March 18, 1952 L. J. GUISTI 2,589,935

SPARK PLUG INSTALLING AND REMOVING TOOL

Filed July 7, 1949

Fig. 1.

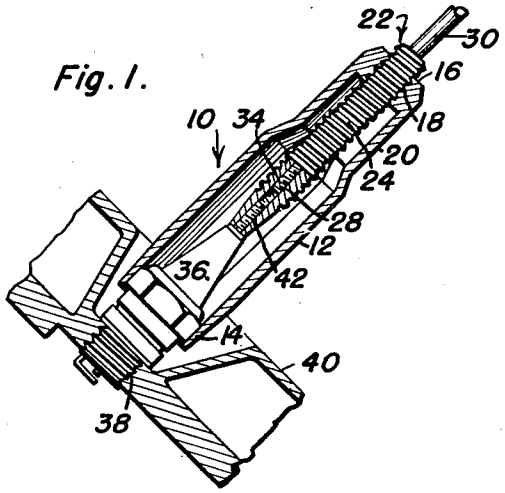


Fig. 2.

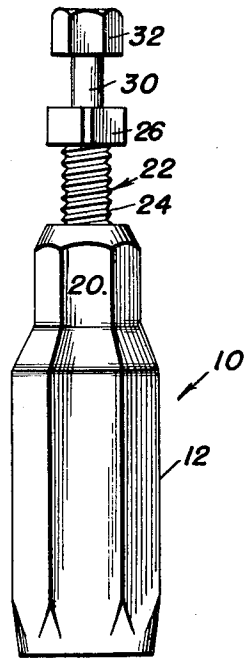


Fig. 3.

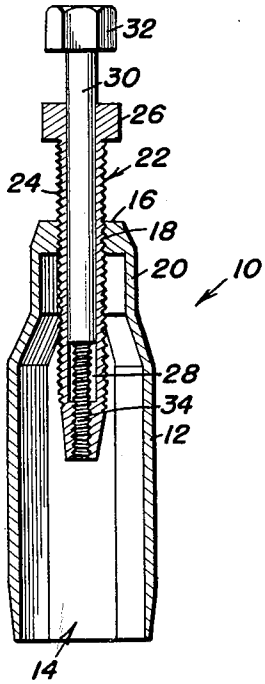


Fig. 4.

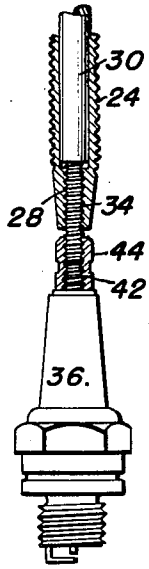


Fig. 5.

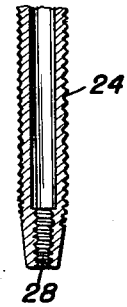
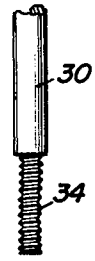


Fig. 6.



Louis J. Guisti

INVENTOR.

BY Thomas A. O'Brien and Harvey B. Jackson

Attorneys

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UNITED STATES PATENT OFFICE

2,589,935

SPARK PLUG INSTALLING AND REMOVING TOOL

Louis J. Guisti, North Augusta, S. C., assignor of thirty-three and one-third per cent to Isaac S. Peebles, Jr., Augusta, Ga., and sixteen and two-thirds per cent to Thos. R. Burnside, Thomson, Ga.

Application July 7, 1949, Serial No. 103,514

1 Claim. (Cl. 81—125)

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This invention relates to new and useful improvements and structural refinements in tools for installing and removing spark plugs, and the principal object of the invention is to facilitate convenient and expeditious installation and removal of spark plugs, particularly those on so-called "valve-in-head" internal combustion engines of automobiles, aircraft, etc., wherein the spark plugs are usually set in a deep recess in the cylinder block, or wherein the spark plugs are otherwise obstructed so that they may not be conveniently installed and removed by hand and by a conventional spark plug wrench.

This object is achieved by the provision of the instant tool which embodies in its construction a spark plug receiving socket of sufficient length to facilitate convenient installation and removal of the plug, together with means for releasably retaining a spark plug in the socket prior to tightening or after loosening of the spark plug is effected.

The primary feature of the invention, therefore, resides in the particular means which are employed for retaining the spark plug in the socket, these means being intended to cooperate with the usual screw-threaded terminal of the spark plugs, regardless of whether that terminal assumes the form of a screw-threaded stud or a screw-threaded nut, both of which are common in the art.

Some of the advantages of the invention reside in its simplicity of construction, in its convenient and expeditious operation, and in its adaptability to economical manufacture.

With the above more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially in the construction and arrangement of parts as shown in the accompanying drawings, in which:

Figure 1 is a cross-sectional view of the invention applied to a spark plug, portions of the barrel and stem being broken away;

Figure 2 is a side elevational view of the invention per se;

Figure 3 is a longitudinal cross-sectional view of the subject shown in Figure 2;

Figure 4 is a fragmentary cross-sectional detail of the spark plug retaining means applied to a terminal nut of a plug;

Figure 5 is a fragmentary cross-sectional view of a barrel used in the invention; and

Figure 6 is a fragmentary elevational view of a stem used therein.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

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Referring now to the accompanying drawings in detail, the invention consists of a spark plug installing and removing tool designated generally by the reference character **10**, the same embodying in its construction an elongated spark plug receiving socket **12** which is preferably of a hexagonal cross-sectional configuration and has an open spark plug receiving end **14** and a closed outer end **16** which, in turn, is provided with a central screw-threaded aperture **18**. It is to be noted that the closed end portion of the socket **12** is substantially reduced in diameter, and by virtue of its hexagonal configuration, affords a region **20** to receive a wrench or the like (not shown) whereby tightening or loosening of the spark plug may be effected.

A rotatable locking member designated generally by the reference character **22** extends into the socket **12**, this member consisting of a tubular barrel **24** provided with external screw threads to operatively engage the screw threaded aperture **18** of the socket, the outer end of the barrel **26** being equipped with a multi-sided head **26**, while the inner end portion of the barrel is reduced in diameter and is internally screw-threaded, as at **28**.

A stem **30**, provided at its outer end with a polygonal head **32**, is rotatably disposed in the barrel **24** and in the inner end portion thereof is diametrically reduced and screw-threaded as at **34** to engage the screw threaded bore or portion **28** of the barrel **24**, substantially as shown.

Having thus described the construction of the invention, its manner of operation will now be explained.

If it is assumed that a conventional spark plug **36** is to be installed in the screw-threaded bore **38** of a cylinder block or head **40**, and assuming, further, that in accordance with the conventional practice the spark plug **38** is provided with a nut-shaped member shown in Figure 1 as engaged by the socket end **14** and a terminal stud or post **42**, the tool **10** is so applied that the spark plug **36** is non-rotatably received in the socket **12**, after which the stem **30** is rotated outwardly from the barrel **24** to a sufficient extent that the terminal post **42** of the plug may be received in the bore **28** of the barrel **24** which, of course, is effected by screwing the barrel inwardly in the aperture **18**, as shown in Figure 1. In this manner, the spark plug **36** will be retained in the barrel **12**, whereupon a wrench may be applied

to the portion **20** of the barrel for the purpose of tightening or removing the plug, as desired.

It is to be noted that this operation may be performed under such circumstances regardless of the presence or absence of the stem **30**.

However, when the terminal post **42** of the plug is equipped with the usual nut **44**, the stem **30** is screwed inwardly in the barrel **34** so that the portion **34** of the stem projects outwardly from the bore **28** and may then be engaged with the screw threads of the nut **44**, as shown in Figure 6. The structural arrangement in this instance is, of course, different, but the result remains the same, namely, that the spark plug **36** is retained in the socket **12** while the installing or removing operation is being effected.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure, and accordingly further description thereof at this point is deemed unnecessary.

Having described the invention, what is claimed as new is:

A spark plug installing and removing tool, comprising an elongated socket provided at one end thereof with a screw threaded opening and provided at its other end with a polygonal wrench

portion to non-rotatably engage a spark plug, an externally screw-threaded barrel threadedly mounted in said opening and extending into said socket, a portion of said barrel in the socket being internally screw-threaded to engage a spark plug terminal, and a rotatable locking stem disposed in said barrel and having a screw-threaded portion engaging the internal screw-threads of the barrel, said screw-threaded portion of said stem being projectable and retractable in the adjacent end portion of the barrel to afford a secondary spark plug terminal engaging element.

LOUIS J. GUISTI.

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