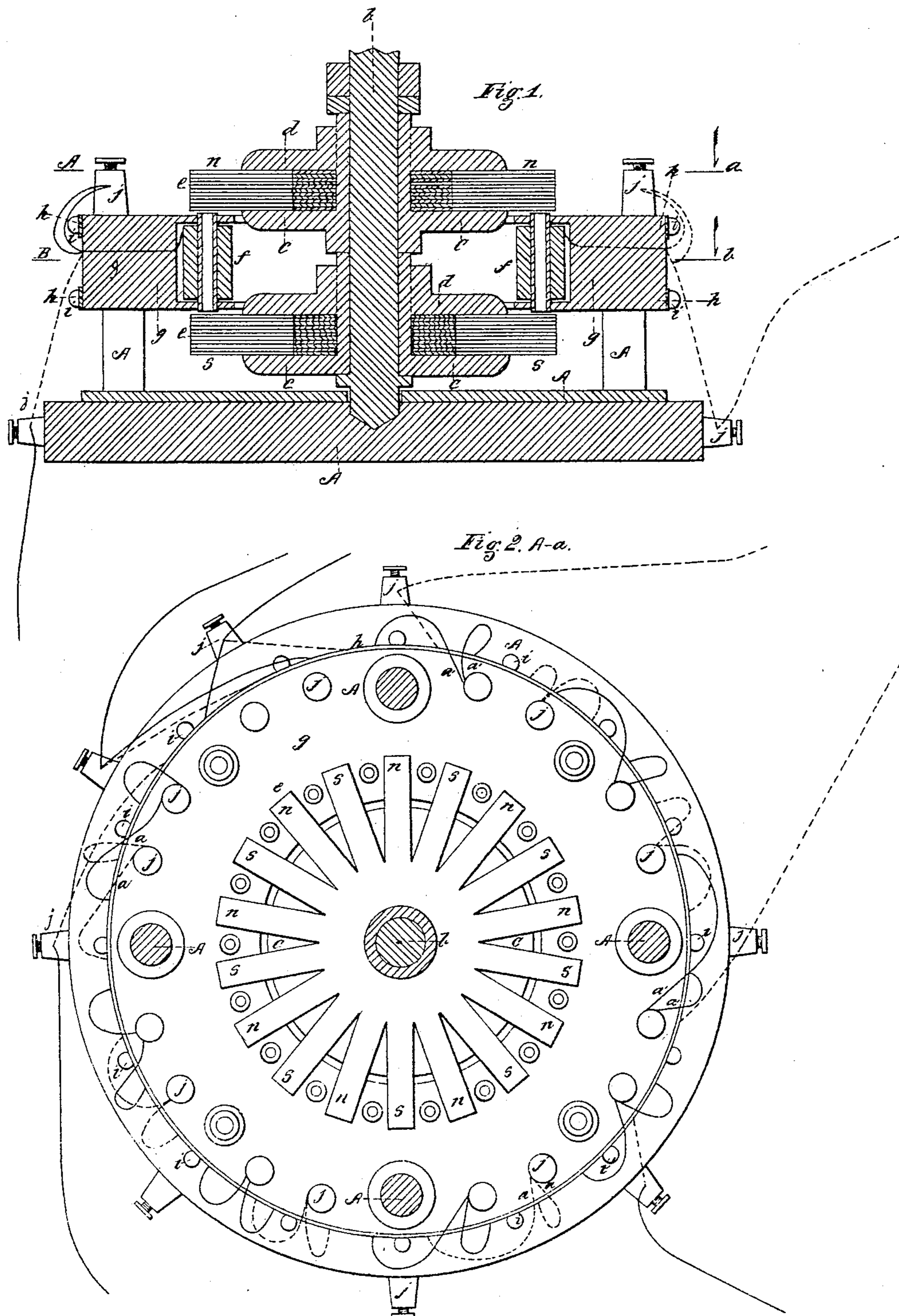


G. W. BEARDSLEE.
Magneto Electric Machine.

No. 26,558.

Patented Dec. 27, 1859.



Witnesses:

Wm H. Anshutz
Peter DeLong

Inventor:

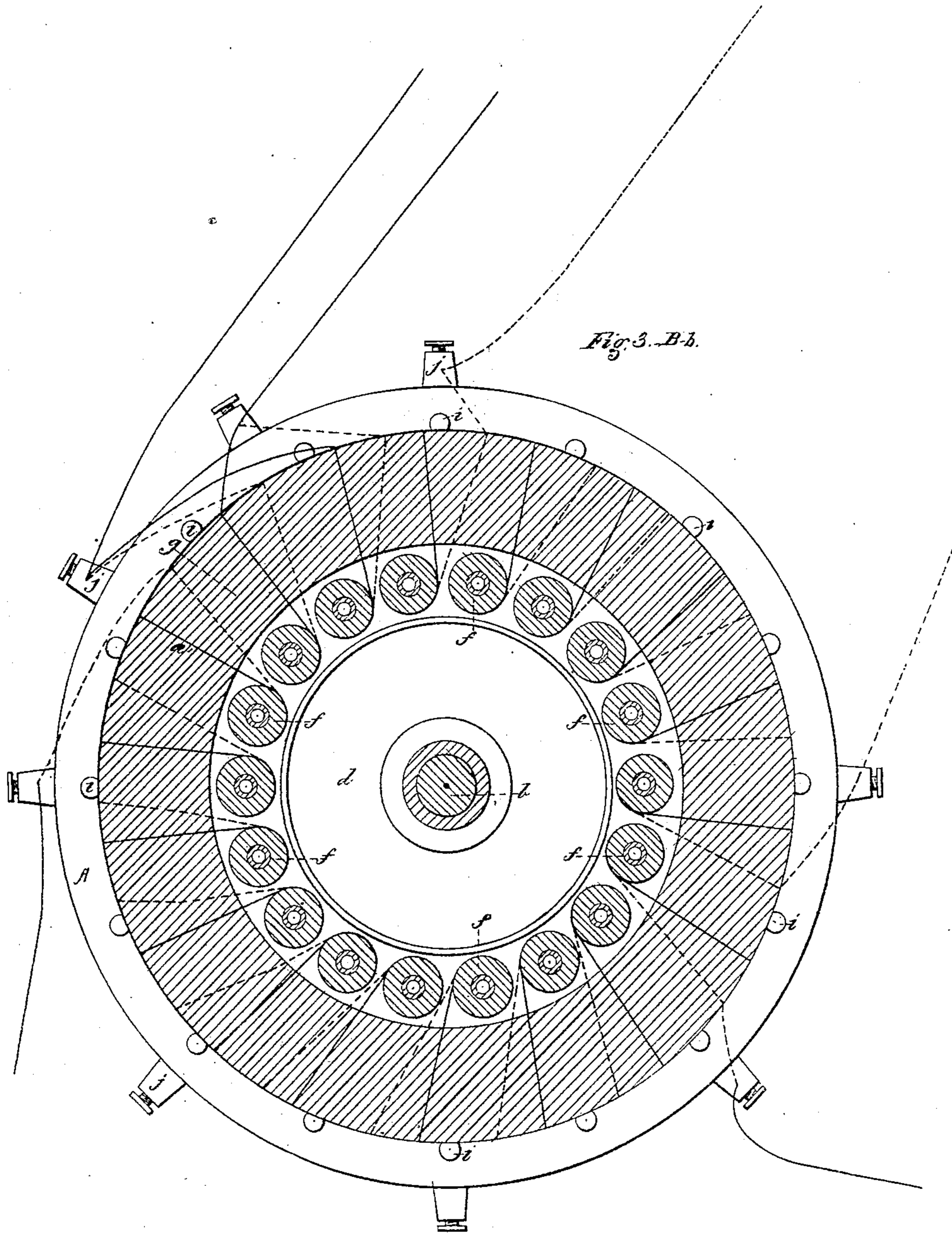
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Wm H. Androp
Peter De Gree

Inventor:

G. W. Beardslee

UNITED STATES PATENT OFFICE.

GEORGE W. BEARDSLEE, OF FLUSHING, NEW YORK.

IMPROVED MAGNETO-ELECTRIC MACHINE.

Specification forming part of Letters Patent No. 26,558, dated December 27, 1859.

To all whom it may concern:

Be it known that I, GEORGE W. BEARDSLEE, of the town of Flushing, College Point, in the county of Queens and State of New York, have invented certain new and useful Improvements in Magneto-Electric Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section of the magneto-electric machine, and Figs. 2 and 3 horizontal sections thereof, taken at the lines A a and B b of Fig. 1.

The same letters indicate like parts in all the figures.

The first part of my invention relates to a novel construction of magnets; and this part of my invention consists in constituting a wheel of magnets of a series of radial plates or bars connected at their inner ends by a continuous ring, thereby forming a compound magnet, whether such connecting-ring be formed by beveling the edges of the several plates or bars at their inner ends and so binding them that they will all be in contact and be thereby closed at their inner ends, or effecting this by abutting the inner ends of the radial plates or bars against a continuous ring, or by forming the whole from a circular plate or disk by cutting out a succession of V-shaped pieces from the periphery, leaving a continuous ring around the hollow center with the series of magnet poles radiating therefrom like spokes from a hub, or however produced so long as the poles radiate and their inner ends are closed either by contact or by a continuous ring in the same plane.

A compound magnet so constituted will be found to present many advantages over a compound magnet composed of a series of horseshoe-magnets connected together to form a wheel, because they can be made cheaper, more accurate, not so liable to warp in tempering, and, if warped, the clamping of a series of such wheels together to multiply the number of compound magnets will bend them back to the required plane. Being closed at the inner ends, they will not be liable to change polarity, and a greater number of poles can be placed in a circle of a given diameter than if

made in any other form, and can be better adjusted or made accurate, which is a matter of great importance; as in the operation of a magneto-electric machine it is important that all the poles should pass over the centers of their appropriate helices at the same instant of time. The most important result of this organization of compound magnets is the equalization of the magnetism in all the poles—a result which is of the first importance in magneto-electric machines in view of the difficulty of obtaining a series of magnets equally charged. When the armature or core of any one helix is just midway between the north and south poles of any one horseshoe-magnet the change of magnetic influence takes place, for the north and south poles of any one magnet are of equal strength, and just midway between the two will be the neutral point, and at the instant of passing this point the change of magnetic influence takes place; but when, by reason of the rotation, the helix is brought between the north pole of one such magnet and the north pole of the next which happens to be of different strength, the neutral point where the change of magnetic influence takes place will not be midway between the two poles, but nearest to the weak pole. This inequality produces confusion in the impulses from the several helices, which, instead of being simultaneous, are produced in succession; but with my improved compound magnet, even when the separate poles are charged with different strength, they all become equal as the two poles of a single horseshoe-magnet, and in consequence the impulses from all the helices will be simultaneous.

The second part of my invention, which relates to an arrangement of fixed bands or rings for receiving the induced electric impulses, consists in combining with rotating compound magnets one or more pairs of insulated rings of non-magnetic metal placed outside the circle of rotating magnets, and with which the terminal wires of the helices are to be connected, whereby the connection and disconnection can be readily made and changed, whether the machine be in motion or at rest.

The construction of the magneto-electric machine is represented in the accompanying drawings.

The bottom and columns A A, which con-

stitute the frame of the machine, may be constructed of any non-magnetic metal, wood, or other material, of such proportions and strength as may be required. The main vertical shaft *b* may be iron or other metal, upon which the revolving plates of brass or other non-magnetic metal are fixed, for the purpose of receiving the series of magnets.

The plates *c c* for receiving the magnets, and to which they are securely fastened by the nuts *d d*, are turned off true in a lathe, and in like manner the magnets, when firmly clamped and secured to the plates, can be turned off to insure accuracy, that they may pass as near to the ends of the armatures or cores of the helices. The compound magnets *e e* are manufactured from a circular plate of the best quality of cast-steel, and of no greater thickness than is necessary to produce a uniform temper. They should be made as true as practicable on the faces and circumference. There may be one or a series of such compound magnets piled one on top of another and firmly clamped to the plates *c c*; and several series may be mounted on the same shaft, two being represented in the drawings.

Each compound magnet has a series of poles, north and south, (marked in Fig. 2 *n* and *s*), radiating from the central portion of the plates like the spokes of a wheel, and formed by cutting out the metal of the plate between every two; and in making these care should be observed to have all the poles in each compound magnet at equal distances, and when a series of such are put together to have them alike and accurately piled on each other and firmly clamped to insure contact.

The poles of all the compound magnets of each series should correspond, and when two series are mounted on one shaft the north poles of the second series should be under the south poles of the first series, and if a third series be added the poles of the third series should correspond with the poles of the first series, and alternate with the poles of the second series, and so on with any number of series that may be employed.

The helices *f f* are formed with their armatures or cores of the best quality of soft iron and wound with well-insulated copper wire of

such length and size as required for the kind of current wished.

The ring *g* for receiving the helices may be of any non-conducting material, and is mounted and firmly held in the required position on the columns of the machine. *h h* are metallic non-magnetic rings attached to the ring *g*, to which clamps *i i* are attached to receive the terminal wires of the helices. There must be two such rings for one or more series of magnets.

The metallic holding-clamps *j j* are fastened to the ring *g*, and also to the bottom of the machine, and are for the purpose of uniting one or more pairs of each series of helices by hitching together the terminal wires *a a* and *a' a'* by clamping them therein; and although I prefer the mode of constructing the compound magnets from circular plates as being decidedly the best, and desire to be understood as making claim to such mode of construction, nevertheless I wish it to be distinctly understood that in the organization of the machine other modes of construction may be substituted as inferior equivalents, but involving the chief characteristic, which I have already defined under the head of the first part of my invention; and, in short, as to the entire invention I wish to be understood as reserving to myself the privilege of making all merely formal changes.

What I claim as my invention is—

1. The compound magnet herein described, consisting of radial poles arranged about a common center and connected together at their inner ends, substantially as and for the purpose described.

2. Forming such a compound magnet with radial poles connected at their inner ends by cutting out the radial poles and connecting rings from a single plate, substantially as and for the purpose specified.

3. In combination with rotating magnets, the insulated rings to which the terminal wires of the helices are connected, substantially as described.

GEO. W. BEARDSLEE.

Witnesses:

ANDREW DE LACY,
WM. H. BISHOP.