April 30, 1957 J. A. BUTTLER 2,790,428

INSTANTANEOUS STEAM GENERATORS

Filed Dec. 23, 1952

Fig. 1

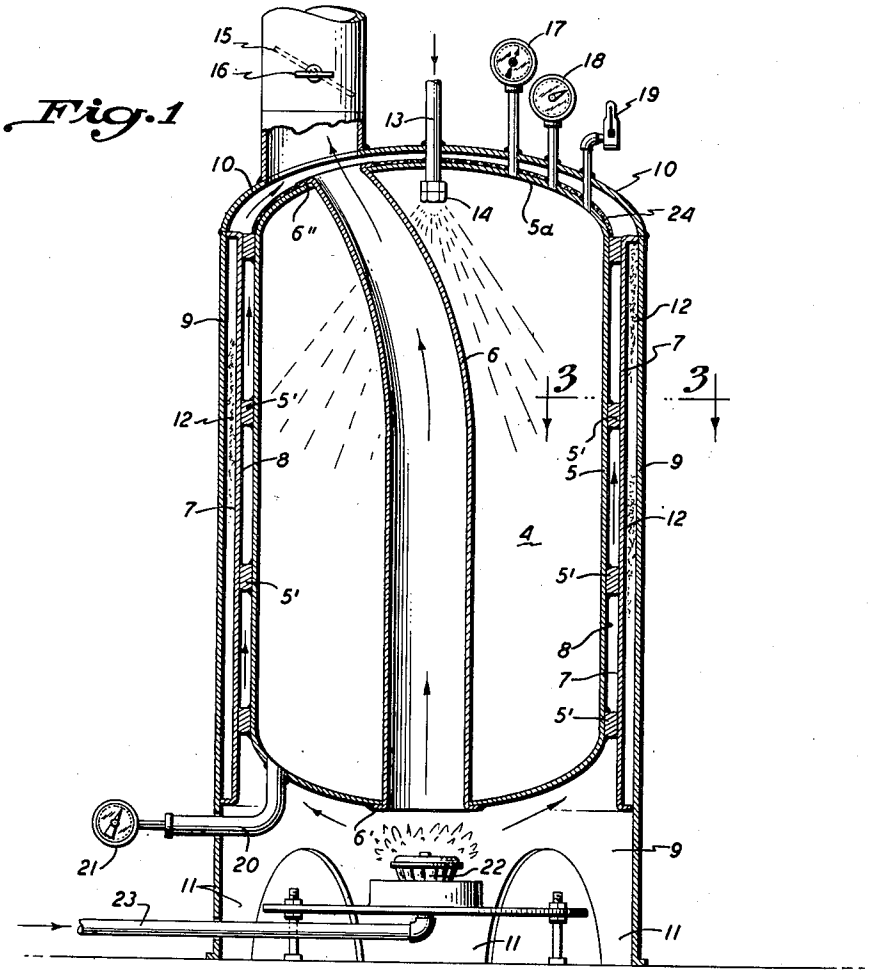


Fig. 2

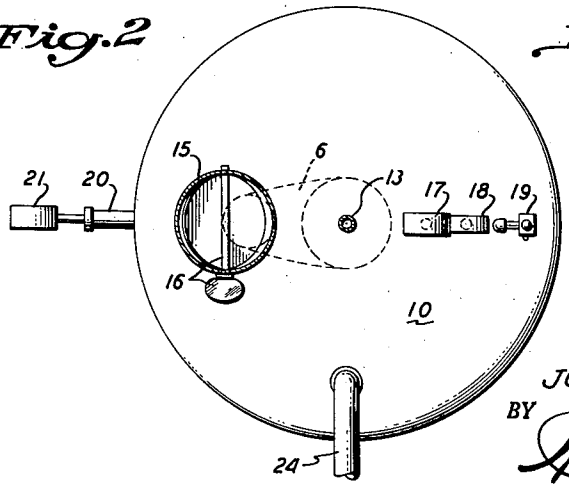
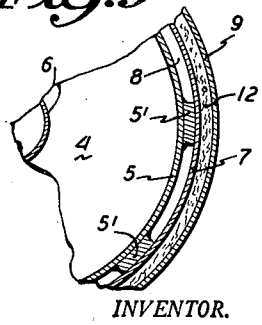


Fig. 3



INVENTOR.
JOHN ALLEN BUTTLER
BY
Attorney.

United States Patent Office 2,790,428
Patented Apr. 30, 1957

2,790,428

INSTANTANEOUS STEAM GENERATORS

John Allen Buttler, Los Angeles, Calif.

Application December 23, 1952, Serial No. 327,590

1 Claim. (Cl. 122—17)

This invention relates to instantaneous steam generators, and it has among its salient objects:

To provide an improved and more efficient steam generator which will operate continuously after being started, for the production of steam for use in steam-propelled engines;

To provide a steam generator of the character referred to with an inner expansion heat chamber, through which an inner flue extends, connected at its opposite ends to the top and bottom of said drum, and through which hot gases and products of combustion pass, thus greatly increasing the heating surface within said expansion chamber;

To provide in connection with an inner heat expansion chamber, a water supply pipe extended thereinto and provided on its inner end with a fog-producing nozzle to discharge on said inner flue and the hot wall of said expansion heat chamber, whereby to convert said fog into steam as it comes into contact with said inner flue;

To provide in a steam generator of the character referred to, an inner drum having an inner flue therethrough with its opposite ends connected through the top and bottom of said drum, said inner flue tapering to a reduced upper end to discharge with something of a jet effect, with an outer flue into which it discharges its hot gases and products of combustion;

To provide in such a steam generator, an inner drum having around it a steel shell, spaced to form a heating space, and having an outermost steel shell around said first steel shell and forming an insulating space, said heating space communicating with said outer flue at the juncture of the upper end of said inner flue, whereby the hot gases from said heating space are drawn to said outer flue by the discharge of hot gases from the upper smaller end of said inner flue.

Other objects and advantages of the invention will appear from the following more detailed description of one practical embodiment thereof, taken with the accompanying sheet of drawings:

Figure 1 is a vertical sectional view through an instantaneous steam generator embodying my invention;

Figure 2 is a plan view thereof; and

Figure 3 is a fragmentary view, taken on line 3—3 on Fig. 1.

Referring now more in detail to the drawings, an inner heat expansion chamber, designated 4, is formed by the steel drum or body 5, having an open ended inner flue 6 extended therethrough from its bottom to its top, as shown in Fig. 1, its bottom end being connected to and opening through the bottom of the drum 5, as at 6', and its upper end being secured to and opening through the top or dome of said drum 5, as at 6'', said inner flue being shown tapering toward its upper end.

Secured to and around said drum or body 5, and suitably spaced therefrom by spacing lugs, as 5', 5', Figs. 1 and 3, is an intermediate steel shell, forming a heat space through which hot gases and products of combustion can pass upwardly, as indicated, said shell is designated 7,

and the space formed thereby is open at its lower end at its upper end, as shown. The annular heating space thus formed is designated 8, and will be again referred to.

An outermost steel shell or drum 9, surrounds said intermediate shell 7, said outermost shell having a dome or top 10, spaced from the top 5a of the inner drum 5. Said outermost shell or drum 9 is spaced from the intermediate shell 7, as shown, and extends to the floor, where arch-forming portions are cut out to provide supporting feet portions, as 11, 11.

The space between the outer shell 9 and the intermediate shell or cylinder 7, is filled with an insulating material, as 12, such as pearlite or any suitable insulating matter.

Said outer shell or drum 9, has extended through its dome 10, and into the inner drum, a water supply pipe 13, with a fog-forming nozzle 14 thereon, whereby water under force from said pipe 13, is forced into said heat expansion chamber 4, through said nozzle as a very fine mist or fog, and as it engages said inner flue 6, and the wall of the hot drum 5, it is instantaneously changed into steam.

The outermost shell or drum is provided in its top or dome 10 with an outer flue, as 15, with damper 16 therein, and into this outer flue 15 the upper, reduced end of the inner flue 6, discharges the hot gases and products of combustion passing upwardly therethrough from the burner 22, as clearly illustrated.

The upper end of said structure is provided with a temperature gauge, as 17, and with a pressure gauge 18, and with a safety valve 19, of usual and well known types.

From the lower end of said drum 5, and said heat expansion chamber 4, is an outlet pipe 20, and this is provided with a second temperature gauge 21. The usual thermostatic controls can be used, if desired, but are not shown, as they form no part of the invention.

Underneath the drum 5, and under the intermediate shell 7, and the heating space 8 formed by said intermediate shell 7, is a burner, designated as a whole 22, with a fuel supply pipe 23, for the fuel, whether it be oil or gas.

It will be observed from the showing that the hot gases and products of combustion from the burner will pass upwardly through the inner flue 6, and also through the annular heating space 8, between the inner drum 5 and the intermediate shell 7, and also between the dome portions 5a and 10 of said members, and thence to the outer flue 15.

The top 5a of the inner drum 5 is preferably covered with a sheet of asbestos or other suitable insulating material, as 24, but not sufficiently thick to close the passageway to the flue 15.

The passage of hot gases and products of combustion upwardly through the flue 6, and into the outer flue 15, will create a certain amount of suction upwardly in the annular heating space 8, around said inner drum 5, and between said dome portions 5a and 10, at the juncture of the flue 15 with the dome 10, thus increasing the heat developed in said passageway. The fact that the inner flue tapers to a smaller end and discharges into the lower end of the outer flue 15, across the space between the domes 5a and 10, creates a certain jet effect and thus causes an upflow of hot gases through the annular heating space and over the top of the inner drum 5, to the outer flue 15, as indicated by the arrows.

A steam pipe, as 24, is shown leading from the top, or domes 5a and 10, in Fig. 2. This would lead to a place of use. It is not seen in Fig. 1 because it would be in the cut away portion.

I do not limit my invention to the details of construction and arrangement here shown for explanatory purposes, for I know that many changes can be made in

said details, except as I may be limited by the hereto appended claim forming a part of this application.

I claim:

A steam generator including a drum, an inner flue through said drum, said flue having its opposite ends connected through the top and bottom of said drum, an intermediate steel shell around said drum and spaced therefrom to form an annular heating space around said drum, an outermost steel shell around said intermediate shell and spaced therefrom to form an insulating space, with insulating material therein, said outermost shell having a dome portion over said drum and said intermediate shell to receive hot gases from said heating space, an outer flue on said dome to receive hot gases from said inner flue and said annular heating space, a fuel burner under said drum and under said inner flue and the lower end of said annular heating space, and a water supply pipe with a fog-forming nozzle on its inner end within said drum, to discharge a fine fog on to said inner flue and against the hot wall of said drum to be converted into steam, and a steam pipe leading from said drum to a place of use, the inner flue extending through said drum is tapering toward its upper end to a smaller size to be connected to and extended through the top of said dome, the lower end of the inner flue being connected to the lower portion of the drum at the center thereof, the upper portion of the inner flue being of obtuse elbow shape and having its extremity connected to the top of the drum at a point offset from the center thereof, said nozzle being located directly above said elbow shape so as to discharge the fog directly thereagainst.

References Cited in the file of this patent

UNITED STATES PATENTS

544,019	Wilson et al.	Aug. 6, 1895
666,886	Ready	Jan. 29, 1901
2,504,092	Thomas	Apr. 11, 1950