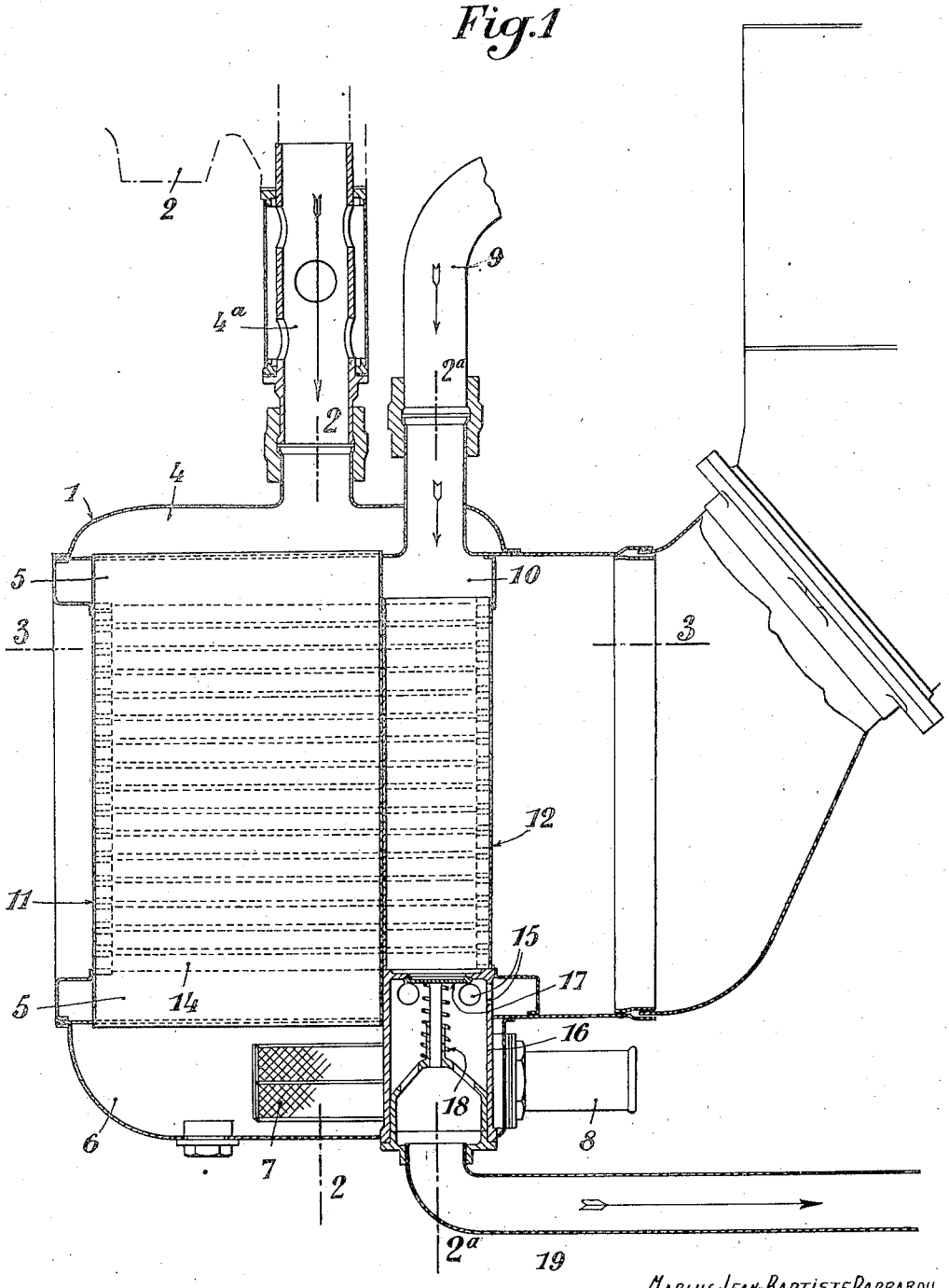
June 13, 1933. M. J-B. BARBAROU 1,914,063

DEVICE FOR HEATING CARBURETORS OR THE AIR FED TO CARBURETORS

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Fig.1



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Fig. 3

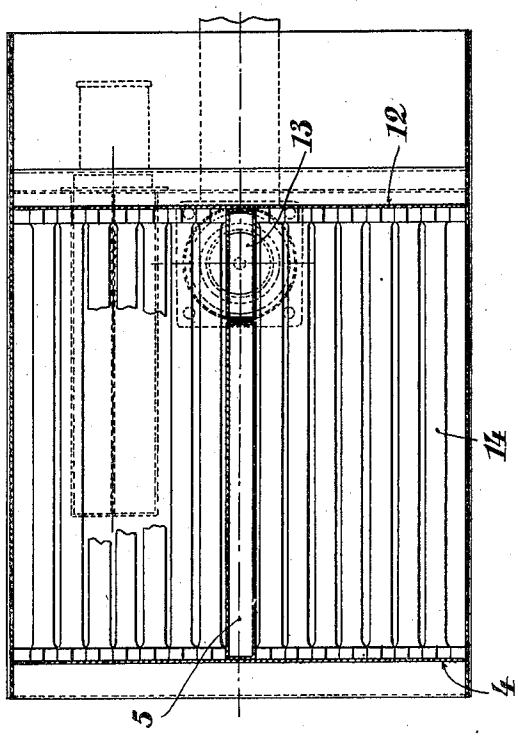
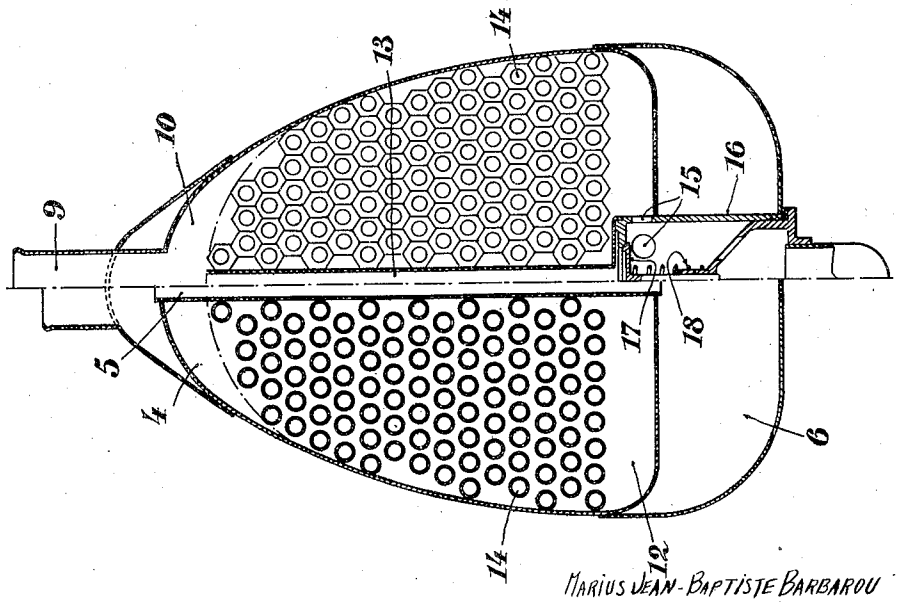


Fig. 2



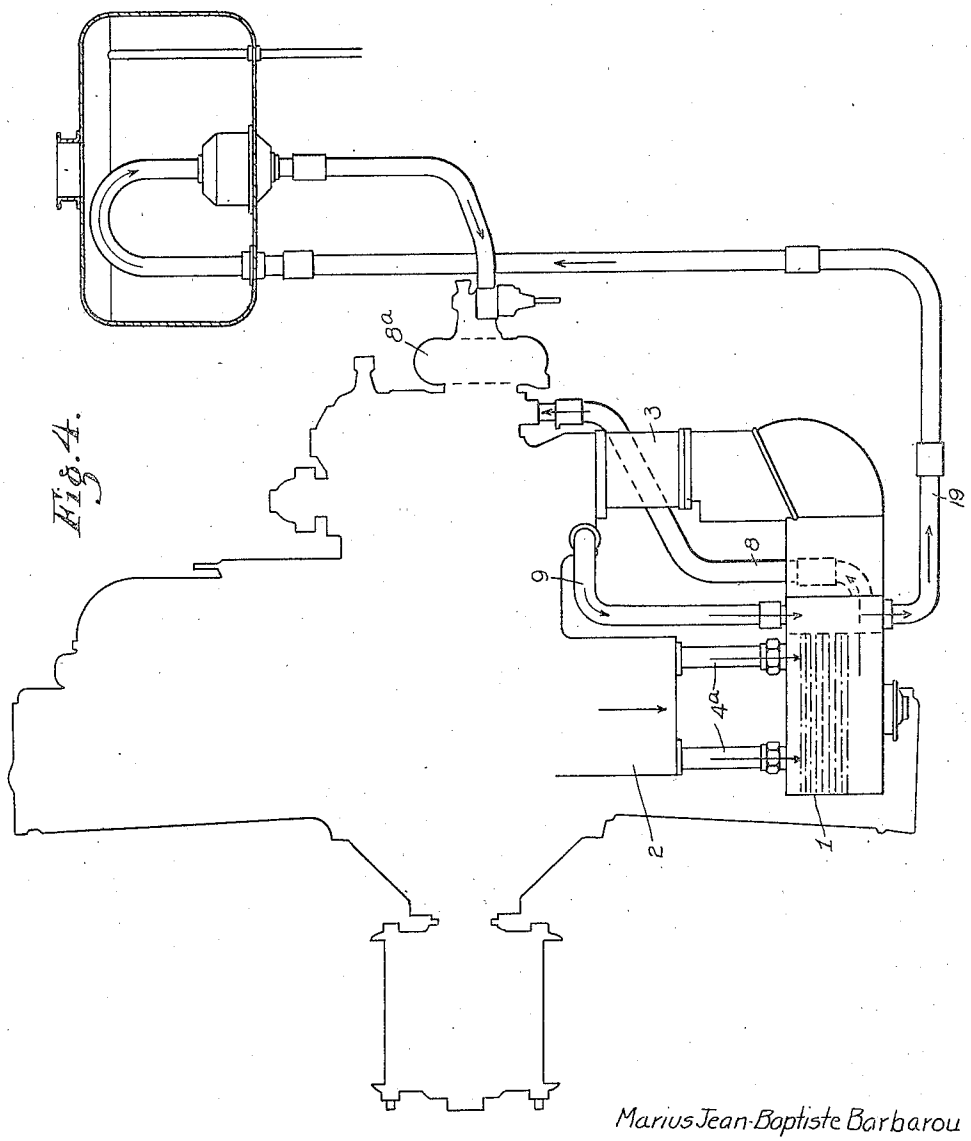
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Fig. 4.



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UNITED STATES PATENT OFFICE

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DEVICE FOR HEATING CARBURETORS OR THE AIR FED TO CARBURETORS

Application filed October 24, 1931, Serial No. 570,803, and in France December 29, 1930.

It is a well known fact that the vaporization of fuel before its entering into the cylinders, so lowers the temperature as to produce frost in the carburetor if the air is moist. It is therefore necessary to sufficiently heat the carbureted mixture or the air to be fed to the carburetor, in order to do away with the above stated drawbacks.

Many devices have already been proposed to that effect, which utilize the action of either the circulation water, or the exhaust gases, or again the lubricating oil when it flows out from the engine.

The object of the present invention is a device for heating carburetors or the air fed to the carburetors by means of the lubricating oil, the main feature of that device being that it is adapted to be used as an oil sump, an oil refrigerator, and an air heater.

According to a preferred embodiment of my invention, the device comprises in a single vessel two independent circuits, the first of which forms a sink and collects the oil brought to a certain temperature in the engine, when the latter is running, while the second one, forming a chamber wholly independent from the first one, comprises a nest of tubes through which the air on its way to carburetor is caused to flow, while the oil flows between the tubes and heats them while being itself cooled.

A discharge pump, driven by the engine, draws in the lubricant from the engine crank-case, discharges it into the nest of tubes, and therefrom into the main tank, so as to complete the full circuit of circulation.

That device has the advantage to make use, as a source of heat, of the oil, and to cool it before its being again utilized in the engine, thus acting as an oil refrigerator, and an air heater.

Another advantage consists in utilizing that device also as an oil sink, which collects the lubricant which has just been utilized in the engine. Such an arrangement makes it possible to avoid an accumulation of oil in the engine crank-case, and an excessive consumption.

As the engine is intended to run at very different temperatures (starting in cold weather, engine at full speed), the device should operate whatever the viscosity may be. Variations of viscosity may produce temporary increases of pressure, which might have very serious consequences for the device, as the nest of tubes, which opposes a considerable resistance to the flow of the oil, might stop the circuit.

According to another characteristic of my invention, in order to obviate this drawback, a direct passage is disposed in parallel with the nest of tubes and forms a by-pass when the pressure of oil increases up to a given value.

Under normal conditions of operation, the oil passes through the nest of tubes, but if the temperature is too low, the viscosity increases, the pressure consequently increases, and the by-pass is brought into operation.

A preferred embodiment of my invention will be hereinafter described with reference to the accompanying drawings, given merely by way of example, and in which:

Fig. 1 is a longitudinal sectional view of a device according to my invention;

Fig. 2 is a sectional view, the left hand part of which corresponds to a section on the line 2—2 of Fig. 1, while the right hand part corresponds to a section on the line 2^a—2^a of Fig. 1;

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

Fig. 4 is a diagrammatical side view of an engine provided with a device according to my invention.

In the embodiment shown in the drawings, the device comprises a sheet iron vessel 1 fixed, on the one hand to the casing 2 of the engine and on the other hand to the carburetor 3. In that vessel is provided a first chamber forming a sink. Said chamber comprises an upper space 4 connected through one or more conduits 4^a with the bottom of crank-case 2, and through a vertical and central partition element 5 with a lower space 6. Said sink serves to collect the whole of the lubricating oil of the engine. Said oil is drawn in through a strainer 7 (Fig. 1) and a connection 8 by a pump 8^a. Said pump discharges the oil through con-

nection 9 into the second chamber 10 of the vessel, which forms an oil refrigerator and an air heater. Chamber 10 comprises the whole part located between vertical sheets 11 and 12, with the exception of central partition element 5 and of another vertical conduit 13 which will be hereinafter described.

Said chamber 10 is filled with tubes 14, whose extremities rest on two vertical metallic sheets 11 and 12, thus forming on side 11 a kind of honeycomb radiator. In normal running the oil arrives through connection 9 and flows between the tubes 14 of the nest of tubes, which it heats, and issues through holes 15 of a box 16.

Valve 17 is provided in said box 16 and the downward displacement of said valve from its seat establishes a connection between vertical conduit 13 and the inside of said box 16. Said vertical conduit 13, whose section is rectangular, or of a similar shape, thus forms a by-pass and affords a direct communication between the inlet and the outlet of channel 10 when the pressure increases. As a matter of fact, in the case of said pressure increasing, valve 17 acts upon spring 18, which is compressed to a determined degree, thus allowing oil to flow, however high the pressure may be, freely and directly, without passing through the nest of tubes 14.

The cooled oil issues, under pressure, through conduit 19, and is conveyed therefrom to the main tank, or, directly, to points to be lubricated.

The air enters the radiator at the front part, passes through tubes 14, where it is heated, and then enters carburetor 3. The whole, or a part, of said air is used for the carburetor, the excess serving, optionally, to heat the carburetor mixture by flowing around the nozzle of any other organ of said carburetor.

While I have disclosed what I deem to be preferred embodiments of my invention, I do not wish to be limited thereto, as there might be changes made in the construction, disposition and form of the parts without departing from the principle of my invention as comprehended within the scope of the appended claims.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination with an internal combustion engine having a crank-case and a carburetor, a casing, a partition in said casing for dividing the latter into an oil sump compartment and a cooling compartment, means for connecting the oil sump compartment to the bottom of the crank-case, whereby said oil sump compartment is adapted to drain hot lubricating oil from the engine crank-case, a nest of tubes extending through said cooling compartment, said tubes communicating with the intake conduit of the carburetor, means for circulating oil from said oil sump compartment to said cooling compartment, and means for returning the cooled oil from said cooling compartment to the engine.

2. In combination with an internal combustion engine having a crank-case and a carburetor, a casing, an inlet chamber at the upper end of said casing, means for connecting said chamber to the bottom of the engine crank-case, an oil sump chamber at the lower end of said casing, a connection between said chambers, a cooling chamber in said casing between the two first mentioned chambers, a flat conduit for connecting said oil sump chamber and said inlet chamber, extending through said cooling chamber, a nest of tubes in said cooling chamber, said tubes communicating with the intake conduit of the carburetor, means for circulating oil from said oil sump chamber through said cooling chamber, and means for returning the cooled oil to the engine.

3. In combination with an internal combustion engine having a crank-case and a carburetor, a cooling chamber, a nest of tubes extending through said cooling chamber, said tubes communicating with the intake conduit of the carburetor, means for connecting said chamber with the bottom of the crank-case, means for returning the cooled oil to the engine, a tube extending through said cooling chamber for by-passing the latter and a loaded valve in said by-pass tube.

4. In a combination as claimed in claim 2, a flat tube for by-passing said cooling chamber and extending through said cooling chamber; said flat tube being in alignment with said flat conduit, and a loaded valve connected with said flat tube.

5. In combination with an internal combustion engine having a crank-case and a carburetor, an oil sump chamber, a cooling chamber, means for connecting the oil sump chamber to the bottom of the crank-case, whereby said oil sump chamber is adapted to drain hot lubricating oil from the engine crank-case, a nest of tubes extending through said cooling chamber, said tubes communicating with the intake conduit of the carburetor, means for circulating oil from said oil sump chamber to said cooling chamber, means for returning the cooled oil from said cooling chamber to the engine, means for by-passing said cooling chamber and a loaded valve in said by-pass means.

6. In combination with an internal combustion engine having a crank-case and a carburetor, a cooling chamber, a nest of tubes extending through said cooling chamber, said tubes communicating with the intake conduit of the carburetor, means for connecting said chamber with the bottom of the crank-case, a box provided with holes for connecting said box with the bottom of said cooling chamber, a tube for connecting the inlet

of said cooling chamber with said box, spring valve interposed between said tube and said box, adapted to be opened when the pressure in said cooling chamber reaches a predetermined value and means for returning the cooled oil from said box to the engine.

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

MARIUS JEAN-BAPTISTE BARBAROU.