March 31, 1942. J. H. JOHNSON 2,277,911

SPARK PLUG CLEANER

Filed March 4, 1940

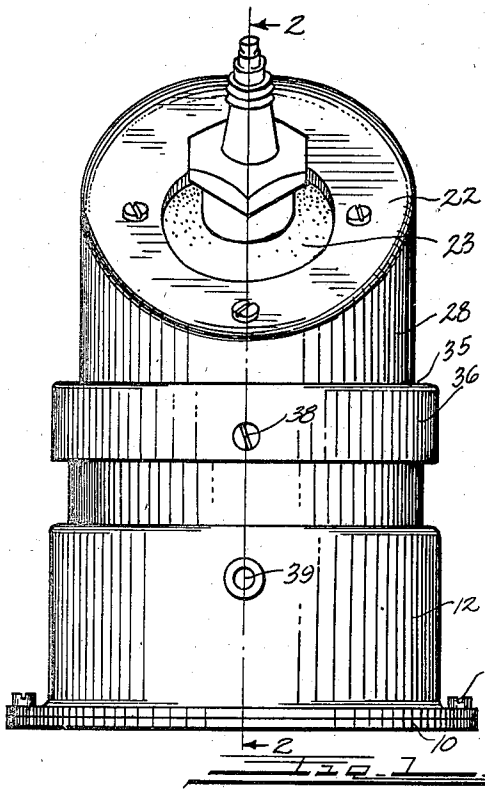


Fig. 1

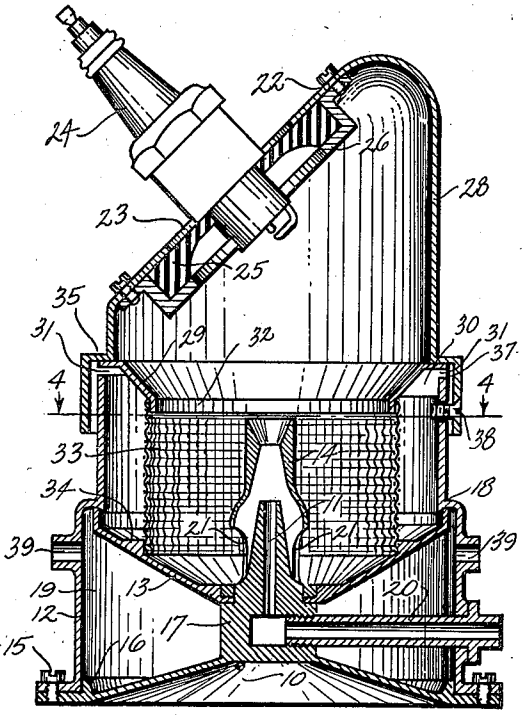


Fig. 2

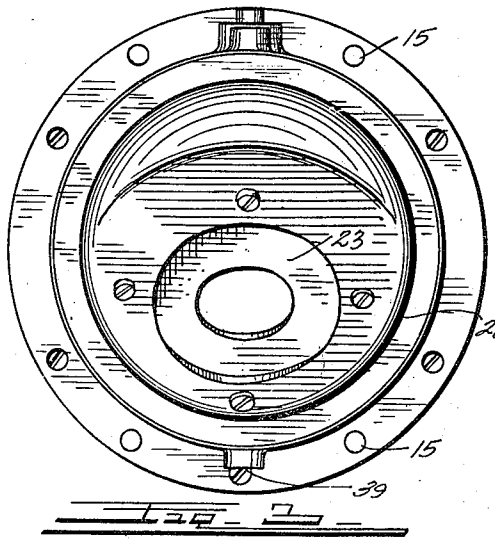


Fig. 3

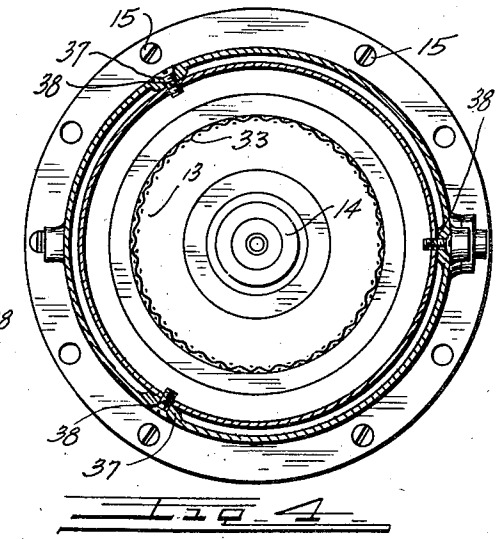


Fig. 4

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SPARK PLUG CLEANER

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2 Claims. (Cl. 51—8)

This invention relates to a spark plug cleaner and has for its principal object the provision of a device of this character which will be simple, compact, and light in weight so that it may be taken to the various jobs around a shop or service station and which employs the air pressure in the regular tire filling hose to impinge a sand blast into the plug to clean the latter.

The usual spark plug cleaner of the sand blast type blows a stream of sand axially into the plug. The stream grinds away the head of the porcelain electrode sleeve, packs sand into the plug interior and yet does not reach the surface of the plug spark gap where effective cleaning is desired. An object of this invention is to so construct the device that the sand stream will always be directed across the spark gap, at the proper angle to reach the sparking surfaces thereof, and against the metallic inner surface of the plug shell so as to clean the interior of the latter without wearing away the porcelain protector.

Still further objects are: to eliminate all unnecessary parts and provide a construction which can be quickly assembled from simple die castings; to provide a positive non-clogging sand feed; to provide efficient means for blowing out the cleaned spark plug; and to provide a construction which will positively prevent the escape of sand and dust.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a side elevation of the improved spark plug cleaner.

Fig. 2 is a vertical section through the cleaner, taken on the line 2—2, Fig. 1.

Fig. 3 is a plan view thereof.

Fig. 4 is a horizontal cross section, taken on the line 4—4, Fig. 2.

The improved spark plug cleaner comprises: a base member 10 formed with an air nozzle 11, a flanged shell 12, a sand hopper 13, and a jet tube 14. All of the above parts can be disassembled simply by removal of cap screws 15 which extend through the flange of the shell 12 into the base member 10.

The shell 12 fits snugly about a receiving bead 16 on the base member 10 which effectively prevents the escape of sand at the bottom of the cleaner. The base member 10 is conical in shape and is formed with an axially positioned block or boss 17 at its apex from which the air nozzle 11 projects.

The jet tube 14 frictionally engages the base of the nozzle 11 and acts to clamp the sand hopper 13 against the block 17 so that the three elements 10, 13, and 14 are tied together as a single unit. As the screws 15 are tightened the periphery of the sand hopper is forced upwardly against an internal shoulder 18 in the shell 12 to seal off the lower portion of the latter to form a chamber 19.

An air nipple 20 is passed through an opening in the shell 12, and through the chamber 19 and is threaded into the block 17 to carry air to the air nozzle 11. The nipple 20 extends beyond the shell sufficiently far to receive the jack or nozzle of one of the usual pneumatic tire filling hoses with which garages and filling stations are provided.

Sand is sucked into the jet tube 14, through suitable ports 21 therein, and is projected upwardly by the jet of air from the nozzle 11.

A cap member 28 closes the top of the shell 12. The top of the cap member 28 is inclined to one side to form an inclined face 22. The face 22 is provided with an opening 23 for the passage of a spark plug 24. The opening 23 is larger than the largest expected spark plug and is partially closed by means of a relatively thick, resilient rubber gasket 25 provided with a central spark plug hole. The gasket 25 is clamped in place within the shell by means of a gasket ring 26 and clamp bolts 27. The gasket 25 is sufficiently resilient to allow the passage of a variety of sizes of spark plugs and yet maintain an air tight joint about the plugs.

It is desired to call attention to the fact that the jet tube 14 is vertical while the face 22 is inclined at an angle of approximately 45° from the vertical. Since the axis of the spark plug is at right angles to the face 22 it is maintained at an angle of approximately 45° to the projected axis of the jet, with its electrodes directly over the jet. Thus the stream of sand enters the plug at an angle and flows directly across and between the electrodes against the inner wall of the plug shell. It has been found that this is the most effective angle for efficient cleaning without damage to the porcelain sleeve which protects the middle electrode in the usual spark plug.

The sand from the jet falls back into the inclined receiving hopper 13 and is conveyed by gravity back to the ports 21 and is drawn from thence back into the air stream.

An annular funnel plate 29 separates the cap member 28 from the shell 12. The funnel plate 29 is provided with separating lugs 30 which accurately center the funnel plate 29 in the shell 12 and also support the plate 29 above the shell 12 to form a peripheral discharge passage 31 entirely around the top of the shell 12. The bottom opening of the funnel plate 29 is outlined by a downwardly depending screen flange 32 for receiving the upper extremity of a cylindrical screen 33. The screen 33 rests in a circular socket formed by a circular boss 34 on the upper surface of the sand hopper 13.

The bottom of the cap member 28 is set out to form an annular shoulder 35 which rests on the funnel plate 29. The shoulder 35 is surrounded by a downwardly depending skirt 36 which is spaced about the shell upon separating pads 37 to allow the air from the passage 31 to escape downwardly. The cap member 28 is secured to the shell 12 by means of screws 38 through the pads 37.

The exhausted air from the air jet flows through the screen 33 at low velocity, due to the great screen area, and drops its sand within the screen. Any remaining dust is dropped by the exceedingly low velocity of the air in the shell about the screen. The air then rises and discharges at 31 around the entire shell 12 and is deflected downward by the skirt 36.

The air chamber 19 in the shell is provided at opposite sides with projecting nipples 39 over either of which the valve jack of an air hose can be placed so as to blow air into the chamber 19. This air discharges from the other nipple 39 and is used to force a blast of air into the interior of a cleaned spark plug, held in the blast, to force the sand and loosened carbon therefrom.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A spark plug cleaner comprising: a shell; a base member closing the open bottom of said shell; an air jet nozzle arising from the middle of said base member; a concave sand hopper surrounding said nozzle; a vertical jet tube surrounding said nozzle and provided with ports at its bottom communicating with said hopper, the peripheral edge of said hopper being forced against an internal shoulder in said shell by the movement of said base member to its place to form an air chamber in said shell below said hopper; means for supplying air to said nozzle; an inclined top in said shell over said tube; means for supporting a spark plug through said top above and at an angle to the vertical axis of said jet tube; and nipples projecting from and communicating with said air chamber so that air can be forced therethrough for creating a spark plug cleaning blast.

2. A spark plug cleaner comprising: a circular convex base plate; an upstanding block at the middle of said base; an air jet arising from said block; an annular shoulder surrounding said jet; a hopper-shaped sand receiver having an opening in its bottom for the passage of said jet and supported on said shoulder; a shell surrounding said receiver, said shell being secured to said base plate at its bottom periphery and extending above said receiver at its upper periphery; an internal, downwardly facing shoulder in said shell resting against said receiver and holding the latter against said shoulder; a cap member over the upper periphery of said shell; an inclined face closing the upper portion of said cap; a spark plug opening through said face at right angles to the latter so as to support a spark plug at an angle to the vertical over said air jet; a vertical jet tube surrounding said jet; a cylindrical screen surrounding said jet tube; means for supplying air to said air jet; and means for sealing said screen to said cap, there being exhaust openings in said shell for the exhaust of the air passing through said screen.

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