

No. 775,016.

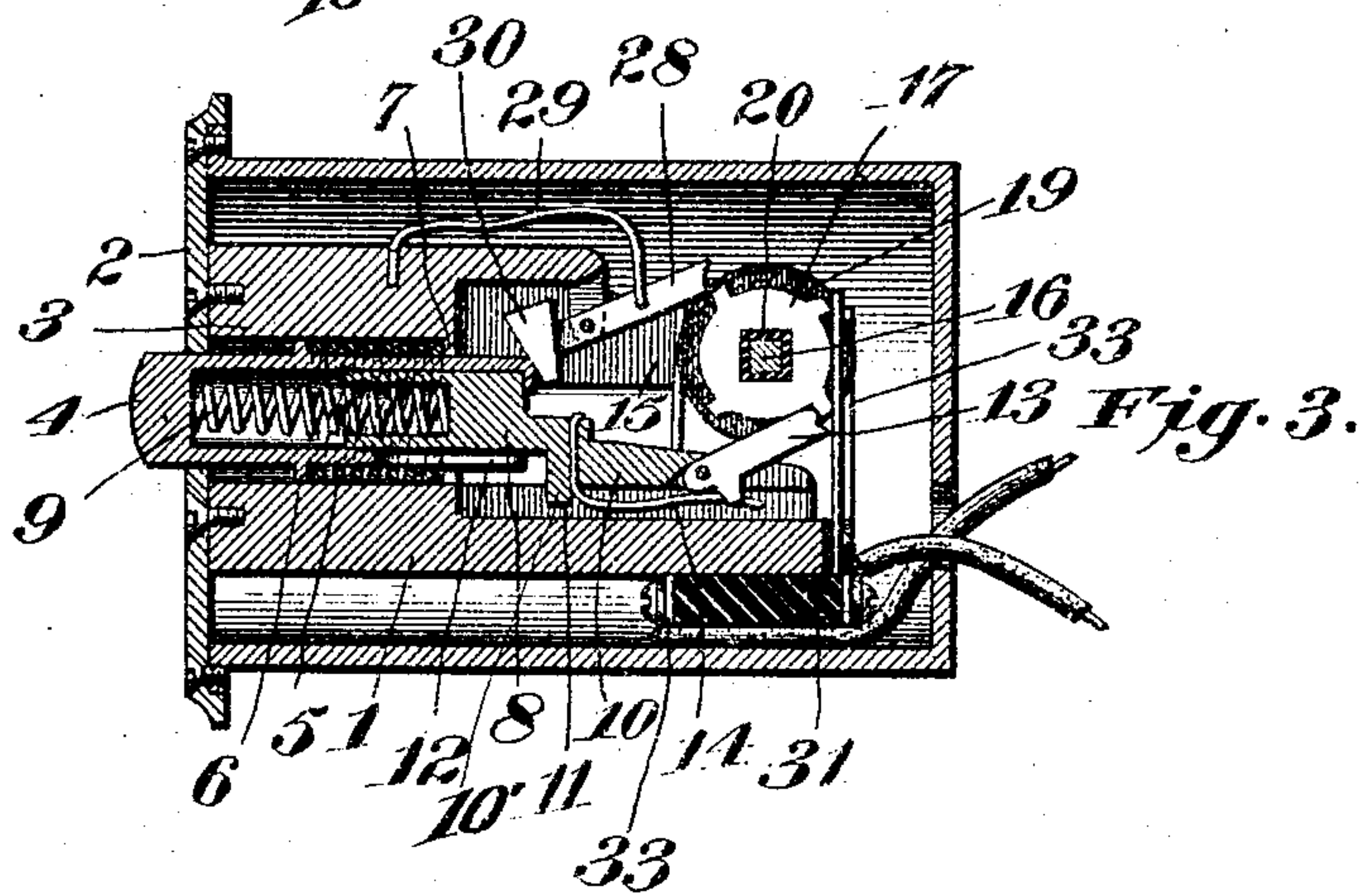
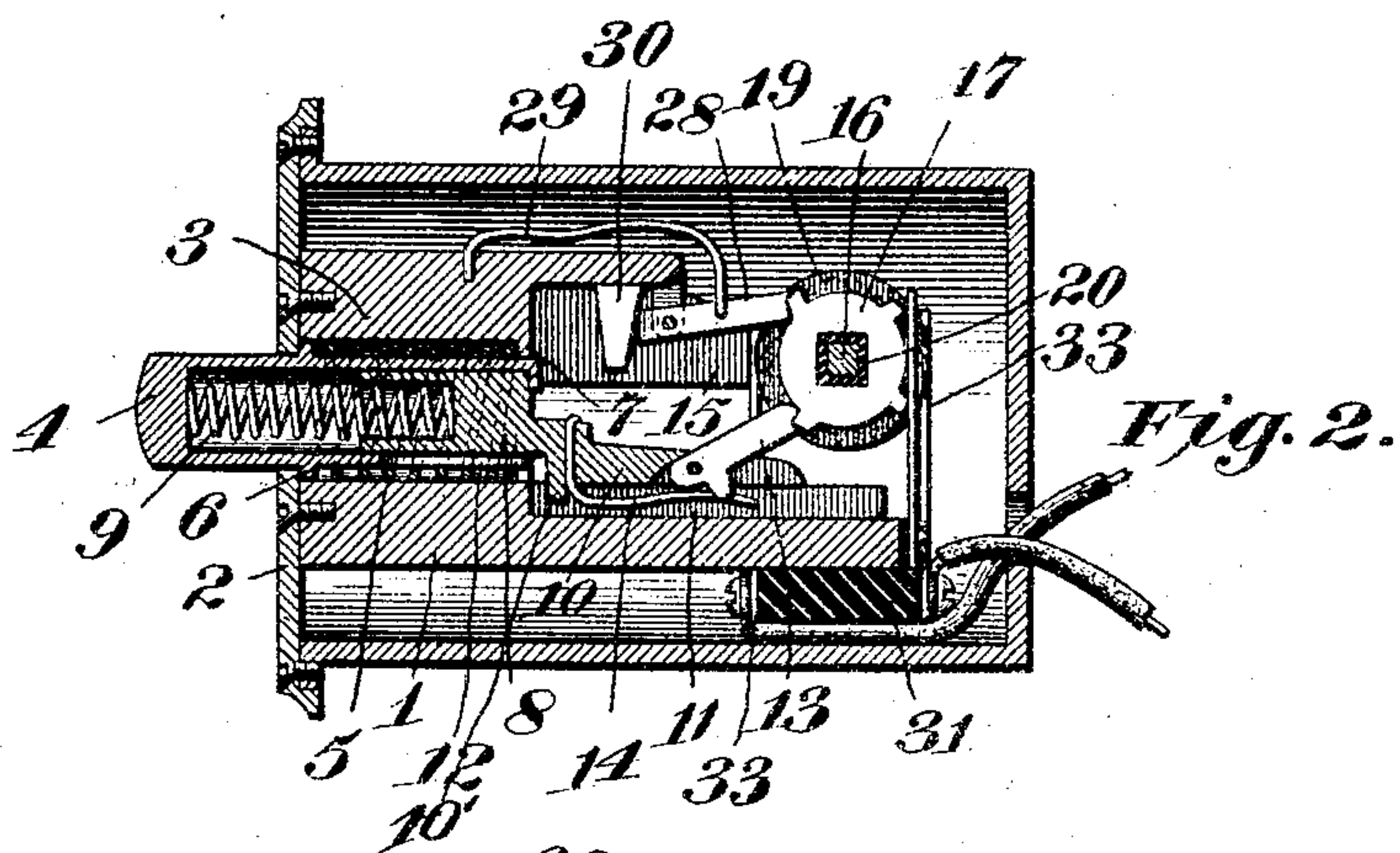
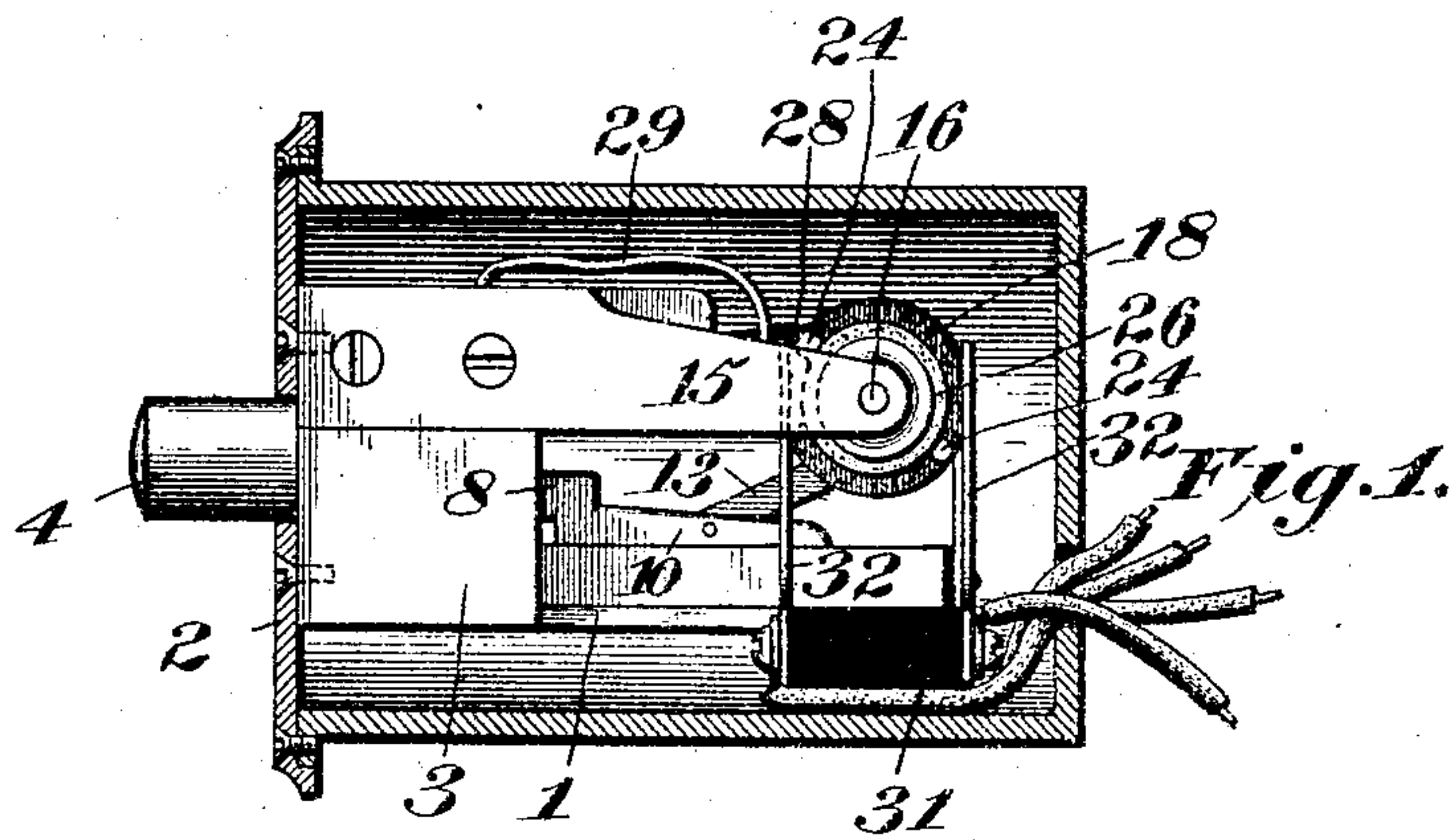
PATENTED NOV. 15, 1904.

I. G. WATERMAN.  
ELECTRIC SWITCH.

APPLICATION FILED MAR. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Inventor

Isaac G. Waterman

Witnesses

Elmer Seavey  
Amos E. Dodge

By

G. A. Hamilton  
Attorney

No. 775,016.

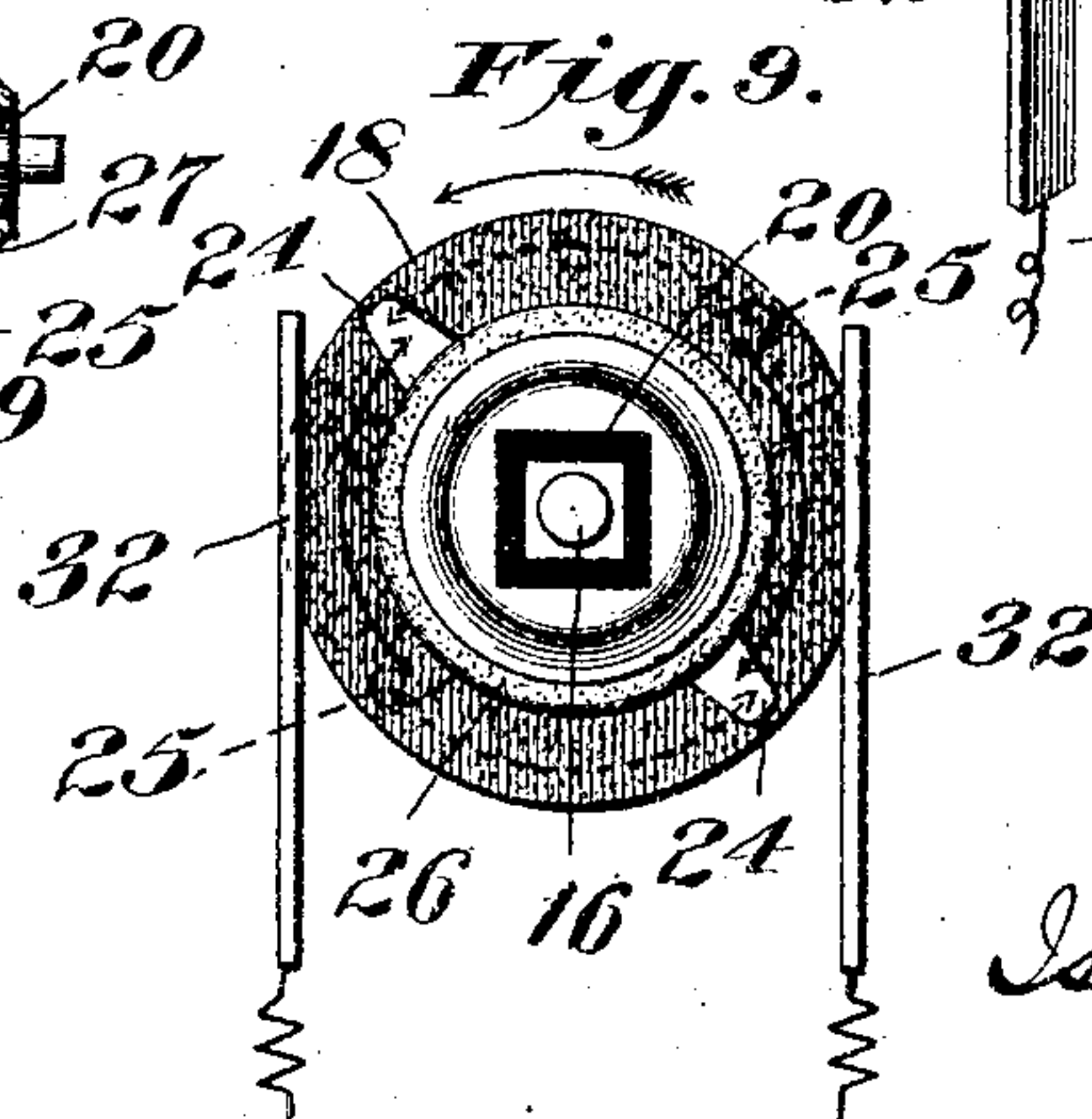
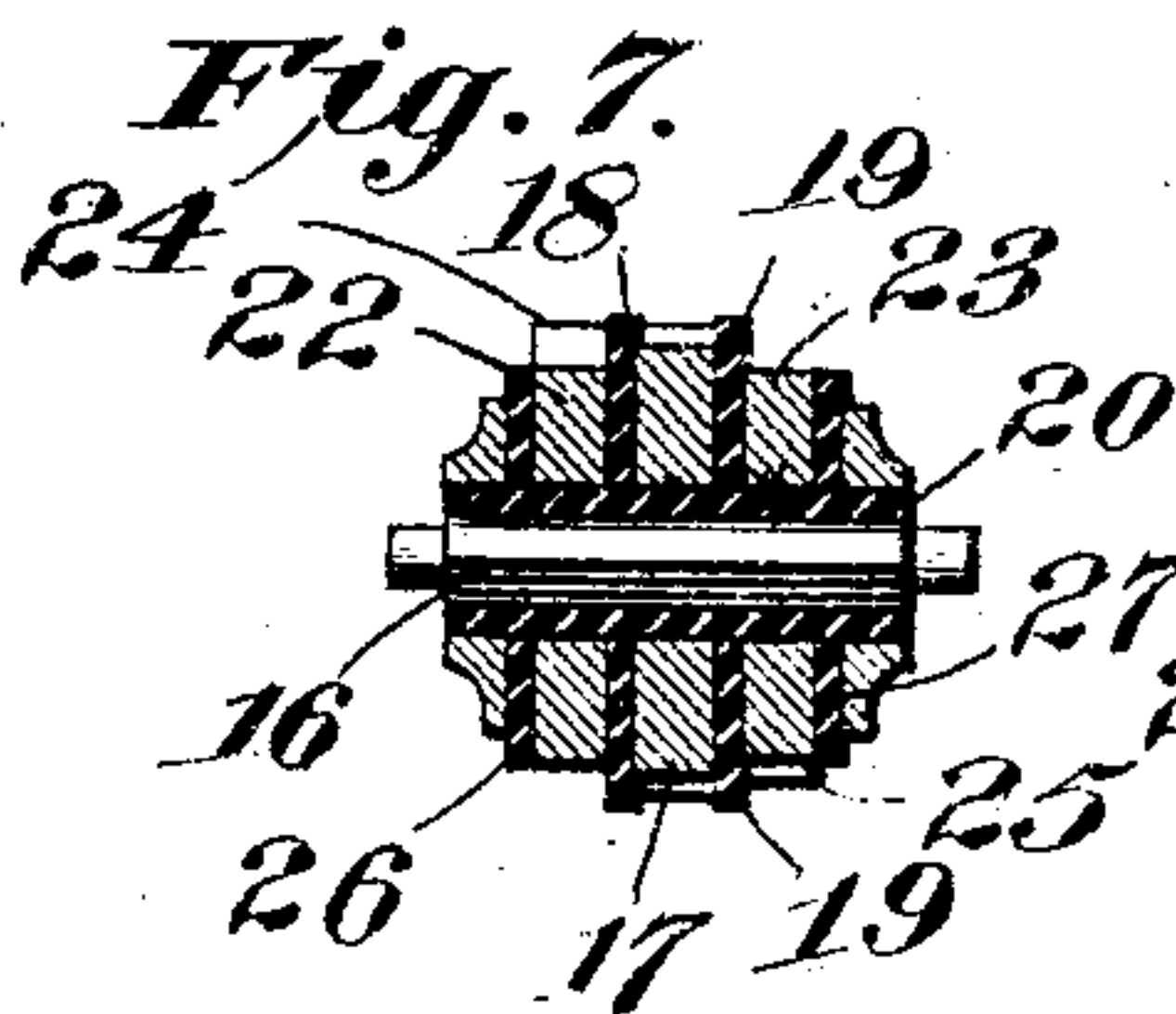
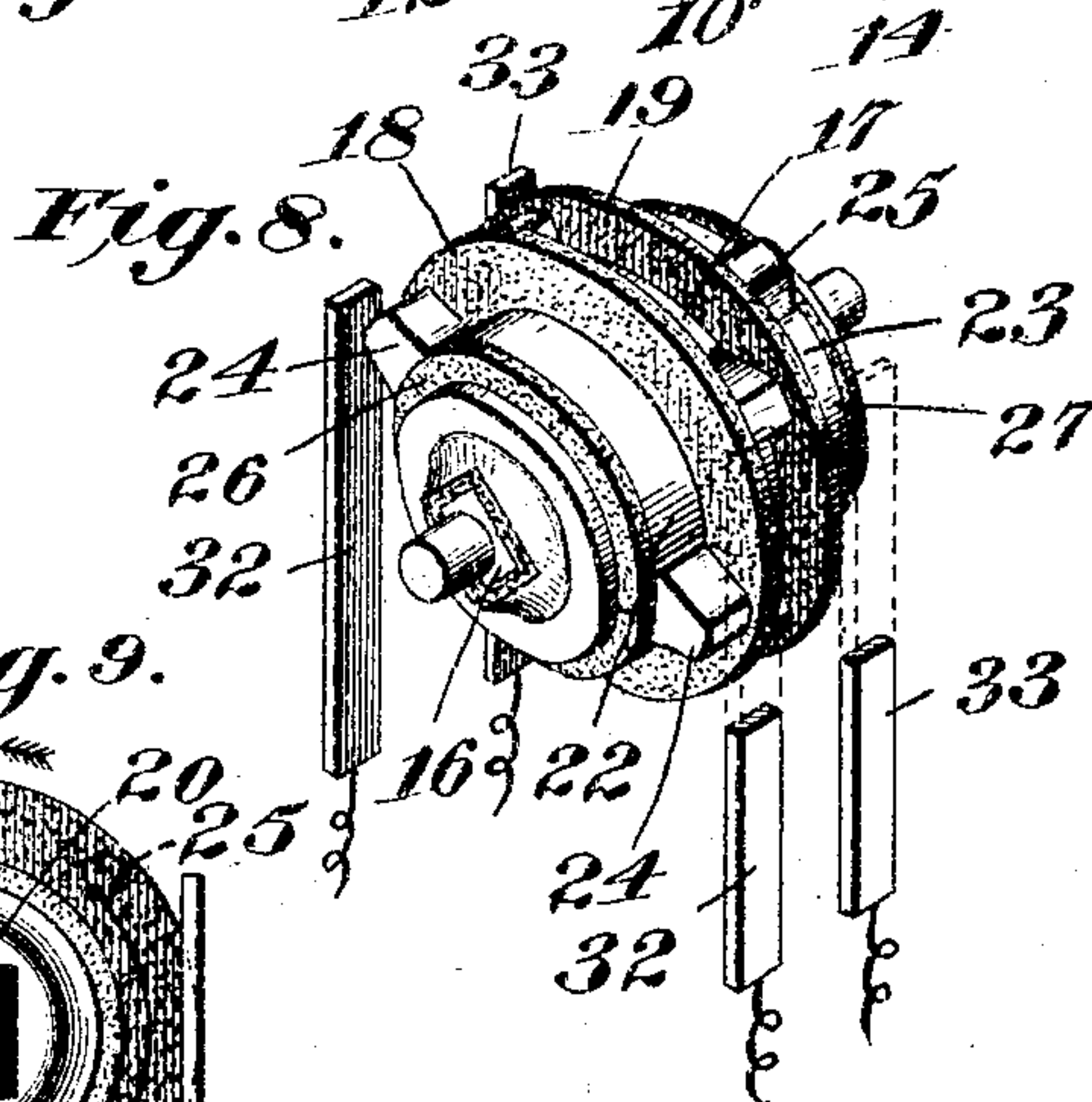
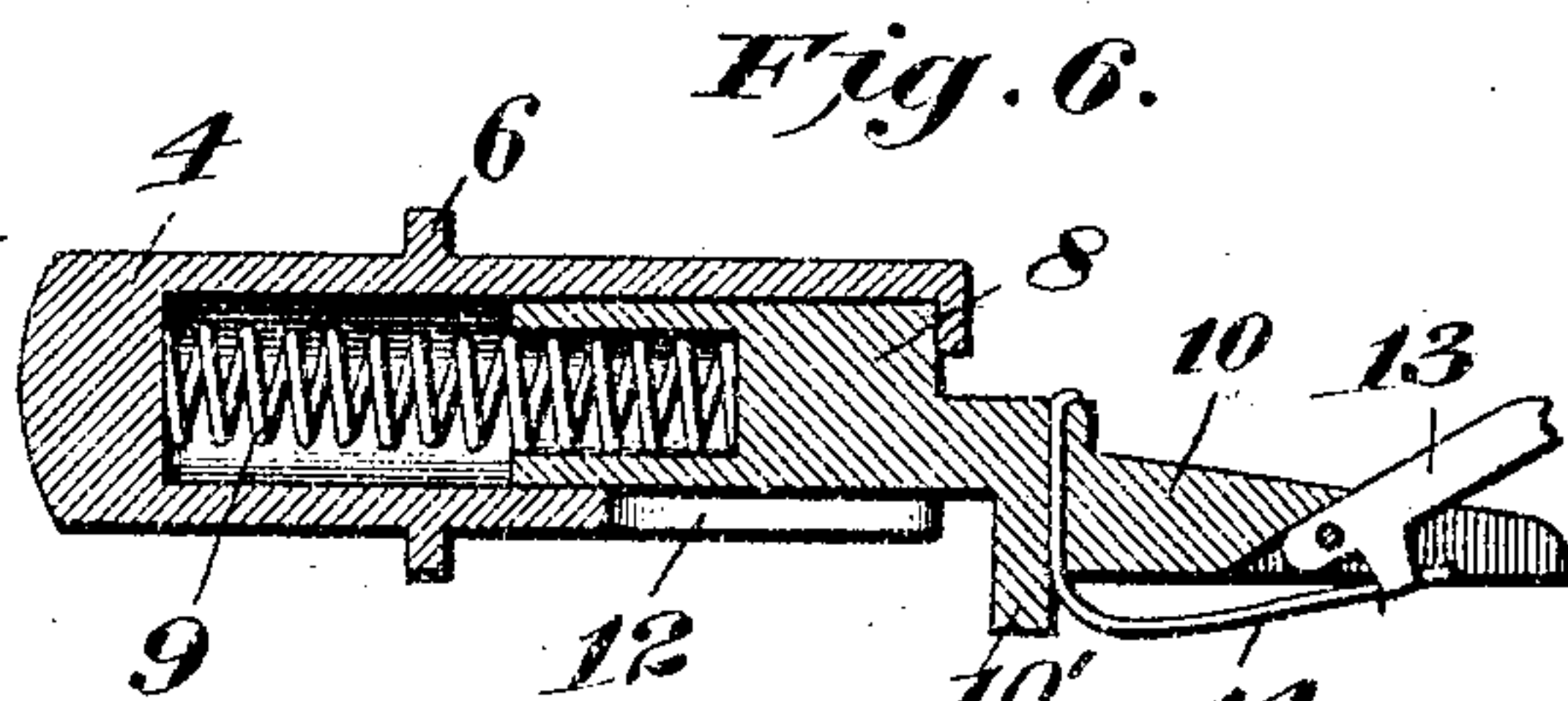
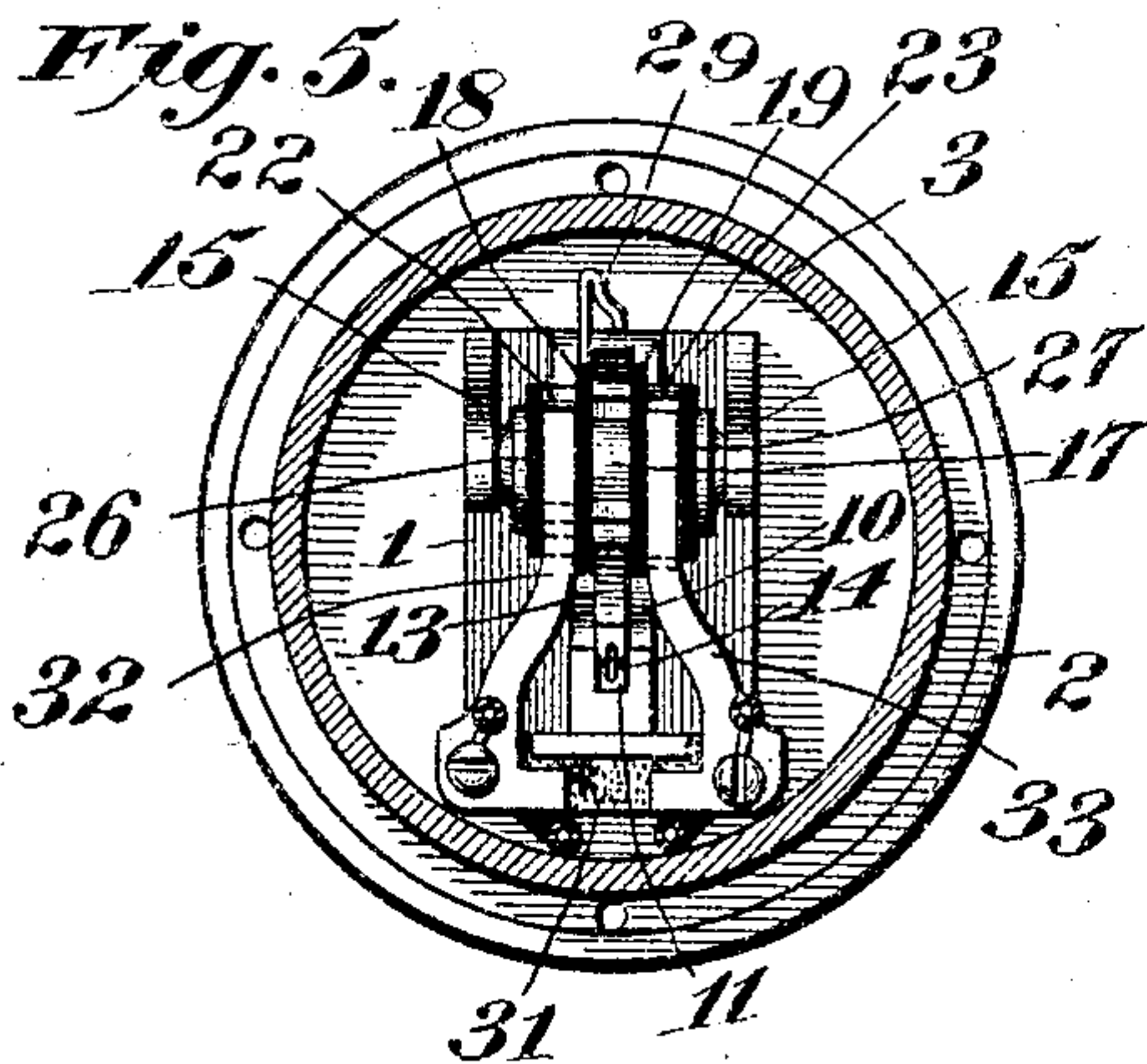
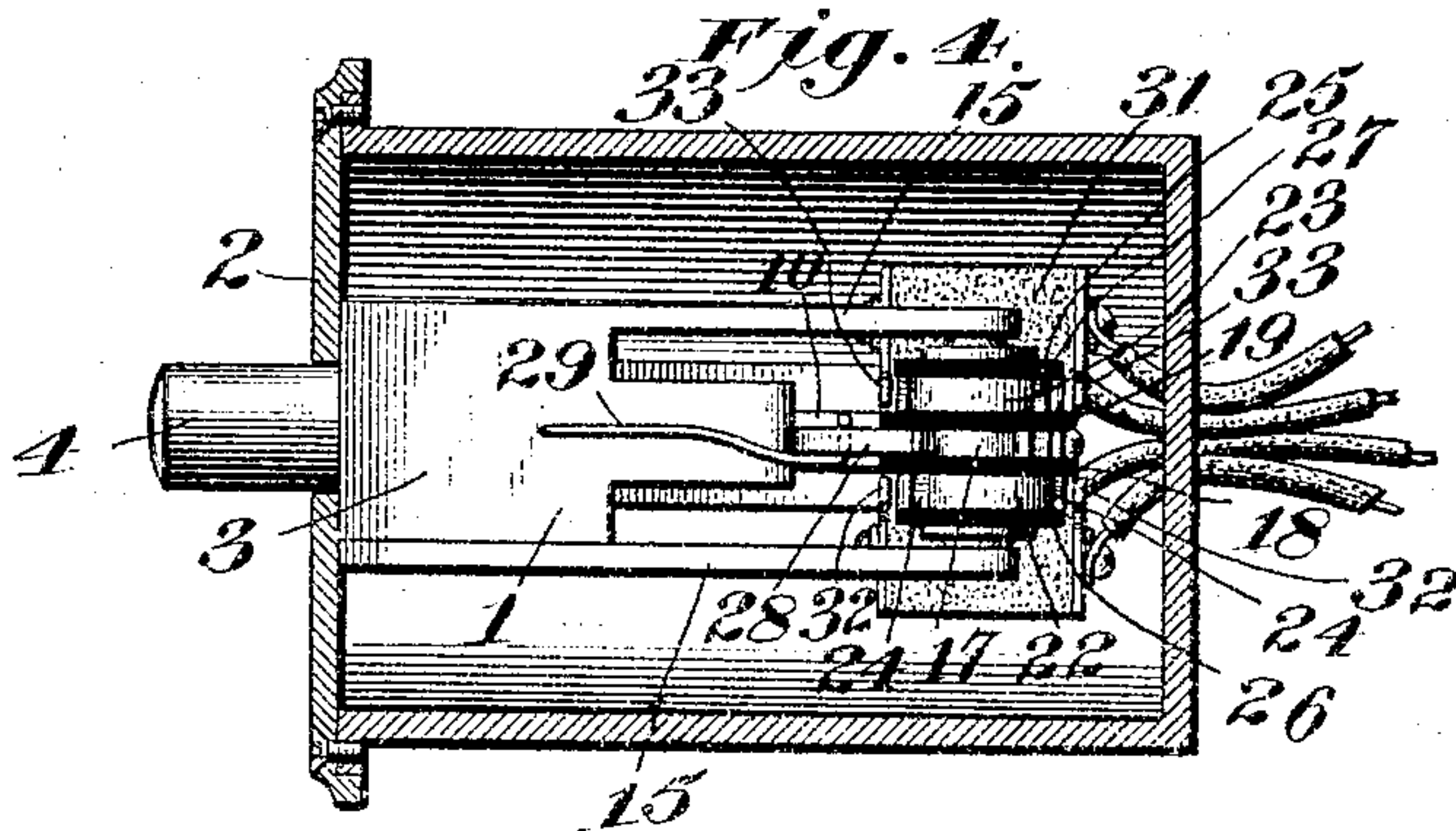
PATENTED NOV. 15, 1904.

I. G. WATERMAN.  
ELECTRIC SWITCH.

APPLICATION FILED MAR. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

Elmer Seavey  
Amos E. Dodge

By

Inventor  
Isaac G. Waterman  
Attorney



# UNITED STATES PATENT OFFICE.

ISAAC G. WATERMAN, OF SANTA BARBARA, CALIFORNIA.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 775,016, dated November 15, 1904.

Application filed March 9, 1903. Serial No. 146,977. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC G. WATERMAN, a citizen of the United States, residing at Santa Barbara, in the county of Santa Barbara and State of California, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

My invention relates to electric switches.

The object of the present invention is the provision of an improved push-button electric switch of few parts and simple construction which will operate in a novel manner with a snap action in throwing the movable contacts and one whereby different circuits will be made on alternate movements of the push-button.

Another object of the invention is to provide novel and improved means for snapping or moving the contacts into a temporary or momentary engagement with the stationary contacts, whereby only a temporary circuit will be made.

The present invention is primarily designed for use in connection with certain improvements in electromagnetically - controlled valves forming the subject-matter of two applications filed of even date herewith, but is also adapted for use in other connections.

The invention consists of certain improved features and novel combinations of parts more fully set forth hereinafter and recited in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a vertical section with the push-button in normal position. Fig. 3 is a similar view with the push-button pushed in. Fig. 4 is a top plan view; Fig. 5, an end elevation; Fig. 6, an enlarged detail section of the actuating member and pawl thereon; Fig. 7, a longitudinal section through the ratchet-wheel and movable contacts; Fig. 8, an enlarged perspective detail of the same; Fig. 9, a view illustrating the action of one of the movable contacts.

The frame 1 is secured to a face-plate 2, adapted for fastening the switch to the wall or other object where needed. On the frame is a box 3, in which the push-button 4 is movable, said button being normally projected by a spring 5 bearing on a collar 6 on the but-

ton and against a shoulder 7 on the box 3. Slidable within the push-button is a plunger 8, which is seated on a spring 9 in the push-button, and formed with the plunger is an actuating member 10, having a lug 10' slidable in a guideway 11 on the frame 1, and the push-button is provided with a slot 12 to receive the actuating member when the push-button is pushed in. Pivoted in the bifurcated end of the actuating member 10 is a pawl 13, pressed by a spring 14.

Journaled in the arms 15 on the frame 1 is a squared shaft 16, on which is a four-toothed ratchet-wheel 17, against the ends of which are mica or insulating fiber disks 18 and 19, and there is an insulating-bushing 20, on which are the ratchet-wheel 17 and the metal two-point contacts 22 and 23, the contact-points 24 of one disk being set quartering—that is, at quadrant distances from the contact-points 25 of the other disk. Outside the contacts 22 and 23 are the insulating fiber or mica disks 26 and 27. The ratchet-wheel, contact-disks, and bushings, and insulating-disks are all rigid in relation to each other and rigid on the shaft.

Pivoted to the frame 1 is a locking-dog 28, held normally engaged with a tooth of the ratchet-wheel by a spring 29 and having a tail 30. The pawl 13 is positioned so as to be adapted to engage the ratchet-wheel when the push-button has been properly pushed in.

Secured to the frame 1 is an insulating-block 31, to which are fastened two sets of contact-fingers, one set, 32, being positioned to be engaged by the contact-points 24 and the other set, 33, by the contacts 25; but the contact-fingers are so disposed that only one set is bridged or engaged at a given time—that is to say, when the contact-fingers 32 are bridged through the contact 22 the contact 23 is not in engagement with the contact-fingers 33, and vice versa; but it will be understood in this connection that in any event the engagement of either contact with its contact-fingers is only a temporary or momentary engagement, as the action is such that the contact-points (either 24 or 25) are by one movement snapped on and then off the fingers and do not remain engaged with the contact-fingers, as in electric switches commonly known to the art.



Under normal conditions neither contact (22 or 23) is engaged with its set of contact-fingers. When the push-button is pressed in, the plunger 8 and actuating member 10 move until the pawl 13 engages a tooth on the ratchet-wheel. Continued movement of the push-button causes the spring 9 to be compressed, and thereafter the push-button engages the tail 30 of the locking-dog 28, causing disengagement of the ratchet-wheel, whereupon the spring 9 expands quickly and snaps the contacts and ratchet-wheel a quarter-revolution, and the ratchet-wheel is then engaged by the locking-dog. During its snap movement the points of one of the contacts engage its set of fingers and momentarily complete the electric circuit in which said fingers are included, after which the contact-points pass off from the said fingers. The other set of fingers and contact are so related that they will not engage at this time. On release of the push-button the spring 6 returns the same, the plunger, and the actuating member to normal position. When the push-button is next pushed in, the same action will be repeated; but this time the other contact will momentarily bridge its set of contact-fingers and temporarily complete the independent circuit in which they are included and then pass off from said contact-fingers. Thus the two independent circuits are temporarily completed in alternation. The contact-fingers of one set are intended to be in circuit with the valve-opening magnet-coil and the other set of contact-fingers will be in circuit with the valve-releasing magnet-coil of either electromagnetic valve set forth in my copending applications filed of even date herewith.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric switch the combination with a step-by-step continuously-rotatable contact, of a switch-contact, a locking member for holding the rotatable contact against rotation, an actuating member, and a spring-actuated

member whose spring mechanism is put under tension by the movement of the actuating member and which is adapted to engage the locking member and release it from the rotatable contact at a predetermined time, said spring mechanism being adapted to cause the actuating member to snap the rotatable contact on and then off the switch-contact.

2. In an electric switch, the combination with a continuously-rotatable contact and ratchet-wheel, of a locking-dog normally engaging the ratchet-wheel and holding it and the contact against rotation, an actuating member having a spring-pressed pawl adapted to engage the ratchet-wheel, a push-button adapted to engage the locking-dog and release it, and a spring put under tension by the operation of push-button prior to the engagement of the push-button with the locking-dog, said spring being adapted to snap the actuating member when the locking-dog is released.

3. In an electric switch, the combination with a continuously-rotatable contact and ratchet-wheel, of a locking-dog normally engaging the ratchet-wheel and holding it and the contact against rotation, an actuating member for the ratchet-wheel and contact, a push-button adapted to engage the locking-dog and release it, a spring put under tension by the operation of the push-button prior to the engagement of the push-button with the locking-dog, and a contact positioned to be temporarily engaged by the continuously-rotatable contact during the movement of the continuously-rotatable contact after the release of the locking-dog, said spring being adapted to snap the actuating member when the locking-dog is released.

In testimony whereof I have signed my name to this specification in presence of two witnesses.

ISAAC G. WATERMAN.

Witnesses:

E. S. PILLARD,

P. M. HAMMOND.