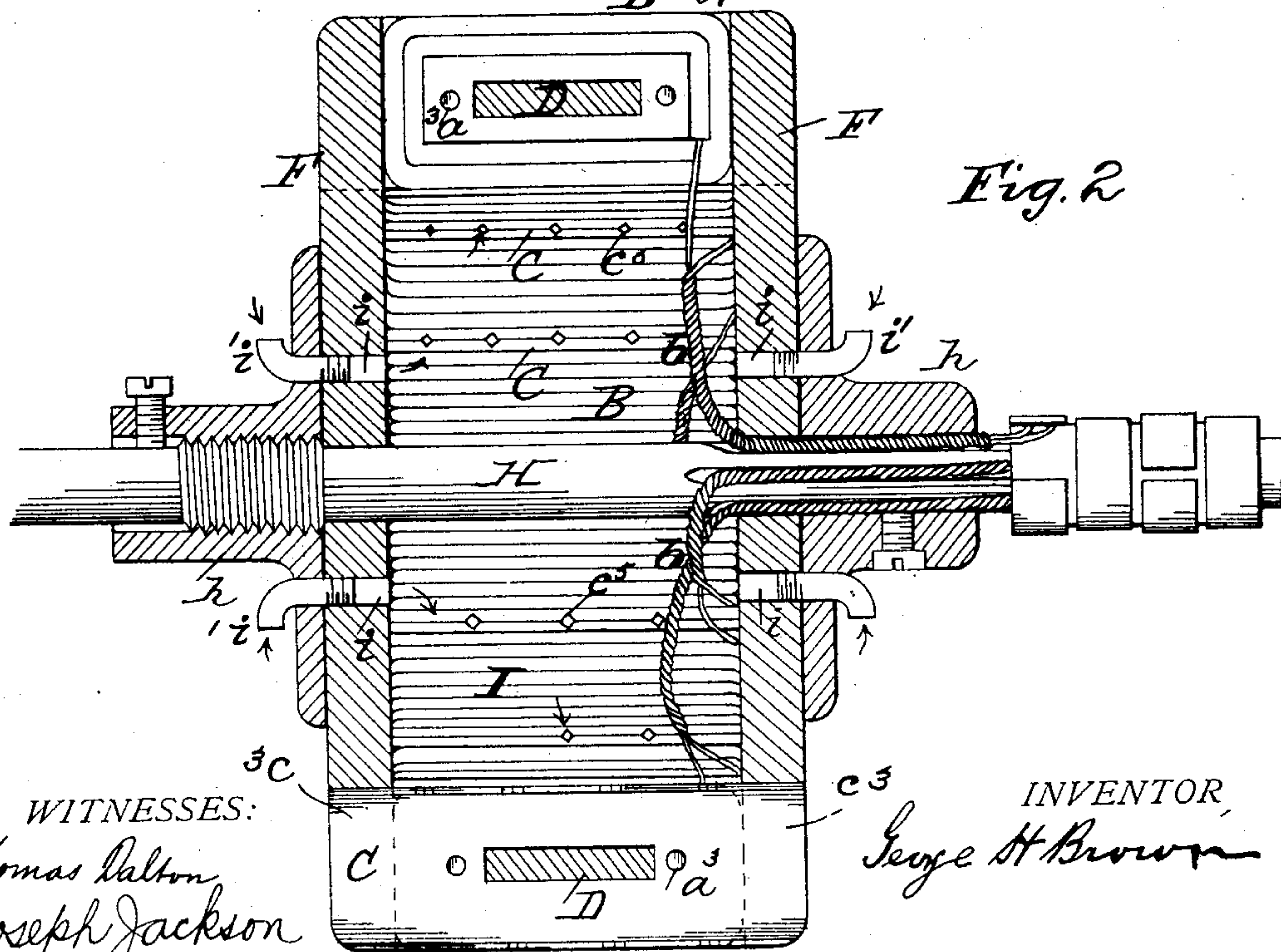
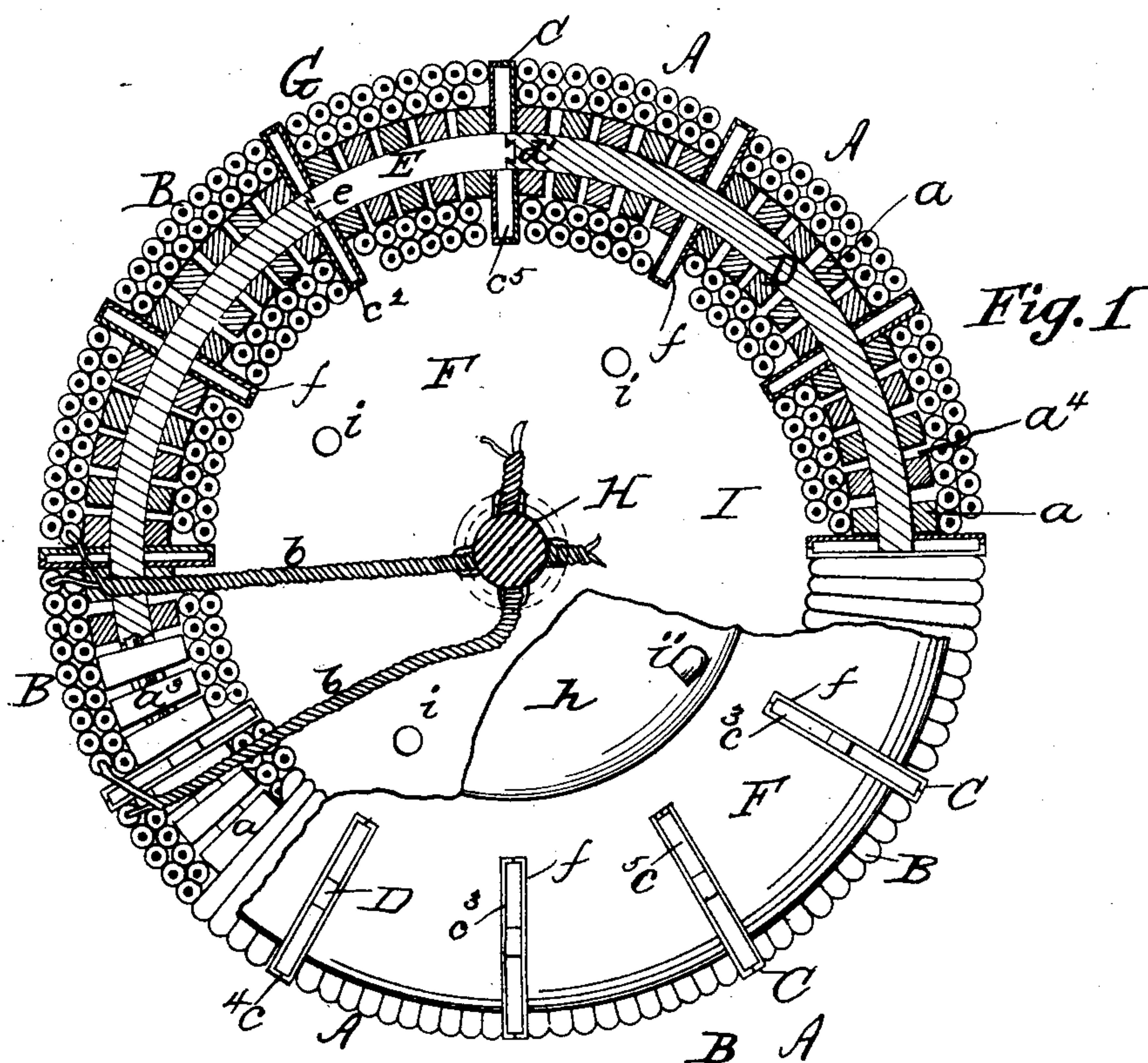


(No Model.)

2 Sheets—Sheet 1.

G. H. BROWN.
ARMATURE FOR DYNAMO ELECTRIC MACHINES.
No. 255,137. Patented Mar. 21, 1882.



WITNESSES:
Thomas Dalton
Joseph Jackson

INVENTOR,
George H. Brown

(No Model.)

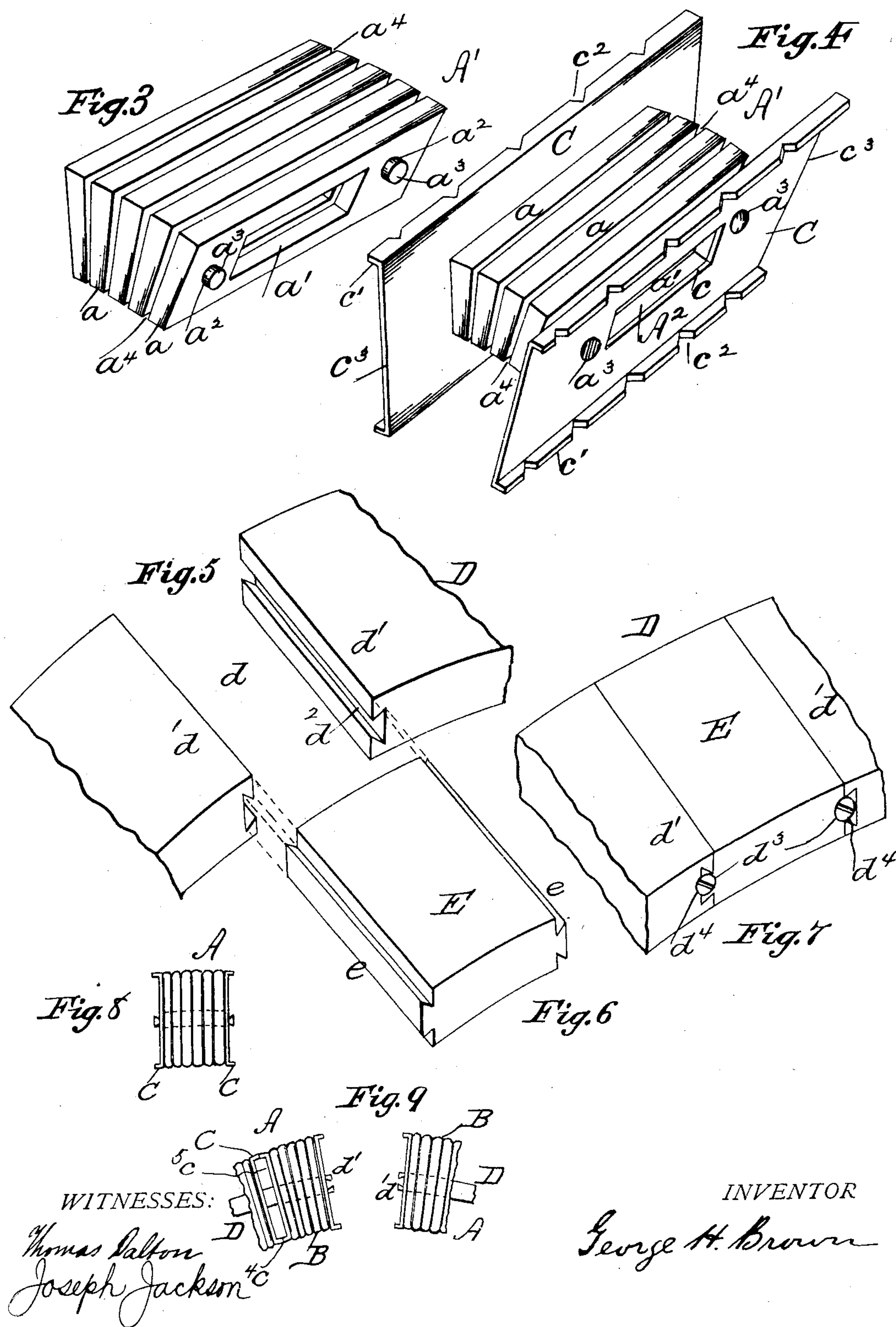
2 Sheets—Sheet 2.

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ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 255,137.

Patented Mar. 21, 1882.



N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE H. BROWN, OF NEW YORK, N. Y., ASSIGNOR TO CHARLES A. CHEEVER, OF SAME PLACE.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 255,137, dated March 21, 1882.

Application filed November 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. BROWN, a citizen of the United States, resident of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Armatures for Dynamo-Electric Machines, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation, partly in section, and Fig. 2 is a transverse vertical section, of an armature constructed according to my invention. Fig. 3 is a perspective of a core of one of the sections or bobbins. Fig. 4 is a like view of the same with attached side pieces, the whole forming the spools for the bobbins or sections. Fig. 5 is a broken perspective, showing ends of band or ring for bobbins or sections. Fig. 6 is a perspective of locking-key for said ends. Fig. 7 is a perspective showing said ends locked together. Fig. 8 is a side elevation of locking-key and bobbin or section therein, and Fig. 9 is a similar view of the band or ring ends.

My invention has relation to armatures for magneto electric or dynamo-electric machines, and has for its object to provide an armature which can be cheaply and expeditiously manufactured, and wherein when one or more of its sections or bobbins are burned or worn out such sections or bobbins can readily be removed and replaced with new ones.

My invention accordingly consists of the novel construction, combination, and arrangement of parts having reference particularly to the following features, viz: to the formation and construction of the armature bobbins or sections; to the provision of a broken or mutilated band or ring for the reception of such sections; to the provision of a lock or connecting-piece for uniting the ends of such band after the bobbins or sections have been placed thereon to form an annulus having an endless succession of sections or bobbins thereon; to the provision of wooden or other insulator armature side pieces so fashioned as regards their configuration that they may be connected to the bobbin or section ring without the aid of screws or bolts; to the manner of connecting

the bobbin or section wires together and to the commutator; to the provision of means for ventilating the armature; and, finally, to the detailed construction of parts, as hereinafter fully set forth.

In referring to the accompanying drawings, I will first proceed to describe the formation and construction of the bobbins or sections of which the armature is composed, and then the construction of the latter, premising that as all the bobbins or sections are identical in construction a description of one will suffice for all.

Referring to Figs. 3 to 9, A represents a bobbin or section, A' the core or spool thereof, and B the wire wound thereon. The core A' is composed of several wedge-shaped bars, $a a$, of soft iron, of any desired length and width, each having a central elongated opening, a' , and small circular apertures $a^2 a^2$ at or near their ends. Any desired number of these bars may be taken to form the core of the section or bobbin, such number being dependent upon the size and shape of the armature to be built, and when determined upon they are placed side by side longitudinally, and pins or rivets $a^3 a^3$ are passed into the apertures $a^2 a^2$ in such manner that said bars are securely bound or connected together. Said bars, when so pinned or riveted together, are relatively arranged to provide intervals or spaces $a^4 a^4$ between them, for purposes hereinafter described.

C C are plates of sheet metal—such as Russia sheet-iron or equivalent material—secured to the outer bars of each section in any appropriate manner, or they and the bars $a a$ may be simultaneously united together by the rivets or pins a^3 . Said plates extend on all four sides beyond the planes of the sides of the bars $a a$, as shown, to form spool ends therefor, and act as guides for winding the wire upon said bars. Said plates are provided with elongated openings c , corresponding to and registering with openings a' in bars $a a$, and have flanged edges c' nicked or cut away, as shown at c^2 . Said parts, when constructed and connected together as described, constitute the core or spool A' of a bobbin or section, which is represented as being longer than it is wide, and having a central elongated passage, A², as

shown in Fig. 4. Such bobbin or section is then placed in a lathe or other suitable winding-machine and the wire is wound longitudinally thereon until it is flush with the top and bottom edges of the plates C C, as indicated in Fig. 9. The bobbin or section is then complete. When the requisite number of bobbins or sections have been constructed they are then built or so arranged to form the bobbin or section ring for the armature, which I will now proceed to describe.

D is a band or ring broken away at d , its ends d' d' having dovetail slots d^2 d^2 formed therein. Upon this band or ring the sections or bobbins A are placed by simply passing one of the ring ends d' d' through the elongated openings A^2 in said bobbins or sections, until a sufficient number of the latter completely covers said band, leaving only its slotted or dovetailed ends d' d' exposed, as shown in Fig. 9. To unite these ends of the band and fill up the intervening space between them with a bobbin or section I proceed as follows: I take a bar, E, of the same material as that of which the band is composed, and which may be brass or other suitable material. Such bar is formed with dovetail tongues e , adapted to fit into the slots d^2 d^2 of band D, and is of sufficient width to support a bobbin or section, as shown in Fig. 8, and fill up said intervening space. Said bar or key, with the bobbin placed thereon, is slid into said space, its tongues e entering slots d^2 , and thereby forming a lock or fastening for uniting the ends of band together, and providing for an endless succession of bobbins. To prevent the bar or key sliding out of its position, the band D is tapped at d^3 , and screws d^4 are inserted therein, and firmly hold the bar in its adjusted position. Such united band and the bobbins or sections thereon form an armature-bobbin ring, G, having side projections, c^3 c^3 , formed by the outer ends of the plates C extending beyond the wire coils B B. The flanged edges of adjacent plates contacting with each other, as shown at c^4 , produce intervening spaces, c^5 , as illustrated, and for purposes hereinafter set forth.

F F are the wooden side pieces for the armature, or they may be made of other insulating material. They are provided with peripheral notches f f , into which enter and are received therein the projections c^3 c^3 of the bobbin-ring G, thereby effecting an interlocking of said ring and side pieces, as shown in Figs. 1 and 2, to firmly and securely connect said parts together without the aid of screws or bolts. The armature is then placed upon a suitable shaft, as shown at H, and is held thereon by means of the screw or other holding nuts, h h . The ends of the wires of each bobbin or section are connected, as plainly shown in Figs. 1 and 2—*i. e.*, the inner end of the wire of one section is connected to the outer end of the wire of the succeeding section, these two ends being twisted together, as shown at b , and both connected or caused to contact with the same

commutator-plate, thereby providing for a continuous flow of current of the same polarity from each succeeding bobbin or section.

The advantages of the foregoing are substantially as follows: Each bobbin is wound separately before it is adjusted or elevated upon its holding or armature ring, thereby avoiding the annoyance of placing the latter in the winding-machine; or, if such ring has great extent of area or diameter, the expense of constructing a winding-machine of sufficient capacity to receive said ring is avoided. The bobbins or sections are held in position without the aid of screws or bolts, and the armature bobbin or section ring is in like manner secured to the sides of the armature, such construction effecting a saving in time, labor, and material, thereby cheapening the cost of manufacture. When any one or more of the coils B burn or wear out the nuts h are unscrewed, the sides F F are then unlocked from the ring G, and the key E and its contained bobbin withdrawn. The bobbins A are then taken off of band D until the useless or worn bobbins are reached. These are then replaced by new ones, whereupon the sound bobbins previously removed from said band are then replaced, the key and its bobbin reinserted in position, and the ring G interlocked with sides F F and secured to shaft H, as above described. It will be noticed that the sides F F are not of sufficient thickness to meet and touch each other, thereby providing an air space or chamber, I, between them. They are each formed with one or more openings, i i , in the outer or exterior ends of which are inserted elbows i' i' . As said armature revolves air is drawn or sucked through elbows i' i' into chamber I, from which it passes and circulates through and escapes from the spaces c^4 between plates C, and in, through, and from those between bars a a , thereby providing a constant current of air to pass through the armature and through the core of each bobbin or section thereof, the result whereof will be that such armature and coil will not heat so rapidly and to such an extent as has heretofore been the case in machines as ordinarily constructed.

What I claim as my invention is as follows:

1. An armature for dynamo-electric machines, consisting of a ring the ends of which are secured together by a removable key, and of a series of bobbins placed thereon, the sides of which overlap the cores of the bobbins, so as to interlock with wooden or other diamagnetic disks constituting the sides of the armature, substantially as shown and described.

2. A ring or band for holding the bobbins of the armature of a dynamo-electric machine provided with a removable key or section, whereby the placing of the bobbins on said ring or band is facilitated and they are more readily removed therefrom to obtain access to and replace burned or destroyed bobbins, substantially as shown and described.

3. An armature for dynamo-electric machines,

consisting of a ring or band provided with a removable key, a series of bobbins the cores of which are composed of two or more bars of soft iron joined together, so as to have intervening air-spaces, and two disks or sides, said parts inclosing or forming an air-chamber which communicates with the external air, whereby during the revolution of said armature air will be drawn into said chamber and circulate into and through the air-spaces in the cores of the bobbins or sections, substantially as shown and described.

4. In a ring-armature, the combination of the following elements, viz: a bobbin holder or ring provided with a removable key, a series of bobbins the cores of which are composed of a series of soft-iron bars slightly separated from each other to form air-spaces, diamagnetic perforated disks or armature-sides, and an intervening air-chamber, substantially as shown and described.

5. An armature for dynamo-electric machines, composed of a series of bobbins the cores of which are formed of a series of bars secured together to form intervening spaces, each of such bobbins having two sides or ends projecting beyond the remaining sides or ends of its core, and a ring provided with a removable key and means for securing the same to said ring, substantially as shown and described.

6. The bobbin or section A, the spool or core of which is composed of a series of soft-iron

bars with intervening air-spaces and enlarged or extended ends C C, having flanged edges, substantially as shown and described. 35

7. The bobbin or section A, having core A', composed of bars *a a*, and ends C³ C³, and provided with central slot or recess, A², substantially as shown and described.

8. The bobbin or section A, having core A', composed of a series of bars with intervening spaces and of side plates, C C, the ends of which project beyond the core A', substantially as shown and described, and for the purpose set forth. 40

9. The combination of ring D, key or bar E, bobbins or sections A A, and sides F F, recessed or slotted at *f f*, substantially as shown and described. 45

10. An armature bobbin ring or band provided with a removable key carrying a bobbin, whereby when said band is filled with bobbins its ends are locked by the insertion therebetween of said key, and at the same time complete the continuity or consecutiveness of the bobbins, substantially as shown and described. 50

In testimony whereof I have hereunto set my hand this 4th day of November, A. D. 1881.

GEORGE H. BROWN.

Witnesses:

SAMUEL KILPATRICK,
J. W. HALLENBECK.