(No Model.)

G. F. CARD.

ELECTRIC MOTOR.

No. 364,086. Patented May 31, 1887.

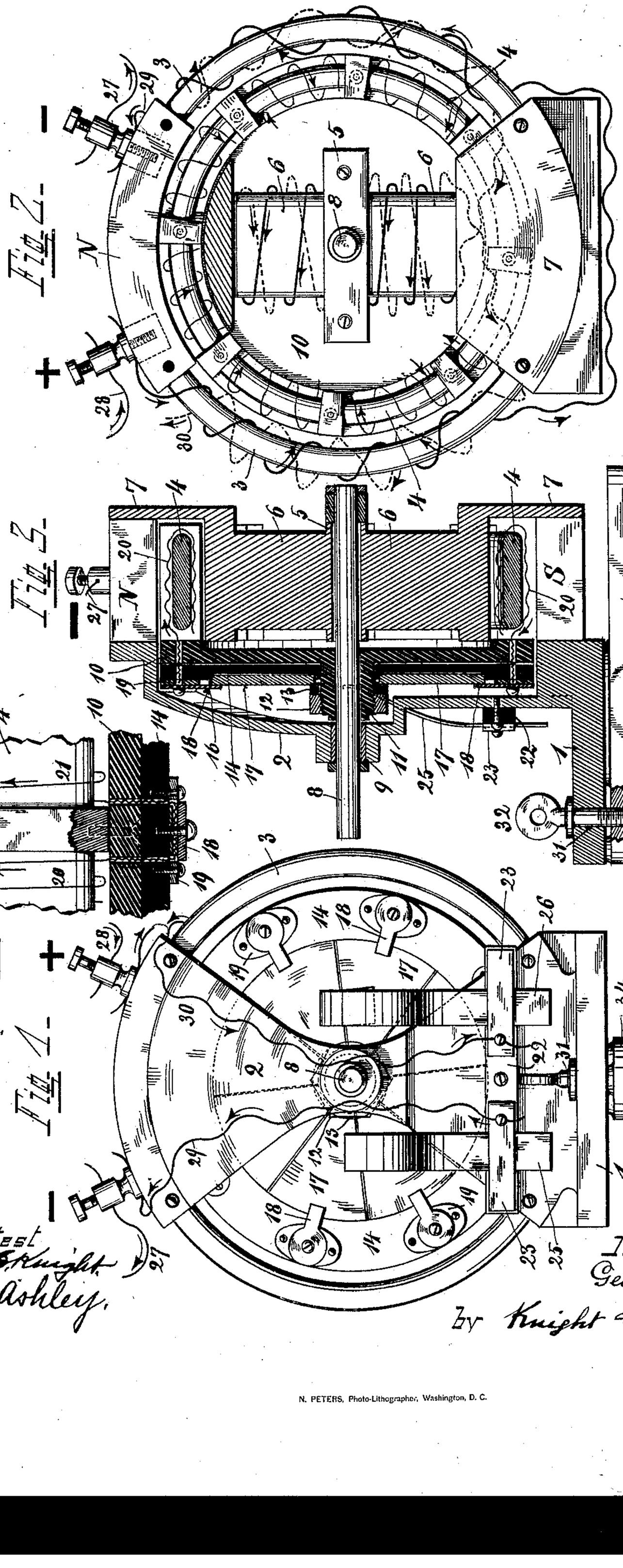

Fig. 1.

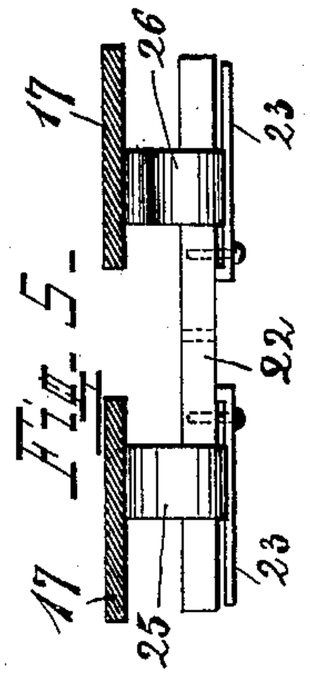

Fig. 5.

Fig. 2.

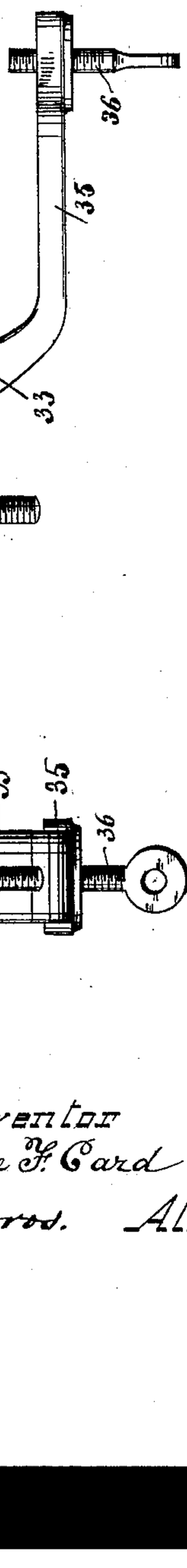

Fig. 6.

Fig. 4.

Attest
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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.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 364,086, dated May 31, 1887.

Application filed November 29, 1886. Serial No. 220,162. (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-Magnetic Motors, of which the following is a specification.

My invention is an improvement in what is known as the "Pacinotti" type of electric motors; and it consists in features of useful novelty, hereinafter described and specified.

In the accompanying drawings, Figures 1, 2, and 3 are respectively a front elevation, a rear elevation, and an axial section of a machine embodying my improvements. Fig. 4 represents the means employed by me to connect each two consecutive bobbins with their appropriate commutator-plate. Fig. 5 is a top view of the brush-holder, two commutator-plates being shown in 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 steel or iron casting, which constitutes the interior field-magnet, and which consists of a central fillet, 5, that connects a pair of flattened cylindrical cores, 6, whose L-formed projections 7 combine with said protuberances to constitute the U-formed pole-pieces of my field, which will be seen to so nearly surround the armature-bobbins as to reduce to a minimum the amount of "idle" wire thereon. A central orifice in the said casting and in the standard 2 receives the armature-shaft 8, which is journaled in suitable bearings, 9, that are attached to the standard and to said casting. The armature-ring 4 is screwed fast to a web, 10, of bronze or other non-magnetic metal, whose hub 11 is keyed or otherwise securely fastened 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 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, 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. 3 and 4. Electrical connection of these wires is secured by the close contact of the brass clip 18 with both, while the electric 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 ready 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. 1, 3, and 4.

+ and — may represent suitably-insulated binding-posts for 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 purpose.

I claim as new and of my invention—

1. In an electro-magnetic motor, the combination, with the exterior field-magnet, 3, of

the following elements, to wit: the attached standard 1,2, perforated concentrically, of the said field-magnet, the shaft 8 of the interposed armature, the bobbin-ring 4, and two U-formed field-poles composed of the attached projections N S 7 of the inner and outer field-magnets, in the manner set forth.

2. In the described combination with the armature-ring 4, the attached non-magnetic web 10, the recessed disk 14, the nut 12, the gasket 13, and the series of commutator-plates 17, clips 18 and washers 19, having metallic contact with the terminals 20 21 of the pairs of consecutive armature-bobbins, substantially as set forth.

In testimony of which invention I hereunto set my hand.

GEORGE F. CARD.

Witnesses:
GEO. H. KNIGHT,
E. M. WILLIAMS.