

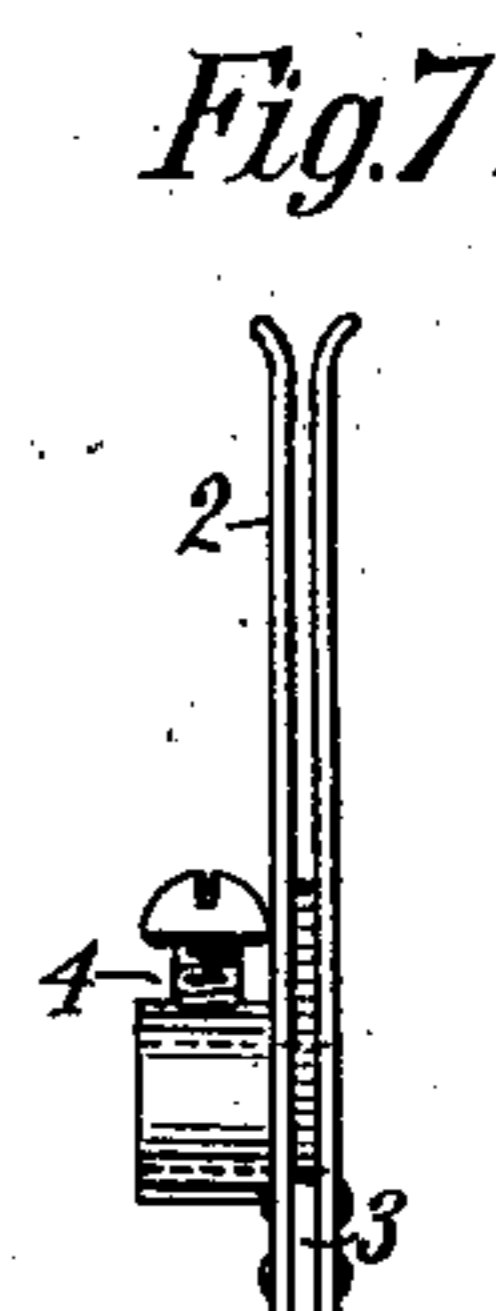
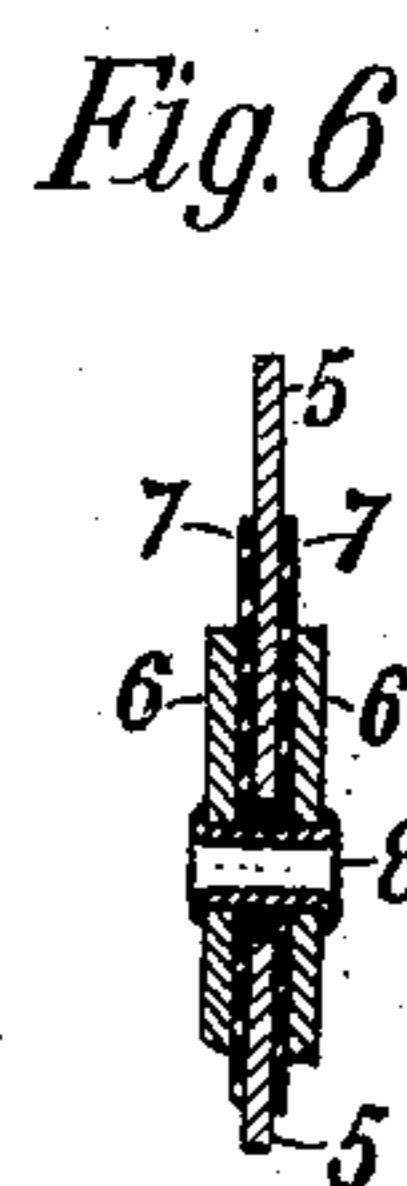
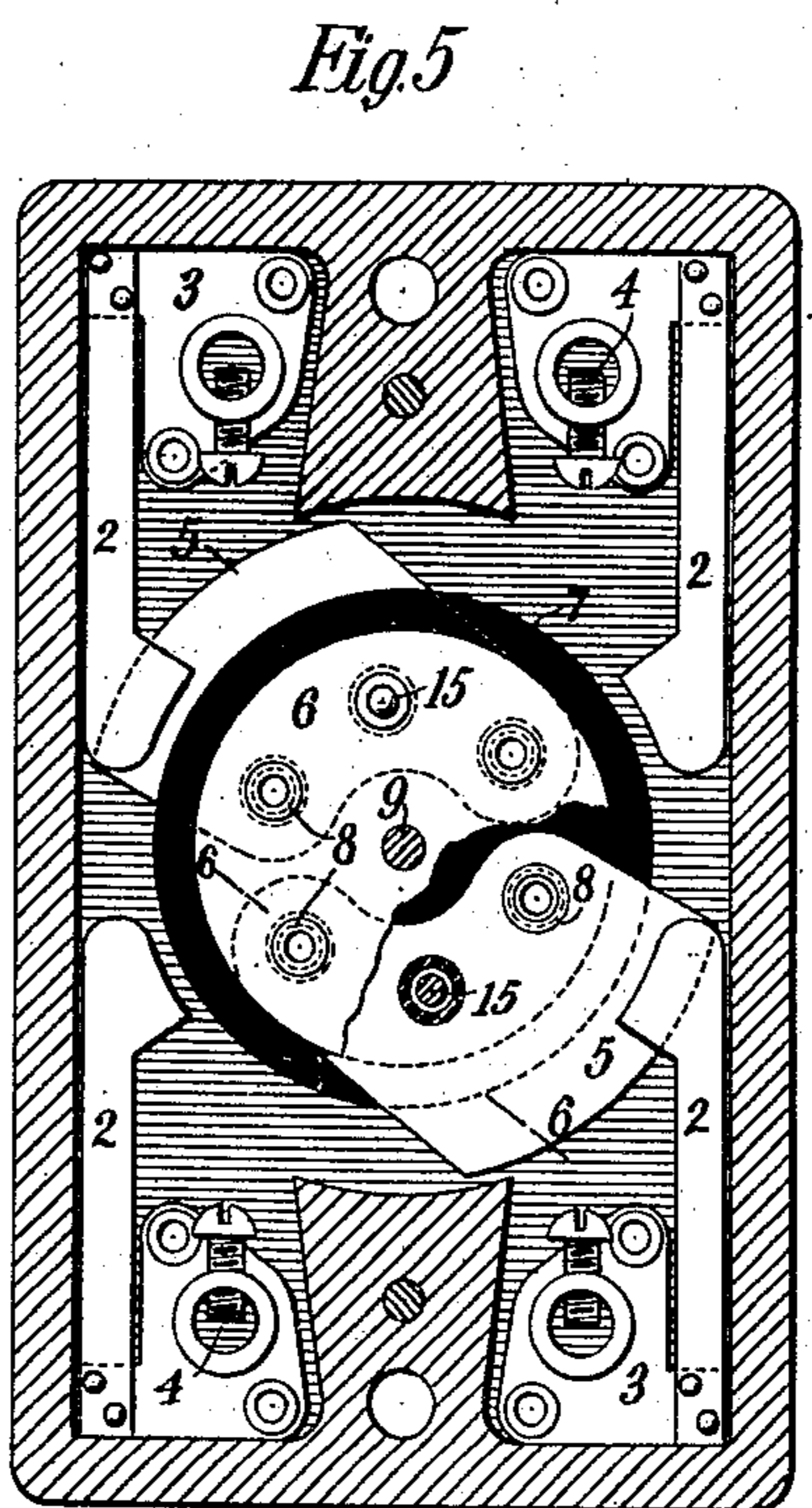
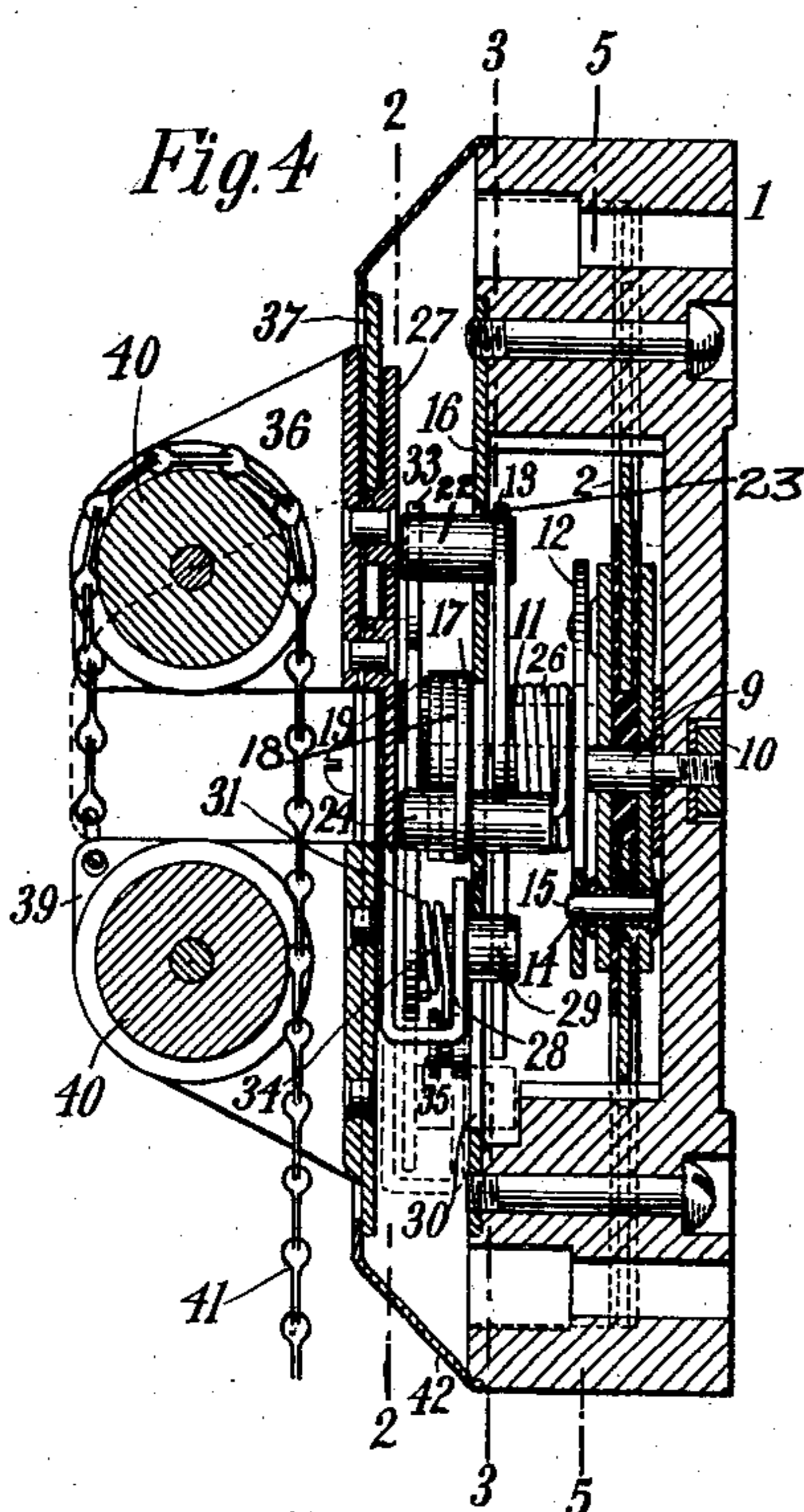
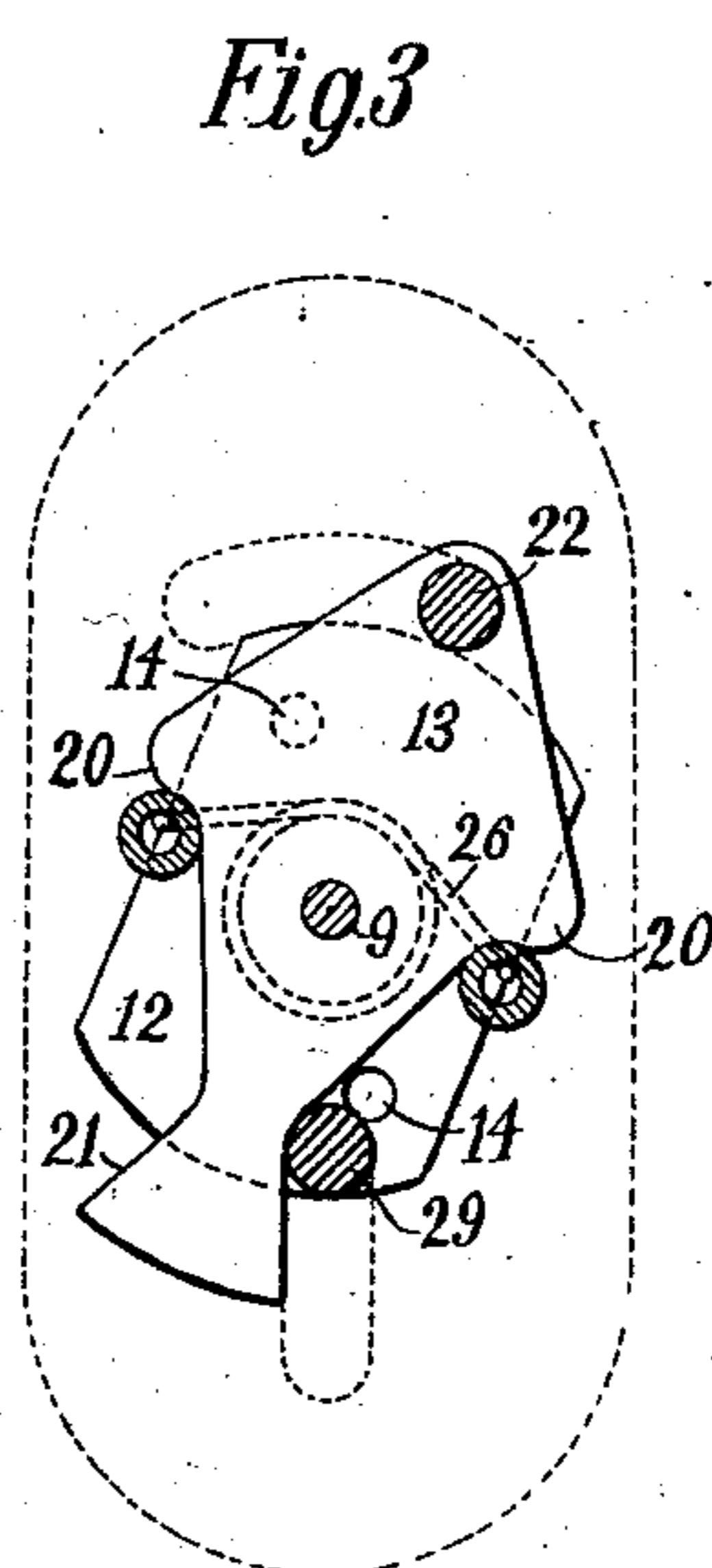
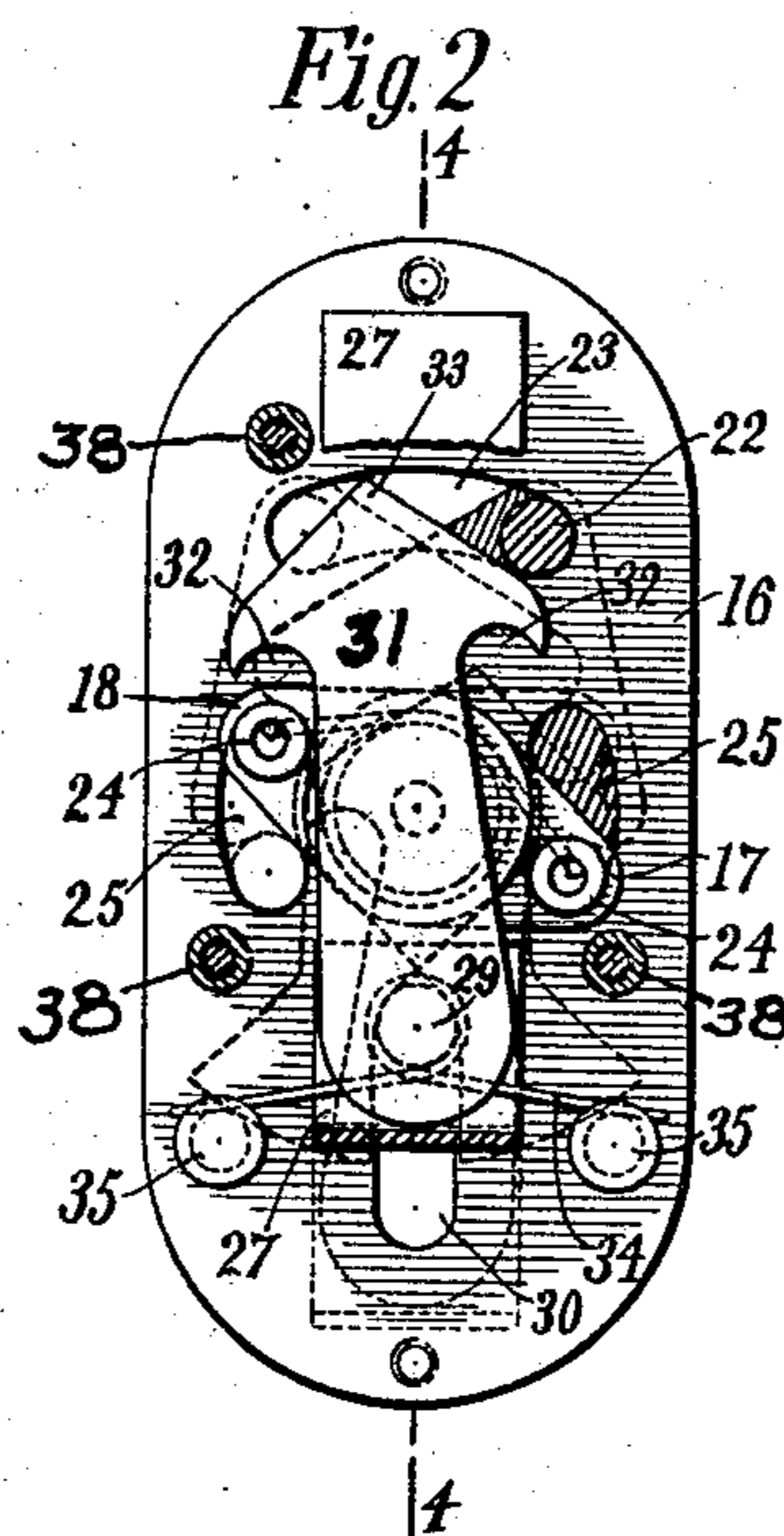
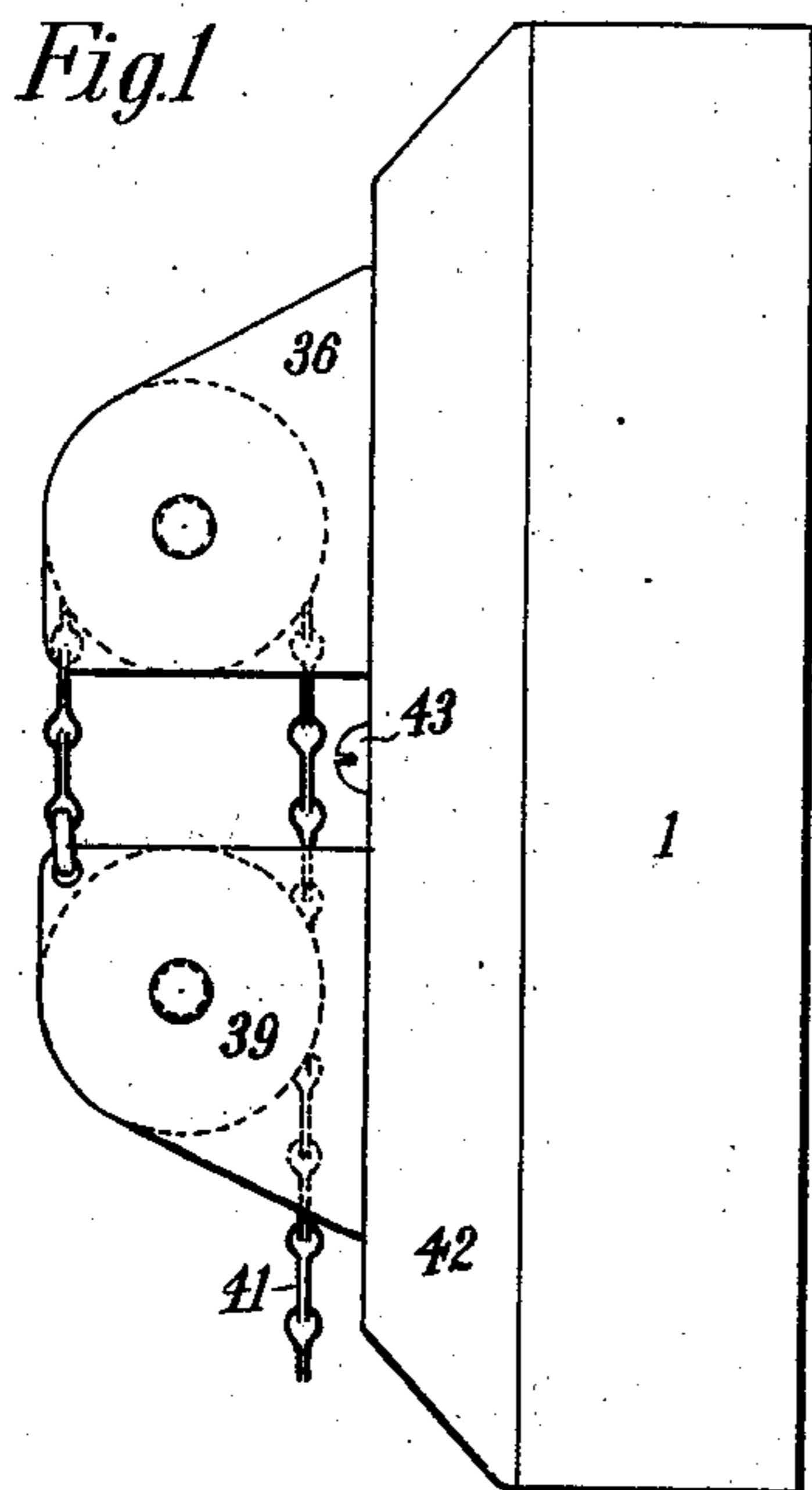
No. 715,511.

Patented Dec. 9, 1902.

H. E. REEVE.
SNAP SWITCH.

(Application filed Feb. 12, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

HENRY E. REEVE, OF BROOKLYN, NEW YORK.

SNAP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 715,511, dated December 9, 1902.

Application filed February 12, 1902. Serial No. 93,692. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. REEVE, a citizen of the United States, residing in the borough of Brooklyn, city of New York, State of New York, have invented a certain new and useful Improvement in Snap - Switches, of which the following is a description.

My invention relates to improvements in snap-switches adapted for effective operation in any plane from horizontal to vertical, and hence designed for use particularly as a ceiling or wall switch.

The objects of the invention are to provide and produce a very simple and effective device for the purpose having relatively few parts, which can be stamped or otherwise cheaply produced and assembled and wherein the spring which actuates the contact devices comes into play only when it has been first placed under its maximum tension, in which respect my improved switch complies with the requirements of the fire underwriters of several of the larger American municipalities.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a side elevation illustrating the exterior of the switch of the preferred embodiment of my invention; Fig. 2, a section on the line 2 2 of Fig. 4; Fig. 3, a section on the line 3 3 of Fig. 4; Fig. 4, a longitudinal section on the line 4 4 of Fig. 2; Fig. 5, a section on the line 5 5 of Fig. 4; Fig. 6, a section on the line 6 6 of Fig. 5, and Fig. 7 a detail view illustrating one of the spring-contacts.

In all of the above views corresponding parts are represented by the same numerals of reference.

The base 1 is made of some suitable insulating material—as porcelain, hard wood, or vulcanized rubber—and in the case of a double-break switch is provided with four sets of contact-springs 2 2, carried by plates 3, secured within the base 1 and having binding-screws 4, by means of which proper contact with the switch is made. Normally bridging opposite pairs of contact-springs 2—i. e., when the circuit is closed—are the contact-plates or knives 5 5, which are carried be-

tween disks 6, being insulated therefrom by mica disks 7, the parts being secured together by rivets 8, from which the contact-plates 5 are insulated. The disks 6 6 are formed with central openings through which passes a shaft 9, which supports the moving member of the switch, and said shaft may, if desired, extend through the base 1 and be provided with a nut 10 on its outer end. The shaft 9 passes through and is secured to a barrel 11, carrying a plate 12 at its bottom and an actuating-latch 13 at its top. The plate 12 is provided with one or more openings 14 therein, which engage over pins 15, passing up from the movable switch member, so that as the plate 12 is swung from one side to the other the contact-plates 5 will be successively moved to make and break the circuit between corresponding pairs of contact-springs. The shaft 9 passes beyond the barrel 11, through a bottom plate 16, and receives above said plate a pair of independently-movable arms 17 18, to which the ends of the actuating-spring are secured, as will be explained. Above the uppermost arm the shaft 9 is provided with a washer 19. By this construction it will be seen that the arms 17 18 are movable independently of the shaft 9 and that the barrel 11, plate 12, and latch-plate 13 are movable with said shaft. If desired, however, the latter elements may be mounted independently of the shaft. The cam-latch 13 is essentially fish-shaped in elevation, being formed with the cam portions 20 at its sides and with the straight guide-cams 21 at its rear or tail portion. The cam-latch is also provided at its front with a stud or pin 22, which works within a curved slot 23 in the bottom plate 16. Each of the swinging arms 17 and 18 is formed with a hollow pin or rivet 24 at its end, working in curved slots 25 in the bottom plate 16, and said rivets or pins extending both above and below said plate. A coiled spring 26 surrounds the barrel 11, and its ends are inserted in the pins or rivets 24, one of which extends a greater distance below the plate 16 than the other, so as to more effectively receive the lower end of the spring 26, as will be understood. Mounted to reciprocate upon and with respect to the bottom plate 16 is a frame 27, through the lower member 28 of which extends a stud or

pin 29, working in a slot 30 in the bottom plate 16. The pin 29 is carried by the rear end of an arm 31, formed with two hooks 32 and with a pointed forward end 33, constituting two inclined cams running from the point to said hooks. The hooks 32 are adapted to engage successively with the portions of the studs 24 above the plate 16 in the operation, as will be explained. The pin 22 on the fish-shaped latch extends up into the path of the pointed forward end of the hooked arm 31, so as to deflect said arm from one side to the other as it is moved toward and with respect to said pin. The frame 27, which carries the hooked arm 31, is normally maintained in the position shown in Fig. 4 and is returned to that position when moved therefrom by a spring 34, surrounding the pin 29 between the hooked arm 31 and the lower member 28 of the frame and anchored at its ends against lugs 35, carried by the plate 16. The frame 27 is moved back and forth to operate the switch by any suitable mechanical devices. As a convenient embodiment of the invention I illustrate a block 36, mounted to slide with respect to a top plate 37, the latter being connected to the bottom plate 16 by suitable posts 38. The block 36 is provided with a shank which extends through a longitudinal slot in the top plate 37 and connects with the frame 27, so that as the said block is reciprocated back and forth on the plate 37 the frame will be similarly moved. Opposite to the block 36 is a stationary block 39, carried by the plate 37. These blocks are provided with rollers 40, over which runs a chain or wire 41, the latter being anchored at one end in one of the blocks, as shown. By this arrangement a definite movement of the chain or wire 41 produces half the movement of the movable block 36, so that the operation of the device will be very easy and smooth. At the same time it will be evident that the switch can be placed either in a horizontal or vertical position without affecting the proper pull of the operating chain or wire. In order to protect the operative parts of the device, a frame or casing 42 is secured by means of screws 43 to the top plate 37 and extends down to make a flush joint with the base 1. In operation the parts will normally occupy the position shown in full lines in Figs. 2 and 4, which, it will be assumed, represents the switch as having broken the circuit, the blades 5 being withdrawn from their bridging position with respect to adjacent contacts 2. In this position one of the hooks 32 of the hooked arm 31 is located immediately over one of the studs 24 of the arm 18, for example. The pin 29 occupies its forward position in the slot 30 and is engaged by one of the tail-cams 21 of the fish-shaped latch-plate 13, so as to lock said latch-plate in the position shown in full lines. One of the side cams 20 of said plate bears against the pin 24 of the other arm—in the assumed case the arm 17. When stress is imposed on the chain or wire 41, the block

36 will be moved toward the block 39, moving the frame 27 rearwardly. The hooked arm 31 is carried by this frame, and its hook engaging the pin 24 of the arm 18 swings said arm with respect to the pin 29, so as to impose an additional tension on the spring 26. The pin 24 of the arm 17 engaging the cam-shoulder 20 of the plate 13 tends to turn the barrel 11; but the tendency is restrained by reason of the engagement of the tail 21 of the latch 13 with the pin 29 of the frame 27. When, however, the frame 27 reaches the end of its rearward movement, the pin 29 will be moved out of engagement with the tail of the latch 13, so as to release the latter, whereupon the latch 13, barrel 11, and plate 12 will be oscillated through a part of a circle by the action of the spring 26, moving the pin 24 of the arm 17 forwardly and carrying the movable portion of the switch with the plate 12 and engaging the knives or contact-plates 5 with adjacent pairs of contact-springs 2, so as to bridge said springs and complete the circuit. When the pin 24 of the arm 17 has been thus moved forward to swing the latch-plate 13 and the movable element of the switch, it will be in position to be engaged by one of the hooks of the arm 31 on the next operation. The other cam portion 20 of the latch 13 engages the pin 24 of the arm 18, so as to hold that pin in the rearward position of its slot until the latch 13 is again released. The position of the parts immediately after the latch-plate 13 has been released and swung to one side is shown in dotted lines in Fig. 2. The movement of the frame 27 having effected a tripping of the plate 12 to move the switch, the spring 34 returns the parts to their normal position. In this return movement the front of the hooked arm 31 will engage the pin 22 of the latch 13, and said hook will be swung pivotally to one side, so as to engage the pin 24 of the arm 17 on the next movement. When, therefore, the wire or chain 41 is again operated to move the frame 27 rearwardly, the hook of the arm 31 will engage the pin 24 of the arm 17, so as to impose tension on the spring 26 in the opposite direction from that of the first movement, whereby when the pin 29 again clears the tail of the latch 13 the plate 12 will be snapped in the opposite direction to return the contact-plates 5 to their normal open-circuit position. In other words, in the operation of the switch the latch 13 is locked against movement by the engagement of the pin 29 with its tail and is released when the pin clears its tail, whereupon one of the pins 24, moving forwardly, swings said latch to partially rotate the plate 12. On the next forward movement the hooked arm 31 is swung to the other side, so as to engage the other pin 24, tending to turn the latch 13 in the opposite direction. During one rearward movement of the pin 29 it travels on one side of the tail of the latch 13 and on the next movement it travels on the opposite side of said tail.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a snap-switch, the combination with
5 a movable contact, of a latch movable with the same, a reciprocating frame, and a stud movable with said frame for locking the latch in either of two positions and for releasing the latch at the completion of the stroke of
10 said frame, substantially as set forth.

2. In a snap-switch, the combination with a movable contact, of a reciprocating frame, an oscillating latch connected to said contact, a stud carried by the frame for locking the
15 latch in either of two positions and for releasing said latch during one of the movements of said frame, and means operated by the movement of the frame for turning the latch when the latter is released, substantially as
20 set forth.

3. In a snap-switch, the combination with a movable contact, of a reciprocating frame, an oscillating latch connected to said contact, a stud carried by the frame for locking the
25 latch in either of two positions and for releasing said latch during one of the movements of said frame, and a hook carried by the frame for turning the latch when the latter is released, substantially as set forth.

30 4. In a snap-switch, the combination with a movable contact, of a reciprocating frame, an oscillating latch, a pin carried by said frame for locking the latch in either of two positions and for releasing the latch during the movement of said frame, an oscillating
35 hook for moving said latch when the latter is released, and a pin on said latch for oscillating said hook on the non-operative stroke of the frame, substantially as set forth.

40 5. In a snap-switch, the combination with a movable contact, of an oscillating latch connected to said contact, a reciprocating frame carrying a pin for locking said latch in either of two positions, a hook on said frame, elastic connections between said hook and the
45 latch for swinging the latter to one side or the other after it has been released, and a pin on said latch for swinging said hook on the non-operative stroke of the frame, substan-
50 tially as set forth.

6. In a snap-switch, the combination with a movable contact, of an oscillating latch connected to said contact, a reciprocating frame carrying a pin for locking said latch in either one of two positions, a hooked arm pivoted
55 to said frame, a pair of studs alternately engaged by said hooked arm and cooperating with the oscillating latch as set forth, an elastic connection between the said studs, and a pin on the oscillating latch for swinging the
60 hooked arm on the non-operative stroke of the frame, substantially as set forth.

7. In a snap-switch, the combination with a movable contact, of an oscillating latch, a reciprocating frame carrying a pin for lock-
65 ing the latch in either one of two positions, a hooked arm pivoted to said frame, a pair of arms pivoted concentrically to said oscillating latch, studs on said arms cooperating with said latch and with which the hooked arm al-
70 ternately engages, a spring connecting said studs, and means for swinging said hooked arm to alternately engage the said studs, substantially as set forth.

8. In a snap-switch, the combination with
75 a movable contact, of an oscillating latch, a reciprocating frame carrying a pin for locking the latch in either one of two positions, a hooked arm pivoted to said frame, a pair of arms pivoted concentrically to said oscillat-
80 ing latch, studs on said arms cooperating with said latch and with which the hooked arm alternately engages, a spring connecting said studs, and a pin on the oscillating latch for swinging said hooked arm into alternate en-
85 gagement with the said studs, substantially as set forth.

9. In a switch, the combination with a movable contact and a frame for operating the same, of a movable block carried by said
90 frame, a stationary block opposed to the movable block, rollers carried by said blocks, and a pull wire or chain cooperating with said rollers, substantially as set forth.

This specification signed and witnessed this
27th day of January, 1902.

HENRY E. REEVE.

Witnesses:

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