

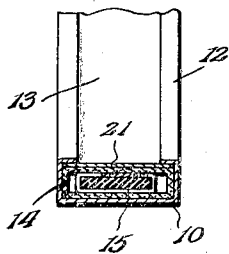
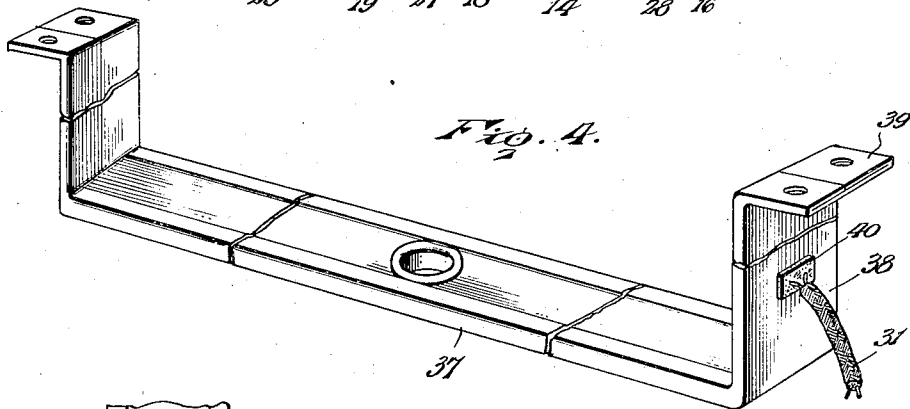
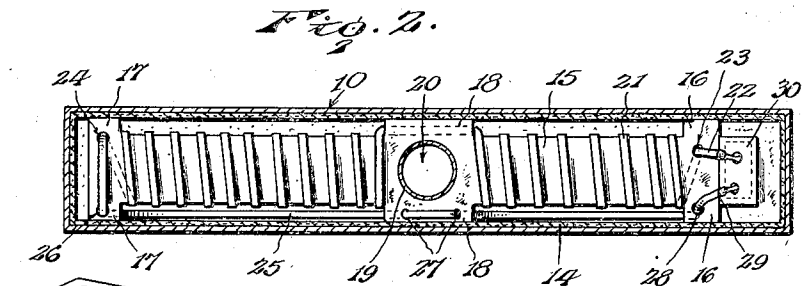
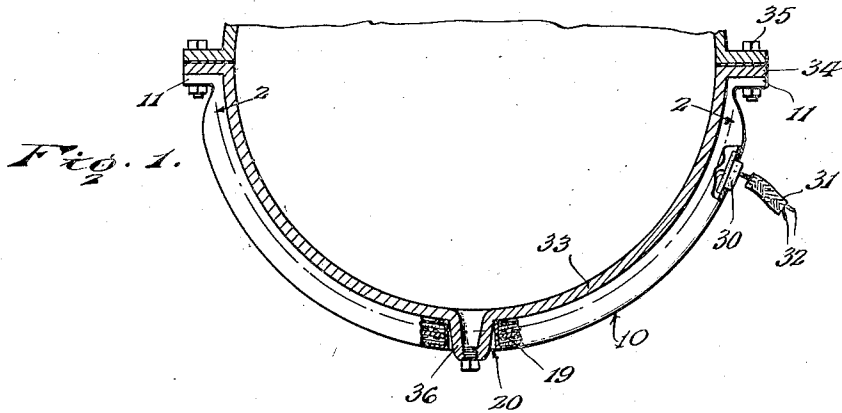
Oct. 11, 1927.

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1,645,230

CRANK CASE OIL HEATER

Filed May 6, 1926



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## UNITED STATES PATENT OFFICE.

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## CRANK-CASE-OIL HEATER.

Application filed May 6, 1926. Serial No. 107,204.

This invention relates to an improved electric crank case oil heater which is particularly, although not exclusively, designed for use in connection with motor vehicle engines, and seeks, among other objects, to provide a heater which may be readily applied to an engine crank case externally thereof for heating the oil within the crank case.

10 The invention seeks, as a further object, to provide a heater which, by initially heating the oil in the crank case, will minimize the troubles of faulty lubrication and engine stiffness at the time of starting of the engine such as would otherwise be brought about by viscosity of the oil in the crank case due to thermal conditions.

And the invention seeks, as a still further object, to provide a heater which will be compact and efficient and which may be installed without the necessity for structural change in the engine to which the device is applied.

Other objects of the invention not specifically mentioned in the foregoing, will appear during the course of the following description.

In the accompanying drawings:

Figure 1 is a fragmentary sectional view showing our improved heater applied to the crank case of a Ford engine.

Figure 2 is a sectional view on the line 2-2 of Figure 1, looking in the direction indicated by the arrows.

Figure 3 is a transverse sectional view through the heater.

Figure 4 is a detail perspective view showing a slight modification of the invention.

40 In carrying the invention into effect, we employ a substantially semi-circular sheet metal casing 10 which, as shown in Figure 3, is illustrated, in the present instance, as being of rectangular channel shape in cross section, and formed on the casing at its ends are laterally directed attaching flanges 11. The side walls of the casing are provided with inwardly overhanging flanges 12 which extend from end to end of the casing, and snugly fitting between said side walls is a closure plate 13 retained by the flanges 12 to tightly close the casing so that both air and moisture will be excluded. Overlying the entire inner wall surface of

the casing is a refractory insulating lining 14 which may be of asbestos or other approved material, and fitting within the casing is a refractory insulating core 15 which may be of porcelain, mica, or other suitable insulating material. At one end, the core is provided with lateral lugs 16 while at its opposite end the core is provided with similar lugs 17, and formed on the core midway between the ends thereof are elongated lugs 18. As shown in Figure 2, these lugs serve to center the core within the casing, and formed on the bottom wall of the casing to extend through the core medially thereof and through the closure plate 13 is a sleeve 19 overturned against said plate and providing an opening 20 midway between the ends of the casing as well as securing the core against endwise movement. Wrapped about the core is a resistance element 21, one end 22 of which is passed through an opening 23 in the core while at the opposite end of the core said element is passed through an opening 24. The free end portion 25 of said element is then passed through an opening 26 in one of the lugs 17, through spaced openings 27 in one of the lugs 18, and through an opening 28 in one of the lugs 16 so that the free end portion of the resistance element thus provides a return connection therefor supported by said lugs in spaced relation to the turns of said element, the end 29 of the resistance element terminating adjacent the end 22 thereof. Fitting through a suitable opening in the bottom wall of the casing near the adjacent end thereof, is an insulating block 30 having a suitable base flange overlying said bottom wall for limiting said block against outward displacement, and extending to the block is a conductor 31, the wires 32 of which are received through suitable openings in the block and are connected to the ends 22 and 29 of the resistance element.

In Figure 1 of the drawings, we have shown the heater applied to the flywheel case portion 33 of the crank case of a Ford engine. As is well known, the crank case is provided with flanges 34 through which extend bolts 35 securing the crank case in position and, as will be observed, the heater is shaped to fit about the portion 33 of the crank case, resting flat thereagainst with the

flanges 11 of the heater casing abutting the flanges 34 of the crank case. The flanges 11 are formed to receive the bolts 35 so that the same bolts which are employed to fasten the crank case are also utilized for securing the heater in position and, as will be observed, the opening 20 through the heater casing is disposed to receive the drain nipple 36 at the bottom of the portion 33 of the crank case. Thus, no structural change in the engine is required to accommodate the device and, as will be appreciated, the device may be readily applied. The wires 32 of the conductor 31 are connected with a battery or other source of electrical energy and a suitable switch is interposed in the circuit so that by closing the switch the resistance element 21 may be heated for heating the oil standing in the portion 33 of the crank case. As is well known, a Ford engine is lubricated from a pool of oil which is contained in the flywheel case and, accordingly, by initially heating the oil, the oil may, in cold weather, be rendered sufficiently fluent to freely flow to the various parts of the engine and thus prevent the premature wear thereon which would otherwise occur.

In Figure 4 of the drawings, we have illustrated a slight modification of the invention wherein the heater is shaped to fit about an engine crank case rectangular in cross section. In this instance, the heater casing 37 is formed at its ends with flanges which are folded upon themselves to form upstanding arms 38 at the extremities of the casing, while the end portions of the arms are bent outwardly to provide lateral attaching flanges 39 corresponding to the flanges 11 of the prior embodiment of the invention and adapted to serve a like pur-

pose. Thus, the modified form of heater may be applied about an engine crank case to extend therebeneath resting flat against the bottom wall of the crank case, while the arms 38 of the heater will extend up along the side walls of the crank case so that the bolts which secure the crank case in place may be arranged to extend through the flanges 39 for anchoring the heater. Preferably, an insulating block 40 like the block 30 is mounted upon one of the arms 38 of the heater casing to receive the leads to the resistance element of the heater. Otherwise, this modified form of the invention is identical with the preferred construction and further description is accordingly believed unnecessary.

Having thus described the invention, what we claim is:

An engine crank case oil heater including a casing, an insulating core enclosed within the casing and provided with end lugs, lugs formed upon the opposite sides of the core intermediate its ends and alined with the end lugs for spacing the core with respect to the casing, and a resistance element wrapped about the core, one end portion of the resistance element extending between and supported by the end lugs and supported intermediately by the central lugs and being supported thereby out of contact with the turns of said element to provide a return connection for the element, and a sleeve engaged in the core between the intermediate lugs and having its ends fixed to the casing.

In testimony whereof we affix our signatures.

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