E. F. BAIR & J. E. STOUT.

POLE CHANGING SWITCH.

APPLICATION FILED DEC. 1, 1916.

1,294,599. Patented Feb. 18, 1919.

Fig. 1.

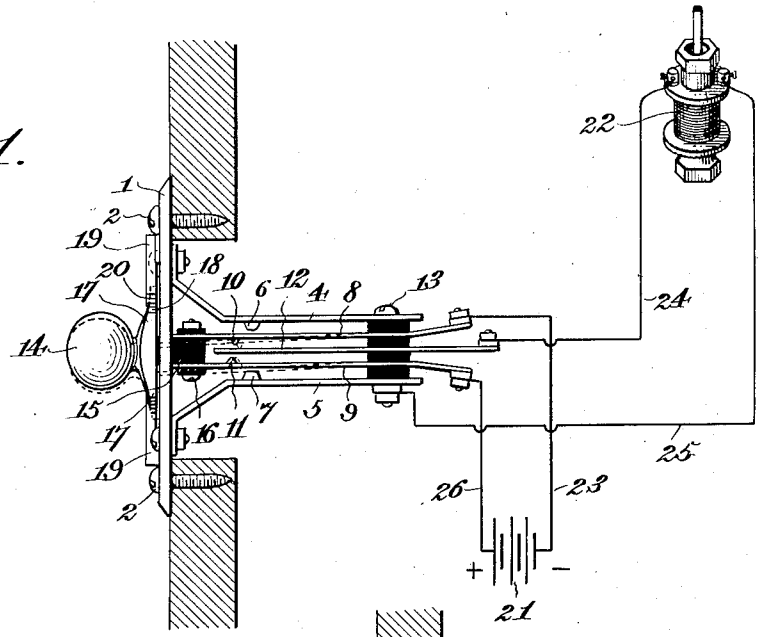


Fig. 2.

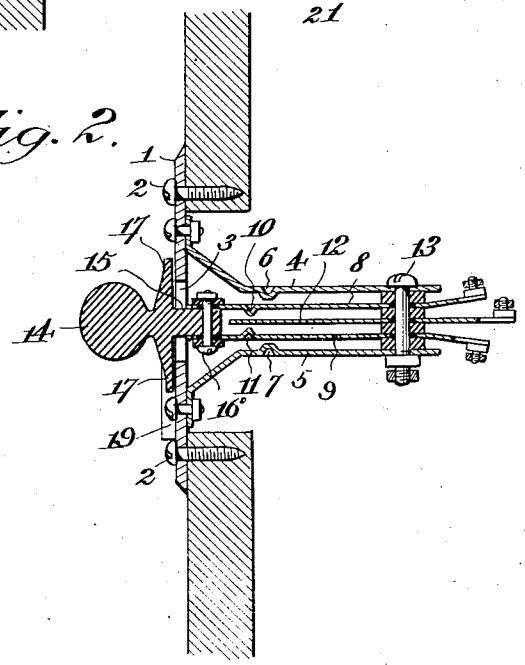
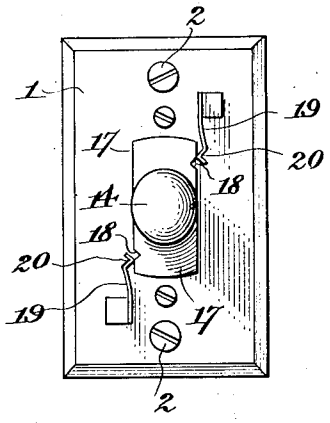


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD E. BAIR AND JAMES E. STOUT, OF HANOVER, PENNSYLVANIA; SAID STOUT ASSIGNOR TO SAID BAIR.

POLE-CHANGING SWITCH.

1,294,599. Specification of Letters Patent. Patented Feb. 18, 1919.

Application filed December 1, 1916. Serial No. 134,517.

To all whom it may concern:

Be it known that we, EDWARD E. BAIR and JAMES E. STOUT, citizens of the United States, residing at Hanover, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Pole-Changing Switches, of which the following is a specification.

The present invention relates to certain novel and useful improvements in pole changing switches.

In the present instance we have shown our invention as employed in connection with an electromagnetic device, such as a solenoid, for the purpose of changing the polarity of such device, but we wish it to be understood that the invention is not limited in its useful application to this particular purpose.

In carrying out the present invention it is our purpose to provide a pole changing switch which will embody the desired features of simplicity, efficiency and reliability, and through the agency of which an electric current may be caused to flow in a desired direction through an apparatus or device connected in circuit with such switch.

With the above recited objects and others of a similar nature in view our invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the accompanying drawing:

Figure 1 is a sectional elevation and diagrammatic view showing the switch connected in operative relation, or in circuit with an electromagnet and with a suitable source of electrical energy, such as a battery.

Fig. 2 is a central vertical sectional view taken through the switch.

Fig. 3 is a view in front elevation of the switch.

In the preferred form of the invention shown herein, our switch embodies, among other features, a plurality of movable contact members as well as a stationary conductor which is common to the movable contact members, means also being employed for retaining the movable contact members in engaging position with their respective stationary contact members and with the common conductor to maintain a constant and indefinite flow of electric current in a particular direction in the current receiving device, such as an electromagnet. The movable contact members of the switch are shown herein normally located in neutral position with respect to the stationary contact members, the various members being properly connected through the circuit wires with the source of current and with the current receiving device, in the present instance the electromagnet, so that the direction of flow of the electric current will be changed, as desired, according as the switch is shifted to close the circuits, the movable contact members of the switch being automatically returned to their normal neutral or circuit opening position after the direction of the flow of the current has been changed.

Referring now to the drawing in detail, the numeral 1 designates an attaching plate which may be of any size and shape. The said plate is provided with apertures through which pass the securing elements or screws 2, for securely holding the device in place. The plate 1 is also provided with an opening 3. Stationary contact members 4 and 5 are secured to the plate 1 and may be insulated therefrom if desired. Each of the members 4 and 5 is upstruck to provide contact points 6 and 7 respectively. Interposed between the stationary contact members 4 and 5 are movable contact members 8 and 9, which are preferably of a resilient material. The said movable contact members normally lie interjacent the stationary contact members in close proximity thereto but out of contact therewith. Each of the movable contact members 8 and 9 is upstruck to provide contact points 10 and 11. 12 designates a conductor which is interposed between the movable contact members. The free ends of the stationary contact members 4 and 5, the movable contact members 8 and 9, and the conductor 12, are held together in spaced relation by a binding stud 13. The conductor 12 as stated, is interposed between the movable contact members 8 and 9, and insulating washers space the various contact members and the conductor apart. The members 8 and 9 and the conductor 12 are insulated from the stud 13, which serves as a binding post or terminal for the stationary members 4 and 5. The manipulating knob 14 is provided with a shank 15 which extends through the opening 3 in the plate 1, and the free ends of the movable contact members 8 and 9 are at-

tached thereto by a stud 16. The knob 14 and its shank 15 are made of insulating material, hence, the members 8 and 9 at their point of attachment, are insulated from each other.

The manipulating knob 14 is formed to provide lateral extensions 17, each of which is provided with a notch 18. Attached to the plate 1, in any suitable manner are spring members 19 having upstruck therefrom projections 20, intended to engage in the notches 18 for a purpose to be explained presently. The spring members 19 and their projections 20 with the notches 18 in the lateral extensions 17 are intended to hold the movable contact members 8 and 9 in either of their two circuit closing positions to maintain a constant indefinite flow of the electric current. Such arrangement just described is shown only by way of illustration, because other means may be adopted to bring about the same result without departing from the spirit of the invention.

21 designates a conventional battery as the source of the electric current, and 22 designates a receptive device of an electro-magnetic type to which the electric current is permitted to flow and in which the direction of flow of current may be reversed for various or intended work-performing purposes. The distribution of the current from its source to the switch and from the switch upon its manipulation to the electro-magnetic device, is accomplished by connecting one pole of the battery 21 with the movable contact member 8 by wire 23. A wire 24 connects conductor 12 with one terminal of the receptive device 22. A wire 25 connects the other terminal of the receptive device with stud 13. A wire 26 connects the movable contact member 9 with the opposite pole of the battery 21.

By this arrangement, the battery leads are connected to the movable contact members 8 and 9—which, through the mounting of its contacts, produces a two-blade terminal unit for the battery circuit, with the blades insulated from each other—while the terminals for the magnet or work-performing circuit are connected respectively to the conductor strip 12 and stud 13—the latter being in metallic contact with both contact members 4 and 5—contact members 4 and 5 and conductor strip 12 thus forming a three-blade terminal unit for the work performing circuit. As will be seen, however, both units are secured in relative position by stud 13 and the insulation carried thereby.

In the drawings, the terminal units are shown in neutral positions, thus breaking both circuits. If, however, knob 14 is shifted downwardly in Fig. 1—the dotted line position—negative terminal 8 of the battery circuit will contact with conductor 12 and positive terminal 9 will contact with contact member 5, thus connecting the battery and work-performing circuits with the current flow to the magnet through wire 24, returning through wire 25. Upon release of the knob, resiliency of the battery terminal unit will cause it to return to the neutral position. If the work-performing circuit is to be completed in the reverse direction, knob 14 is shifted upwardly in Fig. 1, bringing negative terminal 8 into contact with member 4 and contact 9 into contact with conductor 12, thus causing current flow to the magnet through lead 25, returning through lead 24, thus reversing the polarity of the work-performing circuit, the battery circuit remaining constant as to polarity.

By moving knob 14 a distance sufficient to cause it to engage with either of spring members 19, the knob will be held in position to maintain the circuit. However, the structure is designed more particularly for use under conditions where the circuit is closed for a short period—determined by the operator—after which it is opened by simply releasing the knob, thus providing an automatic break to reduce battery wastage.

While we have herein shown and described one particular embodiment of our invention, we wish it to be understood that we do not confine ourselves to all the precise details of construction herein set forth by way of illustration, as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the appended claims.

The claims:

1. In a reversing switch, a supporting plate, and a pair of units insulated from each other and having a common support, one of said units comprising a contact extending from said support and a pair of contacts extending between the support and plate on opposite sides of and insulated from said first-named contact, the other unit comprising a pair of resilient contacts insulated from each other and carried by the support and interposed between the contacts of the first unit, the free ends of the contacts of the second unit being connected by a bridging member extending through said supporting plate.

2. In a reversing switch, a supporting plate, and a pair of units insulated from each other and having a common support, one of said units comprising a contact extending from said support and a pair of contacts extending between the support and plate on opposite sides of and insulated from said first-named contact, the other unit comprising a pair of resilient contacts insulated from each other and carried by the support and interposed between the contacts of the first unit, the free ends of the contacts of the second unit being connected by a bridging member extending through said supporting

plate, the several contacts being blade-like with opposing faces of adjacent contacts normally extending in substantial parallelism, whereby the several units will provide a pack-like formation carried by the supporting plate.

3. A pole changing switch, comprising a plate having an opening therein, a plurality of spaced stationary contact members secured to said plate, a plurality of spaced movable contact members interjacent said stationary contact members, a conductor interposed between said movable contact members, a binding stud connecting the stationary and movable contact members and said conductor together, the movable contact members and the conductor being insulated from each other and the stationary contact members being electrically connected, a manipulating knob having a shank extending through the opening in said plate to which the free ends of the movable contact members are connected insulated from each other for moving the movable contact members to change the direction of flow of an electric current and means associated with said manipulating knob for maintaining the switch in closed position, the said movable contact members being resilient to automatically cause their return to a normal circuit opening position.

4. A pole-changing switch comprising a plate having an opening therein, a plurality of spaced stationary contact members secured to said plate and having contact points thereon, a plurality of spaced movable contact members having contact points thereon interposed between said stationary contact members in close proximity thereto, a conductor interposed between said movable contact members, a binding stud connecting the stationary and movable contact members and said conductor together, insulating washers being inserted between said conductors and said members, the stationary members being electrically connected together, a manipulating knob having notched lateral extensions and a shank which extends through the opening in said plate, the free ends of the movable contact members being connected to said lug and being insulated from each other for moving the movable contact members to change the direction of flow of an electric current, spring members having projections thereon attached to said plate, the said projections being engageable in the notches in said lateral extensions to maintain the switch closed in either position.

5. In a pole changing switch adapted to make and break a work-performing circuit and to provide for reversal of the circuit at will, a work-performing circuit terminal unit including a pair of outer contacts and an intermediate contact, an electrical supply source terminal unit including a pair of resilient terminal contacts on opposite sides of the intermediate contact of the companion unit, said resilient terminal contacts having their free ends insulated from each other and permanently connected to a shiftable bridging member, and means for securing an end of the several contacts in fixed spaced relation with adjacent contacts insulated from each other and with the bridged unit normally in circuit-breaking position, the contacts of the several units extending in the same general direction and normally in substantial parallelism, movement of said latter unit in either direction completing the work-performing circuit with the direction of return flow of the circuit dependent upon the direction of movement of said bridged unit.

In testimony whereof we affix our signatures in the presence of two witnesses.

EDWARD E. BAIR.
JAMES E. STOUT.

Witnesses:
A. C. SCHWARTZ,
E. B. KUMFE.