

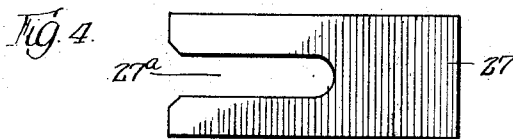
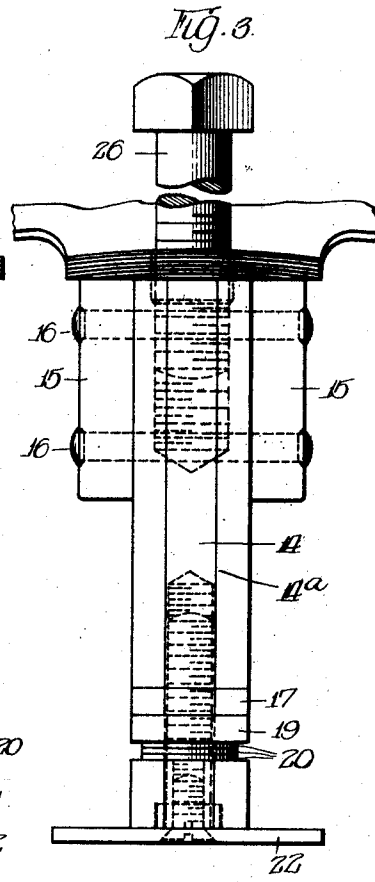
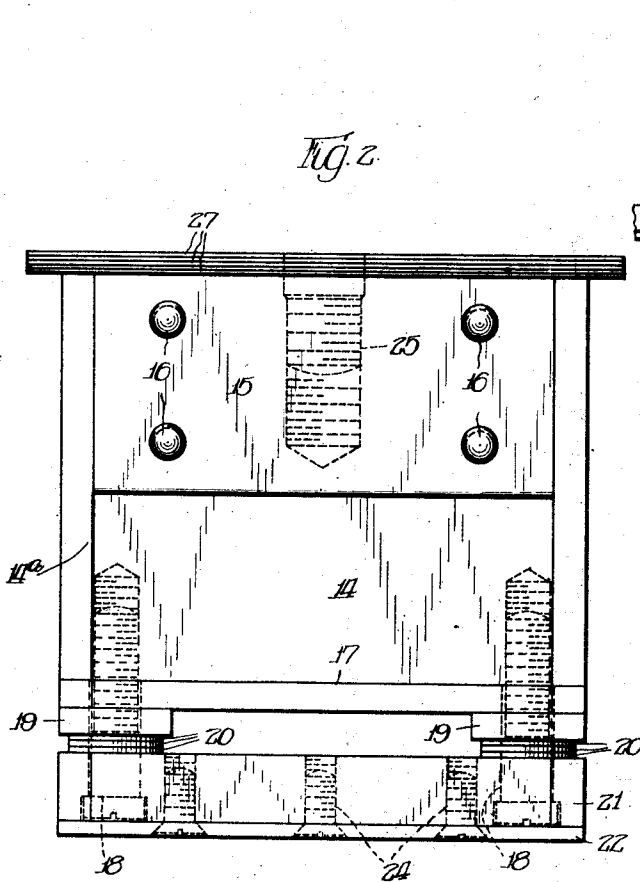
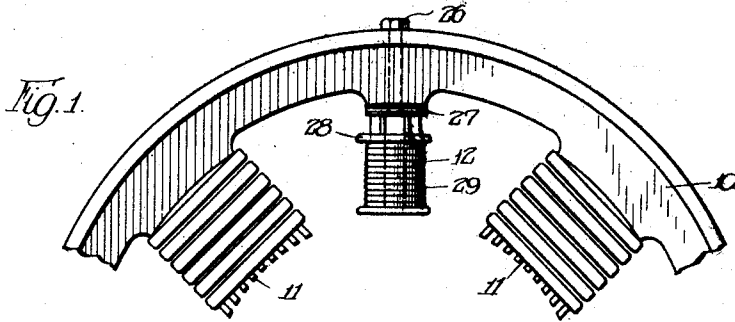
Aug. 25, 1931.

E. SAUTER

1,820,398

INTERPOLE FOR ROTARY CONVERTERS

Filed Aug. 9, 1926



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UNITED STATES PATENT OFFICE

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INTERPOLE FOR ROTARY CONVERTERS

Application filed August 9, 1926. Serial No. 128,111.

This invention relates to the construction of pole pieces for supporting windings in electrical machines, and has particular applicability to construction of the interpoles of rotary converters.

5 A general object of the invention is the provision of construction for pole pieces which facilitates assembly of the apparatus and a variation, as desired, of the effectiveness of the pole as an inductive factor in the machine, whereby a standard design of pole
10 piece may be utilized in machines differing in their electrical characteristics.

15 A specific object of the invention is the provision of a construction whereby a standard design of pole piece is adaptable to different machines requiring different magnetic densities in the poles, or different air gap clearances or different sizes of pole wind-
20 ings.

A further object is the provision of a construction whereby removal of pole wind-
25 ings may be accomplished without dismantling the pole pieces.

25 A further object is the provision of a pole piece construction which will permit adjustment of the air gap after the pole structure and the rotor have been assembled in the frame.

30 Other and further objects of the invention will be pointed out or indicated hereinafter, or will be obvious to one skilled in the art upon an understanding of the invention.

35 In the accompanying drawings forming a part of this specification, I show one embodiment of the invention, but it is to be understood that this is presented for illustration only and is not to be accorded any interpretation having the effect of limiting
40 the claim short of the true and most comprehensive scope of the invention in the art.

In the drawings,

45 Fig. 1 is a part side elevation of an alternating current machine showing two of the main poles and one interpole, the latter being of a construction embodying the invention;

50 Fig. 2 is a side elevational view of an assembled pole piece embodying the invention;

Fig. 3 is an end view of the same, showing its relationship with the machine frame; and

Fig. 4 is a top view of a spacing member, in reduced scale.

In the construction of poles for dynamo-
55 electric machines, and particularly in the construction of commutating poles or interpoles for such machines, the amount of effective magnetic iron, density of the magnetic field, and the air gap clearance are
60 important factors in determining the effectiveness of the poles in the functioning of the machine. Particularly in the case of commutating poles or interpoles, must the
65 construction be such as to maintain the effectiveness of the pole within quite definite limits, so that proper compensation may be attained and overcompensation avoided. In different machines designed for various conditions of service, different degrees of effective-
70 ness are required of the compensating poles. The present invention is designed to provide a pole piece construction which may be standardized for various sizes of
75 machines, and yet permit the necessary variation of features contributing to the poles effectiveness among different machines of the same size but designed for different conditions of operation.

80 The nature of the invention will be readily understood by reference to the illustrative embodiment shown in the drawings, wherein the numeral 10 designates a portion of the machine frame upon which are
85 mounted the main poles 11 and an interpole 12. The latter comprises a suitable winding supported on a pole piece which is mounted on the frame. The pole piece comprises a
90 core member 14 which is a rectangular piece of magnetizable iron having its lateral corners bevelled at 14^a. To its opposite sides are applied the pole plates 15, also of magnetizable iron, the same being held as-
95 sembled on the core member by the rivets 16, and terminating flush with the upper surface of the core member. At the lower, or inner end of the core member is the supplementary plate 17, also of magnetizable
100 metal similar to that of the core member. Said plate conforms in outline to the lateral

contour of the core member 14 and constitutes in effect an extension of the same. There may be a plurality of these supplemental plates thus assembled to extend the core member 14 inwardly. They, together with the distance pieces 19 and 20 and the pole shoe 21, are held in position on the core member by the screws 18, which are of non-magnetizable metal, such as brass. The pole shoe 21 conforms in contour to the cross sectional shape of the core member 14, and like it is of magnetizable material. The distance pieces 19 and 20 are of brass or other non-magnetizable material, and are in the form of washers, through which the screws 18 pass. The heads of the screws 18 are counter-sunk in the pole shoe 21 and the screws are threaded into the core member 14 so that when set up, the supplementary plates 17 are clamped against the end of the core member 14, and the distance pieces 19 and 20 are clamped between the pole shoe and the supplementary plate. To the bottom or inner face of the pole shoe 21, a brass coil-retaining plate 22 is secured by the brass screws 24. By virtue of this construction the iron in the pole piece is interrupted by an air gap, the width of which may be varied to suit the particular installation, by addition or subtraction of one or more of the distance pieces 19 or 20. The length of the pole piece may likewise be lengthened or shortened by addition or subtraction of the supplementary plates 17. At its upper end, the core member 14 is tapped at 25 to receive a bolt 26, whereby the pole is mounted in the machine frame. A plurality of thin shims or spacers 27 is provided, the same being made of magnetizable material, and being slotted at 27^a so that they may be driven in to straddle the bolt between the frame and the pole member. In this manner the distance to which the pole will extend inwardly from the frame may be varied. An outer coil-retaining plate 28, having an aperture to receive the core member 14, abuts the lower margins of the pole plates 15, and the pole winding 29 is fitted on to the core member 14 and the shoe 21 between the plates 22 and 28.

Thus it will be seen, the invention provides a construction wherein the amount of iron in the pole may be varied, the air gap within the pole may be varied, and the air gap between the plate 22 and the rotor may be varied, or may be maintained at a desired clearance with variation in the other features mentioned, through provision of the spacers 27. Accordingly, pole pieces of this design are adaptable to a wide variety of particular instances of machine construction. The windings may be removed, after the rotor is withdrawn, simply by backing out the screws 24, or the pole may be with-

drawn as an entity by backing out the bolt 26.

What I claim is:

In a dynamo electric machine, an annular frame, a pole core including a body portion carried by said frame and extending radially inwardly with respect thereto, a winding disposed on said core, a shoe forming part of said core and disposed at the inner end of said body portion in spaced relation with respect thereto to provide an air gap in said core, spacing means interposed between said body portion and said shoe, a screw extending through said shoe and said spacing means and being screwed into said body portion to clamp said spacing means between the latter and said shoe, a plate disposed against the inner face of said shoe and extending laterally beyond the same, laterally-extending portion of said plate providing against inward movement of said winding out of assembled relation with respect to said core, and means holding said plate in position against the inner face of said shoe.

In testimony whereof I have hereunto subscribed my name this 22nd day of July A. D. 1926, at Zurich, Switzerland.

ERWIN SAUTER.