

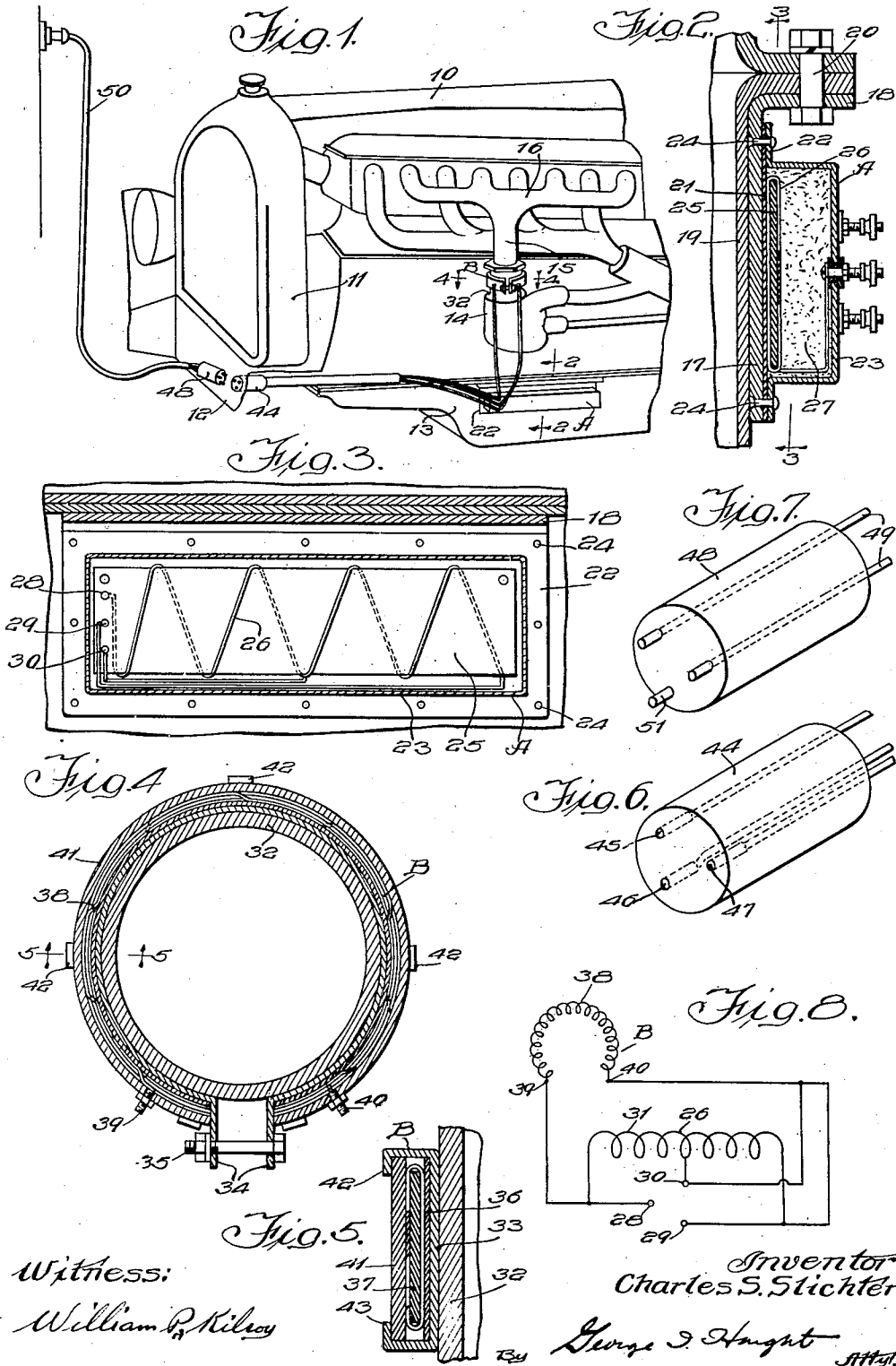
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HEATING DEVICE FOR INTERNAL COMBUSTION MOTORS

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HEATING DEVICE FOR INTERNAL-COMBUSTION MOTORS

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This invention relates to heating devices for internal combustion motors.

A general object of the invention is to provide a heating arrangement adapted to co-operate with an internal combustion motor so as to facilitate starting of the same in cool weather, and wherein the energy necessary to operate the heating arrangement may be drawn from a commercial lighting circuit ordinarily accessible in garages and the like, whereby the oil in the crank case housing may be warmed, and the vaporization of fuel in the carbureter and manifold facilitated.

A more particular object of the invention is to provide a plurality of heating devices electrically connected so as to operate in unison to warm the oil in the crank case and at the same time heat the fuel prior to its introduction into the engine to facilitate vaporization and prevent undesirable condensation.

A still further object of the invention is to provide a heater including an insulated resistance element and support therefor, which is applied to the crank case of an engine in such manner as to warm the oil and thin it, thereby removing a large amount of resistance in starting the motor and avoiding draining of the starting battery and also facilitating immediate circulation of the oil and proper lubrication of the motor.

Another object of the invention is to provide a heating element for use in connection with the carbureter and manifold wherein a resistance element is provided, together with electrical connections and insulation, and disposed about manifold connection so as to warm the fuel issuing from the carbureter into the manifold. It is also an object of the invention to provide a heating element with suitable connections, wherein the heating element is supplied with different amounts of electricity, and the intensity of heat delivered by the heating device varied to suit different atmospheric conditions.

The invention also contemplates a combination wherein the heating devices for the crank case and manifold are electrically connected so as to be actuated from a common

plug which may be detachably connected to a commercial lighting circuit.

Further, the invention includes heating devices for both the crank case and manifold or fuel inlet, wherein the crank case heating device is capable of delivering heat at different temperatures, both heaters being operable from a common plug, having a plurality of contacts, whereby the plug may be connected to the lighting circuit to transmit the electric current to provide different degrees of heat in the crank case heating device.

In the drawing forming a part of this specification, Figure 1 is a side elevational view of the forward portion of an automobile and showing the motor thereof, in connection with which the heating devices are utilized, said figure also illustrating the manner in which the heating devices may be connected to a commercial lighting circuit. Figure 2 is a transverse sectional view taken through the crank case heating device, and corresponding substantially to the line 2—2 of Figure 1. Figure 3 is a longitudinal sectional view of the crank case heating device corresponding substantially to the line 3—3 of Figure 2. Figure 4 is a horizontal sectional view taken through the manifold and manifold heating device and corresponding to the line 4—4 of Figure 1. Figure 5 is a transverse vertical sectional view corresponding substantially to the line 5—5 of Figure 4. Figure 6 is an enlarged detailed perspective view of the plug socket used in connection with the heating circuit. Figure 7 is an enlarged perspective detailed view of a plug used in connection with the lighting circuit, and Figure 8 is a diagrammatic layout of the wiring utilized in connection with the heating devices.

As shown in the drawings 10 represents the forward portion of an automobile having the usual radiator 11, and apron 12 which connects the front fenders. The motor is provided with the usual crank case oil reservoir indicated at 13. The motor also is provided with a carburetor 14 which communicates with the inlet portion 15 of a manifold 16 leading to the cylinders. All of the construction thus far described is of an old type and forms no part of the present invention except

so far as it enters into combination with the heating elements hereinafter described.

A heating arrangement is provided including two heaters, one for the crank case indicated generally by the reference character A and the other for the manifold indicated generally by the reference character B. The heating device A comprises a supporting plate 17, as best shown in Figure 2, the plate 17 being disposed flat against the outer wall 19 of the crank case housing. The flanged portion 18 may be secured in position by the same bolts which extend through the flanges of the crank case housing and motor block, as indicated at 20. Lying flat against the plate 17 is a layer of insulation 21, and bearing upon the outer edges of the layer 21 of insulation are flanges 22—22, of a composition cap of cup-shaped formation indicated at 23, the flanges 22 being secured to the plate 17 by means of rivets 24. Mounted within the housing formed by the plate 17 and the cap 23 is a sheet of insulating material such as mica, indicated at 25, and about the insulating 25 in a longitudinal direction is wound a resistance element or wire indicated at 26, forming a circuit as hereinafter more particularly referred to. Packing 27 is placed within the cap 23 so as to fill the same and bear upon the insulating material 25 as shown.

The circuit for the heating device A is best shown in Figure 8. Through the use of a plug hereinafter referred to, contacts 28 and 29 are provided forming the terminals of the resistance coil 26. Another terminal 30 is tapped into the coil 26 so that it is possible to utilize only a portion of the coil indicated at 31 so as to deliver a greater amount of heat than when the entire coil 26 is utilized by use of the contacts 28 and 29. The heating device A when energized by reason of its position against the crank case produces heat of different degrees, depending upon whether the full coil 26 or only part thereof is utilized, thereby making available heat for warming the oil in the crank case, thinning the same, and facilitating starting and lubrication of the motor.

The heater B is utilized in connection with the carbureter manifold inlet. As shown in the drawing, the heater B is utilized in connection with an extension 32 on the carbureter leading to the inlet portion 15 of the manifold. The heater B comprises an elongated strip 33 adapted to be disposed about the extension 32 as best shown in Figure 4 and is provided with turned ears 34—34 through which are extended a securing bolt 35. Next to the plate 33 is secured a strip of insulating material 36, and outwardly of the strip 36 is a strip of insulating material, such as mica, about which is coiled a resistance wire 38, the ends of which communicate with terminals 39 and 40. The outermost portion of the heater B consists of a layer of insulating

material indicated at 41, which is held in position by a plurality of ears 42—42 at top and bottom, which are bent over the edges of the strip 41 and so maintain the various parts which go to make up the heating unit B in assembled relation. The heater B is connected in parallel with the circuit of the heater A, as best shown in Figure 8. Connecting wires from both the heaters A and B lead to the socket plug 44, the wire from the terminal 28 leading into the socket 45, the wire from the terminal 29 leading to the socket 46 and the wire from the contact 30 leading to the socket 47. A contact plug 48 is provided which communicates with an ordinary commercial lighting circuit through wires 49—49 extending through a suitable cable 50. The plug 48 includes 3 pins, two of which are in electrical communication with the wires 49 and 50, while the pin 51 is dead. The plug 44 is mounted in any suitable manner in some desirable location upon the forward portion of the automobile, such as that shown in Figure 1.

Assuming that the motor is cold, and has been subjected for some time to low temperatures, the oil in the crank case will be relatively thick, and in this condition interferes with easy starting and impeding proper circulation immediately after starting causing excessive use of the starting battery with consequent depletion of the energy thereof; also, under ordinary conditions, the fuel initially drawn into the manifold 15 before the motor is started, will come into contact with the cold walls of the manifold and condense, rendering starting very difficult. In the use of the invention if it is desired to provide relatively great heating effect, the two live points communicating with the wires 49—49 of the plug 48 are inserted into the sockets 45 and 46. This will establish electrical communication with the portion 31 of the coil, and also with the coil 38 of the heater B. This circuit simultaneously energizes both the portion 31 of the heater A and the heater B, resulting in supplying heat to the crank case and to the carbureter manifold. When somewhat slower heating is desirable, the live points of the plug 48 are inserted into the sockets 46 and 47 which results in the entire coil 31 being interposed in the circuit, and the coil 38 also in communication with the circuit, whereby somewhat less heat is generated by the heating device A, while the heater B functions as before described.

While I have herein shown and described what I now consider the preferred manner of carrying out my invention, the same is merely illustrative, and I contemplate all changes and modifications that come within the scope of the claims attached hereto.

What I claim:

1. In an arrangement of the character described, the combination with an internal

combustion motor; of a heating element associated with the fuel intake of said motor for warming the fuel prior to its inlet to the motor, and a second heating element mounted on the crank case of the motor adjacent the oil level therein for warming the oil in said motor prior to starting; and means electrically connecting said heaters for simultaneous operation, said means including a terminal member mounted in an accessible position and connected to both of said heating elements to form a common terminal therefor, and a common plug connected to a lighting circuit and adapted for detachable connection with said terminal member.

2. In an arrangement of the character described, the combination of a vehicle having a motor with a heater mounted on the outside of and in contact with the crank case of the motor below the oil level therein to heat the oil in contact with the inside of said crank case; of a resistance coil for said heater including contacts adjacent its ends and a contact intermediate its ends, said contacts leading to a three-contact plug permanently mounted on said vehicle in an accessible position; a second heater juxtapositioned with reference to and in contact with the carburetor manifold of the motor to heat the fuel through the wall of the manifold, said second heater having a resistance coil connected in parallel with said first coil; and means connected with a commercial lighting circuit for energizing said coils, said means comprising a plug having two contacts adapted to be selectively and detachably engaged with pairs of contacts of the three-contact plug.

3. In a structure of the character described, the combination with an internal combustion motor having a crank case; of an electrical heating means for heating the oil in said crank case, said electrical means comprising a plate formed to fit against the exterior wall of said crank case, and having means engageable with the means for securing the crank case in position upon the motor; a resistance element disposed immediately adjacent said plate; insulation disposed exteriorly of said resistance element and surrounding the same; and a cup shaped cover member enclosing said insulation and said resistance element, said cover being secured to said plate, and having a plurality of terminal posts in electrical communication with said resistance element.

In witness that I claim the foregoing I have hereunto subscribed my name this 6th day of July 1928.

CHARLES S. SLICHTER.