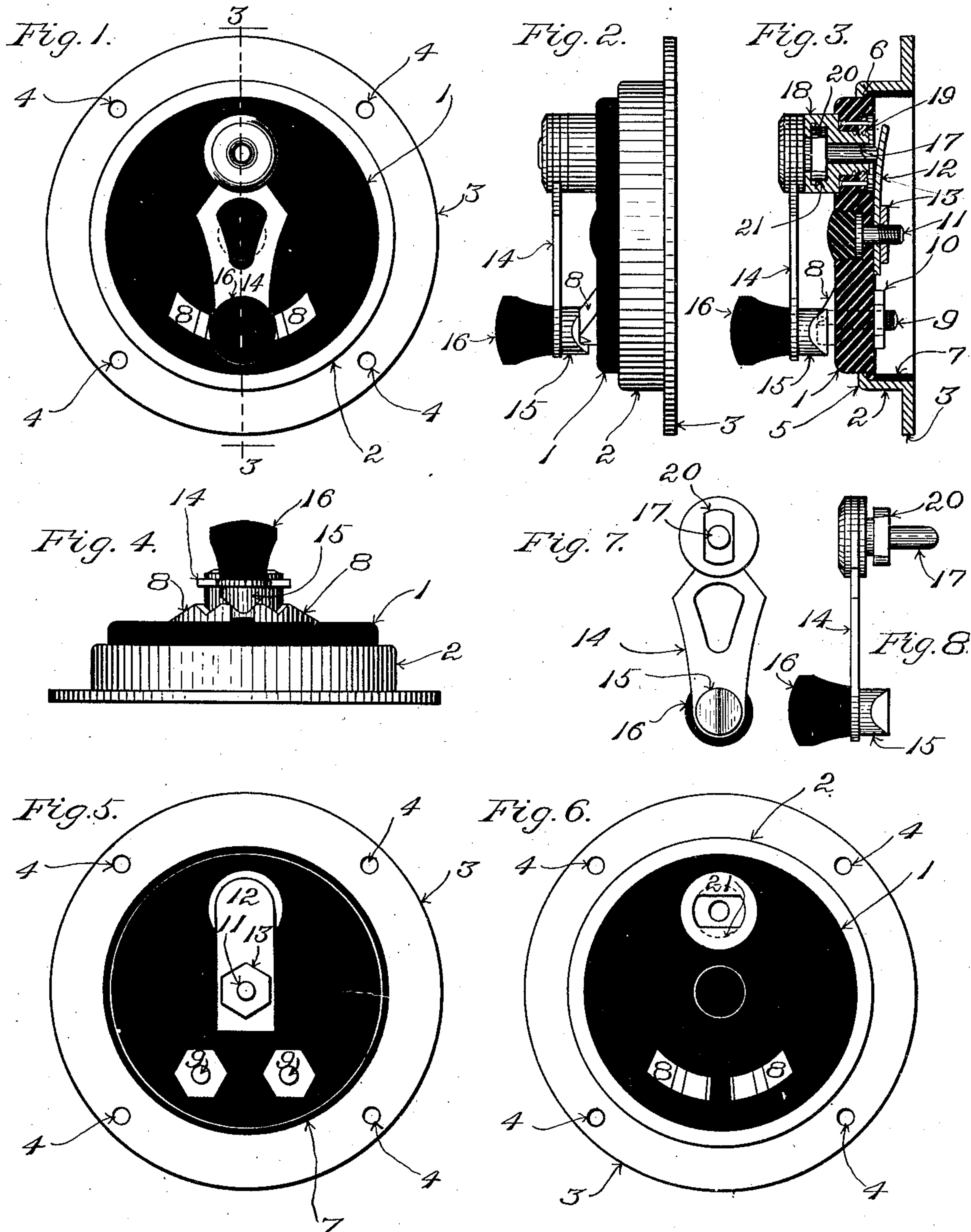


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PATENTED JULY 10, 1906.

E. B. JACOBSON.
ELECTRIC SWITCH.

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ELECTRIC SWITCH.

No. 825,838.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD B. JACOBSON, a citizen of the United States, residing at Pittsfield, in the county of Berkshire, State of Massachusetts, have invented a certain new and useful Improvement in Electric Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention provides an improved electric switch of a character adapting it to be used as a battery-switch for automobiles and for other like purposes. The invention and its respective features, however, are not necessarily restricted to use in this precise connection.

I have herein presented the invention as embodied in a switch having two fixed contact pieces or terminals insulated from each other and a movable contact piece or arm which may be caused to engage with either one of the fixed contact-pieces or with both thereof simultaneously. The said switch is adapted to be employed, in connection with 25 two sets of batteries, with one of the said sets, electrically connected with one of the said fixed contact pieces or terminals and the other thereof with the other fixed contact piece or terminal. When thus employed, 30 the engagement of the movable contact-piece with either of the fixed contact-pieces closes the circuit with the corresponding set of batteries. When the movable contact piece or arm is caused to engage with both 35 fixed contact-pieces at once, the two sets of batteries are embraced in the circuit in multiple.

In accordance with one portion of the invention the movable contact piece or arm is 40 detachable and separately portable, enabling it to be disconnected from the switch when desired and placed in one's pocket, the object of the removal of the said contact piece or arm being to prevent the switch in the meantime from being tampered with and operated 45 to close the circuit with the batteries or either of them.

Other objects and features of the invention will be disclosed in the course of the ensuing 50 description.

A switch embodying my improvements is shown in the said drawings, in which—

Figure 1 shows the said switch in plan.

Fig. 2 is an edge view thereof looking from the right-hand side in Fig. 1. Fig. 3 is a view 55 in vertical section on the plane indicated by the dotted line 3 3 in Fig. 1. Fig. 4 is an edge view looking from below in Fig. 1. Fig. 5 is a back view. Fig. 6 is a plan view with the separately-portable contact-arm removed. Fig. 7 is a bottom view of the said contact-arm detached. Fig. 8 is a side elevation of the said contact-arm.

Having reference to the drawings, an insulating mount or base is shown at 1. It is 65 formed of suitable insulating material and supports the different terminals and contact devices of the switch. A holder for the said insulating-mount is shown at 2, it consisting of a metallic case or shell having a central 70 opening which receives the insulating mount or base and being provided with an attaching-flange 3, that is formed with holes 4 4 for the passage of screws or the like employed in practice in securing the switch to the support 75 therefor. The body of the said case or shell is formed with an inturned retaining lip or flange 5, which latter engages with a radially-projecting peripheral flange or shoulder 6 on the insulating-mount to hold the latter in 80 place within the opening of the case or shell.

At 7 is shown a lining of vulcanized fiber or other suitable insulating material which is applied to the interior surface of the case or shell below the insulating-mount. 85

At 8 8 are the two fixed terminals or contact-pieces, located adjacent each other at one side of the center of the insulating-mount. They are insulated from each other, as by means of an intervening portion of the material of the insulating mount or base. The said terminals are provided with heads that occupy positions at the outer surface of the insulating-mount and with stems 9 9, that pass through holes in the insulating-mount 95 to the inner side of the latter, where they project, the projecting portions of the said stems being screw-threaded and receiving-nuts, as 10, whereby the terminals are secured in place. With the addition of other nuts (not 100 shown) to the said projecting portions of the stems 9 9 the latter serve as binding-posts for the corresponding electric conducting-wires of the batteries with which the switch is employed. A third conducting-wire of the circuit is in practice connected with the screw 105

11, Figs. 3 and 5, which last serves as a binding-post therefor. The head of the screw 11 is seated within the body of the insulating-mount, the stem thereof projecting at the inner side of the said mount and passing through the contact-spring 12, the securing-nut 13, and an additional nut, (not shown,) which last serves in practice as a binding-nut for the said conducting-wire. The nut 13 secures the contact-spring 12 in place against the inner side or back of the insulating-mount.

A swinging contact-arm is shown at 14, it being provided with a projection 15 for engagement with the fixed contact-pieces 8 8. The said contact-arm is formed of electrically-conducting material, but is furnished with a handle 16, which is either formed of insulating material or is insulated. The said contact-arm has connected therewith a pivotal pin 17, which latter works in a bearing that is formed in a sleeve 18, which is applied to the insulating-mount. The sleeve is formed with a portion of reduced diameter (see Fig. 3) that passes through a hole in the insulating-mount, the shoulder or enlargement of the sleeve adjoining the said reduced portion being seated in a recess in the outer surface of the insulating-mount, while the inner extremity of the reduced portion is externally screw-threaded and receives thereon a securing-nut 19, Fig. 3. The said nut is locked, so as to prevent accidental turning thereof, by means of oppositely-located pins (shown in Fig. 3) passing through the same and the thickness of the insulating-mount and having the opposite ends thereof headed or riveted down. When the pivotal pin 17 is in place within the bearing of the sleeve 18, its inner end bears against the contact-spring 12, and the contact-arm thereby is placed in electrical communication with the latter. The said pin 17 is fitted to the bearing of the sleeve in a manner permitting it to be inserted into the said bearing or removed therefrom at will. This enables the movable contact-arm 14 to be applied to the switch or removed therefrom when desired. In order to render it impossible to close or complete the circuit after the removal of the movable contact-arm, by either accidentally or purposely placing a piece of conducting material in contact with the outer or exposed end of the sleeve and with one or both of the fixed contacts 8 8, an electrical break is left between the inner end of the said sleeve and the proximate portion of the contact-spring 12. There is no actual contact between the said inner end and the contact-spring. Consequently when the pivotal pin is withdrawn from contact with the contact-spring—as, for instance, by being removed from the bearing in the sleeve 18—the sleeve is out of electrical communication with the contact-spring.

In order to insure good electrical contact between the inner end of the pivotal pin 17 and the contact-spring 12 while the movable contact-arm is in working connection with the switch, the pin, when inserted fully home within the socket 18, is caused to press against the contact-spring and to bend or flex the latter somewhat, as shown in Fig. 3. In order to prevent the pivotal pin from being expelled from the bearing by the reaction of the contact-spring or withdrawn therefrom in consequence of that of the movable contact-arm when the projection 15 of the movable contact-arm rides upon one of the fixed contact-pieces and causes the said contact-arm, which is made of spring material, to bend or flex, I provide, in connection with the movable contact-arm, a locking means whereby to retain the contact-arm normally in place within the bearing, while leaving the contact-arm free to be swung or shifted with respect to the fixed contact-pieces 8 8. Thus I furnish the pivotal pin with a radial flange 20, Figs. 3, 7, and 8. To receive the said flange, the sleeve 18 is formed with an enlargement 21 of its central bore. To engage with the said flange so as to retain it within the said enlargement, the sleeve is formed with opposite lips, which are represented in Figs. 3 and 6, and which are adapted to overlap with the flange as indicated in the said figures. In order to provide for the removal and subsequent reinsertion of the movable contact-arm, the flange 20 is flattened at opposite sides, as shown in Fig. 7, and the space between the opposite lips is similarly shaped, as shown by Fig. 6. When the movable contact-arm occupies a position in which the length of its flange 20 is parallel or corresponds with the length of the space between the lips of the sleeve, the sides of the flange will be free to slip outward or inward past the edges of the lips, and consequently the contact-arm may be moved so as either to withdraw the pivotal pin from the bearing therefor in order to detach the said contact-arm from the switch or to replace the pivotal pin in the said bearing and restore the movable contact-arm to working relations with the remainder of the switch. The length of the space between the lips of the sleeve extends crosswise with relation to the switch, while that of the flange 20 extends in the direction of the length of the movable contact-arm 14. Consequently when the movable contact-arm extends in either direction crosswise with relation to the switch it is unlocked and free to be removed. Its replacement is provided for by causing it to assume the same position. When, however, the movable contact-arm after being applied to the socket-sleeve 18 and after having its pivotal pin 17 inserted fully home within the bearing is turned, so that the length of the flange 20 is at an angle to the length of the lips of the socket-sleeve, the engagement of

the said lips with the said flange locks the contact-arm in working relations with the remainder of the switch, while leaving the said contact-arm free to be swung or turned in engaging it with the fixed contact-pieces or disengaging it therefrom. The bent or flexed spring 12, Fig. 3, acts constantly with a tendency to expel the pivotal pin from the bearing. The expulsion, however, is impossible so long as the flange crosses the lips at an angle. When the contact-arm is moved into a position in which the length of the flange and the length of the space between the lips correspond, the spring is permitted to act, it then operating to push the pivotal pin outward, thus partially or completely ejecting the same.

Each fixed contact-piece 8 is formed in its acting face with a V-shaped notch or depression to receive the point of the projection 15 of the movable contact-arm. The elasticity of the said contact-arm being brought into play by the bending or flexing of the contact-arm that results when the projection 15 is caused to ride up upon one of the fixed contact-pieces, it insures that the said projection shall enter into the notch to which it is presented or into the space intermediate the fixed contact-pieces and securely remain therein. The V shape of the said projection, as well as that of the notches of the fixed contact-pieces, enables the projection to return with certainty into a given notch or into the said intermediate space in case an accidental blow or a jar should partially displace the movable contact-arm.

What is claimed as the invention is—

1. In an electric switch, in combination, the fixed contact-pieces insulated from each other, separated by a narrow space, and each having a depression, and the movable contact-arm having the projection adapted to enter the depression of either fixed contact-piece and the space between the two fixed contact-pieces, and which is held therein by spring action.

2. In an electric switch, in combination, a

fixed contact-piece, a socket-bearing, a separately-portable contact-arm having a pin to enter the said bearing, means to lock the said contact-arm in connection with the socket-bearing when the contact-arm occupies a normal working position and to release the said contact-arm when the latter is shifted to an abnormal position, to permit of the disconnection thereof, and a contact-spring which is placed under tension by the application of the contact-arm to the socket-bearing and acts to displace the said contact-arm when the latter assumes the said abnormal position.

3. In an electric switch, in combination, a fixed contact-piece, a separately-portable contact-arm having a pivotal pin and a locking-shoulder, a socket-bearing to receive the said pivotal pin, a lip to engage with the said shoulder, the contact-arm being locked to the socket-bearing while the former occupies a normal working position, and being released when caused to assume an abnormal position, to permit of the removal thereof and a contact-spring which is placed under tension by the application of the contact-arm to the socket-bearing and acts to displace the said contact-arm when the latter assumes the said abnormal position.

4. In an electric switch, in combination, a fixed contact-piece, an insulated socket-bearing, a portable contact-arm having a pin to enter the said bearing, means to lock the said contact-arm in connection with the socket-bearing when the contact-arm occupies a normal working position and to release the said contact-arm when the latter is shifted to an abnormal position, to permit of the removal thereof, and a contact-spring electrically insulated from the said bearing and with which the pin engages when inserted into the socket-bearing.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD B. JACOBSON.

Witnesses:

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DAVID L. EVANS.