

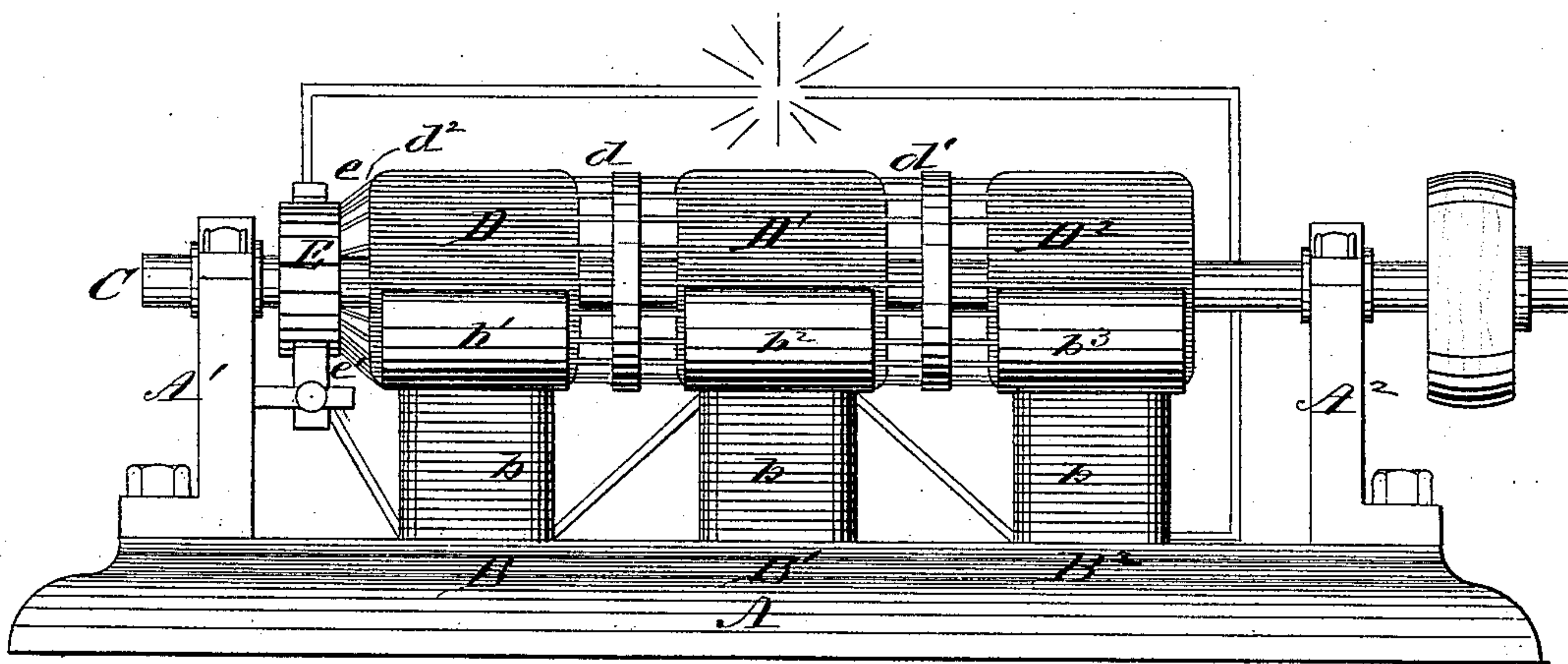
(No Model.)

C. E. BALL.

DYNAMO ELECTRIC MACHINE.

No. 278,076.

Patented May 22, 1883.



Witnesses.

Jos. B. Connolly
Wm H. Powell.

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UNITED STATES PATENT OFFICE.

CHARLES E. BALL, OF PHILADELPHIA, PENNSYLVANIA.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 278,076, dated May 22, 1883.

Application filed February 20, 1883. (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 Dynamo-Electric Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification, in which the figure is a side elevation.

My invention has reference to that class of dynamo-electric machines in which the armature revolves within the field or influence of but one magnetic pole, the first of which was the machine shown and claimed in the Letters Patent of the United States granted to me, dated June 20, 1882, No. 259,791. My improvements thereon have for their object to provide a construction whereby three or more armatures may be employed, each of said armatures being located and adapted to be rotated in the inductive field of only one pole of a magnet, and said armatures being so constructed and arranged that they may be coupled for intensity or for quantity.

My improvements consist in the combination, in a dynamo-electric machine, of three or more armatures on the same shaft, each of said armatures being located in the inductive field of only one pole of a magnet, there being one magnetic pole for each such armature.

My improvements further consist in certain details of construction and combination, hereinafter fully described.

Referring to the accompanying drawing, A indicates the base of a dynamo-electric machine, said base being a casting in which are fastened three upright wrought-iron bars, B B' B². These are the magnet-bars, and they are wound with insulated wire *b* in such a manner as to produce three magnetic poles, two of which are alike in sign—that is, two of the poles are N. and one S., or two may be S. and one N. The pole-pieces of the magnets are designated by the letters *b'* *b'²* *b'³*. At each end of the casting are standards A' A², forming bracket-supports for the armature-shaft C,

which has its bearings thereon. There are three armatures, D D' D², which are fast on the shaft C, and these are so arranged that each of them is in the inductive field of one of the magnet-poles. Said armatures are of the class known as "ring-armatures," and they are coupled together, as shown, the ends of the bobbins of the first armature, D, being connected by the wires *d* with the bobbins of the second armature, D', and the bobbins of said second armature, D', being connected to the bobbins of the third armature, D², by the wires *d'*. The coupling may be for intensity, in which case the wires *d* will be connected to the bobbins of the armature D' in such manner that the current from armature D will flow through armature D', and the wires *d'* will be connected to the bobbins of the armature D², so that the combined currents from armature D' will flow through said armature D²; or the armatures may be coupled for quantity by leading the wires *d* *d'* around the armatures D' D², connecting with the ends of the bobbins of said last-named armatures. From the armature D the circuit is by the usual connection-wires *d²* and commutator to the upper brush, *e*, of the commutator or collector E, thence to the external circuit and field-magnets, thence to the lower brush, *e'*, thence to the armature D, back through armatures D' D², successively, and thence onward, as before.

The number of armatures employed may be increased to any desired extent, so that my invention includes a series of three or more armatures on the same shaft and with the connections substantially as described.

What I claim as my invention is as follows:

1. The combination, in a dynamo-electric machine, of three or more armatures on the same shaft, each of said armatures being located and adapted to be rotated in the inductive field of only one pole of a magnet, said armatures being constructed to allow of their being connected directly together, substantially as shown and described.

2. The combination, in a dynamo-electric machine, of three armatures, each of which is located and adapted to be rotated in the inductive field of only a single magnet-pole, two of the poles being alike, and the remaining

pole unlike the others, substantially as shown and described.

5 3. The combination, in a dynamo-electric machine, of three armatures located and adapted to be rotated in the inductive fields of different poles, there being only one pole for each armature, and all of the pole-pieces being on the same side of the machine, substantially as shown.

In testimony that I claim the foregoing I do have hereunto set my hand this 17th day of February, 1883.

CHAS. E. BALL.

Witnesses:

ROBERT J. OWEN,
M. D. CONNOLLY.