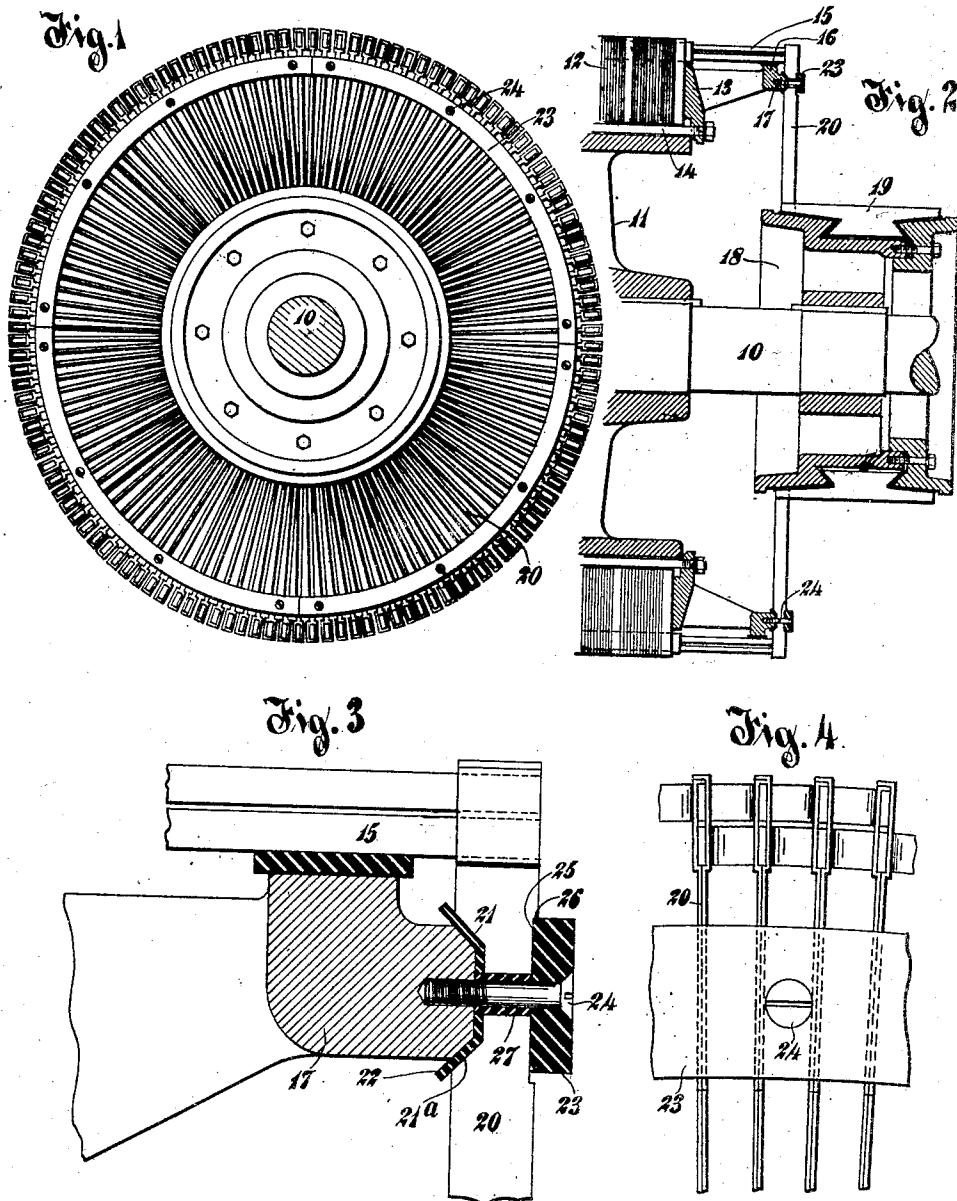


E. MATTMAN.
SUPPORT FOR COMMUTATOR LEADS.
APPLICATION FILED JAN. 31, 1907.

932,042.

Patented Aug. 24, 1909.



Witnesses

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SUPPORT FOR COMMUTATOR-LEADS.

932,042.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed January 31, 1907. Serial No. 355,018.

To all whom it may concern:

Be it known that I, EMIL MATTMAN, citizen of the Republic of Switzerland, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Supports for Commutator-Leads, of which the following is a full, clear, and exact specification.

My invention relates to the rotary members of dynamo-electric machines of the commutator type, such as direct-current machines and rotary converters, and particularly to large units having long commutator necks or leads.

In machines of the direct-current type it is necessary to provide retaining means for the portions of the coils which project beyond each end of the armature core. In nearly all machines except very high speed and very large machines, the end portions of the coils are retained in position by band wire. When the diameter of the rotary member exceeds a certain amount, band wire can not be relied upon for this purpose, but the coils must be held in position by other means.

The rotary members of large units frequently have very long commutator necks or leads. These leads are heavy and consequently the combined centrifugal forces acting upon the commutator necks and coils at the commutator end of the machine are considerable. These centrifugal forces are resisted by the joints or connections between the commutator bars and necks, and by the means provided for retaining the end portions of the coils in place. Consequently there is considerable strain upon said joints or connections, while for obvious reasons such strain should be as small as possible.

One of the best means for counteracting the effects of centrifugal force acting upon the ends of the coils and the commutator necks, when band wire cannot be employed, is by clamping devices disclosed in U. S. Patent to Behrend #792,568, June 13, 1905. As shown in this patent the coils rest on end-heads and the clamps are held in position by screws or bolts passing between the coils into the end-heads. This means can generally be employed in large units and is very effective. In those machines, however, having very closely spaced slots and conductors, clamps can not well be employed

at the commutator ends of the machines for the reason that the conductors can not be spread apart sufficiently to permit the insertion of the holding screws or bolts.

One of the objects of my invention is to provide means for overcoming or counteracting the effect of the centrifugal forces acting upon the long and heavy commutator necks and the ends of the coils connected thereto, so that the strain upon the commutator joints or connections and upon the coil retaining means, if any should be employed, will be lessened. By thus partially overcoming the effect of the centrifugal forces, the coils can be easily retained in position by some means, such as band wire, which alone could not be relied on.

A further object is to provide means for supporting and bracing the commutator necks so that vibration in said necks will be eliminated.

In carrying out my invention I support the commutator necks between their ends in such a manner that the effects of centrifugal force at the commutator necks and coils at the commutator end of the machine are wholly or partially overcome, and the vibration in the necks is reduced or eliminated.

The commutator necks are preferably supported on the end-head at the end of the core on which the ends of the coils rest. The end-head in this instance is provided with an annular flange or projection which engages a shouldered portion on the commutator necks, the shoulders being formed in this case by notches which receive the annular flange. The necks are carefully insulated from the supporting member and may be held tightly in engagement therewith in any desired manner. In this case, as will be explained, the necks are held to the flange by an insulating sectional clamping ring and screws which pass through the clamping ring between the necks and into the flange of the supporting end-member.

My invention further consists in certain novel details of construction and the combinations and arrangements of parts described in the specification and set forth in the appended claims.

In the drawing Figure 1 is an end elevation of a large rotary member equipped with my invention, showing the commutator end of the machine; Fig. 2 is a longitudinal sec-

tion through the same; Fig. 3 is an enlarged partial sectional view; and Fig. 4 is an enlarged partial end view.

Referring now to the figures of the drawing I have shown at 10 the shaft of the machine on which the spider 11 is mounted. The spider carries a core 12 consisting in this case of laminae which are clamped between end members, one of which is shown at 13, by bolts 14. The core is slotted in the usual manner and is provided with a winding, a portion of which, shown at 15, projects beyond the core and rests upon a flange or annular portion 16 of the end member 13. As is shown, the end member is also provided with a laterally extending annular flange or projection 17, the purpose of which will be explained. Also mounted on the shaft at the end of the main spider 11 is a commutator spider 18 to which the commutator bars 19 are tightly clamped. The ends of the coils of the winding 15 and the commutator bars 19 are connected together by commutator necks 20, which, as is shown, are quite long. These necks, as is shown most clearly in Fig. 4, consist of double strips of punched sheet metal which are secured to the coils and bars in any desired manner.

As is clearly shown in the drawings each commutator neck is provided on the inner edge with a notched or recessed portion 21 near the outer end thereof. The notches or recesses are so located that when the necks are assembled the recessed portions form an annular groove which receives the laterally extending flange 17 of the end member. The necks are carefully insulated from the flange by mica or other insulating material 22. The commutator necks are in this case clamped against the flange 17 by means of a sectional ring 23 of fiber or other insulating material and screws 24 which pass through each of the sections of the ring 23 between the commutator necks and into the flange 17 of the end member. The ring is preferably seated in an annular groove in the outer edges of the commutator necks formed by providing each neck on its outer edge with a shallow notch 25 forming a shoulder 26 on each neck against which the outer periphery of the ring bears. Thus the strain upon the screws 24 due to centrifugal force acting upon the ring is greatly diminished. Each one of the screws is preferably spaced from the adjacent commutator necks by an insulating collar 27.

I do not wish to be confined to the shape of the engaging faces of the flange 17 and necks 20 here shown, or to the exact means shown for holding the necks in engagement with the flange. Although the stresses due to centrifugal force acting upon the commutator necks could be better transmitted to the flange 17, if the shoulders 21 at the

inner portions of the notches 21 and the face of the flange 17 engaged by the shoulders were at right angles to radial lines or the axes of the necks, I prefer that the engaging faces of the necks and flange be of the shape shown, since there is less danger of the insulation 22 between the necks and the flange being cut. It will be seen that not only will the centrifugal forces be transmitted to or taken care of by said flange, but the commutator necks will be held more rigidly and firmly in position, and vibration to a certain extent will be eliminated.

I have here shown and described an embodiment of my invention which at this time seems preferable. I do not wish to be confined, however, to the details shown as many changes and modifications can be made without departing from the spirit and scope of my invention.

What I claim as new is:—

1. In the armature of a dynamo-electric machine, a laminated core, end-heads at the ends of the core, one of said end-heads having an annular bracket, a winding on the core, a commutator, commutator necks connecting said winding and said commutator, and bearing against said bracket, and means for clamping said commutator necks against said bracket.

2. In the armature of a dynamo-electric machine, a laminated core, end-heads at the ends of the core, one of said end-heads having an annular bracket, a winding on the core, a commutator, and commutator necks connecting said winding and said commutator and having shoulders which bear against the inside of said bracket.

3. In a dynamo-electric machine, an armature, a commutator, commutator necks connecting the conductors of the armature to the bars of the commutator, said necks having recessed or notched portions, and a supporting member engaging said recessed or notched portions of said necks to take up the effect of centrifugal force in the latter.

4. In a dynamo-electric machine, an armature core, an end-member, a winding carried by said core and projecting over said end-member, a commutator, and commutator necks connecting the conductors of the winding and the bars of the commutator, said necks having shouldered portions between their ends, and said end member having a portion engaging the shouldered portions of the necks to take up any centrifugal force developed in the latter.

5. In a dynamo-electric machine, an armature core, an end-member, a winding carried by said core and projecting over said end-member, a commutator, commutator necks connecting the conductors of the winding and the bars of the commutator, said necks having shouldered portions between their ends, said end member having an annular

flange or projection engaging the shouldered portions of the necks, and an insulating annular clamping member for holding the necks and end-member in engagement.

- 5 6. In a dynamo-electric machine, an armature core, an end-member, a winding carried by said core and projecting over said end member, a commutator, and commutator necks connecting the conductors of the winding and the bars of the commutator, said necks having recessed or notched portions between their ends, and said end member having an annular flange or projection engaging the shouldered portions of the necks.
- 10 7. In a dynamo-electric machine, an armature core, an end-member, a winding carried by said core and projecting over said end member, a commutator, commutator necks connecting the conductors of the winding and the bars of the commutator, said necks having recessed or notched portions between
- 15 20

their ends, said end-member having an annular flange or projection engaging the recessed portions of the necks, and an annular clamping member on the outer edges of said necks for holding the latter and the end member in engagement. 25

8. In a dynamo-electric machine, an armature, a commutator, commutator necks each having shouldered portions on the inner and outer edges, a rigid supporting member engaging the inner shouldered portions of the necks, and an external clamping ring engaging the outer shouldered portions of the necks. 30

In testimony whereof I affix my signature, 35
in the presence of two witnesses.

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Witnesses:

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