

Feb. 19, 1924.

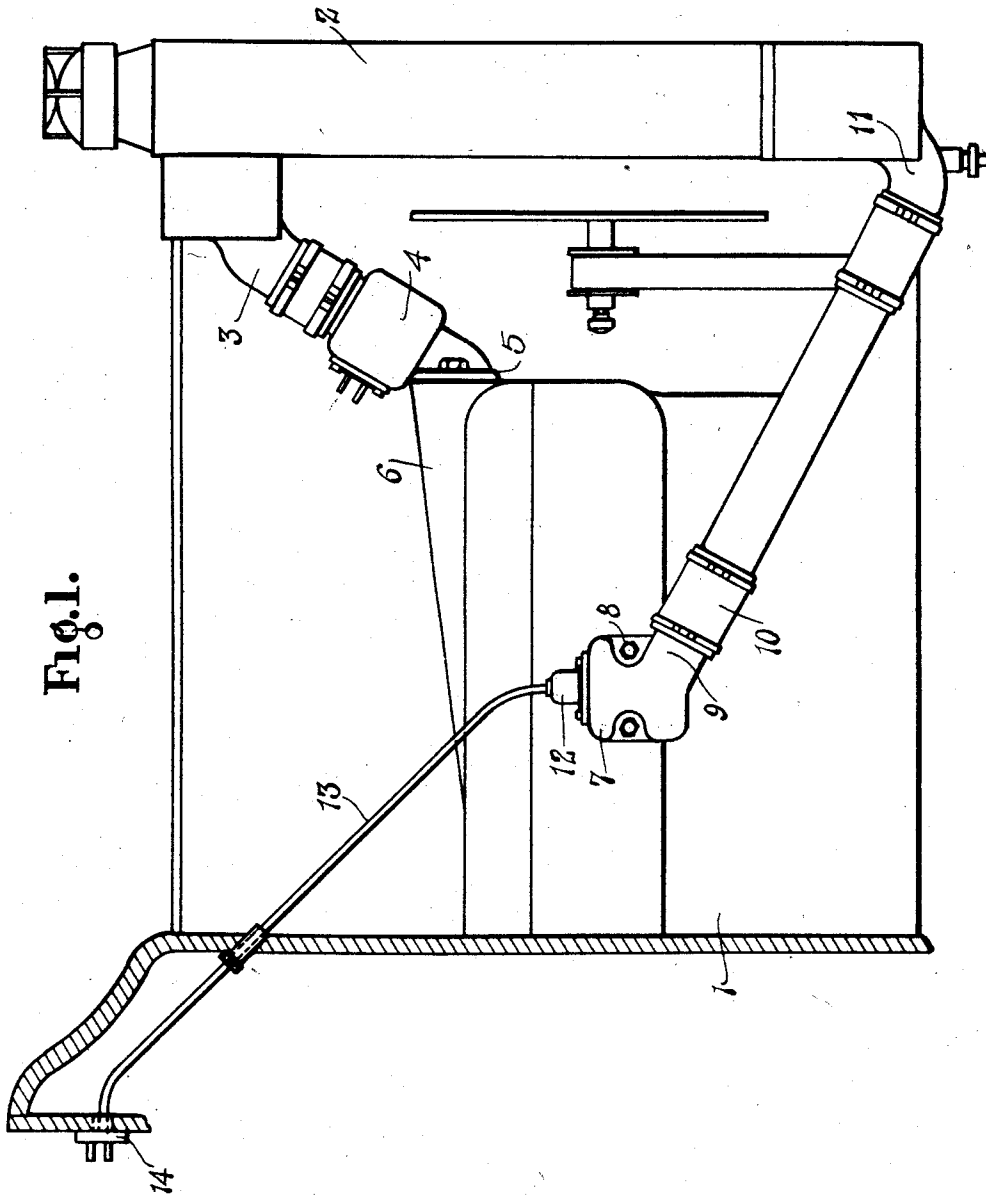
R. C. PAULY ET AL

1,484,152

HEATER

Filed June 19, 1922

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

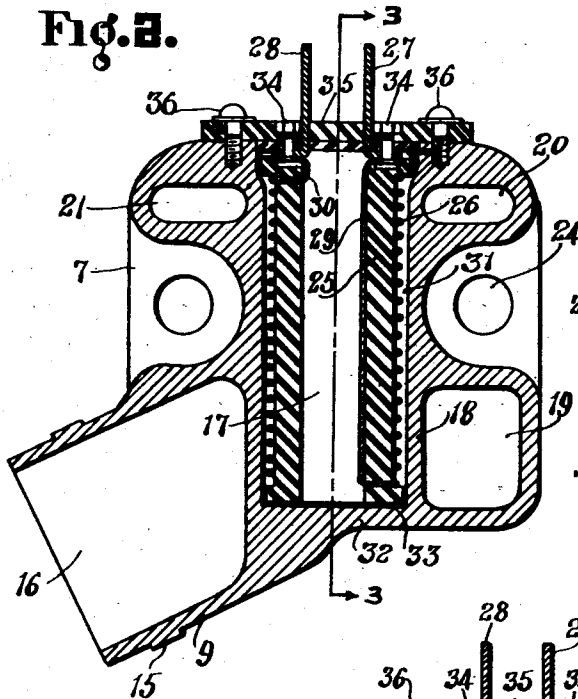


Fig. 3.

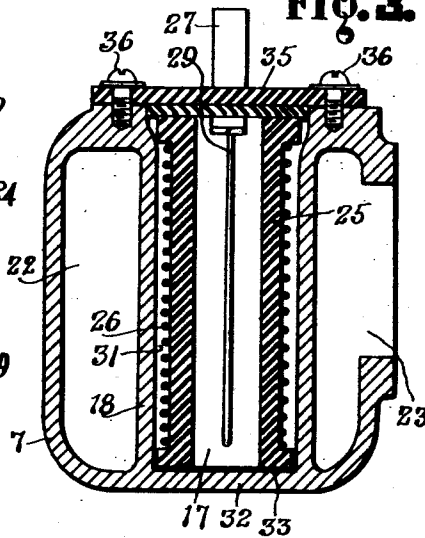
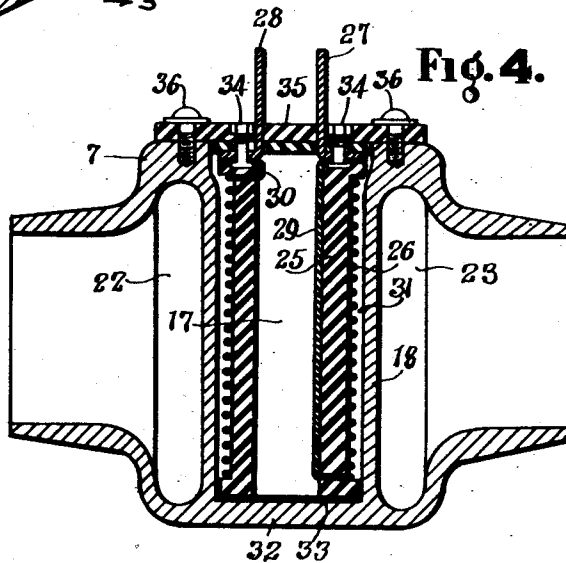


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT CORWIN PAULY, OF DAYTON, AND GROVER F. ILGEN, OF SPRINGFIELD, OHIO.

HEATER.

Application filed June 19, 1922. Serial No. 569,404.

To all whom it may concern:

Be it known that we, ROBERT CORWIN PAULY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, and GROVER F. ILGEN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Heaters, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to heaters and in particular to heaters for the circulation systems of automobiles.

The object of our invention is to provide means for maintaining the temperature of the water in the circulation system of automobiles at a predetermined point to prevent freezing.

It is our object to provide a mechanism to which current may be supplied for this purpose, the current either being supplied by a current source carried by the automobile or from a current source such as provided in an ordinary garage from a separate source of electrical energy.

It is our object to provide a heating unit which may be substituted for existing parts in an automobile which has been constructed and shipped from the factory.

It is a further object of our invention to provide such a substitute part with our invention embodied in it which will fit in the same location in the same way without disturbing the functioning of the automobile, while still providing for a further circulation of the water and the heating of it as it so circulates.

It is an additional object of our invention to provide a unit heating element which may be so substituted and mounted upon the automobile that this unit can be purchased as an accessory in the open market and placed on the automobile by the owner.

It is a further object of our invention to provide a unit casting or cover to take the place of an existing casting on an automobile, this unit casting having further passageways for the circulation of the water or other cooling liquid about a thin walled heating chamber in the casting and it is the object of our invention to provide such an arrangement of the heating elements adjacent the walls of this casting or heating compartment, that a maximum amount

of the heat may be transmitted therethrough to the liquid, the temperature of which is to be so controlled.

It is a further object in this heating compartment to provide a combined support and insulating member which will not only support the heating elements, maintaining them closely adjacent to the wall of the chamber by outer contact therewith, but also form a baffle to prevent the heat from passing through the supporting element and reflecting the heat against the wall to be heated, thus insuring a maximum of heat to be transmitted to the water circulating through the system.

It is our object to obviate the former difficulties in apparatus for heating water in automobile circulating systems by thus conserving and reflecting the heat, bringing it closely adjacent the part to be heated to prevent any contact between heating elements and the part to be heated.

It is an additional object of our invention to provide a ready means for detaching and attaching the current supply and for detaching and attaching the supporting end of the thermo unit within its heating chamber in the casting, thus facilitating ready adjustment and renewal by one unskilled in such matters.

It is an additional object of our invention to provide a means of suspending the supporting and heating unit in such a way that the jars, shocks and strains imparted to the vehicle will not cause injury to the thermo element nor so move it as to bring it in contact with the casing, in which it is supported.

Referring to the drawings:—

Fig. 1 is a side elevation of the heating unit applied to an automobile engine;

Fig. 2 is a section taken transversely of the unit showing the arrangement of the heating chamber, the thermo unit, etc.;

Fig. 3 is a section taken at right angles to the section in Fig. 2 along the line 3—3 and viewed in the direction of the arrows; and

Fig. 4 is a modification of the same general construction.

Referring to the drawings, 1 is an automobile engine provided with the usual circulation system through which water or other liquid may be passing to cool the cylinders of the internal combustion engine. 2 is a radiator through which said liquid is

passed for cooling purposes. The upper portion of the radiator is connected to a pipe 3 in which is interposed at 4 one of the heating units embodying the invention herein described and claimed. It will be observed that this unit is interposed in the pipe 3 and is connected as at 5 to the upper half 6 of the casing of the engine and communicates with the circulation system at the top of the engine. The heating unit 7 embodying the present invention is mounted on the side of the engine where the water enters into the cooling manifold about the engine and takes the place of the existing connecting casting which normally occupies this space. 7 is mounted by the bolts 8 upon the side of the engine and has at its outer end a pipe 9 to which is connected the usual pipe 10 that is joined at 11 to the bottom of the radiator. A plug 12 is connected to a wire 13 which passes upwardly to a dash connection 14. 14 can be connected to any suitable source of current either carried by the car or available in a garage.

It will be noted that this unit 4 or 7 may be applied to the existing automobile, taking the place of a similar connection without the heating unit. It is applied to the same place, using the same bolt holes and the same bolts and accommodates itself to the restricted area into which said parts must fit.

Referring in detail to the unit 7, 9 is the connecting pipe to connect with 10 provided with a shoulder 15 to facilitate the engagement between 9 and 10. Within 9 is a passageway 16 through which the water or other liquid cooling the engine flows. This passageway is continued completely around the heating compartment 17 which is provided with a wall 18. 19, 20, 21, 22 and 23 represent the passageways through which the liquid circulates about the heating compartment 17 adjacent the walls 18. 24 represents the bolt holes through which the bolts 8 pass for retaining the unit in engagement with the engine.

Within 17 is suspended a tubular heat resisting insulating support 25, on which is wound a thermo element 26, of any desired character, which radiates heat upon current being applied thereto and passed through it. Current is applied to the terminals 27 and 28 in any desired manner, these terminals being connected to fit wires 29 and 30 which, in turn, are continued in the coil 26 about 25.

It will be noted that there is a space 31 between 25 and 26 and the wall 18, and there is a space at the bottom of 17 between 25 and the bottom wall 32 of 17, this space being designated 33.

The entire assembly of heating units and insulating units is supported by screws 34—34 on a transverse insulating plate 35

which is mounted upon the top of the casting by the screws 36—36.

It will be apparent that 26 is supported closely adjacent to the wall 18, but separated therefrom, is suspended by 35 which will take up the jars and shocks incident to the operation of the vehicle and has a backing consisting of the core 25 which is heat-resisting and insulating material and which deflects the heat in 26 against the wall 18, thereby insuring that the maximum of heat will be applied to 18 and that the circulation of water in 26 will be at the minimum to prevent cooling of the unit, yet preserving 26 away from 18 so that no contact will be had and no destructive effects will result.

Furthermore, by our invention we are enabled to place the heat radiating unit in the path of the water so that the entire compartment 17 will be surrounded by water or other cooling liquid, receiving the complete effect of all of the heat as the water passes over 18. This arrangement results in having the water completely pass over the unit without the destructive effect of placing the heating unit itself in direct contact with the water. It is a further advantage that the heating element and its supports may be withdrawn for repair, etc., without causing any leaking of the unit which would not be the case if the heating unit were projected directly through the wall of the casing or pipe through which the water is passing. Our invention obviates the disadvantages of such an arrangement.

While we have shown and described certain features as constituting our invention, it will be understood that parts have been shown for purposes of illustration only, and that I do not desire to be limited to such details, as obvious modifications will occur to a person skilled in the art.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a heating unit, a casing containing a water compartment and a heating compartment over which the water in the water compartment will pass, said heating compartment having its upper end open to afford access thereto from the exterior of the casing, a heating element in said heating compartment closely adjacent the wall thereof but spaced therefrom, a plate at the upper end of the heating compartment closing said end removably, a hollow heating deflecting and insulating member supported from said plate and supporting said heating element closely adjacent to said wall, said hollow member being adapted to insulate and deflect heat outwardly to said wall, and means of supplying current to said heating element extending through the hollow insulating member.

2. In a heating unit, a casing containing

a water compartment and a heating compartment over which the water in the water compartment will pass, said heating compartment having its upper end open to afford access thereto from the exterior of the casing, a heating element in said heating compartment closely adjacent the wall thereof but spaced therefrom, a plate at the upper end of the heating compartment closing said end removably, a hollow heating deflecting and insulating member supported from said plate and supporting said heating element closely adjacent to said wall, said hollow member being adapted to insulate and deflect heat outwardly to said wall, means of supplying current to said heating element extending through the hollow insulating member, and flanges on the opposite ends of said hollow insulating member projecting outwardly beyond the heating element whereby to hold the heating element from contact with the wall of the heating compartment.

3. In a device of the kind described, a casing having an inlet and an outlet, said casing being provided with a substantially central heating compartment located between the inlet and outlet, said heating compartment being formed by an annular wall

extending between the top and bottom of the casing, the bottom end of the heating compartment being closed by the bottom wall of the casing and the top end of said heating compartment being open to afford access to the interior thereof, an insulating plate supported at the top of the casing and normally closing the upper end of the heating compartment, a flange plate on the underside of the insulating plate and having peripheral engagement with the inner surface of the heating compartment wall, a hollow cylindrical insulating and supporting element secured to said plates and depending therefrom to the bottom of the heating compartment, said element having a flange at its bottom end engaging the inner surface of the heating compartment wall, a heating element wound on said insulating element, and electrical connections extending through said plates in the opening of the hollow supporting element and through said supporting element to the heating element.

In testimony whereof, we affix our signatures.

ROBERT CORWIN PAULY.
GROVER F. ILGEN.