

(No Model.)

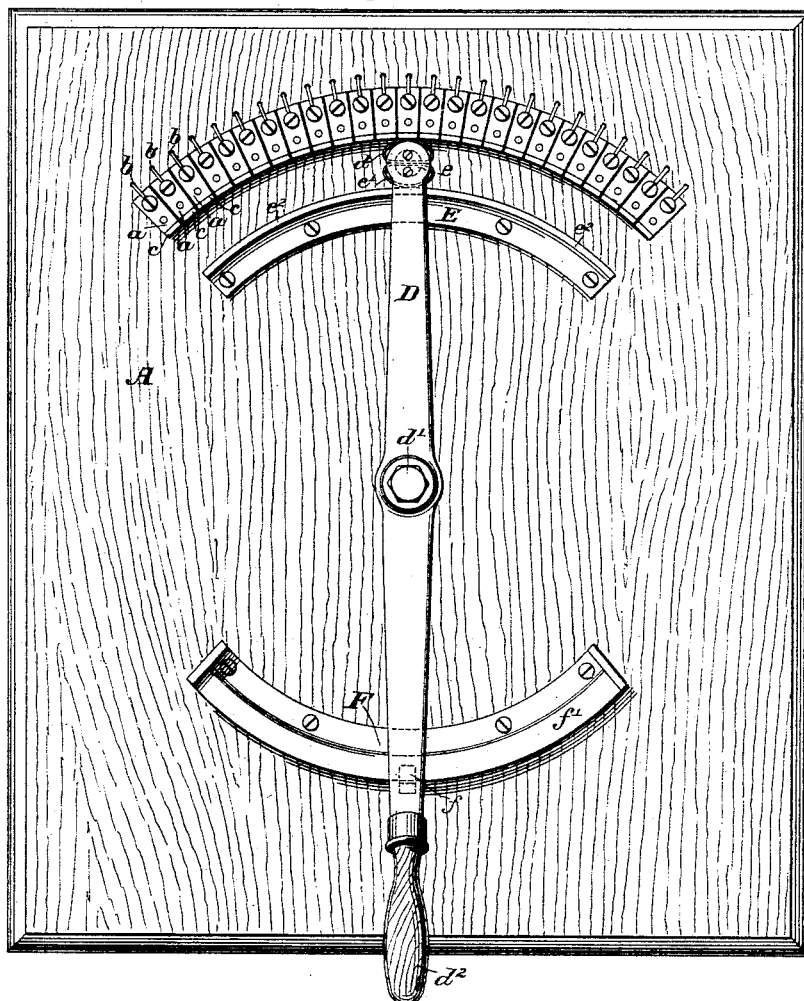
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SWITCH FOR ADJUSTABLE RESISTANCES.

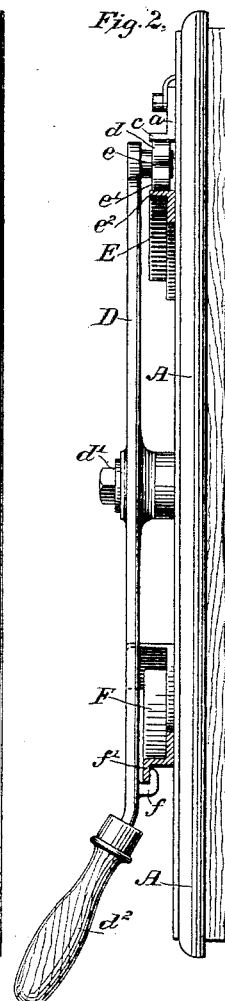
No. 383,647.

Patented May 29, 1888.

*Fig. 1.*



*Fig. 2.*



Witnesses,

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# UNITED STATES PATENT OFFICE.

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## SWITCH FOR ADJUSTABLE RESISTANCES.

SPECIFICATION forming part of Letters Patent No. 383,647, dated May 29, 1888.

Application filed September 1, 1887. Serial No. 248,481. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP LANGE, a citizen of the United States, residing in Pittsburg, in the county of Allegheny, in the State of Pennsylvania, have invented certain new and useful Improvements in Switches for Adjustable Resistances, of which the following is a specification.

The invention relates to the construction of circuit-controlling devices for adjusting the amount of resistance included in an electric circuit, and the object is to provide a convenient and reliable form of circuit-closing device.

The invention consists, generally, in mounting upon a suitable base or box carrying the adjustable resistance a series of contact-plates connected with different points in the length of the resistance, and applying thereto a lever carrying laterally-yielding contacts, which are pressed between the plates, and a guide-plate, which is also mounted upon the base. The contact-lever carries an arm which projects underneath the flange of a suitable plate for steadying its movement. The electrical connections are made with the separate plates through vertical lugs projecting upward some distance from the base. This construction is desirable, so that in case the base-board should warp the lever will still carry the contact-springs in contact with the plates, thus avoiding a difficulty which has been experienced in constructions employed heretofore wherein the contact-surfaces are parallel with or flat upon the base-board.

In the accompanying drawings, Figure 1 is a front and Fig. 2 a side elevation of a switch embodying the features of the invention.

Referring to the figures, A represents a suitable base-board carrying the resistance. Upon this board there is mounted a series of contact-plates, *a a*, to which are connected conductors *b b*, leading from different points in the length of a suitable resistance. (Not shown.) These plates *a* are each provided with an upwardly-extending lug or arm, *c*, the face of which constitutes a contact-surface for a spring, *d*, carried upon a lever, D. The lever D is pivoted at *d'* to the base-board, and is turned upon its pivot by means of a

handle, *d''*, which is preferably of non-conducting material. The plates *a* are arranged in the arc of a circle, having its center at the point *d'*. The spring *d* is preferably formed by bending a piece of resilient metal into the loop form shown, the ends being clamped in a pin, *e*, of insulating material carried by the lever D. A similar contact, *e'*, is curved about the opposite side of the pin *e*, and this bears against a plate, E. This plate E is provided with an upwardly-extending lug, *e''*, similar to the lugs *c*. The lugs *c* and *e''* extend upward a sufficient distance to insure that the spring *d* shall not be thrown out of contact with any of the plates *a*, even though the base-board A should become considerably warped.

One terminal of an electric circuit may be connected to the plate E, and the other terminal to one of the end plates, *a a*, of the series. The amount of resistance which will then be included in circuit may be varied by moving the contacts *d* and *e'* toward and from that end plate.

For the purpose of holding and guiding the lever D a catch, *f*, upon the under side of the lever, near its handle *d''*, extends beneath a flange, *f'*, upon a plate, F, which is curved to the center *d'*.

I claim as my invention—

1. In a switch for resistances, the combination of the base-board, the plates *a a*, having the lugs *c c* projecting perpendicularly from the base-board, the lever D, and a contact-surface, *d*, carried thereby and pressing against the faces of said lugs in a direction parallel with the plane of the base-board.

2. In a switch for resistances, the combination, with a series of plates, *a a*, having the outwardly-projecting lugs *c*, of the lever D, having its axis parallel with said lugs, the plate *e*, having the lug *e''*, and contact-springs *d* and *e'*, compressed between the lugs *c* and *e''*.

3. In a switch for resistances, the combination of the plates *a a*, having the outwardly-projecting lugs *c*, the lever D, a contact-surface, *d*, pressing against said lugs, and a guide-plate, F, having the flange *f'*, and the catch *f*, carried upon said lever and projecting beneath said flange.

4. In a circuit-controlling switch, the combination, with the contact-plates and lever, of a contact-spring carried by the lever and pressing against said plates, consisting of a looped  
5 band of resilient metal having its ends projecting toward each other and fastened to the lever, substantially as described.

In testimony whereof I have hereunto subscribed my name this 4th day of August, A. D. 1887.

PHILIP LANGE.

Witnesses:

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