H. R. VAN DEVENTER.

IGNITION DEVICE.

APPLICATION FILED FEB. 21, 1916.

1,202,128.

Patented Oct. 24, 1916.

FIG. 1.

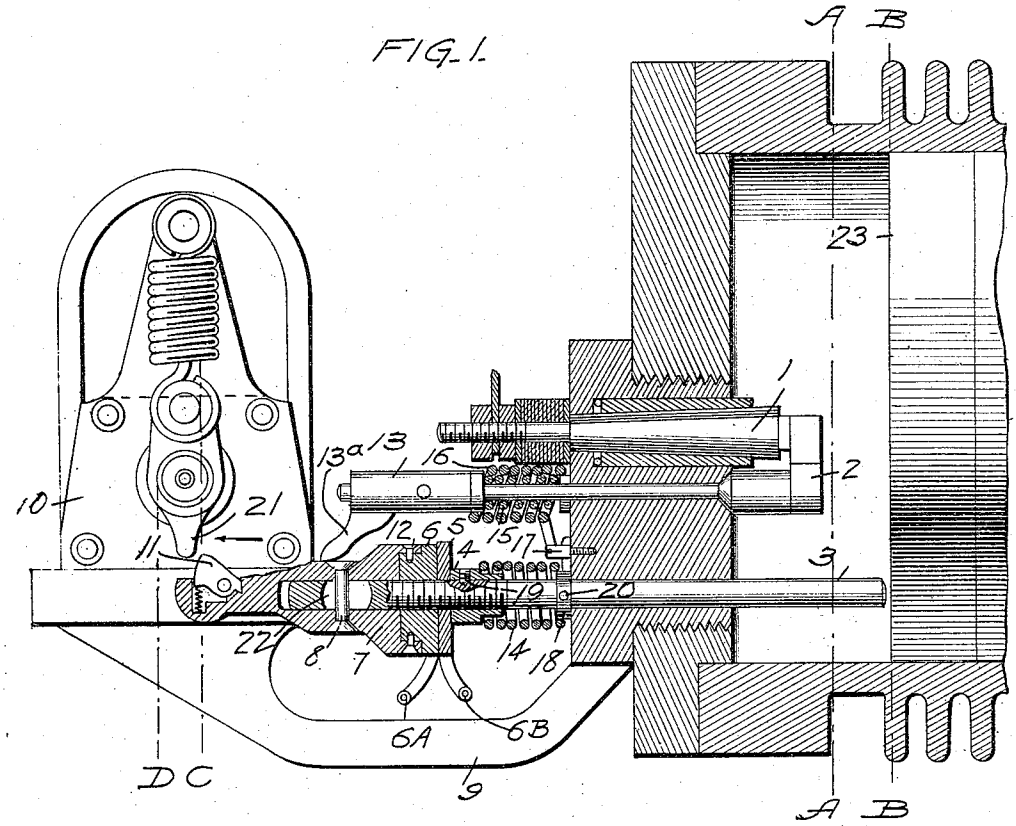


FIG. 2.

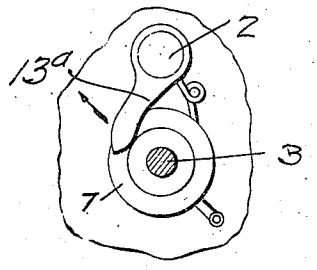
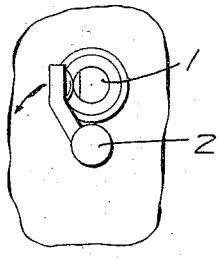


FIG. 3.



Inventor

H. R. Van Deventer,

UNITED STATES PATENT OFFICE.

HARRY RANDOLPH VAN DEVENTER, OF SUMTER, SOUTH CAROLINA, ASSIGNOR TO SPLITDORF ELECTRICAL COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

IGNITION DEVICE.

1,202,128. Specification of Letters Patent. Patented Oct. 24, 1916.

Application filed February 21, 1916. Serial No. 79,652.

To all whom it may concern:

Be it known that I, HARRY RANDOLPH VAN DEVENTER, 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 Ignition Devices, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to ignition devices for internal combustion engines, and the object of my invention is to provide a simple and convenient device for mounting adjacent the cylinder an electric generator and igniter and operating said magneto and igniter directly from a push rod actuated by the engine piston, thereby eliminating the geared or cam-operated push rods heretofore used.

Another object of my invention is to provide means for operating any suitable type of oscillating magneto by a push rod directly engaging the engine piston. Such an arrangement is herein shown for the sake of illustration, but I broadly claim the arrangement for operating the magneto only, regardless of the specific type of igniter used, in another application filed concurrently herewith.

A further object is to provide a simple and efficient means for advancing and retarding the magneto and igniter in unison.

My improvement consists in the combination and arrangement of parts hereinafter described, shown in the accompanying drawings forming a part of this specification, and more particularly specified in the subjoined claims.

In the drawing: Figure 1 is a view partly in section of the supporting bracket carrying the generator, hereinafter called a magneto, and the igniter, and secured to the end of the engine cylinder. Fig. 2 is a view showing the relation of the arm on the movable electrode to the cam face on push rod. Fig. 3 is a view showing the position of the electrodes of the make and break igniter with their contact points, within the engine cylinder.

Like figures of reference denote the same parts wherever they are shown.

In the prior art it has been customary to mount the magneto and igniter on the same bracket. Such an arrangement is shown in U. S. Patent No. 820,535 to Weber, of May 15, 1906, which is an early patent in this art. It will be observed from this patent and others that the means for operating the magneto and igniter includes a push rod or other device operated from some external moving part of the engine by gears, or cams, and that said push rod is usually mounted on the engine, forming a part thereof independent of the magneto, the igniter, or their supports.

It is obvious that such actuating means is liable to disarrangement through wear, misadjustment, or abuse; and in most forms is comparatively complicated and expensive, and to eliminate this operating mechanism I mount the bracket 9, which may form the igniter body and a shelf-like support of the magneto, directly on the end of the engine cylinder to which it is attached by being threaded therein, as shown, or by being bolted thereon in any suitable manner. It is obvious that 9 may be in more than one piece, or the magneto and igniter may have separate supports, also they may be mounted on some portion of the engine other than the cylinder, so as to bear the proper relation to the latter.

On the shelf portion of the bracket is secured an ordinary single vertical spring-oscillating type of magneto designated by the numeral 10, and in the flange portion is mounted the stationary electrode 1 suitably insulated from 9, and the movable electrode 2 forming the usual make and break igniter.

The movable electrode 2 is free to turn in the usual manner, and is held in place within the flange by the cap 13 and compression spring 15, the cap being secured to the stem of 2 and the spring wound in such a direction as to keep the igniter points normally closed.

As make and break igniters are well known and their construction and arrangement may be varied within wide limits, I will not describe this part in detail.

The push rod 3 is free to slide in the flange and is held in place by the tension spring 14, one end of which is held by the screw pin 17 and the other end by the cap 4, which is secured to the push rod 3 by means of a set screw 19. The push rod 3 is kept in proper position in relation to the piston by the washer 18, which is secured to it by the

set screw 20. The tension of 14 tends to keep the push rod in toward the piston.

The projecting nose of the member 7 carried on the rod 3 has a spring latch 11, which—when thrusting in the direction of the arrow, Fig. 2—engages the trip 21 of the oscillating magneto, carries it to the point D and releases. When traveling in the opposite direction the latch springs past the dog 21 and is depressed without engagement.

The member 7 is held in position by the pin 8 thereto, working in a slot 22 in the push rod 3. The push rod is threaded for a distance as shown in Fig. 1, and the nut 6 runs on this threaded portion. A handle 6^A is attached to this nut, which is secured to the member 7 by means of set screws 12 working in a groove cut partially around 6 and thereby not interfering with the turning of 6 on the threads on 3. From this it is obvious that the push rod 3 can be either lengthened or shortened by turning the handle 6^A in either direction, which action moves the member 7 either out from cylinder or in toward it, by reason of nut 6 traveling along the threads of 3. This lengthens or shortens the push rod 3 without however varying the normal position of the inner end of same in relation to the piston, or in any way affecting the effective stroke of the latch 11. In order to lock this mechanism, a nut 5 is provided with a handle 6^B, whereby it may be turned against 6 thereby locking 6 in any position on the threads of 3.

The push rod mechanism is operated while the piston 23 is traveling between the points on the lines A and B, Fig. 1. When the piston reaches the center line B on its upward strokes, it engages the end of 3 and pushes it through the distance B, A. When the piston starts to return on its downward stroke the spring 14 causes the push rod 3 to follow the piston, and 3 assumes its normal position, as shown in Fig. 1. When push rod 3 starts outward, the latch 11 engages the dog 21 of the magneto 10 and carries the dog in the direction of the arrow until the dog is released at the point on line D, whereupon the dog flies back to its original position, during which time the magneto generates. At rest, the latch 11 is to the right of line C, and out of the way of the return oscillation of 21.

At the instant of the release of the dog 21 by the catch 11, the sloping face of the cam 7 comes in contact with the arm 13^a attached to the cap 13, which is rigidly secured to the stem of the movable electrode 2. This lifts arm 13 in the direction of the arrow, Fig. 2, thereby separating the electrode points in the engine cylinder in proper time with the operation of the magneto. When the piston 23 starts on its return stroke and the spring 14 brings the push rod 3 to its normal position, the torsion spring 16 brings the movable electrode 2 to its normal position, with the points closed as in Fig. 3. The catch 11 passes back under the dog 21 without any trouble because of its spring and pivot arrangement, as will be understood by reference to Fig. 1.

It is obvious that, to be able to time the spark with this device, an arrangement by which the tripping of the magneto and the separation of the igniter points can be caused to occur sooner or later must be provided, and this is accomplished by turning the nut 6 in the desired direction, thereby causing the member 7 to move along the threads on push rod 3, thereby making the catch 11 engage the dog 21 sooner or later as desired; and that this also brings the cam face of 7 nearer 13 thereby operating the igniter in unison time with the tripping of the magneto.

It will be seen from the foregoing description that I have eliminated all of the usual side rod half-time connections or geared devices heretofore used for operating a magneto and igniter in unison, and that I operate said devices directly from the engine piston, thereby eliminating many of the disadvantages due to wear in many moving parts heretofore used; and while I show the magneto and igniter mounted on an integral bracket, it is obvious that these parts may be mounted on separate brackets adjacent each other and the same results accomplished. It is also obvious that the magneto may be mounted on the end of the engine cylinder and operated independent of the igniter, the latter being operated by any well known means and located at some other part of the cylinder if necessary. It is also clear that other means of advancing and retarding the magneto and igniter—either in unison or separately—will suggest themselves to those skilled in the art, and the foregoing and all other modifications I deem to be within the scope of my invention, as covered by the appended claims.

I claim:—

1. In combination, an engine cylinder, an electric generator adjacent thereto, an igniter in said cylinder, a piston therein, and means engaging said piston for actuating said generator and igniter.

2. In combination, an engine cylinder, an electric generator mounted thereon, an igniter in said cylinder, a piston therein, and means engaging said piston for actuating said generator and igniter.

3. In combination, an engine cylinder, an electric generator adjacent thereto, an igniter in said cylinder, a piston in said cylinder, and means extending through the wall of said cylinder engaging said piston and actuating said generator and igniter.

4. In combination, an internal combustion engine, a member comprising an igniter

body and generator support secured thereto, a make and break igniter carried by said member, an electric generator carried by said member, a piston within the engine cylinder, and means engaging said piston for actuating said generator and igniter.

5. In combination, an internal combustion engine, a member comprising an igniter body and generator support secured thereto, a make and break igniter carried by said member, an electric generator carried by said member, a piston within the engine cylinder, means engaging said piston for actuating said generator and igniter, and means for varying the timing of the actuation of said generator and igniter.

6. In combination, an engine cylinder, an electric generator adjacent thereto, a make and break igniter, a piston in said cylinder, a push rod extending through said cylinder wall and adapted to engage said piston and to actuate said generator and igniter, and means on said rod for varying the time of actuation of said generator and igniter in unison, substantially as described.

7. In combination, an engine cylinder, a piston therein, an electric generator adjacent thereto, a make and break igniter, means extending through said cylinder wall and engaging said piston for actuating said generator and igniter, said means including a push rod, and means for returning said push rod to normal position after its actuation by said piston, substantially as described.

8. In combination, an engine cylinder, a piston therein, an electric generator adapted to be oscillated, a make and break igniter, a unitary bracket supporting said generator and igniter in positive mechanical relation to each other, means for actuating said generator and igniter supported by said bracket and extending into said engine cylinder and adapted to be engaged by the piston the piston therein, and means coacting with said actuating means whereby said generator is tripped only by the outward stroke of said actuating means, substantially as described.

9. In combination, an engine cylinder, a piston therein, an electric generator, a make and break igniter, a unitary bracket supporting said generator and igniter, means for actuating said generator and igniter extending into said engine cylinder and adapted to be engaged by said piston, means for restoring said actuating means to normal position, and means for preventing the actuation of said generator by said actuating means on the return stroke thereof, substantially as described.

10. In combination, an engine cylinder, a piston therein, an electric generator, a spring-controlled trip device for oscillating the moving element of said generator, a make and break igniter, a unitary bracket supporting said generator and igniter, an actuator extending into said engine cylinder and adapted to be engaged by the piston therein, means for returning said actuator to its normal position after each outward stroke thereof, and means carried by said actuator whereby the time of engagement with said trip device may be varied without varying the position of said actuator in relation to said piston, substantially as described.

11. In combination, an electric generator, spring means including a trip device for oscillating the movable member thereof, a make and break igniter, a unitary bracket supporting said generator and igniter, an actuator for said generator and igniter carried by said bracket and adapted to be actuated by an engine piston, adjustable timing means interposed between said actuator and said igniter for varying the timing of the latter, and means operated in unison with said timing means for operating said trip device, substantially as described.

In testimony whereof I hereunto affix my signature.

HARRY RANDOLPH VAN DEVENTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."