F. H. HEGINBOTTOM.

JUMP SPARK PLUG.

APPLICATION FILED APR. 8, 1916.

1,213,637. Patented Jan. 23, 1917.

Fig. 1.

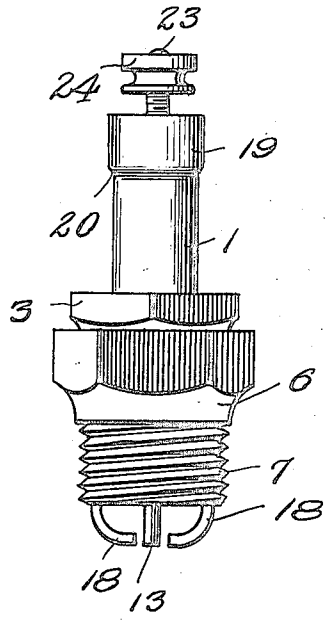
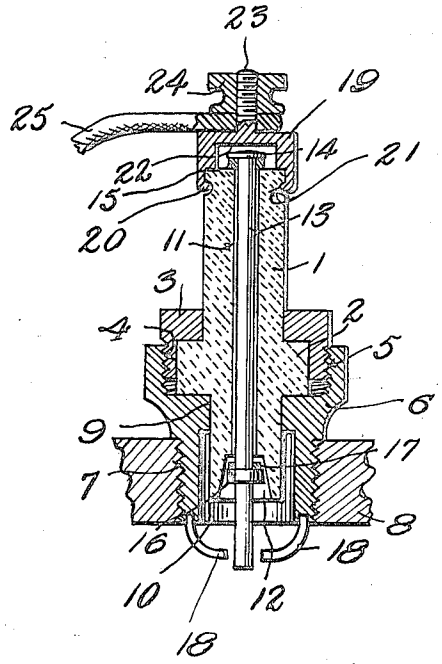


Fig. 2.



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Witnesses

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UNITED STATES PATENT OFFICE.

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JUMP-SPARK PLUG.

1,213,637. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed April 8, 1916. Serial No. 89,933.

To all whom it may concern:

Be it known that I, FRANK H. HEGINBOTTOM, a subject of the King of England, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Jump-Spark Plugs, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a spark plug wherein the core or electrode is reciprocally mounted so that as the piston head is reciprocated within the cylinder the pressure of gas and the suction which takes place at intermittent intervals will cause the core or electrode to reciprocate, thus preventing the formation of carbon within the cylinder from collecting upon the core or electrode and thus short circuiting the spark plug.

Another object of this invention is the production of a spark plug wherein the core or electrode being reciprocally mounted and being lifted by the pressure of gas thereon and returned to its normal lowered position by suction within the cylinder dispenses with any secondary lifting or reciprocating means since this action of the pressure and suction will automatically reciprocate the core or electrode.

With these and other objects in view this invention consists of certain novel combinations, constructions, and arrangements of parts as will be hereinafter fully described and claimed.

In the accompanying drawing: Figure 1 is a side elevation of a spark plug as constructed in accordance with this invention. Fig. 2 is a central vertical section through the spark plug.

Referring to the accompanying drawing by numerals it will be seen that 1 designates the body of the spark plug which, of course, may be of any shape or size and formed of any suitable insulating material. This body 1 has an enlarged annular rib 2 formed thereon so as to support the locking nut 3 having the externally threaded portion 4, which is adapted to engage the internally threaded portion 5 of the coupling 6. This coupling 6 may, of course, be externally threaded, as shown at 7, so as to be carried upon the cylinder head 8 of an ordinary combustion engine, or the like. This coupling 6 is provided with a thickened collar 9 formed integral thereon so as to support the annular rib 2 of the body 1 of the spark plug. The lower end of the body 1 extends through the collar 9 so as to terminate at a distance from the outer end 10 of the coupling 6. From the foregoing description it will be seen that by the connection of the locking nut 3 and the coupling 6 the body 1 of the spark plug will be held in its correct position when in use.

The body 1 is provided with a longitudinally extending bore 11 extending partially therethrough, which communicates at its lower end with the substantially conical pocket 12. The electrode or core 13 passes through the bore 11 and has a washer 14 shrunk upon its outer end, which normally rests upon the gasket 15 carried upon the outer end of the body 1. A second thickened washer 16 is shrunk upon the electrode 13 adjacent its inner end, while a gasket 17 is carried upon the electrode so as to rest upon the inner surface of the washer 16. Since the washers 14 and 16 are shrunk upon the electrode or core 13 it will be seen that they will be held in fixed positions upon the electrode and as a consequence the movement of the electrode inwardly or outwardly with respect to the cylinder head 8 will be limited by these washers, while the washer 16 is positioned within the pocket 12 so as to receive the gas pressure for moving the electrode outwardly or upwardly while the suction within the cylinder head 8 will cause the electrode to be moved downwardly or inwardly. It is, of course, obvious that the lower end of the electrode or core 13 extends far enough beyond the inner end of the body 1 and coupling 6 so as to be positioned at all times adjacent the ends of the sparking wires 18 which are mounted upon the coupling 6 as shown in Fig. 2. A metallic cap 19 is formed so as to have its inner portion 20 crimped into the annular groove 21 formed in the body 1 adjacent its outer end. Thus, it will be seen that the cap 19 will be permanently held upon the outer end of the body 1 and as a consequence, will be held from accidental displacement. This cap 19 is provided with an internal pocket 22 for the reception of the outer end of the core 13 and the washer 14. A binding post 23 extends from the outer surface of the cap 19 and carries the binding nut 24 so that when the conductor wire 25 is positioned upon the binding post the binding nut may be

screwed into engagement therewith so as to positively hold the conductor wire against accidental displacement.

When this spark plug is in use it will assume the position disclosed in Fig. 2. Therefore, as gas within the cylinder head 8 is compressed in the upper portion of the cylinder by means of the upper movement of the piston head the pressure of the gas upon the thickened washer 16 will move the electrode or core upwardly until the gasket 17 engages the lower portion of the body 1 within the pocket 12, at which time the washer 14 and the outer end of the electrode or core 13 will engage the inner surface of the pocket 22 formed in the cap 19. By this action the circuit will be closed so as to cause a spark to jump from the electrode or core 13 to the sparking wire 18, thereby exploding the charge within the cylinder. Since the return for the current from the conductor wire 25 may be through the cylinder 8 upon the downward or upward movement of the piston head it will be seen that sufficient suction will be created within the cylinder to positively return the core or electrode 13 to the position shown in Fig. 2, where it is in a lowered position. Thus, it is seen that by the reciprocation continually of the electrode or core 13 short circuiting between the electrode or core and the sparking wires is prevented. It is well known that carbon very frequently forms within the cylinder, or an excess of oil, due to a worn piston, broken rings, or poor oiling system. In the ordinary jump spark plugs now in use the carbon revolves upon the core or electrode and also upon the sparking wires until the spark between these elements is finally short-circuited because of the fact that the space between these elements is entirely filled with this carbon. Since this electrode or core 13 is caused to reciprocate when this spark plug is in use it will be seen that this carbon will be broken at all times, or rather it will be prevented from forming so as to fill the space between these elements and short circuiting the spark plug.

It is, of course, obvious that this device may be made of any material so as to be of any shape and size, while the various other details may be changed in its construction without departing from the spirit of the invention as long as the changes come within the scope of the device as claimed.

What is claimed is:

1. A spark plug of the class described, comprising a body having a bore extending therethrough, a reciprocally mounted core within said bore, a washer shrunk upon said core adjacent the ends thereof, said washers engaging the ends of said body, thereby holding said core against accidental displacement, and means carried by said body for forming a circuit in combination with said core.

2. A spark plug of the class described, comprising a body having a bore extending therethrough, said body having a pocket formed upon one end, said pocket communicating with one end of said bore, a core reciprocally mounted within said bore, washers fixed upon said core, one washer fitting upon the outer end of said body, the remaining washer fitting within said pocket, means carried by said body for forming a circuit in combination with said core, and the washer within said pocket being adapted to receive gas pressure so as to move and in turn move said core and also be sucked outwardly with respect to said pocket for moving said core.

3. A spark plug of the class described, comprising a body having a bore extending therethrough, said body having a pocket formed in one end thereof communicating with said bore, said pocket being of a substantially inverted frusto-conical pocket, a core reciprocally mounted within said bore, washers fixedly mounted upon said core adjacent its ends, one of said washers movably fitting upon the end of said body, the remaining washer movably fitting within said pocket, means carried by said body for forming a circuit in combination with said core, said pocket being adapted to collect a quantity of gas so as to cause the gas to be compressed for moving the washer within said pocket, thereby moving said core in one direction, and said pocket being adapted to have the gas sucked therefrom, whereby the force exerted upon the washer carried within said pocket will cause the washer to move toward the outer end of said pocket for returning said core to its normal position.

In testimony whereof I hereunto affix my signature.

FRANK H. HEGINBOTTOM.