June 24, 1930. E. E. MILLER 1,765,933

VEHICLE HEATER

Filed Jan. 24, 1928

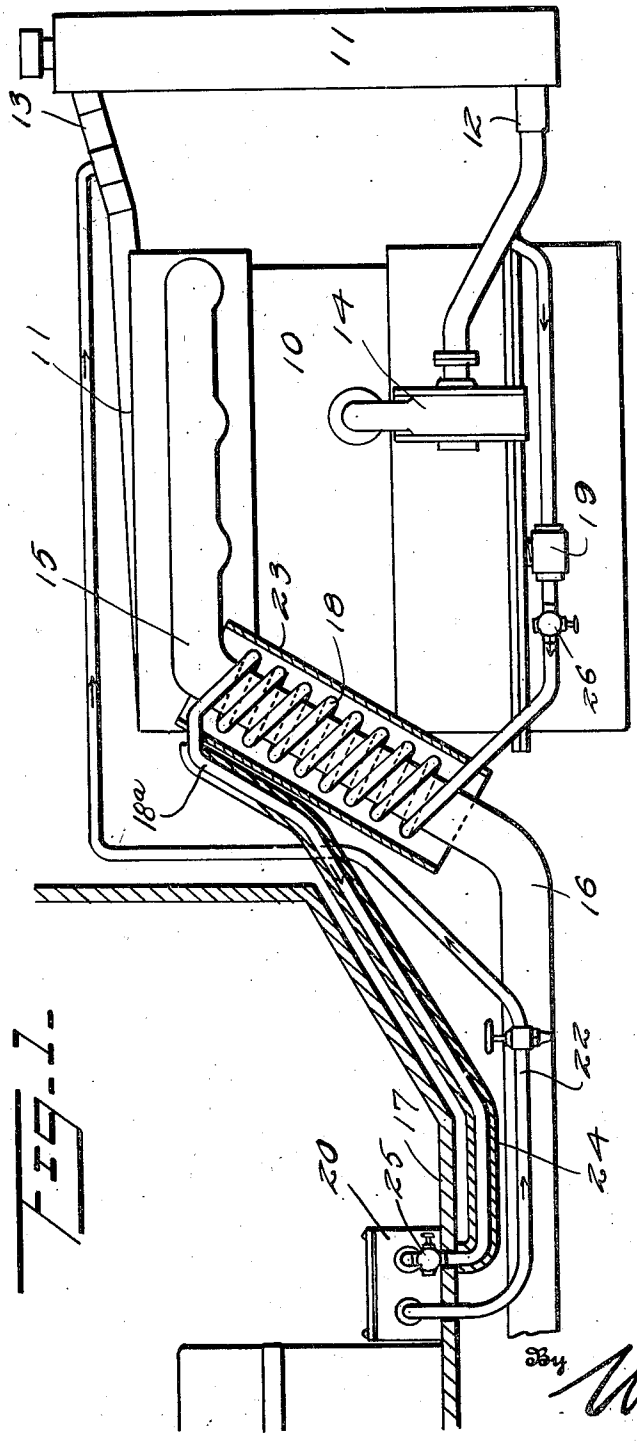

Fig. 1.

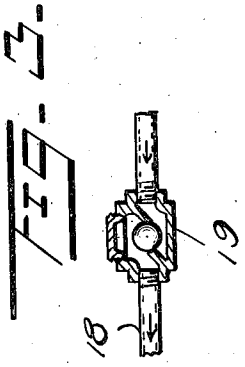

Fig. 3.

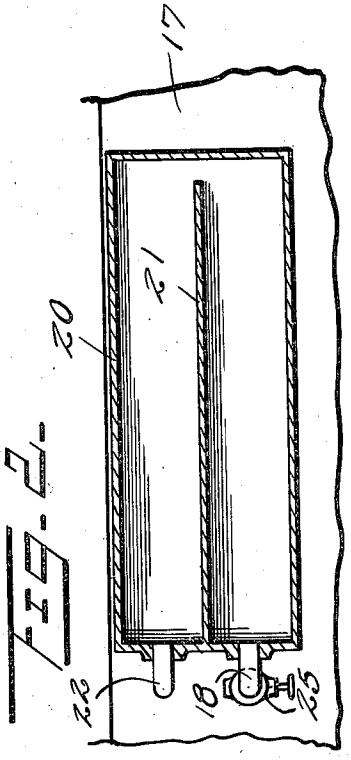

Fig. 2.

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UNITED STATES PATENT OFFICE

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VEHICLE HEATER

Application filed January 24, 1928. Serial No. 249,154.

This invention relates to heaters for vehicles propelled by internal combustion engines, and more particularly to a device of this character, which employs hot water as a heating medium.

An important object of the invention is to provide a heating system of this type in which the engine cooling system forms a source of supply for the water used in the heater in which the construction and arrangement is such that the ordinary operation of the system is not interfered with and the heating system draws water from the cooling system only as it becomes necessary.

A further and more specific object of the invention is to provide an arrangement of this character, wherein the heating system, while connected in parallel with the radiator of the engine, is so constructed that a minimum circulation flow is set up therein and accordingly the system has but a small effect upon the ordinary operation of the cooling system.

These and other objects I attain by the construction shown in the accompanying drawing, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a longitudinal sectional view through a vehicle showing a heating system constructed in accordance with my invention applied thereto;

Figure 2 is a horizontal sectional view through the radiator of the system;

Figure 3 is a section through the check valve.

Referring now more particularly to the drawing, the numeral 10 generally designates a water jacketed internal combustion engine, 11 the radiator thereof and 12 and 13 the usual lower and upper tubes connecting the radiator and the water jacket of the engine. The tube 12 may or may not include the usual circulation pump 14. The numeral 15 designates the exhaust manifold of the engine and 16 that portion thereof which inclines downwardly and rearwardly to pass beneath the floor boards 17 of the vehicle to the usual muffler (not shown). In accordance with my invention, I provide a tube 18 which is coiled about this downwardly inclined portion of the exhaust pipe. The lower end of the coil 18 is connected with the tube 12 through a check valve 19, while the upper end thereof is connected by a pipe 18^a with a radiator 20. This radiator may be of any suitable type and is at present shown as a container having a baffle 21 extending from one end thereof at its center to a point adjacent the opposite end, thus dividing the casing so as to provide a compartment of U-form in plan. The pipe 18^a extends to one end of the compartment of the radiator 20, and a pipe 22 extends from the other end of the compartment to the tube 13. It will be obvious that the connection between the lower end of the coil 18 and the tube 12 of the cooling system should, where the pump 14 is employed, be connected between this pump and the radiator 11. The coil is preferably surrounded by a shield 23, while the connection between the upper end of the coil and the heater should be insulated, as indicated at 24.

In operation, it will be obvious that upon initial installation and filling of the cooling system of the engine, the coil 18 will fill with water. During operation of the engine, this water will be heated by radiated heat from the exhaust pipe. The check valve 19 causes the water heated in coil 18 to pass through the radiator 20. As the water cools, the water displaced, due to expansion, will be replaced by water from the pipe 22 and from the tube 12. Thus, the coil 18 will be continually filled with water which, when heated, will expand to the radiator 20, and this without a continuous circulation of the water from the cooling system of the automobile engine. An operation of this type is particularly desirable where the heating system is applied to autmobiles whose engines employ the thermo-syphonic system of circulation. Attention is directed to the fact that by the construction hereinbefore illustrated, the radiator 20 is arranged at a level below the upper end of the coil, so that there will be no direct thermo-syphonic circulation in the heating system. A cut-off

is provided between the coil and radiator, as indicated at 25, and between the coil and check valve 19 a drain valve 26 is preferably installed.

Since the construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention. I do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

In combination with the inclined exhaust manifold portion and the water cooling radiator of an internal combustion engine, a coil surrounding said manifold portion, a pipe extending from the lower end of the radiator to the lower end of the coil, a check valve in said pipe and seating in the direction of the radiator, a heater casing arranged in a horizontal plane intersecting the coil and provided with a passage of U-form in plan, a pipe extending downwardly from the upper end of the coil to one end of the casing passage, and a pipe extending downwardly from the other end of the casing passage and then upwardly to the upper end of the radiator.

In testimony whereof I hereunto affix my signature.

ERNEST E. MILLER.