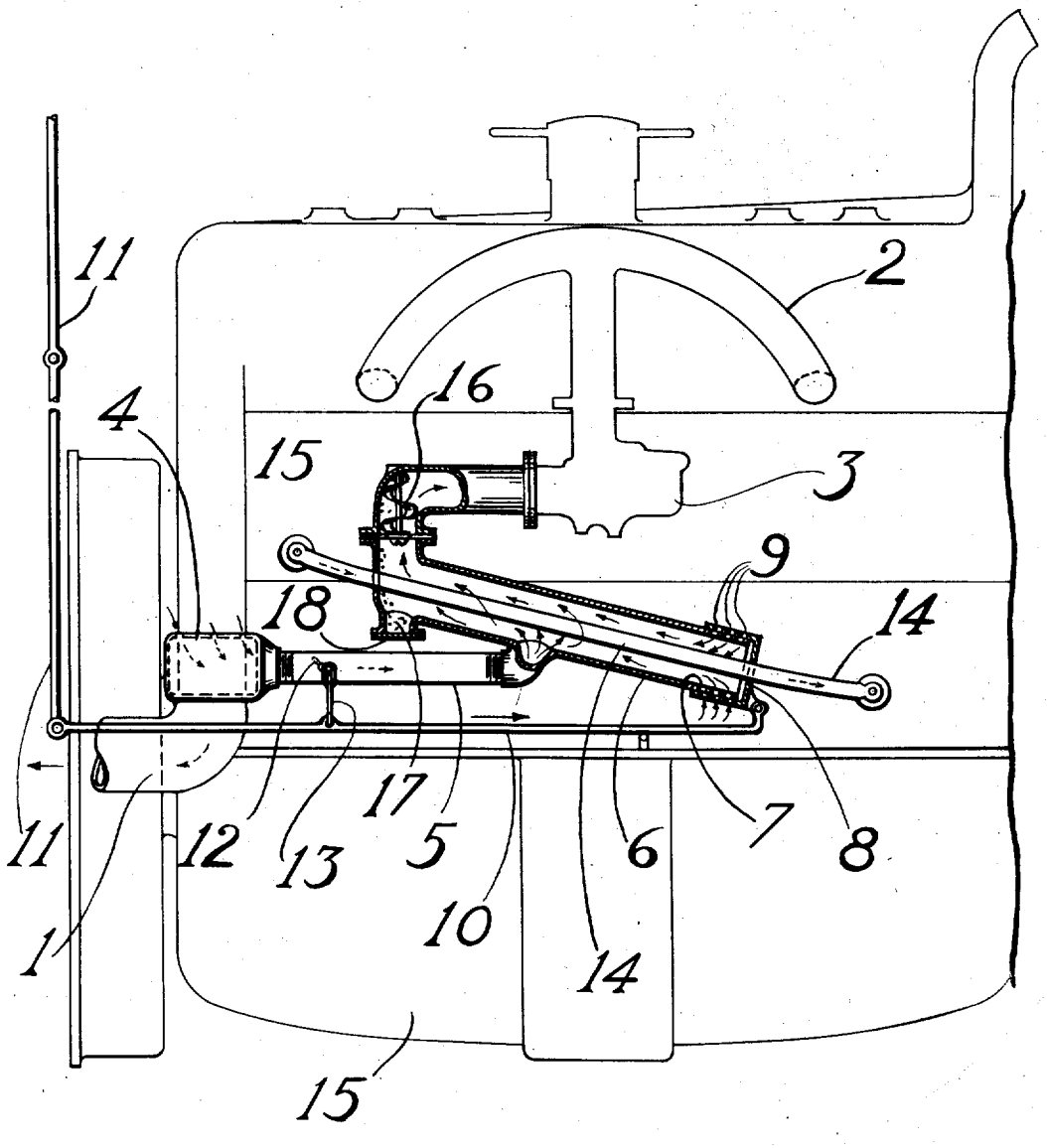
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TEMPERATURE CONTROL IN LUBRICATING OIL SYSTEMS

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By his Attorney

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TEMPERATURE CONTROL IN LUBRICATING OIL SYSTEMS

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This invention relates to improvements in means for controlling the operating temperature of lubricating oil systems by heat exchange between the oil and a hotter or colder fluid, as conditions may require. My improvements are especially designed for use in automobile internal combustion engines but are not limited to this use.

The invention will be fully understood from the following description, read in connection with the accompanying drawing, in which the figure is a diagrammatic, part sectional elevation of an engine.

In the drawing, 1 denotes an exhaust manifold and 2 a fuel intake manifold connected to a carburetor 3 and to the engine cylinders. An air heating jacket or stove 4 is mounted on the exhaust manifold and the heated air is conducted by a pipe 5 to an air inlet pipe 6 connected to the carburetor.

In accordance with my invention, this pipe is elongated and has perforations 7 at the outer end, which is covered by a slidable cap 8 having holes 9 in it. The cap may be adjusted by rods 10 and 11, the latter terminating in a suitable connection on the dashboard (not shown), so as to bring the holes into or out of register with the perforations. This adjustment controls the admission of exclusion of unheated air; that is, air at atmospheric temperature from the exterior of the engine.

A valve 12 is set in the pipe 5 and is rotatable by a stem 13 pivotally mounted on rod 10. This valve controls the admission of heated air from stove 4. The connection of the slidable sleeve and the rotatable valve with the rods 10 and 11 is such that when the valve is wide open, the cap is fully closed and vice versa. In intermediate positions, each is partly open. Of course the sources of heated and unheated air may be independently controlled by the described means or other suitable arrangements.

An oil conduit 14 is mounted longitudinally in the pipe 6, which serves as a jacket through which the heat exchange fluid passes over the oil conduit. The latter is a part of the oil circulation system which includes means for drawing oil from the supply in crank case 15 and forwarding it to the bearings in any suitable way. I prefer to make conduit 14 of brass or other metal of high thermal conductivity. Heat radiating fins or other extended heat-conductive surfaces may be provided on the pipe.

An air cleaner 16 in the form of a spiral or the like may be set in the air inlet 6. A dust trap 17 having a removable closure 18 is arranged to receive dust separated from the air stream.

In the operation of the engine in warm weather, the cap 8 is adjusted so that its holes register with the perforations in the end of pipe 6. Simultaneously valve 12 is rotated to shut off heated air from the stove 4. Air at atmospheric temperature flows through pipe 6 over the oil conduit 14 to the carburetor and cools the oil to a sufficient extent to keep the crank-case temperature down to the desired point. Accordingly, it is not necessary to use so heavy an oil as would otherwise be required to compensate for high oil temperatures.

In cold weather the valve 12 is open and the cap 8 is closed so that warm air from stove 4 sweeps over the conduit 14 to the carburetor. This serves to bring the oil quickly up to the proper temperature without unduly cooling the air stream. Intermediate positions of the valve and cap are possible so that a mixture of heated air and unheated air can be secured. An oil temperature of about 130—135° F. is generally desirable. This is high enough to prevent troublesome dilution with excess gasoline, and low enough for most efficient lubrication.

Various changes and alternative arrangements may be made within the scope of the appended claims, in which it is my intention to claim all novelty inherent in the invention as broadly as the prior art permits.

I claim:

1. In a temperature controlling means for lubricating systems, the improvement which comprises an oil circulation line, a jacket surrounding a portion of said line and opening upon a source of unheated air, a source of heated air, regulable means for connecting said sources to the jacket, and means for

circulating air from the sources through the jacket.

2. Apparatus according to claim 1, in which the regulable means includes provision for opening communication with one of said sources as communication with the other source is obstructed.

3. Apparatus according to claim 7, in which a source of heated air controllably communicates with said jacket.

4. In combination with the oil circulation system, the intake manifold, the carburetor and the exhaust manifold of an internal combustion engine, a pipe adapted to supply air to the carburetor, regulable means for admitting unheated air to said pipe, regulable means for admitting to said pipe air heated by the exhaust of the engine, and means for passing oil in indirect heat exchange with air flowing through said pipe.

5. Apparatus according to claim 4, in which interconnected valve means are adapted to control flow of the heated and unheated air.

6. In combination with the oil circulation system and the carburetor of an internal combustion engine, a pipe adapted to convey air to said carburetor and forming a jacket for a portion of the circulation system, the jacket having an inlet opening and a portion of the jacket having perforations, and a cap slidably fitting the portion and having holes adapted to be brought into or out of register with the perforations.

7. In combination with the oil circulating system and the carburetor of an internal combustion engine, a pipe adapted to convey air to said carburetor and forming a jacket outside of the crank case for a portion of said circulating system and means for controlling the temperature of air passed through said jacket.

8. The method of controlling temperature in the oil lubricating system of an engine, comprising passing at least a portion of the oil in said system into heat exchange with a temperature controlling fluid, positively controlling the temperature of said fluid by regulated addition of heated gas to the fluid in accordance with the working requirements of the engine, and returning the oil to the system.

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