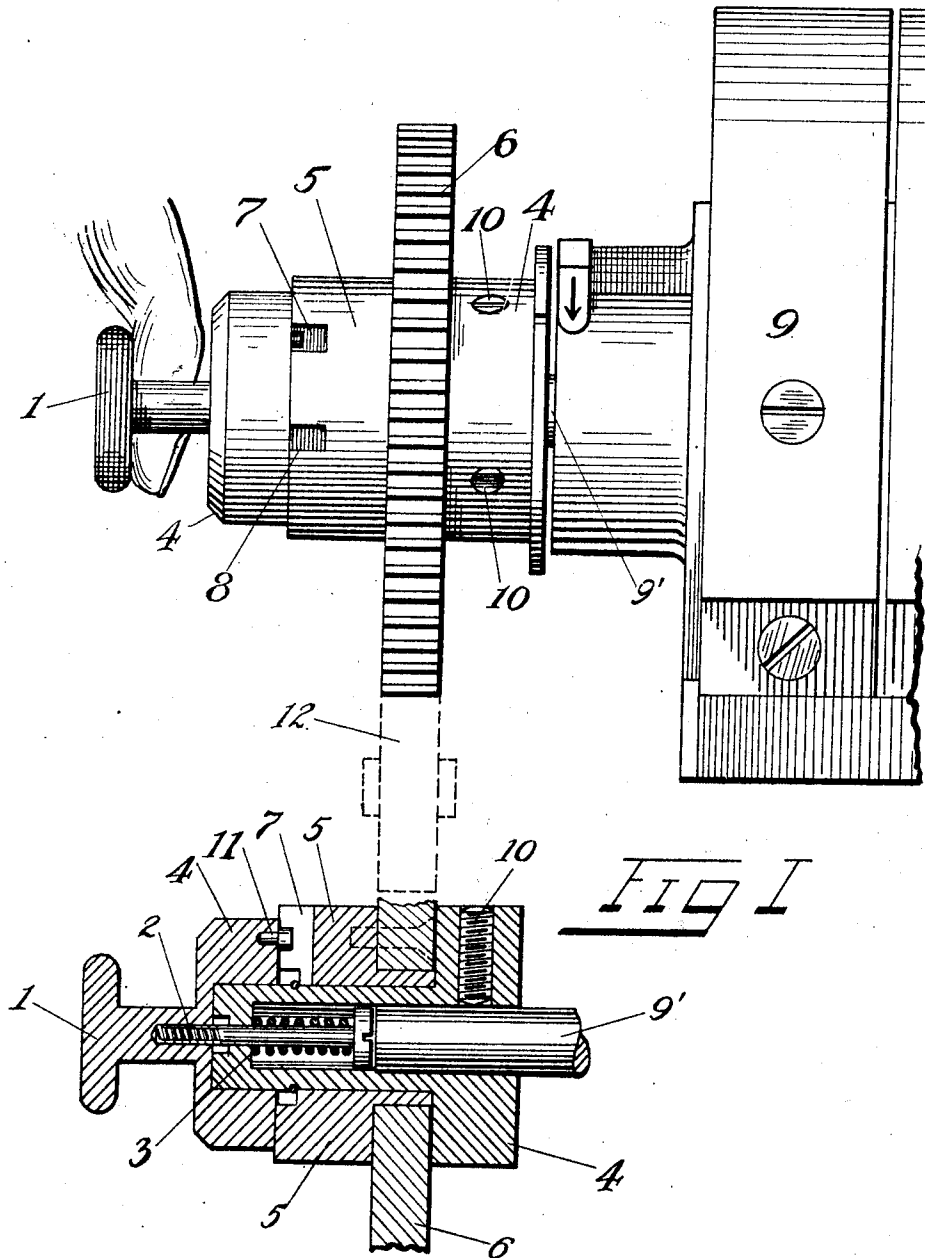


C. T. MASON.
TIMING DEVICE FOR IGNITION SYSTEMS.
APPLICATION FILED OCT. 4, 1911.

1,047,963.

Patented Dec. 24, 1912.

2 SHEETS-SHEET 1.



WITNESSES:
C. M. Gorman.

[Signature]

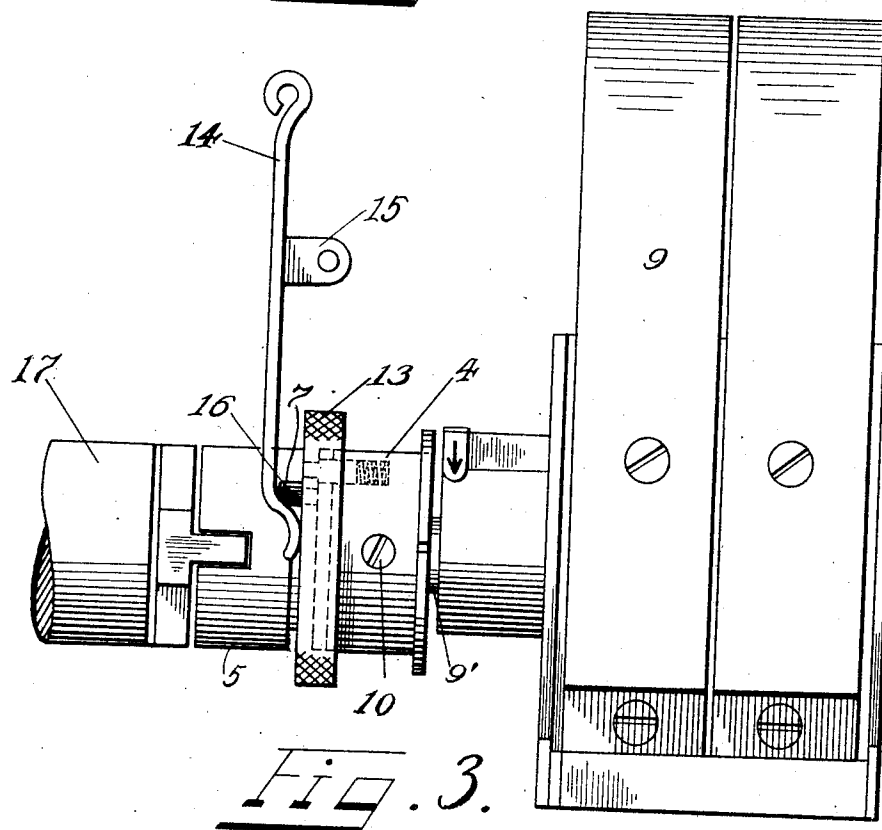
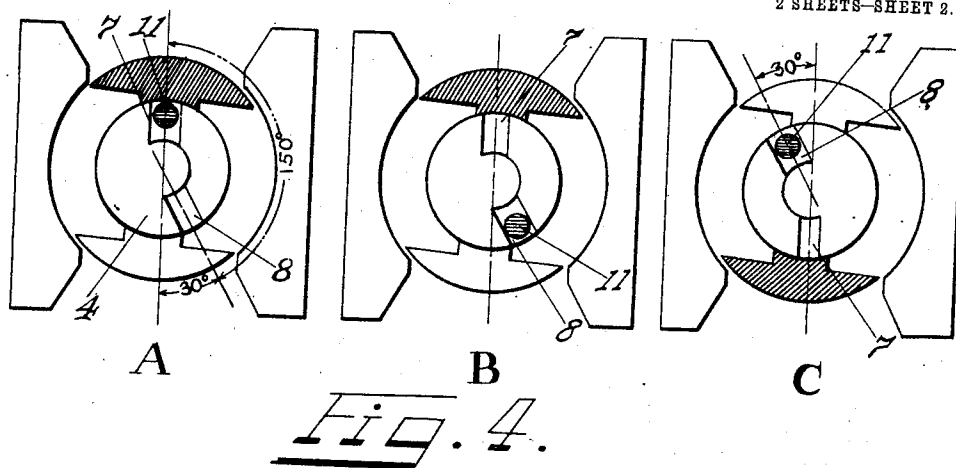
FIG 2

INVENTOR
C. T. Mason.

BY
H. W. Van Dewater.
ATTORNEY

1,047,963.

2 SHEETS—SHEET 2.



WITNESSES:

C. M. Connor.

H. P. Lonnrot.

INVENTOR

C.T. Mason.

BY
H. P. Van Dewater
ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES T. MASON, OF SUMTER, SOUTH CAROLINA.

TIMING DEVICE FOR IGNITION SYSTEMS.

1,047,963.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed October 4, 1911. Serial No. 652,706.

To all whom it may concern:

Be it known that I, CHARLES THOMAS MASON, a citizen of the United States, residing at Sumter, in the county of Sumter and State of South Carolina, have invented certain new and useful Improvements in Timing Devices for Ignition Systems; and I do hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to timing devices for ignition systems used with internal combustion engines and particularly those systems in which an alternating current dynamo, commonly known as a magneto is used, and consists of means whereby the current from the magneto is always utilized while at its maximum or "peak" for producing the spark, whether same is in the advance or retard position.

Heretofore it has been very difficult to use magnetos for ignition systems where the time of the spark is varied because the current from the magneto being alternating in character, at each revolution there would be produced two "peaks" or points of maximum current strength, and two points where the current would be zero, and if the engine igniter was timed to produce the spark with the magneto at the "peak" and the engine in the starting position, it was impossible to advance the spark as this would get the igniter out of range of the "peak" of the magneto and no spark or a very weak one would be produced. My invention obviates this difficulty and permits of the maximum strength of current from the magneto being utilized with the igniter in both starting and running positions.

Figure 1 is a view in elevation of a magneto driven by means of gears and equipped with my timing device. Fig. 2 is a view of the timing device in section. Fig. 3 is a plan view in elevation of my invention adapted for use where the magneto is driven by a shaft. Fig. 4 is a diagram hereinafter referred to as illustrating the manner in which the timing feature of my invention is accomplished.

The same letters and figures of reference

denote the same parts wherever they are shown.

1 is a knob or handle for operating the device which is held in position by means of a screw 2, tension being placed on this screw by means of spring 3 which rests against the shoulder formed in piece 4.

Loosely mounted on piece 4 is the collar 5 on which is mounted the gear wheel 6, which is attached to the collar by screws or in any other suitable manner. In the collar, are two grooves, 7 and 8, which may be spaced at any desired distance apart, the usual distance being 30 degrees. The entire structure is mounted on the shaft of the magneto 9, being securely held by means of the set screw 10 or in any other manner.

In the face portion of the knob member 1, is placed a pin 11, and it is obvious that by pulling outwardly on knob 1, pin 11 may be moved from slot 7 into slot 8, or vice versa. This turns piece 4 and the armature shaft 9 connected thereto in relation to the gear wheel 6, and it is therefore possible to vary the relation of the magneto in regard to the revolutions of the gear 12 which is driven in definite time with the engine.

With some engines, the magneto must be mounted in an inaccessible position where it would be hard to reach the knob to operate my timing device and it is also sometimes advantageous to drive the magneto from a shaft in line with the armature shaft, thereby eliminating the gears, and to meet these requirements, I use the type of mechanism shown in Fig. 3 which is substantially the same as that shown in Figs. 1 and 2, except a movable collar 13 is used in place of and performs the same function as the knob 1 in Fig. 2.

Collar 13 is operated by a lever 14 which is pivoted at 15, and which may be operated either by hand direct, or by means of a rod or wire. Pulling on this lever causes it to bear against the face of 13, which disengages the pin 16 from the slot 7 or 8 in whichever it may be, thus permitting the disk 13 with the armature shaft connected thereto to be revolved by hand, or the shaft 17 to be turned to vary the timing.

To enable the operation of my device to be thoroughly understood I refer to Fig. 4 showing in theory the relative position of the armature of the magneto in relation to the timing of an engine having 30 degrees

spark advance. The side of the armature is shown in solid color to show clearly that same has made one complete revolution taking successively the positions shown in B and C. In A the pin 11 which is connected to the driving portion of my mechanism is shown in slot 7, and therefore the armature which is connected to piece 5 in which the aforesaid slot is formed is in the position for producing the maximum spark with the engine in the retarded position. Desiring now to advance the spark on the engine to running position bearing in mind that the relative position of the armature of the magneto in relation to its pole pieces must be kept the same, knob 1 carrying pin 11 is drawn outwardly thereby allowing piece 5 containing the slots 7 and 8 to stand still until pin 11 takes up against the shoulder of slot 8. This has allowed the engine to revolve through 150 degrees, the armature remaining still, thus restarting the armature at an advance of 30 degrees with regard to the original firing position of the engine and utilizing the opposite "peak" of the generative cycle. This feature of retarding the magneto when advancing the engine, thereby utilizing one "peak" of the generative cycle for starting and the other "peak" of the generative cycle for running is a feature that I deem of great importance, as heretofore to apply the feature of timing, using an alternating current dynamo, use has been made of springs, cams, eccentrics, and other complicated devices made necessary by the fact that the magneto had to be thrown forward in the same direction it was being turned and while in motion. All of these devices are rendered unnecessary by my invention.

From the above, it will be seen that to start the engine using my invention with gear drive as shown in Fig. 1, it is necessary to place the sparking mechanism on the engine in starting position, then pull out knob 1 and turn same as far forward as it will go in the direction in which the engine is going to run. After the engine is started and the spark mechanism on the engine is changed to running position, the knob 1 is pulled out by placing fingers behind it forkwise, as shown in Fig. 1, thus permitting the magneto to automatically advance as just described so that the maximum spark will be produced in the advanced position to correspond with the changed position of the sparking device on the engine. Each time the engine is started knob 1 must be pulled out and turned forward as just described.

In case the direct drive as shown in Fig. 3 is used, the operation is exactly the same except that in place of the knob 1, the lever 14 is operated to bear against the knurled disk 13 which should be turned as far for-

ward as it will go. After engine is running, the operation of lever 14 will bring the magneto in range of the firing position of the engine as previously described.

While I have shown but one form of mechanism for accomplishing my special method of timing and only two methods of operating same, it is evident to those skilled in the art, that other mechanical equivalents may be used without departing from my invention, and while the foregoing description of operation covers my invention as used with a make and break igniter engine, it is obvious that the ordinary jump spark magneto and spark plugs may be used without any change whatever in the method of operation, or the mechanism herein described.

Having thus described my invention, I claim:—

1. In a timing device for ignition systems, a source of power, an alternating current dynamo driven thereby, a 2-part coupling between said dynamo and source of power, and means interposed between said two part coupling for engaging and disengaging the parts of said coupling for a definite portion of a revolution whereby either peak of the alternating current may be utilized.
2. In a timing device for ignition systems, in combination with a dynamo a timing member in two parts, said parts movably connected together, a collar carried by said timing member, driving means on said collar, and means interposed between said collar and timing member whereby the motion of one is imparted to the other.
3. In a timing device for ignition systems, in combination with a dynamo a timing member in two parts, a ring between said parts, a free collar carried by said parts, radial slots in said collar, projecting pins in the timing member, and means for engaging and disengaging said slots and pins.
4. In a timing device for ignition systems, an alternating current dynamo, a collar on the armature shaft of said dynamo, a sleeve on said collar, and means connecting said sleeve and collar whereby the collar may be held during part of a revolution of the sleeve for the purpose of varying the time of ignition.
5. A timing device for ignition systems comprising an alternating current generator having an H type shuttle-wound armature producing two peaks of current per revolution, and a timing device associated with the armature shaft of said dynamo for varying the position of said shaft in relation to its driving means, whereby either peak of the current generated may be brought in time with the ignition timing.
6. In a timing device for ignition systems, an alternating current magneto having an

H type shuttle-wound armature, a shaft therefor, means for driving said shaft, and means on said shaft for varying the position of the armature in relation to the driving source whereby current from either peak of the alternating current may be utilized for ignition in time with the advance or retard position of the engine igniter.

7. A timing device for ignition systems comprising a collar having a horizontally projecting shoulder, a rotatable sleeve carried on said shoulder, an end member in-

closing the end of said shoulder and carried thereby, a ring interposed between said end member and said shoulder, a horizontal projection in said end member toward said sleeve, and a groove in said sleeve adjacent said projection.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES T. MASON.

Witnesses:

H. R. VAN DEVENTER,
S. C. McKEOWN.