

No. 754,379.

PATENTED MAR. 8, 1904.

N. MARSHALL.
ELECTRIC SWITCH.

APPLICATION FILED OCT. 6, 1903.

NO MODEL.

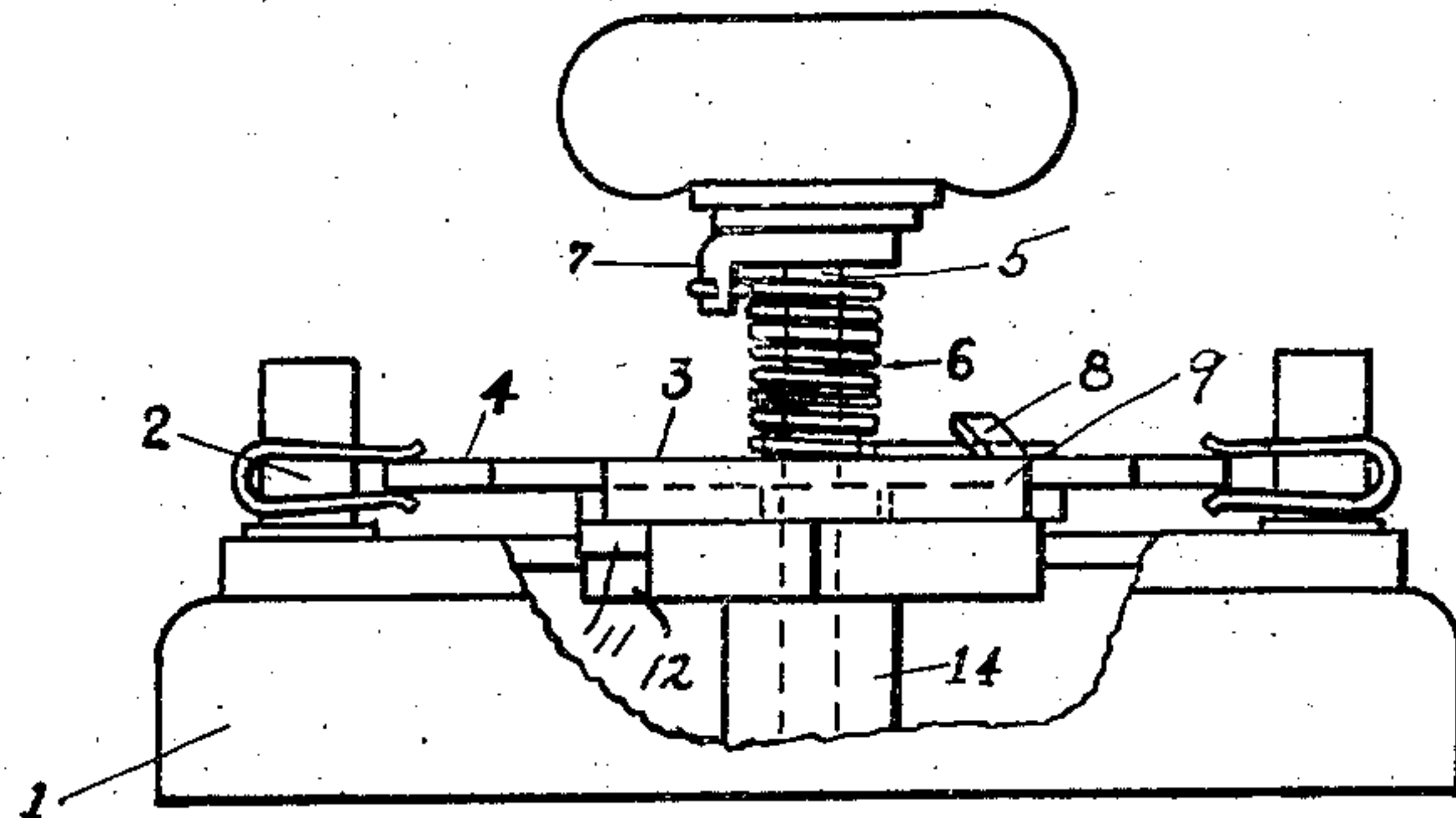


Fig. 1.

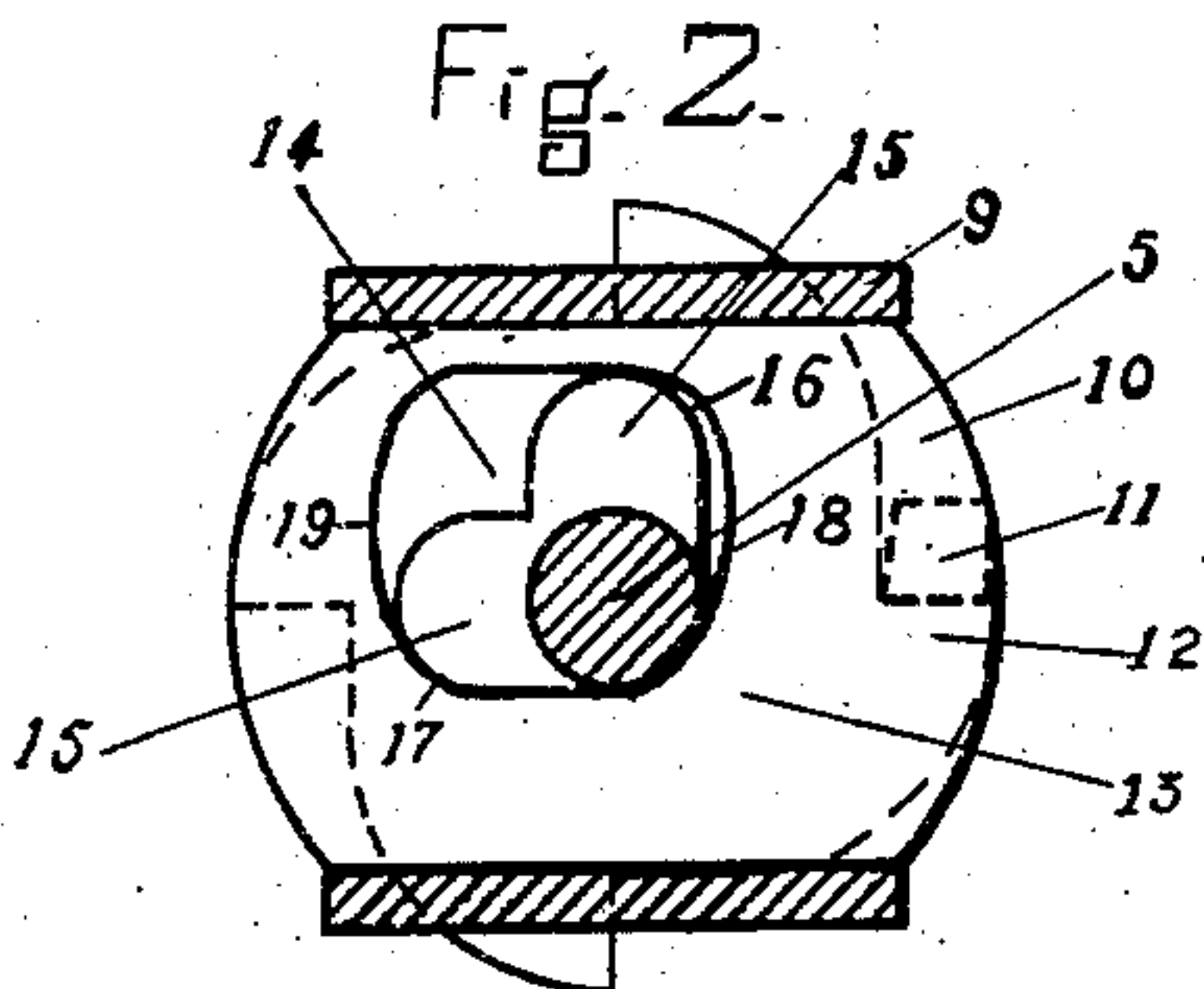


Fig. 2.

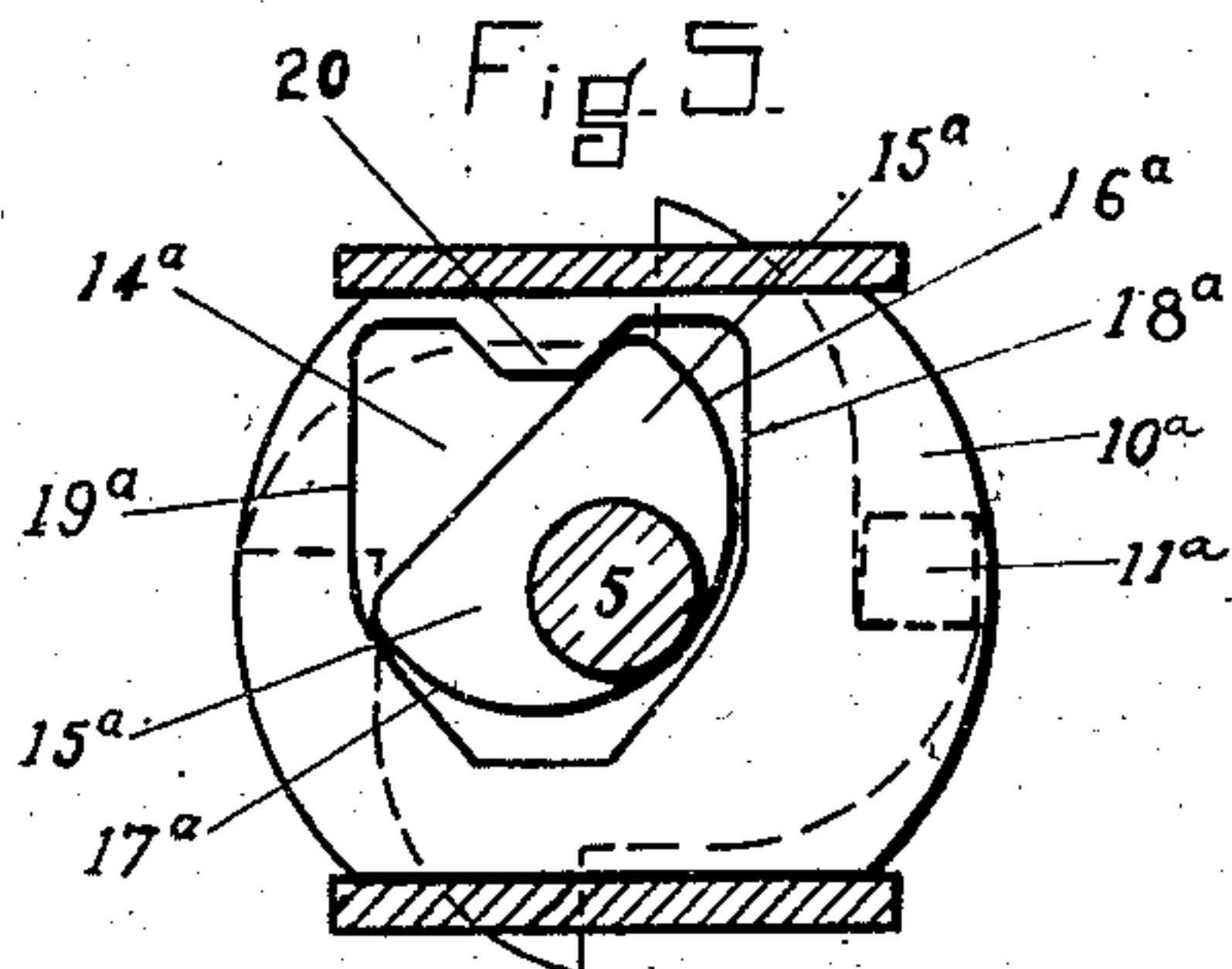


Fig. 5.

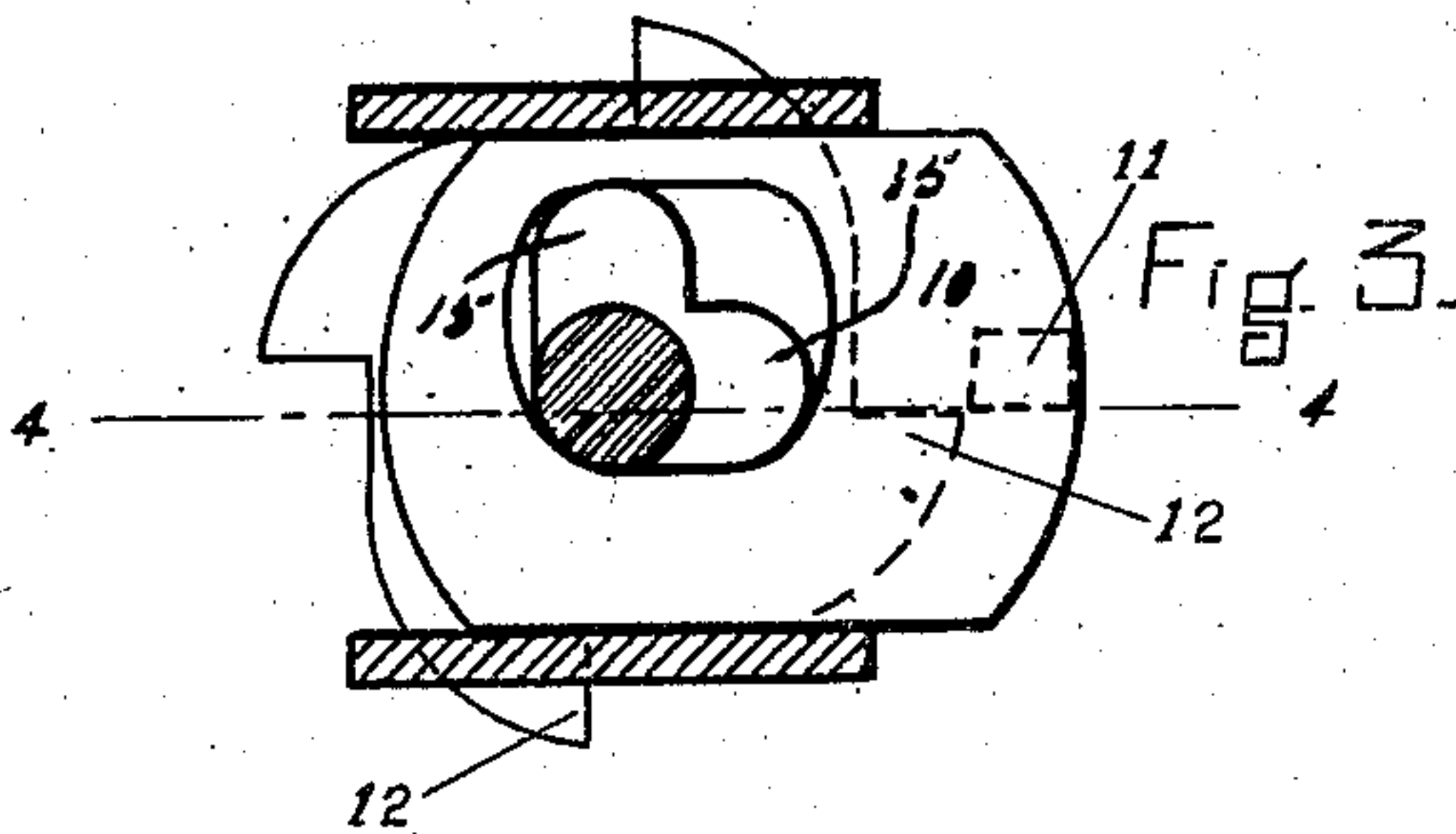


Fig. 3.

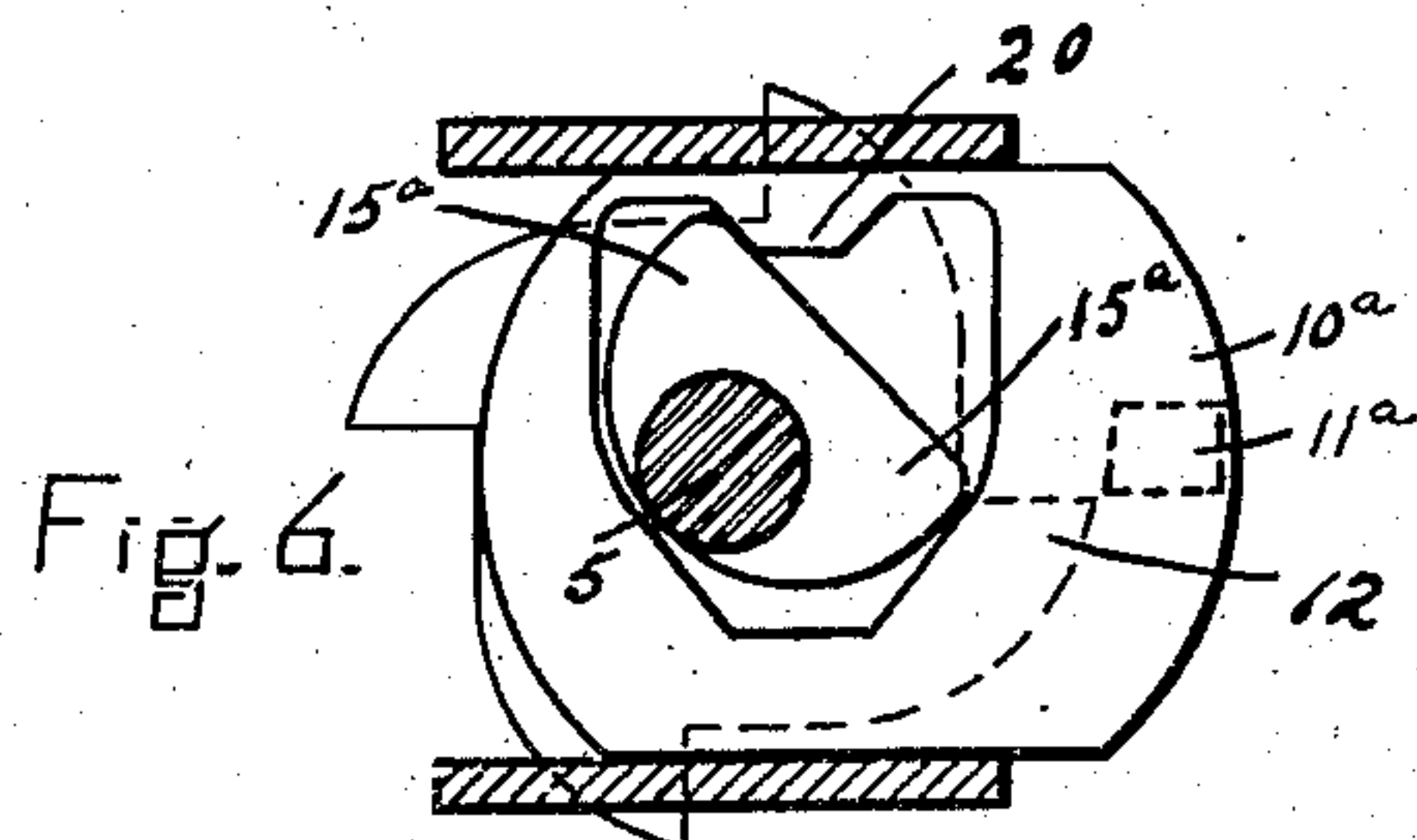


Fig. 6.

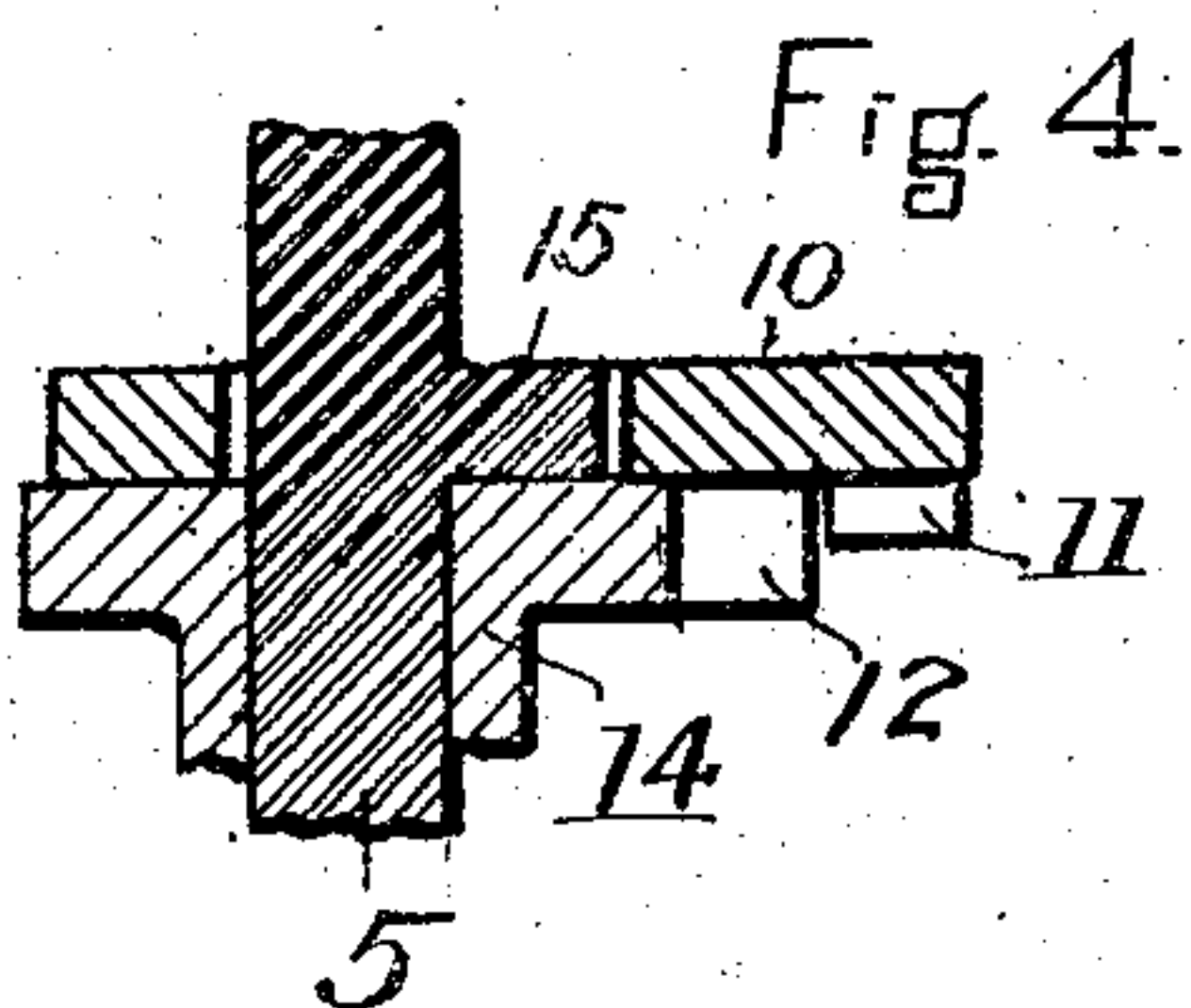


Fig. 4.

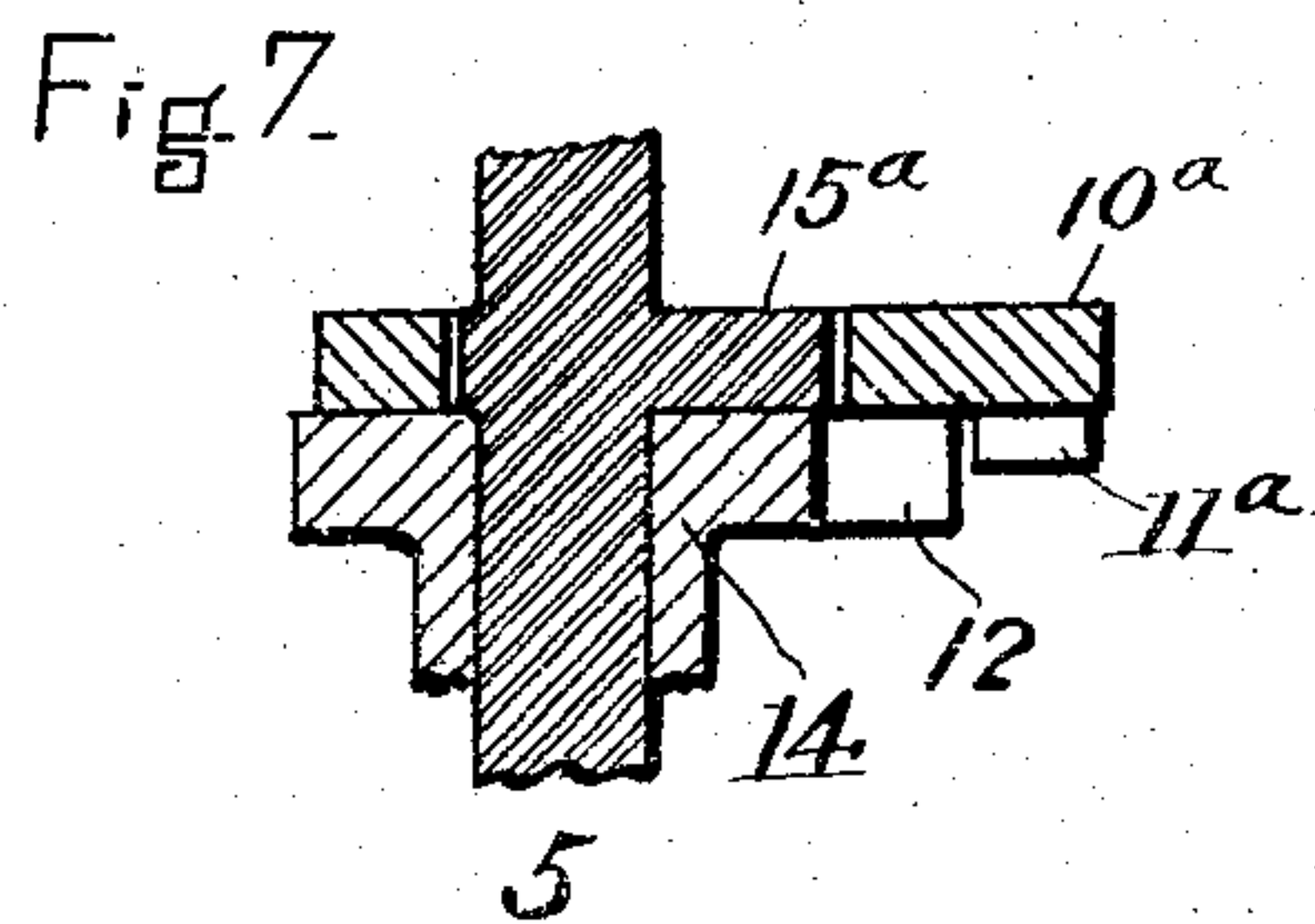


Fig. 7.

Witnesses

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NORMAN MARSHALL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO
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ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 754,379, dated March 8, 1904.

Application filed October 6, 1903. Serial No. 175,949. (No model.)

To all whom it may concern:

Be it known that I, NORMAN MARSHALL, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The invention relates to electric snap-switches in which the rotation of the spindle tensions the spring for operating the switch-plate and also operates a catch which by its engagement with a series of stops restrains the switch-plate until the spring has been tensioned and also determines the movement of the switch-plate after it is released.

The object of the invention is to provide an improved construction which shall be compact, simple, efficient, and durable when made on the small scale required in this class of switches; and to this end the invention consists in the features and combinations set forth in the claims.

In the accompanying drawings, Figure 1 shows an elevation of a snap-switch embodying the invention, a part of the insulating-base being broken away. Fig. 2 is a sectional plan view taken just above the catch-plate in Fig. 1. Fig. 3 is a similar view showing the parts in a different position. Fig. 4 is a vertical section on the line 4 4, Fig. 3. Figs. 5, 6, and 7 are views corresponding to Figs. 2, 3, and 4, showing a modified construction.

As shown in the drawings, the switch is provided with an insulating-base 1, to which the stationary contacts and binding-post 2 are secured and which also supports the other parts of the switch. The switch-plate 3, which carries the movable contacts 4, is loosely mounted on a spindle 5 and is connected therewith by means of a spring 6. One end of the spring is connected with the spindle by engaging a lug 7, carried thereby, and the other end of the spring is connected with the switch-plate by engaging a lug 8, formed thereon. The switch-plate is provided with depending flanges 9, which form guides between which a stop-plate 10 is confined and guided. The catch-plate 10 is provided with a lug 11, arranged to engage a series of teeth 12, which

act as stops for cooperating with the catch-plate in determining the movements imparted to the switch-plate. The teeth 12 are formed on a plate 13, fixed in the base 1 and provided with a depending hub 14, which forms a supporting-bearing for the spindle 5. When the spindle 5 is turned, the spring 6 is tensioned and by its connection with the switch-plate tends to turn said plate about the spindle. The switch-plate is held from rotation, however, by the engagement of the catch 11 with one of the teeth 12. The rotation of the spindle not only tensions the spring, but also slides the catch-plate 10 in its guides to carry the catch 11 along the tooth 12 until the catch is disengaged from the tooth, when the spring 6 will suddenly rotate the switch-plate about the spindle. The forward rotation of the catch-plate with the switch-plate carries the catch 11 into engagement with the next tooth 12, which determines the position of the catch-plate and the connected switch-plate.

The connections between the spindle 5 and the catch-plate 10, by which the sliding movements of the catch-plate in its guides to disengage the catch 11 from one tooth and engage it with the next are effected, consist of a recess or opening 14 in the catch-plate and arms 15, projecting from the spindle 5. The spindle 5 extends through the opening 14, which extends lengthwise of the catch-plate, so that the projecting arms 15 lie within the recess 14 in the same plane with the catch-plate. The arms 15 are provided with cam-surfaces 16 and 17, arranged to act against the ends 18 and 19 of the opening 14, and thereby reciprocate the catch-plate in its guides. Supposing the parts to be in the position shown in Fig. 2, when the spindle 5 is turned the cam-surface 16 will act against the end 18 of the opening 14 and advance the catch-plate from the position shown in Fig. 2 to the position shown in Fig. 3 as the spindle turns through a quarter-revolution. During this movement of the catch-plate the cam-surface 17 moves idly in engagement or substantially in engagement with the end 19 of the opening 14, so that there is no material play or lost

motion between the catch-plate and the arms 15. When the catch-plate has been moved into the position shown in Fig. 3, the catch 11 is free from the tooth 12, and the switch-plate and catch-plate are quickly advanced through a quarter of a revolution with relation to the spindle by the action of spring 6. As the catch-plate rotates about the spindle the cam-surface 17 acts against the end 19 of the opening 14 to retract the catch-plate in its guides, so that as the catch-plate completes a quarter-revolution the catch 11 is brought into engagement with the succeeding tooth 12. During this movement of the catch-plate the end 18 of the opening 14 moves idly along the cam-surface 16. The relative position of the spindle and catch-plate will now be the same as that shown in Fig. 2, the parts having been advanced through a quarter-revolution, however.

In Figs. 5, 6, and 7 a modified form of connection between the spindle and catch-plate is shown. In this construction a part of the movement of the catch-plate is produced by cam-surfaces on arms projecting from the spindle, as in the construction shown in Figs. 2, 3, and 4, while the movement of the catch-plate is completed by the engagement of the arms with a lug projecting inward from the side of the opening in the catch-plate. With this construction the catch-plate may be moved rapidly in completing its movement and slowly at the beginning of its movement. This will result in a sudden release of the catch-plate and at the same time there will be little inward movement of the catch at the beginning of its rotation and no danger, therefore, of its dragging on the top of the stop-teeth. As shown in these views the catch-plate 10^a is provided with an opening 14^a, extending lengthwise thereof, and the spindle 5 is provided with arms 15^a, lying in this opening and provided with cam-surfaces 16^a and 17^a, which act against the ends 18^a and 19^a of the opening. A lug 20 projects inward from the side of the opening 14^a and is so arranged that the arms 15^a will engage the op-

posite sides of the lug and complete the sliding movement of the catch-plate. As the spindle is turned from the position shown in Fig. 5 to the position shown in Fig. 6 the cam-surface 16^a acts against the end 18^a of the opening 14^a and advances the catch-plate in its guides. After the cam-surface 16^a has ceased to act to advance the catch-plate the other arm 15^a engages the rear side of the lug 20 and completes the advance movement of the catch-plate to disengage the catch 11^a from the tooth 12. When the catch-plate rotates with relation to the spindle under the influence of the spring 6, the cam-surface 17^a retracts the catch-plate during the first part of the rotation, and then the other arm 15^a engages the front side of the lug 20 and completes the rearward movement of the catch-plate.

What I claim, and desire to secure by Letters Patent, is—

1. In an electric switch the combination of a stop-plate, a switch-plate, a sliding catch-plate carried by said switch-plate and provided with an opening extending lengthwise thereof, a spindle extending through said opening and provided with projecting arms lying in said opening and having cam-surfaces arranged to engage the opposite ends of said opening and reciprocate said catch-plate, substantially as described.

2. In an electric switch the combination of a stop-plate, a switch-plate, a sliding catch-plate carried on said switch-plate and provided with an opening extending lengthwise thereof, a spindle extending through said opening and provided with projecting arms lying in said opening and having cam-surfaces arranged to engage opposite ends of said opening, and a lug projecting inward from the side of said opening and arranged to be engaged by said arms, substantially as described.

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

NORMAN MARSHALL.

Witnesses:

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KATHARINE A. DUGAN.