

No. 751,991.

PATENTED FEB. 9, 1904.

J. F. McELROY.
CURRENT DIRECTOR.

APPLICATION FILED JAN. 28, 1901.

NO MODEL.

4 SHEETS—SHEET 1.

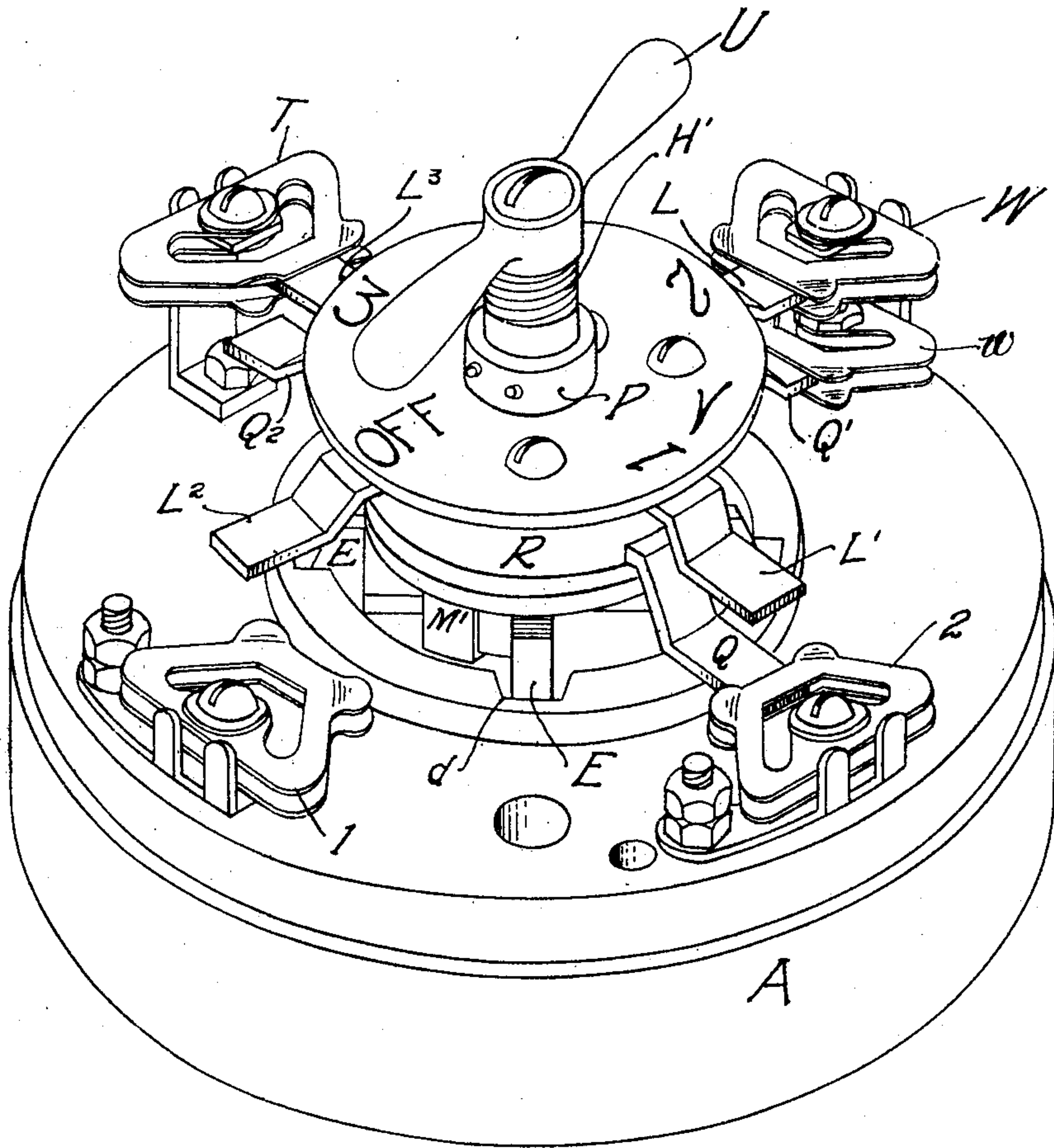


Fig. 1.

Witnesses,
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by

Inventor
James F. McElroy
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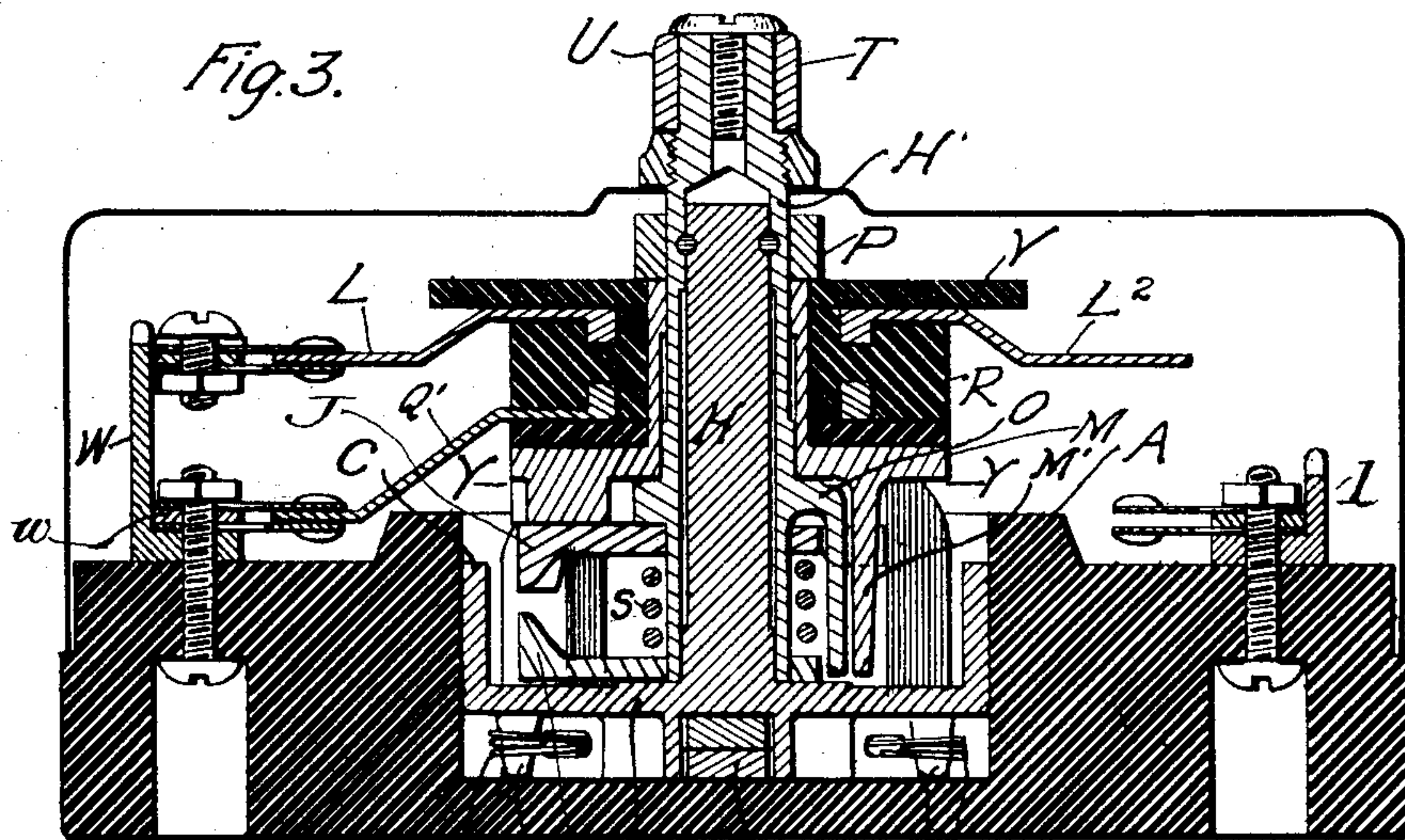
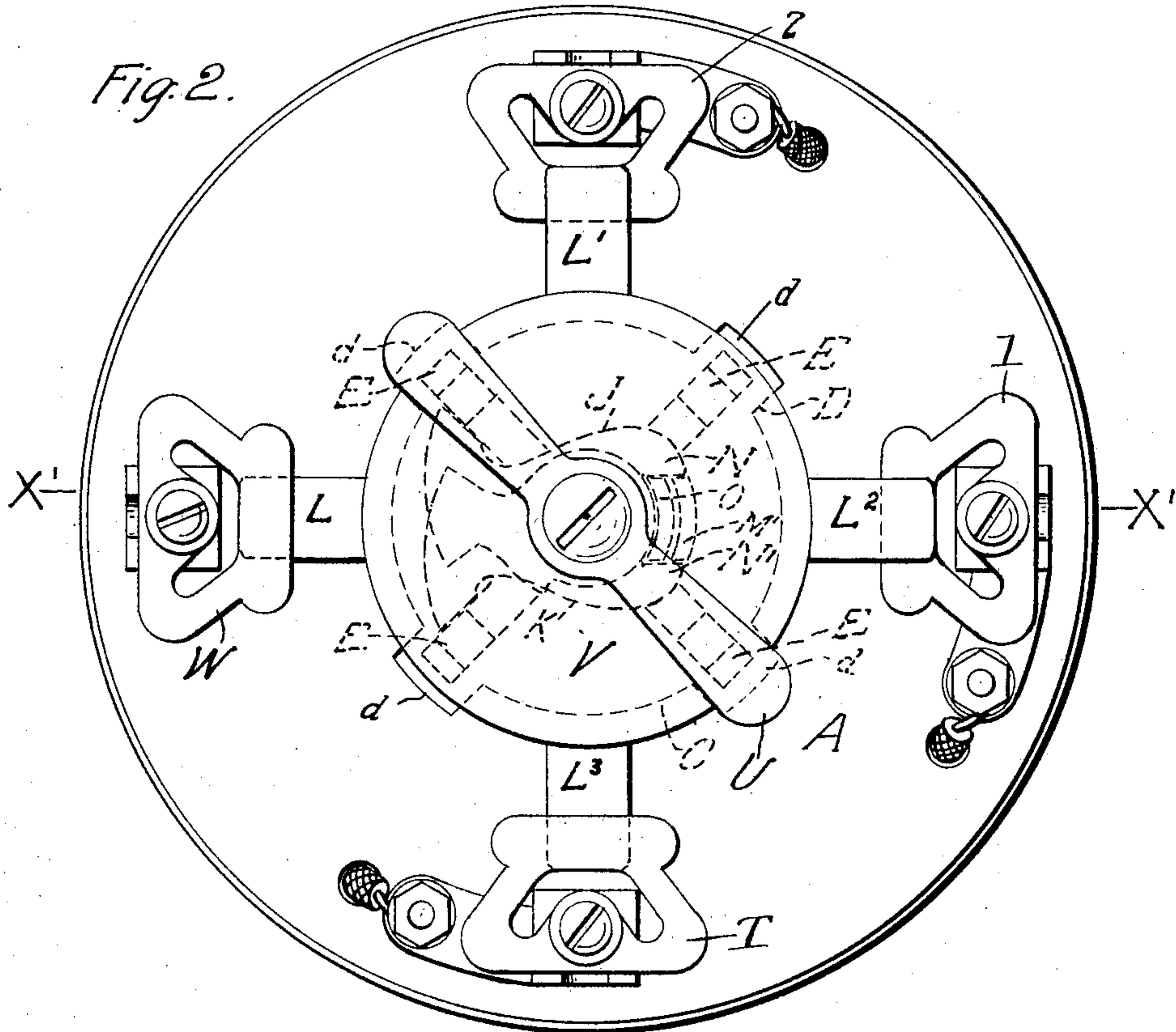
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4 SHEETS—SHEET 2.



Witnesses

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4 SHEETS—SHEET 3.

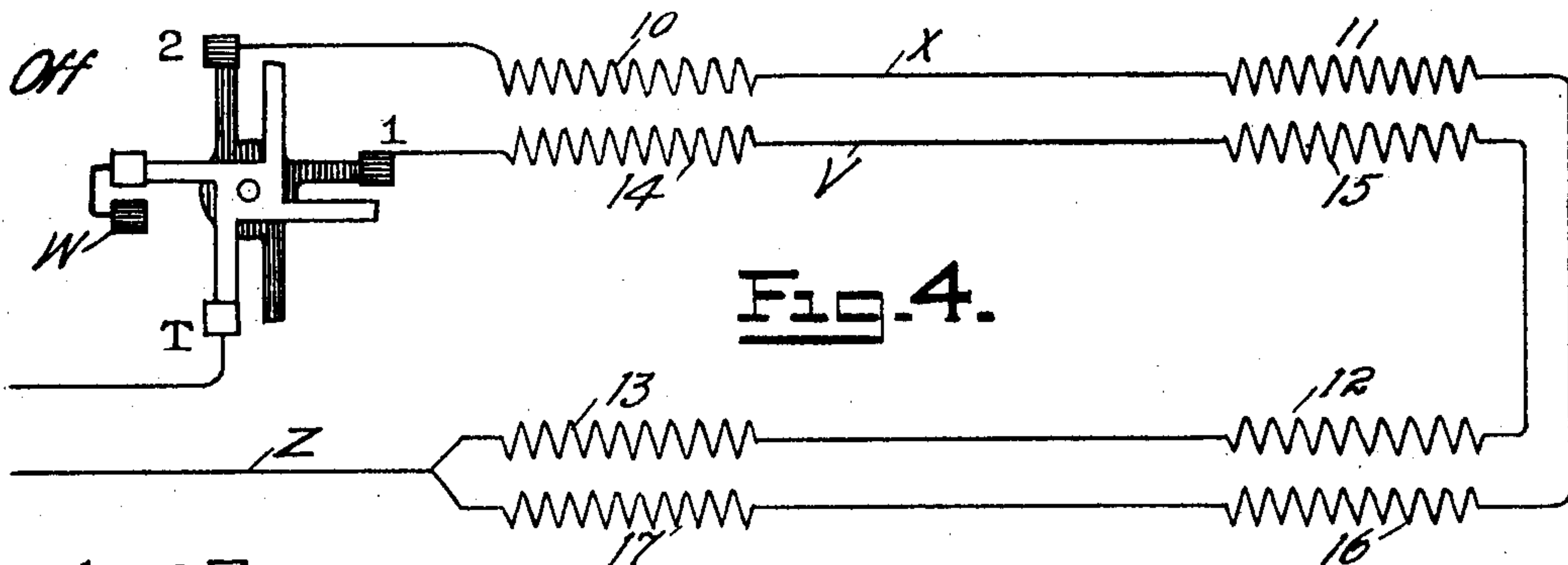


Fig. 4.

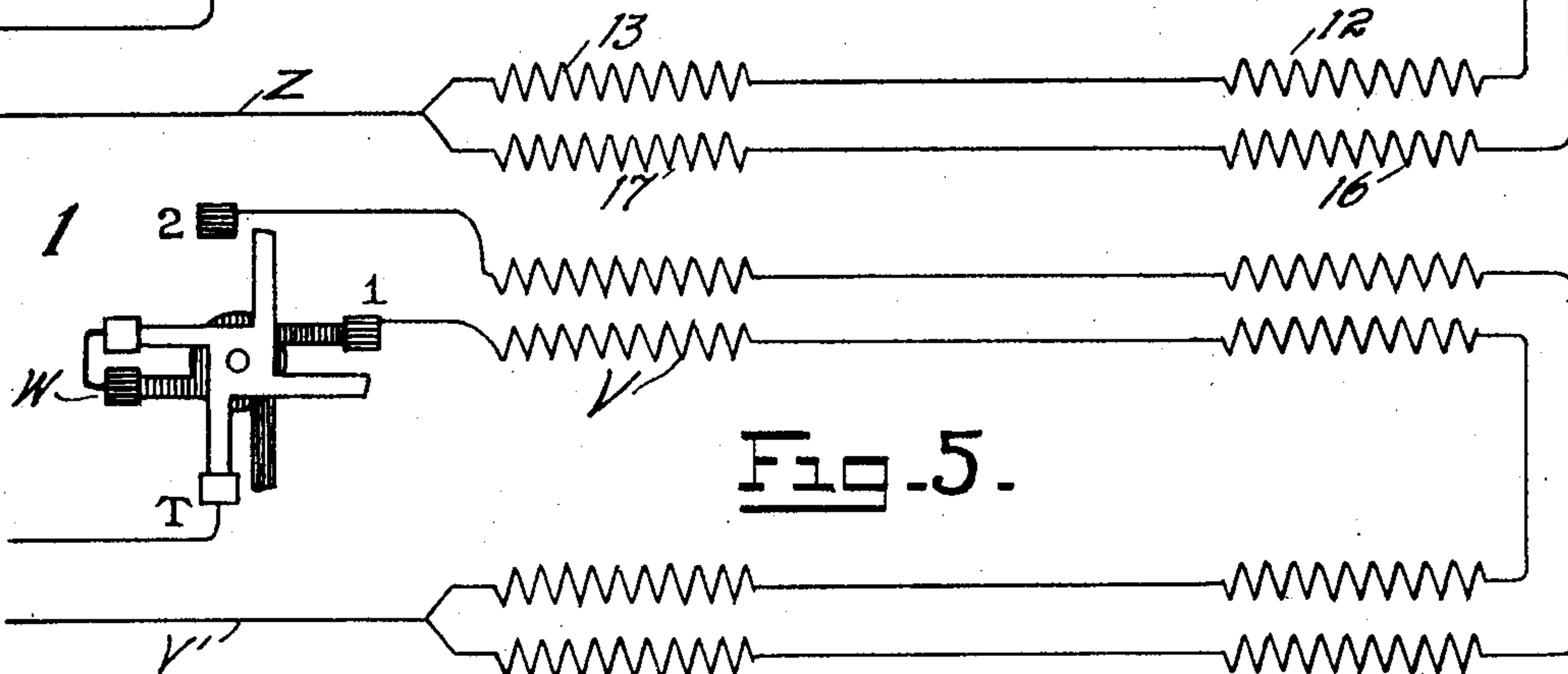


Fig. 5.

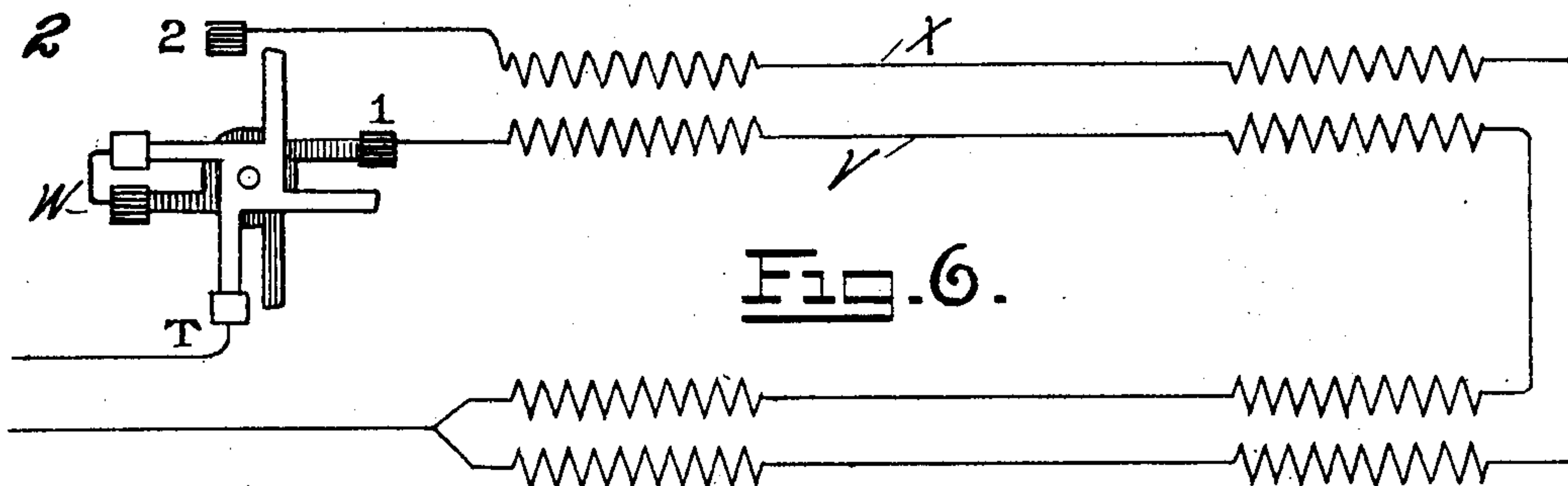


Fig. 6.

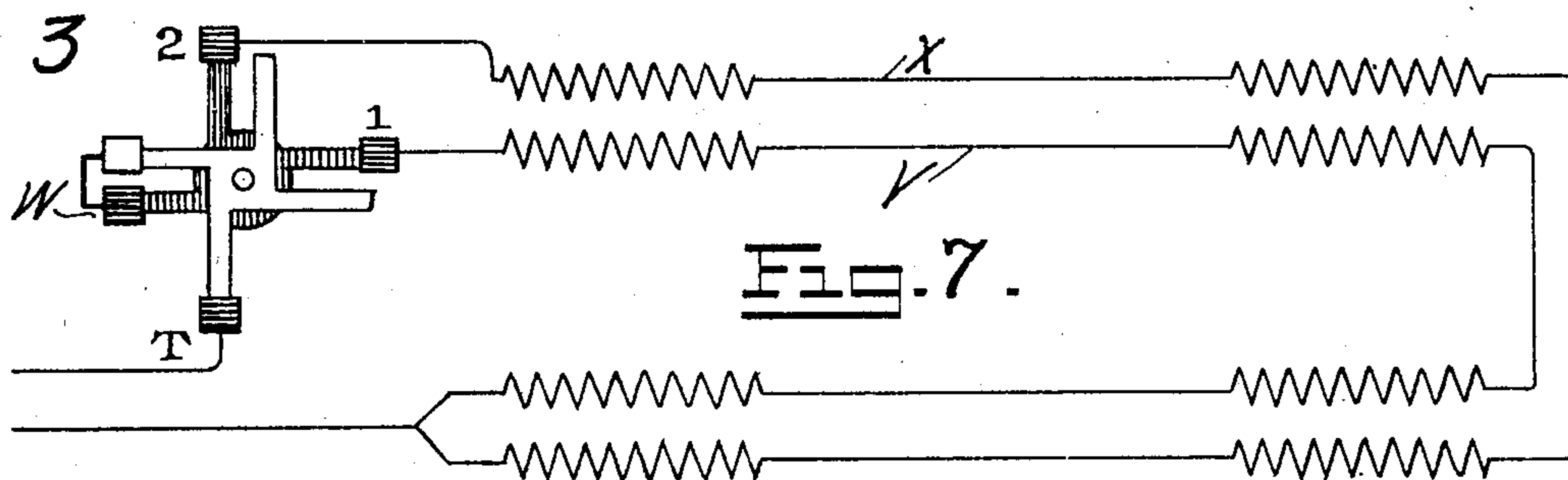


Fig. 7.

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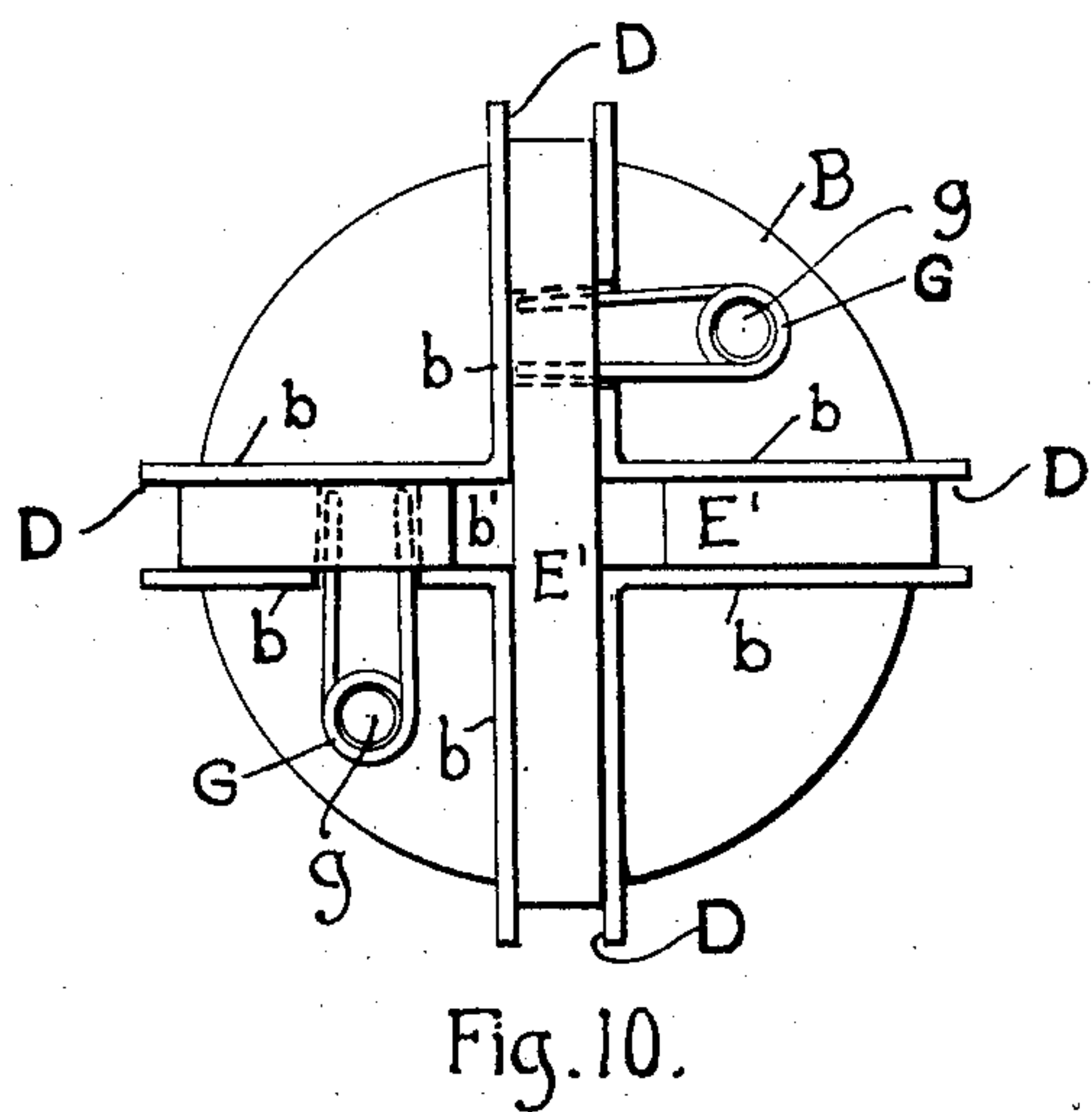
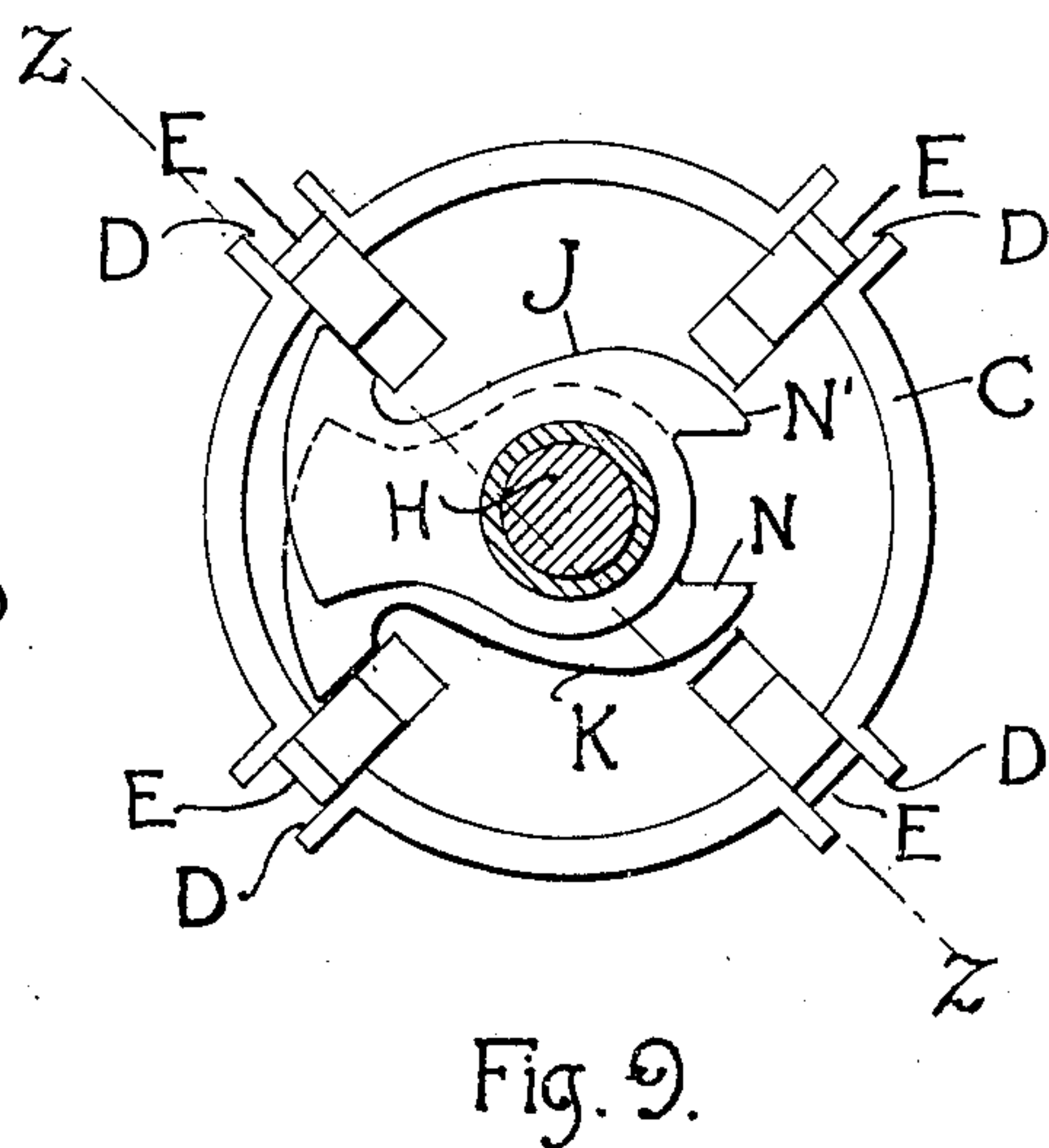
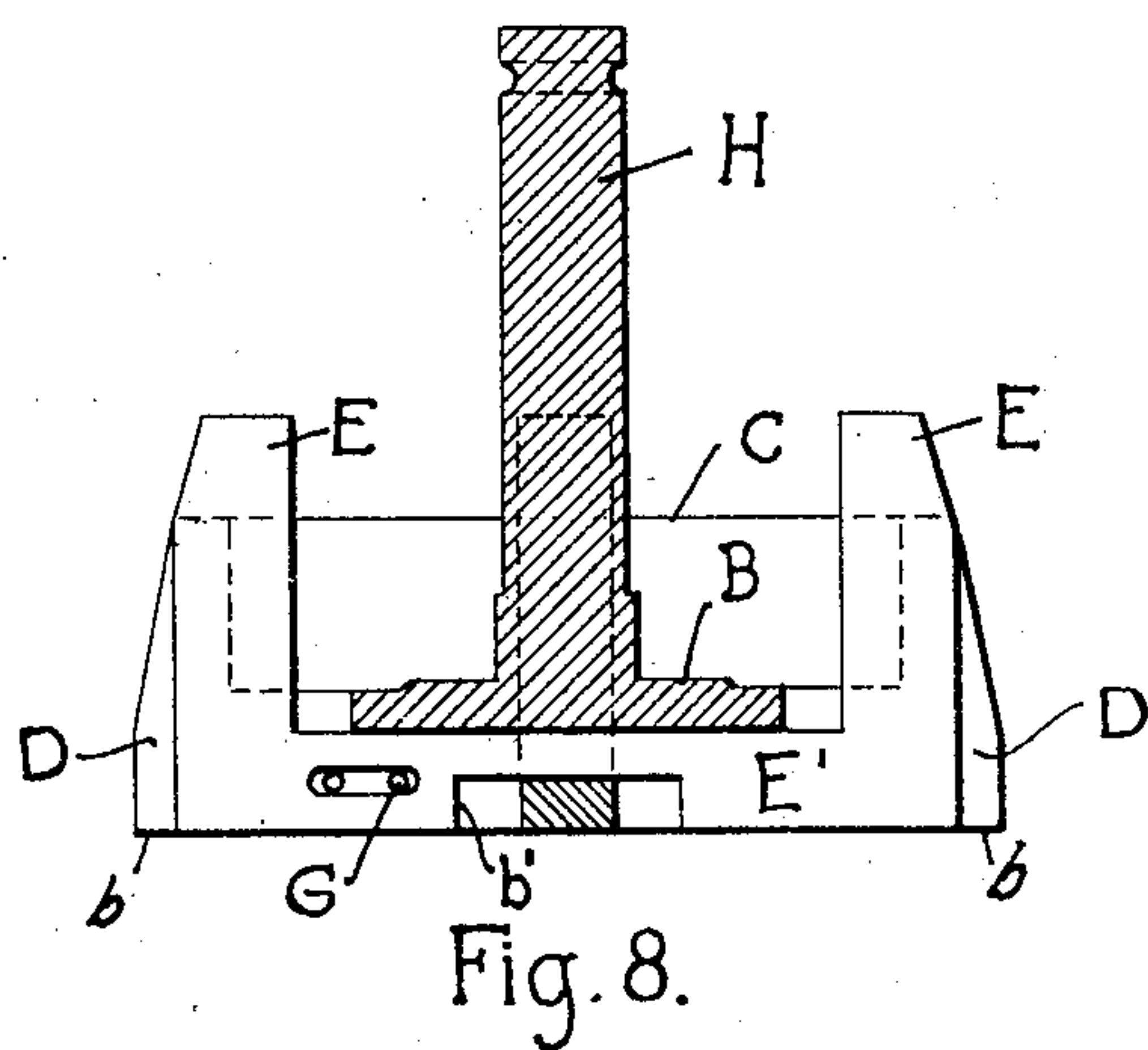
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APPLICATION FILED JAN. 28, 1901.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, OF ALBANY, NEW YORK.

CURRENT-DIRECTOR.

SPECIFICATION forming part of Letters Patent No. 751,991, dated February 9, 1904.

Application filed January 28, 1901. Serial No. 45,025. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States of America, and a resident of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Current-Directors, of which the following is a specification.

My invention relates to electric switches; and the objects of my invention are, first, to provide an improved switch or current-director for the purpose of directing the current to either of two circuits or to both of said circuits when desired or cutting out the current from each circuit; second, to provide for an air-gap which shall be larger than has heretofore been possible with the switches now in use so far as my experience goes; third, to provide two sets of contacts in different planes one above the other and so arranged that the making and breaking of the contacts may be done instantaneously and without sparking. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view. Fig. 2 is a plan view; Fig. 3, a section along the lines X' X' on Fig. 2; Fig. 4, a diagrammatic view showing the position of the contacts and circuit at the zero position of the switch; Fig. 5, a diagrammatic view showing the position of the contacts and circuit in the first position of the switch; Fig. 6, a diagrammatic view showing the position of the contacts and circuit in the second position of the switch; Fig. 7, a diagrammatic view showing the position of the contacts and circuit in the third position of the switch; Fig. 8, a section along the line Z Z on Fig. 9; Fig. 9, a section along the line Y Y on Fig. 3; Fig. 10, a bottom plan view of Fig. 8.

Similar characters refer to similar parts throughout the several views.

In the block A, preferably porcelain, I arrange an opening adapted to receive the casting B. The casting B is provided with an upwardly-projecting rim C, through which rim and into the bottom of the casting B, I cut the openings D, preferably four, arranged one

on each side opposite each other, and upon the bottom and sides of the casting B, adjacent to the openings D, I arrange the ribs b. Within the openings D and between the ribs b I place the latch-bars E E, said latch-bars E E being arranged in pairs, the vertical parts E E of each pair being connected by the horizontal piece E', extending across the bottom of the casting between the ribs b b, each pair having an elongated opening b' cut in its horizontal portion E', one in the upper and the other in the lower surface thereof about midway between the ends for the purpose of allowing them to cross each other in the same plane and permit the latch-bars to move longitudinally upon each other.

Registering with the openings D, I place in the block A a series of openings d, adapted to receive the latch-bars E E when they are drawn within the opening D, it being understood that in their normal position the latch-bars E project toward the center of the casting B within the rim C, as shown in Fig. 8. For the purpose of causing each pair of latch-bars E E to be returned to its normal position I arrange a spring G, which is preferably a coil placed over a stud g, attached to the bottom of the casting B, having its ends secured to the horizontal portion of the latch-bar E' and preferably passing through an opening in the part b, as shown in Fig. 10. As thus arranged when the latch-bar is moved in either direction it will be returned by the action of the spring G to its normal position.

At the center of the casting B, I arrange a post H. On the post H, I place a cored-out post H', capable of rotary movement on the post H. Upon the post H', I place a cam-arm J, which is attached to one end of the spring S, the opposite end of said spring, which spring is wound about the post H', being connected with a similar cam-arm K, which is also placed on the post H'. Cam-arms J and K fit between adjacent latch-bars E E and are so arranged that if the switch is moved in one direction one of the cam-arms—K, for instance—will rest against the latch-bar E, and the cam-arm J will press against the latch-bar E and will when the spring S has received its maxi-

mum tension force the latch-bar E out of engagement with the cam-arm K, thus releasing the spring S, which will cause the switch to be moved forcibly, bringing the cam-arm in
 5 contact with the next latch-bar in the series. If the switch is moved in the opposite direction, the cam-arm J will be held in contact with the latch-bar and the cam-arm K will in like manner force the latch-bar away from en-
 10 gagement, causing a like movement of the switch. Upon the post H', I also mount a metallic arm O, which projects downwardly substantially parallel to the post H', adapted to engage with the projections N N' upon the
 15 cam-arms K J, respectively, as shown in Fig. 2. I also mount movably on post H' a metallic plate M, provided with a downwardly-projecting portion M', also adapted to engage with the parts N N' of the cam-arms K J, re-
 20 spectively. A movement of the plate M will thus tend to move one of the cam-arms, which one depending upon the direction of movement of the plate. Attached to the plate M, I arrange suitable insulating material R, within
 25 which are secured the contact-fingers L L' L² L³ in one horizontal plane and Q Q' Q² in another horizontal plane, one set placed above the other. Secured to the insulating material R, I arrange a plate V, on which I preferably
 30 arrange indicating-figures "Off," "1," "2," "3." Upon the post H', I arrange the handle U for moving the switch.

In the block A, I arrange a series of contact-brushes T W 1 2, adapted to engage the con-
 35 tact-fingers. The brush T is preferably adapted to engage the upper fingers—i. e., those in the upper plane. The brush W is adapted to engage fingers in both planes, being a double brush, its upper portion connected with the
 40 lower electrically. Brushes 1 and 2 are preferably adapted to connect with but the lower fingers. Thus the upper contact plate and fingers are insulated from the lower contact
 45 plate and fingers, and each of the contact-brushes is separate from the others, except the one marked W, in which the brushes are united electrically.

To operate the switch, the handle is turned in the direction desired, which will turn the
 50 arm M', and therefore move one of the cam-arms J or K, depending upon the direction in which the handle of the switch is turned, (J, for instance,) and thus place the spring S under tension, and will press in the latch-bar, and the
 55 contacts of the switch will be moved forcibly and instantaneously to engage the next adjacent brushes. By arranging the contacts one above the other I provide for lengthening, and therefore increasing, the air-gap and do away
 60 with burning and sparking, which is so apt to take place in current-directors.

I have shown in Figs. 4, 5, 6, and 7 the various positions and traced the corresponding circuits. In the diagrammatic Figs. 4, 5, 6,
 65 and 7 I show a series of electric heaters 10, 11,

12, and 13 in a circuit X and 14, 15, 16, and 17 in a circuit V, each of said circuits uniting in a ground-line Z. When the switch is in position denominated "Off" in Fig. 4, the con-
 70 tact is made at T in the upper set of contact-fingers, also at W, where it connects with the lower contact w when the circuit is opened, and consequently current will not pass to the
 75 wires. In the position shown on indicator, as I, (see Fig. 5,) the current enters at T, passes to w on the lower contact, passes out at I into the circuit V, passing through that circuit and
 80 out at V', the heater-coils in the circuit V receiving the current. In the position denominated "2" (see Fig. 6) current enters at T, passes to the lower contact, passes out at 2, current
 85 passing through the circuit X, the heaters in said circuit receiving the current and those in circuit V receiving no current. In the position
 90 denominated "3" (see Fig. 7) the current enters at T, passes to the lower contact w, passes out through 1 into the circuit V and at 2 into the circuit X, sending the current through both circuits.

What I claim as my invention, and desire to
 secure by Letters Patent, is—

1. In a current-director, a block; a fitting placed therein; latch-bars arranged in pairs adapted to be moved in and out of openings in said fitting; spring-actuated cam-arms ar-
 95 ranged to be held by one of said latch-bars during the operation of the switch until the maximum tension of the spring attached to the latch-bars is obtained, the other of said cam-arms arranged to move said latch-bars out of
 100 engagement with the first-mentioned cam-arm, thus releasing the spring and causing the switch to be turned with force; fingers connected with the movable part of said switch; a series of said fingers placed in a horizontal
 105 plane, the second series of said fingers placed in a horizontal plane above the first-mentioned series; contact-brushes adapted to engage said fingers, substantially as described.

2. In a current-director, a block; a fitting
 110 placed therein; latch-bars arranged in pairs; a spring connected with each pair of latch-bars by the operation of which each pair of latch-bars will be returned to its normal position, extending slightly within the fitting, after
 115 they have been operated on by the cam-arms; spring-actuated cam-arms adapted to engage said latch-bars; contact-fingers secured to the movable part of the switch; brushes attached to said block, all substantially as described.

3. In a current-director, a block; a fitting
 120 placed therein; latch-bars adapted to move in and out within openings cut in the exterior rim of said fitting; spring-actuated cam-arms adapted to engage said latch-bars; an arm
 125 adapted to move one of said cam-arms, depending upon the direction in which it is turned; contact-fingers arranged in different planes, those in one plane insulated from those in the other plane; contact-brushes adapted
 130

to engage said fingers, substantially as described.

4. In a current-director, a block; a fitting placed therein; latch-bars arranged in pairs adapted to be moved in and out of openings in the exterior rim of said fitting; a spring attached to each pair of latch-bars adapted to return each pair to its normal position after a movement of the switch; spring-actuated cam-arms adapted to engage said latch-bars; an arm adapted to move one of said cam-arms while the other is held by one of the latch-bars; a series of fingers arranged in one plane with a series of fingers arranged in a different plane and insulated from the first-mentioned series; brushes adapted to engage the fingers of each series, substantially as described.

5. In a current-director, a block; a fitting placed therein; latch-bars arranged in pairs placed within said fitting; a spring connected with said latch-bars by the operation of which each pair will be returned to its normal position after the operation of the switch, substantially as described.

6. In a current-director, a block; a fitting placed therein; latch-bars adapted to be moved in and out of openings arranged in the external rim of said fitting; spring-actuated cam-arms adapted to engage said latch-bars; contact-fingers arranged in different planes, those in one plane insulated from those in the other; brushes adapted to engage said contact-fingers, so arranged that current entering at T engaging with a finger in one of the planes will pass to the double brush W through the finger en-

gaging with the one portion of said brush and be connected to the lower brush, thence it may go to either of the fingers in the other plane, depending upon the position of the switch.

7. In a current-director having four or more positions, mechanism for causing a quick snap-like motion from one position to another in either direction combined with a rotary portion consisting of two sets of contact-fingers, the contact-fingers of one set being placed in series with the contact-fingers of the other set.

8. In a current-director suitable mechanism for producing a quick snap-like motion in either direction combined with contact-fingers in two sets, one set used for making and breaking circuit while the other set is used for distributing current in two, or more prearranged circuits.

9. A current-director consisting of a base containing a stationary post on which is mounted a tube capable of a rotary motion and having on its side a projecting lug, a moving carrying-plate on which is mounted two sets of contact-fingers, these sets being supported in insulating material, said contact-carrying plate being provided with a lug by which a quick snap action may be communicated to the two sets of contact-fingers.

Signed at Albany, New York, this 23d day of January, 1901.

JAMES F. McELROY.

Witnesses:

CHARLES S. DU BOIS,
FREDERICK W. CAMERON.