J. S. COYLE.

IGNITION DEVICE.

APPLICATION FILED JUNE 30, 1919.

1,337,046. **Patented Apr. 13, 1920.**

Fig 1

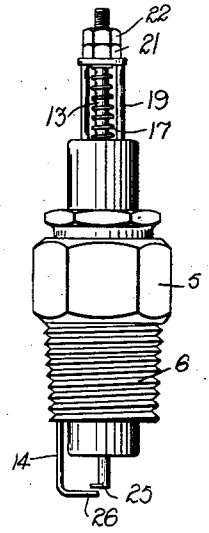


Fig 2

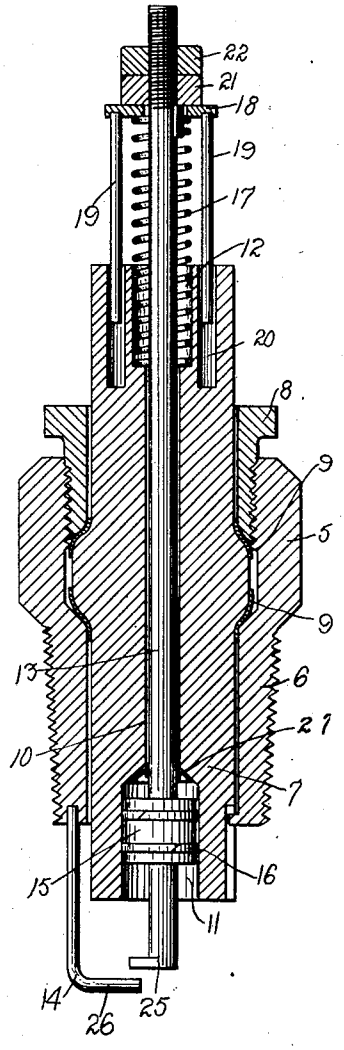
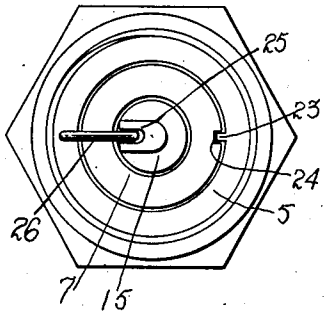


Fig 3



WITNESSES

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JAMES STEPHEN COYLE, OF ST. LOUIS, MISSOURI.

IGNITION DEVICE.

1,337,046. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed June 30, 1919. Serial No. 307,667.

To all whom it may concern:

Be it known that I, JAMES S. COYLE, a citizen of the United States, and a resident of St. Louis, in the State of Missouri, have invented a new and Improved Ignition Device, of which the following is a full, clear, and exact description.

The present invention relates to new and useful improvements in ignition devices for internal combustion engines, and it pertains more particularly to spark plugs therefor.

The primary object of the invention is to provide means for constantly cleaning the electrodes of a spark plug.

A further object of the invention is to construct a device of this character in which the cleaning operation is automatically carried out by the operation of the motor piston.

With the above and other objects in view reference is had to the accompanying drawings in which—

Figure 1 is a view in elevation of a spark plug constructed in accordance with the present invention;

Fig. 2 is an enlarged vertical sectional view thereof;

Fig. 3 is a bottom plan view.

Referring more particularly to the drawings, the reference character 5 designates the spark plug shell, which is constructed of metal in the ordinary manner, and said shell is screw-threaded as at 6 to provide for its attachment in the cylinder head of an explosion motor. Passing through the metallic shell 5 is the porcelain body 7 of the spark plug, and said porcelain body 7 is secured in place by means of the nut 8. Interposed between the shell 5 and the porcelain body 7, are gaskets of copper or other suitable soft metal, which prevent the passage of gas around said porcelain body 7.

The porcelain body 7 is provided with a central passage 10, and the lower end of said passage 10 is enlarged as at 11, its upper end being also enlarged at 12. Mounted in the central passage 10 of the porcelain body 7, is one electrode 13, the other electrode 14 being secured to the shell 5. The electrode 13 is slidably mounted in the passage 10, and near its lower end it is provided with a piston 15, which operates in the lower enlarged portion 11 of the passage 10, and this piston is provided with rings 16 for providing a tight joint between said piston and the enlarged portion 11 of the passage 10.

Mounted in the enlarged portion 12 of the passage 10, and surrounding the electrode 13, is a coil spring 17, the upper end of which engages a washer 18. Depending from the washer 18 and two guides 19 in the form of rigid rods, which operate in recesses 20 in the porcelain body 7. The washer 18 is prevented from passing off the upper end of the electrode 13 by the nut 21 and its lock nut 22, both of which are threaded on the upper end of said electrode.

To prevent movement of the porcelain body 7 relative to the shell 5, the latter is provided with a projecting lug 23, which is received in a recess 24 in the said porcelain body 7 as best shown in Fig. 3.

The lower end of the electrode 13 is bent at right angles, as at 25, and is bifurcated to embrace the right-angular end 26 of the electrode 14. As shown in Fig. 2, the electrode 13 is provided with a valve 27, which is adapted to close the passage 10 when the piston 15 is in the position shown.

The operation of the device is as follows:

Upon the intake stroke of the piston, of the internal combustion motor, the piston 15 is moved toward the open end of the enlarged portion 11 of the passage 10, and the right-angular end 25 of the electrode 13 wipes the right-angular end 26 of the electrode 14, removing all deposit of foreign matter therefrom. As the piston in the motor moves on its compression stroke, the piston 15 is moved to the position shown in Fig. 2, in which position there is sufficient gap to give the necessary spark to ignite the charge compressed. As the operation of the motor continues, the above action takes place upon each reciprocation of the piston, thus assuring clean electrodes at all time.

What is claimed is:

In a spark plug for motors, a stationary electrode, a rod extending longitudinally of the body of the spark plug and having a bifurcated electrode on one of its ends, and a piston carried by said rod, and movable in a cylinder formed in the body of the spark plug by the piston of the cylinder in which it is used, to move the bifurcated electrode in the presence of the stationary electrode to remove deposits of hydrocarbon therefrom.

JAMES STEPHEN COYLE.