

(No Model.)

J. A. POWERS.
ELECTRICAL SWITCH.

No. 406,468.

Patented July 9, 1889.

Fig. 1

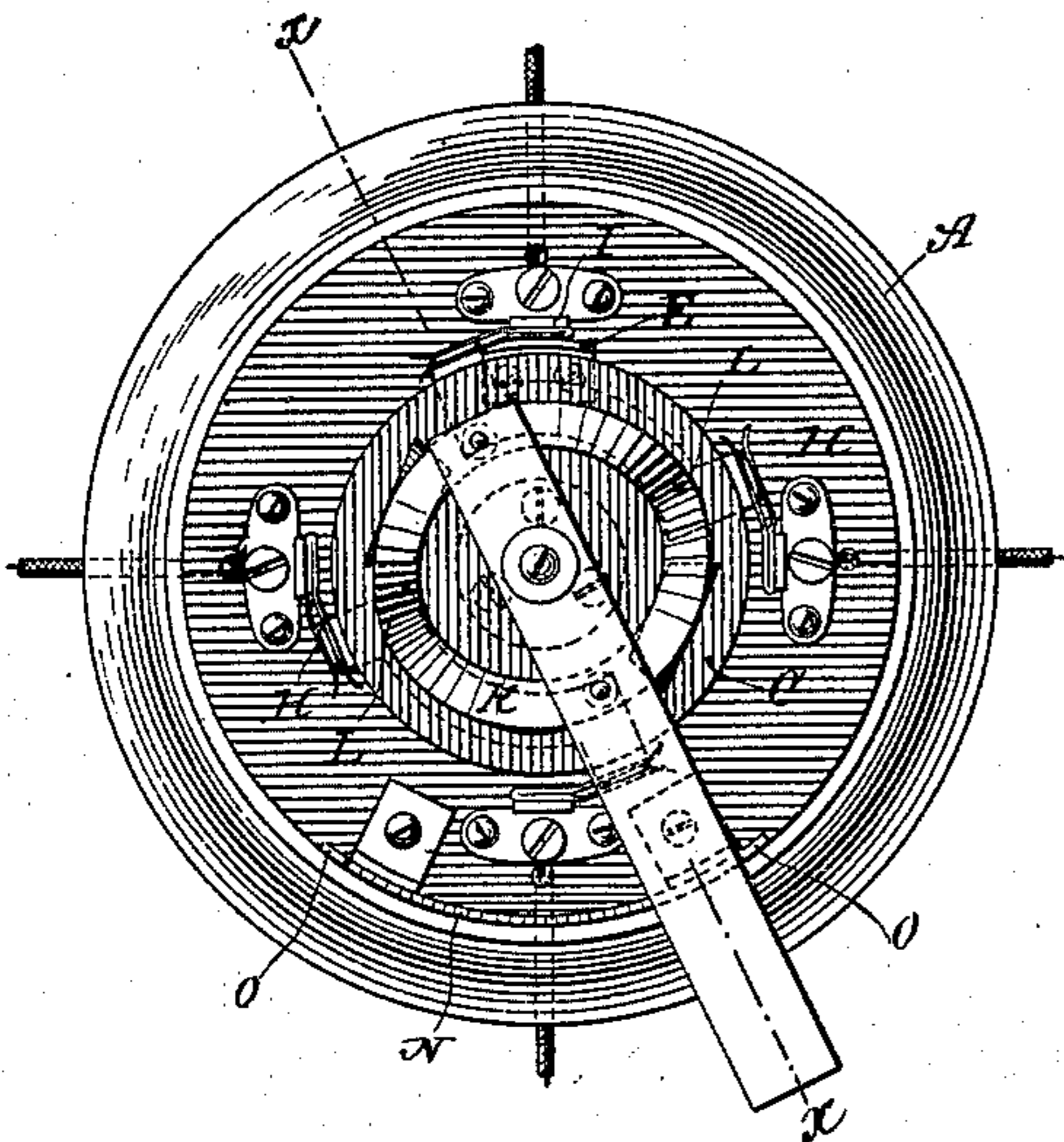


Fig. 2

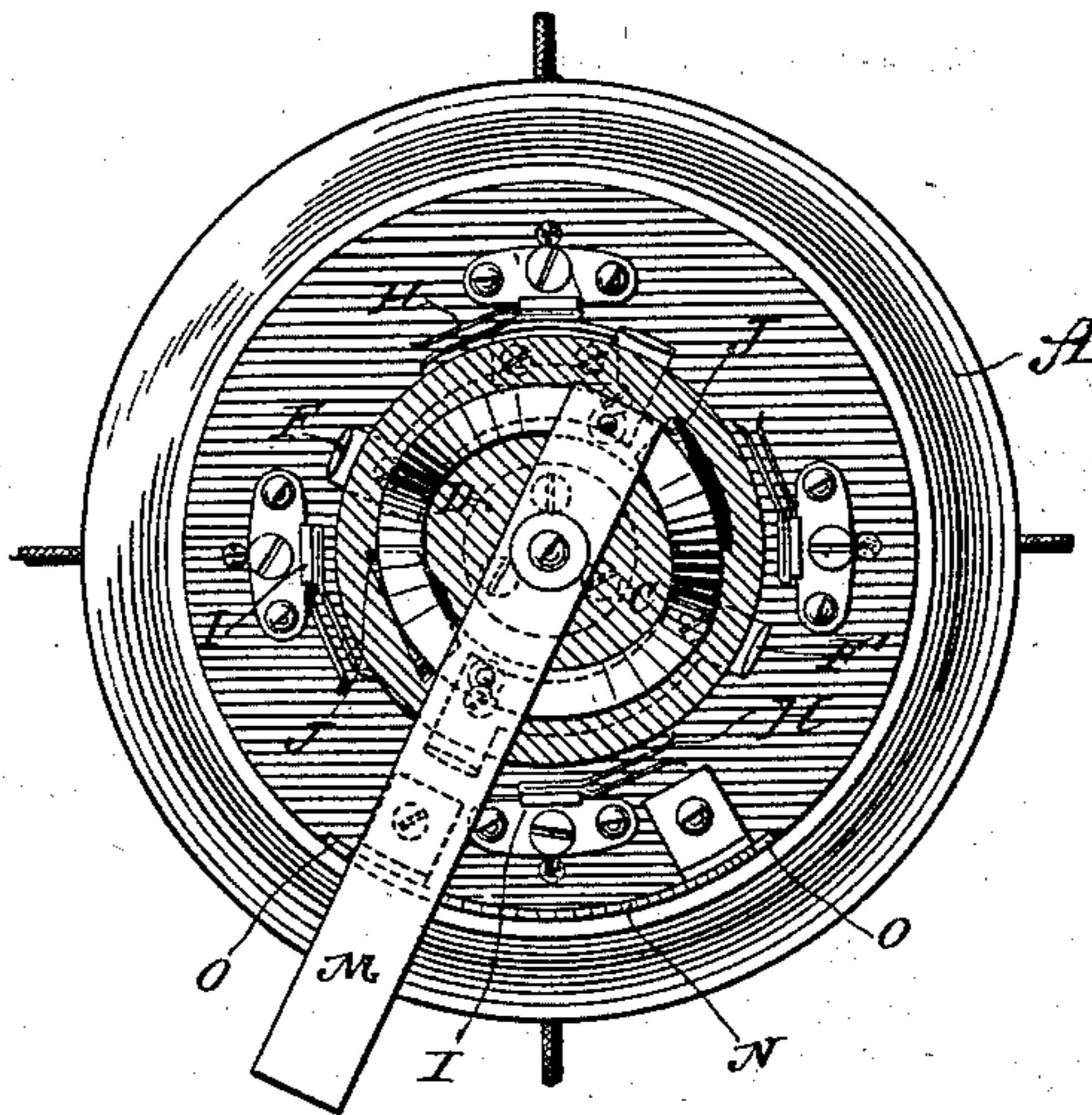


Fig. 3

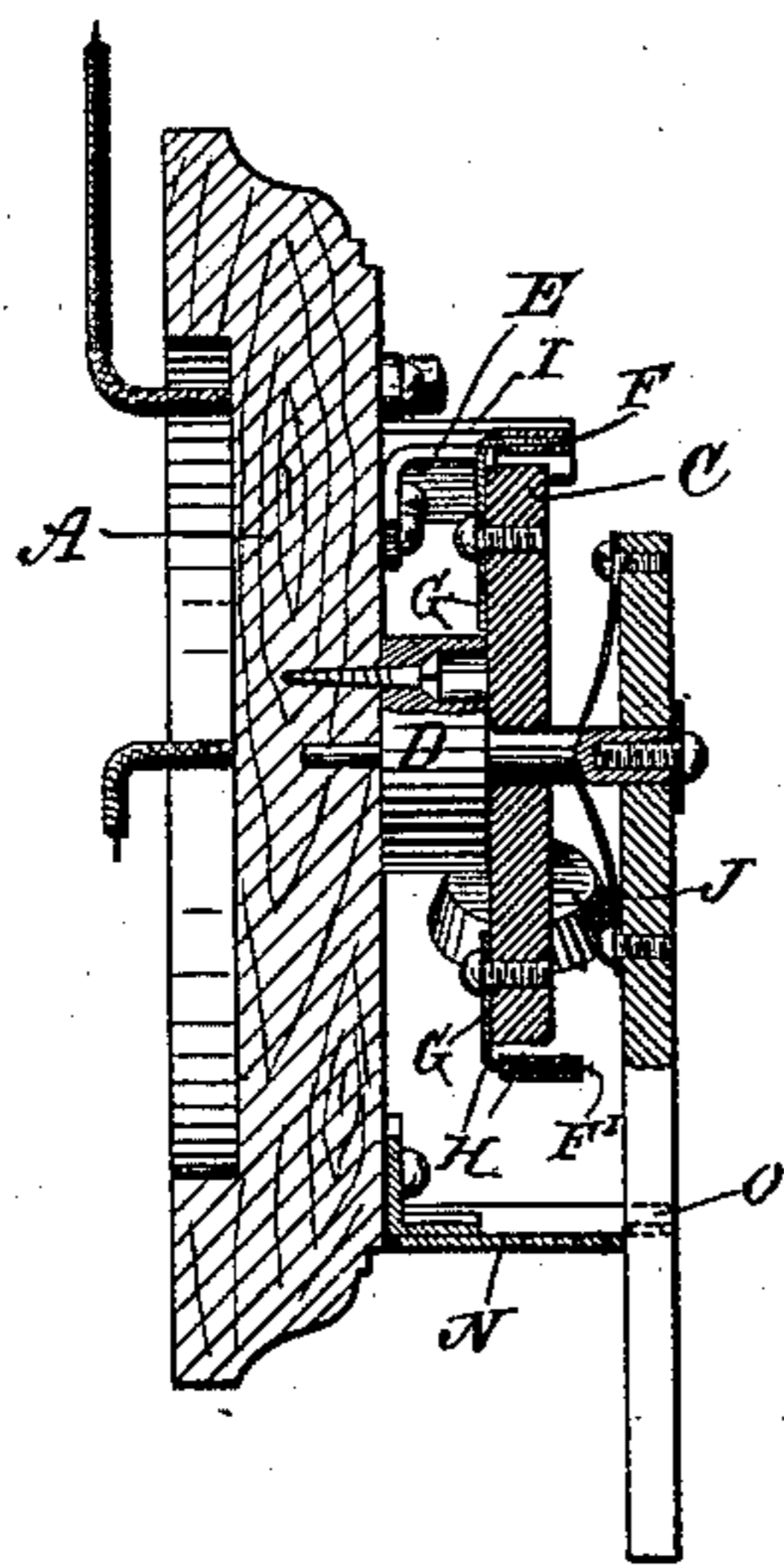


Fig. 4

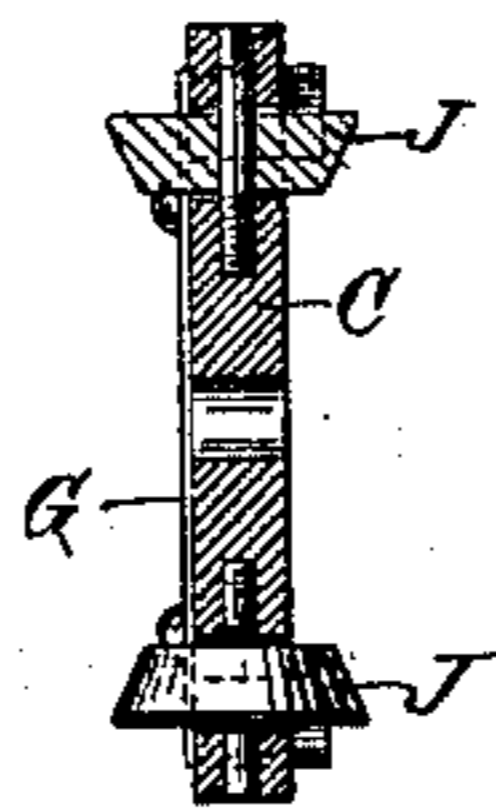
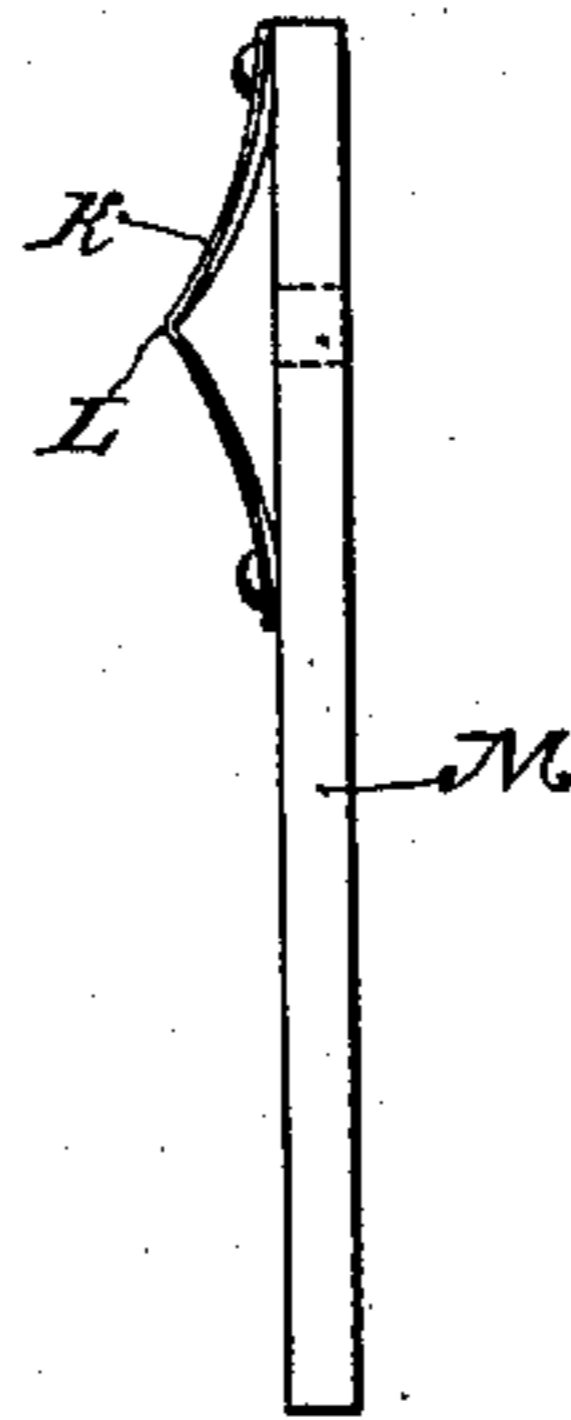


Fig. 5



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UNITED STATES PATENT OFFICE.

JOSEPH A. POWERS, OF LANSINGBURG, NEW YORK.

ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 406,468, dated July 9, 1889.

Application filed March 23, 1889. Serial No. 304,473. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. POWERS, a citizen of the United States, residing at Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention, which is a switch or circuit-controller for electric circuits, is distinguished by the following features of novelty: A disk or insulating-carrier of any desired shape is mounted loosely on a vertical spindle, and by any suitable means its range of movement around said spindle is limited. On opposite sides of its pivotal or axial support are two projections—such as a pair of rollers turning in holes cut through the disk. Pivoted to the same spindle is a lever, which carries a device in the nature of a circular cam-track with two prominent points which travel over the rollers in the disk when the lever is turned; but inasmuch as either the cam-track or rollers must be capable of yielding or rising and falling, the cam-track has a certain resilience, being composed of a circular steel band or any well-known equivalent therefor. Thus the instrument has a double shifting mechanism, by means of which the pressure is applied simultaneously to the contact-carrier at two points on opposite sides of the axial support, by which means a greater mechanical advantage may be secured in shifting the contacts for a switch of given strength, wear very materially reduced, and a simple and cheap mechanism obtained.

The invention, being mainly in the construction of the parts and the special manner of combining the same, will be best understood by reference to the accompanying drawings.

Figure 1 is a plan view of the switch in that one of its two positions in which the circuit-connections are closed. Fig. 2 is a plan view of the parts in the position when the circuit-connections are open. Fig. 3 is a section on line $x x$ of Fig. 1. Fig. 4 is a sectional detail of one of the parts, and Fig. 5 is a side view of the handle or lever.

A is the base, of insulating material, upon which the operative parts are mounted.

B is a spindle with an enlarged base secured to the block A.

C is a circular disk, of insulating material, mounted on the spindle B and resting on the shoulder formed by the enlargement D. A stop E, secured to the base A, projects into the path of some projecting part of the disk C and limits its movement in one direction. Contact-terminals $F F'$, forming parts of conducting-plates G, secured under the disk C, limit the movement of the disk in the opposite direction by encountering springs or contacts H H. In order to secure good contact, I form the stationary contacts of two brass plates or springs H, secured to uprights I, fixed to the base A, and so arranged that the contacts $F F'$, when thrown by the action of the switch to close the circuit-connections, will wedge in between the two springs, making good contact on both sides. The plate or disk C carries two prominences or, preferably, rollers J, usually of brass, which are mounted in perforations in the plate on opposite sides of the center and substantially as shown.

A lever M, preferably of insulating material, is pivotally mounted on the spindle B over the insulating-disk C. This lever carries a double spring-cam K, secured concentrically to the pivotal support of the lever, and preferably formed of a circular spring-band bent at diametrically-opposite points to form two depending prominences L L. The rollers J are mounted under this circular spring, which bears upon them. Any means for limiting the movement of handle or lever M is employed—as, for example, a plate N, having projections O at its ends; and which is secured to the base A under the lever M.

In explanation of the purpose and mode of operation of these devices, let it be assumed that the circuit-connections are broken, or that the switch is in the condition shown in Fig. 2. In this position the movement-limiting projection on the insulating-disk—one of the contact-terminals, as F, is utilized for this purpose—is against or near the fixed stop E. By shifting the lever M the circular spring, acting as a track, travels over the rollers J,

the prominent parts L L moving up over the rollers until they have passed the highest points of the same. Thereupon the pressure of the spring, which up to this time has been
5 directed against the rollers with a tendency to shift or turn the disk against the detent, is suddenly shifted, the direction of pressure being shifted across the axis of the rollers, whereby the disk is thrown with considerable
10 force in an opposite direction, or so as to cause the contacts F F' to wedge in between the terminals H H. By turning the lever in the opposite direction the disk, by a similar operation, is shifted back to separate the con-
15 tacts. Normally the disk in either of its extreme positions is restrained against movement by the detent and the terminals H on the one hand and the pressure of the spring upon the rollers.
20 In the form of switch which I have illustrated I have shown four terminals H and four contacts F F', the instrument forming what is commonly called a "two-pole double-break switch;" but it is obvious that the num-
25 ber of contacts and terminals may be either increased or diminished, and that in other

like respects the construction of the switch may be modified without departing from the spirit of my invention.

What I claim is—

30 1. The combination, in an electric switch mechanism, with a loosely-mounted disk or carrier for the contacts limited in its movement, and prominences J thereon, of a lever pivoted on the arbor of the disk and a spring 35 or yielding cam carried by the lever and having two prominences adapted to engage with those on the disk or carrier, as set forth.

2. In an electric switch, the combination, with an insulating contact-carrying disk 40 loosely mounted on a vertical spindle, detents for limiting the range of movement thereof, and rollers mounted in opposite sides of the disk, of a lever pivoted to the spindle, and a circular spring carried thereby and bent to 45 form a cam-track with two prominent points adapted to engage with the rollers, as set forth.

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