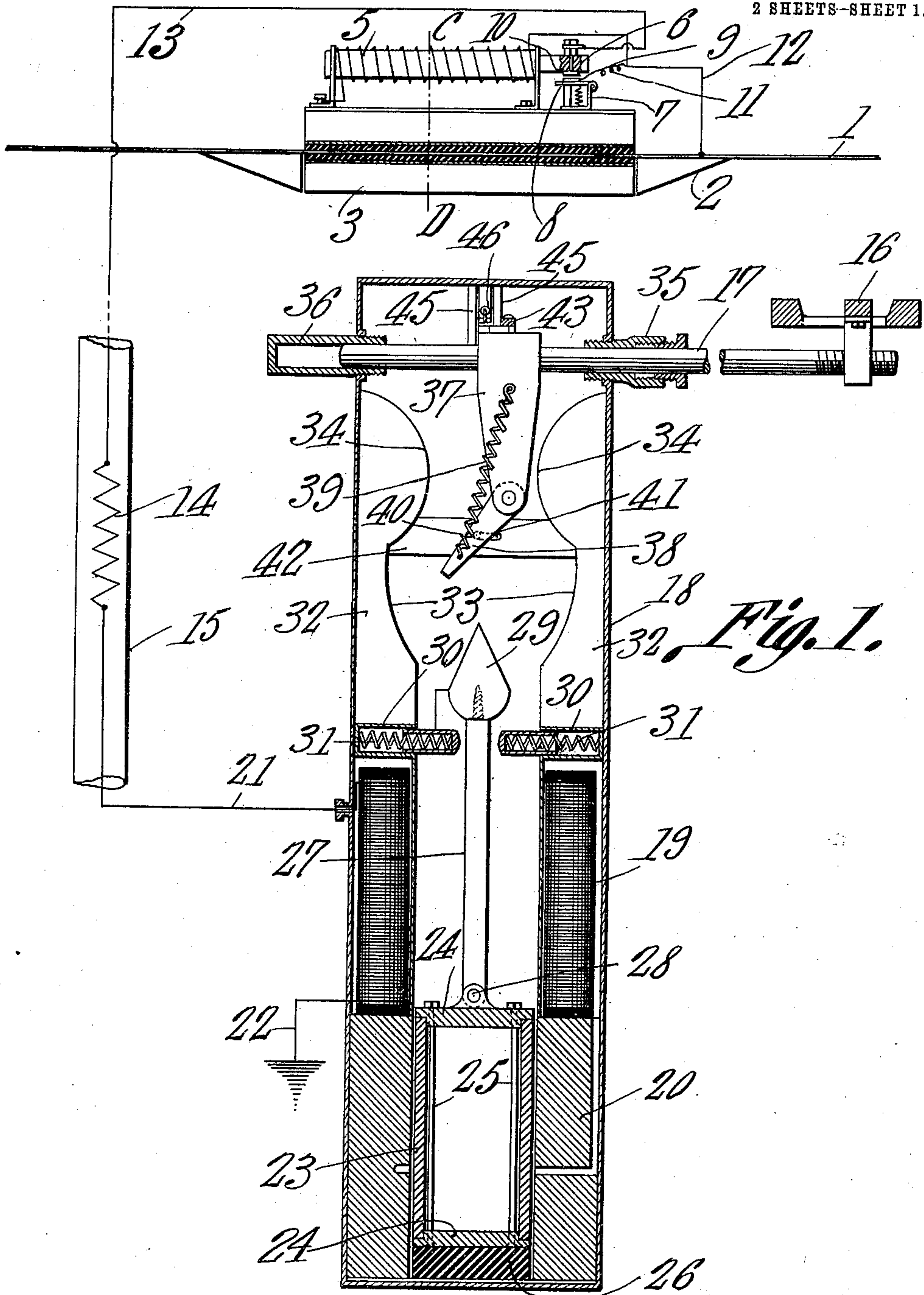


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ELECTRIC SWITCH OPERATING MEANS.  
APPLICATION FILED JULY 11, 1910.

981,683.

Patented Jan. 17, 1911.

2 SHEETS-SHEET 1.



Witnesses

*J. P. Goulding*  
*F. J. Chapman*

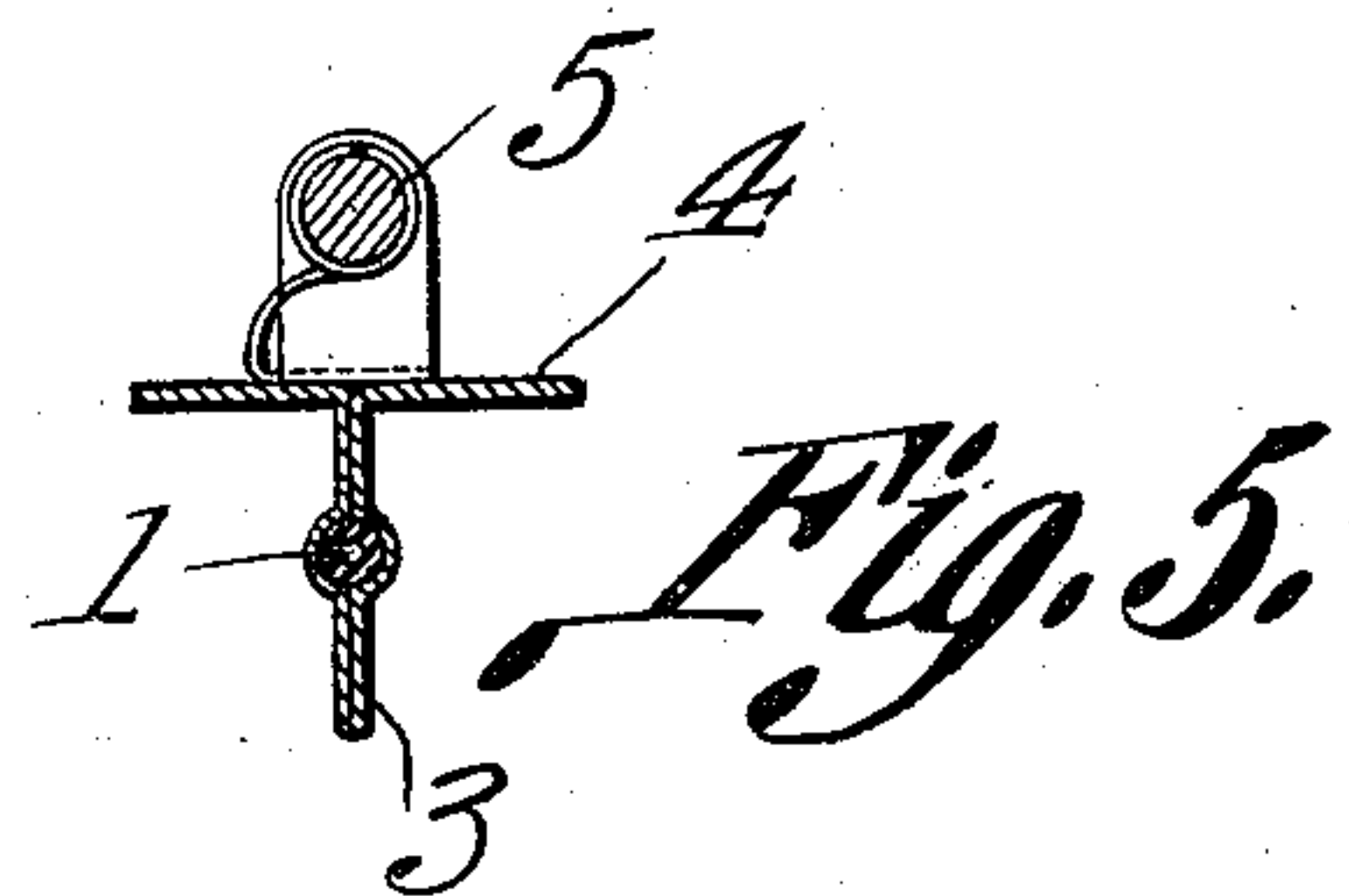
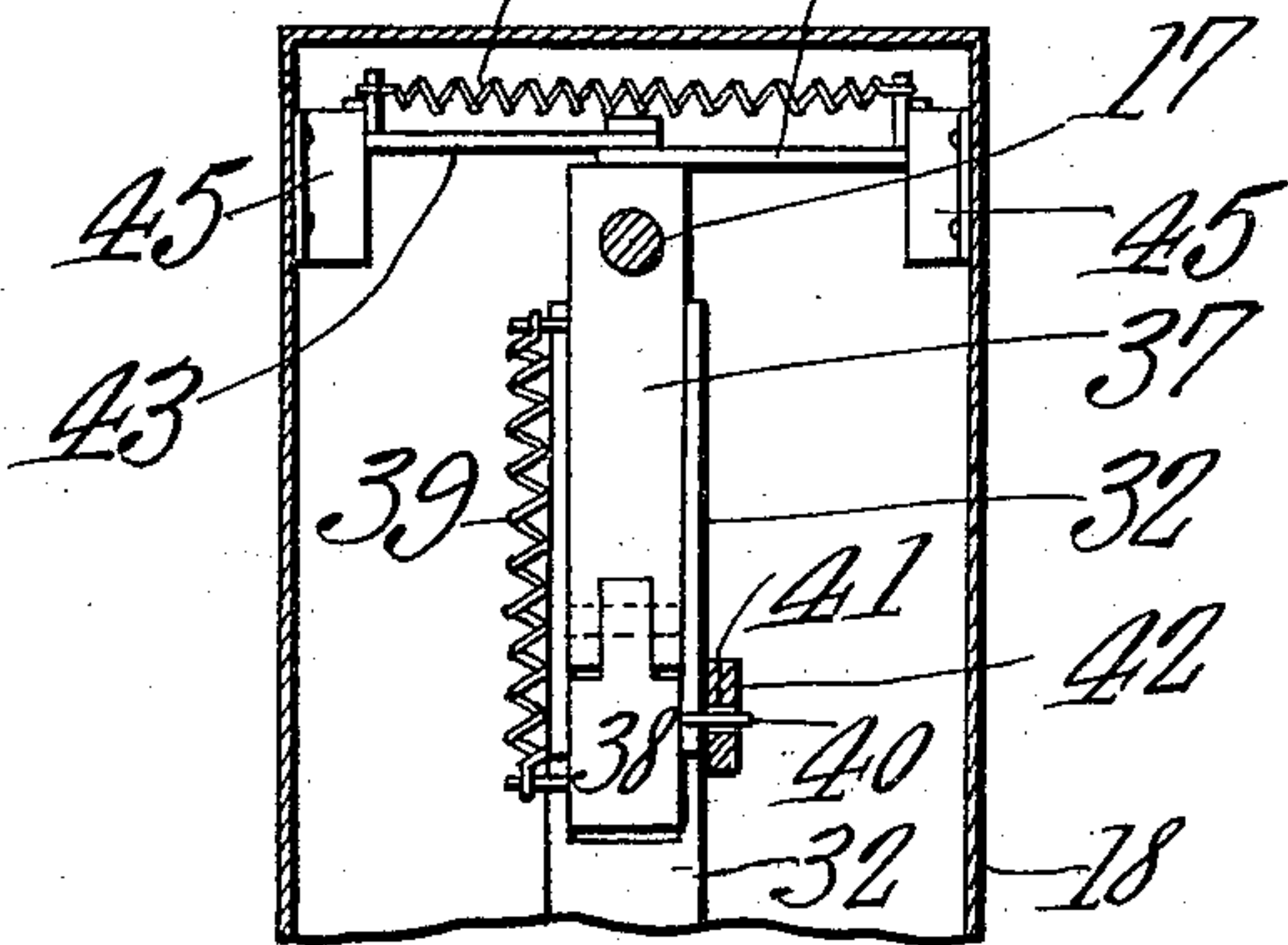
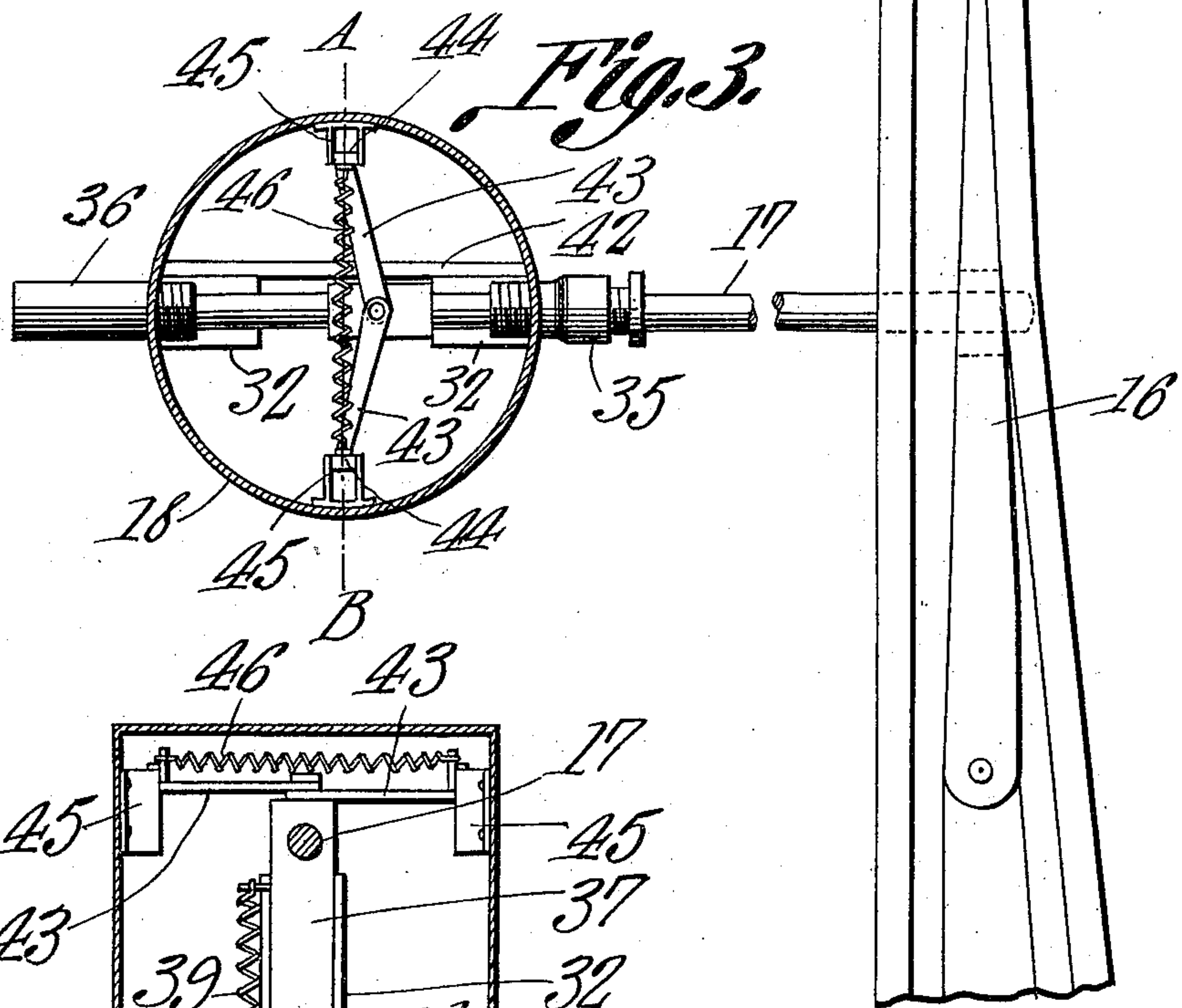
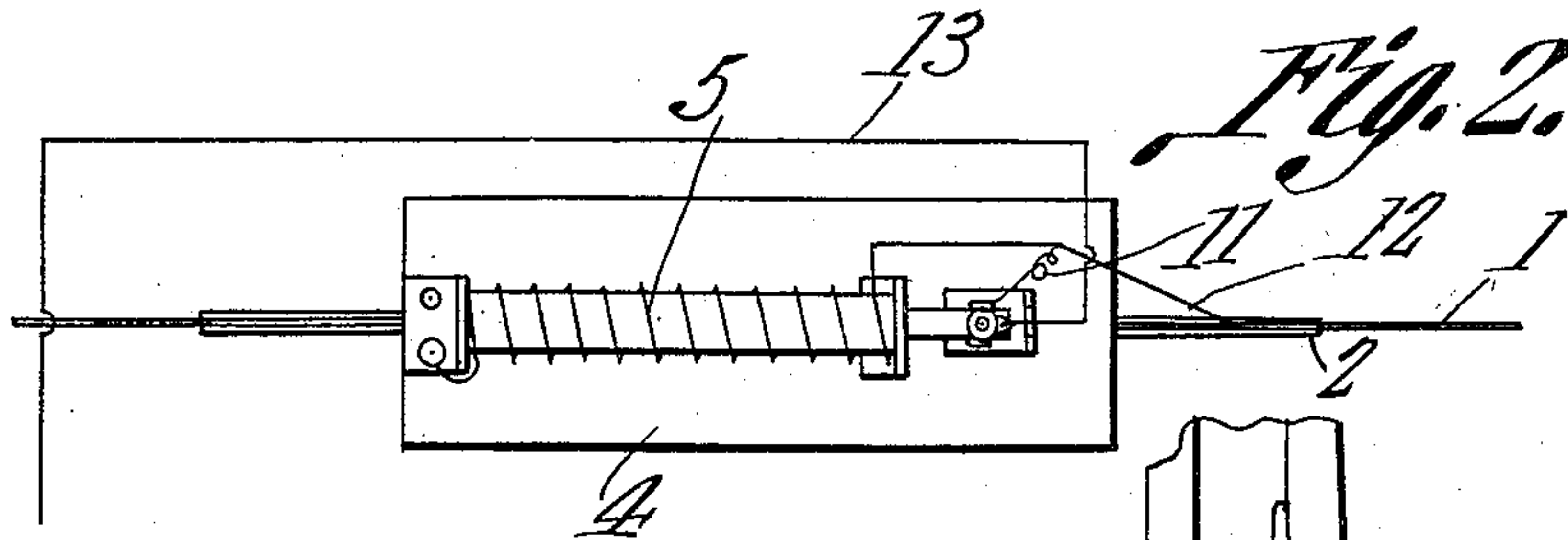
*Theophilus Pinckney*, Inventor  
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Attorneys

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# UNITED STATES PATENT OFFICE.

THEOPHILUS PINCKNEY, OF ASHEVILLE, NORTH CAROLINA.

ELECTRIC-SWITCH-OPERATING MEANS.

981,683.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed July 11, 1910. Serial No. 571,455.

*To all whom it may concern:*

Be it known that I, THEOPHILUS PINCKNEY, a citizen of the United States, residing at Asheville, in the county of Buncombe and State of North Carolina, have invented a new and useful Electric-Switch-Operating Means, of which the following is a specification.

This invention has reference to improvements in electric railway-switch operating means and its object is to cause throwing of a switch point in the proper direction on the approach of a car toward the switch, the action of the device being entirely automatic.

The arrangement of the device is such that on the approach of a car toward the switch a part of the actuating current for the car is diverted to an electro-magnetic switch operating apparatus which will cause the throw of the switch point in the desired direction, no attention being needed on the part of the motorman or conductor of the car.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,

Figure 1 is a partly diagrammatic and partly structural view of a device embodying the present invention, the electro-magnetic switch-operating mechanism being shown in vertical section. Fig. 2 is a plan view of the current diverting means. Fig. 3 is a plan view of the switch point and operating means therefor with a portion of the casing shown in cross section. Fig. 4 is a section on the line A—B of Fig. 3. Fig. 5 is a section on the line C—D of Fig. 1.

Referring to the drawings there is shown in Figs. 1 and 2 a conductor 1 which is assumed to be the conductor for an overhead trolley but may equally well be considered as the conductor for a sub-trolley. At an appropriate distance from a switch the trolley conductor 1 carries short diverting tracks, in the form of triangular blocks 2, for a trolley wheel and these blocks or tracks are spaced apart an appropriate distance to receive a longer track section 3 surrounding and insulated from the conductor 1 and also formed with a shelf or table 4 upon which is mounted an electro-magnet 5 having a core which extends beyond one end as indicated at 6. On the table 4 there is mounted a bracket 7 to which is hinged an armature 8

in position to be attracted by the extended end 6 of the magnet core. The armature 8 carries a contact 9 adapted to engage another contact 10 carried by the magnet core extension 6. The contact 9 is connected by a conductor 11 to another conductor 12 in turn connected to the conductor 1. The conductor 12 is connected to one end of the coil of the magnet 5 and the other end of this coil is connected to the track 3 in any suitable manner. The contact 10 is connected by a conductor 13 to a resistance 14 which in the case of the conductor 1 being an overhead conductor may be mounted upon a convenient trolley pole 15 although these features are mere matters of design and may be variously changed in practical installations of the invention.

In the drawings there is indicated a switch point 16 such as is commonly employed in the tracks of railways and this switch point is under the control of a rod 17 to which reference will be made more particularly hereinafter. Adjacent to the switch point 16 and if necessary sunk a suitable distance in the ground is a tube 18 of suitable size and material for the purposes of the present invention. Housed in this tube 18 is a solenoid coil 19 which may be placed on top of a sleeve 20 constituting a support for the coil 19 raising the latter above the bottom of the tube 18. One terminal of the coil 19 is connected to the resistance 14 by a conductor 21 and the other terminal may be grounded as indicated at 22, the tube 18 if of metal usually constituting a sufficient ground for the coil 19, one terminal of which may be directly connected thereto. The solenoid 19 is provided with a core 23 which may be in the form of an iron pipe with heads 24 held to the pipe by longitudinally disposed bolts 25. The armature core 23 of the solenoid is of such size as to normally lodge within the supporting sleeve 20 and a buffer 26 may be provided at the lower end of the sleeve for receiving the core 23 when not attracted by the solenoid. This buffer 26 may be made of rubber or any suitable elastic material. Mounted on the upper head 24 of the core 23 is an arm 27 preferably of non-magnetic material and connected to the head 24 by a hinge joint 28. The free end of the rod 27 carries a spear head block 29 which when the core 23 is in its lowermost position is above the upper end of the solenoid coil



19. On opposite sides of the rod 27 below the head 29 but above the coil 19 are sleeves 30 each normally projected toward the rod 27 by a suitable spring 31, the spring controlled sleeves 30 tending to centralize the rod 27 for a reason which will presently appear.

Within the tube 18 at diametrically opposite points are blocks 32 the lower ends of which may carry the sleeves 30 with their spring 31. The matching portions of these blocks first recede as shown at 33 and then approach each other in the form of rounded bosses 34.

The rod 17 enters the upper end of the tube 18 in traversing relation thereto through a suitable stuffing box 35 serving to both guide the rod and prevent the entrance of water into the tube 18, while the other end of the rod enters a guiding member 36 on the side of the tube 18 opposite the stuffing box 35 so that the rod is supported at both sides of the tube 18. Mounted on the rod 17 between the stuffing box 35 and the guide 36 is a block 37 to the lower end of which there is hinged a finger 38 under the control of a spring 39 one end of which is connected to the finger 38 and the other end of which is connected to the block 37, the tendency of the spring 39 being to move the free end of the finger upwardly. This movement of the finger 38 is limited by a pin 40 on the finger entering a slot 41 in a transverse bar 42 within the tube 18 to one side of the blocks 32. The lower end of the block 37 is below the point of closest approach of the bosses 34 and the finger 38 extends downward to a still greater extent. Hinged to the upper end of the block 37 are two links 43, these links extending in opposite directions from the block 37 at their outer ends connected to guide plungers 44 between cheeks 45 or other guiding structures fast on the opposite sides of the tube 18 at points substantially at right angles to the length of the rod 17. The free ends of the links 43 are joined by a spring 46 tending to draw the free ends of the links one toward the other and so acting except when the links are in alinement one with the other. The links 43 and spring 46 serve to move the bar 17 in one direction or the other to the full extent, the spring 46 and links 43 operating in the nature of a lock holding the point 16 in one or the other of its two positions.

When a car approaches the track member 2 on the conductor 1 the trolley wheel is moved away from the conductor 1 and directed to the track 3, thus establishing a circuit from the conductor 1 by way of the conductor 12 through the coil of the magnet 5, which coil may be wound to carry such current, and from the magnet 5 the current passes by way of the track 3 to the car and so the magnet 5 is energized without inter-

rupting the flow of current through the car. The energization of the magnet 5 causes the attraction of the armature 8 and another circuit is then established from the conductor 1 through the conductor 12 by way of the conductor 11, thence by the two contacts 9 and 10 to the conductor 13 and through the resistance 14 and by way of the conductor 21 to the solenoid 19 and finally to ground, the resistance 14 preventing any but a small flow of current through the solenoid 19, but this latter may be wound so as to have the required pull with the small amount of current diverted.

As soon as the current flows through the coil 19 the core 23 is attracted and rises into the coil 19 elevating the spear-head 29 which then engages the finger 38, but the latter being held against movement by the pin 40 in the slot 41 diverts the spear-head 29 to one side, the corresponding spring controlled sleeve 30 yielding to this movement, and finally the spear-head 29 is directed against the corresponding boss 34 and the redirection of the spear-head by the boss 34 will cause a movement of the block 36 in a direction away from the position shown in Fig. 1, and the switch point 16 will participate in this movement. The movement of the block 37 under the action of the spear-head continues until the link 43 which has been moved toward the alined position against the action of the spring 46 will pass such position when the continuous movement of the spear-head aided by the action of the spring 46 in again flexing the links 43 will cause the rod 17 to move to the full extent of its travel and then lock the switch point 16 in the new position against accidental displacement.

As soon as the trolley wheel leaves the track section 3 and passes by the second block 2 onto the conductor 1 the magnet 5 becomes deenergized since the circuit there-through is broken. This will result in the gravitating of the core 23 to the bottom of the sleeve 20 since the deenergization of the magnet 5 has caused a separation of the contacts 9 and 10, the contact 9 returning by gravity or under the influence of a spring to its former open position. The block 37 is then out of the way of the spear-head 29 and if the finger 38 be in the path of this spear-head it will readily yield because of the spring 39 to the dropping of the spear-head to its normal position where it is held in centralized position by the spring actuated sleeves 30. The next time that the magnet 5 is energized to complete the circuit through the solenoid 19 the rod 17 will be moved in the reverse direction and the switch point will be moved back to the initial position to be locked therein by the spring 46 acting on the links 43.

It will be understood of course that the magnet 5 and parts controlled thereby are in



practice suitably protected by a cover or housing and the resistance 14 will be likewise protected.

5 While the magnet 5 is shown as carried by the conductor 1 it will of course be understood that this magnet may be located at any other point since the mounting of it on the conductor 1 is only incidental.

What is claimed is:—

10 In a railway, a switch-operating means comprising a suitable casing, electro-magnetic means therein, an actuating block carried by the electro-magnetic means in the casing, centralizing means for the block, a  
15 reciprocable member traversing the casing and connected to a switch point, an elastic lock for the reciprocable member to hold it

at the limits of its travel, a block engaging and directing member carried by the reciprocable member in the path of the block 20 actuated by the electro-magnetic means, and diverting members in the casing coacting with the block engaging means on the reciprocable member for causing the block when actuated to in turn actuate the reciprocable 25 member.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THEOPHILUS PINCKNEY.

Witnesses:

M. A. SENEARNGAU,  
C. F. DEVENISH.