J. E. WEBSTER & J. LE C. DAVIS.

DYNAMO ELECTRIC MACHINE.

APPLICATION FILED MAR. 9, 1908.

**956,554.**

Patented May 3, 1910.

2 SHEETS—SHEET 1.

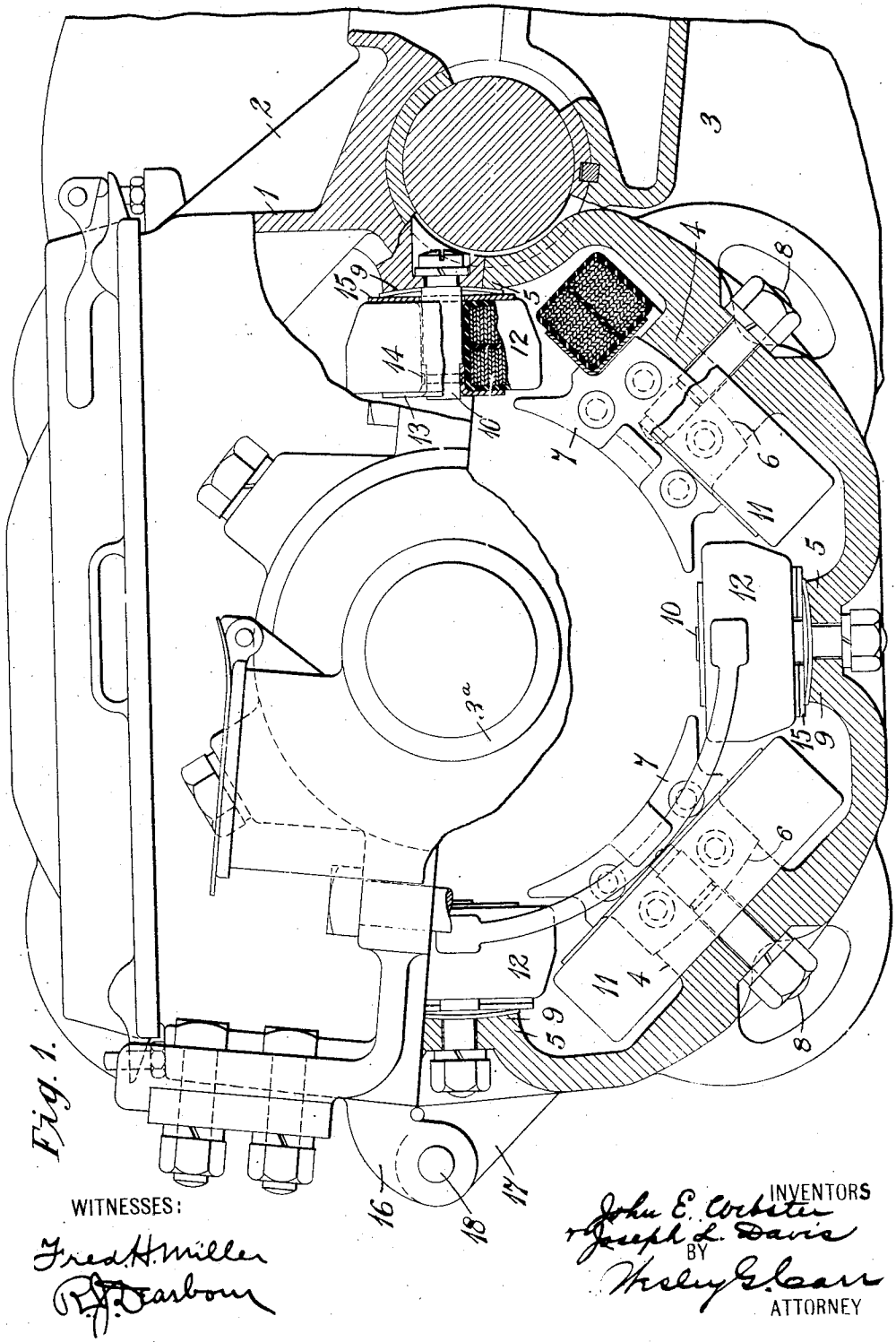


Fig. 1.

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2 SHEETS—SHEET 2.

*Fig. 2.*

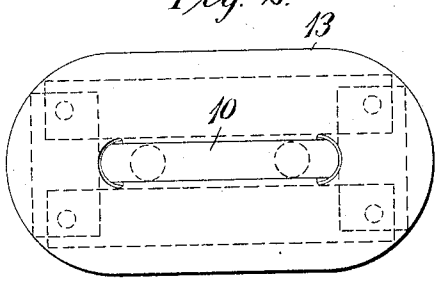



*Fig. 3.*

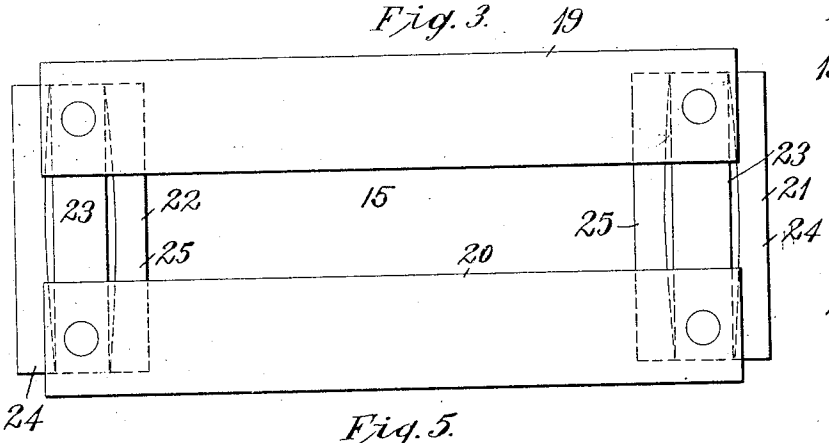



*Fig. 4.*

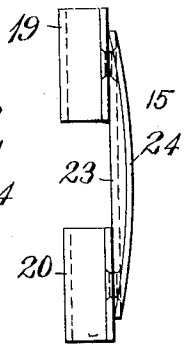



*Fig. 5.*

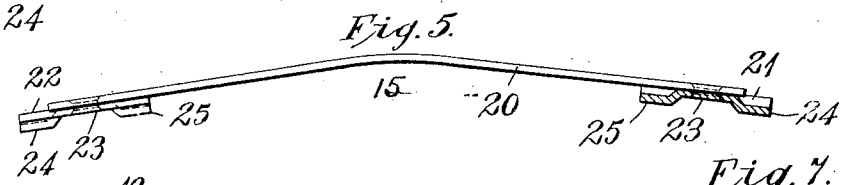



*Fig. 6.*

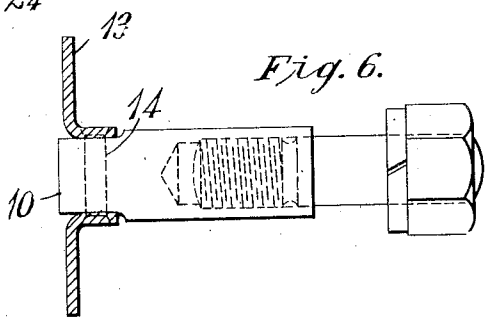
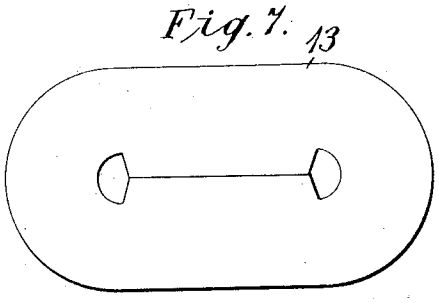



*Fig. 7.*

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# UNITED STATES PATENT OFFICE.

JOHN E. WEBSTER AND JOSEPH LE CONTE DAVIS, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

## DYNAMO-ELECTRIC MACHINE.

956,554. Specification of Letters Patent. Patented May 3, 1910.

Application filed March 9, 1908. Serial No. 420,075.

*To all whom it may concern:*

Be it known that we, JOHN E. WEBSTER and JOSEPH LE CONTE DAVIS, citizens of the United States, and residents of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dynamo-Electric Machines, of which the following is a specification.

Our invention relates to dynamo-electric machines having stationary field magnet windings, and it has special reference to railway motors and similar machines which are provided with field magnet frames that constitute inclosing casings and are divided into two hinge-connected parts.

The object of our invention is to provide improved means for securing the winding of an auxiliary or interpolar field magnet projection in position that shall not interfere with the usual division of the field magnet frame.

The field magnet frame of a railway motor, as usually constructed, is divided into two parts in a substantially horizontal plane through or near the axis of its armature. If a motor of this character is provided with interpolar magnet projections, the interpolar windings or coils are liable to be injured by the relative movement of the two halves of the frame or casing. The foregoing statement is, of course, most applicable to railway motors having the usual four-pole field frame construction, since two of the interpoles are intersected by the dividing line of the field frame in such cases.

According to our present invention, we divide the field frame of the motor in a plane which forms a small angle with the horizontal and interpose a steel spring member between the auxiliary magnet coils and the motor frame and also provide improved means for holding the interpolar windings in position.

Figure 1 of the accompanying drawings is a partially sectional elevation of a dynamo-electric machine embodying our invention, and Figs. 2, 3, 4, 5, 6 and 7 are detail views on a larger scale of supporting and protecting devices for the auxiliary coils of the machine shown in Fig. 1.

Referring to the drawings, the device here illustrated comprises a field magnet frame 1 which is divided into two parts 2 and 3 that are hinge-connected, and an armature (not shown) which may be mounted in bearing brackets $3^a$. The field magnet frame is provided with a plurality of main field magnet projections comprising relatively short base portions 4 which are integral with the frame 1 and have circumferentially curved faces 6, and removable body members 7 which are clamped against the faces 6 by bolts 8. The interpolar projections similarly comprise base portions 5 which are integral with the frame 1 and body portions 10 which are relatively narrow and are located in radial planes substantially half way between two adjacent main poles. The main and auxiliary polar projections are respectively provided with magnetizing coils 11 and 12.

The free ends of the auxiliary polar projections are provided with plates 13 which are preferably formed of brass or other non-magnetizable sheet metal punchings having lateral flanges which are secured to the pole by rivets 14 and serve to hold the coils 12 in position.

In Fig. 7 I have shown a blank from which the member 13 is formed by bending the edges adjacent to the central slit outwardly to form lateral flanges and by making rivet holes in said flanges.

Spring frames 15 are interposed between the circumferentially curved faces 9 of the projections 5 and the coils 12 for the purpose of protecting the outer surfaces of the coils and for guiding the two portions of the field frame together after they have been separated for inspection or for other purposes. As above indicated, the two parts 2 and 3 are hinge-connected by projections 16 and 17 and a pin or shaft 18.

One of the spring frames 15 is illustrated in detail in Figs. 3, 4 and 5, to which special reference may now be had. Each frame 15 comprises two curved side strips 19 and 20 and transverse strips 21 and 22 which are riveted to the ends of the side strips. Each of the strips 21 and 22 has a flat middle portion 23 and outwardly curved side wings 24 and 25 the curvature of which corresponds substantially to that of the faces 9 of the pole piece projections 5.

The frames 15 are located upon the respective auxiliary pole piece members 10,

the spring action of the side strips 19 and 20 being such as to clamp the coil 12 against the member 13. Since the curvature of the wings 24 and 25 of the frames 15 corresponds to that of the faces 9, the frames pertaining to the auxiliary pole pieces which are located adjacent to the plane of division of the frame 1 will serve to protect the corresponding coils 12 from injury and the wings 24 and 25 will insure proper engagement of the frame parts 2 and 3 as they are given relative movements toward or away from each other upon the hinge 16, 17, 18.

It will be understood that modifications in size and arrangement of parts may be made without departing from the spirit or scope of our invention, and that the invention is not limited to the specific type of dynamo-electric machine illustrated.

We claim as our invention:

1. In a dynamo-electric machine, the combination with a magnetizable frame having a plurality of main polar projections and auxiliary or interpolar projections secured to the frame between the main projections, said frame being divided into two parts and hinge-connected, of coils for the interpolar projections and resilient means for supporting the coils across the dividing plane of the field frame.

2. In a dynamo-electric machine, the combination with a magnetizable frame comprising two hinge-connected parts and a plurality of polar projections, and coils mounted on the projections, of means for supporting the coils and for guiding the frame sections when they are swung on their hinges.

3. In a dynamo-electric machine, the combination with a magnetizable frame comprising two hinge-connected parts and having a plurality of polar projections adjacent to the plane of division in the frame, of coils for said projections and resilient means for supporting the coils and for maintaining a predetermined relative position between the two parts of the frame.

4. In a dynamo-electric machine, the combination with a field magnet frame having polar projections and coils mounted on said projections, of spring frames having side and end strips which are curved in opposite directions and are interposed between the coils and the frame.

5. In a dynamo-electric machine, the combination with a field magnet frame, a plurality of polar projections secured thereto and coils mounted on the projections, of resilient spacers interposed between the coils and the frame and comprising sheet metal punchings riveted together substantially in the form of a rectangle, the side and end punchings being bowed in opposite directions.

6. In a dynamo-electric machine, the combination with a magnetizable frame divided into two hinge-connected parts, a plurality of main polar projections secured to the frame and equally spaced on the two parts of the frame and auxiliary or interpolar projections located one on either side and adjacent to the dividing plane of the frame, of coils mounted on the polar projections and resilient means interposed between the coils on the auxiliary projections and the frame for supporting the coils and for maintaining a predetermined relation between the two parts of the frame.

7. In a dynamo-electric machine, the combination with a magnetizable frame divided into two hinge-connected parts, a plurality of main polar projections secured to the frame and equally spaced on the two parts of the frame and auxiliary or interpolar projections located one on either side and adjacent to the dividing plane of the field frame, of coils mounted on the polar projections and resilient means interposed between the coils on the auxiliary projections and the frame for supporting the coils and for maintaining a predetermined relation between the two parts of the frame, said means comprising a substantially rectangular frame having side strips and end strips bent in opposite directions out of the plane of the rectangle.

In testimony whereof, we have hereunto subscribed our names this 27th day of Feb., 1908.

JOHN E. WEBSTER.
JOS. LE CONTE DAVIS.

Witnesses:
H. E. DYCHE,
BIRNEY HINES.