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1,826,358

STEAM GENERATOR OR WATER HEATER

Filed July 21, 1928

3 Sheets-Sheet 1.

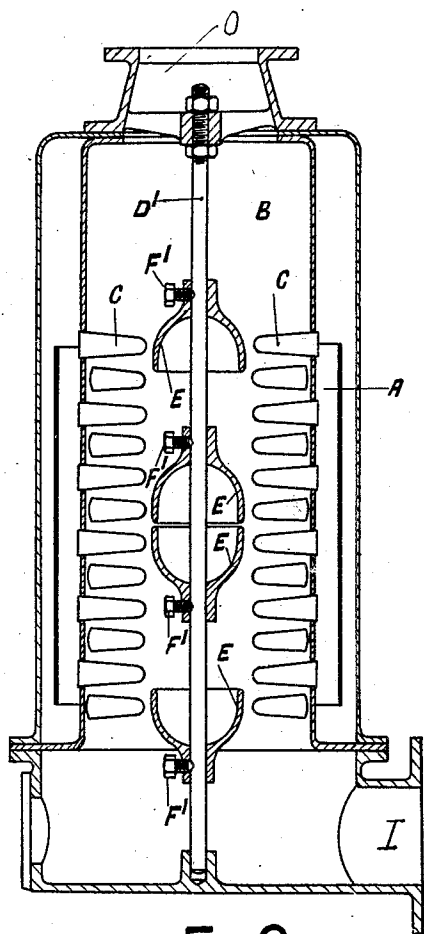


FIG. 2.

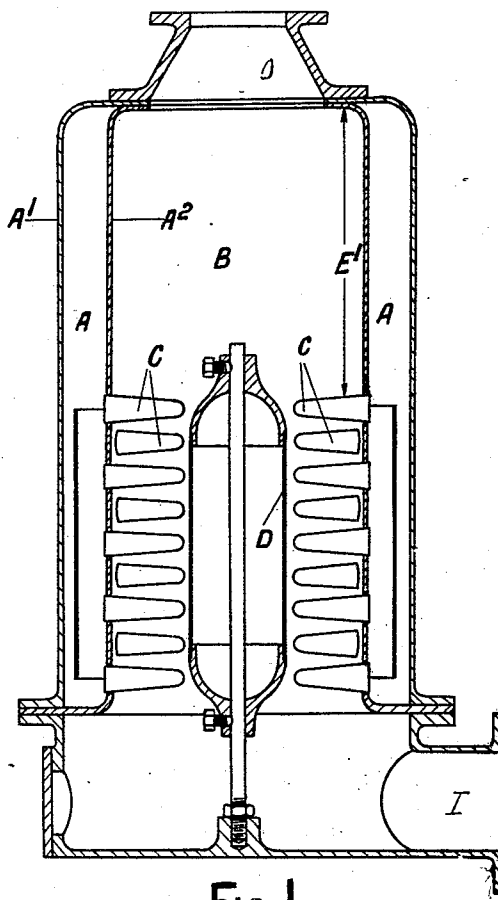


FIG. 1.

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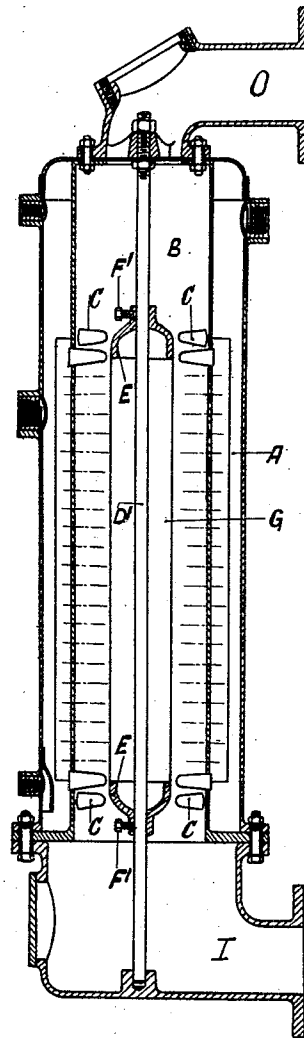


FIG. 3

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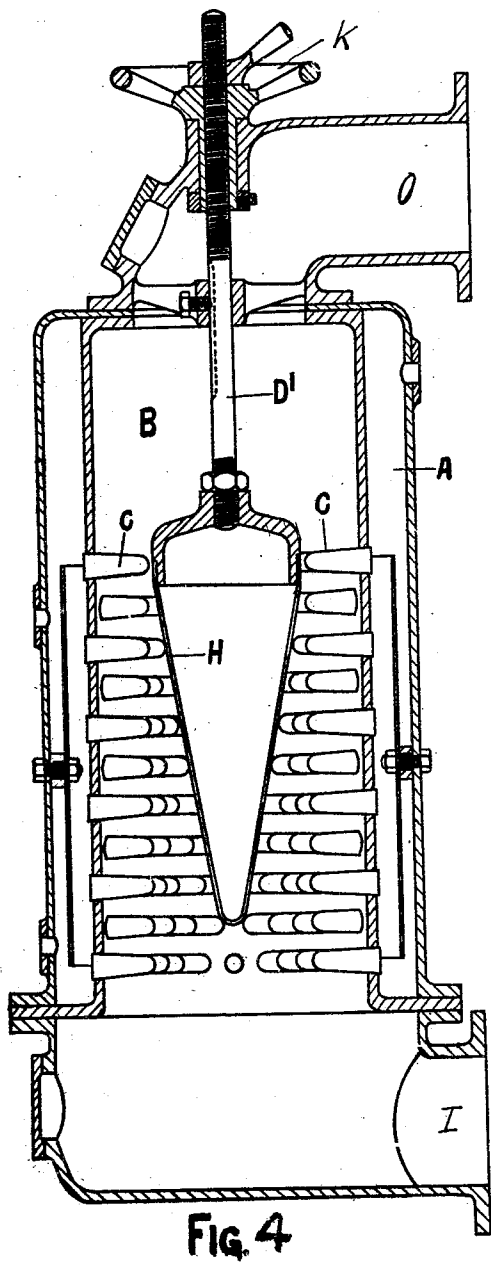


Fig. 4

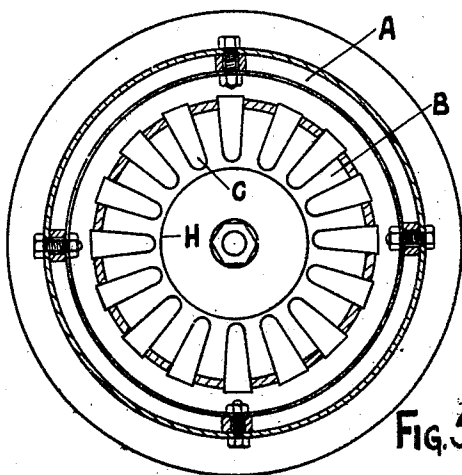


Fig. 5

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UNITED STATES PATENT OFFICE

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STEAM GENERATOR OR WATER HEATER

Application filed July 21, 1928, Serial No. 294,385, and in Great Britain October 21, 1927.

This invention relates to steam generators or water heaters of the kind comprising an outer casing and an inner casing between which is defined an annular water chamber from which short closed-ended tubes or thimbles project radially into a central heating space through which hot gases are passed. The invention has for its object to provide an improved steam generator or water heater of this type utilizing as the heating medium exhaust gases from Diesel or other engines or other sources and acting as a silencer for such exhaust gases.

The invention is illustrated in the accompanying drawings in which Fig. 1 is a vertical section of a steam generator or water heater embodying certain features of my invention. Figs. 2 and 3 illustrate further embodiments showing various arrangements of adjustable baffles. Fig. 4 is a vertical section and Fig. 5 a horizontal section of a boiler embodying certain features of the arrangement shown in Figs. 1 and 2.

In the various figures of the drawings, A denotes the annular water chamber of the steam generator enclosed between outer and inner casings, A', A² respectively, and B denotes the central heating space into which thimbles C extend. I indicates the inlet for the exhaust gases and O the outlet.

In accordance with one feature of the invention and as shown particularly in Figs. 1, 2, 3 and 4 of the drawings a relatively large part of the central heating space of the heater is left free from thimbles, so as to permit expansion of the exhaust gases and to reduce back pressure.

The portion of the water heater free from thimbles may be located at the upper end of the heater, as shown in these figures, and adjacent the outlet O for the exhaust gases to the atmosphere thus permitting expansion of the gases immediately before delivery to the atmosphere through the outlet O. Expansion of the exhaust gases before delivery

to the thimble portion of the water heater is afforded by this free space when the exhaust gases are delivered at O to the upper end of the water heater and pass out at the lower end at I.

The thimble portion of the water heater and the portion free from thimbles provide a combined water jacketed silencer and heat combining device for the hot gases.

In order efficiently to comb the hot gases by means of the thimbles I prefer to provide baffles, preferably adjustable, by which to direct the hot gases among the thimbles. Various arrangements of baffles are shown in Figs. 1 to 3 of the drawings. Referring to these figures it will be seen that I provide on a spindle D' extending axially of the central heating space a baffle or baffles E suitably cup-shaped as shown and adapted to be clamped to the spindle D' in any adjusted position by means of set screw F' or the like. The baffles may be arranged as upright and inverted cups connected by a sleeve D as indicated in Figs. 1 and 3 or may be located adjacent one another as indicated by the two centrally located cups of Fig. 2, so as to provide the equivalent of a continuous baffle.

It will be appreciated that by virtue of the vertically adjustable arrangement of the baffles it is possible to vary their position or to reduce or extend the baffling effect to suit the characteristics of the engine or other source from which the hot exhaust gases are delivered to the steam generator or water heater.

In the embodiment shown in Figs. 4 and 5 the baffle is in the form of a central core of general conical form which provides between itself and the inner wall of the water chamber or the edges of the thimbles an annular heating chamber of gradually decreasing capacity in the direction of flow of the gases so as to tend to equalize the velocity of the gases throughout the water heater. In the embodiments shown the conical baffle is

formed of a metal cone mounted on a cup-shaped base similar to the baffles E shown in the other figures. The baffle may be adjusted vertically on a central rod D' and locked in adjusted position by means of a set screw F', or may be secured to the rod D' which may be raised and lowered from the exterior of the boiler by means of a hand-wheel and threaded sleeve K engaging screw threads on the rod D'.

I claim,

1. A steam generator including an outer casing, an inner casing spaced therefrom, said inner casing defining with said outer casing an annular water chamber and itself defining a central heating space for the passage of hot gases, short closed-end tubes projecting radially from said inner casing into said heating space, and baffle members in said heating space vertically adjustable within wide limits in order to control the velocity of gases at different points of the space occupied by the closed-end tubes.

2. A steam generator including an outer casing, an inner casing spaced therefrom defining with said outer casing an annular water chamber and itself defining a central heating space for the passage of hot gases, short closed ended tubes projecting radially from said inner casing into said heating space, and baffling disposed within the heating space occupied by the closed ended tubes, the inner casing defining a large cylindrical heating space between the radial tubes and the reduced-diameter outlet, said space being entirely devoid of tubes and other obstructions, said baffling being formed of opposed cup shaped members adjustably mounted within said heating space.

3. In a steam generator comprising an outer casing, an inner casing spaced therefrom defining with said outer casing an annular water chamber and itself bounding a central heating space for the passage of hot gases, short closed-ended tubes projecting radially from said inner casing into said heating space, and a central baffle forming with said inner casing a heating chamber of gradually decreasing capacity in the direction of flow of the gases, the inner casing defining a large cylindrical heating space between the radial tubes and the reduced-diameter outlet, said space being substantially devoid of tubes and other obstructions, said baffle being adjustable axially in relation to the space occupied by the closed-ended tubes to control the velocity of the gases at different points of the space occupied by the closed-ended tubes.

In testimony whereof I have signed my name to this specification.

HUGH FREDERICK MARRIOTT.