Feb. 28, 1956 W. A. BYCHINSKY 2,736,877

SPARK PLUG TERMINAL

Filed Oct. 10, 1951

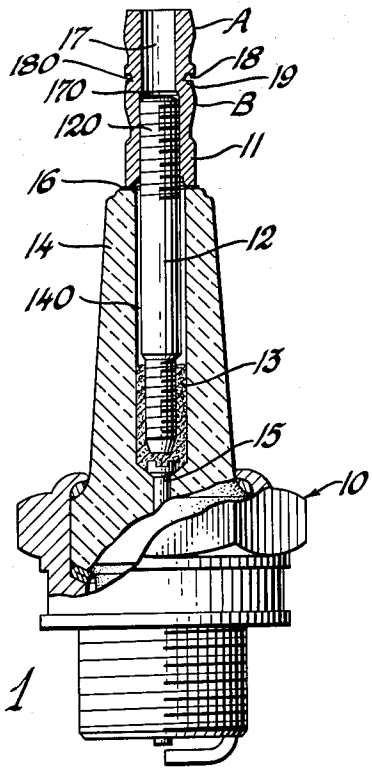


Fig. 1

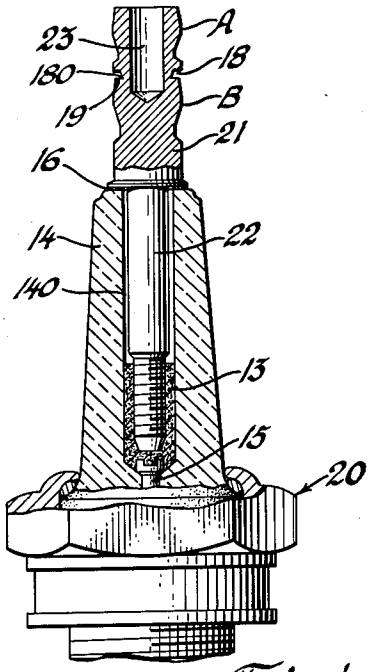


Fig. 4

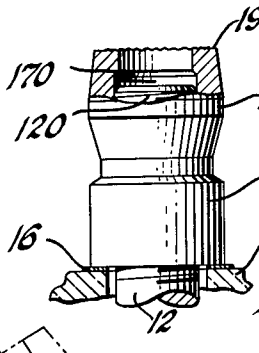


Fig. 2

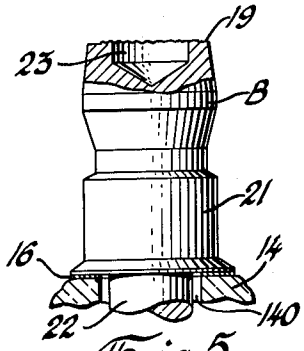


Fig. 5

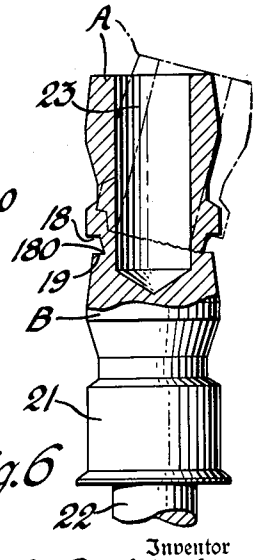


Fig. 6

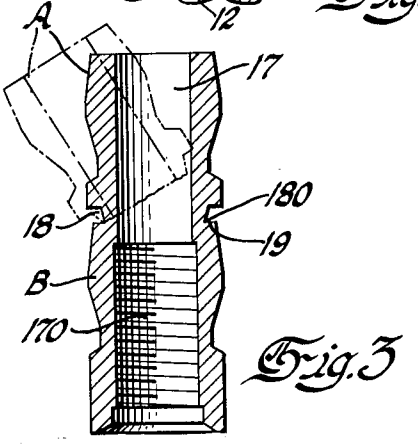


Fig. 3

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SPARK PLUG TERMINAL

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6 Claims. (Cl. 339—268)

This invention relates to spark plugs and in particular to improvements in spark plug terminals whereby to accommodate a single spark plug to a plurality of different installation requirements.

In the prior art it has been customary and considered necessary to provide spark plugs of special configuration to accommodate them to the particular installation requirements encountered in various engines. As an example, spark plugs of identical design are ofttimes made in several different lengths to accommodate them to particular engine block and spark plug well configurations. This situation not only has necessitated the manufacture of spark plugs of the same technical specification and of several different lengths but causes the many thousands of automobile dealers, motor boat dealers, distributors, garages and service stations throughout the United States and foreign countries to carry in stock many more types of spark plugs than would be required otherwise.

With the foregoing in view, it is an object of this invention to provide spark plugs with terminals that accommodate the spark plugs to more than a single installation requirement.

Another object of the invention is to provide, in a spark plug, terminal construction formed to receive a cable terminal at the end of the spark plug terminal or optionally at a point short of the end of the spark plug terminal.

A further object of the invention is to provide a unitary spark plug having a relatively long terminal formed into two or more cable terminal receiving elements having a frangible section therebetween whereby to permit the upper portion of the spark plug terminal to be broken off thereby producing a spark plug having a relatively shorter terminal.

Other objects of the invention will become apparent by reference to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a vertical sectional view of a relatively long terminal spark plug of the type having a two piece terminal comprising a terminal pin and a long terminal head in the form of a nut threaded on the terminal pin, the invention being incorporated in the long terminal nut or head.

Fig. 2 is an enlarged fragmentary vertical sectional view similar to Fig. 1 showing a portion of the long terminal nut or head broken off providing a relatively short terminal spark plug.

Fig. 3 is an enlarged fragmentary sectional view of the long terminal nut or head shown in Fig. 1.

Fig. 4 is a vertical sectional view of a relatively long terminal spark plug having a one piece terminal including a long terminal head, the invention being incorporated in the long terminal head.

Fig. 5 is an enlarged fragmentary sectional view similar to Fig. 4 showing a portion of the long terminal head broken off providing a relatively short terminal spark plug.

Fig. 6 is an enlarged fragmentary sectional view of the long terminal head shown in Fig. 4.

Referring now to the drawing wherein like reference characters refer to like and corresponding parts throughout the several views, the illustrative embodiment of the invention disclosed in Figs. 1–3 inclusive is shown in connection with a spark plug **10** having a two piece terminal composed of a relatively long terminal nut or head **11** threaded onto the extending threaded end **120** of the terminal pin **12**, the said terminal pin **12** being threaded or otherwise upset at its lower end and secured by sealing material **13** within the terminal pin well **140** of the insulator element **14** against the top of the central electrode **15**. A gasket **16** is preferably employed between the terminal nut or head **11** and the top of the insulator element **14** to prevent moisture or foreign matter from accumulating in the terminal pin well **140** of the insulator element **14**.

The terminal nut or head **11** is provided with an axial bore **17** therethrough and is interiorly threaded at its lower end at **170**. The upper end of the terminal head **11** is exteriorly contoured in a suitable manner at A and B to receive and retain a snap-on type cable terminal positioned over the upper end thereof. Between the contoured portions A and B, the terminal head **11** is made frangible by such means as cutting a circumferential weakening groove **18** therearound whereby to permit the upper contoured portion A of the terminal head **11** to be broken neatly away therefrom as indicated by the dot and dash lines in Fig. 3 leaving the lower contoured portion B ready to receive and retain a snap-on type cable terminal. Thus, a spark plug having either a long or a short terminal is provided. Obviously, more than two snap-on type cable terminal contours may be formed on the terminal head or nut **11** with weakened sections therebetween to provide in a single spark plug more than two terminal lengths.

Although the weakening deformation may be of any suitable configuration, it is preferable that, if a circumferential groove **18** is employed, the deepest portion **180** thereof be located adjacent the annular shoulder **19** below the groove to assure that the break at the top of the contour B will be accurate and relatively smooth. The circumferential weakening groove **18** is preferably located above the threaded end **120** of the terminal pin **12** to permit the contoured portion A to be easily broken off the terminal nut or head **11** without removing it from the terminal pin **12**.

The embodiment of the invention shown in Figs. 4–6 inclusive is like and similar to the embodiment of the invention shown in Figs. 1–3 inclusive except that the relatively long terminal head **21** of the spark plug **20** and the terminal pin **22** are integral, and the top of the long terminal head **21** is axially bored at **23** to a point below the circumferential weakening groove **18** located between the exteriorly contoured portions A and B of the terminal head **21**.

Although but two embodiments and applications of the invention have been shown in the drawing and described in detail, it is obvious that many changes may be made in the size, shape, arrangement and detail of the elements of the invention without departing from the spirit and scope thereof as defined by the appended claims.

I claim:

1. In a spark plug, a terminal including a relatively long head having an upper contoured portion to receive a cable terminal at the end thereof and a lower contoured portion to receive a cable terminal short of the end thereof, said head having a circumferential groove therearound between said contoured portions deeper adjacent the lower contoured portion than adjacent the upper contoured portion weakening the said terminal therebetween to permit breaking off the upper contoured portion accurately to provide a relatively shorter terminal spark plug.

2. A spark plug including a terminal therefor, a head

on said terminal having a contoured portion at the end thereof and another contoured portion short of the end thereof, said contoured portions being of substantially identical shape and each being adapted to receive a cable terminal, said head having a frangible section between said contoured portions to permit shortening the spark plug terminal by breaking the terminal head between the contoured portions thereof.

3. In a spark plug, a terminal including a relatively long head having a contoured portion to receive a cable terminal at the end thereof and a second contoured portion to receive a cable terminal short of the end thereof, said contoured portions being of substantially identical shape, said head having a circumferential groove therearound between said contoured portions weakening the said head therebetween to permit breaking off the end contoured portion to provide a relatively shorter terminal spark plug.

4. A spark plug including a threaded terminal pin extending therefrom, a hollow relatively long terminal nut threaded at its lower end on said terminal pin, said terminal nut having an upper contoured portion to receive a cable terminal at the end thereof and a lower contoured portion short of the end thereof, said contoured portions being of substantially identical shape, and said terminal nut having a circumferential weakening groove therearound between said contoured portions, said upper contoured portion and weakening groove being located above the terminal pin to permit the upper contoured portion to be readily broken away to provide optionally a relatively short terminal spark plug.

5. A spark plug including a terminal therefor, a head on said terminal having an upper contoured portion at the end thereof and a lower contoured portion short of the end thereof, said contoured portions being of substantially identical shape and each being adapted to receive a cable

terminal, said head having a circumferential groove therearound between said contoured portions deeper adjacent the lower contoured portion than adjacent the upper contoured portion weakening the said head therebetween to permit breaking off the upper contoured portion accurately to provide a relatively shorter terminal spark plug.

6. A spark plug including a threaded terminal pin extending therefrom, a hollow relatively long terminal nut threaded at its lower end on said terminal pin, said terminal nut having an upper contoured portion to receive a cable terminal at the upper end thereof and a lower contoured portion to receive a cable terminal short of the upper end thereof, said contoured portions being of substantially identical shape, and said terminal nut having a circumferential groove therearound between said contoured portions deeper adjacent the lower contoured portion than adjacent the upper contoured portion, said upper contoured portion and groove being located above the terminal pin to permit the upper contoured portion to be accurately broken away to provide optionally a relatively short terminal spark plug.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 19,092	Despard	Feb. 20, 1934
962,621	Carlson	June 28, 1910
1,297,560	Groenenstein	Mar. 18, 1919
1,580,562	Moore	Apr. 13, 1926
1,677,269	Burghart	July 17, 1928
1,696,523	Cochran	Dec. 25, 1928
1,952,554	Lavarack	Mar. 27, 1934
1,960,309	Herron	May 29, 1934
2,085,074	Boyles	June 29, 1937
2,212,145	Benander	Aug. 20, 1940