

PLUG COIL.

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1,036,760.

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Fig. 1.

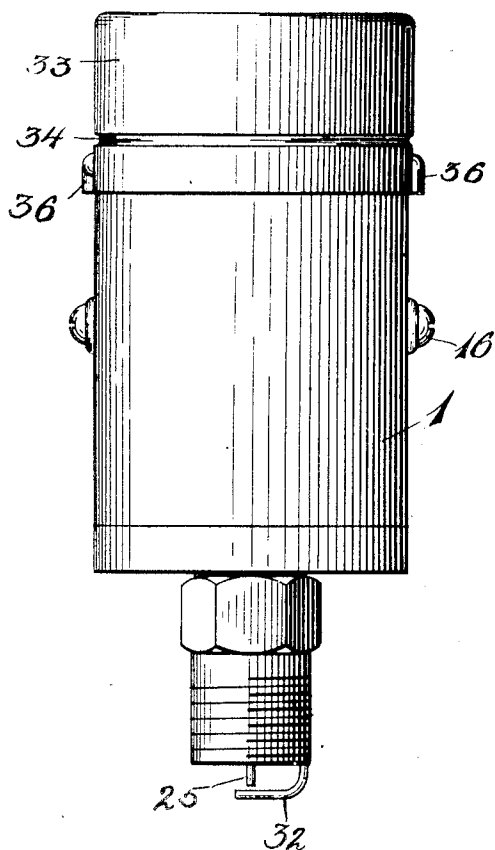
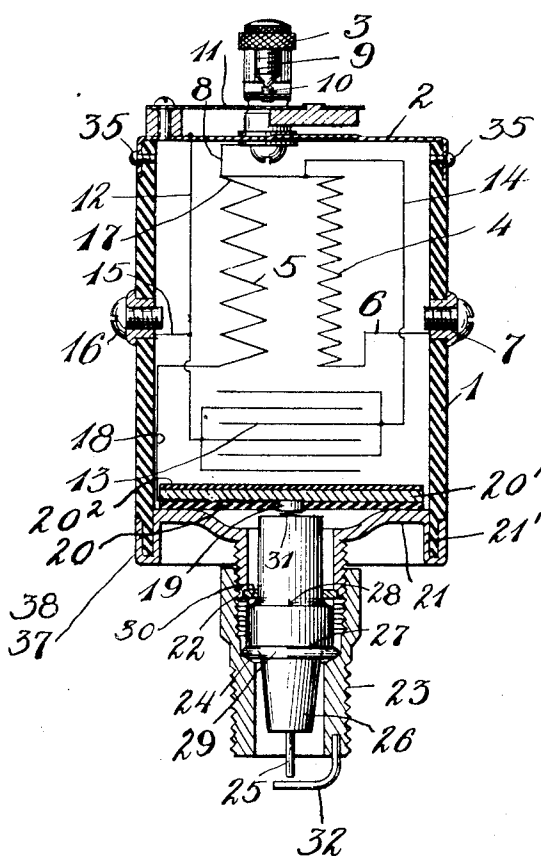


Fig. 2.



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UNITED STATES PATENT OFFICE.

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PLUG-COIL.

1,036,760.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ERNEST C. WILCOX and BURTON L. LAWTON, citizens of the United States, residing at Meriden, New Haven county, State of Connecticut, have invented certain new and useful Improvements in Plug-Coils, of which the following is a full, clear, and exact description.

Our invention relates to ignition mechanism for hydrocarbon engines, and is particularly concerned with improvements in the construction and arrangement of the sparking electrodes and the means for energizing the same.

The object of the invention is to provide a convenient and compact arrangement in which the liability to leakage is practically eliminated.

A further object is to provide a construction in which all of the sparking elements may be mounted within or upon a single compact casing.

A further object is to so construct the device that it is practically waterproof, and may be used, therefore, under conditions which would be prohibitive for the ordinary ignition apparatus now in common use.

With these and other objects in view as will appear from the following description, the invention consists in a construction and arrangement of parts, the preferred embodiment of which is illustrated in the accompanying drawings, in which,

Figure 1 is a side elevation of the complete device. Fig. 2 is a vertical sectional view in the plane of the drawing showing the interior arrangement of the elements, and with the cap or cover plate removed.

In the embodiment of our invention herein selected for illustration, 1 indicates the main casing of the device, which is provided at one end with an end plate 2 upon which a vibrator 3 of the usual construction is mounted. The main casing 1 is made of insulating material, preferably of hard rubber, and within said casing is mounted a spark coil comprising the primary 4 and secondary 5. One end of the primary is connected at 6 with a binding screw 7 extending to the outside of the casing. The opposite end of the primary is connected at 8 with the bridge of the vibrator 3, said bridge carrying a contact 9 which is normally in

engagement with the contact 10 on the armature 11. The armature 11 is connected at 12 with one side of the condenser 13, the opposite side of the vibrator being connected at 14 with the opposite side of the condenser. The armature is also connected at 15 with a contact screw or post 16 which in turn may be connected with an ordinary timer. One terminal of the secondary 5 is connected with the primary at 17, and the opposite terminal of the secondary is connected at 18 with a contact member 19 mounted in an insulating plate 20, which lies just within the end plate 21 of the casing opposite the end plate 2. This end plate 21 is provided with a threaded boss or nipple 22. Upon this nipple may be mounted a threaded connector 23 having a shoulder 24. One of the sparking electrodes 25 is mounted within an insulating, and preferably porcelain, tube or casing 26, said casing having a shoulder 27 adapted to be engaged by the shoulder 24 of the connector, and a second shoulder 28 adapted to rest upon the outer edge of the nipple 22. Suitable expansible packing rings 29 and 30 may be interposed between the shoulders of the electrode tube and the shoulders of the nipple and connector to hold said electrode firmly in position and render the connection thereof with the spark coil casing waterproof. The inner end of the electrode tube is provided with a spring contact 31 connected with the electrode 25 and adapted to be seated in contact with the contact member 19 when the parts are assembled in operative position. The opposite electrode 32 is mounted upon the connector 23 as usual, and is grounded when the device is mounted upon the engine cylinder.

In order to protect the spark coil generally from the heating effects of the engine cylinder, we place an asbestos disk 20' and preferably also one or more mica disks 20" over the inner side of the contact supporting plate 20, whereby the condenser and coil within the casing are effectually protected. It will be understood, of course, that the secondary connection 18 passes between the contact supporting plate and the asbestos disk 31 to the contact 19. The vibrator is also effectually protected by means of the cap or cover plate 33, which is provided

with an internal shoulder 34 adapted to rest against the periphery of the casing cap 2. Said casing cap 2, furthermore, is secured to the body of the casing by means preferably of screws 35, and the cover 33 is provided at its edge with bayonet locking slots 36, which tend to draw the shoulder 34 snugly into engagement with the periphery of the cap plate 2. Hence the vibrator is effectually protected against moisture and the like. The opposite end plate 21 is provided with a peripheral flange 21' having preferably a driving fit within the end of the casing 1, and in order to render the joint more watertight and impart the desired finish to the device, the flanged ferrule 37 is provided, which fits within a rabbeted portion 38 of the end of the casing, the flange extending over the end of the casing and embracing the edge of the flange 21'. The flange 21' of the plate 21 and the ferrule 37 may be riveted through and through the end of the casing, or secured together by suitable screws threaded through from the outside and into the ferrule 37. By the above described construction of the ends of the casing, it will be seen that the casing itself may be rendered entirely waterproof and the vibrator is also protected from moisture.

In the operation of the device, the parts shown in the drawings having been completely assembled, the threaded connector 23 is screwed to the engine cylinder in the usual manner, the contact screw 7 is connected with a battery or other source of electrical energy, and the contact screw 16 is connected to the usual timer. When current from the source of energy is conveyed through the contact 7 and connections, the usual high tension sparking effects will take place between the electrodes 25 and 32. It will be seen that by the compact arrangement of the device and the proximity of the spark coil and the sparking electrodes, very little waste will occur as the electrical energy passes to the electrodes, for the reason that the current from the source of energy to the sparking device is a low tension current, and hence there is less tendency to leakage. Furthermore, the high tension current for sparking purposes is generated practically at the electrodes, that is to say, the connection between the secondary of the spark coil and the electrodes is so short that the possibility of leakage is practically eliminated. Again, it will be seen that the high tension apparatus and all the connections thereof with the electrode 25 are compactly contained within the casing 1, so that they are effectually protected against moisture and other influences which might decrease the energy.

What we claim is:

1. A self-contained sparking unit comprising, in combination, a moisture exclud-

ing casing having a spark coil and condenser therein with suitable connections extending to the outside of said casing, a cap removably mounted upon and tightly inclosing one end of said casing and carrying a vibrator adapted to be connected to said spark coil, sparking electrodes mounted upon said casing, suitable electrical connections for said parts, and a removable cover for said cap having a tight frictional engagement therewith.

2. A self-contained sparking unit comprising, in combination, a tubular moisture excluding casing, a spark coil and a condenser mounted within said casing, a cap removably mounted upon one end of said casing and carrying a vibrator adapted to be connected with said spark coil, sparking electrodes mounted upon the opposite end of said casing and electrically connected with said spark coil, a removable cover for said cap having a frictional moisture excluding connection therewith, and binding posts connected with said spark coil and extending to the outside of said casing.

3. A self-contained sparking unit comprising, in combination, a tubular moisture excluding casing having an open end, a spark coil and condenser within said casing, a cap removably mounted upon and tightly inclosing the open end of said casing and carrying a vibrator adapted to be connected with said spark coil, a spark plug at the other end of said casing having a tight moisture excluding connection therewith, electrical connections extending from said coil to the exterior of the casing, a removable cover for said cap having a frictional moisture excluding connection therewith, and suitable electrical connections between said vibrator, coil, condenser and sparking electrodes whereby a low tension current may be conveyed to said spark coil and a high tension current generated closely adjacent to the sparking electrodes.

4. A self-contained sparking unit comprising, in combination, a tubular casing having a single compartment therein and an open end, a suitably connected spark coil and condenser within said compartment, a cap removably secured to the open end of said casing having a vibrator mounted on its outer face adapted for connection with said spark coil, a removable cover for said cap and vibrator having a frictional moisture excluding connection with said cap, and a removable spark plug secured to the opposite end of said casing in electrical connection with said spark coil and having a tight moisture excluding connection with said casing.

5. A self-contained sparking unit comprising, in combination, a tubular casing having a single compartment therein and an open end, a suitably connected spark coil

and condenser within said compartment, a cap mounted upon and tightly closing said open end and carrying a vibrator upon its outer face adapted to be connected with said
5 spark coil, said cap being detachably secured to said casing by a plurality of headed screws, a cover for said cap and vibrator provided with an internal shoulder frictionally engaging with the sides of said cap to
10 form a moisture tight connection therewith and having a plurality of bayonet slots

therein cooperating with said headed screws to detachably lock said cover to said cap, and a spark plug at the other end of said casing and detachably secured thereto and
15 having a tight moisture excluding connection therewith.

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