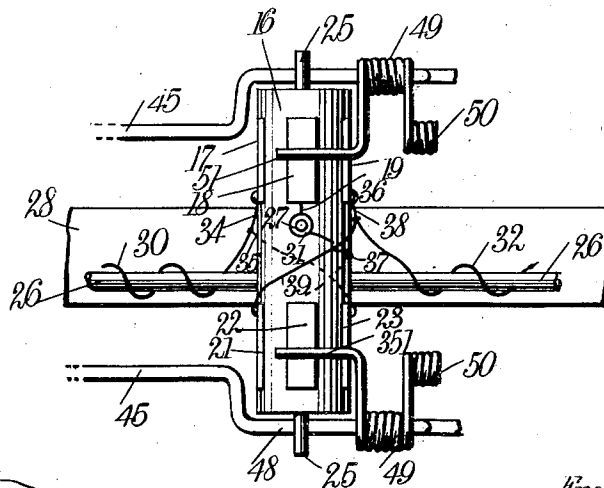
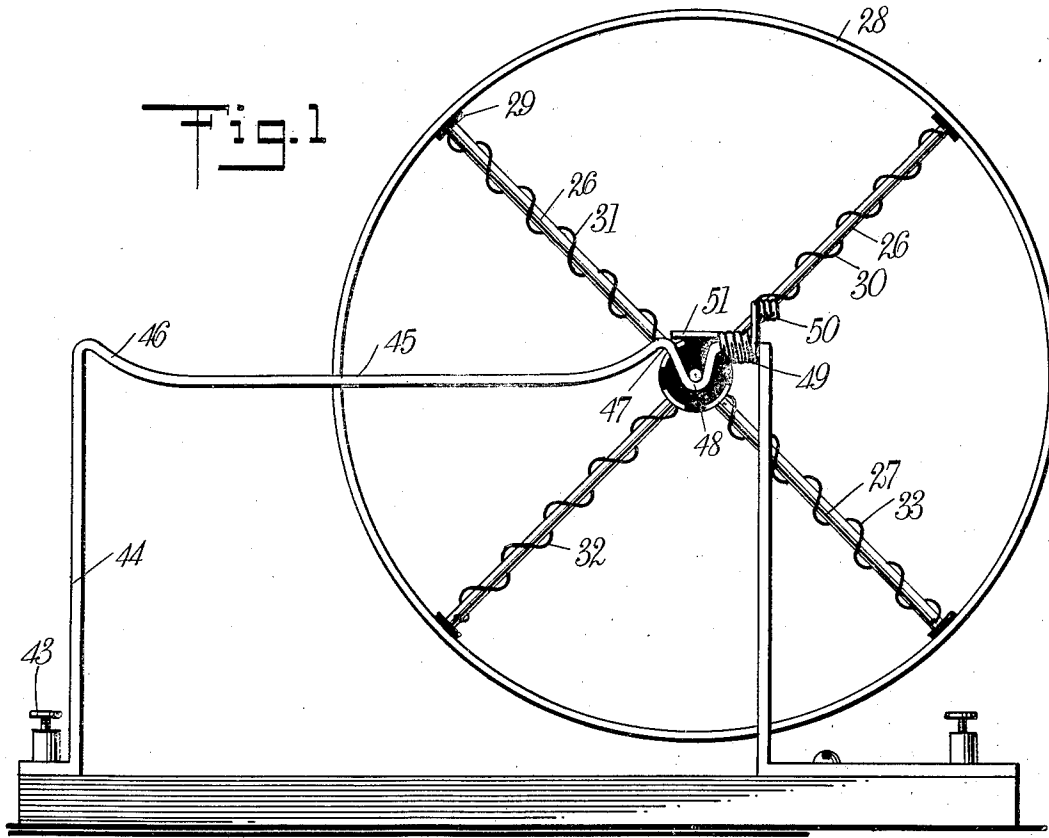


F. L. SOUTH.
FIELDLESS MOTOR.
APPLICATION FILED MAY 7, 1910.

1,019,544.

Patented Mar. 5, 1912.

2 SHEETS—SHEET 1.



WITNESSES
John A. Sargent
Walton Harrison

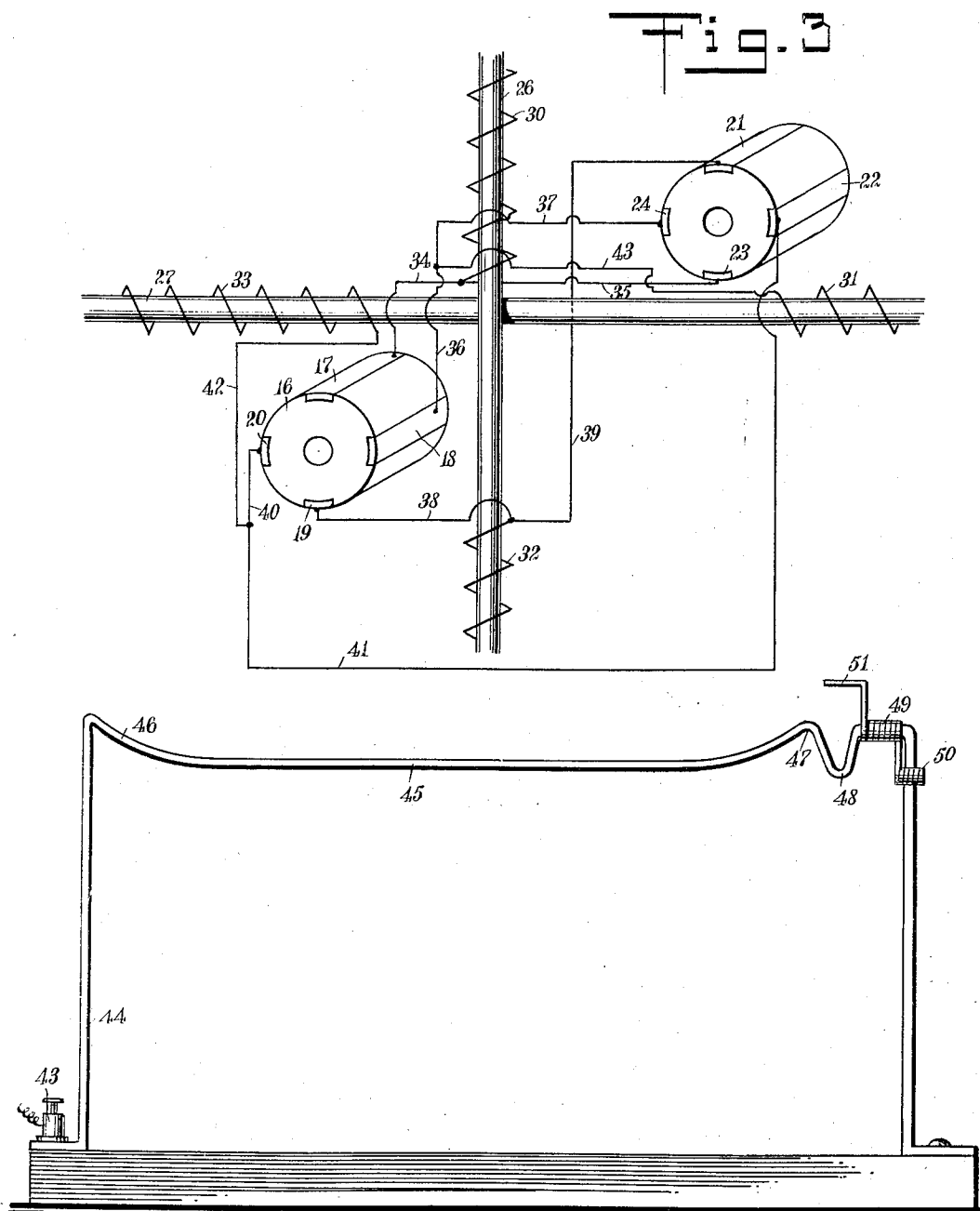
Fig. 2

INVENTOR
Frank Lee South
BY *M. M. Lee*
ATTORNEYS

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WITNESSES:
John A. Benton
Walton Harrison

Fig. 4

INVENTOR
Frank Lee South
BY *Mumfrees*
ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANK LEE SOUTH, OF BALDHILL, PENNSYLVANIA.

FIELDLESS MOTOR.

1,019,544.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed May 7, 1910. Serial No. 580,005.

To all whom it may concern:

Be it known that I, FRANK LEE SOUTH, a citizen of the United States, and a resident of Baldhill, in the county of Greene and State of Pennsylvania, have invented a new and Improved Fieldless Motor, of which the following is a full, clear, and exact description.

My invention relates to electric motors, my more particular purpose being to produce a motor having no field, in the ordinary acceptance of the term, the magnetism of the earth being employed instead of that of a field magnet.

More particularly stated, I seek to produce an electric motor, somewhat in the nature of a scientific toy, and used for demonstrating certain facts relative to the natural magnetism of the earth, and containing a revoluble armature which is in practice turned by merely sending a current through it, the magnetism of the earth co-acting with this armature and taking part in the cause of its rotation.

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 side elevation showing my improved motor; Fig. 2 is a fragmentary elevation of the middle portion of the same, viewed as from the right of Fig. 1. Fig. 3 is a diagram of the wiring and electrical connections; and Fig. 4 is a side elevation showing one of the brackets for supporting the armature.

I provide a revoluble drum 16, provided adjacent to one of its ends with four sectors 17, 18, 19, 20, and adjacent to the opposite end of the drum are four other sectors 21, 22, 23, 24. A shaft 25 extends axially through the drum 16.

Extending diametrically through the drum 16 and supported thereby are two needles 26, 27 of soft steel or iron, as preferred. A light rim 28, of celluloid or other appropriate material, is mounted upon the outer ends of the needles 26, 27 and is provided with bearings 29 which engage the needles.

An insulating wire 30 is wound spirally around a portion (about one-half) of the needle 26, the outer end of the wire 30 being connected electrically with the adjacent outer end of this needle. A wire 31 is similarly wound around a portion of the needle 27.

Wires 32, 33 are in the same way wound around other portions of the respective needles 26, 27. A wire 34 connects the sector 17 with the winding 30 and also with a wire 35 which leads to the sector 23. A wire 36 leads from the sector 18 to a wire 37 which connects with the sector 24. From the sector 19 wires 38, 39 lead to the opposite sector 21, the wires 38, 39 being also connected with the winding 32. The sector 20 is connected by wires 40, 41 with the sector 22, and a wire 42 is connected with the wires 40, 41 and also with the winding 33. Connected with the wires 36, 37 is a wire 43 which leads to the winding 31.

The drum 16, the needles 26, 27, and the windings carried by the latter, together with the rim 28 and the various sectors, together constitute the armature of my motor.

The brackets 44 are provided respectively with binding posts, one of which is shown at 43. These binding posts are connected with a battery or other source of electricity.

For supporting the drum 16 I use two brackets 44 of the type here shown. Each bracket is provided at its top with a substantially horizontal portion 45 extending slightly upward at 46, 47, and bent obliquely downward and outward at 48, the portion thus extending downwardly being in effect a loop. A helix 49 of wire is provided with a brush 51 and with a counterweight 50. There are two of these brushes carried upon the two frames 44 and the two brushes engage the sectors of the armature, as above described, whenever the armature is so mounted that the ends of the armature shaft rest in the loops 48.

The operation is as follows:—Assume at the start that the parts are as indicated in Figs. 1 and 2, and that a battery is connected with the binding posts 43. The following circuit is thus completed: binding post 43, bracket 44, brush 51, sector 17, wire 34, winding 30, to upper end of needle 26, thence directly into upper end of needle, next directly throughout the entire length of the needle (now serving as a conductor), to lower end of winding 32, thence along up this winding to cross wire 39 (see Figs. 2, 3), thence to sector 21, brush 51, bracket 45 and binding post connected therewith, back to battery. This magnetizes the needle 26 which now tends to act as a dipping needle and therefore tends to turn and in so doing causes the rotation of the armature for a

little distance. The brushes next respectively engage the sectors 20, 24, and this completes another circuit in every sense analogous to the one just traced, for the reason that all parts of the mechanism being symmetrical, the partial rotation of the armature throws one pair of sectors out of circuit and another pair into circuit, the various other parts affected by the flow of the current being precisely analogous to those parts affected by the circuit which has just been traced. Each time the armature makes a quarter of a turn, a new pair of sectors are brought into engagement with the same pair and a new circuit is formed so that the needles 26, 27 are each energized first in one sense and then in the opposite sense, and in being thus energized and deenergized they each make half a turn so that the rotation of the armature is continuous. Where the wheel occupies a vertical plane, as in Figs. 1 and 2, this plane should be located north and south, in order that the needles may have a tendency to seek the magnetic meridian. If, now, the armature be so mounted that the ends of the shaft 25 rest in the loops 48, the brushes 51 resting upon the sectors, current is supplied as above described, and the armature turns substantially as described with reference to Figs. 1, 2 and 3. If, however, the drum 16 be rested directly upon the portion 45 of the track, as indicated in Fig. 4, so that the sectors engage two opposite portions 45, the contact of these sectors with the portions 45 supplies current to the armature which thereupon rolls along the portion 45, climbing upon the upturned portions 46, 47.

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

1. A fieldless motor comprising a longitudinal frame provided with substantially horizontal portions, an armature carrying sectors for engaging said horizontal portions, said armature being provided with magnetic members extending radially outward from it and acted upon inductively by the earth's magnetic field, and connections for supplying a current to said horizontally disposed portions of said frame.

2. In a fieldless motor, the combination of a frame provided with substantially horizon-

tal portions of conducting material, an armature provided with substantially cylindrical portions carrying sectors, said armature being further provided with magnetic members extending radially outward, and with windings mounted upon said magnetic members and connected to said sectors, said magnetic members being acted upon inductively by the earth's magnetic field, electrical connections to said substantially horizontal portions, loops supported by said substantially horizontal portions, journals connected with said armature and connected for direct engagement with said loops, and connections from said frame to said sectors carried by said armature.

3. The combination of a pair of metallic frame members having portions formed into loops, an armature provided with a shaft for engaging said loops, said armature being further provided with magnetic members extending radially from it and acted upon by the earth's magnetism, contact members made of spring wire and mounted upon said frame members, each contact member being provided with a counterweight for normally holding it in a predetermined position, each contact member being so balanced that when it occupies a predetermined abnormal position, it rests upon said armature, sectors carried by said armature, and adapted to be engaged by said contact members, and windings connected with said sectors and mounted upon said magnetic members.

4. A fieldless motor comprising a track of conducting material, a revoluble armature resting directly upon said track, and adapted to roll along the same, sectors carried by said armature and successively engaging said track for the purpose of energizing said armature, said armature thus energized being acted upon inductively by the earth's magnetism, and means for supplying an electric current to said track.

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

FRANK LEE SOUTH.

Witnesses:

GILPIN SOUTH,
E. A. SOUTH.