

[54] ANTI-POLLUTION STEAM GENERATION SYSTEM

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Related U.S. Application Data

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[52] U.S. Cl. 122/248, 122/136 R, 122/235 R

[51] Int. Cl. F22b 21/28

[58] Field of Search 122/248, 235 R, 136 R, 122/250 R; 110/28 F, 72, 73

[56] References Cited

UNITED STATES PATENTS

3,713,433	1/1973	Grainger	122/136 R
3,352,289	11/1967	Cunningham, Jr. et al.	122/250 R
1,720,958	7/1929	Jacobus	110/72 R
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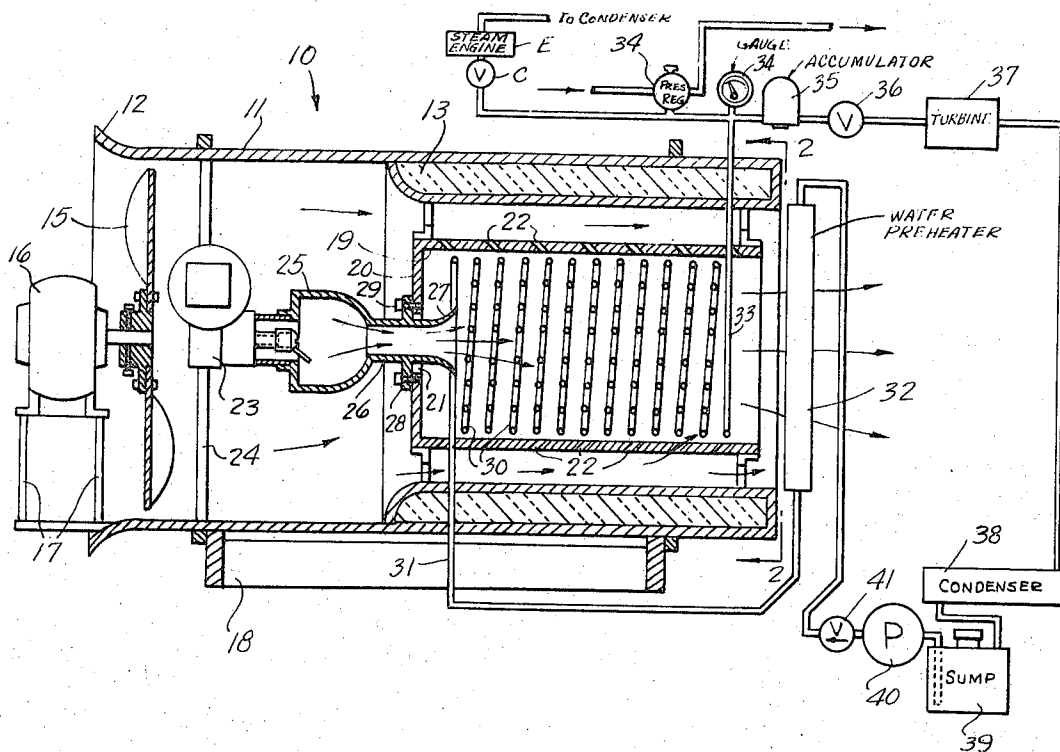
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[57] ABSTRACT

An anti-pollution steam generation system including an outer housing and a secondary combustion chamber spaced inwardly therefrom. An oil burner including a primary combustion chamber is connected into the secondary combustion chamber to provide heat therein and an air fan provides a flow of air through the outer housing and around the secondary combustion chamber with a portion of the air flowing into the secondary combustion chamber through a plurality of apertures in the secondary combustion chamber. Steam coils in the secondary combustion chamber are heated to provide steam with a water pre-heater being positioned down stream of the secondary combustion chamber to be heated by the exhaust gases therefrom to provide heated water for the steam coils.

2 Claims, 3 Drawing Figures



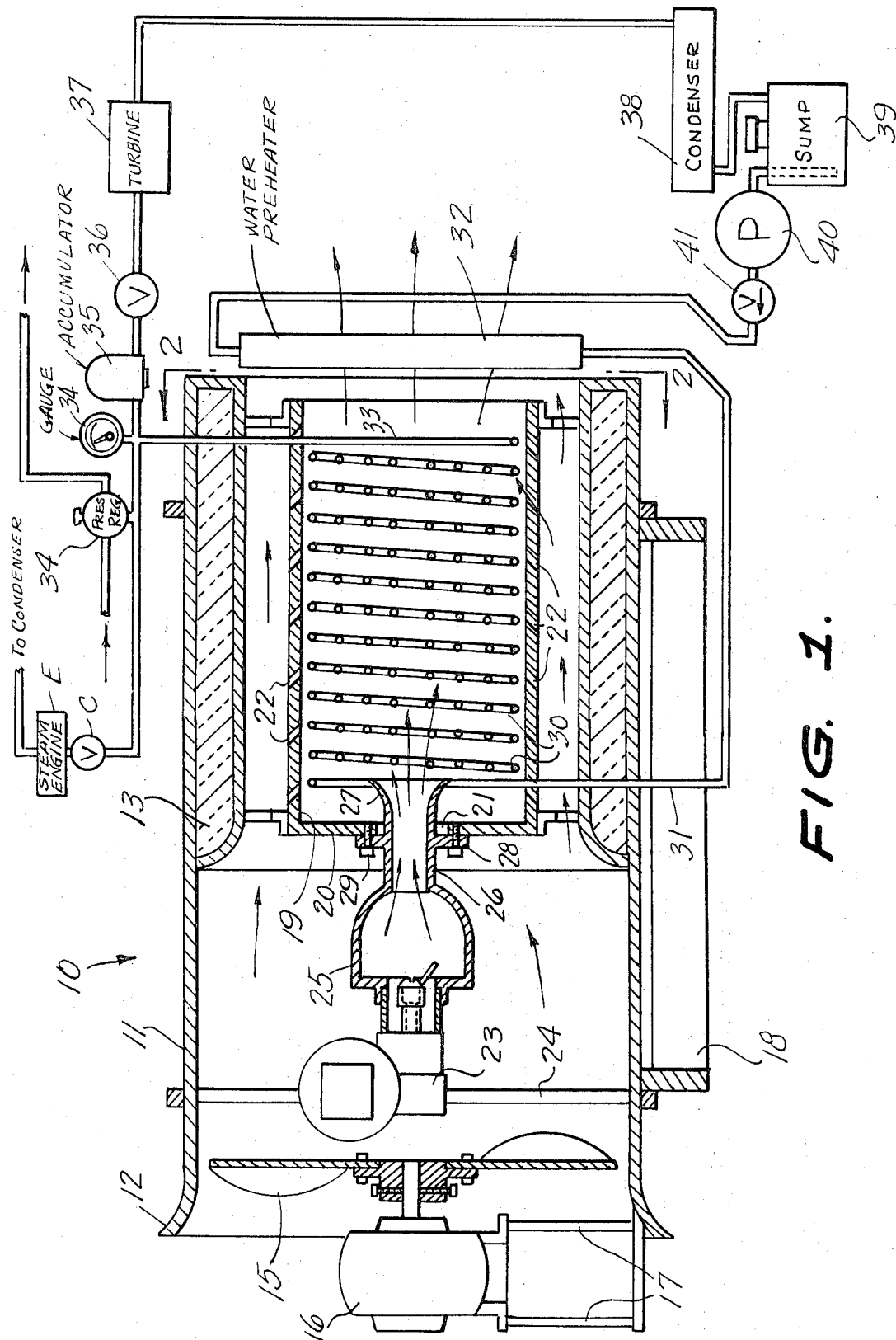


FIG. 1.

FIG. 2.

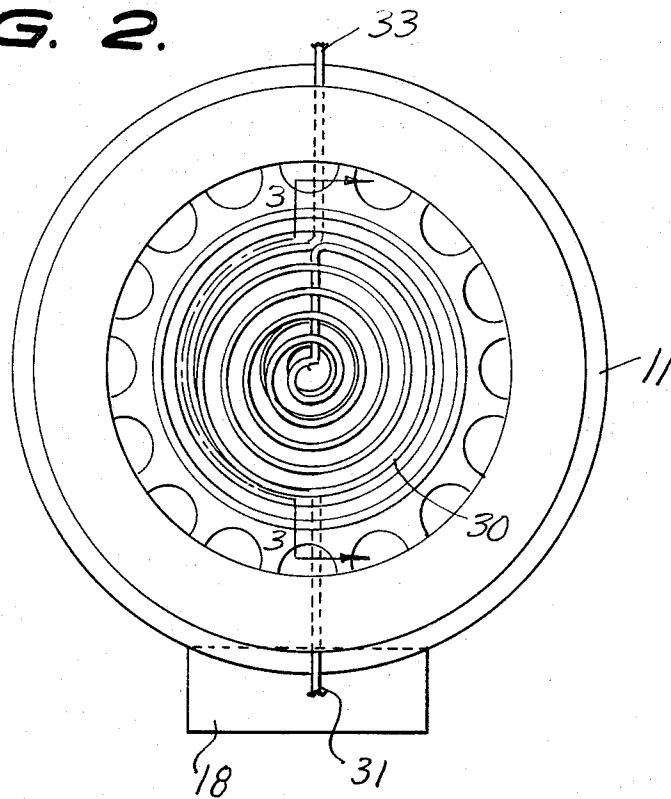
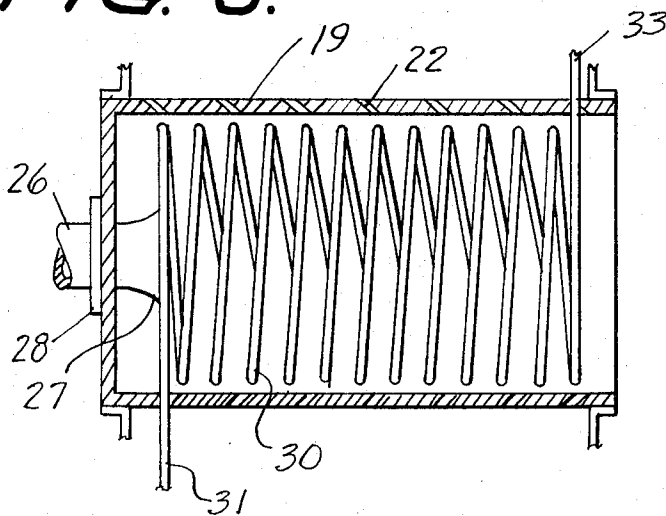


FIG. 3.



ANTI-POLLUTION STEAM GENERATION SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of my co-pending application Ser. No. 182,456, filed Sept. 21, 1971 now U.S. Pat. No. 3,713,433 and entitled, "Anti-Pollution Heating System."

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an anti-pollution steam generation system.

2. Summary of the Invention

The anti-pollution steam generation system of the present invention includes an outer cylindrical housing having an air supply fan positioned at one end thereof and a secondary combustion chamber spaced inwardly of the outer housing and provided with an oil burner heating system therefor. Air under pressure from the air fan flows around the secondary combustion chamber and into the secondary combustion chamber through a plurality of inwardly and tangentially sloping bores formed in the wall thereof. A steam coil is positioned within the secondary combustion chamber and is fed hot water from a water pre-heater positioned down stream from the outlet end of the secondary combustion chamber. The secondary combustion chamber is positioned within an insulated ring in the outer housing to prevent the undue loss of heat therefrom.

The primary object of the invention is to provide a steam generation system fired from an oil burner with all pollutants being consumed in the system.

Other objects and advantages will become apparent in the following specification when considered in the light of the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of the invention;

FIG. 2 is an end elevation taken along the line 2—2 of FIG. 1, looking in the direction of the arrows; and

FIG. 3 is a fragmentary longitudinal sectional view, taken along the line 3—3 of FIG. 2, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, wherein like reference characters indicate like parts throughout the several figures, the reference numeral 10 indicates generally a steam generation system constructed in accordance with the invention.

The steam generation system 10 includes a housing 11, having an outwardly flared inlet end 12 formed thereon. The housing 11 includes an insulated band 13 adjacent the outlet end thereof. A fan 15 is positioned in the inlet end of the housing 11 and is mounted on a motor 16 supported on supports 17. The housing 11 is mounted on a base 18 which may form part of a mobile system or any other desired system.

A secondary combustion chamber 19 is positioned within the insulating ring 13 and extends axially of the outer housing 11. The secondary combustion chamber 19 has an end wall 20 formed therein and having an axial opening 21 extending therethrough. The sec-

dary combustion chamber 19 has a plurality of inwardly and tangentially sloping bores 22 extending through the side wall thereof for reasons to be assigned. An oil burner 23 is mounted in the outer housing 11 on supports 24 and has a primary combustion chamber 25 secured thereto.

The primary combustion chamber 25 has a reduced diameter exhaust throat 26 connected thereto terminating in a flared outlet 27. An annular flange 28 is mounted on the throat 26 and is connected by bolts 29 to the end wall 20 with the throat 26 being positioned within the secondary combustion chamber 19. A steam coil 30 extends spirally through the secondary combustion chamber 19 from an inlet water pipe 31 extending from a water pre-heater 32 mounted in the path of the exhaust gases from the secondary combustion chamber 19. A steam outlet pipe 33 extends from the coil 30 to a steam gauge 34, accumulator 35, valve 36, turbine 37, to a condenser 38 and from there to a sump 39. A pump 40 is adapted to pump water from the sump 39 through a check valve 41 to the water pre-heater 32. Steam from the outlet pipe 33 also extends to a pressure regulator 34 to control the heat and steam pressure in the system. Steam from the pipe 33 also may lead to a control valve C, then to a steam engine E and back to the condenser 38.

Gases and products of combustion flowing from the primary combustion chamber 25 into the secondary combustion chamber 19 mingle with air flowing through the apertures 22 to complete the combustion within the secondary combustion chamber 19 while simultaneously heating the water in the coil 30 to provide steam. The anti-pollution properties of the present invention are identical to that of my co-pending application described above.

Having thus described the preferred embodiment of the invention it should be understood that numerous structural modifications and adaptations may be resorted to without departing from the spirit of the invention.

What is claimed is:

1. An anti-pollution oil burner steam generation system comprising a gun type oil burner having an outlet tube, means in said tube for creating a swirling movement of the air passing therethrough, a primary combustion chamber secured to said tube to receive the products of combustion therefrom, said primary combustion chamber having an diameter greater than the diameter of said tube and having a reduced diameter outlet at the end thereof opposite said tube, a secondary combustion chamber secured to the outlet of said primary combustion chamber to receive products of combustion therefrom, said secondary combustion chamber having a diameter substantially greater than the diameter of said primary combustion chamber, a plurality of bores formed in the wall of said secondary combustion chamber to admit additional air thereto for completing the combustion of materials received from said primary combustion chamber, a steam coil extending longitudinally of said secondary combustion chamber, a water pre-heater positioned down stream of said secondary combustion chamber in the path of the products of combustion flowing therefrom, means connecting said water pre-heater to said steam coil, a generally cylindrical housing completely surrounding and spaced radially outwardly from said secondary combustion chamber, a fan for supplying air to said secondary com-

3

bustion chamber mounted in said housing for blowing air over said secondary combustion chamber and through said bores therein, and an insulating ring in said housing completely surrounding said secondary combustion chamber and spaced radially outwardly therefrom to prevent undue heat loss from said secondary combustion chamber with the air from said fan passing between said secondary combustion chamber

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and said insulating ring.

2. A device as claimed in claim 1 wherein said fan is positioned at one end of said housing with the air from said fan passing over said primary combustion chamber prior to passing over said secondary combustion chamber.

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