H. BATT.

ELECTRIC IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED MAR. 25, 1910.

969,327.

Patented Sept. 6, 1910.

FIG. 1.

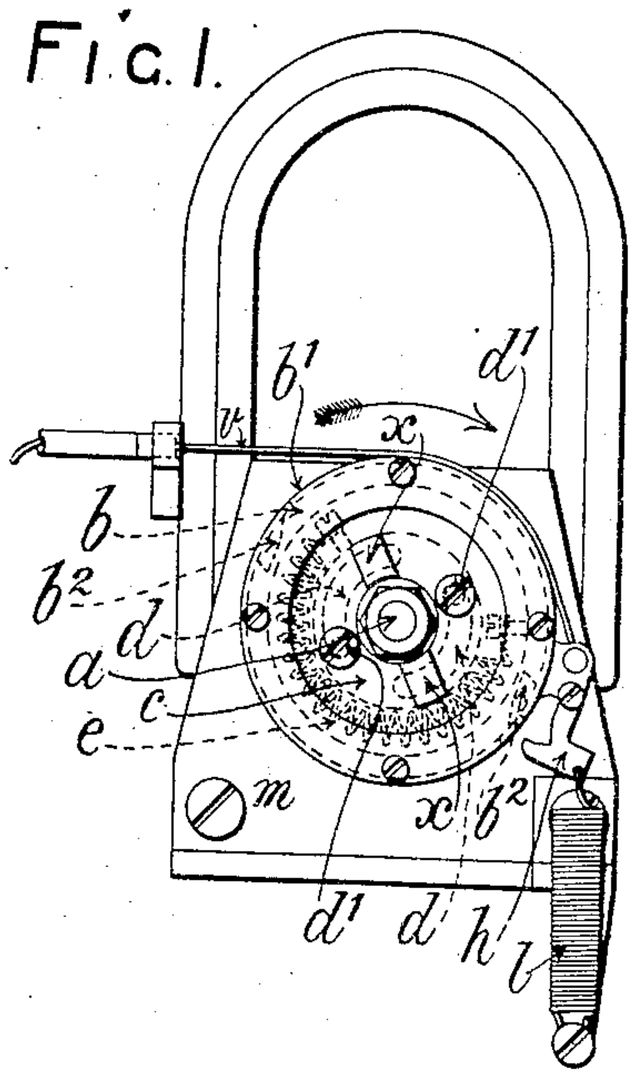


FIG. 2.

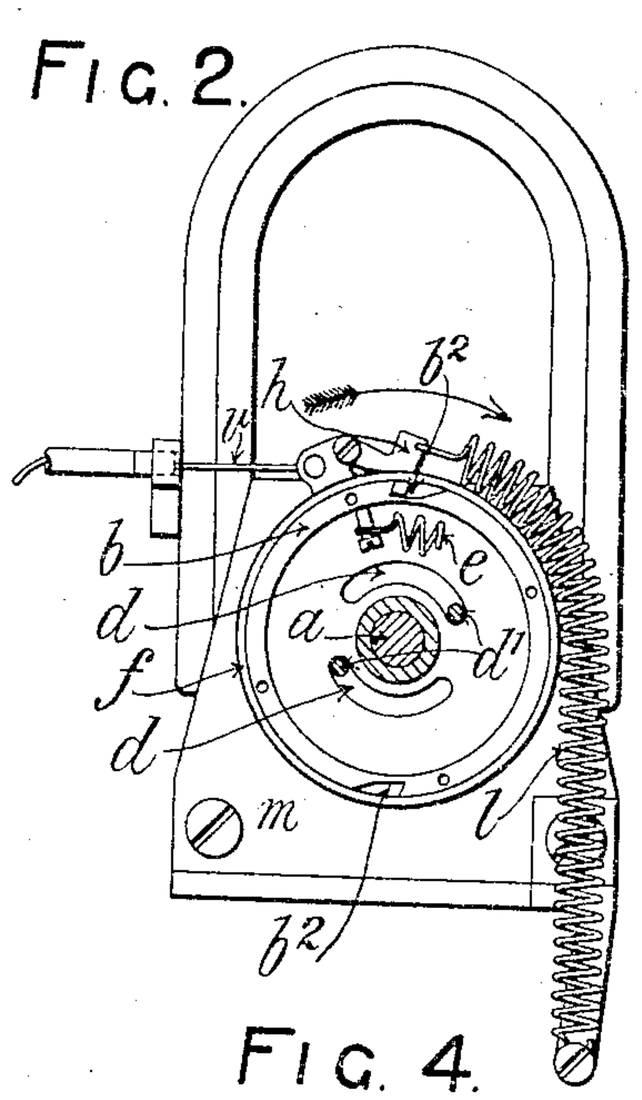


FIG. 4.

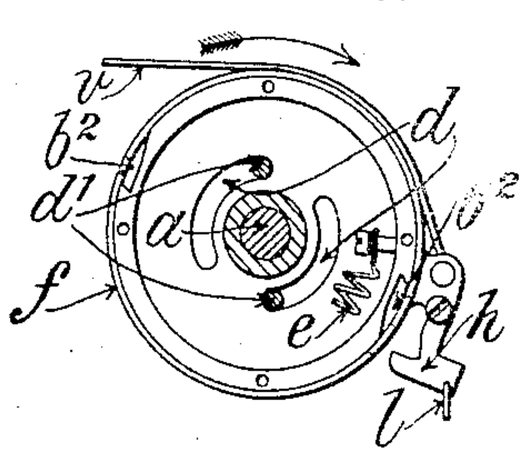


FIG. 3.

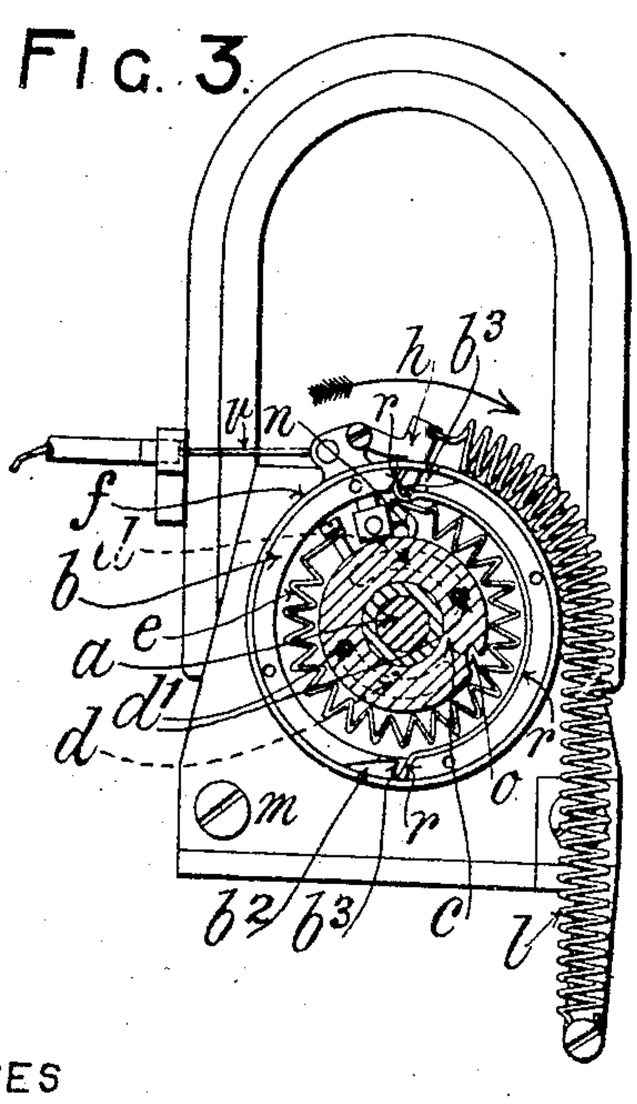
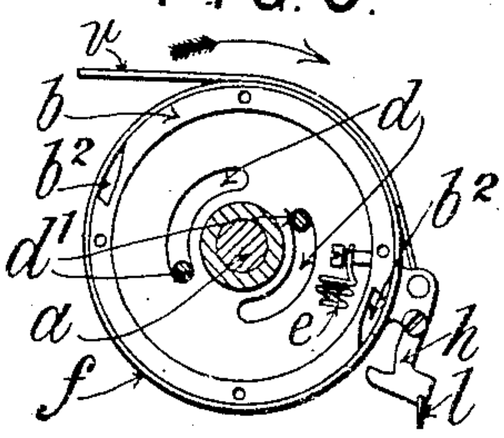


FIG. 5.



WITNESSES

L. B. Middleton

Chas. M. Baruch

INVENTOR:

H. Batt.

by Herbert W. Jenner

Attorney

UNITED STATES PATENT OFFICE.

HENRY BATT, OF HENDERSYDE PARK, KELSO, SCOTLAND.

ELECTRIC IGNITION DEVICE FOR INTERNAL-COMBUSTION ENGINES.

969,327. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed March 25, 1910. Serial No. 551,476.

To all whom it may concern:

Be it known that I, HENRY BATT, a subject of the King of Great Britain and Ireland, and resident of Hendersyde Park, Kelso, in the county of Roxburgh, Scotland, and resident of Hendersyde Park, in Electric Ignition Devices for Internal-Combustion Engines, of which the following is a specification.

This invention relates to electric ignition devices of the high-tension magneto type for internal combustion engines, and consists of mechanism for application to a magneto whereby the armature can be rotated independent of its driving connection through the angle necessary for it to cut the lines of force between the pole pieces, the object being to produce a spark at the terminals of the sparking plug without "cranking" the engine, *i. e.* without rotating the crankshaft of the engine by hand. I attain this end in the manner shown in the accompanying drawing, in which:—

Figure 1 is a view in end elevation of a magneto fitted with this invention. Fig. 2 is a view in end elevation—partly in section—with part of the device removed so as to show more clearly the details of construction and the position the parts take up when the armature is pulled back through its free angle. Fig. 3 is a view in end elevation—partly in section—with part of the device removed showing a modification, the position of the parts shown being that which they take up when the armature is pulled back through its free angle, and Figs. 4 and 5 are broken views in end elevation—partly in section—with part of the device removed showing the position the parts take up, the former when the armature is being driven by the engine and the latter when the armature comes to rest after the engine stops.

Throughout the views similar parts are denoted by like letters of reference and only such parts of the magneto as are actually necessary to illustrate the invention are shown.

Referring to Figs. 1, 2, 4 and 5, on the spindle *a* carrying the armature of the magneto are mounted—in the place usually occupied by the part of the driving couple fixed on the said spindle—two disks *b* and *c* which form the driving couple, the former of which *b*—hereinafter called the "driven" disk—is fixed on the spindle *a* by means of a key or other suitable device, and the latter of which *c*—hereafter called the "driving" disk—is mounted loosely on the spindle *a* or on the boss of the disk *b*. The driving disk *c* engages the driven disk *b* by means of a slotted connection *d*—of which there are two shown in the drawing—by means of which there is a predetermined amount of free movement between the two parts. In the construction shown the slots *d* are in the driven disk *b* and the engaging pins d^1 are carried by the driving disk *c*. Between the two disks is a spring *e* which operates to keep the driven disk (and with it the armature) in as advanced a position with respect to the driving disk as the slotted connection will allow, *i. e.* the pins d^1 carried by the disk *c* engage the opposite ends of the slots *b* to those they engage with in driving the armature of the magneto, so that the driving disk drives the driven disk against the action of said spring. The driving disk *c* is coupled to the driving medium in any suitable manner. In the construction shown said disk is adapted to be driven by an axially arranged shaft and it is therefore provided with two lugs *x x* forming part of a dog clutch. In the periphery of the driven disk *b* is a channel b^1 in which is loosely mounted a ring *f* on which is pivoted a pawl *h* which is adapted to engage with one of two ratchet teeth b^2 in the periphery of the driven disk *b*. To the ring *f* is connected means for rotating it, such for instance as a Bowden wire *v* as shown, and connected to the pawl *h* is a spring *l* which is anchored to a bracket carried by the frame *m* of the magneto in such a position that it operates to normally keep said pawl out of contact with the teeth in the periphery of the driven disk. When rotary motion is imparted to the ring *f* in the opposite direction to the normal direction of rotation of the armature, which in the accompanying drawing is indicated by an arrow, the pawl *h* is drawn into engagement with the adjacent tooth b^2 in the disk *b* and continued movement of said ring imparts rotary motion to the driven disk (and therefore to the armature of the magneto) in the reverse direction to its normal direction of rotation.

The action of the device is as follows:—When the spindle of the armature is being driven the pins d^1 carried by the driving disk *c* engage the forward ends—in the direction of rotation—of the slots *d* as shown

in Fig. 5, the spring *e* being fully extended. When the engine and thereby the driving medium comes to a state of rest the spring *e* causes the driven disk *b* to move forward, *i. e.* in the direction of its normal direction of driving so far as the slotted connection will permit. This position is shown in Fig. 4. Owing to this advanced position of the part of the driving couple fixed to the armature spindle it allows of said part of the couple (and with it the armature) to be moved in the reverse direction to its normal direction of rotation, which is effected by pulling the wire *v* which first causes the pawl *h* to engage one of the ratchet teeth in the periphery of the driven disk *b* and when said engagement is completed to rotate said disk and with it the armature. When the limit of movement is reached—owing to the slotted connection—the wire is suddenly released, whereupon the driven disk—and with it the armature—is rapidly rotated in its normal direction of rotation by the action of the spring *e* through the necessary angle for it to cut the lines of force between the pole pieces and thus produce the current necessary to produce a spark at the terminals of the sparking plug.

It will be understood that the relative positions of the various operative parts of the device are such that the angle through which the armature can be rotated when the engine has come to a state of rest after running free is one which allows the armature to cut the lines of force between the poles of the magnets.

In order to obtain a positive lock between the two disks forming the driving couple when the armature of the magneto is being driven, to avoid the noise and chatter set up by the uneven torque common to all magnetos and intensified in this construction by reason of the free play between the two parts of the driving connection, I employ a positive locking connection between the two disks. A convenient one is that illustrated in Fig. 3 of the accompanying drawing which consists of a pawl *n* mounted on the driven disk *b* and adapted to engage with a notch *o* in the periphery of the driving disk *c* when the two disks are in their proper relative positions for driving. In this construction the driving disk *c* drives the driven disk *b* through the pawl *n* and the notch *o* and not through the slotted connection *d* d^1 which in this construction serves only to limit the free movement between the two parts of the driving couple. The spring *e* may conveniently be connected to the driven disk through the pawl *n* so that it operates also to keep said pawl in its operative position. To bring the pawl *n* out of action a sliding ratchet *r* is employed which is shaped to adapt it to slide within the driven disk and engage said pawl. The ends of the ratchet *r* project through slots b^3 in the periphery of the fixed disk forming extensions of the ratchet teeth b^2 with which the operating pawl *h* engages, so that when said pawl (carried by the ring *f*) is operated to cause it to engage one or other of said ratchet teeth it first engages one or other end of the sliding ratchet *r* and by pressing on same causes it to move to operate to withdraw the pawl *n* out of engagement with the driving disk *c* and thus releases the driven disk and permits it (and with it the armature) to be moved backward, *i. e.* in the reverse direction to its normal direction of rotation, for producing the spark as before described.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In an igniter, the combination, with an armature spindle, and a driven disk secured thereon; of a driving disk operatively connected with the driven disk, a spring connection interposed between the said disks and permitting them to move independently to a limited extent, a ring journaled concentric with the said spindle and provided with a pawl for engaging with the said driven disk, means for revolving the said ring at will backward of the motion of the armature, and a spring which holds the pawl out of engagement with the driven disk until the said ring is revolved backward and which subsequently restores the ring and pawl to their original positions.

2. In an igniter, the combination, with an armature spindle, and a toothed driven disk secured thereon; of a driving disk operatively connected with the driven disk, a spring connection interposed between the said disks and permitting them to move independently to a limited extent, a ring journaled on the driven disk, a pawl pivoted to the said ring, means for revolving the ring at will backward of the motion of the armature, and a spring which holds the pawl out of engagement with the toothed driven disk until the said ring is revolved backward and which subsequently restores the ring and pawl to their original positions.

3. A driving couple for high-tension magnetos comprising two disks mounted on the spindle of the armature the one fixed and the other loose thereon, a slotted connection between the two disks whereby a limited amount of relatively free movement between said disks is provided, a spring operating circumferentially between the two disks, a ring loosely mounted on the disk fixed on the armature spindle, a pawl pivoted on said ring, two ratchet teeth in said fixed disk with which said pawl can engage, means for operating said pawl to bring it into operative engagement with said ratchet teeth, and means for rotating said ring.

4. A driving couple for high-tension mag-

netos comprising two disks mounted on the spindle of the armature the one fixed and the other loose thereon, a spring operating circumferentially between the two disks, a pawl pivoted on the disk fixed on the armature spindle, a notch or tooth in the loose disk with which said pawl can engage, a sliding ratchet adapted to lift the said pawl out of engagement with said notch or tooth, a ring loosely mounted on the disk fixed on the armature spindle, a pawl pivoted on said ring, two ratchet teeth in said fixed disk with which said pawl can engage, means for operating said pawl to bring it into operative engagement with said ratchet teeth, means for rotating said ring.

5. A driving couple for high-tension magnetos comprising two disks mounted on the spindle of the armature the one fixed and the other loose thereon, a slotted connection between the two disks whereby a limited amount of relatively free movement between said disks is provided, a spring operating circumferentially between the two disks, a pawl pivoted on the disk fixed on the armature spindle, a notch or tooth in the loose disk with which said pawl can engage, a sliding ratchet adapted to lift the said pawl out of engagement with said notch or tooth, a ring loosely mounted on the disk fixed on the armature spindle, a pawl pivoted on said ring, two ratchet teeth in said fixed disk with which said pawl can engage, means for operating said pawl to bring it into operative engagement with said ratchet teeth, means for rotating said ring.

In testimony whereof I have hereunto affixed my name in the presence of two subscribing witnesses.

HENRY BATT.

Witnesses:
RODGER FISH,
MARK STEED.