

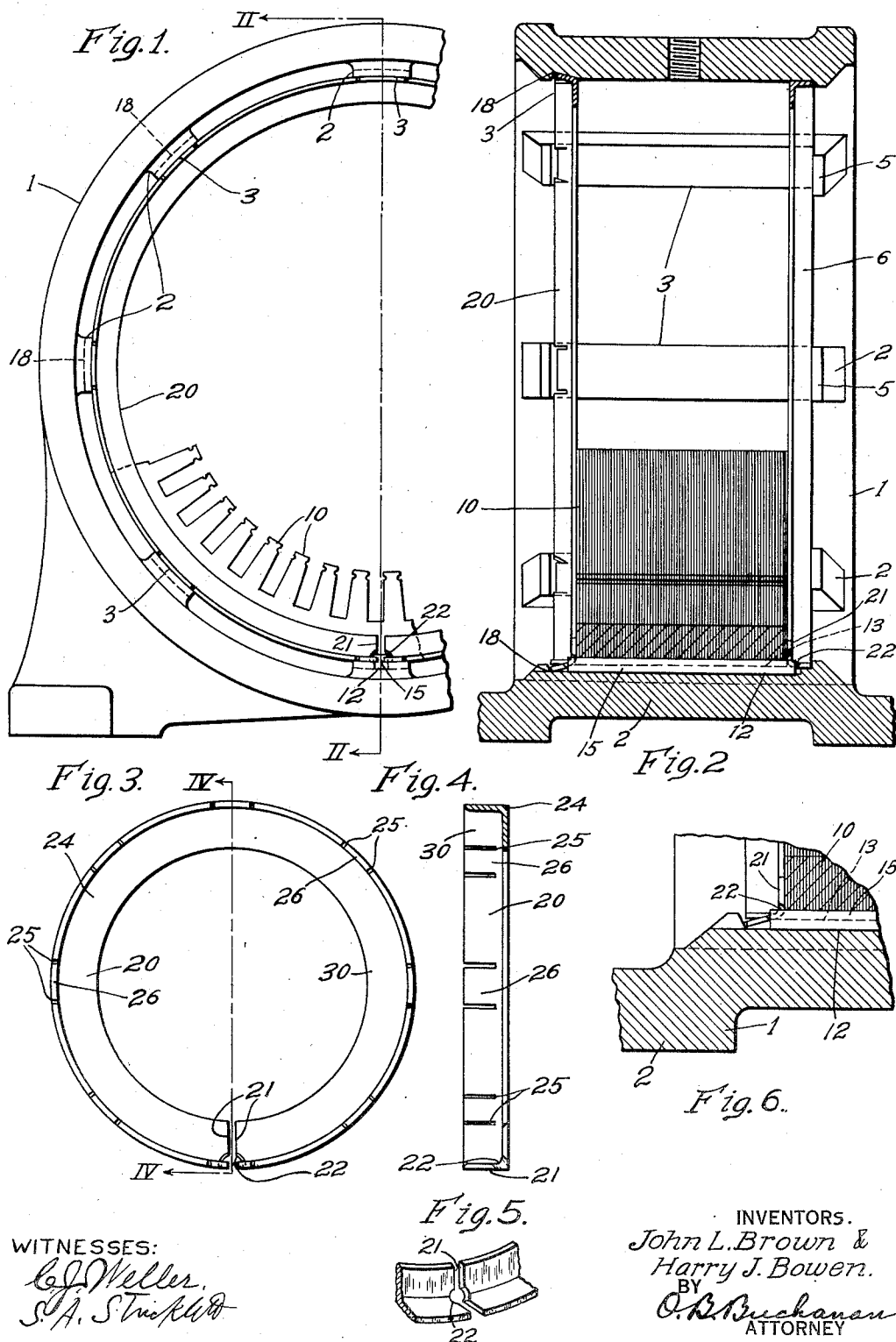
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MEANS FOR HOLDING PRIMARY PUNCHINGS

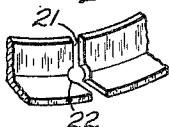
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WITNESSES:

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Fig. 5.



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MEANS FOR HOLDING PRIMARY PUNCHINGS

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11 Claims. (Cl. 171-252)

Our invention relates to a core structure for dynamo-electric machines and particularly to means for retaining the laminated core of such structures.

In the manufacture of dynamo-electric machines, it is customary to provide a ring-like retaining structure usually having a plurality of ribs on which the laminated core is seated. A large proportion of the cost of such laminated core structures arises from the expense of assembling and retaining the core structure within the retaining rings.

It is an object of our invention to provide an improved core structure which may be easily and cheaply assembled from a relatively small number of standard parts. The core structure of our invention comprises the usual cast or fabricated retaining frame having a core seat extending part way through the frame structure and having a lug at the end of the core seat.

A suitable retaining ring is placed on the seat in contact with the lugs for positioning the laminated structure on the seat and for supporting the end laminations against flaring. The laminated structure itself is pressed tightly against the retaining ring and held in place by a split ring formed from a rolled structural steel member commonly known in the trade as angle iron, the angle iron ring having a portion thereof expanded into suitable slots in the frame for retaining the core and frame in assembled position.

It is a further object of our invention to provide an improved retaining ring for core structures.

Other objects and advantages will be apparent from the following detailed description and the accompanying drawing in which:

Figure 1 is a partial elevation of a frame structure constructed according to our invention;

Fig. 2 is a sectional view taken on line II-II of Fig. 1;

Fig. 3 is a front elevation of the split ring;

Fig. 4 is a sectional view taken on line IV-IV of Fig. 3;

Fig. 5 is a detail perspective view showing the manner in which the abutting ends of the retaining rings are apertured; and

Fig. 6 is a detail view showing the manner in which the key interfits with the milled portion of the ring.

The structure, according to our invention, comprises a cast or fabricated frame member 1 having plurality of parallel axially extending ribs 2, the inner face of the ribs being machined for the greater portion of their length to provide a

core seat 3, while leaving an unmachined end portion to provide an inwardly extending lug 5 on each of the seat members. A suitable retaining ring 6 is placed on the seat 3 in contact with the inwardly extending lugs 5 to form an abutment for a laminated core structure. A core structure 10 is composed of a plurality of stacked laminations pressed firmly into engagement with the retaining ring 6 and the core seat. At least one of the bars 2 carrying the core seat 3 is provided with a longitudinally extending key slot 12, this key slot being of greater length than the laminated core structure.

The core structure 10 is provided with a complementary key slot 13 and after the punchings have been assembled on the core seat a key 15 of greater length than the width of the core structure is driven into the complementary core slots to prevent radial movement of the core structure. Each of the seat bars is provided with a depressed slot-like portion 18 for receiving our improved retaining ring presently to be described.

Our improved retaining ring is constructed of a length of rolled structural steel commonly known in the trade as angle iron by passing through a pyramid roll to produce a helical structure of substantially the same outside diameter as the diameter of the core seat. In winding the bar into helical form, one face of the angle structure is maintained parallel to the axis of the helix with the other face substantially perpendicular thereto.

After bending or rolling to the proper diameter, the helix is severed preferably by a torch to provide a plurality of ring-like structures 20, roughly of the diameter of the core seat. The roughly formed rings are placed in a jig or mandrel and finally shaped to the exact circumference of the core seat, and a portion of the meeting faces 21 is machined away to provide an accurately sized gap 22 between the ends of the ring.

While this machining at 22 may be done by any suitable cutter, we prefer to machine this section by passing a drill of proper diameter through the meeting edges at such an angle as to bisect the angle of the structural member and continue through the apex of the angle (see Fig. 5).

This drilling can most advantageously be performed while the retaining ring is held in the sizing jig. By passing the drill through the ring 20 in such a manner as to bisect the angle, only that portion of the ring adjacent the junction of the flanges is provided with the accurately sized slot 22, while the remainder of the meeting ends

21 of the ring are left roughly sized as when first cut from the helix. The machined slot 22 is of such size as to snugly receive the projecting end of the key 15 extending through the laminated core structure. The outer or axially extending flange 24 of the retaining ring 20 is provided with a plurality of closely spaced slits or cuts 25 to provide tongues 26 which may be struck up or bent slightly outwardly or radially for engagement with the slot-like depressions 18 in the seat bars for holding the ring 20 in assembled position.

To assemble the core structure of our invention, the retaining ring 6 and the laminations 10 are keyed into position and our improved retaining ring 20 placed in such position that the accurately machined portion 22 of the slot between the meeting ends 21 of the ring coincides with the key member 15. The entire core structure is then compressed and the tongues 26 struck up to permanently secure the ring 20 to the core seat. When the structure is thus assembled, the end of the key 15 enters the machined portion 22 of the ring ends 21 and expands the ring 20 to the exact diameter of the core seat. However, the non-machined portion of the ring ends 21 provides a restricted gap so as to prevent disassembly of the key 15.

While we have shown and described a specific embodiment of our invention, it is apparent that changes and modifications may be made therein without departing from the spirit and scope thereof. We desire, therefore, that only such limitations shall be imposed as are modified in the accompanying claims or as may be necessitated by the prior art.

We claim as our invention:

1. An electric machine structure comprising a frame having a core seat therein, means at one end of the seat for retaining a core on the seat, a core pressed against said retaining means, the seat having a key-way cut therein, the core having a complementary key-way therein, a key in said key-way said key extending beyond the core, a split ring of angle cross section, said ring having a hole through the angle at the split, said hole being adapted to receive the extending end of the key, a flange of said ring being slitted at intervals to produce tongues, said tongues being struck up, the seat having slots adapted to receive the tongues for retaining the ring in said seat.

2. A dynamo-electric machine comprising a frame, a core seat in said frame, a stop at one end of the seat, a key-way cut in said seat and extending the full length of the seat, a core retaining ring seated on the core seat and against the stop, a laminated core supported by the seat, said core having a key-way aligned with the key-way in the seat, a key of greater length than the core, a split retaining ring or rolled angle iron disposed so as to hold the core in place, the split having an inner portion adapted to receive the end of the key and an outer restricted portion for preventing passage of the key.

3. A core assembly for a dynamo-electric machine comprising a frame, parallel punching-supports on said frame, a plurality of punchings supported thereby, an end ring of rolled angle iron, said supports having grooves adjacent the outer edge of said ring, and the ring having portions depressed into contact with said groove for maintaining the core in assembled relation.

4. A stator assembly comprising a frame, a plurality of axially extending ribs for supporting

a laminated core, a shoulder at one end of the ribs, an end plate seated on said ribs and against the shoulders, a laminated core supported by said ribs, a rolled steel end ring for holding said core in place, the ribs having grooves adjacent the ends thereof, and the ring having portions bent into the grooves for holding the stator elements in assembled relation.

5. A stator assembly for a dynamo-electric machine comprising a cast frame structure, a plurality of ribs in said frame for supporting a laminated core, a shoulder at one end of said ribs, a key-way in the face of one of said ribs, a split ring seated on said ribs and against the shoulders, a key in said key-way, one end of said key extending into the split in said ring, a laminated core supported by said ribs and pressed against said split ring, a split retaining ring of rolled steel pressed against the core, a portion of the split of said last-mentioned ring adjacent the core being of sufficient size for admitting the end of the key while the outer portion of the split is of reduced width for preventing passage of the key, the ribs having radial grooves therein adjacent the outer edge of the last-mentioned retaining ring and portions of the latter being depressed into the grooves for retaining the stator in assembled relation.

6. A machine comprising a frame, a core structure mounted within said frame, said frame having a plurality of spaced axially extending ribs engaging the outer periphery of said core structure, means at one end of said ribs to provide an abutment for one side of said core structure, said ribs being provided with notches at the other end, and a split ring comprising a rolled steel member bent into ring form, the ring being slitted at intervals to provide tongues adapted for displacement out of the ring body for engagement with said notches to hold said ring in position against the other side of said core structure.

7. A machine comprising a frame, a core structure mounted within said frame, said frame having a plurality of spaced, axially extending ribs engaging the outer periphery of said core structure, means at one end of said ribs to provide an abutment for one side of said core structure, said ribs being provided with notches at the other end, a split ring comprising a rolled steel member bent into ring form with its ends nearly in abutment, the ring being slitted at intervals to provide tongues adapted for displacement out of the ring body for engagement with said notches to hold said ring in position against the other side of said core structure, and means for expanding the ring to proper size and for providing a positive safeguard against the contraction of the ring.

8. A machine comprising a frame, a core structure mounted within said frame, said frame having a plurality of spaced, axially extending ribs engaging the outer periphery of said core structure, means at one end of said ribs to provide an abutment for one side of said core structure, said ribs being provided with notches at the other end, and a split retaining ring comprising a length of angle iron bent to ring form having one of the flanges of the angle parallel to the axis of the ring, said axial flange having a plurality of cuts on the free edge thereof for providing tongues for engagement with said notches to hold said ring in position against the other side of said core structure.

9. A machine comprising a frame, a core structure mounted within said frame, said frame having a seat for engaging the outer periphery of

- said core structure, means at one end of said seat to provide an abutment for one side of said core structure, said seat being notched at the other end, and a split retaining ring cooperating with said notched end for retaining said core structure in place, said retaining ring comprising a rolled steel member bent to circular shape with the ends nearly in abutment, a portion of the abutting ends being cut back more than the remaining portions of the abutting ends for providing an accurate gap between the ends, and means cooperating with said cut-back portion for providing a positive safeguard against the contraction of the ring.
10. A machine comprising a frame, a core structure mounted within said frame, said frame having a seat for engaging the outer periphery of said core structure, means at one end of said seat to provide an abutment for one side of said core structure, said seat being notched at the other end, and a split retaining ring cooperating with said notched end for retaining said core structure in place, said retaining ring comprising a structural member rolled to substantially circular shape with the ends substantially in abutment, a portion of the abutting ends being cut back more than the remaining portions of the abutting ends for providing an accurate gap therebetween, said machine having a portion cooperating with said gap for providing a positive safeguard against the contraction of the ring.
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