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FLUSHING DEVICE FOR ENGINE LUBRICATING SYSTEMS

Filed Feb. 13, 1945

2 Sheets-Sheet 1

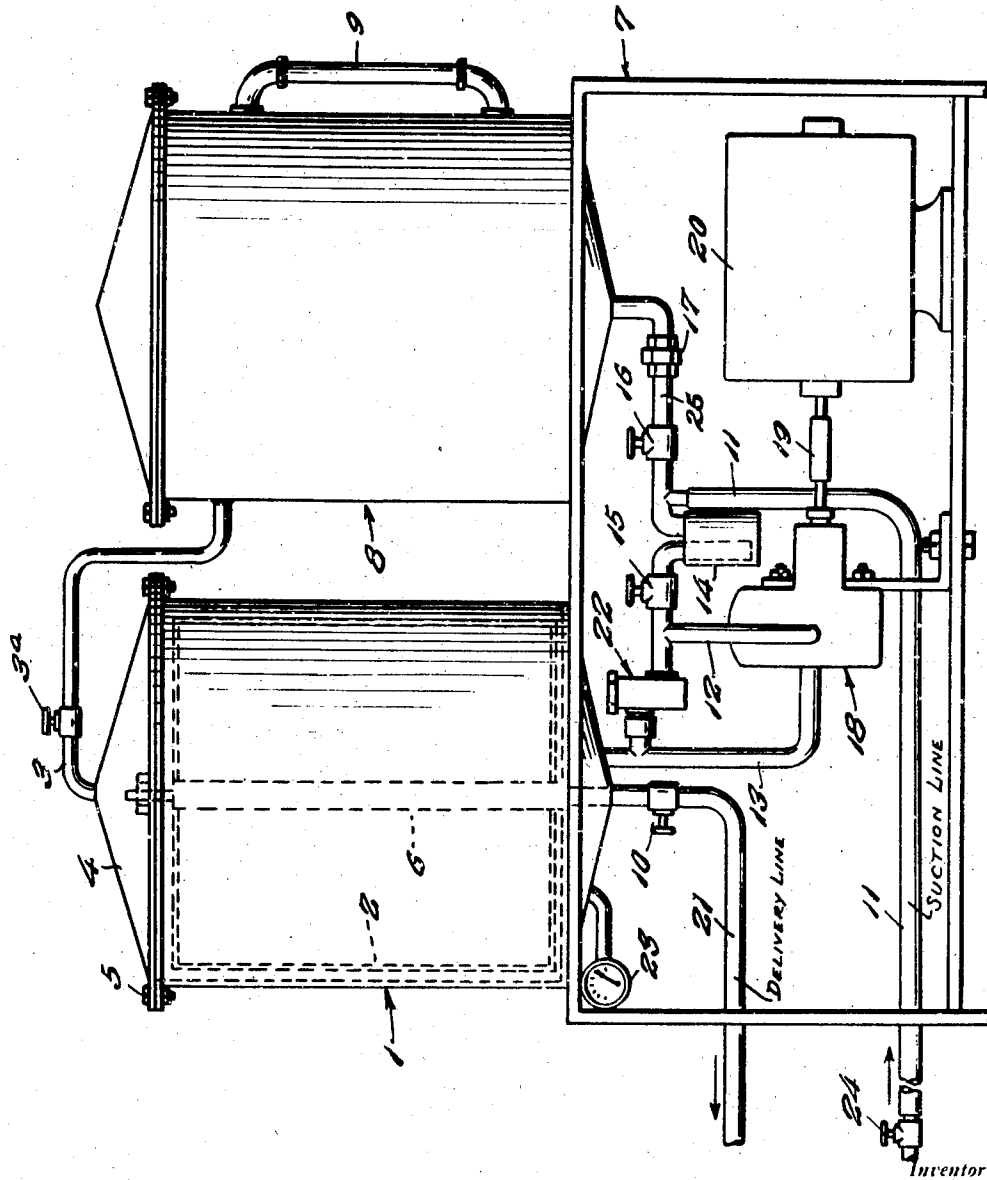


Fig. 1.

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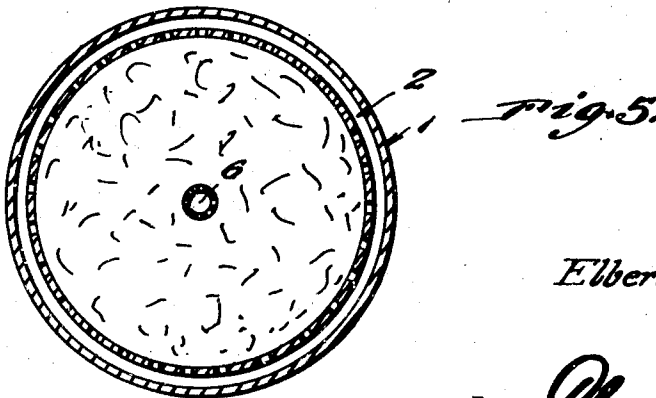
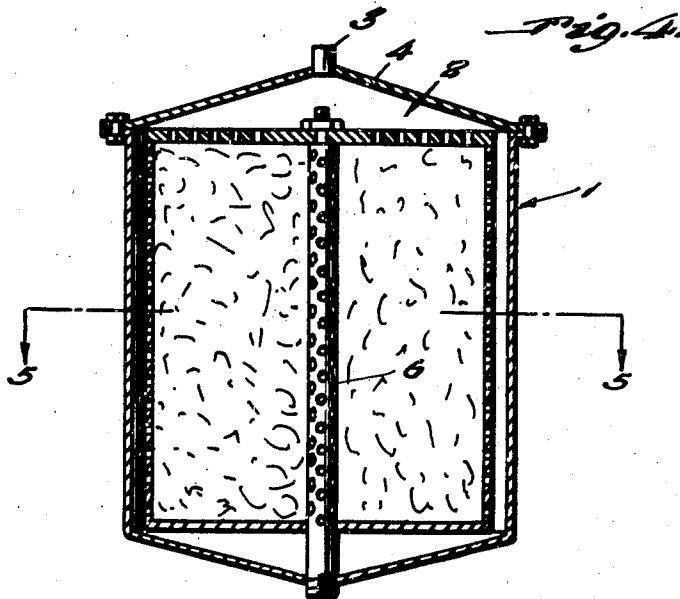
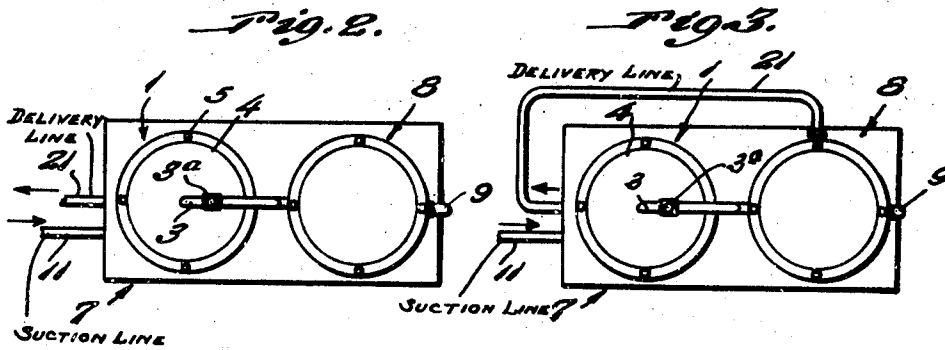
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2 Sheets-Sheet 2



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FLUSHING DEVICE FOR ENGINE
LUBRICATING SYSTEMS

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5 Claims. (Cl. 134-13)

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This invention relates to an apparatus or device which is expressly designed to forcibly circulate a given amount of oil and solvent in the lubricating systems of internal combustion engines, primarily so-called automobiles and trucks.

More specifically, the device is constructed to maintain a proper oil level while circulating oil through a filter, thus flushing out and removing carbon, sludge, water, dirt, varnish and other deposits, these being loosened by suitable solvent oils.

Briefly, the solvent oil is pumped from a suitable reservoir through a gear pump equipped with a by-pass valve to regulate proper pressure, is then pumped through a suitable large filter, and from the filter through a flexible hose to the engine filler neck. Then, when a proper amount of solvent oil has been pumped into the engine, the flow of oil is switched from the oil reservoir of my device to oil drain plugs of the engine by a flexible hose which circulates solvent oil through the engine, the engine running during this period, maintaining a proper level in the engine and flushing out and filtering dirt and deposit from the engine.

In carrying out the principles of the invention, I have evolved and produced a simple and expedient structural arrangement characterized by the aforementioned solvent reservoir and associated filter, these coacting with a single gear pump by way of appropriate valved pipe connections, and selectively usable hose lines, appropriately valved, and associated with said pipes to direct and properly regulate the circulatory steps.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a side elevational view of an apparatus constructed in accordance with the principles of the present invention;

Figure 2 is a relatively small top plan view of the assemblage seen in Figure 1, showing the valved delivery line leading to the crankcase;

Figure 3 is likewise a top plan view like Figure 2 showing the valved delivery line flexed around and connected to the solvent reservoir, for fluid return;

Figure 4 is a sectional and elevational view detailing the filter;

Figure 5 is a horizontal section on the line 5-5 of Figure 4, looking in the direction of the arrows.

Referring now to the drawings by distinguish-

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ing reference numerals, the oil filter tank is denoted at 1 and is provided on its interior (see Fig. 4) with an appropriate filtering cartridge unit 2 of the replaceable type as shown. The numeral 3 designates a vent pipe having a suitable control valve 3a, said pipe being connected with a reservoir to be hereinafter described. The tank 1 is provided with a conical cover 4 which permits access to be had to the filter for cleaning and repacking the filter unit or cartridge. This cover is held in place by bolts 5. The aforementioned filter unit 2 embodies a perforated tube 6 for discharging the clean oil, and this screws into the filter tank at the bottom.

A solvent-containing reservoir 8, together with tank 1 are supported on stand 7, as is clearly shown in Figure 1. Reservoir 8 includes a sight gauge 9 to show when the proper amount of solvent oil has been pumped from the reservoir to the engine crankcase (not shown). Numeral 10 denotes a valve closing the discharge of oil from filter tank 1, and section line 11 denotes a hose with a valve 24 on its outer end, said hose serving as the return line from the engine crankcase to the device, the purpose thereof soon to be more fully explained.

A pipe 12 connects with the gear pump 18, and a pipe 13 leads from the center of one side of the pump to tank 1, as shown in Figure 1. Numeral 14 denotes a relatively small filter or trap for large pieces of carbon and other foreign matter to prevent their passage into gear pump 18.

A valve 15 prevents the back flow of oil from filter 1 when cleaning the small filter trap 14. A pipe 25 connects to the bottom of reservoir 8 by means of a union 17 and terminates in trap 14. Suction line 11 terminates in T-connection in pipe 25 adjacent its point of entry into filter 14. A valve 16 in pipe 25, between suction line 11 and reservoir 8, controls the oil flow from the reservoir to filter tank 1.

A flexible drive connection 19 is provided between the electric motor 20 and the gear pump 18. A one-quarter horsepower electric motor will do, for a purpose later to be described.

Numerals 21 is a hose leading from tank 1 and serves as the delivery line for filtered oil from tank 1 to the engine, or as the return hose to the supply reservoir 8 as will appear hereinafter. A pressure regulating by-pass valve 22 is provided and is in communication with the pipes 12 and 13. This serves to by-pass oil from the discharge connection of the gear pump back to the inlet connection of said pump in case the pressure in the oil filter 1 exceeds the pressure setting of said

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pressure regulating by-pass valve. An oil pressure gauge is shown at 23, and is mounted on the conical bottom of the filter.

The flushing machine reservoir 8 is filled with solvent oil. With valve 24 closed and valves 15 and 16 and 10 open, and with hose 21 run back to reservoir 8 (see Fig. 3), motor 20 drives gear pump 18, pumping oil from reservoir 8 through valve 16 through small filter 14, through valve 15 to the inlet 12 of gear pump 18. It is then pumped through outlet 13 into filter tank 1, through filter element 2, filter outlet tube 6, valve 16, hose 21 and then back to reservoir 8. During the above circulation vent 3a is opened to permit the escape of air. When the filter is completely primed, vent 3a is closed and enough solvent added to reservoir 8 to bring the oil level to the top of gauge 9. The device is now ready for operation.

The used motor oil is now drained from crankcase of engine to be serviced. Then I connect valve 24 to the crankcase or receptacle drain with valve 24 closed. With the motor 20 shut off, I connect hose 21 to the receptacle with valves 16, 15 and 10 open. Then I start motor 20 and fill the engine crankcase with solvent until the connecting rods (not shown) will splash in solvent oil, while the engine is running. It is necessary to check the drain hole in the engine fly wheel cover to be sure that it is open so if any solvent oil should go into fly wheel housing it can drain out and avoid depositing of solvent oil on the clutch. When the proper oil level is attained in crankcase, valve 16 is closed and valve 24 is opened. This will permit oil to circulate from crankcase drain, through filters 4 and 2, back through valve 10 and hose 21 back to the engine. This procedure is maintained with the engine running until the solvent oil has loosened and carried out all possible dirt, carbon, gum, varnish, etc. There will be some foaming of oil in filter 1, which will have to be bled out of filter through vent valve 3a, back to supply reservoir 8, and thereby some solvent oil will be carried back to supply reservoir which will have to be pumped back to the engine crankcase by cracking valve 15 occasionally. When the crankcase becomes clean, the engine is turned off, and valve 10 is closed. Hose 21 is removed from the connected engine to supply reservoir 8. Valve 10 is opened and solvent oil in the crankcase is turned to supply reservoir 8. Then valve 24 is closed and line 11 is disconnected from the crankcase. Motor 20 is shut off and the engine crankcase is refilled with new motor oil.

A careful consideration of the foregoing description in conjunction with the invention as illustrated in the drawings will enable the reader to obtain a clear understanding and impression of the alleged features of merit and novelty sufficient to clarify the construction of the invention as hereinafter claimed.

Minor changes in shape, size, materials and re-arrangement of parts may be resorted to in actual practice so long as no departure is made from the invention as claimed.

I claim.

1. An apparatus for cleansing a crankcase of an engine and the like, comprising, a motor driven pump, a filtering device, a fluid storage chamber, and means including said pump for selectively circulating fluid for cleansing between said storage chamber and said filtering device and addi-

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tional means including said pump for optionally circulating fluid between said filtering device and said crankcase, and means for venting said filtering device to said storage chamber.

2. An apparatus for cleansing a crankcase of an engine comprising, a motor driven pump, a filtering device, a cleaning fluid storage tank having an outlet, a conduit between said storage tank outlet and the inlet side of said pump, a delivery passage from the discharge side of said pump to said filtering device, a delivery conduit from said filtering device to said crankcase and a return line from said crankcase to said conduit, and means for causing circulation of cleaning fluid from said pump to said filtering device, thence to said crankcase while the engine is running and thence to said inlet side of said pump, and a valve in said conduit said valve being operable to selectively admit additional fluid to said circulatory system.

3. An apparatus for cleansing a crankcase of an engine comprising, a motor driven pump, a filtering device, a cleaning fluid storage tank having an outlet, a conduit between said storage tank outlet and the inlet side of said pump, a delivery passage from the discharge side of said pump to said filtering device, a delivery conduit from said filtering device to said crankcase and a return line from said crankcase to said conduit, and means for causing circulation of cleaning fluid from said pump to said filtering device, thence to said crankcase while the engine is running and thence to said inlet side of said pump, and a valve in said conduit said valve being operable to selectively admit additional fluid to said circulatory system, and a sediment trap disposed in said connecting passage.

4. Means for cleansing an engine crankcase during operation of said engine comprising means for initially supplying cleaning fluid to said crankcase and means for cyclically withdrawing fluid from said crankcase, additional means for cleansing and filtering and releasing entrapped oil from said withdrawn fluid and returning said withdrawn and cleansed fluid while maintaining a constant fluid supply in said crankcase during engine operation.

5. A method of cleansing an engine crankcase comprising, supplying cleaning fluid to said crankcase, continuously withdrawing fluid from said crankcase while returning cleansed fluid thereto at a sufficient rate to maintain a constant quantity of fluid in said crankcase, promoting turbulence in said fluid in said crankcase by operating said engine and cleansing said withdrawn fluid preparatory to its return to said crankcase and intermittently releasing entrapped oil from said circulatory cleaning fluid.

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