

(No Model.)

C. E. BALL.

ARMATURE FOR ELECTRIC MOTORS.

No. 285,547.

Patented Sept. 25, 1883.

Fig. 1.

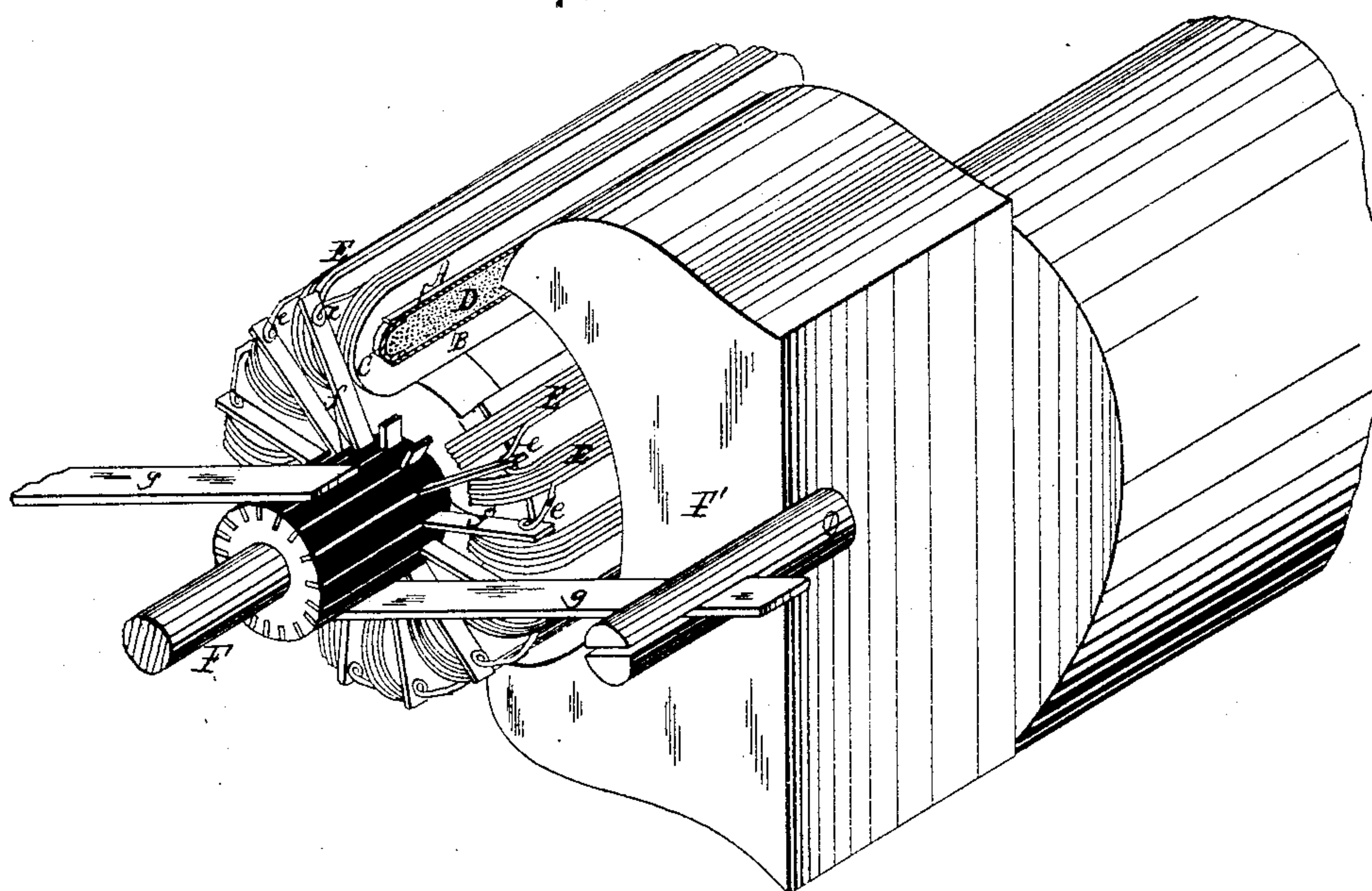
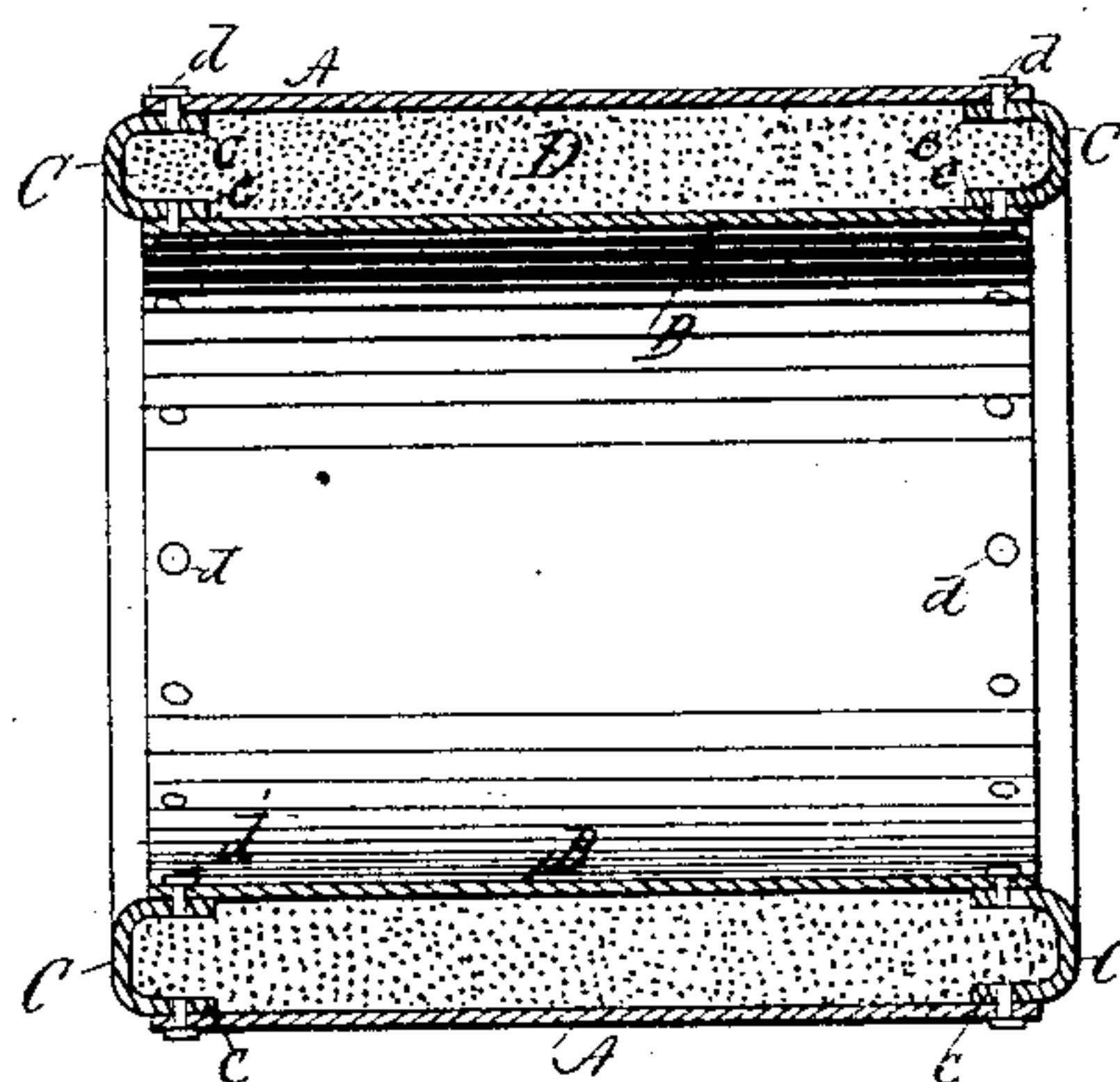


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

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ARMATURE FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 285,547, dated September 25, 1883.

Application filed December 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BALL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in the Armatures of Electric Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective partly broken away, and Fig. 2 a longitudinal section.

In electromotors of that class in which the armature consists of an armature-body of magnetic material enwrapped with an insulated conductor of electricity it has been found that there is considerable loss of energy, due to the imperfect or tardy demagnetization of the core of the armature. Such cores have commonly consisted of a solid ring of iron, or of several plates of iron laid side by side, or of a continuous iron wire.

My invention has for its object the provision of means whereby the annular core of an electromotor may be caused to rapidly part with its magnetism upon passing out of the field of force or influence of the field-magnets; and it consists in an annular core composed of a hollow ring of magnetic or non-magnetic material, whose interior cavity is filled with a magnetic material in a finely-divided state—such as iron filings, turnings, or shavings—such core being enwrapped with an insulated conductor of electricity in the ordinary or any suitable manner.

In practice I prefer to construct the armature-core of two concentric cylinders of iron, one set within the other, and secured together by annular heads, having flanges turned up around their edges, to which the cylinders are secured by rivets or bolts, the hollow ring so formed having its interior cavity completely filled with iron filings or turnings, and being then enwrapped with insulated copper wire and mounted on a shaft in the ordinary manner.

In a previous patent I have described a dynamo-electrical machine consisting of an annular armature revolving in the field of force of a single pole of an electro-magnet, and I have found that the principle of using but one

pole of a field-magnet to develop the current in the armature is of equal value in electromotors, and I have shown my invention applied to a motor constructed substantially in the same manner. I do not, however, limit myself to this construction, as the present invention is equally applicable to a motor in which two or several poles of a field magnet or magnets are employed.

Referring to the accompanying drawings, A represents the exterior cylinder of the annular core. B is the interior cylinder, and C C the annular rings which form the sides of the core. The rings C C have their edges turned up all around, so as to form flanges *c c*, which fit within the cylinders A and B, and to which such cylinders are attached by rivets *d d*. The corners of the rings C C are rounded off, as shown, so as to avoid cutting or injuring the insulation of the conductor with which the cylinder is wrapped.

D represents the filling of the core, consisting of iron filings or other magnetic material in a finely-divided state, and E represents the insulated conductor with which the cylinder is enwrapped. The terminals *e e* of the conductor-coils are connected with suitable commutator-plates, *f f*, which revolve in contact with brushes *g g*. The armature and commutator are mounted on a shaft, F, and the former rotates in proximity to the pole F' of an electro-magnet, the entire arrangement, with the exception of the core, being of the usual or of any preferred form of electromotors.

It is well known that an electro-magnet whose core is composed of a number of rods or wires bunched together is capable of being rendered more powerfully magnetic under the influence of a given current of electricity than where such core is composed of a single piece of iron, and I have found that where the core is composed of particles of iron in a finely-divided state it is capable of a still higher degree of magnetization, while at the same time possessing the quality of instantly parting with every particle of its magnetism on cessation of the current by which such magnetism is induced. My invention is therefore of great advantage when applied to electromotors, as any retention of magnetism by the armature-core after

the cessation of the current retards the motion of such core and results in a loss of energy and consequent power.

What I claim as my invention is as follows:

- 5 A core for the armature of an electric motor, consisting of a hollow ring whose interior cavity is filled with a magnetic material in a finely-divided state, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of 10 December, 1882.

CHAS. E. BALL.

Witnesses:

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