May 2, 1939. C. LESTER 2,156,594

AIR FILTER WASHER

Filed Aug. 31, 1937

Fig. 3.

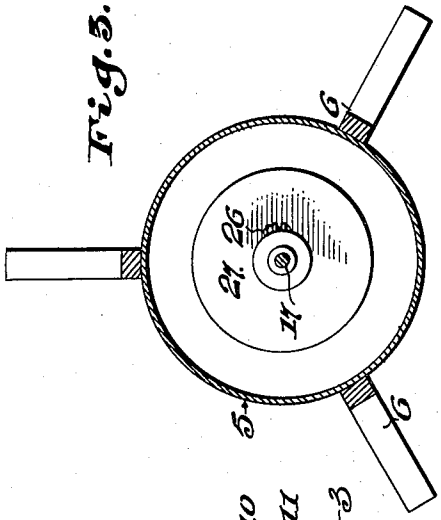


Fig. 4.

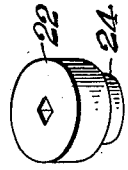


Fig. 5.

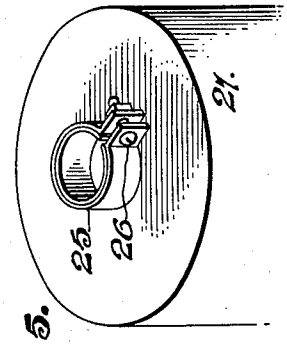


Fig. 2.

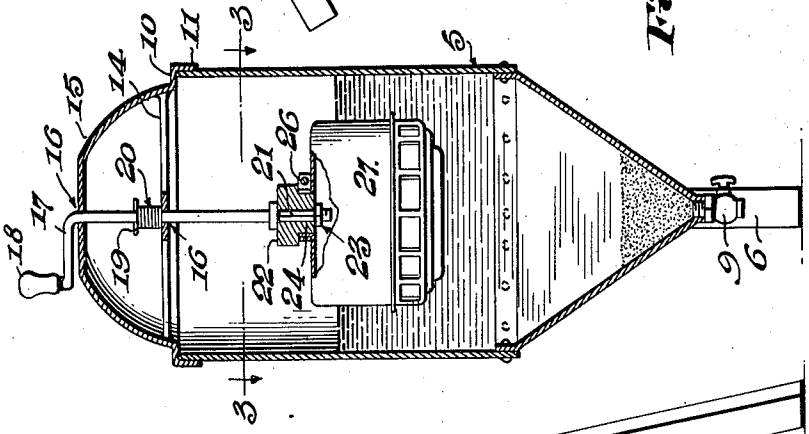
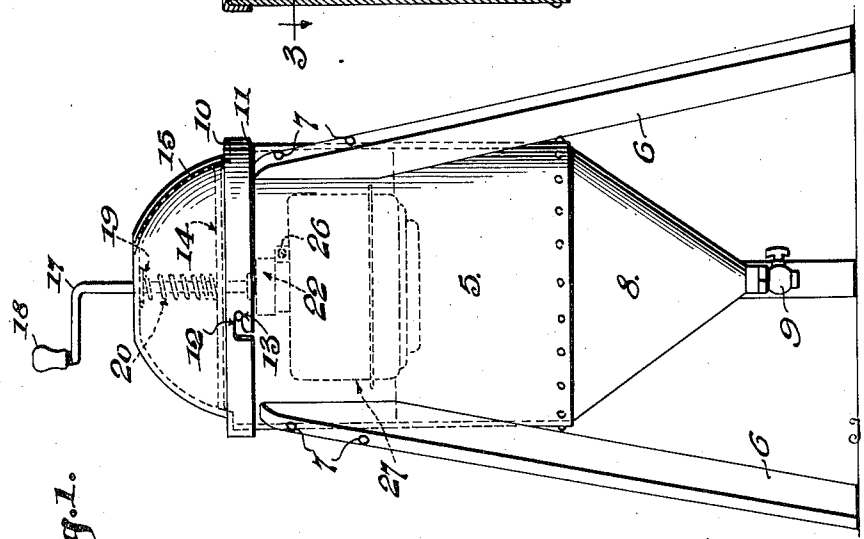


Fig. 1.



Inventor

Charles Lester

By Mason & Porter

Attorneys

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AIR FILTER WASHER

Charles Lester, Ironton, Ohio

Application August 31, 1937, Serial No. 161,840

3 Claims. (Cl. 141—1)

The invention relates generally to washing apparatus and has for an object to provide a simple, inexpensively constructed and easily operated means for washing or cleaning the air filter units commonly associated with the air intake throats of automobile carbureters.

Modern automobiles commonly are provided with air filtering units removably mounted on the air intake throats of the engine carbureters and which usually embody metal wool and felt air filtering media for filtering out solid particles from the inrushing air and thus protecting pistons and cylinders of the engine from abrasion. After long periods of use these filtering media become partially clogged and so retard the inflow of air into the engine cylinders as to starve the motor with respect to air for combustion and create an effect similar to constant use of the choke, thereby reducing the efficiency of the engine and unnecessarily increasing gas consumption. The invention seeks to remedy this condition by the provision of simple means for cleaning these filter units.

In its more detailed nature, the invention resides in the provision of a container, vertically supported and partially filled with a cleaning fluid, and a crank member rotatably and longitudinally movable in said container and equipped with a driving chuck to which filter units can be removably secured to be given compound or simple, longitudinal and rotary, or longitudinal or rotary, movements in and out of the cleaning fluid for the purpose of cleaning the filtering media contained in such units.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawing.

In the drawing,

Figure 1 is a side elevation illustrating the invention, the movable parts being in the normal, at rest position.

Figure 2 is a central vertical section, a filter unit being shown immersed in the cleaning bath.

Figure 3 is a horizontal section taken on the line 3—3 on Figure 1.

Figure 4 is a detail perspective view of one of the selective driving chuck elements.

Figure 5 is a detail perspective view illustrating the mounting collar portion of an air filter unit.

In the practical development of the invention, I provide a container 5, preferably cylindrical in general form, and supported with its axis disposed vertically upon legs 6 secured thereto at 7. The container is open at the top and includes a coniform appendage 8 preferably equipped with a drain valve 9.

The open top of the container is closed by a removable cover 10 having a flange 11 for embracing the upper end of the container and which may be equipped with bayonet slots 12 for cooperating with lugs 13 projecting from the container wall in securing the cover upon the container against accidental displacement during cleaning operations.

At its base portion the cover 10 is equipped with a cross spider 14 and the cover preferably is extended upwardly from the base portion to provide a dome-like top portion 15 spaced from the spider. The top portion 15 and the spider 14 are apertured to provide spaced bearings 16 for a rotor or crank member 17 including a handle portion 18 extending above the cover in position to be manually actuated for imparting movement to the member 17. Just below the dome 15 the member 17 is equipped with an abutment member 19 which may take the form of a simple cotter pin and which is engageable with the dome to limit movement of the member 17 in the upward direction. A spring 20, coiled about the member 17 between the spider 14 and the abutment 19, serves to yieldably hold the member 17 in the normal, elevated position shown in Figure 1.

At its lower end, projected well into the interior of the container, the member 17 carries means for effecting removable attachment with filter units which are to be cleaned in the apparatus. Any suitable means for effecting this attachment may be employed. As an example, the lower extremity of the member 17 may be made non-circular as at 21, to fit the like shaped receiving aperture in a driving chuck member 22, and equipped with securing means 23 by which said chuck member can be removably secured upon the non-circular portion.

The air cleaner units supplied as standard equipment on various makes of cars differ somewhat in specific dimensions but most of them include the usual metal wool and felt air filtering media which filter out solid particles that would otherwise be drawn into the engine through the carbureter air throat. These units usually are removably mounted directly upon the carbureter air throat, and in order to adapt my apparatus to the cleaning of the various standard sizes of filter units, I provide a plurality of selective driving chuck units 22 generally the same

in construction but each including a distinct mounting collar portion 24 of a diameter corresponding to that of the carbureter air throat of the particular automobile from which a given filter unit has been removed. Thus, by simply changing driving chucks, an operator can clean the filter units carried by the various makes of automobiles.

The filter units usually each includes a grip collar 25 removably secured upon the carbureter air throat by a clamping screw 26, and this means is employed for removably securing the air filter units upon the mounting collar 24 of the respective drive chuck 22. A portion of an air filter unit 27 embodying the securing equipment 25, 26 is shown in Figure 5.

In the practical use of the invention, the container 5 is partially filled with a cleaning fluid capable of washing oil and dirt from the filtering media contained within the standard air filter units. Gasoline can be used. Some models of air filters employ felt cloth disks which constitute the final filtering material, and these usually are removable. It is preferable to remove these felts prior to cleaning in order to prevent any packing or closing of the pores in the felts. When the particular model of filter unit does not admit of removal of the felts, it is then preferable to use a light solvent liquid, such as dry cleaner liquid, in order to avoid this packing of the felts.

When a filter unit has been suitably secured upon the selected driving chuck 22, the cover is applied to the container as shown in Figure 1. The handle 18 can now be employed to reciprocate the filter unit into and out of the bath of cleaner fluid, to rotate the unit in the cleaner fluid, or to impart a combination of rotary and reciprocatory movement to said unit in said bath for the purpose of thoroughly cleansing the filtering media in said unit of its accumulation of oil and dirt. After subjecting the unit to a thorough cleaning operation, pressure can be released from the member 17 and the spring 20 will return it to its normal, elevated position shown in Figure 1. In this position the handle 18 can be used to spin the unit and remove therefrom surplus cleaning fluid by action of centrifugal force.

By reason of the provision of the coniform appendage 8, all sediment is collected in a relatively quiet central zone. Thorough cleansing of air filter units is thus greatly facilitated because precipitated solids are collected in a zone substantially free of agitation and are not again thrown up into the cleaning zone due to excessive agitation which would otherwise be caused by the cleaning function.

I claim:

1. In an air filter cleaning apparatus, an upright open topped container adapted to contain a bath of cleaning fluid, a removable cover for the container, means providing spaced bearings on said cover, a crank shaft vertically disposed and rotatably and reciprocably mounted in said bearings, an abutment on said shaft, spring means engageable with one of the bearings and said abutment for normally holding the shaft elevated, and an air filter driving chuck removably carried at the lower extremity of said shaft and having provision for removable attachment with an air filter unit.

2. In an air filter cleaning apparatus, a container adapted to contain a bath of cleaning fluid, a removable cover for the container, said cover having an opening therethrough providing a bearing, a spider extending across said cover below the opening therein and providing a second bearing spaced from the said opening, a crank shaft vertically disposed and rotatably and reciprocably mounted in said bearings, spring means disposed between said spider and the opening in said cover and operatively connected to the shaft for normally holding the shaft elevated, and an air filter driving chuck removably carried to the lower extremity of said shaft and having provision for removable attachment with an air filter unit.

3. In an air filter cleaning apparatus, an upright open-topped container adapted to contain a bath of cleaning fluid, a removable dome-shaped cover for the container, said covering having an opening therethrough providing a bearing, a spider carried by said cover below the top thereof and providing a second bearing spaced from the opening in the cover, a crank shaft vertically disposed and rotatably and reciprocably mounted in said bearings, an abutment on said shaft, spring means disposed between said spider and said abutment for normally holding the shaft elevated, and an air filter driving chuck removably carried at the lower extremity of said shaft and having provision for removable attachment with an air filter unit.

CHARLES LESTER.