Sept. 15, 1931. J. H. HUGHES 1,823,048

CRANK CASE OIL HEATER

Filed April 30, 1930

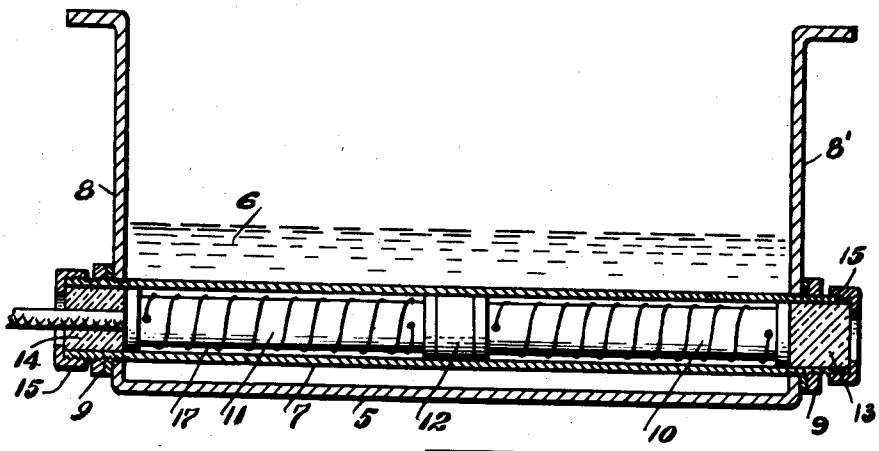


Fig. 1.

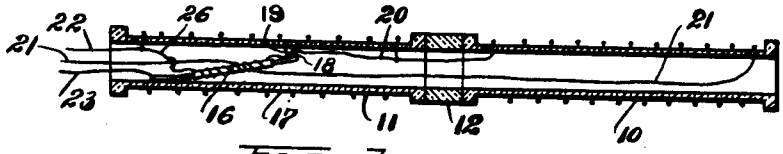


Fig. 2.

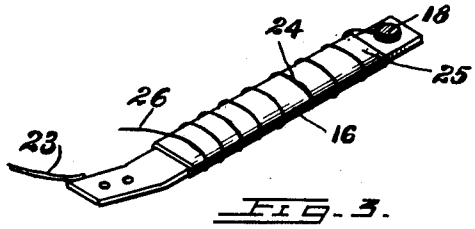


Fig. 3.

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UNITED STATES PATENT OFFICE

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CRANK CASE OIL HEATER

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The invention relates to improvements in crank case oil heaters as described in the present specification and shown in the accompanying drawings which form part of the same.

As is well known, in cold weather when an internal combustion engine is not in operation its exposure to the cold causes the oil in the crank case to become sluggish and viscous. This not only makes it very difficult to start the engine but also results in insufficient oil being fed to the moving parts that are lubricated by the oiling system, and consequently these parts are subject to excessive wear.

The present invention contemplates an improved type of electric heater for quickly rendering the oil fluent in engines particularly of automobiles and tractors. Heating the oil, besides enabling it to readily circulate, facilitates starting the engine.

A salient feature of the invention resides in its construction and arrangement whereby the heating coils are readily accessible for repairs and replacements without having to detach the crank case.

Referring to the drawings: Figure 1 is a cross section of the lower half of a crankcase depicting the invention applied thereto.

Figure 2 is a longitudinal section through the heating coils illustrating a thermostatic control.

Figure 3 is a perspective view of the thermostat.

In the drawings, the reference numeral 5 denotes the lower half of the crank case exemplified in Figure 1, which contains a body of oil 6 for lubricating purposes.

In carrying out this invention a length of tubing 7 is fitted in the crank case so as to extend horizontally through the walls 8, 8′ and project slightly therefrom as shown in Figure 1. The tubing may be of copper or other suitable material and is submerged in the body of oil. The protruding ends are screw-threaded to take the check nuts 9, which nuts are tightened against the outside faces of the walls 8, 8′, or against interposed gaskets to preclude leakage.

Within the tube are two electric heating coils 10 and 11 separated from each other by a refractory member 12. The coils are held against displacement by means of refractory members 13 and 14 engaged with the outer ends of the coils and secured by caps 15 screwed onto the ends of the tubing.

It will be apparent that this construction permits of the coils being inserted or removed from the outside of the crankcase and is particularly convenient for making repairs or otherwise servicing the heater.

It is proposed to so arrange the electric circuits of the heating coils that upon closing a switch a single heating coil will be initially energized so as to produce a high degree of heat, but when this coil has been in operation for a short time it is automatically thrown in series with the second coil in order to produce a lower degree of heat. This is accomplished by means of the thermostat 16 which is fixed at one end to the inner surface of the hollow insulation member 17 of the coil 11, and provided at its other end with a point 18 that normally contacts with the point 19 of the lead 20. This lead is connected to the inner end of the resistance wire of each coil. The outer end of the resistance wire of the coil 10 has a lead 21 and the corresponding end of the other resistance wire has a lead 22, whereas a lead 23 is also connected to the fixed end of the thermostatic metal strip 16. Accordingly, when the circuit, of which the leads form a part, is energized the coil 10 is initially heated. The heat raises the temperature of the oil and by reason of the thermostat being exposed to the heat it flexes at the temperature to which it is set, thus opening the circuit of the lead 20 and putting the coils in series.

To expedite the flexing of the thermostat should it be desired to throw the coils in series much sooner than would be accomplished by heat radiated from the coil 10, it is suggested that the thermostat be wound with a resistance wire 24 having an interposed insulation 25. One end of the heating coil 24 is connected to the point 18 while the other is connected by a lead 26 to the lead 22. By this arrangement the heating coil 24 is energized concurrently with the coil 10. It is, of course, understood that the leads 21, 22 and 23 will

have to be connected to conventional switch mechanism, not shown since it does not form a part of the present invention.

What I claim is:—

1. A crank case oil heater consisting of a tubular member horizontally disposed in the lower half of the crank case with its ends projecting through openings in opposing walls, a hollow electric heating element mounted in the bore of said tubular member, said heating element having its resistance wire divided into two units, and a thermostatic control fitted in the interior of the heating element and connected to the two units of the heating element.

2. A crank case oil heater consisting of a tubular member horizontally disposed in the lower half of the crank case with its ends projecting through openings in opposing walls, a hollow electric heating element mounted in the bore of said tubular member, said heating element having its resistance wire divided into two units, a strip of thermostatic metal fixed at one end to the interior of said heating element, a contact point normally engaged with the free end of said thermostat, an insulation encompassing the major part of the thermostat, a heating coil wound around the insulation, and circuit wiring so connecting the thermostat and its heating coil to the separate units of the hollow heating element and the contact point that one of said units is energized in advance of the other.

Signed at Macklin, Sask., the 19th day of April, 1930.

JAMES HENRY HUGHES.