

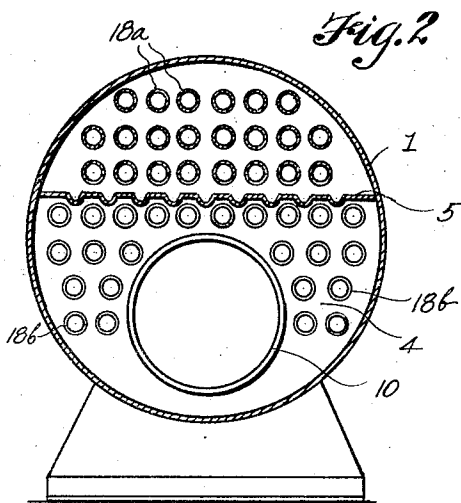
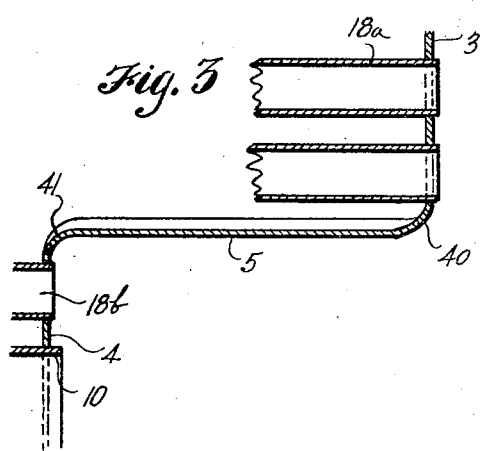
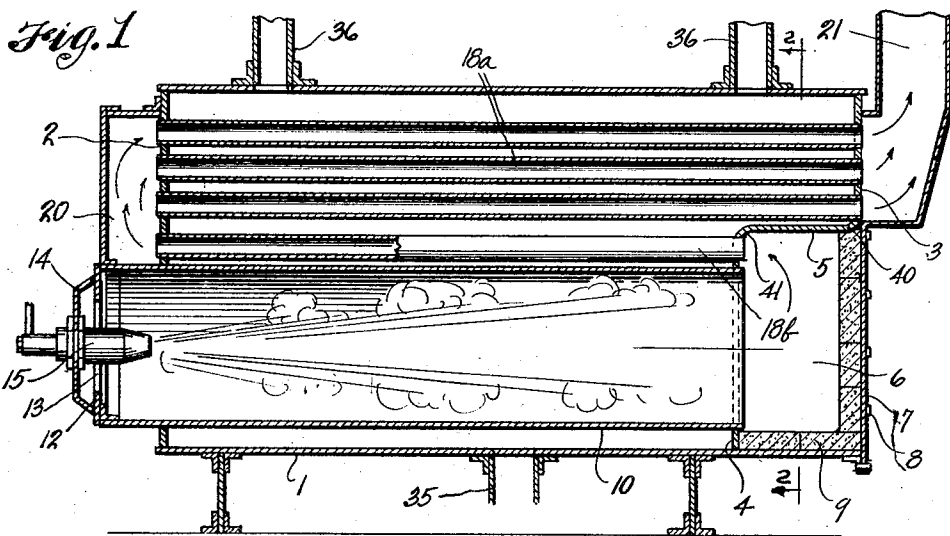
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J. H. FOX

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BOILER

Filed Feb. 16, 1931



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JONAS H. FOX, OF SEATTLE, WASHINGTON

BOILER

Application filed February 16, 1931. Serial No. 516,072.

This invention relates to tubular boilers and has reference particularly to stationary, low pressure steam and hot water boilers of a type especially designed for heating plants as used in apartment buildings, stores, residences, etc.; this particular invention being an improvement on the construction disclosed and illustrated in my co-pending application filed on July 22, 1929, under Serial Number 380,020.

The above numbered application discloses a fire tube boiler in which the rear end is closed by an upper flue sheet, a lower flue sheet set forwardly thereof and a horizontal sheet that is welded at one edge, to the bottom edge of the upper flue sheet, and is likewise welded at another edge, to the top edge of the bottom flue sheet. In this particular construction, the horizontal sheet is subjected to boiler pressure which tends to bow or warp it downwardly. Also, by reason of contraction and expansion of various boiler parts attached to the flue sheets, there is a resultant relative movement of these latter parts which tends to and does cause loosening of the welded joints with resultant leakage in the boiler.

In view of the above objectionable features of the boiler as previously built, it has been the object of this invention to eliminate them by the provision of a construction in which the two flue sheets and the horizontal sheet are all formed in one integral plate, and wherein breaking at the junction points is avoided by the merging of one part into the other through a gradual bend. Also to overcome buckling or bowing of the horizontal plate by the use of corrugations which add stiffness and rigidity and this makes it unnecessary to use supporting stay bolts, or the like.

Other objects of the invention reside in the various details of construction and combination of parts as will hereinafter be described.

In accomplishing these objects, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing, wherein—

Fig. 1 is a central, sectional view of a boiler

embodying the features of construction in accordance with the present invention.

Fig. 2 is a cross section taken substantially on the line 2—2 in Fig. 1.

Fig. 3 is a sectional detail of the flue sheet showing the merging of the various sections through gradually curved bends.

Referring more in detail to the several views of the drawing—

The boiler, briefly described, comprises a horizontally disposed cylindrical shell 1, closed at its forward end by a flue sheet 2 and closed at its rear end by a flue sheet comprising an upper section 3, a lower section 4 and an intermediate, horizontal section 5. In this arrangement the lower section is set forwardly of the upper section and together with the horizontal sheet 5 and shell 1 forms a combustion chamber 6; this chamber being closed at its rear side by a plate 7 attached to the shell flange by bolts 8. The combustion chamber is also lined at the back side and bottom and sides, by suitable fire brick as designated at 9.

Located within the lower portion of the shell and axially parallel thereto, is a tubular furnace 10 which at its rear end, opens through the flue sheet 4 into the combustion chamber and, at its forward end, extends through the front sheet 2. The front end of this furnace tube 10 is closed by a plate 12 having an opening 13 equipped with a door 14 within which an oil burner 15 is mounted to adapt the furnace to the burning of oil.

Extending lengthwise of the boiler shell are the five tubes, there being several rows of these tubes, as designated at 18a, which have their opposite ends extended through the front and rear flue sheets 2 and 3, and there is a like number of tubes designated at 18b which extend at their forward ends through the flue sheets 2 and at their rearward ends through flue sheet 4 into the combustion chamber. The forward ends of all tubes open into a smoke box 20 mounted on the front end flue sheet above and at opposite sides of the furnace. The rear ends of tubes 18a open into a stack connection 21 mounted on the rear end sheet 3. Water connections,

such as at 35 centrally of the base of the shell, and 36—36, at the top, are provided for intake and outlet, respectively.

The feature of the present invention resides in the rear end flue sheet construction, the several sections of which are formed in an integral plate, and in this respect it differs from the construction in the prior application. It will be observed by reference particularly to Fig. 3, that the top section 3 merges into the horizontal section through a gradually curved bend as at 40. Likewise, the horizontal plate merges into the lower section 4 through a gradually curved bend 41. This construction permits forward or rearward flexure of the sheet incident to expansion or contraction of the shell and flues without danger of breaking any connecting joints since the plate simply yields at the curved places to compensate for relative movement.

The plate 5 has also been stiffened by use of corrugations formed lengthwise thereof, as shown best in Fig. 2. These corrugations are sufficient to give the required stiffness to the plate so that it will not be bowed downwardly under the boiler pressure. An advantage in this corrugated construction resides in the fact that stay bolts are not required and this permits of a more practical disposition of the fire tubes.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters-Patent, is:

In a boiler of the character described, a horizontal shell, a flue sheet closing one end of the shell and comprising upper and lower relatively offset sections, and a horizontal connecting section merging into the offset sections in gradually rounded curves; said horizontal section being corrugated lengthwise with the corrugations thereof merging at their ends within the rounded curves.

Signed at Seattle, King County, Washington, this 27th day of January, 1931.

JONAS H. FOX.