L. SANCHEZ.

IGNITION DEVICE.

APPLICATION FILED OCT. 11, 1917.

1,274,941. Patented Aug. 6, 1918.

Fig. 1.

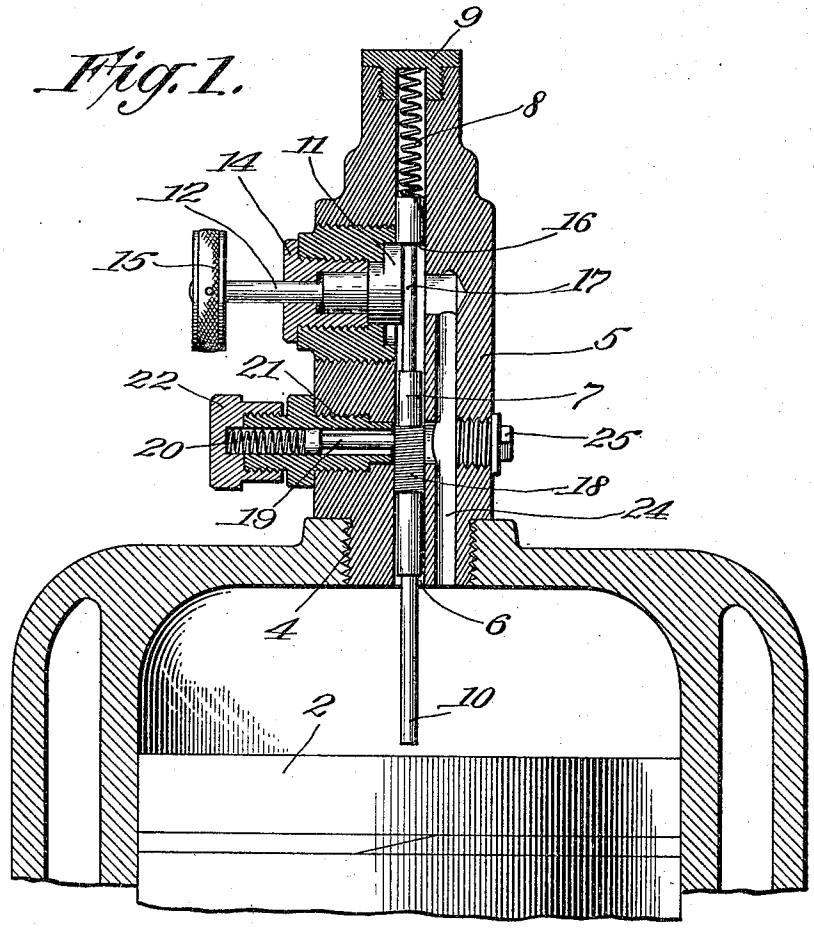
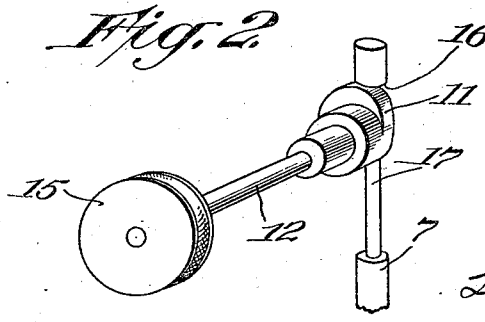


Fig. 2.



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UNITED STATES PATENT OFFICE.

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IGNITION DEVICE.

1,274,941. Specification of Letters Patent. Patented Aug. 6, 1918.

Application filed October 11, 1917. Serial No. 195,906.

To all whom it may concern:

Be it known that I, LEONARDO SANCHEZ, a citizen of the Republic of Cuba, and a resident of Habana, Cuba, have invented certain new and useful Improvements in Ignition Devices, of which the following is a specification.

This invention relates broadly to the art of internal combustion engines, and more particularly to an ignition device for such engines.

The principal object of the present invention is to provide a complete ignition device in the form of a plug which may be secured in the engine cylinder in place of the ordinary spark plug.

A further object of the present invention is to provide a device of this type which may be used in place of the ordinary spark plug without necessitating any modification of the engine construction.

A still further object of the invention is to provide a plug constituting a self-contained igniter which entirely eliminates the necessity of employing an electric ignition system.

Another object of the present invention is to provide an igniter of this type having means for advancing or retarding the time of formation of the igniting flame.

These and other objects together with their attendant advantages will be apparent as the invention becomes better understood by reference to the accompanying specification, and the drawings forming a part thereof, throughout the several views of which like characters of reference have been used to indicate like parts.

In the drawings, Figure 1 is a longitudinal sectional view of my improved igniter.

Fig. 2 is a detail view of the advancing and retarding mechanism.

I am aware that attempts have heretofore been made to eliminate the electric ignition system commonly employed in connection with internal combustion engines, by the substitution of a suitable pyrophoric material in combination with mechanically actuated means for striking the same to produce a spark at the proper time. Such means has customarily been actuated from the crank shaft of the engine thereby necessitating a modification of the engine construction to a greater or less extent to accommodate for the attachment of an igniter of this type. In the present construction the igniter is entirely contained within the body of a plug adapted to be fastened into the engine cylinder in the ordinary manner in place of the usual spark plug, thereby making it unnecessary to in any manner change the engine construction.

Referring more particularly to the drawings, I have indicated the usual engine cylinder 1 having a piston 2 reciprocating therein, and provided with the well known opening 4 for the reception of the igniting device. In the present instance the engine is shown as provided with my improved igniter, which comprises a main body or plug 5 having an opening 6 extending longitudinally through the central portion thereof for receiving a rod 7 adapted to be reciprocated therein, and normally held in depressed position by the spring 8 bearing at one end against the upper end of the rod 7, and at its opposite end against the removable cap or plug 9. In such position the lower end 10 of the rod is adapted to project a considerable distance into the engine cylinder so as to lie in the path of movement of the piston and be engaged by the piston upon reciprocation thereof. The extent to which the end 10 projects into the cylinder, and consequently the time at which it is engaged by the piston, is determined by means of an eccentric 11 suitably secured to one end of the shaft 12 journaled in the bushing 14 of the igniter plug, and having an operating thumb nut 15 for varying the position thereof. Movement of the eccentric is transmitted to the rod by means of the shoulder 16 formed above the central reduced portion 17 of the rod 7. It will be apparent that upon turning the eccentric, that the rod 7 may be raised or lowered a corresponding distance, thereby varying the time at which the rod is engaged and actuated by the engine piston for the purpose hereinafter more fully pointed out.

Formed on the rod 7 is a roughened, corrugated or ribbed portion 18 adapted during reciprocation of the rod to bear against a pencil 19 of suitable pyrophoric material, such as cerium or the like, which is held in engagement therewith by means of the

spring 20. The pencil of pyrophoric material is mounted within the bushing 21 having its outer end closed by a cap 22 forming a housing for the spring 20 and preventing the escape of the combustible mixture from the engine cylinder.

A supplemental passageway 24 permits the combustible charge to enter the body of the plug so as to surround the rod 7 and the pencil of pyrophoric material. Access to this passageway may be had by removing the plug 25. If desired, a priming pet cock of any usual construction may be substituted for the plug 25 so that a combustible fluid may be injected directly into the body of the plug.

It is believed from the foregoing that the operation of my improved igniter will be obvious. Upon the down stroke of the engine piston a suitable charge of combustible mixture is drawn or forced into the engine cylinder, which charge is compressed upon the following up stroke of the piston. Just about the time of compression dead center the piston comes into contact with the end 10 of the rod 7 and reciprocates the same so that the roughened portion is forced across the end of the pencil or body of pyrophoric material. This in turn produces a hot spark which ignites the combustible charge contained in the passageway 24 leading to the main body of the charge in the engine cylinder. By manually adjusting the eccentric 11 the spark may be advanced or retarded to accommodate the engine for various speeds and conditions of operation.

It will be apparent that any pyrophoric material may be employed, but I preferably use a material the particles of which do not act as an abradant when thrown off by the action of the igniter. For increasing the life of this material it may be combined, alloyed or coated with any desired material capable of increasing the strength and life thereof. Iron and copper have been found to be useful in this connection.

While I have described the preferred embodiment of my invention, it will be apparent that changes may be made therein within the scope of the appended claims without departing from the spirit thereof.

What I claim is—

1. An igniter for internal combustion engines, comprising a main body portion having means for securing the same to an engine cylinder, a reciprocatory rod carried by said plug and adapted to project into the engine cylinder in the path of travel of the piston therein so as to be reciprocated by the action of said piston, and a body of pyrophoric material adapted to be engaged by said rod upon reciprocation thereof.

2. An igniter for internal combustion engines, comprising a plug adapted to be secured into an engine cylinder, a rod carried by said plug and adapted to extend into the engine cylinder in the path of travel of the piston therein so as to be reciprocated thereby, a body of pyrophoric material adapted to be engaged by said rod upon reciprocation thereof to produce a spark, and manually controlled means for adjusting said rod.

3. An igniter for internal combustion engines, comprising a main plug adapted to be secured in an engine cylinder and having an opening extending longitudinally thereof, a rod mounted in said opening and adapted to project into the engine cylinder in the path of travel of the piston therein so as to be reciprocated thereby, a body of pyrophoric material in contact with said rod so as to produce a spark upon reciprocation thereof, and an eccentric adjustable at will for controlling the position of said rod to advance or retard the spark produced by the igniter.

4. An igniter for internal combustion engines, comprising a plug adapted to be secured in an engine cylinder, a reciprocatory member carried thereby and extending into the path of the piston in said cylinder, and a body of pyrophoric material in contact with said member so as to produce a spark upon reciprocation thereof.

5. An igniter for internal combustion engines, comprising a plug having means for securing the same in an engine cylinder, a reciprocatory member carried by said plug and extending into the path of the piston in said cylinder, a body of pyrophoric material in contact with said member so as to produce a spark upon reciprocation thereof, and means adjustable at will for varying the amount of reciprocation of said member.

6. An igniter for internal combustion engines, comprising a main body portion having means for securing the same to an engine cylinder, a reciprocatory rod carried by said plug and adapted to project into the engine cylinder in the path of travel of the piston therein so as to be reciprocated by the action of said piston, and a second rod adapted to be engaged by said first mentioned rod upon reciprocation thereof, one of said rods being provided with pyrophoric material so as to produce a spark upon relative movement between said rods.

LEONARDO SANCHEZ Y MARTINEZ-MALO.

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