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OIL RECTIFIER.

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To all whom it may concern:

Be it known that I, WILLIAM G. WALL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Oil Rectifiers, of which the following is a specification.

My said invention relates to an oil rectifier for use in automobiles and it is an object of the same to provide a device of this character which shall remove impurities such as dirt, water, gasoline, kerosene and particles of metal from the oil in the crank case of the engine. It is well-known that such impurities are a source of danger to the engine on account of possible burning out of bearings and scoring of cylinders and they are also a source of excessive wear which is detrimental to the life of the engine. A slight amount of dilution of the oil due to the presence of a very small percentage of the heavier fractions of kerosene is, however, distinctly advantageous in cold weather and is detrimental to only a very slight degree in warm weather so far as the lubrication is concerned.

Another object of the invention is to provide an oil rectifier which may be connected to the carbureter, as it requires but a low degree of vacuum or only a relatively slight amount of suction as compared with previously known devices of this character. It is known to be objectionable to connect an oil rectifier to the intake manifold as is customary since such connection due to the breaking of the vacuum in the intake manifold is apt to cause sensitive engines to miss when idling and this is objectionable. Furthermore the suction effect on the pipe leading to the oil rectifier from a point adjacent the throttle valve is greatest when the engine is running slowest with no load and therefore the oil is drawn through the device faster at slow speeds. The heat in the exhaust increases with increasing speed of the engine while the flow of oil decreases and therefore there is danger of too much distillation at high speeds and too little distillation at low speeds in cases where the connection is to the intake manifold.

A further object of the invention is to provide means for removing the mechanical particles or foreign matter, preferably before the distillation takes place.

Referring to the accompanying drawings

which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a side elevation of an engine with my device connected thereto.

Figure 2, a central section through the oil rectifier, and

Figure 3, a horizontal section on line 3—3 of Figure 2.

In the drawings reference character 10 indicates an engine of conventional character having a carbureter 11. An oil pump 12 is provided for circulating the oil through the parts to be lubricated, a pipe 13 leading from the crank case to the pump and a pipe 14 leading from the pump to the cylinders and other parts to be lubricated.

A branch 15 extends from the pipe 14 to a chamber 16 in the lower part of the rectifier having a port 17 through which the oil enters from the branch 15, it being understood that the pump regularly forces a certain part of the oil through the branch 15 to purify it. The chamber 16 provides a settling basin for the oil with a drainage outlet 18 connected to a threaded port 18' at the bottom for removal of the heavier impurities such as dirt and particles of metal accumulating therein and is provided above the port 17 with a metallic screen 19 above which is a fabric screen 20, these parts being held between a shoulder on the main shell 21 of the rectifier and the removable bottom piece 22 of the chamber 16 in the embodiment of the invention here illustrated.

A pipe 23 extends upward from the chamber 16 to the main chamber 24 of the device said pipe being closed at its upper end by a valve 25 supported by a thermostatic strip of metal 26 of such a character that excessive heat in the chamber 24 will bend the strip upward at its free end to lift the valve 25 out of the pipe 23 so as to afford free passage for the oil through a siphon hereinafter described. This action is of importance if the oil reaches too high temperature in the chamber 24, the temperature of the oil being regulated by the rate of its flow. Normally the oil passes from the pipe 23 into the chamber 24 through a relatively small opening at 27 under the action of suction from the carbureter 11 which transmits its suction effect through a pipe 28 to a passage 29 at the upper end of the

chamber 24. The thermostatic strip is held in place by a screw in a manner to permit adjustment so that the valve will register with the pipe 23.

5 An air line 30 is supported centrally of the chamber 24 said line connecting with the outer air through a passage 31. The air line passes upward through a hole in the strip 26 which is fixed in position by a screw 32 and is closed at its upper end by a valve 33 which has a conical part at its upper end adapted to seat in the conical port 34 at the entrance to the passage 29. For this purpose the valve is fixed to a float 35 in any convenient manner, the float being raised by the oil as the liquid level rises in the chamber 24 so as to open the passage through pipe 30 from the outer air. A passage 38 leads from the chamber 24 to a siphon 36 connected to the rectifier at 37, the siphon leading back to the crankcase. The valve 33 aids the action of the siphon when the chamber becomes filled to a sufficiently high level, by cutting off the suction through the passage 29 and restoring normal air pressure in the chamber 24. At the same time it prevents any possibility of oil being drawn through passage 29 to the carbureter.

30 The air that is drawn through the passage 29 by the suction from the carbureter carries with it the gasoline and other vapors distilled from the oil in chamber 24 by the heat imparted thereto from the jacket 40, which jacket is connected to the exhaust at 41.

The operation of my device will, it is thought, be understood from the foregoing description but may be briefly summarized as follows. The oil is forced into the chamber 16 positively by the pump 12, the lower portion of the chamber forming a settling basin to receive the dirt and metallic particles which settle out of the oil and which may be drawn off at appropriate times through the drain passage 18. The oil then passes through screens 19 and 20 which act with great efficacy because the oil is heated to nearly the same temperature in the settling basin as in the chamber 24. From the upper part of the chamber 16 the oil passes through pipe 23 and port 27 directly to the chamber 24 except when it is heated to an excessive extent when the thermostatic strip 26 will open the valve 25 to permit the oil to pass in full volume through the pipe 23. A slightly smaller proportion of the oil from the pump now goes through the main passage 14, and a little more through passage 15 owing to the decreased resistance in the pipe 23. As the chamber is filled the float 35 will rise opening the passage 30 and then closing passage 29. The distillation chamber is now substantially filled with oil, which rises above

the bend in pipe 36 whereupon the siphon action begins. The suction being cut off at 34 by the valve 33 and the passage 30, 31 being opened the normal air pressure is restored in the chamber 24 and the oil passes off through the siphon more rapidly than it is forced in through the pipe 23 with the result that the chamber is soon emptied whereupon the chamber 24 again begins to fill and the action is repeated.

As the speed of the engine increases the pressure of the oil pump increases to heighten the flow of oil. At the same time the vacuum in chamber 24 is increased as is also the heat from the exhaust. As all factors increase (or decrease) in unison the action of the rectifier must be uniform and reliable.

By using a siphon to return the oil to the crankcase, and eliminating the valve heretofore used in oil rectifiers I provide for a constant suction of air through the oil during the process of distillation, which makes the distillation more rapid and complete. The slight vacuum thus caused above the oil in the distillation chamber also helps to make the distillation efficient and complete.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. An oil rectifier for engines comprising a refining chamber, and a pipe having one end connected to said chamber and having its other end connected to the fuel inlet passage at the side of the throttle valve remote from the engine, substantially as set forth.

2. An oil rectifier for engines comprising a distillation chamber, a sediment chamber adjacent the distillation chamber, an inlet for oil into the sediment chamber, an outlet for oil from the distillation chamber, a strainer for the oil in the sediment chamber, and a pipe having one end connected with the distillation chamber said pipe having its other end connected to the fuel inlet passage at the side of the throttle valve remote from the engine, substantially as set forth.

3. An oil rectifier comprising a distillation chamber, means for supplying oil to the chamber, means for heating the chamber, means connected to the carbureter for withdrawing from the chamber the gases evolved therein, automatic means for withdrawing the purified oil from the chamber at intervals, comprising a siphon, substantially as set forth.

4. An oil rectifier comprising a distilla-

tion chamber, means for supplying heat to said chamber, a siphon for withdrawing oil from the chamber, suction means for withdrawing the gases evolved from the oil, a
5 pipe in the chamber connected to the atmosphere, a valve normally closing said pipe and a float in the chamber connected to said valve to operate the same, substantially as set forth.

10 5. An oil rectifier comprising a distillation chamber, means for supplying heat to said chamber, a siphon for withdrawing oil from the chamber, suction means for withdrawing the gases evolved in the chamber,
15 a pipe in the chamber connected to the atmosphere, a valve normally closing said pipe, and a float in the chamber connected to said valve to operate the same said float also controlling the suction means, substantially as set forth.

20 6. An oil rectifier comprising a chamber,

a settling basin below said chamber, means for supplying oil to the settling basin, a pipe extending from the settling basin to the chamber, large and small ports between
25 said pipe and said chamber, a valve closing the larger port, and thermostatic means controlling said valve, substantially as set forth.

7. An oil rectifier comprising a distillation chamber, means for supplying oil to said chamber, large and small passages connecting the oil supplying means to the chamber, a valve controlling the larger passage, and thermostatic means for operating
35 said valve, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana this 3rd day of February, A. D. nineteen hundred and twenty-five.

WILLIAM G. WALL. [L. s.]