Nov. 14, 1939. C. STRECK 2,180,022

SWITCH MECHANISM

Filed Oct. 23, 1937

Fig. 1.

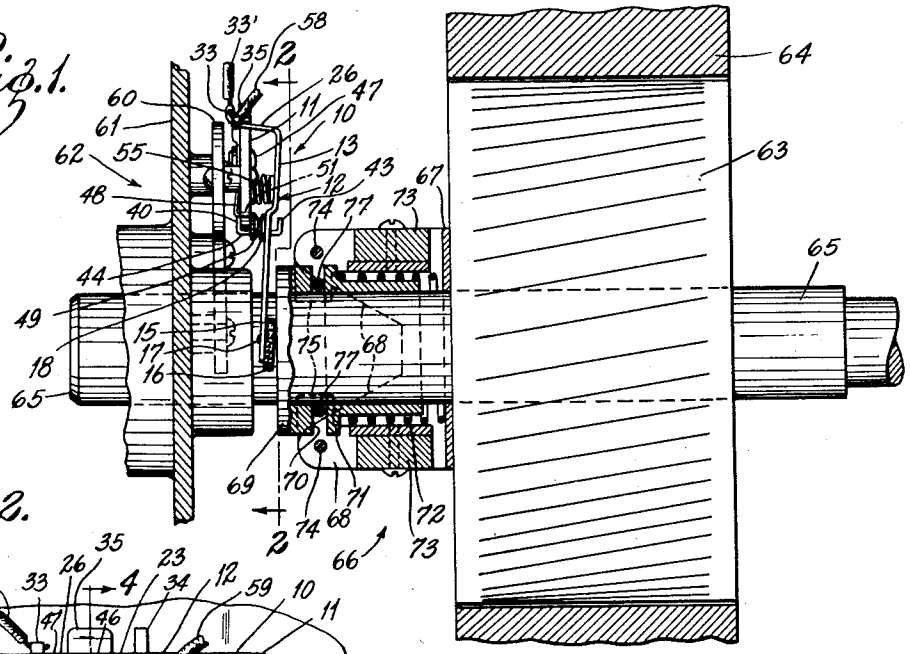


Fig. 2.

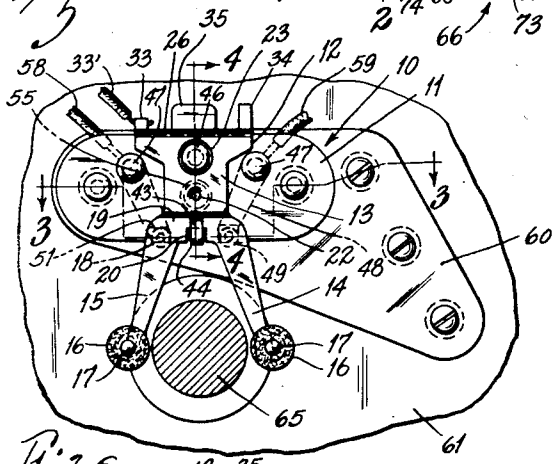


Fig. 4.

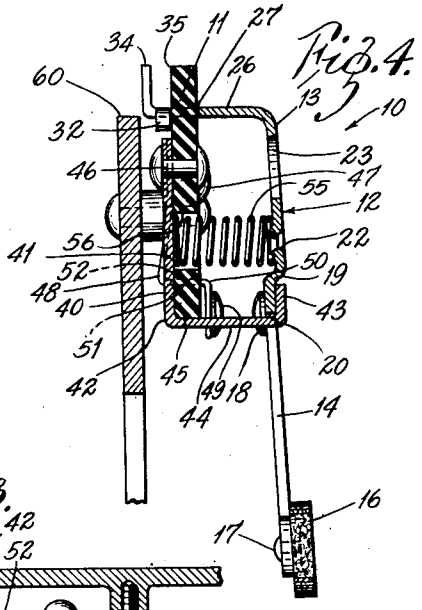


Fig. 6.

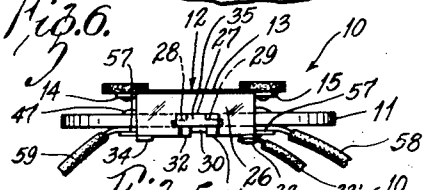


Fig. 5.

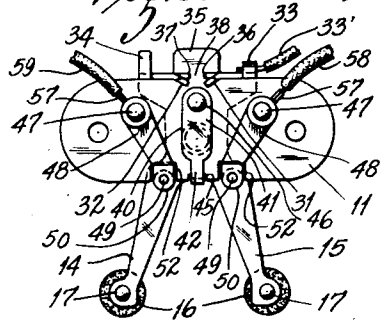
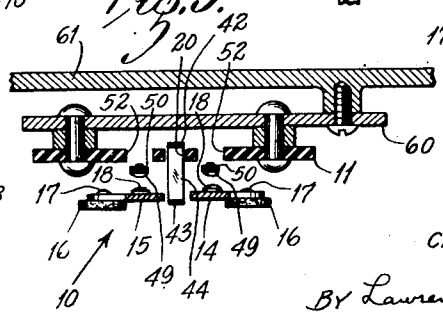


Fig. 3.



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SWITCH MECHANISM

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Application October 23, 1937, Serial No. 170,583

4 Claims. (Cl. 200—80)

The present invention relates generally to switches, and more particularly to an electric switch which is adapted to be used in conjunction with and to be actuated by a centrifugal mechanism.

An object of the present invention is to provide an electric switch which includes contacts that are under constant contact pressure when the switch is closed.

Another object is to provide a switch in which the contacts thereof are mounted for wiping action in make and break operations.

Another object is to provide a switch which incorporates all of the characteristics of simplicity as to facility of manufacture, inexpensiveness, minimum number of parts, and ease of operation.

Another object is to provide a switch of novel construction which is particularly adapted to be used in conjunction with centrifugally operated mechanism and which, therefore, lends itself especially to the control of the starting circuit of a motor in the normal operation thereof.

Other objects and advantages will be apparent from the following description, taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a side view of a switch constructed in accordance with the teachings of the present invention, shown mounted on a motor in operative disposition relative to a centrifugally operated mechanism, certain of the motor elements being in section;

Fig. 2 is a section on the line 2—2 of Fig. 1, showing the switch in full front view;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a rear view of the switch; and,

Fig. 6 is a top view of the switch.

Referring to the drawing more particularly by reference numerals, 10 indicates generally a switch constructed in accordance with the teachings of the present invention. A base 11 of insulating material pivotally supports a forked member generally designated 12.

The forked member 12 includes a flat body section 13 from which extend two prongs 14 and 15 in a plane parallel thereto but offset towards the plane of the body (Fig. 4). To the free end of each of the prongs 13 and 15 is connected a disc 16 of felt, or the like, by a rivet 17. Each of the prongs 14 and 15 further supports a contact 18 adjacent the connecting extremity and on the side disposed towards the base 11. The prongs 14 and 15 are connected adjacent the body section 13 by a web 19 which has a notch 20 cut therein.

The body section 13 has a boss 22 formed on that side disposed towards the base 11 and has a relatively large aperture 23 therethrough located above the boss 22 for the purpose of facilitating the assembly of the switch elements. A flange 26 extends from that edge of the body section 13 opposite to the edge to which the prongs 14 and 15 are connected.

The flange 26 includes a slot 27 (Fig. 6) adjacent the free edge, the configuration of which provides shoulders 28 and 29. The flange 26 is cut away at 30 to provide an opening to the slot 27 and to provide projections 31 and 32. Tabs 33 and 34 initially extend from the free corners of the flange 26 in a plane parallel to the plane of the body section 13, an optional tab being bent through substantially 180° as is shown for the tab 33 to securely retain a lead 33'. The lead 33' may be operatively connected to a heater, or the like (not shown).

The base 11 includes a tab 35 which is cut away adjacent its juncture with the base 11 to provide oppositely disposed recesses 36 and 37 forming a central neck 38.

The neck 38 is adapted to slide between the projections 31 and 32 into a position whereby a portion thereof rests within the narrowed section of the slot 27 (Fig. 6). In the operative position of the neck 38 the shoulders 28 and 29 rest in the recesses 36 and 37. In the assembly of the switch mechanism 10, after the neck 38 has been disposed as aforesaid, the projections 31 and 32 are bent downwardly into the position shown in Fig. 5.

The base 11 supports in fixed relation a retaining member 40 which includes a main section 41 and an extension 42 which is bent twice at 90° to provide a hook 43 (Figs. 4 and 5). One segment 44 of the extension 42 is disposed in a notch 45 in the base 11 to prevent the retaining member 40 from pivoting about its connection 46 with the base 11. The hook 43 provides one limit for the pivotal movement of the forked member 12, contacting the web 19. The segment 44 of the retaining member 40 extends through the notch 20 to prevent lateral movement of the forked member 12 (Figs. 4 and 5).

In the assembly of the switch elements, this retaining member 40 is connected to the base 11 with the segment 44 disposed in the slot 45 and with the prong 43 against the web 19 after the forked member 12 has been disposed in the above-described relation to the tab 35.

At each side of the retaining member 40 a contact-carrying arm 48 is connected to the base 11 by rivets 47 (Fig. 5). A contact 49 is supported by an offset portion 50 of each contact-carrying arm 48, the offset portion 50 being connected to the contact-carrying arm 48 proper by a right angularly disposed portion 51 which extends through a notch 52 in the base 11 (Figs. 4 and 5). The arms 48 are of resilient material so that the contacts 49, which are disposed in cooperative relation to the contacts 18, can yield when the contacts 18 are moved against them to provide a wiping make and break action.

A helical spring 55 is disposed between the forked member 12 and the retaining member 40, one end thereof being disposed about the boss 22 and the other end being against the retaining member 40, the spring 55 extending through an aperture 56 in the base 11 to effect this relationship (Fig. 4).

A lead clamp 57 is secured by each rivet 47 against the associated arm 48. Leads 58 and 59 are securely held by the clamps 57.

In Fig. 1, the switch 10 is shown mounted on a motor 62 in operative relation to a centrifugally actuated mechanism 66. The switch 10 is shown as spaced from and fastened to a securing plate 60 which is, in turn, spaced from and secured to an end plate 61 of the motor 62. The motor 62 includes a rotor 63 and a stator 64, the rotor 63 being secured to and rotated with a shaft 65. The centrifugally operated mechanism 66 includes a plate member 67 having parallel extensions 68 disposed to each side of the shaft 65, the configuration of which are shown in dotted lines. A sleeve 69 is freely mounted on the shaft 65 between the extensions 68, and includes an annular groove 70 and a shoulder 71. A helical spring 72 is disposed about the sleeve 69 between the shoulder 71 and the member 67 which biases the sleeve 69 away from the member 67. Weights 73 are pivoted by pins 74 to the extensions 68, each of which includes extensions 75 which support pins 77 disposed in the annular groove 71.

Operation

The operation of the device is relatively simple. In Fig. 1 the contacts 18 and 49 are shown in make position. When current is supplied to the starting circuit of the motor 62 with which the switch 10 is in series, the shaft 65 is rotated by the rotor 63. As the shaft 65 gains speed, the weights 73, through the effect of centrifugal force, move outwardly about their pivots 74, thereby moving the pins 77 and therethrough the sleeve 69 to the right (Fig. 1). Since the contacts 18 and 49 are maintained in the make relation by the abutment of the sleeve 69 against the pads 16 of the prongs 14 and 15 of the forked member 12, movement of the sleeve 69 to the right permits the helical spring 55 to exert its force to move the forked member 12 into the position shown in Fig. 4, thereby breaking the contacts 18 and 49 which breaks the starting circuit. The breaking and making actions of the contacts 18 and 49 are wiping actions, since the contacts 18 and 49 are wiped across each other rather than pulled apart perpendicularly, due to the pivotal mountings of both of these sets of contacts.

It is thus apparent that there has been provided a switch particularly adapted to be used in conjunction with centrifugally operated mechanism which is simple in construction and operation, which is inexpensive, and which includes a minimum number of parts. The several elements of the switch are easy to manufacture and to assemble into the finished product.

It is to be understood that the foregoing description and accompanying drawing have been given by way of illustration and example and not for purposes of limitation, the invention being limited only by the claims which follow.

What is claimed is:

1. A switch comprising a non-conductive base, said base including a tab extending from one edge thereof, a forked member pivotally connected to said tab and to the adjacent edge of the base including prongs adapted to be contacted by a centrifugally actuated mechanism, contacts carried by said member, and other contacts supported by said base in cooperative disposition relative to the first-named contacts.

2. A switch comprising a base, a member pivoted thereto, contacts supported by said member spaced from one face of the base, contact-carrying arms connected to the opposite face of said base and extending through slots in said base, and contacts on said arms disposed in cooperative relation to said first contacts.

3. A compact switch comprising a base, a forked member pivoted directly to an edge of said base through cooperative engagement of integral parts of the base and the member, spaced contacts supported thereby, two arms supported by said base, each having a free end, a contact on each free end, said several contacts being in cooperative disposition, a retaining member for establishing one extreme position of the member, and a spring biasing said member into said one extreme position.

4. A switch comprising a base including a tab having portions spaced from said base by recesses and a neck established by said recesses, a member pivotally connected to said base by a flange having a slot in which said tab neck rests, said slot defining shoulders disposed in said recesses and adjacent said tab neck, said flange including projections disposed at an angle to maintain said tab neck within the slot, contacts carried by said member, and other cooperative contacts carried by said base.

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