July 17, 1962 E. W. MALCHOW 3,044,093

SPARK PLUG CLEANER

Filed Nov. 9, 1959

Fig. 1.

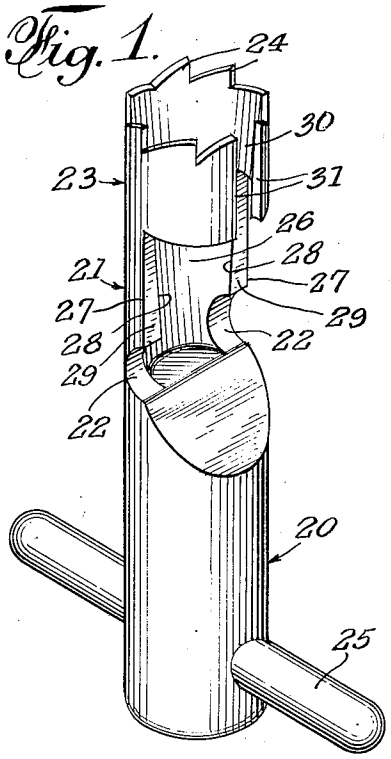


Fig. 2.

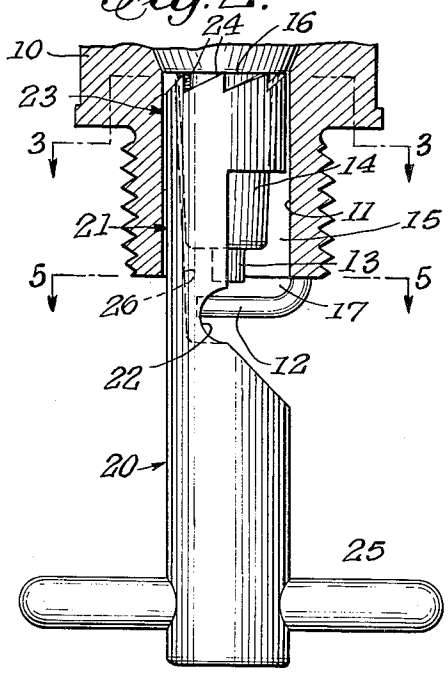


Fig. 3.

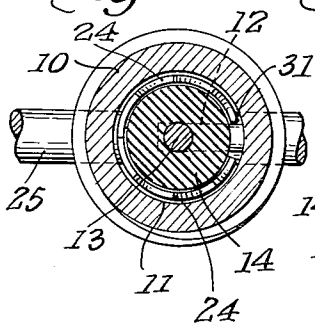


Fig. 4.

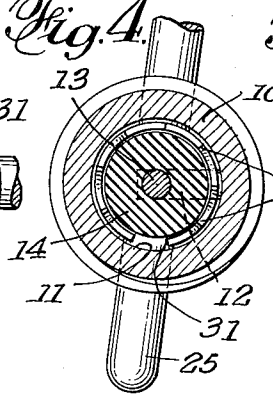
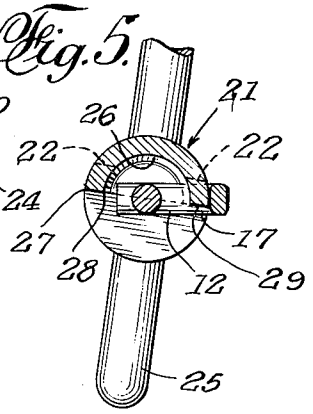


Fig. 5.



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3,044,093
SPARK PLUG CLEANER

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This invention relates to a tool for cleaning spark plugs and has for an object to provide a device that, by simple oscillatory movements, simultaneously cuts into and removes burnt oil and carbon deposits around the central electrode insulator as well as in the bend of the ground electrode and particularly around the insulator at the base thereof. Thus, the present tool comprises means whereby current-dissipating and -shorting deposits may be removed with easy facility to restore a fouled spark plug to efficient operating condition.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a perspective view of a spark plug cleaner according to the present invention.

FIG. 2 is a side elevational view thereof in operative cleaning position with a spark plug, the latter being shown fragmentary and in vertical section.

FIG. 3 is a broken cross-sectional view as taken on the line 3—3 of FIG. 2 with the cleaner in one operative position.

FIG. 4 is a similar view with the tool in another position.

FIG. 5 is a cross-sectional view, in the position of FIG. 4, as taken on the line 5—5 of FIG. 2.

The spark plug shown in FIG. 2 is generally typical in that the same has an outer mounting shell **10** that has an interior hollow **11** and carries a ground terminal or electrode **12** that is directed radially across the end of said hollow in the usual way, a central electrode **13** in cooperative sparking association with the electrode **12**, and an insulator **14** carried by the shell **10** and carrying the electrode **13** and disposed in said hollow **11**. The insulator and shell define an annular space **15** between them, said space being open at the end toward the electrode **12** and closed at the opposite end **16** by an enlargement of the insulator. The insulator **14** is ordinarily tapered as shown.

It will be understood that said annular space **15** and particularly the end **16** thereof may accumulate deposits of carbon and burnt oil. Also, that the bend **17** in the ground electrode **12** may fill with such deposits. The present tool by simple manual oscillations, may clean away such deposits in a matter of a fraction of a minute.

The present tool comprises, generally, a handle part **20**, a semi-cylindrical extension **21** of said part **20**, relief recesses **22** in the extension and an end cylindrical cleaner **23** provided with crown teeth **24**. The tool above generally described is integrally formed of the mentioned parts and is adapted to be produced from a round bar of suitably hard metal and a transverse smaller handle bar **25**.

The handle part **20** has the bar affixed thereto so that manual rotational manipulation of the tool is rendered

easy so that the tool may be oscillated on its axis with finger application on bar **25**.

The extension **21** and cylindrical cleaner **23** extending from said extension are intentionally hollow. In this case, the same are provided with a tapered bore **26** that conforms, generally, to the taper of the insulator **14** and freely accommodates the same. Said extension has longitudinal outer edges **27** that scrape the hollow or bore **11** of the shell **10**, and longitudinal inner edges **28** that scrape deposits from the tapered insulator **14**.

The recesses **22** are formed in said extension **21** so that, as shown in FIG. 5, the horizontal portion of the ground electrode **12** may be received therein, enabling the lower ends of faces **29** to displace deposits that may accumulate in the bend **17** of said electrode.

The cleaner **23** is cylindrically tubular and the same is interrupted by a longitudinal slot **30** of a width to enable the tool to be applied past the electrode **12**. The edges **31** of slot **30** comprise scraper edges similar to edges **27** and **28**, the same scraping the inward portions of the shell bore **11** and the tapered insulator **14**. The cleaner **23** may be proportioned, longitudinally, as desired.

The teeth **24** are shown right hand on one side and left hand on the other. Thus, the teeth on one side or the other will scrape or cut irrespective of the direction that the tool is turned. If desired, the teeth may be alternately right hand and left hand. In any case, the teeth **24** may be brought to bear against deposits in the end **16** of the electrode so that oscillations of the tool will cut into and remove such deposits.

It will be noted that the recesses **22** may be oversize with respect to the electrode **12**, so that the teeth **24** gradually cut into deposits until the same reach fully into end **16** while full oscillatory movement of the tool for cleaning the bend **17** is being effected.

While the foregoing specification illustrates and describes what I now contemplate to be the best mode of carrying out my invention, the construction is, of course, subject to modification without departing from the spirit and scope of my invention. Therefore, I do not desire to restrict the invention to the particular form of construction illustrated and described, but desire to cover all modifications that may fall within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A spark plug cleaner comprising a handle part, a semi-cylindrical extension of said handle part provided with longitudinal faces defined between inner and outer scraping edges, recesses formed in said faces and constituting abutments to limit oscillatory movement of the cleaner when said extension is entered into the annular space between the tapered insulator of the central electrode and the metal mounting shell of a spark plug and said recesses are engaged, alternately, with opposite sides of the bent ground electrode of said plug, each recess having an edge portion that overlaps the electrode in the bend thereof when the recesses are so alternately engaged, a tubular cleaner part on the end of said extension having a longitudinal slot large enough to allow the ground electrode to pass during entry of the cleaner into the mentioned annular space, crown teeth on the end of said cleaner part, said semi-cylindrical extension and the tubular cleaner on the end thereof having a common tapered bore so that the inner scraper edges of the extension bear on the surface of the mentioned insulators.

2. In a spark plug cleaner, an elongated tubular body having an intermediate cut-away portion that is of substantially semi-circular cross-section and terminating at substantially diametrically disposed and longitudinal faces

that are defined between inner and outer scraping edges, each face having a recess formed therein that reduces the circumferential extent of the intermediate portion of the body, transverse edges being formed where the recesses and the respective longitudinal faces meet, said transverse edges being adapted to clean within the bend of the ground electrode of a spark plug while the body is being moved in oscillatory fashion around its axis to move the scraping edges thereof in cleaning relation to the insulator and mounting shell of the spark plug and when the recesses engage the mentioned electrode to limit the mentioned oscillatory movement, said inside walls of the elongated tubular body and the intermediate semi-circular portion being provided with a common tapered interior wall so that the inner scraping edges engage the tapered surface of the insulator surrounding the central electrode of the spark plug.

3. A spark plug cleaner according to claim 2 wherein crown teeth are provided on the end of the elongated tubular body.

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