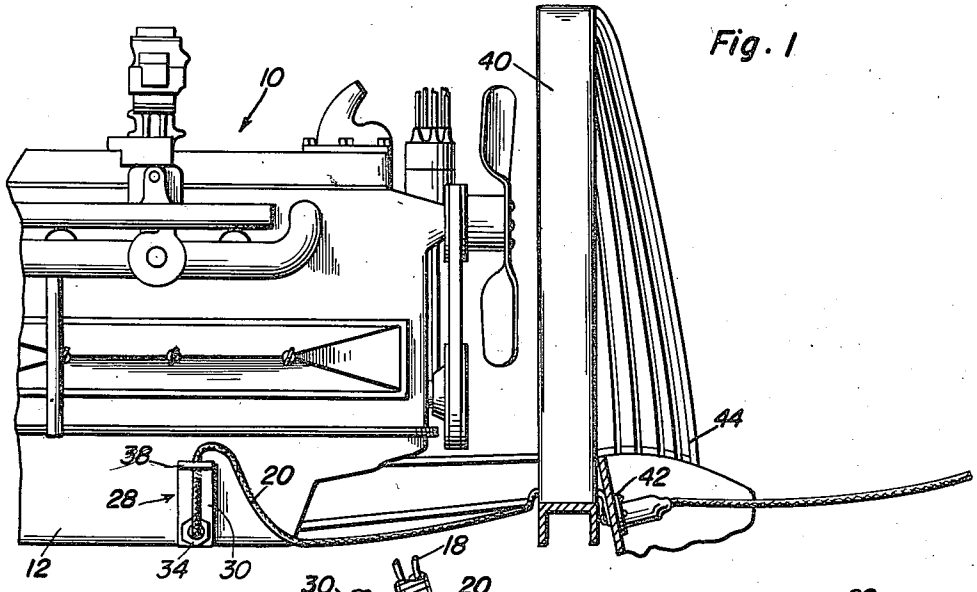
Dec. 2, 1952 S. BOGER ET AL 2,620,429

CRANKCASE OIL HEATER ATTACHING MEANS

Filed June 26, 1950

Fig. 1



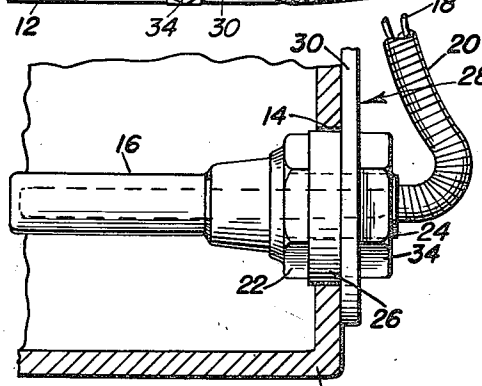


Fig. 2

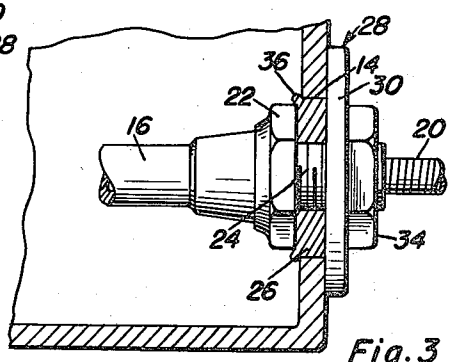
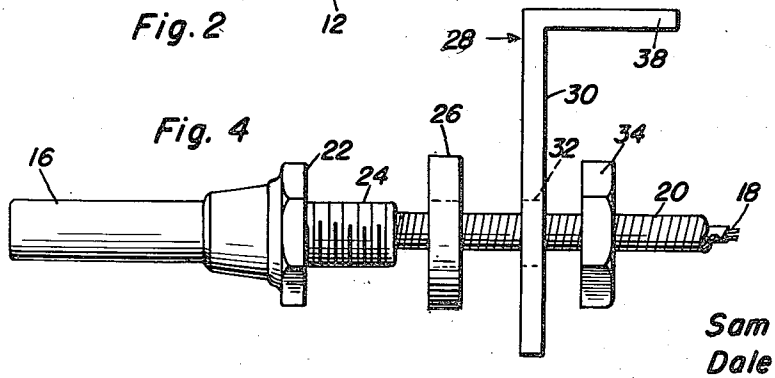


Fig. 3

Fig. 4



Sam Boger
Dale V. Davis
INVENTORS

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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CRANKCASE OIL HEATER ATTACHING MEANS

Sam Boger and Dale V. Davis, Dodge City, Kans.

Application June 26, 1950, Serial No. 170,442

4 Claims. (Cl. 219—38)

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This invention relates to an attachment for a crankcase oil heater and constitutes an improvement over the Boger Patent No. 2,470,972.

The primary object of this invention is to provide a means for readily and easily attaching the crankcase oil heater described in Patent No. 2,470,972 to the oil pan of a conventional internal combustion engine. The elements making up the attachment are such that the heater may be readily and easily attached as a side entry installation to the conventional oil pan in such a manner that the heater becomes virtually a part of the oil pan itself. The heating cartridge may be readily and easily replaced with the same ease that it can be installed and may be accomplished with a minimum of effort and manipulation without damaging or weakening either the oil pan or the heating cartridge itself.

Yet another object of this invention is to provide an attachment for a crankcase oil heater which is relatively simple in design and construction, inexpensive, and very efficient for its intended purpose.

These, together with various ancillary objects and features of the invention which will later become apparent as the following description proceeds, are attained by the device, a preferred embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

Figure 1 is a fragmentary side elevational view disclosing a portion of an internal combustion engine, the pan of the crankcase, and the visible L-shaped bracket forming a part of the attaching means for the oil heater.

Figure 2 is an enlarged view showing a portion of the oil pan or crankcase in section, showing the heater and attaching means before the latter is finally clamped to the oil pan.

Figure 3 is a view similar to Figure 2 with parts broken away and shown in section and showing the attachment means in its finally clamped position.

Figure 4 is an "exploded" elevational view showing the electrical heater unit and the improved attaching means therefor with the parts separated for better presentation.

Specific reference is now made to the drawings. In the several views in the accompanying drawings and in the following specification reference characters indicate corresponding elements thoughout.

Indicated generally at 10 is the engine of an automotive vehicle to the bottom of which is

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secured in a conventional manner an oil pan 12. The side of the oil pan is provided with an aperture 14 through which the heating cartridge 16 extends into the interior of the oil pan and at which position the heating cartridge is attached by the means to be described hereinafter. The heating cartridge is of the type described in the Boger Patent No. 2,470,972 and includes a shell having a dielectric core therein and a heating element about the core which is communicated with conductor wires 18 extending through a conventional flexible cable 20.

Secured upon the shell of the cartridge 16 is an enlarged shoulder 22 of diameter somewhat smaller than the diameter of the oil pan aperture 14, the shoulder being integral with an externally threaded portion 24, it being understood that the cable 20 extends through the threaded portion 24 and the shoulder 22 for operative communication with the heating element inside the cartridge 16. A deformable washer or packing ring 26 is provided which is preferably fabricated of lead or lead alloy and which is of external diameter approximately equal to the diameter of the aperture 14 in the oil pan.

An L-shaped bracket 28 is provided having one leg portion 30 thereof which includes an aperture 32 slidably receiving the cable 20 and disposed in front of the deformable washer 26.

In use, the cartridge 16 with the attached shoulder 22 and reduced threaded extension 24 is positioned in the interior of the oil pan through the aperture 14 with the major portion of the cable 20 extending exteriorly of the oil pan. The leg 30 of the L-shaped bracket 28 is pressed against the side of the oil pan 12 and an internally threaded nut 34 is slipped on the cable 20 and made to engage the reduced threaded extension 24 of the shoulder 22 so that when the nut 34 is tightened into the position shown in Figure 3, the lead washer 26 is compressed into and over the hole as at 36 sealing the heater unit so tightly in the oil pan that for all practical purposes it becomes a part of the oil pan. The L-shaped bracket 28 also assists in properly supporting the heater within the oil pan. This form of attachment does not damage or weaken either the heating element or the oil pan and retains the heater therein in such a manner that substantial jarring of the automotive vehicle will not loosen the heating element in the oil pan. The other leg 38 of the L-shaped bracket includes an aperture for receiving a portion of the cable 20 as shown clear-

ly in Figure 1, the cable of course being made to extend along the side of the motor, around the radiator **40**, and to be connected to an outlet **42** through the grill **44** for handy connection to a 110-volt electrical circuit.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

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

1. In combination, a liquid containing pan having a flat side wall with an opening therein, an electrical heating unit situated in said pan and embodying an integral shoulder having a flat face in parallelism with the inner surface of said side wall, said shoulder being of a diameter less than the diameter of said opening, a reduced hollow screw-threaded stud projecting from the center portion of said shoulder and extending outwardly through and beyond said opening, a deformable packing ring encircling and mounted on said stud and plugged into said opening and of a diameter slightly less than that of the opening and greater than that of the shoulder, and non-compressible nut retained means mounted on the outer end of said stud bridging and covering the outer side of said opening and having firm backing contact with the adjacent side of said packing ring.

2. In combination, a liquid containing pan having a flat side wall with an opening therein, an electrical heating unit situated in said pan and embodying an integral shoulder having a flat face in parallelism with the inner surface of said side wall, said shoulder being of a diameter less than the diameter of said opening, a reduced hollow screw-threaded stud projecting from the center portion of said shoulder and extending outwardly through and beyond said opening, a deformable packing ring encircling and mounted on said stud and plugged into said opening and of a diameter slightly less than that of the opening and greater than that of the

shoulder, a flexible current conducting cable electrically connected with said unit and extending outwardly through and beyond said stud, an L-shaped bracket embodying one limb apertured, fitting removably on said stud and spanning said opening and having abutting contact with said packing ring and outer surface of said side wall, an assembling and clamping nut screwed on said stud and abutting and retaining said limb in place, and the remaining limb having an aperture and the adjacent portion of said cable being threaded through said opening.

3. The structure defined in claim 1, wherein said packing ring is of a cross-sectional thickness greater than the cross-sectional thickness of said side wall.

4. For use in heating oil in the oil pan of a crankcase construction wherein the pan has a vertical side wall provided with an opening for insertable and removable heating means; an electrical heating unit situated in said pan and embodying a lateral integral flat faced shoulder disposed in parallelism with the inner surface of said vertical wall, said shoulder being of a diameter less than the diameter of said opening, a reduced hollow screw-threaded stud projecting from the center portion of said shoulder and extending outwardly through and beyond said opening, a deformable packing ring encircling and mounted on said stud and plugged into said opening and of a diameter slightly less than that of the opening and greater than that of the shoulder, and non-compressible nut retained means mounted on the outer end of said stud bridging and covering the outer side of said opening and having firm backing contact with the adjacent side of said packing ring.

SAM BOGER.
DALE V. DAVIS.

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