

No. 652,391.

Patented June 26, 1900.

J. R. HARRIS.
STEAM BOILER.

(Application filed Feb. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.

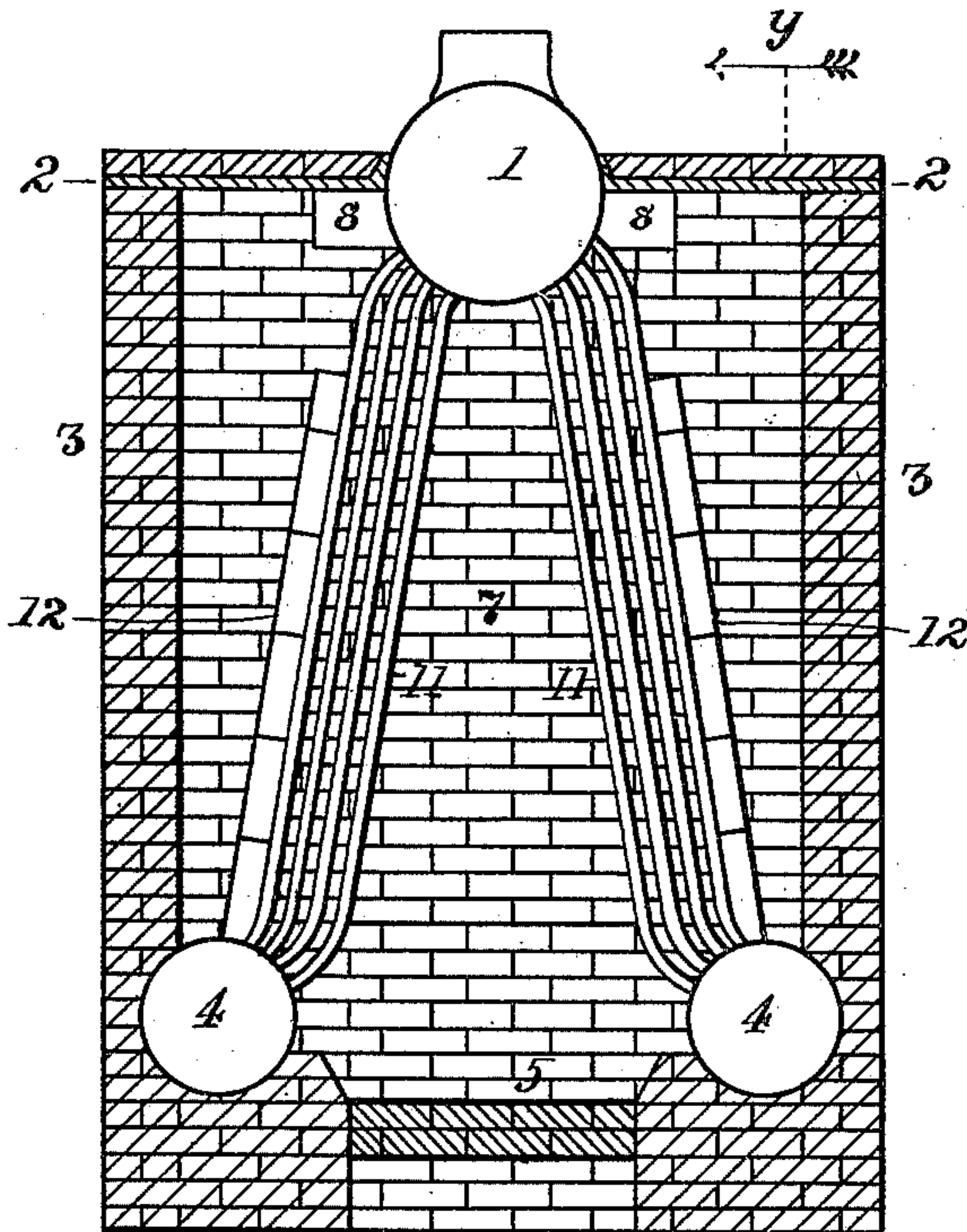


Fig. 1. *y-y*

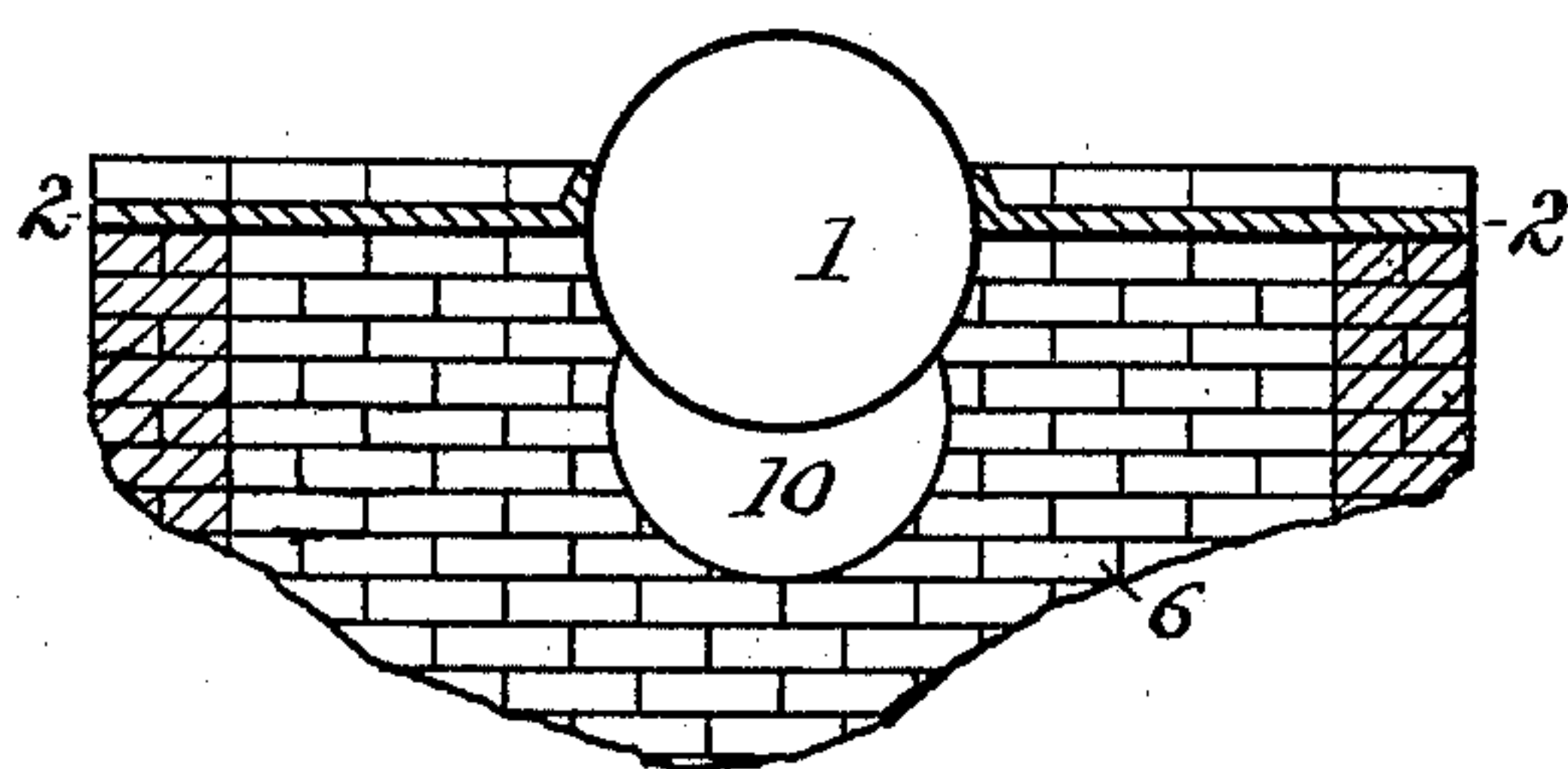


Fig. 2.

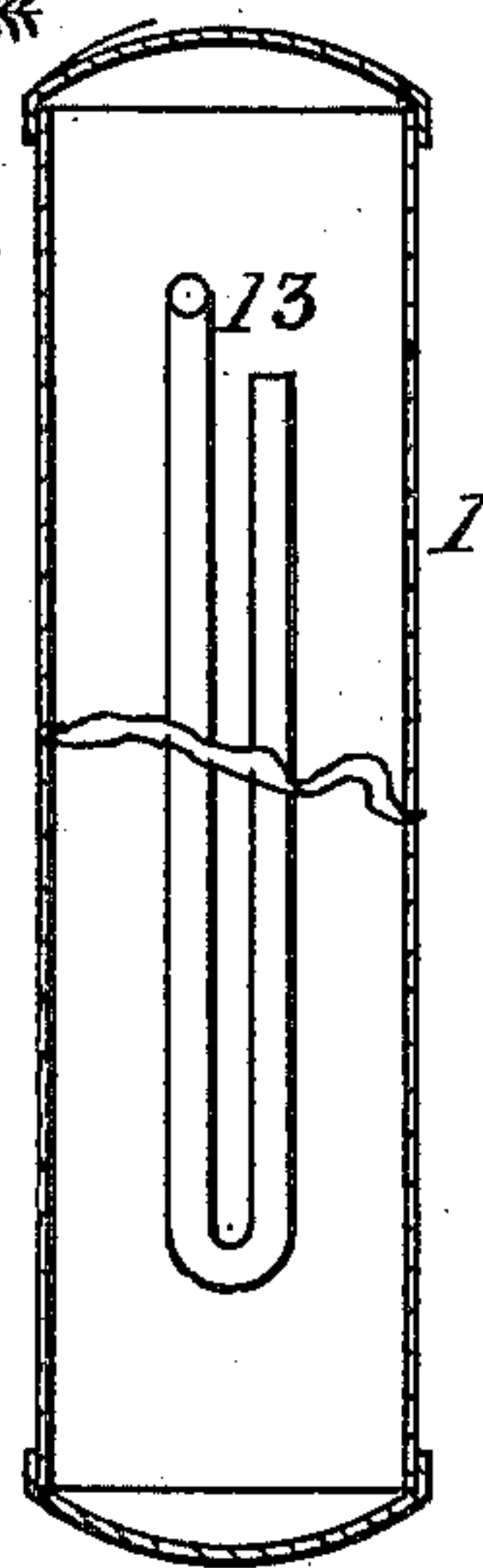


Fig. 3.

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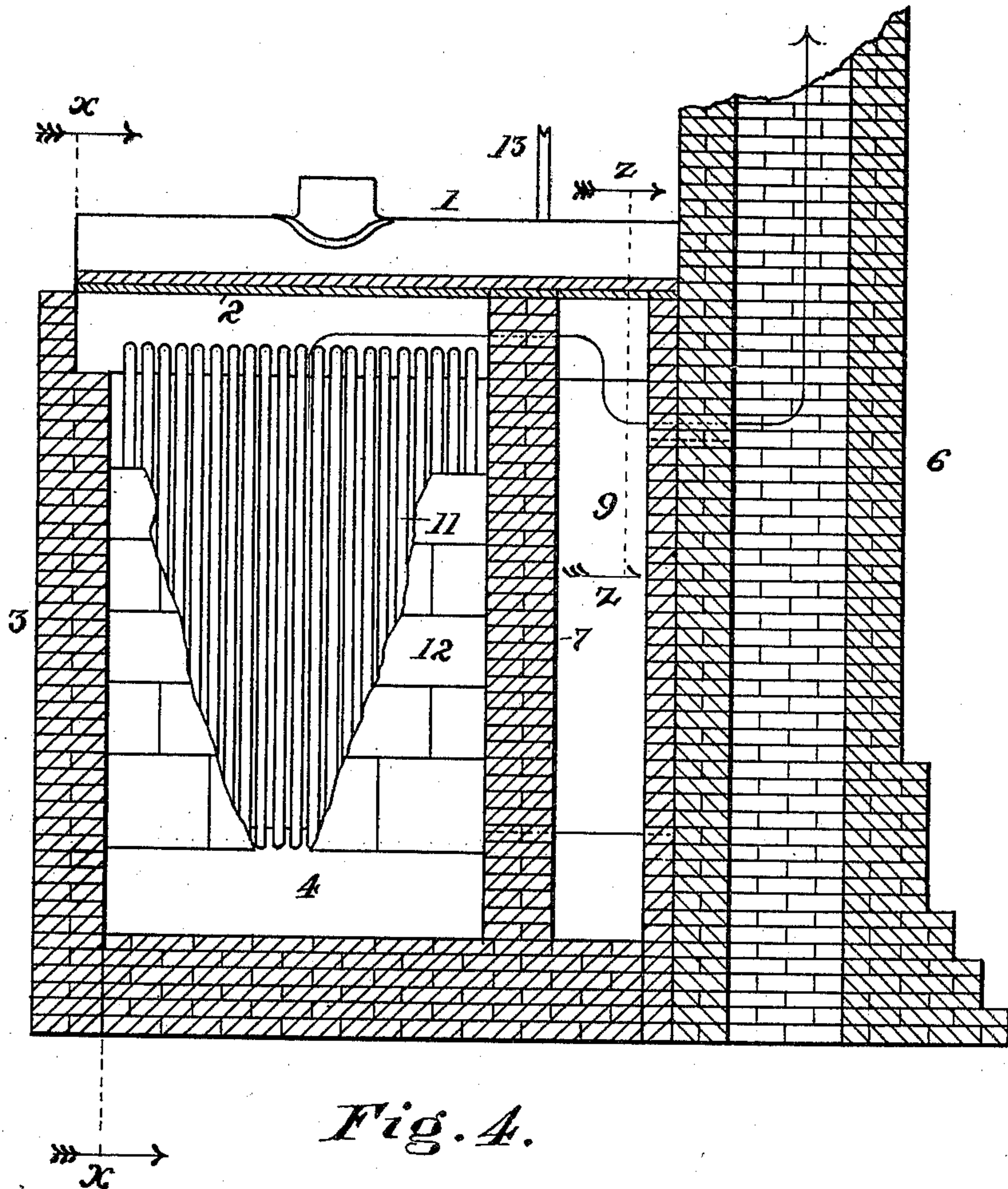
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UNITED STATES PATENT OFFICE.

JOHN R. HARRIS, OF BARBERTON, OHIO, ASSIGNOR OF ONE-HALF TO
WALTER M. VIALI, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 652,391, dated June 26, 1900.

Application filed February 27, 1899. Serial No. 706,953. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. HARRIS, a citizen of the United States, residing at Barberton, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention has relation to improvements in furnaces for that class of steam-boilers in which series or ranks of water-tubes are connected with upper and lower cylinders or drums, the tubes and drums being subjected to the heat of a furnace and the course of heat being directed and confined by means of baffle-plates or partitions.

The objects of my invention are to produce a new and improved furnace for boilers of the class designated and to provide means for precipitating the soot and fine ashes in separate apartments, so as not to impede the heating effect of the fire on the boiler-tubes or clog the passage of the products of combustion to the chimney, and generally to secure greater steam-power from the quantity of fuel consumed.

To the aforesaid objects my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claim, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different views, Figure 1 is an end elevation of my improved boiler and furnace, the latter in section at the line X X of Fig. 4; Fig. 2, an end elevation of the back end of the boiler, showing the smoke-opening into the chimney, the furnace in section at the line Z Z of Fig. 4; Fig. 3, a longitudinal central horizontal section of the upper drum, showing the method of introducing fresh water; Fig. 4, a vertical section of Fig. 1 at the line Y Y with the partition broken away.

Referring to the figures, 1 is the upper drum, supported by flange-plates 2, that rest on the walls of the furnace 3. The lower drums are shorter than the upper drum, so that their front ends do not extend through the furnace-

front, and these drums rest on suitable shelves in the lower part of the furnace, and between them is the fire-grate 5. Between the chimney 6 and furnace 3 is a fire-wall 7, that extends entirely across the furnace and has two openings 8 on opposite sides of the boiler, leading into a chamber 9 between the fire-wall 7 and chimney 6. From the chamber 9 a central opening 10 leads into the chimney 6. Between the fire-wall 7 and the front of the furnace the upper drum 1 and lower drums 1 and 4 are connected by ranks of water-tubes 11, usually four ranks being used to secure great heating-surface, these tubes being bent at their ends to enter the drums 1 and 4 radially, and the outer rank on each side of the furnace is shut in by partitions 12, preferably composed of slabs of fire-brick reaching nearly to the lower line of the boiler upper drum 1. By this construction and arrangement the lower drums receive the direct heat from the fire in the furnace, the tubes practically form the sides of the furnace, and the flame and heat rise along and around the tubes 11, the space being contracted toward the top by the tubes and partitions until they reach and pass through the openings 8, whence they descend under the bottom of the drum 1 and enter the chimney through the opening 10. I also secure greater heating effect by firing at one end of the drums than if they are fired crosswise, as the heat reaches the entire length of the drums approximately evenly, thus heating all parts alike instead of having an excess of heat at a limited portion of the boiler.

Fine ashes and soot not carried away by the chimney fall over between the partitions 12 and outer wall of the furnace and into the chamber 9, whence they are removed when necessary.

If the tubes 11 become at any time clogged with soot, they are readily cleaned by a steam-jet introduced into the furnace, that drives the soot and ashes over the partitions 12.

To introduce fresh water, a feed-pipe 13 enters the upper drum 1 at the top and descending to near the bottom is bent and runs nearly to the front and thence returns, having its open discharge end near the first bend. This

enables the water to be heated in the pipe before it mingles with the water in the boiler.

I claim as my invention—

5 The combination with a steam-boiler having an upper drum and two lower drums situated on opposite sides of the upper drum and sets of water-tubes connecting said upper and lower drums, an inclosing furnace and a firing-space between said lower drums,
10 of partitions of fireproof material located

within said furnace outside and adjacent to the sets of water-tubes and extending from said lower drums nearly to said upper drum, substantially as shown.

In testimony that I claim the above I here- 15
unto set my hand.

JOHN R. HARRIS.

Witnesses:

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