(No Model.) 2 Sheets—Sheet 1.

J. B. ENTZ.

DYNAMO ELECTRIC MACHINE.

No. 434,590. Patented Aug. 19, 1890.

FIG. 1.

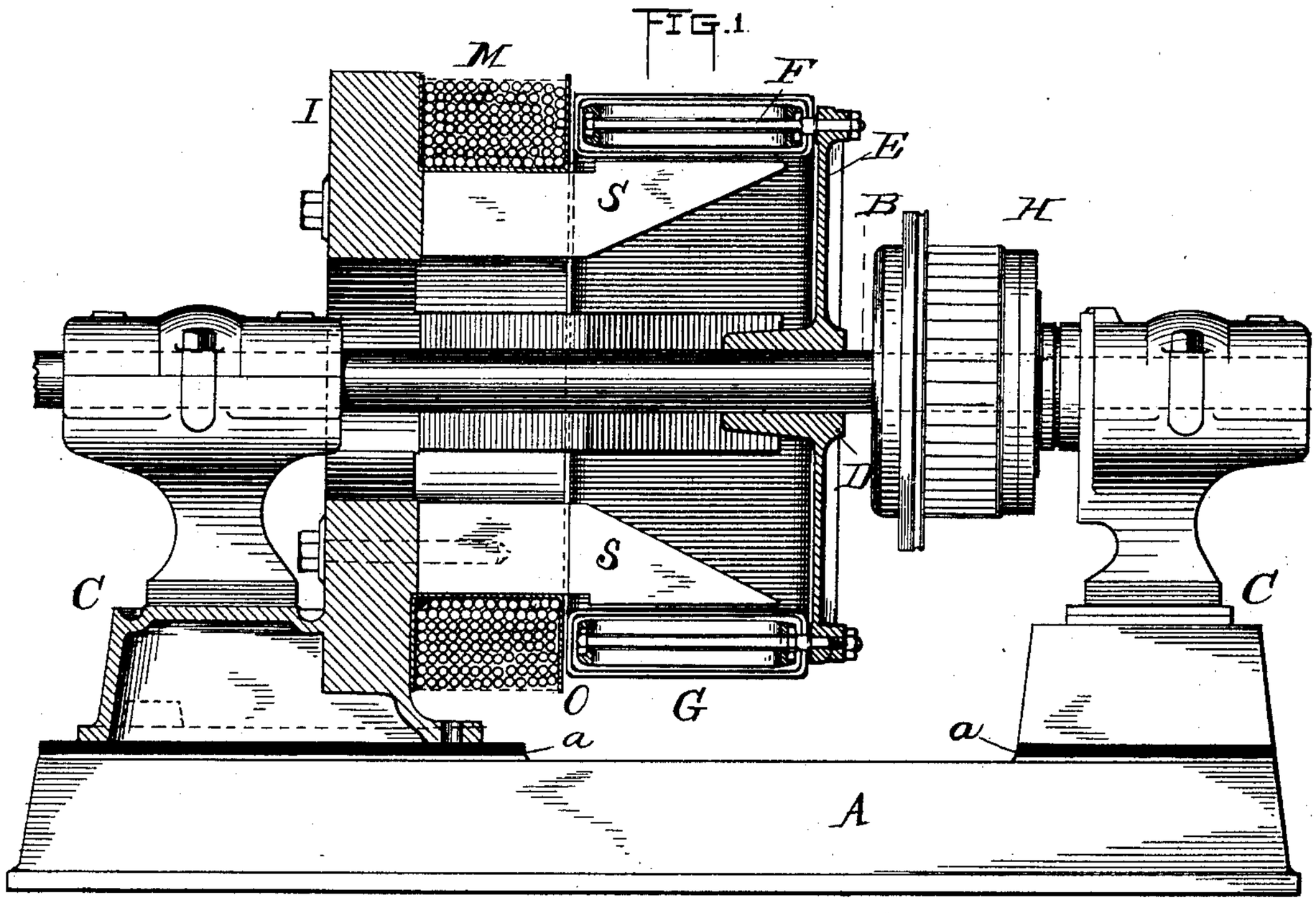
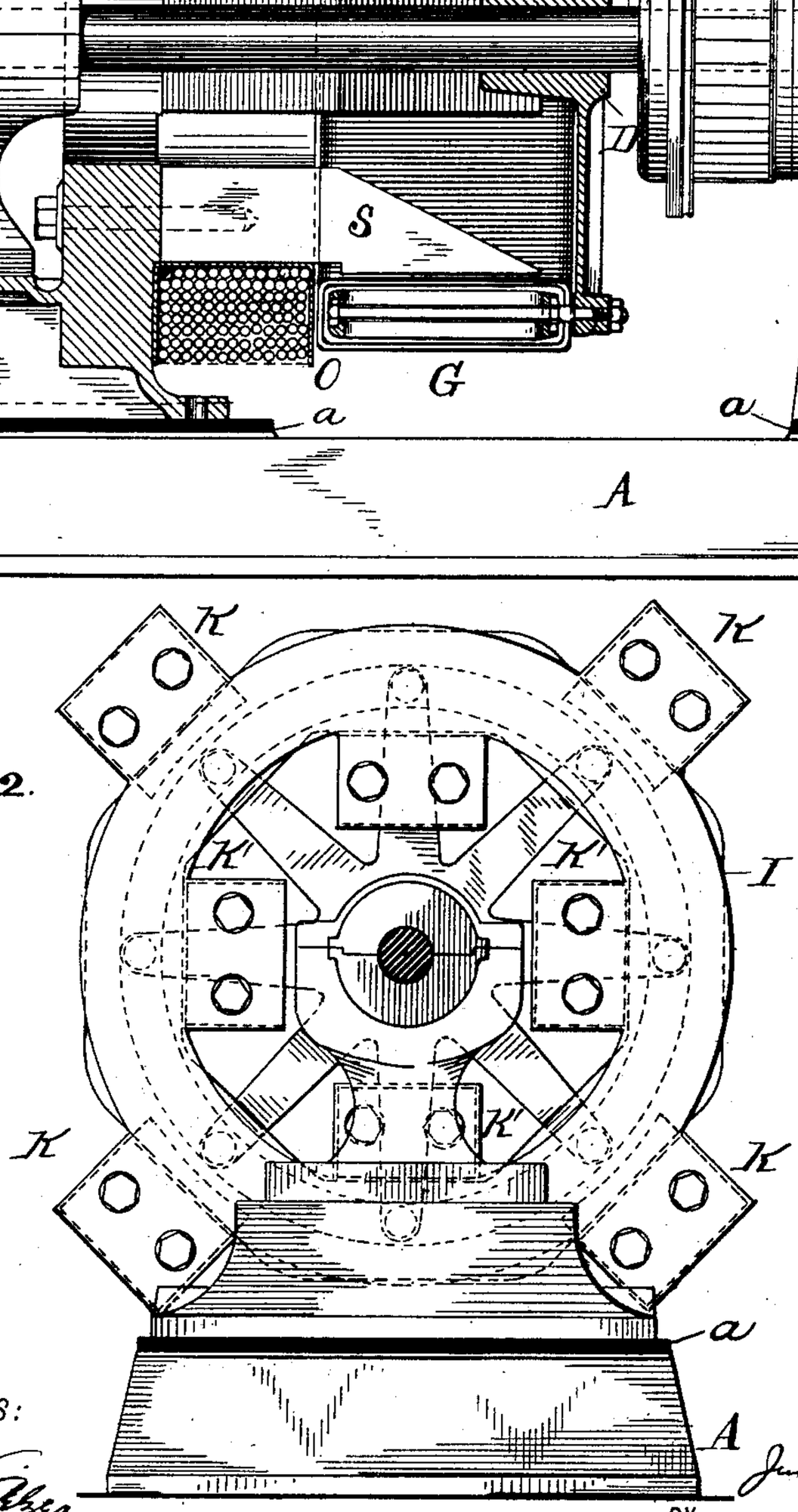


FIG. 2.



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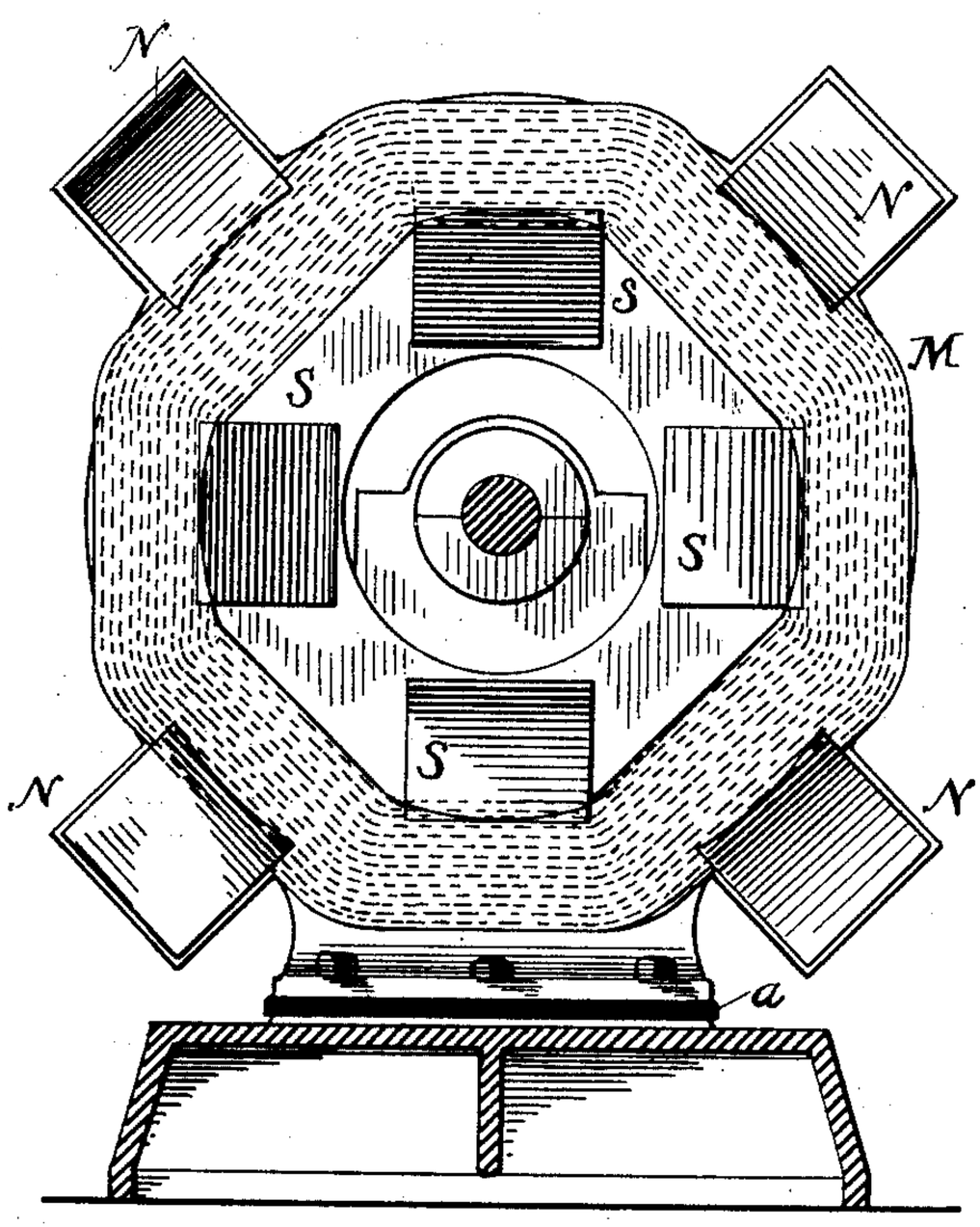
(No Model.) 2 Sheets—Sheet 2.

J. B. ENTZ.

DYNAMO ELECTRIC MACHINE.

No. 434,590. Patented Aug. 19, 1890.

FIG. 3.



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UNITED STATES PATENT OFFICE.

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DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 434,590, dated August 19, 1890.

Application filed December 6, 1888. Serial No. 292,831. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS B. ENTZ, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented a certain new and useful Improvement in Dynamo-Electric Machines, of which the following is a specification.

My invention relates to that class of electrical generators known as "multipolar dynamo-electric machines," in which a number of field-magnet poles are arranged around an armature with north and south poles alternating in position, the armature being wound with a continuous coil connected at intervals with blocks of a commutator.

The object of my invention is to provide a more simple, compact, cheap, and effective construction for this class of machines than has hitherto been produced.

The main feature of my invention consists in arranging the field-magnet poles so that all the poles of one sign are inside the ring-armature and all the poles of the opposite sign outside of it.

Another feature of my invention is the use of only one exciting coil or helix for all the field-magnet poles, such coil being wound outside of all the poles of one sign and inside the poles of the other sign. The poles are arranged substantially in a circle and joined together and supported by a circular or other yoke or back piece.

My invention further consists in various novel devices and combinations of devices employed by me in carrying into effect the above-named objects, as hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings.

Figure 1 is a longitudinal vertical section of the armature of the field-magnet with the commutator and journal-boxes in elevation; Fig. 2, an end view of the machine viewed from the left of Fig. 1, and Fig. 3 an end view of the field-magnet looking in the opposite direction.

The machine is supported upon a suitable bed-plate A.

B is the armature-shaft supported by pillow-block C at the ends of the bed-plate, such pillow-blocks being insulated from the bed-plate by sheets of vulcanized fiber or other suitable insulating material *a*.

Upon the shaft B is a hub D, from which spokes E radiate, and to these spokes is attached by bolts or otherwise a ring F, which forms the core of the armature. The coils G are wound continuously upon this core and are connected at intervals with the blocks of commutator H. These connections are not illustrated; but they are such as are common in multipolar machines. The field-magnet consists of a continuous yoke or back piece I, supported from or formed in one piece with the pillow-block at one end of the machine. The yoke I is formed with lugs or projections K and K′, which extend alternately from the outer and inner edges of said yoke. As shown, the yoke is in circular form; but it may be of any other suitable shape for supporting and joining together the pole-pieces. Such pole-pieces are supported from the lugs K and K′. The pole-pieces N, extending from the external lugs K, are all of one polarity and extend outside of the armature F, and the pole-pieces S are all of the opposite polarity and extend from the lugs K′ inside the armature F. Between the armature F and the yoke I is a space for the field-magnet coil. This is an annular coil of wire M, wound on a shell O, which shell is placed upon the contracted portion of the pole-pieces S, which are the cores of the magnet, and within the circle of the pole-pieces N. Such coil therefore acts to energize all the pole-pieces in the most effective manner and without loss of the magnetic lines of force of such coil, the lines from one side of the coil being expended in magnetizing the poles S and those from the other side being utilized in the poles N.

It will be seen that this furnishes a very compact and simple construction for a multipolar machine, and one that is exceedingly effective in its results. I have illustrated the use of eight poles in the machine; but it is evident that a larger or smaller number may be employed, if desired.

What I claim is—

1. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having all its poles of one po-

larity inside the armature and all those of the opposite polarity outside of said armature, substantially as set forth.

2. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having a substantially circular yoke and poles extending from said yoke alternately outside and inside of said armature, substantially as set forth.

3. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having a substantially circular yoke provided with alternate internal and external lugs, and poles extending from said lugs alternately inside and outside of said armature, substantially as set forth.

4. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having poles extending alternately inside and outside of said armature, all said inside poles being of one polarity and all said outside poles being of the opposite polarity, substantially as set forth.

5. In a multipolar dynamo-electric machine, the combination, with the armature and the alternating poles of opposite polarity, of an exciting-coil wound outside of all the poles of one polarity and inside of those of the opposite polarity, substantially as set forth.

6. In a multipolar dynamo-electric machine, the combination, with the armature, of the field-magnet having poles of alternating polarities extending from its yoke with the poles of one polarity in one substantially circular line and those of the opposite polarity in a line concentric therewith, and a single exciting-coil wound outside the poles of one polarity and inside those of the other polarity, substantially as set forth.

7. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having poles extending alternately inside and outside of said armature, and a single exciting-coil for all said poles, substantially as set forth.

8. In a multipolar dynamo-electric machine, the combination, with a ring-armature, of a field-magnet having poles extending alternately inside and outside of said armature, and a single exciting-coil wound outside of said inner poles and inside of said outer poles, substantially as set forth.

9. In a multipolar dynamo-electric machine, the combination, with an armature-shaft, of spokes radiating therefrom, a ring-armature carried by said spokes, a substantially circular field-magnet yoke concentric with said shaft, and poles extending from said yoke into proximity with said armature, substantially as set forth.

10. In a multipolar dynamo-electric machine, the combination, with an armature-shaft, of spokes radiating therefrom, a ring-core carried by said spokes, a substantially circular yoke concentric with said shaft, poles extending from said yoke alternately inside and outside of said core, and an annular exciting-coil wound outside of said inner poles and inside of said outer poles, substantially as set forth.

This specification signed and witnessed this 17th day of November, 1888.

JUSTUS B. ENTZ.

Witnesses:
H. F. T. ERBEN,
H. C. YOUNG.