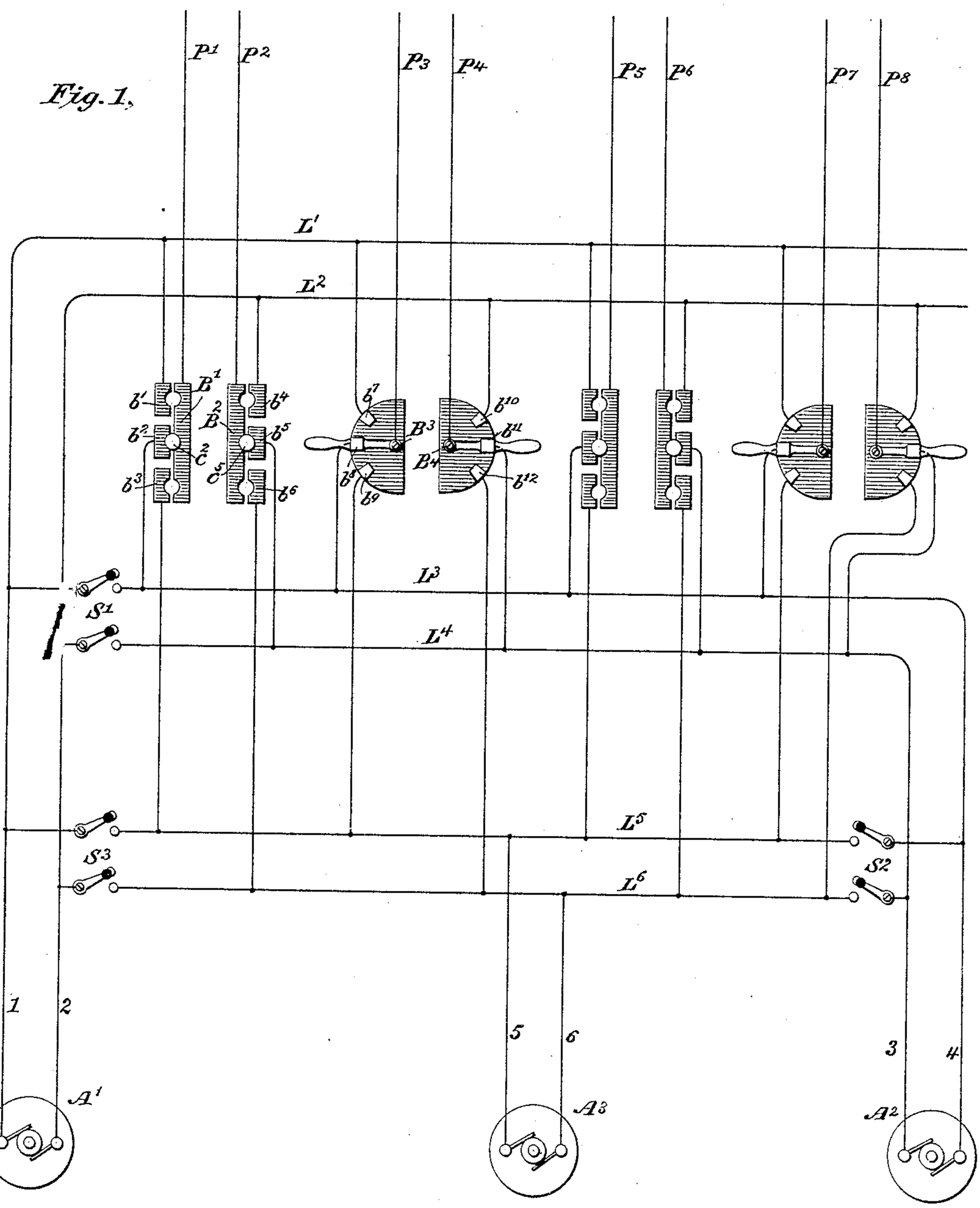
(No Model.) 2 Sheets—Sheet 1.

O. B. SHALLENBERGER.

CIRCUIT CONTROLLING APPARATUS FOR ELECTRIC LIGHTING CIRCUITS.

No. 383,661. Patented May 29, 1888.

Fig. 1.



Witnesses,
Geo. W. Breck.
Carrie E. Ashley.

Inventor,
O. B. Shallenberger.
By his Attorneys
Pope Edgecomb & Terry.

(No Model.) 2 Sheets—Sheet 2.

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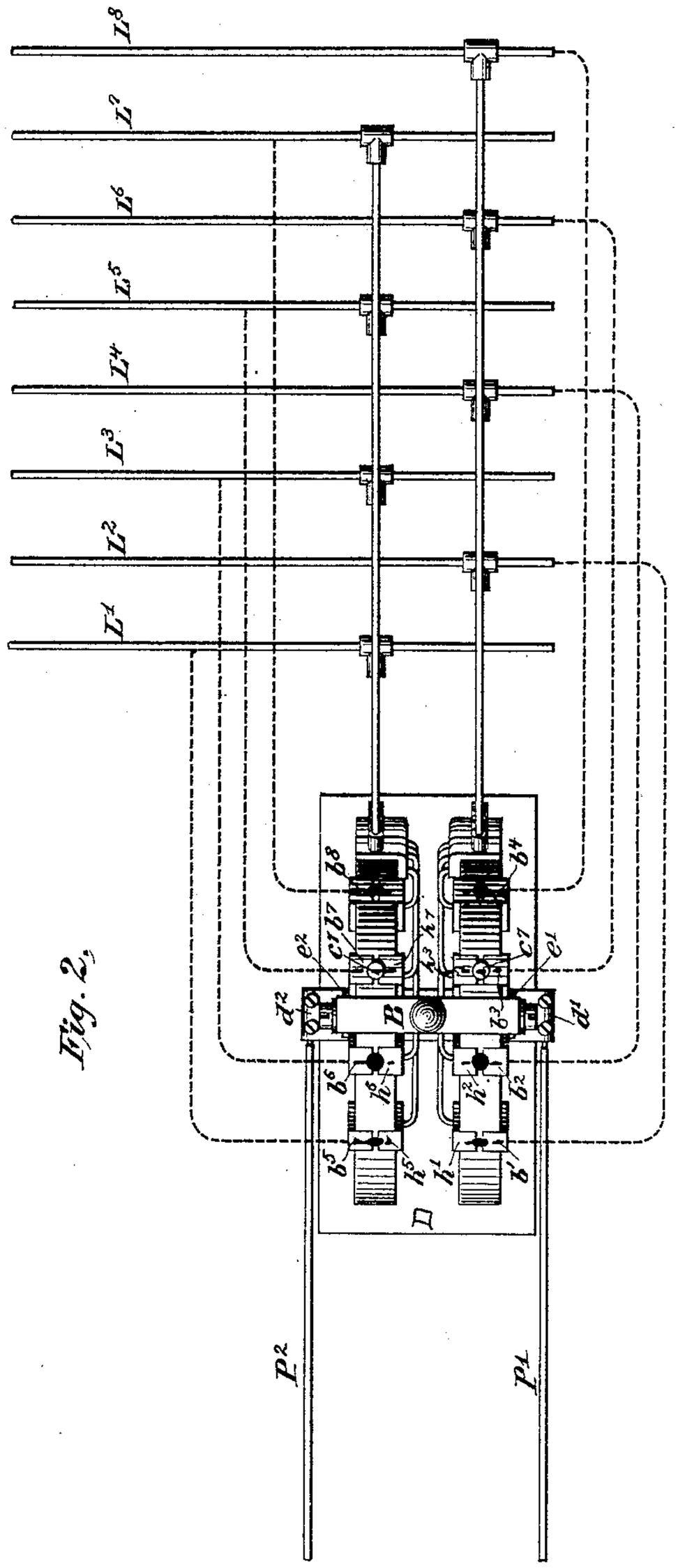

Fig. 2.

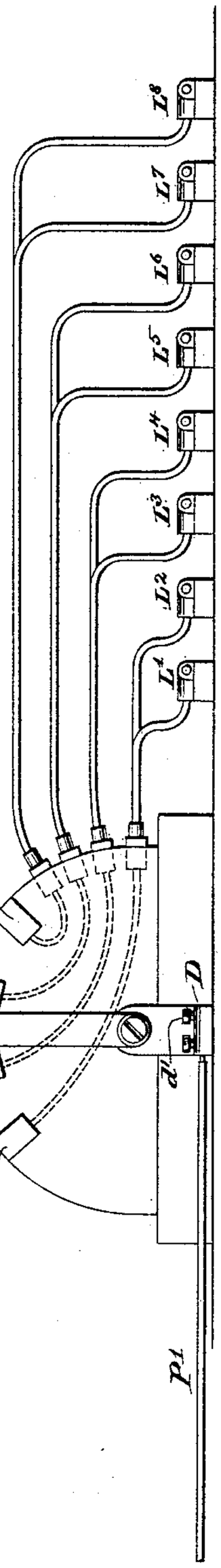

Fig. 3.

Witnesses,

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UNITED STATES PATENT OFFICE.

OLIVER B. SHALLENBERGER, OF ROCHESTER, ASSIGNOR TO GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

CIRCUIT-CONTROLLING APPARATUS FOR ELECTRIC-LIGHTING CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 383,661, dated May 29, 1888.

Application filed March 28, 1887. Serial No. 232,667. (No model.)

To all whom it may concern:

Be it known that I, OLIVER B. SHALLENBERGER, a citizen of the United States, residing in Rochester, Beaver county, in the State of Pennsylvania, have invented certain new and useful Improvements in Circuit-Controlling Apparatus for Electric-Lighting Systems, of which the following is a specification.

The invention relates to an organization of circuits and apparatus to be employed at the central stations of electric-lighting systems for securing any desired circuit-connections between different pairs of main lines or supply-conductors and different generators at will; and the object of the invention is to provide convenient apparatus for this purpose which may be used without producing any noticeable effect upon the lights during the changes in the connections, and which is easily controlled.

The invention will be described in connection with the accompanying drawings, in which—

Figure 1 is a diagram illustrating the general organization of circuits, and Figs. 2 and 3 are respectively a side elevation and a front view of the switch devices.

Referring to Fig. 1, A', A^2, and A^3 represent three independent electric generators, which may in this instance be conveniently considered as being alternate-current generators. The poles of the generator A' are respectively connected by conductors 1 and 2 with supply-conductors L' and L^2. The generator A^2 is connected by conductors 3 and 4 with supply-conductors L^3 and L^4, and the generator A^3 by conductors 5 and 6 with the supply-conductors L^5 and L^6.

A series of primary conductors, or conductors leading to converters or other suitable apparatus, are represented in pairs at P' P^2, P^3 P^4, P^5 P^6, and P^7 P^8. These are supposed to lead to independent apparatus; but it may be desired to connect them with any one of the different generators, according to the different circumstances under which the system is to operate at different times. The conductor P' is connected with a contact-strap, B', and the conductor P^2 with a similar strap, B^2. The strap B' is provided with three insulated contact-disks, b', b^2, and b^3, with which it may be connected by suitable switch-plugs, as shown at c^2. The disks b', b^2, and b^3 are respectively connected with the lines L', L^3, and L^5, which may, for convenience, be considered as positive conductors, or conductors having currents of the same character at any given time. Similar disks, b^4, b^5, and b^6, are applied to the strap B^2, and these are respectively connected with the conductors L^2, L^4, and L^6. The switch-plug c^5 shows the strap B^2 as connected with disks b^5. Thus the lines P' and P^2 are shown as connected, respectively, with the conductors L^3 and L^4. By changing the position of the pins c^2 and c^5 the lines P' and P^2 may be connected with either of the other pairs of conductors.

In connection with the lines P^3 and P^4 the same system of connections is shown, different forms of switches being illustrated. These each consist of a movable arm, B^3 B^4, respectively connected with the lines P^3 and P^4, each provided with three contact-plates, as shown at b^7 b^8 b^9 and b^{10} b^{11} b^{12}. The connections are essentially the same as described with reference to the lines P' and P^2, and by moving the switch-arms the lines P^3 and P^4 may be connected with any pair of conductors, L' L^2, L^3 L^4, or L^5 L^6. Switches S', S^2, and S^3 may be employed for connecting the different generators in multiple arc in an evident manner.

For the purpose of securing convenient connections and allowing for changes in the connections without injuring the contacts and without producing false connections, the device illustrated in Figs. 2 and 3 is employed. This consists of a support, D, carrying upon suitable studs, d' d^2, a yoke-shaped lever, B, provided with two contact-plates, e' and e^2, designed to make electrical connection with the individual contact-plates b', b^2, b^3, and b^4, and b^5, b^6, b^7, and b^8. These last-named plates are respectively provided with contact-plates h', h^2, h^3, &c., which are respectively connected with the conductors L' L^2 L^3 L^4 L^5 L^6 L^7 L^8 to any desired extent. By inserting a switch-plug, c^7, between any pair of plates, b' and h', for instance, and the corresponding pair, b^5 and h^5, and then moving the switch B into contact with the plates b' and b^5, the circuit-connections will be completed from corresponding lines, L' and L^2, to the switch-plates e'

and e^2 of the switch B. These plates are respectively connected with the lines P′ and P². If it is desired to change the connections to the lines L⁵ L⁶, for instance, then the switch-plugs are placed between the plates b^3 and h^5 and b^7 and h^7, and the switch B is moved over the intervening contact-plates without completing any circuit-connections therewith, the plugs being removed until it arrives at plates provided with the plugs c^7 c^7, whereupon the desired circuit-connections are completed.

Instead of the exact arrangement of plugs shown, one series may be used alone, as b^5 h^5, &c., while the contact-plates for the opposite pole may remain normally connected—*i. e.*, b' and h' may be one plate. The plugs would then interrupt the circuit in only one place when removed, instead of two.

The dotted lines show the connections made by the respective contact-plates.

I claim as my invention—

1. A switch or circuit-controlling device consisting of a movable lever, two independent circuit-closing plates upon said lever, two independent series of contact-plates, in contact with which the circuit-closing plates may be respectively placed, individual contact-plates adjacent to the last-named contact-plates, and switch-plugs or circuit-closing devices adapted to place the individual contact-plates in connection with their respective contact-plates at will.

2. A circuit-controlling switch consisting of two independent circuit-closing plates, two independent series of contact-plates, in contact with which the respective circuit-closing plates may be placed, corresponding series of independent contact-plates, one or both of which series are normally electrically insulated from the first-named contact-plates, switch-plugs or circuit-closing devices for completing the connections between any two of the first-named contact-plates and their corresponding insulated contact-plates, and a lever or support for moving the circuit-closing plates into contact therewith.

3. In a system of electrical distribution, the combination of an outgoing and return wire, two circuit-closing plates with which said wires are respectively connected, two series of contact-plates arranged in pairs, means for moving said circuit-closing plates into contact with different contact-plates of said series simultaneously, pairs of supply-conductors, and coupling devices for completing the connections of any pair of contact-plates with a corresponding pair of supply-conductors at will, substantially as described.

4. The combination of the switch B, the plates e' and e^2, carried thereby, the two series of contact-plates b' b^2, &c., and b^5 b^6, &c., and their corresponding plates, h' h^2, &c., and h^5 h^6, &c., and conductors leading from the latter, substantially as described.

5. The combination of the pivoted lever B, the contact-plates e' and e^2, carried thereby, the contact-plates h' h^2, &c., and h^5 h^6, &c., arranged in curved series, and the corresponding insulated plates with which said plates are respectively adapted to be connected, substantially as described.

6. The combination, with two or more generators, of multiple circuit-closing plates, respectively constituting the terminals of the generators, a series of contact-plates for each of said circuit-closing plates, into contact with which the latter may be moved, a second series of contact-plates, one plate being provided for each of the first-named contact-plates, coupling devices for connecting the second contact-plates with the respective first-named plates, main lines connected with the respective second contact-plates, and independent switches for connecting the generators in multiple-arc circuit.

In testimony whereof I have hereunto subscribed my name this 21st day of March, A. D. 1887.

OLIVER B. SHALLENBERGER.

Witnesses:

DARWIN S. WOLCOTT,

R. H. WHITTLESEY.