June 24, 1941. P. PIFFATH 2,246,754

MAGNETO

Filed Nov. 2, 1939

Fig. 1.

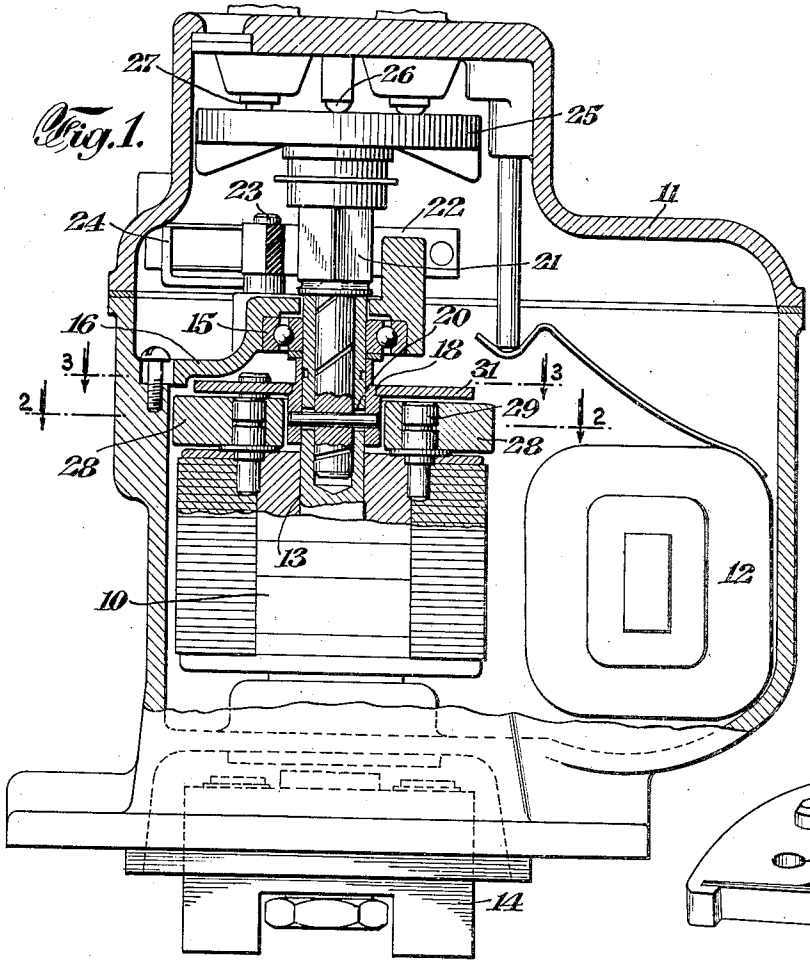


Fig. 4.

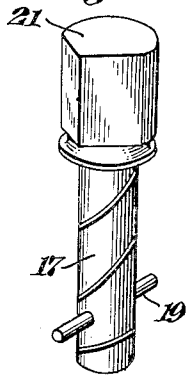


Fig. 5.

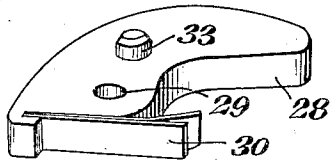
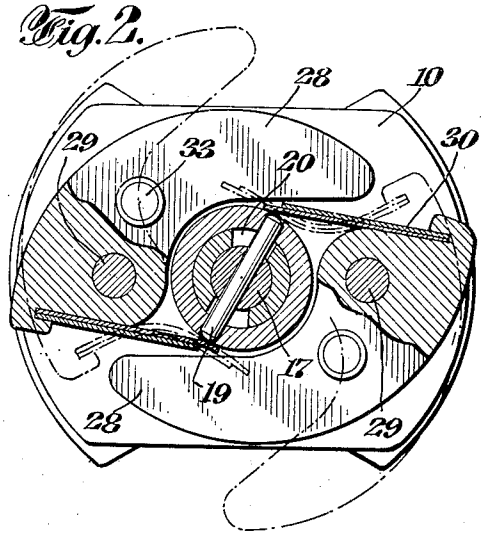


Fig. 2.



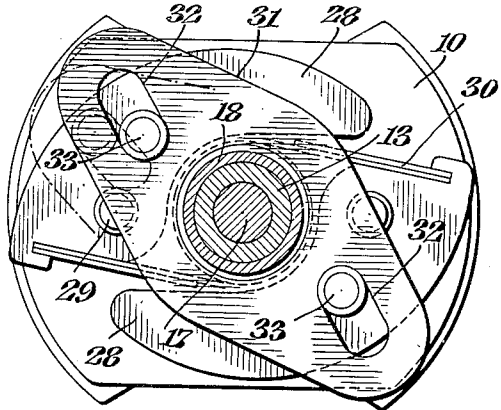


Fig. 3.

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MAGNETO

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Application November 2, 1939, Serial No. 302,484

2 Claims. (Cl. 171—209)

This invention relates to magnetos and has for its object a magneto having provision for automatically advancing the timing of the spark upon increase of the rotational speed of the armature.

In the preferred embodiment of the invention, the armature is equipped with a hollow shaft rotatable therewith, and a second shaft is rotatably supported within said hollow shaft. The operating cam is fixed to the second shaft, and cooperates with the interrupter in the usual manner. Wings are pivoted to the armature for swinging movement under the influence of centrifugal force and resilient means are provided for opposing such movement of the wings. The wings are interconnected with the second shaft for effecting rotary movement of the latter upon swinging movement of the former, thereby varying the orientation of the cam shaft relative to said hollow shaft.

Other objects, novel features and advantages of this invention will become apparent from the following specification and accompanying drawing, wherein:

Fig. 1 is a vertical section through a magneto embodying a preferred form of the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a perspective view of the cam shaft, and

Fig. 5 is a perspective view of one of the operating means.

An armature 10 of standard construction is contained within the casing 11 in which is also contained an induction coil 12 of standard construction. The armature shaft 13 is journalled at its lower end in a bearing (not shown) and is equipped with a coupling 14 for connecting the armature shaft to a shaft forming part of the internal combustion engine with which the magneto is used. The upper end of the shaft 13 is hollow and is journalled in a bearing 15 supported by a bracket 16 attached to the casing 11. A solid shaft 17 snugly fits the hollow portion of the shaft 13 and is rotatable therein. A hub 18 is rotatably mounted on the shaft 13 and is fixed to the shaft 17 by a pin 19 extending through peripheral slots 20 in the shaft 13, the pin also extending through a diametrical hole in the shaft 17 and diametrically opposite holes in the hub 18.

At the upper end of the shaft 17 is provided a cam head 21 which has rubbing contact with the interrupter 22 of the usual type to oscillate later to make and break the spark circuit in the usual manner. The interrupter 22 is pivoted on a pin 23 with which co-operates a spring 24 to hold the interrupter in contact with the cam. The structure and arrangement of the elements just described is conventional and for that reason are not disclosed in detail.

The cam shaft as shown is provided with a distributor disk 25 having the usual radially extending metal strip for co-operation with a center contact 26 and outer contacts 27 in the usual manner.

A pair of wings 28 are pivotally supported by pins 29 extending axially of the armature from the end thereof. The shape of the wings 28 and the arrangement thereof relative to the pins 29 is such that each of the wings tends to swing counterclockwise under the influence of centrifugal force developed upon rotation of the armature. Each of the wings is provided with a resilient member consisting of two leaf springs tending to oppose movement of the wings 28 under the influence of centrifugal force and to swing the wings against the shaft 13 when the armature is not in rotation. Each resilient member has one end fixed to a wing 28 and its other end in contact with the outer surface of the shaft 13 and in engagement with one end of the pin 19, thus serving to hold the latter against movement radially of the shaft 17. A plate 31 is attached to the collar 18 and is provided with a pair of slots 32 extending toward and away from the shaft 13. Each of the slots 32 receives a stud 33 carried by a wing 28. Such arrangement causes relative rotary movement of the hub 18 and the armature upon outward movement of the wings 28.

In the operation of the magneto above described, the resilient members 30 hold the wings in the position shown in full lines in Figs. 2 and 3 until sufficient centrifugal force has been developed by rotation of the armature to overcome the effect of the resilient members. After the development of a certain amount of centrifugal force, the wings begin to swing outwardly toward the position shown in the dot-dash lines of Fig. 2 and will reach such positions upon the armature acquiring a predetermined speed. Such movement of the wings causes movement of the hub 18 relative to the shaft 13 and like movement of the cam shaft 17 relative to the shaft 13. The cam 21 is thus automatically advanced with respect to the armature and with respect to the crank shaft of the engine, so as to cause a change in the timing of the operation of the interrupter relative to the engine crank shaft, the ignition

spark being supplied to the spark plugs of the engine in the well-known manner by means of the distributor.

I claim:

1. In a magneto, a rotor having a hollow shaft provided with a pair of arcuate slots, a cam shaft rotatably supported within said hollow shaft, a hub rotatable on said hollow shaft, a radial pin carried by said cam shaft with its ends passing through said arcuate slots and being interconnected with said hub, wings pivoted to said rotor for swinging movement by centrifugal force, a spring carried by each wing for opposing such movement thereof and contacting said hub surface in overlying relation to an end of said radial pin, and means interconnecting said wings and said hub for effecting rotary movement of the latter relative to said hollow shaft upon swinging movement of the former.

2. In a magneto, a rotor having a hollow shaft provided with a pair of arcuate slots, a cam shaft rotatably supported within said hollow shaft, a hub rotatable on said hollow shaft, a radial pin carried by said cam shaft with its ends passing through said arcuate slots and being interconnected with said hub, wings pivoted to said rotor for swinging movement by centrifugal force, a spring carried by each wing for opposing such movement and contacting said hub surface in overlying relation to an end of said radial pin, a slotted plate fixed to said hub, and a stud on each wing extending into a plate slot, the plate slots being so arranged as to effect rotation of said hub relative to said hollow shaft upon swinging movement of said wings.

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