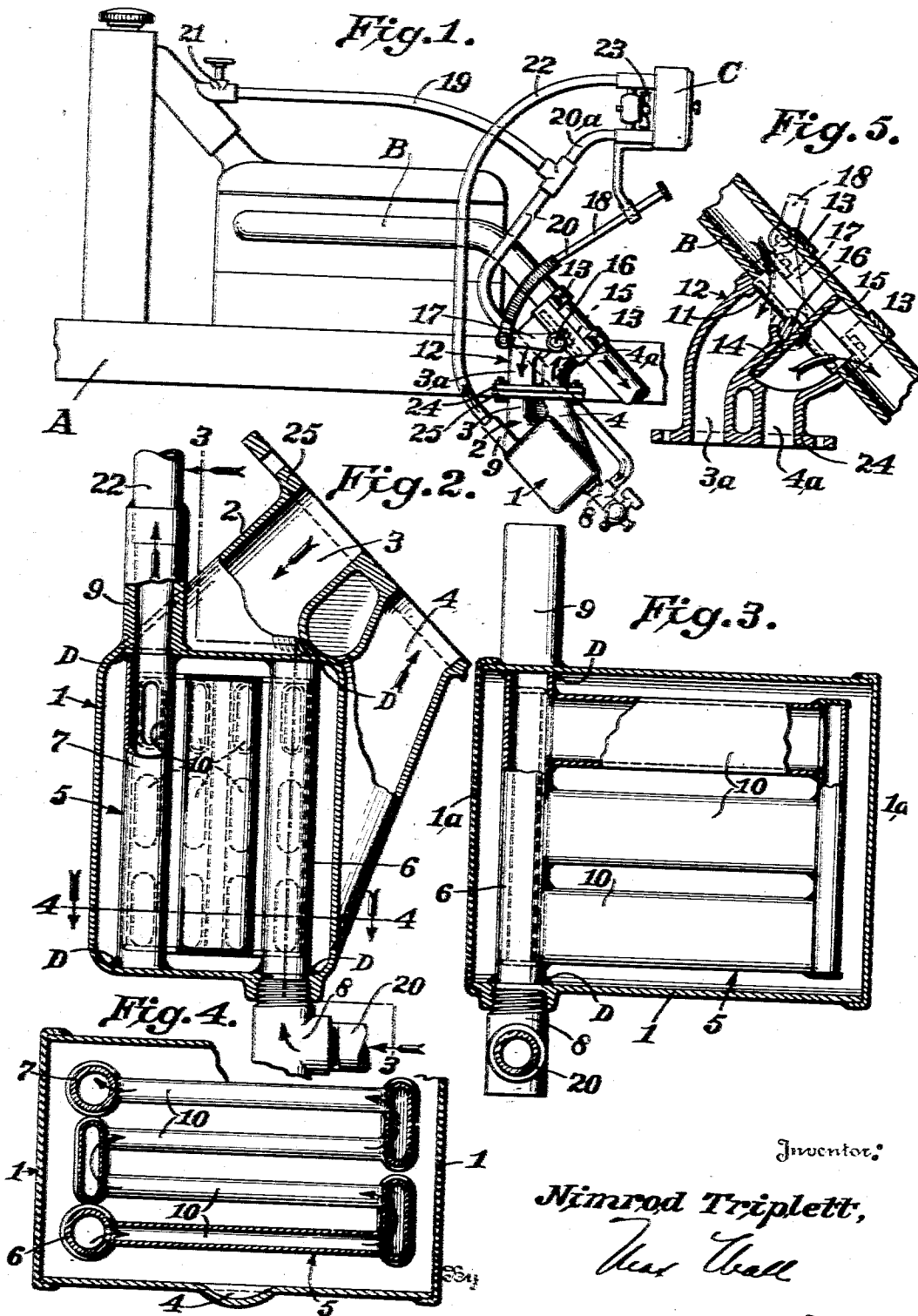


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AUTOMOBILE HEATER

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AUTOMOBILE HEATER

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2 Claims. (Cl. 257—241)

This invention relates to improvements in automobile heaters. More particularly, it consists of an automobile heater of the type attached to the exhaust manifold of an internal combustion engine, and which utilizes the heat of the exhaust gases of the engine.

Among the objects of the invention are to provide a heater in which a great degree of heat is developed in a very short time; which can be used on water-cooled or air-cooled engines; in which there is no evaporation and consequently can be used in conjunction with the water-cooling system in the winter without fear of evaporating alcohol or other anti-freeze liquids; which may very easily be attached to or detached from the manifold; which is composed of two separable units, one of which is attached to the manifold and carries a butterfly valve, the other portion, comprising the heater proper, being secured to said valve-carrying portion; and in which the design of the water-carrying coils is such as to permit of expansion at low temperatures.

For a more complete understanding of the present invention, reference is made to the accompanying drawing in which a preferred form of the invention is illustrated, like reference characters referring to like parts throughout the several views.

In the drawing:

Figure 1 shows a side elevation of the invention as applied to an internal combustion engine of the water cooled type, the engine being shown diagrammatically;

Figure 2 is a transverse vertical sectional view through the heater, with the casing shown in section and the heat transfer coils shown partly in elevation and partly in section;

Figure 3 is a sectional view taken along the line 3—3 of Figure 2, with parts shown in section and parts shown in elevation;

Figure 4 is a transverse horizontal sectional view taken along the line 4—4 of Figure 2; and

Figure 5 is a vertical sectional view of the coupling by means of which the heater is attached to the exhaust manifold.

In the embodiment disclosed in the drawing, A represents the body of an automobile or other vehicle having an engine provided with a water-cooling system of the well known type, having an exhaust manifold B.

The heater, which is secured to the exhaust manifold, comprises a casing 1 having an angularly disposed portion 2 in which exhaust gas inlet and outlet passages 3 and 4, respectively, are arranged. Within the casing 1 there is a

heating coil generally designated by 5 comprising circular water inlet and outlet headers 6 and 7, respectively, which are welded at the top and bottom to the interior walls of the casing 1 as shown, and which communicate with the water cooling system of the engine through suitable couplings 8 and 9 arranged at diagonally opposite corners of the heater casing 1. Communication between these headers in the casing is obtained by means of horizontally arranged, interconnected tubes 10 which are arranged in tiers and which are substantially rectangular in cross-section.

Exhaust gases from the exhaust manifold are conducted to the heater through a rectangular slot 11 which is cut into the bottom of the manifold B. A coupling generally designated by 12 is mounted on the manifold by means of semi-circular clamps 13 which are bolted to the lower corresponding face of the coupling. The coupling is divided by a wall 14 to provide passages 3a and 4a corresponding to and in alignment with passages 3 and 4. The wall 14 carries a butterfly valve 15, pivoted at 16 which is operable from the instrument board of the vehicle by means of a link 17 and control rod 18 as shown in the drawing. By means of this valve, exhaust gases may be supplied to the heater or may be shunted around the heater as desired, as when the valve is in open position, as shown in Figure 5, gases can pass only into the passage 3a. The coupling has a flange 24 by means of which it is fastened to the flange 25 of the heater casing.

The heater is connected to the water cooling system by feed pipes 19 and 20, the pipe 19 having a shut-off valve 21, and only enough water is supplied to the heater to fill the tubes 10, when the valve 21 may be closed to cut the heater off from the engine cooling system and thus forming a closed heater circuit. The heater unit is in circuit with a standard radiating device C by means of supply pipe 22 and return pipes 23, 23a. A fan 23 is situated behind the radiator C to distribute the heated air throughout the interior of the vehicle.

It will be observed that the coil 5 is secured to the casing 1 at four points D which are welded or brazed joints. The remainder of the coil is spaced from the body of the casing, which insures the maximum heat conducting efficiency of the coil. The coil is inserted into the casing 1 as a unit and is then welded, brazed or otherwise suitably secured in place. The end caps 1a are then likewise secured to the casing by welding or brazing.

In operation, water being supplied to the tubes

10, and the lever 17 operated to open the valve 15, hot gases from the manifold flow through the passage 3a, 3 into the body of the heater 1 and circulate in the spaces between the tubes and headers, heating the water in the tubes and headers and finally passing out through passage 4, 4a into the discharge end of the manifold. When the water in the tubes is heated sufficiently to induce circulation, it begins to flow through pipe 22, into the radiator C from which the heat is distributed into the vehicle to be heated by the fan 23.

It will thus be seen that I have provided a heater which is small and compact, which operates on a very small supply of water, which may be shut off from the water cooling system, thereby avoiding loss of water and anti-freeze solutions by evaporation, and which is extremely simple to construct and install. Minor changes in construction may be made without departing from the spirit of the invention as defined by the appended claims.

Having thus described my invention, I claim:

1. An automobile heater comprising a casing having inlet and outlet passages adapted to be attached to the manifold of an automobile for receiving the exhaust gases of the automobile engine, a coil arranged in the casing in the path of said exhaust gases, said coil comprising substantially parallelly extending header members each being rigidly attached to opposite sides of the casing, each of said header members having a portion extending through the opposite walls of the casing, respectively, to provide inlet and outlet passages for the fluid to be heated, parallelly extending tubes arranged perpendicularly with respect to said headers, and intermediate headers connected to said tubes to complete the fluid circuit.

2. A device in accordance with claim 1, in which the said tubes and intermediate headers are spaced at all points from the casing wall to allow for expansion of the coil.

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