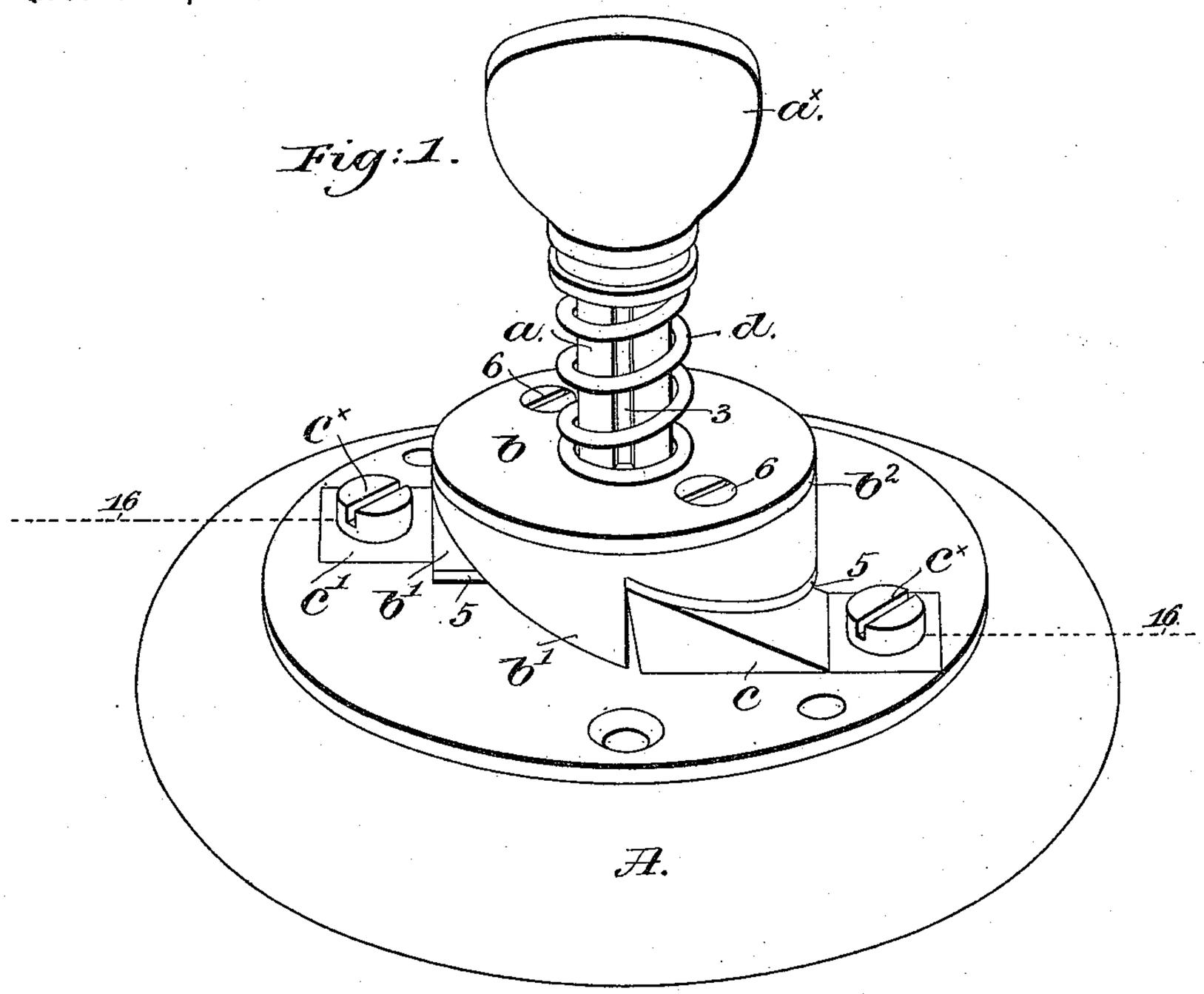
(No Model.) 2 Sheets—Sheet 1.

C. H. HERRICK.

ELECTRIC SWITCH.

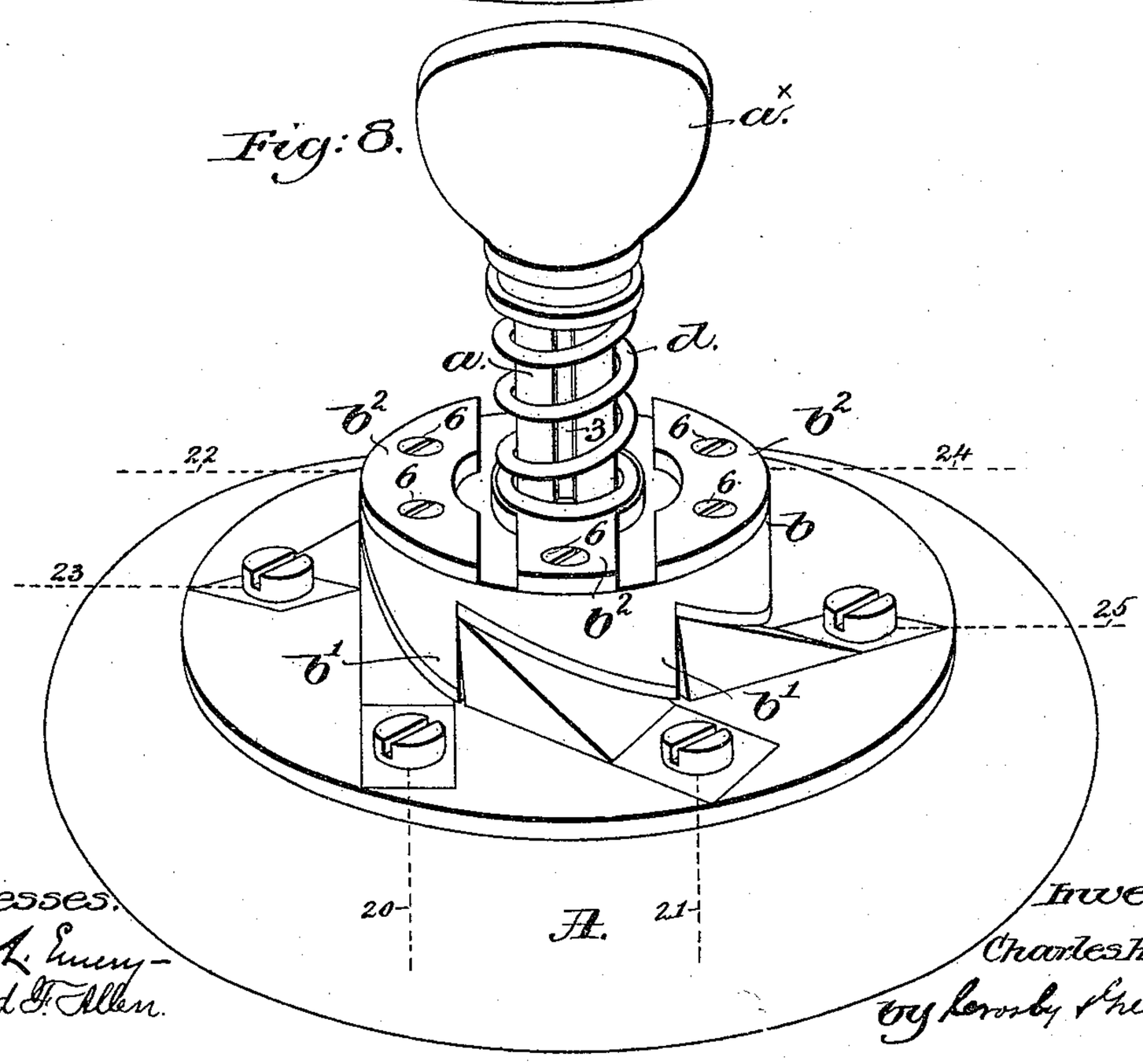
No. 440,845. Patented Nov. 18, 1890.

Fig: 1.



A.

Fig: 8.



A.

Witnesses.
Helen L. Emery
Edward F. Allen.

Inventor.
Charles H. Herrick
by Crosby & Gregory Attys

(No Model.) 2 Sheets—Sheet 2.

C. H. HERRICK.

ELECTRIC SWITCH.

No. 440,845. Patented Nov. 18, 1890.

Fig: 1.a

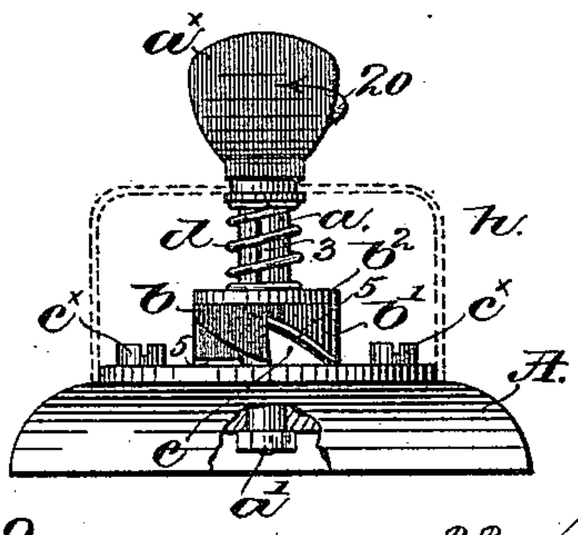


Fig: 2.

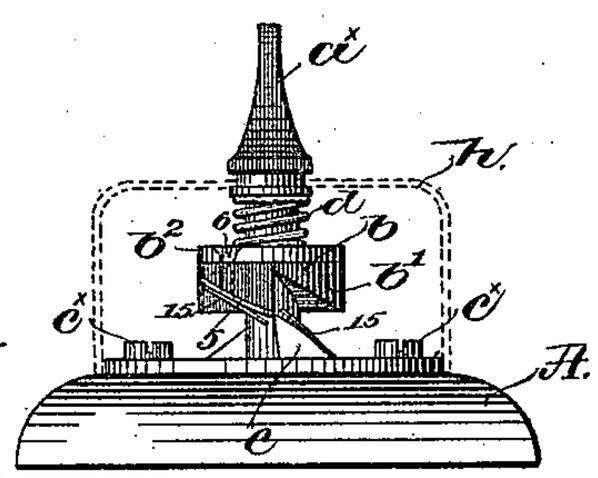


Fig. 8.a

Fig. 9.

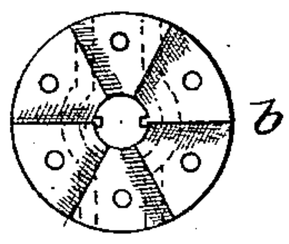


Fig: 6.

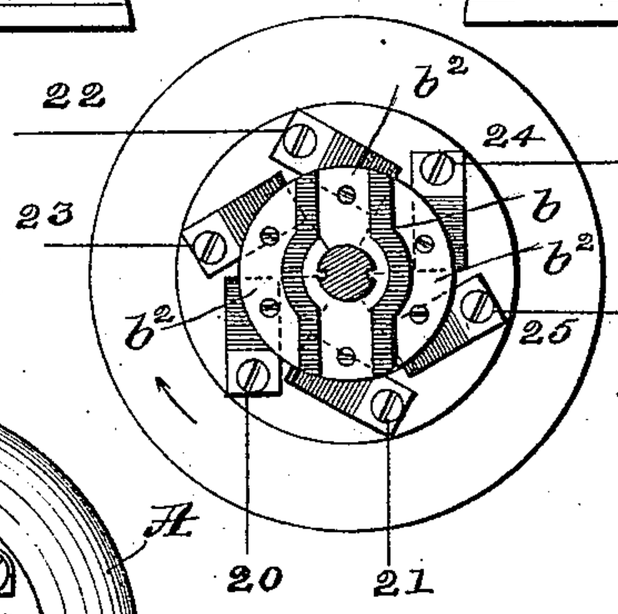


Fig: 4.

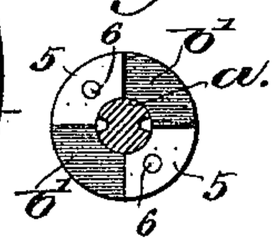


Fig. 11.

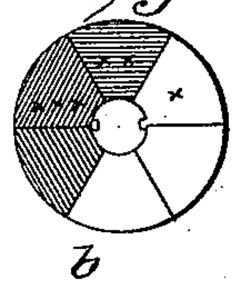
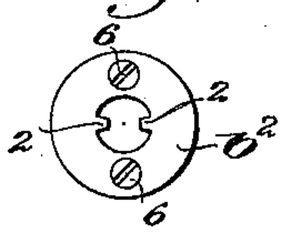


Fig: 5.



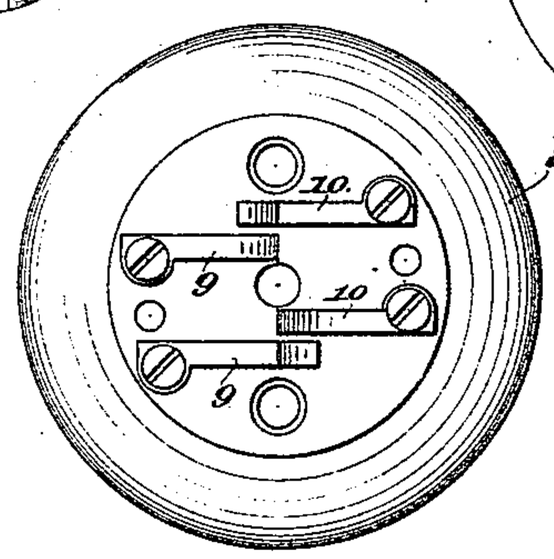
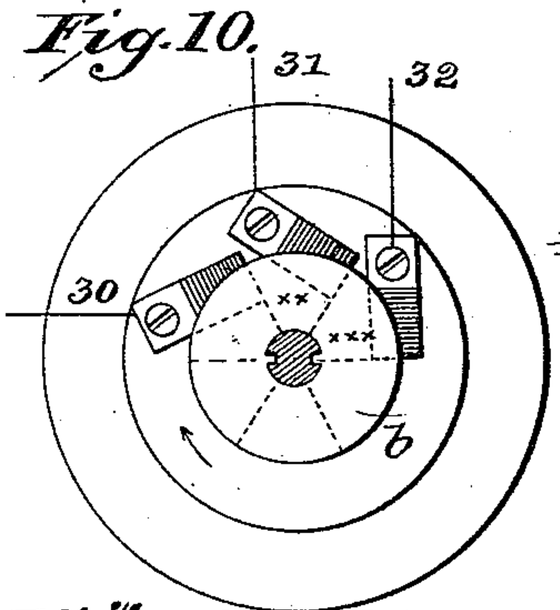
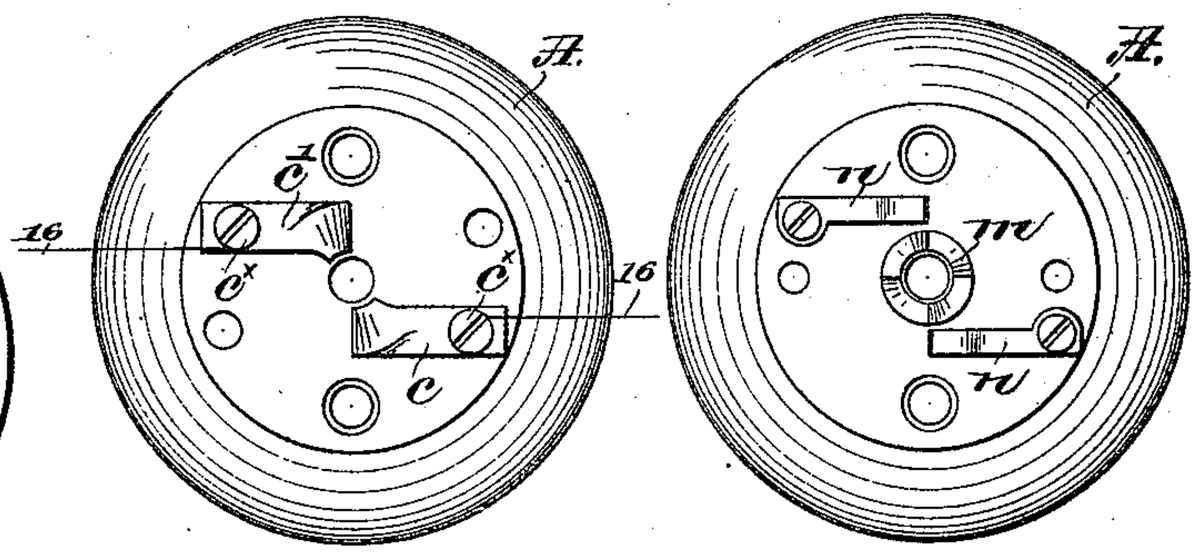


Fig: 3.

Fig: 7.

Fig. 10.





Witnesses.
Fred. S. Greenleaf
Frederick L. Emery

Inventor.
Charles H. Herrick,
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

CHARLES HUBBARD HERRICK, OF WINCHESTER, MASSACHUSETTS.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 440,845, dated November 18, 1890.

Application filed August 19, 1890. Serial No. 362,399. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HUBBARD HERRICK, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Electric Switches or Cut-Outs, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a simple, effective, and compact electric switch or cut-out.

In accordance with this invention the usual base has a suitable bearing for the support of a rotatable spindle, on which is mounted a sliding spring-controlled disk or plate, preferably of insulating material, provided upon one of its faces with a series of ratchet-teeth and adapted to co-operate with contacts secured to the base to make and break an electric circuit. The conducting-faces of any two or more teeth may be electrically connected, so that when the spindle is rotated the current will be alternately permitted to pass from one contact to the other through the said conducting-faces or will be interrupted or broken by the insulated teeth, as will be described.

One part of my invention therefore consists in the combination, with the base and a rotatable spindle carried thereby, of a spring-controlled disk mounted to rotate with and to slide on the said spindle and provided with a series of ratchet-teeth and co-operating fixed contacts, to operate substantially as will be described.

Other features of my invention will be hereinafter described, and pointed out in the claims.

Figure 1 is a perspective view of a switch embodying this invention; Fig. 1ª, a side elevation of the same; Fig. 2, a view similar to Fig. 1ª, showing the spindle partially rotated; Fig. 3, a plan view of the base; Figs. 4 and 5, details to be referred to, and Figs. 6 to 11 modifications to be described.

Referring to the drawings, the base A, of desired shape and preferably of insulating material, has a suitable bearing for the support of the vertical spindle *a*, herein shown as held in place by a nut *a'*, (see Fig. 1,) and the said spindle is provided at its upper end with a suitable handle $a^{\times}$.

A disk or plate *b*, preferably of insulating material, is mounted to slide on the spindle *a*, the said disk being provided with keys 2, which enter and slide in the longitudinal splines or grooves 3 in the said spindle, (see Figs. 1, 4, and 5,) to thus cause the disk to rotate with the spindle and at the same time permit a movement longitudinally thereon.

The disk or plate *b* has arranged radially upon its lower face a series of ratchet-teeth *b'*, herein represented as four in number, which co-operate with the fixed beveled contacts *c c'*, secured to the base A and provided with binding-screws $c^{\times}$, to which are connected the line-wires.

As herein represented, every alternate tooth *b'* on the insulated disk *b* is fitted with a metallic or other conducting-face 5, secured by screws 6, passed through the said disk from a plate b^2 upon the upper face thereof, (see Figs. 1 and 2,) thus electrically connecting, as shown, the opposite conducting-faces 5 through the said screws and plate b^2.

A spiral or other spring *d* is interposed between the handle $a^{\times}$ and the disk *b* to thus keep the said disk firmly pressed upon the contacts *c c'*.

In practice the line-wires 16 are connected to the binding-screws $c^{\times}$, (see Fig. 3,) and assuming the various parts to be in the position shown in Fig. 1, with the current passing from one side of the line to the other through the connected conducting-faces 5, the operation of my improved switch is as follows: As the spindle *a* is rotated by means of the handle $a^{\times}$ in the direction of arrow 20, the disk *b* is caused to rotate with it, the inclined faces of the ratchet-teeth *b'* acting against the inclined fixed contacts *c c'*, causing the said disk to move upward on the spindle *a*, compressing the spring *d*, as shown in Fig. 2. Further rotation of the spindle causes the teeth upon the disk to be carried by or beyond the contacts *c c'*, when the spring will immediately force said disk down to its normal position, this time with the insulated teeth of the disk in contact with the contacts *c c'*, thus interrupting or breaking the circuit through the switch. By again rotating

the spindle one tooth in the same direction the circuit may again be established in precisely the same manner as described. As the teeth are moved practically instantaneously into and out of contact with the contacts *c c'*, the formation of an arc is impossible, and the contacting-faces are always kept bright and clean by the rubbing action of one surface upon the other.

If desired, I may provide the contacting conducting-faces of the ratchet-teeth and of the fixed contacts with flexible or yielding plates 15 to insure a perfect contact between the two surfaces.

The construction hereinbefore described is adapted for what are commonly termed "single-pole" switches; but my improved construction is equally adapted to "double-pole" switches, (see Fig. 6,) wherein two contacts 9 and 10 are provided in place of each contact *c c'* described, the top plate b^2 in this construction being omitted, so that when the switch is in the position shown in Fig. 1 the current will pass from the contact 9 to the contact 10 through the face-plate 5, and when rotated a distance of one tooth the insulated tooth will break the connection from one contact to the other.

In practice the operating parts will be inclosed in a case *h*. (Shown by dotted lines, Figs. 1 and 2.)

It is obvious that the number of teeth on the disk *b* may be increased or decreased, as desired, and that the number and arrangement of contacts on the base may also be as desired to accommodate the switch to various classes of work.

I have herein shown the alternate teeth as made conducting and non-conducting; but I desire it to be understood that all the teeth may be made conducting, as shown in Figs. 8, 8^a, and 9, to adapt the switch to other classes of work—as, for instance, when it is desired to keep a light or series of lights continually lighted, or where a continuous current is required for some purpose—such as charging storage-cells—it is desirable to have two generators, either one of which may be thrown into or out of circuit at will.

Referring to Figs. 8, 8^a, and 9, the base A has a series of contacts, shown as six in number, wires 20 21 being attached to two of the contacts, said wires leading to a light or series of lights or to a storage-cell, and the wires 22 23, attached to two other contacts, and leading to a generator, and wires 24 25, attached to the remaining two contacts, leading to another generator. The toothed disk *b* (shown separately in Fig. 9) has its teeth electrically connected in pairs by plates b^2, and screws 6, as shown, and when said disk is in position shown in the drawings the current from the generator entering over the wires 22 23 will pass out over the wires 20 21 to the lights or to the storage-cell, the wires 24 25 being cut off from the wires 20 21; but by rotating the disk *b* one tooth in the direction of arrow the wires 22 23 are cut off from the wires 20 21, and the wires 24 25, leading from the other generator, are electrically connected with the wires 20 21.

Referring to Figs. 10 and 11 yet another arrangement is illustrated. The wire 30, secured to one contact, is the positive wire leading from a generator, and the two negative wires 31 32, secured to two other contacts, return to the generator, each including in its line, for instance, a certain proportion of the lights in one large chandelier. As shown, all the lights are cut out; but by rotating the disk *b* in the direction of the arrow one tooth the lights on wire 31 would be cut in, and further rotation one tooth would cut in additionally the lights on wire 32.

While I have shown these modifications as an illustration of some of the uses to which my improved switch may be applied, still I do not desire to limit this invention to these alone, as by varying the number and arrangement of contacts and teeth upon the disks the switch may be adapted to almost any variety of work desired.

Instead of the construction herein shown, wherein the ratchet-shaped contacts lift the disk *b*, I may employ a construction such as, is shown in Fig. 7, wherein an independent ratchet *m* lifts the disk, the conducting teeth or faces of the said disk extending beyond the ratchet *m* sufficiently far to make and break contact with independent contacts *n*, it being possible by this arrangement to make the contacts *n* flexible or spring-like, which is frequently desirable.

In lieu of the cylindrical spindle having the disk splined thereon, I may employ a square or other than round spindle with the disk fitted to slide on it, or a slotted spindle, the disk having a pin which passes through the slot. Therefore I do not desire to limit this invention to the particular shape and construction of the various parts shown, as the same may be varied without departing from the scope of the invention, the gist of the invention lying in the vertically-movable disk or plate, which may be provided with two or more contacts to be moved over and to cooperate with fixed contacts of the base; neither do I desire to limit my invention to the particular application herein shown, as the same is applicable to a variety of uses.

I claim—

1. The herein-described switch, consisting, essentially, of the base A, fixed contacts thereon, a disk provided with ratchet-teeth, a rotatable spindle on which the said disk is mounted to slide vertically, and a spring, the rotation of the spindle taking with it the disk and moving the same over the said contacts, the parts operating substantially as described.

2. The combination, with the base A, the fixed contacts thereon, and the rotatable spindle carried by said base, of a disk *b*, splined on the said spindle and provided with a series of alternately-arranged insu-

lated and conducting teeth, and a spring to force said disk upon the said contacts, substantially as described.

3. The base A and ratchet-tooth-shaped contacts $c\,c'$ thereon, combined with the spindle a, the ratchet toothed disk b, splined thereon, the plate b^2, face-plates 5, and screws 6, and the spring d, to operate substantially as described.

4. The combination, with the base and a series of ratchet tooth-shaped contacts thereon, of a rotatable spindle, and a spring-controlled plate mounted to rotate with and to slide on the said spindle, said plate having three or more circumferentially-arranged contacts, to operate substantially as described.

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

CHARLES HUBBARD HERRICK.

Witnesses:
JAS. H. CHURCHILL,
EDWARD F. ALLEN.