

(No Model.)

2 Sheets—Sheet 1.

J. PIERPOINT.
TUBULAR BOILER.

No. 472,660.

Patented Apr. 12, 1892.

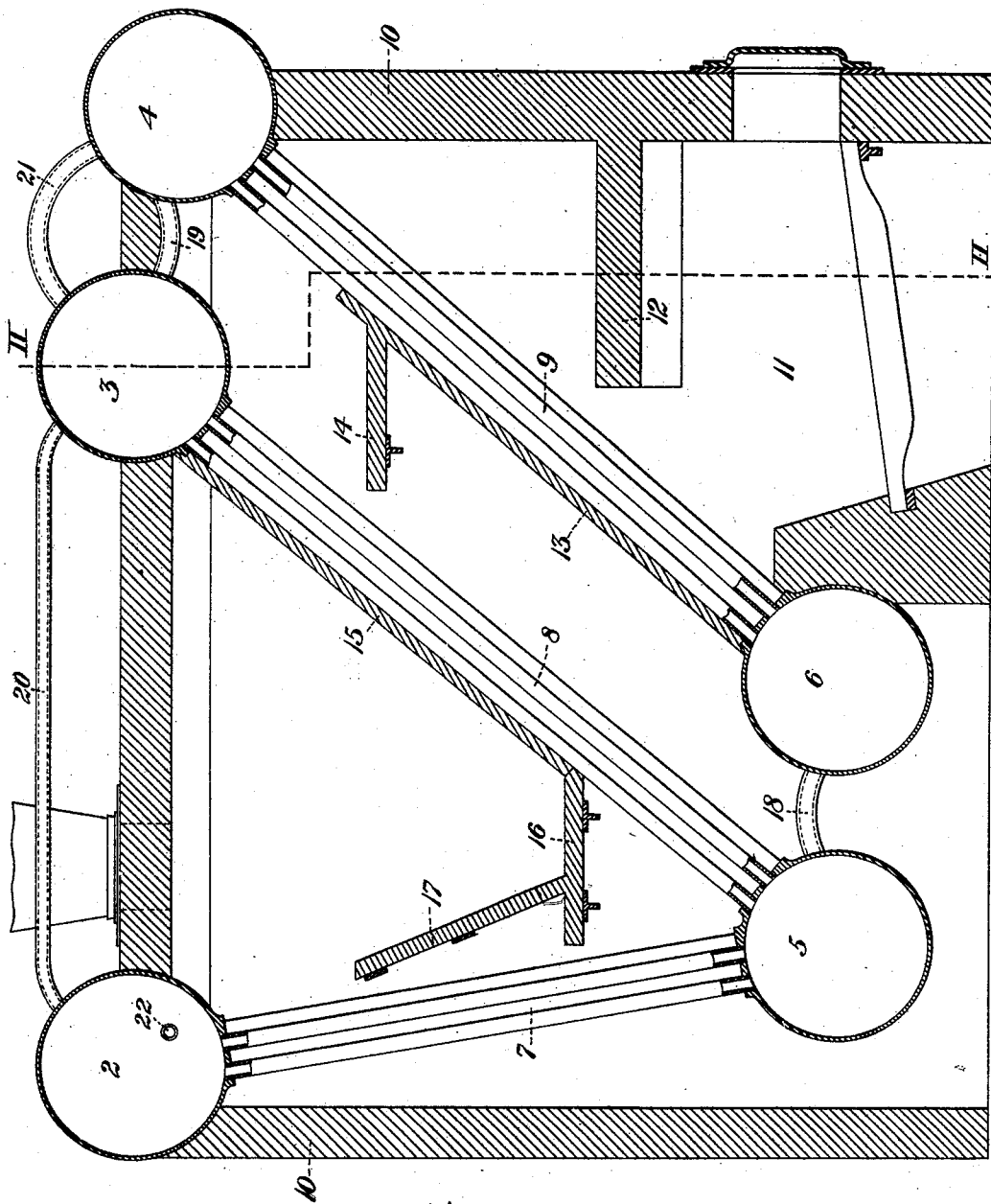


Fig. 1.

WITNESSES.

C. Byrnes
H. M. Corwin

INVENTOR.

James Pierpoint
by his attorneys
W. B. Kenwell & Sons

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Fig. 2.

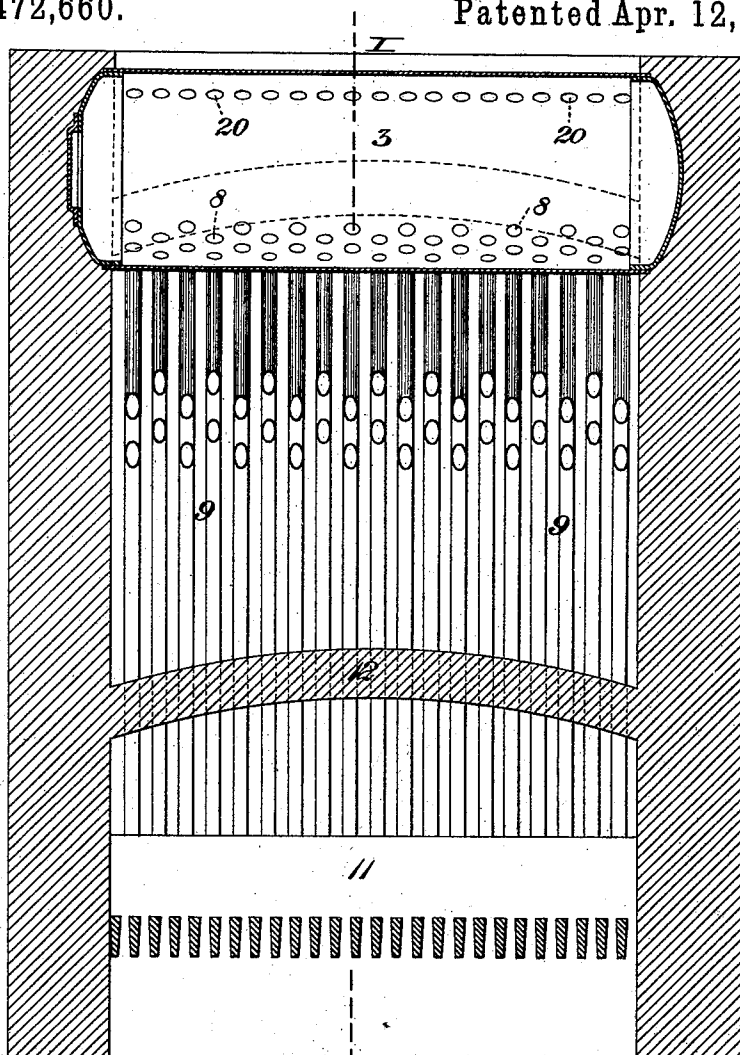
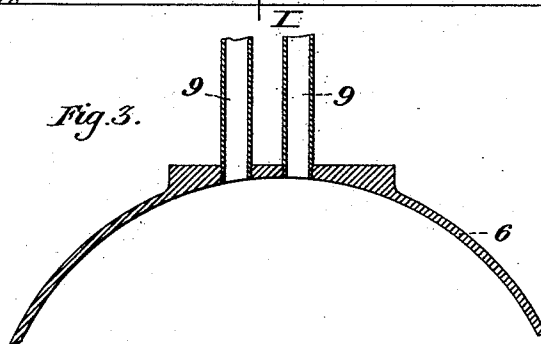


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES PIERPOINT, OF PITTSBURG, PENNSYLVANIA.

TUBULAR BOILER.

SPECIFICATION forming part of Letters Patent No. 472,660, dated April 12, 1892.

Application filed October 26, 1891. Serial No. 409,802. (No model.)

To all whom it may concern:

Be it known that I, JAMES PIERPOINT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tubular Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a transverse vertical sectional view on the line I I of Fig. 2. Fig. 2 is a longitudinal sectional view on the line II II of Fig. 1, and Fig. 3 is a detached view of a segment of the drum at the points where the water-pipes are connected therewith.

Like symbols of reference indicate like parts in each.

I will now proceed to describe my invention, so that others skilled in the art may manufacture and use the same.

In the drawings, 2, 3, and 4 are the steam and water drums, and 5 and 6 are the mud-drums. Extending from the bottom of the water-drum 2 to the top of the mud-drum 5 are a series of water-tubes 7, from the mud-drum 5 to the water-drum 3 a series of tubes 8, and from the water-drum 4 to the mud-drum 6 a series of water-tubes 9. These drums and tubes are suitably set in the walls 10 of the furnace. Situate above the fire-box 11 is the arch 12, and in rear of the series of tubes 9 is a partition-wall 13, which causes the flames and heat from the fire-box to circulate between the tubes 9 and to impinge against the drums 3 and 4. On the other side of the partition 13 is a shelf 14 and a partition 15 in rear of the tubes 8, which cause the heat to pass down between these tubes to the shelf 16, from which point it passes up between the tubes 7 and in rear of the partition 17 to and against the drum 2. The mud-drums 5 and 6 may be connected with each other by the water-tubes 18, and the water-drums 3 and 4 may be connected with each other by a water-tube 19. The drums 2 and 3 and 3 and 4 are connected with each other by the steam-tubes 20 and 21. Water is admitted to the drum 2 by the pipe 22 and thence passes through the tubes 7 to the mud-drums 5 and 6, and by the tubes 8 and 9 to the drums 3 and 4, and owing to this circulation and the location of the drums the sediment in the water is deposited in the mud-drums before the water passes to the drums 3 and 4, which are located in the

hottest part of the furnace. Not only is this deposit of sediment more fully accomplished 55 by my improvement than in prior boilers, but there is also a greater and more regular amount of heat imparted to the water contained in the tubes and drums.

Heretofore in boilers of this class it has been 60 customary to employ water-tubes having a curve or bend at or near the point where the tubes are connected with the drums, as in order to obtain the necessary support the tubes must enter the drums on a line with 65 the center. This curve, however, prevents the tubes from being readily cleaned, and besides this the tubes are not interchangeable with each other, and in order to replace a damaged tube one of special construction and 70 shape must be furnished. To obviate this difficulty and to permit of the use of straight tubes, which are easily cleaned and any one of which may be substituted for another, I form a segment of the drums in the shape 75 shown in Fig. 3, where the outer surface of the plate presents a plane surface and the inner conforms to the curvature of the drum. Owing to the plane outer surface, the tubes are readily attached to the plate, so that the 80 tubes may be straight and parallel to each other, and at the same time, owing to the curvature of the inner surface, the strength of the drum is in no wise impaired, as is the case where a segment of the drum is replaced 85 by a flat plate, which plate can only be successfully held so as to resist the pressure of the steam by stays or other equally-objectionable means. This feature of the outer plane-surfaced segment (shown in Fig. 3) I do not 90 claim herein, as I am aware that the same is old in the art.

Having thus described my invention, what I claim is—

A water-tube boiler consisting of the drums 95 2 3 4, having connecting-pipes, mud-drums 5 6, and water-tubes 7 8 9, in combination with the partition-walls 13 and 15, substantially as and for the purposes described.

In testimony whereof I have hereunto set 100 my hand this 8th day of October, A. D. 1891.

JAMES PIERPOINT.

Witnesses:

JAMES K. BAKEWELL,
W. B. CORWIN.