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1,502,527

W. REICHEL ET AL

ROTARY FIELD MAGNET

Filed Nov. 6, 1920

Fig. 1

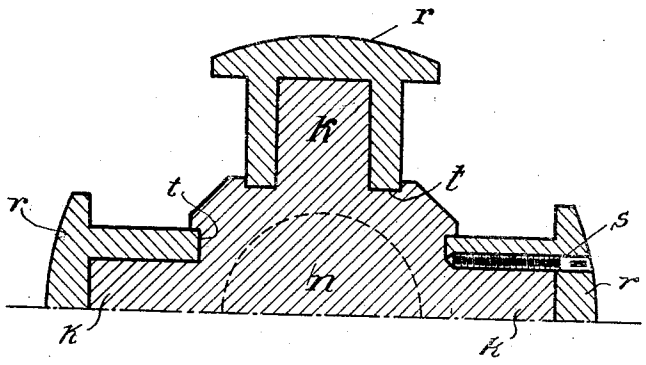
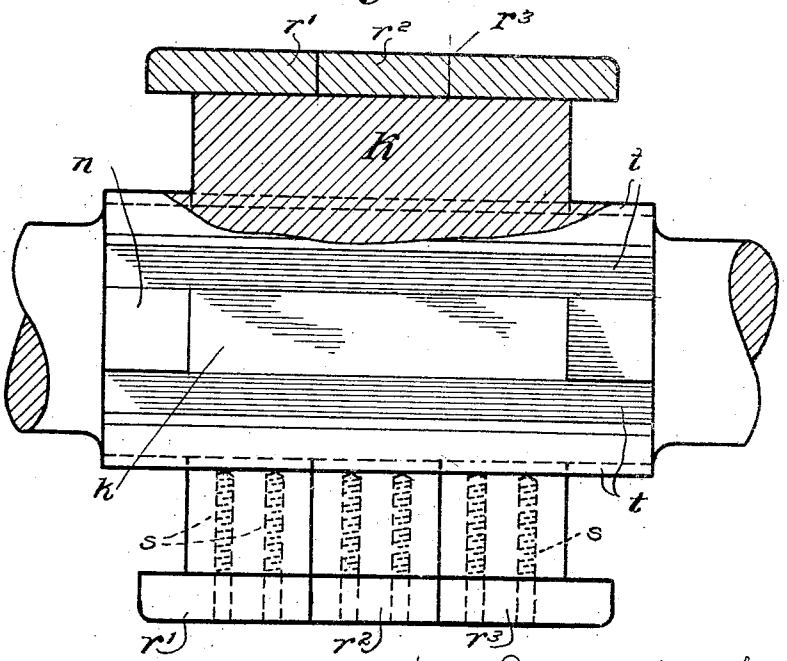


Fig 2



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UNITED STATES PATENT OFFICE.

WALTER REICHEL, OF BERLIN-LANKWITZ, AND WILHELM GSCHEIDLEN, OF BERLIN-SCHMARGENDORF, GERMANY, ASSIGNORS TO SIEMENS-SCHUCKERTWERKE GESELLCHAFT MIT BESCHRANKTER HAFTUNG, OF SIEMENSSTADT, NEAR BERLIN, GERMANY, A CORPORATION OF GERMANY.

ROTARY FIELD MAGNET.

Application filed November 6, 1920. Serial No. 422,359.

To all whom it may concern:

Be it known that we, WALTER REICHEL and WILHELM GSCHEIDLEN, citizens of the German Republic, resides at Berlin-Lankwitz, Germany, and Berlin-Schmargendorf, Germany, respectively, have invented certain new and useful Improvements in Rotary Field Magnets, of which the following is a specification.

Our invention relates to rotary field magnets for electrical machines, a form of execution of which is shown, by way of example, in the accompanying drawing, in which—

Fig. 1 is a cross section, and

Fig. 2 a side elevation, with a part broken away to show the construction.

In the case of high speed field magnet systems for alterating current machines, having a relatively small diameter, the customary manner of attaching the pole pieces, such as by dove-tailing, bolting, or the like, proves inexpedient owing to the great centrifugal forces present. In order, therefore, to successfully counteract the extraordinary heavy strains to which the pole pieces are subject, it has been suggested to subdivide these latter into pole-cores and pole-hoods, in such manner that cylindrically shaped core sections are provided integral with the hub of the rotary field magnet, over which sections suitably hollowed hoods, having the exterior customary shape of the finished poles, are slipped. The pole core in such cases is usually threaded to enable the hood to be screwed thereon, or else the outer face of the pole core is made entirely smooth, the hood being slipped over and secured in its place by means of screws inserted in an axial direction in the joint between the pole core and the hood.

In the case of rotary field magnets having a very long axis an arrangement of this kind embodying only a single cylindrically shaped pole-core has, however, proved insufficient, and it was found necessary to arrange a plurality of such cores, side by side, in order to firmly secure the hoods. But this arrangement causes serious inconveniences of manufacture. In such case the pole-cores must be disposed exactly along one and the same plane to enable the hood to be readily slipped on and removed. Precision work of this nture is very hard to execute, and thus very expensive.

Another method of attaching pole-shoes to long rotary field magnets, consists in halving the pole-shoe, each half or section being provided in the centre with pole stumps which are firmly clamped or secured by being pressed in midway between a central portion of the core integral with the rotor hub, and two lateral core sections arranged on rings, and adapted to glide along the hub; the pole-shoes are prevented from flying out by the firmly meshing of these sections by means of a tongue and groove arrangement. Still, this method of attachment also involves the essential drawback that a great number of parts have to be machined, and that a considerable quantity of copper is required for the exciting winding, because this winding must always be wider in the axial direction than the pole-core, after this latter has been assembled or fitted together, in order to enable the outer portions of the core to be withdrawn when the sections or halves of the pole-shoe are either to be fitted in or removed.

In accordance with our invention, the manufacture of rotary field magnets is substantially simplified by arranging contact faces between pole-hood and pole-core only in parallel to the rotor axis. In this case the hoods are shaped to form saddles having shanks which looking in the direction of the rotor axis are disposed at either side of the pole-core.

In the form of execution shown in Fig. 1, a solid boss k protrudes from hub n extending substantially the length of said hub constituting the pole-core. On to this core is mounted the saddle r, fixed to the core k by means of a screw s.

In the case of extraordinary high speeds, the lateral components of the centrifugal forces acting on the shanks of the pole-hoods may attain a magnitude constituting an objectionable additional stress for the hoods. According to this invention, the said lateral components are therefore neutralized by the shanks being to a certain extent counter sunk in grooves t formed in the hub (Fig. 1).

To render the saddles sound and strong, they are preferably produced by forging. To enable this to be done, the saddles are

divided into a plurality of sections according to requirement. For instance, as shown in Fig. 2 they may be divided into three sections r_1, r_2, r_3. As is also shown in this figure, grooves t, similar to those shown in Fig. 1 are provided, in which the ends of the shanks of the pole pieces r_1, r_2, r_3 are located, and the screws s holding the pole pieces in position are shown in dotted lines at the lower pole. The pole core k, facing the observer, is shown without pole pieces.

As will be obvious from the foregoing, the manufacture of rotary field magnets for high speed machines is greatly simplified by means of our invention, as the supporting faces, for one thing, may be readily planed already in the workshop. Should circumstances render it desirable, the saddles may be made of stamped sheet metal plates.

We claim:

1. In a rotating field magnet system for electrical machines, a plurality of pole cores of substantially rectangular cross-section, all having a common hub integral therewith, and saddle-shaped pole hoods arranged thereon, the shanks of said polehoods extending to said hub and only on the sides of the cores parallel to the rotor axis.

2. In a rotating field magnet system for electrical machines, a plurality of pole cores of substantially rectangular cross-section, all having a common hub integral therewith, and saddle-shaped pole hoods arranged thereon, the shanks of said pole hoods extending to said hub and only on the sides of the cores parallel to the rotor axis, said hub having grooves adapted to receive the ends of said shanks.

In testimony whereof we affix our signatures.

WALTER REICHEL.
WILHELM GSCHEIDLEN.