July 15, 1952 E. C. KIEKHAEFER 2,603,202

MAGNETO HOUSING

Filed May 5, 1949 2 SHEETS—SHEET 1

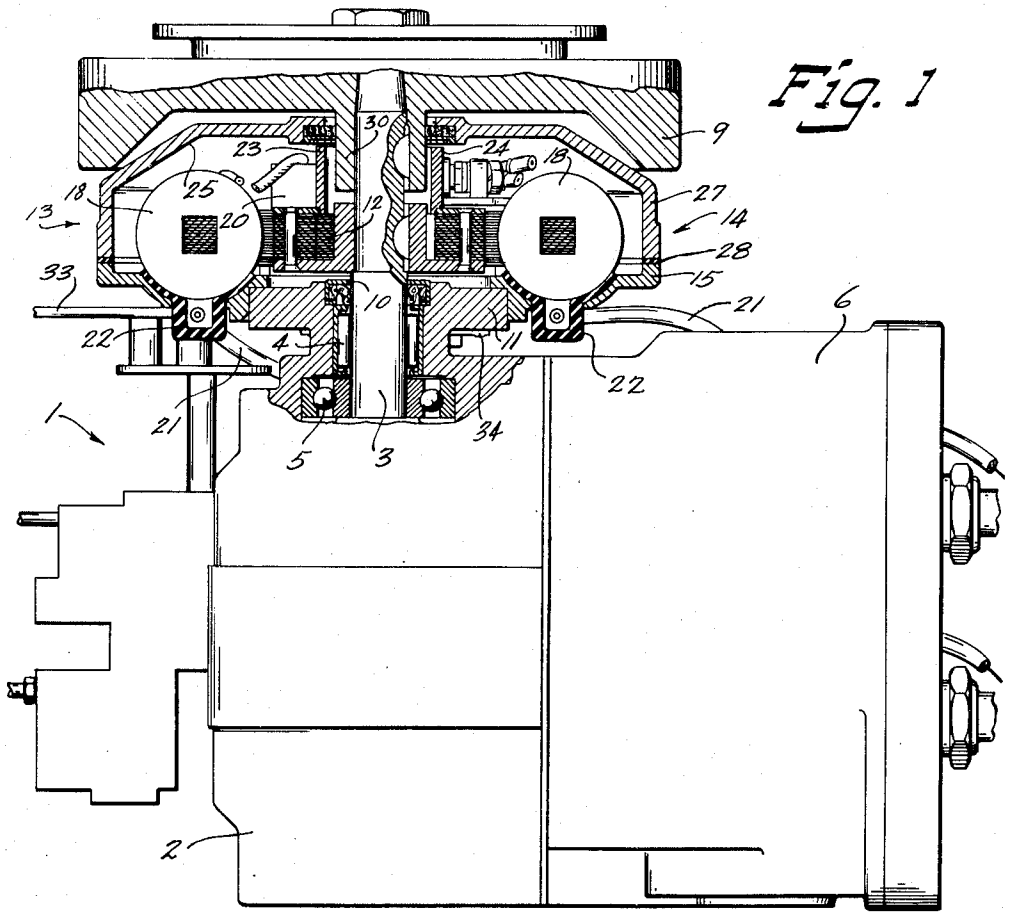

Fig. 1

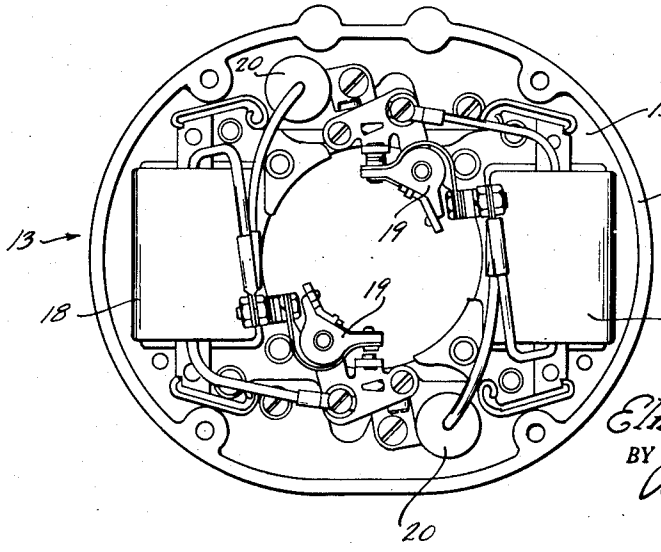

Fig. 2

INVENTOR.
Elmer C. Kiekhaefer
BY
Andrus & Sceales
Attorneys

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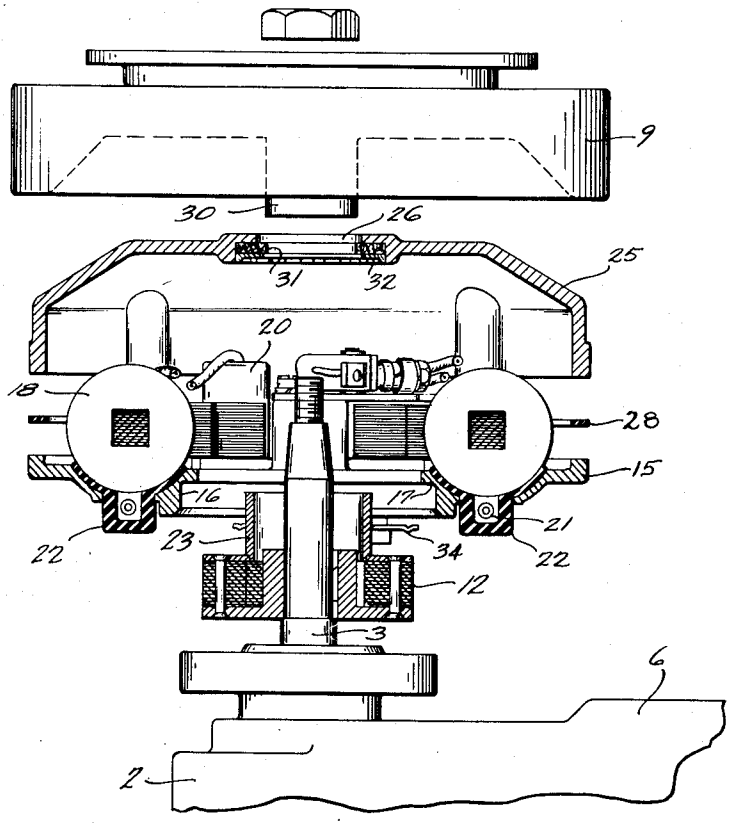
Fig. 3



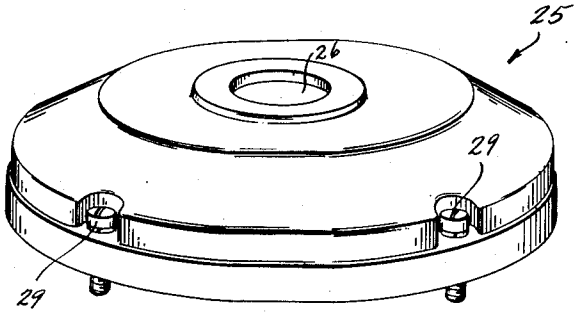


Fig. 4

INVENTOR.
Elmer C. Kiekhaefer
BY
Andrus & Sceales
Attorneys

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MAGNETO HOUSING

Elmer Carl Kiekhaefer, Cedarburg, Wis.

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5 Claims. (Cl. 123—195)

1

This invention relates to magnetos for internal combustion engines and particularly to the housing and mounting means therefor.

The invention provides an improved mounting which more fully protects the engine magneto unit which is mounted on and operates directly from the crankshaft at one end of the engine.

An object of the invention is to provide a compact fully enclosed magneto unit adapted to be mounted for operation on the engine crankshaft.

Another object of the invention is to preclude ignition failure or shorting out due to moisture, water or air-carried foreign particles reaching certain parts of the magneto and timing means.

Another object is to prevent water and moisture as well as other particles from entering the housing enclosing the magneto through the opening provided for the crankshaft.

Another object is to provide for mounting of the magneto unit on the engine prior to installation of the housing to allow adjustment of the same.

Another object is to provide a unitary housing member fully enclosing the magneto unit which is easily removed to make the entire unit fully and immediately accessible for repair or adjustment.

These and other objects and advantages will be more fully set forth in the following description of a preferred embodiment of the invention illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a two-cylinder engine for an outboard motor having a magneto and ignition timing means operating on the upper end of the vertically disposed engine crankshaft with certain parts broken away and sectioned to show the construction thereof;

Fig. 2 is a view showing the plan of the stationary parts of the magneto unit and the accessibility of the same;

Fig. 3 illustrates the assembly and disassembly of the flywheel and magneto unit on the crankshaft of the engine; and

Fig. 4 is a perspective view of the magneto housing cover.

The engine 1 shown in the drawings comprises the crankcase 2, the vertically disposed crankshaft 3 supported in the upper bearings 4 and 5 and the intermediate and lower bearings, not shown, and the cylinder block 6 secured to crankcase 2. The upper and lower combustion cylinders, not shown, with block 6 are fired alternately by the respective spark plugs 7 and 8 with each one-half revolution of crankshaft 3.

The engine flywheel 9 is carried by the upper

2

end of crankshaft 3 which extends through the sealed opening 10 in the center of the circular mounting flange 11 of crankcase 2.

The single permanent magnet-type rotor 12, and the separate and complete magneto induction and timing units 13 and 14 for each spark plug comprise the engine ignition means. Rotor 12 is mounted on crankshaft 3 and secured rotationally thereto above flange 11.

The substantially circular stator plate 15 carries the separately operating stator units 13 and 14 mounted thereon. Flange 11 is preferably cast integrally with crankcase 2 and has an outer diameter which is larger than rotor 12 to fit the circular central bore 16 of plate 15. The shoulder 17 of plate 15 engages flange 11 to support the plate while providing for at least a limited rotational movement thereof on the axis of rotation of crankshaft 3. Stator units 13 and 14 are oppositely disposed or mounted on plate 15 180° of each other with respect to the axis of rotation of the plate and crankshaft 3.

Each stator unit 13 and 14 comprises a coil 18 having a primary and a secondary winding, the circuit breaker or switch 19 and the condenser 20. The lead wires 21 connecting stator units 13 and 14 and spark plugs 7 and 8, respectively, extend from the rubber shields 22 of coils 18 which project through plate 15 to the underside thereof.

The cylindrical cam member 23 which encircles crankshaft 3 is carried by rotor 12 concentrically with the shaft to rotate therewith. The outer periphery of member 23 is engaged by the timing switches or circuit breakers 19 carried by plate 15 and which are normally closed. The cam surface 24 of member 23 is disposed with each 180° of rotation of shaft 3 to open alternately the switch breakers 19 and the respective primary winding connected thereto to release a timed spark impulse for the operation of the engine generated by rotor 12 in the corresponding secondary winding.

The single-piece cover member 25 is disposed on crankshaft 3 projecting through the central hole 26 and corresponds generally to the outer dimensions of stator plate 15. The circumferential flange or wall 27 of cover 25 extends downwardly around magneto stator units 13 and 14 and is seated on the gasket 28 extending around the outer margin of plate 15.

The bolts 29 extend downwardly within wall 27 into stator plate 15 and are equally spaced about cover 25 to secure the latter on plate 15 with the gasket 28 tightly therebetween and to completely seal the closure.

The hub 30 of flywheel 9 is mounted on crank-

shaft 3 immediately above rotor 12 and extends through hole 26 of cover 25 within member 23. The felt ring 31 secured within hole 26 of cover 25 by the retaining ring 32 engages hub 30 to seal the opening against the entry of dirt and moisture into the magneto housing.

In assembly, rotor 12 with cam member 23 is first mounted on the engine crankshaft 3. The complete magneto housing including plate 15 with cover 25 secured thereto and enclosing stator units 13 and 14 may then be mounted on flange 11 and over rotor 12 with the latter passing through bore 16 of the plate to be disposed between coils 18, while the upper end of crankshaft 3 passes through hole 26 of cover 25. If desired, the complete magneto including rotor 12 and plate 15 carrying stator units 13 and 14 may be mounted on engine 1 prior to installing cover 25, to provide complete and full accessibility of all the parts of the magneto for inspection and adjustment thereof as assembled for operation. Flywheel 9 is thereafter mounted on crankshaft 3 over cover 25 with hub 30 disposed in engagement with felt ring 31.

The lever 33 provides for the manual adjustment of the timing of the magneto by rotating plate 15 on flange 11. The spring clips 34 on plate 15 engage the underside of flange 11 to secure the plate thereon.

The entire magneto assembly is accessible and open to inspection at any time upon removal of flywheel 9 and cover 25. In handling the stator plate with cover 25, the cover protects the parts of the magneto from damage.

When mounted on the engine the magneto is protected from dirt and moisture which otherwise interferes with the operation of the circuit breakers and eventually shorts the wires of the magneto.

Various embodiments of the invention may be employed within the scope of the accompanying claims.

I claim:

1. In an internal combustion engine, a crankcase and a crankshaft carried by said crankcase and projecting therefrom, a magneto and ignition timing assembly comprising a rotor and cam means carried by said crankshaft adjacent said crankcase and a stationary winding and timing device disposed in operative relation to said cam means and carried by said crankcase, and a single cover provided with a sealed opening for said crankshaft and a wall disposed to extend over said assembly and joined to said crankcase to fully enclose said assembly.

2. In an internal combustion engine, a crankshaft, a magneto rotor and cam mounted on the end of said crankshaft, a magneto stator and timing means, a housing member carrying said stator and timing means having a sealed opening adapted to receive the end of said crankshaft and an opposite larger opening to receive said rotor and cam means into said housing member

for assembly of said stator and timing means as a unit on said crankshaft in operative relation with said rotor and cam, respectively, and a crankcase for said crankshaft closing the larger opening of said housing member and supporting the latter with respect to said rotor and cam.

3. In an internal combustion engine, a crankshaft, and a magneto and ignition timing device therefor comprising: a housing having opposite sealed openings receiving said crankshaft, a permanent magnet-type rotor carried by said crankshaft within said housing, and a number of complete stator and corresponding timing means disposed within said housing and arranged about said rotor and crankshaft in operative relation thereto.

4. In an internal combustion engine having a crankcase and a crankshaft carried by said crankcase and projecting therefrom, a plate carried by said crankcase for limited rotation on the axis of said crankshaft projecting therethrough, a magneto and ignition timing assembly comprising a rotor carried by said crankshaft adjacent said plate and a stationary core and winding and timing means in operative engagement with said crankshaft, said core and winding and timing means being mounted on said plate, and a cover provided with a sealed opening for said crankshaft and disposed to extend over said magneto and timing assembly and to be securely joined to the periphery of said plate to enclose the magneto while providing for rotation of the stationary assembly thereof for spark adjustment.

5. In an internal combustion engine including a crankcase and a crankshaft carried by said crankcase and projecting therefrom, a circular end member with the crankshaft projecting through an opening in the center of said member, a magneto rotor and cam means mounted on the projecting end of said crankshaft adjacent said end member, a magneto stator and timing means, and a housing carrying said stator and timing means having opposite openings adapted to receive said crankshaft and rotor and to be mounted for limited rotation on said end member, said end member and housing providing a complete closure of said magneto and cam means.

ELMER C. KIEKHAEFER.

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