

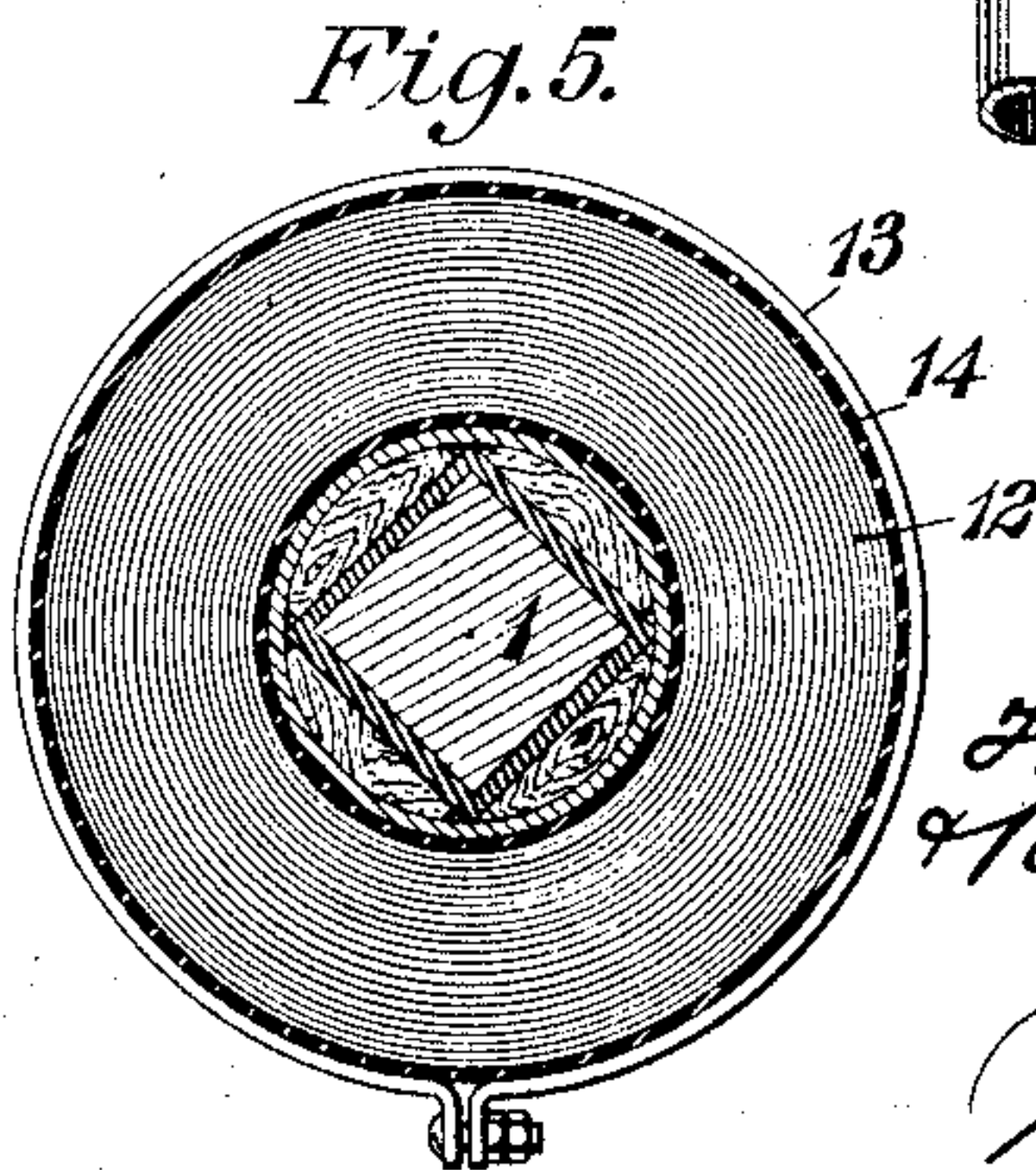
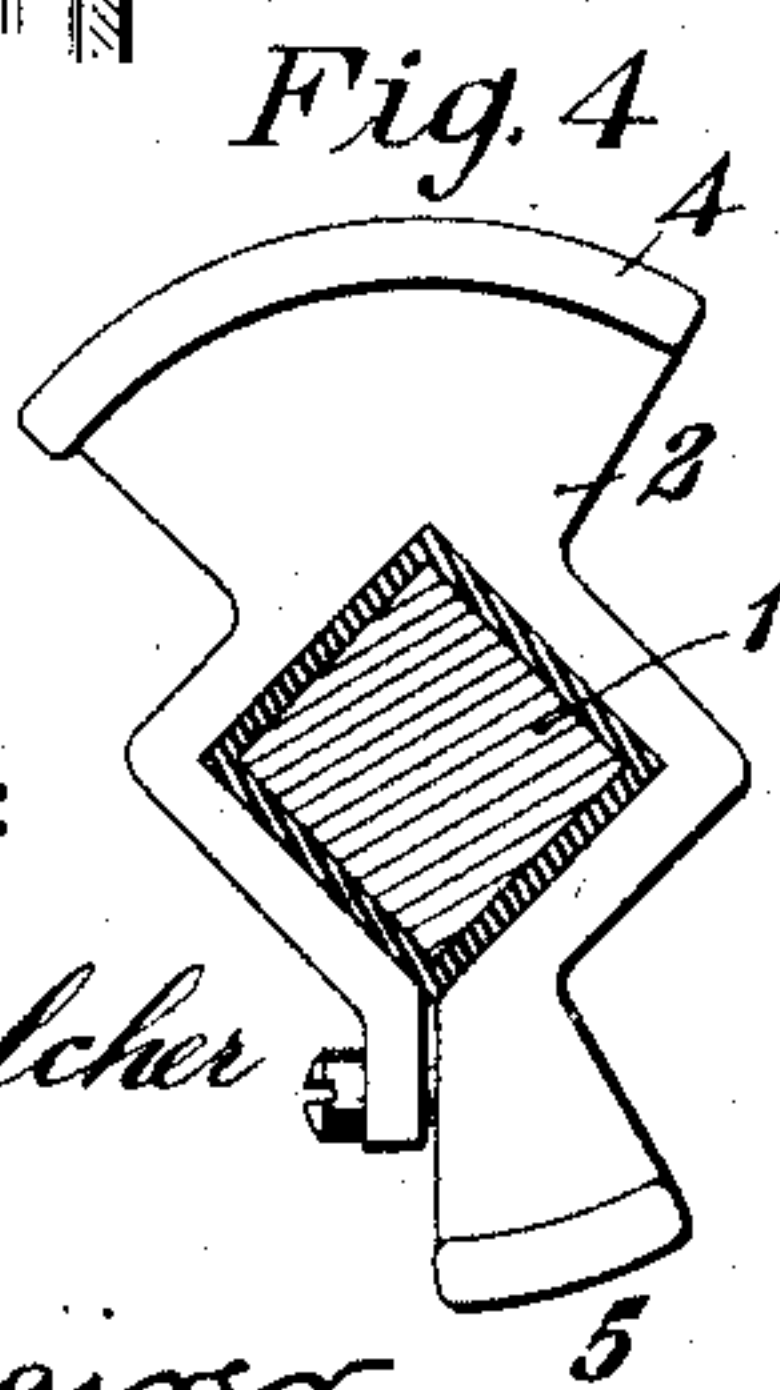
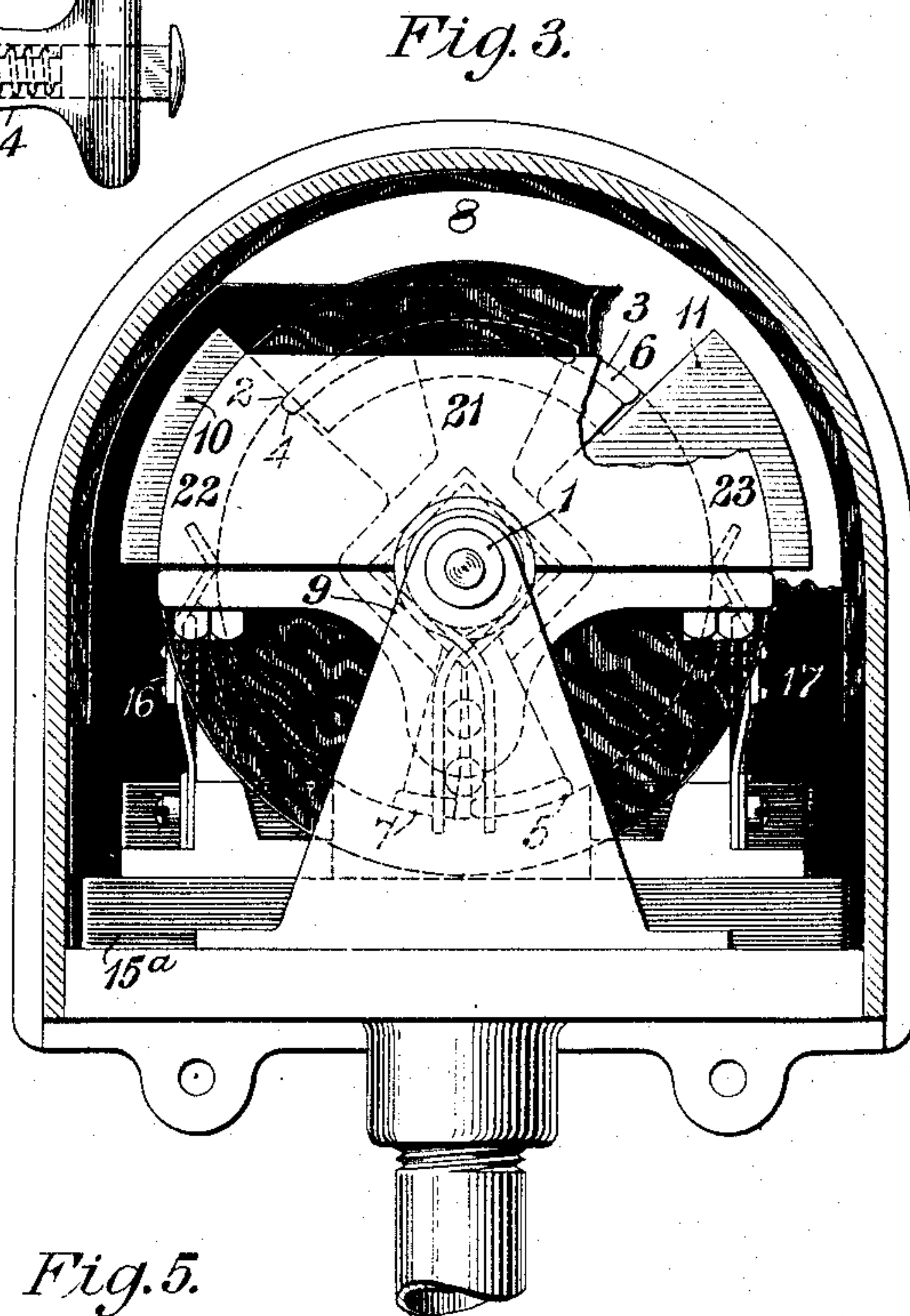
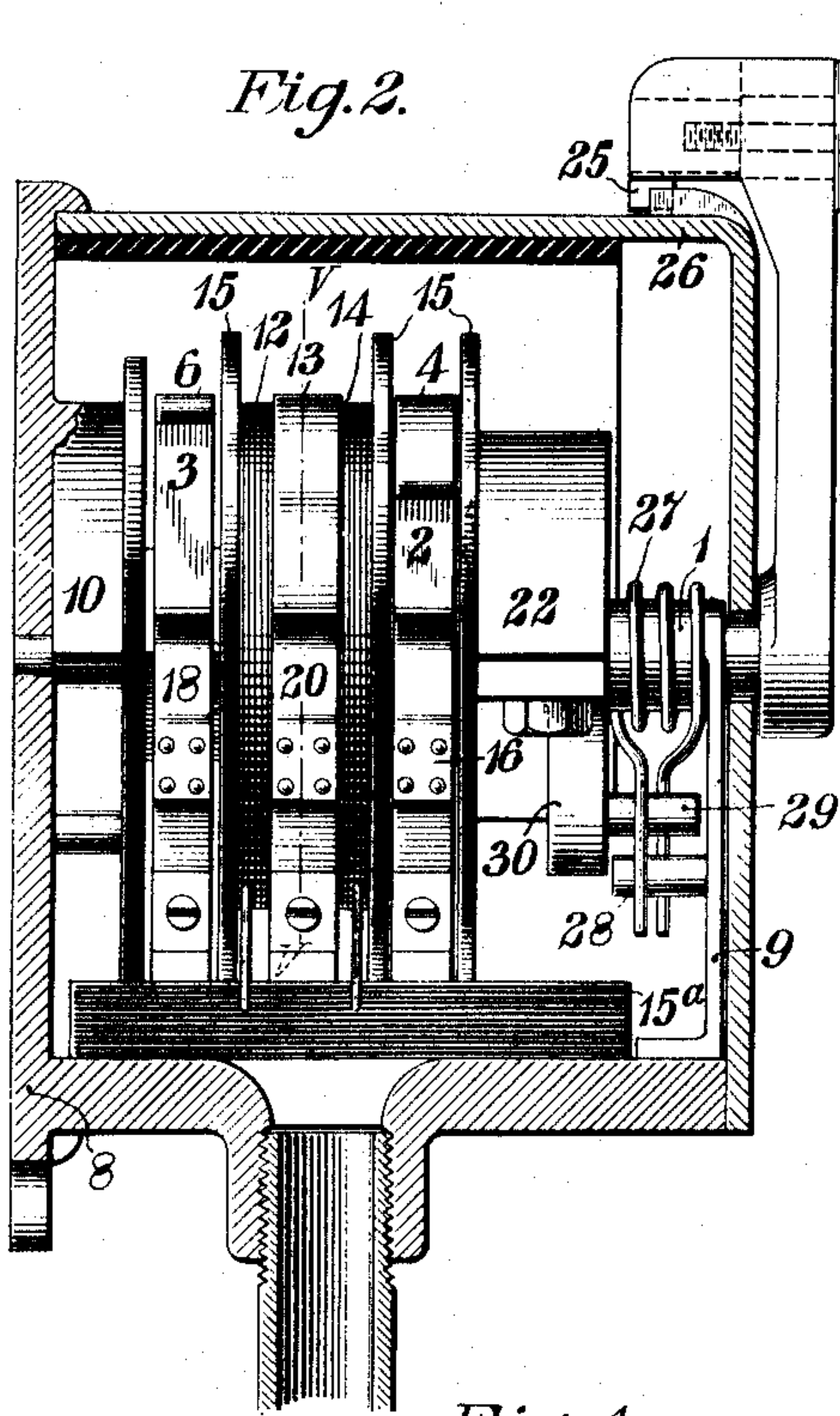
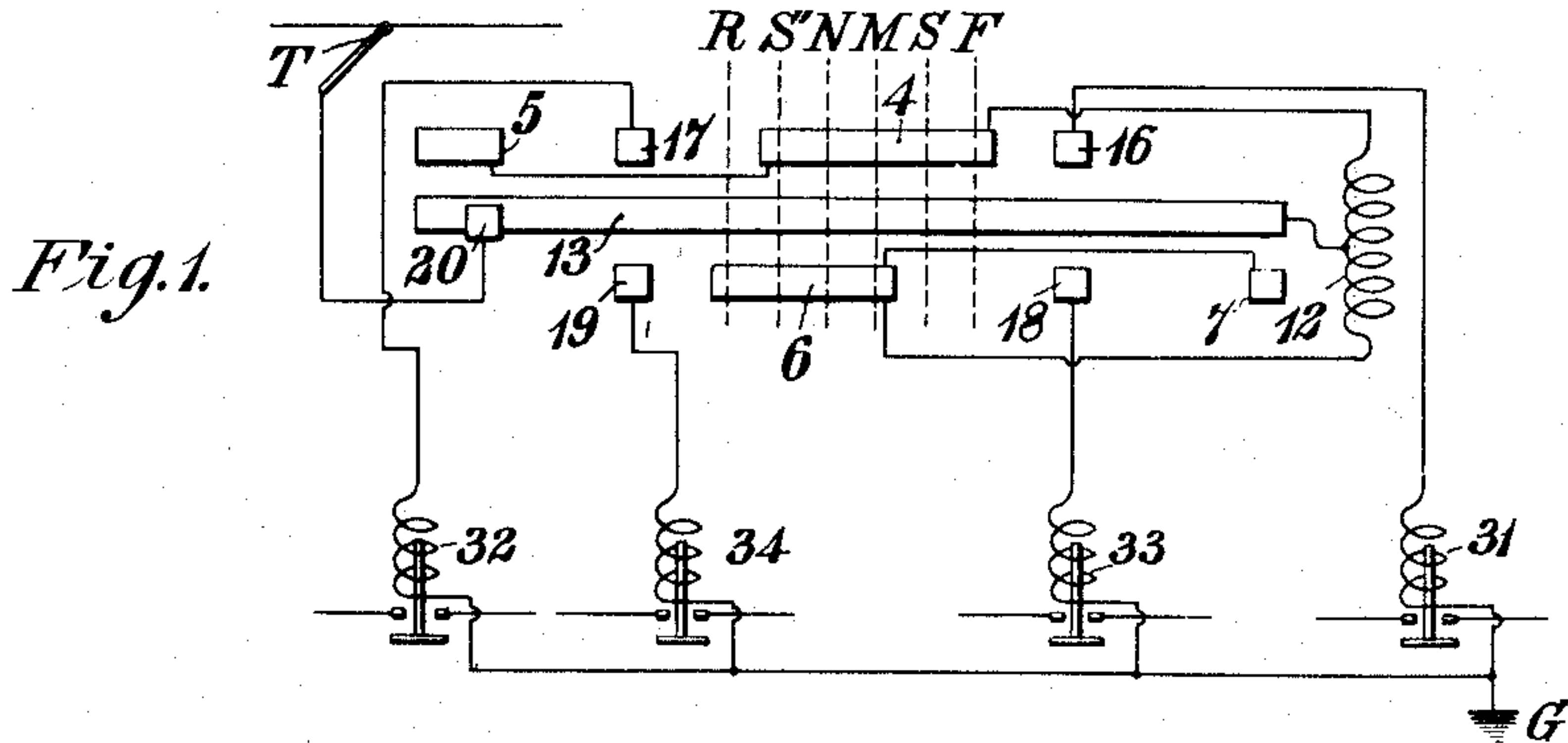
No. 814,324.

PATENTED MAR. 6, 1906.

T. S. PERKINS & R. P. JACKSON.

CONTROLLER SWITCH.

APPLICATION FILED JUNE 6, 1904.



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# UNITED STATES PATENT OFFICE.

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## CONTROLLER-SWITCH.

No. 814,324.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed June 6, 1904. Serial No. 211,369.

*To all whom it may concern:*

Be it known that we, THOMAS S. PERKINS and RAY P. JACKSON, citizens of the United States, and residents of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Controller-Switches, of which the following is a specification.

Our invention relates to switches for electrical circuits, and particularly to controller-switches of the drum type which are employed to control a plurality of circuits.

The object of our invention is to provide a controller-switch of simple and inexpensive construction in which the blow-out coil operates to blow the arcs which ordinarily occur when engagement is interrupted between contact-surfaces of the drum-segments and the contact-fingers of controllers outwardly regardless of the direction of rotation of the drum.

In an application, Serial No. 211,368, filed by us of even date herewith we have set forth the essential features of a system of multiple control for electric motors by means of which all of the units of a train may be individually or collectively controlled from some one remote point at which the master-switch comprising our present invention is located.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a simple diagrammatic view of the connections and relations of its elements. Fig. 2 is a view in side elevation of the switch embodying our invention, the casing of which is shown in section. Fig. 3 is a view in front elevation of the switch shown in Fig. 1, the casing and operating-handle being removed. Fig. 4 is a detail view of one of the drum-segments, and Fig. 5 is a view in section on line V V of Fig. 2.

Upon a shaft 1 having a squared body portion are mounted drum-segments 2 and 3, having contact-surfaces 4 and 5 and 6 and 7, respectively, the shaft 1 being journaled at one end in a frame 8 and at its other end in a bracket 9 of any suitable non-magnetic material. The portion of the frame 8 adjacent to the bearing for the shaft 1 is so shaped as to form pole-pieces 10 and 11, which will be more fully described hereinafter.

Between the drum-segments 2 and 3 and concentric with the shaft 1 is a blow-out coil

12, having its terminals connected, respectively, to said drum-segments and having its middle point connected to a segment 13 of ring form, which is mounted upon an insulating-cylinder 14, surrounding the coil 12. Disks or other properly-shaped pieces 15 of any suitable non-conducting material are provided between the drum-segments and between the drum-segments and the pole-pieces for the purpose of preventing arcing between the said parts.

Secured to the base of the frame 8 upon a block or plate 15<sup>a</sup>, made of any suitable insulating material, are fingers 16 and 17 and 18 and 19, which are adapted to engage, respectively, with the contact-surfaces of the drum-segment 2 and with the contact-surfaces of the drum-segment 3 and also a contact-finger 20, which engages the ring 13. Mounted upon the shaft 1 adjacent to the drum-segment 2 is a piece 21 of magnetic material shaped so as to form pole-pieces 22 and 23, which are respectively adjacent to the contact-fingers 16 and 17 when the switch is in its initial or "off" position. The pole-pieces 10 and 11 in the frame 8 correspond in shape to the pole-pieces 22 and 23 and are respectively adjacent to the contact-fingers 18 and 19.

At the outer end of the shaft 1 is an operating-handle 24, provided with any suitable means for retaining the handle in any of the running positions of the switch—such as a latch 25, that is adapted to engage with notches in the casing 26, which incloses the operating parts of the switch. Surrounding the shaft 1 is a helical spring 27, the ends of which are extended, so as to embrace between them pins 28 and 29, that are secured, respectively, to the bracket 9 and to a piece 30, which is mounted upon the shaft 1. Means are thus provided for retarding the rotation of the operating-handle 24 and for returning it to its initial position when it is released.

The coöperation of parts here shown to cause the arcs which may be formed between the drum-segments and the contact-fingers to be blown outwardly may be best understood from a consideration of Fig. 1. In the first position F of the switch the finger 16 engages the contact-surface 4 and a circuit is established from any suitable source T



through contact-finger 20, drum-ring 13, one-half the blow-out coil 12, drum-segment 4, contact-finger 16 to the ground G through any suitable solenoid 31 or other translating device, which in the system of control described in the previously-mentioned application, Serial No. 211,368, is one of the actuating-coils of the reversing-switch. In the second position S of the switch contact-surface 5 of the drum-segment 2 engages finger 17, and a circuit is then established through any other suitable solenoid 32 or other translating device to the ground G, and in position M contact-surface 6 of the drum-segment 3 engages finger 18, and a circuit is then established through any other suitable solenoid 33 to the ground G. Similarly, for rotation of the switch in the opposite direction the fingers 19, 17, and 18, respectively, engage with the contact-surfaces 6, 4, and 7 for the positions R, S', and N, the circuit then being established through the other half of the blow-out coil 12 and through the solenoids 34, 32, and 33 successively.

It is evident that an outward blow of the arc always occurs, since only one-half of the blow-out coil is useful at any one time, and the direction of the flux in the magnetic circuit is reversed with respect to the direction of the flow of current between the fingers and the rings as the direction of rotation of the drum is reversed.

While we have described our invention as particularly applicable to the system of control set forth in the subject-matter of our application Serial No. 211,368, we do not wish it limited to such specific use, as it is evident that variations within reasonable limits may be made in the connections and arrangements of parts, as well as in the apparatus which it is intended to operate, without departing from its scope.

We claim as our invention—

1. A controller-switch comprising a shaft, drum-segments mounted thereon, pole-pieces carried by said shaft, a blow-out coil and stationary pole-pieces that cooperate with said shaft and its pole-pieces to provide a magnetic circuit for the coil.

2. A controller-switch comprising a shaft, drum-segments mounted thereon, pole-pieces carried by said shaft, a blow-out coil concentric with the shaft, and stationary pole-pieces that cooperate with the shaft and its pole-pieces to provide a magnetic circuit for the blow-out coil.

3. A controller-switch comprising a shaft, drum-segments mounted thereon, stationary

pole-pieces at one end of said shaft and corresponding pole-pieces at the other end of and carried by said shaft, said pole-pieces and shaft forming parts of the same magnetic circuit.

4. A controller-switch comprising a shaft, drum-segments mounted thereon, stationary pole-pieces at one end of said shaft, corresponding pole-pieces at the other end of and carried by said shaft and a blow-out coil concentric with the shaft, said pole-pieces and shaft forming parts of the same magnetic circuit.

5. A controller-switch comprising a shaft, drum-segments mounted thereon, contact-fingers which engage respectively therewith and a blow-out coil concentric with said shaft the terminals and middle point of which are so connected to the drum-rings as to cause an outward blow of the arc due to the disengagement of said fingers from said segments, regardless of the direction of rotation of the latter.

6. A controller-switch comprising a shaft, drum-segments mounted thereon, contact-fingers which engage respectively with said segments and a blow-out coil having its terminals and middle point respectively connected to said segments.

7. A controller-switch comprising a shaft, drum-segments mounted thereon, contact-fingers which engage respectively with said segments and a two-part blow-out coil mounted upon said shaft and connected to said segments, the one or the other part of said coil being energized to produce a magnetic flux in said shaft respectively in the one or the other direction according to the direction of rotation thereof.

8. A controller-switch comprising a shaft, drum-segments mounted thereon, stationary pole-pieces at one end of said shaft, corresponding pole-pieces at the other end of and carried by said shaft and a two-part blow-out winding concentric with said shaft, the one or the other part thereof being energized to produce a magnetic flux between the said stationary and rotatable pole-pieces in the one or the other direction according to the direction of rotation of the shaft.

In testimony whereof we have hereunto subscribed our names this 31st day of May, 1904.

THOMAS S. PERKINS.  
RAY P. JACKSON.

Witnesses:

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BIRNEY HINES.