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ROTOR FOR MAGNETOS

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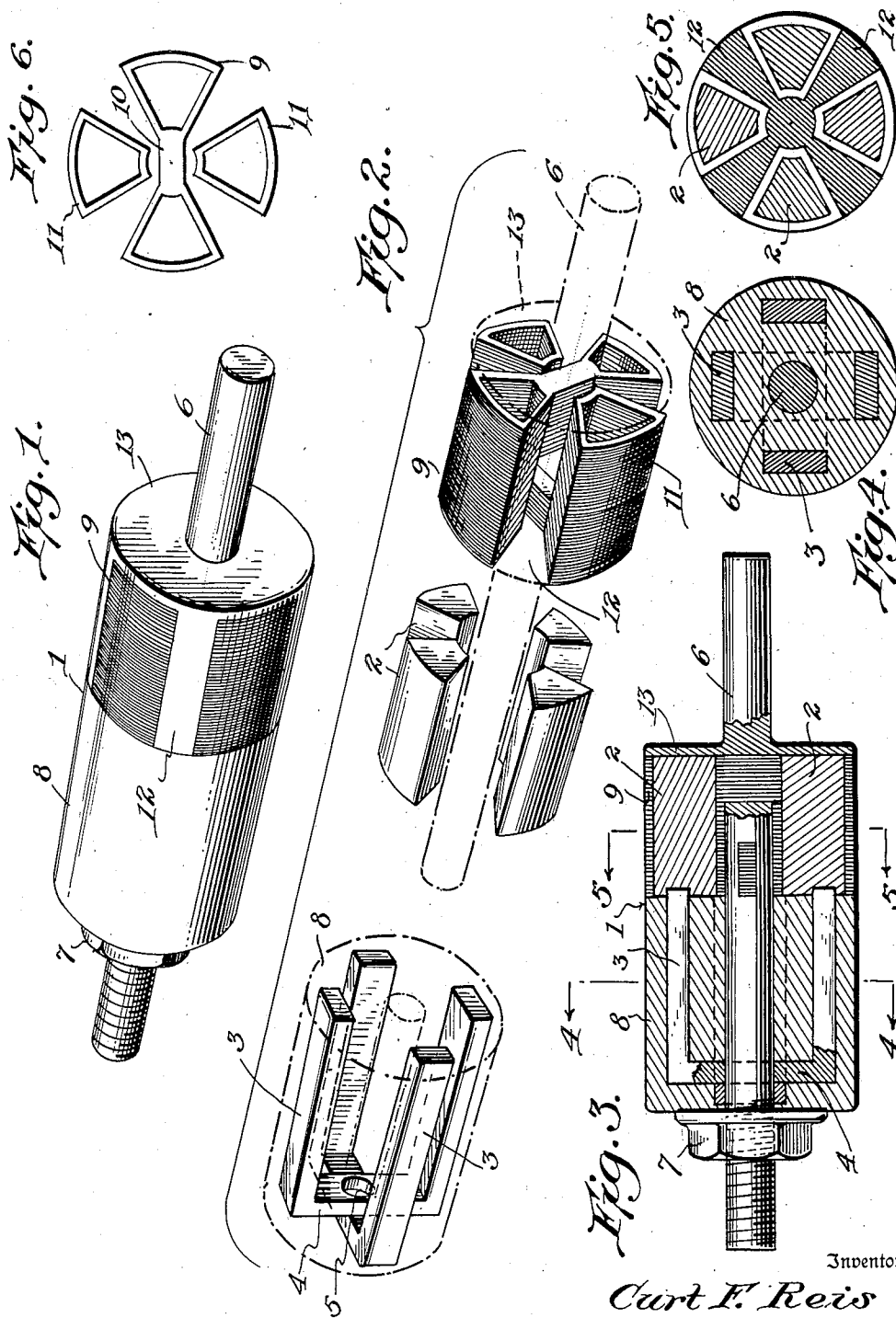


Fig. 3.

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## UNITED STATES PATENT OFFICE

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## ROTOR FOR MAGNETOS

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The present invention relates to magnetos, particularly of the type employing a rotating permanent magnet and a stationary generating winding, and has special reference to the general improvement of the construction of the rotor of such devices, whereby the same may be more readily and cheaply assembled. In some respects this invention is similar to the rotor disclosed in my copending application Serial No. 197,214, filed June 7, 1927, now Patent No. 1,726,043.

In the usual construction of rotors of the present general type a circular plate or disc is attached to the free end of the magnet or magnets for the purpose of furnishing a support for the shaft and for centering the pole pieces. These plates are usually attached by means of screws or the like. Such structures are objectionable, in that the screws sometimes become loose, thereby permitting the disc to become detached or partly so, with the result that the mechanism is partly disrupted, if not entirely destroyed.

In prior types of magnetos the rotor pole pieces are usually formed integrally with the hub or boss of the rotor and thus necessitate the special construction of the entire rotor if the number of poles is to be varied or if their thickness is to be increased or decreased for the purpose of varying the strength of the magnetic field.

It is an object of this invention to eliminate the objectionable features of magneto rotors as above referred to and at the same time reduce to a minimum their cost of manufacture.

A further object of the invention resides in the construction of a rotor of extreme cheapness, and yet which has a perfect balance due to the fact that in its final form it consists of a solid mass of metal.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawing, in which

Figure 1 is a perspective view of the complete rotor.

Figure 2 is a perspective view of the several parts of the rotor about to be assembled,

certain of the parts being shown in dotted outline.

Figure 3 is a longitudinal sectional view through the rotor; and

Figures 4 and 5 are transverse sectional views taken on lines 4-4 and 5-5 respectively of Figure 3.

Figure 6 is a plan view of the laminations per se.

Referring to the drawing in greater detail the numeral 1 designates the rotor as a whole, here shown as composed of four pole pieces 2, although it will be understood from the following description that the number of poles may be readily varied at will in the fabrication of the rotor. Furthermore, the pole pieces 2 are comparatively short, as indicated, for the purpose of reducing the cost of manufacture, and in order to close the magnetic circuit between these poles I provide the substantially U-shaped members 3 of magnetic material such as hard steel. Two, three or more of these members may be employed depending upon whether four, six or a greater number of pole pieces are to be incorporated in the rotor.

The U-shaped members 3 are arranged in the manner shown in the view at the left of Figure 2, and when assembled in the completed rotor their free ends are in intimate contact with the inner ends of the several pole pieces as shown in Figure 3. The bases 4 of the U-shaped members are provided with registering apertures 5 to receive a shaft 6 which is provided at one end with means such as a nut 7 for locking the assembled parts together. Shaft 6 extends completely through the rotor to provide bearing members at opposite ends thereof. The members 3 are preferably embedded in a casing of aluminum or the like 8.

Each of the pole pieces is provided with a plurality of laminations as described in my patent above referred to. Some of these laminations such as 9 are in the form of double loops connected by an integral web 10 and adapted to tie together the opposed pole pieces while other laminations 11 consist of

single loops and are disposed between the two stacks of double loops so as to maintain the webs associated with the two pairs of pole pieces out of contact; this arrangement is clearly shown in Figure 2. Disposed between the adjacent stacks of laminations are webs of non-conducting material 12 such as bronze or brass and which are integrally formed on the shaft 6.

In fabricating the rotor the laminations 9 and 11 are arranged in a mold with suitable cores, and molten brass or other non-magnetic metal poured into the mold so as to unite the laminations, the shaft 6, webs 12 and end plate 13 as indicated in dotted lines at the right of Figure 2. The U-shaped members 3 are also arranged in a mold and properly cored so as to provide an opening for shaft 6. Aluminum or the like is then poured into the mold so as to completely envelope the members 3 with the exception of their free ends which are to contact with the inner ends of the pole pieces 2.

With the parts as thus prepared, the pole pieces 2 are slid into the pockets formed by the laminations 9 and 11 until they abut the plate 3. Element 8 with its embedded U-shaped members 3 is then passed over shaft 6 until the ends of members 3 are brought into intimate contact with the pole pieces 2. The several parts are then locked in their proper relative position by means of the nut 7 or other conventional means. The rotor is now in the form shown in Figures 1 and 3 and is ready for installation.

From the foregoing description taken in connection with the accompanying drawing it will be observed that I have provided a rotor comprising, in its final form, a solid mass of metal symmetrically arranged and hence having a perfect balance; that the parts are so designed as to permit their production at a minimum cost and may be quickly and cheaply assembled so as to provide a rotor of strong and durable construction at an extremely low price. It will also be noted that by the present construction there are no parts liable to become loosened during operation of the rotor, and that therefore there is no liability of disorganization of the rotor in use.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A rotor for magnetos including a plurality of separate U-shaped members of magnetic material, and pole pieces each having one end in intimate contact with one of the arms of said U-shaped members.

2. A rotor for magnetos including a plurality of U-shaped members arranged with their bases in intersecting relation, a mass of cast metal in which said members are embedded, and a plurality of pole pieces each having one end in contact with one of the arms of said U-shaped members.

3. A rotor for magnetos including a plurality of pole pieces, laminations encircling said pole pieces, and a mass of cast non-magnetic metal intimately uniting said laminations, a shaft integrally united with said mass of metal, and a plate integrally united with said shaft and engaging the ends of said pole pieces.

4. A rotor for magnetos including a plurality of U-shaped members of magnetic material, a mass of cast metal in which said members are embedded with their ends exposed, a plurality of pole pieces, a shaft on which said pole pieces are mounted, and means for locking said members in position with their exposed ends in engagement with said pole pieces.

5. A rotor for magnetos including a plurality of U-shaped members of magnetic material, a mass of cast metal in which said members are embedded with their ends exposed, said mass of metal provided with a central opening, a shaft extending through said opening, a plurality of pole pieces carried by said shaft, and means for locking said shaft in said opening with one end of each of said pole pieces in engagement with the exposed ends of said U-shaped members.

6. A rotor comprising two elements intimately connected together, one element including a plurality of separate U-shaped members, and the other element including a shaft and a plurality of pole pieces carried thereby.

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