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CRANKCASE FLUSHER

2,627,862

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2 SHEETS—SHEET 1

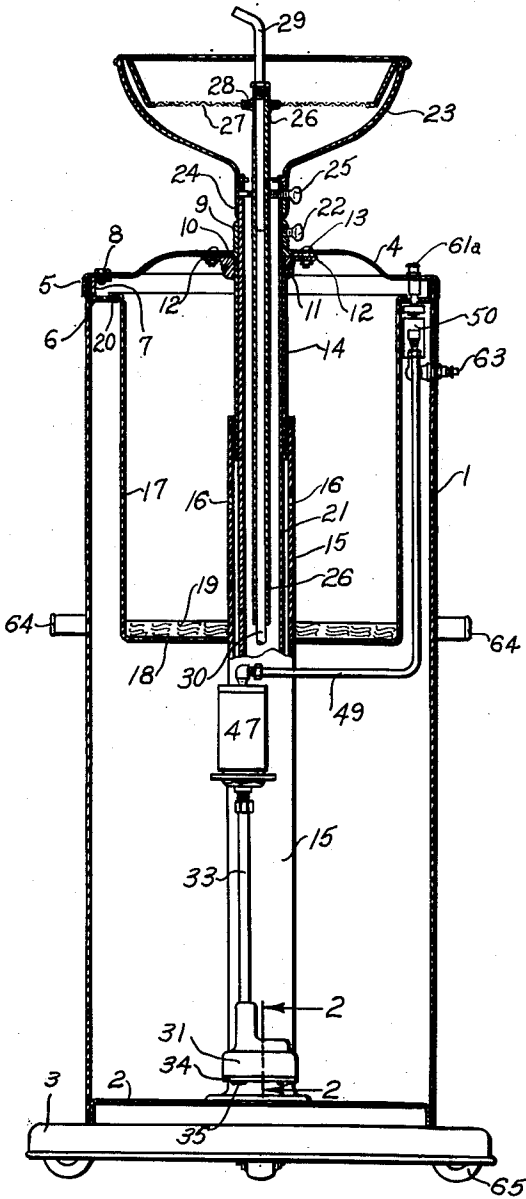


FIG. 1

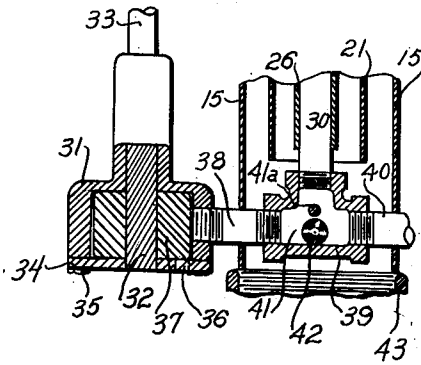


FIG. 2

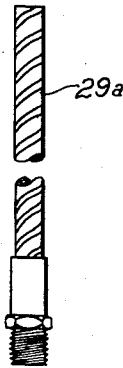


FIG. 3

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2 SHEETS—SHEET 2

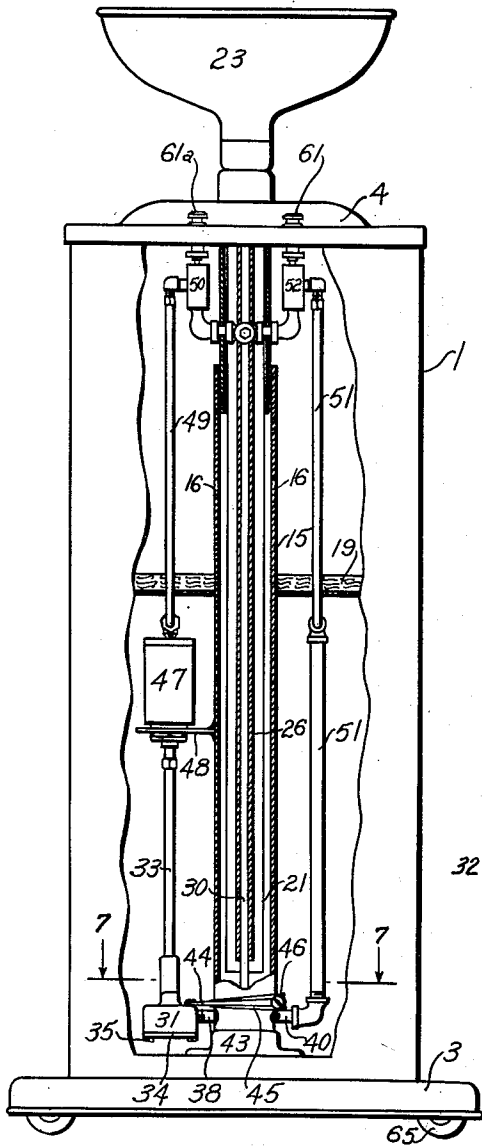


FIG. 4

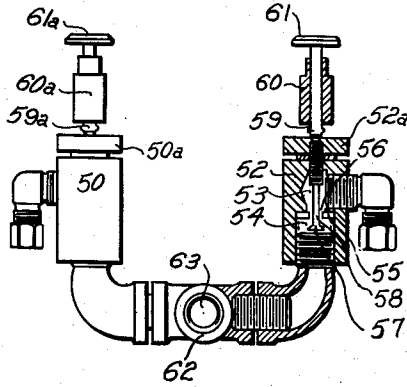


FIG. 5

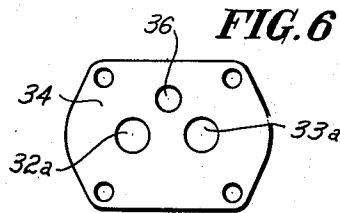


FIG. 6

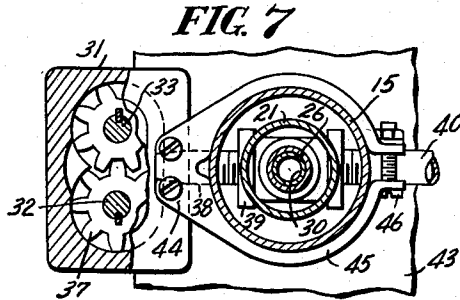


FIG. 7

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# UNITED STATES PATENT OFFICE

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## CRANKCASE FLUSHER

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4 Claims. (Cl. 134—99)

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This invention relates to improvements in portable crank case flushers for combustion engines and has for its object to provide a flusher that will clean all parts of the crank case and lower motor.

It is also an object of this invention to provide in connection with a crank case flusher, means for recovering the flushed liquid and removing therefrom carbon particles and sludge.

It is also an object of this invention to provide a crank case flusher in which there is no fire hazard, in which there are few moving parts and in which all parts are well protected and their operations are simple.

These and other advantages will appear from the following description taken in connection with the drawings, in which:

Figure 1 is a vertical section of an outside container, the filter, and partial section of a telescopic tube for conveying the filter liquid.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a view showing one form of nozzle.

Figure 4 is a side elevation of the flusher taken from the right hand side of Figure 1 with the outer container broken away to show the interior construction and the telescopic tubes in section.

Figure 5 is a view showing a valve attachment partly in section for controlling the admission of air in the flusher.

Figure 6 is a bottom view of the cover of the gear pump.

Figure 7 is a section on line 7—7 of Figure 4.

The outer part of the flusher consists of a body or container 1, a bottom 2, a supporting base 3 and a cover 4. These parts are all preferably made of some sheet material, any suitable material may be used. The cover 4 is made to fit the shape of the body or container 1 and has around its outer edge a downwardly extending flange 5 which fits over the outer edge of the upper end of the container 1. On the inside of the upper end of the container is an annular bracket 6. At spaced intervals around the upper end of the container is a bracket 7 attached to the cover 4 by means of studs or rivets 8. In the center of the cover 4 is an opening or circular hole around which there is located an annular collar 9. This collar 9 has a flange 10, extending therefrom beneath the cover 4. Below this flange 10 is an annular collar 11 which has a flange 12 and is attached to the cover 4 by means of rivets or bolts 13.

Fitting in the collar 11 is a fixed pipe 14. This pipe is in alignment with the collar 9 and ex-

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tends downwardly into the upper end of a pipe 15 which is supported in the bottom of the container. In this pipe 15, a little below the lower end of the pipe 14, is a series of holes 16 through which fluid may flow from the pipe 15 into a filter can 17 which has holes 18 in its bottom. On the bottom of this filter can is a hair filter pad 19 through which the oil or fluid used must filter and where the sludge is removed from the oil. The upper end of the filter can 17 has thereon an outwardly extending flange 20 which rests upon, and is supported by, the annular bracket 6.

Fitting within the collar 9 and the pipe 14 is a telescopic pipe 21. This pipe 21 may be held in adjusted relation with the collar 9 by means of a set screw or thumb screw 22 passing through the collar and engaging with the pipe 21. Mounted on top of the pipe 21 is a catch basin 23 which has on its lower end a collar shaped part 24. Extending through the collar shaped part 24 and the upper end of the pipe 21 is a thumb screw 25 which engages the outer surface of a telescopic tube 26 which extends downwardly into the container.

Tubes 26 and 30 constitute an adjustable flushing passageway. Tube 21 constitutes a drain-back passageway from the catch basin 23 to the lower part of the pipe 15. As the fluid is drained back from the catch basin into the lower part of pipe 15, it fills this pipe up until the fluid reaches the holes 16 through which it then passes into the filter can 17. The fluid seeps through the bottom of the filter can 17 into the container. Thus the fluid can be used over and over again.

In the catch basin 23, and supported by its periphery, is a screen 27 which has thereon a collar 28 around the upper end of the telescopic tube 26. Threaded onto the upper end of the tube 26 is a nozzle 29. This nozzle may be of any shape, form, size and length. In Figure 3 there is shown a flexible nozzle indicated by the numeral 29a. This nozzle 29a is the one that goes into the breather pipe of the motor.

Within the telescopic tube 26 is a stationary oil tube 30. Supported on the bottom or lower end of the pipe 15 is a gear pump housing 31 which has therein a jack shaft 32 and a pump shaft 33. The lower end of the housing 31 is open to provide for the ready insertion of the pump elements and their shafts and is closed by means of a pump cover 34 which provides bearing holes 32a and 33a for the lower ends of the jack shaft and the pump shaft respectively. In this pump cover 34 is a hole 36 through which oil passes from the lower part of the container into pump case.

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Within the pump housing 31 are two gear elements 37 forming the operating parts of the pump. One of these gear elements is on the jack shaft 32 and the other is on the pump shaft 33. Extending from the pump housing 31 into the lower end of the pipe 15 is an outlet pipe 38 through which the oil is forced from the pump into the lower end of the tube 30. The end of the pipe 38 within the lower end of the pipe 15 is inserted into one part of a T connection 39 as shown in Figure 2.

In line with the pipe 38 and threaded into part of the T connection is a pipe 40 which is an air pipe connected to an air attachment shown in Figure 5. The lower end of the oil tube 30 is threaded into one side of the T connection so that there is provided between the pipes 30, 38 and 40 a space 41 in which there is a ball valve 42 adapted to close the end of the pipe 38 or the end of the pipe 40. A pin 41a prevents the ball from closing the oil tube 30.

The bottom of the pipe 15 rests upon, and is threaded into, the base 43 which rests upon the bottom 2 of the container 1. In addition to being supported in part by the pipe 38, the pump 31 is supported by means of a metal plate 44 attached to the pump and to a hose clamp 45 clamped around the lower end of the pipe 15. This clamp is tightened by means of a screw 46.

One of the very attractive features of this invention is the motor by which the flushing is done. In order to prevent any possibility of sparks or fire, there is provided within the container an air motor 47 which is supported by means of a bracket 48 attached to one side of the pipe 15. This motor operates the pump shaft 33 connected to the gear pump 31. Leading into the motor 47 for the purpose of operating it is an air pipe 49 connected at its upper end to a valve body 50.

Located within the container, and as shown in the drawings, substantially parallel with the pipe 49 and the shaft 33, is an air pipe 51. This air pipe 51, at its lower end, is connected to the pipe 49 leading into the space 41 in the T connection at the lower end of the oil tube 30. The upper end of the air pipe 51 is connected into a valve body 52 which has therein a chamber 53 directly connected to the pipe 51. Beneath the chamber 53 is a second chamber 54 and between the two chambers 53 and 54 is a valve seat 55 forming a passageway 56 through which air may pass from one chamber into the other. This passageway may be closed by means of a valve 57 located on the lower end of the valve stem 58 passing out through the top of the valve body 52. This valve stem is operated by means of a plunger 59 supported by a valve guide 60. The upper end of the plunger 59 is provided with the finger button 61. The chamber 54 is connected by an elbow to a T connection 62 which has a compressed air inlet 63. The other part of the T connection 62 is connected by means of an elbow to the valve body 50 which is constructed internally in every way similar to the mechanism found in the valve body 52. The valve in the body 50 is operated by means of a plunger 59a, which is supported by a valve guide 60a. On top of the plunger 59a is a button 61a. The upper ends of the valve stems found in the valve bodies 50 and 52 are threaded and have mounted thereon washers 50a and 52a and between each of these washers and the valve bodies are gaskets that prevent the escape of air when the valve is open.

In the use of applicant's flusher the nozzle 29 and the basin 23 are adjusted to the proper

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height. After these parts are properly adjusted should it be desired that the parts be cleaned by blowing air thereon, the button 61 is pressed to operate the valve 52 to open the passageway 56, so that air is emitted from the inlet 63 into the pipe 51. The air from this pipe 51 passes through the pipe 49 into the space 41 from which the air passes through the pipe 39 and out at the nozzle 29. The pressure of the air causes the ball 42 to close the passageway or entrance into the pipe 38 closing off the pump. When it is desired to apply flushing fluid the button 61a is pressed. This operates a mechanism located in the housing 50 similar to that in connection with the valve structure for the admission of air through the pipe 51. This air which enters the chamber 50 from the inlet 63 passes down through the pipe 49 for operating the air motor 47. This air motor 47 operates the shaft 33 for operating the pump, shown in Figure 2. The fluid taken from the container 1 first moves a ball 42 to close the opening in the end of the pipe 40 so that the fluid will pass up through the pipe 30, from this pipe 30, the fluid is forced out through the nozzle 29 or the nozzle 29a, shown in Figure 3.

For the purpose of transportation, the container is provided with handles 64 and swivel rollers 65. What I claim is:

1. In a crank case flusher, a container for a flushing liquid, an outlet from the container, a pump in the container for forcing the liquid through the outlet, an air motor in the container for operating the pump, a source of air, and means to connect the air to the motor or the outlet.

2. In a crank case flusher, a container for a liquid, a flushing tube leading out of the container, a pump in said container having an outlet connected to the tube, an air motor for operating the pump, an attachment in the container, said attachment having an inlet adapted to be connected to a supply of air under pressure, an outlet connected to the tube and a second outlet leading to the motor, means to cut the tube off from the pump outlet or the first named attachment outlet, and means extending from the attachment out of the container and operable on the air to determine whether liquid or air shall be discharged through the flushing tube.

3. In a crank case flusher, a container for a liquid, a flushing tube leading out of the container, a pump in said container having a pipe leading to the tube, an air motor in said container for operating the pump, an attachment in the container, said attachment having an inlet adapted to be connected to a supply of air under pressure, an outlet connected to the tube and a second outlet leading to the motor, a valve in each outlet normally closed by the air pressure thereon, and means extending from the valves to the outside of the container to open the valves to admit air to the motor or to the outlet connected to the tube.

4. In a crank case flusher, a container having a liquid in the lower end thereof, a filter can in the top of said container, an extensible tube leading from the liquid in the container to a point outside the container, means to catch the liquid after it has left the tube and return it to the filter can, an attachment in the container, said attachment adapted to be connected to a source of air under pressure, said attachment also being connected to the extensible tube, a pump in said container adapted to force the liquid from the container out through the ex-

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tensible tube, an air motor for operating said pump located in said container and an air connection between said attachment and the air motor, and means connecting with said attachment for directing the air to the extensible tube or to the air motor whereby a liquid pumping operation takes place or an air blowing operation takes place.

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