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LAMINATION ASSEMBLY

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Fig. 1.

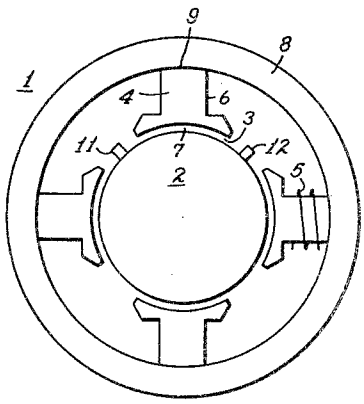
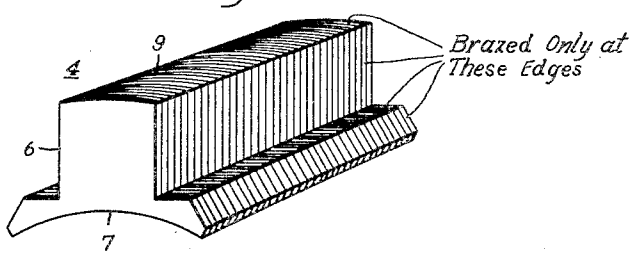


Fig. 2.



WITNESSES:

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LAMINATION ASSEMBLY

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6 Claims. (Cl. 171—252)

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My invention relates to lamination-assemblies for electric machines, particularly dynamo-electric machines.

The object of my invention is to provide an improved and cheaper lamination-assembly than one in which the stack of laminations is held together by riveting.

My invention is particularly applicable to small motors and generators, where the labor-cost is large in proportion to the material-cost, and where the efficiency-level is not as high, or as important, as in larger machines.

An important particular object of my invention is to provide a dynamo-electric machine in which the laminations, or some of them, are held in stacked relation by very light brazing on end or side surfaces where flux-variations are not great.

With the foregoing and other objects in view, my invention consists in the machines, combinations, parts, and methods of assembly and use, hereinafter described and claimed, and illustrated in the accompanying drawing, wherein:

Figure 1 is a diagrammatic view of a direct-current dynamo-electric machine which is illustrative of an application of my invention in the assembly of the pole-pieces of the stator-member, although my invention is not limited to direct-current machines, or to the stator laminations of a machine; and

Fig. 2 is a perspective view of one of my novel laminated-pole assemblies.

As illustrated in the drawing, my invention is applied to a dynamo-electric machine having a stator-member 1 and a rotor-member 2, with an air gap 3 therebetween. The stator-member 1 comprises a plurality of separately formed, laminated, magnetizable, salient pole-pieces 4, having suitable windings 5 thereon. As shown in Fig. 2, each pole-piece 4 comprises a stack of magnetizable punchings having lateral edges which, in the stacked assembly, constitute the sides 6 of the pole-pieces.

In accordance with my present invention, when this stack of punchings is assembled, and while it is being temporarily pressed tightly together, the edges of the stack, such as the edges 6, and in fact all edges or side-surfaces where flux-variations are not great, are painted with a paint containing copper powder, and then the assembly is brazed together in a furnace. Only a small amount of copper brazing material is used, and hence the brazed surface will be extremely thin, and of high electrical resistance, but it will extend over a relatively large area, being substantially continuously joined to the lamination-ends, and unitarily adherent thereto, so that this large surface-area, while weak in any one spot, has an overall strength which is sufficient to hold the punchings together without the usual bolting or riveting.

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In general, the laminated magnetizable portions which are thus treated are portions which carry substantially radially flowing magnetic fluxes, or fluxes flowing through said portions in a direction substantially parallel to the laminations; and the lamination-edges which are surface-brazed constitute approximately radially disposed side-surfaces of said flux-carrying portions, or side-surfaces which are disposed substantially parallel to the magnetic fluxes. In some instances, as shown in Fig. 2, it is feasible to lightly surface-braze all of the edge-surfaces of a stack of laminations or punchings which make up a part such as a separately formed salient pole-piece, with the sole exception of the surface-portion which forms a part of the air gap, as indicated at 7, this air-gap surface being left unbrazed, so as to avoid increasing the pole-face losses.

The salient pole-pieces 4 of Fig. 1 are adapted to be secured within the inner periphery of a cylindrical magnetizable yoke-member 8, which may, or may not, be laminated. In many instances, it is feasible and desirable to lightly surface-braze the end-surface 9 of the pole-piece assembly, where the pole-piece makes contact with the yoke-member 8, although, in cases where the flux of the machine is rapidly changed, during the operation of the machine, or where the losses are critical, it may be desirable to omit the brazing of this particular surface.

The rotor-member 2 of my machine is only diagrammatically indicated in Fig. 1, by means of a single circle which may be understood to represent both the armature and the commutator of the machine, in accordance with a well-understood system of symbolic representation. I have also shown two brushes 11 and 12 bearing on the commutator of the rotor-member 2.

It is to be understood that my invention is applicable to both main and commutating poles, and to the rotor-member as well as to the stator-member of an electrical machine.

Since only a small amount of copper brazing-material is used, the brazing will penetrate only for a short distance at the edge of the laminations, so that the amount of short-circuiting of the laminations will not defeat the purpose of the laminations.

While I have illustrated my invention in but a

single illustrative application, I wish it to be distinctly understood that my invention is not limited to this precise form of application. I desire, therefore, that the appended claims shall be accorded the broadest construction consistent with their language.

I claim as my invention:

1. An electric apparatus having one or more laminated magnetizable portions carrying magnetic fluxes flowing therethrough in a direction substantially parallel to the laminations, said portions comprising stacked magnetizable lamination-portions having lamination-edges which, in the stacked assembly, constitute side-surfaces disposed substantially parallel to the magnetic fluxes of said flux-carrying portions, said lamination-edges being substantially continuously joined with a thin, unitarily adherent surface-coating which constitutes a high-resistance means for holding the stack in its assembled position.

2. A dynamo-electric machine having a plurality of separately formed, laminated, magnetizable, salient pole-pieces, each pole-piece comprising a stack of magnetizable punchings having lateral edges which, in the stacked assembly, constitute the sides of the pole-piece, said lateral edges being substantially continuously joined with a thin, unitarily adherent surface-coating which constitutes a high-resistance means for holding the stack in its assembled position.

3. A dynamo-electric machine having stator and rotor members separated by an air gap, at least one of said members having a plurality of

separately formed, laminated, magnetizable, salient pole-pieces, each pole-piece comprising a stack of magnetizable punchings having a plurality of edge-surfaces, not at the air gap, substantially continuously joined with a thin, unitarily adherent surface-coating which constitutes a high-resistance means for holding the stack in its assembled position.

4. The invention as defined in claim 1, characterized by said continuously joined surface being a thin layer of copper brazing.

5. The invention as defined in claim 2, characterized by said continuously joined surface being a thin layer of copper brazing.

6. The invention as defined in claim 3, characterized by said continuously joined surface being a thin layer of copper brazing.

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