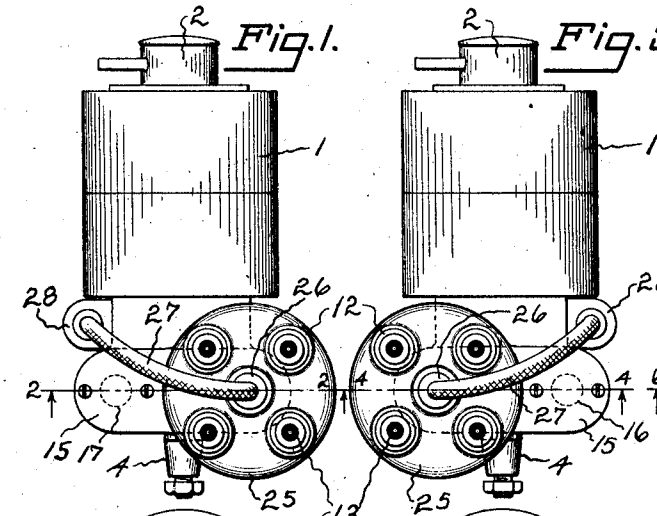
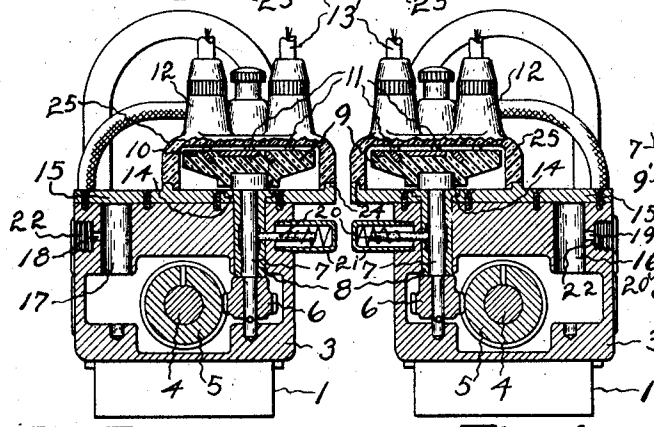
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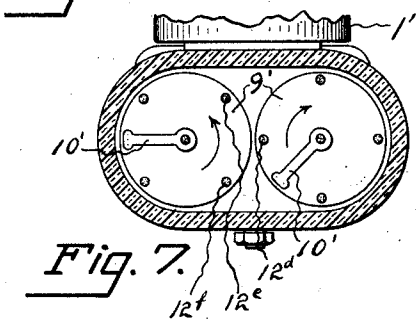
W. E. SCHWARZMANN

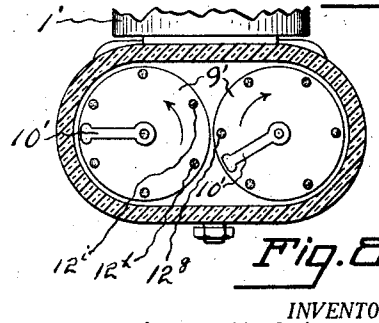
MAGNETO

Filed Dec. 23, 1920









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BY

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UNITED STATES PATENT OFFICE.

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MAGNETO.

Application filed December 23, 1920. Serial No. 432,708.

To all whom it may concern:

Be it known that I, WOLFGANG E. SCHWARZMANN, a citizen of the United States, residing at Longmeadow, in the county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Magnetos; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an ignition system for internal combustion engines and particularly to the magneto thereof having a distributing means in operative connection with the shaft of the magneto.

In previous magneto constructions a distributor was connected to the shaft by gears with the distributor permanently mounted upon either the left or right hand side of the shaft depending upon whether the magneto was to be installed on the left or right hand side of the engine, thus necessitating a special magneto for either installation. Such magnetos had no means for operatively connecting a distributor in selective position on either side of the magneto shaft nor for connecting a multiple of distributors to the shaft of the magneto so that selective or multiple ignition might be had with a single magneto. It is, therefore, an object of my invention to construct a magneto which is compact in form and universal in use as a right or left hand magneto and with one or more distributors driven from either side or both sides of a common drive shaft of the magneto.

In accordance with one part of the invention the magneto has a shaft in operative connection, as by a common drive means, such as a spiral gear on the shaft in driving connections with a spiral pinion on a spindle of a distributor which has means, such as a reversible mounting, which may be in the form of a reversible base plate, whereby the distributor may be selectively mounted on the magneto upon such mounting or base plate in operative connection with the shaft in either one of two positions.

As another part of the invention, whether or not having a reversible mounting or base plate, although preferably having such, I construct a gearing housing at the end of the magneto in which are included the common driving means, such as a spiral gear on the rotor shaft and a pinion on the spindle of the distributor, and into which extends an end of the shaft. Upon this housing may be selectively supported a distributor upon a reversible mounting, such as a reversible base plate, so that the distributor is operatively connected to the shaft in either of two positions.

It is another part of my invention, whether or not the megneto has, although preferably having, reversible means thereon for selectively mounting the distributor in either of two operative positions, to provide the magneto with interchangeable lead connecting means for selectively connecting the distributor in its selected position on either side of the magneto, and as a still further part of the invention, to likewise provide the magneto with interchangeable lubricating means in the magneto so that the distributor may be lubricated in either of its selected positions on either side of the magneto, or both.

It is a still further part of my invention to construct the magneto with means such as a gearing housing, upon which may be supported a distributing means comprising one or more distributors in operative connection with the shaft on either side thereof, as by a common connecting or driving means, such as a spiral gear on the shaft, and one or more spiral pinions on one or more distributor spindles, so that dual or duplex distribution of ignition may be effected.

The distance between the axes of the magneto and distributor shafts heretofore has been maintained as small as possible and within comparatively small dimensions, for economical reasons, and it has heretofore been impossible with the existing size of distributors to mount two separate distributors in operative and close relation upon a single magneto. But my invention, however, an arrangement has been devised to use two distributors in one distributor shell without in any way sacrificing the close relation of the axes of the magneto and dis-

tributor shafts and without the mechanical and electrical interference of the distributors, heretofore making such arrangement impossible.

As a still further part of the invention, a pair of distributors are operatively supported on the magneto, as upon a gear housing located at the end of the magneto and into which the shaft, comprising a driving gear, extends, with the distributors located on both sides of the shaft and gear, and so juxtaposed that the distributing contacts are arranged in staggered relation to avoid short-circuiting of the contacts of the two distributors located proximate to each other, a common driving means or connection being provided between the shaft or gear and the distributors to operate both distributors together or simultaneously for effecting a duplex distribution of ignition to the engine.

In the accompanying drawing illustrating preferred forms of the invention:

Fig. 1 is a top plan view of a magneto showing the distributor located on one side thereof; Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1; Fig. 3 is a top plan view similar to Fig. 1, showing the distributor on the other side of the magneto; Fig. 4 is a transverse section taken on line 4—4 of Fig. 3; Fig. 5 is a top plan view of a magneto similar to that of Figs. 1 and 3, showing the use of a double distributor; Fig. 6 is a transverse section taken on line 6—6 of Fig. 5; Fig. 7 is a fragmentary section taken on line 7—7 of Fig. 6; and, Fig. 8 is a view similar to Fig. 7 showing the use of distributors with six contacts instead of four.

Referring more particularly to the drawing the system comprises a magneto 1 having an interrupter 2 at one end thereof, and a gear housing 3 at the other end. Within and through the latter extends a rotor shaft 4 to which is secured or made fast a worm or spiral gear 5 operatively enmeshed with a worm gear or spiral pinion 6 secured to a spindle 7 rotatably mounted in the bearing 8 suitably supported in the gear housing 3. At the upper end of the spindle 7 is mounted a distributor block or head 9 having a metal distributor brush 10 embedded in the material of the distributor block or head 9 and extending radially to cooperate with brush contacts or ignition lead points 11 extending into the lead posts 12, from which leads 13 extend to their respective spark plugs in the cylinders of the engine. The bearing member 8 has an end flange 14 resting in a recess formed within a base plate 15 supported upon and secured to the top of the gear housing 3. The base plate 15 is preferably flat and is reversible so that it may occupy either of the positions shown in Figs. 1 and 2, wherein the spindle 7 and the distributor block 9 are supported on the right-hand side of the magneto shaft, as shown in Fig. 1 or on the left hand side of the shaft, as shown in Fig. 2. It will be observed that the gear housing has a pair of apertures 16 and 17 each adapted to receive the bearing 8 and the spindle 7 upon either side of the drive shaft 4 and the gear 5. Both sides of the gear housing also have apertures 18 and 19 through either of which extends a lubricating wick 20, as the case may be, and in which is fastened, as by screw threads, a lubricant container 21 which may be changed from one side to the other of the gear housing, depending upon which side the distributor head may be located, for the purpose of lubricating the distributor spindle in its bearing 8 at whatever side located, the other aperture on the other side of the gear housing being suitably closed by a plug 22 when such aperture is not in use for lubrication.

The plate 15 is provided with an annular upstanding flange 24 with which is engaged the lower flanged end of a distributor cap 25, made of bakelite or similar material, and also having a central post or lead connection 26 to which is connected a collector lead 27, the other end of this lead being connected through a collector electrode 28 interchangeably insertable in either side of the magneto casing so that the collector electrode may engage with the collector spool within the magneto on either side thereof. To illustrate the above, it will be observed that in Fig. 1, where the distributor is located on the right hand side of the magneto shaft, the lead 27 extends from the central binding post 26 to the electrode 28 inserted in an aperture provided on the left hand side of the magneto casing, while in Fig. 3, where the distributor is shown located upon the left hand side of the magneto shaft, the lead 27 extends from the central post 26 to the electrode 28 inserted in an aperture provided in the magneto casing on the right hand side of the magneto. The central post 26 has a usual form of contact brush bearing upon the plate 10 at the center of the block 9 as in the usual manner.

When it is desired to change the location of the distributor from one side of the shaft to the other, as for example, from that shown in Figs. 1 and 2 to that shown in Figs. 3 and 4, it is merely necessary to disconnect the plate 15, removing the spindle 7 with its bearing sleeve 8 from the aperture 16, and to reverse the position of these parts so as to locate the same in the position as shown in Figs. 3 and 4 wherein the spindle 7 and the sleeve 8 are inserted in the aperture 17, and also by inserting the electrode 28 on the left hand side of the magneto casing instead of on the right, the pinion 6 being previously disconnected from

the spindle and moved from the right hand side to the left side of the gear 5, and subsequently reconnected to the spindle at the left hand side of the shaft and into engagement with the spiral gear.

The above description has reference to where a single distributor is used, but it will also be observed that a double distributor or two distributors may be used to operate simultaneously so as to control duplex ignition, or in the event of using a battery, in connection with the magneto, to control dual ignition to the spark plugs of the cylinders of the engine. Accordingly, as shown in Figs. 5, 6 and 7, a magneto similar to that shown in Figs. 1 to 4 inclusive, has a gear housing 3′ upon which is supported a plate 15′ supporting two flanged bearing sleeves 8′, the flanges 14′ thereof resting in recesses provided in the plate, as in the case of the plate 15 shown in Figs. 2 and 4, each bearing 8′ carrying a spindle 7′ to each of which is secured a spiral pinion or worm gear 6′ in engagement with the worm or spiral gear 5′ secured to the magneto shaft 4′, the pinions 6′ engaging with the gear 5′ on the opposite sides thereof. The plate 15′ is somewhat longer than plate 15 and carries flanges 24′ at its ends and sides so as to receive the lower flanged end of a distributor cap 25′, the latter being elongated and sufficiently large to include both distributor blocks 9′ and to carry a double set of lead posts 12′ to which are connected the ignition leads. For the purpose of compactness, the posts 12′ of one distributor are located, with reference to the posts of the other distributor, in angular staggered relation so that a post, such as post 12^a of one distributor, will be located between and in staggered relation with the posts 12^b and 12^c of the other distributor so that the contact 12^d of the former will not be at a point proximate to either of the contacts 12^e and 12^f of the latter, during the rotation of the heads 9′, but will be at their maximum relative distances when the contact 12^d is nearest to the periphery of the block 9′. This is illustrated in Fig. 7 where the contact 12^d is located at a greater distance from the contacts 12^e and 12^b than the distance the contact 12^d is located from the path of travel of the contacts 12^e and 12^f. If the contact 12^e or 12^f were angularly half way between the positions thereof shown in Fig. 7, the contacts 12^e or 12^f would be close to contact 12^d, there would be a chance for short-circuiting or arcing between such contacts as they crossed the line connecting the axes of the distributors, but by arranging the contacts in the relation shown, so that the contact 12^d will pass such line in advance of or later than either of the contacts 12^e or 12^f, short-circuiting or arcing is avoided, besides making it possible to make the arrangement more compact.

Fig. 8 represents the same relation of contacts when using six contact points instead of four but the principle of arrangement is the same so that the contact 12^g will be in advance of the contact 12^h and retarded from the position of the contact 12^i so that these contacts are at their greatest distances at all times irrespective of the proximity of the contact of one distributor block with respect to the part of travel of the contacts of the other distributor block.

Having thus described my invention what I claim is:

1. In an ignition system for internal combustion engines, the combination of a magneto having a gearing housing at one end thereof and a shaft extending into said housing, a distributor selectively supported in either of two operative positions on said housing, and common means operatively connected to said shaft and to said distributor for operating said distributor in either of said positions.

2. In an ignition system for internal combustion engines, the combination of a magneto having a gearing housing at one end thereof and a shaft extending into said housing, a distributor, a reversible mounting on said housing for selectively supporting said distributor in either of two operative positions, and common means in said housing and operatively connected to said shaft and to said distributor for operating said distributor in either of said positions.

3. In an ignition system for internal combustion engines, the combination of a magneto having a gearing housing at one end thereof and a shaft extending into said housing, a distributor, a reversible base plate secured to said housing in either of two positions for selectively supporting said distributor in either of two operative positions, and common means in said housing and operatively connected to said shaft and to said distributor for operating said distributor in either of said positions.

4. In an ignition system for internal combustion engines, the combination of a magneto having a shaft, a distributor, reversible means on said magneto for selectively mounting said distributor in either of two operative positions, common means connected to said shaft distributor for operating said distributor in either of said positions, and interchangeable lead connecting means on said magneto for selectively connecting said distributor in its selected position on either side of said magneto.

5. In an ignition system for internal combustion engines, the combination of a magneto having a shaft, distributing means comprising a pair of distributors, means on said magneto for operatively supporting said distributors on both sides of said shaft for duplex distribution of ignition to said engine,

and common means connected to said shaft and distributors for simultaneously operating the latter.

6. In an ignition system for internal combustion engines, the combination of a magneto having a distributor gearing housing at one end thereof, a shaft extending into said housing and having a driving gear, means on said housing for supporting a pair of distributors in operative position on both sides of said shaft and gear for duplex distribution of ignition to said engine, and driving connections between said gear and said distributors.

In testimony whereof I affix my signature.

WOLFGANG E. SCHWARZMANN.