

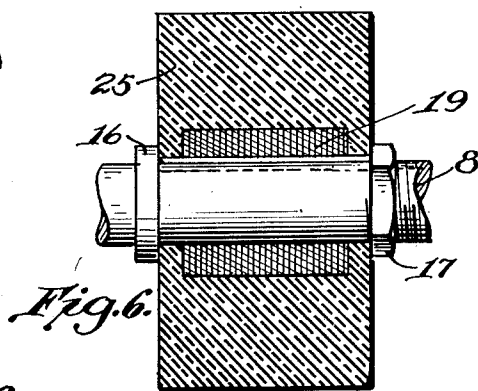
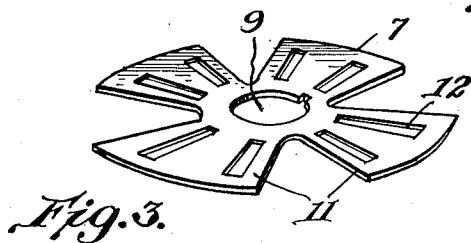
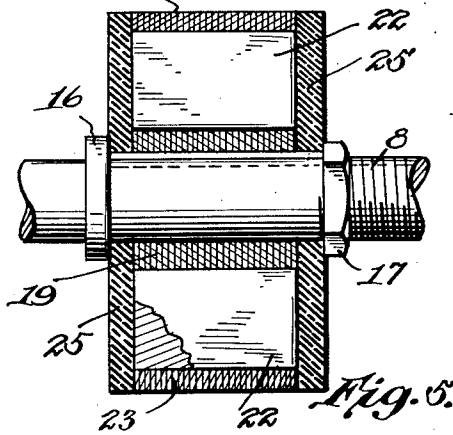
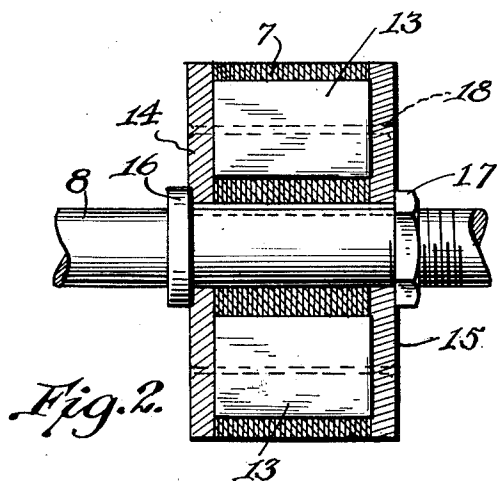
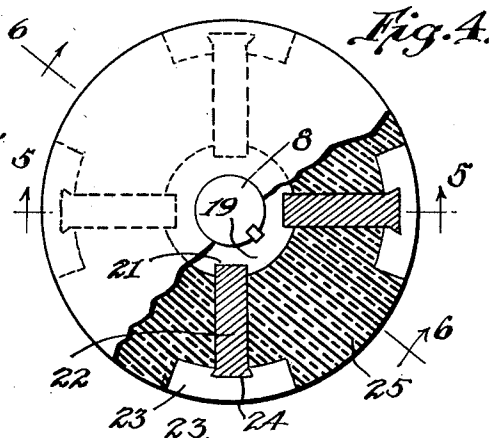
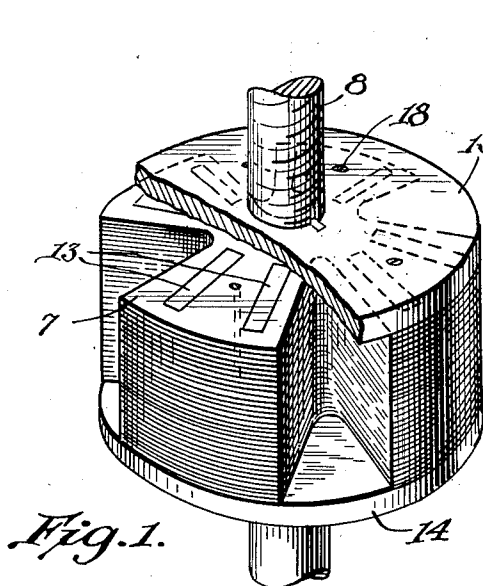
Nov. 3, 1936.

T. J. HARLEY

2,059,518

MAGNETO ROTOR

Filed Nov. 19, 1934



Inventor
Thomas J. Harley

By *Exelston & Exelston,*
Attorneys

UNITED STATES PATENT OFFICE

2,059,518

MAGNETO ROTOR

Thomas J. Harley, Chicago, Ill.

Application November 19, 1934, Serial No. 753,745

7 Claims. (Cl. 171—209)

This invention relates to magneto rotors and particularly to rotors of the polarized type adapted for use with magnetos employing a fixed generating winding.

5 According to this invention the parts are constructed and arranged to totally enclose the permanent magnets and to hold them in permanent magnetic association with their pole pieces by a simple permanent structure. The invention also
10 contemplates using magnets which are of simple bar form.

The objects of the invention will appear fully from the following description when read in connection with the drawing in which:

15 Figure 1 is a perspective view of one embodiment of the invention, with parts broken away to show a portion of the interior construction.

Figure 2 is a longitudinal section taken parallel to the shaft of Figure 1.

20 Figure 3 is a detail view of one of the laminations employed in the structure of Figure 1.

Figure 4 is an end view, partially in section, of a modified form of rotor; also embodying this invention.

25 Figure 5 is a section on line 5—5 of Figure 4.

Figure 6 is a section on line 6—6 of Figure 4.

The rotor shown in Figure 1 comprises a plurality of laminations 7 threaded onto a shaft 8 through openings 9. These laminations are
30 preferably composed of steel and each is made up of a body having a plurality of radial arms 11, adapted when stacked in registry to form polar projections, here shown as four in number. It will be obvious that any desired number of such
35 polar projections may be obtained by varying the form of laminations 7 to provide different numbers of arms.

Each arm is perforated as at 12 so that when the laminations are stacked with these openings in registry open ended pockets are formed. These
40 pockets are closed adjacent the shaft and near the peripheral ends of the laminations, but their lateral ends are open for the insertion of bar magnets 13. These magnets may be formed of
45 rolled bar stock of any suitable steel, such as chrome, tungsten, or cobalt. As shown each arm contains two magnet pockets although either a greater or a lesser number may be employed.

The laminations are preferably held together
50 on the shaft by non-magnetic end plates or discs 14 and 15 and secured together by bolts, rivets or the like. As shown rivets 18 extend entirely through the plates 14 and 15 as well as the stacked laminations of each of the arms 11. The end
55 plates 14 and 15 not only tend to shield the mag-

nets 13 against leakage but they cooperate with the pockets to entirely house the magnets and prevent them from shifting their positions.

In accordance with usual practice the shaft 8 may be provided with an integral shoulder 16
5 abutting the plate 14, and a nut 17 threaded onto the shaft at the other side of the laminated body and abutting the plate 15. When nut 17 is tightened the assembly is effectively secured on the shaft. It will be clear that after the laminations
10 are stacked the magnet bars already magnetized may be inserted in the pockets and the end plates secured in position to complete the assembly. Although the end plates are shown as discs it is obvious that they may assume the same shape
15 as the laminations (Fig. 3) without departing from the spirit of the invention.

The two magnets 13 associated with each arm will be magnetized so that their outer enclosed ends are of the same polarity. Hence each polar
20 projection comprising a plurality of stacked laminations will be of one polarity and adjacent projections of alternating polarity as in usual practice. The inner ends of the magnets will, therefore, be connected by laminated material
25 so as to avoid magnetic leakage. The shaft 8 may be of either magnetic or non-magnetic material.

The above structure is of simple and highly satisfactory form in that the magnets are of the
30 simplest possible construction and are enclosed so as to avoid demagnetization and magnetic leakage. Not only are the magnets totally housed in the laminated rotor body but they may be made readily accessible by removing one or both of the
35 end plates.

A modified form of rotor incorporating the basic principles of the invention is shown in Figs. 4, 5 and 6. In Fig. 4 the reference character 8
40 designates the shaft as before, and 16 the shoulder. Carried on this shaft and preferably keyed to it is a core 19 made of annular laminations, each having notches cut in its periphery. When the laminations are stacked the notches form
45 pockets 21 for the reception of bar magnets 22 similar to those just described. These magnets extend radially outward from the shaft and each carries at its outer end a pole piece 23 composed of small polar laminations, each cut out at
50 24 to receive and interlock with the outer end of a magnet. Any desired configuration may be given to the notches 21 and 24 in order to aid the interlocking action between the magnets and the two sets of laminations.

When the laminations and magnets are assem- 55

bled on the shaft, as shown in Fig. 4, the whole assembly is enclosed in a mold and united by an insulating mass 25, which is hardened under heat and pressure. The insulating material is preferably a phenolic condensation product such as "Bakelite", which has good insulating and binding properties and also has the required mechanical strength to secure the pole pieces, magnets, core and shaft into intimate permanent relation. Rigid union between the molded material and the shaft may be secured by use of a key as shown, or by knurling the shaft to afford a better gripping surface for the molded material. The insulating material 25 effectively encloses the magnets 22 against leakage. The pole pieces 23 may be of any desired polarity while the inner ends of magnets 22 are effectively shielded against demagnetization and leakage.

While but a single magnet 22 is shown connecting each pole piece 23 with the core 19, it is obvious that a plural magnet structure such as that of Fig. 1, might be adopted. Likewise, while the rotor of Fig. 4 is shown as of the four-pole type the structure is not limited in any way to this specific number of poles.

The structures shown are not only simple to construct and manufacture but they offer the advantage of permitting the generation at low voltage, of heavy currents in the primary circuit of an ignition system with the expenditure of a minimum of power.

I claim:

1. A magneto rotor comprising a shaft; a laminated magnetic core enclosing said shaft adjacent the midportion thereof; a plurality of thin flat permanent magnets secured in contact with and magnetically linked to said core in radial spaced relation to said shaft; laminated pole pieces on said magnets; and means for securing said core, said magnets and said pole pieces in permanent assembled relation.

2. A magneto rotor comprising a shaft; a plurality of flat bar magnets disposed longitudinally of said shaft and extending radially therefrom; a laminated core on said shaft, said core having recesses for anchoring said magnets in spaced relation to one another and out of magnetic contact with said shaft; laminated pole pieces on said magnets; and means for securing the pole pieces, magnets, core and shaft in permanent assembled relation.

3. A magneto rotor comprising a laminated magnetic body made up of stacked laminations, all of said laminations having magnet receiv-

ing openings in registry; a flat permanent magnet in each pocket formed by the stacked laminations; a shaft for supporting said laminations, said shaft being spaced from and out of the magnetic circuit of said magnets; and means for anchoring said parts in permanent assembled relation.

4. A magneto rotor comprising a shaft; an assembly of perforated magnetic laminations embracing said shaft and forming a magnetic core surrounding said shaft; a plurality of thin flat permanent magnets housed within pockets formed by the perforations in the laminations, said magnets being disposed radially and longitudinally of said shaft and having their inner ends contacting with said core in spaced relation to said shaft; an end plate on each side of said assembly of laminations; and means for securing said end plates, said laminations and said magnets in permanent assembled relation.

5. A magneto rotor comprising a shaft; a hollow laminated magnetic core embracing said shaft; a plurality of thin flat permanent magnets contacting with said core in spaced relation to said shaft and extending longitudinally of said shaft and radially from said core; a laminated pole piece on the outer end of each magnet; and a solid body of insulating material embedding said magnets and securing them to the core and pole pieces to form a unitary cylindrical member.

6. A unitary magneto rotor assembly comprising a shaft; a cylindrical body of insulating material having a hollow laminated tubular core embracing said shaft; a plurality of thin flat permanent magnets having their inner ends anchored in contact with the periphery of said core, said magnets being spaced from and extending longitudinally of said shaft and radially therefrom; and a laminated pole piece on the outer end of each magnet, said pole pieces being in spaced relation to each other and exposed on the surface of said cylindrical body.

7. A magneto rotor comprising a shaft; a laminated core embracing said shaft; a plurality of thin flat magnets contacting with the periphery of said core in spaced relation to said shaft and extending radially therefrom; a laminated pole piece contacting with the outer end of each magnet; and a solid cast cylindrical body of insulating material embedding said core, said magnets and said pole pieces to form a rigid unitary structure.

THOMAS J. HARLEY.