

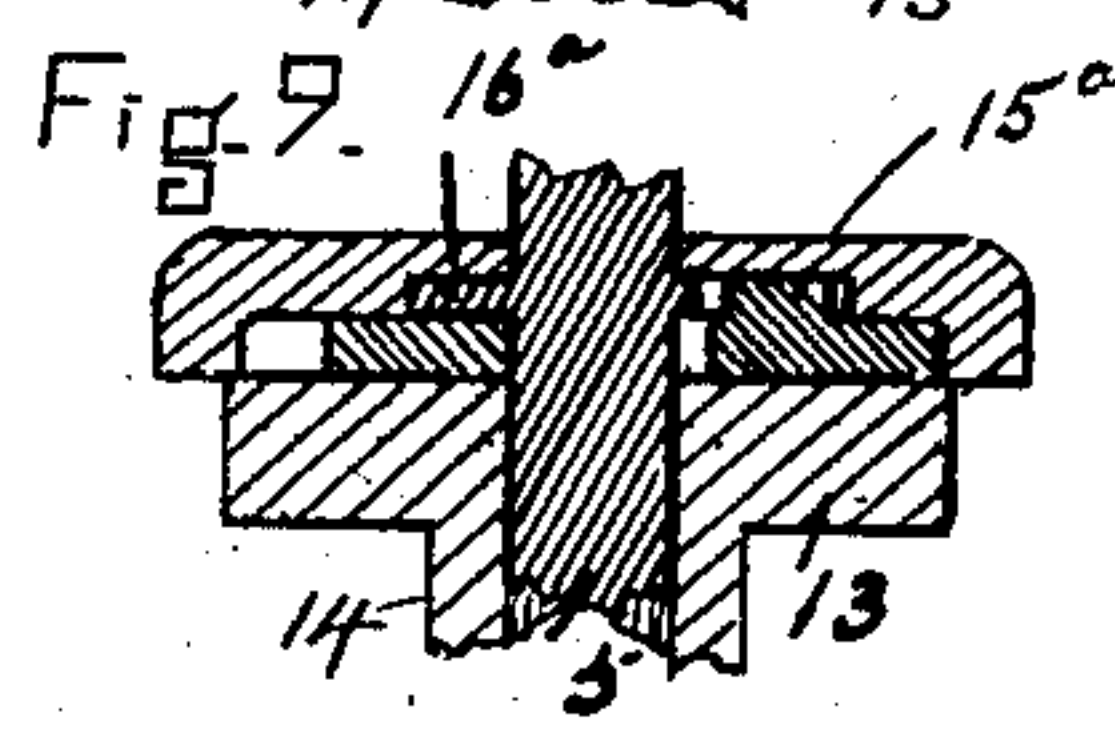
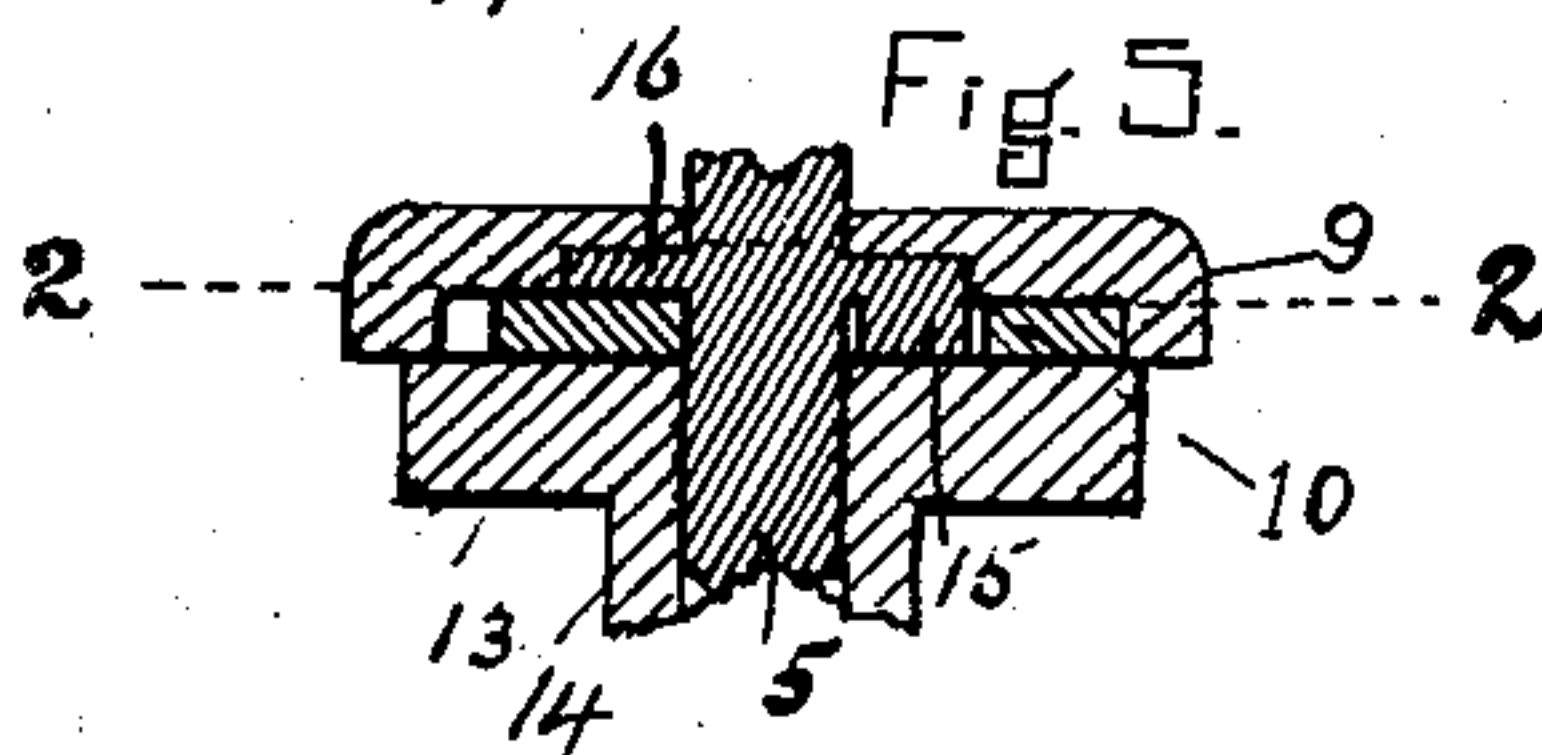
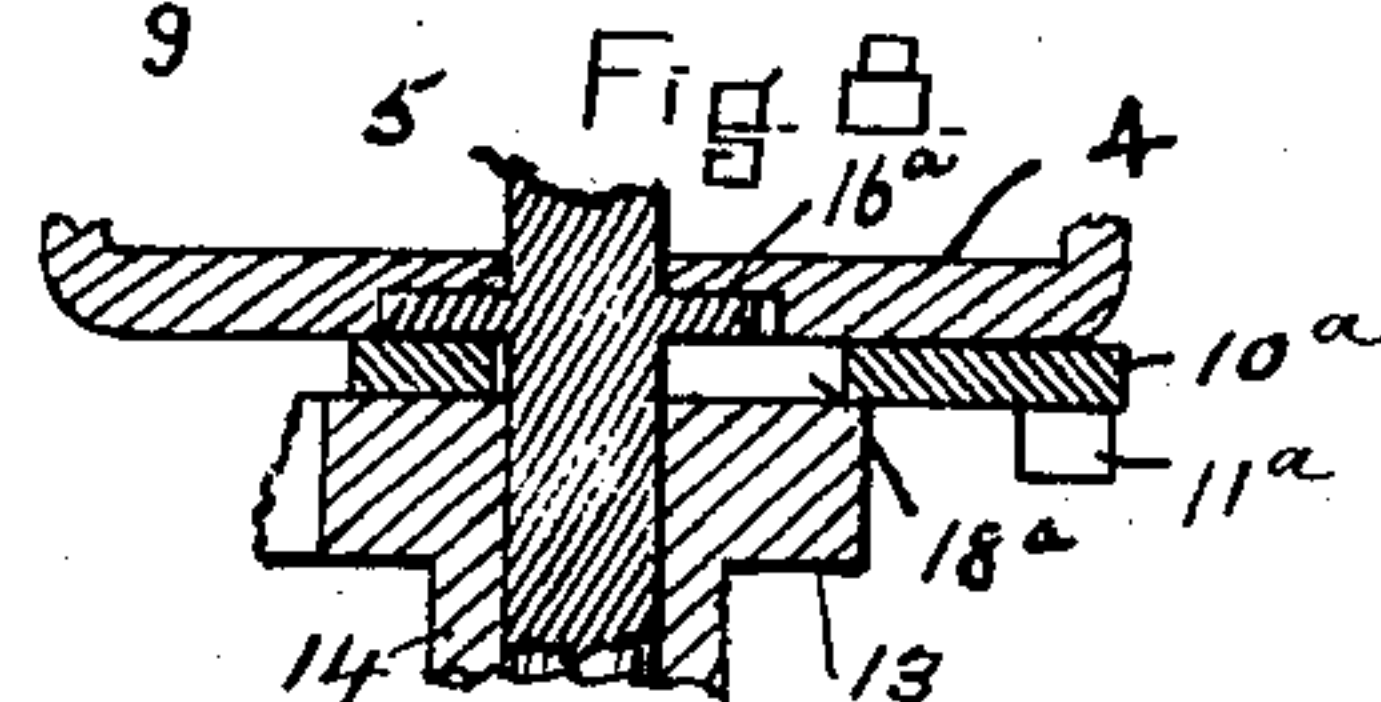
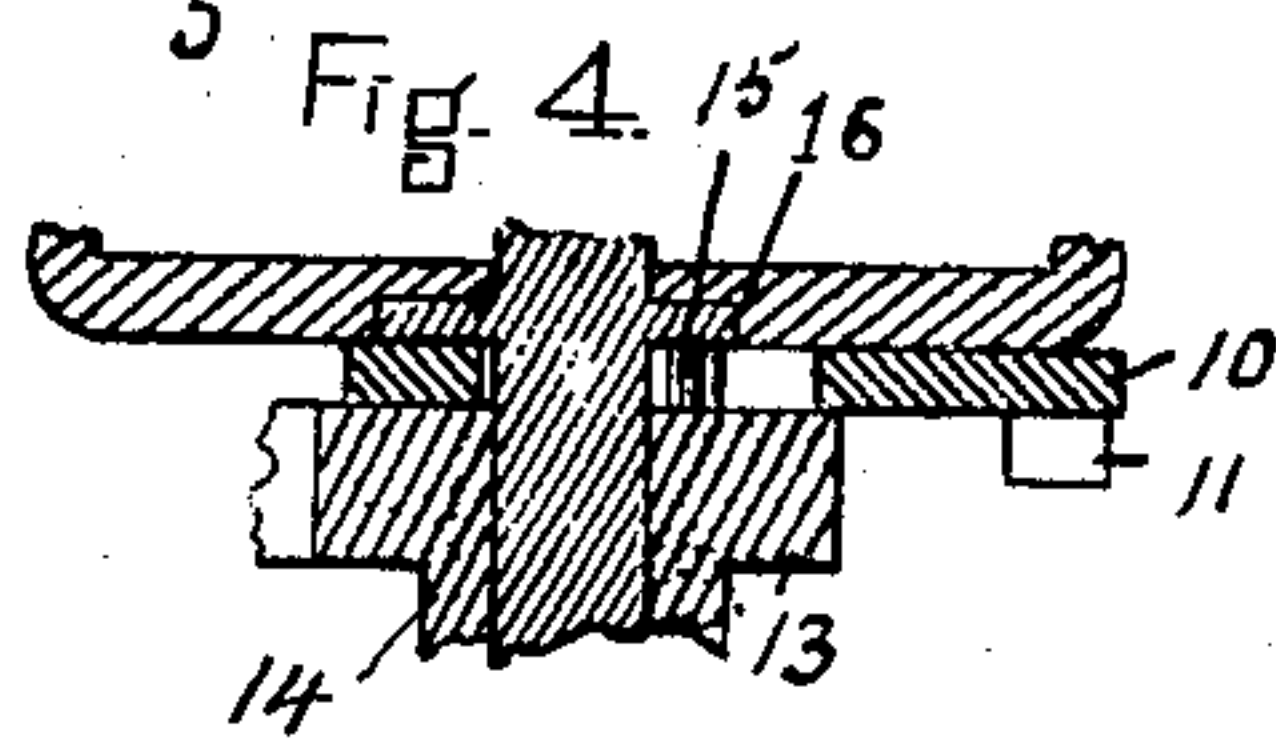
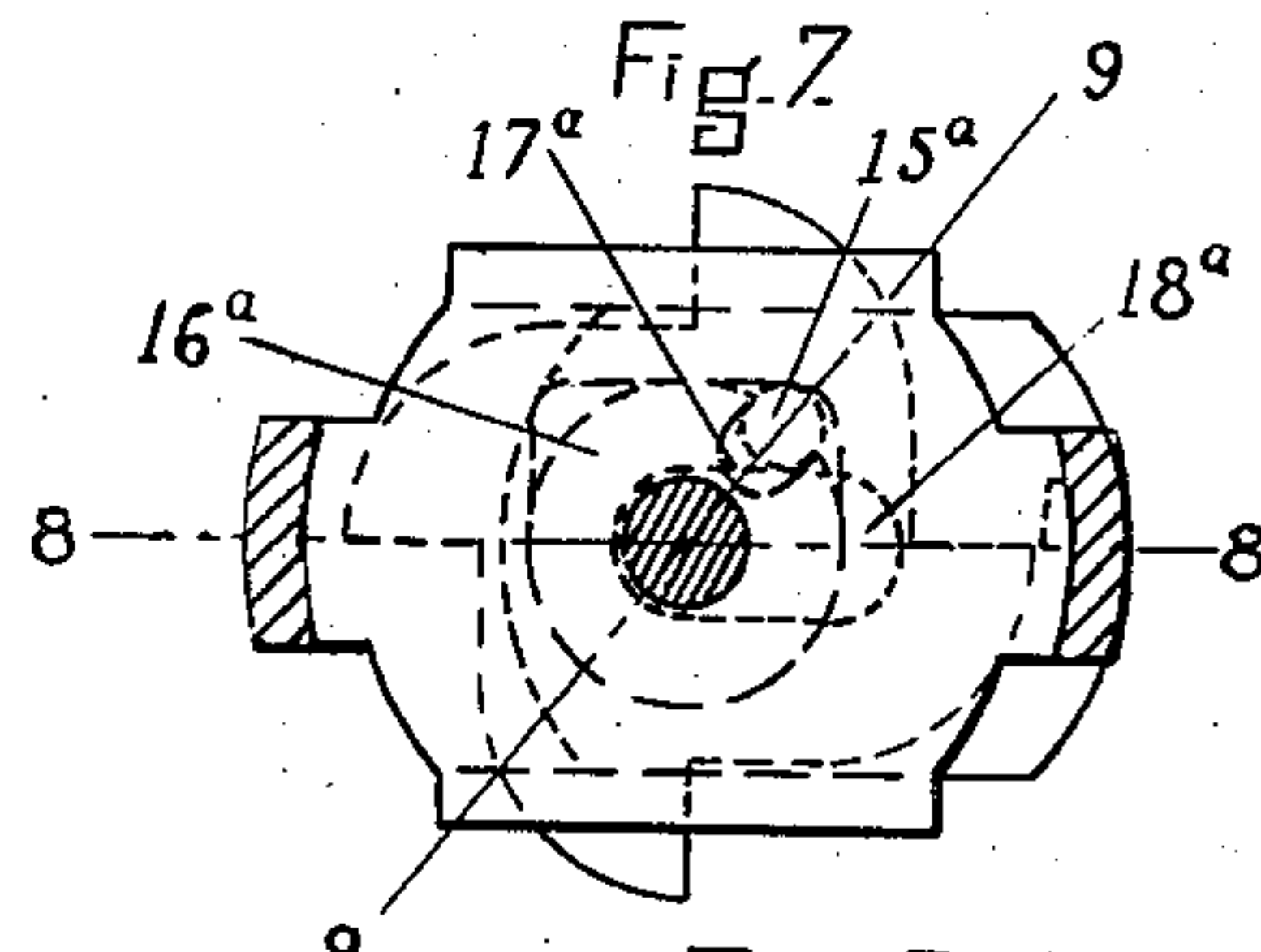
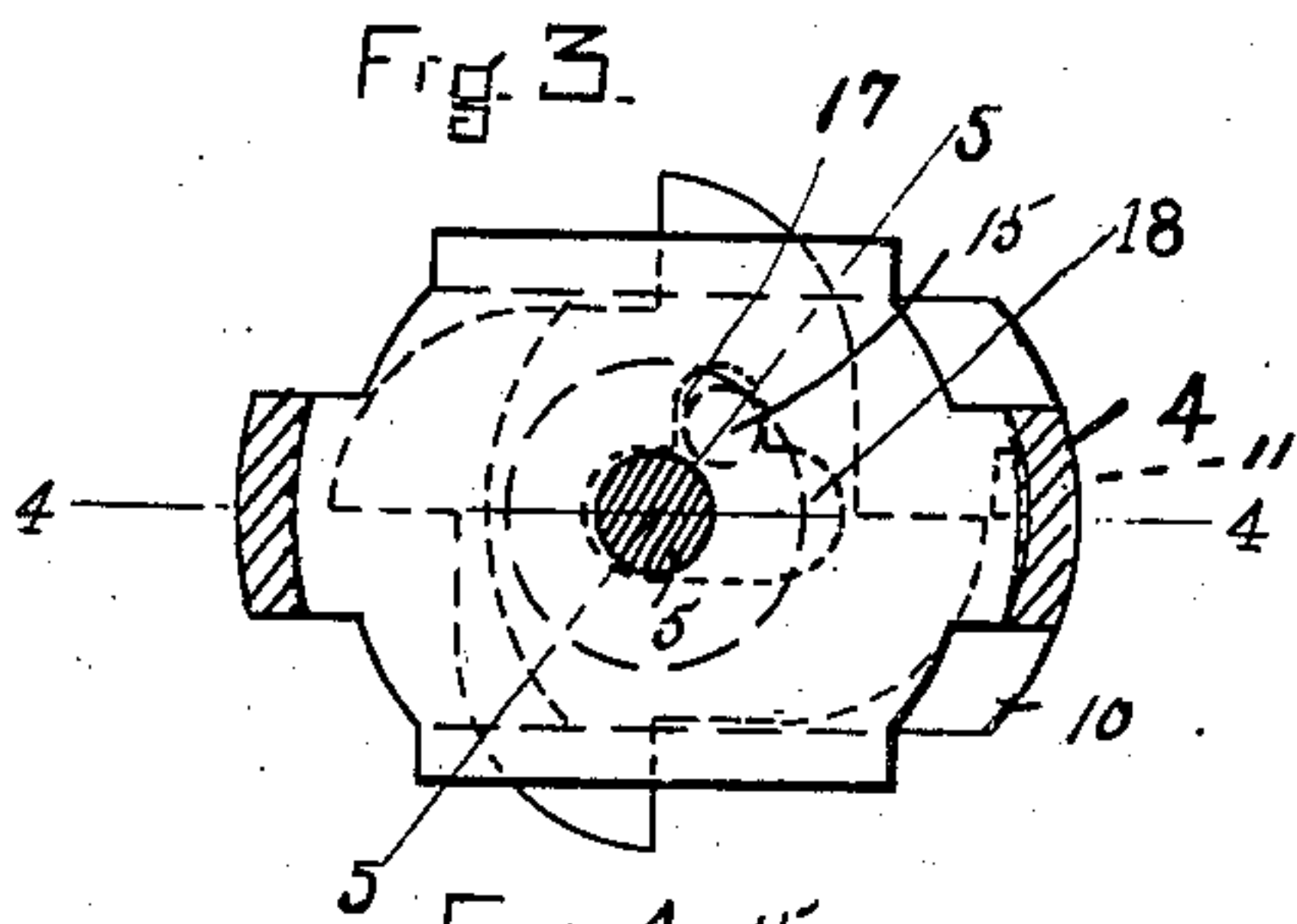
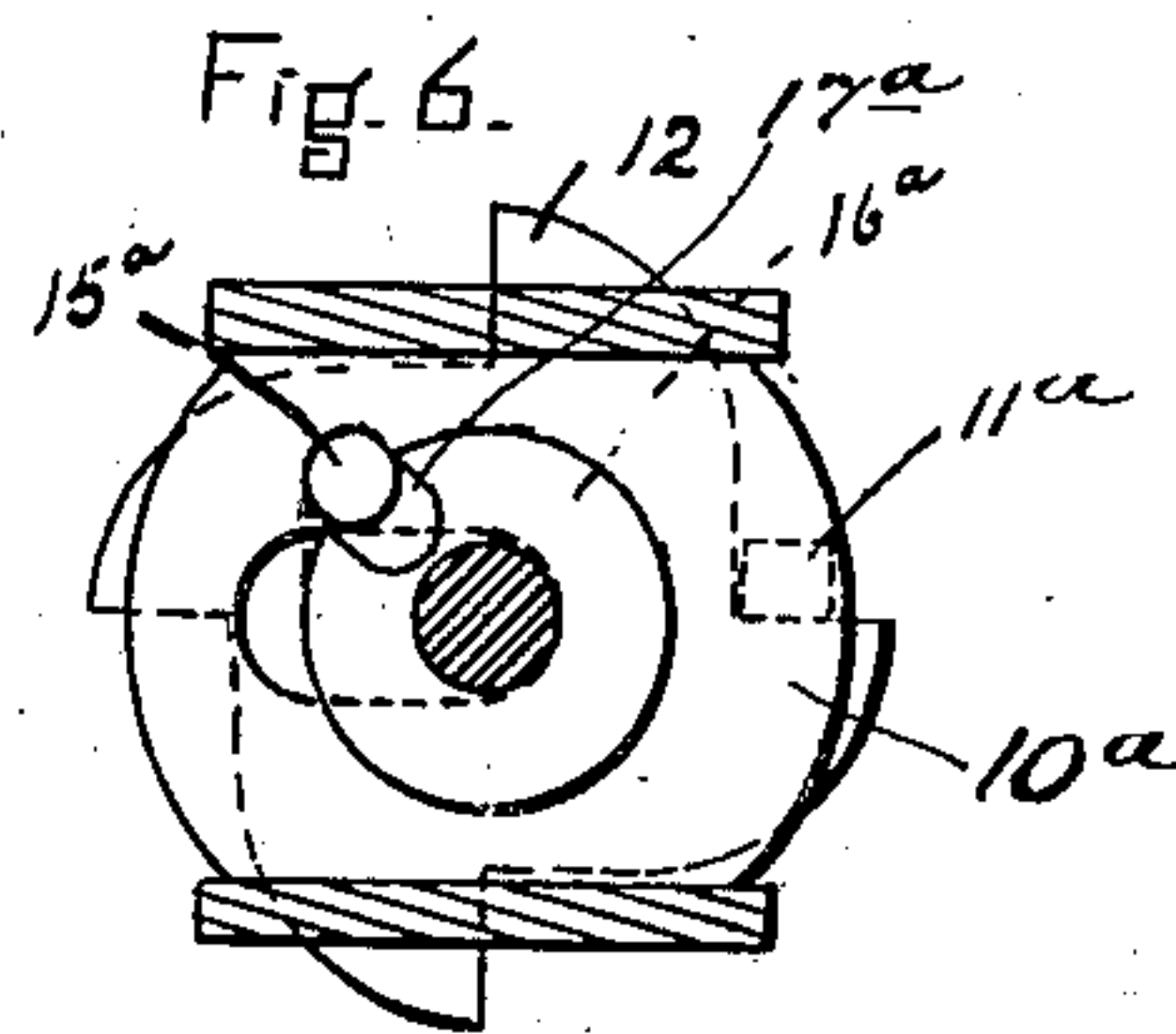
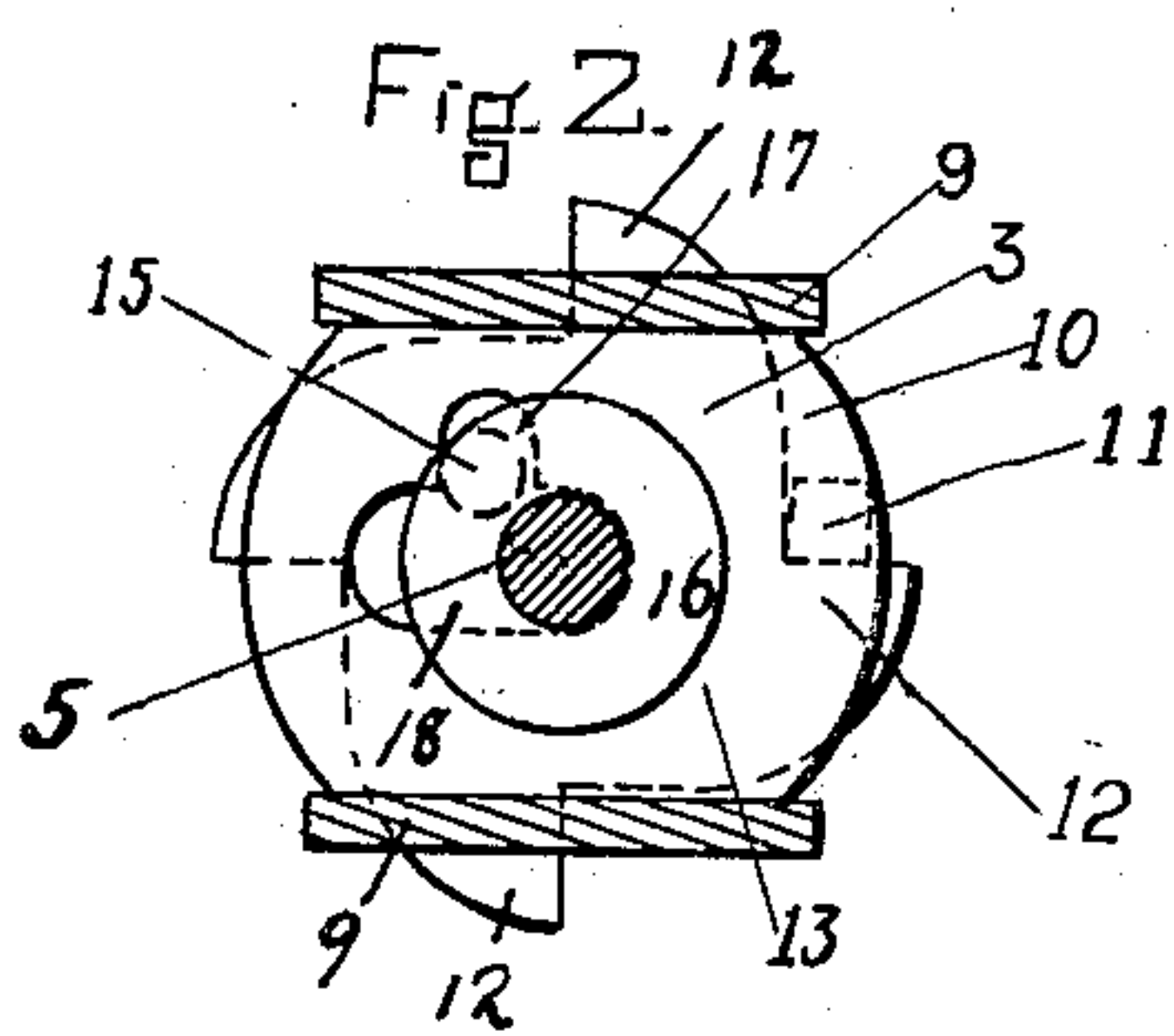
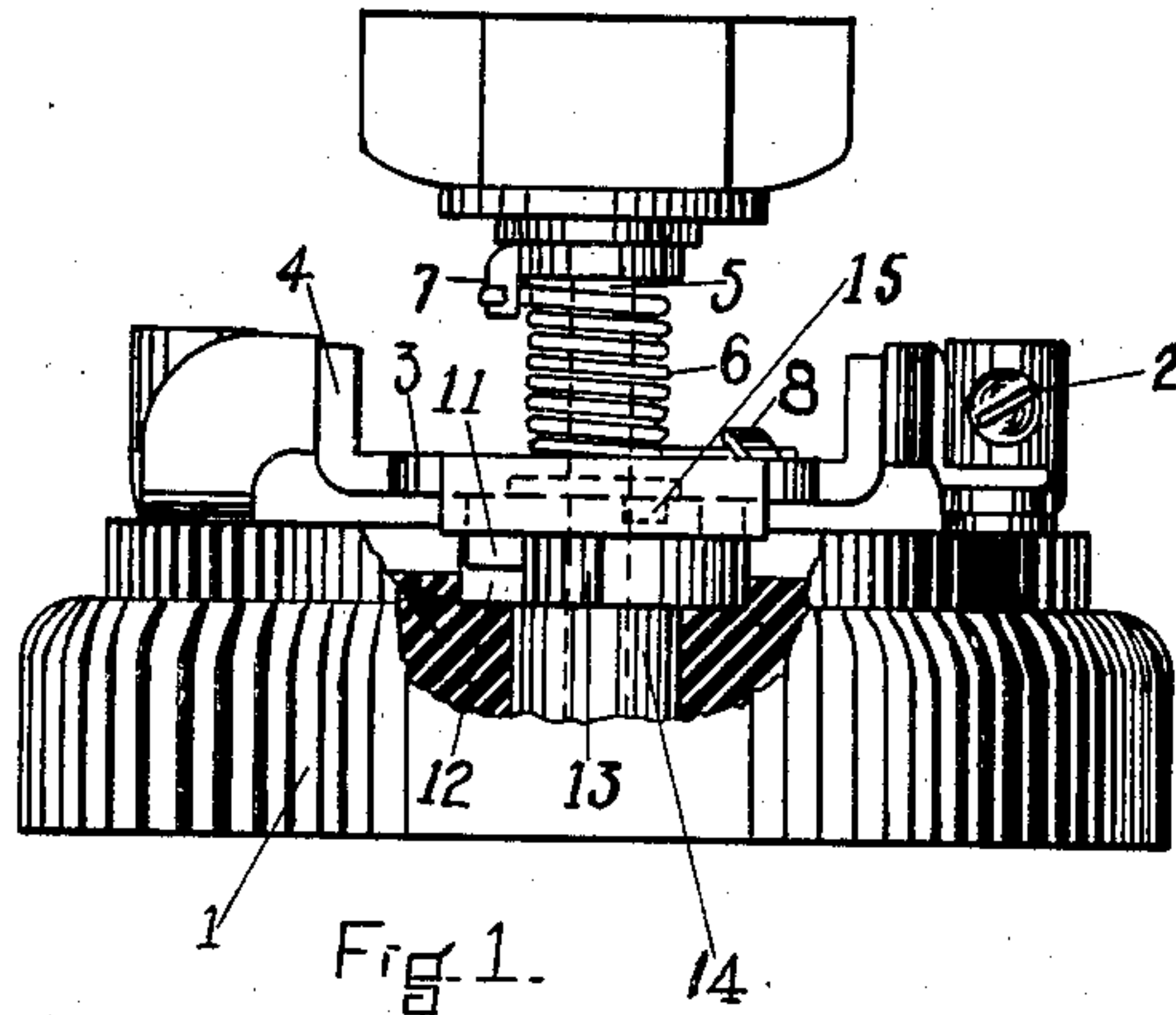
No. 754,380.

PATENTED MAR. 8, 1904.

N. MARSHALL.
ELECTRIC SWITCH.

APPLICATION FILED OCT. 6, 1903.

NO MODEL.



Witnesses

Mathew A. Dugan
A. L. Goddard

Inventor

Norman Marshall

by

Loa L. Fish

Attorney

UNITED STATES PATENT OFFICE.

NORMAN MARSHALL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO
MARSHALL SANDERS COMPANY, OF BOSTON, MASSACHUSETTS, A
CORPORATION OF MAINE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 754,380, dated March 8, 1904.

Application filed October 6, 1903. Serial No. 175,950. (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 horizontal section on the line 2 2 on Fig. 5, the collar 16 being shown in plan. Fig. 3 is a similar view showing the parts in a different position. Fig. 4 is a vertical section on line 4 4, Fig. 3. Fig. 5 is a vertical section on line 5 5, Fig. 3. Figs. 6 and 7 are views corresponding to Figs. 2 and 3, showing a modified construction. Fig. 8 is a vertical section on line 8 8, Fig. 7. Fig. 9 is a vertical section on line 9 9, Fig. 7.

As shown in the drawings, the switch is provided with an insulating-base 1, to which the stationary contacts and binding-posts 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 3 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 sliding movements of the catch-plate in its guides are produced whenever there is a relative rotation between the spindle and catch-plate by a pin-and-slot connection between the spindle and catch-plate arranged to move between the spindle and the edge of the catch-plate in the direction of the sliding movement of the catch-plate.

In the construction shown in Figs. 2 to 5 the pin-and-slot connection between the spindle and catch-plate consists of a crank-pin 15, depending from a flange 16 on the spindle and engaging a transverse slot 17 in the catch-plate. The flange 16 is in the form of a disk and lies within a circular recess formed in the under side of the switch-plate 3, as indicated in Figs. 4 and 5. The catch-plate is provided with an opening 18, extending lengthwise of the plate, through which the spindle 5 extends, and the slot 17 extends laterally from this opening.

Supposing the parts to be in the position shown in Fig. 2 and that the spindle 5 is ro-

tated from left to right, the pin 15 will move forward and by its engagement with the front side of the slot 17 will move the slide 10 forward with it until at the end of a quarter-revolution the catch 11 will be disengaged from the tooth 12. The spring will now act to quickly rotate the switch-plate and catch-plate about the spindle, and during this rotation the pin 15 will act against the rear side of the slot 17 and retract the catch-plate, so that the catch 11 will engage the succeeding tooth 12. The movable parts will now be in the same relation as shown in Fig. 2, but advanced through a quarter-revolution. When the switch is to be again operated, the spindle is again turned through a quarter-revolution and the above operation is repeated.

In the construction shown in Figs. 6 to 9 the pin-and-slot connection between the spindle and the catch-plate consists of a pin 15^a, projecting upward from the catch-plate and engaging a radial slot 17^a, formed in a disk 16^a on the spindle. The disk 16^a lies in a recess in the under face of the switch-plate 3, and the switch-plate is also recessed to accommodate the movements of the pin 15^a, as indicated in dotted lines in Fig. 7. The catch-plate 10^a is provided with an opening 18^a, extending lengthwise of the plate, through which the spindle 5 extends.

Supposing the parts to be in the position shown in Fig. 6 and the spindle be turned from left to right, the slot 17^a will be advanced between the spindle and the side of the catch-plate and by its engagement with the rear side of the pin 15^a will advance the catch-plate until the catch 11^a is disengaged from the tooth 12. The spring 6 will then rotate the switch-plate and catch-plate about the spindle, and the slot 17^a will act against the front side of the pin 15^a to retract the catch-plate, so that the catch 11^a will engage the succeeding tooth 12.

In both of the constructions the pin-and-slot connection is arranged so that the move-

ment of either the pin or slot, as the case may be, with relation to the switch-plate is between the spindle and the side of the catch-plate and in the direction of the sliding movement of the catch-plate. By thus arranging the pin-and-slot connection a compact construction is provided which will effectively move the catch-plate through the distance requisite in an efficient and reliable construction of switch.

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 catch-plate connected with said switch-plate, a spindle provided with a projection, and a pin-and-slot connection between the projection and catch-plate arranged to move between the spindle and side of the catch-plate in the direction of movement of the catch-plate upon relative rotation between the spindle and catch-plate, substantially as described.

2. In an electric switch the combination of a stop-plate, a switch-plate, a catch-plate connected with the switch-plate, a spindle, a flange on the spindle, a radial slot in said flange, and a pin on the catch-plate engaging said slot, substantially as described.

3. In an electric switch the combination of a stop-plate, a switch-plate, a catch-plate connected with said switch-plate, a spindle provided with a projecting flange, a connection between the flange and catch-plate consisting of a pin projecting from one part into a slot in the other part and arranged to move between the spindle and side of the catch-plate in the direction of movement of the catch-plate upon relative rotation between the spindle and catch-plate, substantially as described.

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

NORMAN MARSHALL.

Witnesses:

IRA L. FISH,

KATHARINE A. DUGAN.