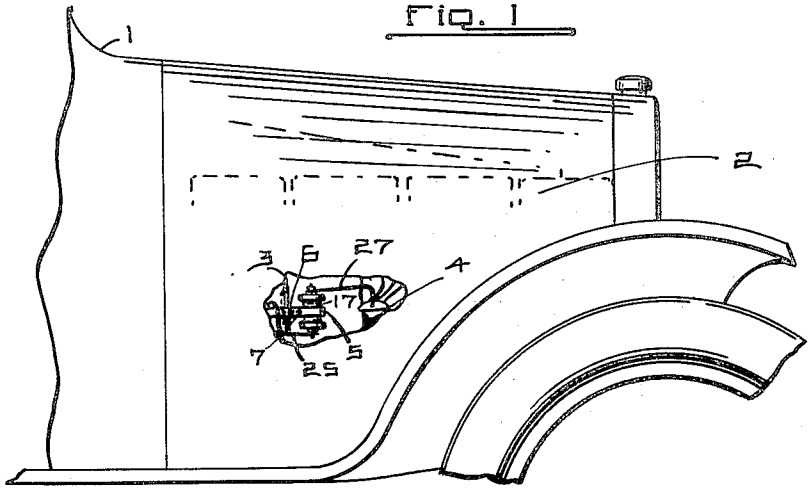
July 29, 1924. 1,502,682

J. H. REED

IGNITION DEVICE

Filed Nov. 3, 1921

Fig. 1



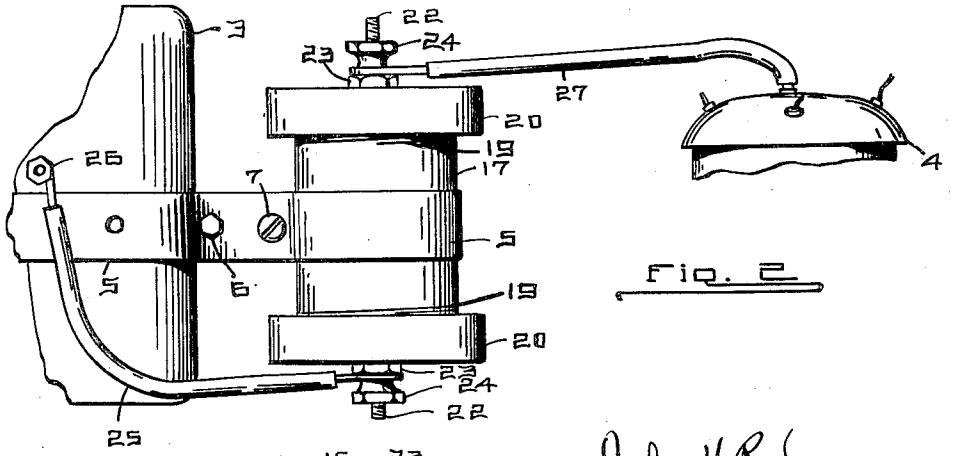


Fig. 2

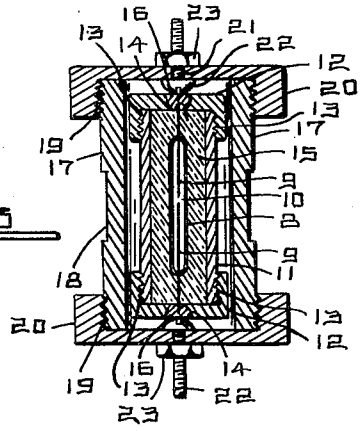


Fig. 3

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Patented July 29, 1924. 1,502,682

UNITED STATES PATENT OFFICE.

JOHN H. REED, OF MAUMEE, OHIO, ASSIGNOR OF ONE-HALF TO ALBERT SWARTZ, OF TOLEDO, OHIO.

IGNITION DEVICE.

Application filed November 3, 1921. Serial No. 512,594.

To all whom it may concern:

Be it known that I, JOHN H. REED, a citizen of the United States of America, residing at Maumee, Lucas County, Ohio, have invented new and useful Ignition Devices, of which the following is a specification.

This invention relates to a voltage change device and high tension insulation.

This invention has utility when incorporated as an ignition intensifier for jump sparks, as in internal combustion motors.

Referring to the drawings:

Fig. 1 is a fragmentary view of a motor vehicle with which an embodiment of the device is assembled;

Fig. 2 is a detail view, on an enlarged scale of the device; and

Fig. 3 is a medial longitudinal section through the device.

Motor vehicle 1 is shown as propelled by internal combustion motor 2, and as provided with an ignition system including an induction coil 3 and a distributer head 4. Metal strap 5 is clamped about the coil 3 by bolt 6. This strap 5 thus forms a bracket and by means of bolt 7 anchors the ignition intensifier in assembled relation.

The intensifier embodies an elongated glass chamber 8 having leads 9 spaced apart to form a gap 10. The leads 9 are sealed into this tube and the air exhausted therefrom, thereby to provide this as a vacuum tube element of the device. A cylindrical housing or jacket insulation member 11 of considerably greater diameter than the tube 8, is provided with a cap 12 having threaded engagement 13 with said cylinder 11. This cap 12 is provided with a central opening 14 into which a lead 9 may extend to be held centrally. A second cap 12 is placed upon the opposite end of the shell or cylinder 11. Filler or packing, say in the form of a plastic insulation composition may then be poured through upper concentric opening 14. As this filler 15 sets, the vacuum tube 8 is anchored centrally of this housing. Before the filler hardens, the upper lead 9, which has been in the hole 14 while the packing 15 was being poured in, is pulled up slightly, just so as not to come quite up to flush position with the outer face of the cap 12. This upward pull, lifts the vacuum tube 8 and with it the lower lead 9, so that this lower lead 9 which had been resting down flush with the outer face of the lower side of the cap 12 is now slightly inward therefrom. A sealing, as of solder 16, closes these perforations 14 of the caps 12, not only to seal the plastic filler 15 therein, but as conductor means in communication with the respective leads 9 to establish electric conductor communication from within the tube 8 to the flush outer faces of metallic conductor caps 12. This feature of stopping the leads short of the cartridge length, precludes disturbance of the leads 9 which might tend to fracture the tube 8.

The cartridge as thus completed is ready for assembly in a second insulation housing, as further high tension protection therefor. To this end there is provided an insulation cylinder 17 having a central groove 18 receiving the bracket strap 5 as clamped by the bolt 7. This cylinder 17, as of hard rubber, is provided with threaded ends 19, upon which exteriorly threaded portions insulation caps 20 may be threaded. These caps 20 may also be of hard rubber.

Concentric opening 21 permits terminal providing screw 22 to have its head on the inner side of the cap 20 and to protrude outward and be locked in position by nut 23. Supplemental terminal nut 24 completes the device as an ignition intensifier unit. The cartridge carrying the vacuum tube, is readily assembled in the hard rubber insulator outer housing by taking off one cap 20, inserting the cartridge in the cylinder 17 to have a cap 12 abut a screw 22. The detached cap 20 is then assembled on the open end of the cylinder 17, thereby bringing the second terminal screw 22 against the cartridge other end conductor cap 12.

Line 25 from terminal 26 on the induction coil 3, instead of extending directly to the distributer head 4, is now taken to a terminal 22 and assembled therewith by the nut 24. The other terminal 22 is then connected up by conductor line 27 to the distributer head 4.

The dual insulation contributes materially to the practicability and permanency of the device as an ignition intensifier under the conditions met in motor vehicle operation. The cartridge houses the fragile spark gap vacuum tube and maintains conductivity with the leads. The outer housing of the cylinder 17 and caps 20, affords a substantial housing and insulation for good contact terminal connection with the cartridge

with remote possibility of any leakage or jumping between such terminals, even exteriorly of this abrupt shoulder cap structure of this outer housing.

The gap is uniform in its action at all times. It is in a vacuum and is not susceptible to weather disturbance. The step up, due to this condenser action of the gap, is uniform in its breaking down to allow the increased voltage with minimum of static leakage. The voltage increase for increasing the heat of the spark in the motor, is nearly a doubling of the pressure from the coil. The utility of the gap as one for the several sets of spark plugs in a multi-cylinder motor, demands a high rate of action. This is met by establishing the vacuum gap to approximate a minimum distance consistent with non-arcing. A spacing within one thirty-second of an inch has been found meeting the operating conditions for this vacuum spark gap ignition intensifier.

What is claimed and it is desired to secure by Letters Patent is:

1. An ignition intensifier including a vacuum tube, a pair of leads spaced to form a gap in said tube, an insulation packing for the tube and leads therefrom, and conductor means extending flush beyond the ends of the leads and carried by the packing.

2. An ignition intensifier including a vacuum tube, a pair of leads extending from the tube and providing a spark gap within the tube, an insulation cylinder housing for the tube and spaced therefrom, an insulation filler packing for the housing to anchor the tube therein, perforate caps for the cylinder housing, and conductor providing sealing means for the cap perforations in communication with said leads.

3. An ignition intensifier including a vacuum tube, a pair of leads extending from the tube and providing a spark gap within the tube, an insulation cylinder housing the tube, insulation filler packing the tube in the cylinder with concentric terminally protruding conductor leads, conductor caps for the cylinder having central openings, said leads from the tube as protruding from the packing being short of protruding from said openings, and conductor providing sealing means for the openings anchoring said leads in conductor communication with said caps.

In witness whereof I affix my signature.

JOHN H. REED.