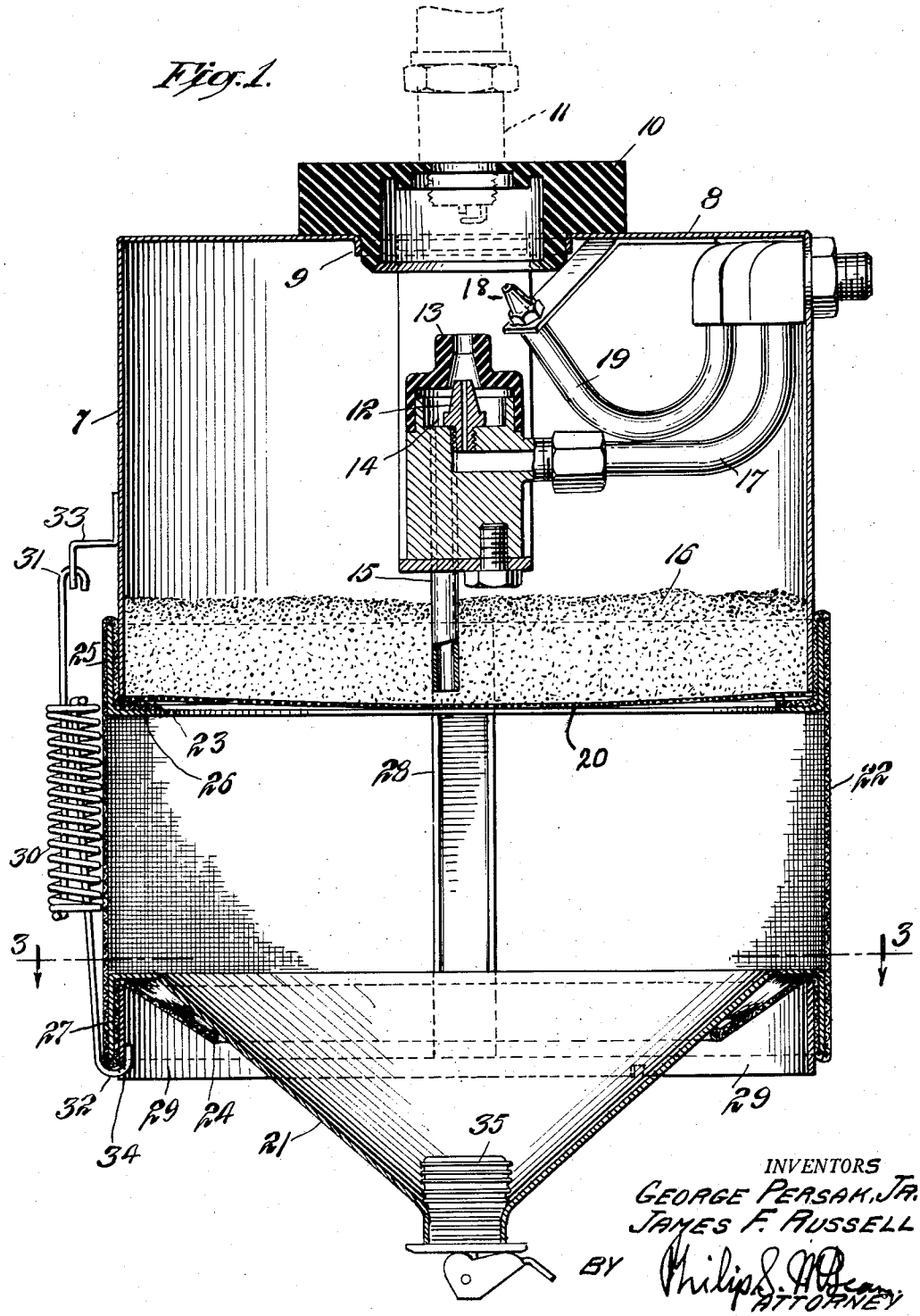
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SPARK PLUG CLEANER

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Fig. 1.



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Fig. 4.

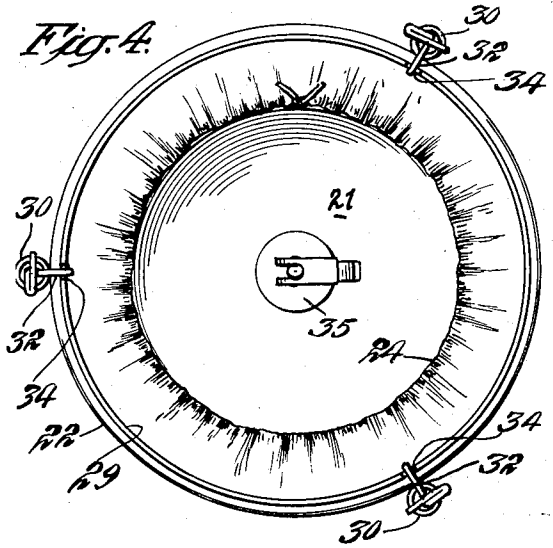


Fig. 3.

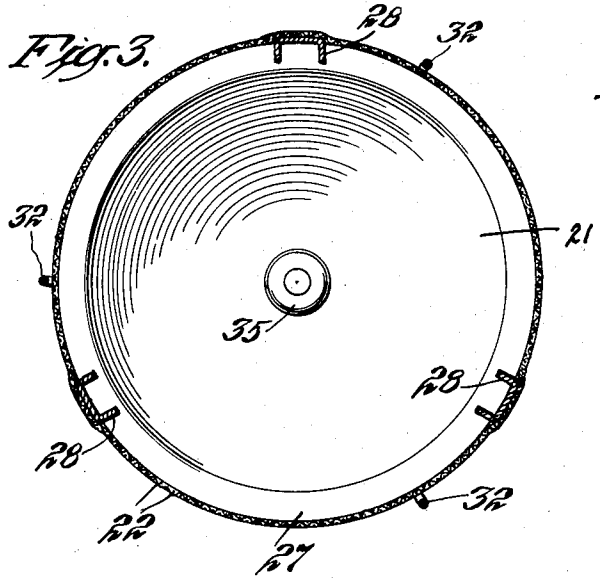
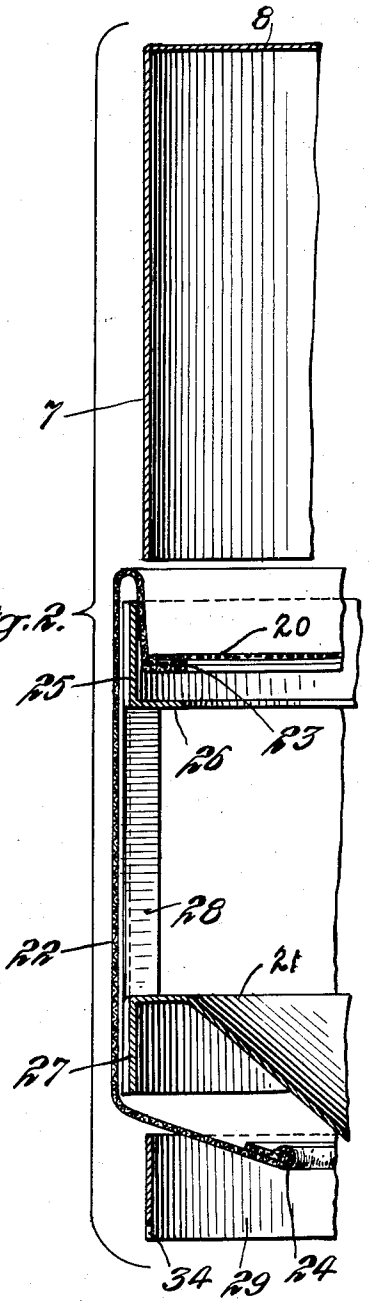


Fig. 2.



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SPARK PLUG CLEANER

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Application May 28, 1956, Serial No. 587,809

4 Claims. (Cl. 51—8)

The invention here disclosed relates to spark plug cleaners of the type covered in Patent #2,505,422, issued April 25, 1950, in which cleaning is effected by means of compressed air carrying granular abrasive.

In the use of such machines the carbonaceous and other matter removed from the plugs in the cleaning action re-circulates with the abrasive. This removed material as it accumulates retards the action of the abrasive more and more, slowing down the cleaning action and eventually requiring replacement of the entire abrasive body.

Objects of the present invention are to avoid this loss inefficiency and to eliminate the need for replacing the abrasive. This has been accomplished by a built-in filtering action effecting automatic removal of the carbon and dirt as a part of the scrubbing and cleansing action, thus to keep the abrasive effectively clean even with long continued repeated use.

Other important objects of the invention are to incorporate the automatic filtering action into the machine in a thoroughly practical, low cost construction.

Other desirable objects attained by the invention and the novel features of construction, combination and relation of parts, constituting the invention, are set forth and will appear more fully in the following specification.

The drawings accompanying and forming part of the specification illustrate a present commercial embodiment of the invention. Structure, however, may be modified and changed as regards this illustration, all within the true intent and scope of the invention as hereinafter defined and claimed.

Figure 1 in the drawings is a broken vertical sectional view of the abrasive holding and circulating portion of one of the new spark plug cleaners.

Figure 2 is a broken sectional view of the main parts of the filter in separated relation.

Figure 3 is a horizontal cross sectional view through the lower filter chamber on substantially the plane of line 3—3 of Figure 1, on a smaller scale.

Figure 4 is a bottom plan view of the filter.

In Figure 1, the powdered or granular abrasive, such as garnet, is shown confined within an inverted can-like container 7 open at the bottom and having a top wall 8 provided with a central flanged opening 9 for a rubber adapter 10 for holding a spark plug 11 centered over the abrasive nozzle.

The abrasive nozzle is shown as made up of a central air nozzle 12 and an outer blast nozzle 13 surrounding and spaced from the inner nozzle to provide an annular induction chamber 14 for abrasive picked up by the tube 15 extending downwardly from this chamber into the body of granular abrasive 16 in the bottom of the holder.

Compressed air is supplied to the central nozzle through connection 17 and air is furnished to a separate cleaning jet nozzle 18 by connection 19, the two air lines being usually controlled by separately operable valves, not shown.

The bottom of the abrasive holder in the present invention is made up of a flexible screen 20 of a mesh to filter out the carbon and dirt removed from the spark plugs, which is usually smaller in particle size and to hold back granules of abrasive.

While different screen materials may be used it has been found that a woven strand mesh screen of polystyrene is satisfactory, providing desired flexibility, resistance to wear and ability to hold the granular abrasive while filtering out the more or less dust-like contaminants.

Agitation is imparted to the filter screen in the normal operation of the machine and particularly in turning the machine on and off, the sudden pressure changes in the abrasive chamber having the effect of positively vibrating the screen at such times to shake loose and drop foreign matter collected in the cleaning operation.

The foreign matter shaken out of the abrasive is allowed to drop and collect in a funnel shaped hopper 21 supported in spaced relation below the screen and enclosed by a breather.

The latter is shown as made up of a bag 22 of suitable mesh fabric and a special feature is that this bag, in the form of a cylinder, is secured at the top by stitching or other fastening at 23 to the disc of screen material 20 and is closed by drawstring 24 or the like over the hopper shaped bottom 21 so as to be held stretched between the abrasive container 7 at the top and the collecting funnel 21 at the bottom.

Figure 2 shows how in combining these parts the flexible screen is pushed down over the edge of a ring 25 into seated engagement on a flange 26 and the lower portion folded inwardly over a lower ring 27, spaced from the upper ring by struts 28.

The lower open end of the cannister form holder 7 is of a size to fit inside the upper ring 25 and inside the downturned portion of the breather bag, Figure 2, and thus to hold the filter screen firmly seated on supporting flange 26, as in Figure 1.

To secure the bag fully stretched and the lower end firmly engaged over the lower ring 27, a loose ring 29 is provided which will fit up inside the lower ring 27 and inside the folded lower end of the bag, as in Figure 1.

The parts are held in the assembled relation shown in Figure 1 with the breather bag secure and properly stretched by helical springs 30, Figures 1 and 4, having hooked terminals 31, 32 caught to brackets 33 on the sides of the holder and into notches 34 in the lower edge of clamping ring 29.

This arrangement affords quick and easy assemblage and replacement of breather bags and screens if such becomes desirable.

The hopper bottom is shown provided with a cam released removable plug closure 35 enabling quick and easy removal of the screened out contaminating material collected in the hopper.

While vibration or motion normally present in the machine will be effective to some extent to cause the flexible screen to filter out carbon and dirt removed from the plugs, the screening action is made more positive by the turning on and off of the air pressure for scrubbing and for cleaning the plugs. Each time the air is turned on and off in either of the nozzles, a pressure difference is created between the interior of the abrasive holder and outside atmosphere, causing a quick flexing of the screen and shaking of the material supported by the screen, thus to loosen and drop collected material free from the abrasive granules.

In this manner the granular carbon is cleaned and kept clean by actual use of the machine. The cutting and scrubbing effectiveness of the abrasive is thus kept sub-

stantially constant so there is no slow down in the continued operation of the machine. This practically eliminates need for replacement of abrasive although it may be desirable from time to time to add small amounts of fresh abrasive to replace such as may have been reduced in size or effectiveness by long continued use.

The machine constructed as disclosed consists of but relatively few, simple parts and can be manufactured at reasonable cost. The filtering action is positive and fully automatic. The location of the end of the abrasive suction pipe close to the screen creates a sweeping movement of material over the mesh, assuring loosening and dropping of the material scrubbed from the spark plugs. The action starts as soon as the air is turned on. The lower end of the pipe being submerged in and to that extent closed by the abrasive causes a sudden increase in pressure in the abrasive containing chamber, effecting a downward deflection of the flexible screen and with flow of abrasive starting practically immediately the effect is reversed, with the screen snapping upwardly toward or possibly into striking engagement with the lower end of the tube, shaking the material on the screen and causing drop-out of the collected finer waste material.

What is claimed is:

1. Spark plug cleaner comprising the combination of an abrasive containing chamber, an abrasive nozzle, an abrasive supply tube extending from within said chamber to said nozzle, said abrasive containing chamber being made up of a can having a lower open end and a flexible fine mesh screen stretched across said open lower end, a breather bag attached to the edge of said screen, an upper supporting ring telescopically engaged over the lower end of said can with the upper end of the breather bag looped over the same, a hopper bottom for collecting screened material, struts connecting said hopper bottom to said upper supporting ring and supporting said hopper bottom in spaced relation below the screen, said hopper bottom having a dependent annular flange about the rim of the same and the lower end of the breather bag being folded inwardly and upwardly over said flange, a clamping ring telescopically engaged within said flange and clamping the folded lower end portion of the breather bag to the flange and spring means yieldingly and detachably connecting said clamping ring to the body of the can.

2. Spark plug cleaner comprising the combination of an abrasive containing chamber having a horizontally disposed flexible abrasive supporting screen bottom wall of a mesh to hold granular abrasive and to screen out material collected from abrasive scoured spark plugs, an abrasive nozzle in said chamber having an abrasive conducting pipe extending downwardly close to said screen, a hopper bottom for collecting screened material and provided with a removable closure for enabling removal of collected material, a breather bag connecting said hopper bottom with the screen bottom of the chamber and readily releasable means for removably securing said breather bag and hopper bottom to said abrasive containing chamber.

3. Spark plug cleaner comprising the combination of an abrasive containing canister, an abrasive nozzle, an abrasive supply tube extending from within said canister to said nozzle, said canister having an open lower end, a supporting ring telescopically engageable over said open lower end of the canister and having an inwardly extending annular flange opposite the lower end of the canister, a breather bag having its upper end engaged over said supporting ring and clamped between said ring and the lower end of the canister, a flexible mesh screeen secured to said upper end of the breather bag and interposed between said annular flange and the lower end of the canister, a hopper for collected screened material, means supporting said hopper spaced below said supporting ring, said hopper having a dependent annular flange and the lower end of the breather bag being looped upwardly over said flange and readily releasable means for removably securing said hopper, breather bag and screen to said canister.

4. Spark plug cleaner comprising an abrasive containing chamber having a horizontal, flexible mesh screen wall, a dust collection chamber having a porous breather wall and positioned to accumulate dust released from the abrasive containing chamber through said flexible mesh screen wall, an abrasive nozzle within said abrasive containing chamber and an abrasive supply tube extending from a position close to said flexible horizontal screen wall within said abrasive containing chamber to said abrasive nozzle.

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