

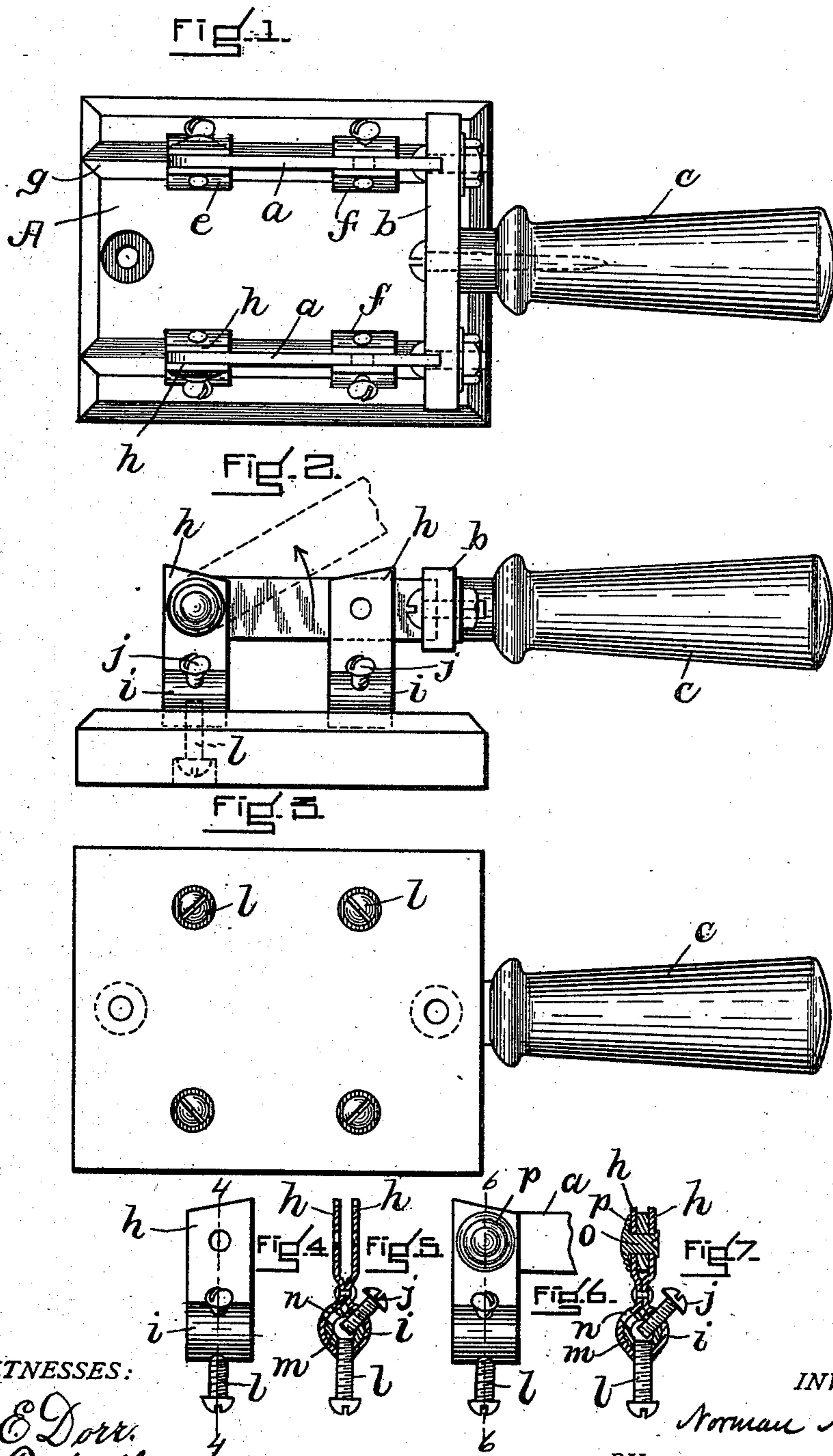
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Patented Nov. 25, 1902.

N. MARSHALL.
ELECTRIC SWITCH.

(Application filed Nov. 2, 1901.)

(No Model.)



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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 714,593, dated November 25, 1902.

Application filed November 2, 1901. Serial No. 80,847. (No model.)

To all whom it may concern:

Be it known that I, NORMAN MARSHALL, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Electric Switches, of which the following is a specification.

The invention relates to that class of electric switches known as "knife-switches;" and
10 one of the features of the invention consists in providing the insulating-base of the switch with a groove, or in the case of a double or multiple pole switch with grooves having converging sides with which the bases of the con-
15 tacts are engaged and by which the contacts may be brought into proper alinement in securing them to the base without any special care or skill on the part of the workman assembling the parts of the switch.

20 A further feature of the invention consists in a contact having a tubular part for receiving the end of the conducting-wire and having two blades to form the brushes for holding the knife-blade. This contact is simple
25 and compact and may be cheaply made without waste of material. It is also well adapted for manufacture by automatic machinery, since it may be formed by stamping out and bending up a sheet-metal blank. Moreover,
30 the manufacture of the contact may be further cheapened by stamping out the holes for the binding and attaching screws and for the knife-blade pivot before the contact-blank is bent into shape, thus doing away with the
35 drilling usually necessary.

A further feature of invention consists in providing the pivot-pin for the knife-blade with a spring-head, which acts to draw the contact-brushes and knife-blade together and
40 to take up wear and prevent looseness at the joint.

In describing the features of the invention more in detail I will refer to the accompanying drawings, in which I have shown a double-pole switch embodying all the features of
45 the invention in their preferred forms.

In the drawings, Figure 1 is a plan view of the switch. Fig. 2 is a side elevation. Fig. 3 is a bottom view. Fig. 4 is a side view of

a contact separate from the base. Fig. 5 is a
50 section on lines 4 4, Fig. 4. Fig. 6 is a side view of a contact with the knife-blade pivoted between the brushes; and Fig. 7 is a section on lines 6 6, Fig. 6.

In the drawings I have shown a double-pole
55 switch in which two knife-blades and four contacts are used; but it will be understood that the features of invention may be embodied in single-pole switches or in other multiple-pole switches.
60

The switch shown is provided with two knife-blades *a*, connected by the usual bar *b*, of insulating material, to which the usual handle *c* is secured. The parts of the switch are supported on a base *A*, of insulating material, and
65 the contacts *e f*, which coöperate with the knife-blade *a*, are secured to the base by being drawn down into a groove *g*, formed in the base and having converging sides. The bases of the contacts are formed to engage the sides
70 of the groove, and the contacts are brought into alinement and firmly held from displacement by the groove. No special care or skill is therefore required in securing the contacts to the base or in adjusting them to bring them
75 into alinement, but the contacts may be quickly secured in place and are thereby brought into alinement. The alining groove also forms an efficient means for holding the contacts in alinement and preventing any
80 accidental displacement thereof. This construction also admits of each contact being secured to the base by a single screw *l*, which holds the contact down in the groove, thus simplifying the construction and reducing
85 the labor and material consumed in making the switch.

Any suitable form of contact having a base which will coöperate with the groove may be used. The form of contact shown is well
90 adapted to coöperate with the groove and embodies certain features of invention which may be also used with advantage in switches which do not embody the alining groove. This contact is provided with two parallel
95 blades *h*, forming the brush portion of the contact, which engages the opposite sides of the knife-blade. Below the brush portion of

the contact is a tubular part *i*, forming a socket for receiving the conducting-wire, and a set-screw *j* is threaded through the wall of the tubular part and serves to bind the wire to the contact. In case the contact is to be used in a switch having an alining groove the base of the contact will have converging surfaces to cooperate with the sides of the groove. The contact is best made by stamping out a blank of sheet metal and bending it to form the tubular part and to bring the ends of the blank into parallel relation to form the brush-blades *h*, the opposing parts of the contact-blank being riveted or otherwise secured together above the tubular part. It is also preferred to so form the contact that the lower portion of the tubular part forms the base of the contact. In case the sheet metal from which the contact is made is too thin to effectively hold the thread of the set-screw *j* and the securing-screw *l* the tubular part may have its walls thickened by a bushing *m*, into which the screws are threaded. This bushing may be best made by stamping it out of sheet metal and bending it into shape, as shown. This contact is simple in construction and is well adapted for manufacture by automatic machinery. If found desirable, the holes in the contact may be stamped out before bending the contact-blank into shape, thus avoiding the labor and expense incident to drilling such holes. With this construction of contact it is also feasible to have all the contacts in a switch duplicates of each other, so that only one form of contact need be made or carried in stock. Thus by forming the brush-blades with holes for the knife-blade pivot and by providing tapped holes *n* on each side of the tubular part *i* for the binding-screw any contact may be used for the contact *e*, to which the knife-blade is pivoted, or for the contact *f*, and any contact may be used as a right-hand or left-hand contact in constructing a symmetrical double-pole switch, such as shown in the drawings.

The knife-blade *a* is connected with the blades *h* of the contact *e* by means of a pivot-stud *o*, having a spring-head *p*, the outer edge of which engages one of the blades *h*. In securing the stud in place the stud is drawn inward, thus springing the head so that said head acts to forcibly draw the parts together and will prevent the parts from becoming loose as they wear. In the construction shown the stud is held with the head under tension by spreading the end of the stud against the outer surface of the brush-blade *h*. The head is preferably provided with annular corrugations to strengthen it and make a more effective spring therein.

What I claim, and desire to secure by Letters Patent, is—

1. A knife-switch having an insulating-base provided with an alining groove, and contacts having bases having converging sides fitting within said groove, and cooperating with the sides of said groove to bring the contacts into

alinement as the bases are drawn down into the groove, substantially as described.

2. A knife-switch having an insulating-base provided with a groove having inclined sides, and contacts having bases to fit said groove, whereby the contacts are alined by engagement with the groove, substantially as described.

3. A knife-switch having an insulating-base provided with a groove having converging sides, contacts having bases to fit said groove, and screws for holding said contacts down in said groove, substantially as described.

4. A knife-switch comprising an insulating-base provided with an alining groove, two contacts provided with bases having converging sides which cooperate with the sides of the alining groove to bring the contacts into alinement as the bases are drawn down into the groove, and a knife-blade for connecting said contacts, substantially as described.

5. A contact for a knife-switch consisting of a strip of sheet metal bent to form a tubular socket for the conducting-wire, and having the ends in parallel relation to form the brush-blades of the contact, substantially as described.

6. A contact for a knife-switch formed of a strip of sheet metal having a tubular part which forms the base of the contact and also the socket for receiving the conducting-wire, and having the ends of the strip in parallel relation to form the brush-blades of the contact, substantially as described.

7. A contact for a knife-switch consisting of a strip of sheet metal bent to form a tubular socket for the conducting-wire, and having the ends in parallel relation to form the brush-blades of the contact, a bushing within the tubular part and a binding-screw threaded through the wall of the socket, substantially as described.

8. A contact for a knife-switch formed of a strip of sheet metal having a tubular part which forms the base of the contact and also the socket for receiving the conducting-wire and having the ends of the strip in parallel relation to form the brush-blades of the contact, a bushing in the tubular part, a binding-screw threaded through the wall of the socket, and a threaded hole through the base part of the tubular socket for receiving a securing-screw, substantially as described.

9. A knife-switch having a knife-blade *a*, a contact provided with brush-blades *h* between which the knife-blade is pivoted, a pivot-stud extending through the blades *a*, *h*, having a spring-head which forcibly draws the parts together and prevents the parts from becoming loose when worn, substantially as described.

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

NORMAN MARSHALL.

Witnesses:

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