

No. 686,759...

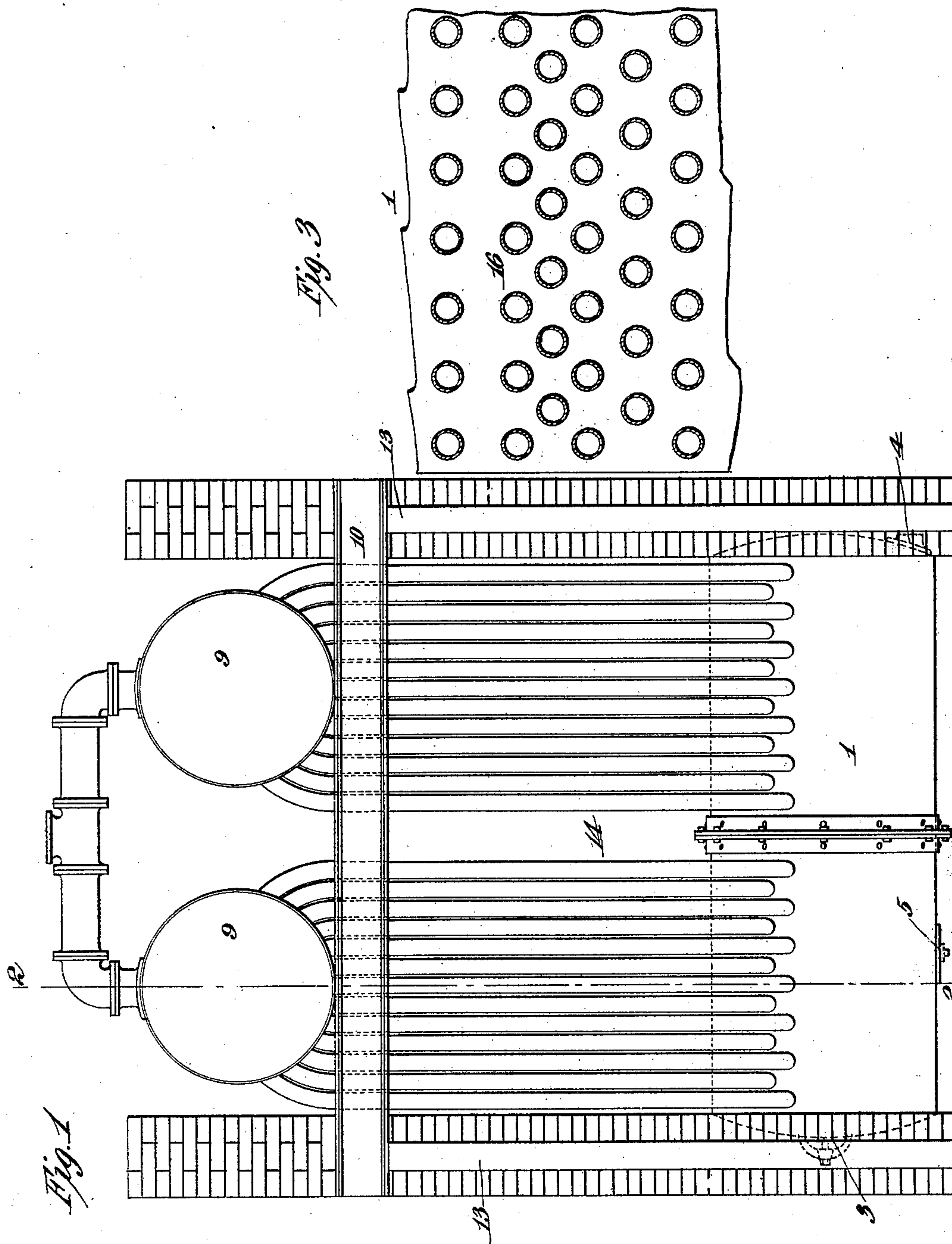
**Patented Nov. 19, 1901.**

**R. C. PEABODY.**  
**WATER TUBE BOILER.**

(Application filed Mar. 13, 1901.)

(No Model.)

**2 Sheets—Sheet 1.**



***Witnesses:***

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**Inventor**  
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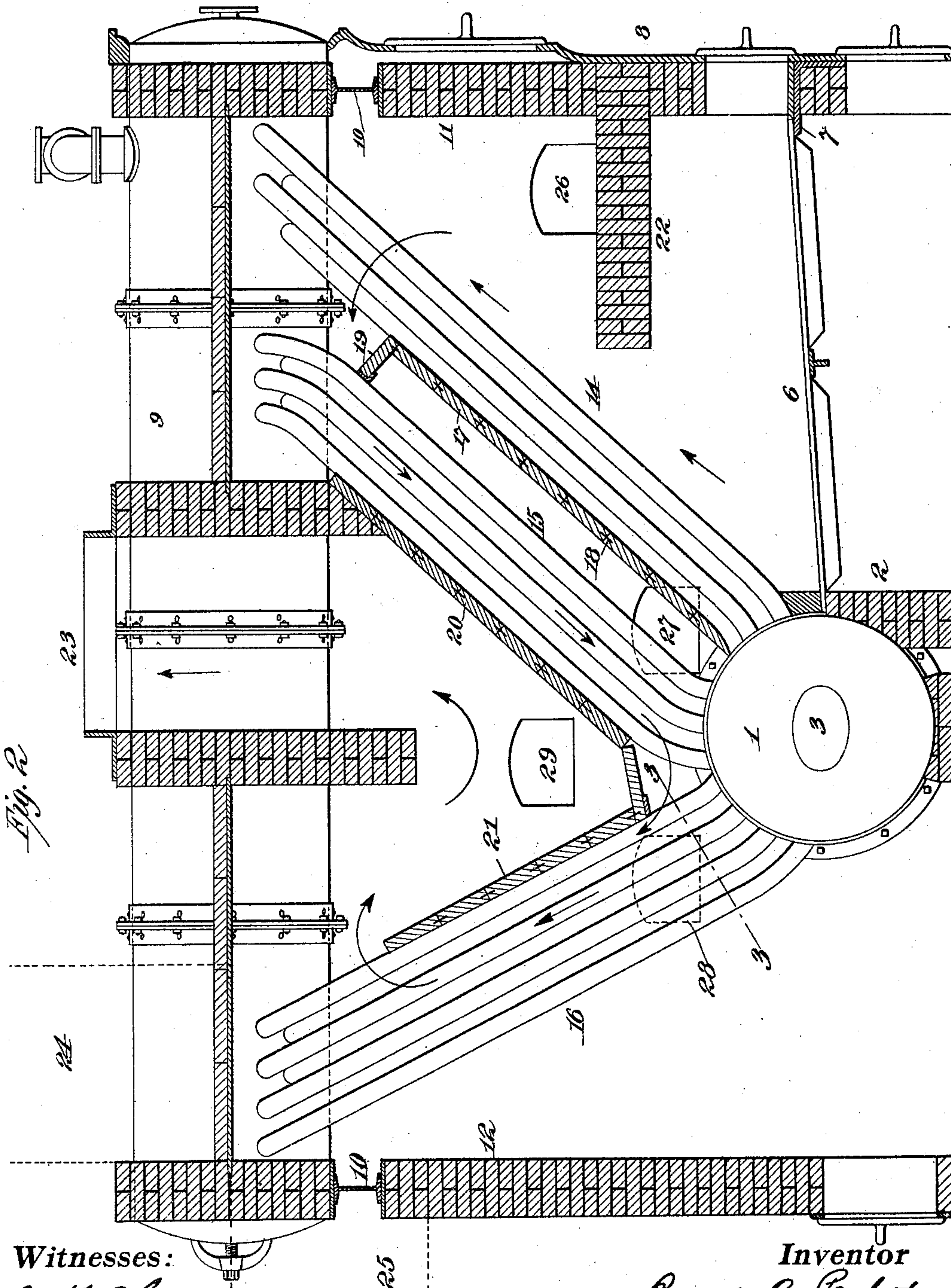
Patented Nov. 19, 1901.

R. C. PEABODY.  
WATER TUBE BOILER.

(Application filed Mar. 18, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ROYAL C. PEABODY, OF BROOKLYN, NEW YORK.

## WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 686,759, dated November 19, 1901.

Application filed March 13, 1901. Serial No. 50,922. (No model.)

*To all whom it may concern:*

Be it known that I, ROYAL C. PEABODY, a citizen of the United States, residing in the borough of Brooklyn, city of New York, State of New York, have invented a certain new and useful Improvement in Water-Tube Boilers, of which the following is a description.

My invention relates to various new and useful improvements in water-tube boilers; and my objects generally are to improve and simplify the construction of boilers of that type and to increase the efficiency.

A further and subsidiary object is to so construct a water-tube boiler as to permit of its being transported in relatively small sections and quickly assembled for use or to be again easily knocked down for purposes of transportation, thereby affording a construction of boiler which is especially designed for use in localities which cannot be reached by railroads and where all merchandise must be transported by pack-animals.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a front view of the boiler, showing the front wall of the furnace removed; Fig. 2, a section on the line 2 2 of Fig. 1, and Fig. 3 a section on the line 3 3 of Fig. 2 looking toward the mud-drum.

In all of the above views corresponding parts are represented by the same numerals of reference.

1 represents a mud-drum made, preferably, of flanged sections bolted together, as shown, which may be of any desired length and which extends transversely of the furnace directly behind the bridge-wall 2. Each of the sections of the mud-drum when the latter is made sectional is of a sufficiently light weight to be transported by a pack-animal. The mud-drum is provided with the usual man-hole 3, with a valve-inlet 4 for feed-water, and with a blow-off pipe 5 for blowing off sediment. The grate-bars 6 extend, as is common, between the bridge-wall 2 and a suitable shelf 7, secured to or embedded in the front wall 8 of the furnace.

9 9 are two steam-drums, which are also preferably made of flanged sections bolted together, which are of any suitable length and

which extend at right angles to the mud-drum, being supported on channel-irons 10 10, carried within the front and back walls 11 and 12, respectively. For the support of these channel-irons supporting-pillars 13 may be employed, embedded within the front and back walls and suitably supported on the bottom foundation of the boiler. Instead of employing two steam-drums, as shown, one only may be used, or three or more may be employed, it being only necessary to shorten or lengthen the mud-drum to correspond therewith. Extending between the mud-drum 1 and each of the steam-drums 9 are two sets of upflow-tubes 14 and 15, respectively connected at their ends to the drums in any suitable and approved way. Extending between each steam-drum and the mud-drum is a single set of downflow-tubes 16, similarly connected. Mounted on the tubes 14 is a fire-brick partition 17, made of slabs laid in place or secured together by tie-rods 18, and at the top of this partition is a short partition 19, which deflects the products of combustion from the tubes 14 to the tubes 15, as shown by the arrows. Mounted on top of the tubes 15 is a partition 20, similarly constructed, and mounted on top of the tubes 16 is a partition 21, made also of fire-brick. The fire-box may be provided with a top 22 for deflecting the products of combustion toward the lower end of the upflow-tubes 14; but, if desired, said top may be dispensed with. The stack for carrying off the products of combustion may be located at any suitable point. Preferably, as shown in full lines, the stack 23 is located between the partitions 20 and 21; but it may extend vertically above the downflow-tubes 16, as shown at 24, (dotted lines,) or horizontally out from the top of said tubes, as shown at 25, (dotted lines.) Doors 26, 27, and 28 are formed in the side walls of the furnace to permit an operator to reach the several sets of tubes, and a door 29 may be formed in the side walls to enable an operator to reach the space between the partitions 20 and 21 for removing ashes or sediment therefrom. The several sets of tubes 14, 15, and 16 are arranged, preferably, as shown in Fig. 3, so that by disconnecting any tube from the mud-drum and steam-drum it may be removed without interfering with the other tubes. Thus,



as shown in Fig. 2, the tubes 14 may be arranged in six rows, there being sufficient space between the tubes of the first and second and fifth and sixth rows to permit the  
5 passage between them of the tubes arranged in the third and fourth rows, which latter tubes may be, as shown, arranged very closely together.

In operation the products of combustion  
10 pass from the fire-box around the upflow-tubes 14, down around the upflow-tubes 15 and beneath the partition 20, and up in contact with the downflow-tubes 16, finally emerging from the stack. In this circulation of the  
15 products of combustion the steam drum or drums and the mud-drum also will be subjected to the effects of the heat. Owing to the higher temperature of water in the tubes 14 and 15, water will circulate up through said  
20 tubes, back through the steam-drums, and down through the downflow-tubes 16 to the mud-drum. The ordinary water-level is to be substantially in line with the upper end of the circulation-tubes, as shown.

25 Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a water-tube boiler, the combination  
30 of a substantially horizontal steam-drum made in sections, a substantially horizontal mud-drum made in sections and extending at right angles to the steam-drum, removable upflow-tubes connecting one end of the steam-drum with the mud-drum, removable down-  
35 flow-tubes connecting the other end of the steam-drum with the mud-drum, and sectional partitions adjacent to both sets of tubes for

directing the products of combustion into direct contact therewith, substantially as and for the purposes set forth. 40

2. In a water-tube boiler, the combination of a mud-drum, a steam-drum mounted above the same and extending at right angles therewith, two sets of upflow-tubes connecting the mud-drum with one end of the steam-drum, 45 downflow-tubes connecting the mud-drum with the other end of the steam-drum, a partition on top of each set of upflow-tubes, a partition on top of the downflow-tubes, and a connection between the latter partition and 50 the adjacent partition of the upflow-tubes, whereby a continuous flue for the products of combustion will be formed between the upflow-tubes and the adjacent set of downflow-tubes above the mud-drum, substantially as 55 set forth.

3. In a water-tube boiler, the combination of a sectional mud-drum, a sectional steam-drum mounted above the same and extending at right angles therewith, two sets of re- 60 movable upflow-tubes connecting the mud-drum with one end of the steam-drum, removable downflow-tubes connecting the mud-drum with the other end of the steam-drum, a sectional partition on top of each set of up- 65 flow-tubes, and a sectional partition on top of the downflow-tubes, substantially as set forth.

This specification signed and witnessed this 4th day of March, 1901.

ROYAL C. PEABODY.

Witnesses:

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