

March 17, 1936. A. J. M. A. VAN DER DOES DE BIJE 2,034,452

BOILER

Filed Aug. 13, 1932

2 Sheets-Sheet 1

FIG. 1.

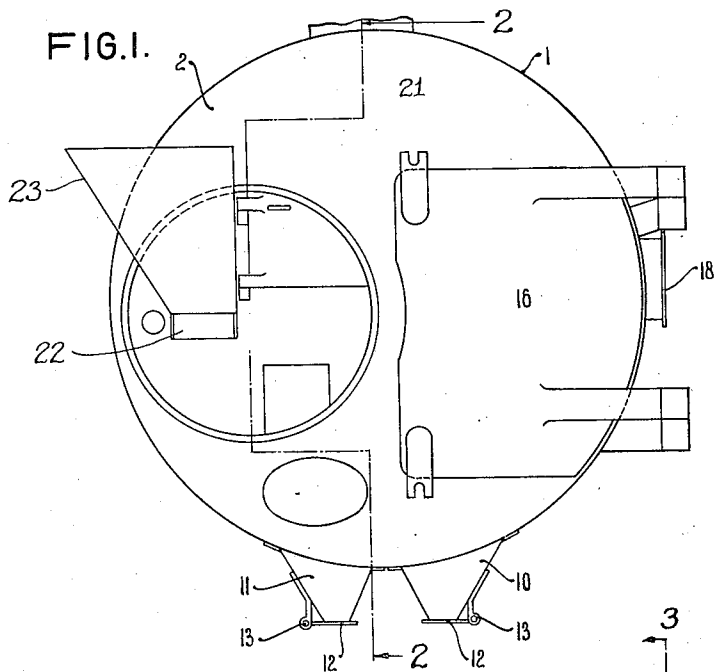
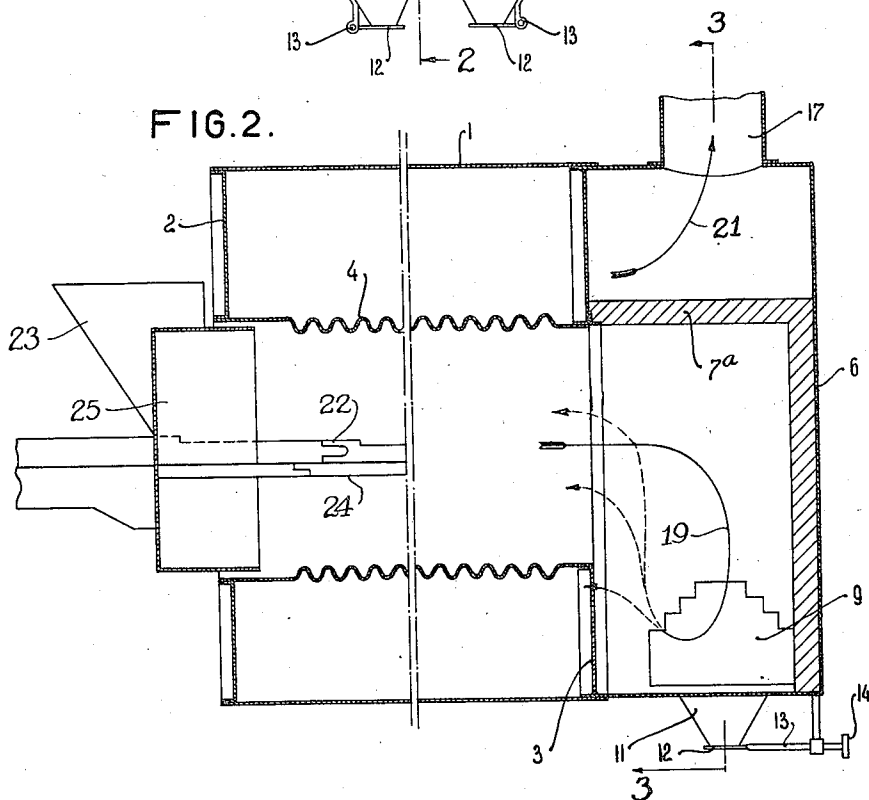


FIG. 2.



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FIG. 3.

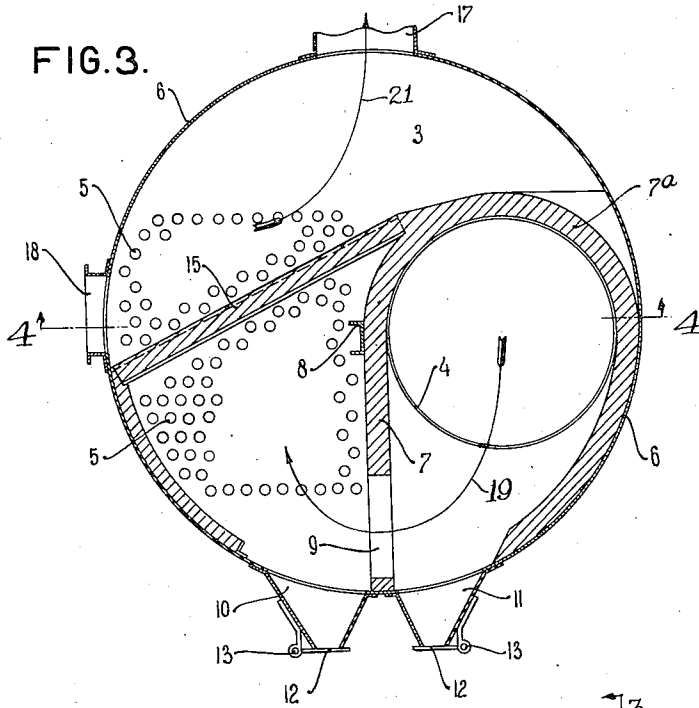
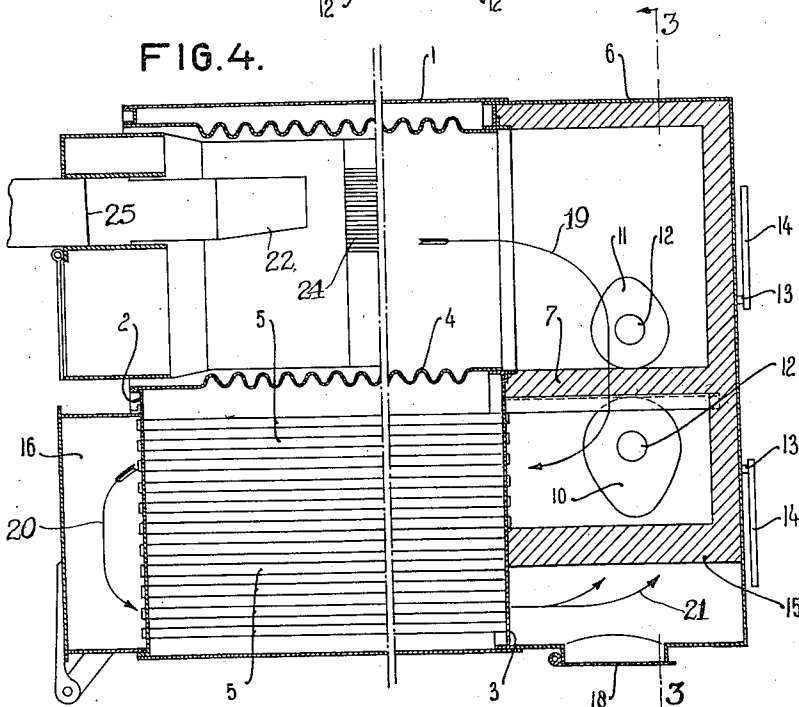


FIG. 4.



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UNITED STATES PATENT OFFICE

2,034,452

BOILER

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In the Netherlands March 15, 1932

1 Claim. (Cl. 110—97)

Steam and hot water boilers are known in which a nest of smoke tubes is arranged beside a furnace flue. The nest of smoke tubes may be divided into two groups, disposed on either side of the furnace flue.

According to the invention, the hot gases from the furnace flue in such a boiler are forced in the combustion box to flow around a substantially vertical, longitudinal baffle or partition, before they can pass into the smoke tubes. This baffle may consist of refractory material, a water chamber, water or superheater tubes arranged close together, or a combination of these known means.

An advantage of the new arrangement is that the hot gases, after passing the fire bridge in the furnace flue, must round the longitudinal baffle as if this were a second fire bridge, so that they are caused to change their direction and to eddy, whereby unconsumed gases and particles of the fuel are burnt. Moreover, when the stream of gases changes its direction, the fly-ashes carried thereby have an opportunity of settling on the bottom of the combustion box, which may be provided with an ash trap and means for removing the ashes.

The arrangement to the baffle is specially favourable for causing the fly-ashes to be deposited in the ash trap. A further advantage of guiding the hot gases downwards in the combustion box by means of the baffle is that the lower part of the boiler is thereby more strongly heated and consequently the water circulation is assisted.

In consequence of the deposition of fly-ashes in the combustion box less dust is deposited in the smoke tubes so that the efficiency of the boiler continues to be satisfactory for a longer period and the smoke tubes seldom require cleaning.

The accompanying drawings illustrate an embodiment of the invention.

Fig. 1 is a front elevation of the boiler.

Fig. 2 is a section on the line II—II of Fig. 1.

Fig. 3 is a section on the line III—III of Fig. 2, and

Fig. 4 is a section on the line IV—IV of Fig. 3.

In the cylindrical shell 1 of the boiler having ends 2, 3, the furnace flue 4 is arranged at one side and the smoke tubes 5 at the other side. Provided at the rear end of the boiler is a combustion chamber or box 6, lined with refractory material and having a baffle 7, the upper part of which is arched, as indicated at 7^a. Laterally, said baffle is supported by a beam 8. The vertical lower part of the baffle is carried by the

bottom of the combustion box 6. Near the bottom the baffle 7 has a wide opening 9.

The traps 10 and 11 for collecting the ashes are provided with flap valves 12, which can be opened and closed by means of shafts 13 and levers 14.

In the combustion box 6 a second baffle 15 is provided dividing the nest of smoke tubes into two groups. Through the lower of these groups the combustion gases flow from the flue 4 in the direction of the arrows 19 towards the front, where they are reversed in a smoke box 16, as indicated by the arrows 20. They are ultimately discharged through a chimney 17 connected to the combustion box 6 at the top thereof in the direction of the arrows 21. The combustion box 6 is accessible through a soot door 18.

The front end of the boiler is shown to be provided with an automatic stoker provided with a ram 22 movable backwardly and forwardly, over the fire bottom or grate 24. Coal is fed from the hopper 23 by means of the step 25 on the ram 22. A portion of the grate is indicated in top plan in Fig. 4 and is designated by the numeral 24. This can be used with especial advantage in a boiler of the construction described, since with it a short flame is obtained and the greater part of the heat generated in the furnace flue is transmitted to the boiler by radiation. In this way comparatively small demands are made on the refractory baffle 7 and the refractory lining of the combustion box 6.

If it is not desired to allow the hot gases to flow backwards again from the smoke box 16, the chimney may be arranged on this box, such as is the case in a Scotch marine boiler.

Since the upper part of the box 6 provides ample space, the chimney branch may be arranged where this is most suitable with a view to the erection of the boiler.

The boiler may if desired also be provided with two or more furnace flues each having nests of smoke tubes and baffles beside it. The invention is not limited therefore to boilers with only one furnace flue, only one nest of smoke tubes and one baffle.

The smoke box 6 may be replaced by brick-work setting accommodating a smoke chamber.

What I claim is:—

In a boiler, a furnace flue, a nest of smoke tubes arranged beside said furnace flue, a combustion box or chamber into which open said furnace flue and said smoke tubes and disposed at one end of the boiler, and a substantially vertical baffle within said box or chamber, said baffle

being placed parallel with the direction of the furnace flue and against the end of the boiler between the furnace flue and the nest of smoke tubes whereby hot gases issuing from the furnace flue are caused to flow around the baffle before they can pass into the smoke tubes, the upper

portion of said baffle extending between the end of the boiler and the opposite wall of said box or chamber and leaving an opening in the lower part of said box or chamber for the passage of combustion gases.

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