Sept. 13, 1927. 1,642,631

W. E. STEVENS

AUTOMOBILE HEATER

Filed Aug. 20, 1925 2 Sheets-Sheet 1

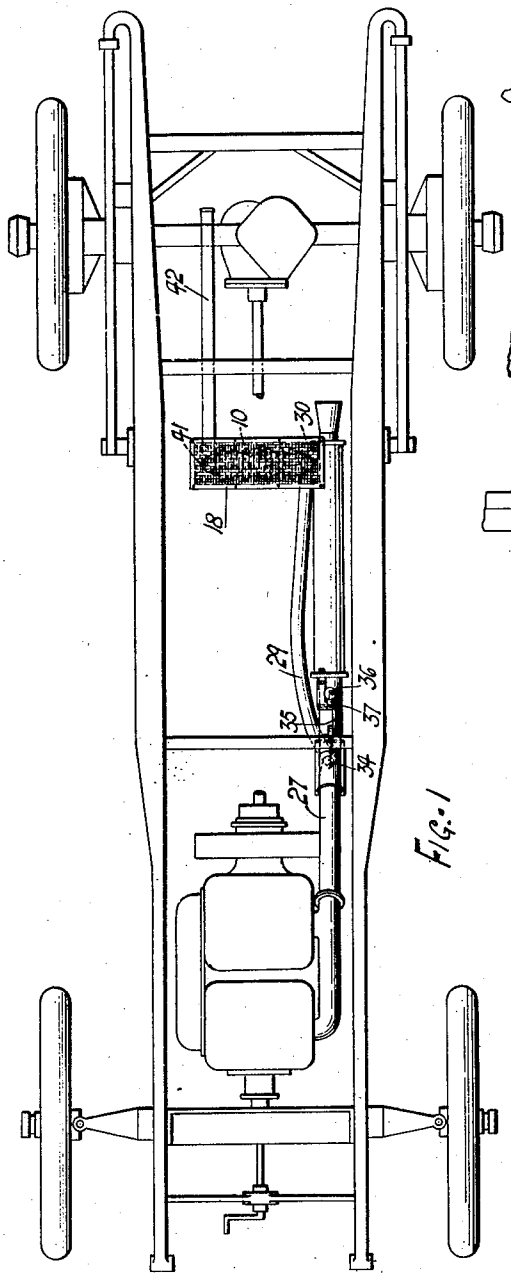



Fig. 1

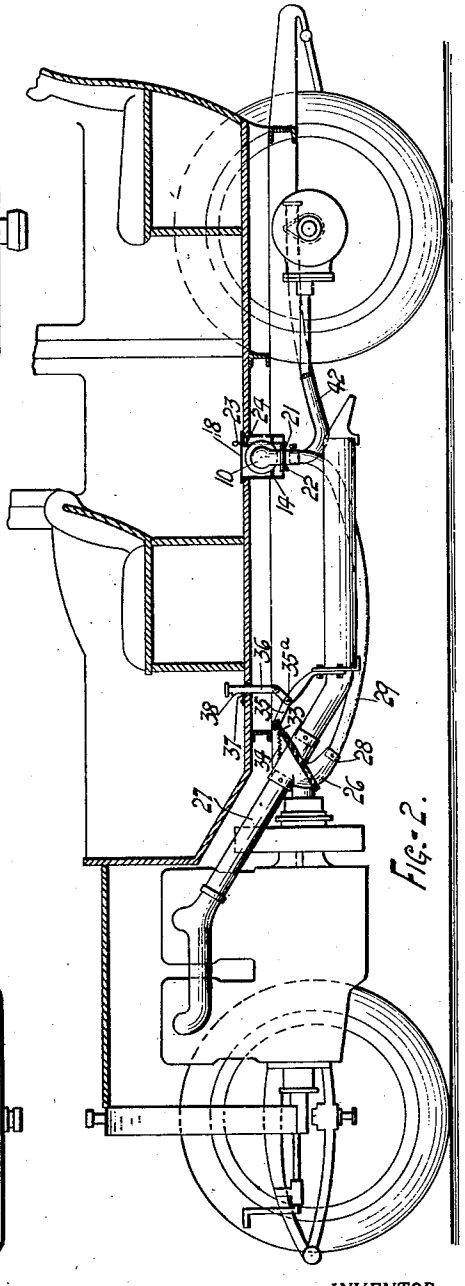



Fig. 2.

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FIG.-3.

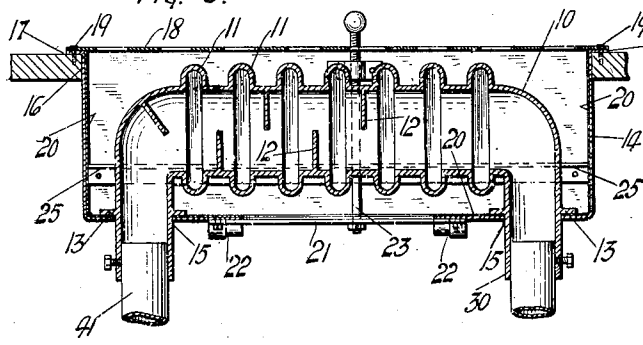
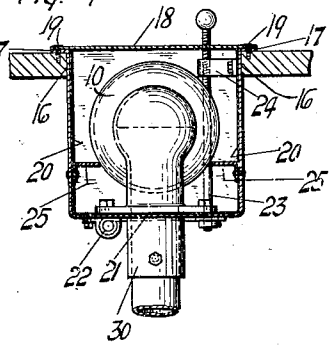



FIG.-4



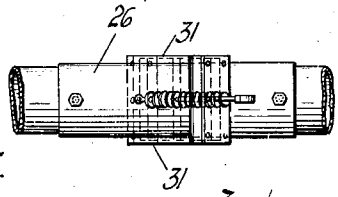




FIG.-5.

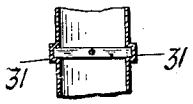



FIG.-8.

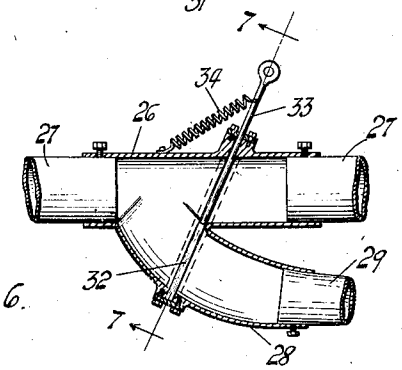



FIG.-6.

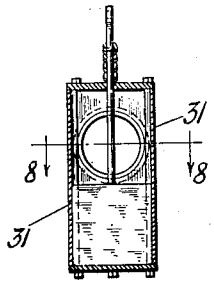



FIG.-7

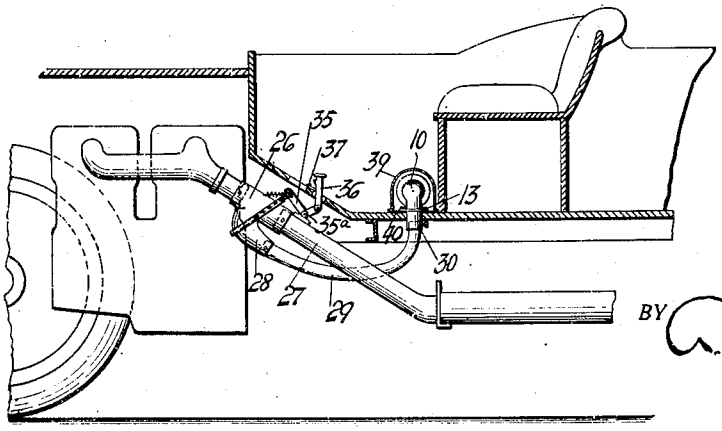



FIG.-9.

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# UNITED STATES PATENT OFFICE.

WALTER E. STEVENS, OF AKRON, OHIO.

## AUTOMOBILE HEATER.

Application filed August 20, 1925. Serial No. 51,312.

This invention relates to automobile heaters and particularly to exhaust gas heaters and control means therefor.

One object of the invention is to provide an improved heater of simple construction and designed to radiate a maximum of heat from a given flow of exhaust gas without causing a back compression in the gases tending to choke the engine.

Another object is to provide a heater adapted to be formed as a single casting and adapted to be arranged either above the floor as when used in touring or other open cars, or below the floor which is preferred when used in closed cars.

Another object is to provide an improved means for controlling the flow of exhaust gas to the heater.

Other objects are to provide a casing for the heater having means thereon controllable from within the car for maintaining a flow of fresh air past the heater into the car and to provide, in addition, means within the casing for directing the flow of air about the surfaces of the heater in close relation thereto.

The foregoing and other objects are obtained by the construction illustrated in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific forms thereof shown and described.

Of the accompanying drawings:

Figure 1 is a plan of the chassis of a car illustrating the improved heater installed therein according to one mode of carrying out the invention;

Figure 2 is a section through the car illustrating the heater installation partly in side elevation and partly in section;

Figure 3 is an enlarged longitudinal section through the heater;

Figure 4 is an enlarged transverse section through the heater casing, the heater proper being shown in elevation;

Figures 5 and 6 are, respectively, a plan and a sectional elevation of a control valve for the exhaust gases;

Figure 7 is a section on line 7—7 of Figure 6;

Figure 8 is a section on line 8—8 of Figure 7; and

Figure 9 is a section through a car illustrating another mode of carrying out the invention.

Referring to the drawings, 10 represents the heater proper which is formed as a single, thin walled, hollow, tubular radiating member of inverted U-shape formed with spaced annular pockets 11, 11 in its inner surface and having vertical baffles 12, 12 extending half way across the inner passage through the heater alternately from the top and the bottom and alternating with said pockets toward the discharge end of the heater, no baffles being provided near the inlet end of the heater whereby a back-compression tending to choke the engine could develop. Flanges 13, 13 are also formed on vertical arms of the heater 10 to facilitate mounting thereof according to either of the arrangements to be described.

For use in closed cars, the heater 10 is preferably mounted in a casing 14, the vertical arms thereof extending downwardly through apertures 15, 15 in the bottom of the casing and flanges 13 resting on the bottom thereof to support the heater 10 in the casing. Casing 14 is mounted in the car by being inserted downwardly through an aperture 16 cut through the floor thereof and is provided with flanges 17, 17 engaging with the top of the floor and on which is mounted a grid plate 18, the casing 14 and plate 18 being secured to the floor of the car by suitable means, such as screws 19, 19.

Casing 14 is lined with asbestos, as indicated at 20, to conserve the heat therein so that it will all be directed upwardly through grid 18 and has pivoted in the bottom thereof a shutter 21 hinged at 22, 22 and arranged to be opened by a rod 23, loosely connected thereto in any suitable manner, extending upwardly into the car and threaded through a fixed lug 24 secured on casing 14 whereby rotation of the rod by the occupant will open or close the shutter any desired amount to permit any desired flow of fresh air up through the heater into the car.

It is desirable, in order to obtain a maximum effect of the heater 10 on the air flowing upwardly through casing 14, to cause said air to follow a comparatively narrow path as closely adjacent the heater as possible. Accordingly, a baffle plate 25 is mounted in casing 14 so as entirely to surround heater 10 in a plane parallel to the bottom of the casing and substantially tangent to the inner circumference of the heater, the plate being formed with a rectangular aperture defined by edges tangent to the outer surfaces of

pocket portions 11 whereby air flowing upwardly past the heater will be directed in paths between the extending pocket portions 11 and will thus be subjected to heat from three sides.

The supply of gases to the heater 10 is arranged for by the provision of a Y-shaped valve 26 adapted to be inserted in the exhaust gas line 27 and the branch 28 of which is connected by a pipe 29 to the inlet to heater 10, indicated at 30. Operable on slides 31, 31 in valve 26 is a valve gate 32 reciprocable by a rod 33, so as in one position to close branch 28 leaving exhaust line 27 open, or to close the exhaust line 27 leaving branch 28 open, the gate 32 normally being held in the position shown in Figure 6, to cut off the supply of gases to the heater and to leave the exhaust line 28 open, by means of a spring 34. For operating the gate 32 against the action of spring 34, a bell-crank lever 35, pivoted at $35^a$, is connected to rod 33 and has connected thereto a pedal rod 36 operable by the driver through the floor of the car and adapted to be latched to hold gate 32 across exhaust line 27 by means of a latch plate 37 on the floor of the car arranged to engage a ratchet 38 on rod 36.

In the form of the invention shown in Figure 9, casing 14 is dispensed with and a casing 39 adapted to be positioned above the floor of the car is provided, flanges 13 being employed to mount heater 10 on the floor of the car, an asbestos sheet 40 being arranged over the floor of the car under the heater.

In either form of the invention, the outlet indicated at 41 is connected to a pipe 42 extending toward the rear of the car to conduct the exhaust gases from the heater 10.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. An exhaust gas heater for automobiles, comprising a thin walled, hollow, tubular radiating member having a series of spaced, annular pockets formed therein and perpendicular baffles extending alternately from opposite sides of the radiating member substantially half way across the same and arranged between said pockets, the inlet end of said heater being free of baffles, and means on said radiating member for supporting the same.

2. A heater for automobiles comprising a heat radiating member through which the exhaust gases are conducted, said member being formed with heat radiating projections, a casing for said member opening substantially the entire length of the bottom and having substantially the entire length of the top opening into the interior of the automobile, means for admitting air into the casing to flow upwardly past said member into the automobile, and a baffle in the casing for directing the air in paths upwardly between said projections.

3. An exhaust gas heater for automobiles comprising a tubular conductor formed with spaced projections on its outer surface, said projections having grooves or sockets extending thereinto from the inner surface of the conductor and baffles arranged between said grooves on the inside of the conductor adapted to direct hot gases into said grooves without so obstructing the flow of said gases as to create a back pressure in the conductor.

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