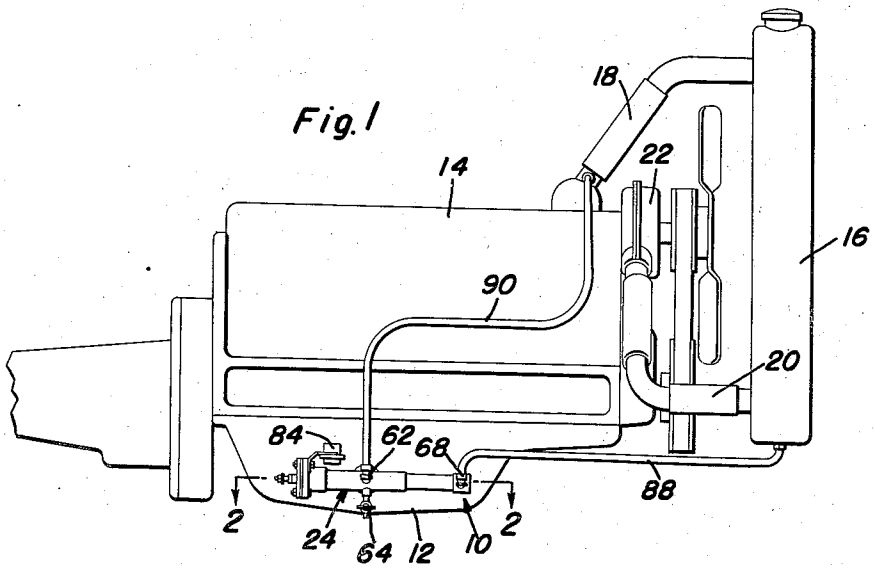
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CRANKCASE ATTACHMENT

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Fig. 1



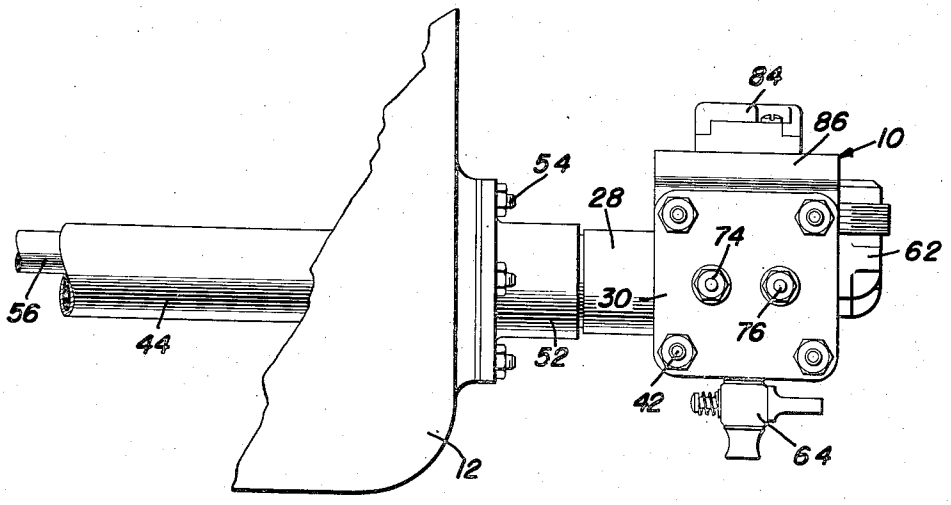


Fig. 4

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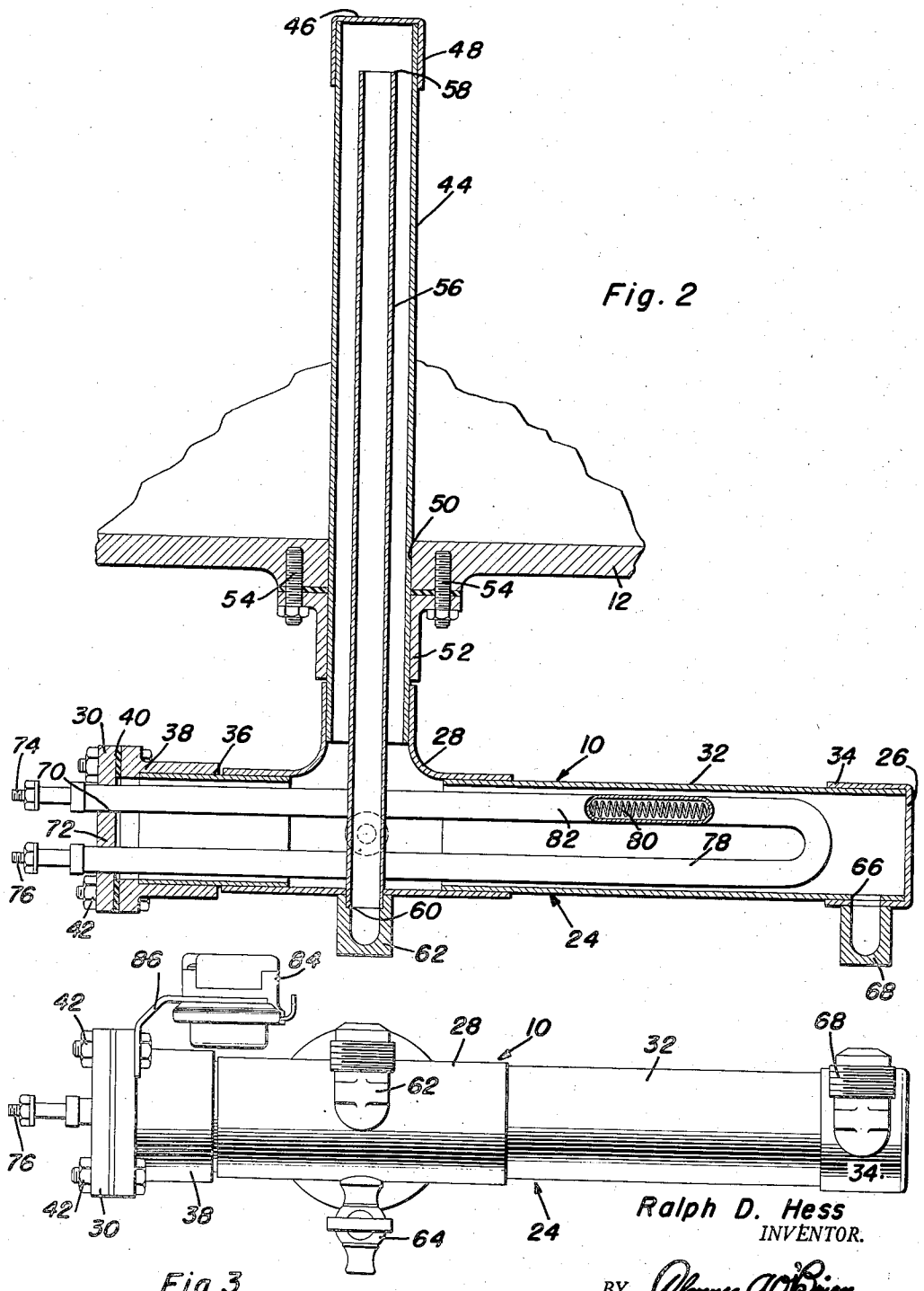


Fig. 2

Fig. 3

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CRANKCASE ATTACHMENT

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5 Claims. (Cl. 123—142.5)

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This invention comprises novel and useful improvements in engine preheating devices, and more particularly pertaining to a device for preheating the engine and lubricating oil.

An important object of this invention is to provide a device for heating the lubricating oils in an engine crank case or oil reservoir, to evaporate therefrom the moisture which condenses therein and to prevent the further condensation of moisture therein, during periods in which the engine is not running.

Another important object of this invention is to provide a device to preheat the lubricating oil, in accordance with the foregoing object, which device will also preheat the engine by circulating heated liquid through the engine cooling system, to thereby render the engine easier to start in cold weather.

Yet another object of this invention is to provide an attachment which is adapted to be attached to an engine crank case, and which will heat and circulate heated fluids through the oil in the crank case without necessitating a fluid pump.

An important feature of this invention resides in the provision of the casing and an outer conduit attachment to and communicating with the casing, with means enclosed in the casing for heating fluids contained therein, with an inner conduit disposed in the outer conduit to provide a return line for the liquid circulated through the outer conduit.

These, together with various ancillary objects and features, are obtained by this device, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a side elevational view of an engine having a liquid cooling system, and a crank case, with the preheater shown attached to the crank case and connected to the engine cooling system;

Figure 2 is a horizontal sectional view, taken substantially on the plane 2—2 of Figure 1, and showing details of construction of the engine preheating attachment;

Figure 3 is a side elevational view of the attachment; and,

Figure 4 is a fragmentary end elevational view of the attachment shown mounted in a crank case.

Reference is now made more specifically to the accompanying drawings wherein like numerals designate similar parts throughout the various views. The attachment, indicated generally by the numeral 10 is adapted to be attached to

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the crank case 12 of a liquid cooled internal combustion engine 14 having a radiator 16 thereon. As is conventional, the upper end of the radiator 16 is connected by conduit 18 which is connected to the water jacket of the engine 14, the lower end of the radiator being connected by means of conduits 20 and water pump 22 to a different portion of the water jacket of the engine 14.

The attachment 10 includes a casing 24 having an end wall 26 on one end thereof, a T coupling 28 intermediate thereof, and a second end wall 30 on the other end thereof. Conveniently, the casing 24 may be formed of a first tube 32 which is welded or otherwise connected to one of the extension of the T fitting 28, the end wall 26 being provided with a peripheral flange 34 which may be soldered or threadedly attached to the other end of the tube 32. A second tube 36 may also be attached to the T 26, in axial alignment with the tube 32, which tube carries the flange collar 38. A suitable gasket 40 is interposed between the flange collar 38 and the end wall 30, and the flange collar and end wall are attached together by means of suitable fastening bolts 42.

An outer conduit 44 is also attached to the T coupling 28, and in communication therewith, the conduit 44 extending substantially perpendicular to the casing 24, and having an end wall 46 which is secured to the end of the conduit remote from the casing, by means of an annular flange 48 carried by the end wall. The outer conduit 44 is adapted to be attached to the side of the crank case 12, the conduit extending through a bore 50 therein. For this purpose a flanged collar 52 is attached to the conduit 44, whereby the attachment 10 may be attached to the crank case by means of studs 54, as is best shown in Figure 2 of the drawings.

An inner conduit 56 extends longitudinally of the outer conduit 44, and has the inner end 58 thereof terminating in spaced relation to the end wall 46 on the conduit 44, the other end 60 of the inner conduit 56 extending through the casing 24, and communicates with the elbow 62 which is carried by the end 60 of the inner conduit 56. A suitable pet-cock 64 is also carried by the casing 24, adjacent the under side thereof, to permit draining of the attachment when that is desired.

The casing 24 is also provided with an inlet port 66, adjacent to the end wall 26, which port also communicates with an externally threaded

elbow 68, by means of which the casing may be connected to the engine cooling system.

The second wall 30 is provided with a pair of spaced bores 70 and 72, through which the contact terminal 74 and 76 of an immersion type heating element 78 extends, which heating element is preferably of a configuration which extends substantially the length of the casing 24, to heat the fluids contained therein. As is conventional, the immersion type heater 78 includes a heating element 80 which is disposed in an electrically insulating casing 82.

It is also intended that a thermal responsive switch 84 be attached to the preheating attachment 10, by means of a bracket 86. As it is intended that the switch 84 be responsive to the temperature of the casing 24, it is preferred that the thermal responsive switch be disposed adjacent to the upper surface of the casing, and in close proximity thereto.

The fluid inlet elbow 68, carried by the casing 24 is connected by means of a tube 88 to a point adjacent the lower portion of the radiator 16, the fluid outlet elbow 62 being connected by a conduit 90 to an upper portion of the liquid cooling system of the engine 14.

In operation, whenever the engine 14 is idle, the heating element 78 is connected, by suitable wires (not shown) to a thermal responsive switch 84, and to a source of power whereby the heating elements will heat the fluids contained within the casing 24. The heated fluid will then be conducted through the outer conduit 44, into the crank case 12, to heat the oil contained therein, the fluid then flowing out through the inner conduit 56 through the pipe 90, and then through the cooling system of the engine 14. Obviously, as the heated liquid passes through the water jacket of the engine, it will heat the engine block, thereby rendering the engine 14 easier to start, particularly in cold weather.

From the foregoing, it is thought that the operation and construction of the device will be readily understood, and further discussion is therefore believed to be unnecessary. However, numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawing, it is not intended to limit the invention to that shown and described, but all suitable modifications may be be resorted to falling within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In an internal combustion engine having a liquid cooling system and a lubricant reservoir; an attachment for preheating the lubricant in the reservoir comprising a casing, a heating unit disposed in said casing, an outer conduit having an end wall on one end thereof and communicating with said casing at the other end thereof, an inner tube disposed in said outer tube and terminating in spaced relation to said end wall, said inner conduit and said casing being adapted to be connected to the engine cooling system.

2. An attachment for preheating engines comprising an outer conduit having an end wall, means carried by said outer conduit for mounting the same on an engine crank case, an elongated casing having an intermediate portion thereof connected to said outer conduit, said casing being disposed transversely of said outer conduit, an inner conduit disposed in said outer conduit, one end of said inner conduit terminating adjacent said end wall of said outer conduit, an end wall detachably secured to one end of said casing, and an immersion heater unit carried by said end wall and extending longitudinally of said casing for heating the circulating fluid, said casing having a fluid inlet port adjacent the other end thereof, the other end of said inner conduit constituting a fluid outlet port.

3. The combination of claim 2 including thermal responsive means for selectively actuating said heat element.

4. In combination with an engine having a liquid cooling system and an oil reservoir, fluid conduit means disposed in said oil reservoir, means communicating said conduit means with said liquid cooling system, means carried by said fluid conduit means for heating the engine cooling fluid as it passes therethrough, said conduit means including an outer tube having an end wall and disposed in said oil reservoir, and an inner tube disposed in said outer tube and terminating in spaced relation to said end wall.

5. In combination with an engine having a liquid cooling system and an oil reservoir, fluid conduit means disposed in said oil reservoir, means communicating said conduit means with said liquid cooling system, means carried by said fluid conduit means for heating the engine cooling fluid as it passes therethrough, said conduit means including an outer tube having an end wall and disposed in said oil reservoir, an inner tube disposed in said outer tube and terminating in spaced relation to said end wall, a casing carried by said outer tube and communicating therewith, said casing being disposed externally of said oil reservoir, and said heating means being disposed in said casing.

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