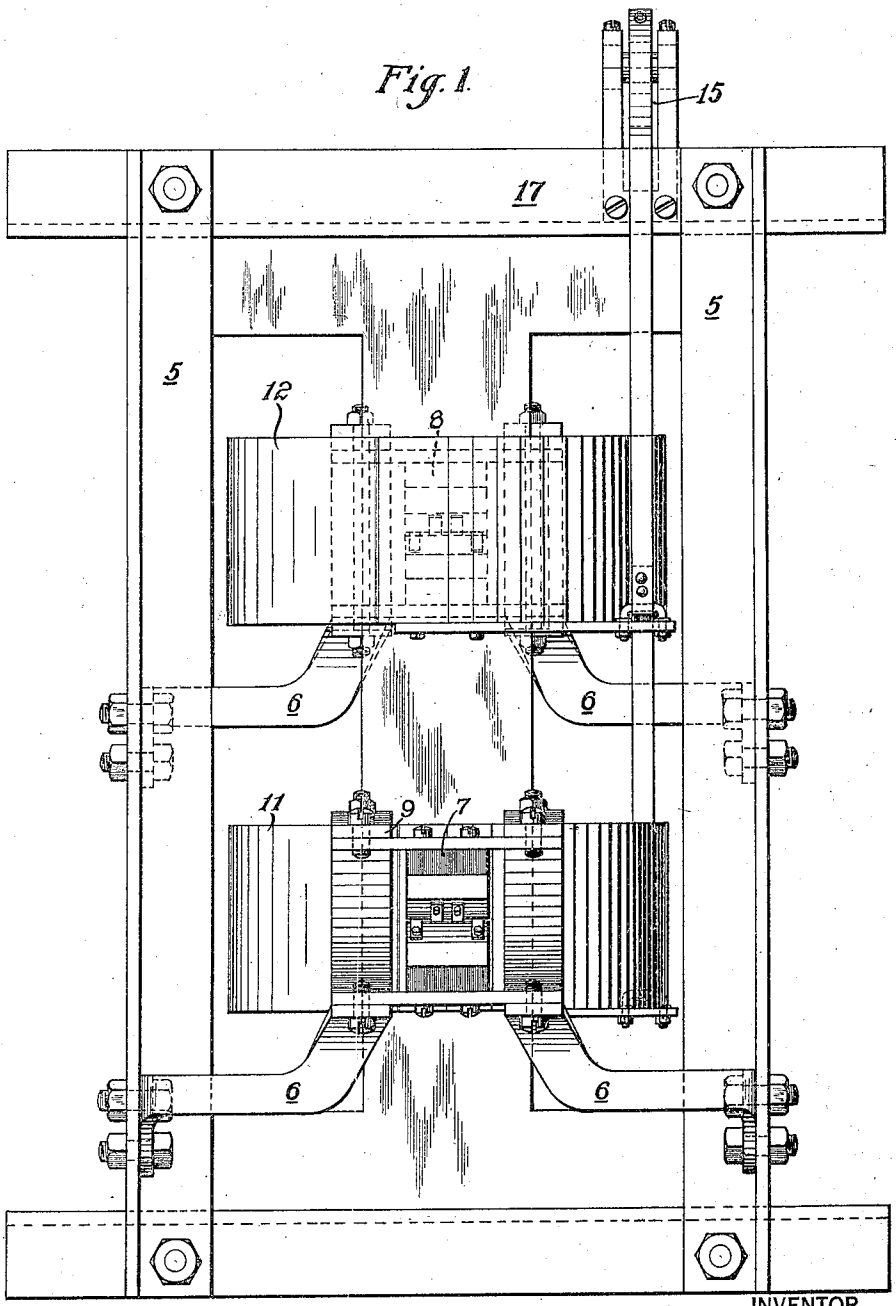
Oct. 2, 1923. 1,469,231

R. E. MARBURY

BEARING FOR COIL REGULATORS

Filed July 30, 1920 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

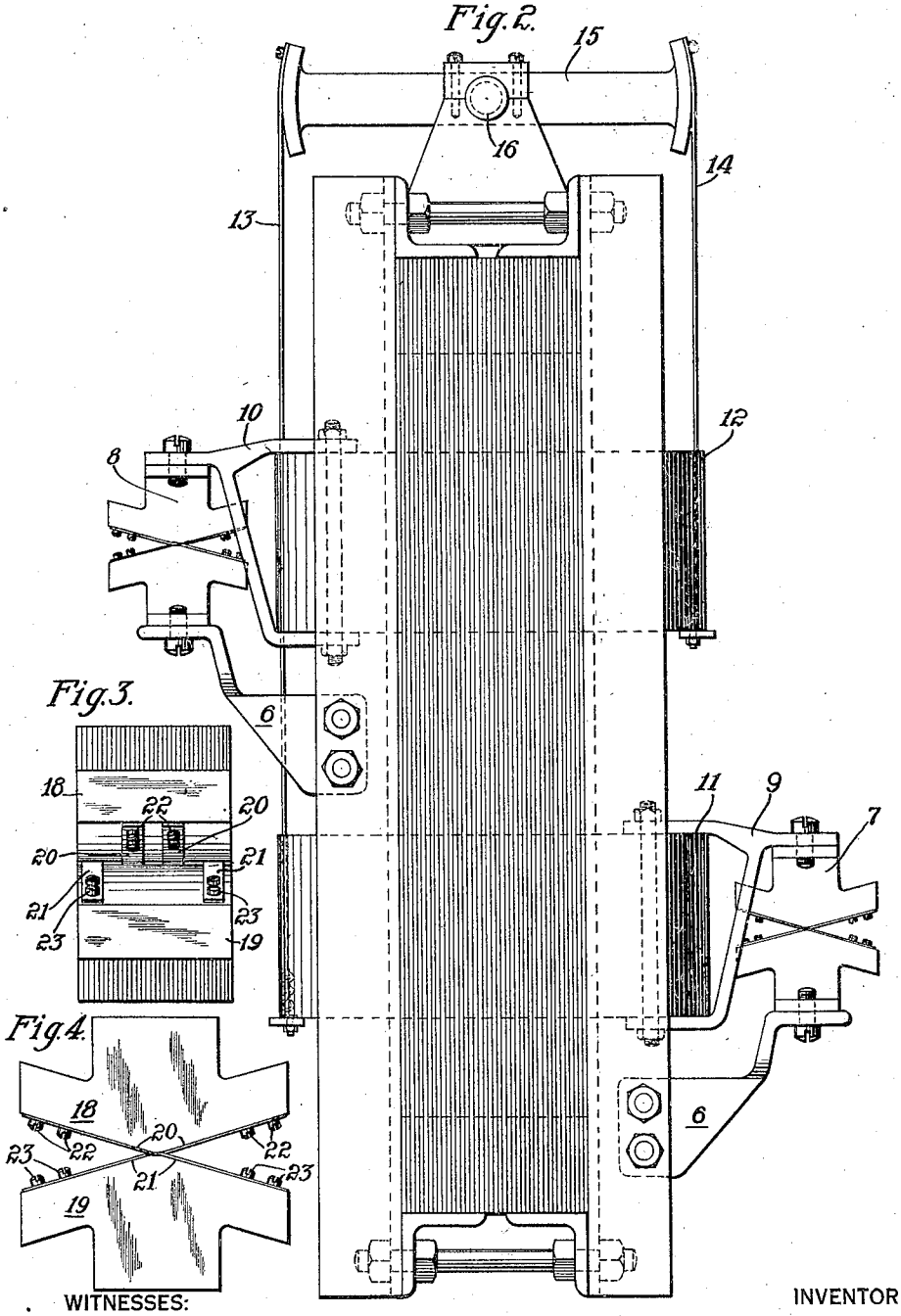


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

RALPH E. MARBURY, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

BEARING FOR COIL REGULATORS.

Application filed July 30, 1920. Serial No. 400,264.

To all whom it may concern:

Be it known that I, RALPH E. MARBURY, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Bearings for Coil Regulators, of which the following is a specification.

My invention relates to frictionless bearings for supporting movable coil regulators, and it has for its object the provision of a simple and durable joint construction, having a minimum of friction, for supporting movable regulating coils, such as used in transformers, and one in which the effect of a wide range of movement is secured by a comparatively small degree of oscillation.

In the construction of moving-coil regulators heretofore, the coils were mounted from ball-bearing joints or on knife-edge supports which were of complicated design and expensive, and the knife edges were very liable to damage by chipping.

I have shown my invention as applied to transformers of the moving-coil regulator type, wherein changes of load in the secondary circuit are accompanied by automatic movement of the primary and secondary coils with respect to one another in such manner as to maintain a constant current in the secondary circuit; that is, decreases in resistance in the secondary circuit cause the coils to move farther apart and so prevent an increase in current and vice versa. As shown in the drawing—

Figures 1 and 2 are elevational views taken at right angles to one another and showing the manner in which the coils are supported on the transformer.

Fig. 3 is a side view of the rocker bearing for the coil-supporting bracket, and

Fig. 4 an end view of the same.

Mounted on the upright members 5 of the transformer framework, are four brackets 6—two of which support the rocker bearing 7 and the other two of which support the bearing 8. Carried on the respective bearings are brackets 9 and 10 which carry the coils 11 and 12, respectively.

Referring more particularly to Fig. 2, the outer extremities of the coil members 11 and 12 are caused to counterbalance each other by means of the flexible straps 13 and 14 secured to the oscillating bar 15, pivotally mounted at 16 on the cross bars 17 of the transformer framework. The bar 15 is placed adjacent to one side of the framework, as shown in Fig. 1, in order that the strap 13 (Fig. 2) shall not interfere with the movement of bearing 8.

As shown clearly in Figs. 3 and 4, the bearings 7 and 8 are each composed of an upper member 18 and a lower member 19, having rocking engagement. To maintain these bearing members in operative relation, strips of spring steel, 20, 20 and 21, 21 are employed. Strips 20 are, at one end, fastened to the under side of the upper bearing member, by screws 22, and, extending between the upper and lower members, have their other ends fastened, in like manner, to the upper side of the lower bearing member. Similarly, strips 21 are fastened, at one end, to the upper side of the lower bearing member by screws 23 and, at their other ends, are fastened to the under side of the upper bearing member. It will thus be seen that while the two bearing members may oscillate freely, they are positively maintained against relative displacement.

The effective bearing surfaces of the members 18 and 19 are rounded a distance sufficient to permit a rocking movement of about 18 degrees from the vertical, in each direction, giving a total range of 36 degrees in movement, and the top member rolls freely without any frictional resistance. Those portions of the faces of these members 18 and 19, which extend beyond their rounded portions, lie in planes tangential to the rounded portions. It will thus be seen (Fig. 4) that the spring steel strips suffer very slight distortion during the flexing of the joint and that they will not wear out quickly.

By reference to Figs. 1 and 2, it will be seen that each lower bearing member 19 is firmly attached to a pair of brackets 6, carried on the framework of the transformer; and that the upper bearing members 18 are screw-fastened to the coil-supporting brackets 9 and 10.

The purpose in mounting the bearings on opposite sides of the transformer is in order to maintain the coils 11 and 12 in parallelism with respect to one another, longitudinally. Thus, when the coils move away from one another, they rock on their respec-

tive bearings 7 and 8, and, at their outer extremities, each moves away from the bearing of the opposing coil the same distance; and, when the coils move toward one another, the outer extremity of each moves toward the bearing of the opposing coil. It will be apparent that, although the coils have their supports in different horizontal planes, their horizontal, or longitudinal, faces are always in parallelism, whether the coils are in contact or at whatever distance apart they may be.

The coils, at their outer extremities, are supported, and counterbalance one another through the straps 13 and 14, carried by oscillating bar 15, which construction also aids in maintaining parallelism between the coils.

The reason for maintaining longitudinal parallelism between the coils is to, at all times, keep every portion of any one winding in substantially the same magnetic field and to secure a regulating effect by a smaller range of movement than would be necessary if the coils were not made to move in parallelism.

I recognize that the broad idea of mounting moving regulator coils in oppositely disposed bearings is not new but, by my construction, a greater ease and accuracy of movement is secured than is possible in the constructions of the prior art.

I claim as my invention:—

1. A bearing comprising a bottom member having a curved bearing surface, a top member supported thereby and having a curved bearing surface adapted to coact with the bearing surface of the first-named member for rolling contact therewith, and yieldable means secured to said surfaces for maintaining said bearing surfaces in operative relation.

2. A bearing comprising a bottom member having a curved bearing surface, a top member supported thereby and having a curved bearing surface adapted to coact with the bearing surface of the first-named member for rolling contact therewith, and resilient means secured to said surfaces for maintaining said bearing surfaces in operative relation and for biasing said members to a central position.

3. In combination, in a bearing, a bottom member having a curved bearing surface, a top member having an oppositely curved bearing face co-operating with said first-mentioned surface for rolling contact therewith, and means engaging each of said surfaces for maintaining said bearing surfaces in operative relation.

4. In a rocker bearing, the combination of two co-operating bearing members, each having a rounded bearing surface extending longitudinally thereof and two oppositely disposed flat faces merging with, and lying in, planes tangent to said rounded bearing surface.

5. In a rocker bearing, the combination of two co-operating bearing members, each having a rounded bearing surface extending longitudinally thereof and two oppositely disposed flat faces merging with, and lying in planes tangent to, said rounded bearing surface, and flexible members extending between the bearing surfaces and lying on said tangential surfaces, each flexible member being secured, at its opposite ends, to a different bearing member.

6. A bearing comprising a bottom member having an upwardly extending bearing ridge, a top member supported thereby having a similar downwardly extending bearing ridge and flexible means for preventing lateral displacement of said members and thereby maintaining said members in operative engagement with each other.

7. A bearing comprising two relatively movable members, each of said members having inclined surfaces terminating in a longitudinal bearing edge for rocking contact with the other of said members, said bearing edges being curved in opposite directions, and means for yieldably maintaining said members in operative engagement with each other.

In testimony whereof, I have hereunto subscribed my name this 21st day of July, 1920.

RALPH E. MARBURY.