

Oct. 10, 1961

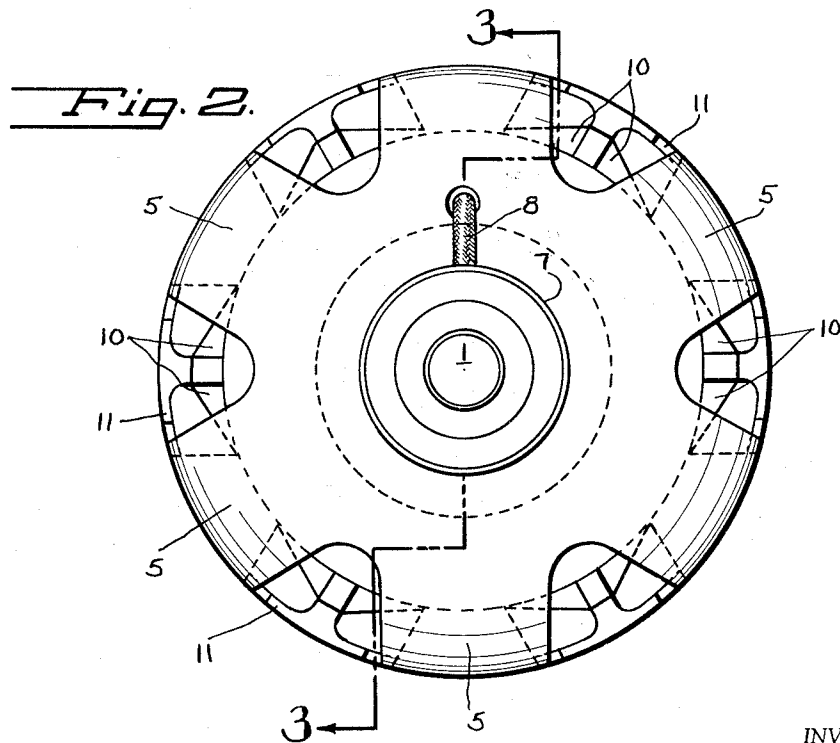
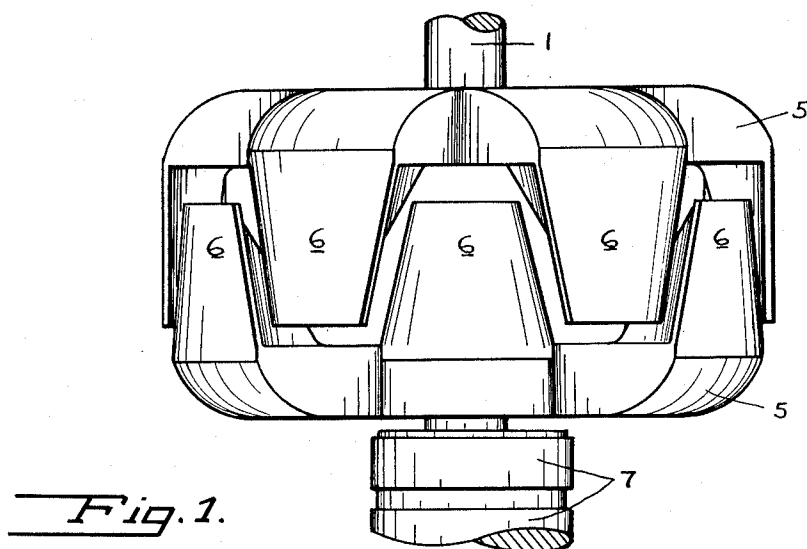
R. C. NODDIN

3,004,181

ALTERNATOR

Filed July 14, 1958

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

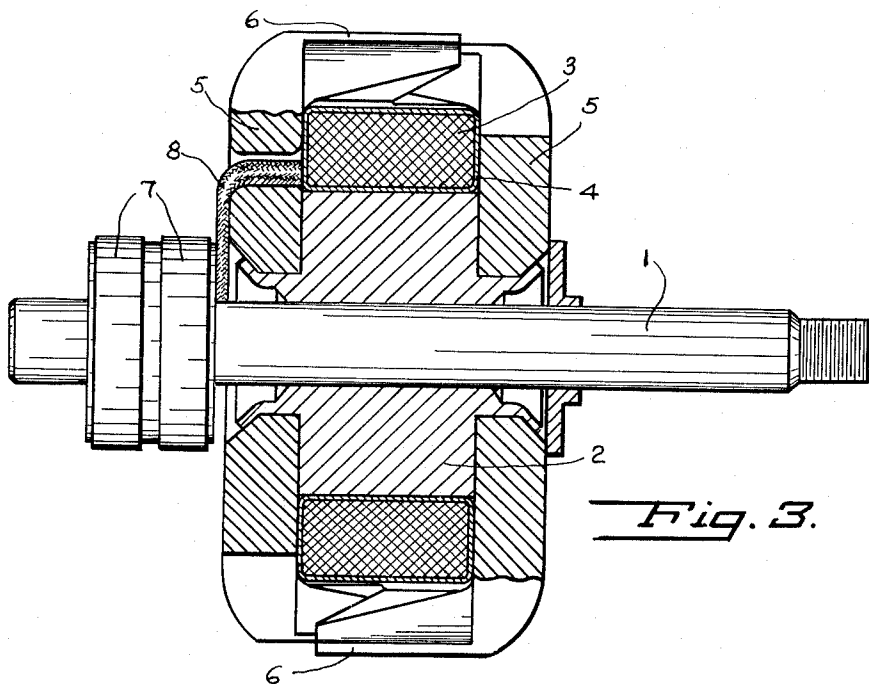


Fig. 3.

Fig. 5.

Fig. 4.

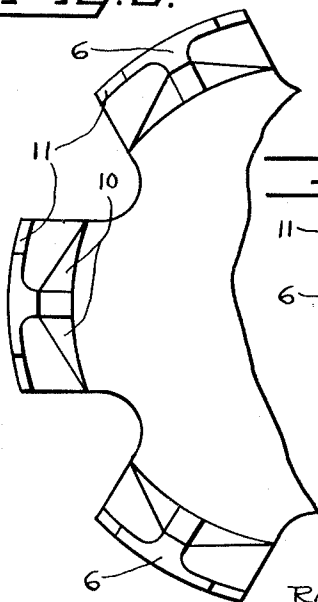
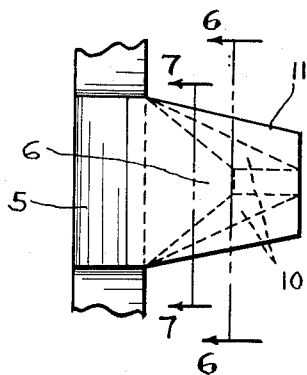


Fig. 6.

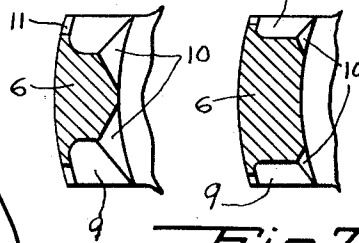


Fig. 7.

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1

3,004,181

ALTERNATOR

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2 Claims. (Cl. 310-263)

This invention relates to a new and improved alternator rotor.

The principal object of the invention is to provide a new and improved alternator rotor having its pole shoes so constructed as to preserve the maximum area across the top and to keep the adjacent sides of the pole shoes as far apart as possible in order to reduce the amount of the leakage flux without impairing the magnetic circuit.

Another object is to provide a new and improved alternator rotor having increased performance over existing alternator rotors due to an increased working flux.

Another object is to provide a device of the character described that permits the use of a wider pole shoe than do existing rotors.

Another object is to provide a device of the character described that allows a reduced leakage flux between the rotor shoes or pole shoes than is possible with existing rotors.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings. It will be understood that changes may be made in the details of construction and arrangement of parts shown and described as the preferred forms have been given by way of illustration only.

Referring to the drawings:

FIG. 1 is a top view of the alternator rotor;

FIG. 2 is a side view of said rotor;

FIG. 3 is a sectional view of the rotor taken on line 3-3 in FIG. 2, looking in the direction of the arrows;

FIG. 4 is a fragmentary view of FIG. 3 and shows the top view of one of the pole shoes;

FIG. 5 is a fragmentary view of the inner side of one of the pole pieces;

FIG. 6 is a sectional view taken on line 6-6 in FIG. 4, looking in the direction of the arrows; and

FIG. 7 is a sectional view taken on line 7-7 in FIG. 4, looking in the direction of the arrows.

Referring more particularly to the drawings wherein similar reference characters corresponding parts throughout, the arrangement shown in FIG. 3 comprises a shaft 1 about which is positioned the usual magnetic core 2.

Surrounding said magnetic core 2 is the annular rotor field coil 3 which is insulated by the coil insulation 4.

The shaft 1 carries the opposed pole pieces 5 which have the intermeshing pole shoes 6. Also carried by the shaft 1 are the slip rings 7 which are connected to the field coil 3 by lead 8.

In order to reduce the flux leakage between adjacent pole shoes 6, said pole shoes 6 are formed as follows:

The pole shoes 6 are undercut at their opposite side edges at 9 so as to preserve the maximum area across the top while keeping the adjacent sides as far apart as possible to reduce leakage flux without impairing the

2

magnetic circuit. This will be seen best from FIGS. 4-7 wherein the undercut areas on the opposed sides of the pole shoes 6 is clearly shown. As will be seen from FIGS. 4, 6 and 7, the under surface of the pole shoes 6 have a portion 10 removed to reduce the weight or mass of the pole shoes 6 because of the action of centrifugal forces at high speed.

As will be seen from FIGURES 5, 6 and 7 the portions 10 taper in two directions, that is, toward the free end of the pole shoe and towards the undercut portions 11.

It will be seen that with the construction shown and described that the thickness of the upper side edges 11 of the pole shoes 6 will be reduced as far as practicable to thereby reduce leakage flux without impairing the magnetic circuit and thereby increase the performance of the rotor by increasing the working flux. This arrangement permits the using of much wider pole shoes 6 with reduction in leakage flux and also reduces the mass or weight of the pole shoes 6.

The rotor operates in the conventional manner with the advantages stated above.

From the above, it will be seen that I have provided new and improved means for obtaining all of the objects and advantages of the invention.

I claim:

1. In an alternator rotor, a pair of opposed pole pieces, said pole pieces each having a plurality of spaced pole shoes with the pole shoes of said pole pieces being in opposed, intermeshing relation, said pole shoes having arcuate outer surfaces of constant periphery and diameter, each of said pole shoes tapering in width from its respective pole piece to the free end of said pole shoe, each of said pole shoes having undercut portions on its inner surface adjacent its side edges and opposed tapered portions on its inner surface each adjacent said undercut portions and extending to an undercut portion, said opposed tapered portions each tapering toward the free end of said pole shoe and toward said adjacent undercut portion, whereby the amount of leakage flux is reduced without impairing the magnetic circuit.

2. In an alternator rotor, a pair of opposed pole pieces, said pole pieces each having a plurality of spaced pole shoes with the pole shoes of said pole pieces being in opposed, intermeshing relation, said pole shoes having arcuate outer surfaces of constant periphery and diameter, each of said pole shoes tapering in width from its respective pole piece to the free end of said pole shoe, each of said pole shoes having undercut portions on its inner surface adjacent its side edges and opposed tapered portions on its inner surface each adjacent said undercut portions and extending to an undercut portion, said opposed tapered portions each tapering toward the adjacent side edge and toward the free end of the pole shoe.

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