

Aug. 2, 1932.

C. B. LITTLE ET AL

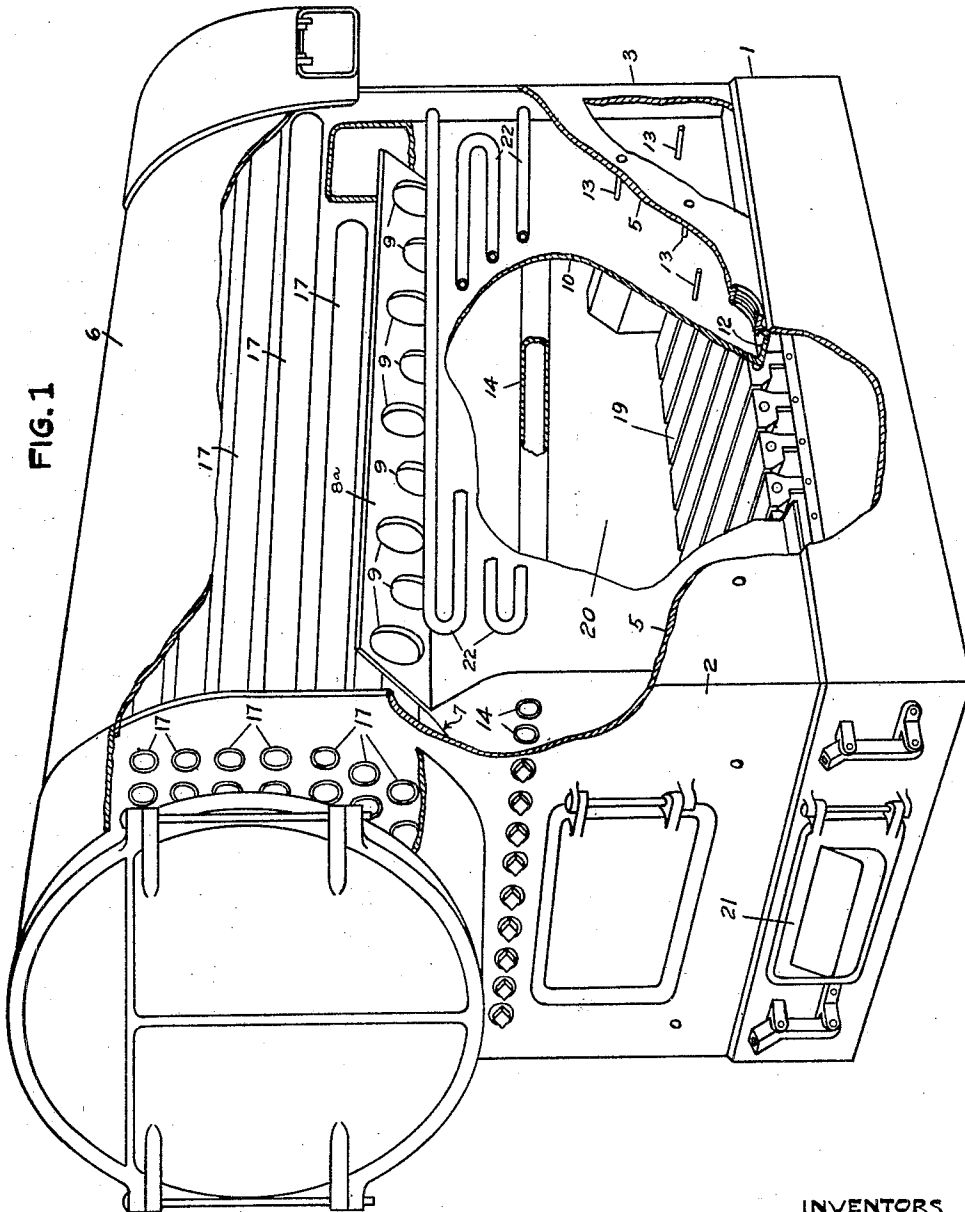
1,870,059

BOILER

Filed May 27, 1929

5 Sheets-Sheet 1

FIG. 1



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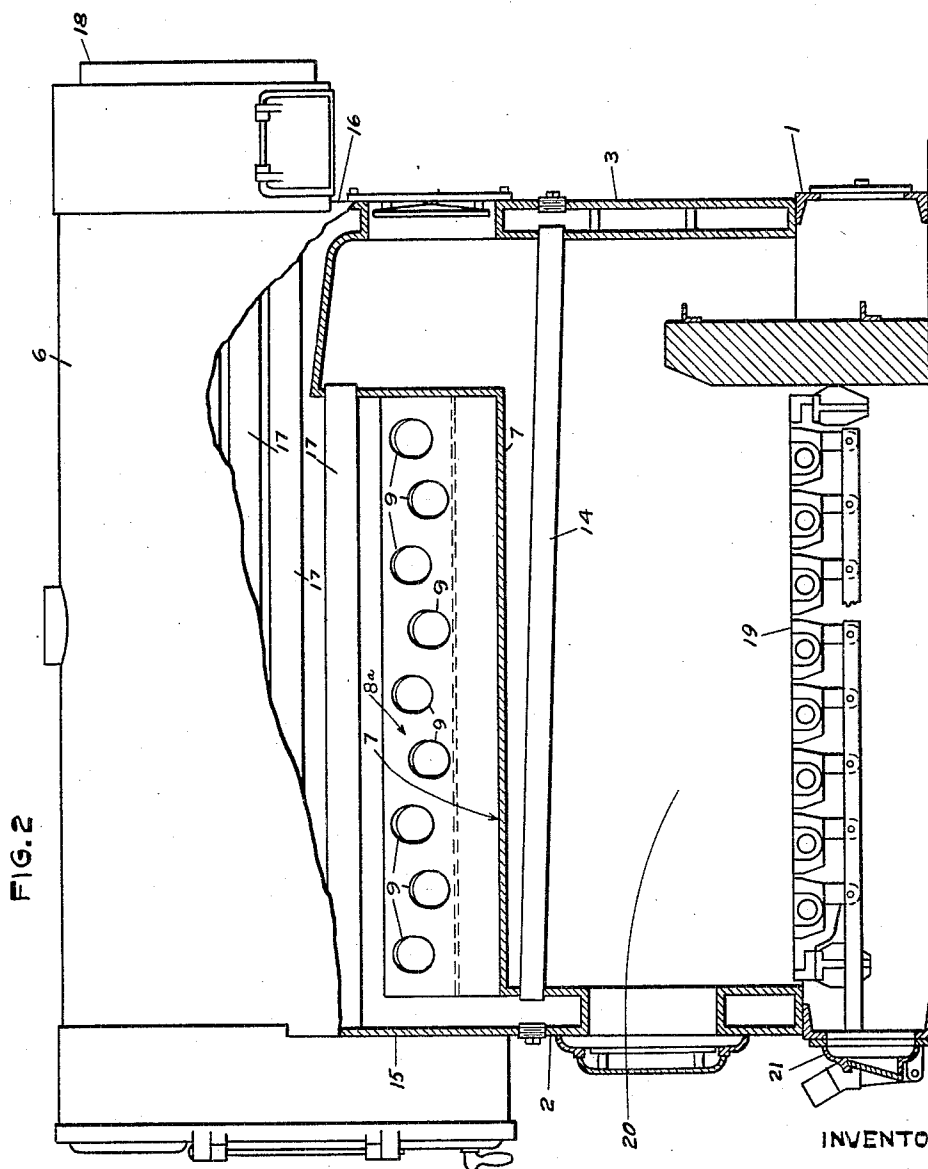
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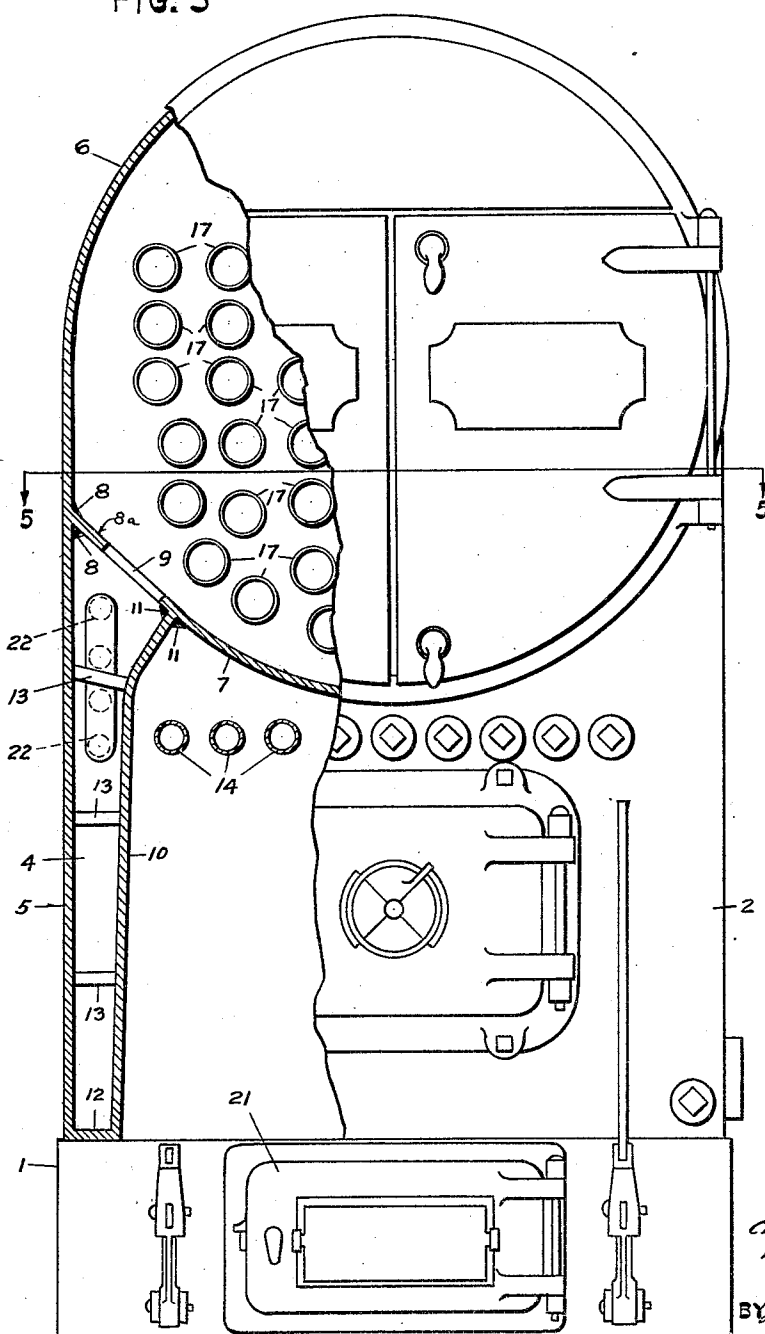
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FIG. 3



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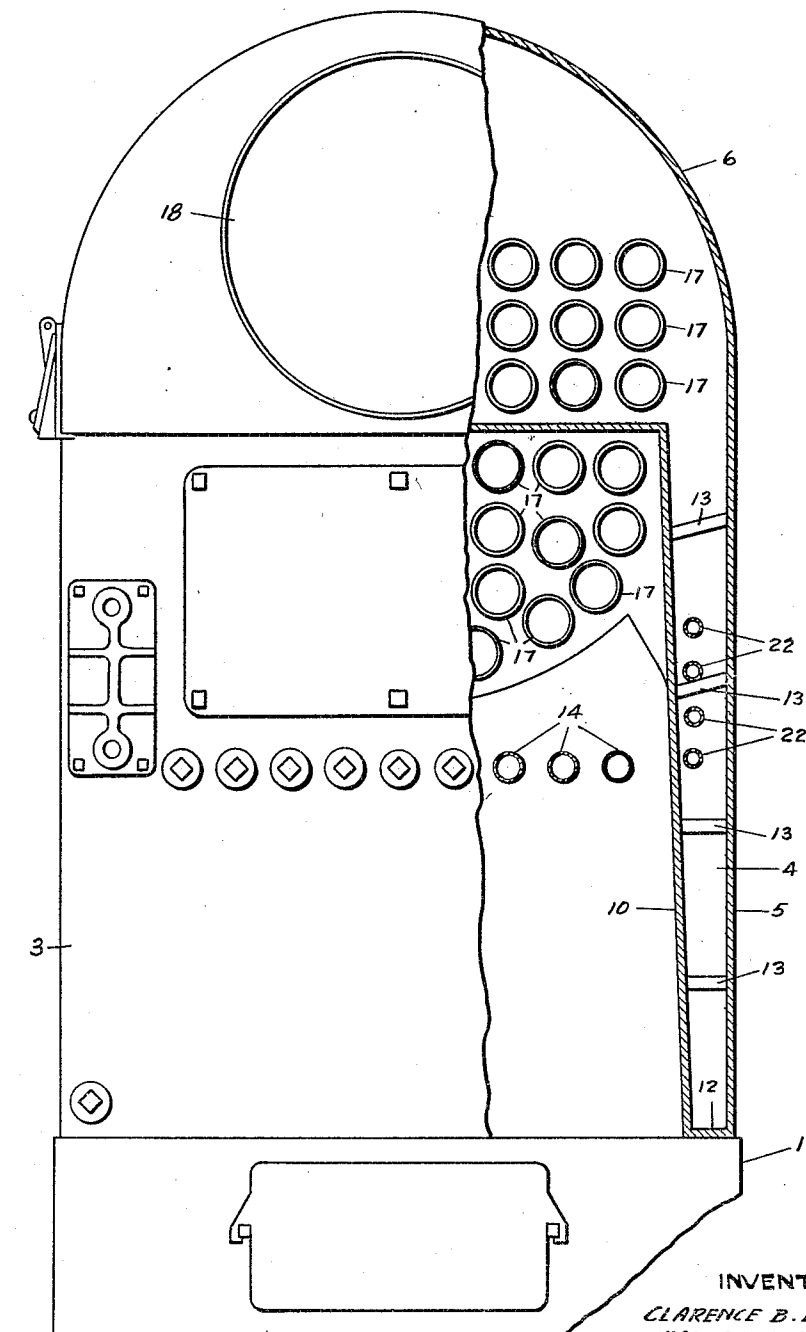
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FIG. 4



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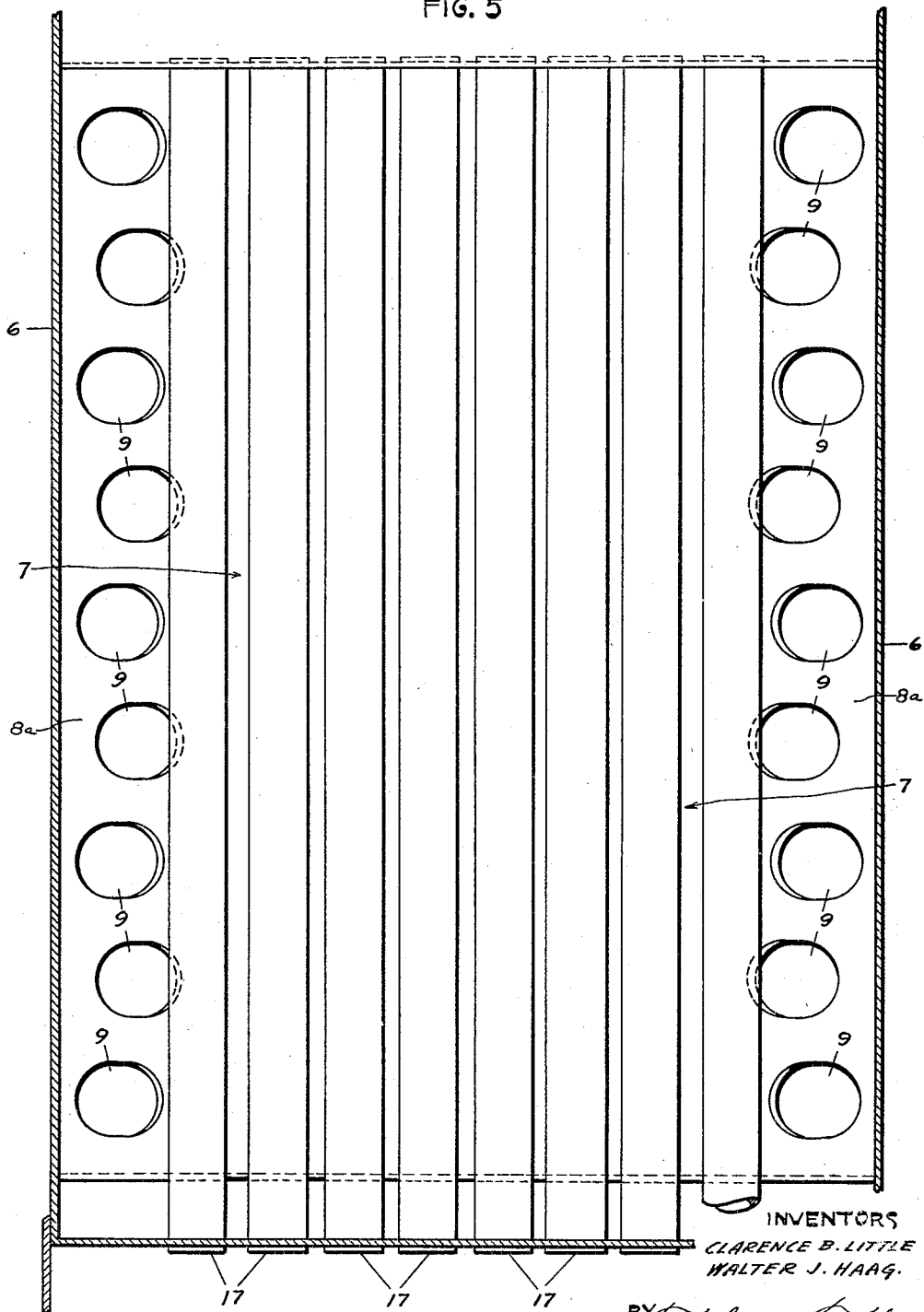
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BOILER

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5 Sheets-Sheet 5

FIG. 5



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UNITED STATES PATENT OFFICE

CLARENCE B. LITTLE AND WALTER J. HAAG, OF DAYTON, OHIO, ASSIGNOR TO THE
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BOILER

Application filed May 27, 1929. Serial No. 366,239.

This invention relates to boilers.

It is the object of the invention to provide a boiler having a self-supporting crown sheet and an arch brace.

5 It is a further object to provide a tapering water leg, one wall of which is formed of a continuous sheet with the boiler, with the arch brace sheet forming the bottom of the boiler between the outside walls of the water
10 leg.

It is a further object to provide a boiler in which the arch brace is so arranged as to provide free circulation of water there-
15 vice versa while, at the same time, securing the present effect and rigidity consequent upon the use of the bottom sheet of the boiler extending from side to side of the boiler.

20 It is a further object to provide a boiler in which the radiant surface giving greater evaporation is materially increased by providing water tubes communicating with the water legs and by providing extra circulation through the fire box and fire tubes.

25 It is the object of the invention to provide a boiler which eliminates all rivets, bolts and other attaching means and which can be formed into a single continuous integral body by welding of the parts together which are so
30 arranged to have sufficient strength by reason of their construction to permit of the elimination of stay bolts and rivets.

Referring to the drawings:

35 Figure 1 is a perspective of the boiler partially broken away to show the arrangement of the successive walls and pipes;

Figure 2 is a side elevation, a portion of which is cut away on a vertical plane to show in section the arrangement of the parts;

40 Figure 3 is a front elevation with the front wall of the boiler broken away to show the arrangement of the water leg and arch brace;

45 Figure 4 is a rear elevation partially broken away to show the arrangement of the water leg and fire box;

Figure 5 is a section on the line 5—5 of Figure 3 showing in plan the arrangement of the arch brace.

50 Referring to the drawings in detail, 1 is the foundation for the boiler on which the

water legs rest, the forward water leg being designated 2, the rear water leg 3 and the side water legs 4.

The outside wall of the side water legs 4 is formed of a single, continuous sheet, which
55 also forms the top and sides of the boiler. That portion of the sheet, which is the outside of the side water leg, is designated 5. That portion, which is composed of the sides and top of the boiler is designated 6, but it
60 will be understood that the portions 5 and 6 are a single, continuous sheet.

Mounted between the legs of this continuous sheet and engaging the inside of such
65 legs 5 at the top of the water legs 4 is an arch brace sheet 7 welded at 8 to the inside of the sheet having the portions 5 and 6. Over the water leg itself on the side are located a plurality of staggered apertures 9 in this arch
70 brace sheets 7 to permit of free circulation between the boiler and the water legs 4.

The inside of these side water legs is formed by the sheets 10 which are welded at 11 to the arch brace sheet 7 and are attached at the
75 bottom by the plates 12 to the outside wall 5 of the leg. Braces 13 serve to space the walls 5 and 10 which are progressively spaced further and further from one another as the leg rises towards the boiler.

Communicating with the fore and aft water
80 legs 2 and 3 are the heating pipes 14 through which water circulates.

Mounted in the front wall 15 and the rear wall 16 of the boiler are fire tubes 17 through
85 which the heat circulates before it makes its exit through the stack at 18, 19 indicates the usual grate, 20 the fire box and 21 the ash door.

The heat pipes are located to convey water
90 between the water legs as at 22.

The walls 8a are straight, forming a rigid brace.

It will be understood that we desire to com-
prehend within our invention and within the
scope of our claims such modifications as may
95 be fairly comprehended within such claims and invention due to necessary modifications to adapt our invention to varying conditions of use and to varying purposes.

Having thus fully described the invention, 100

what is claimed as new and desired to secure by Letters Patent, is:

1. In a boiler, the combination of a continuous sheet forming the inside and outside of side water legs and the sides and top of the boiler, an arcuate arch brace sheet forming the crown sheet of the boiler welded along its edges to the interior of the first mentioned sheet and welded to the top of the inside sheets of the water legs with the part of the sheet between the welds being straight and having apertures in said straight part for circulation between the legs and the boiler, whereby when the structure is assembled and welded it forms a continuous integral braced structure without rivets or bolts, and braces transversely arranged between the walls of the water legs formed by said continuous sheet.
2. In a boiler, the combination of a continuous sheet forming the inside and outside of side water legs and the sides and top of the boiler, an arcuate arch brace sheet forming the crown sheet of the boiler welded to the interior of the boiler sides and welded to the top of the inside sheets of the water legs so that the parts of the arch brace between the welds are straight and having apertures for said water legs for circulation between the legs and the boiler, whereby when the structure is assembled and welded it forms a continuous integral braced structure without rivets or bolts, and braces transversely arranged between the walls of the water legs formed by said continuous sheet, said water legs being progressively larger from the bottom to the top.
3. In a boiler, the combination of a continuous sheet forming the inside and outside of side water legs and the sides and top of the boiler, a second sheet of arcuate form forming the bottom of the boiler resting on the inside sheet of the water legs at substantially right angle thereto and engaging at its ends the inside of the outside sheet of the water legs, said arcuate sheet over the water legs being straight and having apertures for water circulation, front and end water legs cooperating with the front and end walls of the boiler, fire tubes between said front and end walls, a portion of which communicate with the fire box of the boiler and others of which communicate with the stack, overhanging fore and aft heat circulation chambers communicating with the fire box.
4. In a boiler, the combination of a continuous sheet forming the inside and outside of side water legs and the sides and top of the boiler, a second sheet of arcuate form forming the bottom of the boiler resting on the inside sheet of the water legs and engaging at its ends the inside of the outside sheet of the water legs, said arcuate sheet between the inside and the outside of each water leg being straight and having apertures over the

water legs for water circulation, front and end water legs cooperating with the front and end walls of the boiler, fire tubes between said front and end walls, a portion of which communicate with the fire box of the boiler and others of which communicate with the stack, overhanging fore and aft heat circulation chambers communicating with the fire box, and water tubes connecting the front and rear water legs located across the fire box.

5. In combination in a boiler of a boiler wall forming the top and sides thereof, and an arcuate arch brace wall located therebetween to form the bottom of the boiler, the ends of said arch brace wall being flat an appreciable distance from their point of juncture with the top and side wall of the boiler, water legs for said boiler, said flat portions of the arch brace wall extending over said water legs and attached thereto and having circulation apertures through said flat portions.

6. In combination in a boiler of a boiler wall forming the top and sides thereof, and an arcuate arch brace wall located therebetween to form the bottom of the boiler, the ends of said arch brace wall being flat an appreciable distance from their point of juncture with the top and side wall of the boiler, water legs for said boiler, said flat portions of the arch brace wall extending over said water legs and attached thereto and having circulation apertures through said flat portions, said water legs being arranged of greater width at the top than at the bottom.

In testimony whereof, we affix our signatures.

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