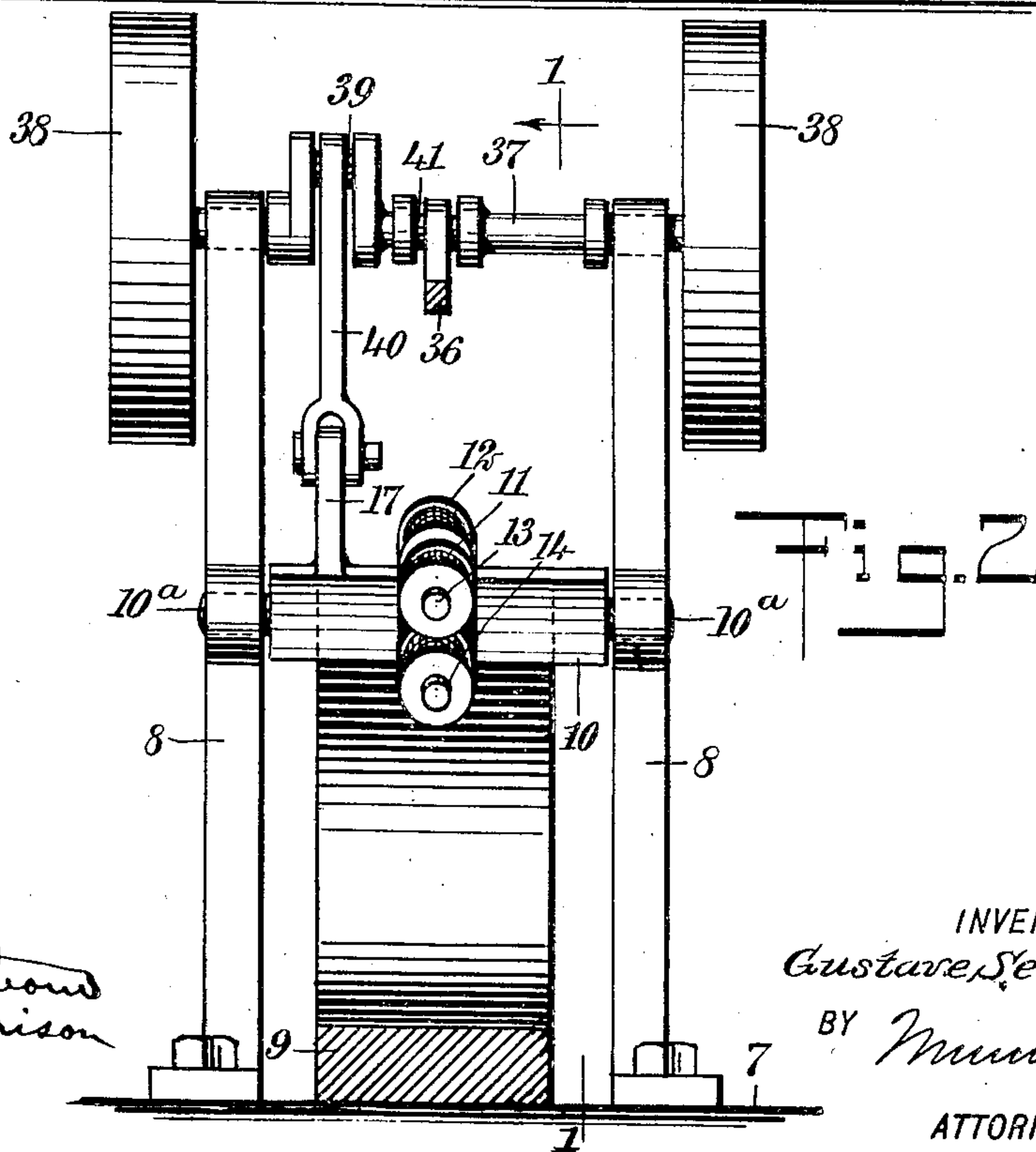
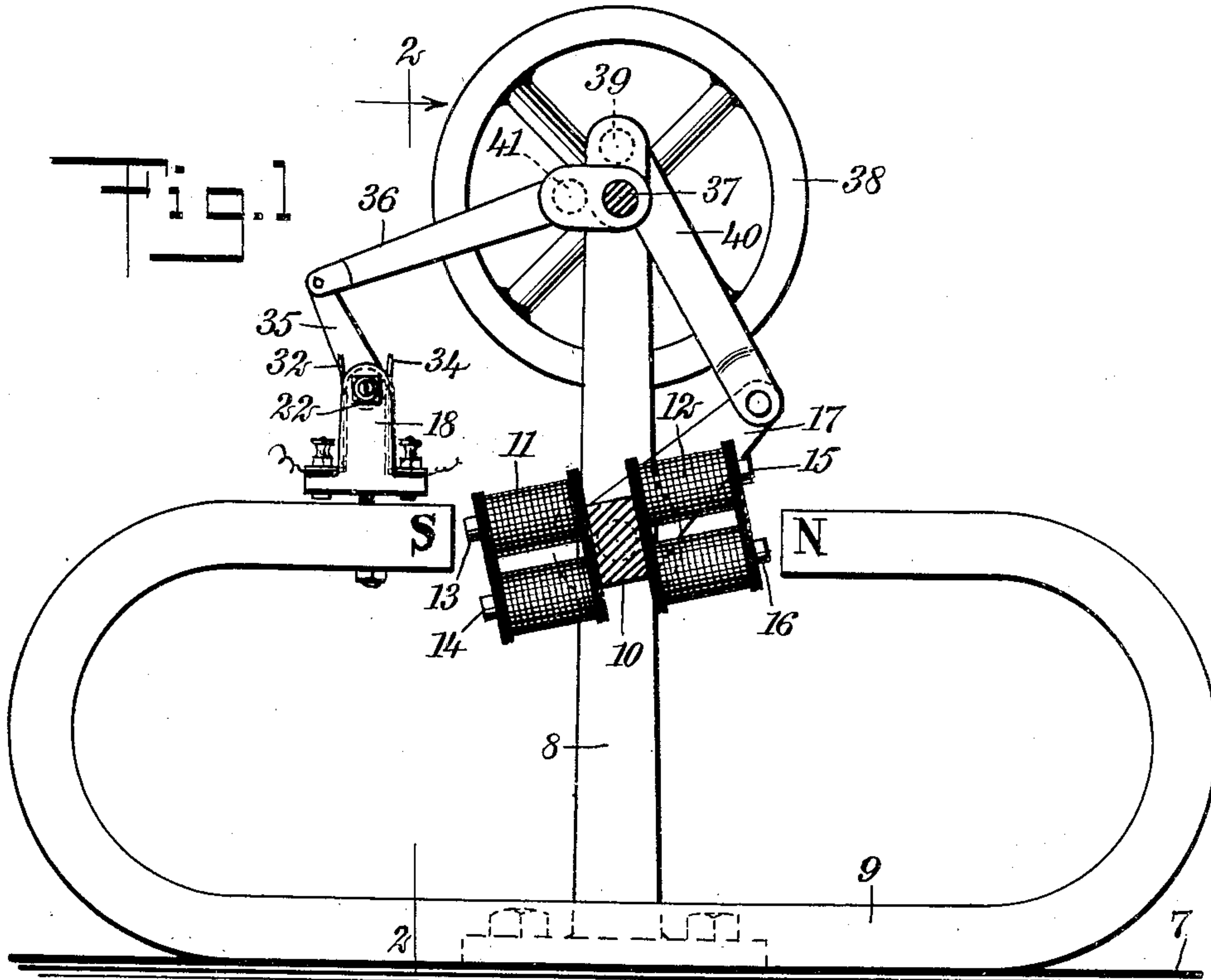


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ELECTRIC MOTOR.  
APPLICATION FILED AUG. 5, 1908.

912,037.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 1.



WITNESSES  
*John A. Seipton*  
*Walton Harrison*

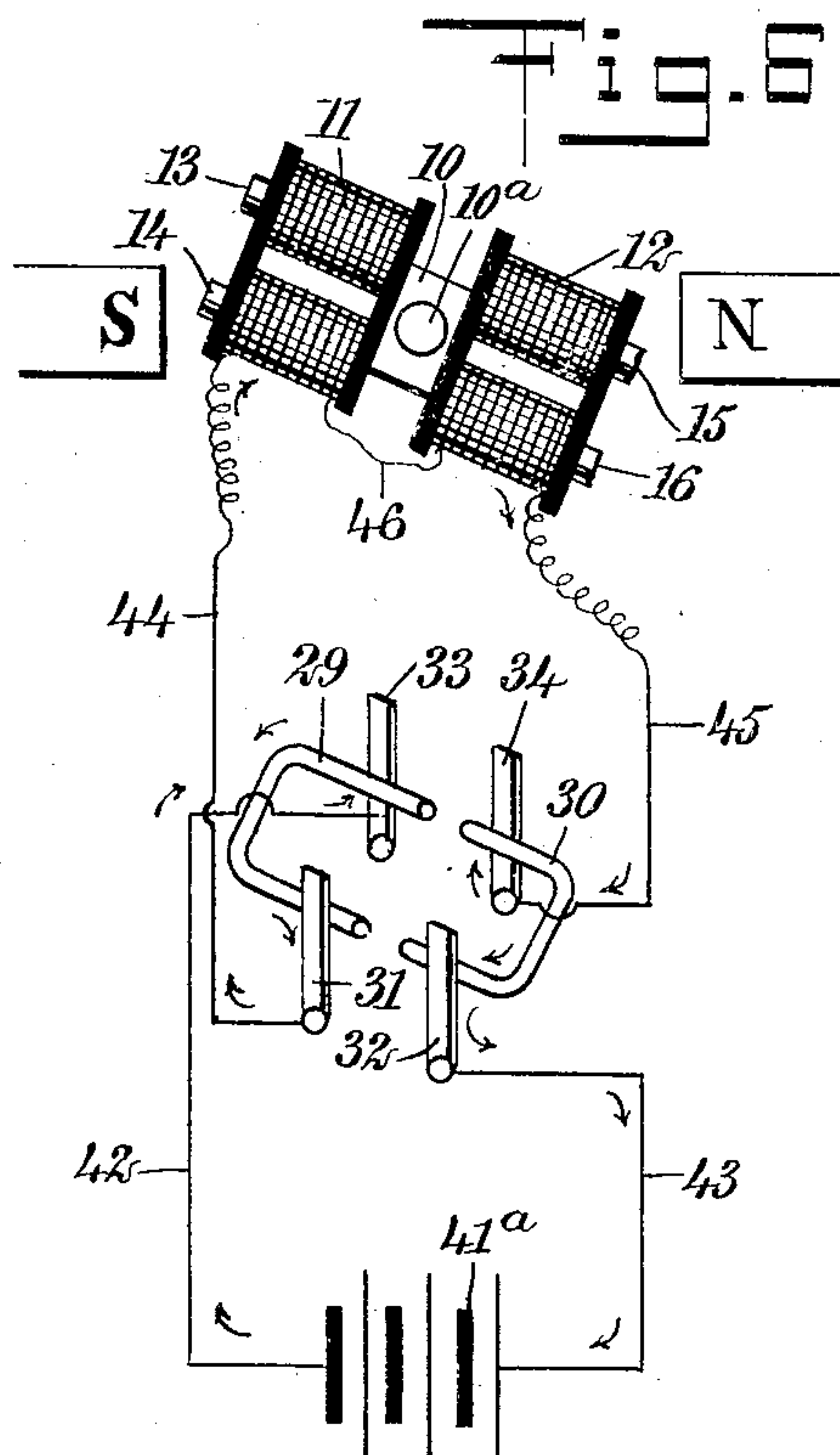
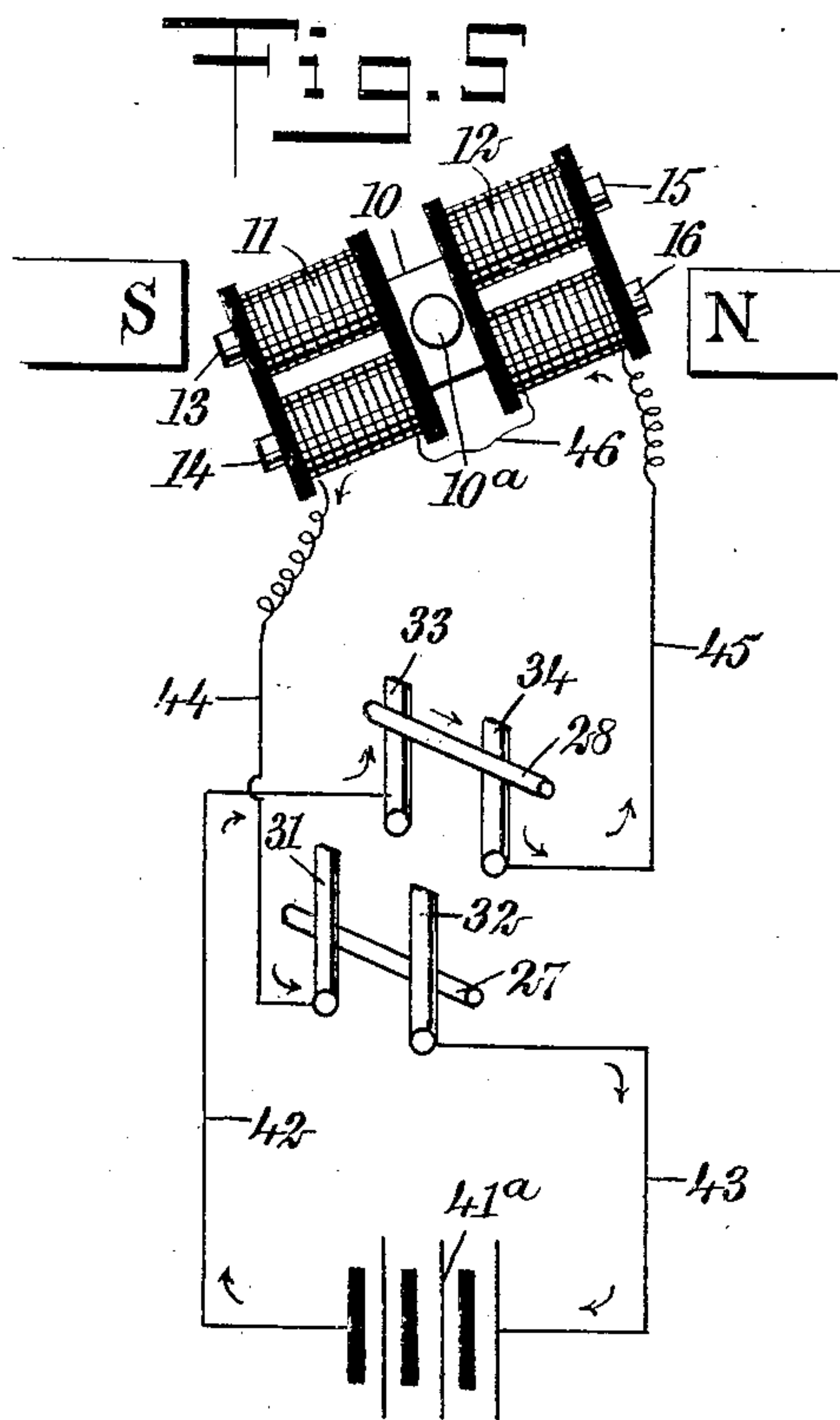
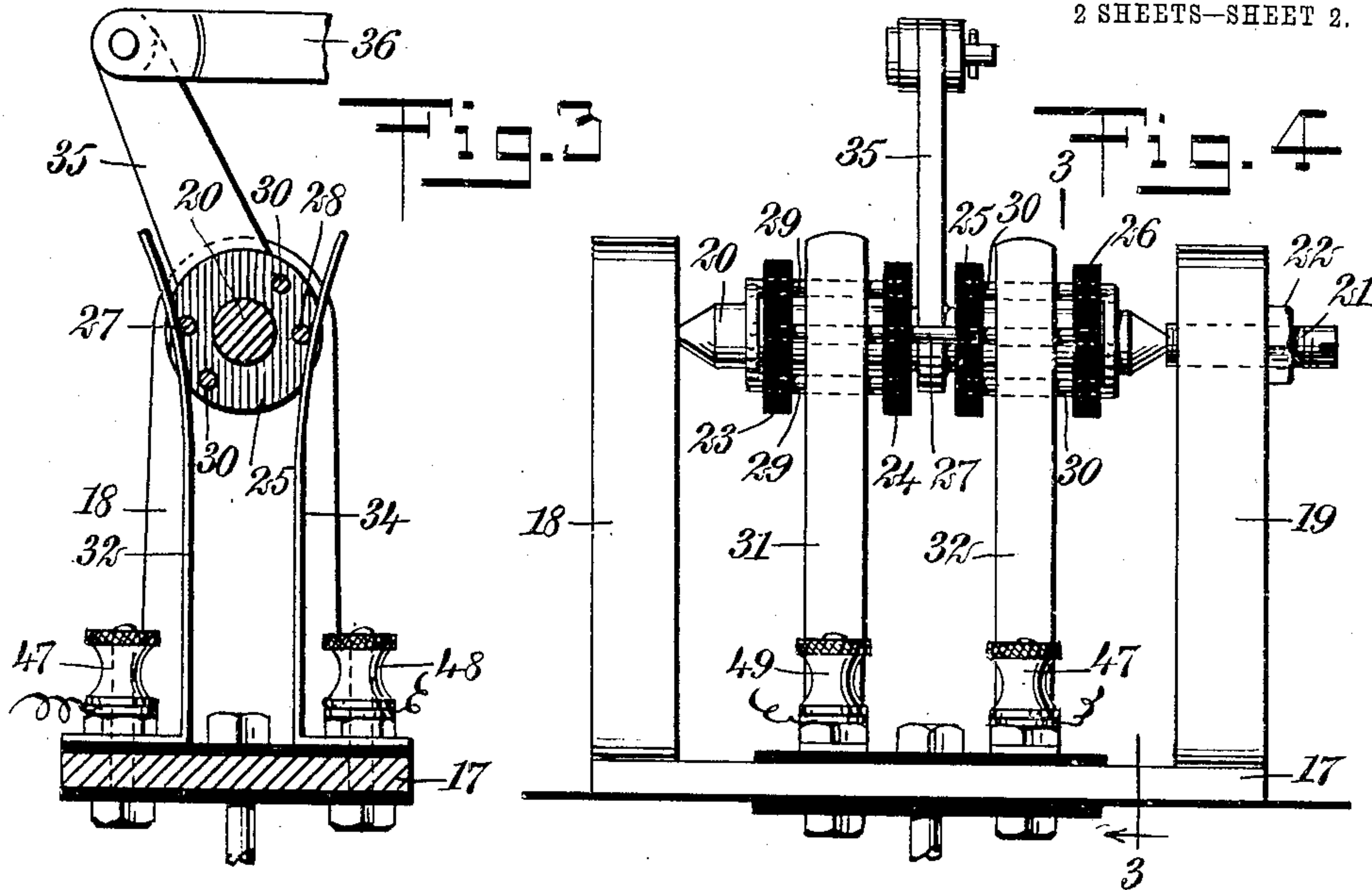
INVENTOR  
*Gustave Seidel*  
BY *Munn & Co.*  
ATTORNEYS

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2 SHEETS—SHEET 2.



WITNESSES

*Johna Bergstrom*  
*Walton Harrison*

INVENTOR

*Gustave Seidel*  
BY *Munn & Co.*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

GUSTAVE SEIDEL, OF SAUNDERSTOWN, RHODE ISLAND.

## ELECTRIC MOTOR.

No. 912,087.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed August 5, 1908. Serial No. 447,067.

*To all whom it may concern:*

Be it known that I, GUSTAVE SEIDEL, a citizen of the United States, and a resident of Saundertown, in the county of Washington and State of Rhode Island, have invented a new and Improved Electric Motor, of which the following is a full, clear, and exact description.

My invention relates to electric motors, my more particular purpose being to provide a motor having a rocking armature and a permanent magnet, the polarity of the armature being periodically reversed in order to produce a rocking motion of the armature by the action of its poles upon those of the permanent magnet.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section upon the line 1—1 of Fig. 2, looking in the direction of the arrow, and showing the permanent magnet, the rocking armature having a number of separate poles, the shaft to be turned by the rocking of this armature, and the pole changer for reversing the polarity of the electromagnets carried by the armature; Fig. 2 is a vertical section through the same, taken upon the line 2—2 of Fig. 1, looking in the direction of the arrow; Fig. 3 is an enlarged vertical section taken upon the line 3—3 of Fig. 4, looking in the direction of the arrow, and showing the pole changer with its contact brushes and contact bars for changing the direction of the current through the armature magnets; Fig. 4 is a front elevation of the pole changer; Fig. 5 is a diagram showing the rocking armature as occupying one of its extreme positions, the contact mechanism being controlled accordingly for the purpose of sending a current in one direction through all of the electromagnets; and Fig. 6 is a diagram somewhat similar to Fig. 5, but showing the rocking armature as occupying a different position from that which it occupies in Fig. 5, and further showing the contact mechanism so disposed as to send the current in the opposite direction through the electromagnets.

Mounted upon a base 7 are standards 8, and disposed intermediate the latter is a permanent magnet 9 having substantially the form of a C, its poles N, S being of opposite polarity.

A rocking armature is shown at 10 and by aid of necks 10<sup>a</sup> is journaled upon the standards 8. Mounted upon the armature 10 are electromagnets 11, 12, the magnet 11 being provided with poles 13, 14, and the magnet 12 having poles 15, 16. While the polarity in the electromagnets is reversible, the windings are so arranged that the poles 13, 14 are always unlike, the poles 15, 16 are always unlike, the poles 13, 15 are unlike and the poles 14, 15 are unlike.

An arm 17 is rigidly connected with the rocking armature 10. Two standards 18, 19, disposed parallel with each other, support a rocking shaft 20, as shown more particularly in Figs. 3 and 4. This rocking shaft is adjustable by aid of a bolt 21 and a locking nut 22. The rocking shaft 20 supports a number of disks 23, 24, 25, 26, of insulating material. Contact bars 27, 28 extend through all of these disks and are disposed oppositely to each other. The two other contact bars 29, 30, of substantially U-shape, are so mounted that the bar 29 connects together disks 23, 24, while the contact bar 30 connects together the disks 25, 26. Contact springs are provided at 31, 32, 33, 34 and are adapted to be engaged by the contact bars as the rocking shaft 20 is actuated. Connected rigidly with the rocking shaft 20 is an arm 35, and connected with the latter is a pitman 36.

A revoluble shaft is shown at 37 and is journaled upon the standards 8. This revoluble shaft carries upon its opposite ends two fly wheels 38. This revoluble shaft is further provided with a crank 39 which is connected by a pitman 40 with the arm 17, and has another crank 41 to which the pitman 36 is connected.

A battery is shown at 41<sup>a</sup>, and from it a wire 42 leads to the contact spring 33. From the battery 41<sup>a</sup> another wire 43 leads to the contact spring 32. A wire 44 connects the contact spring 31 with the electromagnet 11, and the electromagnet 12 is connected by a wire 45 with the contact spring 34. The two electromagnets are connected together by a wire 46. Binding posts 47, 48, 49 are employed for the purpose of readily connecting the wires with the different parts above described. The several parts shown in Figs. 3 and 4 together constitute a pole changer for reversing the direction of currents through the electromagnets.

The operation of my device is as follows:



The parts being assembled as above described and the bolt 21 (see Fig. 4) being adjusted and tightened by aid of the nut 22, the armature shaft 10 is rocked slightly by hand and thereafter continues to rock by the general action of the motor, the shaft 37 and fly wheel 38 turning continuously so long as current is supplied. I will assume first that the parts are in the positions indicated in Fig. 5. The contact bars 27, 28 now happen, for the moment to engage the contact springs 31, 32, 33, 34, as indicated in this figure. The battery circuit is now complete and may be traced as follows: Battery 41<sup>a</sup>, wire 42, contact spring 33, contact bar 28, contact spring 34, wire 45, electromagnets 12, 11, wire 44, contact spring 31, contact bar 27, contact spring 32, and wire 43 back to battery 41<sup>a</sup>. The two electromagnets 11, 12, being thus energized and the poles 13, 16 being alike, the adjacent poles S, N of the permanent magnet are repelled by the poles of the electromagnet. Meanwhile the poles 14, 15 of the electromagnet are attracted by the poles of the permanent magnet. The net result is that all four of the electromagnet poles act to rock the armature in one direction. This movement of the armature being executed, the armature occupies the position indicated in Fig. 6. The contact spring 32 is now temporarily in communication with the contact spring 34 by aid of the U-shaped contact bar 30. Similarly the contact springs 31, 33 are in communication with each other through the U-shaped contact bar 29. The circuit may now be traced as follows: battery 41<sup>a</sup>, wire 42, contact spring 33, U-shaped contact bar 29, contact spring 31, wire 44, magnets 11, 12, wire 45, contact spring 34, U-shaped contact bar 30, contact spring 32, wire 43, back to battery 41<sup>a</sup>. This completes the circuit through the electromagnets 11, 12 in the opposite direction, but the electric current through the magnets is now in the opposite direction from that taking place while the parts were in the position indicated in Fig. 5. The result is that the tendency of all four of the electromagnet poles is to rock the armature back into its original position, as indicated in Fig. 5. The armature

is thus rocked continuously and, of course, causes a corresponding rocking movement of the shaft 20 and arm 35. Motion from the arm 17 being communicated by the pitman 40 to the crank 39 causes the rotation of the shaft 37. Each time the armature shaft 10 is rocked, the shaft 20 (Figs. 3 and 4) of the pole changer is also rocked, though there is no direct connection between the two shafts. The idea is that the rocking of the armature 10 causes rotation of the shaft 37, and this rotation causes rocking of the shaft 20 of the pole changer. Each time the shaft 20 is rocked to its limit in either direction, the polarity of all of the electromagnets is reversed, yet the cumulative action of all four of the electromagnet poles is used in causing the armature to rock. None of the electromagnet poles are idle, therefore, except when the electric current ceases to flow.

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

The combination of a permanent magnet having substantially the form of a C and provided with poles of different sign, a rocking shaft disposed intermediate said poles, two electromagnets placed back to back upon said rocking shaft, each magnet having two poles of opposite sign, a source of electricity for energizing said electromagnets, so that each pole of said permanent magnet may attract one electromagnet of a pair and at the same time repel the other electromagnet of said pair, an arm connected with said rocking shaft, driven mechanism connected with said arm, a pole changer, a connection from said driven mechanism to said pole changer, and a source of electricity connected with said electromagnets and controllable by said pole changer for the purpose of simultaneously reversing the polarity of all of said electromagnets.

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

GUSTAVE SEIDEL.

Witnesses:

AUGUST BAUMANN,  
JOSEPH D. HAYES.