

J. F. CAVANAGH.
IGNITION DEVICE.
APPLICATION FILED AUG. 3, 1911.

1,011,884.

Patented Dec. 12, 1911

Fig. 1.

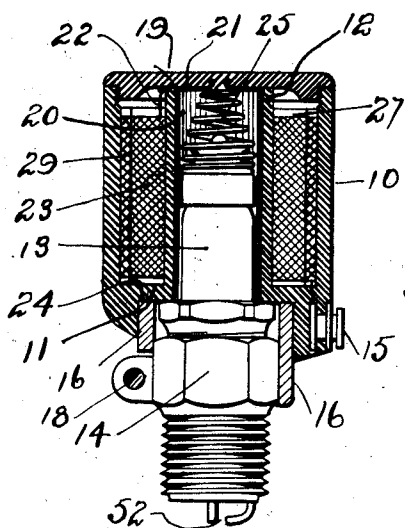


Fig. 2.

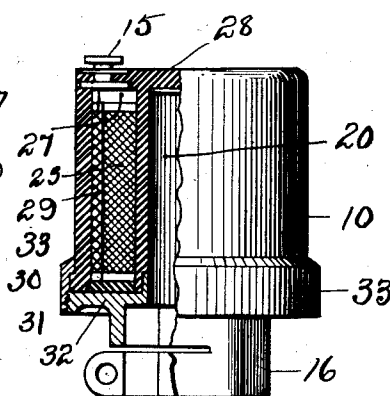


Fig. 3.

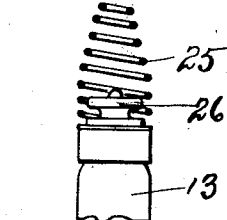


Fig. 4.

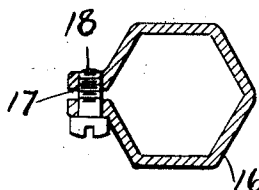
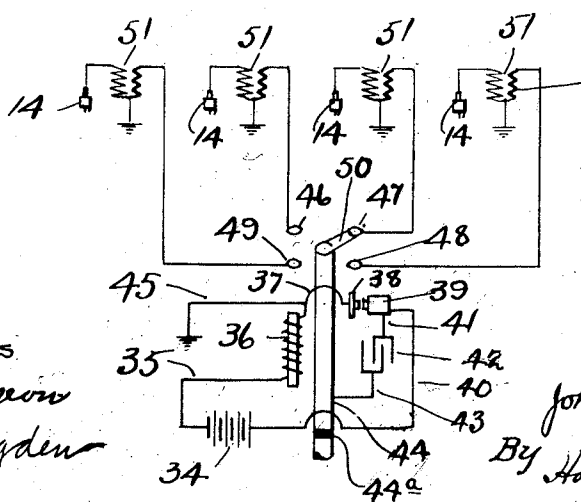


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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IGNITION DEVICE.

1,011,884.

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Application filed August 3, 1911. Serial No. 642,208.

To all whom it may concern:

Be it known that I, JOHN F. CAVANAGH, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Ignition Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to an ignition device especially adapted to be mounted directly upon the spark plug of a hydrocarbon engine, and the object of the invention is to provide an extremely small and compact
15 yet highly efficient device comprising a coil carrying casing having a central recess whereby it may be readily mounted upon a spark plug and a coil having a hollow center portion mounted in said casing and surrounding said receiving recess, said casing
20 being also provided with simple and effective means whereby the device may be detachably connected to the ordinary spark plug.

25 A further object of the invention is that by mounting this device directly upon the spark plug it serves as an insulating hood or cap to inclose, cover and protect the otherwise exposed conducting parts of the
30 spark plug. Then again, it eliminates all high tension wiring thereby obviating the necessity of heavy insulation against moisture or other external influences.

With these and other objects in view, the
35 invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

Of the accompanying drawings: Figure
40 1—is a sectional view of the casing and coil showing the same applied to a spark plug of standard construction. Fig. 2—is a modified construction of casing showing the same as being adapted to be filled from the bottom
45 instead of from the top as that illustrated in Fig. 1. Fig. 3—shows the upper portion of a spark plug with the spring wire contact connected thereto. Fig. 4—is a sectional plan view of the clamp for attaching the
50 device to the spark plug. Fig. 5—is a wiring diagram of my improved ignition device.

Referring to the drawings, 10 designates a cylindrical casing formed preferably by the molding of insulating material, the same

being provided with a bottom portion 11 55 and a central tubular member 12 forming a central longitudinally disposed recess 20 for the reception of the upper end 13 of the ordinary spark plug 14, an outer annular
60 chamber 27 being formed around the inner central recess for the reception of the coil hereinafter described. A contact member 15 is molded or otherwise secured into the base portion of the casing to which the lead
65 wire, not shown, may be connected. Into this base portion is also molded or otherwise fixed a metal clamping member 16 which is preferably made to conform to the nut portion of the standard spark plug and is split
70 as at 17 and provided with a binding screw 18 for the purpose of being set up firmly to secure the casing rigidly onto the spark plug of an engine. A cap 19, also of insulating
75 material, may be threaded or otherwise secured into the upper end of the casing. A contact plate 21 is preferably secured to the inner side of said cap and projects out therefrom into the upper end of the coil chamber.

In this device I preferably use a high frequency coil, that is, a coil which depends
80 for its excitation upon the oscillatory discharge of a condenser. This coil consists of an outer primary and inner secondary winding and is particularly well adapted for my present purpose as it is provided with a hollow middle portion and is adapted to be inserted into the annular chamber 27 and
85 about the spark plug receiving recess 20. One end of the secondary winding 23 of this coil may be connected at its upper end to the contact plate 21 by the wire 22, the other
90 end of said coil being grounded on the engine through the wire 24, clamp 16 and plug 14. In order to make the proper contact through the spark plug I connect a coil
95 wire spring 25 to the binding post 26 of the spark plug and when the coil is placed in position over the spark plug this contact spring engages the plate 21 thereby completing the circuit through the plug. 100

In the modified form of casing illustrated in Fig. 2 the same is also made in a cylindrical form, the top portion being provided with a fixed head or cap 28 thereover into which is molded or otherwise fixed the contact member 15. After the coil 29 has been
105 placed in the coil chamber 27 from the bottom end of the casing, a head 30 having a

slightly beveled edge 31 is placed in position and the clamping member 16 having a threaded edged flange 32 is drawn up and firmly secured to the casing which also secures the head 30 in position by means of the coupling member 33.

The wiring diagram illustrates the coil as applied to a four cylinder engine in which 34 designates the source of energy of comparatively low voltage which is connected to one wire 35 which passes through the inductance 36 thence through wire 37 to one point 38 of the interrupter through to the other interrupter point 39 and wire 40 back to the source of energy. In other words, the inductance and interrupter are in series. The terminal 38 of the interrupter is connected to ground through the wire 45. One terminal 41 of the condenser 42 is connected to the point 39 of the interrupter. The other terminal 43 of said condenser is connected to the rotating distributing member 44 which is insulated at 44^a. The distributor contact points 46, 47, 48 and 49 are adapted to receive the current from the rotating distributing arm 50 to conduct the same to their respective ignition devices 51 and through its spark plugs 14 to ground, in other words, the condenser is connected in series with the primary winding of the respective ignition devices across the contact points of the interrupter. It will be understood from the above that the condenser discharges through the primary winding of the high frequency coil mounted upon the spark plug.

In the operation of this device the contact members 38 and 39 are closed by the mechanical action of a rotating cam illustrated and described in my copending application Serial No. 625,075. Immediately upon the completion of the circuit through said interrupter the points 38 and 39 are instantly separated by the mechanism described in said co-pending application. The inductance coil 36 charges the condenser 42 which instantly discharges through the

distributor and the proper coil. This discharge through the primary winding of said coil induces the high frequency spark in the gap 52 in the spark plug 14 serving to ignite the mixture in the engine.

I claim:

1. In an ignition device, a coil provided with a hollow center portion for the reception of a spark plug, and a contact to complete the circuit through said spark plug when the device is applied thereto.

2. In an ignition device, a coil provided with a hollow center portion for the reception of a spark plug, a contact to complete the circuit through said spark plug when the device is applied thereto and an insulating casing inclosing said coil.

3. In an ignition device a coil carrying casing provided with a central longitudinal recess for the reception of a spark plug, a coil provided with a hollow center portion mounted in said casing and surrounding said spark plug receiving recess and a contact in said recess to complete the circuit through the spark plug when the device is applied thereto.

4. In an ignition device a coil provided with a hollow center portion for the reception of a spark plug, and a contact to complete the circuit through said spark plug when the device is applied thereto, and means for securing said device in position.

5. In an ignition device, a coil provided with a hollow center portion for the reception of a spark plug, and a contact to complete the circuit through said spark plug when the device is applied thereto and an insulating casing inclosing said coil and means for removably securing said casing to its spark plug.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. CAVANAGH.

Witnesses:

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