

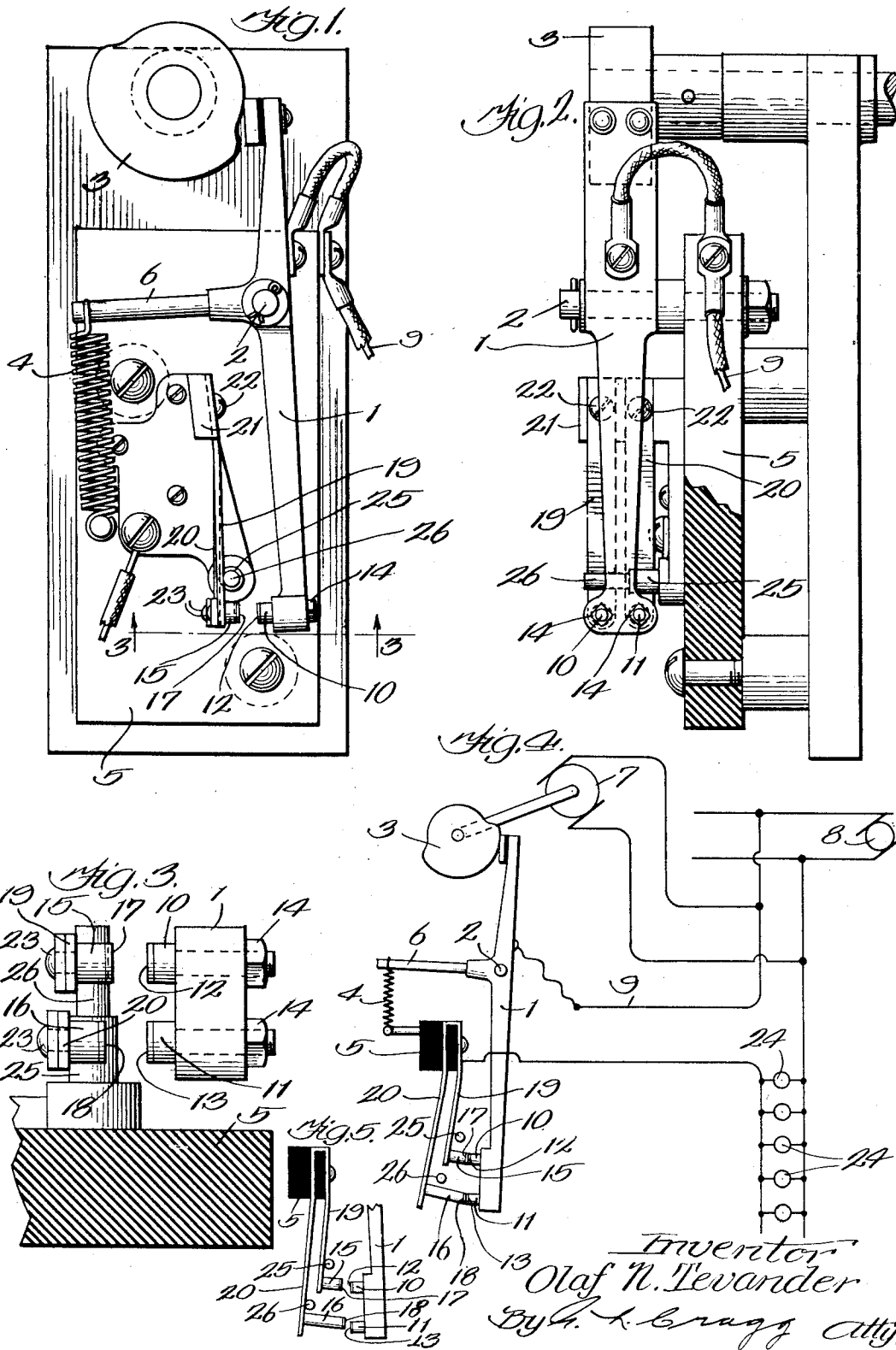
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ELECTRIC SWITCH

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ELECTRIC SWITCH

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5 Claims. (Cl. 200—146)

My invention relates to electric switches and has for its general object the safe guarding of complemental contacts thereof against the effect of sparking or of providing supplemental contacts which come into play when the first contacts have deteriorated beyond their usefulness. In carrying out my invention I provide a switch with two electrically connected contacts and one contact member complemental to both contacts, said contact member and said two contacts being relatively movable to effect and break contact between said contact member and said two contacts, there being means whereby separation between said contact member and one of the aforesaid two contacts is occasioned before separation occurs between said contact member and the remaining contact.

In the preferred embodiment of the invention said two electrically connected contacts are relatively movable and the contact member is movable with respect to both of these contacts to make and break circuit. The two relatively movable contacts are individually spring pressed upon said contact member to follow it in its circuit breaking movement, the relative ranges of this following movement of the two contacts being such that the contact member separates from one of said contacts before it separates from the other. In order that the object of my invention may be fully realized the two contacts and the parts of the contact member respectively engaged thereby are each separable from their supports to permit replacement.

The invention will be more fully explained in connection with the accompanying drawing in which Fig. 1 is a front elevation of the preferred embodiment of the invention; Fig. 2 is a side view of the structure shown in Fig. 1, a portion being shown in section; Fig. 3 is a sectional view on line 3—3 of Fig. 1, on a larger scale; Fig. 4 is a circuit diagram illustrating one use to which the invention may be put, the switch being shown in circuit closing position; and Fig. 5 shows the switch of Fig. 4 in circuit opening adjustment.

The switch illustrated includes an arm 1, pivoted at 2, between its ends. This arm bears, at one end, upon a cam 3, being pressed upon the cam by a spring 4 which is anchored at one end upon an insulating mounting block 5 and is attached at its other end to a finger 6 that projects angularly from said arm. This cam is illustrated as being constantly turned by an electric motor 7 which is supplied with current from a generator 8. Said arm is connected with one pole of the generator through the intermediation of a conductor 9. Said arm is enlarged at its other end and there carries two contact posts 10 and 11 which may be of brass. These posts desirably have faces 12 and 13 of some highly refractory conducting material, such as tungsten. Said contact posts are provided with threaded extensions that pass through the enlarged portion of the arm and which receive clamping nuts 14 that draw the larger portion of the posts against the arm. The whole arm and the contacting parts 10 and 11 thereon together constitute one contacting member and while said contact parts are preferably mounted in the manner stated to permit of their replacement, the invention is not to be thus limited. I provide two contacts 15 and 16 that are respectively complemental to and engageable with the contact parts 10 and 11. Said contacts 15 and 16 are also desirably in the nature of brass posts which have faces of tungsten 17 and 18. The contacts are respectively mounted upon leaf springs 19 and 20. These springs may be individually mounted upon a metallic bracket 21 by means of metallic screws 22 which bring these leaf springs into firm mechanical and electrical connection with said bracket. The insulating mounting block 5 is desirably also large enough to carry said bracket and a mounting for the contact member 1. In the diagrammatic Figures 4 and 5 the leaf springs 19 and 20 are shown as being formed from an integral piece of strip metal, such as brass, which is folded and received within the mounting block 5, as illustrated. The contacts 15 and 17 are also desirably removably secured in position as by means of the screws 23 which pass into them and hold them in assembly with the leaf springs 19 and 20 or said leaf springs carrying such contacts may be removed for replacement by removing the screws 22. During each revolution of the cam 3, the switch arm 1 is brought into and out of circuit closing adjustment as will be apparent by an inspection of Fig. 4. Whenever the circuit is closed the load, such as the lamps 24, is brought into and out of circuit. Said leaf springs are under such tension that they will follow the circuit opening movement of the switch member 1 until they are individually arrested in this following movement by the stops 25, 26. These stops are so relatively located as to enable the stop 25 to hold the spring 19 from its following movement while spring 20 is still engaged in its following movement. In this way the contact 15 and the portion 10 of the contact member 1 are separated before contact 16 is separated from the contact 11.

Arcing is prevented from occurring between the contacting parts 10 and 15 and only occurs when the contact part 11 has been separated from the contact 16. The contact parts 10 and 15 are thus guarded from the injurious effect of sparking by the contact parts 11 and 16, since the gap that occurred between the contact parts 10 and 15 is bridged by the contact part 11 and the contact 16. During the further withdrawing movement of the contact member 1 the latter two contacts are separated and the delayed arc is manifested therebetween. Ultimately the parts 11 and 16 will be so worn away by arcing that sparking may occur between the parts 10 and 15. When this happens these latter two parts are desirably replaced.

Changes may be made without departing from the invention.

Having thus described my invention, I claim:

1. An electric switch including a support; a pivoted arm carried by said support; a plurality of contact elements on said arm; a bracket carried by said support; relatively stationary contacts adjacent said arm, said contacts being supported upon independently flexible leaf springs carried by said bracket; a common stop element for said leaf springs and means for actuating said arm, whereby the arm causes successively yielding engagement between said contacts and said contact elements.

2. An electric switch including a support; a pivoted arm carried by said support; a plurality of contact elements on said arm; a bracket on said support; relatively stationary contacts adjacent said arm, said contacts being supported upon independently flexible leaf springs carried by said bracket; a stop element complementary to both springs to hold said springs in flexed position; and means for actuating said arm, said

means urging said arm for making successively yielding engagement between said contacts and said contact elements.

3. An electric switch including a support; a pivoted arm carried by said support; a plurality of contact elements on said arm; a bracket supporting a plurality of contacts mounted on leaf springs and adapted to coact with the contacts carried by said arm; means to move said arm whereby the resiliently carried contacts are independently displaced from their normal position; and independent means coacting with said resiliently carried contacts whereby one of said contacts separates from a contact carried by said arm before the other contact.

4. An electric switch including a support; a movable arm having contact means, said arm mounted on said support; spring pressed relatively stationary contacts cooperating with said first mentioned contact means for establishing an electric circuit; a single means coacting with both said relatively stationary contacts for causing tension on each contact and holding each in stepped relationship one with respect to the other; and means for moving said arm to establish engagement of said contact means.

5. An electric switch including a support; a movable arm carried by said support; a plurality of contact elements on said arm; a bracket carried from said support; complementary spring mounted contacts carried by said bracket; a common stop means to position each of said contacts relative to each other and in stepped relation with respect to their corresponding arm contacts; and means for actuating said arm whereby the arm moves the contact elements to successively contact with said complementary contacts.

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