(No Model.)

G. F. CARD.

ELECTRO DYNAMIC MACHINE.

No. 380,020. Patented Mar. 27, 1888.

Fig. II.

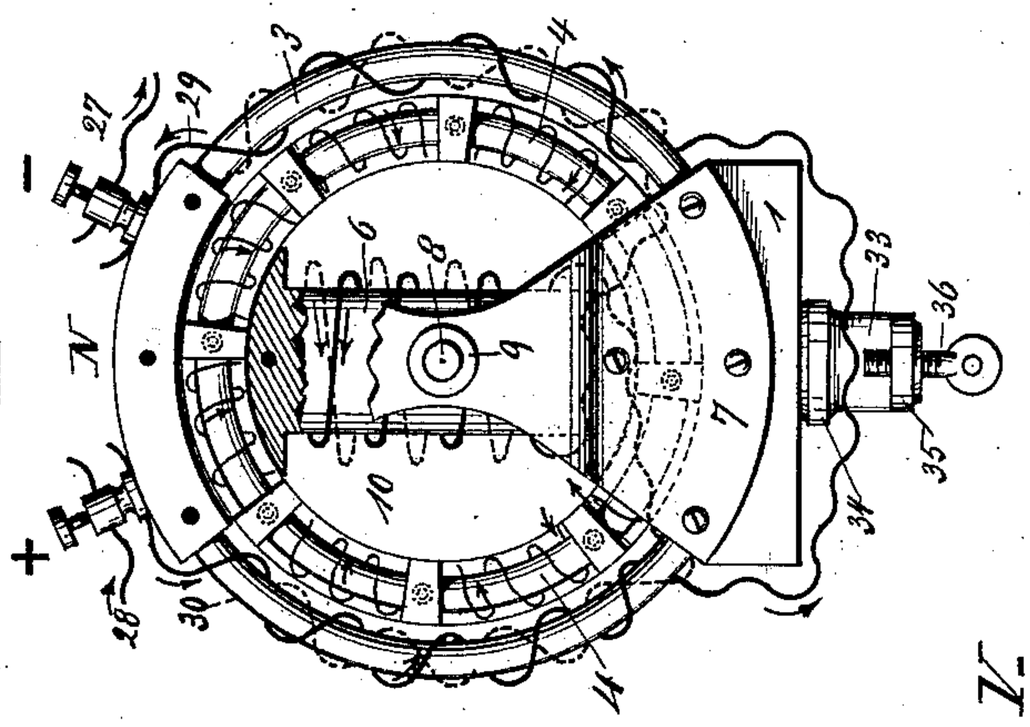


Fig. III.

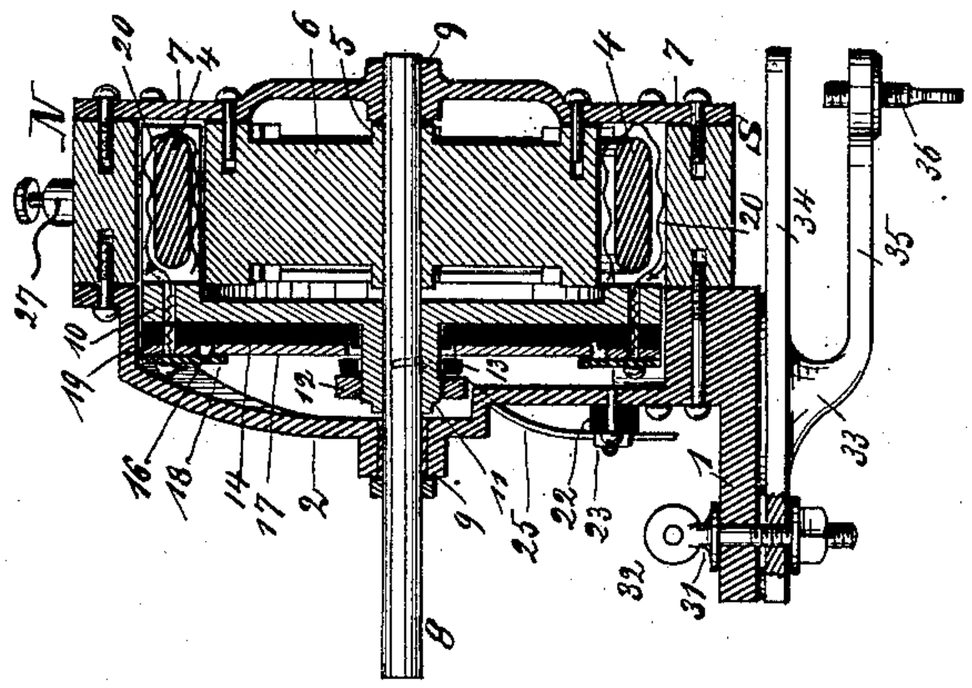


Fig. I.

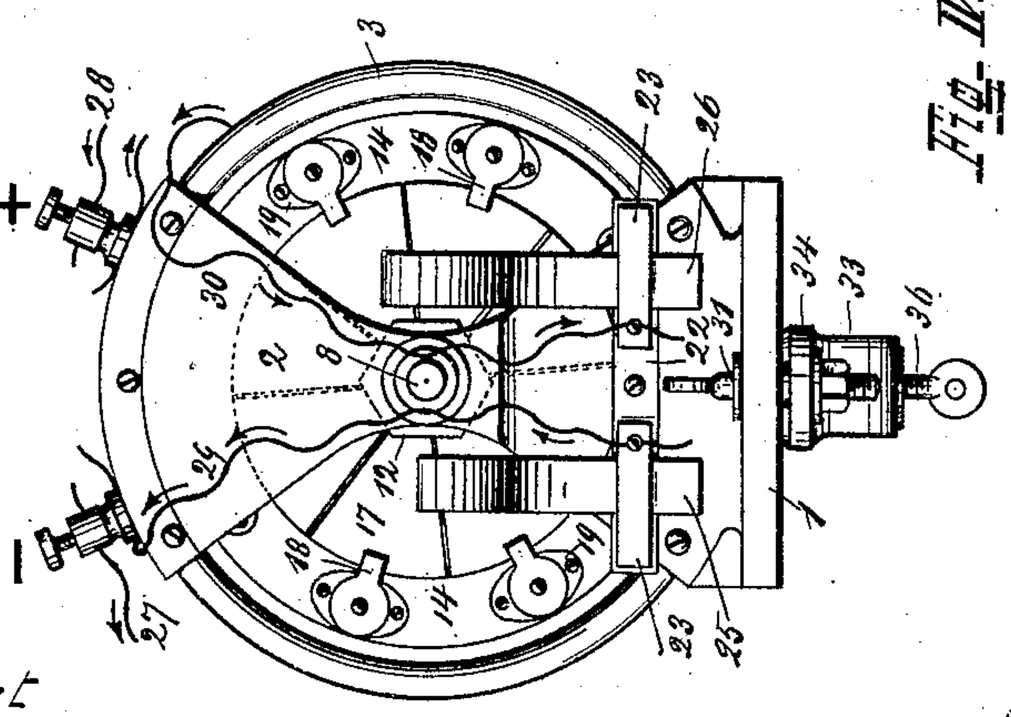


Fig. V.

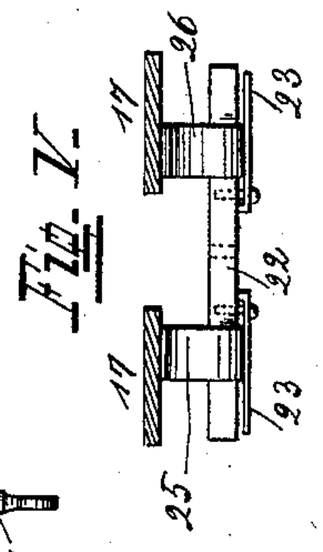
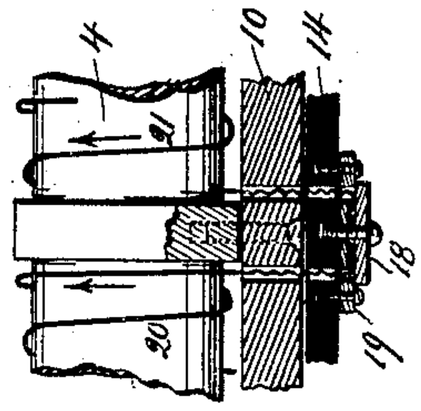


Fig. IV.



Attest

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Inventor
George F. Card
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UNITED STATES PATENT OFFICE.

GEORGE F. CARD, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE GEORGE F. CARD MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRO-DYNAMIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 380,020, dated March 27, 1888.

Application filed June 8, 1887. Serial No. 240,644. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CARD, of Covington, Kenton county, Kentucky, have invented a new and useful Improvement in Electro-Dynamic Machines or Motors, of which the following is a specification.

My invention is an improvement in the class of electric motors such as illustrated in my patent, No. 364,086, granted May 31, 1887; and it consists in features of useful novelty, hereinafter described and specified.

In the accompanying drawings, Figures I, II, and III are respectively a front elevation, a rear elevation, and an axial section of a machine embodying my improvements. Fig. IV represents the means employed by me to connect each two consecutive bobbins with their appropriate commutator-plate. Fig. V is a top view of the brush-holder, two commutator-plates being shown in the section.

The base 1 and the standard 2 may be integral parts of a single casting of bronze or other non-magnetic metal.

3 and 4 are respectively the field and armature rings of my motor. The annular core or ring 3 of my field is screwed fast at its polar protuberances N S to the standard 2. Screwed to the rear faces of the same protuberances is a web or bearing-plate, 7, of phosphor-bronze or other non-magnetic metal, to which is likewise screwed a soft-iron forging which constitutes the interior field-magnet core, and which consists of a central fillet, 5, that connects a pair of flattened cylindrical cores, 6. This forging constitutes the core of my interior field-magnet, which magnet is, in the present form of my invention, magnetically insulated from my exterior magnet, as will presently appear. A central orifice in the said forging and like orifices in the non-magnetic plates 2 and 7 receive suitable journals, 9, of the armature-shaft 8.

The armature-ring is screwed fast to a web, 10, of phosphor-bronze or other non-magnetic metal, whose hub 11 is keyed or otherwise firmly secured to the shaft 8. A nut, 12, on the screw-threaded extremity of the said hub 11, and a rubber gasket, 13, hold firmly against the face of the said web 10 a disk, 14, of hard rubber or other like substance. A shallow annular groove or recess, 16, in the face of the rubber disk 14 receives the brass commutator plates or sectors 17, which are held in place partly by the rubber gasket 13 and partly by brass clips 18, which are screwed fast to the rubber disk 14. A brass washer, 19, being interposed between the said disk and the respective clips, serves the double purpose of elevating the said clips sufficiently from the face of the disk and of affording attachment for the wires 20 21 from the neighboring pair of armature-bobbins, as shown in Figs. III and IV. Electrical connection of these wires is secured by the close contact of the brass clip 18 with both, while the electrical loop thus formed has, through the same clip, the electrical communication with the proper plate of the series of commutator-plates required in this type of machines.

The described construction enables inspection of said bobbin-connections and of renewal of any one or more commutator-plates without dismemberment of the machine.

Screwed fast to the standard 2 is a plate, 22, of vulcanized fiber or like substance, and screwed to this plate are two brass clamps, 23, which coact with said plate to hold the brushes 25 26, of spring-copper, whose free ends press against the vertical faces of the commutator-plates, as shown in Figs. I, II, III, IV.

+ and — may represent suitably-insulated binding-posts for the attachment of the line-wires 27 28 and of the ingoing and outgoing wires 29 30 of the motor.

The preferred winding (in series) of the field and armature is shown diagrammatically in the several figures.

To enable ready attachment of the machine to a bench or other fixture, the base 1 has a vertical orifice, 31, for a pivot-bolt, 32, which secures a clamp or yoke, 33, having two rigid jaws, 34 35, of which the lower jaw, 35, carries a set-screw, 36, to screw against the under side of such bench. The screw 32 having been temporarily slackened, the machine may be adjusted to any desired angle for convenient belting or other purposes.

My aforesaid patent recited some of the advantages incident to a construction in which the interior and exterior field-cores have mag-

netic continuity. Such arrangement of the parts obviously secures two diametrically-remote extremities of high polar intensity restricted to two limited portions of the circumference.

In my present arrangement the number of polar terminals is doubled and the magnetic action is distributed over much longer arcs in the plane of rotation, with consequently more equable and more prolonged polar action.

Each mode of construction is believed to possess its own special advantages for application to different uses.

I claim as new and of my invention—

1. In an electro-dynamic or electro-magnetic machine, the combination of the following elements, to wit: the front and rear non-magnetic bearing-plates, 2 7, and the mechanically-attached but magnetically-insulated cores 3 6 of the respective exterior and interior field-magnets, as and for the purposes designated.

2. The combination of non-magnetic bearing-plates 2 7, having the attached magnetically-insulated magnet-cores 3 6, and affording journal-bearings 9 for armature-shaft 8, the web 10, the hard-rubber disk 14, the nut 12, gasket 13, series of commutator-sectors 17, the clips 18, the washers 19, and the terminals 20 21 of the armature-bobbins.

In testimony of which invention I hereunto set my hand.

GEORGE F. CARD.

Attest:

WM. B. THOMAS,
GEO. H. KNIGHT.