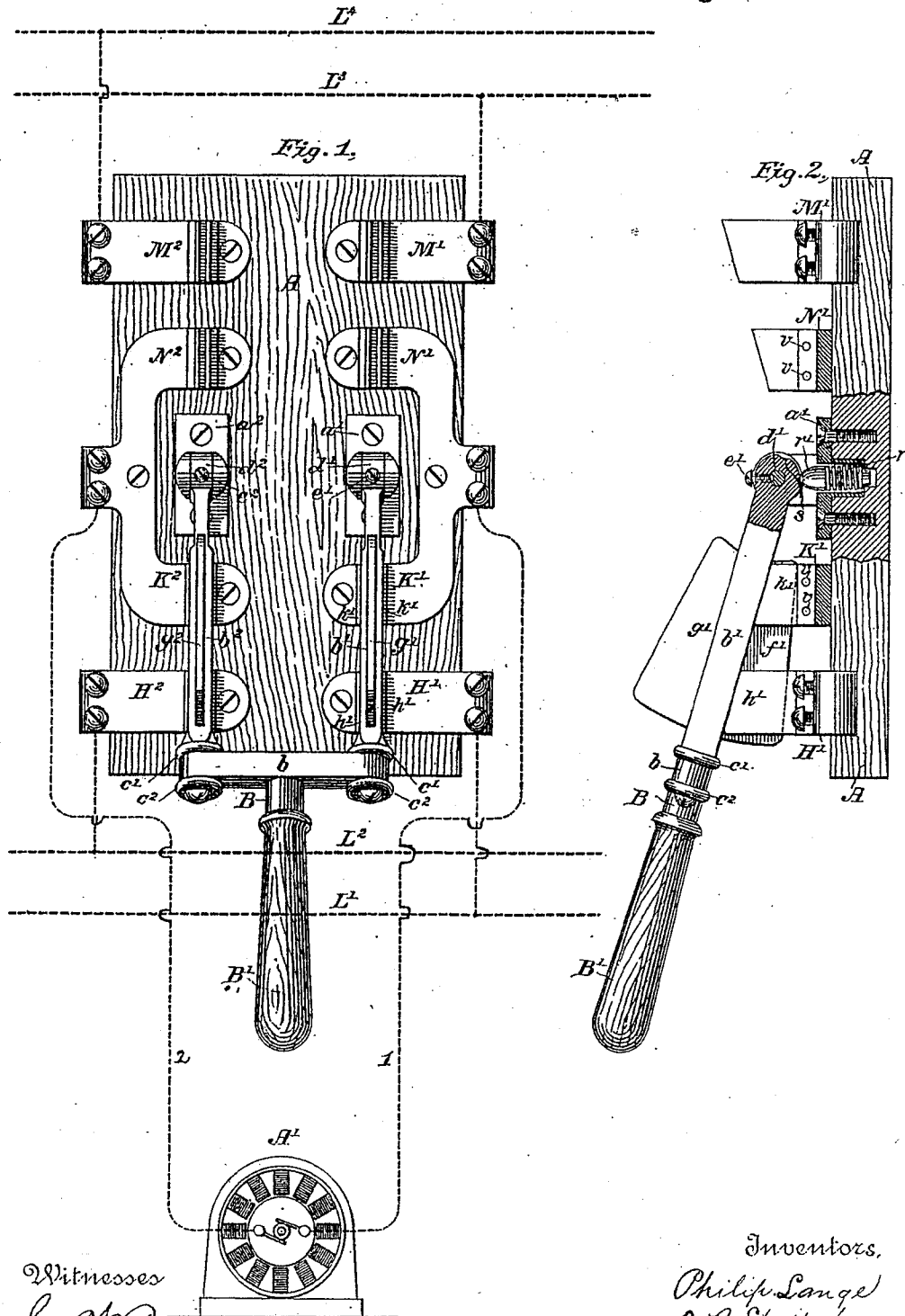


(No Model.)

P. LANGE & O. B. SHALLENBERGER.
SWITCH FOR ELECTRIC CIRCUITS.

No. 434,151.

Patented Aug. 12, 1890.



Witnesses
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UNITED STATES PATENT OFFICE.

PHILIP LANGE, OF PITTSBURG, AND OLIVER B. SHALLENBERGER, OF ROCHESTER, ASSIGNORS TO THE WESTINGHOUSE ELECTRIC COMPANY, OF PITTSBURG, PENNSYLVANIA.

SWITCH FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 434,151, dated August 12, 1890.

Application filed September 1, 1887. Serial No. 248,473. (No model.) Patented in England May 29, 1888, No. 7,851; in France May 29, 1888, No. 190,873; in Belgium May 29, 1888, No. 81,966, and in Italy May 29, 1888, XXII, 23,538, and XLVI, 259.

To all whom it may concern:

Be it known that we, PHILIP LANGE and OLIVER B. SHALLENBERGER, citizens of the United States, residing, respectively, in Pittsburg, Allegheny county, and in Rochester, Beaver county, in the State of Pennsylvania, have invented certain new and useful Improvements in Switches for Electric Circuits, (for which we have obtained Letters Patent in 10 Great Britain, No. 7,851, dated May 29, 1888; in Italy, XXII, 23,538, and XLVI, 259, dated May 29, 1888; in France, No. 190,873, dated May 29, 1888, and in Belgium, No. 81,966, dated May 29, 1888,) of which the following is a 5 specification.

The invention relates to the class of devices employed for controlling the connections of electric circuits, and the object is to provide convenient and efficient means for connecting the terminals of any given electric circuit with either of two pairs of conductors at will.

The invention consists, generally, in providing a lever carrying four contact-blades with four sets of contact-plates, whereby the 5 blades may serve to complete the connections of a source of electricity with one pair of conductors when in one position; with another pair in another position, and to sever all its connections when in an intermediate position.

The invention also involves certain details which will be described in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of the switch, and Fig. 2 is a side elevation, partly in section.

Referring to the figures, A represents a non-conducting base upon which the switch is mounted. This base carries two plates a' and a^2 , insulated from each other.

A circuit-controlling lever B is constructed with two arms or levers b' and b^2 , pivoted at one end to the respective plates a' and a^2 . These are of metal, and are connected at their remaining ends with a transverse plate or 5 bar b of metal insulated therefrom, as shown, by the thimble-rings c' c^2 . This bar b carries a handle B' , of non-conducting material, by means of which the entire structure may be

turned upon the pivots d' d^2 . These pivots extend through upright lips upon the plates 50 a' a^2 , and preferably the pivots turn in these lugs and are fastened into the arms b' and b^2 by screws e' and e^2 , so that they cannot slip out. The arm b' carries two circuit-closing blades f' and g' , projecting from opposite 55 sides. The arm b^2 is likewise provided with blades, one only of which g^2 is shown. It is designed that these blades shall serve to complete the connections of different electric circuits, according to the position of the circuit-controlling lever. Thus when the lever is 60 down to the position shown in the drawings the blade f' will be in contact with two contact-plates H' and K' , and the corresponding blade upon the arm b^2 will be in contact with 65 two plates H^2 and K^2 . When the lever is thrown in the opposite direction, the blade g' and the corresponding blade g^2 will be in contact with the plates M' and N' and M^2 and N^2 , respectively. 70

The plate H' is preferably formed with two lips h' h' , projecting upon opposite sides of the blade f' , and likewise the plate K' has two lips k' k' for receiving the same blade f' . 75 These lips may be of resilient copper and sufficiently near together to be forced apart by the blade as it enters, and thus afford good frictional contacts with the blades. The other plates M' N' , &c., are similarly constructed. The contact-lips h' k' are preferably fastened into their several plates by 80 screws or rivets v v . For convenience of construction the plates K' and N' are formed in one piece, being shaped to project upon opposite sides of the pivoting-plate a' , and likewise the plates K^2 and N^2 . The blades upon the respective levers widen toward their outer ends, and the ends of the lips carried upon the respective contact-plates are beveled to correspond, the angles being such that contact will be made with the several sets of plates approximately at the same time when 85 the lever is turned in either direction.

It is designed that the terminals of a source of electricity—such, for instance, as an alter- 95 nate-current electric generator A' —shall have

its respective poles connected by the conductors 1 and 2 with the plates K' N' and K^2 N^2 . The plates H' and H^2 are respectively connected with main lines or feeders L' and L^2 , for instance, and the plates M' and M^2 are connected with other lines I^3 and I^4 . By throwing the handle B' of the lever B in one direction or the other circuit-connections may thus be made from the generator to either pair of lines at will.

For the purpose of interrupting the connections of the generator the lever may be placed in a position midway between the sets of plates, and for the purpose of holding it in such position bolts r' are inserted in the plates a' and a^2 . These are normally forced upward against the corresponding arm b' or b^2 by a spring r . At the proper point in each arm b' or b^2 there is preferably formed an indentation, as shown at s , for receiving the head of the bolt and holding the arm midway between the sets of plates. These springs and bolts also afford sufficient friction to hold the lever B in any desired position.

It is designed that the switch shall be placed against the wall in the position shown in the drawings, so that when the handle is in its central position, completing no circuit-connections, it will stand out from the wall. In practice it is found to be a matter of great convenience to be thus able to determine at a glance whether or not the circuit-connections are completed, and if so, with which set of conductors.

Heretofore it has been customary to move the switches for this class of work parallel with their bases or supports, instead of outward.

The advantage of the present construction is apparent.

It is desired, also, to direct attention to the fact that the lever itself is not in connection with the generator or source of electricity when the switch is in its intermediate position, and that the parts are so arranged as to

complete the connections with the outside conductors simultaneously with or approximately simultaneously with the completion of the connections with the generator.

We claim as our invention—

1. The combination, with a supporting base of two pivoted arms or levers moving in different parallel planes, a handle for moving the same, contact-blades carried upon the respective sides of each lever, and two sets of contact-plates for each lever projecting from the base in the plane of movement of the corresponding lever, said blades being narrowed toward the point of support of the levers, and said contact-plates being beveled in a corresponding direction.

2. The combination, with two pivoted levers moving in different parallel planes and single handle with which both are connected of contact-blades carried by each lever and extending in the plane of movement of the corresponding lever, two sets of contact-plate for each lever, one contact-plate of each set being connected with a corresponding contact-plate of the other set, and a retaining device normally tending to hold the lever in a position midway between the sets of contact-plates.

3. In a switch for electric circuits, the combination of the base, two contact-arms located in two different parallel planes for completing circuit-connections, and pivoted upon said base and capable of moving toward and away from the base, contact-plates for the arms upon the base, and a single actuating device or handle for both arms.

In testimony whereof we have hereunto subscribed our names this 4th day of August A. D. 1887.

PHILIP LANGE.

OLIVER B. SHALLENBERGER.

Witnesses:

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