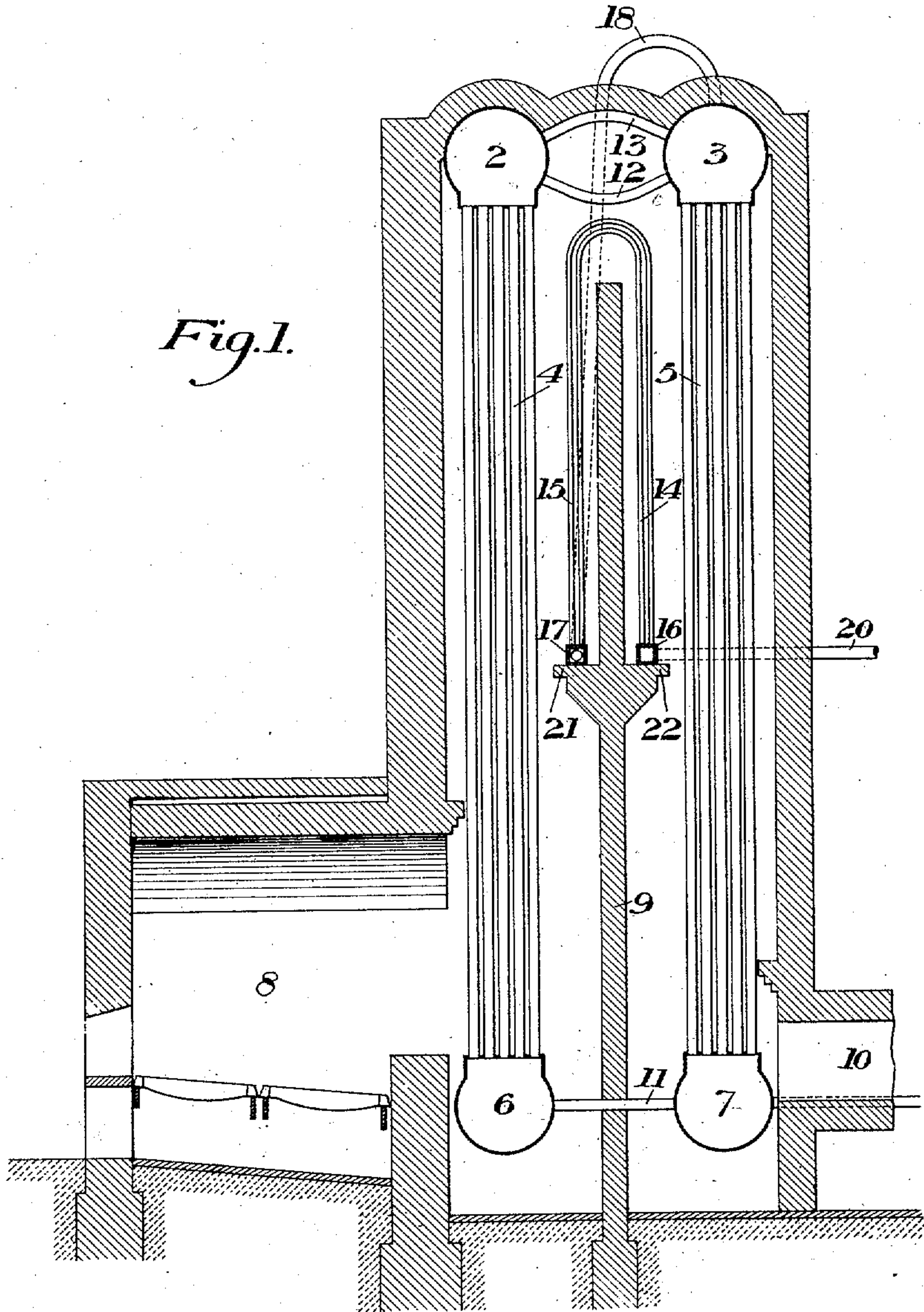


J. E. BELL.
SUPERHEATER BOILER.
APPLICATION FILED JULY 8, 1907

954,914.

Patented Apr. 12, 1910.
2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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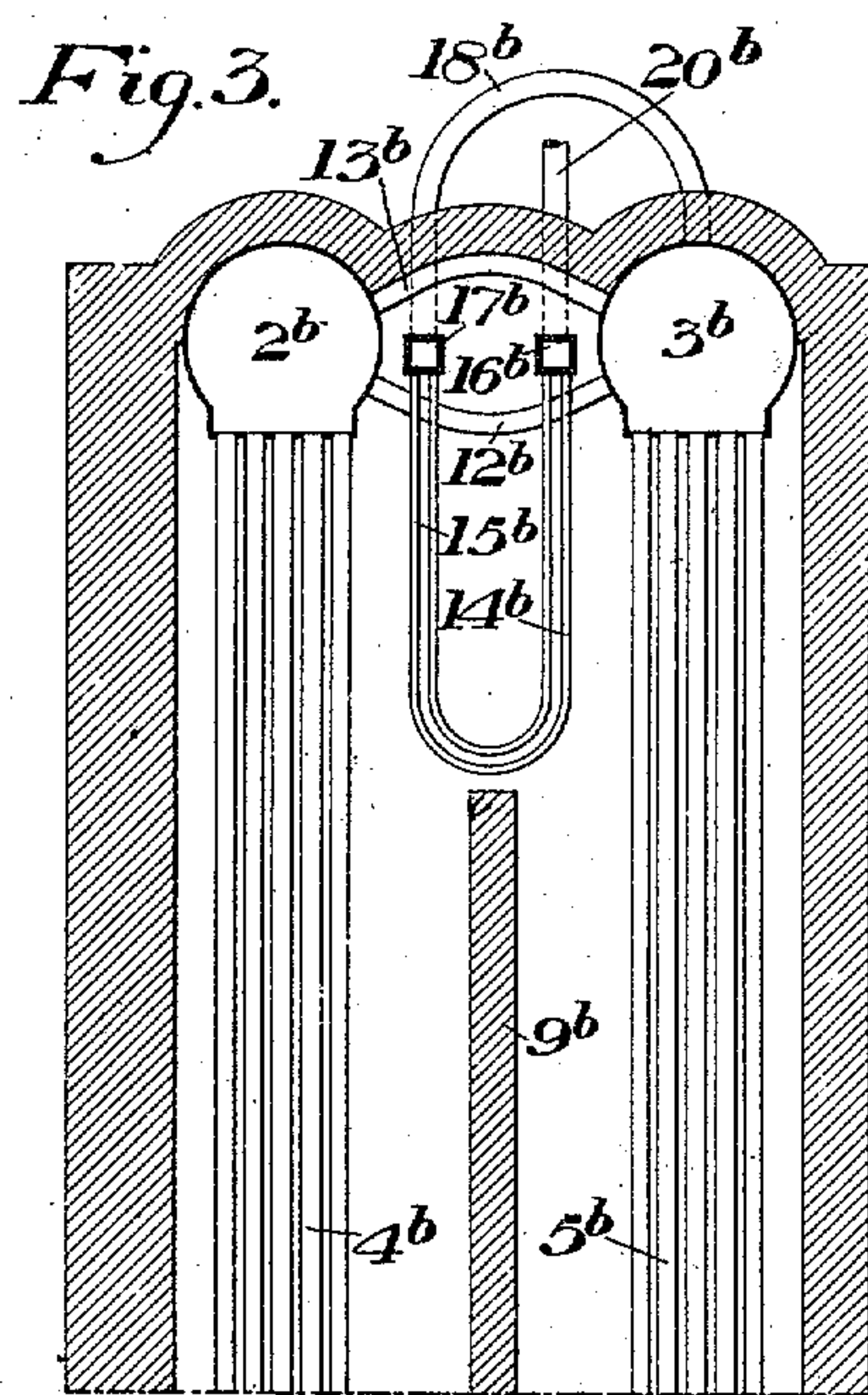
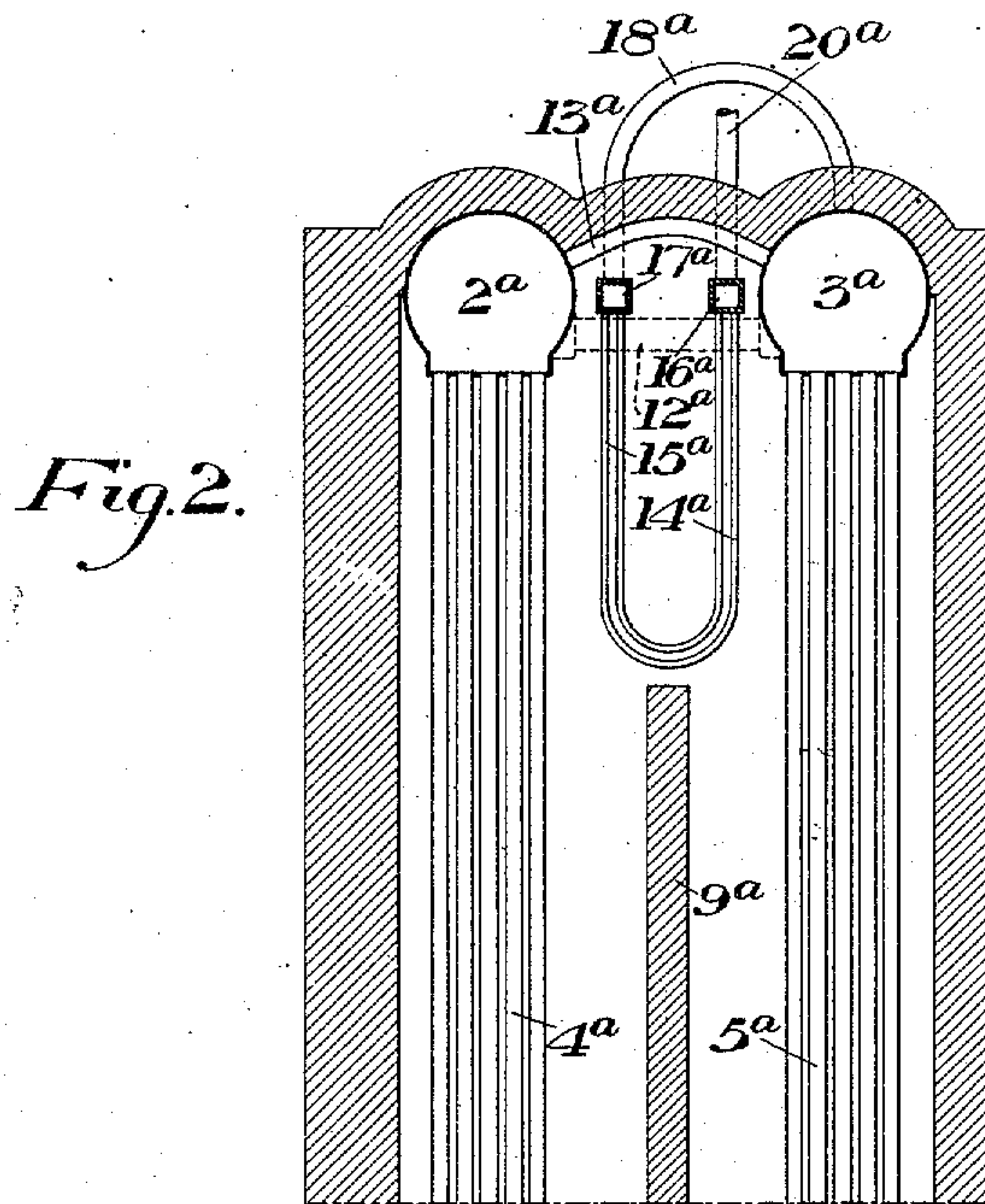
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954,914.

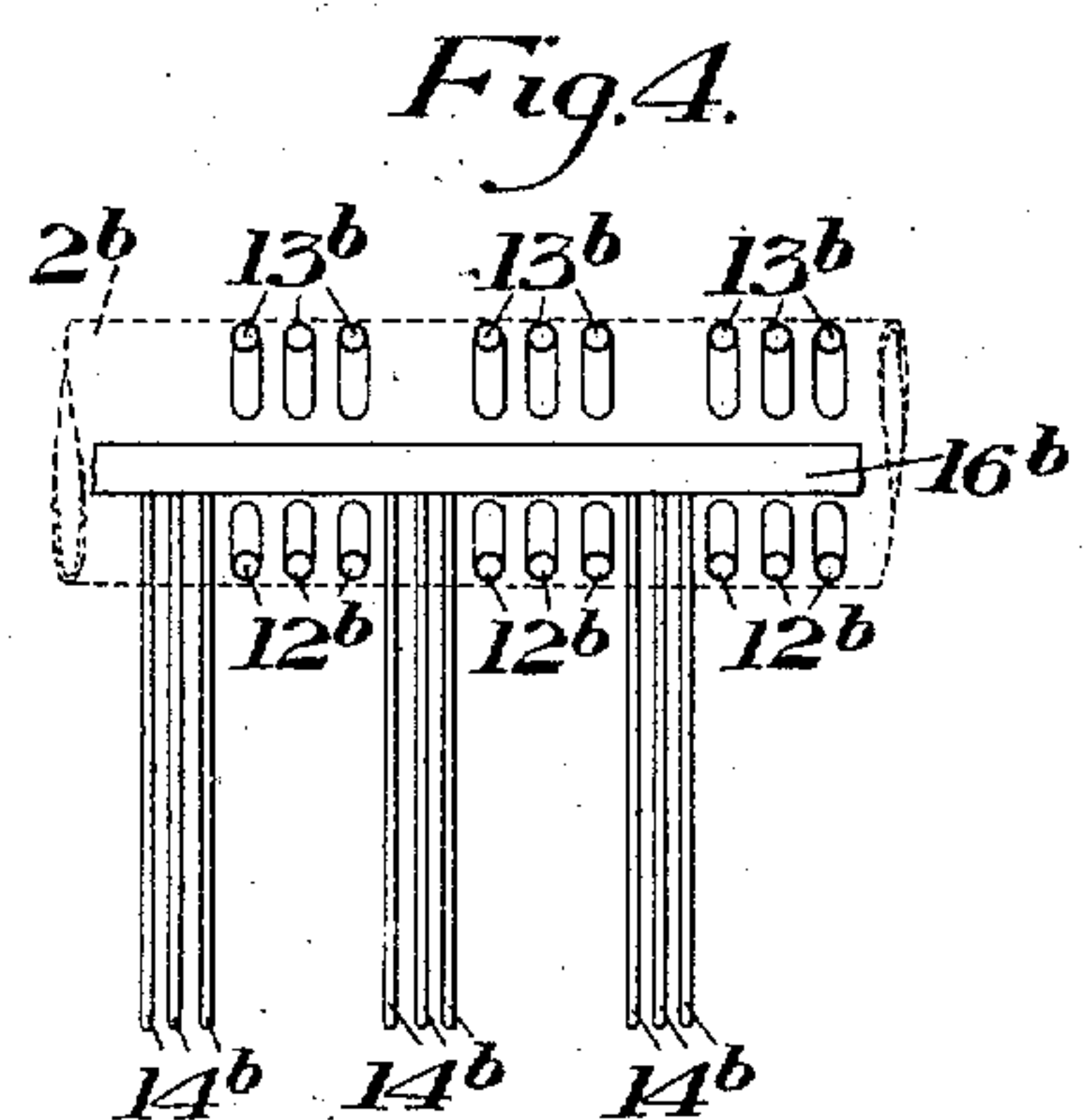
Patented Apr. 12, 1910.

2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN E. BELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

SUPERHEATER-BOILER.

954,914.

Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed July 8, 1907. Serial No. 382,589.

To all whom it may concern:

Be it known that I, JOHN E. BELL, of Brooklyn, Kings county, New York, have invented a new and useful Superheater-Boiler, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation showing one form of boiler constructed in accordance with my invention; Fig. 2 is a partial section showing a modified form and Fig. 3 is a view similar to Fig. 2 showing another form, and Fig. 4 is a detail view showing the arrangement of the tubes in Fig. 3.

My invention relates to superheater boilers and especially to the combining of the superheater with the boiler of a multiple-bank, serial-pass transverse drum type.

The object of the invention is to provide a simple, cheap and effective arrangement whereby large superheating surface may be obtained without substantially increasing the floor space or changing the spacing apart of the bank of tubes.

To that end it consists in providing a superheater with tubes which extend on both sides of the vertically extending baffle used in this general type of boiler.

It also consists in employing U-shaped tubes which straddle the baffle, and further in the construction and arrangement of the parts hereinafter described and claimed.

In the drawing, referring to the form of Figs. 1, 2 and 3 indicate upper transverse steam and water drums connected by banks of tubes 4 and 5 with transverse mud drums 6 and 7. The tubes may be either straight throughout their length or provided with bent or curved ends; and they may also extend vertically or in a vertically inclined direction.

8 indicates a furnace or combustion chamber projecting from the front of the boiler and directing the gases in the lower part of the front bank 4. Between the tubes is located the baffle 9 which projects upwardly and allows the products of combustion to pass over its top and descend through the rear pass to the outlet flue 10. The mud drums 6 and 7 are preferably connected by tubes or nipples 11 and I have shown the water spaces of the steam and water drums as connected by a row of water circulators

12; and also by steam circulators 13 which lead the steam from the drum 2 into the drum 3. These connections may be varied or omitted as desired.

Between the banks of tubes I place a U-shaped superheater α having legs 14 and 15 on each side of the baffle 9 and extending to the lower headers or boxes 16 and 17. One of these boxes (shown at 17) is connected by supply pipe 18 to the drum 3; and the other box 16 is provided with the outlet pipe 20 for the superheated steam. In the form shown I have connected the legs 14 and 15 at their upper ends to make the legs of the U-shaped tube but their upper ends may be connected by a box or any other desirable connection. I have also shown the boxes or headers 16 and 17 as resting upon baffle shelves 21 and 22 which project from the baffle 9 and direct the gases among the water tubes. The boxes preferably project through the side walls of the setting and the inlet or outlet pipes may connect with the respective boxes at the inner or outer sides of the walls of the setting. The U-shaped tubes may also extend through the side walls with their legs straddling the partition in a horizontal direction, though I prefer the form shown.

In Fig. 2 I show another form of the invention wherein the U-shaped tubes of the superheater are inverted and placed above the baffle 9^a. In this case the boxes 16^a and 17^a are between the steam and water drums, and the water circulators are shown in the form of large circulating pipes 12^a which are embedded in the side walls of the setting beyond the superheater tubes.

In Figs. 3 and 4 I show a form similar to that of Fig. 2, except that the superheater tubes are arranged in separated groups 14^b and 15^b, as shown in Fig. 4, the boxes 16^b and 17^b extending between the steam circulator tubes and the water-circulator tubes of the two drums. In this case the water circulators 12^b extend in groups between the groups of superheating tubes.

In Fig. 2 parts similar to those of Fig. 1 are marked with similar numerals with the letter α applied, and in Figs. 3 and 4 similar parts are also marked with similar numerals with the letter β applied.

The advantages of my invention result from the arranging of the superheater with its pipes extending on both sides of the partition or baffle between the banks of tubes.

In this way large superheating surface may be obtained while the boiler need not be enlarged as to floor space or height. The U-shaped tubes are of advantage in this particular location as they straddle the partition and provide superheating surface above it.

One or more mud drums may be employed, the tubes may be curved or straight and either vertical or inclined, more than two banks of tubes may be used and the form of superheater may be varied without departing from my invention.

I claim:—

1. A superheater boiler having two or more transverse steam and water drums connected by banks of tubes to a mud drum or drums, a baffle or partition between the banks of tubes and a superheater having tubes extending on both sides of the partition between it and the water tubes said superheater being independent of the boiler drums; substantially as described.

2. A superheater boiler having two or more transverse steam and water drums connected by banks of tubes to a mud drum or drums, a baffle or partition between the banks of tubes and a superheater having U-shaped tubes extending on both sides of the partition between it and the water tubes; substantially as described.

3. A superheater boiler having two banks of tubes connecting transverse upper and lower drums, a partition between the banks and a superheater having U-shaped tubes with their legs directed downwardly and straddling the partition; substantially as described.

4. A superheater boiler having transverse steam and water drums connected by banks of tubes to transverse connected drums, a partition between the banks of tubes, a superheater having tubes on each side of the partition between it and the water tubes and

projecting upwardly between the steam and water drums and water circulating tubes connecting the steam and water drums and extending across the upper ends of the superheater tubes; substantially as described.

5. A superheater boiler having transverse steam and water drums connected by banks of tubes to transverse connected mud drums, water circulators between the steam and water drums, and a superheater consisting of U-shaped tubes with their legs at opposite sides of the partition and their upper portions extending between the water circulators; substantially as described.

6. A superheater boiler of the transverse-drum, multiple-bank, serial-pass type having a vertical baffle dividing the space between adjacent banks into an up-pass and a down-pass, a superheater having at least a portion thereof located above the baffle between two of the banks of tubes, a part of the superheater being in the up-pass and another part of the superheater being in the down-pass, substantially as described.

7. A superheater boiler of the transverse-drum, multiple-bank, serial-pass type, having an upwardly-extending baffle or partition between two of the banks of tubes dividing the space into an up-pass and a down-pass, and a superheater located between the banks of tubes and including boxes and U-shaped tubes connected thereto, at least a portion of the superheater being above the baffle with a part of the superheater in the up-pass and another part in the down-pass, substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN E. BELL.

Witnesses:

C. L. HARVEY,
ESTHER B. KLUG.