

(No Model.)

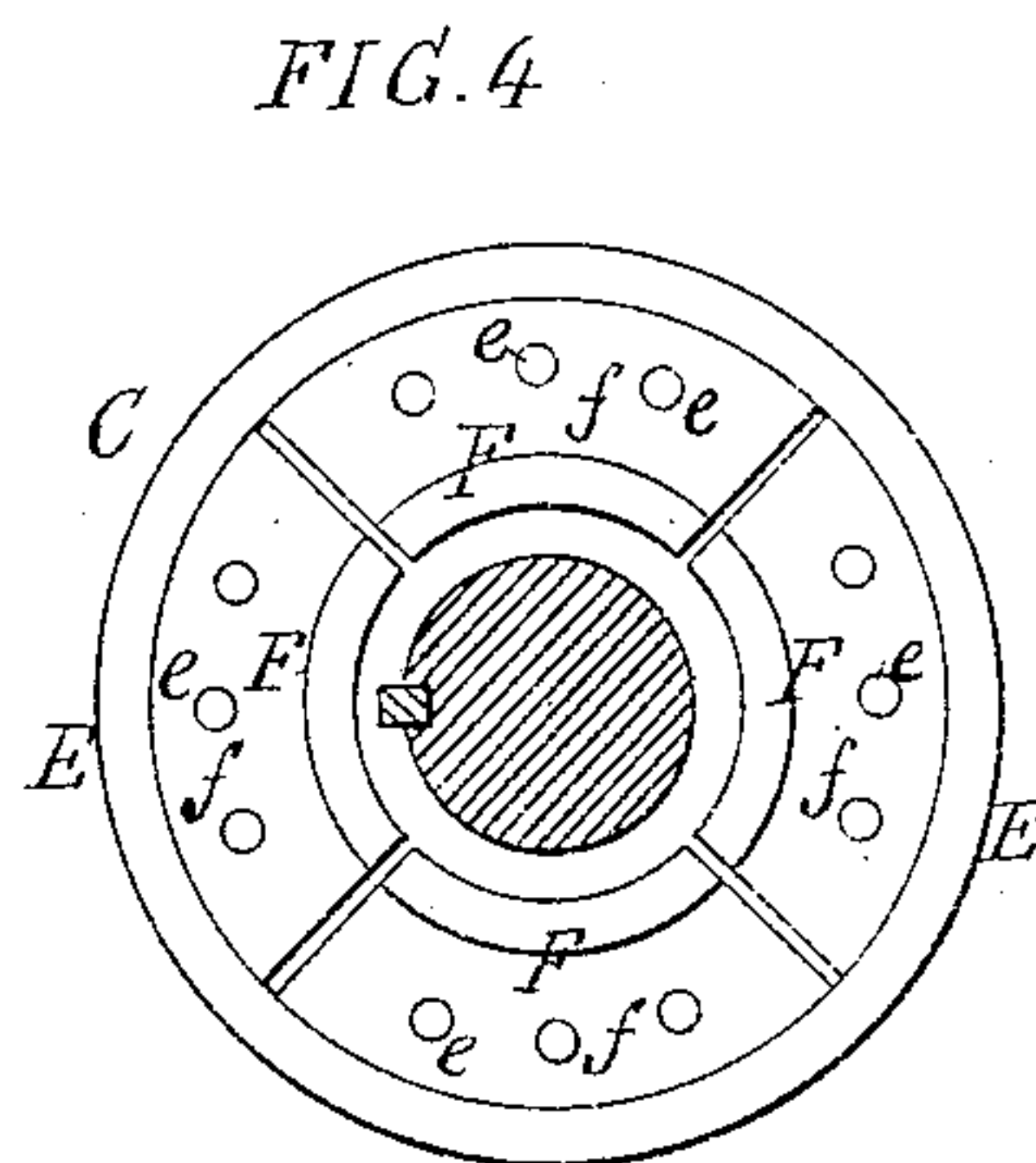
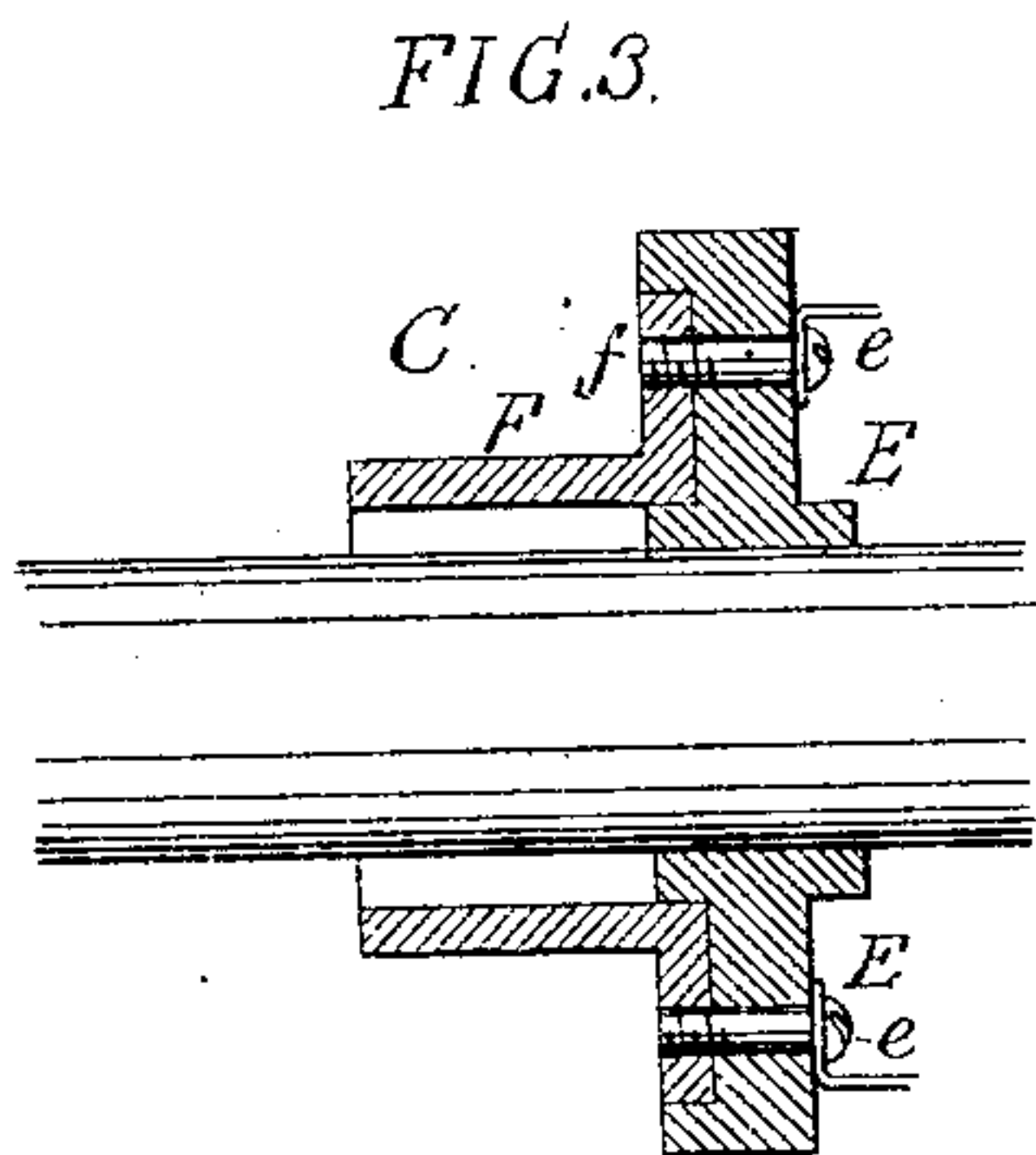
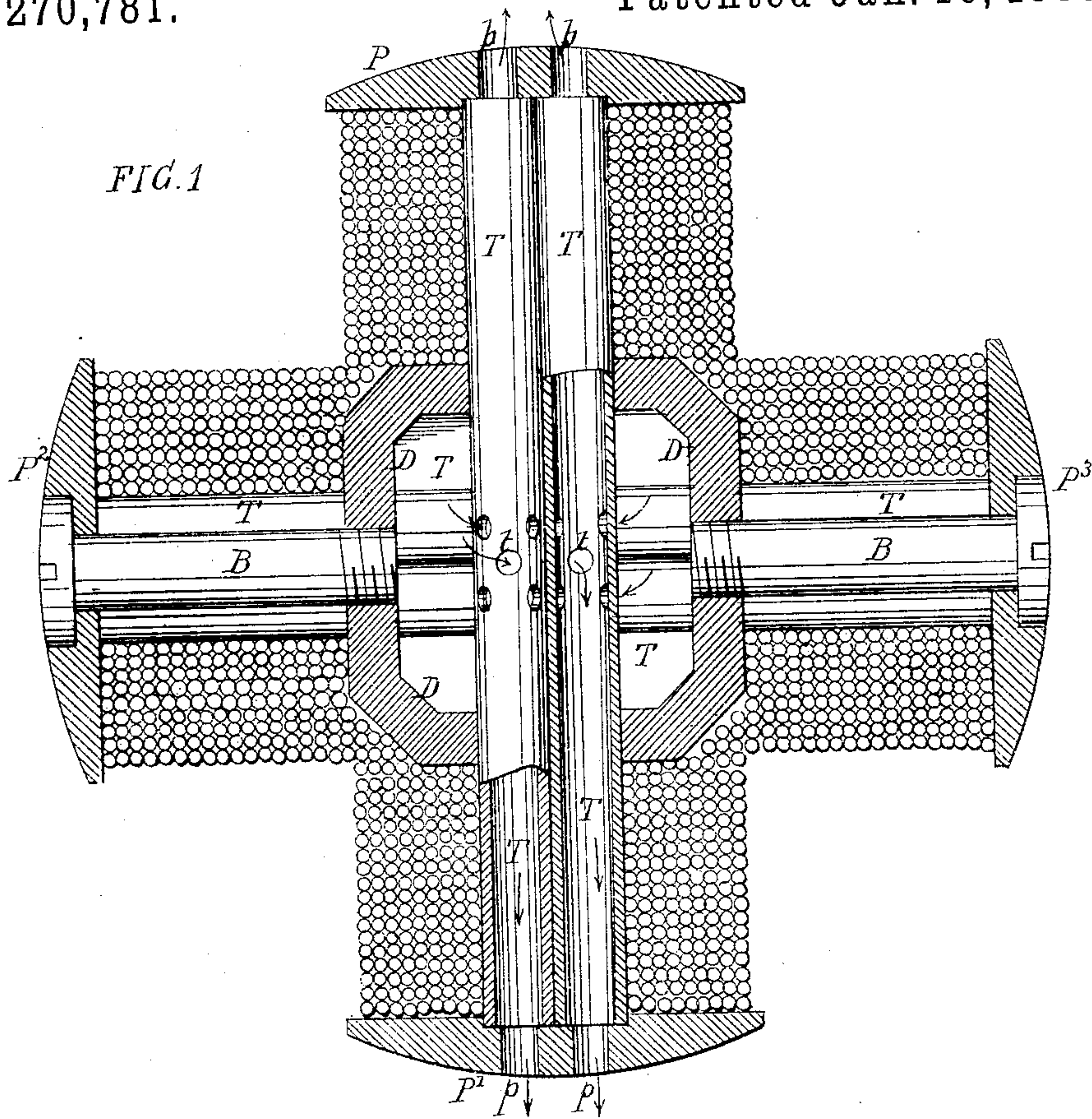
2 Sheets—Sheet 1.

W. P. FREEMAN.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 270,781.

Patented Jan. 16, 1883.



WITNESSES:

James F. Tobin
Hamilton D. Turner.

INVENTOR:

Warren P. Freeman
by his Attorneys
Brown and Ford

(No Model.)

2 Sheets—Sheet 2.

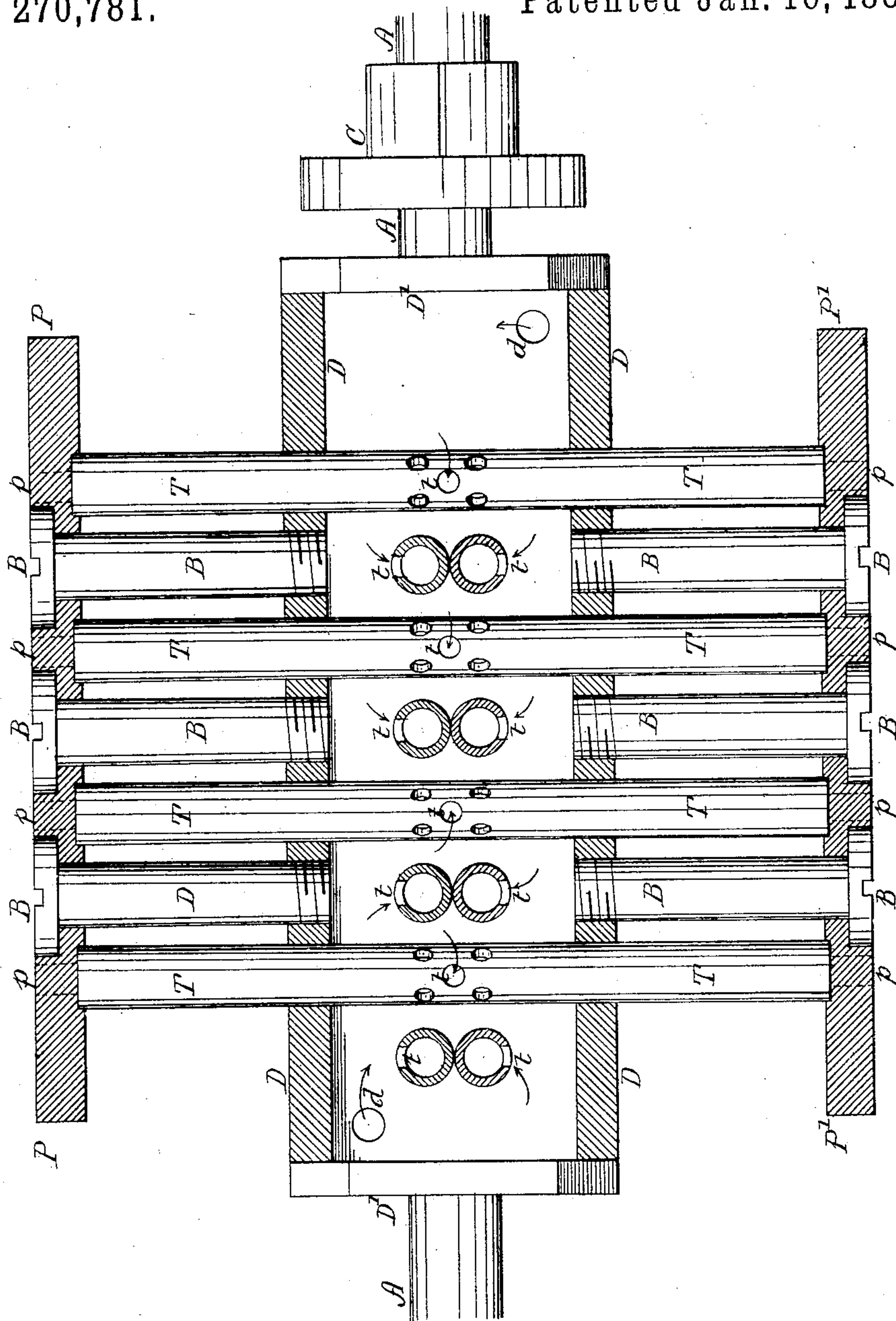
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FIG. 2



WITNESSES:

James F. Jobins

Hamilton D. Turner

INVENTOR:

Warren P. Freeman
by his Attorneys
Howe and Fessenden

UNITED STATES PATENT OFFICE.

WARREN P. FREEMAN, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM F. JOBBINS, OF EAST ORANGE, NEW JERSEY.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 270,781, dated January 16, 1883.

Application filed October 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, WARREN P. FREEMAN, a citizen of the United States, and a resident of New York city, New York, have invented certain Improvements in Armatures for Dynamo-Electric Machines or Electric Motors, of which the following is a specification.

My invention consists of improvements in the construction of the armatures of dynamo-electric machines or electric motors, as fully described hereinafter.

In the accompanying drawings, Figure 1 is a transverse section of my improved armature; Fig. 2, a longitudinal section of the armature without its inducing-coils, and showing an outside view of the commutator; Fig. 3, a sectional view of the commutator I prefer to employ, and Fig. 4 an end view.

In the drawings I have shown the armature as having four pole-pieces, $P P' P^2 P^3$; but the number may be varied to suit different requirements, and the opposite pole-pieces are magnetically connected through the medium of tubes $T T$, extending from pole to pole and passing diametrically through a drum, D , of brass or other non-magnetic material. I prefer to arrange these tubes in pairs, there being shown in the drawings four pairs of tubes for each pair of pole-pieces $P P'$ and $P^2 P^3$, the pairs of tubes being set apart, so that a pair of tubes of one set of pole-pieces, $P P'$, will pass at right angles between two adjacent pairs of tubes connecting the other two pole-pieces, $P^2 P^3$, the tubes of one pair of pole-pieces being out of contact with those of the other pole-pieces. The ends of the tubes $T T$ are set into shallow sockets in the pole-pieces, and all are securely held in place by bolts B passing through the pole-pieces and screwed into the brass drum D , the heads of the bolts being let into recesses in the faces of the pole-pieces so as not to project beyond the latter. To each end of the drum is secured a head, D' , carrying a journal, A , these journals being adapted to bearings in which the armature, when complete, may rotate between the poles of the field-magnets. I prefer to make the drum hollow, and at one or both ends of the same are formed air-inlets d , and the tubes T , within the interior of the drum, are provided with perforations $t t$, while in the pole-pieces $P P'$ are formed openings $p p$, Fig. 1, coincid-

ing with the ends of the tubes T , so that when the armature revolves it will act like a fan, and there will be a constant current of air through the armature, as indicated by the arrows in the drawings. The tubes T , with the bolts B , form the cores of the armature, on which are wound the inducing-coils, as indicated in Fig. 1, the terminals of these inducing-coils being connected to the segments of the commutator C , Fig. 2, keyed to one of the journals A , Fig. 4. The body of the commutator is formed of a disk, E , of insulating material and having an annular recess or groove in its outer face, and in this groove are fitted the flanges f of metal segments F , (four in the present instance,) suitably spaced and secured by screws e , some of which also secure the terminal wires and form the proper electrical connections. The projecting portions of the segments F , Fig. 3, form a ring, as shown in Fig. 4, on which the commutator-brushes bear.

I claim as my invention—

1. The combination of a drum and the pole-pieces of an armature with connecting-tubes forming the core, substantially as set forth.

2. The combination of a non-magnetic drum and pole-pieces of an armature with connecting-tubes forming the core, substantially as described.

3. The combination of a non-magnetic drum and pole-pieces, with tubes passing through said drum and connecting the opposite pole-pieces, and bolts securing the parts together.

4. The combination of a non-magnetic drum, four or more pole-pieces, and tubes passing through the drum and connecting opposite pole-pieces, the tubes of one pair of poles being out of contact with the tubes of the other pair, substantially as set forth.

5. The combination of a hollow drum with pole-pieces and connecting-tubes passing through said drum, the tubes being perforated within the drum, and the pole-pieces having openings coinciding with the ends of the tubes.

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

WARREN P. FREEMAN.

Witnesses:

GEO. W. OLLIFF,

WALTER K. FREEMAN.