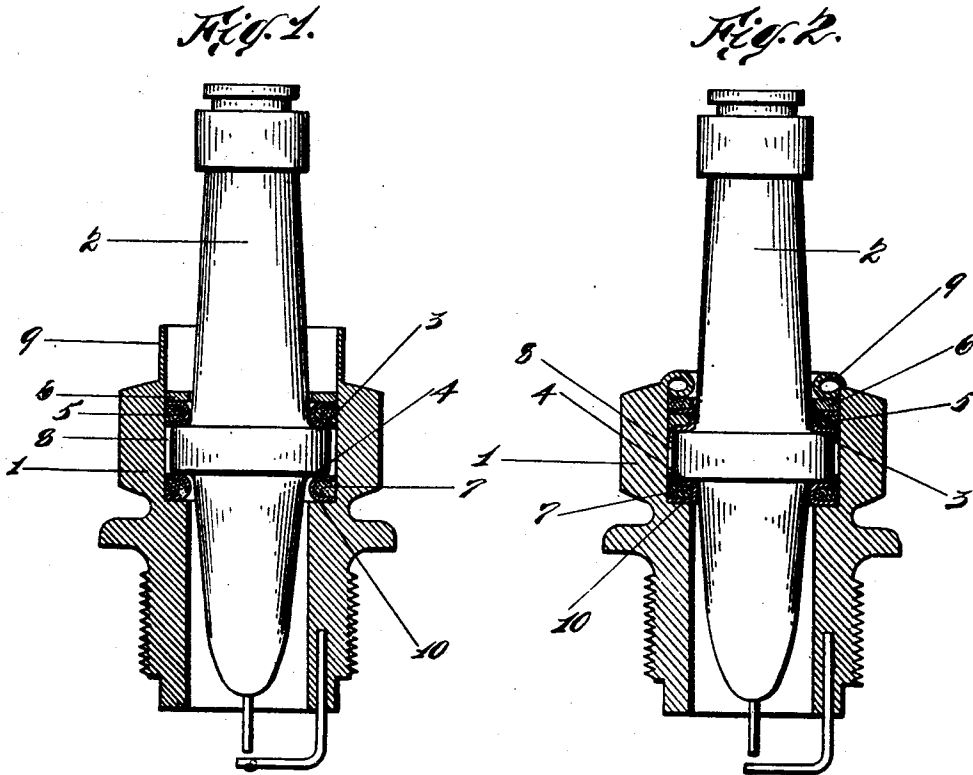
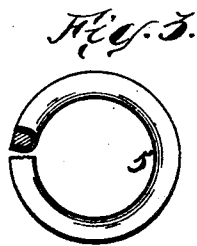
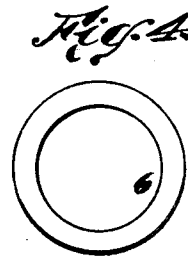


D. B. MILLS.
SPARK PLUG.
APPLICATION FILED FEB. 28, 1914.

1,153,942.

Patented Sept. 21, 1915.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID B. MILLS, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO PASHA SPARK PLUG COMPANY, A CORPORATION OF NEW JERSEY.

SPARK-PLUG.

1,153,942.

Specification of Letters Patent.

Patented Sept. 21, 1915.

Application filed February 28, 1914. Serial No. 821,634.

To all whom it may concern:

Be it known that I, DAVID B. MILLS, a citizen of Canada and a subject of His Majesty King George of England, residing at Montclair, New Jersey, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a clear, full, and exact description.

My invention relates to spark plugs for igniting the explosive charges in hydrocarbon engines, and has for its object to improve, simplify, and lower the cost of manufacture of the same.

The scope of my invention will be defined in the appended claims.

Referring to the drawings which illustrate a preferred embodiment of my invention,—Figure 1 shows a vertical section through the same before the shank-retaining portion has been curled over; Fig. 2 is a similar section with said shell portion curled over to retain the shank in place; and Figs. 3 and 4 are details of a packing gasket and protecting washer used in the plug.

Referring more particularly to the drawings, 1 indicates the shell of the spark plug usually made of metal and having an interiorly located ledge 10 as shown for receiving the shank. The shank 2 is of any suitable insulating material such as porcelain, and is formed as shown with an upper shoulder 3 and a lower shoulder 4, said lower shoulder being adapted to rest upon the interior ledge 10 of the shell. Packing gaskets 5 and 7 are preferably provided, one for each shoulder 3 and 4 respectively. These packing gaskets may be made up in the usual way of a soft metal ring filled with asbestos.

The shell 1 is formed at its upper end with a comparatively thin portion 9 adapted to be upset or doubled over upon itself as hereinafter described for retaining the parts of the plug in place. At the upper shoulder 3 and preferably interposed between the gasket 5 and the doubled-over portion 9 of the shell is a washer 6 of suitable material, preferably of hard metal for protecting the soft metal gasket against the doubled-over portion 9 when the latter is upset in assembling the plug. This protecting washer 6 may also be of various sizes and thicknesses for properly fitting different sized porcelain shanks within the shell. When the

parts of the plug are assembled as shown in Fig. 1, the thin portion 9 of the shell is doubled over upon itself by any suitable means so as to bear down snugly against the washer 6 and retain all the parts in place. This doubled-over portion 9 forms an efficient locking means for the parts below it. By reason of being doubled back upon itself as shown, this retaining means yields slightly to the expansion of the porcelain. The pressure from this expansion only tends to press the two parts of the doubled-over portion of the shell more firmly together rather than loosen the retaining means as it would in the case of a single bent-over portion.

It will be noted that a slight clearance 8 is provided between the side of the porcelain shank 2 and the inner wall of the shell 1. This feature, together with the arrangement of the packing gaskets at the upper and lower shoulders of the porcelain shank, allows for the necessary expansion of the shank when in use in a heated engine cylinder. It is not desirable in spark plugs of this character to retain the porcelain in place too rigidly and yet it must be held tight enough to prevent leakage of the explosive gases through the joints. The combination of devices just described provides for such a yielding retaining means which also prevents any leakage of gases.

It is obvious that various changes may be made in the details of my construction without departing from the broad scope of my invention as defined in the appended claims.

What I claim as new is:—

1. In a spark plug, in combination, an outer shell having an interior ledge, an inner shank of insulating material having an upper shoulder and having a lower shoulder which is adapted to rest upon said ledge, the upper end of said shell above the upper shoulder of said shank being turned in and back toward itself and peened down until the original outer face of the turned portion acts against said shoulder, whereby strains of expansion of said shank are distributed between the upper and lower bends of said inturned portion.

2. In a spark plug, in combination, an outer shell having an interior ledge, an inner shank of insulating material having an upper shoulder and having a lower shoulder

which is adapted to rest upon said ledge, upper and lower gaskets of soft material for said shoulders, the upper end of said shell above said upper shoulder being rolled in
5 and back toward itself and peened down until the original outer face of the rolled in portion acts against said shoulder, and a protecting washer of hard material interposed between the gasket which rests on said

upper shoulder and the recurved portion of 10 said shell.

Signed at New York city, N. Y., this 27th day of February, 1914.

DAVID B. MILLS.

Witnesses:

C. T. NEAL,
BEATRICE MIRVIS.