No. 691,780. Patented Jan. 28, 1902.

C. J. KINTNER.

ELECTRICAL SWITCH.

(Application filed Oct. 29, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

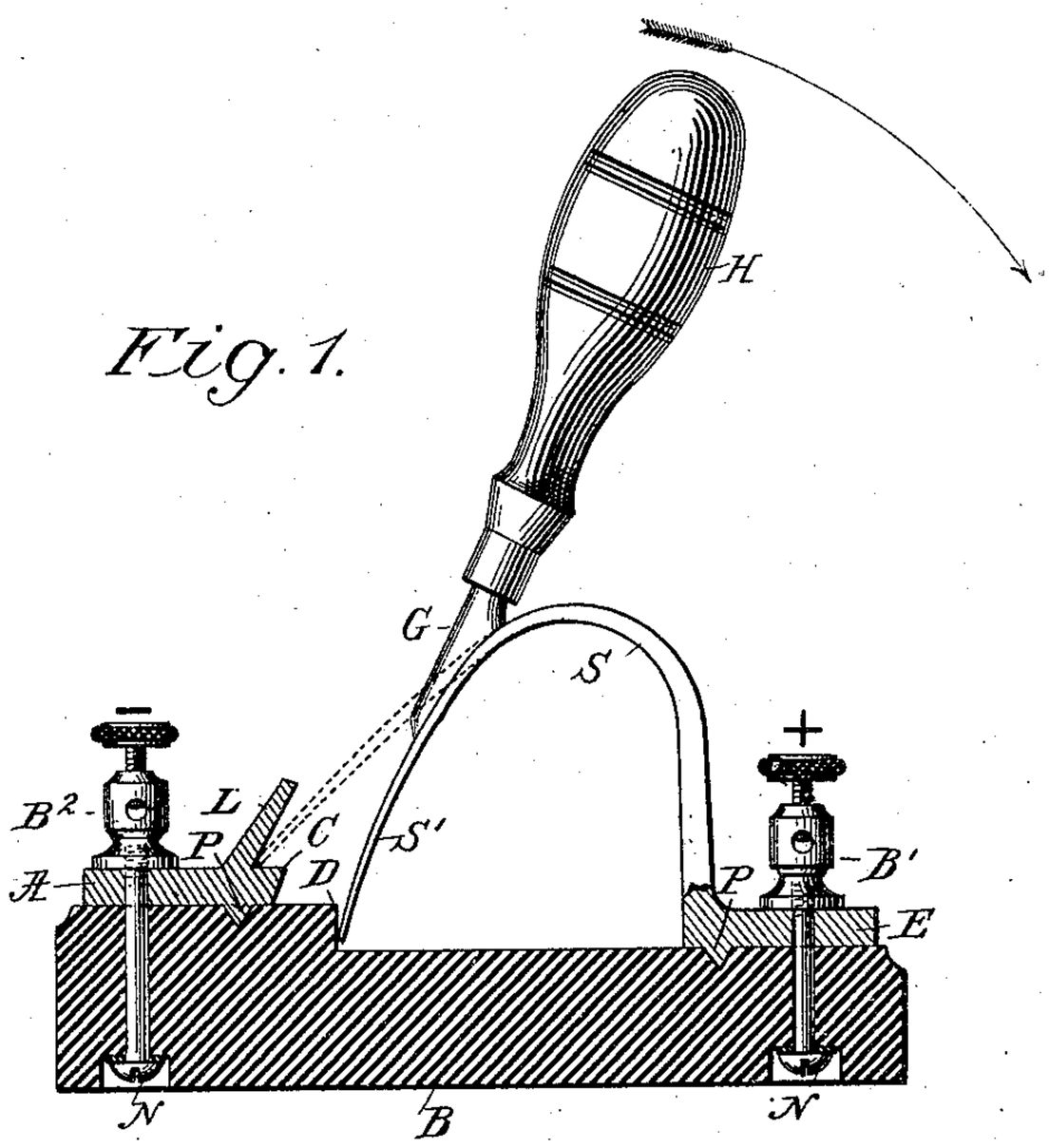

Fig. 2.

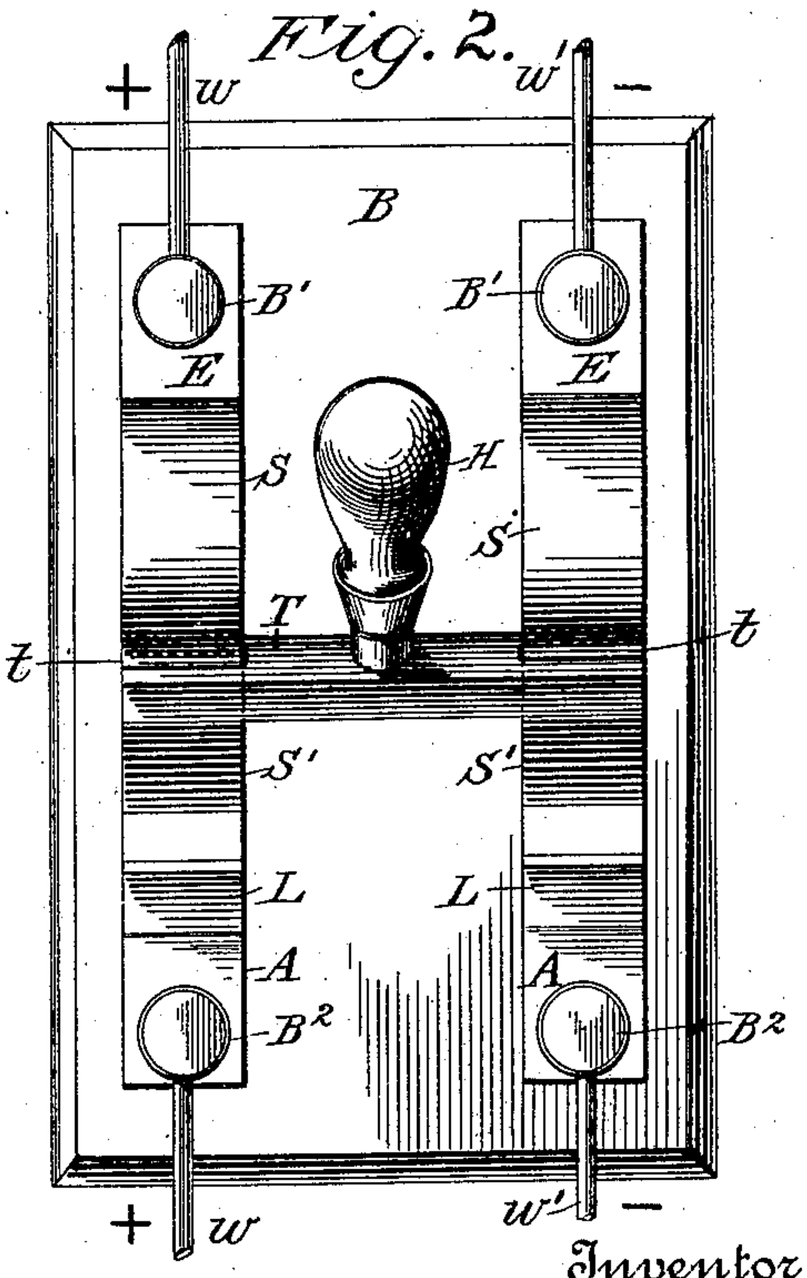

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Fig. 3.

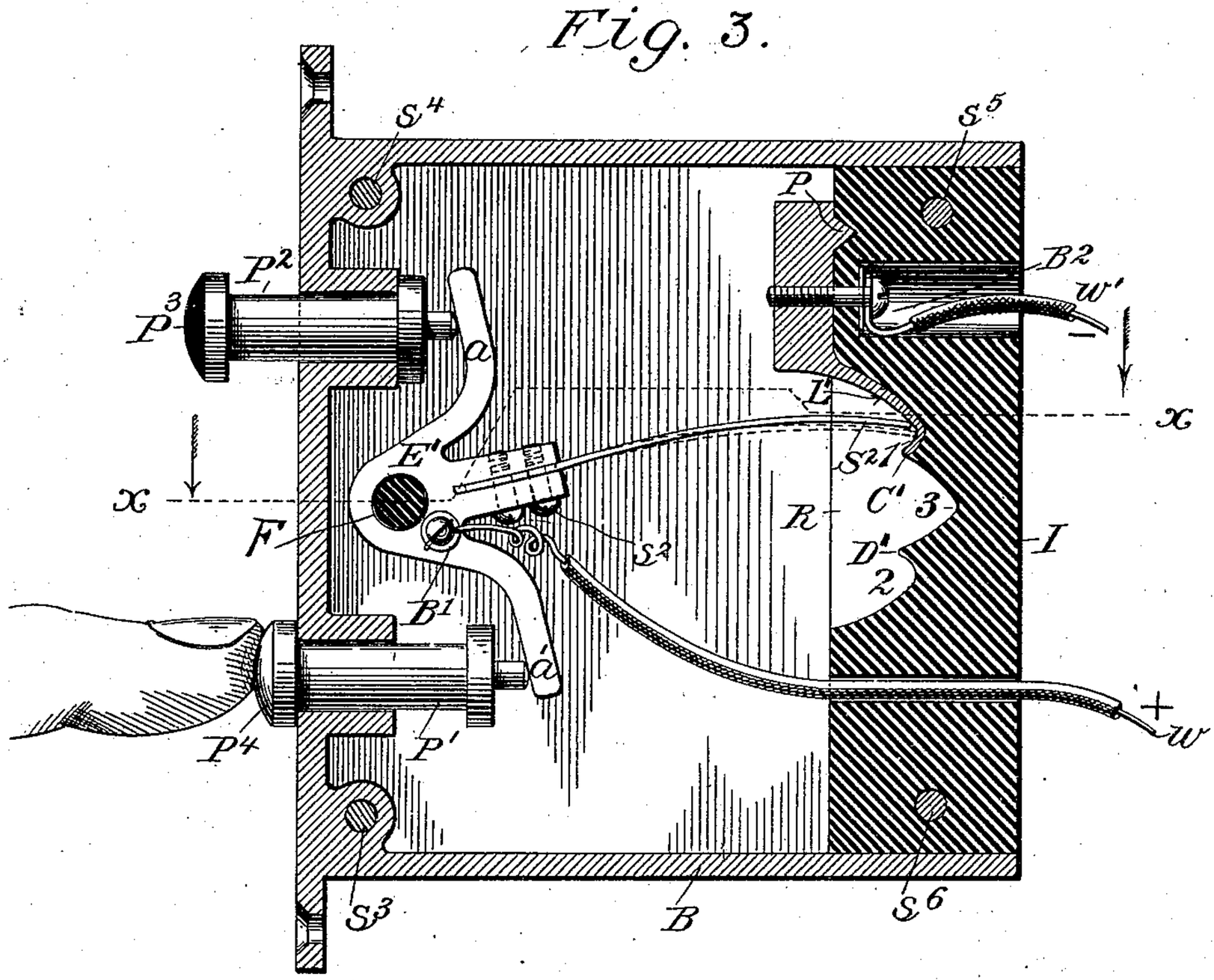
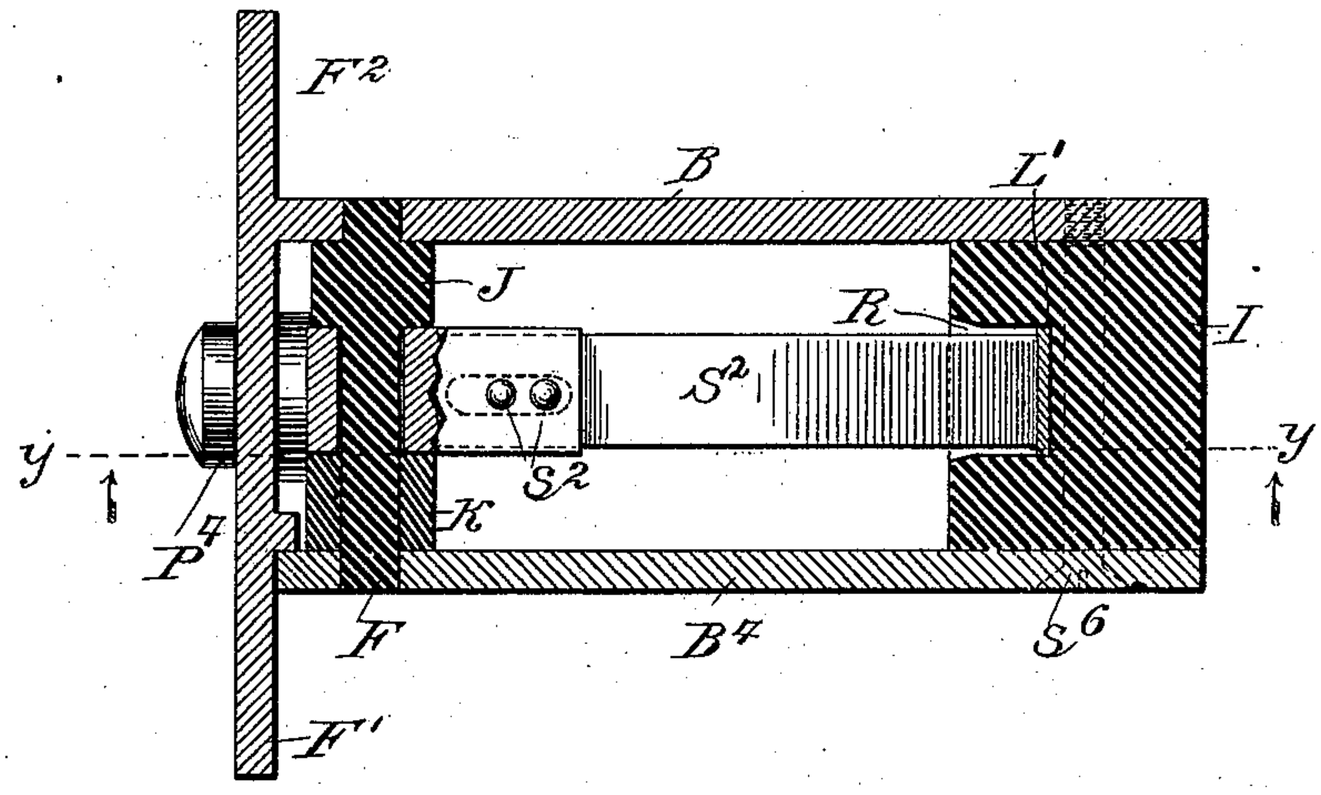


Fig. 4.



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CHARLES J. KINTNER, OF NEW YORK, N. Y.

ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 691,780, dated January 28, 1902.

Application filed October 29, 1900. Serial No. 34,766. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. KINTNER, a citizen of the United States, residing at New York, in the borough of Manhattan, county and State of New York, have made a new and useful Invention in Electrical Switches, of which the following is a specification.

My invention is directed particularly to improvements in that type of switches known in the art as "snap-switches;" and it has for its object to devise a switch of this type which shall be of the simplest possible structure, least number of parts, and adapted for use wherever it is required to quickly and effectively interrupt an electrical circuit of relatively high potential without dangerous or damaging arcing and will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view, taken through the body, of the simplest form of my novel switch, parts of the switch being shown in side elevational view. Fig. 2 is a plan view illustrating the application of my improvement to a bipolar switch. Fig. 3 is a vertical sectional view taken through Fig. 4 on the line *y y* and as seen looking thereat in the direction of the arrows from the bottom toward the top of the drawings, illustrating the application of my improvement to what is known in the art as a "flush switch." Fig. 4 is a transverse sectional view of the same, taken on the broken line *x x*, Fig. 3, and as seen looking thereat in the direction of the arrows from the top toward the bottom of the drawings.

Referring now to the drawings in detail, and first to Fig. 1, B represents an insulating base-board or support, preferably of marble or slate, and E and A are the metallic or conducting terminals of the switch proper secured thereto by binding-posts B′ B² and screws N N, extending through said parts. The terminal E is made, preferably, of steel and is so constructed that its free or movable end is in the nature of a thin flat leaf-spring S′, the intermediate portion S between the terminal E and the spring S′ being of gradually-decreasing thickness. The part S is curved, as shown, so that when the terminal E is secured to the base and the free end of S′ is in the position shown behind the ledge D of an upraised portion of the base B it will be under strain. H is an insulating-handle supported by a metallic shank G, which in turn is brazed or otherwise secured to the combined part S S′. The inner end of the fixed terminal A, adjacent to the free end of the movable spring-terminal S′, is provided with an upwardly-extending arm L and an angular ledge C, the point of which bears a fixed or definite relation to the fulcrum about which the handle H turns when moved in the direction of the arrow. The angle of the ledge D bears the same relation to said fulcrum. P P are cone-shaped lugs on the under surfaces of the terminals A and E, adapted to fit into corresponding cone-shaped holes in the base B, the arrangement being such that when the binding-posts B′ B² and screws N N are in position the terminals A and E will be firmly secured to the base or support and in direct alinement with each other. The operation of this form of the apparatus is as follows: Under the present condition the circuit is interrupted between the free end of the movable spring-terminal S′ and the adjacent end of the fixed terminal A, and said spring is held under strong tension against the face of the ledge D. To connect the switch in circuit, the operator simply takes hold of the handle H and bears down upon it, forcing it to the right in the direction of the arrow, thereby causing the free end of the movable spring-terminal S′ to snap over the ledge D and past the corresponding ledge C against the face of the arm L of the fixed terminal A. When the handle is released, the spring S′ assumes the position shown in dotted lines, bearing endwise, with its free end abutting firmly against the angular face between the upwardly-extending arm L and the ledge C and in such manner that the flat face thereof makes relatively large surface contact against the corresponding face of said arm. When it is desired to rupture the circuit, the switch-handle is simply moved in the other direction, the spring-terminal S′ being caused to buckle a sufficient amount to give it a snap-acting force, so that its free end will snap past the ledges C and D in a reverse direction from the first operation, where it will remain, as clearly shown in full lines in the drawings.

In Fig. 2 of the drawings I have shown the application of this especial form of my improvement to a bipolar switch where the parts, as shown and described in connection with Fig. 1, are simply duplicated in the + and — circuits of an electrical system embodying two current-mains *w w' w' w'*. In this structure, however, the combined parts S S' are connected together by a cross-bar T, of hard rubber, having grooves, as shown at *t t*, at its opposite ends, which fit snugly over the parts S S' of the combined switch, the handle H in this instance being secured to the middle of the cross-bar T. The operation of this form is obvious, it being apparent that the circuit will be interrupted at two points in the current-mains *w w w' w'* simultaneously in the same manner that it was interrupted at one point by the switch shown in Fig. 1.

In Figs. 3 and 4 I have illustrated the application of my improvement to what is known in the art as a "flush snap-switch," in which the outer face of the supporting base or box of the switch is flush with the wall or facing wherein it is seated and secured and two push-buttons are provided for actuating the switch. In this form of the improvement, B represents the supporting-base in the nature of a metallic box, and B^4 the cover therefor, the part B being provided with flanges F' F^2, extending entirely around it, and internal bearings for push-pins P' P^2, which latter are made, preferably, of hard rubber or other insulating material and provided with heads at their opposite ends, the outer heads P^3 P^1 being the former of black material and the latter of light material, as is usual, and both detachable from the pins. S^2 represents the yielding or movable terminal of the switch, which is similar in all respects to the spring S', hereinbefore described, and it is adjustably secured in a slit in the pivotal terminal E' by clamping-screws s^2 s^2, said terminal being provided with operating-arms *a a'* and pivotally supported upon an insulating journal-bearing F, provided with a shoulder J and washer K, the arrangement being such that when the parts are assembled the terminal will be wholly insulated from the box B and its lid or cover B^4, while the free end of the spring S^2 will be adapted to move back and forth through an opening R in an insulating-block I, preferably of porcelain or hard rubber, the bottom of said opening being constructed, as shown, with three depressions 1, 2, and 3. The depression 3 is considerably deeper than are the corresponding depressions 1 and 2, the function thereof being to enable one to adjust the spring S^2 to the proper position in the slit and secure the same therein with the clamping-screws s^2 when the switch is set up. The insulating-block I, the cover B^4, and the box B are properly assembled and secured together by four screws s^3 s^4 s^5 s^6, although the screws s^3 s^4 might be done away with, if preferred, and a single screw substituted therefor, extending through the insulating-bearing F in a manner which will be entirely obvious. One of the conductors *w* extends through an opening in the insulating-block I and is secured by a binding-post B' directly to the terminal E'. The other conductor *w'* and the conducting fixed terminal are secured to the insulating-block I by a binding-post B^2 and projecting lug P in substantially the same manner as are the like parts in Fig. 1. The downwardly-extending arm L' partakes of the necessary curvature to fit within the depression 1 so that its free end constitutes a ledge C', similar to the corresponding ledge C, Fig. 1, D' being a shoulder or ledge corresponding to the like shoulder or ledge in Fig. 1. The operation of this modified form of the invention will be obvious, it being apparent that on depressing the push-pin P' by the thumb, as illustrated, the switch will assume the position shown in full lines, and upon removal of the thumb it will assume the position shown in dotted lines, there being sufficient endwise pressure between the free end of the spring S^2 and the arm L' to always assure good contact and to leave it (the spring) slightly buckled or curved, so that when the push-pin P^2 is acted upon the spring will buckle in a reverse direction in the same manner as did the like part in Fig. 1 and the end thereof ultimately be seated in the depression 2 behind the ledge D'. In other words, when the free end of the spring S^2 is released from either of the positions behind the ledge C' or D' the pressure exerted upon the proper push-pin at that time, together with the elastic action of the spring S^2, will cause its free end to pass entirely over the depression 3 and behind the proper ledge C' or D'.

I do not limit my invention to the specific constructions herein shown and described for effecting the rupture of a relatively high potential electrical circuit without damaging or dangerous arcing, as I believe I am broadly entitled to claim a structural electrical switch in which the buckling or yielding action between a conducting-spring which constitutes the movable conducting-terminal thereof is brought into play by endwise pressure against a fixed conducting-terminal and in such manner that a snap action is effected at the free end of the movable spring terminal when the operating or controlling handle of such movable terminal is moved in opposite directions through a definite range of movement, so as to cause the buckling action of the spring to effect a sudden snap or rupture of the circuit, and my claims are generic as to the application of this buckling action due to endwise pressure between the fixed and movable terminals.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An electric switch consisting of fixed and movable conducting-terminals, the movable

terminal being in the nature of a spring so arranged, when the circuit is closed, that the free end thereof bears endwise against the fixed terminal, thus causing the spring to be bent or buckled under pressure, and in such manner that when it is forced away from the fixed terminal it will leave the same with a sudden or snap action, substantially as described.

2. An electric switch consisting of fixed and movable conducting-terminals, the movable terminal being in the nature of a spring yieldingly secured at one end only to a base or support, while the free end thereof is adapted to contact with the fixed terminal secured to the same base or support, the arrangement being such that when the circuit is closed the free end of the movable terminal bears endwise against the fixed terminal and causes the spring to assume a bent or buckled shape, substantially as described.

3. A snap-switch consisting of fixed and movable conducting-terminals secured to a supporting-base, the movable terminal being in the nature of a spring operatively connected with two push-pins extending through the face of the base, the fixed terminal being secured in the path of the free end of the movable terminal in such manner that when the circuit is closed the movable terminal is caused to assume a bent or buckled shape, owing to the endwise pressure between it and the fixed terminal, substantially as described.

4. An electric switch consisting of fixed and movable conducting-terminals secured to a base or support, the movable terminal being in the nature of a spring adjustable in the direction of its length and adapted, when the circuit is closed, to bear endwise against the fixed terminal in such manner as to give to the spring a bent or buckled shape, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES J. KINTNER.

Witnesses:
JAMES P. J. MORRIS,
M. F. KEATING.