(No Model.) 3 Sheets—Sheet 1.

S. BERGMANN.

SWITCH.

No. 433,883. Patented Aug. 5, 1890.

Fig 1.

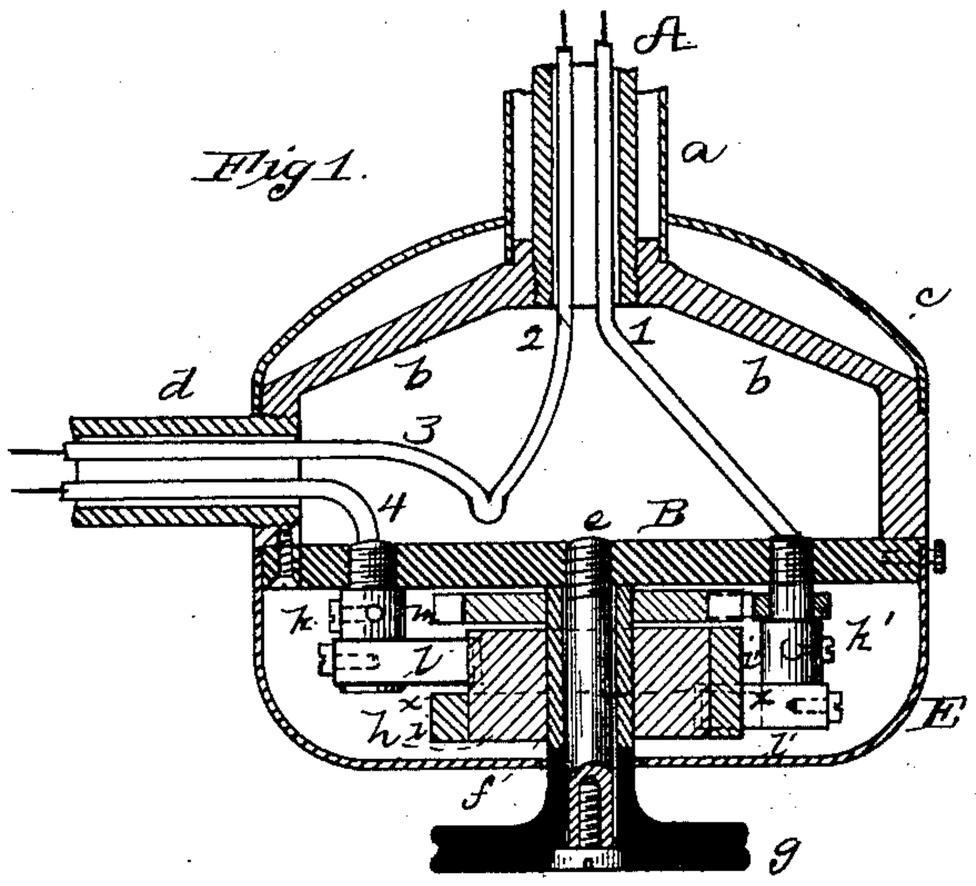


Fig. 2.

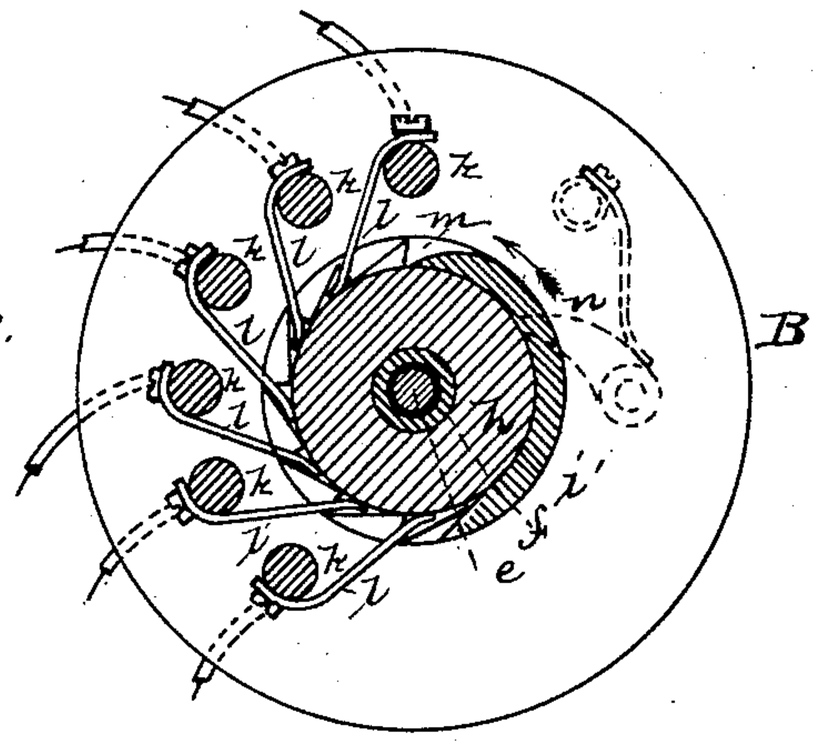
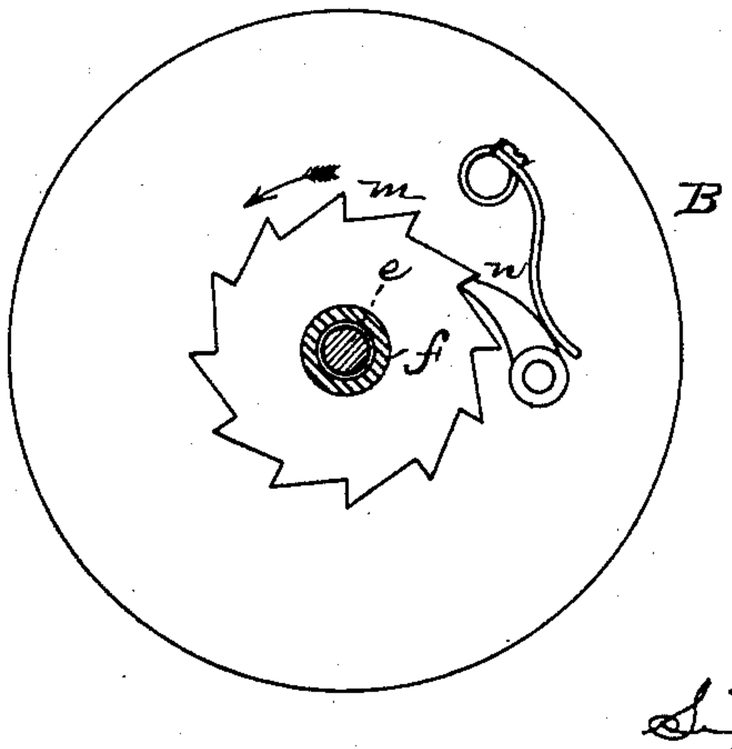


Fig. 3.



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INVENTOR:

Sigmund Bergmann

By Dyer & Seely

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(No Model.) 3 Sheets—Sheet 2.

S. BERGMANN.

SWITCH.

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Fig 4.

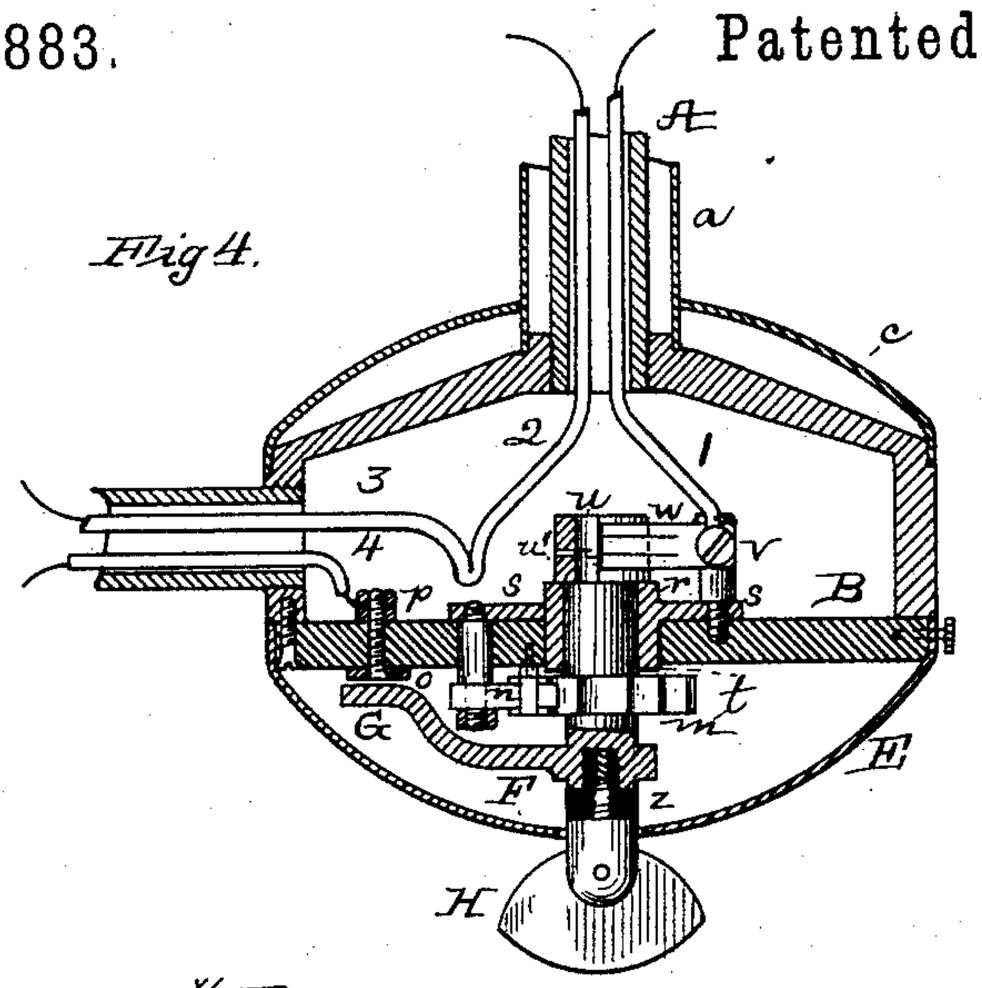


Fig. 7.

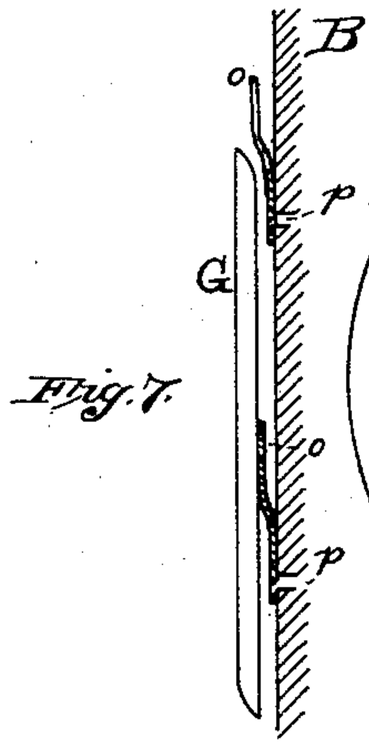


Fig 5.

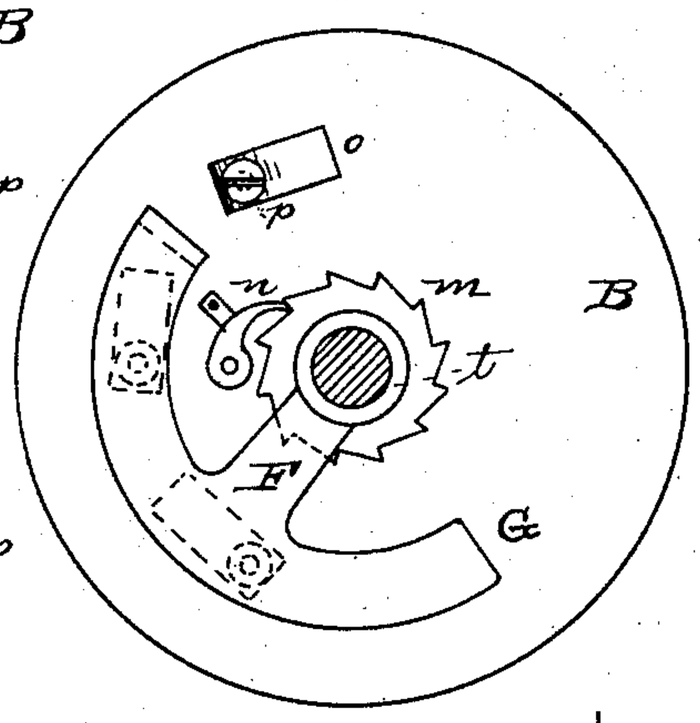
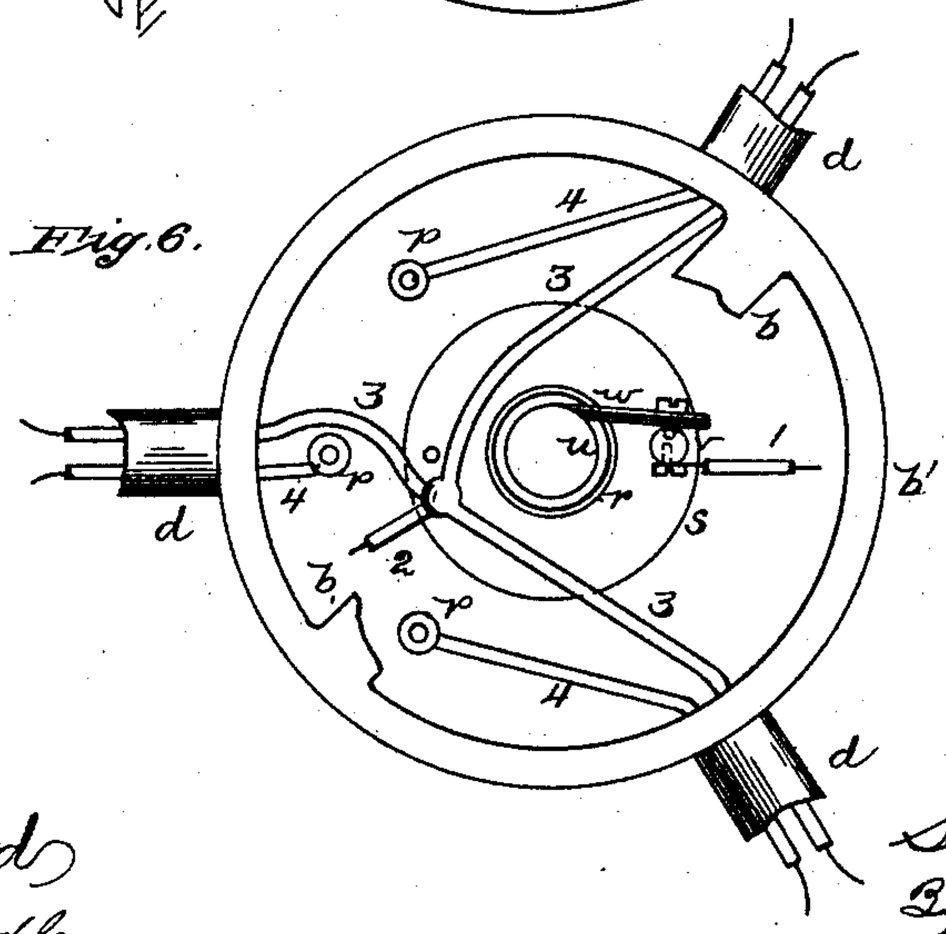


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

S. BERGMANN.

SWITCH.

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Fig. 8.

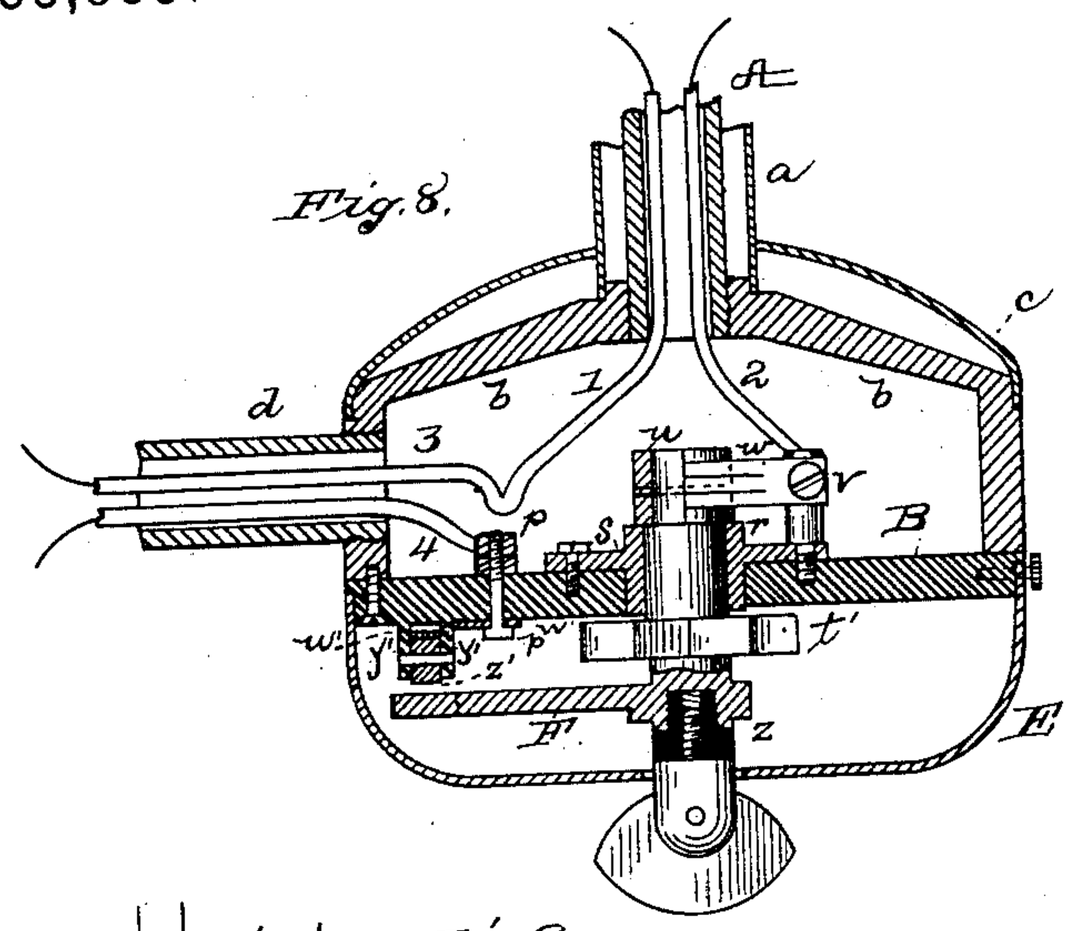


Fig. 11.

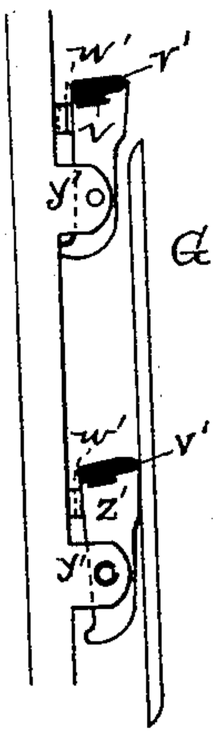


Fig. 9.

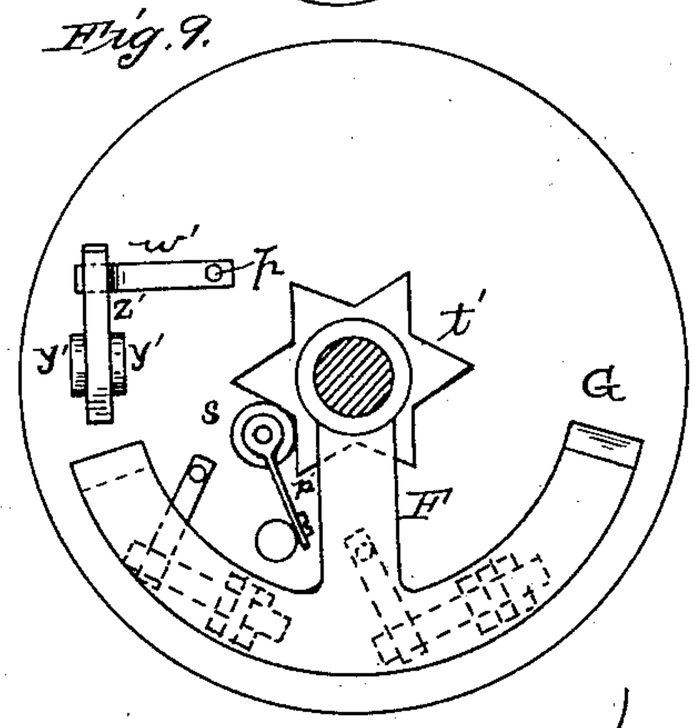
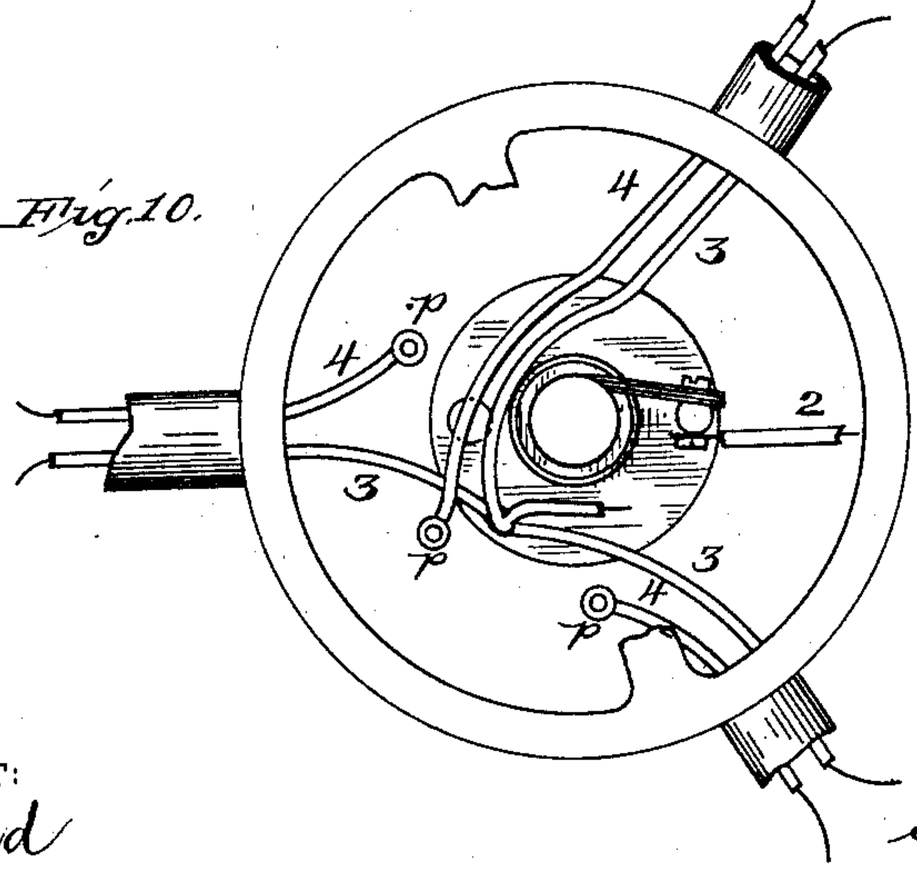


Fig. 10.



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UNITED STATES PATENT OFFICE.

SIGMUND BERGMANN, OF NEW YORK, N. Y.

SWITCH.

SPECIFICATION forming part of Letters Patent No. 433,883, dated August 5, 1890.

Application filed February 28, 1885. Serial No. 157,432. (No model.)

To all whom it may concern:

Be it known that I, SIGMUND BERGMANN, of New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Circuit-Controllers for Electric-Light Fixtures, of which the following is a specification.

The object of my invention is, mainly, to provide an electric-light fixture carrying several—two or more—lamps with a switch, by the movement of which one or all or any desired intermediate number of said lamps may be placed in circuit and lighted or cut out of circuit and extinguished. The switch is one having a continuous movement in one direction, by which movement the lamps are thrown successively into circuit and then successively out of circuit, and it is preferably provided with ratchet or similar mechanism, by means of which the movement from one lamp, contact to another is determined, and by which the switch is prevented from moving backward at any time. In the preferred form of my switch one of the primary wires of the electrolier is connected with a stationary spring and one wire of each secondary circuit of the electrolier is connected with one of a series of other stationary springs. The other secondary wires are all connected as usual with the other primary wire. Between the primary spring and the series of secondary springs is situated a moving conductor, which in its movement is constantly in contact with the primary spring and is adapted to be brought into contact with any desired number of the secondary springs, whereby any desired number of the secondary or lamp circuits are closed. The moving conductor is preferably revolved by a turning key or stem provided with a ratchet and pawl, which limit its movement from one secondary contact to the next and prevent the turning backward of the switch. In some cases, however, I connect the primary wire directly with a moving contact adapted to bridge the free terminals of the secondary circuits.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the lower portion of an electrolier provided with a switch embodying the preferred form of my invention; Fig. 2, a horizontal section on line *x x* of Fig. 1, looking from below; Fig. 3, a plan view of the ratchet used in this form of switch; Fig. 4, a view similar to Fig. 1, showing another form of switch; Fig. 5, a bottom view of this form; Fig. 6, a top view showing the connections; Fig. 7, a view illustrating the arrangement of the contacts in this form; Fig. 8, a view similar to Figs. 1 and 4, showing still another form of switch; and Figs. 9, 10, and 11 are views similar to 5, 6, and 7, illustrating this last form.

A is the stem of the electrolier, having a suitable ornamental casing *a*. From the lower end of the stem extend arms *b b*, which support the insulating disk or body B. The inclosing shell *c* forms the distributing-body, and from it any suitable number of lamp-supporting arms *d* extend.

Referring now to Figs. 1, 2, and 3, below the disk B extends the turning-key, whose stem *e* is supported by said disk and turns in it. The key is made in three parts secured together—the said stem *e*, and a metal sleeve *f* upon said stem, and the turning-handle *g*, of insulating material, which extends through an opening in the shell below the fixture for operating the switch. The sleeve *f* carries the cylindrical block of insulating material *h*, which is preferably a non-combustible and non-carbonizable substance. Upon the outside of block *h* is a metal band whose lower part *i* is continuous, extending entirely around the block, while the upper part *i'* extends only part way around.

Below the disk B extend several posts *k k*, corresponding in number to the number of lamps or circuits controlled by the switch. For it is evident that two or more of the lamps of the fixture might in some cases be placed in the same secondary circuit, so that both or all such lamps are lighted or extinguished simultaneously. Each of these posts carries a flat spring *l*, and all these springs are substantially in the same horizontal plane and bear upon the upper portion of the block *h* above the continuous metal ring *i*. A post *k'* also extends downwardly from disk B, and this post carries a flat spring *l'*, which rests on ring *i*. The turning-key also carries above the block *h* a ratchet-wheel *m*, with which engages the spring-pawl *n*, supported by the post *k'*. The posts *k* may in some cases be dispensed

with and flat springs bent twice and twisted at the middle part may be used, one end of the spring being secured to the disk whlle the other bears on the contact-ring.

1 and 2 are the insulated primary wires of the fixture, which extend down through the stem. Wire 1 passes directly to post *k'* and is secured thereto. From wire 2 secondary wires, as 3, each forming one side of a lamp-circuit, extend to the lamp-arms. The return-wires 4 from each lamp-arm are brought to the posts *k*, respectively, and are there connected. These circuit-connections are more fully illustrated in one of the figures to be presently described. It will be seen that if the key and insulating-body carried thereby are turned in the direction of the arrows the springs *l l* will successively be brought to bear upon the metal part *i'*. When the first of such springs *l* reaches said part, circuit is completed from wire 1 through spring *l'* and the metal band to such spring *l* and its wire 4 through the lamp (not shown) and through wire 3 to primary wire 2. One lamp is thus placed in circuit. By turning the key still farther, so that the revolving contact bridges two springs, another lamp is lighted. Thus one or all or any desired number of lamps may be placed in circuit by turning the key so as to bridge all the springs in succession.

As shown in Fig. 2, there are no lamps lighted, for all the springs *l l* are resting on the insulating-surface *h*. The spring pawl and ratchet are so arranged that a movement of one tooth or a determined number of teeth of the ratchet causes the placing of another lamp in circuit, and the ratchet prevents the key from being turned back. Thus a movement in one direction successively lights the lamps, and if continued successively extinguishes them. The switch is concealed by the lower inclosing shell E, through which the key projects.

In the form shown in Figs. 4, 5, 6, and 7 the disk B has upon its lower surface a number of flat springs *o o*, each having one end secured to said disk by a screw *p*, passing through the disk. The free ends of the springs are normally away from the disk-surface. In the center of the disk is an aperture in which is the metal sleeve *r*, which has a flange *s* resting upon the upper surface of the disk. Sleeve *r* forms a bearing for the turning-stem *t* of the circuit-controlling key. Above the sleeve *r* the stem is of smaller size, and upon it is placed a turning-sleeve *u*, secured to the stem by a pin *u'*. This secures the parts closely together, so that the contact-arm which is covered by the stem maintains the necessary close contact with the circuit terminals, as will be described. A post V, rising from the disk B, carries a spring or brush *w*, which bears upon the sleeve *u*. From near the lower end of the stem *t* a metal arm F extends, which terminates in a metal contact-arc G, situated in proximity to the surface of disk B.

H is the turning-handle of the key removed from the circuit by the interposed section of insulating material *z;* or the handle may itself be of insulating material, as before described. The stem *t* carries also the ratchet *m* and pawl *n*, said pawl being supported from the disk, as shown. These determine the movement of the stem, as in the previously-described form. The primary wire 1 of the electrolier passes to post *v*. From wire 2 the secondary wires 3 extend to the lamp-arms *d*. Secondary wires 4 extend each to one of the screws *p*, which hold the springs *o*. When the key is turned, the arc G is brought into contact successively with the springs *o*, and as the spring *w* constantly maintains contact with the stem of the key circuit is closed through the arc and springs to the lamps successively, and broken by a further movement, if desired.

The positions of the springs are illustrated in Fig. 7, one spring being there pressed down by the contact-arc, while the next one is raised above the surface.

Figs. 8, 9, 10, and 11 illustrate the use of another form of contacts. These contacts are placed, as before, on the under side of disk B. Each consists of a metal piece *z'*, preferably of the shape shown, pivoted between lugs *y'*, extending from the surface of the disk. Under the free end of each of these pivoted contacts is the end of a bent flat spring *w'*, whose other end is held by screw *p* passing through the disk and connected with a secondary wire 4. The turning contact is the same as in Fig. 4. The springs *w* maintain pressure between the contacts *z'* and arc *z* when the arc is brought into connection with said contacts. Each contact *z'* has a facing *v'* of rubber or other suitable insulation, these contacts being intended to prevent the turning of the switch backward, for the spring *w'* throws the contact up as soon as arc *z* leaves it, and thus the arc cannot be turned back, for if this is attempted the arc strikes the insulating-facing and does not close the secondary circuit. With this form of contacts a star-ratchet *t*, with a roller *s'*, carried by a spring-arm *r'*, may be used to determine the movement from one contact to the next.

What I claim is—

1. In an electrical switch, the combination of a series of fixed springs in the same plane, each forming a branch-circuit terminal, a fixed spring in a different plane forming a main-circuit terminal, and an intermediate movable conductor constantly in contact with said main terminal and adapted to be brought into contact with said branch terminals successively, and to maintain contact with preceding terminals until contact is made with all the succeeding ones, substantially as set forth.

2. In an electrical switch, the combination of a series of fixed springs arranged in a curved line, each forming a branch-circuit

terminal and all in the same plane, a fixed spring in a different plane forming a main-circuit terminal, a revolving block on which said springs bear, said block being provided with a metal ring continuous in the path of said main-circuit terminal and broken in the path of said branch-circuit terminals, but adapted to bridge all said branch-circuit terminals at the same time, substantially as set forth.

3. The combination, with the series of branch-circuit terminals and the main-circuit terminal, of a switch for connecting one or more of the branch-circuit terminals with the main-circuit terminal, which consists in a conductor of sufficient extent to span all of the branch-circuit terminals normally out of contact therewith, but movable onto and off from them in succession, and means for determining the movement of said main terminal from one branch terminal to the next, substantially as set forth.

4. The combination of the series of branch-circuit terminals and the main-circuit terminal of sufficient extent to span all of the branch-circuit terminals normally out of contact therewith, but movable onto andoff from them in succession, and means for preventing a backward movement of said main-circuit terminal, substantially as set forth.

5. The combination, in an electrolier carrying two or more lamps, of a switch located within the distributing-body thereof, having a terminal for each secondary circuit of the electrolier, a contact constantly in connection with a primary conductor of sufficient extent to contact with all of the secondary-circuit terminals and movable in one direction onto and off from them in succession, whereby one, two, or more lamps may be thrown into circuit and then the number of lamps reduced by a continued movement, substantially as described.

This specification signed and witnessed this 4th day of February, 1885.

SIGMUND BERGMANN.

Witnesses:
WM. H. MEADOWCROFT,
ALFRED W. KIDDLE.