

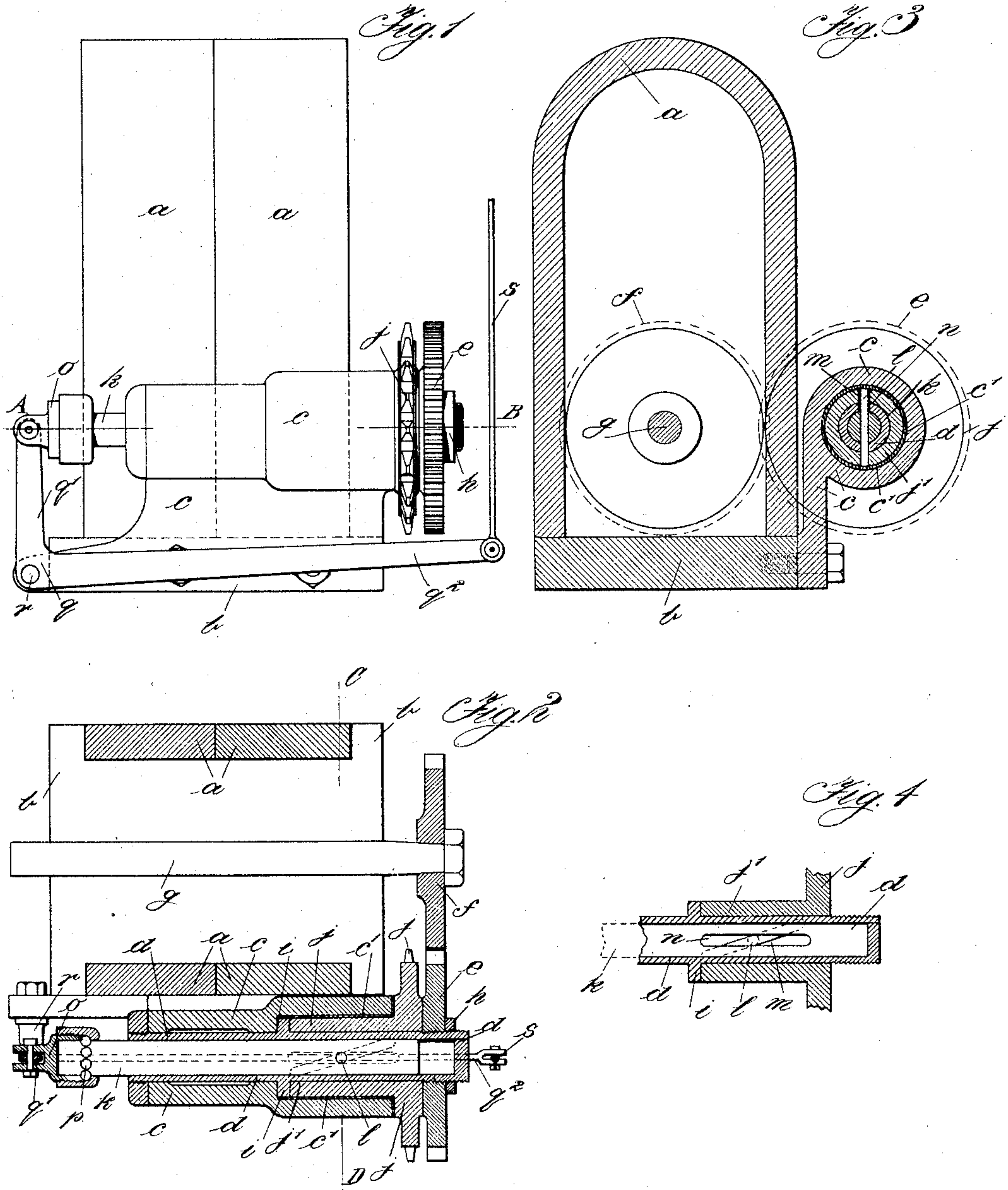
W. MULHOLLAND.

MAGNETO IGNITION DEVICE FOR USE IN CONNECTION WITH INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 11, 1909.

979,328.

Patented Dec. 20, 1910.



Witnesses
E. Smith
E. Smith

Inventor
William Mulholland
by *Carl Jones*
His Attorney

UNITED STATES PATENT OFFICE.

WILLIAM MULHOLLAND, OF BELFAST, IRELAND.

MAGNETO-IGNITION DEVICE FOR USE IN CONNECTION WITH INTERNAL-COMBUSTION ENGINES.

979,328.

Specification of Letters Patent.

Patented Dec. 20, 1910.

Application filed November 11, 1909. Serial No. 527,431.

To all whom it may concern:

Be it known that I, WILLIAM MULHOLLAND, a subject of the King of England, and resident of Belfast, Ireland, have invented
5 Improvements in Magneto-Ignition Devices for Use in Connection with Internal-Combustion Engines, of which the following is a specification.

This invention relates to magneto-ignition devices for use in connection with internal combustion engines and the improvements consist in providing means for mechanically advancing and retarding the ignition while retaining the maximum spark in
15 all positions whether fully advanced or fully retarded thus rendering magneto-ignition equal in flexibility or adaptability to accumulator or battery ignition.

The invention is especially adapted for
20 use with magneto-ignition devices constructed on the Bosch and other well known systems.

In order that my said invention may be properly understood I have hereunto appended an explanatory sheet of drawings,
25 whereon:—

Figure 1 is a side view of a magneto-ignition device as constructed under my invention. Fig. 2 is a sectional plan of same taken on the line A B, Fig. 1. Fig. 3 is a sectional end view taken on the line C, D, Fig. 2. Fig. 4 is a detail view.

In carrying out my invention I mount the magnets *a* on a suitable base *b* as usual, and
35 fitted to or forming part of the base *b* is a hollow bracket or sleeve *c* which has fitted in it a hollow countershaft *d* preferably slightly tapered and screwed at one end for the reception of a toothed wheel *e* which
40 gears with a corresponding wheel *f* fitted on the armature spindle *g*. This toothed wheel *e* may be suitably secured on the tapered screwed end of the hollow countershaft *d* by means of a jam nut or its equivalent *h*.

The hollow countershaft *d* is preferably provided with a collar or the like *i* about
45 midway of its length and fitted loosely on the exterior of said hollow countershaft *d* is a driving pinion *j* actuated by a chain drive, pinion drive or in other convenient manner from the usual half-speed or other suitable shaft. The driving pinion *j* is made
50 with a boss or sleeve *j*¹ which extends along the exterior of the hollow countershaft so

that its end bears against the collar or the like *i* formed thereon.

Fitted in the hollow countershaft *d* and extending a short distance beyond one end thereof is another shaft *k* which is capable
60 of being moved backward and forward longitudinally and is provided with a pin or its equivalent *l* which projects at right angles therefrom.

The boss *j*¹ of the driving pinion *j* is made
65 with a short or helical slot *m* while the hollow countershaft *d* is likewise made with a slot *n* parallel to its axis the arrangement being such that the pin or its equivalent *l*
70 fitted on the longitudinally moving shaft *k* projects through the longitudinal slot *n* in the hollow countershaft *d* into the volute or helical slot *m* in the boss *j*¹ of the driving
pinion *j*. In order to prevent the ends of
75 the projecting pin *l* abrading or wearing the interior surface of the hollow bracket or sleeve *c* where they come in contact with
same an additional liner or casing *c*¹ made of
80 harder metal may be fitted in the interior of the bracket or sleeve.

The projecting end of the longitudinally
85 moving shaft *k* has preferably fitted to it an end piece *o* to which one arm *q*¹ of a bell crank lever *q* is suitably secured. In order to allow of freedom of movement this end
piece *o* may be provided with a ball bearing
or such like *p*.

The bell crank lever *q* is suitably fulcrumed at *r* to the base *b* carrying the magnets *a* and as already stated the one arm *q*¹
90 thereof is connected to the longitudinally moving shaft *k* while to its other arm *q*² is secured the lower end of the usual advancing and retarding lever *s*.

The arrangement of the mechanism is
95 such that when the advancing and retarding lever *s* is raised or depressed the longitudinally moving shaft *k* is actuated either in one direction or the other and in such longitudinal movement the projecting pin or its
100 equivalent *l* in said shaft moves freely along the slot *n* in the hollow countershaft *d* but as said pin *l* also projects into the volute or helical slot *m* in the sleeve or boss *j*¹ of the
driving pinion *j* and as this latter is capable
105 of a certain amount of rotary movement on the hollow countershaft *d* its movement can be either advanced or retarded in accordance
with the direction of movement of the longitudinally moving shaft *k*. As the driving
110

pinion *j* is directly connected to the armature of the magneto it will be obvious that when the movement of the pinion is advanced or retarded the armature is similarly advanced or retarded.

By advancing or retarding the movement of the driving pinion *j* and the armature of the magneto in the manner described through the medium of the lever *s*, bell crank lever *q*, and longitudinally moving shaft *k* the ignition can be either advanced or retarded mechanically as may be desired while the maximum spark is retained.

The improvements are specially applicable to magnetos such as are used on motor cycles, and the like where space is limited lengthwise, and as the mechanism is all enclosed the apparatus is practically rendered dust-proof and therefore more suitable for exposed positions than advancing or retarding mechanisms hitherto used.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:—

Improvements in magneto-ignition devices, comprising in combination, an armature spindle and a gear wheel thereon, a

base, a sleeve carried on the base, a slotted, hollow countershaft in said sleeve, a toothed wheel which is carried by said countershaft and gears with the wheel on the armature spindle, the said countershaft also being slotted, a collar on said countershaft, a driving pinion carried on the latter, a slotted boss integral with said pinion, a longitudinally movable shaft (*k*) arranged inside said hollow countershaft, a pin carried at the end of the shaft and adapted to project through the slots in said boss and said countershaft, an end piece at the end of said shaft, a bell crank lever fulcrumed to the base, one arm of said lever being pivoted to said end piece, and an advancing and retarding lever secured to the other arm of said bell crank lever, substantially as described and shown, and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM MULHOLLAND.

Witnesses:

SAMUEL S. KNABENSHUE,
M. E. ORR.