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W. H. FOOT.

CROSS CONNECTION FOR DYNAMO ELECTRIC MACHINES.

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Fig. 1.

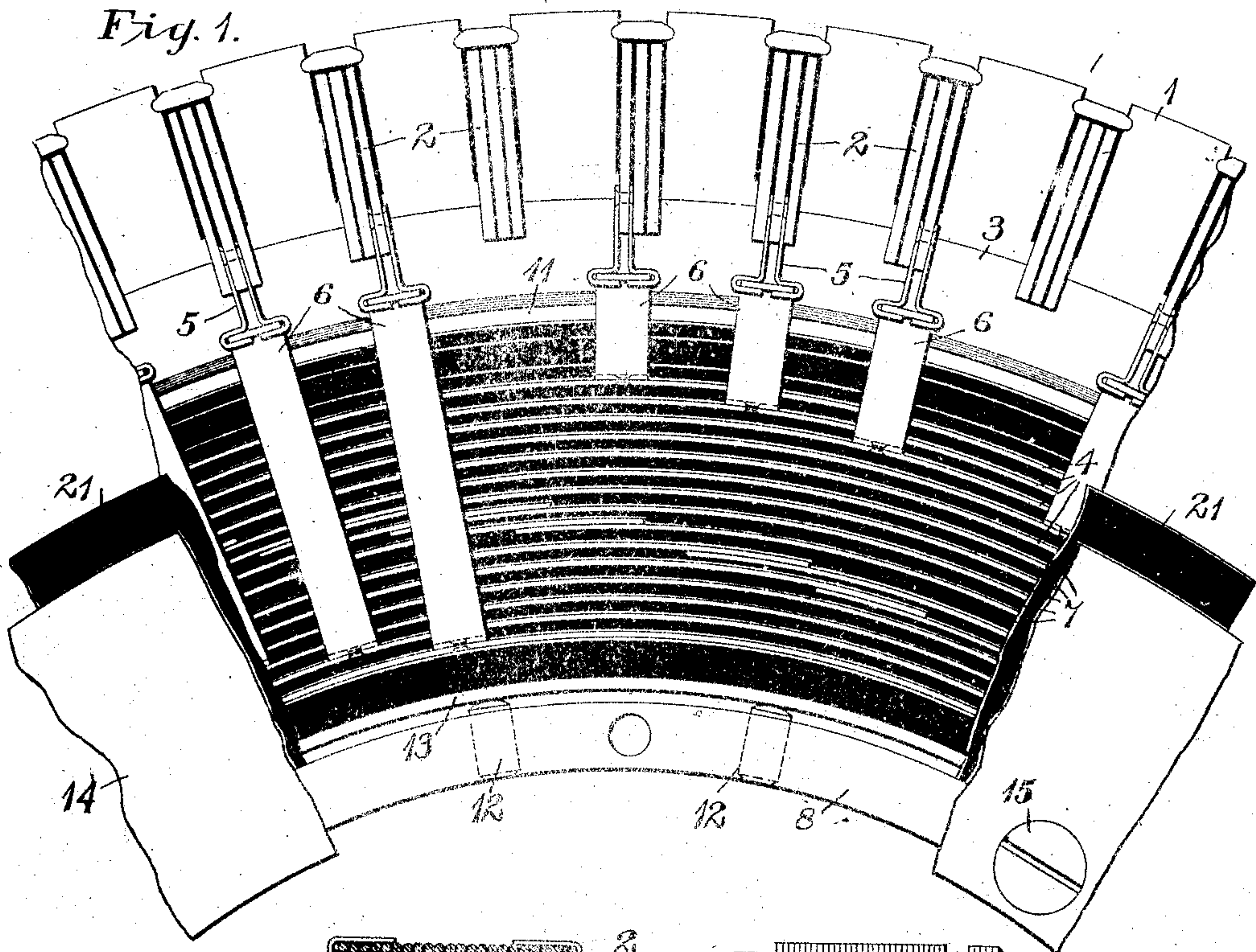
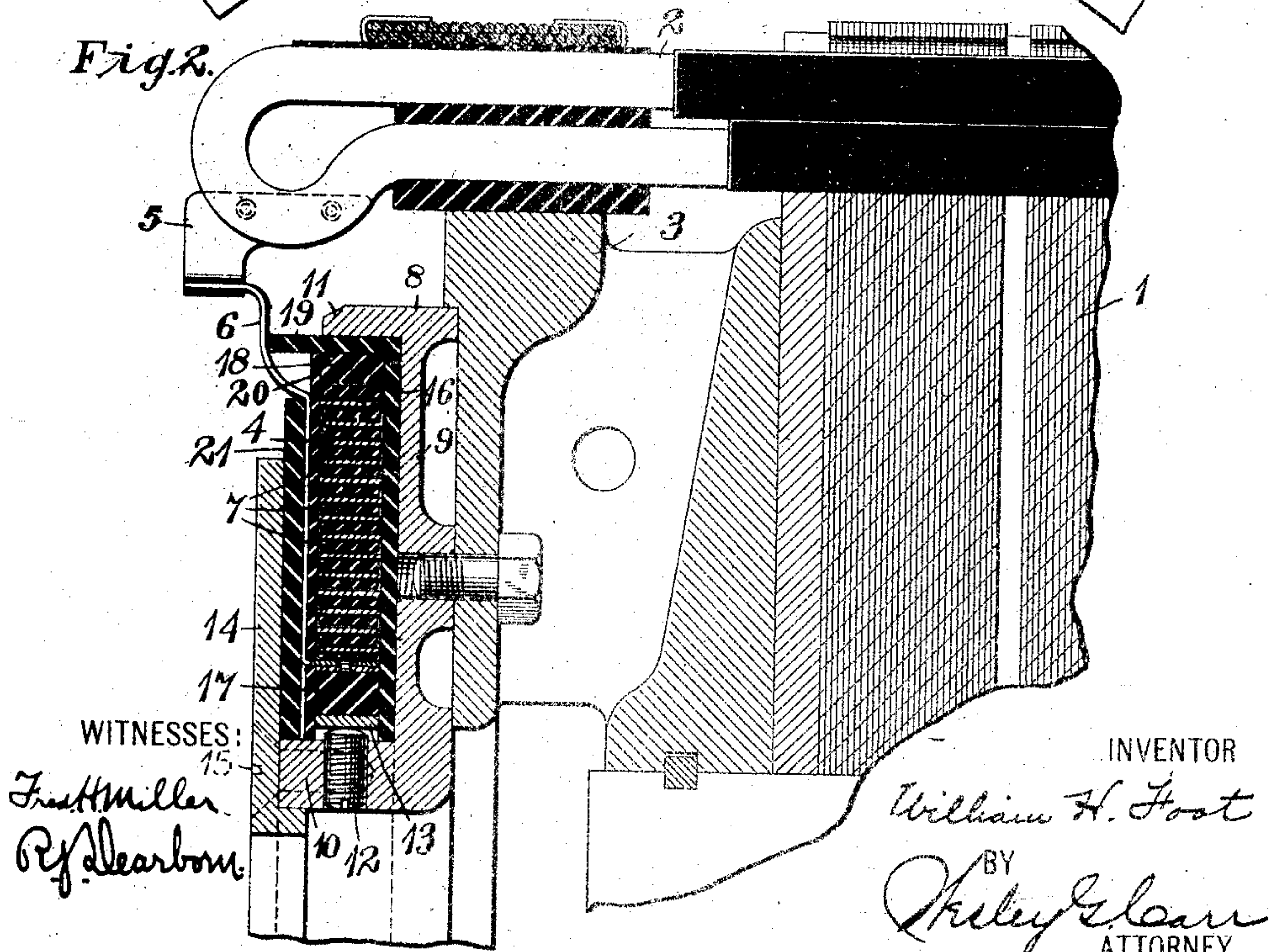


Fig. 2.



UNITED STATES PATENT OFFICE.

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No. 882,242.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed April 28, 1906. Serial No. 314,205.

To all whom it may concern:

Be it known that I, WILLIAM H. FOOT, a subject of the King of Great Britain, and a resident of Wilkesburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Cross Connections for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to cross connections for dynamo-electric machines and it has for its object to provide an improved means for interconnecting equipotential points in the windings of such machines as are subjected to relatively high speeds in operation, that shall occupy a relatively small amount of space and shall be adequately protected from displacement or injury.

The windings of the rotating parts of dynamo-electric machines are usually provided with cross connectors which comprise suitably insulated cables or similar connectors, the ends of which were electrically connected to the proper winding coils. Connectors of this character occupy a considerable amount of space and are liable to be injured or displaced if the member of the machine with which they are employed is operated at high speeds.

According to my present invention, the cross-connections comprise ring-shaped strap connectors of copper or other suitable material which are of unlike diameters, and are insulated from each other by insulating ribbons or strips and firmly supported by an annular case in which they are concentrically mounted. Each set of coils that are to be interconnected are electrically connected with a single ring by means of short flexible conductors.

Figure 1 of the accompanying drawings is an end elevation of a portion of the rotating member of a dynamo-electric machine which is cross connected in accordance with my invention and Fig. 2 is a sectional elevation of the parts illustrated in Fig. 1.

Referring to the drawings, a magnetizable armature core 1, having a winding 2, is provided with a combined end ring and coil-support 3. The equipotential points of the winding 2 are interconnected by a plurality of strap ring conductors 4, terminals 5 and flexible conducting strips 6, the terminals 5

being riveted to the armature coils and clamped and soldered to the outer ends of the strips 6 and the inner ends of the strips 6 being riveted to the rings 4.

It will, of course, be understood that both rivets and solder or either alone may be employed for making each or any of the electrical connections just described, as may be found desirable in practice.

The ring conductors 4 are separated by insulating ribbons or strips 7 and are concentrically mounted in an annular case 8 which is fastened to the coil-supporting ring 3. The annular case 8 comprises a plate 9 having flanges 10 and 11 at its inner and outer edges, respectively, and may preferably be mounted concentric with the axis of rotation of the rotating member of the machine. The inner flange 10 is provided with a plurality of radial adjusting screws 12.

A relatively stiff clamping ring 13 is interposed between the strap conductors 4 and the inner flange 10 of the case 8 against which the ends of the adjusting screws 12 may act. After the strap conductors 4 have been assembled and properly connected to the winding 2, they may be clamped in position by tightening the radial adjusting screws 12. A cover 14 may be fastened by screws 15, or otherwise attached, to the case 8 in order to prevent axial displacement of the cross connectors.

The strap rings 4 may be insulated from the plate 9 by means of a plate 16 of fuller board or similar material and from the clamping ring 13 and the flange 11 by insulating rings 17, 18 and 19. Insulating plates 20 and 21 are also interposed, respectively, between the rings 4 and the strips 6 and between the said strips and the cover 14.

The strap conductors 4 are preferably made of sufficient length to overlap at their ends so that the resistance between the connectors, located on opposite sides of the interruption, may be reduced, since the pressure exerted by the clamping ring 13 insures a good electrical connection between the ends which are overlapped.

Although the arrangement of the cross connections is illustrated in connection with a machine which is provided with a combined end ring and coil-support to which the annular case is attached, my invention is not

limited to such arrangement and the casing may be supported in any other suitable manner.

I claim as my invention:

5 1. In a dynamo-electric machine, the combination with a substantially cylindrical core, and a winding therefor, of an annular case supported by the core structure, cross-connecting strap conductors concentrically dis-
10 posed in said case, and insulating rings and plates between which said conductors are clamped.

2. In a dynamo-electric machine, the combination with a core, a winding and a com-
15 bined clamping ring and coil-support, of an annular case attached to the core support, concentrically-disposed ring shaped strap conductors rigidly clamped in said case, and strap leads between said conductors and
20 suitable points in the winding.

3. In a dynamo-electric machine, the combination with a cylindrical core member and a winding, of concentrically mounted cross-connecting rings for said winding, insulating
25 strips between the cross-connecting rings, insulating rings and plates surrounding said connecting rings, and means for clamping said parts together and to said core member.

4. In a dynamo-electric machine, the combination with a core, a winding and a com-
30 bined clamping ring and coil support, of an annular case attached to the coil support, ring shaped strap conductors concentrically mounted in said case to which suitable
35 points in the winding are connected, inner, outer and intervening insulating rings and insulating side plates for said strap conductors, and a plurality of radial adjusting screws located in a flange of the annular case.

40 5. In a dynamo-electric machine, the combination with an armature core and winding, of cross-connecting conductors which interconnect equipotential points in the winding

and comprise concentrically mounted strap
conducting rings, insulating rings and plates 45
between and around said conducting rings, and a casing in which said parts are clamped.

6. In a dynamo-electric machine, an armature having cross-connecting conductors comprising annular concentric straps and
50 radial flexible strips between said straps and the armature coils, in combination with means for insulating said parts and means for inclosing and clamping them in position.

7. In a dynamo-electric machine, an armature having cross-connecting conductors comprising annular straps, the meeting ends
55 of which overlap, and flexible strips between said straps and the armature coils, in combination with means for supporting and in-
60 sulating said connecting conductors.

8. In a dynamo-electric machine, an armature having cross-connecting conductors comprising concentrically disposed annular straps and substantially radial strips be-
65 tween said straps and the armature coils, in combination with insulating means between and around the connecting conductors, and a casing in which said parts are closely fitted
70 and clamped.

9. In a dynamo-electric machine, an armature having cross connectors comprising a plurality of concentric strap rings and sub-
stantially radial strap conductors riveted to the rings and to the armature coils and dis-
75 posed flatwise with reference to the ring edges, in combination with supporting and insulating means for said connectors.

In testimony whereof, I have hereunto subscribed my name this 27th day of April, 80
1906.

WILLIAM H. FOOT.

Witnesses:

W. P. BALLARD,
BIRNEY HINES.