

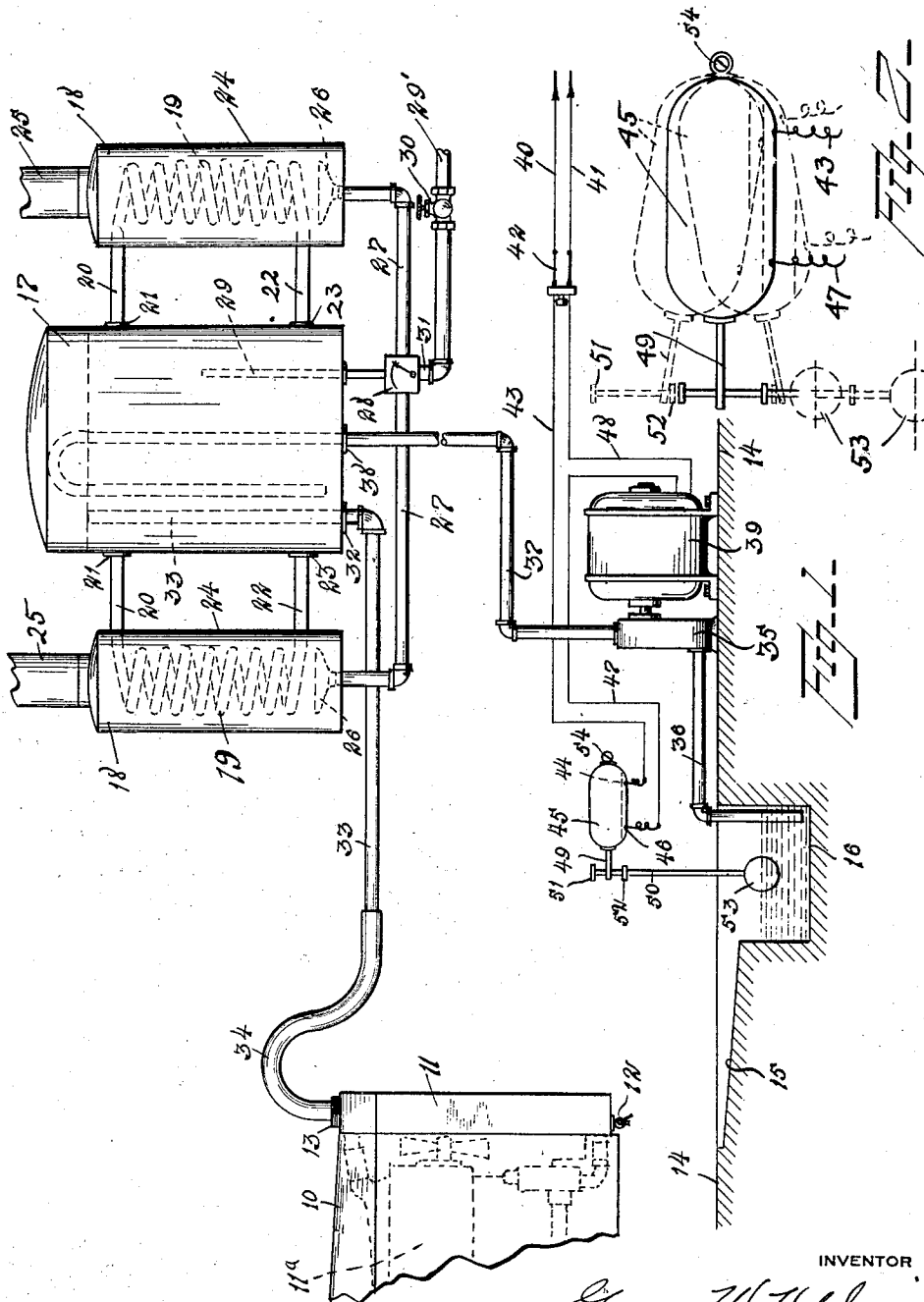
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MOTOR HEATER

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MOTOR HEATER

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This invention relates to a heating apparatus and more particularly to an apparatus adapted to heat the engine of a motor vehicle during cold weather preparatory to starting the engine.

An object of the present invention is to provide an apparatus of the character referred to which will quickly, safely and economically warm the engine of a motor vehicle during cold weather preparatory to starting.

With the objects above indicated and other objects hereinafter explained in view, the invention consists in the relationship of the elements embodied in the apparatus as will be more fully described and claimed.

Referring to the drawings

Fig. 1 is a diagrammatic view of the apparatus embodying the invention.

Fig. 2 is an enlarged view of the mercury switch employed in the apparatus showing the switch in its extreme high and low positions.

In the drawings, 10 represents a motor vehicle, a fragmentary portion of which is herein illustrated having at its forward end a radiator 11 connected in the usual manner to the engine 11^a which is partly shown, and at the lower portion of the radiator 11 is a pet cock 12 for the purpose of draining the water from the circulating system. The upper portion of the radiator 11 is provided with a water inlet 13 which receives the usual radiator cap, in this instance the latter being removed.

The apparatus, of course, is preferably located within a garage or like structure and may be suitably supported upon the walls of the structure, although it is not thought necessary to herein illustrate the garage or similar structure. However, the floor of the garage is indicated by 14 upon which the motor vehicle may rest. A metal drainage pan 15, of any suitable size, is supported by the floor 14 and extends downwardly and rearwardly communicating with a sump 16, of any desired size, which is adapted to receive the water or non-freezing solution contained within the circulating system of the engine, after it is drained out through the pet cock 12, the flow

of liquid from the pet cock 12 contacting with the drainage pan 15 and running down the declined surface into the sump 16.

A hot water storage tank 17, of any desired capacity, is suitably supported at a height so that the under side of the storage tank is above the water inlet 13 of the radiator 11. The water or other solution within the storage tank 17 is heated by means of water heaters 18 disposed upon opposite sides of the storage tank, as clearly shown in Fig. 1, and comprise vertically arranged water coils 19, the upper ends 20 being connected through the pipe connections 21 to the storage tank 17 below the normal level of the water or other liquid within the storage tank. The lower ends 22 of the water coils 19 are also connected to the lower portion of the storage tank 17 by suitable pipe connections 23. These water coils 19 are enclosed in suitable casings 24 with flues 25 connected to the upper portions thereof through which products of combustion may pass to the atmosphere. The lower ends of the casings 24 are open and disposed therein, directly beneath the water coils 19, are gas burners 26 for the purpose of heating the coils and the water contained therein. It will be noted, inasmuch as the level of the water within the storage tank 17 is maintained above the upper ends 20 of the coils 19, that upon applying heat from the burners 26 to the coils a continuous circulation is set up, the colder water passing from the storage tank 17 through the lower ends 22 into the water coils 19 and subsequently through the upper ends 20 of the coils 19 and back into the storage tank 17.

The burners 26 are connected together by a gas pipe 27 having disposed therein, between the burners 26, a thermostatic control valve 28 of any standard construction, the details of which are not herein illustrated. Extending upwardly from the thermostatic control valve 28 and into the liquid within the storage tank 17 is a thermostat 29 adapted to act upon the valve 28 and maintain the liquid within the storage tank 17 at any predetermined temperature. Gas is supplied to the burners 26 through a gas supply pipe 29' connected to any suitable source of supply,

the flow being controlled by a manually-operated valve 30 in the gas supply line. This gas supply line 29' is connected to the gas pipes 27 by a branch pipe 31 connected through the thermostatic control valve 28. It will, therefore, be noted that the thermostatic control valve 28 may be predeterminedly set so as to maintain the water or liquid within the storage tank 17 at any desired temperature.

The storage tank 17 is provided at its lower portion with a fitting 32 through which extends an overflow pipe 33 extending vertically through the storage tank 17 and terminating adjacent the normal level of the water within the storage tank. Therefore, as the water or liquid within the storage tank 17 rises above the end of the overflow pipe 33 it passes downwardly through the pipe 33 by gravity and out through, preferably, a rubber hose 34 having one end connected with the pipe 33 while the free end is adapted to be positioned within the water inlet 13 of the radiator 11. Therefore, the heated water or solution within the tank 17, rising above the overflow pipe 33, is caused to pass downwardly therethrough and into the radiator 11 and through the circulating system of the engine of the motor vehicle and subsequently out through the pet cock 12 into the drainage pan 15.

It is, of course, desirable to return the water or liquid drawn from the circulating system of the engine, and any suitable pumping apparatus may be employed for this purpose, although the following is the preferable arrangement.

A pump 35 is supported upon the floor 14 or any other suitable structure, and has its inlet end communicating, by a pipe 36, with the water or liquid within the sump 16, while the outlet of the pump 35 is connected, by a suitable pipe 37, with the storage tank 17 through a suitable connection 38 in the under side of the storage tank. This pipe 37 extends upwardly within the storage tank and is bent in the form of an inverted U with the loop substantially above the normal level of the water or liquid within the storage tank and subsequently extends back downwardly within the liquid to a point adjacent the lower portion of the storage tank, as clearly shown in Fig. 1. A motor 39 is suitably supported as upon the floor 14 and is connected to the pump 35 to thereby actuate the latter. When this pump is in operation the water or liquid within the sump 16 is drawn through the pipe 36, passes through the pump 35, through the piping 37 and empties the water or liquid into the storage tank 17 adjacent the lower edge thereof, the water within the sump 16 being pumped into the storage tank 17 so long as any water remains within the sump 16.

The current for the motor 39 is supplied from main line conductors 40 and 41 across

which there is connected a main line switch 42 which may be manually operated to break the circuit. A conductor 43 from the switch 42 is connected to a terminal 44 of a mercury switch 45, while the terminal 46 of the switch is connected by a conductor 47 with one terminal of the motor 39. The other terminal of the motor 39 is connected by a conductor 48 with the other side of the main line switch 42.

The mercury switch 45 is provided with an extension 49 having an opening at the end within which a rod 50 is slidably disposed. The upper end of the rod 50 is provided with a stop 51 positioned above the extension 49 and with a stop 52 positioned below the extension 49, while the lower end of the rod is connected to a float 53 adapted to rest upon the water or liquid within the sump 16. The motor is adapted to operate the pump 35 and thereby pump the water from the sump 16 into the storage tank 17. If, however, the water or liquid within the sump 16 should drop below a predetermined level or to such an extent that the stop 51 is brought into contact with the extension 49 of the mercury switch 45, the switch would be moved downwardly about the axis of the pivot 54 and the mercury within the switch 45 would then assume the position shown in dotted lines in Fig. 2, thereby breaking the current to the motor and discontinuing the operation of the pump 35. The same is equally true where the water or liquid within the sump 16 rises to a point above a predetermined level in which instance the lower stop 52 engages with the extension 49 of the mercury switch 45, causing the latter to be moved upwardly about the axis of the pivot 54 and assume the position shown in dotted lines in Fig. 2, the mercury assuming the position indicated therein which would break the circuit to the motor 39 and consequently cut off the operation of the pump 35.

It is to be understood that in cold weather the engines of motor vehicles, the latter of which are not kept in heated garages, become very cold and are exceptionally difficult to start, resulting in the running down of the battery and loss of considerable time and poor combustion. With the apparatus described these objections may be avoided. The water or other liquid within the circulating system of the engine may be drained off through the pet cock 12 into the drainage pan 15 where it will run into the sump 16, thereby removing the water from the circulating system. The burners 26 may be lighted in order to heat the water within the storage tank 17, in the manner already described, and the thermostatic control valve 28 predeterminedly set in order to maintain the water within the storage tank at the desired temperature. With the main switch 42 thrown to closed position the motor 39 will actuate the pump 35 and consequently draw the solu-

tion in the sump 16 through the pump and force the same through the pipe 37 into the storage tank 17. The level of the water or other liquid therein having been raised above the overflow pipe 33 a quantity runs downwardly through the pipe and out through the hose 34, the end of which has been previously placed within the water inlet 13 of the radiator 11. The hot water, therefore, running into the water inlet 13 from the hose 34 passes through the circulating system of the engine and the radiator 11 and efficiently and quickly heats the motor block, subsequently running out through the pet cock 12 and back into the drainage pan 15. After this circulation of heated water has taken place for a couple of minutes the gas may be shut off and the main switch opened to thereby stop the operation of the apparatus. It will be found that this heated water has heated the motor block considerably, and as a result the engine is very easily started.

While I have described the preferred embodiment of the invention it is to be understood that I am not to be limited thereto as changes and modifications may be resorted to without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of means adapted to receive the liquid drained off from said system, a liquid storage receptacle, means for transferring said drained off liquid to said storage receptacle, means for heating the liquid in said receptacle, and means for conveying heated liquid from said receptacle to said circulating system.

2. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of a receptacle adapted to receive the liquid drained off from said system, a liquid storage tank, pumping means for transferring said drained off liquid from said receptacle to said storage tank, means for heating the liquid in said tank, and means for conveying heated liquid from said tank to said circulating system.

3. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of means adapted to receive the liquid drained off from said system, a liquid storage receptacle adapted to contain liquid, means for transferring said drained off liquid to said storage receptacle, means for heating the liquid in said receptacle, and an overflow pipe for conveying heated liquid from said receptacle to said circulating system.

4. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of a

sump adapted to receive the liquid drained off from said system, a liquid storage tank adapted to contain liquid, means for pumping said drained off liquid from said sump to said storage tank, heating means associated with the tank adapted to heat the liquid in said tank, and means for conveying the overflow of heated liquid from said tank to said circulating system.

5. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of a sump adapted to receive the liquid drained off from said system, a liquid storage tank, a pump for transferring said drained off liquid to said storage tank, a motor for operating said pump, control means for said motor actuated by the liquid in said sump, means for heating the liquid in said tank, and means for conveying heated liquid from said tank to said circulating system.

6. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of a sump adapted to receive the liquid drained off from said system, a liquid storage tank, a pump for transferring said drained off liquid to said storage tank, a motor for actuating said pump, a switch associated with said motor, a float associated with the liquid in said sump and with said switch whereby said motor is stopped when said liquid reaches certain limits, means for heating the liquid in said tank, and means for conveying heated liquid from said tank to said circulating system.

7. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of means adapted to receive the liquid drained off from said system, a liquid storage tank, means for transferring said drained off liquid to said storage tank, means for heating the liquid in said tank, means for maintaining the liquid in said tank a predetermined temperature, and means for conveying the overflow of heated liquid from said tank to said circulating system.

8. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of means adapted to receive the liquid drained off from said system, a liquid storage receptacle, means for forcibly transferring said drained off liquid to said storage receptacle, coils associated with said storage receptacle, means for heating said coils to thereby heat the liquid in said receptacle, and means for conveying heated liquid from said receptacle to said circulating system.

9. In a heating apparatus of the character described, the combination with the water circulating system of a motor vehicle, of a receptacle adapted to receive the liquid drained off from said system, a liquid storage

5 tank adapted to contain a predetermined
quantity of liquid, a pump for transferring
said drained off liquid from said receptacle
to said storage tank, an electric motor for ac-
10 tuating said pump, a switch associated with
said motor, a float for actuating said switch
associated with the liquid in said receptacle,
means for heating the liquid in said tank, a
thermostat associated with said tank for
15 maintaining the liquid at a predetermined
temperature, and means for conveying the
overflow of heated liquid from said tank to
said circulating system.

In testimony whereof, I hereunto affix my
signature.

GEORGE W. HOPKINS.

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