(No Model.)

L. N. P. POLAND.

DYNAMO ELECTRIC MACHINE.

No. 383,320. Patented May 22, 1888.

Fig. 1.

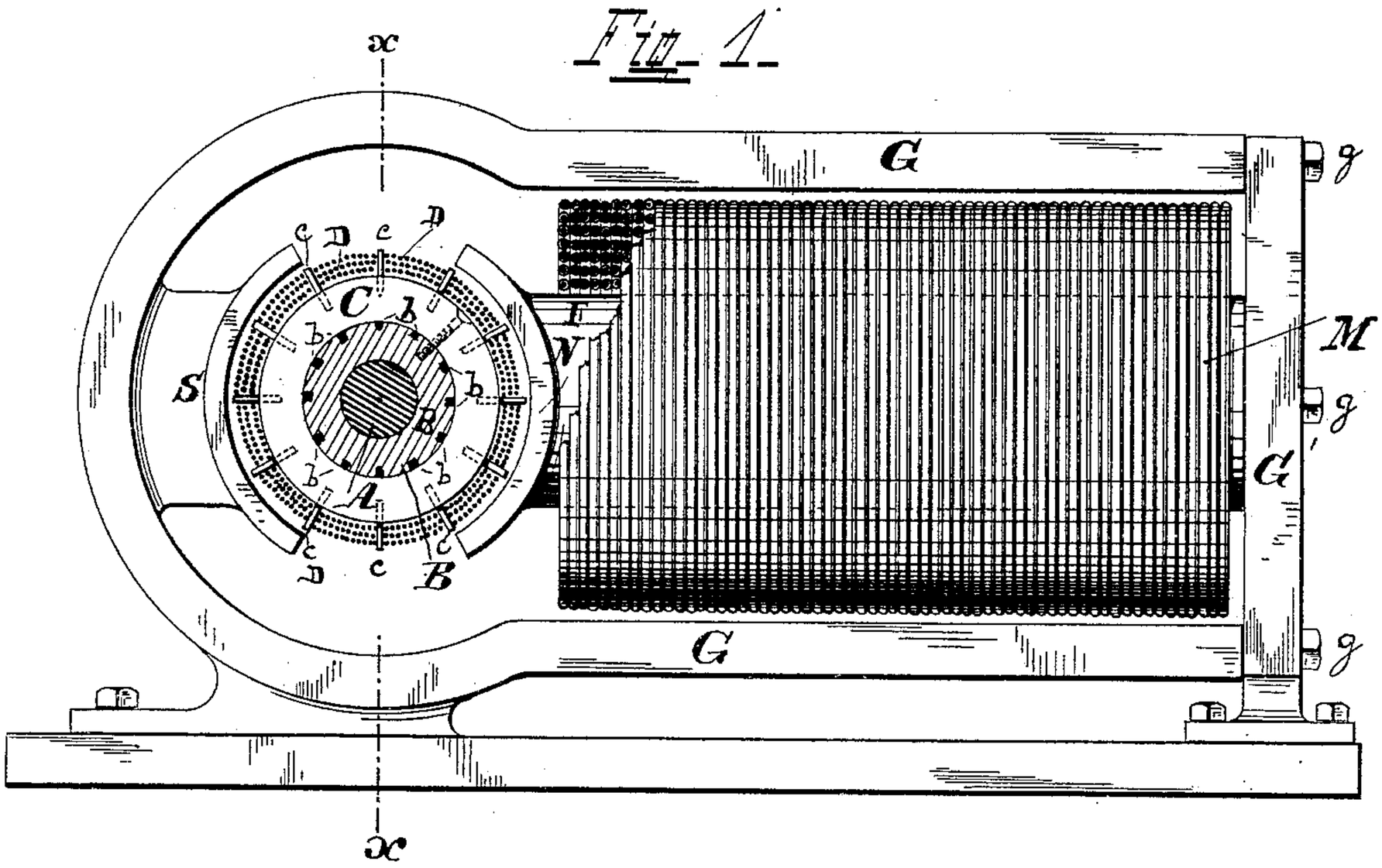


Fig. 2.

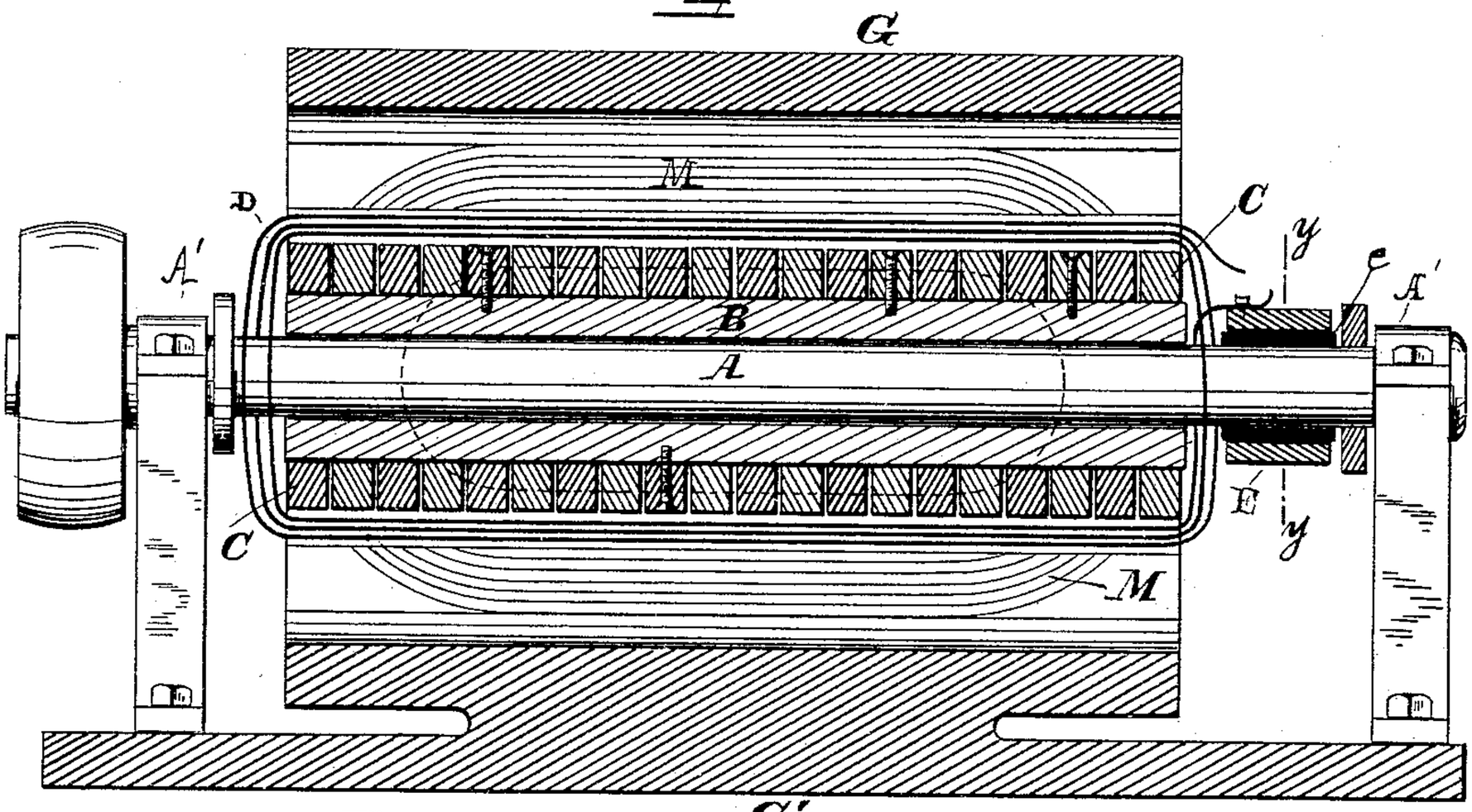
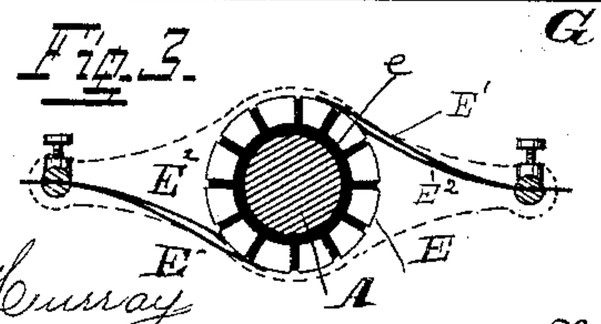


Fig. 3.



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UNITED STATES PATENT OFFICE.

LAWRENCE N. P. POLAND, OF CINCINNATI, OHIO.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,320, dated May 22, 1888.

Application filed April 21, 1887. Serial No. 235,590. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE N. P. POLAND, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification.

My invention is an improved dynamo-electric machine.

The object of my invention is, first, a light compact machine in which provision is made for ventilating the coils, and thus preventing their heating; second, to provide for short-circuiting the neutral coil, whereby less power is required to drive the machine, and sparking is prevented and the wear of the commutator greatly reduced; third, to so arrange the field-magnet as to utilize the outward induction of the magnet-coils, and save wire on the magnet and the power used to excite the magnet.

The invention will be first fully described in connection with the accompanying drawings, and then particularly referred to and pointed out in the claim.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, Figure 1 is a view, partly in central vertical section, taken transversely through the armature and longitudinally through the magnet, the axes of the armature and magnet being of course at a right angle to each other. Fig. 2 is a longitudinal section through the axis of the armature on the line *x x* of Fig. 1. Fig. 3 is a vertical section through line *y y*, Fig. 2, showing the commutator and brushes in end elevation.

On the armature-shaft A, which is mounted in standards A′, secured on the base of the machine, is fitted a wooden cylinder, B. This cylinder has longitudinal grooves *b*. On the cylinder B are secured a number of wrought-iron rings, C. Each end ring is provided with outwardly-projecting pins *c*. The wire coils D are wound over the rings C. The pins *c* keep the wire in place and separate the coils from each other, so that the spaces between the coils and the spaces between the rings C, together with the longitudinal grooves *b* in the wooden cylinder B, afford perfect ventilation, keeping the whole armature cool when the machine is in use, and thus allowing a very large yield of the current.

On the armature-shaft A is mounted the commutator E, which may be of any approved form and insulated from the shaft A by the tube *e*, of some non-conducting material. The current comes from the coils in the usual manner, and is taken off by two brushes, E′, at the maximum point. In addition to these two brushes E′, which are of the usual form, there are also two more brushes, E², slightly in advance of but in electrical connection with them, so that two coils of the armature are always in connection with the brushes, so that the neutral coil is short-circuited. The current is therefore not interrupted, sparking is avoided, the wear of the commutator greatly reduced, and less power is required to drive the machine. The field-magnet consists of one central magnet, F, which is heavily wrapped, forming the field-coil M. This magnet is inclosed by a heavy iron shell, G. To one end, G′, of this shell the magnet F is secured by screws *g*, or in any other suitable manner. The opposite end of the shell curves around and incases the armature. The pole N of the magnet F conforms to the shape of the armature, as does also the opposite pole, S, which is preferably cast in one piece with the shell G. As the field-magnet is nearly closed, it utilizes the outward induction of the magnetic coil, and keeps the residual magnetism better than as though made more open. It thus effects a great saving of the wire used on the magnet and of the current used to excite it, and the machine will start up more readily.

What I claim is—

In a dynamo-electric machine, the combination, substantially as specified, of the armature-shaft, the longitudinally-grooved wooden cylinder mounted thereon, the iron rings C on said cylinder, said rings being separated from each other, the separate coils, the field-magnet having poles N S, the armature, and the shell inclosing the armature and magnet.

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