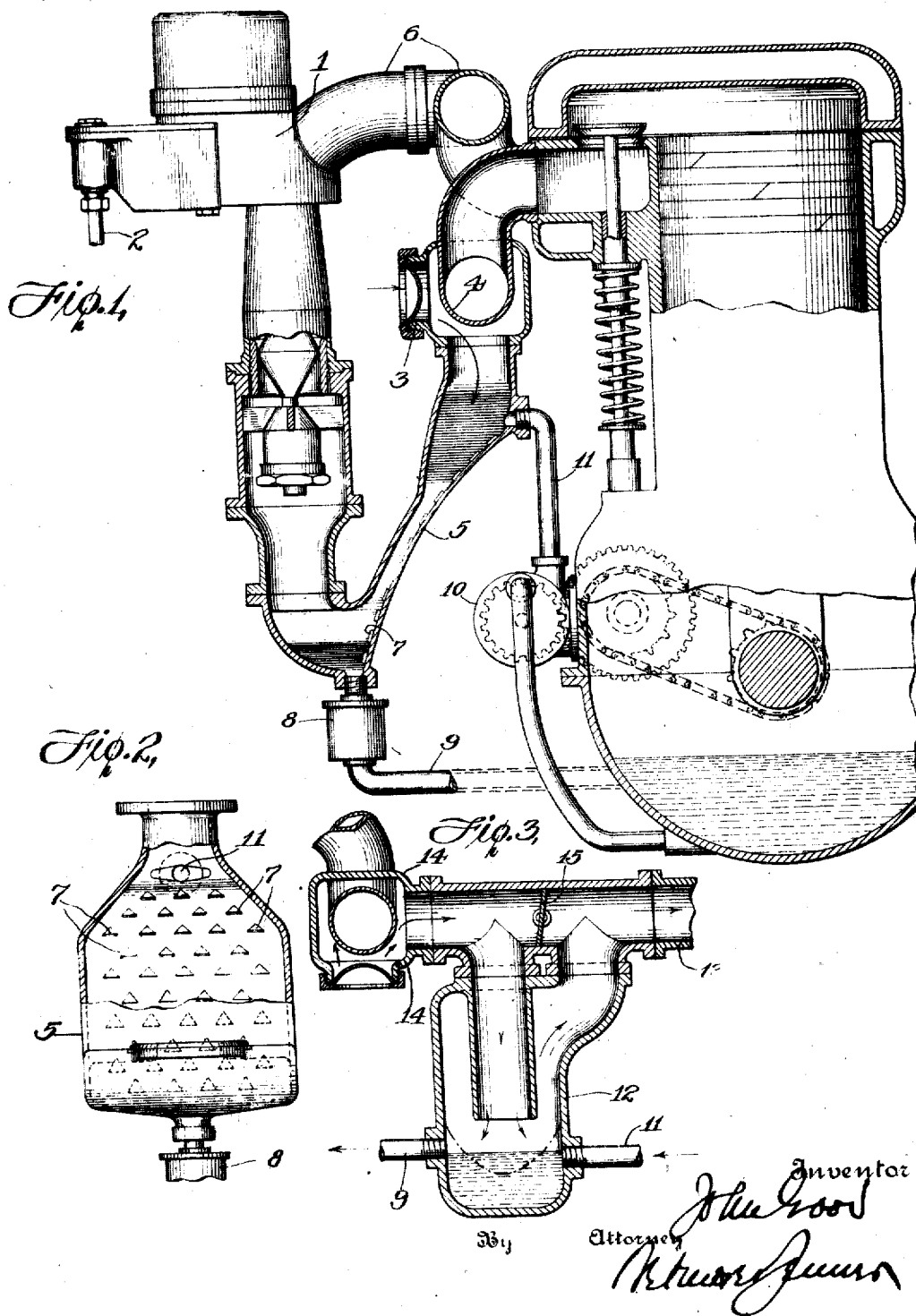


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 COMBUSTION ENGINE OIL PURIFIER.
 APPLICATION FILED FEB. 15, 1917. RENEWED MAY 31, 1918.
 1,369,803. Patented Mar. 1, 1921.



UNITED STATES PATENT OFFICE.

JOHN GOOD, OF BROOKLYN, NEW YORK

COMBUSTION-ENGINE OIL-PURIFIER.

1,369,803.

Specification of Letters Patent.

Patented Mar. 1, 1921.

Application filed February 15, 1917, Serial No. 148,807. Renewed May 31, 1918. Serial No. 237,823.

To all whom it may concern:

Be it known that I, JOHN GOOD, a United States citizen, residing in Brooklyn, New York, have invented the following described
5 Improvements in Combustion-Engine Oil-Purifiers.

The invention is directed to improvements in the means of eliminating the contamination of the lubricating oil in internal combustion engines, which has occurred therein from admixture with the liquid fuel escaping past the pistons into the engine crank case, and the invention consists in means for bringing the contaminated lubricating oil into intimate contact with a current of air or other gaseous medium, preferably in the presence of heat, for the purpose of evaporating off the fuel liquid therein which is more volatile than the lubricating oil. The invention also consists in the utilization of the exhaust gas heat of the engine, either directly or indirectly as a source of heat to facilitate the evaporation and also in the returning of the so evaporated fuel back to the combustion space of the engine and in other features which will be made apparent to those skilled in this art from the following description.

In the accompanying drawings:

30 Figure 1 represents in vertical section a preferred form of this invention with the appurtenant engine parts shown more or less in diagram;

35 Fig. 2 is a side elevation partly in section of the vaporizing chamber; and

Fig. 3 is a section of a modified form of evaporating chamber.

The engine shown in Fig. 1 may be assumed to be any ordinary internal combustion engine supplied with charge mixture of liquid fuel and air, in suitable proportions, from a charge-forming device 1, to which the liquid fuel is supplied by a pipe 2. Such fuel may be assumed to be any fuel
45 such as heavy gasoline, kerosene, or the like, which when mixed with and retained in the lubricating oil impairs its lubricating qualities and is therefore dangerous to the engine bearings. The air component of the charge mixture enters from the atmosphere through the box or stove 3 which surrounds the engine exhaust pipe 4 and is thereby heated sufficiently for the purposes of this invention. The degree of heat so applied may be greater or less according to the volatility of the engine fuel and other conditions and

may be supplied solely by the exhaust gas or by other and independent means. From the stove 3 the air, heated or otherwise, passes through an evaporating chamber 5 to the intake side of the charge-forming device. In the latter it is mixed with the fuel and the charge mixture passes thence through the manifold pipe 6 to the inlet valves which do not appear in the drawing. The evaporating chamber 5, which thus constitutes part of the suction intake of the engine, is a wide, shallow chamber with a curved or sloping floor which is provided with protuberances 7 to increase its superficial floor area. Lubricating oil from the engine crank case is delivered at the top of the evaporating chamber, through the pipe 11, so as to spread out and flow downward over the floor in distended and substantially film form, finding an outlet from the chamber through the filter 8 connected to its bottom and thence into the return pipe 9 from which it may flow back to the crank case or elsewhere as desired. The oil circulating system includes an engine-driven pump 10, drawing oil from the oil space in the crank case and delivering it through the pipe 11 to the evaporating chamber but it will be apparent that, depending upon the conveniences of engine design, the circulation may be established by other means, by pump alone or by pump and gravity. It will also be apparent that the shallow and relatively high velocity air current in contact with the distended oil film in the evaporating chamber will evaporate the relatively volatile fuel therein and carry it off to the charge-forming device, while the oil freed from this contamination will be returned to the lubricating system of the engine. When the engine fuel is fairly volatile the heating means for the air may be omitted as above stated, in which case the evaporation will result in a marked and desirable cooling effect upon the oil, but with heavy fuel and particularly kerosene, a heated gaseous medium is advisable and constitutes an important feature of the invention; the heat imparted to the main body of oil is largely absorbed by the evaporating process, and of course the usual oil cooler, commonly used in combustion engines may also be employed in connection with this invention if desired.

Referring to Fig. 3, the modification there shown consists in forcibly directing some or all of the gaseous evaporative fluid into di-

rect impinging contact with the surface of a body of the lubricating oil contained in a bowl-form chamber 12 and thence conducting it into the passage 13 which leads to the charge-forming device. The gaseous medium is heated by first passing through a stove or heater 14 and the amount directed into contact with the oil in the chamber 12 is controlled by a by-pass valve 15 which can be opened wide when it is desired to have the suction intake passage without any restriction to flow. The oil in the chamber 12 forms part of the circulating system above described, being set at a constant level by the relative disposition of the inlet and outlet pipes 11 and 9 thereof. The dotted line represents the surface of the oil under impingement by the air current.

Claims:

1. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines, comprising in combination means for circulating the oil through a vaporizing chamber separate from the engine crank case and means for directing an evaporating flow of gaseous medium through said chamber.
2. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines, comprising in combination means for circulating the oil through a vaporizing chamber separate from the engine crank case and means for coincidentally transmitting the engine heat to said chamber and directing an evaporative flow of gaseous medium through the same.
3. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines, comprising means for circulating the oil through a vaporizing chamber and passing an evaporative flow of air therethrough, in combination with the engine exhaust passage arranged to raise the temperature of said chamber.
4. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines comprising means for

circulating the oil from the crank case through an evaporating chamber separate from the engine crank case and means for directing heated evaporative fluid into contact with the oil in said chamber.

5. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines comprising means for circulating the oil from the engine crank case over the floor of a shallow evaporating chamber separate from the engine crank case and a passage connected with the combustion space of the engine and with said chamber for directing a current of evaporative fluid through the latter and in contact with the liquid therein.

6. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines comprising means for circulating oil from the crank case of the engine over the floor of a shallow vaporizing chamber, said chamber forming part of the suction intake of the engine and adapted also to conduct evaporated fuel back to the combustion space of the engine.

7. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines comprising means for circulating oil from the engine crank case over the floor of a shallow vaporizing chamber forming part of the suction intake of the engine and a filter and a return pipe for conducting oil from the said chamber back to the crank case.

8. Means for removing liquid fuel contamination of lubricating oil in internal combustion engines comprising in combination with the charge forming device and the air intake of the engine opening thereto, of an evaporating chamber located in said intake between its entrance and the charge forming device, and means for circulating oil from the engine crank case through said chamber.

In testimony whereof, I have signed this specification.

JOHN GOOD.