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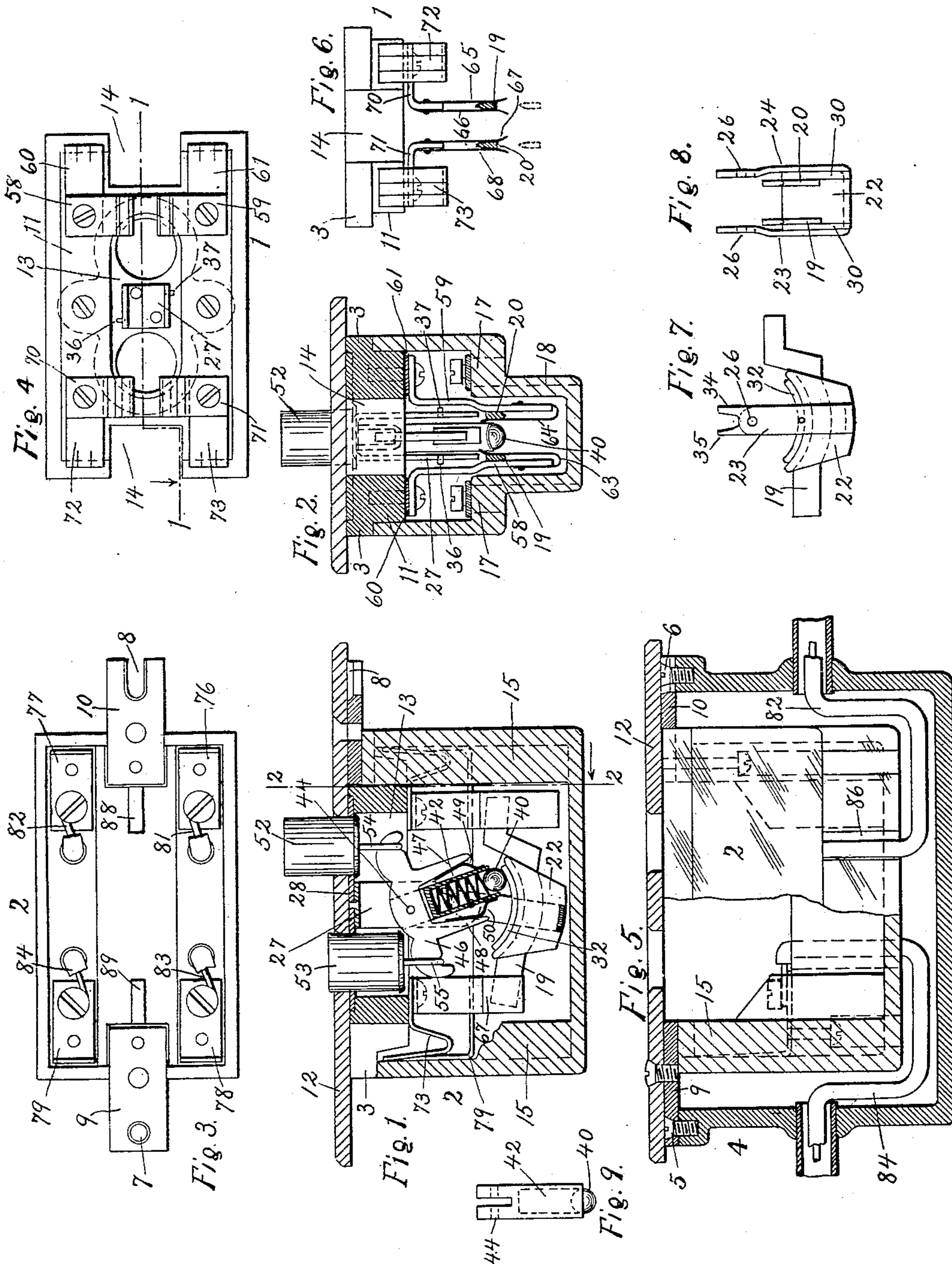
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W. J. NEWTON.

ELECTRICAL FLUSH SWITCH.

(Application filed July 26, 1900. Renewed Mar. 21, 1902.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRICAL FLUSH SWITCH.

SPECIFICATION forming part of Letters Patent No. 702,989, dated June 24, 1902.

Application filed July 26, 1900. Renewed March 21, 1902. Serial No. 99,269. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. NEWTON, a citizen of the United States of America, and a resident of the borough of Manhattan, in the city of New York and State of New York, have invented certain new and useful Improvements in Electrical Flush Switches, of which the following is a specification.

This invention relates to improvements in electrical flush switches.

This invention provides a simple and effective switch of moderate cost and wherein the switch movement is so effected that it takes place at the instant of opening or closing the circuit with great suddenness and practically instantaneously, thereby reducing the sparking to a minimum. This result is effected by interposing between the member which is actuated by the push-buttons and the switch proper an elastic member or members, the tension or compression of which is utilized to throw the switch very suddenly just at the proper instant and simultaneously open or close the break or breaks.

The invention may therefore be embodied in various modifications all equally containing its essential principles, and the accompanying drawings illustrate that modification which I prefer.

Referring to the said drawings, Figure 1 is a longitudinal section of the casing and switch mechanism on the line 1 1 of Fig. 4, the wall-box being removed and the plug being broken away on one side to show certain contacts. The parts are in the position wherein the circuit is closed. Fig. 2 is an end view of the plug and showing the walls of the casing in section on the plane of the line 2 2 in Fig. 1. Fig. 3 is a top view of the casing, the switch mechanism being removed. Fig. 4 is a view of the base or plug from below, the switch mechanism being removed. Fig. 5 is a longitudinal section of the wall-box and showing the casing with part of the wall broken away and without the switch mechanism. Fig. 6 is an end view of the plug or base and certain contacts. The movable parts of the switch mechanism are removed. Fig. 7 is a side and Fig. 8 an end elevation of the switch proper. Fig. 9 is an elevation of the barrel and spring-actuated ball which throws the switch.

The working parts of the switch are carried on a chambered base (or plug) 1, of suitable insulating material, as porcelain, which is inserted into a casing 2, of porcelain or other insulating material. Said casing 2 is preferably shaped in cross-section as shown in Fig. 2, with the shoulders 17 and contracted inner part 18, and is secured in the wall-box 4 by screws 5 6, which pass through holes 7 8 in the metal lugs 9 10 of the casing 2 into tapped holes in said wall-box. One of the holes in the said box, as 8, is a slot to facilitate screwing the casing to the wall-box. A cover-plate 12 is secured to said lugs 9 10 by screws, as shown. Said base 1 is preferably formed, as shown, with the top flange 3, the raised part 11, in which is the chamber 13, and the spaces or slots 14, which latter fit around the posts 15 of said casing 2, on which posts are secured the said lugs 9 10.

The switch proper is a lever (shown in side elevation in Fig. 7) and consists of two similar metal plates 19 20, shaped as shown and fixed in a block of insulating material, as rubber, 22, and said block 22, which is concaved on the inner surface, as shown, is secured in a metal yoke, the arms 23 24 of which are pivoted at 26 26 in the standard 27. For cheap and convenient construction said standard is made in U shape, the bend being fixed to the metal plate 28, which is set into the plug 1.

The preferred construction of the switch shown in Fig. 8 is to set the plates 19 20 in recesses formed in the sides of the block 22, strips of rubber or other insulating material 30 being then secured on the sides of the said block. Grooves in the outside faces of these strips fit the aforesaid arms 23 24, and the block is held in place by the curved metal shoe 32, which is fastened between said arms 23 24, as shown. The inner end of each of said arms 23 24 has a projection, respectively 34 35, which engages against a stop 36 37, respectively, on the standard 27 to limit the motion of the switch. A spring-actuated ball 40, carried in a barrel 42, presses and works on said shoe 32. The inner end of said barrel 42 is slotted and pivoted at 44 in said standard 27. A manually-actuated lever 46 fits loosely in the slotted end of said barrel 42 and is independently pivoted at 44 in said

standard. Said lever 46 is provided with arms 47 48, between each of which and said barrel 42 is a spring 49 50, respectively. The ends of said lever 46 are respectively connected with the push-buttons 52 53 by the yokes or eyes 54 55.

Adjacent to each end of the switch are spring-contacts, which are preferably constructed as follows: Near the right ends of the aforesaid plates 19 20 are two springs 58 59, of resilient brass or copper, bent as shown and screwed to the base 1 and in good electric contact, respectively, with the leaved spring-contacts 60 61. To the free ends of these springs 58 59 are fastened gooseneck spring-contacts 63 64, respectively. Adjacent to the left ends of said plates 19 20 are spring-contacts 65 66 67 68, arranged in pairs, each pair being fastened to pieces of brass or copper, respectively 70 71, which are bent as shown and screwed to said base 1 in good electric contact with the leaved contact-springs 72 73.

The aforesaid spring-contacts 60 61 72 73 being all of similar construction and shape, as shown, make good electrical contact when the switch mechanism is in the casing 2, with corresponding leaved contact-springs 76 77 78 79, which are carried on the shoulders 17 of the casing 2 and are held in good electrical contact with the bared ends of the wires 81 82 83 84. Said wires being properly insulated enter the wall-box 4 through the usual openings in the ends and pass up through suitable holes 86 to their respective contacts.

When the parts are assembled, insulating-partitions 88 89, integral with casing 2, respectively separate and insulate spring-contact 63 from spring-contact 64 and spring-contact 66 from spring-contact 67, effectually preventing short-circuiting.

The operation is as follows, supposing the switch in the closed position shown: Now assuming that the current enters by wire 81 it goes to contact 76, contact 60, spring 58 and spring 63 to plate 19 of the switch-lever, to contact-springs 65 66, to contact-springs 72 78, to wire 83, to fixture, back by wire 84 to contact-spring 79, contact-spring 73, to contact-springs 67 68, to plate 20 of the switch-lever, to springs 59 64, to contact-spring 61, contact-spring 77, to wire 82, and back to the source, thereby completing the circuit. Now if button 52 be pushed in lever 46 will be shifted. Spring 49 will shift barrel 42 with ball 40, and as the ball moves in contact with the shoe 32 it will throw the switch-lever, the left ends of the plates 19 20, passing entirely out of the contact-springs 65 66 67 68 and the right ends of said plates simultaneously passing beyond the ends of the springs 63 64 and out of contact with the springs 58 59, because said springs are bent, as shown. Thus the circuit is simultaneously broken in four places, and the construction is such that the switch makes the breaks with great suddenness just as the lever 46 comes near its

limit of motion and so that sparking is greatly reduced. Conversely, to close the circuit button 53 will be pushed in, when the left ends of plates 19 20 will pass in between the springs 65 66 and 67 68, and simultaneously the right ends of said plates will pass in between the springs 58 and 63 and 59 and 64, the switch now closing both breaks simultaneously.

When it is not desired to have the base and switch mechanism removable from the casing, the springs 60 61 72 73 76 77 78 79 may be omitted, and the terminal wires may be connected directly with the contact members 58 59 70 71 of the switch mechanism, and I therefore consider said switch mechanism and its equivalents my invention, whether it is used on a removable plug or base or not.

The springs 49 50, together with the spring-actuated ball 40 and the shape of the shoe 32, insure that the switch cannot stop on a dead-center, but must as it comes to the center fly suddenly over to its full limit of motion, instantaneously making or breaking the circuit.

By the construction hereinbefore described I am enabled to make the length of the break in the circuit the greatest possible permitted by the size of the casing in any instance, gaining additional security against arcing and fires with currents of relatively high potential, and this is a very valuable feature of my construction.

It will be evident that by first throwing the switch to the position for breaking the circuit the switch mechanism can be removed from the casing without sparking or shock.

Now, having described my improvements, I claim as my invention—

1. The combination of a switch-blade, an oscillating barrel, a spring-actuated member carried thereby and adapted to actuate said switch-blade, push-buttons, a lever actuated thereby, and an elastic member operatively connecting said lever and said barrel, substantially as described.

2. In a flush-switch device, the combination of a switch-blade, an insulating-body curved substantially as described, an oscillating barrel, and a spring-actuated member carried thereby and adapted to engage the curved portion throughout the oscillation of the barrel, substantially as described.

3. The combination in a flush switch, of spring-contacts connected with the circuit-terminals, a switch contact member having contact-plates insulated from each other and adapted to contact with said spring-contacts, an oscillating barrel, a spring-actuated member carried thereby engaging said switch contact member, push-buttons, a lever actuated thereby, and an elastic connection between said lever and said barrel, substantially as described.

4. In a flush switch, the combination of a casing provided with the terminals of a circuit, a removable base provided with springs

adapted to contact with said terminals, contact-springs in electric connection with said first-named springs, a switch contact member adapted to make and break contact with said
5 contact-springs, an oscillating barrel, a spring-actuated part carried thereby and engaging said switch contact member, push-buttons, a lever actuated thereby, and an elastic connection between said lever and said barrel,
10 substantially as described.

5. The combination in a flush switch, of an oscillating manual lever operated by push-buttons, an oscillating barrel at right angles to said manual lever, and pivoted at the center of oscillation thereof, a spring-actuated
15 ball in said barrel, spring connections between said manual lever and said barrel, a plurality of switch-blades insulated from each other, and a shoe on the insulating material
20 on which said ball engages, substantially as described.

6. In a flush-switch mechanism, the combination of a U-shaped standard, a switch contact member consisting of a plurality of
25 metal blades mounted at their middle portion

in a block of insulating material, said block being pivoted in said standard, a curved shoe on said block, a manual lever actuated by push-buttons, and an elastic member or members between said manual lever and said shoe, 30 substantially as described.

7. In a flush-switch mechanism, the combination of a U-shaped standard, a manual lever operated by push-buttons and mounted in said standard, a block 22 of insulating material provided with arms which are mounted in said standard, stops to limit the motion of said arms, metal plates set in said block and adapted to open and close a circuit as the block oscillates, a metal shoe on said block 40 insulated from said plates, a barrel, a spring-actuated ball therein adapted to engage said shoe, and springs between said manual lever and said barrel, substantially as described.

Signed at New York city this 24th day of 45 July, 1900.

WILLIAM J. NEWTON.

Witnesses:

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