

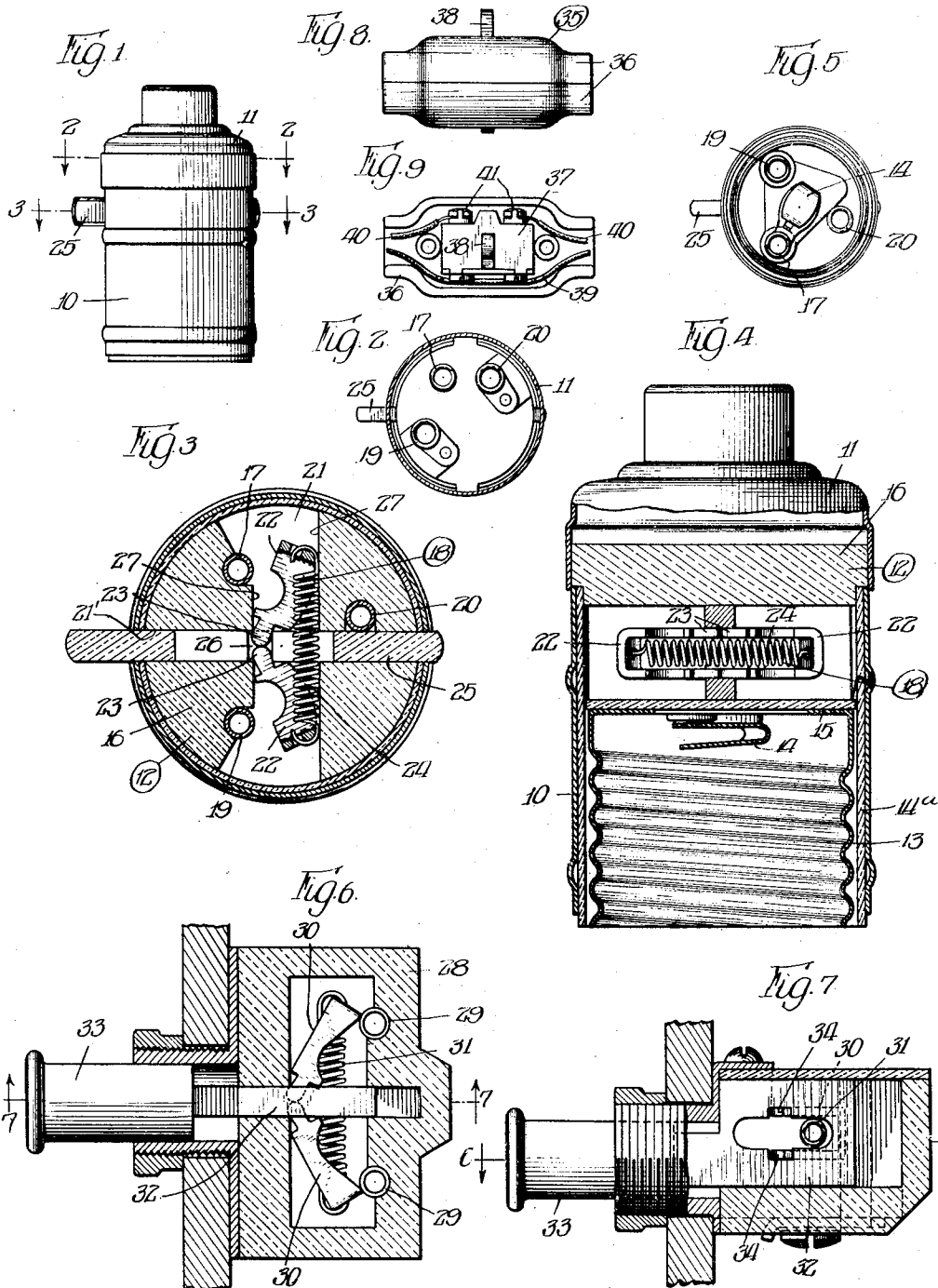
Oct. 18, 1927.

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1,645,528

ELECTRIC SWITCH

Filed Feb. 15, 1926



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed February 15, 1926. Serial No. 88,173.

The present invention relates to improvements in electric switches.

An object of the present invention is to provide an electric switch of simple construction which will be positive in action and relatively cheap to manufacture.

A further object is to provide an electric switch which will be sturdy in construction and which is simple from a shop assembly standpoint.

A further object is to provide an electric switch which may be adapted to various forms of switches, as for example the "push through" type and the "push-pull" type.

A further object is to provide an electric switch which though small in size is well adapted to meet the demands of commercial service.

Further objects will appear as the description proceeds.

Referring to the drawings—

Figure 1 is a view in side elevation of an electric switch of the "push through" type;

Figure 2 is a sectional view taken along the plane indicated by the arrows 2—2 of Figure 1;

Figure 3 is a view on an enlarged scale showing a section taken along the plane indicated by the arrows 3—3 of Figure 1;

Figure 4 is a longitudinal sectional view of the structure shown in the preceding figures;

Figure 5 is a bottom plan view of the structure shown in Figure 1;

Figure 6 is a sectional view illustrating an embodiment of the present invention in a switch of the "push-pull" type, said view being taken along the plane indicated by the arrows 6—6 of Figure 7;

Figure 7 is a sectional view taken along the plane indicated by the arrows 7—7 of Figure 6;

Figure 8 is a view in side elevation of an electric switch which may be placed intermediate of the length of an electric cable; and

Figure 9 is a view illustrating the structure of Figure 8 with one-half of the cover thereof removed and illustrating the fact that one side of the electric circuit may be unbroken, while completeness of the other side may be controlled by switch mechanism embodying the principles of the present invention.

Referring first to the structure shown in Figures 1 to 5, inclusive, the numeral 10 indicates a cylindrical casing having the cap portion 11, said casing 10 and cap portion 11 serving to enclose a switch mounting 12. Said switch mounting 12 carries the screw-threaded sleeve portion 13 and the center contact 14, which are adapted to cooperate with the usual contacts of an electric lamp or connection plug. The means for connecting said center contact 14 and screw-threaded sleeve 13 to the two sides of an electric circuit need not be described in detail, but it may be stated briefly that said screw-threaded sleeve portion 13 (which is insulated from the casing 10 by the insulating sleeve 14^a) has an inturned upper wall 15, which wall is secured against the lower portion of the insulating holding member 16. The center contact member 14 may be folded back upon itself, the upper portion of said contact member 14, as the parts are viewed in Figure 4, being secured to the under side of the holding member 16 but insulated from the sleeve 13. Any preferred holding means, such as an eyelet 17, may be provided for holding the center contact 14 in position. Said eyelet 17 serves not only as a holding means, but as one of the contacts of the electric switching mechanism, which switching mechanism is indicated as a whole by the numeral 18. Disposed in parallel relationship with the eyelet 17 is the eyelet 19, which also forms a contact for the switching mechanism 18. When said switching mechanism 18 is in one position, said eyelets 17 and 19 are bridged, and when said switching mechanism is in its alternative position, the bridging relationship between said eyelets 17 and 19 is broken. Said eyelet 19 provides a binding post for one side of an electric circuit. Mounted in parallel relationship with the eyelets 17 and 19 is the third eyelet 20, which also provides a binding post, adapted to be connected to the other side of said electric circuit. Said eyelet 20 is electrically connected to the inturned wall of the sleeve 13 and serves as a fastening means for said sleeve. It will be clear that when the eyelets 17 and 19 are bridged by the switching mechanism 18, a circuit will be complete from the binding post provided by the eyelet 20 to the sleeve portion

13 through the cooperating translating device or plug to the center contact 14. From said center contact 14 circuit may be traced through the eyelet 17 and thence
5 through the switching mechanism 18 to the eyelet 19, which provides the binding post for the other side of the electric circuit.

The switching mechanism 18 provides a quick make and break with the eyelets 17 and 19, said switching mechanism 18 being
10 adapted to operate upon the principle of a toggle and being provided with a spring, whereby rapidity of action is had. The holding member 16 of insulating material is
15 provided with an aperture indicated by the numeral 21, which aperture 21 is intersected by the diametrical aperture 21' arranged substantially at right angles to the length of said aperture 21. Said aperture 21 contains
20 a pair of electrical conducting contact members 22—22, which contact members are formed in the shape of a U. The conformation of each of the contact members 22—22 is best illustrated in Figures 3 and 4. Said
25 contact members 22—22 have rounded adjacent end portions 23—23, which portions are adapted to have rolling contact with each other at all times, and are therefore always electrically connected together. The outer
30 extremities of the contact members 22—22 are connected by means of the tension spring 24. Said spring 24 will bias the contact members 22—22 into contacting relationship with the eyelets 17 and 19 when said spring
35 is on one side of the region of contact of the rounded portions 23—23 of said contact members 22—22, and will hold said contact members 22—22 out of bridging relationship with said eyelets 17 and 19 when said spring
40 24 is disposed on the opposite side of the region of rolling contact between said portions 23—23 of the contact members 22—22.

The biasing effect of said spring 24 is governed by the plunger 25, which is disposed within the aperture 21'. Said plunger
45 25 is provided with slats 26 intermediate of its length for receiving the rounded end portions 23 of the contact members 22—22. Movement of the plunger 25 to the right or
50 to the left as the parts are viewed in Figure 3 will result in the changing of the position of rolling contact between said rolling portions 23—23 relative to the spring 24. When said plunger 25 has been moved to such a
55 position that the region of rolling contact between the portions 23—23 passes dead center, a snap action will occur in a manner which will be readily understood. The walls 27—27 of the aperture 21 will limit movement of the contact members 22—22.
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According to the structure illustrated in Figures 6 and 7, the present invention is adapted for use in a push-pull switch. According to the structure shown in Figures
65 6 and 7, a casing 28 is provided having the

electric terminals 29—29. Said casing contains the U-shaped contact members 30—30, which perform the functions of bridging said contact members 29—29, or of interrupting the electric connection between said
70 contact members 29—29. A spring 31 operates to bias the contact members 30—30 to one or the other of said positions, depending upon the position of the region of rolling contact between the inner extremities of said
75 contact members 30—30 relative to said spring 31. For controlling the positions of the contact members 30—30, a plunger 32 is provided, having the handle 33. Said plunger 32 is mounted in an aperture whose
80 axis intersects the interior of the casing 28. The two leg portions of each of the U-shaped contact members 30 straddle said plunger 32, having their inner extremities in rolling contact with each other. Said inner ex-
85 tremities are disposed in slots 34—34 on the two sides of said plunger 32, whereby the region of rolling contact between said end portion and the contact members 30—30 may be controlled by movement of said
90 plunger 32.

In the two embodiments of the present invention disclosed in Figures 1 to 7, inclusive, the two contact members having rolling contact with each other will operate with a
95 snap action either to contact-making position or contact-breaking position, the snap action being accomplished when the relative position is changed between the region of rolling engagement between said contact
100 members and the axis of the biasing spring. The structures disclosed have a minimum of parts, do not require careful machining or careful assembly, may have ample sturdiness even in relatively small embodiments of the
105 present invention, and are well adapted to meet the demands encountered in service.

According to the embodiment of the present invention shown in Figures 8 and 9, a simple two-part housing is provided which
110 housing is indicated by the numeral 35. Said housing 35 is made up of the two counterparts 36—36, which may be connected together by any preferred holding means and which house the switch block 37
115 having the plunger 38. Said plunger 38 operates in the same manner as the plunger 25 shown in Figure 3 or the plunger 32 shown in Figure 6. According to the embodiment of the present invention shown in
120 Figures 8 and 9, only one side of the electric circuit need be used. As shown in Figure 9, the wire 39 is left intact and extends through the housing 35. The wire 40 forming the other side of the electric circuit is connected to the two terminals 41—41 of the
125 block 37.

Though certain preferred embodiments of the present invention have been described in detail, many modifications will occur to
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those skilled in the art. It is intended to cover all such modifications that fall within the scope of the appended claims.

I claim:

5 1. In switch mechanism, in combination, a pair of contact members having rolling contact with each other, a biasing spring adapted to hold said contact members selectably on one side or the other of the region of rolling
10 contact between said contact members, and means for positively moving said region of rolling contact relative to the line of action of said spring.

15 2. In switching mechanism, in combination, a member of insulating material comprising a chamber, a pair of contact members having rolling contact with one another, a plunger having a portion disposed in said chamber and having operative engagement
20 with said contact members, and a spring for biasing said contact members to either of two selectable positions.

25 3. In switching mechanism, in combination, in insulating member providing a chamber, a pair of contact members mounted in said chamber, said contact members hav-

ing their adjacent extremities in constant rolling contact with one another, a plunger for holding said contact members in predetermined relationship to one another, and 30 a spring, said plunger being adapted to move the region of rolling contact between said contact members selectably to either side of the line of action of said spring.

35 4. In switching mechanism, in combination, an insulating member comprising a chamber, a pair of contact members mounted in said chamber, each of said contact members comprising a U-shaped device, the
40 extremities of the legs of one of said members having rolling contact with the extremities of the legs of the other of said contact members, a plunger intersecting said chamber and having positioning relationship with
45 the adjacent extremities of said contact members, and spring means normally tending to draw the bases of said U-shaped devices toward one another.

Signed at Chicago, Illinois, this 10th day of February, 1926.

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