

No. 775,055.

PATENTED NOV. 15, 1904.

I. G. WATERMAN.
ELECTRIC SWITCH.

APPLICATION FILED MAR. 25, 1903. RENEWED SEPT. 7, 1904.

NO MODEL.

Fig. 1.

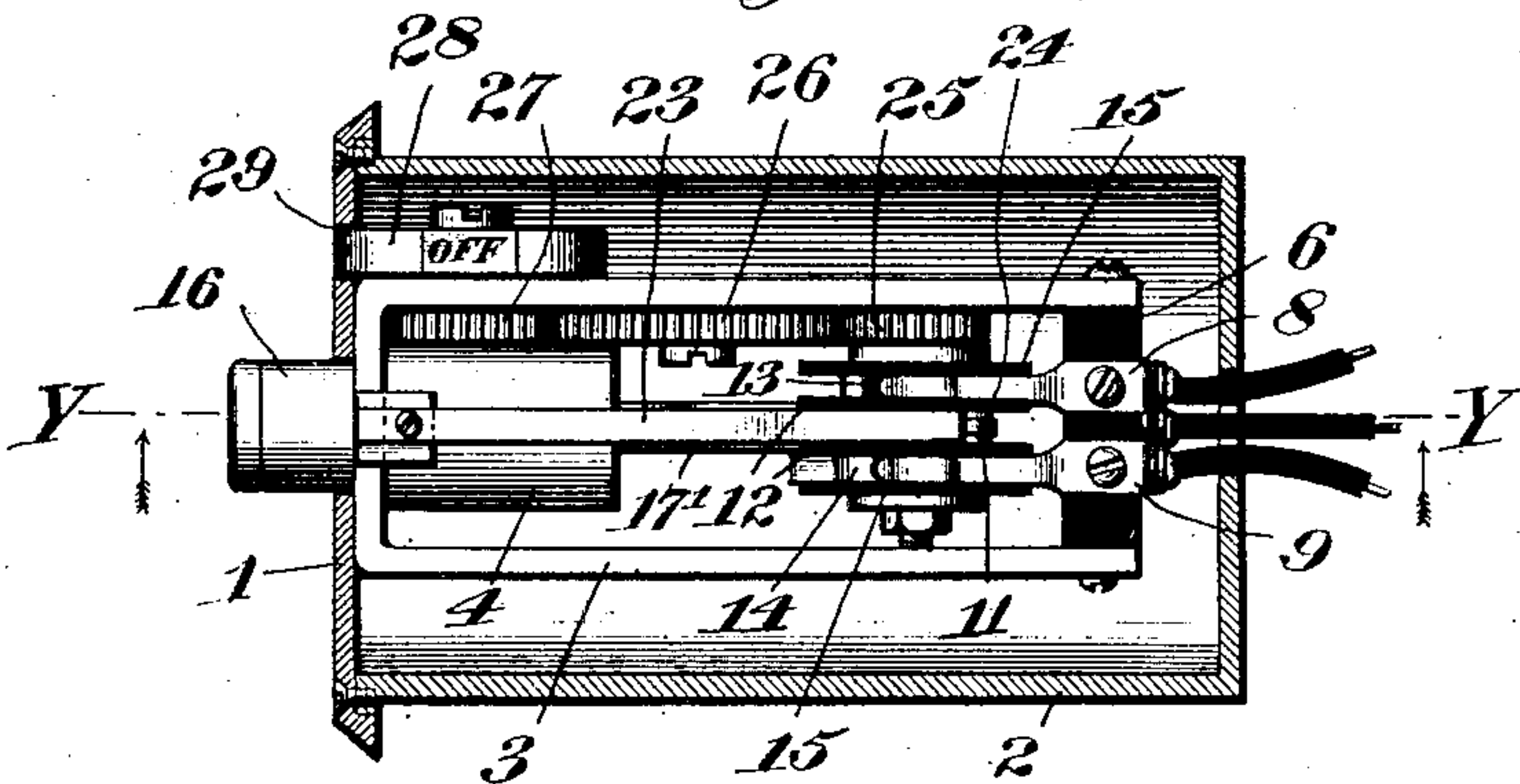


Fig. 2.

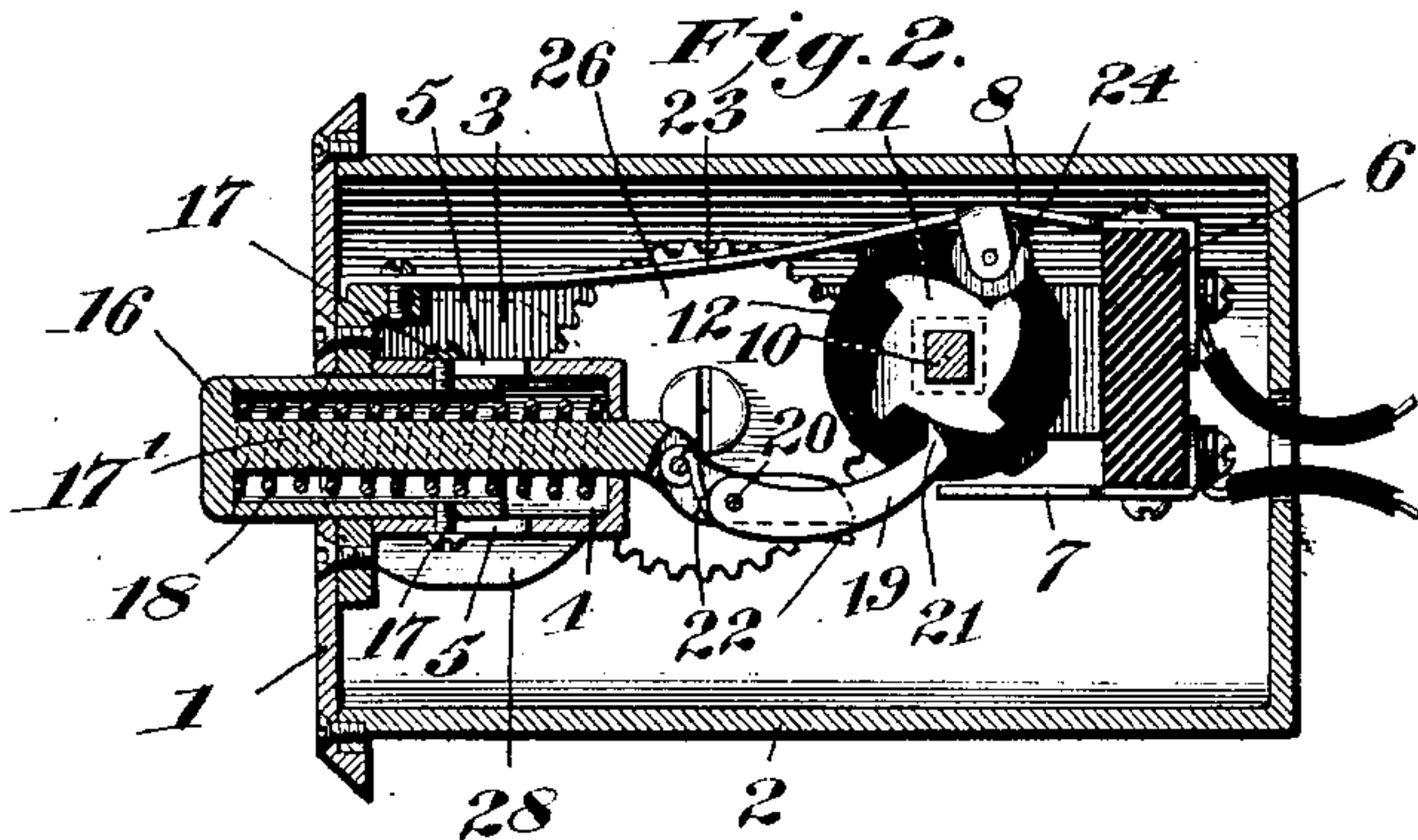


Fig. 3.

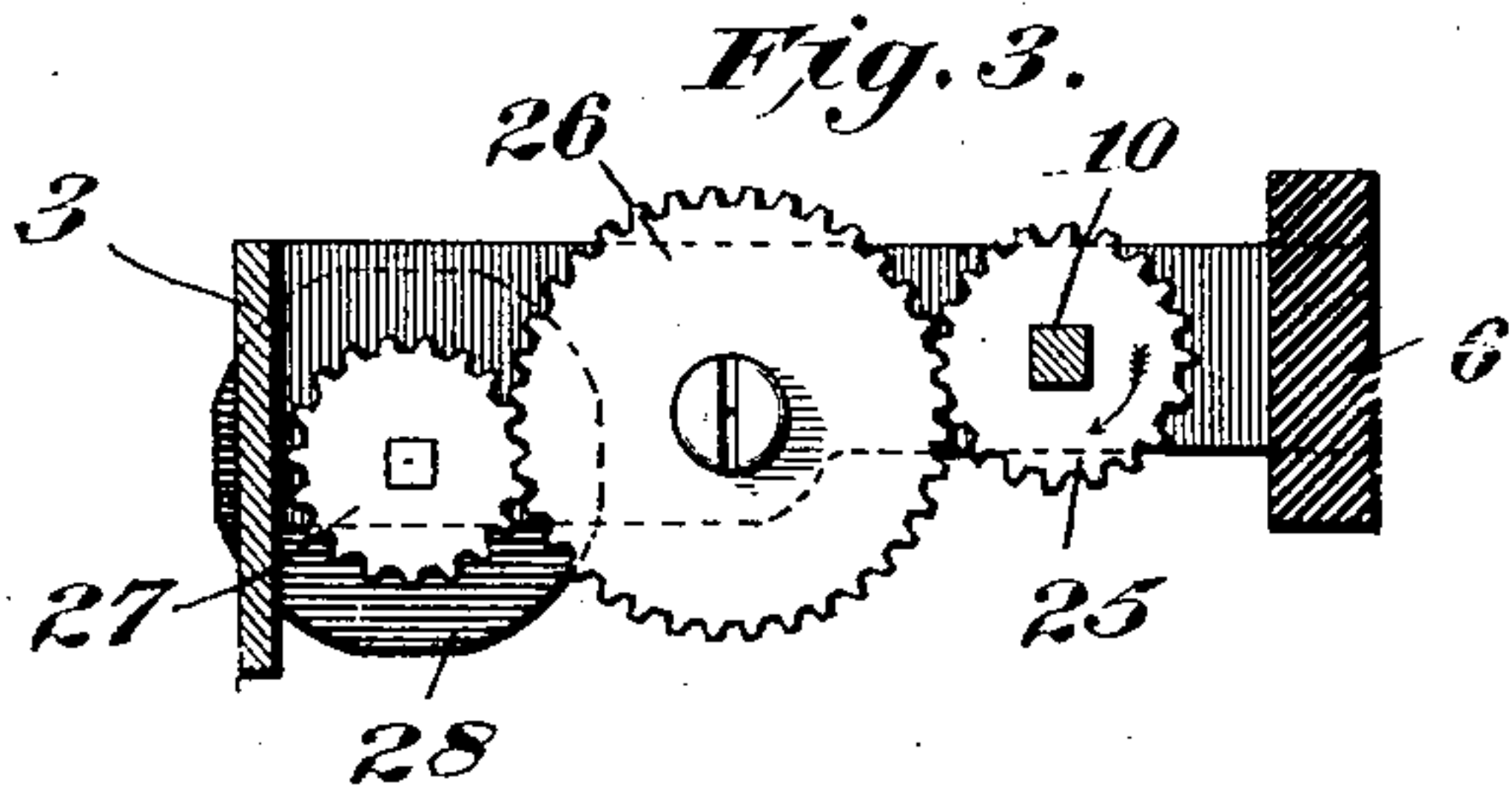
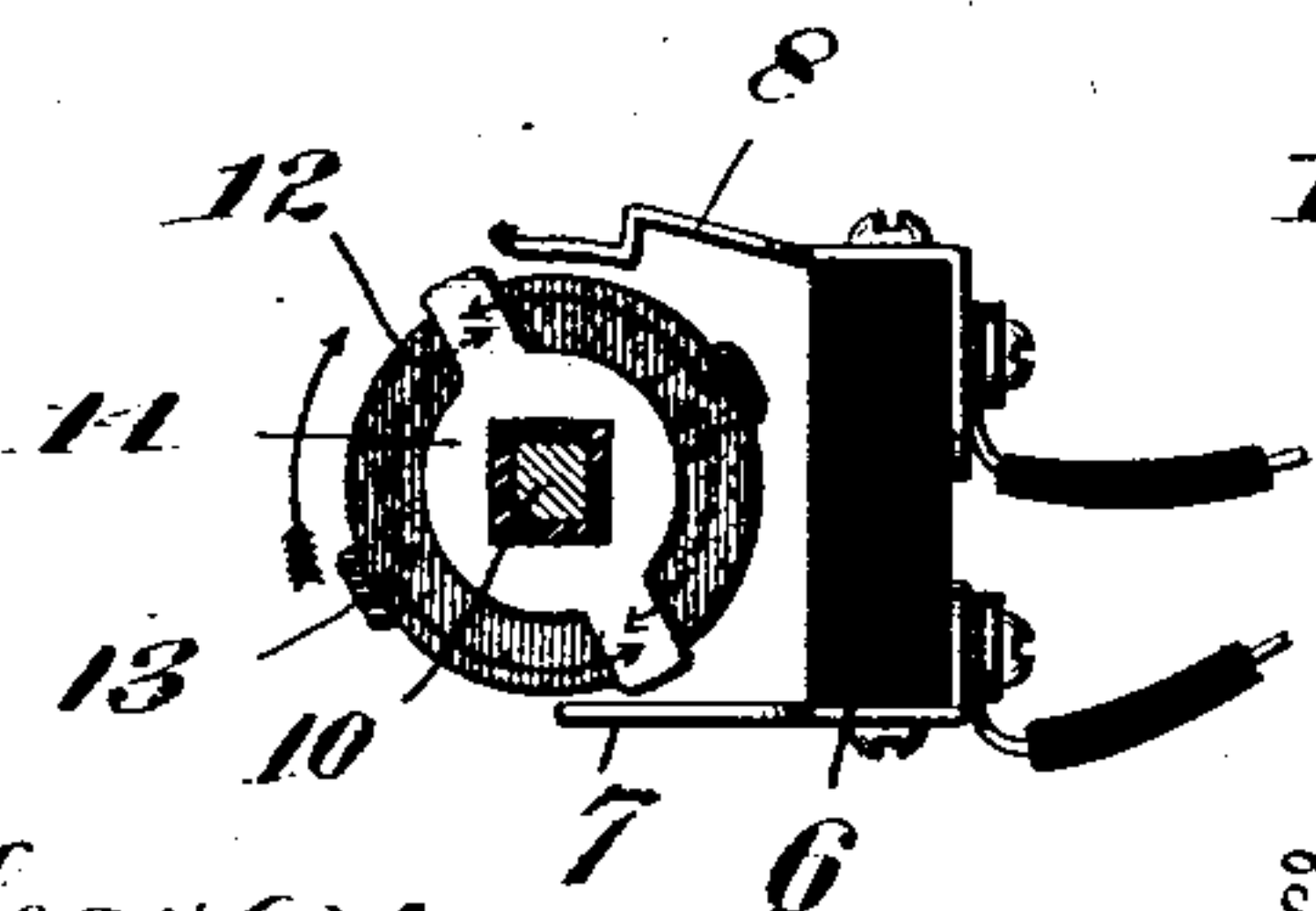


Fig. 4.



Witnesses

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ISAAC G. WATERMAN, OF SANTA BARBARA, CALIFORNIA.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 775,055, dated November 15, 1904.

Application filed March 25, 1903. Renewed September 7, 1904. Serial No. 223,653. (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.

This invention relates to electric switches, and is an improvement on the electric switch set forth in my copending application filed March 9, 1903, Serial No. 146,977.

One object of the present invention is the provision, in connection with an electric switch, of an improved and novel indicator operated by the switch adapted to indicate which of the circuits controlled by the switch has previously been made.

I may say that the present switch, like the switch of my copending application before referred to, is adapted especially for use in connection with either of the electromagnetic valves set forth in my copending applications filed March 9, 1903, Serial No. 146,975, and filed March 9, 1903, Serial No. 146,976, which are intended to be opened by a temporary current, then locked in open position, and finally released by another temporary current. The improved indicator of the present switch is designed to indicate whether the valve is open or closed, and it is particularly designed for use when my electromagnetic valve is used to control hot-water or steam radiators.

Another object of the invention is the provision of improvements on the push-button and contact-actuating pawl.

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

A further object is to provide an improved switch adapted to alternately complete different circuits on alternate actuations of the switch.

To accomplish the foregoing objects, I provide the novel and improved features and com-

binations of parts set forth in detail herein- after and recited in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view; Fig. 2, a vertical section on line Y Y of Fig. 1; Fig. 3, a detail view of the gearing and indicator; Fig. 4, a detail side elevation of the contact mechanism, showing the action diagrammatically.

The switch has a face-plate 1 and inclosing shell 2 and a frame 3 for the different mechanisms, the latter being made from a single stamping. Secured to the frame 3 is a tubular guide 4, having slots 5 in its sides.

An insulating-block 6 is secured to the ends of the frame 3 and carries the common contact 7 and the two contacts 8 and 9, one contact, 8, being in the circuit of the valve-raising magnet, and the other contact, 9, in the circuit of the valve-locking magnet of the valve shown in either of my copending applications before referred to. The common contact 7 is for the return-wire of both circuits.

Journaled in the frame 3 is a square shaft 10, on which are secured a central ratchet-wheel 11, insulating-strips 12 at the sides thereof, and contact-disks 13 and 14, each having diametrically-disposed contact projections and the projections on one disk being set "quartering" to those on the other disk. Outside the other disks are insulating-disks 15.

The foregoing arrangement and construction of contact-disks, ratchet-wheel, &c., is substantially similar to that disclosed in my copending application, filed March 9, 1903, Serial No. 146,977.

Slidable within the tubular guide 4 is a hollow push-button 16, having pins or screws 17 movable in the slots 5 and provided with a central stem 17', surrounded by a coil-spring 18, which bears against the end of the push-button and the end of the tubular guide 4 and keeps the push-button and parts movable therewith retracted. The stem 17' is extended beyond the end of the push-button, and in its bifurcated end is a pawl 19 on a pivot 20. This pawl has a tooth 21, positioned to engage the teeth of the ratchet-wheel by a spring 22. A spring-dog 23, having a roller 24 at its end, is adapted to engage and lock the ratchet-

wheel and contacts after being turned by the pawl 19.

On the shaft 10 is a gear 25, with which meshes a gear 26, which in turn meshes with a gear 27, fast with an indicator-wheel 28, a portion of whose periphery projects through a slot 29 in the face-plate 1 and bears the two words "On" and "Off," so arranged that they will be displayed alternately on succeeding movements of the push-button.

I have described a convenient form which the indicator may assume; but it will be understood that the same result could be accomplished in different ways, and I do not, therefore, limit myself to the foregoing construction. The indicator, it will be understood, shows the "on" and "off" positions of the valve with which the switch will be used and does not indicate the fact of the switch-contact disks being on or off their contacts. It can be readily understood, however, that the indicator could as well be used to indicate the fact of the movable contact being on or off its contacts.

When the push-button is pressed in, the tooth of the pawl snaps into engagement with another tooth of the ratchet-wheel, and on the release of the push-button the spring 18 retracts the push-button, stem, and pawl and turns the ratchet-wheel and contacts with a snap action a quarter-revolution, causing the circuit to be made momentarily by reason of the temporary engagement of the projections on one of the disks (either 13 or 14) with the common contact 7 and either contact 8 or contact 9, as the case may be. The dog 23 locks the ratchet-wheel and contact-disks where turned. During the foregoing operation the gears turn the indicator and display the indicia thereon.

The essential idea of my invention being the provision of a switch having a movable contact and an actuating member cooperating with the movable contact to cause the latter to only momentarily or temporarily engage the circuit-contact, other mechanism than what I have disclosed in this application can be employed to carry out my object, and I do not limit myself to the construction herein shown and described.

As the essential idea of the invention is the operation of the movable contact to first pass on and then off the circuit-contact as a complete action on any given single complete operation of the actuating member, in the use of the words "on each complete operation" of the actuating member or language of similar import in the claims I have reference, in the broadest sense, to a complete cycle of movement of the actuating member on any given single actuation.

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 stationary contact, of a movable contact arranged to only momentarily or temporarily engage the stationary contact when actuated, a spring-retracted actuating member, and means operated thereby adapted to snap the movable contact first on then off the stationary contact during the automatic spring retraction of the actuating member.

2. In an electric switch, the combination with a stationary contact, of a movable contact arranged to only momentarily or temporarily engage the stationary contact when actuated, a spring-retracted push-button, and a pawl carried thereby adapted to snap the movable contact first on then off the stationary contact during the automatic spring retraction of the push-button.

3. In an electric switch, the combination with a stationary contact, of a rotary contact arranged to only momentarily or temporarily engage the stationary contact when actuated, a spring-retracted push-button, and a pawl carried thereby adapted to snap the rotary contact first on then off the stationary contact during the automatic spring retraction of the push-button.

4. In an electric switch, the combination with a stationary contact, of a movable contact arranged to only momentarily or temporarily engage the stationary contact when actuated, a spring-operated actuating member adapted to automatically snap the movable contact first on then off the stationary contact, a separate indicator for displaying the successive operations of the switch, and means for automatically operating said indicator when the switch is operated.

5. In an electric switch, the combination with separate movable contacts controlling independent circuits, of means for actuating said contacts, and an independent indicator for displaying the successive operations of said contacts.

6. In an electric switch, the combination with separate movable contacts controlling independent circuits and adapted to complete their circuits in alternation, of means for actuating said contacts, and an independent indicator for displaying the successive operations of the contacts.

7. In an electric switch, the combination with separate rotary contacts movable together which control independent circuits and complete their circuits in alternation, of a spring-actuated actuating member for operating said contacts, and a separate or independent indicator cooperating with the contacts to disclose the action thereof.

8. In an electric switch, the combination with separate rotary contacts controlling independent circuits and means for turning said contacts step by step to complete their circuits in alternation, of a rotary indicator, and gearing interposed between said rotary indicator and the rotary contacts, said indicator

disclosing the successive operations of the rotary contacts.

9. In an electric switch, the combination with a switch-contact, of a movable contact, an actuating member, and mechanism cooperating with the actuating member and with the movable contact which snaps the movable contact on and then off the switch-contact on each complete operation of the actuating member.

10. In an electric switch, the combination with a switch-contact, of a rotary contact, an actuating member, and mechanism cooperating with the actuating member and with the rotary contact which snaps the rotary contact on and then off the switch-contact on each complete operation of the actuating member.

11. In an electric switch, the combination with a switch-contact, of a rotary contact adapted for a step-by-step advance movement in one direction, an actuating member, and mechanism cooperating with the actuating member and with the rotary contact which snaps the rotary contact on and then off the switch-contact on each complete operation of the actuating member.

12. In an electric switch, the combination with a switch-contact, of a movable contact, an actuating member, and a spring-actuated member operated by the actuating member and having means for snapping the movable contact first on and then off the switch-contact on each complete operation of the actuating member.

13. In an electric switch, the combination with a switch-contact, of a rotary contact movable step by step, and a spring-actuated member for snapping the rotary contact first on and then off the switch-contact on each complete operation of said actuating member.

14. In an electric switch, the combination with a switch-contact, of a rotary contact movable step by step, and a slidable spring-actuated push-button for snapping the rotary contact first on and then off the switch-contact on each complete operation of said push-button.

15. In an electric switch, the combination with separate movable contacts controlling independent circuits and adapted to temporarily complete their circuits in alternation, of relatively stationary contacts for engagement by the respective movable contacts, and means for snapping the movable contacts first on and then off the relatively stationary contacts to cause the aforesaid alternate temporary or momentary completion of the independent circuits by the separate contacts.

16. In an electric switch, the combination with separate rotary contacts movable together which control independent circuits and

are arranged to temporarily complete their circuits in alternation, of relatively stationary contacts for engagement by the respective rotary contacts, and a spring-actuated member for snapping said rotary contacts first on and then off the relatively stationary contacts to cause the aforesaid temporary or momentary completion of the independent circuits in alternation by the separate rotary contacts.

17. In an electric switch, the combination with separate rotary contacts movable together, of separate contacts controlling independent circuits, said separate rotary contacts being arranged to engage their respective contacts alternately on alternate operations thereof, and a spring-actuated operating member for the rotary contacts adapted to first snap a given rotary contact on and then off its contacts by one operation.

18. In an electric switch, the combination with a switch-contact, of a movable contact, a push-button and mechanism cooperating with the push-button and with the movable contact which snaps the movable contact on and then off the switch-contact on each complete operation of the push-button.

19. In an electric switch, the combination with a switch-contact, of a rotary contact, a push-button and mechanism cooperating with the push-button and with the rotary contact which snaps the rotary contact on and then off the switch-contact on each complete operation of the push-button.

20. In an electric switch, the combination with separate contacts controlling separate circuits, of a movable contact device adapted for alternately momentarily completing the respective circuits through the respective contacts, and a spring-actuated push-button adapted on each complete operation to operate the movable contact and snap the contact device first on and then off the circuit-controlling contacts, thereby completing one of the circuits.

21. In an electric switch, the combination with a switch-contact, of a rotary contact movable step by step, a slidable spring-actuated push-button, and a pawl carried by the push-button and engageable with the rotary contact, whereby the rotary contact is snapped first on and then off the switch-contact on each complete operation of the push-button.

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

ISAAC G. WATERMAN.

Witnesses:

E. S. PILLARD,
ELMER SEAVEY.