Dec. 5, 1933. E. F. WESTON 1,937,677

MAGNETO

Filed Aug. 5, 1931

Fig. 1.

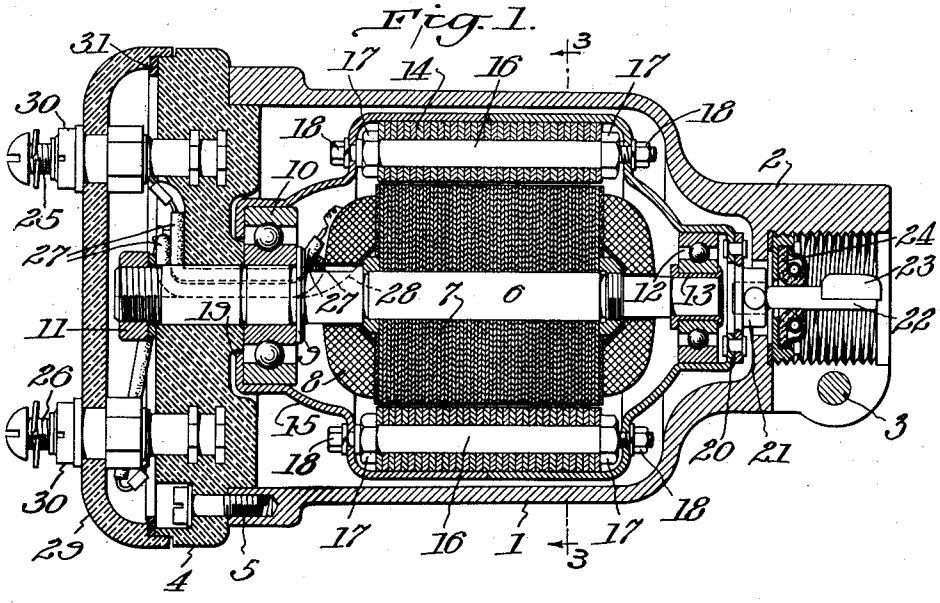
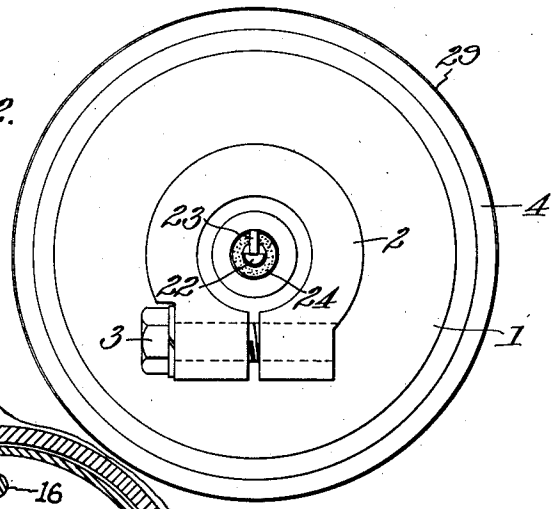


Fig. 2.



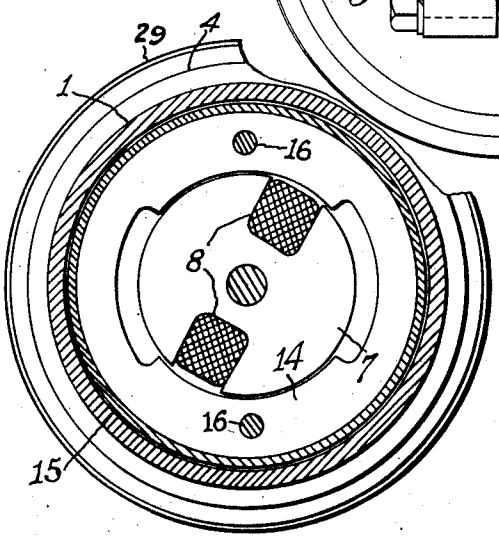


Fig. 3.

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MAGNETO

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19 Claims. (Cl. 171—209)

This invention relates to magnetos, and while not restricted to any particular size of magneto is especially useful in the construction of small and relatively light magnetos intended for use, with appropriate electrical measuring instruments, as tachometers.

An object of the invention is to provide a magneto of simple and sturdy construction, and one in which the parts are so related and interconnected that the assembly, repair and/or replacement of parts is facilitated. An object is to provide a magneto in which all of the electrical and magnetic parts are assembled upon and carried by a base plate, and the casing which supports and houses the assembly may be connected to or removed from the base plate without disturbing the assembly. A further object is to provide a magneto of the rotating magnet type which includes a satisfactory, rugged support for the rotating magnet. More specifically, an object is to provide an armature and circular magnet assembly in which a shell carries the magnet and encloses the assembly, and in which the armature shaft extends through one end of the shell and the opposite end of the shell carries a second shaft, one of said shafts serving to support the assembly while the other serves as the drive for the rotating element of the magneto.

These and other objects of the invention will be apparent from the following specification and the accompanying drawing in which:

Fig. 1 is a central longitudinal section taken through one embodiment of the invention,

Fig. 2 is an end view of the same, and

Fig. 3 is a transverse section taken substantially on line 3—3 of Fig. 1.

In the drawing, the numeral 1 identifies the main section of the casing, which preferably takes the form of a cylinder having one end 2 of reduced diameter that is internally threaded for connection to the sleeve which houses the tachometer drive shaft of an airplane or other engine, this reduced diameter section being split longitudinally and provided with a clamp bolt 3 for locking the magneto casing to the engine structure.

The end plate 4 closes the open end of the casing 1 and is secured thereto by bolts 5 that engage the thickened rim at the open end of the tubular casing. The end plate 4 is preferably formed of a molded synthetic resin and has a central aperture for receiving the end of the rod or shaft 6 that supports both armature and magnet structures. The laminated armature 7 is secured upon the shaft 6 and may be of the conventional design with longitudinal slots to receive the windings 8.

Shaft 6 has a radial flange 9 that engages the inner race of a ball bearing 10 to clamp the bearing against the inner face of the end plate 4 when the nut 11 is threaded upon the outer end of shaft 6 to secure the shaft to the armature end plate. A second bearing 12 is secured to the opposite end of shaft 6 by a bushing 13, and the outer races of the bearings carry the circular magnet 14 through the supporting frame or shell 15. The magnet is laminated and the stampings are held together by bolts 16 and nuts 17, the bolt ends projecting well beyond the magnet laminations to receive nuts 18 which clamp the shell 15 to the magnet. The shell is formed in two sections which preferably meet approximately at the longitudinal center of the magnet and the ends of the shell are of reduced diameter to fit snugly upon the bearings 10, 12, and are provided with inturned flanges 19, 20. The flange 19 adjacent the end plate 4 is seated against the outer race of bearing 10, and the flange 20 is spaced from bearing 12 and carries a plate 21 to which the coupling shaft 22 is secured. The shaft 22 has a key or projecting rib 23 for engagement with the form of tachometer drive shaft construction that is customarily employed on airplane engines, and the shaft lies within the sleeve 2 of the casing in such position that the driving connection is established when the magneto casing is secured to the engine casing by the sleeve 2. A flexible guard 24 is mounted in the sleeve extension 2 to prevent oil, dust or other foreign matter from entering the casing about the shaft 22.

As stated above, the end plate 4 preferably comprises a molded body of synthetic resin as this construction permits the shanks of the magneto terminals 25, 26 to be secured to the end plate during the molding operation. The leads 27 from the armature winding 8 are brought through the end plate through a slot 28 in the shaft 6, and are connected to the respective terminals 25, 26. The terminals extend through a cover plate 29 and carry nuts 30 which hold the cover plate in place, a gasket 31 being preferably arranged between the cover plate 29 and the end plate 4 to provide a dustproof closure for the outer end of the magneto structure.

The construction is particularly advantageous from the standpoint of assembly, testing and repair or replacement. The end plate 4 provides a cantilever support for the armature shaft 6 which carries the armature-magnet system, and,

since the terminals are also secured to the end plate 4, the entire magneto assembly is built up and tested before the casing 1 and cover plate 29 are in place. The identical magneto assembly may therefore be housed in other types of casings, the design of the casing and of the coupling shaft 22 being varied in accordance with the nature of the structure upon which the magneto is to be mounted and the type of rotating system which is to operate the magneto.

I claim:

1. In a magneto, a casing, an armature within said casing, a shaft rigidly connecting said armature and casing, a winding on said armature, a magnet within said casing and surrounding said armature, bearings carried by said shaft at opposite ends of said armature, means rotatably supporting said magnet on said bearings, a coupling shaft connected to said magnet supporting means, and means on said coupling shaft adapted to connect the same to a power source outside of said casing.

2. The invention as set forth in claim 1, wherein said casing comprises a plurality of sections, and said armature shaft is connected to only one of said sections.

3. The invention as set forth in claim 1, wherein said casing comprises a plurality of sections, and one of said sections terminates in a sleeve for mounting said magneto on a supporting structure, said coupling shaft being positioned within said sleeve.

4. In a magneto, a tubular casing having one end provided with means for securing the casing to a support, a shaft secured to the opposite end of and extending axially of said casing, a frame having the opposite ends thereof rotatably supported on said shaft, means preventing axial displacement of said frame on said shaft, a magnet carried by said frame, and a winding supported by said shaft within said magnet.

5. The invention as set forth in claim 4, wherein said frame comprises a shell completely enclosing said magnet and winding.

6. In a magneto, a casing comprising sections meeting on a plane normal to the axis of the casing, a shaft secured to one of said sections and extending substantially through the space within said casing, a frame having the opposite ends thereof rotatably supported on said shaft, a magnet carried by said frame, an armature on said shaft within said frame, and a winding on said armature.

7. The invention as set forth in claim 6, wherein said frame comprises a shell enclosing said magnet and armature, and coupling means on the end of said shell at the end thereof remote from the supported end of said shaft.

8. The invention as set forth in claim 6, wherein the casing section not supporting said shaft terminates in a sleeve for securing said magneto to a supporting structure, and means in said sleeve and connected to said shell for rotating the same.

9. In a magneto, a tubular casing having an open end, an end plate closing the said open end of said casing, a shaft supported by said end plate, an armature on said shaft, a winding on said armature, a circular magnet surrounding said armature, a frame carrying said magnet, and means rotatably supporting the outer ends of said magnet frame on said shaft.

10. In a magneto, a tubular casing having an open end, a closure for said open end, a shaft fixed to said closure, an armature and armature winding carried by said shaft, a circular magnet surrounding said armature, and a transversely split shell secured to said magnet and substantially enclosing said magnet and armature, said shell having end portions of reduced diameter rotatably supported on said shaft.

11. The invention as set forth in claim 10, in combination with a coupling shaft secured to the end of said shell remote from said casing closure, the end of said casing adjacent said coupling shaft being of reduced diameter and carrying a dust guard through which said coupling shaft projects.

12. In a magneto, an armature having a winding thereon, a shaft carrying said armature, bearings having the inner races thereof supported on said shaft adjacent the ends thereof, a circular magnet, and a split shell supporting said magnet and enclosing said armature, said shell having end portions of reduced diameter within which the outer races of said bearings are seated.

13. The invention as set forth in claim 12, wherein the reduced diameter portion of one end of said shell is internally flanged, a plate secured to said flange, and a coupling shaft secured to said plate.

14. In a magneto, the combination with a substantially rigid assembly comprising an end plate, a shaft having one end thereof secured to and axially of said plate, and an armature and armature winding fixed upon said shaft, of a circular magnet surrounding said armature, means rotatably supporting said magnet on said shaft, a casing open at both ends, said casing being secured to said end plate and with the end plate closing one end of said casing, and a coupling shaft within said casing and secured to said magneto, said coupling shaft being accessible through the other open end of said casing.

15. The invention as set forth in claim 14, wherein said supporting means includes a shell secured to said magnet and enclosing said armature.

16. The invention as set forth in claim 14, in combination with means at the end of said casing opposite said end plate for securing said casing to a support.

17. In a magneto, a casing, a plate closing one end of said casing, a shaft secured to said plate, an armature and armature winding on said shaft, a magnet rotatably supported by said shaft, terminals for said winding and carried by said plate, and a cover secured to said plate, said cover being apertured for the passage therethrough of said terminals.

18. In a magneto, the combination with a plate, an armature and winding supported from said plate, a magnet cooperating with said winding, mounting means for said magnet and supported from said plate, and terminals carried by said plate and connected to said winding, of a casing secured to said plate and enclosing said winding and magnet, and means on said casing for securing said magneto to a supporting structure.

19. The invention as set forth in claim 18, wherein one end only of a shaft is secured to said end plate, and said shaft carries said armature, said windings, and bearings supporting said magnet.

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