Sept. 30, 1941. T. A. WORSHAM 2,257,144

SPARK PLUG CLEANER

Filed Dec. 19, 1939 2 Sheets-Sheet 1

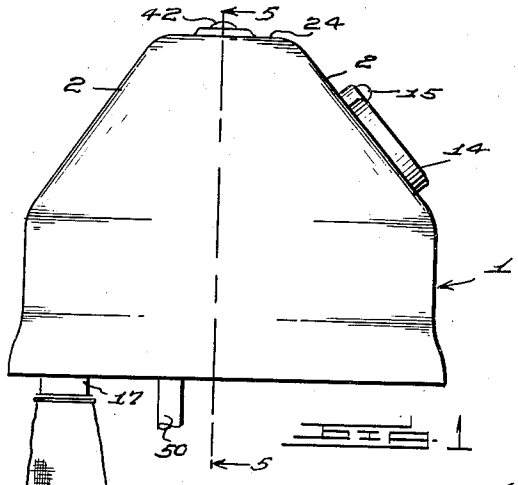


Fig. 1

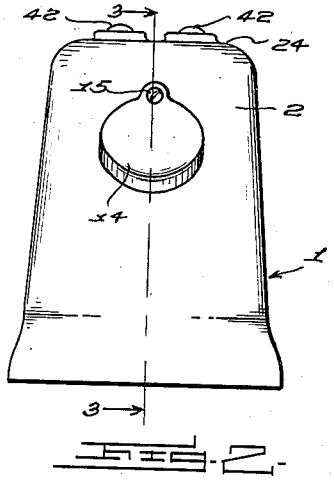


Fig. 2

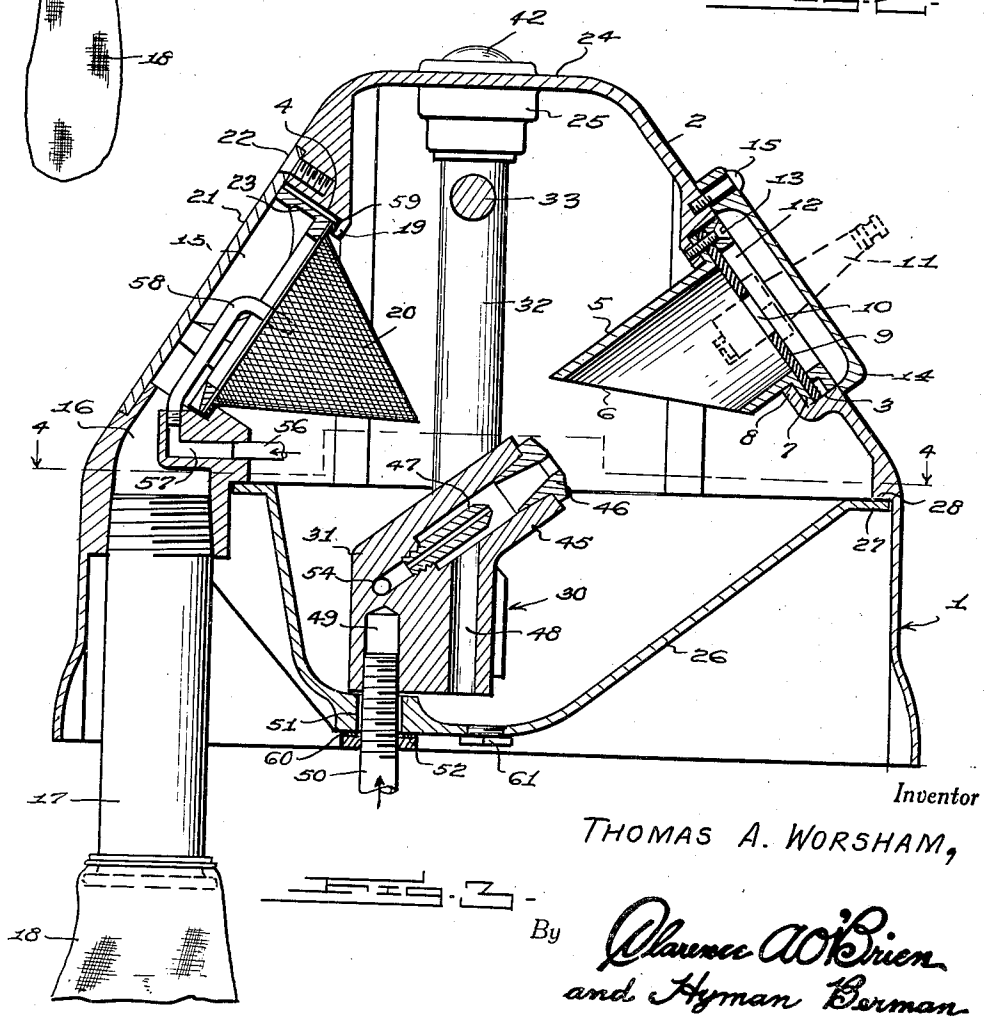


Fig. 3

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SPARK PLUG CLEANER

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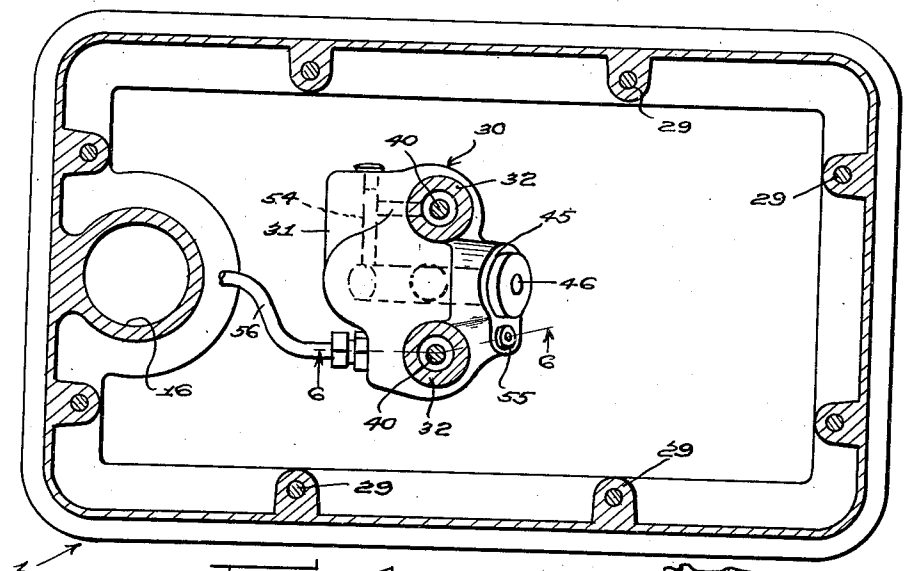


FIG. 4.

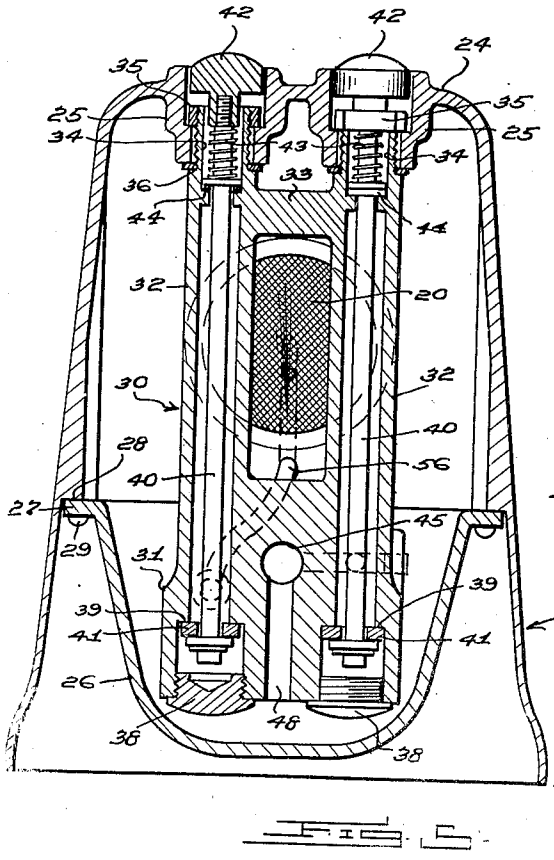


FIG. 5.

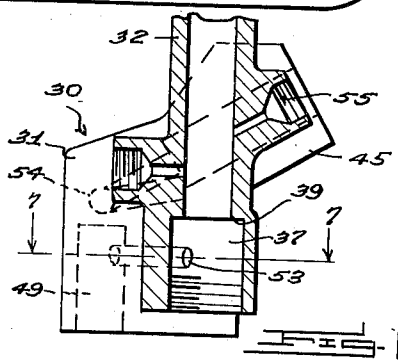


FIG. 6.

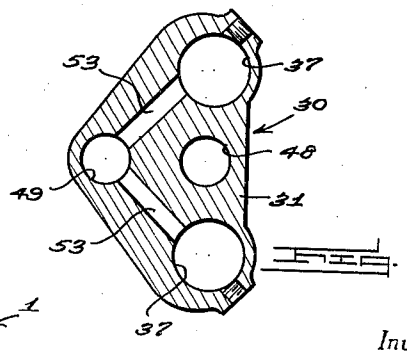


FIG. 7.

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SPARK PLUG CLEANER

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3 Claims. (Cl. 51—8)

This invention relates generally to spark plug cleaners of a type generally similar to that constituting the subject matter of U. S. Patent No. 1,987,374, issued on January 8, 1935, upon which the present device constitutes an improvement.

An important object of the present invention is to provide, in a manner as hereinafter set forth, a spark plug cleaner of the character described comprising a valve unit or assembly of a novel construction and arrangement for controlling the air.

Another very important object of the invention is to provide a spark plug cleaner of the aforementioned character comprising means operable by a single control for cleaning the plug after the sand blasting operation has been completed and for cleaning the screen which removes the sand from the air as said air leaves the device.

Other objects of the invention are to provide a spark plug cleaner which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation of a spark plug cleaner constructed in accordance with the present invention.

Figure 2 is a view in front elevation thereof.

Figure 3 is a view in vertical longitudinal section through the device, taken substantially on the line 3—3 of Figure 2.

Figure 4 is a view in horizontal section, taken substantially on the line 4—4 of Figure 3.

Figure 5 is a cross sectional view, taken substantially on the line 5—5 of Figure 1.

Figure 6 is a detail view in vertical section through the valve unit, taken substantially on the line 6—6 of Fig. 4.

Figure 7 is a view in horizontal section, taken substantially on the line 7—7 of Figure 6.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a shell or casing of suitable metal which is designated generally by the reference numeral 1. The upper part of the casing 1 includes a pair of oppositely inclined wall portions 2 having openings 3 and 4 therein. Removably mounted in the opening 3 is a substantially cylindrical, inclined baffle 5 having a beveled inner end 6. The baffle 5 includes a flange 7 on its outer end which is engaged with a complemental flange 8 on the wall of the opening 3. Mounted on the outer end of the baffle 5 in the opening 3 is a flexible rubber washer 9 having a centrally located opening 10 therein for the reception of a spark plug to be cleaned, as at 11. A ring 12 is engaged with the rubber washer 9, said ring also being located in the opening 3. Screws 13 removably secure the elements 5, 9 and 12 in assembled position. A closure 14 for the opening 3 is pivotally mounted, as at 15, on the casing 1.

The opening 4 is formed to define a chamber 15' with which an outlet passage 16 communicates. Connected with the outlet passage 16 and depending therefrom is an air exhaust pipe 17 to which a cleaning bag 18 is connected.

The wall of the opening 4 is flanged, as at 19, and mounted thereon is a removable conical screen 20. A removable plate 21 closes the opening 4, said plate being countersunk in the casing 1 and secured thereto by screws 22. A metallic spacer 23 between the plate 21 and the screen 20 clamps the latter in position on the flange 19.

The top 24 of the casing 1 has formed therein what may be referred to as wells 25, the purpose of which will be presently set forth. The bottom of the casing 1 is in the form of a hopper 26 for the reception of sand. The hopper 26 has its upper portion flanged, as at 27, for abutting engagement with a horizontal shoulder 28 in an intermediate portion of the casing 1. Screws 29 removably secure the hopper 26 in position.

Mounted in the casing 1 is a control unit which is designated generally by the reference numeral 30. The control unit 30 includes a cast metallic body 31 from which integral tubes 32 rise. A brace 33 extends between the upper portions of the tubes 32. The tubes 32 terminate in reduced, externally threaded upper end portions 34 which extend into the wells 25. Nuts 35 are threaded on the upper end portions 34 of the tubes 32 in the wells 25 for suspending the control unit 30 in the casing. The reduced portions 34 of the tubes 32 provide shoulders 36 beneath the wells 25 which coact with the nuts 35 for clamping the unit 30 in position.

The tubes 32 communicate with a pair of chambers 37 in the lower portion of the body 31. Removable plugs 38 close the lower ends of the chambers 37. The chambers 37 are of greater diameter than the bores of the tubes 32, thus

providing seats 39. The reference numeral 40 designates valve stems which are slidable in the tubes 32, said stems extending into the chambers 37. Mounted on the lower end portions of the stems 40 are valves 41 which are engageable with the seats 39. This is shown to advantage in Figure 5 of the drawings. Threadedly mounted on the upper end portions of the stems 40 are buttons 42 which are operable in the wells 25. Coil springs 43 encircle the upper end portions of the stems 40 and are engaged beneath the buttons 42 for normally closing the valves 41. Means including suitable packings 44 in the upper portions of the tubes 32 prevent air leakage around the stems 40. It will be noted that the coil springs 43 are engaged with the packings 44.

The body 31 is formed to provide a nozzle 45 which is aligned with the cylindrical, inclined baffle 5 for playing a blast of sand ladened air squarely on the spark plug 11. The nozzle 45 is provided with an outer tip 46. Mounted in the nozzle 45 is a jet tip 47. Formed in the body 31 is a vertical duct 48 which communicates with the nozzle 45 for elevating sand thereto from the lower portion of the hopper 26. The hopper 26, it will be observed, is shaped to cause the sand therein to feed by gravity toward the lower end of the duct 48.

The lower portion of the body 31 is further provided with a chamber 49 into which is threaded a supply pipe 50 from a suitable source of air under pressure. An opening 51 in the hopper 26 accommodates the air supply pipe 50. A clamping nut 52 is threaded on the air pipe 50 and engaged beneath the hopper 26. Ducts 53 (see Figs. 6 and 7) connect the chamber 49 with the chambers 37. Then, an angular duct 54 connects the lower portion of one of the tubes 32 with the sanding nozzle 45, the tip 47 being mounted in the discharge end portion of said duct 54. These ducts, it will be noted, are formed in the body 31.

Communicating with the lower portion of the other tube 32 is a nozzle 55 (see Figs. 4 and 6) which is also directed toward the spark plug 11 in the cylindrical baffle 5. This tube is also connected by a pipe 56 with an angular duct 57 (see Fig. 3) in the wall defining the exhaust opening 16. Communicating with the duct 57 is an angular nozzle 58 which is adapted to direct a blast of air into the conical screen 20 for cleaning same.

It is thought that the operation of the device will be readily apparent from a consideration of the foregoing. Briefly, the spark plug to be cleaned is forced into the comparatively small opening 10 of the resilient rubber washer 9 which supports said spark plug in position. Thus, the inner end portion of the spark plug projects into the cylindrical baffle 5. The correct valve 41 is now opened against the tension of its respective coil spring 43 for admitting air to the sanding nozzle 45. As this air rushes through the nozzle 45 a suction is created in the duct 48 as a result of which sand from the hopper 26 will be drawn upwardly, said sand mixing with the stream of air. This sand ladened stream of air plays on and in the spark plug 11 in a manner to thoroughly clean said spark plug in a minimum of time. The construction and arrangement of the cylindrical baffle 5 is such as to cause most of the sand to return by gravity to the hopper 26 after contacting the spark plug 11. The air passes through the conical screen 20 by which it is further cleaned and exhausts into the bag 18 through the chamber 15', the passage 16 and the pipe 17. Any loose matter that may cling to the spark plug 11 after the sanding operation is blown therefrom by opening the other valve 41 thus admitting clean air to the nozzle 55. This also admits air to the nozzle 58 for removing any accumulation of dust or sand from the screen 20. A gasket 59 of suitable material is provided between the flange of the screen 20 and the flange 19. A washer 60 is provided on the air intake pipe 50 between the nut 52 and the hopper 26. The reference numeral 61 designates a drain plug for the hopper 26.

It is believed that the many advantages of a spark plug cleaner constructed in accordance with the present invention will be readily understood and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. A spark plug cleaner comprising a casing, means for supporting a spark plug to be cleaned in said casing, a valve unit mounted in the casing, said unit including a body, tubes on said body secured to the casing for supporting the body therein, a nozzle on the body for directing a blast of sand ladened air on the spark plug, a nozzle on the body for directing a stream of air only on the spark plug, and manually actuated valves operable in the tubes for controlling the nozzles.

2. A spark plug cleaner comprising a casing, a hopper in said casing for the reception of sand, means for supporting a spark plug to be cleaned in the casing, a body positioned in the hopper, tubes rising from said body and secured to the top of the casing for suspending the body therefrom, a nozzle in the body for directing a blast of sand ladened air on the spark plug, said body having a duct therein communicating with the nozzle and the hopper for conducting sand from said hopper to said nozzle, another nozzle in the body for directing a stream of air on the spark plug, and manually opened valves operable in the tubes for controlling the first and second named nozzles.

3. A spark plug cleaner comprising a casing for the reception of a spark plug, means for projecting a blast of air and cleaning material on the spark plug, a screen for separating the cleaning material from the air, and means for projecting a blast of air in a reverse direction through the screen for removing the cleaning material therefrom.

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