

(No Model.)

H. HUBBELL.
ELECTRIC SWITCH.

No. 471,612.

Patented Mar. 29, 1892.

Fig. 1

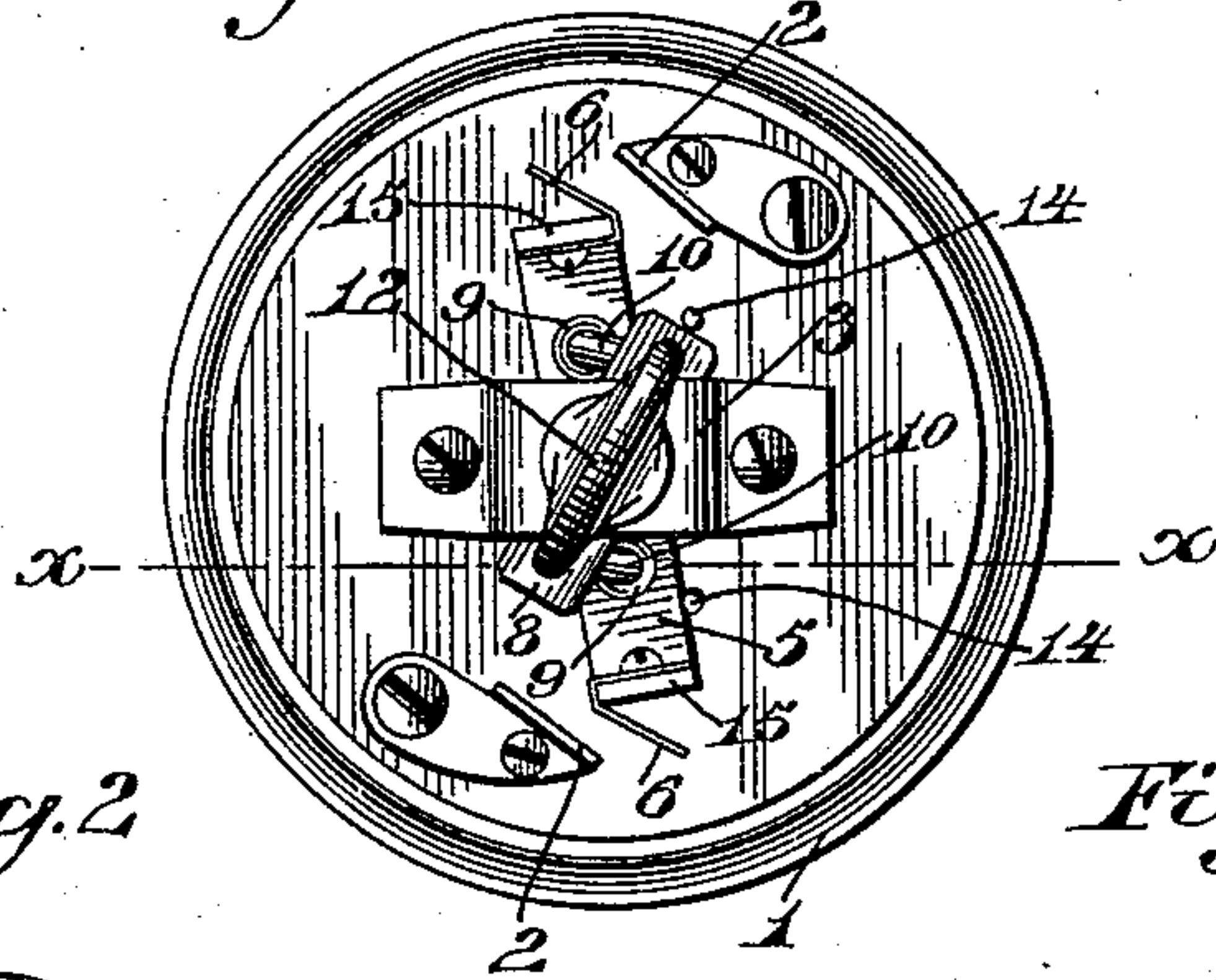


Fig. 2

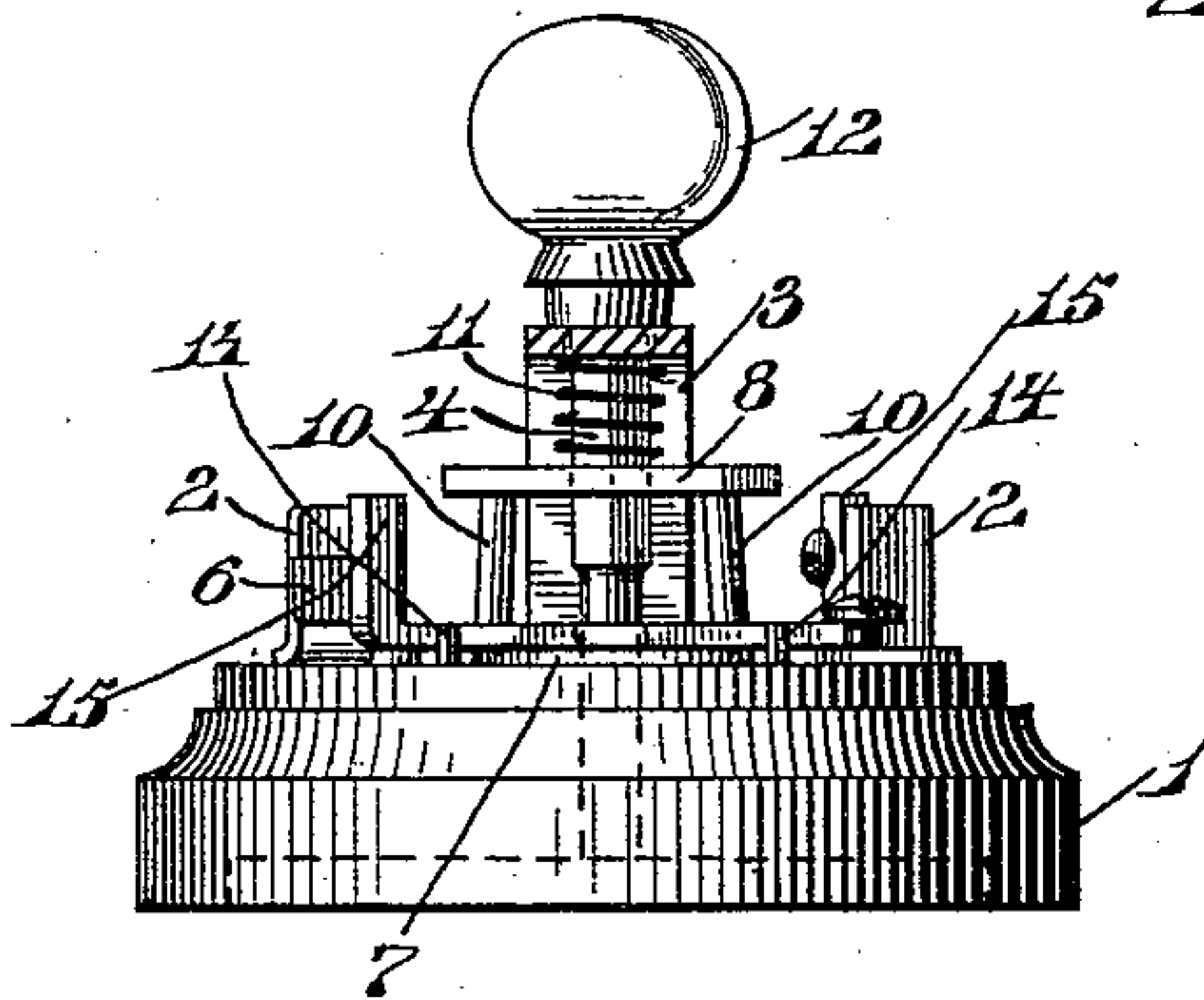


Fig. 3

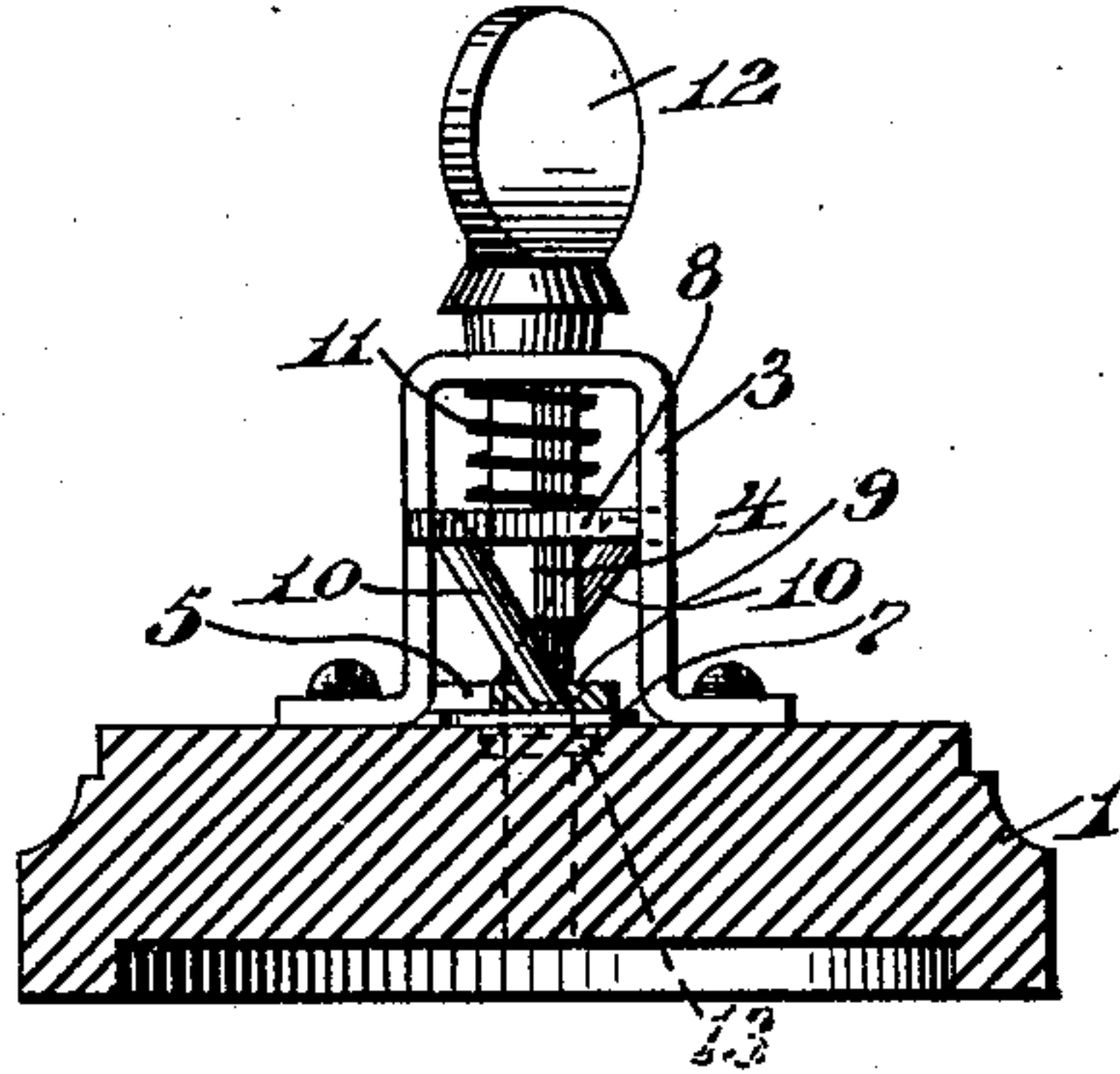


Fig. 4

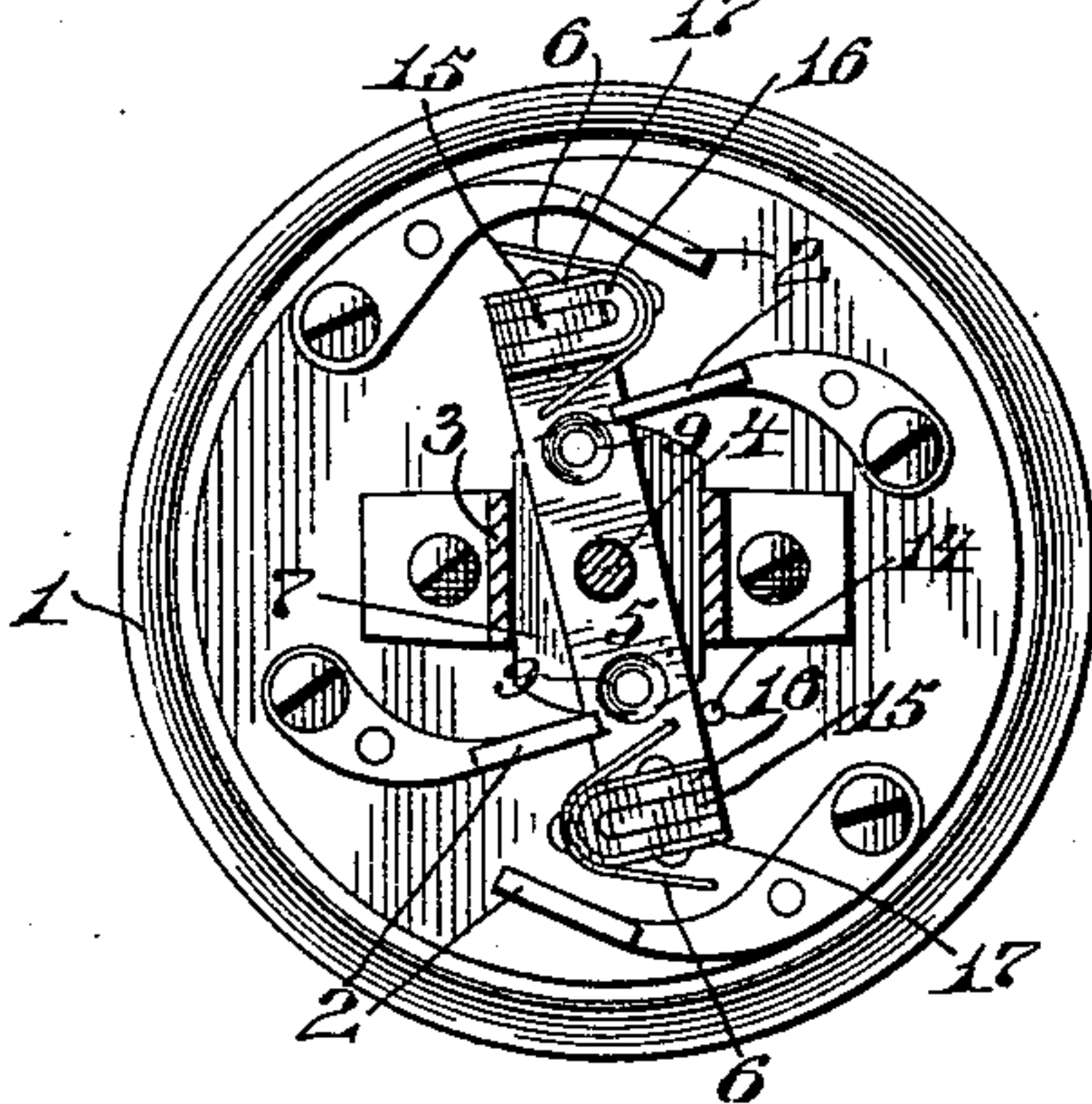


Fig. 7

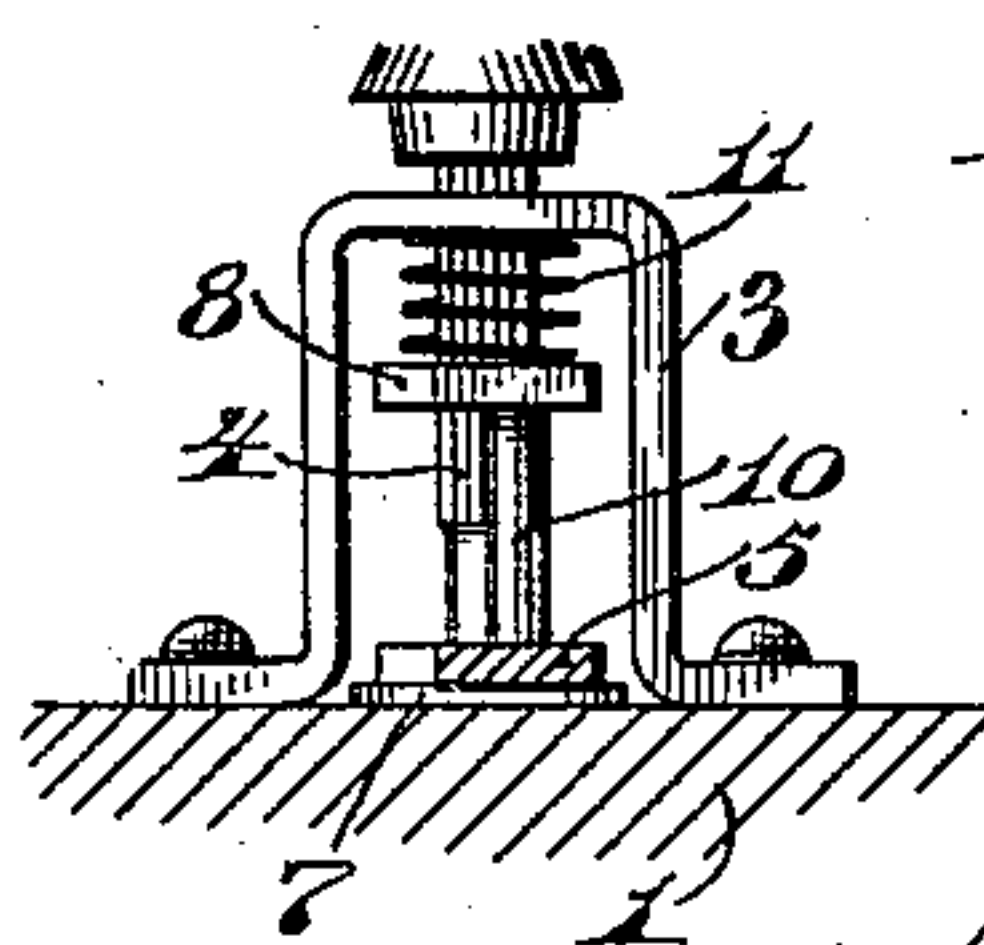


Fig. 5

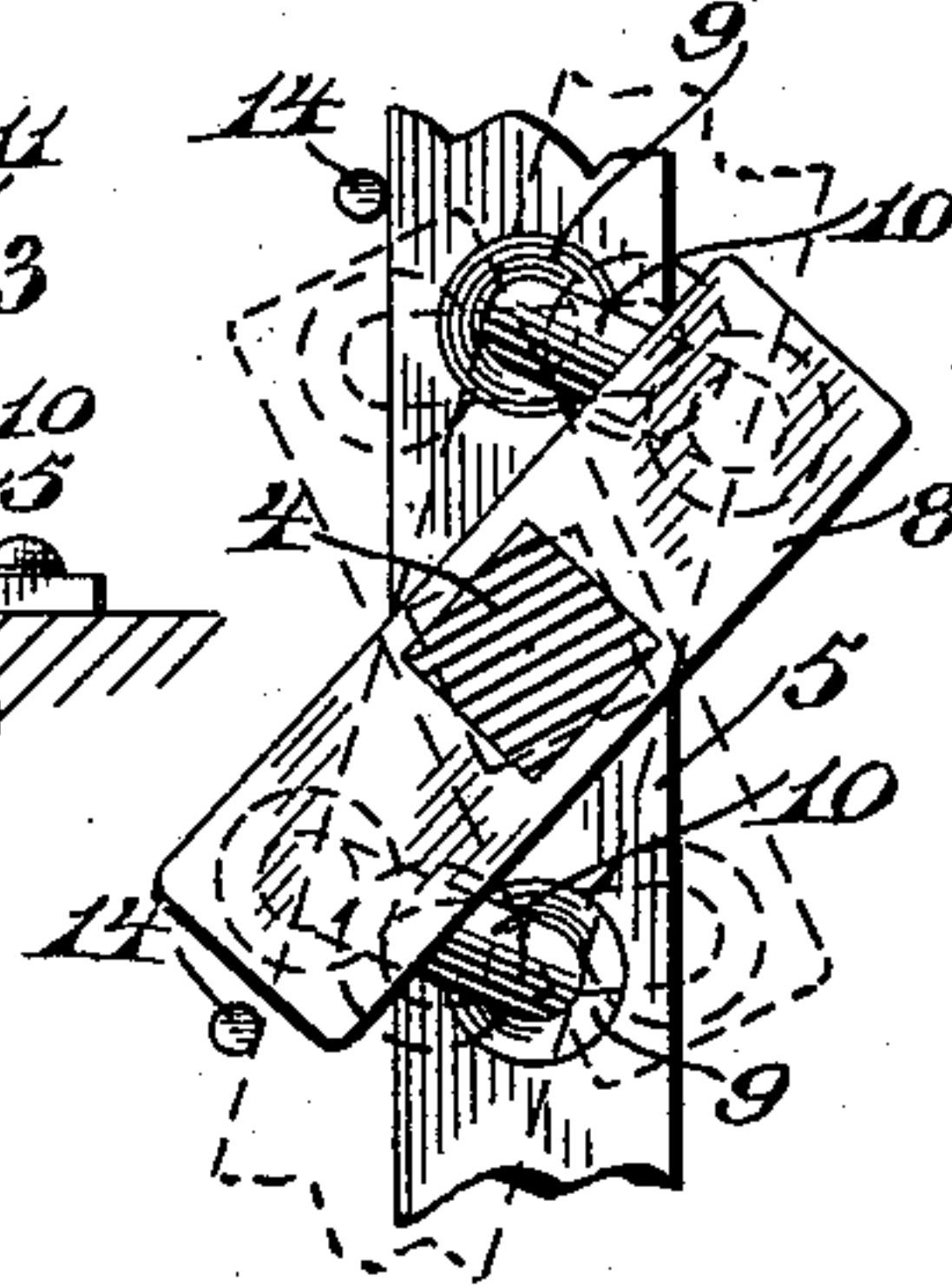
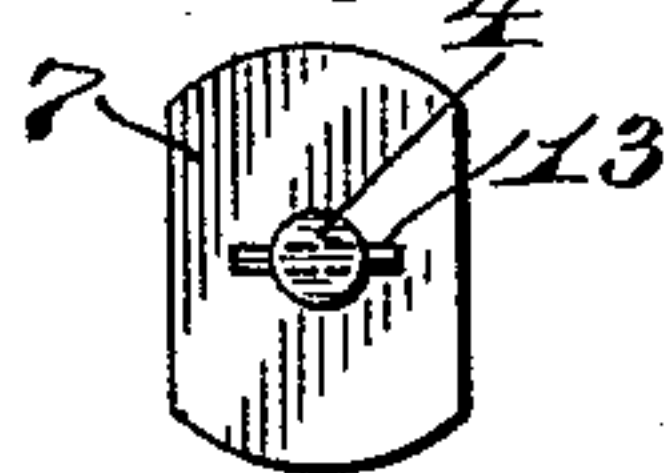


Fig. 6



WITNESSES

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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 471,612, dated March 29, 1892.

Application filed October 5, 1891. Serial No. 407,740. (No model.)

To all whom it may concern:

Be it known that I, HARVEY HUBBELL, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electric Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a simple, durable, quick-acting, and inexpensive electric switch. With these ends in view I have devised the simple and novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to designate the several parts.

Figure 1 is a plan view illustrating the principle of my invention as applied to a single-pole switch, the contact-bar being shown as in the open position; Fig. 2, a side elevation as seen from the right in Fig. 1, the yoke being in section; Fig. 3, a section on the line x x in Fig. 1; Fig. 4, a horizontal section of the yoke and spindle, showing the application of my invention to a double-pole switch, the contact-bar, brushes, and terminals appearing in plan; Fig. 5, a detail view, on an enlarged scale, illustrating the operation of the cross-piece and contact-bar; Fig. 6, an inverted plan view of a supporting-plate, preferably used and under the contact-bar, showing the manner in which the spindle is held against removal; and Fig. 7 is a detail view corresponding with Fig. 3, showing the cross-bar in an intermediate position and the pins in a vertical position, said parts being in the position they occupy an instant before the movement of the contact-bar.

1 denotes the base, which may be made of wood, porcelain, or any suitable material; 2, the terminals; 3, the yoke, which is rigidly secured to the base; 4, the spindle, which oscillates freely in the yoke and base; 5, the oscillating contact-bar; 6, the brushes, and 7 a supporting-plate lying upon the top of the base between the arms of the yoke. The upper portion of the spindle is shown as made angular

in cross-section and carries a cross-piece 8, which may or may not slide up and down on the spindle, but must oscillate therewith. The under side of the cross-piece and the upper side of the contact-bar are provided with depressions 9, which receive the respective ends of pins or bars 10.

11 denotes a strong spring, which bears upon the under side of the yoke and upon the upper side of the cross-piece, thus acting to force the cross-piece downward. At the upper end of the spindle is a finger-piece 12, which is rigidly secured thereto. The lower end of the spindle—i. e., the portion which passes through the contact-bar and supporting-plate—is ordinarily made round.

13 is a pin, which passes through the spindle under the supporting-plate, thereby holding the spindle against removal until the yoke is removed.

14 denotes stops in the base, which limit the movement of the contact-bar in single-pole switches when it is thrown to either the open or closed position, the oscillations of the cross-piece being limited by the yoke, as clearly shown in Fig. 3.

The operation is as follows: In assembling suppose the contact-bar to be at the open position, as in Figs. 1 and 3. The cross-piece is placed at the opposite extreme of its movement with the pins lying obliquely between said parts, the ends resting in depressions 9, as is also clearly shown in Fig. 1. The action of the spring is to force the cross-piece down and hold the parts in this position. When the parts are in the position shown in Fig. 3, movement of the finger-piece toward the right will carry the spindle and cross-piece to the position shown in Fig. 7, the cross-piece sliding upward on the spindle if left loose thereon, and both cross-piece and spindle rising if the cross-piece is attached to the spindle. As soon as the cross-piece has moved past the dead-center—i. e., so that the upper ends of the pins incline toward the right—the spring will act again to force the cross-piece downward, the effect of which will be to throw the contact-bar instantly to the opposite extreme of its movement. Suppose that when the movement of the finger-piece began the contact-

bar was in the open position, as in Figs. 1 and 3. Said contact-bar would be instantly thrown to the closed position; or if said contact-bar was in the closed position it would be instantly
5 thrown to the open position.

I have shown the contact-bar as provided with upwardly-turned ends 15, to which the brushes are secured by screws, or in any ordinary or preferred manner. In double-pole
10 switches, (see Fig. 4,) as it is necessary that the brushes should be insulated, I place a layer 16 of suitable insulating material, ordinarily hard rubber, about the upwardly-turned ends of the contact-bar. In order to give the
15 greatest possible strength, I preferably place a strip 17 of brass about the layer of insulating material, and to this I attach the brushes, the brushes themselves being made of bronze or any suitable material.

20 Having thus described my invention, I claim—

1. The combination, with a spindle carrying a cross-piece and a contact-bar turning freely on said spindle, said cross-piece and
25 contact-bar having depressions 9, of a spring acting to force the cross-piece downward and pins engaging, respectively, the depressions in the cross-piece and contact-bar.

2. The combination, with a rotary spindle,
30 a cross-piece carried thereby, and a contact-bar mounted and turning loosely on the spindle, of a yoke, a spring engaging the yoke and cross-piece to force the latter downward, and pins engaging the cross-piece and contact-bar and acting to throw said parts away
35 from each other, so that when the cross-piece is moved toward the contact-bar the cross-piece will be raised against the power of the

spring until the dead-center is passed, when the spring will again act to throw the contact-
40 bar quickly in the opposite direction.

3. The combination, with a rotary spindle, a cross-piece carried thereby, and a contact-bar turning loosely on the spindle, of a spring
45 acting to hold the cross-piece downward, pins engaging the cross-piece and contact-bar and acting to throw them in opposite directions, a yoke by which the parts are held in place and which serves as a stop to limit the movement
50 of the cross-piece, and stops 14, which limit the movement of the contact-bar in either direction.

4. The combination, with a yoke, a spindle, a cross-piece carried thereby, and a spring
55 acting to force the cross-piece downward, of a contact-bar, a plate 7, upon which it rests, pins engaging the cross-piece and contact-bar and acting to throw them in opposite directions, and a pin 13 in the spindle below plate
60 7, by which the parts are held in position until the yoke is removed.

5. The combination, with the spindle carrying a cross-piece and a spring acting to force
65 the cross-piece downward, of a contact-bar having upwardly-turned ends, insulating pieces upon said upwardly-turned ends, brushes secured to the insulating pieces, and pins 10, engaging the cross-piece and contact-bar to throw them in opposite directions when
70 the spindle is rotated.

In testimony whereof I affix my signature in presence of two witnesses.

HARVEY HUBBELL.

Witnesses:

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EDITH G. ELY.