May 20, 1930. K. H. BOWEN 1,759,389

HEATING DEVICE

Filed Jan. 2, 1929

Fig. 1.

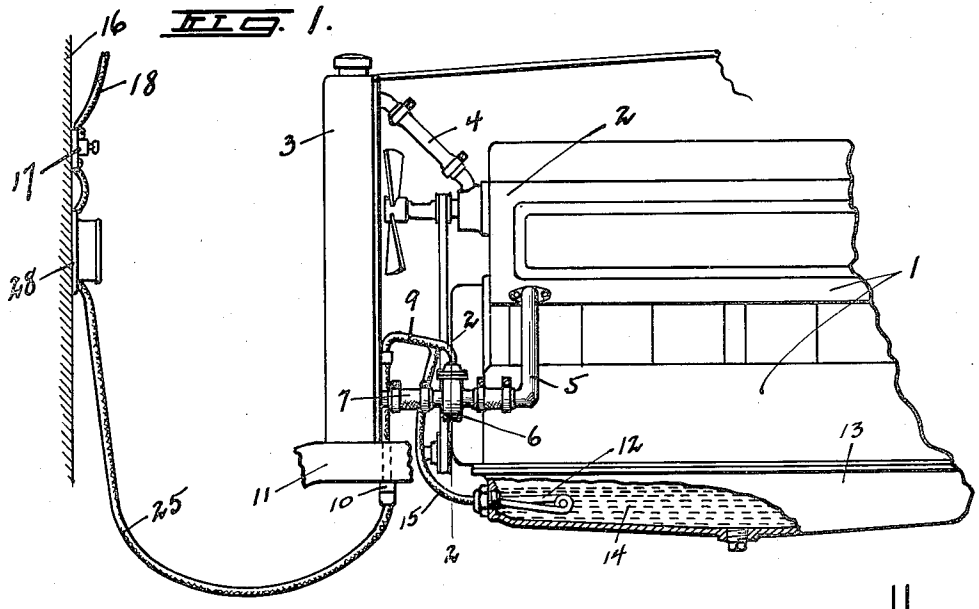


Fig. 2.

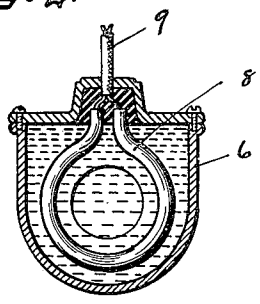
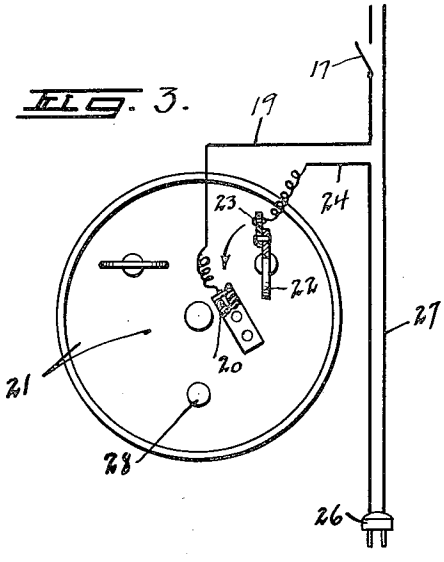


Fig. 3.



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WITNESS.

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UNITED STATES PATENT OFFICE

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HEATING DEVICE

Application filed January 2, 1929. Serial No. 329,761.

This invention relates to a new and improved heating device and is particularly adapted for use with internal combustion engines.

In the case of internal combustion engines in which the cooling system consists of a supply of water which is circulated around the cylinders of the engine and then is cooled by means of a cellular radiator and a fan for circulating air, the temperature of the water in the circulating system, when the engine is not running, will be lowered to the temperature of the surrounding atmosphere. In case the temperature of the atmosphere is below the freezing point, the water in the circulating system will freeze, with the liability that certain parts of the engine or radiator will be cracked or broken by the expansion of the ice in the circulating system. Furthermore even if the temperature of the atmosphere is not below the freezing point, the cooling of the water and the consequent cooling of the different parts of the engine will make the starting of the machine difficult.

Also, in engines of this character the supply of lubricant for the cylinders, crank shaft, etc., is usually carried in the base of the engine and is kept in a normally fluid condition by the heat emanating from the cylinders of the engine. When the engine is stopped and the temperature of the oil drops to the temperature of the surrounding atmosphere, it will become more viscous and will to a certain extent impede the operation of the engine when it is again started.

The main object of my invention is to provide a heating means for the water in the cooling system of an internal combustion engine and heating means for the lubricant carried in the base of the engine which may be made operative from a source of potential extraneous to the engine itself, so that such heating means may be employed when the engine itself is inoperative.

When an engine has been running so that the water in the circulating system and the lubricant in the base is in a heated condition, there will be a considerable lapse of time after the engine has been stopped before the temperature of the water and the lubricant will be lowered sufficiently to interfere with the re-starting of the engine or become frozen, if the temperature of the surrounding atmosphere is sufficiently low to produce such a result. During the time when the heat units carried by the water in the circulating system are sufficient to keep the engine and the component parts warm any extraneous heating means would be superfluous. Furthermore, there are certain times of the year when the temperature of the atmosphere is not sufficiently low to turn the water in the circulating system into ice, but is sufficiently low so that the cooling of the water and lubricant and the component parts of the engine will render the re-starting of the engine difficult. Under these conditions, it is desirable to have an extraneous heating means which can be employed for a selected length of time prior to the time when it is desired to re-start the engine. It would of course, be possible to put in operation the extraneous heating means at any selected time by the manual operation of a switch, but such mode of operation would be inconvenient for the operator, and the starting of the heating means might be overlooked, due to the human equation, with the resulting ill-effects.

Another object of my invention is to provide an automatic means for putting the extraneous heating means in operation at a predetermined selected time, so that the operator, by the use of such means, may arrange in advance the time at which the heating means will be put in operation without any necessity of further attention or action on his part.

Other objects and advantages relate to the size, shape, and arrangement of parts, all as will more fully appear from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevation partially broken away of an internal combustion engine and radiator with my device attached thereto.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a rear elevation of my automatic starting means.

In the drawing, —1— is an internal com-

bustion engine having a water-jacket 2 surrounding the cylinders (not shown) and connected to the upper portion of a radiator 3 by a conduit 4. From the lower part of the water jacket a downwardly extending conduit 5 has its lower end connected to a heating unit casing 6, which casing 6 is also in communication with the lower end of radiator 3 through a conduit 7. In casing 6, I provide an electrical resistance unit 8 from which a two-wire cable 9 extends outwardly and downwardly to a contact plug 10 secured to the radiator supporting frame 11.

A second electrical resistance unit 12 is positioned in the base 13 of engine 1 immersed in the lubricant 14 contained therein. The resistance unit 12 is connected through a two-wire cable 15 to two-wire cable 9 so that resistance unit 12 is in circuit with resistance unit 8.

At a convenient place, as for example, the wall 16 of the garage in which the automobile is stored, I provide a switch 17 of any convenient style having one side connected by means of a cable 18 to a source of potential (not shown), and having the other side connected by a wire 19 to a contact post 20 secured on the rear face of a clock mechanism 21 of the type which is provided with an alarm and a wing-nut 22 by which the alarm is wound. The preferred type consists of that in which the wing-nut 22 revolves when the alarm is wound. On one end of wing-nut 22, I provide a contact post 23, so positioned that when the alarm of the clock mechanism is rung, wing-nut 22 will revolve to bring contact 23 into contact with contact post 20. From contact 23, I lead a wire 24 which is carried in a cable 25 to one side of a contact plug 26. From the other side of contact plug 26 a wire 27 is carried through cable 25 and switch 17 to cable 18 and thence to the source of potential.

With plug 26 in position in plug 10, it will be seen that when switch 17 is connected and contact 23 is in electrical contact with contact post 20, the potential will flow through cable 18, switch 17, line 19, contacts 20 and 23 and line 24 to plug 26 and thence through plug 26 to one wire in cable 19, and to one wire in cable 18, through resistance units 8 and 12 and thence back through the second wire in cables 15 and 19 through plugs 10 and 26 and wire 27 back to the source of potential to complete the circuit.

With the parts in the position just described, the water in the circulating system adjacent resistance unit 8 will become heated and by a thermo-siphon action will move upwardly, the colder water in the system moving downwardly to become heated, with the result that all of the water in the water circulating system will be raised to a temperature which will heat the engine to an easily operable condition and which will also prevent freezing of the water. Similarly the oil 14 in the base of the engine, in which the resistance unit 12 is immersed, will also become heated which will prevent its becoming viscous.

So that the winding and setting of the clock and alarm mechanism may be conveniently done, I provide on wall 16 adjacent switch 17 an anchor plate 28 in which the clock mechanism 21 is slidably mounted and from which it may easily be removed.

Operation

When it is desired to use my device, the automobile with which it is to be used is placed in a position so that plug 26 may be inserted into plug 10. The clock mechanism 21 is then set and started, the wing-nut 22 turned in a clock-wise direction to wind the spring of the alarm and the knob 28 of the alarm setting mechanism (not shown) rotated to insure the starting of the alarm at any desired time. When this has been done, the switch 17 is closed, but as the rotation of wing-nut 22 has caused contact 23 to be moved away from contact post 20, the electrical circuit to resistance units 8 and 12 remains broken. When sufficient time has elapsed so that the starting time of the alarm has been reached, the alarm mechanism of the clock will automatically start, with the result that wing-nut 22 will revolve in an anti-clockwise direction to bring contact 23 into electrical contact with contact post 20 to complete the circuit from the source of potential to the resistance units 8 and 12.

It will be apparent that with this device the resistance units 8 and 12 may be caused to start at any predetermined time with nothing further required from the operator beyond the initial adjustment of the mechanism.

It will also be understood that the particular type of clock mechanism which is used may be varied as desired provided only that it be provided with a rotating or otherwise movable member, the movement of which is initiated at any time selected by the operator.

It will also be understood that the particular size, type, and location of the resistance units may be varied, for although I have shown and described a specific structure and form of part as an exemplification of an embodiment of my invention, I do not desire to restrict myself to the exact size, shape or relation of parts as various changes may be made within the scope of the appended claims.

I claim:

1. In a device of the class described, an automobile engine, a water circulating system for cooling the engine, a heating unit in and forming a permanent part of the water circulating system, an extraneous source of potential, an electrical circuit connecting the

heating unit and the source of potential, an extraneous clock operated switch interposed in said circuit, and a manually operated means interposed in said circuit to permit a part of the circuit to be disconnected from the portion of the circuit which includes the heating unit.

2. In a device of the class described, an automobile engine having a fluid space, a heating unit in said space and forming a permanent part of the engine, an extraneous source of potential, an electrical circuit connecting the heating unit to the source of potential, manually operated means for connecting or disconnecting a portion of the circuit to or from the portion which includes the heating unit, and an extraneous switch interposed in the circuit and having one contact member mounted on a movable part of a clock mechanism.

In witness whereof I have hereunto set my hand this 24th day of December, 1928.

KENNETH H. BOWEN.