Jan. 9, 1934. H. RABEZZANA 1,943,028

SPARK PLUG

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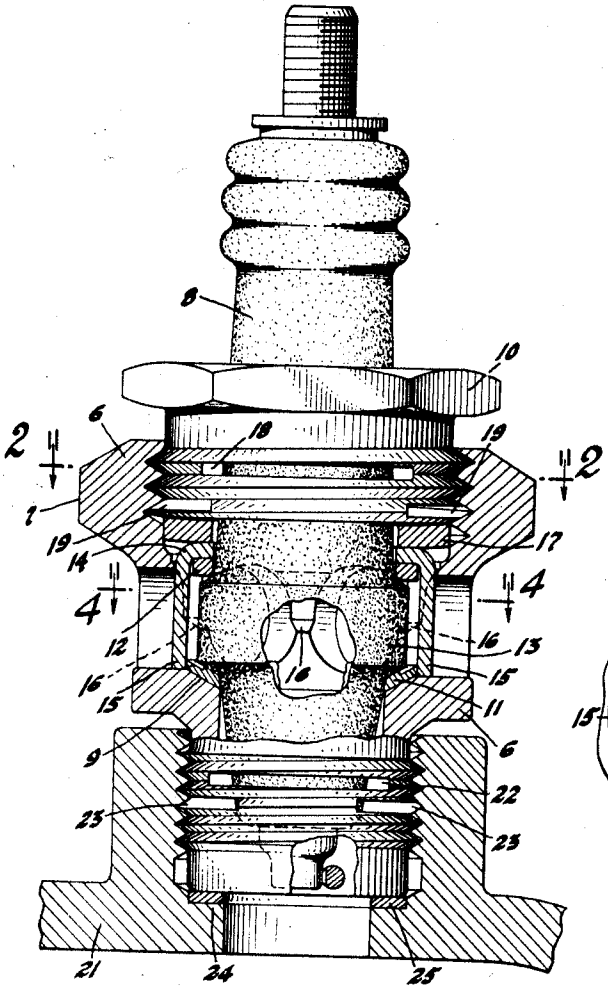


Fig. 1

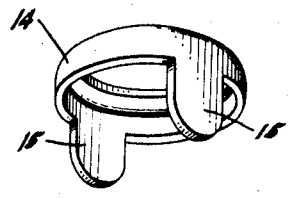


Fig. 3

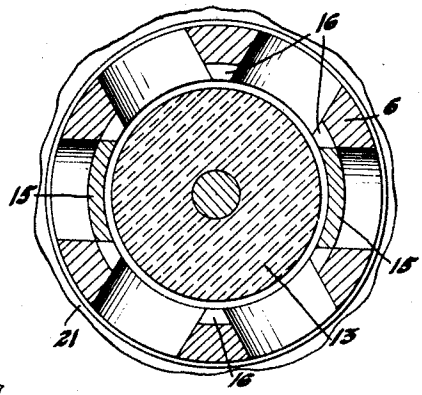


Fig. 4

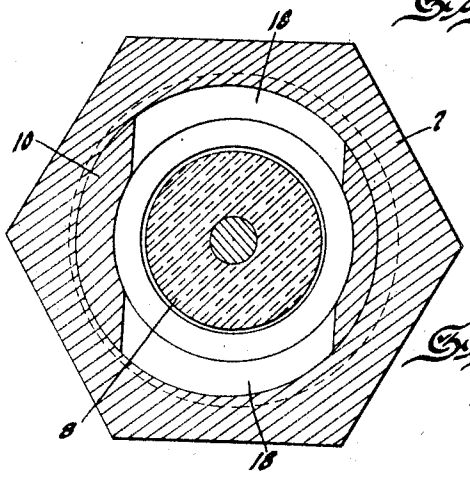


Fig. 2

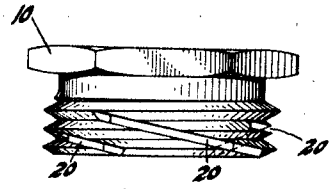


Fig. 5

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SPARK PLUG

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8 Claims. (Cl. 123—169)

My invention relates to spark plugs for internal combustion engines; and the object thereof is to provide a tighter plug, that is one wherein the leakage of high pressure gas from the cylinder of the engine outward past the plug, is more effectively prevented than has been the case in plugs not having the features wherein my invention consists.

The drawing accompanying and forming a part of this specification illustrates the preferred form of my invention, and therein:

Figure 1 is a view showing my improved spark plug partly in section and partly in elevation, the view being about three times the size of a plug as usually made.

Figure 2 is a view showing a section upon a horizontal plane indicated by the line 2—2, Figure 1, looking down.

Figure 3 is a perspective view showing an annular cupped washer used in my improved plug.

Figure 4 is a view showing a section upon a horizontal plane indicated by the line 4—4, Figure 1, looking down.

Figure 5 is a view showing a modified form of the bushing member of my improved plug in side elevation.

In the drawing, the numeral 6 designates the outer metallic shell or casing of my improved plug, the same having the usual hexagonal wrench receiving portion 7, and being hollow to receive the porcelain or equivalent insulator 8 of the plug. This insulator is enlarged at its central part and is supported from an internal ledge 9, and is held in place by an annular threaded bushing 10 which screws into an internally threaded part of the upper end of the passage within the hollow shell 6, as shown.

Gaskets 11 and 12 are placed between the ledge 9 and a shoulder at the lower end of the enlarged central part 13 of the insulator, and between a shoulder at the upper end of said central part and a cupped washer 14 (shown by itself in Figure 3) which annular washer serves to receive and confine said last named gasket. This washer has depending lugs 15 the lower ends of which lie between pairs of inwardly extending stops 16 formed inside the casing 6, when the parts are assembled, and which stops and lugs serve to prevent the washer and gasket within the same from rotating along with the bushing 10 when the latter is screwed into place in assembling the plug. Another slightly dished washer 17 is shown between the lower end of the bushing and the upper side of the washer 14; but the lower end of the bushing may, if desired, abut directly against the upper side of said washer as the lug arrangement described will keep the washer 14 from rotating with the bushing whether or not the washer 17 is used.

The pitch of the external threads upon the annular bushing 10 and of the internal threads within the upper end of the hollow casing 6 differ to a slight degree from one another; and one or more long narrow slots 18, 19 are formed in and extend through the wall of said threaded part. These slots extend along the threads and they are preferably narrower than the pitch of the threads; and they may be in a plane or planes at right angles to the axis of the plug, as shown in Figures 1 and 2, or inclined as shown at 20 in Figure 5 so that they cut across or intersect two or more of the threads. As an example of difference in pitch of the threads of the two parts mentioned plugs have been made and have proven satisfactory wherein the pitch of the threads upon the annular bushing 10 is .086 of an inch, and that of the threads within the upper end of the shell 6 is .0833 of an inch.

The lower annular threaded end of the shell or casing 6 which screws into a threaded opening in the cylinder wall 21 is shown as provided with slots 22, 23 extending therethrough like the slots in the bushing 10; said lower end abutting against an inwardly extending ledge 24 of the cylinder, a copper or equivalent gasket 25 being interposed between the two to secure a gas-tight joint.

In view of the premises it will be appreciated that binding action between the threads of the two results as the bushing 10 is screwed into the threaded upper end of the opening within the shell which receives the insulator 8, during which lengths of the threads alongside the slots yield slightly to permit the threads upon the two parts to accommodate themselves to one another. The yielding, however, is not great enough to strain the thread parts beyond the elastic limit of the metal of the bushing; from which it results that the screwing of the bushing into place produces a gripping action, due to the tendency of the sprung lengths of the threads to return to their initial conditions, which gripping action prevents the bushing from unscrewing. The yielding of the thread parts acts further to maintain such gripping action notwithstanding such slight expansion and contraction of the parts, due to temperature variations thereof as occurs when the plug is in use and the bushing, being thus more effectively prevented from unscrewing than in prior plugs, it follows that a better joint is secured initially, and a tighter joint is maintained

at the supporting ledge 9 by the use of the features wherein my invention consists than has heretofore been the case.

Substantially the same binding action and the same restraint against the unscrewing of the plug from the threaded opening in the cylinder wall 21 is secured as the plug is screwed thereinto against the gasket 25 supported by the ledge 24, thereby maintaining a more perfect gas-tight joint at the lower end of the plug than has been secured prior to my invention.

Having thus described and explained my invention I claim and desire to secure by Letters Patent:

1. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within the same and provided with an upper shoulder; stops arranged within said casing; an annular cupped washer surrounding said insulating member adjacent said upper shoulder and having depending lugs which engage the stops aforesaid to prevent said washer from turning; a gasket within said cupped washer and between the same and said upper shoulder; and an annular threaded bushing having one or more slots extending through the wall thereof, and which bushing screws into the internally threaded part of said casing and acts to force said gasket against said shoulder.

2. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within the same and provided with an upper shoulder; stops arranged within said casing; an annular cupped washer surrounding said insulating member adjacent said upper shoulder and having depending lugs which engage the stops aforesaid to prevent said washer from turning; a gasket within said cupped washer and between the same and said upper shoulder; and an annular threaded bushing screwed into the upper end of said hollow casing and acting to force said gasket against said shoulder.

3. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and and an insulating member supported within the same and provided with an upper shoulder; stops arranged within said casing; an annular cupped washer surrounding said insulating member adjacent said upper shoulder and having depending lugs which engage the stops aforesaid to prevent said washer from turning; a gasket within said cupped washer and between the same and said upper shoulder; an annular threaded bushing screwed into the upper end of said hollow casing; and an annular washer surrounding said insulating member and arranged between the lower end of said bushing and said cupped washer.

4. A spark plug having an annular externally threaded member, said member having a slot in and extending through the wall of its threaded part, and which slot extends along said threads and is inclined so as to intersect two or more of them, said slot being of less width than the pitch of said threads and defines a plane intersecting the longitudinal axis of the plug.

5. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within said casing; an annular externally threaded bushing the threads of which engage with and differ in pitch from the threads within said casing, and which bushing holds said insulator in place within said casing; said bushing having a transverse slot extending through the wall of its threaded part, and the width of which slot is less than the pitch of the threads thereupon.

6. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within said casing; an annular externally threaded bushing the threads of which engage with and differ in pitch from the threads within said casing, and which bushing holds said insulator in place within said casing; said bushing having a narrow slot extending along the threads thereupon and through the annular wall thereof and defining a slot intersecting the axis of the plug.

7. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within said casing; an annular externally threaded bushing the threads of which engage with and differ in pitch from the threads within said casing, and which bushing holds said insulator in place within said casing; one of said parts having a narrow slot extending along the threads thereof and through the wall of said member, said slot defining a plane intersecting the axis of the plug.

8. A spark plug having a hollow outer shell or casing internally threaded at its upper end, and an insulating member supported within said casing; an annular externally threaded bushing the threads of which engage with and differ in pitch from the threads within said casing, and which bushing holds said insulator in place within said casing; said bushing having a transverse slot extending through the wall of its threaded part and the length of which is less than the diameter of said part, and the width of which slot is less than the pitch of the threads thereupon.

HECTOR RABEZZANA.