

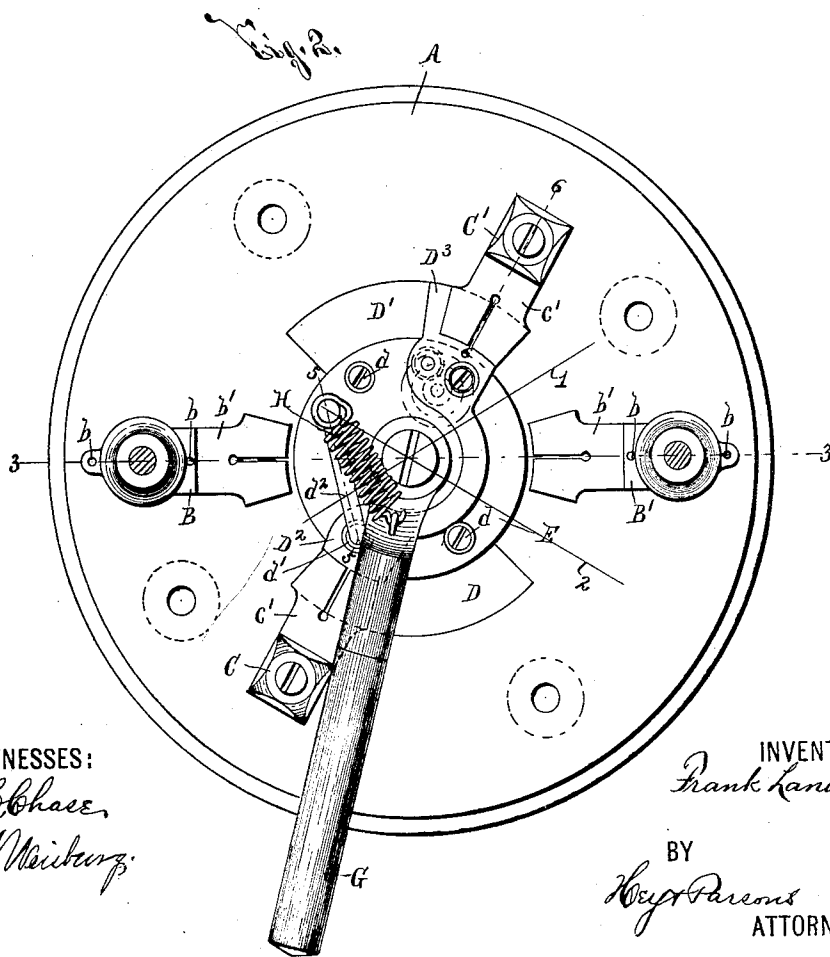
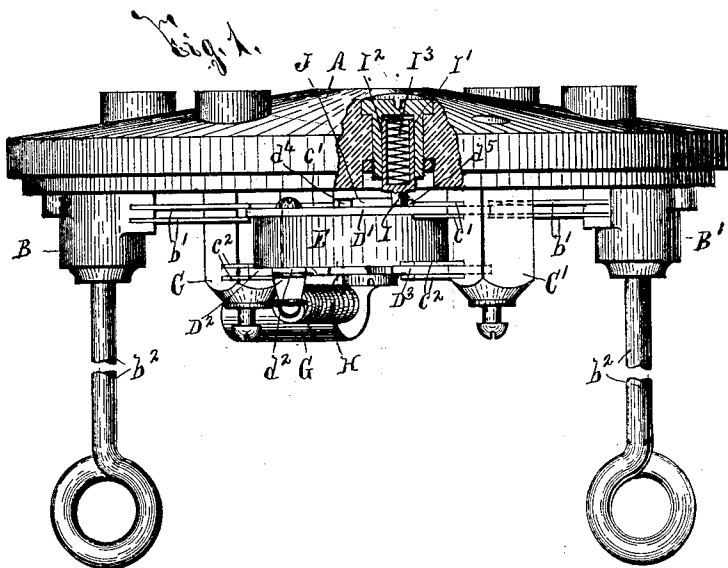
(No Model.)

2 Sheets—Sheet 1.

F. LAND.
ELECTRIC SWITCH.

No. 561,116.

Patented June 2, 1896.



WITNESSES:
H. C. Chase
E. A. Weitzburg

INVENTOR
Frank Land.

BY
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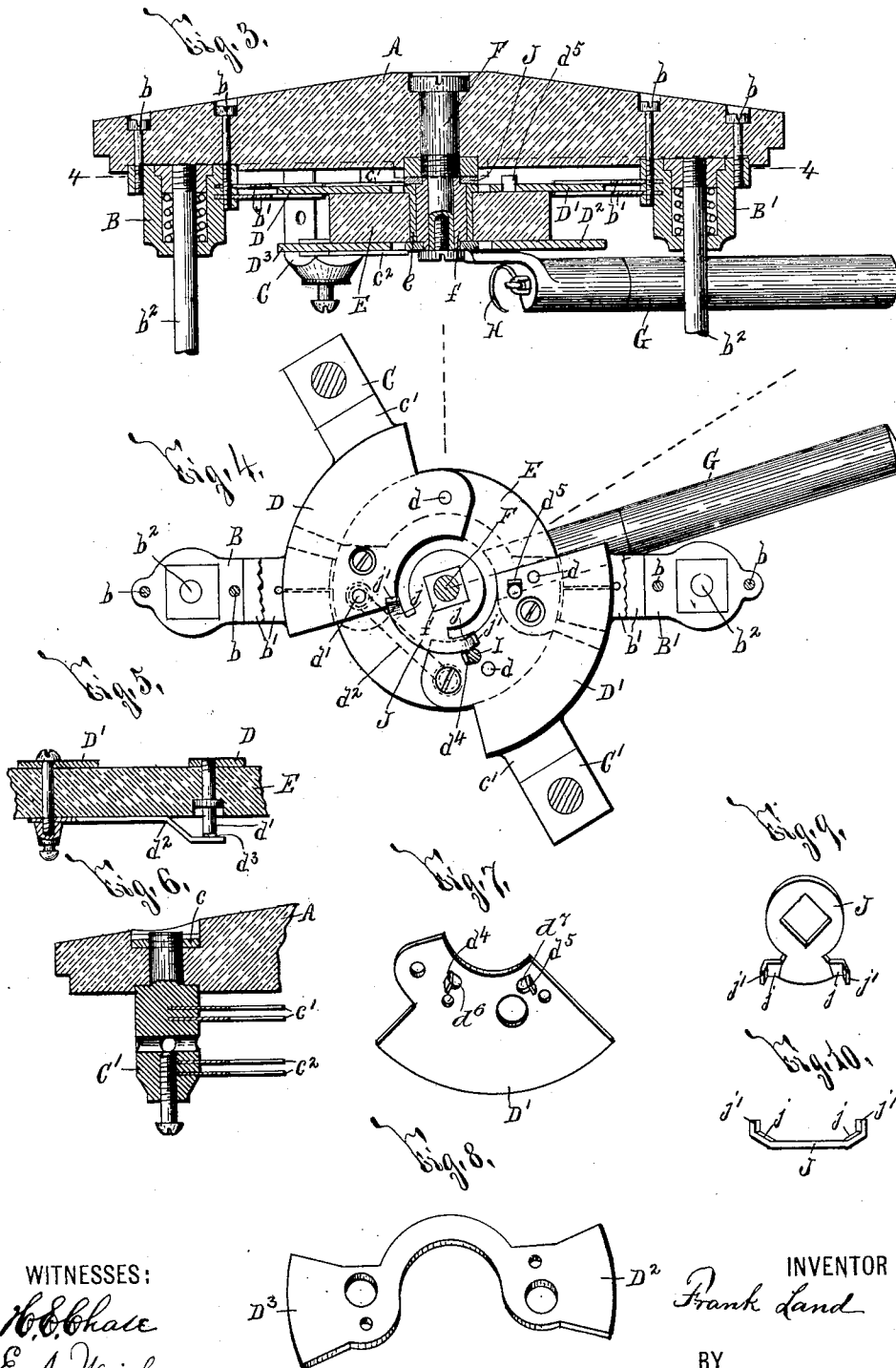
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UNITED STATES PATENT OFFICE.

FRANK LAND, OF SYRACUSE, NEW YORK.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 561,116, dated June 2, 1896.

Application filed June 19, 1895. Serial No. 553,280. (No model.)

To all whom it may concern:

Be it known that I, FRANK LAND, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful
5 Improvements in Electric Switches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in
10 electric switches, particularly applicable for use with arc electric lamps, and has for its object the production of a device which is economically manufactured, readily assembled, and particularly effective in operation;
15 and to this end it consists, essentially, in the construction and arrangement of the component parts of the switch, all as hereinafter fully described, and pointed out in the claims.

In describing this invention reference is
20 had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figures 1 and 2 are respectively an elevation, partly in section, and an inverted plan
25 view of my improved switch. Figs. 3 and 4 are vertical and horizontal sections taken, respectively, on lines 3 3, Fig. 2, and 4 4, Fig. 3. Figs. 5 and 6 are detail sections taken, respectively, on lines 5 5 and 6 6, Fig. 2. Fig.
30 7 is an isometric view of one of the inverted movable terminals of my switch. Fig. 8 is an isometric view of a movable connecting bar or piece provided with terminals at its
35 extremities, and Figs. 9 and 10 are respectively isometric and edge views of the inverted movable cam of my switch.

The base A of my improved switch, which preferably supports an arc electric lamp connected thereto, is of any desirable form, size,
40 and construction, although its upper face preferably inclines downwardly from its central portion.

B B' are opposite fixed terminals secured
45 to the lower face of the supporting-base A by suitable fastening means, as screws b, and provided with inwardly-extending engaging portions, which preferably consist of separated arms or plates b', arranged in close
50 proximity to the lower face of said base. The terminals B B' are also provided with pendant supports, as rods b², formed of conduct-

ing material and having their upper ends suitably connected to said terminals and their lower ends adapted to support an arc electric
55 lamp. It is obvious, however, that other articles may be supported by the rods b² and that said rods may be dispensed with, if desired.

C C' are additional opposite fixed terminals secured to the lower face of the supporting-base A by suitable fastening means, as
60 screw-threaded shanks and nuts c. As best seen at Fig. 2, the terminal C is considerably closer to the terminal B than to the terminal B', and the terminal C' is correspondingly
65 closer to the terminal B'. The line-wires (not illustrated) are suitably secured to the terminals C C', which are provided with engaging portions, Fig. 6, consisting, preferably, of separated
70 arms or plates c', alined with the corresponding plates b' of the terminals B B', and similar separated arms or plates c², considerably separated from the plates c'.

D D' D² D³ are movable terminals for engaging the fixed terminals B B' C C', and E
75 is a support for said movable terminals. The terminals D D' are preferably of greater length than the distance between the adjacent fixed terminals B C B' C' in order that
80 the terminals D D' may simultaneously engage the arms or plates b' c' of the adjacent fixed terminals and electrically connect the same for passing the current to the terminals
85 B B', whence it is conducted to the lamp or other article connected to my switch.

The terminals D D' are insulated from each other and are secured by suitable fastening means d to the upper face of a reversely-rocking
90 support E. If desired, suitable conducting-pieces d' d², Fig. 5, separated by combustible insulation d³, may project from the terminals D D' for connecting the same when said insulation is destroyed; but as said
95 conducting-pieces form no part of my present invention it is unnecessary to additionally describe or illustrate the same. The terminals D² D³ engage the arms or plate c² of the fixed terminals C C' when the terminals B B' D D' are disengaged, and although said terminals
100 D² D³ may be connected in any desired manner for permitting the passage of the current from one to the other I preferably form them upon the opposite extremities of a connecting

bar or piece suitably secured to the lower face of the terminal-support E.

G is an actuating-lever for controlling the movement of the terminal-support E, and H is a spring connected to said terminal-support and lever for independently moving the terminal-support. The lever G preferably rocks to and fro in reverse directions and is removably secured to the lower end of a sleeve *f*, loosely mounted on a spindle F, suitably secured to the base A. The terminal-support, which also preferably rocks to and fro, encircles the sleeve *f* and is usually provided with a wearing-sleeve *e*. The lever G is preferably utilized to tension the spring H and to force the same to its operative position, and the terminal-support E is restrained from movement by a suitable stop, presently described, which is automatically forced from operative position during the movement of said lever.

The spring H preferably consists of a spiral normally arranged at one side of the axis of the terminal-support, and its opposite ends, which are suitably secured to the support E and lever G, extend on opposite sides of a line 1, passed through said axis at right angles with the longitudinal plane of said spring. When the lever G has been sufficiently moved to align the spring H with the line 2, Fig. 2, drawn through the axis of the support E, the spring H is considerably elongated, and as said spring is forced beyond said position it tends to shorten and to quickly move the terminal-support E in a direction opposite to that of the lever G. The stop for preventing movement of the terminal-support E until the spring H assumes its operative position may be of any desirable form, size, and construction; but it preferably consists of a spring-actuated pin or bolt I, having a reduced lower extremity movable into engagement with shoulders d^4 d^5 , and also movable into apertures d^6 d^7 , Fig. 7, formed in the movable terminal D' by punching out the metal to produce the shoulders d^4 d^5 , which preferably extend upwardly from said terminal. The shoulders d^4 d^5 limit the reverse movements of the terminal-support E when actuated by the spring H, and the walls of the apertures d^6 d^7 form stop-shoulders, which, when engaged by the reduced lower end of the pin or bolt I, prevent movement of the terminal-support in either direction. The pin or bolt I is provided with a hollow barrel I', guided in a suitable socket I², located in the base A, and a spring I³ is arranged within said barrel and socket for forcing the stop pin or bolt I into operative position.

Any suitable mechanism may be utilized for forcing the reduced lower extremity of the pin or bolt I out of the apertures d^6 d^7 in the terminal D' and permitting onward movement of the terminal-support E; but I preferably use a cam J, removably secured to the upper end of the sleeve *f* and provided with cam-faces *jj* for engaging the lower end face of the barrel I' contiguous to the reduced lower

extremity of the pin or bolt I and forcing said pin or bolt endwise. The lever G and the cam-faces *jj* are so relatively arranged and proportioned that the movement of said lever necessary for forcing the spring H to assume its operative position is sufficient to cause one of said cam-faces to elevate the barrel I' and thereby remove the reduced lower end of the pin or bolt I from operative position, whereupon the spring H is free to automatically rock the terminal-support E. During or after the movement of the terminal-support the lever G continues its movement until stop-shoulders *jj'*, formed upon the cam J, engage the peripheral face of the barrel I', which preferably forms a stop for limiting the movement of the lever G and the cam J.

The operation of my invention will be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be evident that the current is alternately conducted to the terminals B B' and prevented from passage thereto, that the terminal-support is prevented from movement until the desired moment and is actuated by a quick-acting spring as soon as it is free to move, and that the actuating-lever for the switch merely disengages the terminal-support from its stop and forces said spring to its operative position.

The exact detail construction and arrangement of the parts of my switch may be somewhat varied without departing from the spirit of my invention, and hence I do not herein specifically limit myself thereto.

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

1. In an electric switch, the combination of pairs of opposite fixed terminals, a reversely-movable terminal-support, opposite movable terminals secured to the support and formed of greater length than the distance between the adjacent fixed terminals, for simultaneously engaging said fixed terminals, a conducting bar or piece secured to the support and provided with opposite terminals and additional fixed terminals for engaging the terminals of the conducting bar or piece, substantially as and for the purpose specified.

2. In an electric switch, the combination of pairs of opposite fixed terminals, a movable terminal-support, opposite movable terminals secured to the support and formed of greater length than the distance between the adjacent fixed terminals, for simultaneously engaging said fixed terminals, a conducting bar or piece secured to the support and provided with opposite terminals and additional fixed terminals for engaging the terminals of the conducting bar or strip, a lever movable on the same axis as the support, and a spring connected to the support and the lever for moving said support independently of the lever, substantially as and for the purpose set forth.

3. In an electric switch, the combination of

a supporting-base, fixed terminals secured to the base, additional fixed terminals secured to the base and provided with engaging portions separated a greater distance from the base than the engaging portions of the former terminals, a movable terminal-support secured to the base, movable terminals fixed to one face of the support for contacting with the former fixed terminals, and a conducting bar or piece secured to the opposite face of the support and provided with opposite terminals for engaging the additional fixed terminals, substantially as and for the purpose specified.

4. In an electric switch, the combination of a supporting-base, a movable terminal-support secured to the base, a stop supported by the base for preventing movement of the support, a spring for forcing the stop to operative position, a movable cam interposed between the base and the terminal-support for forcing the stop from operative position, and a lever supported at the outer face of the terminal-support and connected to the cam for actuating the same, substantially as and for the purpose described.

5. In an electric switch, the combination of a supporting-base, provided with a spindle, a movable lever having a sleeve encircling the spindle, a movable terminal-support, encircling the sleeve and connected to the lever, a stop supported by the base for preventing movement of the support, a spring for forcing the stop to operative position, a cam secured to the sleeve of the movable lever for forcing the stop from operative position, and means for limiting the movement of the lever, substantially as and for the purpose specified.

6. In an electric switch, the combination of a supporting-base provided with a spindle, terminals fixed to the base, a reversely-rocking terminal-support mounted on the spindle and provided with terminals for engaging the former terminals, a reversely-rocking lever mounted on the spindle, a spring connected to the terminal-support and the lever for actuating the terminal-support, a stop for preventing movement of the terminal-support,

and a cam connected to the lever and interposed between the base and the terminal-support for forcing the stop from operative position, substantially as and for the purpose set forth.

7. In an electric switch, the combination of a supporting-base provided with a terminal a movable terminal-support, a terminal secured to said support and provided with a shoulder and a perforation, a stop for engaging the shoulder and the wall of the perforation and thereby preventing movement of the support, and a movable cam for forcing said stop from operative position, substantially as and for the purpose set forth.

8. In an electric switch, the combination of a terminal-support, a stop for preventing movement of the terminal-support, a movable cam having cam-faces for moving the stop endwise and forcing the same from operative position, said cam being provided with a stop-shoulder for engaging the peripheral face of the stop and limiting the movement of the cam, substantially as and for the purpose specified.

9. In an electric switch, the combination of a supporting-base provided with a spindle, a movable lever having a sleeve encircling the spindle, a terminal-support provided with a sleeve encircling the former sleeve, a terminal secured to the support and having stop-shoulders, a stop for alternately engaging the shoulders, a movable cam secured to the first sleeve and provided with stop-shoulders and opposite cam-faces for alternately forcing the stop from operative position, and means for engaging the stop-shoulders of the cam and limiting its movement, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 5th day of June, 1895.

FRANK LAND.

Witnesses:

E. A. WEISBURG,
K. H. THEOBALD.