May 14, 1957 M. J. MILLER 2,792,439

MAGNETO ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

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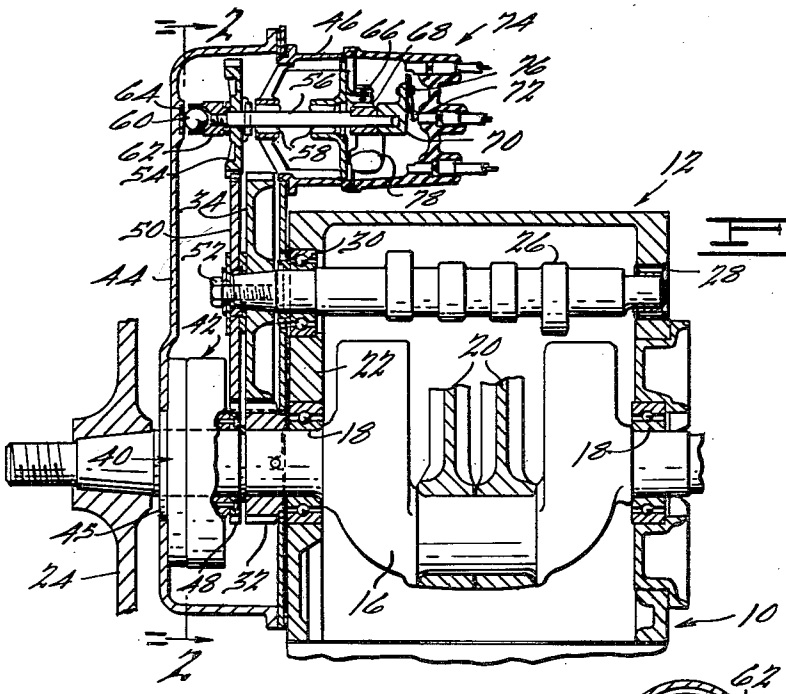

Fig. 1.

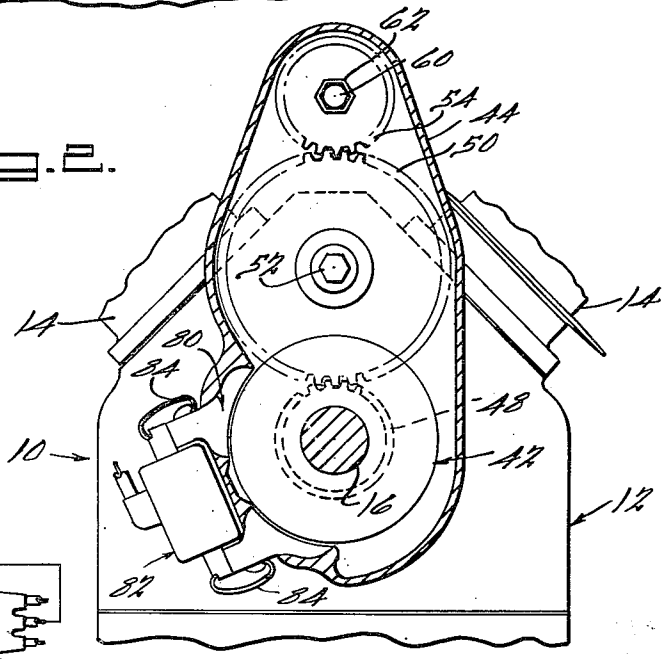

Fig. 2.

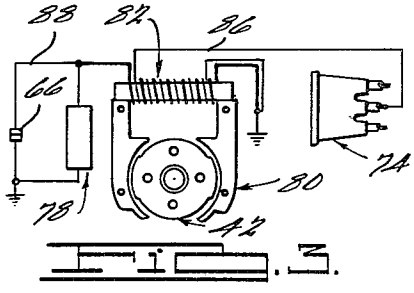

Fig. 3.

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MAGNETO ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

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7 Claims. (Cl. 123—149)

This invention relates to magneto ignition systems and has particular reference to a new and improved impulse type magneto arrangement for internal combustion engines.

The present invention is directed to an improved mounting arrangement for various elements of a more or less conventional impulse type magneto for providing the ignition system of an internal combustion engine. Heretofore it has been customary to employ impulse type magnetos in internal combustion engines with the entire magneto system disposed within a housing which is mounted on some accessible part of the engine. However, the magneto takes up a considerable amount of space and arrangements of this sort have always presented the problem of locating the magneto at a readily accessible place within the space available for the engine. The present invention is designed to overcome the aforesaid problems connected with location of the magneto and is particularly suited for use in an internal combustion engine of the V type in which the cylinders are angularly related on opposite sides of the engine block. More specifically, the invention consists of mounting the impulse coupling and magneto rotor directly on the crankshaft of the engine and mounting a breaker and distributor mechanism on the engine above the crankshaft and within the space between the cylinders. The resulting arrangement does not materially increase the space taken up by the engine and magneto system while providing a readily accessible location for the breaker and distributor mechanism.

A principal object of the invention therefore is to provide a new and improved magneto system for an internal combustion engine.

Another object of the invention is to provide an improved mounting arrangement for an impulse type magneto for an internal combustion engine.

Other and further objects of the invention will be apparent from the following description and claims and may be understood by reference to the accompanying drawing, which by way of illustration shows a preferred embodiment of the invention and what I now consider to be the best mode in which I have contemplated applying the principles of my invention. Other embodiments of the invention may be used without departing from the scope of the present invention as set forth in the appended claims.

In the drawings:

Fig. 1 is a vertical sectional view of the magneto system of the present invention;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1; and

Fig. 3 is a wiring diagram illustrating the electrical circuits of the magneto system.

In the drawings, an internal combustion engine indicated at 10 includes an engine block or housing 12 and cylinders 14 mounted thereon and angularly related to the vertical center line through the engine. The crankshaft 16 is journalled in bearings 18 and the connecting rods 20 are journaled on the crankshaft 16 and connected to the pistons within the cylinders 14. The crankshaft projects through the end wall 22 of the engine housing and a flywheel 24 is secured thereon in a conventional manner. A cam shaft 26 is journaled in the housing 12 by bearings 28 and 30 and is driven from the crankshaft 16 through a gear 32 keyed onto the crankshaft and a gear 34 secured on the projecting end of the cam shaft 26 and meshed with gear 32. The engine as described thus far is more or less of a conventional type and has been selected for purposes of illustration only since the magneto system comprising the present invention may be employed in conjunction with engines of different types than that disclosed herein.

The magneto system of the present invention comprises in general an impulse coupling 40 mounted on the projecting end of the crankshaft 16 so as to be driven with the flywheel 24 and crankshaft 16. A magneto rotor 42 is also mounted on the crankshaft 16 and is connected to the impulse coupling 40 so as to be driven therefrom. The details of construction of the impulse coupling 40 and the magneto rotor 42 are well known to those skilled in the art and are not illustrated herein since any suitable impulse coupling may be employed in the present magneto system. The impulse coupling and magneto rotor are located within a casing 44 mounted on the end wall of the engine housing and the crankshaft 16 projects through a suitable seal arrangement 45 with the flywheel 24 mounted on the crankshaft exteriorally of the housing 44. The housing 44 extends upwardly above the engine housing 12 between the cylinders 14 of the engine and a breaker and distributor housing indicated at 46 is suitably secured to the housing 44.

A gear 48 is secured to the rotor 42 for rotation therewith, it being understood that the rotor and gear 48 are rotatably journaled on the crankshaft 16 so as to be driven from the impulse coupling 40 in a conventional manner. An idler gear 50 is rotatably journaled on the end of cam shaft 26 and retained thereon by a nut 52. The gear 50 is meshed with gear 48 so as to be driven therefrom and is also meshed with a gear 54 keyed onto an operating shaft 56 which is journaled in bearings 58 supported by the breaker and distributor housing 46. A ball bearing 60 located within a bearing cup 62 secured on the end of operating shaft 56 engages a hardened plate 64 located on the interior of casing 44 and provides an end thrust bearing for the shaft 56.

A pair of breaker contacts 66 located within the housing 46 are adapted to be opened by a cam 68 secured on shaft 56. A distributor arm 70 is also secured on the end of shaft 56 and includes a contact 72 engaging a contact connected to the conductor leading into the distributor indicated at 74, and a rotatable contact 76 adapted upon rotation of arm 70 to successively engage the points which are connected to the several spark plugs of the engine. A condenser 78 is also located within the distributor housing, and the construction and operation of the breaker points and the distributor mechanism are conventional and will be well understood by those skilled in the art. It will be seen that the operating shaft 56 for the breaker and distributor mechanism is driven with rotor 42 through the gears 48, 50 and 54.

Referring now to Figs. 2 and 3, it will be seen that the magneto rotor 42 rotates within a laminated stator core 80 and that the coil 82 is suitably secured within a housing detachably mounted on the casing 44 by clamps 84. The arrangement of the stator 80 and coil 82 illustrated in Fig. 2 is for purposes of illustration only and it will be apparent that such parts might be located entirely within the space in casing 44 if desired. The coil 82 includes a secondary winding 86 leading to the central connector of the distributor 74 and a primary winding 88 connected in series with the breaker contacts 66.

The condenser **78** is connected in parallel with the breaker contacts **66**. The wiring diagram illustrated in Fig. 3 is conventional in magneto systems of the present type and the operation of the system will be readily understood by those skilled in the art.

It will be noted that the breaker and distributor mechanism is located directly above the chankshaft **16** and within the space between the cylinders **14**, while the impulse coupling **40** and magneto rotor **42** are mounted directly on the crankshaft with suitable gearing providing a driving connection between the rotor and the operating shaft **56** of the breaker and distributor mechanism. The magneto system thus provided takes up little or no extra space beyond that necessary to accommodate the engine itself and also provides a readily accessible location for the breaker and distributor mechanism for purposes of service and repair. The impulse coupling and rotor add very little to the length of the engine, while the space within which they are located can accommodate a relatively large diameter coupling and rotor and at the same time the relatively great length of the breaker and distributor mechanism is accommodated in a space which is readily available without increasing the height of the engine above that required for the cylinders **14**.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In an impulse type magneto ignition system for an internal combustion engine, an impulse coupling mounted on the crankshaft of the engine, a magneto rotor mounted on said crankshaft and driven with said coupling, a distributor and breaker housing mounted above said crankshaft and adapted to contain a breaker mechanism and a distributor, an operating shaft in said housing for operating the breaker mechanism and distributor, and gear means providing a driving connection between said rotor and said operating shaft.

2. In a magneto ignition system for an internal combustion engine having a crankshaft projecting therefrom, an impulse coupling and a magneto rotor driven therewith mounted on the projecting portion of said crankshaft, a breaker and distributor mechanism mounted on the engine at a point remote from said coupling and rotor, said mechanism including an operating shaft, and gear means providing a driving connection between said operating shaft and said rotor.

3. In an impulse type magneto ignition system for an internal combustion engine, an impulse coupling mounted on the crankshaft of the engine, a magneto rotor mounted on said crankshaft and driven with said coupling, a distributor and breaker housing mounted exteriorly of the engine and above said crankshaft, an operating shaft for the breaker and distributor mechanism, and gear means providing a driving connection between said rotor and said operating shaft.

4. In an impulse type magneto ignition system for an internal combustion engine, an impulse coupling mounted on the crankshaft of the engine, a magneto rotor mounted on said crankshaft and driven with said coupling, a distributor and breaker housing mounted on the engine and adapted to contain a breaker mechanism and a distributor, a shaft in said housing for operating the breaker mechanism and distributor, and means providing a driving connection between said rotor and said operating shaft.

5. An ignition system according to claim 4 wherein said operating shaft is disposed parallel to and above said crankshaft and gearing providing said driving connection between said rotor and operating shaft.

6. In a magneto ignition system for an internal combustion engine of the V type having a crankshaft projecting therefrom and the cylinders of the engine extending above the engine housing and angularly related thereto; an impulse coupling and a magnetic rotor driven therewith mounted on the projecting portion of said crankshaft, a breaker and distributor mechanism mounted on the engine above said crankshaft and within the space between said cylinders, said mechanism including an operating shaft disposed parallel to said crankshaft, and gear means providing a driving connection between said operating shaft and said rotor.

7. In a magneto ignition system for an internal combustion engine of the type having a crankshaft projecting therefrom and the cylinders of the engine extending above the engine block and angularly related thereto; an impulse coupling and a magnetic rotor driven therewith mounted on the projecting portion of said crankshaft, a breaker and distributor mechanism mounted on the engine above said crankshaft and within the space between said cylinders, said mechanism including an operating shaft disposed parallel to said crankshaft, a cam shaft driven from said engine, an idler gear on one end of said cam shaft, and gear means on said rotor and said operating shaft meshed with said idler gear for driving said breaker and distributor mechanism from said rotor.

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