

Dec. 4, 1934.

J. D. CURTIS  
SPARK INTENSIFYING DEVICE

1,982,950

Filed Jan. 23, 1933

FIG. A

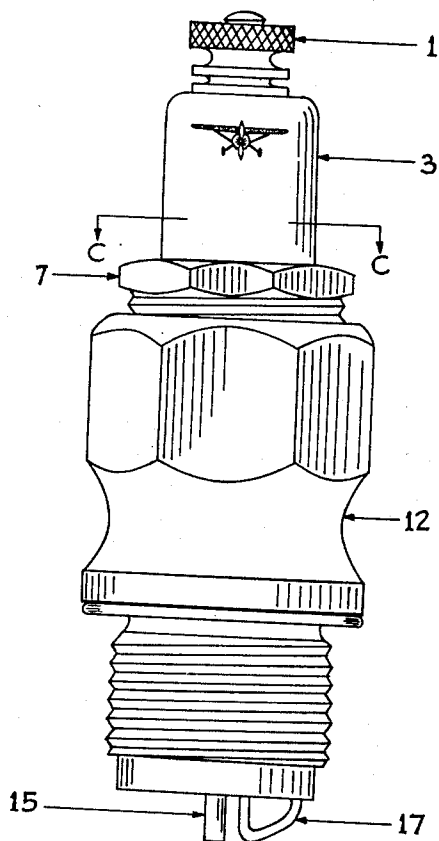


FIG. B

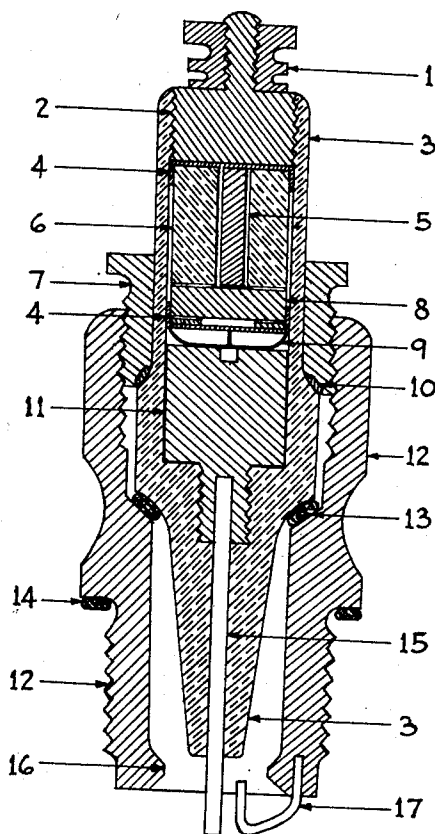


FIG. C

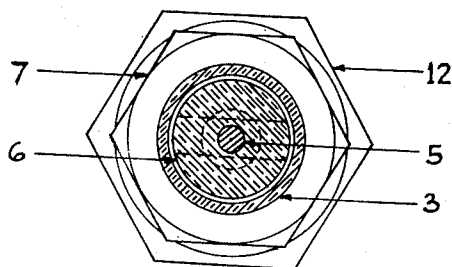


FIG. E.

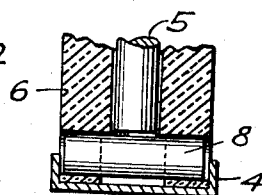
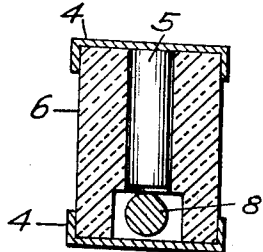


FIG. D.



INVENTOR.

JAMES D. CURTIS

BY

Augustus B. Doughty  
ATTORNEY.

## UNITED STATES PATENT OFFICE

1,982,950

## SPARK INTENSIFYING DEVICE

James D. Curtis, Collingswood, N. J., assignor, by  
 meane assignments, to Helen Baus Curtis,  
 Camden, N. J.

Application January 23, 1933, Serial No. 653,000

6 Claims. (Cl. 123-169)

The subject of my invention is a spark plug for use with internal combustion engines containing a spark intensifying device. The spark intensifying device contains as an element thereof an electrical resistance. The spark intensifying device also contains a condenser or vibrating spark gap.

For a further exposition of my invention reference may be had to the annexed drawing and specification at the end whereof my invention will be specifically pointed out and claimed.

In the drawing,

Figure A is a side elevation of my device.

Fig. B is a longitudinal cross section through the device.

Fig. C is a transverse cross section on line C—C of Fig. A.

Fig. D is a vertical cross section through the spark intensifying device, at right angles to Fig. B, and

Fig. E is a partial, vertical cross section through the spark intensifying device.

In that embodiment of my invention, chosen for illustration in the drawing, my device is shown as consisting of a terminal nut 1. Nut 1 is attached to top stud 2 as by screw threads. Insulator 3 which forms the body of the spark plug carries top stud 2 as by screw threaded engagement therewith.

Located within a chamber in the spark plug and in insulator 3 there is shown the spark intensifying device. This consists of upper and lower caps 4 which may conveniently be made of brass or other metal. Adjacent or in contact with the upper cap 4 there is provided an electrical resistance 5 carried by the condenser body 6 which is conveniently made of insulating material. Also mounted in condenser body 6 is condenser roller 8 which may conveniently be loosely mounted in body 6 adjacent one end of resistance 5 and in contact with or adjacent cap 4. Resistance 5 has a resistance of more than 1000 ohms, a preferred example of such resistance being 50,000 ohms.

As will be more clearly seen from Figs. B, D and E, resistance 5 may be mounted in condenser body 6, so that there is a space or clearance between these elements. Likewise, condenser roller 8 has a slight space at its upper side between it and the holes in condenser body 6, in which roller 8 is located. Condenser body 6 extends below the ends of roller 8 since condenser body 6 has holes therein the lower parts of whose walls are shown in cross-section in Fig. E. Roller 8 also has a slight space at its ends between it and

cap 4. It will thus be seen that roller 8 is separated from cap 4 by portions of condenser body 6 and by air gaps, these serving as the dielectric of a condenser. When current of sufficient intensity is built up, sparks may pass between the ends of roller 8 and cap 4, and between the center of roller 8 and the center of cap 4.

Gland nut 7 surrounds insulator 3 having engagement therewith by means of a shoulder adjacent the gland nut gasket 10. Shell 12 has screw threaded or other engagement with nut 7 so that they clamp insulator 3 between them. Shell gasket 13 is provided between shell 12 and a shoulder on insulator 3. In contact with lower cap 4 there is provided a condenser spring 9 which conducts the current to electrode screw 11 which in turn conducts it to electrode wire 15. Shell 12 has a shoulder adapted to engage or to be located adjacent to the internal combustion engine with which the spark plug is used. Spark plug gasket 14 rests adjacent this shoulder. At the lower end of shell 12 adjacent its mouth there is provided a baffle or flange 16 forming a transverse area of reduced cross section adjacent the outlet end of the shell. This end is exposed to the compression of the internal combustion engine so that the baffle 16 serves to prevent or check the rush of gases into the chamber within shell 12 and thus prevents cracking or breaking of the insulator or porcelain 3. Shell 12 carries at its lower end ground wire 17 which has a portion of considerable length parallel the inner electrode wire 15.

Resistance 5 serves to prevent the oscillations of the high tension spark jumping between electrode wire 15 and ground wire 17 from causing oscillations of the entire ignition system and thus interfering with a radio on the vehicle with which the internal combustion engine is used.

The condenser roller 8 serves to build up a high tension current before the discharge passes between electrode wire 15 and ground wire 17. Thus a larger and surer spark is obtained.

I do not intend to be limited in the practice of my invention save as the scope of the prior art and of the attached claims may require.

I claim:

1. In a spark plug, a spark intensifying device comprising an insulating body, a resistance of more than 1000 ohms mounted in said body, a metallic roller mounted in said body adjacent said resistance, and means for conducting current to said resistance and to said roller.

2. In a spark plug, a spark intensifying device comprising an insulating body, a resistance of more than 1000 ohms mounted in said body, a

metallic roller loosely mounted in said body adjacent to but spaced from said resistance, and metallic caps on the ends of said body for conducting current to said resistance and to said roller.

3. In a spark plug, a spark intensifying device comprising an insulating body, a resistance of more than 1000 ohms mounted in said body, a metallic roller mounted in said body adjacent to said resistance, and metallic caps on the ends of said body for conducting current to said resistance and to said roller, said roller being adjacent to but spaced from one of said caps.

4. In a spark plug having a spark gap therein, a spark intensifying device comprising an insulating body, means for suppressing the oscillations generated by the spark passing at the gap

of said spark plug, second means in said body for increasing the intensity of the current passing through said plug, and third means for conducting current to said first and second means.

5. In a spark plug, a spark intensifying device comprising an insulating body, a resistance of more than 1000 ohms mounted in said body, a condenser mounted in said body, and means for conducting current to said resistance and said condenser.

6. In a spark plug having a spark gap, a device comprising an insulating body, a resistance of more than 1000 ohms mounted in said body, a condenser located between said resistance and said gap, and means for conducting electricity to said resistance and said condenser.

JAMES D. CURTIS.

20

25

30

35

40

45

50

55

60

65

70

75

95

100

105

110

115

120

125

130

135

140

145