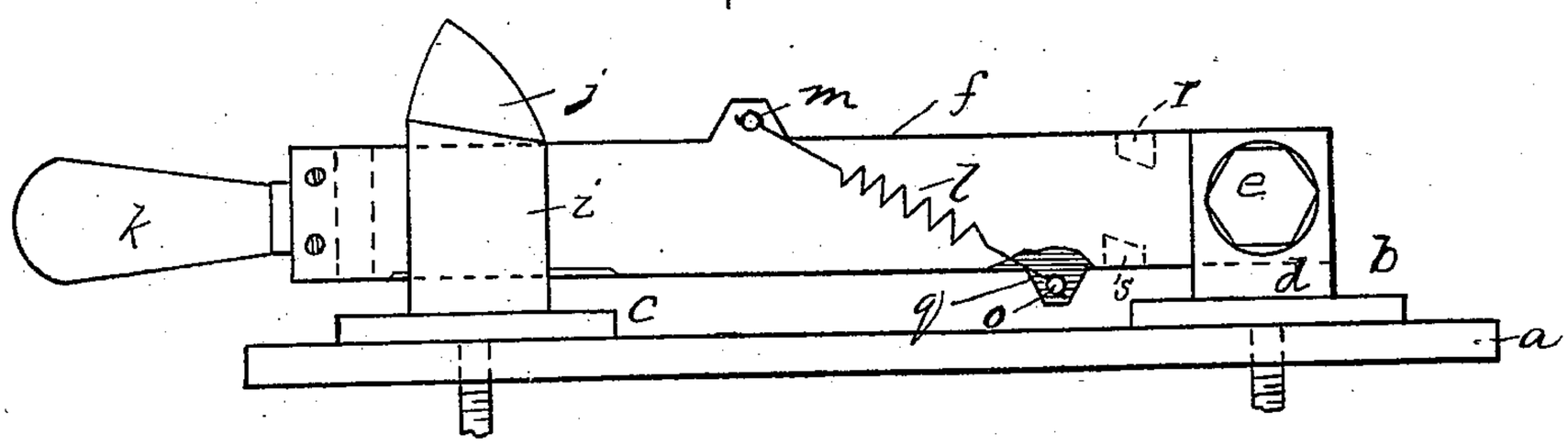
(No Model.) 2 Sheets—Sheet 1.

A. B. HERRICK.

SNAP SWITCH.

No. 556,185. Patented Mar. 10, 1896.

Fig. 1.



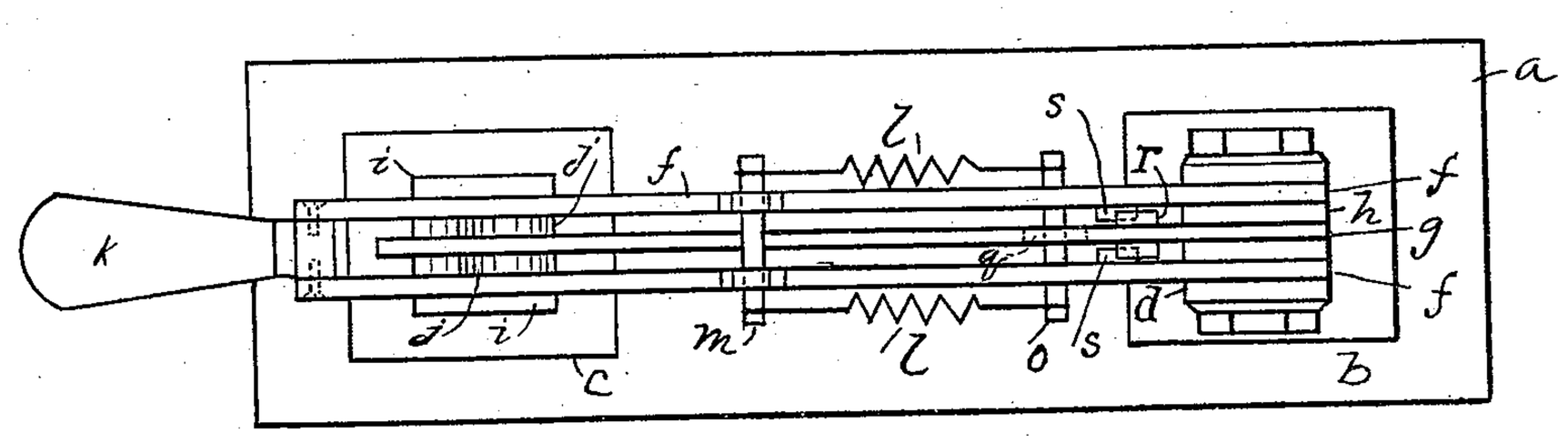


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

A. B. HERRICK.

SNAP SWITCH.

No. 556,185. Patented Mar. 10, 1896

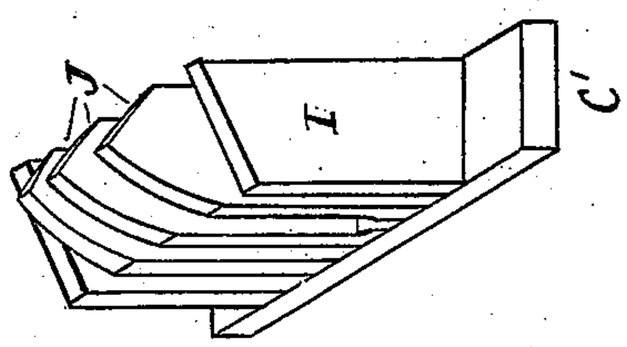


Fig. 3.

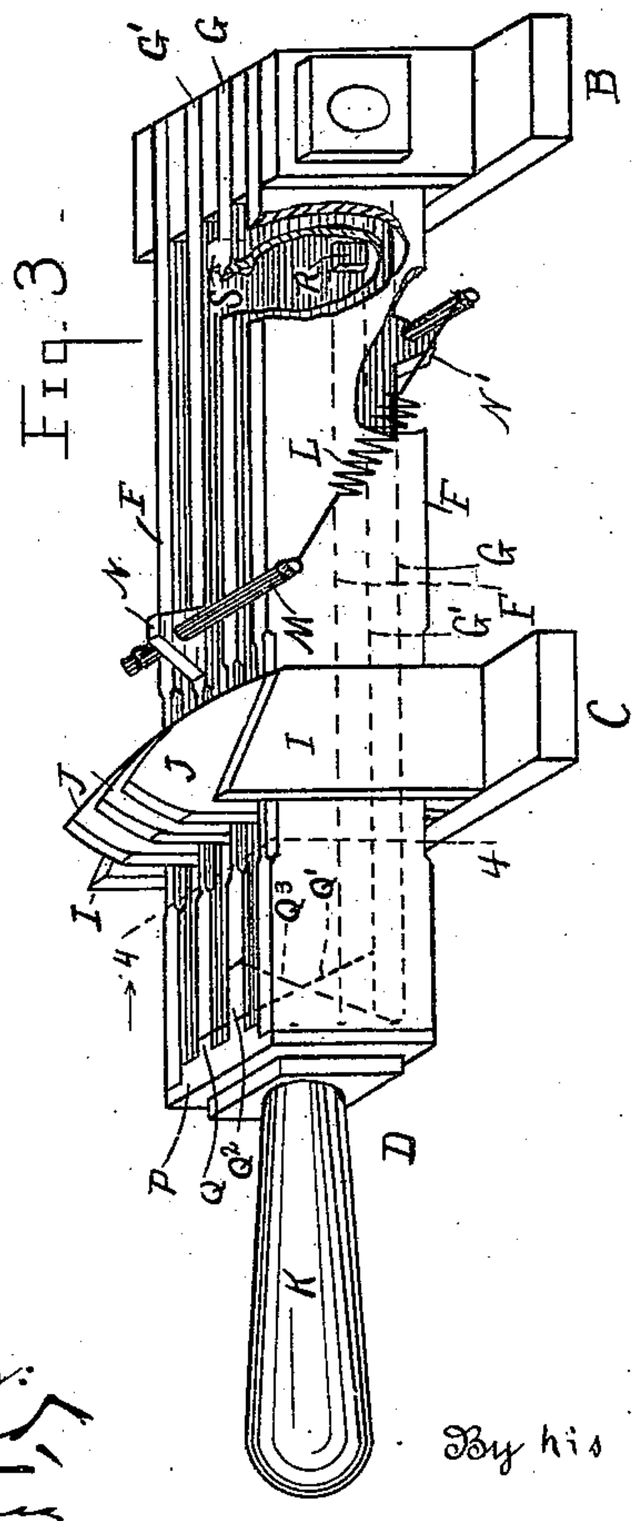
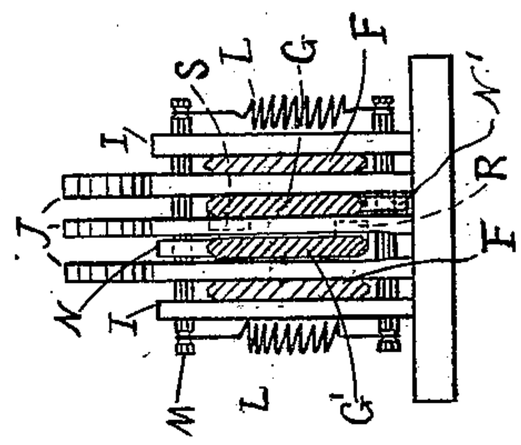


Fig. 4.



Witnesses:
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Inventor

By his Attorney Charles M. Catlin.

UNITED STATES PATENT OFFICE.

ALBERT B. HERRICK, OF BAYONNE, NEW JERSEY, ASSIGNOR TO THE GENERAL INCANDESCENT ARC LIGHT COMPANY, OF NEW YORK, N. Y.

SNAP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 556,185, dated March 10, 1896.

Application filed November 23, 1895. Serial No. 569,952. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. HERRICK, a citizen of the United States, and a resident of Bayonne, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Snap-Switches, of which the following is a specification.

This invention relates to snap or rapid-breaking electric switches, the purpose of which is to break electric circuits carrying currents of high potential without arcing at the point where the main switch member breaks contact with a second switch contact or terminal, such switches being in common use.

The main object of my invention is to provide a practical and efficient switch of the character above mentioned. This switch consists substantially of a plurality of pivoted blades side by side with co-operating contact clips or parts, some of the blades being main blades and others being snap-blades, the latter making and breaking contact at a point over which the main blades do not move.

In the drawings, Figures 1 and 2, Sheet 1, are respectively side and plan views of the preferred form of my single-throw switch. Fig. 3, Sheet 2, is a perspective view of my double-throw switch with parts of two of the blades broken away, and Fig. 4 is a cross-sectional view on line 4 4.

Referring to Sheet 1, *a* is a non-conducting base to which are secured switch-terminals *b c*, to which the wires of a circuit to be made and broken may be connected. Terminal *b* has conducting-standards *d*, forming supports for the pivot-bolt *e*, on which the main switch blade or blades *f* and the snap-blade *g* are pivoted, being held the proper distance apart by washers *h*. Terminal *c* has conducting-clips or contact parts *i j*, into contact with which and from which the switch-blades can be moved. The main blades, of which two are shown but of which the number may be varied, are preferably made of sufficient capacity to carry the entire, or nearly the entire, current of the circuit in which the switch is to be used. Said blades are secured to a handle *k*, by which they can be moved by the operator. The snap-blade is in a plane beside the main blades—that is, in a plane intersecting the pivot *e* at a different point in its length—and is not positively connected to the handle, but is connected indirectly through blade *f* and spring *l*. Preferably two springs are used, the upper ends being secured to a pin *m*, secured to blades *f*, near their upper edges, but disconnected from the snap-blade. The lower ends of the springs are secured to a pin *o*, which is connected to the snap-blade by passing through lug *q*, but is not connected to blades *f*.

On the inner faces of blades *f* are lugs *s*, and on the faces or sides of blade *g* are lugs *r*. These lugs are so arranged that when the switch is closed they stand at some distance apart, but when blades *f* are moved to open the switch the lower lugs, *s*, will approach lug *r*. At the same time springs *l* will be put under increased tension, the upper ends being raised while the lower ends remain stationary. About the time blades *f* leave contacts *i j* lugs *s* engage lugs *r*, thus raising the snap-blade until the resistance to movement thereof is small and the springs are able suddenly to pull the blade out and complete the breaking of the circuit.

The clips for the main blades are formed by springs *i j*, and those for the snap-blades by springs *j j*. Said clips are side by side—that is, in planes intersecting the pivot at different points in its length, (each clip corresponding in position to its blade,) but not edge to edge in a single plane and having common clips, as has been heretofore proposed. With the described arrangement of blades and contact clips or parts, the snap-blade has no contact with the surfaces, with which the main blades make contact or over which they rub in breaking the circuit, and consequently no arc will occur between any blade and the contact-surfaces of the clips, which receive the main blades, which will therefore not be burned by arcing nor scratched by roughnesses, such as are caused by arcing. Hence said blades and clips will always make good contact when the switch is closed, and will be more durable than when, as in certain old switches, the circuit is opened at the main clip.

When the snap-blade becomes roughened or burned, it can readily be replaced, the main blades being retained.

The preferred construction of double-throw switch illustrating my improvements is shown on Sheet 2, where B C are the terminals of one circuit and B C′ those of another circuit. D is a switch-arm pivoted to B and adapted to co-operate with either clip C or C′. Arm D is shown as having four blades, (although this number is not essential,) two main blades F, adapted to make contact with clips I J, and two snap-blades G G′, adapted to make contact with clips J only, but not on the same side of either spring J as blades F. The blades and also the clips are beside each other in planes intersecting the pivot at different points in its length, and the circuit is never opened at any part of the surfaces over which the main blades move, as described in connection with Sheet 1.

In order that the switch may serve as a double-throw switch to control a plurality of circuits, a plurality of snap-blades G G are provided, half of which are arranged to snap when the arm D is thrown in one direction, and the other half to snap when it is thrown in the opposite direction from its open position. Blade G is the snap-blade when arm D is moved from terminal C, and blade G′ when said arm is moved from terminal C′. The springs J at terminal C, between which the idle blade G′ stands, are far enough apart to admit the blade without resistance. At clip C′ the springs, between which blade G stands when the switch is closed on that side, are similarly arranged, as shown at the right in Fig. 3. Block P, to which handle K is connected, is provided with a projection Q, which has an inclined edge Q′ fitting under a similar edge or end of blade G, and is also provided with a projection Q^2, the edge Q^3 of which is oppositely inclined, and against which rests the end of blade G. These projections with oppositely-inclined edges, respectively engaging the different snap-blades, form means for positively connecting one blade or the other to the handle, so as to be carried forward by the handle, leaving the other blade behind to snap when started from its clip by engagement between projections R on one edge of blade G′, and projections S on the other edge of blade G, under the influence of springs L, one end of which is connected to a pin M, carried by a lug N, projecting up from blade G′, the other end of said springs being connected to a similar pin carried by a lug N′, projecting from the other edge of blade G. The operation of this switch is obvious without further description.

I claim—

1. A snap-switch, having, in combination, a main pivoted current-carrying blade and co-operating contacts, a separate pivoted snap-blade beside the main blade in a different plane, and co-operating contact parts or surfaces for the snap-blade out of the range of the main blade, and a spring connection between the main and snap blades.

2. A snap-switch having, in combination, pivoted main and snap blades beside each other, separate clips or contact parts for the different blades, a spring connection between the main and snap blades, and means forming a positive connection between the main and snap blades during a portion of their movement.

3. A snap-switch, having, in combination, separately-movable main and snap blades parallel with each other side by side and pivoted on the same axis, separate clips or contact parts for the main and for the snap blades, and means, as a spring connecting the main and snap blades, for throwing the latter suddenly from their clips.

4. A double-throw snap-switch having, in combination, a pivoted switch-arm to which one side of both circuits to be controlled may be connected, circuit-terminals on different sides of the arm to which the other wire from each of the same circuits may respectively connect, said switch-arm consisting of separately-movable main and snap blades beside each other, means, as a spring, brought into use by movement of the main blade to suddenly throw the snap-blade, and separate contact parts for the main and snap blades at both terminals.

5. A double-throw snap-switch having, in combination, a pivoted switch-arm to which one side of both circuits to be controlled may be connected, circuit-terminals on different sides of the arm to which the other wire from each of the same circuits may respectively connect, said switch-arm having main and snap blades beside each other, separate contact parts for the main and snap blades at both terminals, a spring adapted to act on the snap-blades, and means for connecting one end of said spring to the pivoted switch-arm when the arm is thrown in one direction, and the opposite end to a snap-blade, and means for connecting the opposite ends of said spring to the switch-arm and to a snap-blade when the arm is thrown in the opposite direction.

6. A double-throw snap-switch having, in combination, a pivoted switch-arm, two terminals on different sides of the arm, with contact clips or parts, the switch-arm having main blades arranged so as to make contact with certain of the contact parts at each terminal, and having also a plurality of snap-blades beside the main blades in different planes, and arranged so as to make contact with different contact parts at each terminal, from the parts with which the main blades make contact and over which they rub, part of the snap-blades making contact at one terminal and the rest of the snap-blades at the other terminal.

7. The combination, in a pivoted double-throw switch, of main blades, a plurality of snap-blades side by side with each other and

with the main blades in different planes, a spring connection between the main and snap blades, contact on different sides of the pivot and co-operating with the blades, the snap-blade operating on one side being a different one from that operating on the other side.

8. A double-throw snap-switch having, in combination, a switch-arm having main blades and a plurality of snap-blades acting alternately and in opposite directions, terminals on different sides of the arm, and separate contact clips or parts for the main blades and for the snap-blades, the clip-springs between which one of the snap-blades passes at each terminal being farther apart than the springs between which the other snap-blade passes, for the purpose specified.

Signed this 17th day of October, 1895.

ALBERT B. HERRICK.

Witnesses:

C. M. CATLIN,

C. L. BELCHER.