Jan. 19, 1937. W. SCHWALGE 2,068,473

LUBRICATING OIL RECLAIMING APPARATUS

Filed Sept. 14, 1934

Fig. 1.

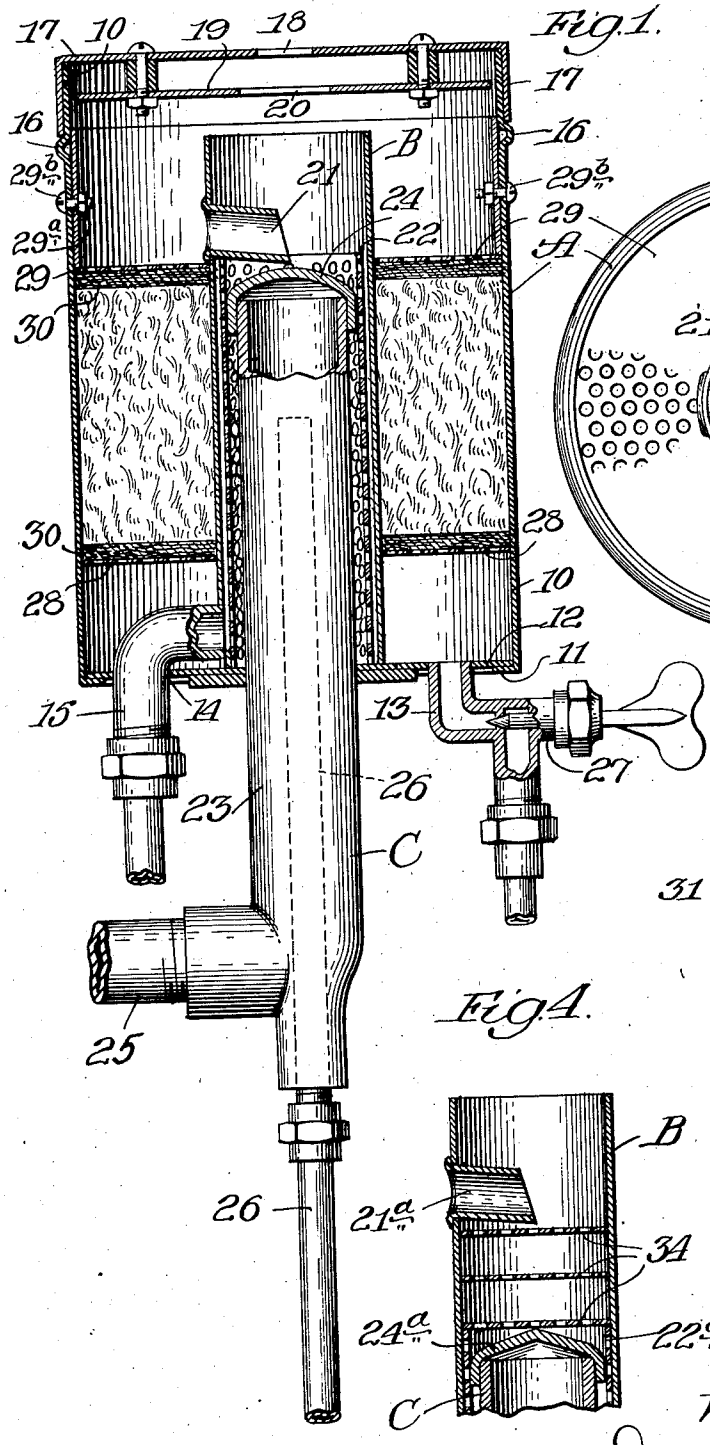


Fig. 2.

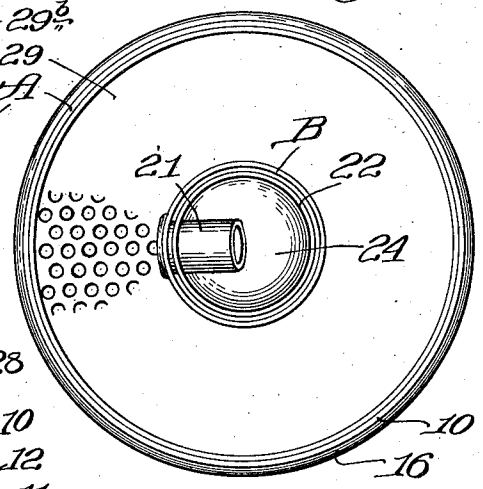


Fig. 3.

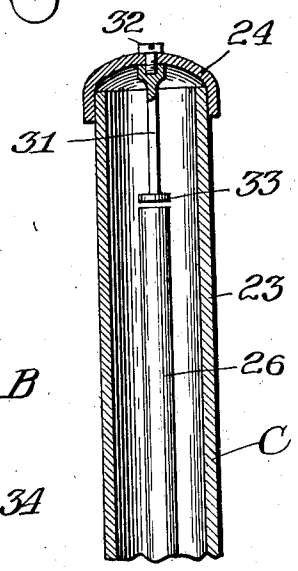


Fig. 4.

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LUBRICATING OIL RECLAIMING APPARATUS

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6 Claims. (Cl. 210—131)

This invention relates to lubricating oil reclaiming apparatus and more particularly to apparatus for reclaiming or purifying lubricating oils that have been employed in internal combustion engines or the like.

An object of the invention is to provide a lubricating oil reclaiming unit which is adapted to filter the oil and heat it to the point where gasoline, water, and other undesirable materials are removed. A further object is to provide a filtering and heating unit in compact form whereby it can be supported under the hood of an automobile or the like and employed to purify the lubricating oil in the crank case, etc. A further object is to provide a reclaiming unit which may be conveniently supported adjacent an internal combustion motor and in which the exhaust gases from the motor may be utilized for evaporating undesirable liquids in the oil. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawing, in which—

Figure 1 is a broken sectional view of a reclaiming unit embodying my invention; Fig. 2, a plan view of the unit with the cap removed; Fig. 3, a sectional detail view of another form of heating pipe showing a modified form of the invention; and Fig. 4, a sectional view of the modified form of heating and filtering mechanism.

In the apparatus illustrated in Figs. 1 and 2, A designates a cylindrical casing member; B, an inner cylindrical member; and C, a heating member housed within the inner cylinder B.

The casing A may be of any suitable construction. It is illustrated in the form of a metal cylinder **10** having an inwardly turned annular flange **11** at its bottom to which is secured a bottom plate. An inlet pipe **13** enters the bottom plate **12**, and the plate is also apertured at **14** to receive the outlet pipe **15**. At its upper side, the cylinder **10** is provided with a corrugation **16**. The portion above the corrugation **16** is adapted to receive a metal cap **17** which is apertured at **18**. The cap **17** is provided with a lower inner top wall **19** which is provided with an opening at **20** aligned vertically with the opening **18** of the top wall.

The inner cylinder B may also be of any suitable construction. It is shown in the form of a metal cylinder secured to the bottom plate **12** and extending upwardly to a point aligned with the corrugation **16**. The cylinder B is equipped with an inlet overflow pipe **21** and with an outlet pipe **15** which enters the cylinder preferably at a point just above the bottom plate **12**. If desired, the foraminous tube **22** may be placed within the cylinder B to aid in the breaking up of the streams of lubricant entering the inner chamber.

The heating member C is preferably in the form of a metal pipe or fitting **23** which extends within the cylinder B and which is provided with a cap **24** sealing the upper end of the pipe. The pipe **23** is provided with an intake pipe connection **25** through which exhaust gases from the combustion motor may be passed. An outlet pipe connection **26** for the exhaust gases extends through the bottom of the tube **23**, as indicated in dotted lines in Fig. 1.

The oil inlet pipe **13** is preferably provided with a valve, as indicated by the numeral **27**, by which the volume of flow to the reclaiming apparatus can be controlled. If desired, the reclaiming apparatus may be fed from a by-pass oil line so that only a portion of the lubricating oil employed in the motor is treated at a time, the remainder of the oil being sufficient for the normal operation of the motor.

The filtering material is preferably supported within the container as follows: A pair of perforated plates **28** and **29** are supported within the casing A in spaced relation and between them is placed filtering material **30** of any suitable material, such as cotton waste, mineral wool, etc. A retaining ring **29a** is placed above the plate **29** and is secured to the outer cylinder **10** by means of bolts **29b**.

If desired, an electric resistance element may be employed to supply the heat within the pipe **23**, the current for the element being generated by the motor.

In the operation of the device, lubricating oil is passed from the crank case or oil by-pass line through the valve controlled inlet pipe **13** into the outer chamber formed between the casing walls A and B. The oil is passed upwardly through the perforated plate **28**, filtering material **30** and perforated plate **29**. The filter oil then flows through overflow pipe **21** into the inner chamber afforded by cylinder B, where it comes in contact with the heating pipe **23**. The oil flows downwardly about the heating pipe **23** and the perforated tube **22** to the bottom of the chamber where it is drawn through outlet pipe **15**. To heat the pipe **23**, exhaust gases from the motor are drawn through inlet pipe **25** and pass through the elbow of the fitting into the vertical

pipe chamber and are withdrawn therefrom through outlet pipe 26.

In the modification shown in Fig. 3, a thermostatic or expansion element 31 is secured to the cap 24 by screw 32. The element is equipped at its lower end with a valve member 33 which closes or partially closes the opening to the outlet pipe 26 when the element 31 is expanded. When the heat of the exhaust gases becomes excessive, the element 31 will expand and close the outlet pipe 26 or reduce the flow of gases therethrough so as to reduce the temperature of the heating pipe 23.

In the modification shown in Fig. 4, three perforated plates 34 are supported between the overflow pipe 21^a and the cap 24^a and serve to distribute the oil in drops evenly over the deflector cap 24^a. It will be noted that the cap is pointed and that its sides engage the perforated tube 22^a.

It will be observed that the gasoline, water, or other vapors passing off from the heated oil may escape through the aligned openings 20 and 18 of the cap 17.

The reclaiming unit, as described, is very compact in form and may be supported conveniently below the hood of an automobile and near the exhaust pipe thereof, to which suitable connections can be made for passing the exhaust gases through the heating pipe. By connecting the oil feed line with the by-pass line, only a small portion of the lubricant will normally be passed through the apparatus so that, even if clogging should occur within the apparatus, sufficient lubricating oil will be supplied to the bearings of the motor. The filtering of the incoming oil prior to its contact with the heating element protects the heating chamber and prepares the oil for the heat treatment, the cleaned oil responding much more readily to the action of heat in removing water, gasoline, etc.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. In apparatus of the character set forth, adapted for use with an internal combustion motor, a pair of concentric cylinders closed at their lower ends, a perforated cap for said outer cylinder, said cylinders providing an inner chamber and an outer chamber, filtering means supported in said outer cylinder, a pipe extending into said inner chamber, connections between said pipe and the exhaust manifold of said motor whereby the exhaust gases pass through said pipe, means for sealing the inner end of said pipe, a foraminous tube extending about said pipe, an overflow pipe establishing communication between the outer and the inner chambers, an inlet through which oil may be passed into said outer chamber, and an outlet pipe communicating with the bottom of said inner chamber.

2. In apparatus of the character set forth, a pair of nested receptables providing inner and outer chambers, filtering means supported in said outer chamber, heating means supported in said inner chamber, an overflow pipe connecting said outer chamber and said inner chamber, a perforated plate supported in said inner chamber below said overflow pipe and above said heating means, means for passing oil through said outer chamber, and means for withdrawing oil from said inner chamber.

3. In apparatus of the character set forth, a pair of nested receptacles providing inner and outer chambers, filtering means supported in the outer chamber, a heating pipe supported in said inner chamber, said pipe being provided with a cap closing the upper end thereof, an overflow pipe establishing communication between the outer chamber and the inner chamber, and a plurality of spaced perforated plates extending across said inner chamber between said overflow pipe and said cap, means for passing oil through said outer chamber, and means for withdrawing oil from said inner chamber.

4. In apparatus of the character set forth, a pair of nested receptacles providing inner and outer chambers, filtering means supported in the outer chamber, a heating pipe supported in said inner chamber, said pipe being provided with a cap closing the upper end thereof, an overflow pipe establishing communication between the outer chamber and the inner chamber, and at least one perforated plate extending across said inner chamber between said overflow pipe and said cap, means for passing oil through said outer chamber, and means for withdrawing oil from said inner chamber.

5. In apparatus of the character set forth, a pair of nested receptacles providing inner and outer chambers, filtering means supported in the outer chamber, a heating pipe supported in said inner chamber, said pipe being provided with a cap closing the upper end thereof, an overflow pipe establishing communication between the outer chamber and the inner chamber, a plate within said inner chamber for spreading the oil in a thin film within said inner chamber to promote evaporation, means for passing oil through said outer chamber, and means for withdrawing oil from said inner chamber.

6. In apparatus of the character set forth, a pair of nested receptacles providing inner and outer chambers, filtering means supported in the outer chamber, a heating pipe supported in said inner chamber, said pipe having its upper end closed, an overflow opening between said inner and outer chambers, means within said inner chamber for directing the overflowing oil to the central portion of the top of said heating pipe to cause said oil to flow evenly about said heating pipe, means for passing oil through said outer chamber, and means for withdrawing oil from said inner chamber.

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