at a midpoint in the housing, a contact spring fixedly mounted on the pedestal, the ends of the spring having free movement, a stationary contact positioned in the housing near each end of the contact spring, and a cover member defining two apertures one of which is in alignment with each contact spring end and its associated stationary contact whereby a key of conducting material inserted in one of the cover apertures

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can be advanced to bend an end of the contact spring and to make electrical contact between the end of the contact spring and its associated stationary contact.

As best shown in FIG. 4, the switch of this invention consists of a housing 10 and cover 11 formed of molded plastic material such as a phenolic or urea formaldehyde polymer, a contact 12 having movable ends, two stationary contacts 13, a retainer frame 14, and a key 15.

The molded housing 10 is rectangular in plan and has an integrally molded pedestal 16 positioned at a midpoint along one side wall. An aperture through the pedestal 16 serves for fixedly positioning the leaf spring contact 12 on the pedestal as by a rivet 17 as well as for the passage of a lead wire 18 (FIGS. 2 and 3). The housing 10 also defines a pair of apertures 21 at the corners opposite the pedestal 16 and these are utilized for positioning the contacts 13 to which the lead wires 22 are connected. Immediately adjacent the apertures 21 is an integrally molded barrier 23 which serves to limit the configuration of key which will operate the switch.

The leaf spring contact 12 has a U-shape and it is fixedly positioned on the pedestal 16 at its midpoint. The ends of the contact 12 curve around so that they are parallel with the end walls of the housing 10 and reach to a point just short of the barrier 23. The top surface of the spring 12 is above the top surface of the contacts 13 but below the level reached by the barrier 23. Consequently, as best shown in FIG. 3, the key 15 must have a forked end to enable it to reach beyond the barrier 23. It first makes contact with the end of the spring 12 which is bent down slightly thereby effecting wiping contact with one fork of the key. As soon as the other fork of the key makes contact with the fixed contact 13, a circuit is completed through the lead wire 18 and one of the lead wires 22. Consequently, the presence of the barrier 23 prevents an unauthorized person from fashioning a key from a square-ended metal piece.

The cover member 11 includes apertures 24 (FIG. 4) which are in register with the barrier 23 and these apertures combine with guide passageways within the body of the cover 11 to guide a key 15 into contact with one of the ends of the spring contact 12 and its associated fixed contact 13. The cover 11 is maintained in position on the housing 10 by means of the frame retainer 14 which includes spring tabs 25 which cooperate with integrally molded retainer bosses 26 on the exterior ends of the housing 10.

The handle 27 of the key 15 is preferably coated with an insulating material so as to prevent any possibility of a shock when the key is in closed circuit position. Since the control circuit normally carries only 24 volts, the danger from a shock is minimal.

Like all switches, the switch of the present invention is normally installed with the long dimension extending vertically and with the "On" aperture in upper position. The user is never in doubt as to which key slot to use to close the power circuit and which to open it. The fact that the key does not have to be rotated in order to close a circuit further simplifies its use.

While the invention has been described with reference to a particular embodiment, it is obvious that there can be variations which fall within the true spirit of the invention. Accordingly, 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 low-voltage momentary-contact key switch comprising a molded plastic housing, a pedestal positioned at a midpoint in said housing, a contact spring mounted on said pedestal, said spring being fixedly mounted at a midpoint with the ends having free movement, a sta-

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tionary contact positioned in said housing near each end of said contact spring, and a cover member for said housing, said cover member defining two apertures, one of which is in alignment with each contact spring end and its associated stationary contact, a key of conducting material having one end integrally formed with first and second spaced contacting portions, said first and second contacting portions being electrically conducting therebetween, said key being adapted for insertion in either one of said cover apertures, said first contacting portion of said key engaging and bending the aligned contact spring end and said second contacting portion of said key engaging the associated contact on advancement of said key into said housing so as to make electrical contact between said contact spring and said associated stationary contact.

2. A low-voltage momentary-contact key switch comprising a molded plastic housing, a pedestal positioned at a midpoint in said housing, a leaf spring mounted on said pedestal, said spring being fixedly mounted at a midpoint with the ends having free movement, a stationary contact positioned in said housing in spaced relation with each end of said leaf spring, a barrier integral with said housing between each stationary contact and the end of said leaf spring, said barrier extending above the surface of the stationary contacts, and a cover member for said housing, said cover member defining two apertures one of which is in alignment with each leaf spring end and its associated stationary contact, and a forked key of conducting material for insertion in one of the cover apertures, said key being advanced to bend an end of the leaf spring to make electrical contact between said end of said leaf spring and its associated stationary contact.

3. A switch as claimed in claim 2 wherein the leaf spring is U-shaped.

4. A low-voltage momentary-contact key switch com-

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prising a molded plastic housing of rectangular plan, an integral pedestal along a sidewall of said housing at a midpoint position, a leaf spring contact fixedly mounted on said pedestal, said leaf spring being U-shaped and mounted on said pedestal at the base of the U with the ends thereof being curled near the end walls of said housing and having free movement, a lead wire connected to said leaf spring, a stationary contact in each corner of said housing spaced from the ends of said leaf spring, a lead wire connected to each stationary contact, an integral barrier between the ends of said leaf spring and said stationary contacts, the top of said barrier extending above the level of the leaf spring, and a cover member for said housing, said cover member defining two apertures, one of which is in register with each leaf spring and its associated stationary contact, and a bifurcated key of conducting material for insertion in a cover aperture, said key being advanced to bend an end of the leaf spring and to make electrical contact between said end of said leaf spring and its associated stationary contact.

5. A key switch as claimed in claim 4 wherein the level of the leaf spring is above the level of the stationary contacts.

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