June 17, 1930. S. V. JACKSON 1,764,021

ENGINE PREHEATER

Filed March 6, 1928

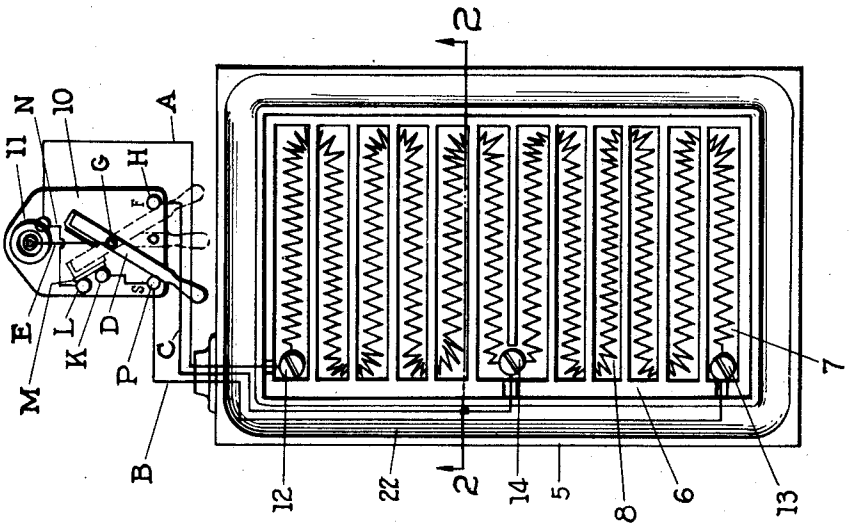



FIG. 3.

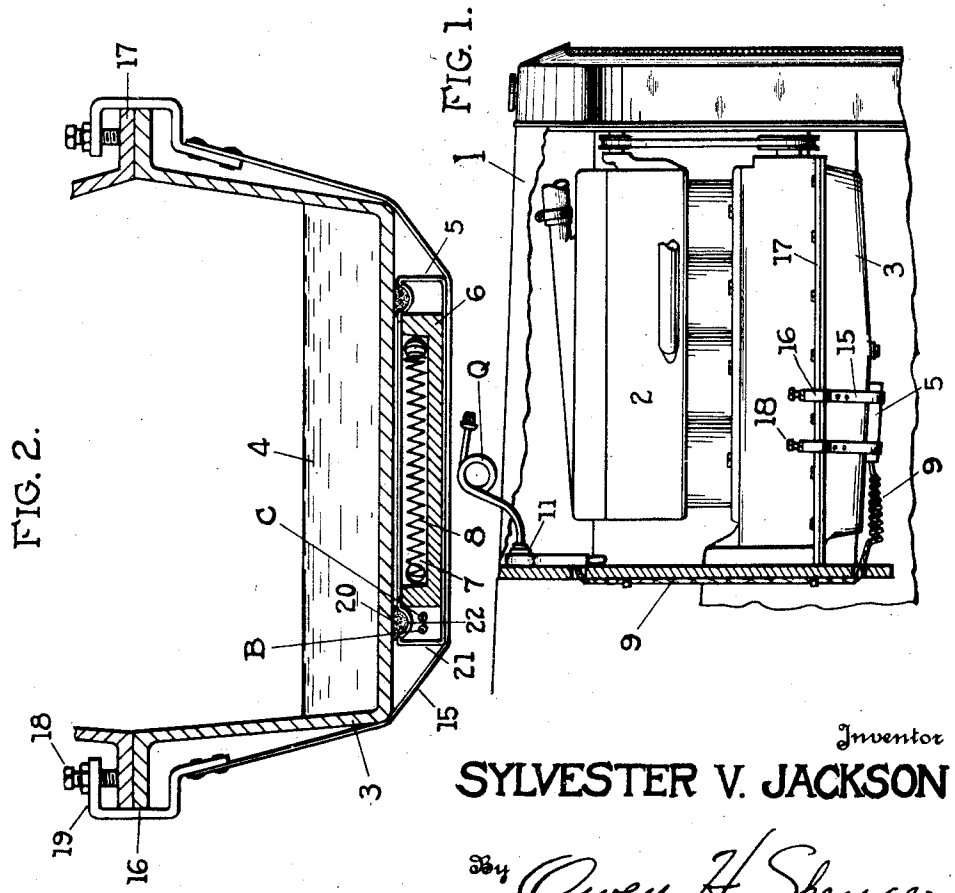



FIG. 1.

FIG. 2.

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# UNITED STATES PATENT OFFICE

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## ENGINE PREHEATER

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This invention relates to heating elements primarily adapted for heating the crank case of an internal combustion engine, and one feature of the invention is the provision of means for suspending the heating element against the outer face of the crank case in such manner that the oil within the crank case will be heated, when the heating element is electrically energized.

A further feature of the invention is in so constructing the suspending means that the heating element may be located at any suitable point beneath the crank case or pan containing lubricating oil, and associated with motors of various designs.

A further feature of the invention is the provision of a sealing means between the heating element and the crank case, whereby the heat will be confined within the area of the heating element.

A further feature of the invention is the provision of means for connecting the heating element to a source of electric supply whereby the heating element may be readily energized, slowly or rapidly as desired.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specification.

In the accompanying drawing which is made a part of this application.

Figure 1 is a side elevation of an internal combustion engine as embodied in an automobile, with the heating element attached thereto.

Figure 2 is a transverse sectional view through the crank case of the engine and heating element, indicated by line 2—2, Fig. 3, and

Figure 3 is a top plan and diagrammatic view of the heating element, and connections.

Referring to the drawing, the numberal 1, indicates the hood of an automobile in which is located an engine 2, said engine having the usual crank case oil pan 3.

When the engine is idle during cold weather, the oil 4 within the oil pan 3 becomes chilled to such an extent that it is very difficult to turn the motor over, and in some instances, becomes so chilled that the motor cannot be started.

To overcome this objectionable feature and reduce the oil to a pliable or normal state, a heating element 5 is provided, comprising a body portion 6 the upper face of which is provided with a plurality of grooves 7, within which is located a heating coil 8 of any ordinary or preferred type.

When the current is fed to said heating coil, for short intervals a comparatively intensive heat is desired, and is conveniently taken from the usual garage illuminating circuit to shunted groups of the heating coil convolutions. To this end, a three wire conductor 9 containing the wires A, B and C is extended from an extension cord socket 11 through the swich 10 which is preferably mounted as a unit with the base of said socket. Said socket and switch are located at any suitable point within the confines of the automobile, the two wires A and B being connected to the connecting posts 12 and 13 respectively of the coil 8.

When the engine is thus employed for heating the oil 4 at a somewhat rapid rate, the switch lever D is swung toward the letter "F" as is indicated by the dotted outline of said lever, said letter "F" being marked upon the switch housing and meaning "fast." By this arrangement, the current may travel from the socket 11, thru the wire E to the switch fulcrum G, through said lever to the contact point H, and thence through the wire C to the medial connecting post 14 of the coil 8, and thence dividing and passing through the different halves of said oil to the posts 12 and 13, and thence through the wires A and B enroute to the socket 11. The current carried by the wire A passes through contacts K and L, it being understood that an insulated strip M on the end of said switch lever opposite the contact H from the fulcrum G, connects the point K with the point L from where the current is carried by the wire N to the same part of the socket 11 which receives the wire A.

The current is carried to said socket by a common extension cord means Q, to a socket or plug connection within the building near or containing the automobile.

By this arrangement it will be understood

that current from the light circuit is thus shunted through the two halves of the coil 8 which are made up of substantially the same number of convolutions.

When it is desired to apply more moderate heat to the engine over a long period of time the lever D is moved to a position in the direction of the attached letter "S" (meaning "slow") as indicated by solid lines and the current may then travel from the socket 11 to the fulcrum G, by way of the wire E, thence through said lever to the contact P which is a part of the wire B, and thence through said wire to the end post 13, of the coil 8, through said coil to other end post 12 thereof, and thence through the wire A to said socket. It will be understood that since said heating coil is thus completely connected in series the resistance to the current will be greater and the heating effect being less, and the rate at which the current is used being less.

From the foregoing it will be understood that, for example when it is desired to keep the oil heated over night the switch lever D is set in the slow position indicated by the letter "S" or other suitable markings on the switch. In other instances the user will want to heat up his engine in a very short period of time and the lever is in that case moved to the "fast" position as indicated by the letter "F" or any other suitable marking. It will also be understood that the current may be entirely cut off by moving the lever to an intermediate position as shown by dot-and-dash lines. This position may be indicated by any desired marking as for example the letter "O" as marked on the switch housing and meaning "off."

In applying the device to use, after the car has been placed in a garage, and when the weather is extremely cold, the invention may be used until the next time the car is driven, thus maintaining the oil in a warm pliable state until such time as the motor is again started. When the weather is not so extremely cold, the heating element need not be energized until a short time before the motor is to be started.

The heating element 5 is suspended at any suitable point against the lower face of the crank case 3 by means of straps 15 having at their terminals, clamps 16 which fit over the ribs 17 of the motor and serve thus to support the heating element. In order to draw the heating element firmly against the under face of the crank case, clamping screws 18 are threaded downwardly through the overhanging ends 19 of the clamps 16, and by turning said screws downwardly, after the heating element has been located beneath the crank case, until they are forced against the crank case, they hold the heating element in fixed position.

To better confine the heat within the area of the heating element and cause it to expend all its heating properties against the crank case, any suitable form of gasket 20 is introduced between the frame 21 of the heating element and the wall of the crank case 3, the frame preferably having a channel 22 in which the gasket rests. This gasket also protects the coil 8 from dirt and grease.

The engines of different automobiles vary somewhat in their lower oil pan surfaces. This variance is usually more pronounced in engines put out by different manufacturers and the gasket 20 is suitable in size and cross section to adapt itself to the different shapes of the different engine bottoms by which arrangement the present device may be manufactured and marketed so as to be somewhat universally and interchangeably applied to different automobiles.

It will also be obvious, from Fig. 1, that the angular portions of the engine bottom may be compensated for by making different adjustments of the screws of the clamps 16 and 18.

The straps 15 are so constructed that they may be readily shaped or bent to conform to the outlines of the engine to which they are to be secured, thereby adapting the heating element for attachment to any well known make of engine, without changing any of the parts thereof.

In addition to heating the crank case, the cylinders and other parts of the engine are indirectly heated, as well as the water in the water jackets and radiator, and this also warms the atmosphere within the atuomobile hood, all of which is obviously advantageous.

As will be understood by those familiar with conventional automobile and similar explosive engines, water accumulations are nearly always present in the oil compartments of the crank case. In some instances this is due to the condensation of moisture from the atmosphere as drawn in through the crank case breather, and in some instances through the water jackets. The presence of this water in the oil has a destructive effect upon certain working parts of the engine and especially upon the cylinders and pistons. It is obvious that this invention will serve to evaporate these water accumulations in the crank case and thus free the oil from same, and thus avoid the aforesaid destructive effect upon the engine.

While the description and drawing illustrate in a general way, certain instrumentalities which may be employed in carrying the invention into effect, it is evident that many modifications may be made in the various details, without departing from the scope of the appended claims, it being understood that the invention is not restricted to the particular example herein described.

What I claim is:

1. A heating element for the crank case of an internal combustion engine, comprising

a heating element proper, flexible straps for suspending said heating element at any suitable point on the external surface of the crank case and shape to the contour of the parts over which they extend, clamps attached to the ends of said straps adapted to engage parts of the engine and means carried by the clamps adapted to be forced against the parts of the engine engaged by the clamps for drawing the heating element firmly against the face of the crank case.

2. A heating element for the crank case of an internal combustion engine, comprising a frame having a channel in one face thereof, a body portion within said frame, having longitudinal grooves therein, a heating coil disposed in said grooves, means for conveying electricity to said coil, means entering the channel of said frame for forming a seal between the frame and crank case, and flexible means for clamping the heating element at any suitable point against said crank case.

3. A heating element for the crank case of an internal combustion engine comprising a heating element proper; an adjustable means for detachably holding the heating element against the engine surface; and a yielding surface means on said element adapted to yieldingly embrace the engine surface, and adapt the element to different and irregular engine surfaces.

In testimony whereof, I have hereunto set my hand on this the 2nd day of March, A. D. 1928.

SYLVESTER V. JACKSON.