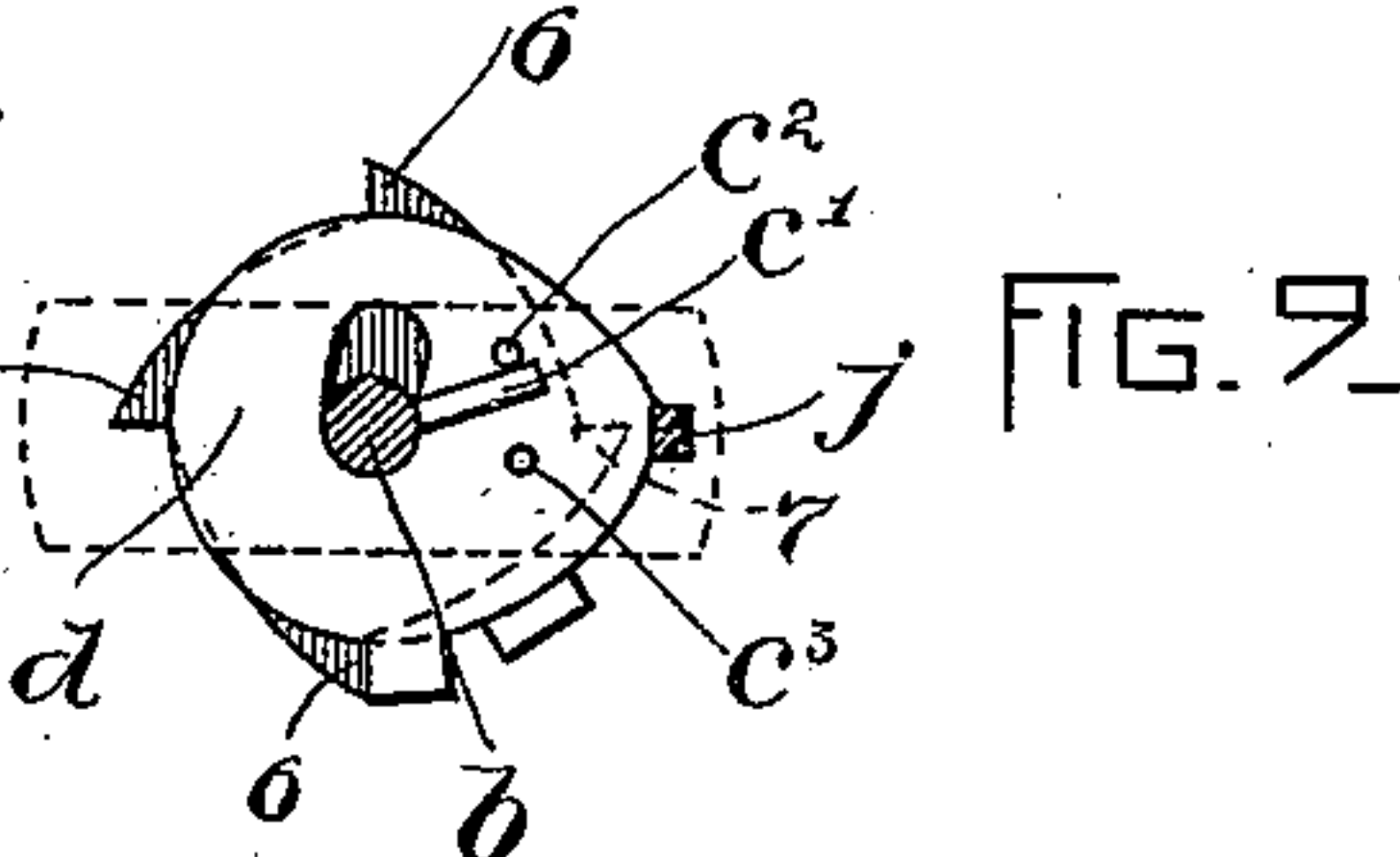
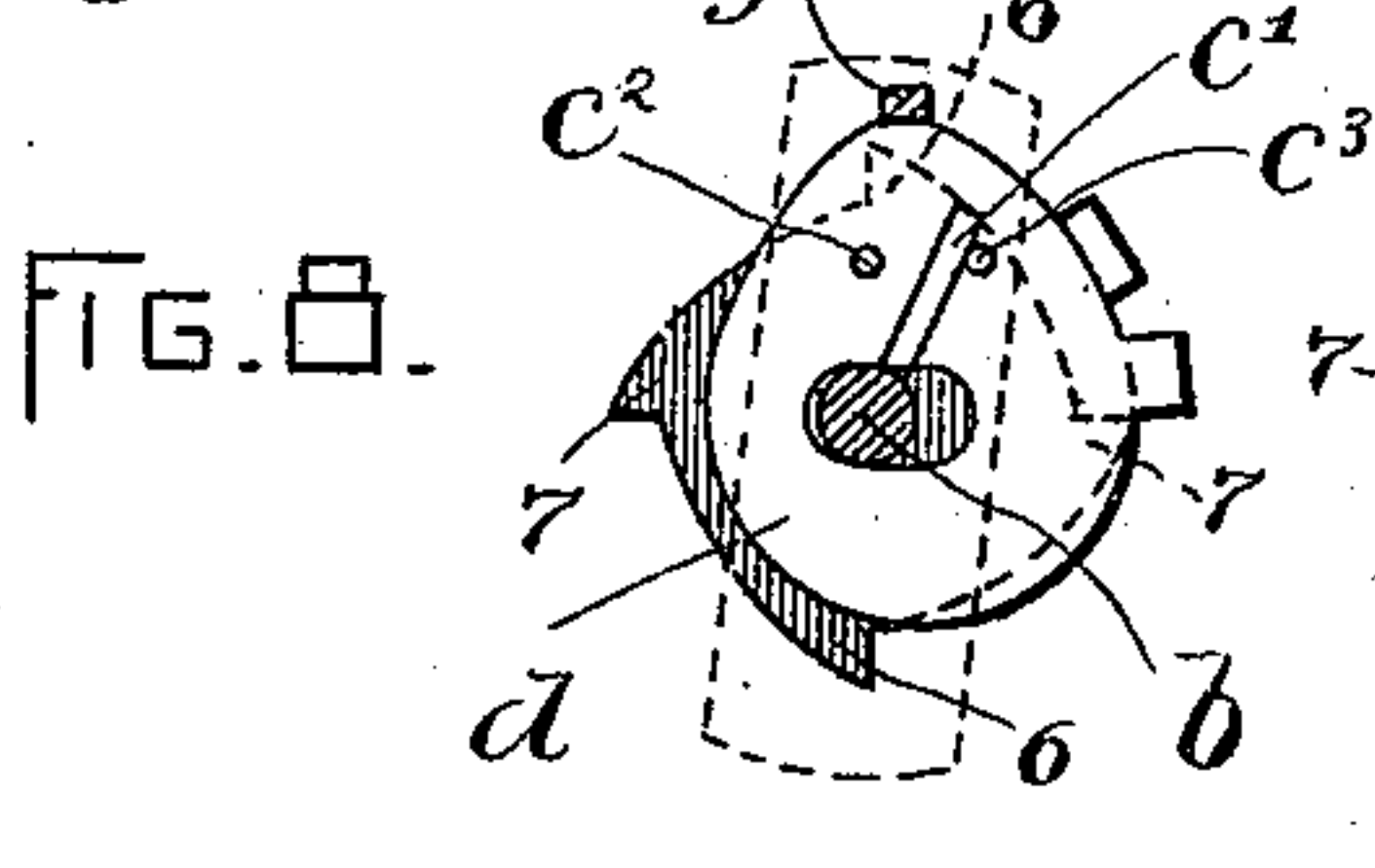
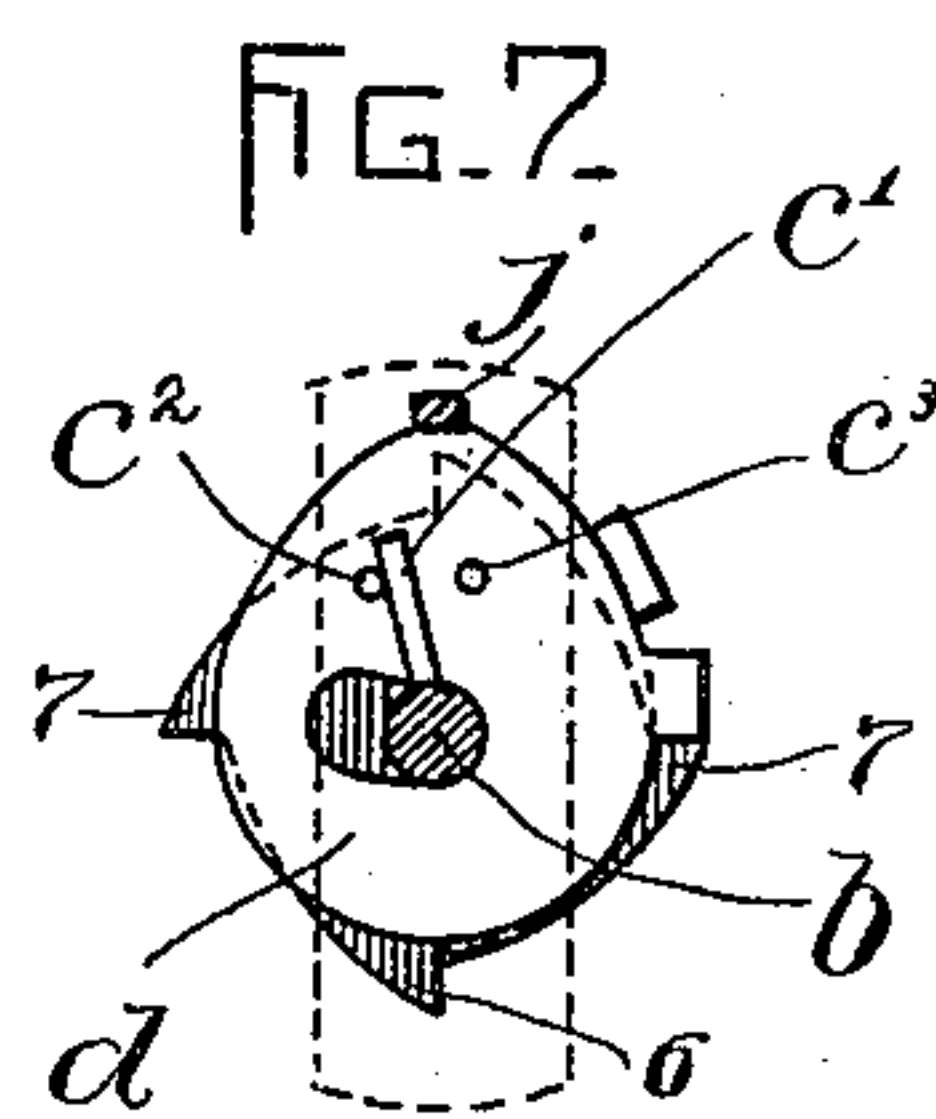
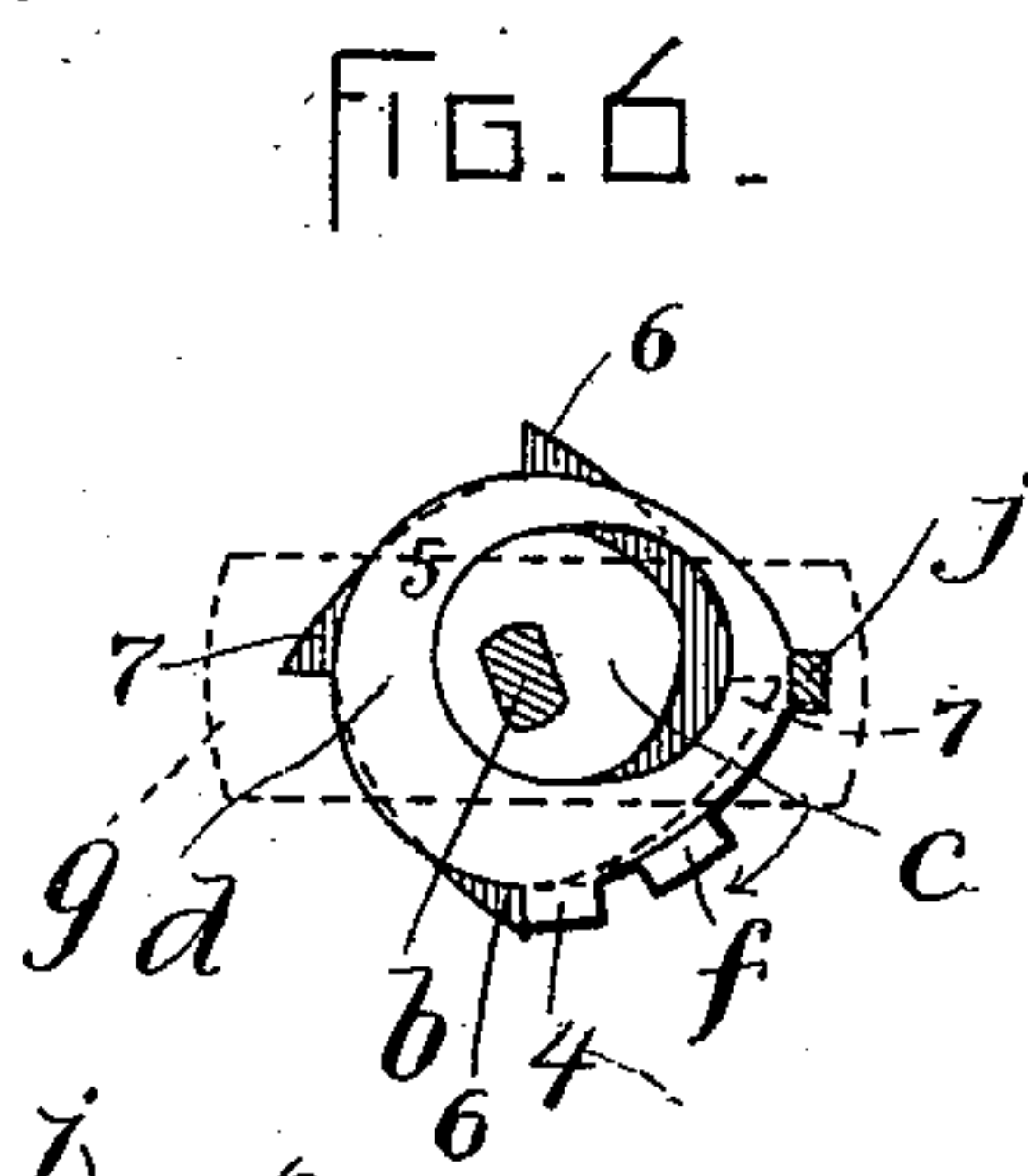
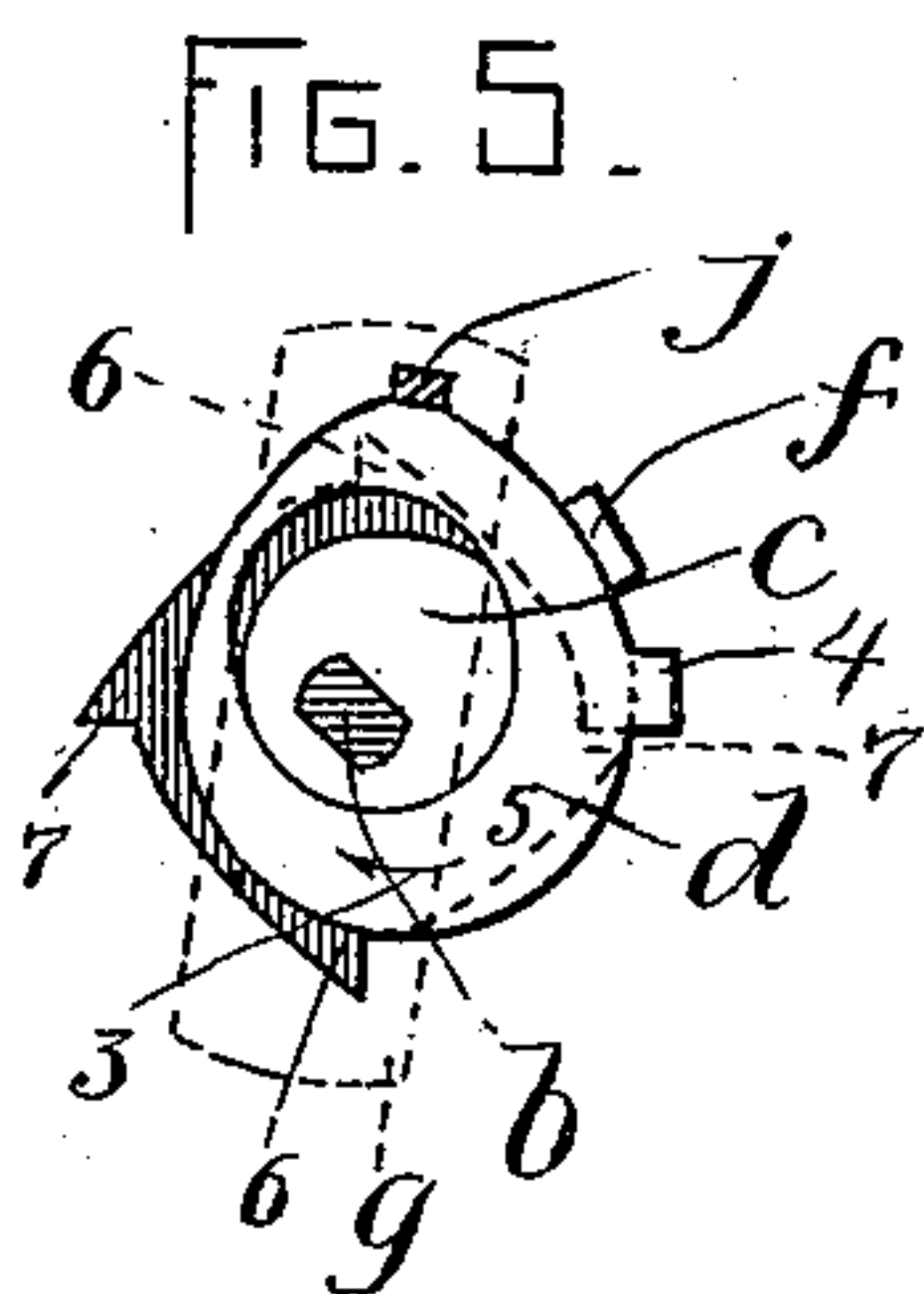
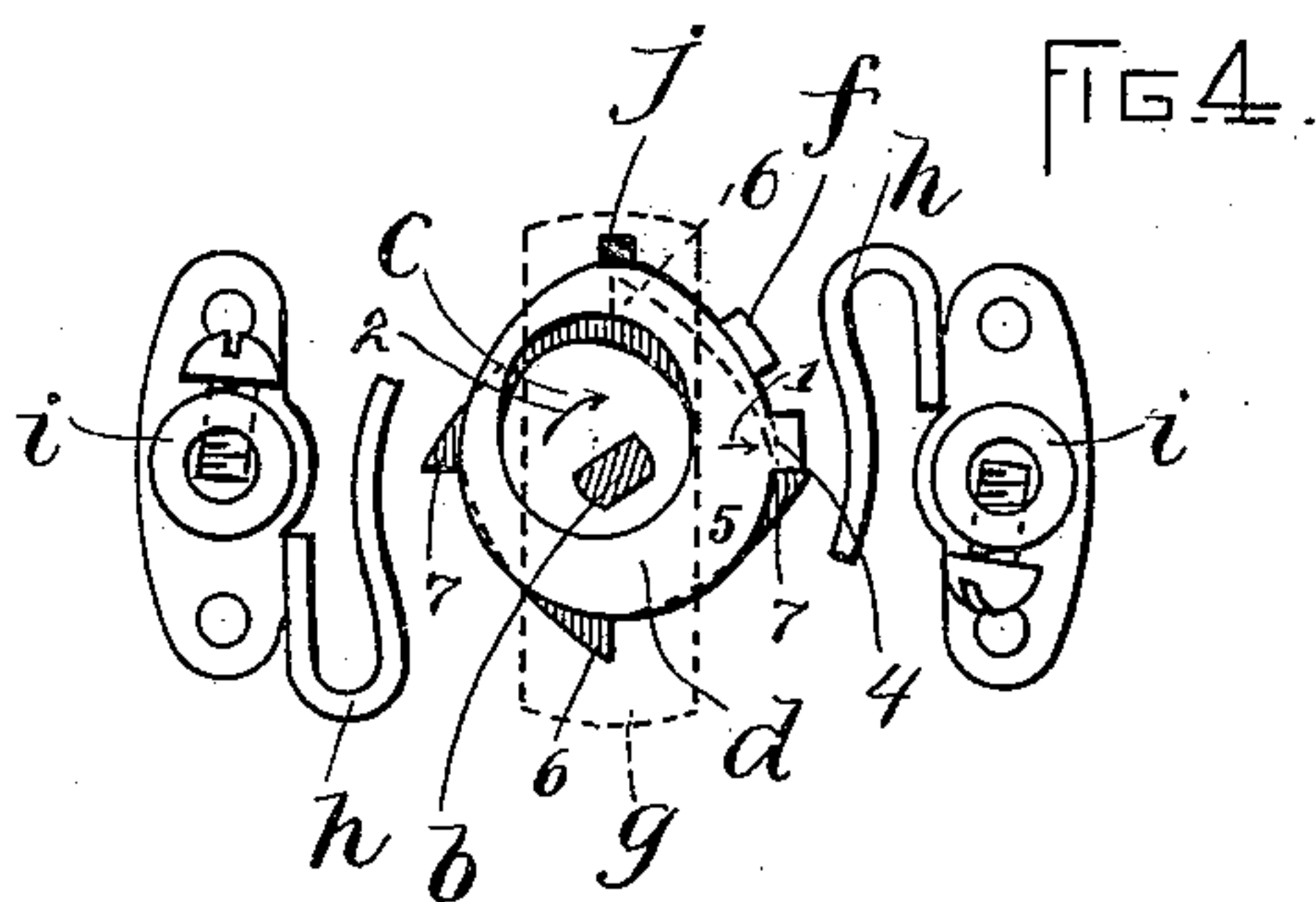
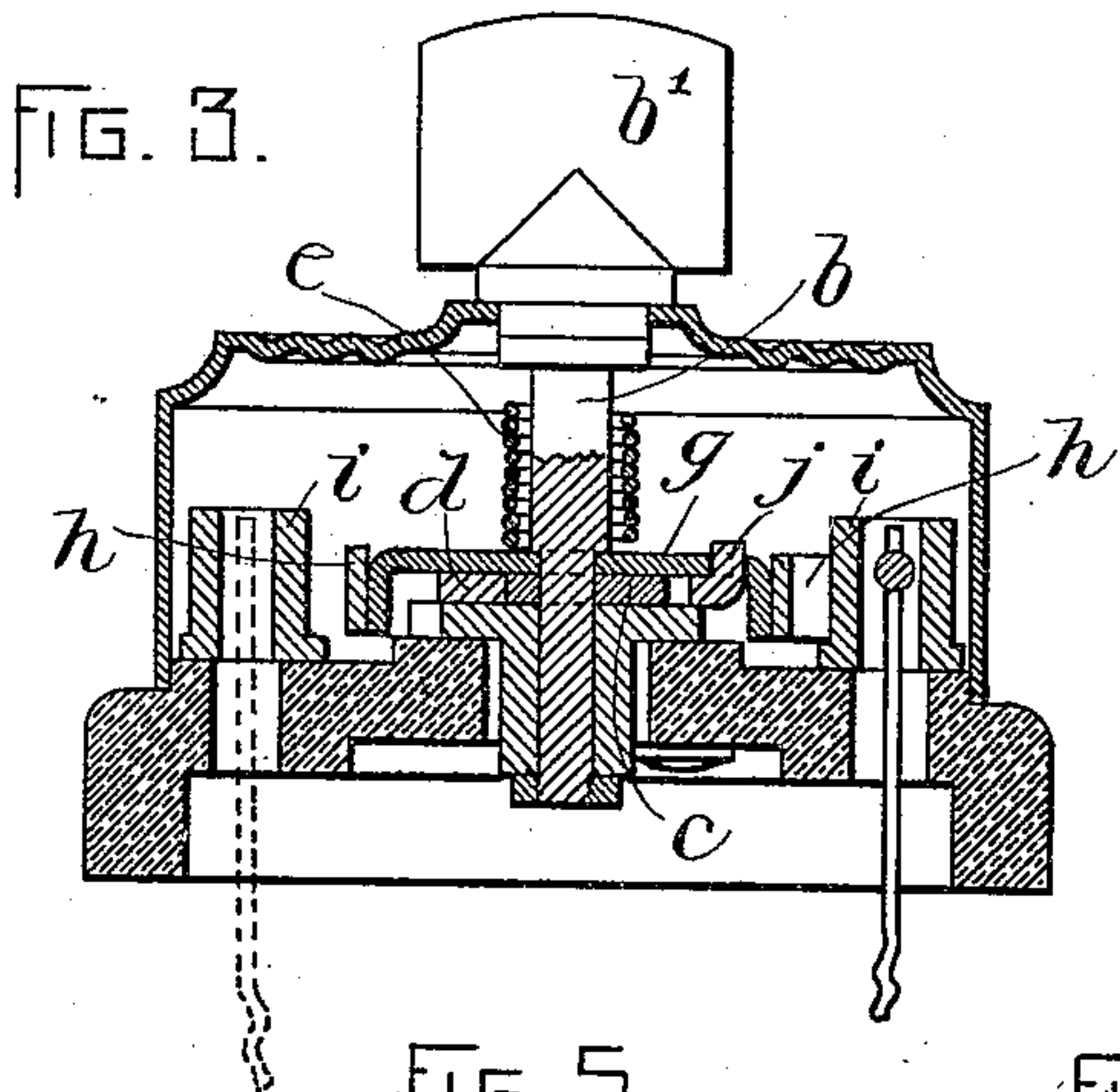
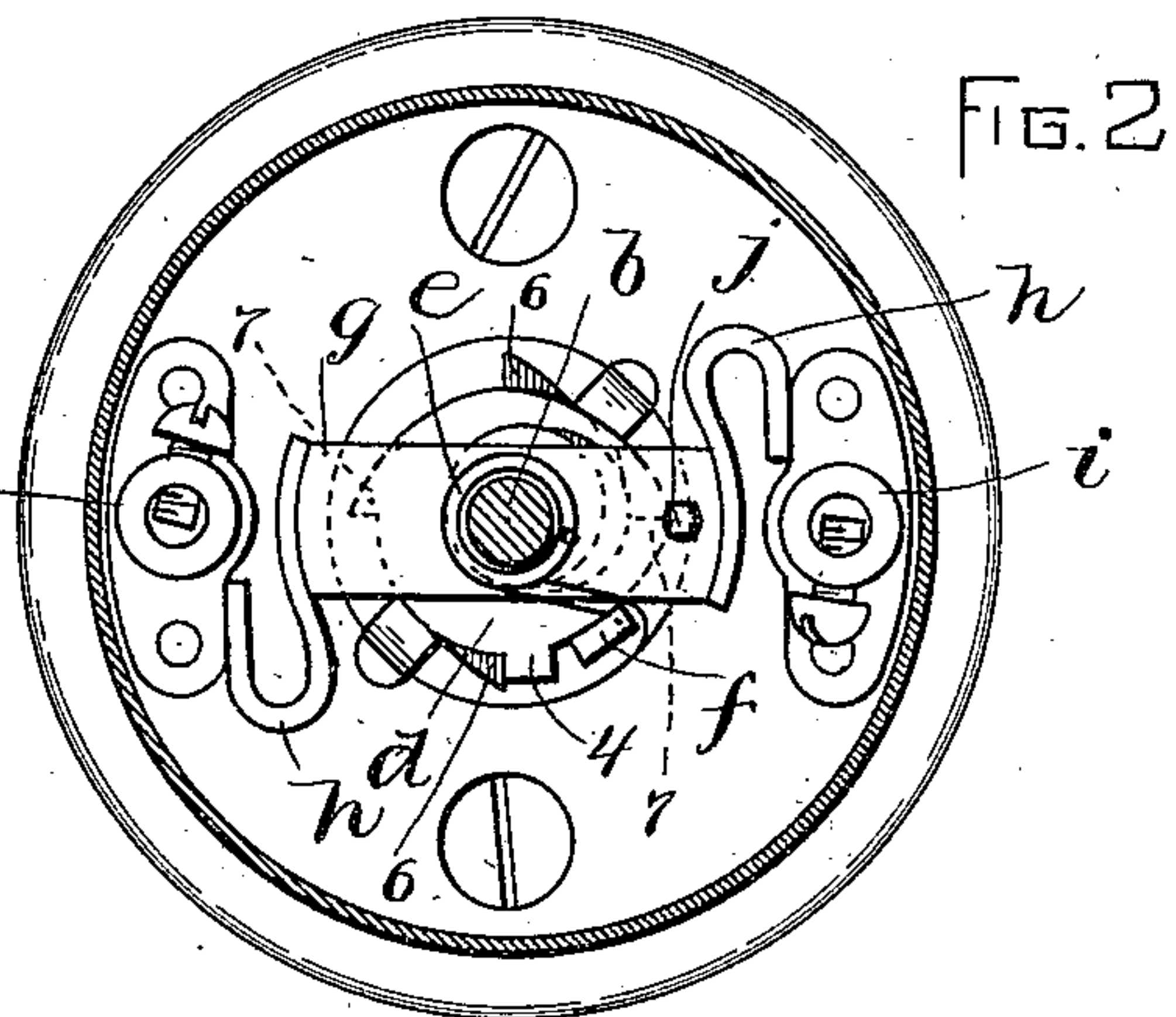
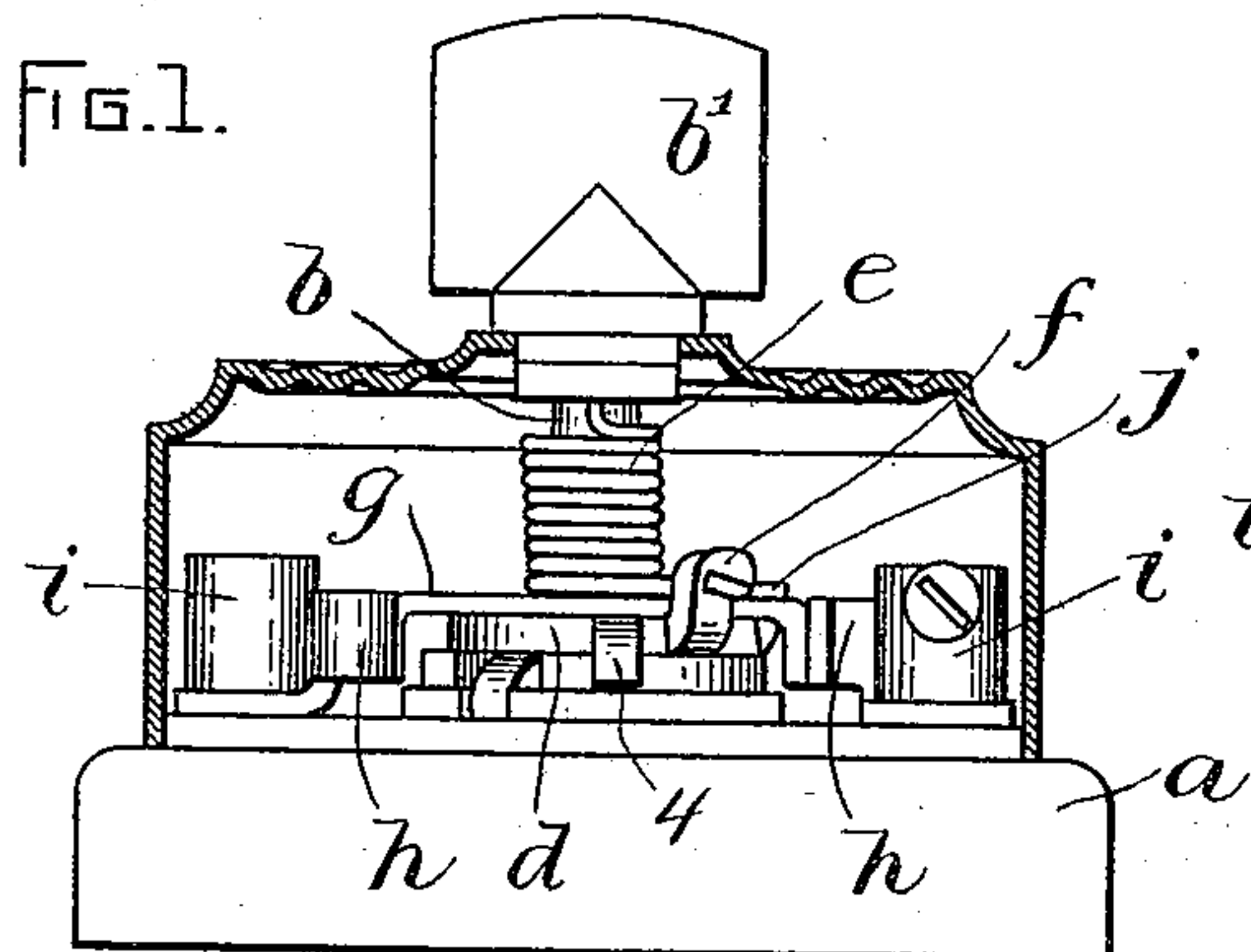


(No Model.)

N. MARSHALL.
ELECTRIC SWITCH.

No. 547,149.

Patented Oct. 1, 1895.



WITNESSES:
A. D. Hanson
Rollin Abell

INVENTOR:
Norman Marshall
by M. H. Brown & Quincy
Attys.

UNITED STATES PATENT OFFICE.

NORMAN MARSHALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
ANCHOR ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 547,149, dated October 1, 1895.

Application filed June 8, 1895. Serial No. 552,076. (No model.)

To all whom it may concern:

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

This invention relates to that class of electric snap-switches in which the switch-bar is thrown from one position to another by a spring which is caused to act by the partial rotation of a spindle; and it has for its object to provide an improved construction which shall be effective, simple, and durable.

To this end the invention consists in certain novel features of construction and combinations of parts set forth in the appended claims.

In the accompanying drawings, forming a part of this specification, Figure 1 shows the device in side elevation with the covering-cap in section. Fig. 2 shows a section on line 2 2 of Fig. 1. Fig. 3 shows a section on line 3 3 of Fig. 2. Figs. 4, 5, and 6 are sectional views showing the operation of my invention. Figs. 7, 8, and 9 are similar views showing a modification.

The same letters and figures of reference indicate the same parts in all the views.

In the drawings, *a* represents a base, of porcelain or other suitable insulating material, having holes for the reception of attaching-screws *a' a'*.

b represents a spindle fitted to rotate in a bearing in the base and provided with a thumb-piece or handle *b'*, by which it may be rotated. With the spindle is engaged a laterally-projecting arm *c*, (here shown as of approximately circular form,) eccentrically located on the spindle, the said arm having an oblong orifice, which receives a correspondingly-shaped portion of the spindle.

d represents a switch-bar-carrying device, which for convenience I term a "pawl," the same comprising a lug or pawl proper 4 and a shank or body portion 5, which is formed to surround the spindle and its arm and is of annular form, its inner edge presenting bearings for the arm, while its outer edge has the pawl portion 4, the latter being formed to engage teeth or stops 6 6 7 7 on a plate affixed to the base, said plate and its teeth being

hereinafter referred to as a ratchet. Said pawl is adapted to revolve about the spindle and its arm, and is further adapted to be moved laterally by the arm, the opening in the annular portion 5 being larger than the arm, so that the pawl may have independent edgewise movements. The pawl is connected with the spindle by a spring *e*, one end of which is engaged with the spindle and the other end with an ear *f* on the pawl. Owing to the connection of the spring with the pawl instead of with the switch-bar a quick action is obtained and the pawl is held closely in position at all times. The pawl, being hinged to the switch-bar and having a lateral movement independent of the latter and of the spindle, would possess an undesirable freedom of movement if not subject to the direct pressure of the spring.

g represents a switch-bar, which extends across the spindle and the annular portion of the pawl and has its ends formed to make contact with the springs *h h*, which are electrically connected with the binding-posts *i i*, the latter being adapted, as usual, for connection with the circuit-wires. Said switch-bar has a central orifice, through which the spindle passes, and has at one end an orifice receiving a stud *j*, formed on the pawl, said stud and orifice constituting a hinge, connecting the pawl with the switch-bar, whereby the pawl is caused to revolve the switch-bar about the spindle step by step, as hereinafter described.

The operation of the device is illustrated in Figs. 4, 5, and 6, where I have shown the switch-bar in dotted lines to more clearly show the parts below it. It will be observed that when the switch-bar is in its circuit-breaking position, as shown in Fig. 4, and held by one of the ratchet-teeth 7 the spindle and its arm are in position to move the pawl edgewise or outwardly in the direction indicated by the arrow 1 when the spindle and arm are rotated in the direction indicated by the arrow 2. A quarter-rotation of the spindle to the position shown in Fig. 5 moves the pawl outwardly sufficiently to disengage it from the tooth 7, whereupon the spring, which is compressed by said movement, throws the pawl in the direction indicated by

the arrow 3 to the position shown in Fig. 6, the pressure of the spring at the same time giving the pawl an inward edgewise movement, so that when it reaches the next tooth 5 6 it is engaged by the latter, the switch-bar being arrested in its circuit-closing position. It will be seen, therefore, that the spindle-arm when partially rotated compresses the spring for action and at the same time releases the pawl, and thereafter, during the rotation of the pawl by the spring, permits the spring to cause the engagement of the pawl with the next ratchet-tooth.

The hinge connection between the switch- 15 bar and the pawl is an important feature of my invention, said connection permitting the described movements of the pawl into and out of engagement with the stops and maintaining an operative engagement between the 20 pawl and switch-bar, whereby the pawl is enabled to throw the switch-bar from each position to the next.

I do not limit myself to the above-described form of connection between the spindle and 25 the pawl, and may employ any suitable connection involving an arm or projection on the spindle and bearings therefor connected with the pawl and adapted to co-operate with said arm in giving the pawl an outward lateral 30 movement to disengage it from one stop when the spindle is turned and in permitting an inward lateral movement of the pawl to engage it with the next stop while the pawl is being moved by the spring and the spindle 35 is at rest. A modification is shown in Figs. 7, 8, and 9 in which the spindle *b* is provided with an arm *c'*, located above the plane of the annular portion of the pawl and projecting between two pins *c² c³*, affixed to and project- 40 ing above the said annular portion, the latter having an elongated opening formed to permit the described inward and outward edgewise movements of the pawl. The pins *c² c³* and arm *c'* are arranged so that when the 45 spindle is first rotated its arm *c'* bears on the pin *c³* and through the latter moves the pawl edgewise to the position shown in Fig. 8,

where the pawl becomes disengaged from the ratchet, the spring then rotating the pawl to the position shown in Fig. 9.

I claim—

1. In an electric snap-switch, the combination of a base having suitable contacts and a fixed ratchet, a spindle journaled in the base and provided with an arm or projection, a 55 switch-bar loosely mounted on the spindle, a pawl located between the ratchet and switch-bar and having a hinged or pivotal connection with the latter and capable of a lateral swinging movement, and a spring connecting 60 the spindle and pawl.

2. In an electric snap-switch, the combination of a base having suitable contacts and a fixed ratchet, a spindle journaled in the base and provided with an arm or projection, a 65 switch-bar loosely mounted on the spindle, a pawl consisting of a flat plate surrounding the spindle between the ratchet and switch-bar and pivotally connected with the latter so as to move laterally independent thereof 70 and having a lug to engage the teeth of the ratchet, and a spring connecting the spindle and pawl.

3. In an electric snap-switch, the combination of a base having suitable contacts and a 75 fixed ratchet, a spindle journaled in the base and provided with an arm or projection, a pawl formed to engage said ratchet and provided with an annular portion surrounding said arm and having an opening of greater 80 diameter than the arm whereby independent edgewise motion of the pawl is permitted, a spring connecting the spindle with the pawl, and a switch-bar hinged at one end to the 85 pawl and having a central orifice through which the spindle passes.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 6th day of February, A. D. 1895.

NORMAN MARSHALL.

Witnesses:

HORACE BROWN,
A. D. HARRISON.