May 30, 1933. A. A. KNOWLES 1,911,758

OIL RECTIFIER AND LUBRICATOR

Filed Sept. 9, 1930

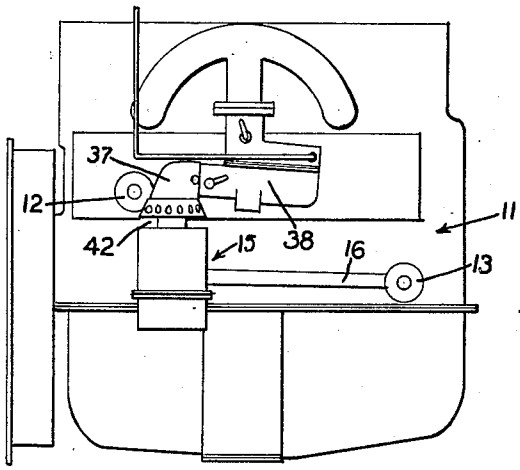


FIG. 1.

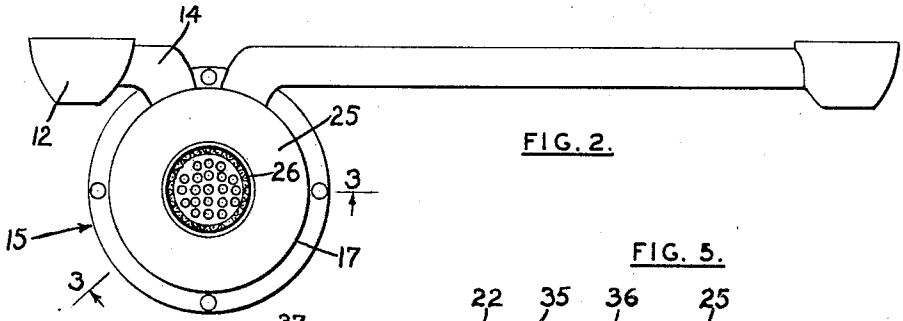


FIG. 2.

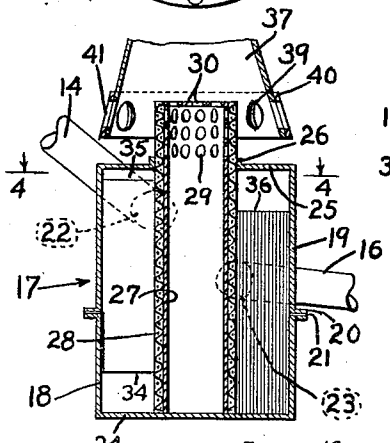
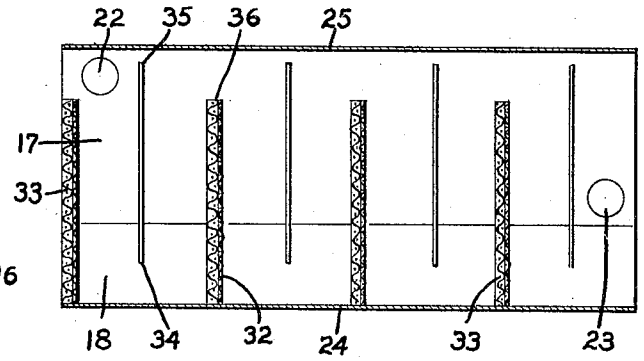


FIG. 3.

FIG. 5.



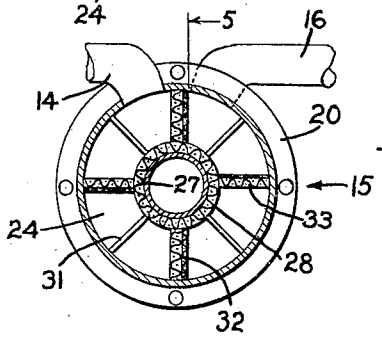


FIG. 4.

INVENTOR
A.A. KNOWLES
BY Hazard and Miller
ATTORNEYS

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UNITED STATES PATENT OFFICE

AUGUSTUS A. KNOWLES, OF LOS ANGELES, CALIFORNIA

OIL RECTIFIER AND LUBRICATOR

Application filed September 9, 1930. Serial No. 480,642.

My invention relates to an oil rectifier and lubricator for internal combustion engines, principally of the automobile type, adapted to handle the crank case oil and to remove the gasoline or other dilution, and also to cause the conveying of a certain amount of lubricating oil with the gasoline fuel into the combustion chambers of the cylinders.

It is well known that the crank case oil of an internal combustion engine, such as an automobile engine, becomes diluted through the unburnt gasoline vapors penetrating past the pistons into the crank case. In certain cases the oil becomes so diluted as to lose its lubricating value. An object, therefore, of my invention is to flow the crank case oil through a rectifying device and subject the oil to a suction action, this suction removing the volatile dilutant from the crank case oil.

Another object of my invention is connecting the rectifier to the intake manifold and, preferably, making a connection to the air intake to the carburetor so that the suction on the rectifier is through the medium of air flow through the carburetor. This air flow functions, as above mentioned, to remove the vapors of the dilutant of the crank case oil and also to carry vapors of the oil and small particles thereof through the carburetor and the intake manifold to the combustion chambers of the engine, the volatile dilutant burning as a gas and the crank case or engine oil acting as a lubricator for the pistons.

Another detail feature and object of my invention is the mounting and connection of the rectifier on the outside of an engine block so that the oil pumped through a circulating system will flow through the rectifier and by means of wicks the dilutant and a certain amount of the oil flows upwardly and is exposed to a suction action of the carburetor intake, such intake being adjustable to increase or decrease the suction on the wicks.

Another detail feature of my invention employs a rectifying device which is formed in an upper and lower section, the lower section being readily removable with the wicks to allow cleaning.

My invention in illustrated in connection with the accompanying drawing, in which:

Fig. 1 illustrates a side view of an engine block showing my rectifier and lubricator in side elevation.

Fig. 2 is a plan of the rectifier with the connecting oil pipes removed from the engine.

Fig. 3 is a vertical detail section on the line 3—3 of Fig. 2 in the direction of the arrows.

Fig. 4 is a horizontal detail view on the line 4—4 of Fig. 3 in the direction of the arrows.

Fig. 5 is a developed vertical section starting and ending on the section line 5 of Fig. 4.

My invention is illustrated in connection with a Ford model A engine, the engine block being designated by the numeral 11. This engine block is provided on the outside with a cup structure 12 connected to oil ducts or pipes on the inside, the oil being forced outwardly and then carried through a pipe not illustrated to a second cup structure 13, the oil flowing again into the engine block. In my construction I utilize these cup structures 12 and 13 which may be attached to the engine block in any suitable manner forming a connection to form an oil tight seal with the oiling system connections of the engine, and have a pipe 14 which leads from the outlet 12 of the engine block to the rectifier designated generally by the numeral 15. A second pipe 16 leads from the rectifier to the cup structure 13 and thus the oil circulates and flows back to the engine.

The rectifier is preferably made in the form of a cylinder 17, this having a lower or base section 18 and an upper section 19 with connecting flanges 20, there being a gasket 21 between these flanges. The flanges are secured by bolts to allow ready separation for cleaning of the rectifier as hereinunder detailed. The pipe 14 leads into the upper portion of the rectifier as indicated

at 22 and the return pipe 16 is connected to the upper part as indicated at 23.

The rectifier has a base 24 and a top 25, such top having an opening 26 with a slight flange or rim at such opening. A metal tube 27 extends from the base 24 upwardly through the opening 26 and on the outside of this tube there is a fabric wick 28. The tube has perforations 29 at the top and also has a top closer 30 provided with perforations. Inside of the rectifier there are a series of radial partitions 31 which extend inwardly from the outer wall and are attached to the upper section 19 at the sides. These partitions lightly touch the central wick 28. There are a series of secondary radial partitions 32 which also extend inwardly from the outside of the wall and are connected to the base structure 18 at the side walls and at the bottom 24, and these form a support for vertical wicks 33, which wicks are attached to the partitions 32, such partitions being formed of wire netting.

It will be noted that the partitions 31 have their lower edge 34 terminating some distance above the bottom 24 and their top edge 35 spaced from the top 25. The oil flow through the device is by means of the pipe 14 where it enters at the top. The oil then follows a somewhat zig-zag up and down path, flowing underneath the lower edge 34 of the partitions 31. Some of the oil flows upwardly over the top 36 of the partitions 32 having the wicks 33 attached thereto but a certain amount of this oil flows directly through the wick and through these partitions, which are formed of a gauze or wire netting. The oil flows out through the lower portion of the case through the pipe 16, such pipe, however, being above the joint of the removable base. If the pressure of oil is excessive a certain amount of this will by-pass over the top 35 of the partitions 31. In this circulation of oil around the container the wicks carry the oil upwardly by capillary attraction and the radial wicks conveying the oil laterally to the central wick 28. As this wick extends above the top of the casing it is exposed to an air suction action.

This air suction is due to the action of the engine, and I provide a hood or cover 37 which may be attached directly to the air intake of a carburetor 38. The hood is somewhat conical in shape, having a diverging skirt with a series of perforations 39 therethrough. A rotatable ring 40 also having a series of perforations 41 is mounted on the outside of the skirt of the hood and the opening may be varied by the alignment or disalignment of the perforations. The bottom of the hood is also spaced from the top of the rectifying device by a space indicated at 42. The air suction created by the engine through the carburetor causes air to flow over the exposed part of the central wick and such air flow causes the evaporation of the volatile constitutents of the crank case oil, these being principally the dilution of gasoline vapors, and a rapid flow of air also carries a certain amount of the lubricating engine oil. This passes through the carburetor, a certain amount burns and the remainder acts as a lubricant for the upper part of the cyiinders and the pistons.

The perforations in the top of the tube 27 cause a certain amount of air to be drawn transversely through the upper part of the wick, thus conveying more of the oil vapors and oil particles to the carburetor intake.

The manner in which I build up the rectifier allows its ready disassembling by removing the base or lower section for cleaning, and it is an important characteristic of my invention that the rectifier acts as an oil filter or cleaner and, therefore, requires to have the base cleaned out periodically to remove the sediment. I find that the wicks remain comparatively clean due to the washing action of the oil. The rectifying action results from the readily volatile vapors, such as a gasoline dilutent, being vaporized or gasified by the flow of air over the upper portion of the wick, and also by the light constituents of the lubricating oil also becoming vaporized due to the exposure of a portion of the oil to the air flow. The general tendency, therefore, of my rectifier is to maintain the viscosity of the lubricating oil so that its lubricating characteristics remain substantially constant.

I find with my rectifier that the cylinder oil does not need to be changed so often, and if the proper oil level is maintained the oil may be used for a long period of time.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. An oil rectifier having a shell with a wick therein, said wick having a portion exposed to the air outside of the shell, means to flow oil in and out of the shell and in contact with the wick, and an air draft means connectible to the intake of an engine to create an air suction adjacent the exposed part of the wick.

2. An oil rectifier having a shell with a central wick, the upper part exposed above the shell, and a series of radiating wicks extending laterally therefrom, means to flow oil in and out of the shell in contact with the wicks, and an air suction means adapted for connection to the intake of the engine and disconnected from the shell to create an air suction adjacent the exposed part of the central wick.

3. An oil rectifier as claimed in claim 15, the said shell having a series of partitions

between the radiating wicks, said partitions creating a zig-zag path for the flow of oil, the said radiating wicks having a foraminous support, the oil being adapted to flow through the radiating wicks and through the support.

4. An oil rectifier having a shell with an upper section and a removable base, a central wick connected to the base and having a top exposed above the upper part, a series of radiating wicks connected to the base, means to flow oil in and out of the shell and in contact with the wicks, the said wicks being removable with the lower part of the shell, and an air suction means adapted for connection to the intake of an engine and disconnected from the shell to create a suction adjacent the exposed part of the central wick.

5. An oil rectifier having a cylindrical shell with a base and an upper portion attachably connected together, a central tube extending upwardly from the base, the upper portion having a top with the said tube extending therethrough, a central wick surrounding the said tube and extending above the top, a series of radiating wicks connected to the base and contacting with the central wick, means to flow oil in and out of the shell in contact with the wicks, and an air suction hood adapted for connection to the intake of an engine and disconnected from the shell and for positioning adjacent the exposed part of the central wick.

6. An oil rectifier as claimed in claim 5, the said shell having a series of radiating partitions connected to the upper part, said partitions terminating above the base and below the top and adapted to give a zig-zag flow to the oil.

7. An oil rectifier having a shell with a top closure having an opening therein with a wick in said opening, means to direct a flow of oil through the shell to contact with the wick, means positioned above the shell and over the wick to direct a flow of air against the exposed portion of the wick, and an inlet and outlet for oil in the shell.

8. An oil rectifier comprising a shell having a top closure with an opening therein, a tubular wick extending upwardly through said opening with means to support the interior of such wick, means positioned above the shell to direct a flow of air against the exposed portion of the wick, and an inlet and outlet for oil in the shell.

9. An oil rectifier having a cylindrical shell with a bottom and top closure, the top closure having a circular opening, a supporting tube extending upwardly through this said opening, a tubular wick mounted thereon and extending through the opening, the upper part of the tube being perforated, means to direct a flow of air against the exposed portion of the wick, and an inlet and outlet for the oil in the shell.

10. An oil rectifier as claimed in claim 9, a plurality of radial wicks connected to the bottom of the shell and touching the central wick and the outer periphery of the shell, the outlet for oil being connected to the shell below the top of said wicks.

11. An oil rectifier as claimed in claim 9, a plurality of radial wicks connected to the bottom of the shell and touching the central wick and the outer periphery of the shell, the outlet for oil being connected to the shell below the top of said wicks, and a series of radial partitions spaced from the bottom of the shell to effect a zig-zag flow of oil in passing around the central wick, the inlets and outlets for oil being positioned to effect a flow of oil partly around the central wick.

In testimony whereof I have signed my name to this specification.

A. A. KNOWLES.