

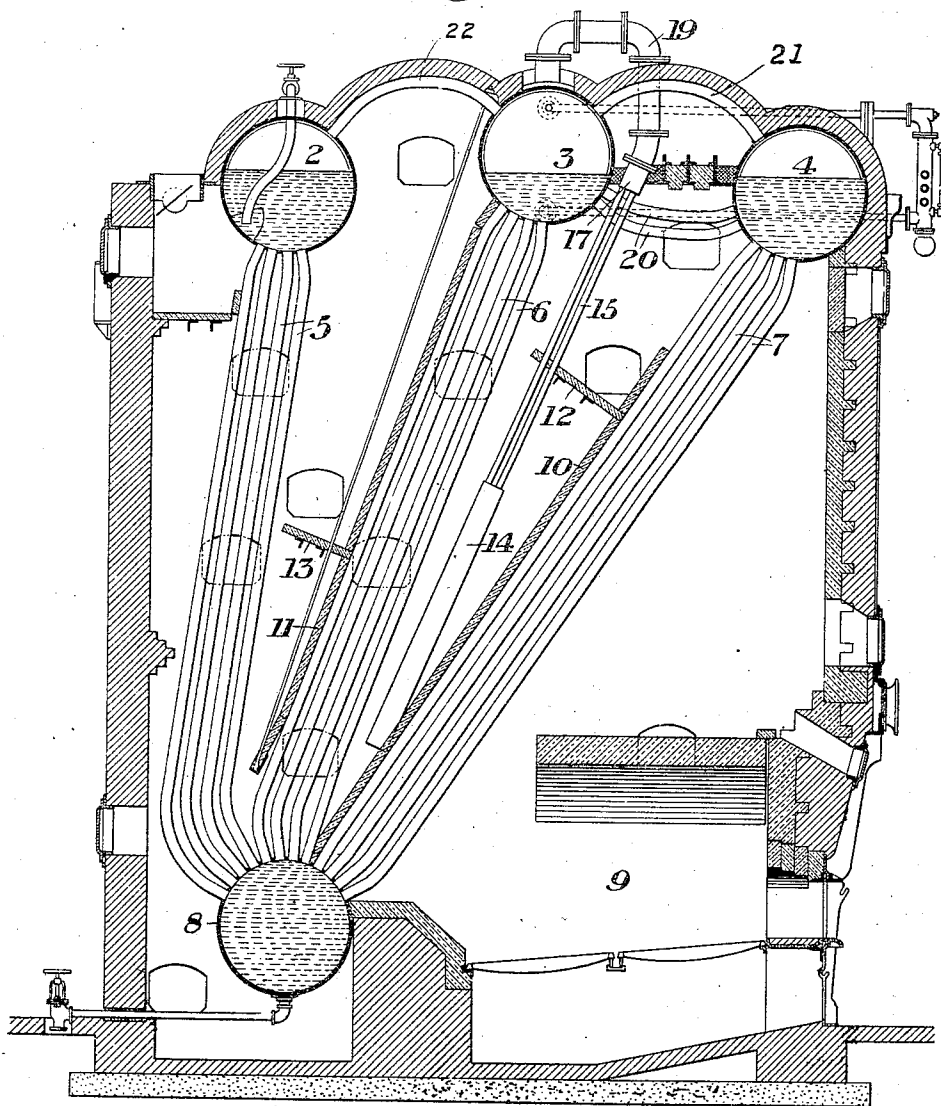
J. E. BELL.  
 SUPERHEATER BOILER.  
 APPLICATION FILED MAR. 11, 1907.

1,057,994.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.

*Fig. 1.*



WITNESSES

*R. A. Balderson*  
*W. V. Swartz*

INVENTOR

*J. E. Bell*  
*by R. A. Balderson*  
*his atty*

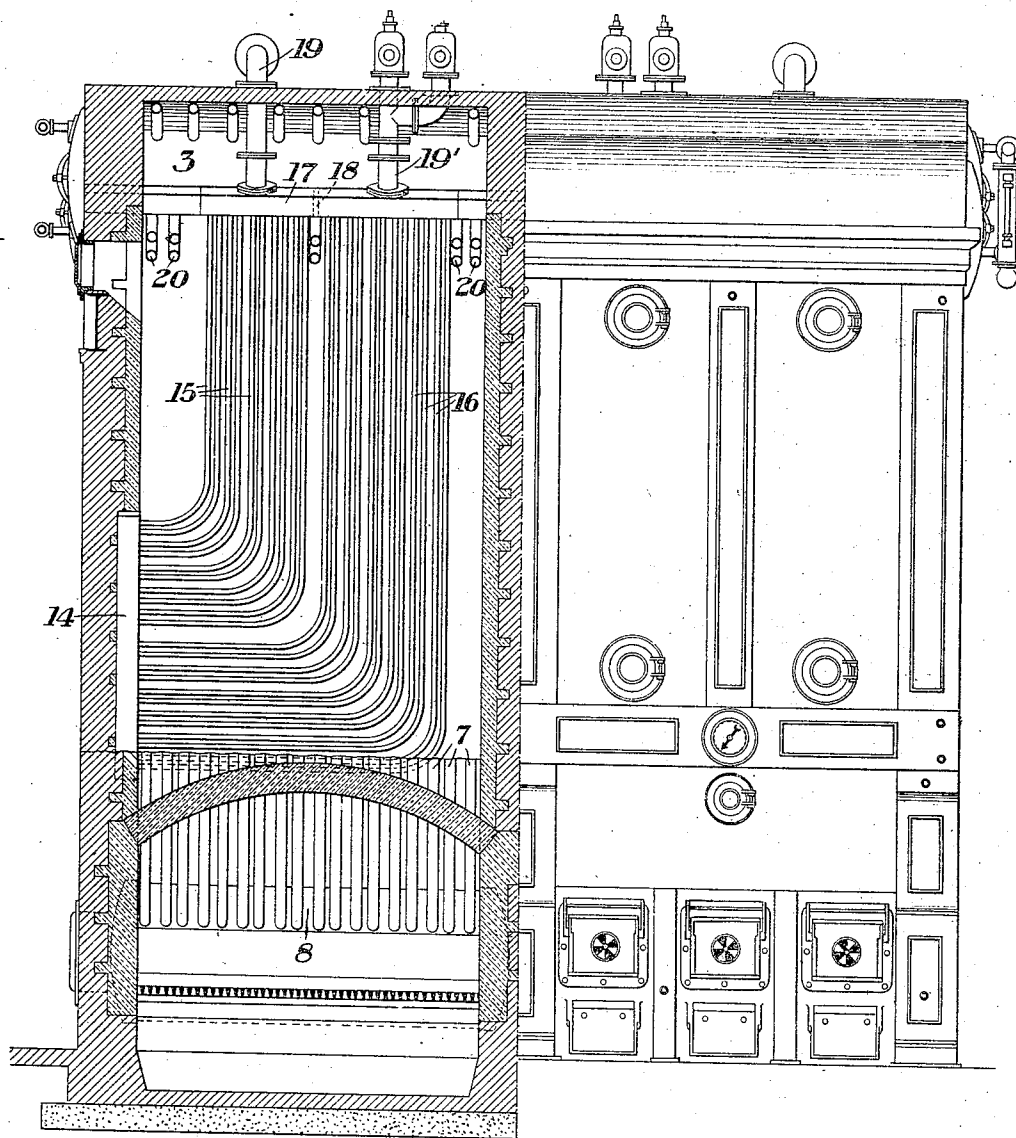
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2 SHEETS—SHEET 2.

*Fig. 2.*



WITNESSES

*R. A. Baldwin*  
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# UNITED STATES PATENT OFFICE.

JOHN E. BELL, OF NEW YORK, N. Y., ASSIGNOR TO THE BABCOCK & WILCOX COMPANY,  
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## SUPERHEATER-BOILER.

1,057,994.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed March 11, 1907. Serial No. 361,687.

*To all whom it may concern:*

Be it known that I, JOHN E. BELL, of New York city, in the county and State of New York, have invented a new and useful  
5 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—

10 Figure 1 is a sectional side elevation, showing a boiler provided with my improved superheater; and Fig. 2 is a front elevation, partly in section, to show the superheater.

My invention relates to superheaters and  
15 superheater boilers, and is designed to provide a cheap, simple and efficient form of superheater, and also a boiler in combination therewith.

The object of the invention is to do away  
20 with U-shaped tubes, and provide L-shaped tubes which connect with a transverse box at one end and a box or header in the side-wall at the other end, thus giving a simple construction with an efficient arrangement  
25 of the tubes.

In the drawings, in which I have shown the invention as applied to a water tube boiler of the transverse drum multiple bank serial pass type, 2, 3, and 4 represent steam  
30 and water drums, connected by transverse banks of tubes 5, 6, and 7 with a lower transverse mud drum 8. The flame and gases rise from the front furnace 9 to the top of the baffle 10, then descend to the bottom of the baffle 11 and rise among the tubes  
35 5. The baffles 10 and 11 are preferably provided with projecting shelves 12 and 13, of which the shelf 12 preferably extends to the front portion of the superheater.

40 21 are steam circulating tubes between the drums 3 and 4 and 22 are similar tubes connecting the drums 2 and 3.

20 are water circulating tubes between the steam and water drums 3 and 4.

45 This superheater consists of a header 14 set in the side wall of the boiler setting, and from which extend two groups of L-shaped tubes 15 and 16 to the upper transverse header or box 17. The box 17 is preferably  
50 set in the roof of the setting close to the central drum 3, where the superheater is in the position shown, and is provided with a central partition 18 which is between the two sets of tube connections. The steam is led  
55 from the central steam and water drum to

one compartment of the header 17 through pipe 19, and thence passes down through the tubes 15 to the side-wall header, and thence through tubes 16 into the other compartment of the upper header. The steam is  
60 drawn off from this upper compartment through outlet pipe 19'.

The water circulators 20 between the front steam and water drums are preferably arranged in three groups, as shown in  
65 Fig. 2, one group between the two sets of superheater tubes, and the other two groups between these tubes and the side walls. I have shown a duplex boiler setting with two boilers arranged side by side; and in this  
70 case the side wall headers will of course be placed in the two outer side walls of the setting, the horizontal legs of the two superheaters extending in opposite direction.

The advantages of my invention result  
75 from the use of the curved or L-shaped tubes connecting a side wall header with an upper transverse header or box; also from the division wall in the upper header, which gives a down and an up-pass to the steam through  
80 the superheating tubes. With this arrangement the tubes are well arranged for receiving heat from the gases while they are accessible at both ends.

The superheater can be readily drained  
85 from the bottom of the vertical header in the side wall; and also flooded by a water pipe connection to this header, either from a steam and water drum or another source. On account of the spaces provided at the  
90 sides of the set of superheater tubes, the middle bank of water tubes of the boiler is accessible for inspection and repair, as are also the superheater tubes. Another advantage is that both the inlet and outlet con-  
95 nections for the superheater are at the top of the boiler and close to the middle drum; consequently the cost of these connections is small.

Drums or steam receptacles of other form  
100 may be used in place of the boxes, the superheating tubes may be curved instead of L-shaped, the superheater may be placed in any desirable part of the boiler structure, or may be used in other connections for su-  
105 perheating; and other changes may be made without departing from my invention.

I claim:—

1. The combination with a boiler of the transverse drum multiple bank serial pass 110

type, having direct water and steam circulators between two of the steam and water drums, of a transverse steam receptacle below the steam circulation and above said water circulators, another steam receptacle in the side wall of the setting, and curved or L-shaped tubes having long vertical legs and short horizontal legs connecting the steam receptacles and extending between the water circulators; substantially as described.

2. The combination with a boiler of the transverse drum multiple bank serial pass type, of a superheater located between a baffle at the rear of the front bank and the second bank of water tubes, and a shelf projecting from the baffle of the front bank beyond the superheater tubes, said tubes connecting an upper transverse steam receptacle above the shelf and a side-wall steam receptacle below the shelf; substantially as described.

3. The combination with a boiler of the transverse drum multiple bank serial pass type, having direct water and steam circulators between two of the steam and water drums, of a transverse steam receptacle located between said water and steam circulators, another steam receptacle in the side wall of the setting below the circulators, and curved tubes connecting the two steam receptacles and arranged to give back and forth passes to the steam, the water circulators being spaced apart in groups to allow passage of the superheating tubes between them; substantially as described.

4. The combination with a boiler of the transverse drum multiple bank serial pass type, of a superheater located between a baffle at the rear of the front bank and the second bank of water tubes, and a shelf projecting from the baffle of the front bank beyond the superheater tubes, said tubes con-

necting an upper transverse steam receptacle and a side-wall steam receptacle and extending below the shelf; substantially as described.

5. The combination with a boiler of the transverse drum multiple bank serial pass type, of a superheater located between a baffle at the rear end of the front bank and the second bank of water tubes, and a shelf projecting from the baffle of the front bank beyond the superheater tubes, said tubes connecting an upper transverse steam receptacle and a side-wall steam receptacle, the latter receptacle being in the lower part of the boiler and extending below its central horizontal plane.

6. The combination with a boiler of the transverse drum multiple bank serial pass type, having direct water and steam circulators between two of the steam and water drums, of a transverse steam receptacle located between said water and steam circulators and having a partition therein, another steam receptacle in the side wall of the setting, curved tubes connecting the upper steam receptacle on both sides of the partition with the steam receptacle in the side wall and arranged to give back and forth passes to the steam, the water circulators being spaced apart in groups to allow passage of the superheating tubes between them, a baffle between the superheater tubes and the first group of water circulators, and a shelf extending from the baffle beyond the superheater tubes, between the steam receptacles; substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN E. BELL.

Witnesses:

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CARRIE M. BRENNAN.