Sept. 26, 1933. J. FRITZ ET AL 1,928,127

HEATING SYSTEM FOR AUTOMOBILES

Filed Aug. 19, 1930

Fig. 1.

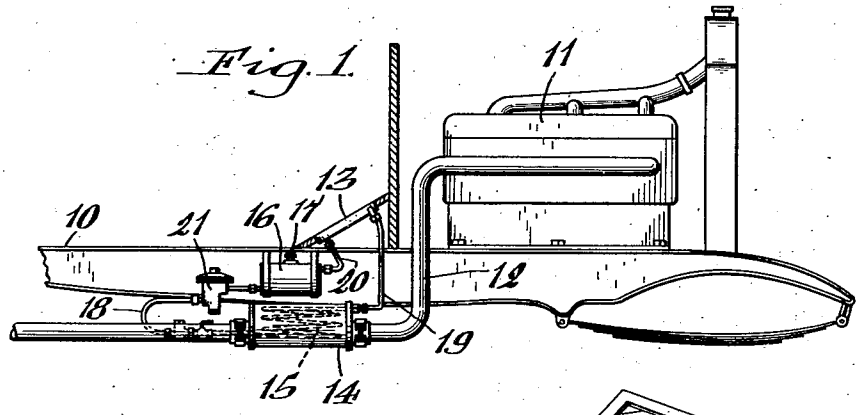


Fig. 2.

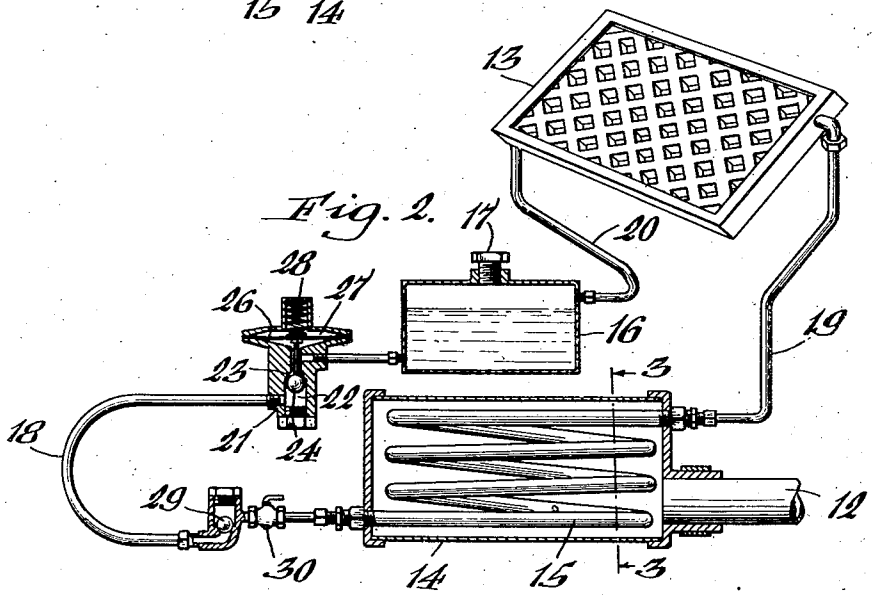


Fig. 3.

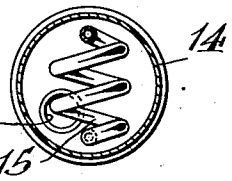
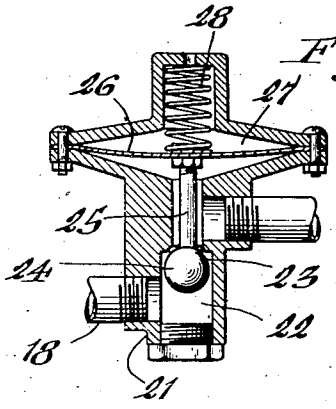


Fig. 4.



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HEATING SYSTEM FOR AUTOMOBILES

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4 Claims. (Cl. 237—12.3)

This invention relates to improvements in heating systems for automobiles and particularly to a system which utilizes the exhaust from the engine as the heating medium.

One of its objects is the provision of an automobile heating system which is efficient in operation and can be brought up to a heating temperature in a minimum period of time, which is positive and reliable, and which can be manufactured and installed at a moderate cost.

Another object of the invention is to provide a vapor or steam heating system which is sealed throughout its various connected parts against leakage, which is automatic in operation, and which does not require any attention on the part of the car-owner.

In the accompanying drawing:—

Figure 1 is a fragmentary side elevation of an automobile chassis showing our improved heating system applied thereto. Figure 2 is an enlarged sectional elevation of the parts included in the system. Figure 3 is a cross section taken on line 3—3, Figure 2. Figure 4 is an enlarged vertical section of the control valve of the system.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring now to the drawing, which shows the preferred embodiment of our invention, 10 indicates the frame of the automobile, 11 the motor, 12 the exhaust pipe leading from the motor, and 13 one of the heaters or radiators of the system which is of the cellular type for the circulation of vapor or steam therethrough and which may be mounted in the floor-board of the vehicle, as shown, or at any other appropriate place to meet the comfort of the occupants. Each radiator is disposed in substantially the inclined position shown, the inlet end for the heating medium being at the upper side of the radiator and the outlet thereof being at the lower side, whereby the radiator is self-draining.

Inserted in the exhaust pipe 12 is a heating chamber or casing 14 of substantially cylindrical form and containing a heating coil 15 arranged in a vertical position within said chamber and whose coils are more or less elongated in the direction of length of the casing. A water or like fluid storage tank 16 is disposed below the radiator 13 or between the latter and the heating coil, this tank having a filling opening normally closed by a screw plug 17. The lower or outlet side of this tank is connected by a sectional pipe 18 with the lower or inlet end of the coil 15, while the upper or outlet end of the coil is connected by a pipe 19 with the corresponding upper inlet side of the radiator 13, the lower outlet side of the latter being connected by a pipe 20 with the upper or inlet side of the tank. By this arrangement of parts, the water is circulated from the tank 16 through the coil 15 where it is heated by the exhaust gases and turned into vapor or steam and delivered to the radiator or radiators 13 for heating the car. When the steam is condensed, it flows by gravity through the pipe 20 into the tank.

The water tank 16 is comparatively small and it has been found in practice that approximately a pint of water is sufficient for operating the system. If water is used as the heating medium, alcohol or some other similar element may be added to it to prevent its freezing at low temperatures.

Means are provided in the system for automatically regulating or controlling the flow of fluid therethrough, so as to prevent overheating and maintain a practically uniform temperature. To this end, a control valve is interposed in the sectional pipe 18 adjacent the tank 16, said valve consisting of a body 21 having a chamber or passage 22 communicating with the corresponding sections of said pipe and including a valve seat 23 against which a ball or like valve 24 is adapted to engage to cut off the flow of water from the tank to the heating coil 15. This ball-valve is preferably so mounted that it closes upwardly against its seat 23 and is carried by a stem 25 suspended from a diaphragm 26 contained in a diaphragm chamber 27 formed at the upper end of the valve-body 21. A spring 28 serves to normally maintain the diaphragm in its lowered position and the valve in its corresponding open position for circulating the water through the system. By this construction, should the pressure on the water in the tank 16 reach a predetermined point, due to the generation of vapor therein, the diaphragm 26 will be raised against the resistance of the spring 28 and close the valve 24, thereby cutting off the flow of water to the coil. When this pressure is again relieved, the valve will automatically open and permit the circulation of water from the tank to the coil. This action of the system not only affords a uniform temperature but it eliminates danger of explosions.

To prevent the water in the heating coil backing up into the tank, we prefer to place a check valve 29 in the sectional pipe 18 between the heating chamber 14 and the control valve 21, as seen in Figure 2. Likewise, a shut-off cock 30 is inserted in said pipe for shutting off the circula-

tion of water through the system at the will of the operator. For convenience, this cock may be controlled from the dash-board of the vehicle, so that whenever it is desired to use the heating system or shut it off, the control cock is simply opened or closed.

We claim as our invention:—

1. The combination with an automobile body and an internal combustion engine, of a casing interposed in the exhaust of the engine and through which the hot gases circulate, a heating coil having an inlet and an outlet arranged in said casing, a radiator connected to the outlet end of said coil, a fluid tank disposed below said radiator in communication therewith and having a discharge connected to the inlet end of said coil, and a normally open automatic valve interposed in the connection between the tank and the coil, said valve including a pressure-actuated part for automatically closing it whenever the pressure on the fluid in the tank, due to generation of vapor therein, reaches a predetermined point.

2. The combination with an automobile body and an internal combustion engine, of a casing interposed in the exhaust of the engine and through which the hot gases circulate, a heating coil having an inlet and an outlet arranged in said casing, a radiator disposed in an inclined position in said body and connected at its upper end to the outlet of said coil, a fluid tank having an inlet and a discharge disposed below said radiator and connected at its discharge to the inlet of said coil and at its inlet to the lower end of the radiator, a normally open automatic valve interposed between the tank and the coil and including a pressure-actuated part for automatically closing the valve whenever the pressure on the fluid in the tank reaches a predetermined point, due to generation of vapor therein, and a check valve disposed between said automatic valve and said coil.

3. A heating apparatus for automobiles, comprising in combination with the internal combustion engine thereof, and its exhaust a chamber adapted for attachment to the exhaust of the engine and through which the hot gases are adapted to circulate, a heating coil having an inlet and a discharge arranged in said casing, a radiator having an inlet and an outlet, the inlet being connected to the discharge of said heating coil, a fluid tank disposed below said radiator and communicating therewith above the fluid level of the tank and having an outlet below the fluid level thereof connected to the inlet of the heating coil, and an automatic valve governed by the pressure on the fluid in the tank due to generation of vapor therein for controlling the flow of fluid from the tank to the coil.

4. A heating apparatus for automobiles, comprising in combination with the internal combustion engine thereof, and its exhaust a chamber adapted for attachment to the exhaust of the engine and through which the hot gases are adapted to circulate, a heating coil having an inlet and a discharge arranged in said casing, a radiator having an inlet and an outlet, the inlet being connected to the discharge of said heating coil, a fluid tank having an inlet and an outlet, disposed below said radiator and connected at its inlet end to the outlet end of the radiator, the outlet of said tank being connected to the inlet of the heating coil, an automatic valve governed by the pressure on the fluid in the tank due to generation of vapor therein for controlling the flow of fluid from the tank to the coil, and a check valve between the latter and said automatic valve for preventing backward flow of the fluid from the coil to the tank.

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