

(No Model.)

J. W. BATTERSHALL.  
ELECTRIC HAND SWITCH.

No. 437,352.

Patented Sept. 30, 1890.

Fig. 1.

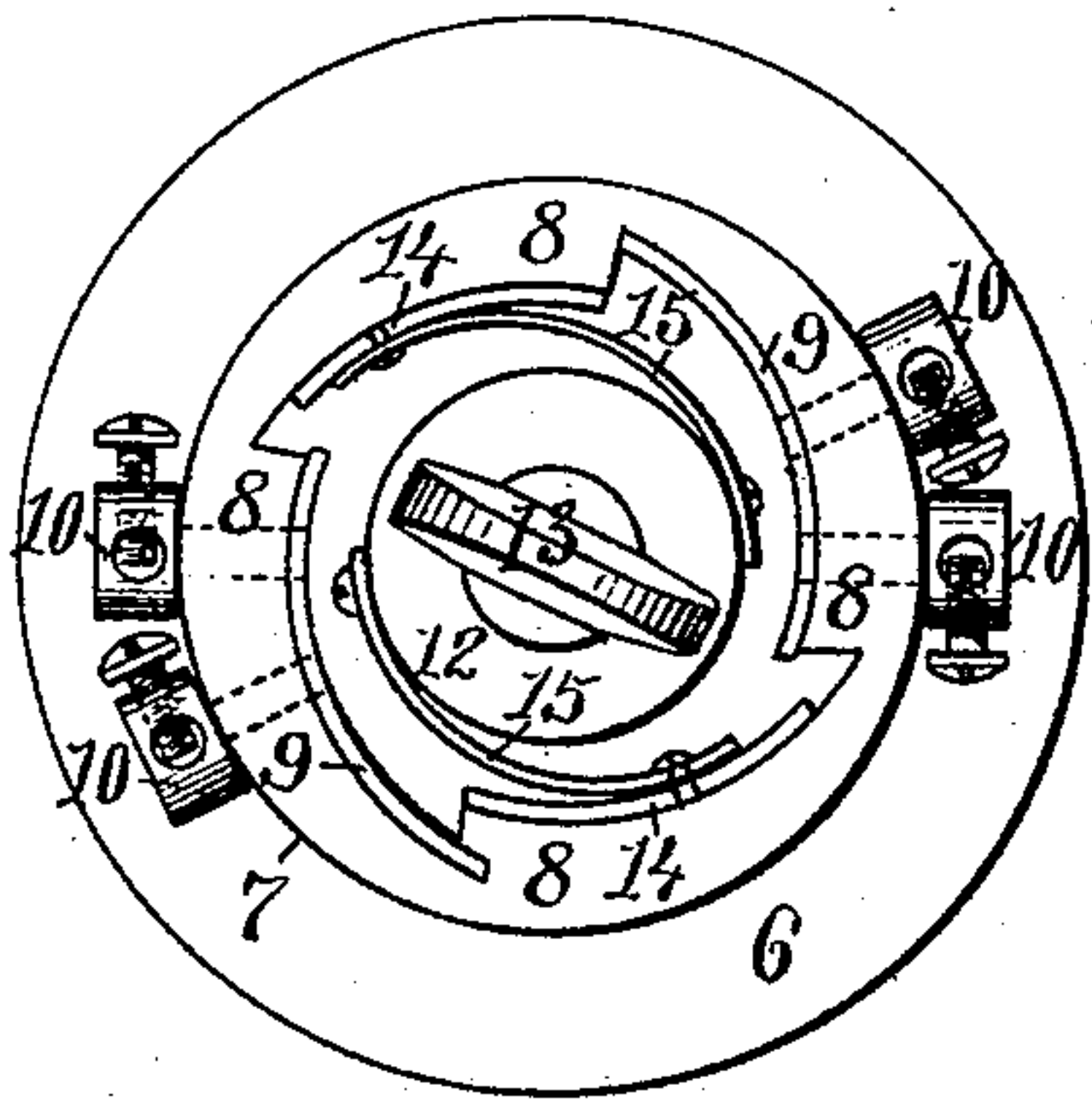


Fig. 2.

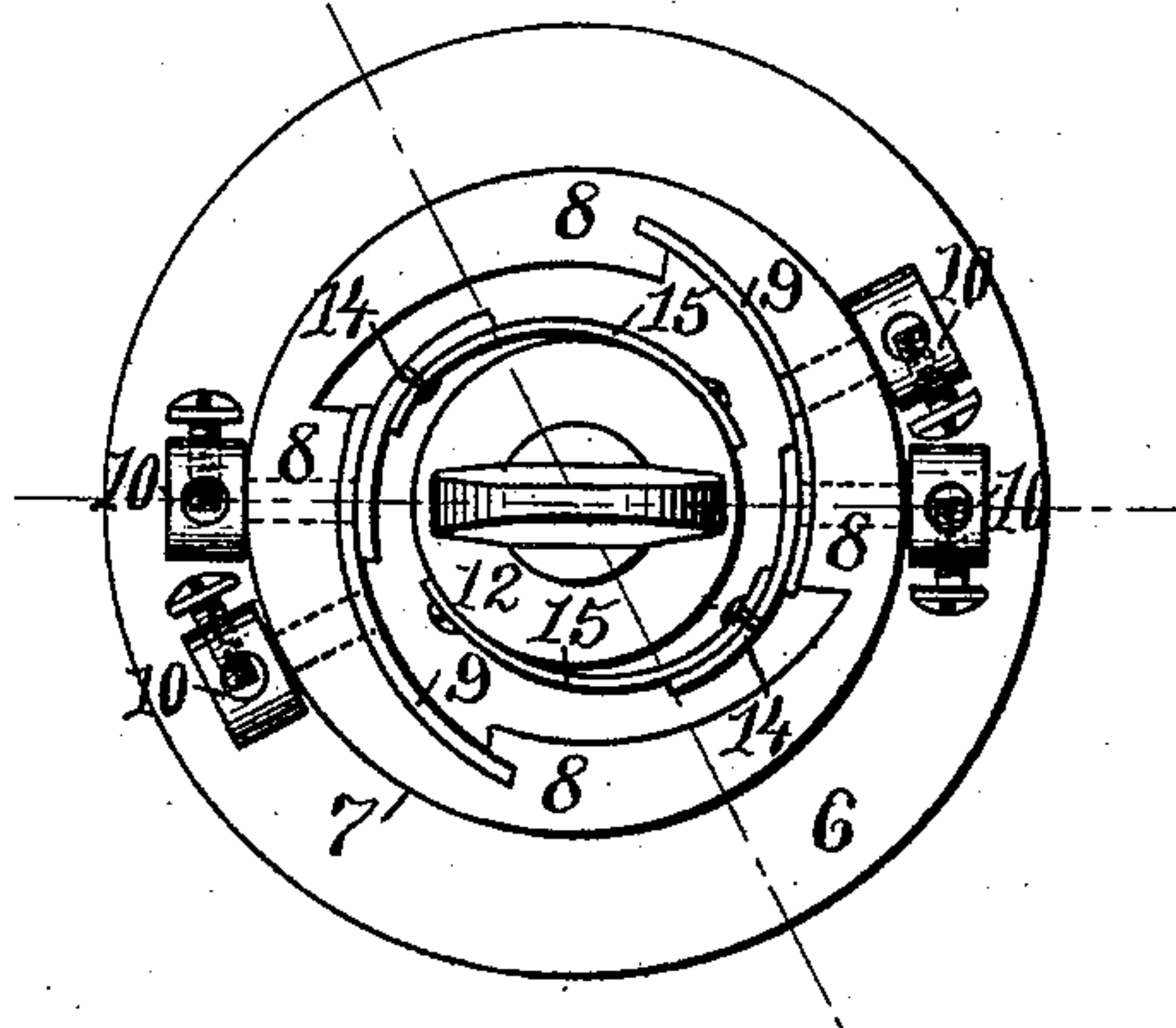


Fig. 3.

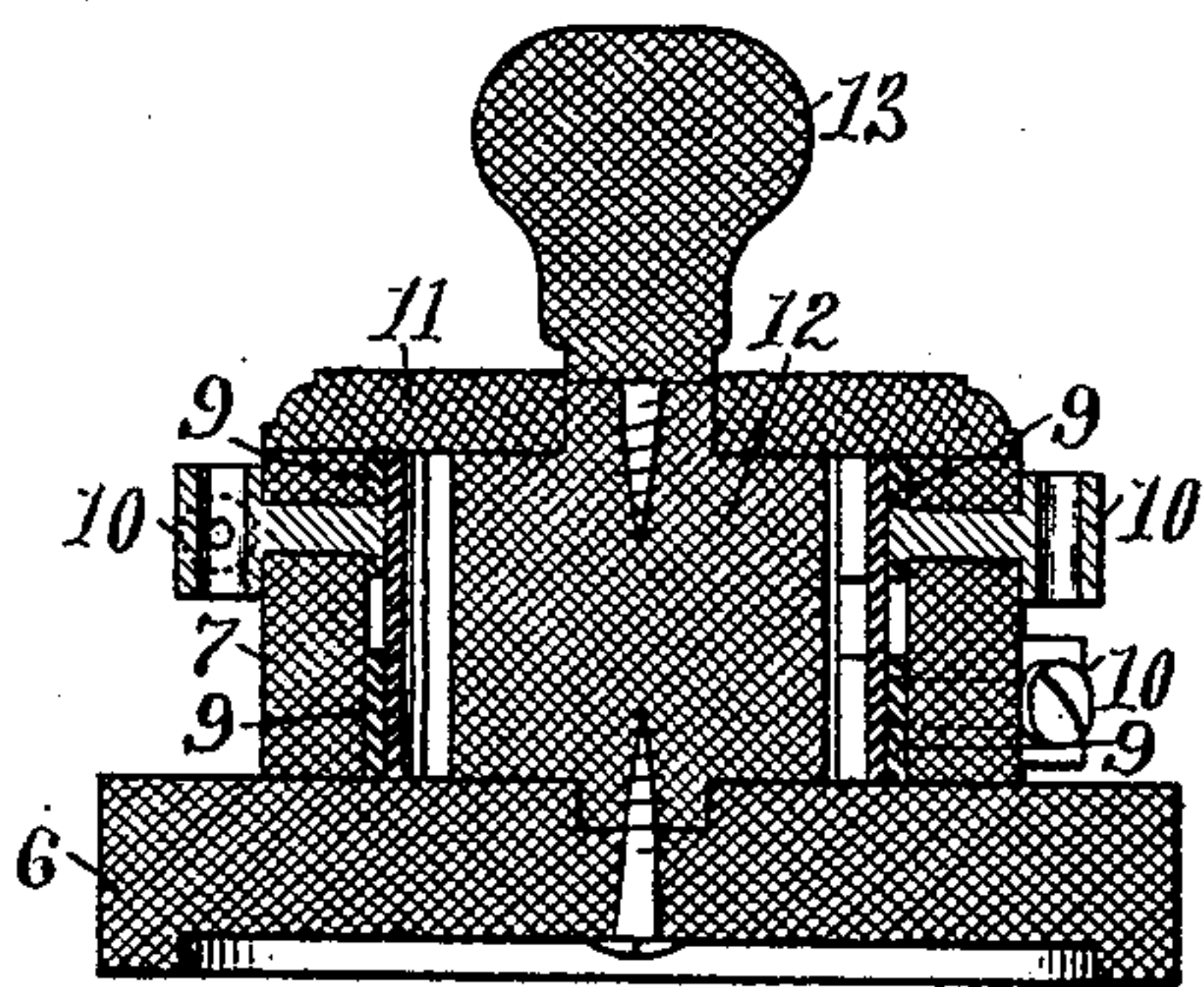
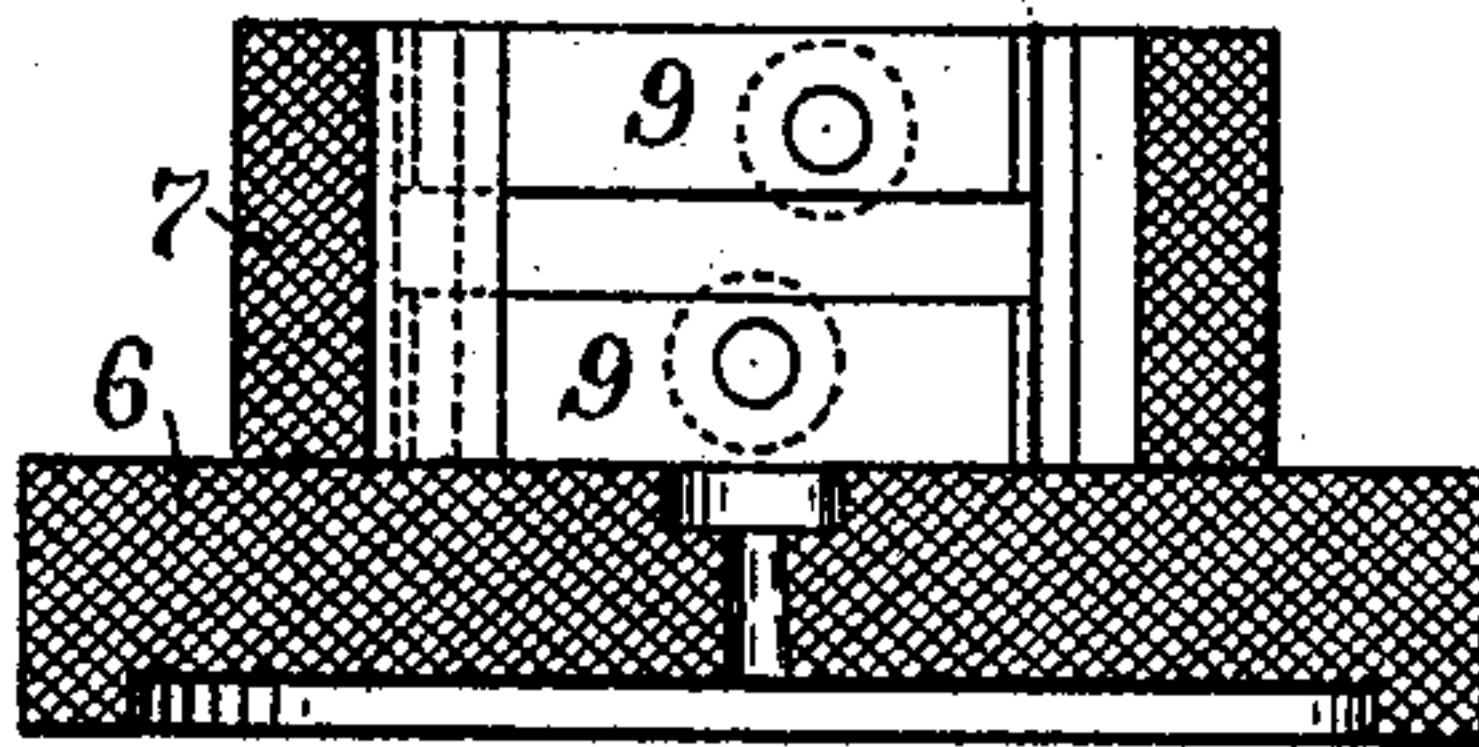


Fig. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOSEPH W. BATTERSHALL, OF ATTLEBOROUGH, MASSACHUSETTS.

## ELECTRIC HAND-SWITCH.

SPECIFICATION forming part of Letters Patent No. 437,352, dated September 30, 1890.

Application filed December 24, 1889. Serial No. 334,872. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. BATTERSHALL, of Attleborough, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in electric-light switches; and it consists in the peculiar and novel construction of the contact-surfaces and the spring-pressed contact-plates, by which the contact is made and broken instantaneously and arcs or flashes avoided, as will be more fully set forth hereinafter.

The object of this invention is to produce an electric switch in a small compass with binding-posts on the outside readily accessible, contact-surfaces on the inside, and wiper contact-plates which by a partial rotation will be brought instantaneously into contact with the contact-surface, and which, by a further rotation, will be pressed with increasing pressure into contact until the contact is instantaneously broken, so that the generation of heat and arcs is avoided.

Figure 1 is a plan view showing the switch in the position when the circuit is cut out. Fig. 2 is a plan view showing the switch in the position when the circuit is cut in, but nearly at the point when the same will be cut out. Fig. 3 is a vertical sectional view of the switch; and Fig. 4 is a vertical sectional view of the switch-cylinder, showing the contact-strips.

Similar numbers of reference indicate corresponding parts in all the figures.

In the drawings, the number 6 indicates the base, and 7 a short cylinder of any suitable non-conducting material. The interior surface of the cylinder 7 is formed into four ratchet-teeth 8, each tooth having, preferably, a curved face and undercut ends. The alternate teeth 8 have each the two contact-strips 9 secured to the curved face. These strips project slightly beyond the end of the teeth.

11 indicates the cover. The central shaft 12, made of suitable non-conducting material, is journaled in the base 6 and cover 11, and is provided with the thumb-piece 13, by which

it is turned. The contact-plates 14 are of such width as will cover the width of the two contact-strips and the intervening space. The plates are secured to one end of the springs 15, the other end of the springs being secured to the shaft 12. The resilience of the springs 15 forces the contact-plates 14 firmly against the inner surface of the cylinder 7. As this inner surface is formed into the four ratchet-teeth 8, the contact-plates 14 are forced against the face of the teeth. When now the shaft 12 is turned, the contact-plates act as wipers. They slide on the face of two opposite teeth 8, and, as the faces of the teeth are curved inward, the strain on the springs 15 increases the contact, until at the end of the teeth the contact-plates are suddenly and forcibly with a snap released each from a tooth and brought into contact with the face of the next tooth at the point farthest from the center, forming by the rotation of the shaft 12 a succession of wiping-contacts increasing in resistance by the increase of the frictional contacts, caused by the compression of the springs 15 and sharp, snapping, instantaneous breaks. As the alternate and opposing faces of the teeth 8 are each provided with two contact-strips 9, and these strips are connected by the binding-posts with the circuits, it will be seen that at the position shown in Fig. 1 the switch has cut out a loop or circuit. When now the shaft 12 is turned by the thumb-piece 13, or by a lever that may be secured to the shaft 12, or any other practical means for turning the shaft, the tension on the springs 15 will be increased as the contact-plates are forced up the curved incline face until the end of the contact-plates 14 reaches the end of the teeth, when the plates are instantly released and are forced with a snap against the contact-strips 9 on the face of the next succeeding teeth, thus making an instantaneous contact between the strips 9 by the contact-plates 14 presenting a large surface. When now the contact is to be broken, the rotation of the shaft 12 drags the contact-plates 14 over the contact-strips 9, gradually diminishing the area of surface in contact. The springs increase the pressure of the contact as the plates are drawn over the inwardly-curved contact-strips, so that as the area of contact dimin-

ishes the quality of the metallic contact improves until the rear end of the contact-plates reach the ends of the contact-strips, when the contact is instantaneously broken, and the  
5 contact-plate is with an instantaneous snap moved so far from the contact-strips that no arc can be formed and heating or burning is avoided. In a small switch a large area of contact-surface is secured, which is kept clean  
10 and bright by use.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

15 In a four-pole electric switch, the combination of two insulating ratchet - teeth, two ratchet-teeth the inner curved surface of each

of which is provided with the two metal plates 9, each having metallic connections with a binding-post, the insulated shaft 12, journaled in the base 6 and cap 11 and provided with 20 the thumb-piece 13, the springs 15, secured to the shaft 12, and the plates 14, secured to the springs, each plate connecting when in contact the two plates 9 on opposite sides simultaneously to cut in the lights and to cut out 25 the lights by a partial rotation, as described.

In witness whereof I have hereunto set my hand.

JOSEPH W. BATTERSHALL.

Witnesses:

M. F. BLIGH,

JOSEPH A. MILLER.