

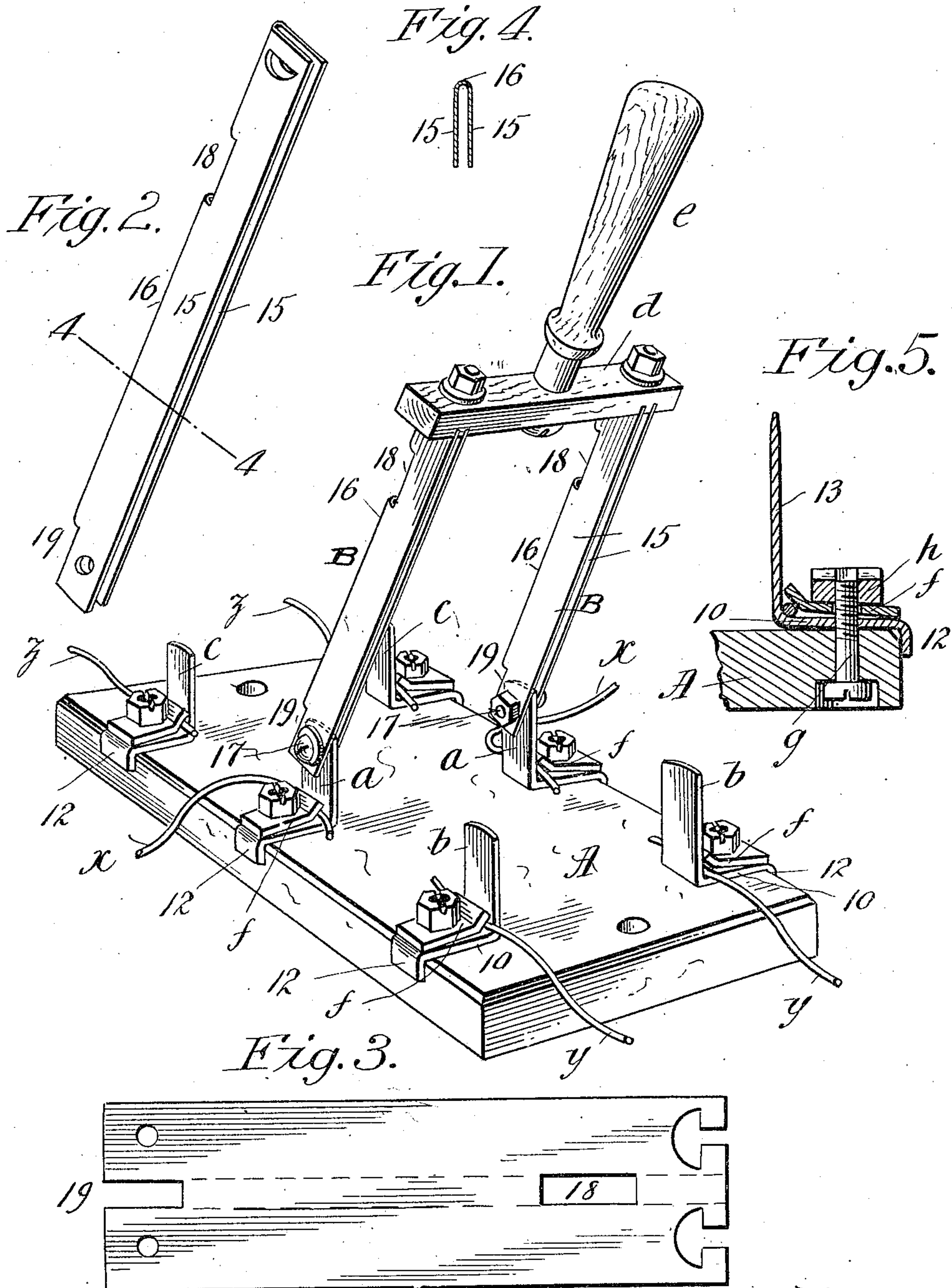
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Patented Aug. 8, 1899.

H. H. CURTIS.
ELECTRIC SWITCH.

(Application filed Nov. 5, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 630,667, dated August 8, 1899.

Application filed November 5, 1898. Serial No. 695,528. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. CURTIS, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, and exact description.

This invention relates to specific improvements in electric switches of the general type illustrated in the accompanying drawings, vast numbers of switches of this general class being employed for circuits where electric lights are used and where electric currents for many other purposes are employed. In view of the necessary duplication or multiplication of the switches the matter of simplicity and cheapness consistent with efficiency and durability is of great importance. Heretofore most generally these switches have comprised upstanding forked or bifurcated contacts or pole members and a hinged switching-bar or switching-frame comprising one or more parallel blades and an operating insulated handle, all mounted on a base or switchboard of slate, marble, or other suitable non-conducting material, and in such switches the blades have been usually constructed of copper or brass bars having considerable thickness. In some cases the contact-receiving or pole members of the switch have consisted of upstanding single tongues, plates, or bars, and the hinged part of the switch has consisted of single or duplicated sets of paired separated blades held together against distance-blocks or separating-pieces; but in this latter-mentioned form of switch, in which the paired members of each bar are swung down to contact on the opposite sides of the single upstanding tongue or contact-receiving pole-member, the paired blades or members of each of the bars have necessarily been of considerable thickness, as necessary to impart the required rigidity to the swinging portion of the switch.

The object of this invention is to produce a switch of the general class referred to which will fulfil all requirements in respect of safety, certainty of operation, and durability, and which will necessitate much less weight of the comparatively expensive copper or brass, thereby for that reason lessening the

cost of the switch very materially, and which by reason of the specific form and mode of production of the parts permits that they may be stamped out of unusually thin sheet brass or copper in a punch-press, whereby the production may be one of great rapidity and uniformity.

The invention resides in a switch comprising an upstanding single tongue or flat-sided post to constitute a terminal or pole for a circuit and a second pole member combined with a switch-bar, the same consisting of a single blank of sheet metal bent into U form, whereby opposite parallel longitudinally-extending cheeks or blades are constituted, united by an integral intermediate bridging and reinforcing back, the so-formed switch-bar being pivotally hung upon one of the upstanding posts and adapted when swung down upon the other to have the inner sides of its cheeks contact against the opposite sides of the other upstanding single tongue or post.

The invention furthermore consists in a certain recessed formation at the back of the sheet-metal U-shaped double-cheek switch-bars, whereby they are adapted to be comprised in "double-throw" switches; and the invention furthermore consists in other specific construction and combination of parts, all substantially as will hereinafter fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which the present switch improvements are shown as exemplified in a "double-pole double-throw switch" as termed in the trade.

Figure 1 is a perspective view of a switch designated above. Fig. 2 is a perspective view of one of the switch-bars. Fig. 3 is a plan view of a punched-out sheet-metal blank from which the double-cheek bar is integrally produced. Fig. 4 is a cross-sectional view of the bar. Fig. 5 is a vertical sectional view of a part of the switch.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the base of the switchboard, having the upstanding conductor members *a a* and the upstanding pairs of contact or pole members *b b* and *c c*.

B B represent paired switch-bars united by the insulating cross member *d*, having the

handle *e*, the inner ends of said bars being pivotally hung to the said parts *aa*. As usual in a double-pole double-throw switch of this kind the switch-bars *B B* may be swung so that the wires *xx*, joined to the parts *aa*, may through said bars form connection either with the wires *yy* or the wires *zz*. Each of the conductor and contact members or angle-posts *a*, *b*, or *c* is formed of a single blank or plate of suitable metal, comprising base portion 10, the vertically-downturned lip or flange 12, and the upstanding contact or conductor portion 13. Each angle-post is placed with its base member 10 resting on the switch-base *A* near its lateral edge, with its depending portion 12 lying flatwise against the vertical edge of the said base *A*.

f represents the clamp-plate, combined with each angle-post, the same consisting of a rectangular blank of brass or copper having its inner end angularly turned and having its center perforated.

g represents the clamping-bolt, the head thereof being set within the countersunk opening therefor in the under side of the base, the shank passing upwardly through the base portion 10 of the angle-post and through the plate *f*, receiving at its upper screw-threaded end the nut *h*, which clamps the parts *f* and 10 together to bind the wire firmly at the corner where portions 10 and 13 of the angle-post meet, this device also insuring the firm retention of these parts with the use of but a single bolt and nut, which, as seen, in conjunction with the angularly-turned vertical lip, insure that the angle-post will be held rigidly and without any liability of turning on the switch-base.

In the more common construction of the corresponding parts of the switch two bolts or screws have been necessary to secure the engagement of the contact or pole member on the base, and a third one has been required to insure the confinement of the conductor-wire; but this simple means, whereby all of the stated conditions and purposes are provided for and served, contributes materially to the practical value and utility of the switch-board.

Each switch-bar is formed of a single rectangular blank of comparatively thin sheet brass or copper bent along its median longitudinal portion to produce a bar which in transverse section is of **U** form and having the opposite side members or cheeks 15 15 and the integrally-formed uniting and reinforcing back 16.

The end portion of each double-cheeked switch-bar *B* is straddled over the upper end of the upstanding angle-post of the conductor or contact member *a*, so that the swinging motion of the bar on its connecting-pivot 17 will bring the cheeks or separated blade portions 15 15 down in contact over and against the sides of the upstanding tongue member 13 of the terminals or pole members *b b*, and in the double-throw switch, comprising the pole member

c in the same plane of swinging movement of the bar *B* and of the member *b*, the back 16 of the double-bladed **U**-formed switch-bar is recessed, as shown at 18, whereby when the switch-bar is thrown over from contact *b* to the one *c* the apertured portion of the bar permits contact to be made by the same services of the blades on member *c* as was made by them on member *b*.

This invention is applicable, of course, in a single-throw switch—that is, one in which in addition to the contacts *a*, to which the switch-bar is jointed, there is a contact or contacts at one end only of the switchboard, and, as manifest, the invention is applicable in switches of this general class having greater or less capacity for circuit-changing, ranging from a single-pole single-throw switch to a double-throw triple-pole or multiple-throw multiple-pole switch.

In Fig. 3 the form of the blank from which the double-cheeked switch-bar for a double-throw switch is produced is shown, the opposite side portions outside of the longitudinal dotted lines being the parts which constitute the double parallel separated cheeks of the bar, while the middle longitudinal portion between the dotted lines constitute the cheek-uniting and switch-bar-reinforcing part.

For the double-throw switch in addition to the recess 18 a second recess 19 is produced at the pivoted end, whereby the switch-bar may be completely overturned.

Inasmuch as the blank of the form substantially as shown may be most rapidly, easily, uniformly, and cheaply produced by stamping out in a punch-press from very thin metal and because each double-bladed switch-bar *B* when turned into the **U** shape has all required rigidity, I am enabled to place upon the market an improved switch at lessened cost, because of the decreased bulk and weight of metal needed and because of the novel mode of its mechanical construction.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric switch of the character described, a base of non-conducting material having an upstanding tongue or flat-sided post or pole member as *b*, and a conductor-post, *a*, a switch-bar pivoted to the post *a*, and consisting of sheet metal bent along its central longitudinal portion into **U** form, providing opposing separate double blades having for substantially their entire length the integral uniting and reinforcing back, and adapted to be swung to bring the inner sides of its opposite blades in contact on the outer opposite sides of the pole member or tongue *b*, substantially as and for the purposes set forth.

2. In a double-throw electric switch, the base having secured thereon between its ends the conductor member *a*, and near its opposite ends the upstanding flat-sided tongues or pole-posts, a switch-bar having its one end

pivoted to the member *a*, and consisting of sheet metal bent on its central longitudinal portion into U form providing double opposing separated blades having the integral uniting and reinforcing back, and provided near its end with the recess through such back, substantially as and for the purposes set forth.

3. In an electric switch of the class described, a non-conducting base, and two sets of post or pole members, and a set of conductor-posts placed midway between them, combined with a switch-bar consisting of sheet metal bent along its central longitudinal portion into U form, and which is provided with openings 18 through which either set of post or pole members pass, whereby the switch-bar may be used in connection with either set, substantially as described.

4. In an electric switch of the character described, the combination with the base A, of a conductor or pole member, composed of a thin bar or plate, right-angularly bent twice in opposite directions, and constituting the upstanding tongue or flat-sided post 13, the horizontal base or rest 10, and the vertically-depending flange 12 engaging facewise the edge of the switch-base A, the clamp-plate *f*

having its inner end angularly obliquely turned and placed upon the said base member 10 with its obliquely-turned extremity within the corner angle at the junction of parts 10 and 13, the single-headed bolt *g* having its shank passed upwardly through the parts 10 and *f* and receiving at its upper end the confining and clamping nut, substantially as shown.

5. A switch having two upstanding tongues *b b*, two upstanding tongues or contacts *a a*, two switch-bars, each consisting of the sheet metal bent along its central longitudinal portion into U form providing opposing separate double blades, having for substantially their entire length the integral uniting and reinforcing back, said blades being pivoted at their one end to the contact members *a*, and having their opposite ends united by the cross-bar *d* of insulating material, and provided with a handle and adapted to operate as described.

Signed by me, at Springfield, Massachusetts, this 1st day of November, 1898.

HENRY H. CURTIS.

Witnesses:

WM. S. BELLOWS,
M. A. CAMPBELL.