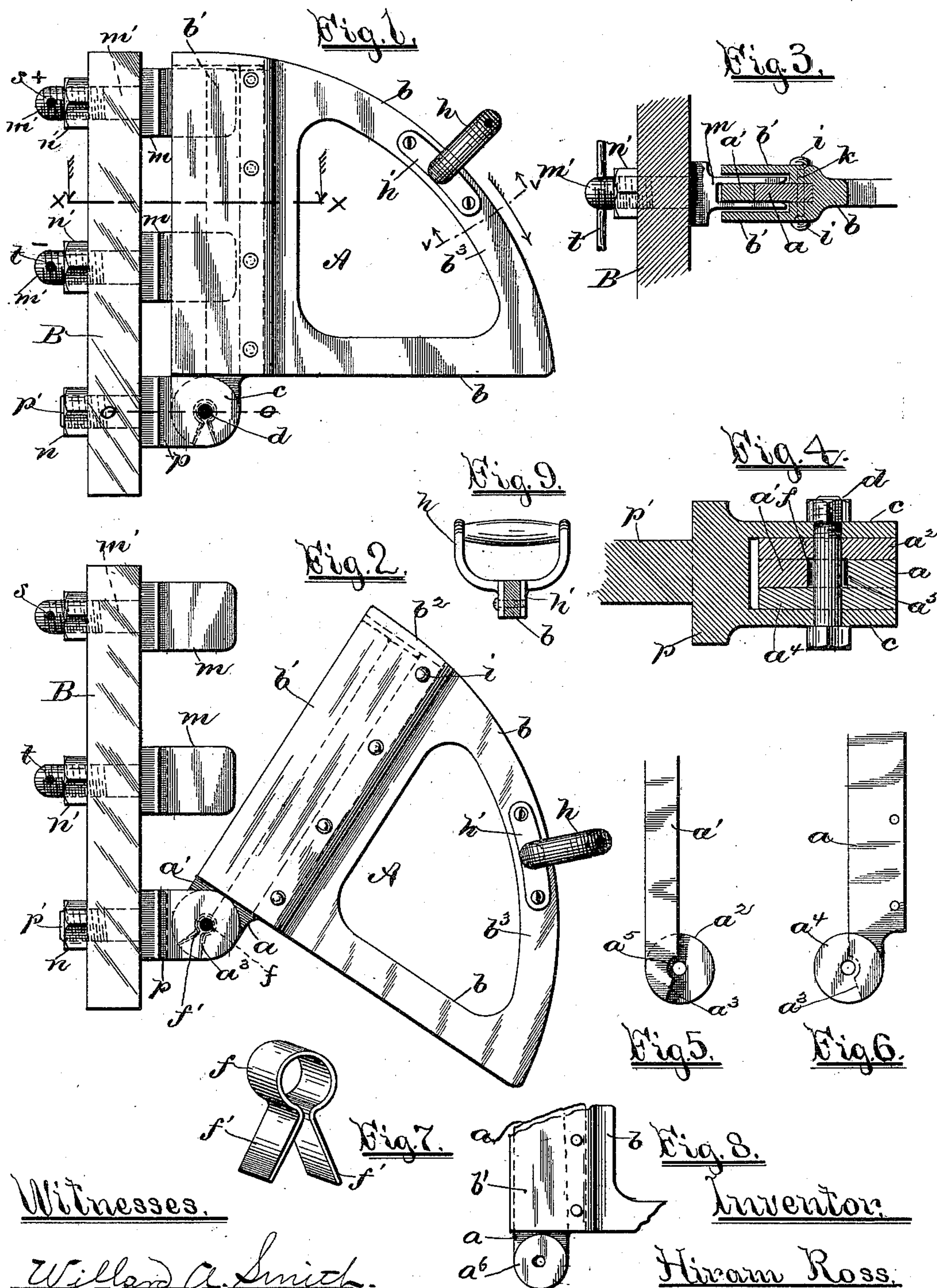


(No Model.)

H. ROSS.
ELECTRIC SWITCH.

No. 561,284.

Patented June 2, 1896.



Witnesses.

Willard A. Smith.
Kernington Sherman

Inventor.

Hicorn Ross.

by Geo. A. Remington & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

HIRAM ROSS, OF PROVIDENCE, RHODE ISLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 561,284, dated June 2, 1896.

Application filed February 17, 1896. Serial No. 579,640. (No model.)

To all whom it may concern:

Be it known that I, HIRAM ROSS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Electric Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in electric switches; and it consists, essentially, in the combination of a pivotally-mounted current-conducting arm or lever member arranged to swing into and out of electrical contact with one or more energized contact-plates and a non-conducting handle or operating member secured to said arm, the sides of the non-conducting member being arranged to inclose the said conductors, thereby forming a permanent insulating protector or guard. It also consists in the novel construction of the lower or pivot end of the lever when the conducting-blade of the latter is composed of two parts, as in a separable or snap-switch lever, all as will be more fully hereinafter set forth and claimed.

In a patent of the United States granted to me October 29, 1895, No. 548,819, is shown and described an electric switch combining certain novel features. In that device the swinging portion consisted of a pair of laterally-separated quadrant-shaped levers, each provided with a tie formed of non-conducting material and both united by a handle, through which the levers were capable of being operated simultaneously.

The object I have in view in the present invention is to provide the swinging levers of electric switches of the single-arm type with means whereby they may be operated more efficiently and with comparatively little or no danger to the persons manipulating them.

In the accompanying drawings, Figure 1 is a side elevation of a pivotally-mounted separable single-lever electric switch embodying

my present improvement, the position of the parts indicating a closed circuit. Fig. 2 is a similar view, the lever being swung out of engagement with the conducting or contact plates, the circuit then being broken. Fig. 3 is a horizontal section taken on line *x x* of Fig. 1. Fig. 4 is a similar section, enlarged, taken on line *o o* of Fig. 1. Fig. 5 is a side elevation showing the lower portion of one-half of the separable arm or contact-blade. Fig. 6 shows the corresponding portion of the other half of the lever. Fig. 7 is a perspective view of a spring employed for keeping the said two parts of the blade normally closed. Fig. 8 is a partial side view corresponding with Fig. 6, showing a non-separable conducting arm or blade; and Fig. 9 is a cross-section taken on line *v v* of Fig. 1.

In the drawings, A indicates the improved switch-lever as a whole. I would state here that in electric switches of this type the blades or conducting portions of the swinging levers are sometimes made in two parts or separable, in order to lessen the degree or extent of flashing when the lever is being withdrawn from the contact-plates, such being termed "snap-switches." Sometimes the blades or arms are single, the area or cross-section of the latter in such case being substantially the same as that of the two parts comprising the separable blade. In the drawings I have shown a separable form of blade. I may further add that the levers are usually arranged to swing on pivots secured to non-conducting bases or switchboards. B indicates a portion of such a base.

At or near the lower edge of the board B is secured a stand or bracket *p*, having laterally-separated ears *c*, through which passes the pivot pin or bolt *d*, and forming a fulcrum for the lever. The stand *p* has a stem *p'* extending through the base B, a nut *n*, screwed snugly against the back of the base, holding the stand in position.

As drawn, the base B is further provided with a pair of current-conducting contact-plates *m m*, communicating with the poles of the electric circuit. These plates are secured to the front side of the base and are separated from one another vertically a suitable

distance and are practically in alinement with the stand *p*. Each plate *m* has a shank *m'* passing through the base *B* and is held in place by a nut *n'*. The outer end of the shank
 5 may be extended so as to carry one of the poles or main conductors of the circuit. The positive pole *s* is represented as soldered or secured to the upper plate *m*, the other or negative pole *t* being similarly secured to the
 10 lower plate, or vice versa. The plates are also provided with slightly-yielding laterally-separated jaws or sides, substantially as usual, capable of frictionally engaging the lateral sides of the blade.

15 The switch-lever proper, *A*, is, as drawn, provided with a current-conducting blade *a*, capable of being swung into and out of engagement with the said jaws of the plates *m*. The lower end of the blade is enlarged and
 20 loosely mounted on the pivot-pin *d* and located between the ears *c c* of the stand. In switch-levers hitherto made the blades thereof have in some cases been separable and provided at the pivot end with loose washers,
 25 the whole being loosely mounted on the pin *d*. In the drawings my present device is represented as having a separable or two-part blade provided with washers or bosses integral therewith—that is to say, each of the two
 30 parts *a a'*, comprising the conducting-blade, has a hub or washer-like projection, the main part *a* having a boss *a⁴* on its front side, a similar boss *a²* being integral with the reverse side of the part *a'* (see Figs. 5 and 6)—the arrangement being such that when mounted in
 35 the stand *p* the several parts are in contact with one another, the parts *a a'* being in a plane common to both. The adjacent vertical edges of the lower ends of said parts *a a'*
 40 are oppositely beveled, as at *a³*. The center portion is also cut away at *a⁵* to form a chamber or space to receive the head of a U-shaped spring *f*, the downward-extending sides *f'* of the latter being in yielding contact with said
 45 beveled edges *a³*. By means of this construction and arrangement the main part *a* of the blade may be first partly or wholly withdrawn from the jaws of the contact-plates *m*, independently of the part *a'*, until the said sides
 50 *f'* of the spring are brought well together, after which a further forward movement of the lever causes the part *a'* to be forced from the contact-plates. As soon as the blade is fully withdrawn from the influence of the
 55 plates *m* the reactive force of the compressed sides or wings *f'* of the spring instantly operates to swing the part *a'* ahead into snug engagement with the fellow part *a*. (See Fig. 2.) Now in order to protect the said blade
 60 or conducting part of the lever I provide it with a combined guard and handle or operating member *b*, the same being made of suitable non-conducting or insulating material, as vulcanite, wood, &c. The sides *b'*, as well

as the upper end *b²* of the said member *b*, are 65 extended so as to practically inclose the blade parts *a a'* and also inclosing the corresponding sides of the contact-plates *m*. (See Fig. 1.) The part *b* is permanently secured to the blade *a* by suitable bolts or rivets *k*, the 70 heads or outer ends being covered or protected with buttons or caps *i*, made of non-conducting material. (See Fig. 3.)

I have represented the curved arm part *b³* of the guard *b* as having a handle *h* secured 75 thereto, the same being so arranged that it forms a more convenient handle device by which the lever may be operated than the curved arm *b³* alone would afford. (See also Fig. 9.) 80

It is obvious that the pivot-bracket *p* may be energized, if made of suitable conducting material, as brass, and used as one of the poles of the circuit in lieu of the lower contact-plate. In such case, however, it is obvious that the 85 blade portion of the lever is correspondingly energized at all times.

In a switch having a non-separable blade the latter may be constructed as indicated in Fig. 8, wherein the current-conducting portion *a* is provided with integral center hubs or bosses *a⁶*, adapted to be mounted on the pin *d* of the pivot-bracket *p*, the sides *b'* of the non-conducting protector *b* extending across 90 the blade, as shown. 95

By means of my improvement the switch-lever may be readily manipulated at all times with comparatively little or no risk whatever to the person in charge.

I claim as my invention— 100

1. In an electric switch, the combination, with the switchboard and a pair of independent contact-plates secured thereto and connected with the poles of an electric circuit, of a current-conducting arm or blade capable of 105 being swung into and out of engagement with said contact-plates, as in closing and opening the circuit, and a non-conducting member, as *b*, secured to the blade having laterally-separated sides *b'* extending across the blade so as 110 to form a guard or protector, substantially as hereinbefore described and for the purpose set forth.

2. The switch-lever, substantially as hereinbefore described, the same consisting of the 115 flat blade or conducting portion arranged to be pivotally secured to any suitable base or holder, a non-conducting guard member secured to and extending longitudinally of said blade, said guard member having insulating 120 sides or cheeks, as *b'*, extending across and practically concealing the working faces of the blade, and a handle secured to or integral with said guard member by means of which the lever may be manipulated. 125

3. In an electric switch, the combination, with a suitably-mounted pivot-stand and one or more contact-plates connected with the

poles of an electric circuit, of a swinging
switch-lever having a separable blade, as $a a'$,
mounted in said stand, adapted to be energized
by contact with said plates, and having the
5 center or pivot portion of the blades cut away,
as at a^3, a^5 , and a spring $f f'$ mounted in the
said cut-away portion of the blades, so as to
keep the adjacent faces of the two parts of the

blade in normal contact, substantially as de-
scribed. 10

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

HIRAM ROSS.

Witnesses:

GEO. H. REMINGTON,
REMINGTON SHERMAN.