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J. F. MARTIN ET AL

2,057,241

DYNAMO-ELECTRIC MACHINE

Filed Feb. 5, 1935

Fig. 2.

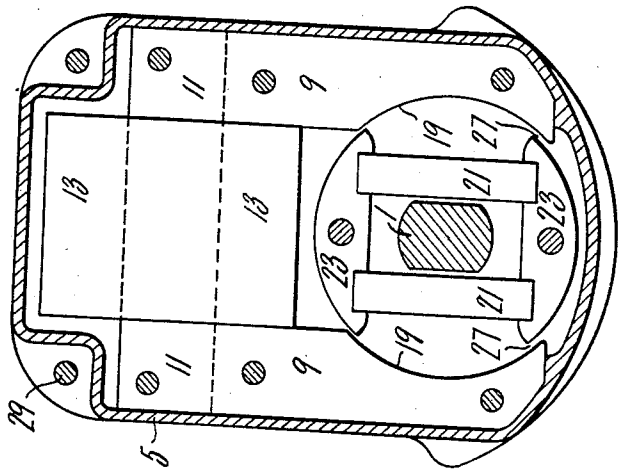


Fig. 1.

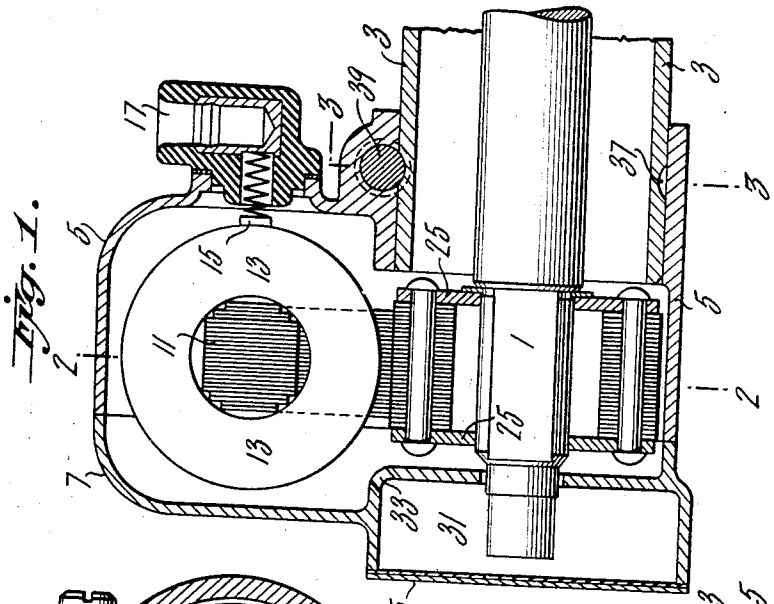


Fig. 3.

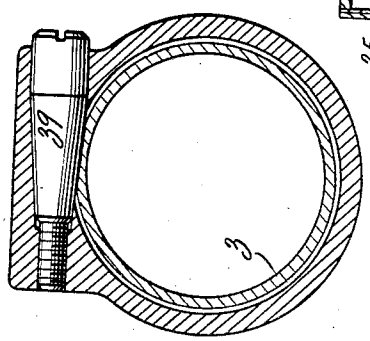
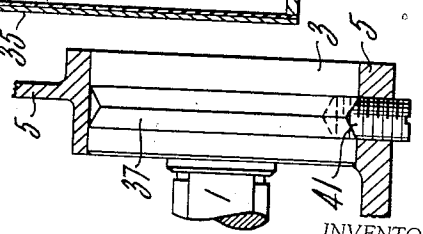


Fig. 4.



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DYNAMO-ELECTRIC MACHINE

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2 Claims. (Cl. 171—252)

This invention relates to dynamo electric machines and more particularly to magnetos of the single or multiple cylinder type for supplying ignition current to internal combustion engines.

Magnetos heretofore have been constructed with very small clearances between the rotor and poleshoes. After a period of use, the bearings and shaft become worn and allow the rotor to fall out of proper alignment, particularly where plain bearings are used. The periphery of the rotor is then in rubbing contact with the lower poleface sections and an injurious and rapid wear is set up which quickly destroys the magneto.

One of the chief objects of this invention is to provide a magneto having a larger tolerance to the displacement of the rotor with respect to the stator member.

Another object is to provide a magneto which may be more readily constructed and disassembled.

A further object is to provide a magneto and interrupter mechanism having a simpler and more economically produced housing.

Still a further object is to provide an improved clamping means for securing the magneto to the engine in proper timed relation.

Other objects and advantages will in part be specifically stated and in part be obvious when the following specification is read in connection with the drawing, in which:

Fig. 1 is a vertical section of the magneto, showing the relative position of the rotor, interrupter housing and the combined timing and supporting means; Fig. 2 is a section taken on line 2—2 of Fig. 1; Fig. 3 is a section taken on line 3—3 of Fig. 1, showing the combined timing and supporting means; and Fig. 4 is an alternative form of a combined timing and supporting means.

The magneto here shown and described is of the rotating magnet type without variable timing range. In the preferred embodiment of the invention as shown and described, the rotor is mounted directly on the camshaft of a single cylinder four-cycle engine, not shown and forming no part of the present invention. For use with such an engine, one spark is required for each camshaft rotation. The cam has a single lobe which actuates a suitable interrupter to break the primary circuit once in each rotation, and although two sparking impulses per rotation may be generated in the magneto, only one is utilized. Many alternative uses of the magneto are possible. For example, it may be applied to a single cylinder two-cycle engine by placing the rotor on the end of the crankshaft. Furthermore, two ignition sparks per rotation may be generated and the excess spark caused to occur near the beginning of the exhaust stroke without effect. In any event the magneto is preferably mounted upon a tubular sleeve which is an integral part of the engine crank case and encloses the projecting shaft whether cam shaft or crank shaft. The timing of the spark is determined by the angular position of the magneto upon the sleeve member, and the proper position is suitably indicated upon the sleeve when the engine is constructed.

The invention later described and claimed is applicable to many types of magnetos and is shown in connection with this particular type only for the purpose of clear illustration and explanation.

Referring in more detail to Fig. 1, the numeral 1 represents the camshaft of the associated engine having a suitable single-lobe interrupter cam formed on the end thereof and having provision for carrying the magneto rotor. A tubular sleeve 3 partially encloses the camshaft and may be an integral part of the engine crankcase. The magneto housing is preferably divided into two die cast sections comprising a shell 5 and endplate 7. The end wall of the shell 5 has an aperture for receiving the tubular sleeve 3 and carries special provisions for clamping and locking the magneto in the desired angular position as will later be explained in detail. Suitably mounted in the shell 5 are vertical stator laminations 9 supporting a laminated core 11 for the primary and secondary windings 13. A contact button 15 conducts the high tension current to the insulated terminal indicated generally as 17. Polefaces 19 are machined on the stator laminations 9. The polefaces are not true arcs along the circumference of a circle, but more nearly correspond to equal sections of an ellipse, taken parallel to the greater axis thereof. The laminations 9 are stamped roughly to this shape, the magneto is assembled, and the sleeve receiving aperture in the shell 5 is bored with the same tool and in the same operation with the upper section of the polefaces. The smaller diameter rotor may thus be removed through the aperture without disassembling the housing.

As before mentioned, the rotor is mounted directly upon the camshaft 1. It comprises two parallel bar magnets 21 joined by laminated polepieces 23. Non-magnetic endplate 25 and suitable tie bolts hold the laminations in place,

the endplates being rigidly secured to the camshaft 1. The rotor is made smaller in diameter than the aperture in shell 5 and the upper portions of polefaces 19. When assembled, the upper portion of the polefaces are substantially concentric with the rotor surface, but diverge from the rotor surface below the horizontal median line to form an increased clearance 27 at the lower portions of the polefaces. This increased clearance below the horizontal permits the rotor to drop further, as a result of bearing or shaft wear, without contacting with the polefaces.

The die cast endplate 7 is attached to the shell 5 by tie bolts 29 illustrated in Fig. 2. Integrally formed in the endplate is a recessed interrupter housing 31, the wall of which has an opening 33 for receiving wire connections between the primary winding, interrupter and condenser, not shown and forming no part of this invention. A larger central opening in the same wall receives the camshaft 1 and allows the cam on the end thereof to project into the interrupter housing. A removable cover plate 35 provides a closure and dirt seal for the interrupter mechanism.

The magneto is suitably timed in relation to the engine by adjusting the angular position thereof with respect to the tubular engine sleeve 3. One method of adjusting and maintaining the magneto in proper timing relation is shown in Figs. 1 and 3, wherein a groove 37 having a suitably located tangential flat bottom surface is shown on the tubular engine sleeve 3. A threaded taper pin 39 is carried in the housing shell 5, and occupies a portion of the groove 37. The magneto housing is rotated until the flat bottom surface of groove 37 registers with the pin 39, whereupon the pin is tightened, holding the magneto securely in position. An alternative arrangement is shown in Fig. 4, where a set screw 41 cooperates with an indentation or other suitable locating point in the groove 37. Many such alternative securing methods may be devised without departing from the idea of providing a dual function timing and supporting means for the magneto.

The magneto shown and described forms a compact structure with a minimum of machine operations, is rugged and dependable in performance, and is capable of long and trouble-free service, but may be readily disassembled for inspection and repair.

It will be apparent that many changes and modifications may be made without departing from the spirit and scope of the invention as expressed in the following claims:

We claim:

1. In a dynamo electric machine having a rotor and a stator member, two arcuate polefaces formed on said stator member and positioned adjacent said rotor, said polefaces substantially defining the opposing major arcs of an ellipse, and means supporting said rotor whereby the axis thereof is maintained on a level above a line bisecting both of said arcs.

2. In a dynamo electric machine having a rotor and a stator member, arcuate polefaces formed on said stator member and being positioned adjacent to said rotor, said polefaces substantially corresponding in shape to equal and opposite sections of an ellipse, said sections being taken parallel to the major axis of said ellipse, and means supporting said rotor on a center lying above a line bisecting said arcuate polefaces.

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