

No. 691,766.

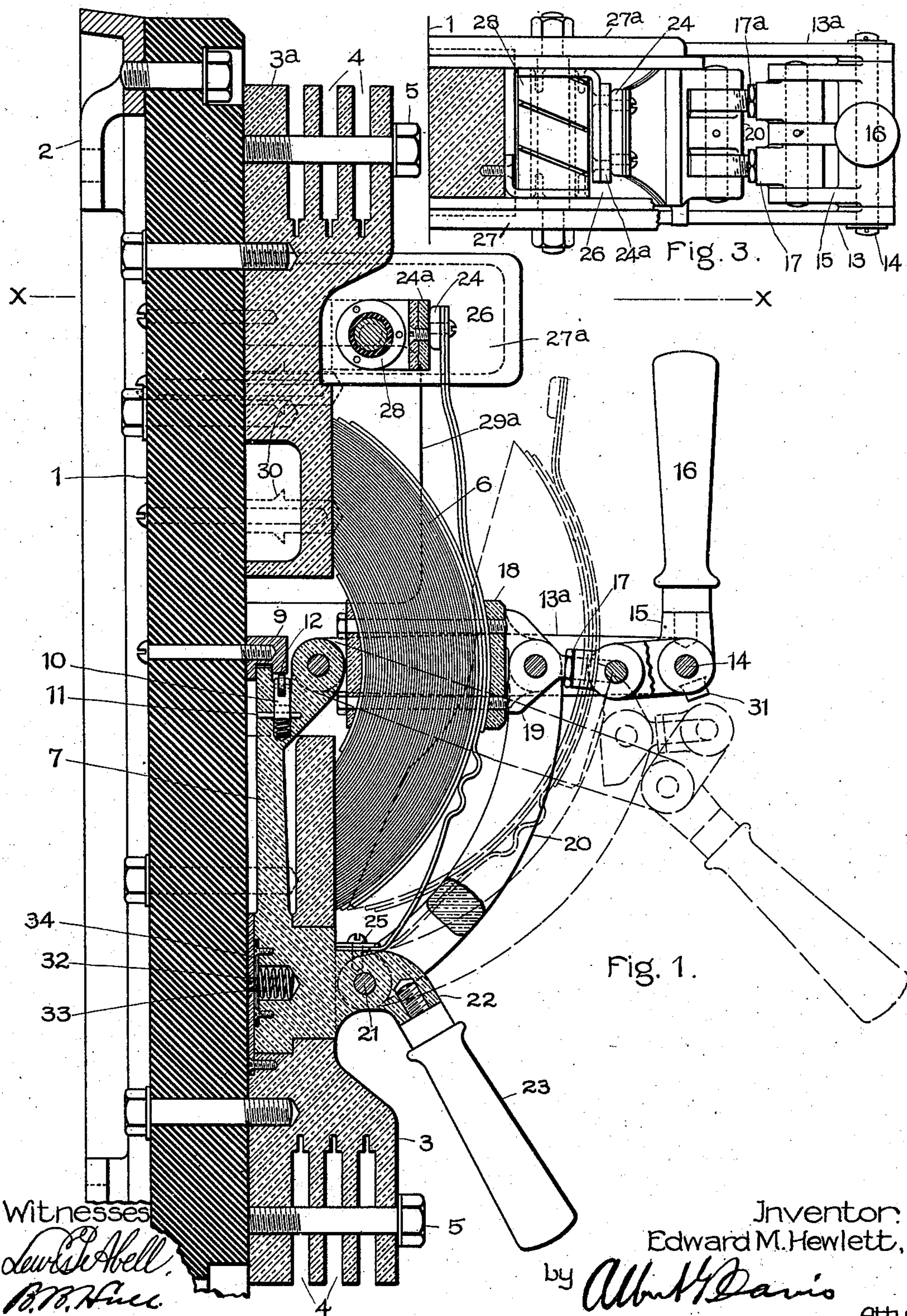
Patented Jan. 28, 1902.

E. M. HEWLETT.  
ELECTRIC SWITCH.

(Application filed Jan. 12, 1900.)

(No Model.)

2 Sheets—Sheet I.



Witnesses  
*Lawrence A. Bell*  
*B. B. Hume*

Inventor:  
Edward M. Hewlett,  
by *Albert H. Davis* Atty.

No. 691,766.

Patented Jan. 28, 1902.

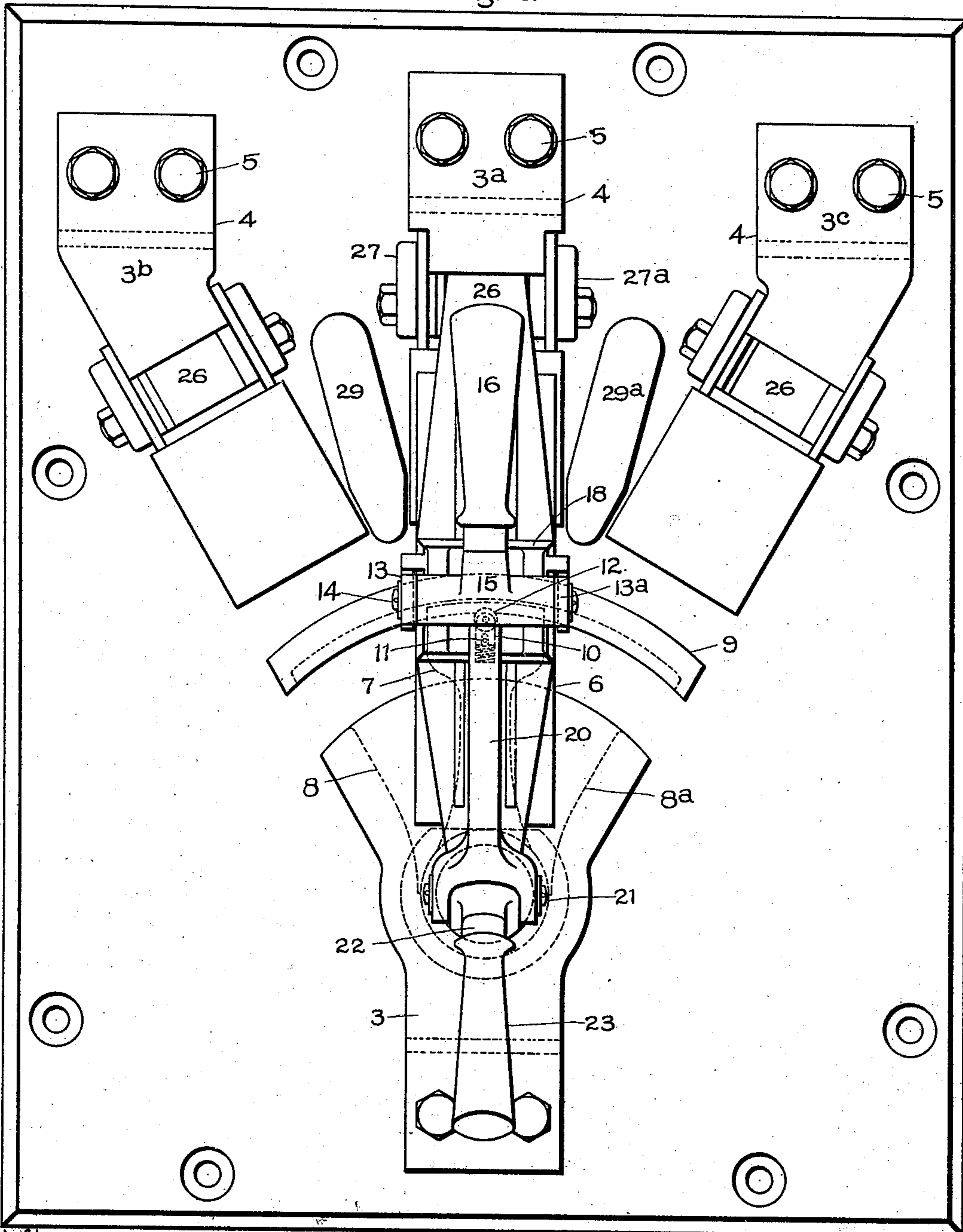
E. M. HEWLETT.  
ELECTRIC SWITCH.

(Application filed Jan. 12, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.



Witnesses:

*Levi P. Bell*  
*Benjamin B. Rice,*

1

Inventor:

Edward M. Hewlett,

by

*Albert G. Davis*

Atty.

# UNITED STATES PATENT OFFICE.

EDWARD M. HEWLETT, OF SCHENECTADY, NEW YORK, ASSIGNOR TO THE  
GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 691,766, dated January 28, 1902.

Application filed January 12, 1900. Serial No. 1,173. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD M. HEWLETT, a citizen of the United States, residing in Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electric Switches, (Case No. 1,488,) of which the following is a specification.

The object of my present invention is to provide a multiple-point switch by which connection of currents of large amperage may be made between or with different circuit-mains.

In carrying out my invention I provide a plurality of terminals, rotatively connected with one of which is a switch-arm carrying a bridge adapted to be shifted into connection with one of a number of cooperating terminals and locked in good conductive relation thereto. I provide a shunting-contact adapted to permit sparkless interruption of the main circuit in the manner customary in the construction of modern circuit-breakers and journal the support which carries the bridge for movement in a plane away from the terminals, so as to permit the bridge to be rotatively operated to connect any desired pair of terminals. I provide also means for locking the bridge into intimate electrical contact with the terminals, such as a toggle provided with an operating-lever for cramping or releasing the same.

My invention involves various features of construction, the novelty of which will be hereinafter definitely pointed out, and specifically indicated in the claims.

In the drawings which illustrate my invention, Figure 1 is a sectional view of a switch embodying my improvements. Fig. 2 is a plan, and Fig. 3 is a section on the plane of the line X X of Fig. 1.

The operating parts of the switch are secured to an insulating-base of marble, slate, or other non-combustible insulating material, as indicated at 1. To the rear of this may be secured, by bolts or screws, a metal frame having a flange on the inside, as indicated at 2, by which the apparatus may be bolted to the switchboard or other support. Upon the insulating-base 1 are mounted a plurality of terminals 3 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup>, secured to the base by screws passing from the rear, as indicated. The out-

side ends of the terminals are grooved or slotted, as indicated at 4, into which cooperating tongues mounted upon the end of the bus-bar or circuit-terminal may be inserted and the two bound into intimate electrical connection by means of connecting-screws, as 5. The terminals 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup> are mounted upon the insulating-support on the arc of a circle, as indicated in Fig. 2, and the terminal 3 at a central point, in which is journaled the movable arm which carries the bridge 6. The inner part of the terminal 3 is hollowed to accommodate the movement of an extension 7, forming part of the rotary member of the switch. The end walls of the inner end of the terminal form stops to limit the movement of this arm, as indicated in dotted lines in Fig. 2 at 8 8<sup>a</sup>. A metallic segment of a circle is screwed to the base and provided with a groove, into which the extension 7 projects and which serves as a guide and an abutment to take the strain of the toggle. A pin 10 rests in a hole bored in the end of the arm and is pressed outwardly against the upper edge of the segment by a coil-spring, as indicated. This pin is slotted on its rear end, through which slot passes a pin 11, which prevents it from turning. The outer end of the pin carries a roller 12, which bears against the face of the segment 9. In the latter at a central point is a recess, into which the roller is projected by the spring and which serves to lock the switch in the central position. The roller seated in the recess is indicated in Fig. 2 in dotted lines. This lock is, however, not sufficient to prevent a forced movement of the switch to either side.

Journaled on the end of the extension 7 are two rods extending outwardly from the support, as indicated at 13 13<sup>a</sup> in Figs. 1 and 2. Connecting these rods at their outer ends is a pin 14, on which is journaled a bell-crank lever 15, provided at its free end with an operating-handle 16 and connecting at the other end with two adjustable links 17 17<sup>a</sup>, to which is pivotally connected the laminated bridge-contact 6, held in a supporting-frame 18, formed of two metallic plates clamped to the bridge by bolts, as indicated. The ends of the links nearest the bridge-support are provided with lateral extensions or toes, as indi-

cated at 19, which bear firmly against the terminals upon the bridge-support. Upon the same pivot upon which the links 17 17<sup>a</sup> and the bridge 18 are journaled is journaled an arm 20, forked at its lower end and pivoted to the rotary switch member at 21. Integral with the part 7 is a socket 22 for a handle 23, by which the movable element of the switch may be rotated. A shunt-contact 24 is mounted upon the end of two or more laminæ of spring metal, as phosphor-bronze, secured to the bridge 6 and in good electrical contact with the metallic portion of the rotary switch member, as indicated at 25. The length of the spring upon which the shunt-contact 24 is mounted is such as to permit said contact to be held by the resilience of the spring in engagement with its cooperating shunt-contact 24<sup>a</sup> until after the bridge has left the terminal. Thus, in closing, the shunt is first completed, and the spring carrying the contact is then put under tension, after which the bridge-contact is completed. The shunt-contact 24 is made of carbon and is inclosed in a chute 26, formed of two walls extending in a plane at right angles to the base. Outside of the chute-walls are two iron extensions, as 27 27<sup>a</sup>, (see Fig. 3,) forming pole extensions of a core of a magnet-coil 28, included in series with the switch. This coil is formed of a few turns of heavy copper of sufficient capacity to carry the currents of heavy amperage for which the switch is used without undue heating. Between the adjacent terminals to which the switch may be shifted are placed barriers 29 29<sup>a</sup>, of insulating refractory material, which rise above the plane of the terminals sufficiently to prevent the possibility of arcing from one to another. These barriers may be secured to the support in any suitable way. An efficient form (shown in the drawings) consists in boring two or more holes in the base and countersinking or enlarging the bore, as indicated at 30 in dotted lines in Fig. 1, and introducing a lead socket to receive the screws.

In operating the switch the toggle is first knocked down by pulling outwardly the handle 16, when if the switch is in a vertical position it will drop to the position indicated in dotted lines in Fig. 1, first opening the main contacts between the terminals and the bridge 6 without arcing and producing a final break at the shunt-contact 24, the arc being blown out by the magnetism developed by the coil 28. A cushion 31, of rubber or leather, set in the lever 15, receives the impact of the movable parts as they drop to the dotted position in Fig. 1. The switch may then be shifted by the handle 23 into position to engage one of the terminals 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup> and closed by pressing outwardly from the base the handle 23 and then pressing toward the base the handle 16; thereby cramping the toggle and forming a firm contact between the bridge and the two terminals to be connected.

It is desirable to prevent the passage of current across the joint between the pivot of the movable switch member and the terminal 3 after the main contact made by the bridge is opened. In order to effect this, I provide in the base of the pivotal point a few thin sheets or laminæ of copper 32 in good conductive relation to the movable member, being screwed thereto, as indicated in Fig. 1, and pressed by a spring 33, nesting in a recess in the journal. This plate bears upon a hard-metal plate 34, screwed fast to the terminal 3. Thus there is a path for current to the shunt-contact independent of the joint between the movable member and the main terminal, and when the handle 23 is pressed a very firm engagement of plates 32 and 33 is effected.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An electric switch comprising a movable switch member, a plurality of terminals adapted to be connected thereto, a circuit-closing contact movable outwardly in a plane away from the terminals, to permit the switch to be shifted laterally into cooperative relation to any desired contact, and a toggle for cramping the contacts into intimate engagement.
2. An electric switch comprising a rotary member movable in the plane parallel to the base, a plurality of terminals adapted to be engaged thereby, insulating-barriers between the terminals, a contact carried by the rotary member movable to and from the base to clear the barriers and a toggle for cramping the contacts in firm engagement.
3. An electric switch comprising a movable member journaled for movement in the plane parallel to the base and in continuous connection with one circuit-terminal, an arm mounted on the movable member and movable away from the base, a bridge for the terminals carried by said arm, a link between the arm and the movable member, and a toggle to cramp the bridge and effect a good contact.
4. In an electric switch, a plurality of terminals, a rotary switch member permanently connected with one of the same and adapted to effect connection with any of the others, a pivoted bridging-contact carried thereby to effect such connection, a switch-operating handle, a toggle connected to the bridging-contact, a handle to cramp the same, and a link connecting the rotary member and the cramping-handle.
5. In an electric switch, the combination of a plurality of terminals, a switch-arm journaled in one of them, a fixed guide engaging the end of the arm, a toggle and operating-handle pivoted to the arm, a bridge-contact, and a pivoted arm provided with a handle carrying the contact and connected to the toggle.
6. In an electric switch, a plurality of terminals, a switch-arm, journaled in one of them for movement in a plane parallel to the base, a bridge-contact movable away from the

base, a shunt-contact to prevent arcing at the bridge, and a branch connection between the terminal and the switch-arm to divert the current to the shunt-contact from traversing the joint.

7. The combination in a switch of a circuit-terminal, a rotary switch-arm, an operating-handle therefor, a bridging-contact carried thereby, and a plurality of metal laminæ between the arm and the fixed terminal, said laminæ bearing face on between the arm and the terminal and effecting a good rotary contact to divert current from the joint and provide a yielding connection.

8. In an electric switch, a base, a rotary arm carrying a bridge-contact pivoted for movement away from the base, a fixed guide for the end of the arm to brace the same when cramped and a toggle connected to the end of the arm to cramp the bridge-contact.

9. In an electric switch, a rotary arm carrying a bridge-contact pivoted for movement away from the base, a fixed guide for the end of the arm, a toggle connected to the arm to cramp the bridge-contact, a plurality of terminals, and stops for the arm when in position to close the circuit at the several terminals.

10. In an electric switch, the combination of a rotary switch-arm journaled in a terminal, a plurality of cooperating terminals, a bridge-contact, a pivoted arm carrying the same, links, a toggle between the arm and the links, and a handle to operate the toggle.

In witness whereof I have hereunto set my hand this 10th day of January, 1899.

EDWARD M. HEWLETT.

Witnesses:

BENJAMIN B. HULL,  
MABEL E. JACOBSON.