

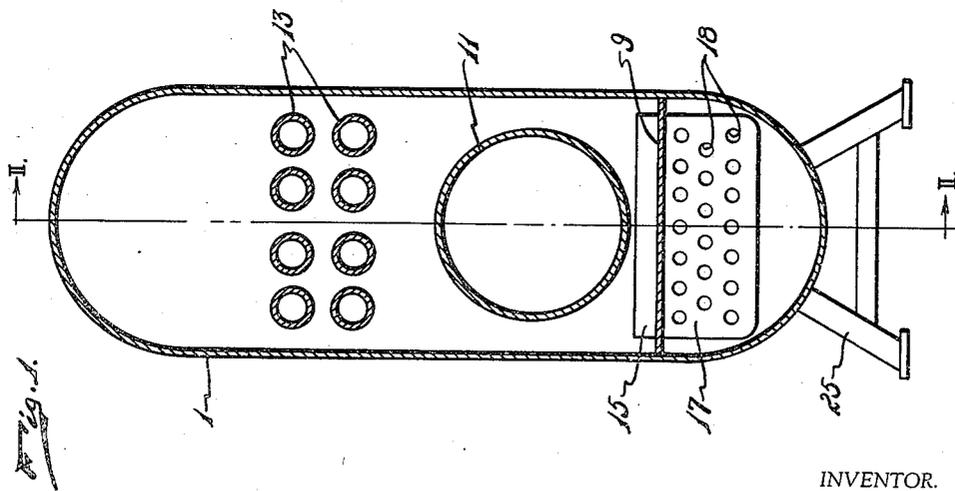
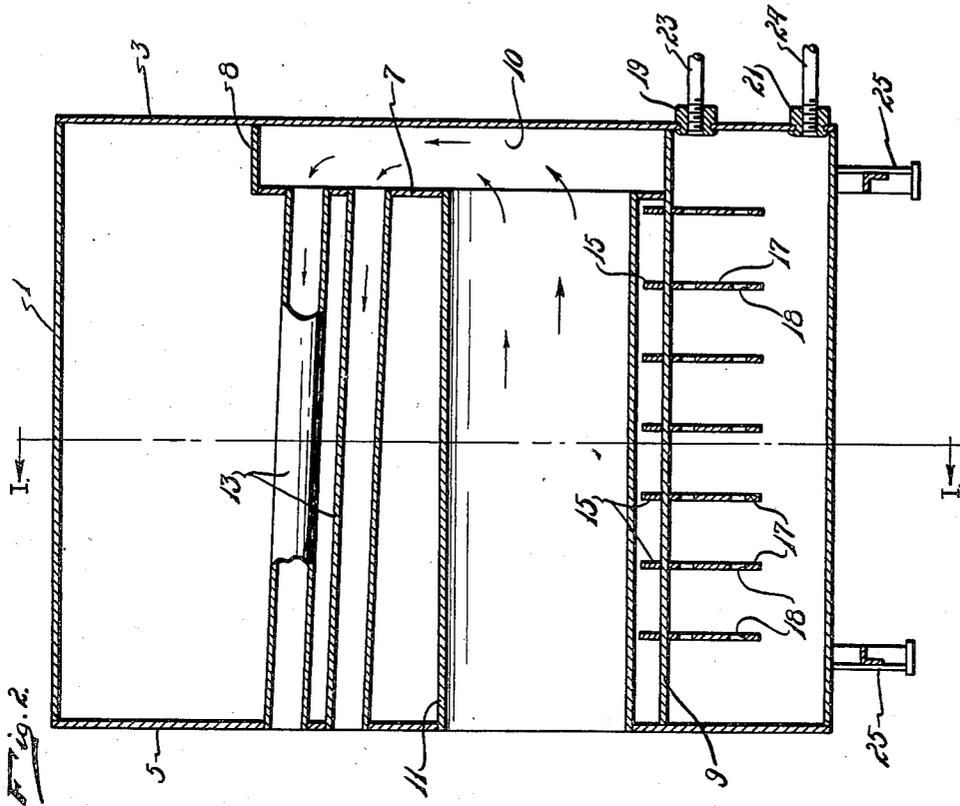
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WATER HEATER

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WATER HEATER

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2 Claims. (Cl. 122—32)

My invention pertains to a storage water heater and more particularly to a combined steam or hot water boiler and storage tank water heater.

It is an object of my invention to provide a steam or hot water boiler embodying a combined storage tank water heater which comprises a circumferentially enclosing shell closed by a flue sheet at one end and by an end plate at the other having an associated flue sheet spaced interiorly thereof to form a smoke box and provided with a heat conductive separating plate extending across the bottom portion of the shell under the flues which extend between the flue sheets whereby a hermetically segregated storage water tank is disposed in intimate heat conducting relation with the heat medium in the boiler.

It is also an object of my invention to provide the above type of combined boiler storage water heater with a separating plate having heat conductive fins welded to, and projecting from, opposite sides for providing increased thermal coupling between the fluids on opposite sides thereof.

The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments, when read in conjunction with the accompanying drawing, in which:

Fig. 1 is a vertical cross sectional view on line I—I of Fig. 2 showing a combined boiler and storage water heater arranged in accordance with my invention; and

Fig. 2 is a longitudinal sectional view thereof.

Referring more particularly to the drawing the heater comprises a circumferential inclosing shell closed at one end by an end plate 3 and at the opposite end by a flue sheet 5. The smaller flue sheet 7 is secured in inwardly spaced relation from the end plate by a flange projecting outwardly from the upper edge thereof in abutting relation with the end plate. The lower edge of the small flue sheet 7 is terminated substantially above the bottom of the boiler and it abuts a separating plate 9 which extends across the bottom portion of the boiler shell 1 throughout the full length thereof. The boiler shell 1 is rigidly secured to the end plate 3, the large flue sheet 5, and the separating plate 9 in hermetically sealing relation, as by welding or riveting together, in any suitable manner well known to those skilled in the art of boiler construction. The smaller flue sheet 7 is similarly secured at its lower edge to the separating plate 9 and at

its upper edges to the end plate 3, thereby enclosing a smoke box 10.

Gas conducting flues 11 and 13 extend between the flue sheets and have their opposite ends hermetically secured therein by welding or beading in any suitable manner.

In order to increase the thermal coupling of the heating fluid above the separating plate 9 with the water in the storage water tank below, heat conductive fins 15 are secured on the upper surface of the plate in opposed relation to downwardly projecting fins 17 on the lower surface of the plate. To secure the fins to the plate in good heat conductive relation they are preferably welded or soldered thereto.

The downwardly projecting fins 17 are provided with perforations 18 through which the water in the storage tank may circulate in intimate thermal association therewith.

Suitable pipe fittings 19 and 21 are provided in the end plate 3 to receive respective inlet and outlet connections 23 and 24 for supplying water to be stored and heated in the storage tank.

The boiler is preferably provided with pedestal portions 25 for mounting whereby it may be installed and supported in spaced relation above the floor in damp locations.

When installed the boiler may be associated with suitable combustion means (not shown) for supporting combustion in or adjacent the large flue 11 through which the flames pass to the smoke box. This may be readily accomplished by mounting a suitable burner for liquid and gaseous fuels, or grates for solid flue, directly in the large flue 11 or by providing an associated fire box connected directly thereto in any suitable manner. For connecting the open end of the smoke flues to the stack, a connection may be provided in associated relation with the flue sheet, as will be readily understood by those skilled in the art, and suitable connections are also provided in the boiler shell for circulating the heating medium therethrough as will be readily understood. As indicated by the arrows, the flames and hot gases pass from the large flue 11 into the smoke box 10 from which they return through the smoke flues 13 to a suitable stack connection (not shown).

In operation the water in the storage tank disposed under the combustion flue circulates continuously through the apertures 18 in the downwardly projecting heat conductive fins 17 whereby the stored water is heated to a temperature substantially equal to that of the heating medium circulating in the boiler proper.

It will be understood that the distance of the flues above the separating plate 9 and the number of spaced heat conductive fins may be varied with different boilers to suit the individual requirements.

5 It will be seen that I have provided a combined steam or hot water boiler incorporating a storage tank water heater wherein the stored water is efficiently heated through a heat conductive
10 finned separating plate from the heat medium and by an arrangement which avoids projecting obstructions in the combustion channel that would interfere with the combustion draft and the cleaning of the combustion surfaces. My
15 arrangement also voids exposure of the water to a flame heated surface causing the accumulation of scale and sludge in the water storage tank.

Aside from the specific embodiments of the invention herein shown and described, it will be
20 understood that numerous details of the construction may be altered or omitted without departing from the spirit and scope of the invention as disclosed and claimed, and that I do not
25 desire to limit the invention to the exact constructions herein set forth.

I claim as my invention:

1. A combined steam or hot water boiler and storage tank water heater comprising, a circumferential enclosing shell, a flue sheet closing one
30 end of said shell, an end plate closing the other

end of said shell, a flue sheet spaced inwardly from said end plate to form a smoke box, gas conducting flues extending between said flue sheets and having their opposite ends hermetically secured therein, a separating plate extending across
5 the bottom portion of said shell under said flues for providing a hermetically segregated storage water tank in intimate thermal coupled association with the heating medium circulating in the shell around said flues.

10 2. A combined steam or hot water boiler and storage tank water heater comprising a circumferential enclosing shell, a flue sheet closing one end of said shell, an end plate closing the other
15 end of said shell, a flue sheet spaced inwardly from said end plate to form a smoke box, gas conducting flues extending between said flue sheets and having their opposite ends hermetically secured therein, a separating plate extending
20 across the bottom portion of said shell under said flues for providing a hermetically segregated storage water tank in intimate thermal coupled association with the heating medium circulating in the shell around said flues, and heat conductive
25 fins secured upon and projecting from opposite sides of said separating plate for providing increased thermal coupling between the fluids on opposite sides thereof.

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