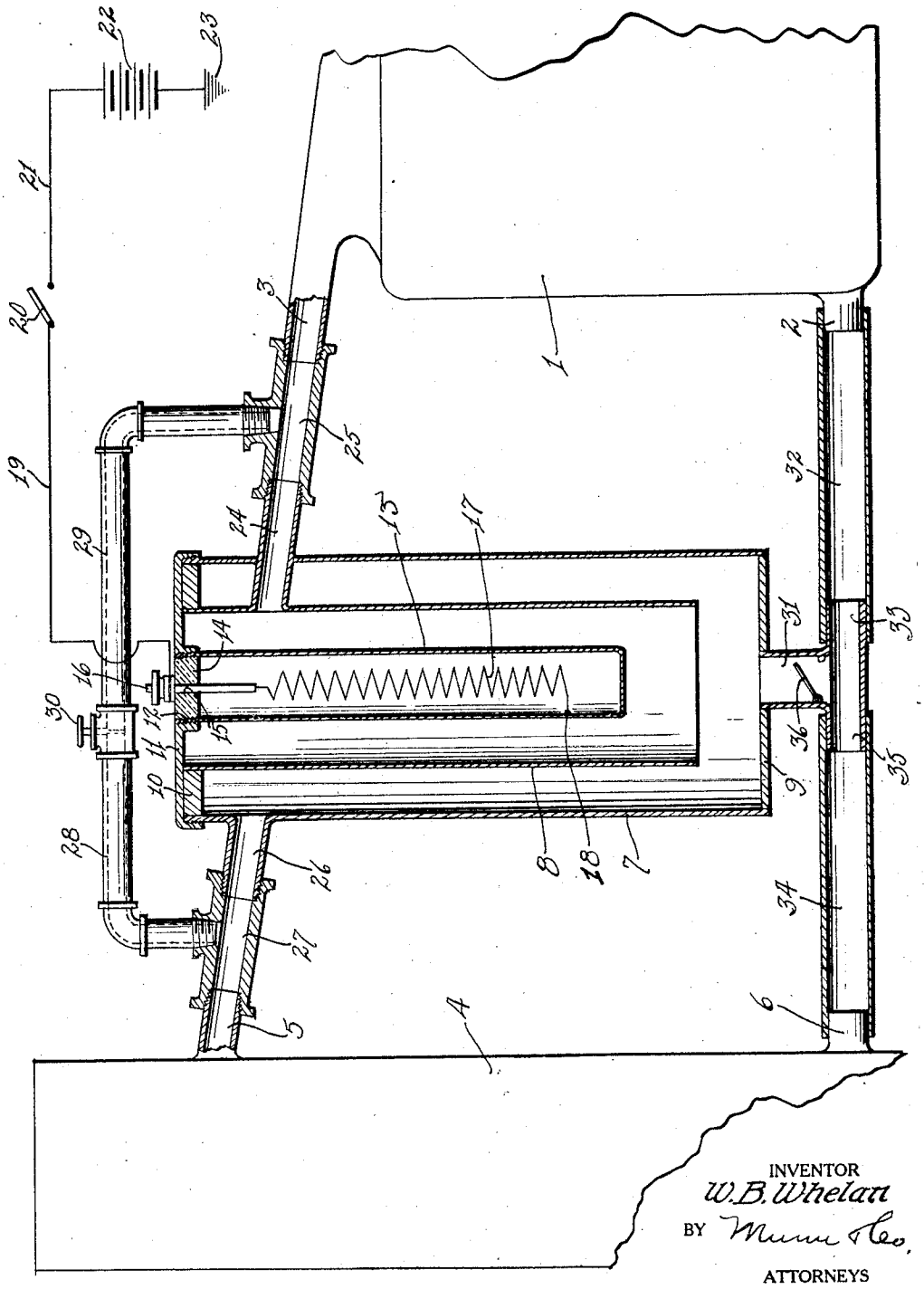
June 11, 1929. W. B. WHELAN 1,716,715

WATER CIRCULATION PREHEATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Filed Dec. 3, 1926



INVENTOR
W. B. Whelan
BY Munn & Co.
ATTORNEYS

Patented June 11, 1929. 1,716,715

UNITED STATES PATENT OFFICE.

WILLIAM B. WHELAN, OF CHICAGO, ILLINOIS.

WATER-CIRCULATION PREHEATING SYSTEM FOR INTERNAL-COMBUSTION ENGINES.

Application filed December 3, 1926. Serial No. 152,447.

My invention relates to improvements in electric heaters for automobile engines, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide an electric heater for automobile engines by means of which the motor may be heated quickly without the motor running.

A further object of my invention is to provide a device of the type described which is disposed between the radiator and the motor and which is adapted to heat the water coming from the motor and cause the hot water to circulate through the motor without interfering with the water in the radiator.

A further object of my invention is to provide a device of the type described which when turned on heats the water in the motor and when turned off during the running of the motor permits the water to pass therethrough to the radiator.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claim.

My invention is illustrated in the accompanying drawing, forming part of this application, which shows a sectional view of my device as applied to a motor and a radiator of an automobile.

In carrying out my invention, I make use of a motor 1 having an inlet 2 and an outlet 3. I further make use of a radiator 4 having an inlet 5 and an outlet 6.

I provide a heating unit which consists of a casing 7 having a cylinder 8 centrally disposed therein and terminating a short distance from the bottom 9 of the casing. The upper ends of the casing 7 and the cylinder 8 are rigidly secured to each other by a ring 10 disposed therebetween and secured in place by any suitable means, such as welding. A cover 11 is provided with a centrally-disposed screw-threaded portion 12 for receiving the threaded end of a tubular member 13. A plug 14 constructed of insulating material and having a central opening 15 is disposed in the outer end of the tubular member 13. A terminal post 16 is disposed in the opening 15. A resistance coil 17 has one end secured to the terminal post 16 and the other end grounded at 18 upon the tubular member 13. A conductor 19 is secured at one end to the post 16 and at the other end to one of the contact points of a switch 20. A conductor 21 is secured at one end to the other contact point of the switch 20 and at the other end to a battery 22. The battery is grounded at 23 to any suitable part of the automobile, such as the frame or the motor. The cover 11 is removably disposed upon the upper end of the casing 7, the tubular member being centrally disposed in the cylinder 8, the lower end of the tubular member being closed and terminating a short distance from the lower end of the cylinder 8.

The cylinder 8 is provided with an inlet pipe 24 which passes through the casing 7 and is secured to one end of a T pipe connection 25, the other end of this connection being secured to the outlet 3. The casing 7 is provided with an integral outlet pipe 26 which is secured to one end of a T pipe connection 27, the other end of the connection 27 being secured to the inlet 5. The T connections 25 and 27 are connected to each other by pipes 29 and 28 which are joined by a valve 30.

A by-pass 31 is rigidly secured to the bottom 9 at the center thereof and provides an inlet for the casing 7. A tube 32 is secured at one end to the inlet 2 and at the other end to an outwardly extending tubular portion 33 of the by-pass 31. A tube 34 is secured at one end to the outlet 6 and at the other end to a tubular portion 35 of the by-pass 31. A valve 36 is disposed in the by-pass 31 for permitting water to enter the casing 7 and for preventing the water within the casing from passing outwardly through the by-pass.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. During warm weather the valve 30 is opened permitting the water from the motor to pass through the pipes 29 and 28, through the radiator 4, the outlet 6, through the tubes 34 and 32, through the inlet 2 of the motor, and through the motor.

However, during cold weather, the valve 30 is closed causing the water normally to flow from the motor through the outlet 3, the T connection 25, the inlet pipe 24 into the cylinder 8, beneath the cylinder 8 into the casing 7 out through the outlet pipe 26, the T connection 27, the inlet 5, through the radiator and back to the motor through the tubes 34 and 32.

Assuming that the operator wishes to park the automobile for a half hour or more and

wishes to keep the motor warm during this period, the operator closes the switch 20 permitting the source of current to flow from the battery 22 through the conductor 21, the switch 20, the conductor 19, the post 16, through the resistance coil 17 to ground at 18 which carries the source of current back to the ground 23 and to the battery. As the source of current flows through the resistance coil 17, the tubular member 13 is heated. In this manner the water surrounding the tubular member 13 is also heated. As this water is heated, it passes upwardly within the cylinder 8 and passes outwardly through the pipe 24, the T connection 25, the outlet 3, through the motor, and out of the inlet 2 into the tube 32. As the hot water passes out of the cylinder 8, cold water is drawn into the cylinder 8 through the by-pass 31 past the valve 36. This circulation is continued as the water within the cylinder 8 is heated by the resistance coil 17 within the tubular member 13.

It will be observed that the heating unit is disposed substantially adjacent the motor whereby the circuit for the water is made as short as possible for enabling the heating unit to heat the water in a relatively short time and keep the motor heated. It is not necessary to heat the water in the radiator in order to heat the motor.

When the operator again wishes to start the motor, the water flows through the motor and the radiator in the usual manner.

I am aware that electrical heating units have been employed for heating the water in the radiator and in the motor of an automobile, but an object of my invention is to provide a device which readily heats the water within the motor without the necessity of heating the water within the radiator. With this system of heating, a much smaller amount of water need be heated for heating the motor.

The battery 22 is an auxiliary battery which is employed for the heating unit alone in order that the supply of current required for the heating unit need not interfere with the lights or the running of the motor.

I claim:

The combination with a motor having a water inlet and a water outlet and a radiator having a water inlet and a water outlet, of means positioned between said motor and said radiator for heating water passing from the inlet in said motor, said means comprising a casing, communication between the lower portion of said casing, the outlet of said radiator, and the inlet of said motor, the inlet of said radiator communicating with said casing at the upper extremity thereof, a cylinder disposed in said casing and having an open end disposed in substantial alignment with the communication at the lower extremity of said casing, the outlet of said motor being in communication with the upper portion of said cylinder, a tubular member disposed in said cylinder, a heating unit disposed in said tubular member, and means for energizing said heating unit for heating said tubular member for heating water received in said cylinder from the outlet of said motor, the heated water in said cylinder surrounding said tubular member and passing through the outlet of said motor, through said motor, through the inlet of said motor, and again into the casing where it will be drawn upwardly into said cylinder as the heated water passes therefrom, thus reversing the normal circulation of the water through the motor.

WILLIAM B. WHELAN.