

No. 613,968.

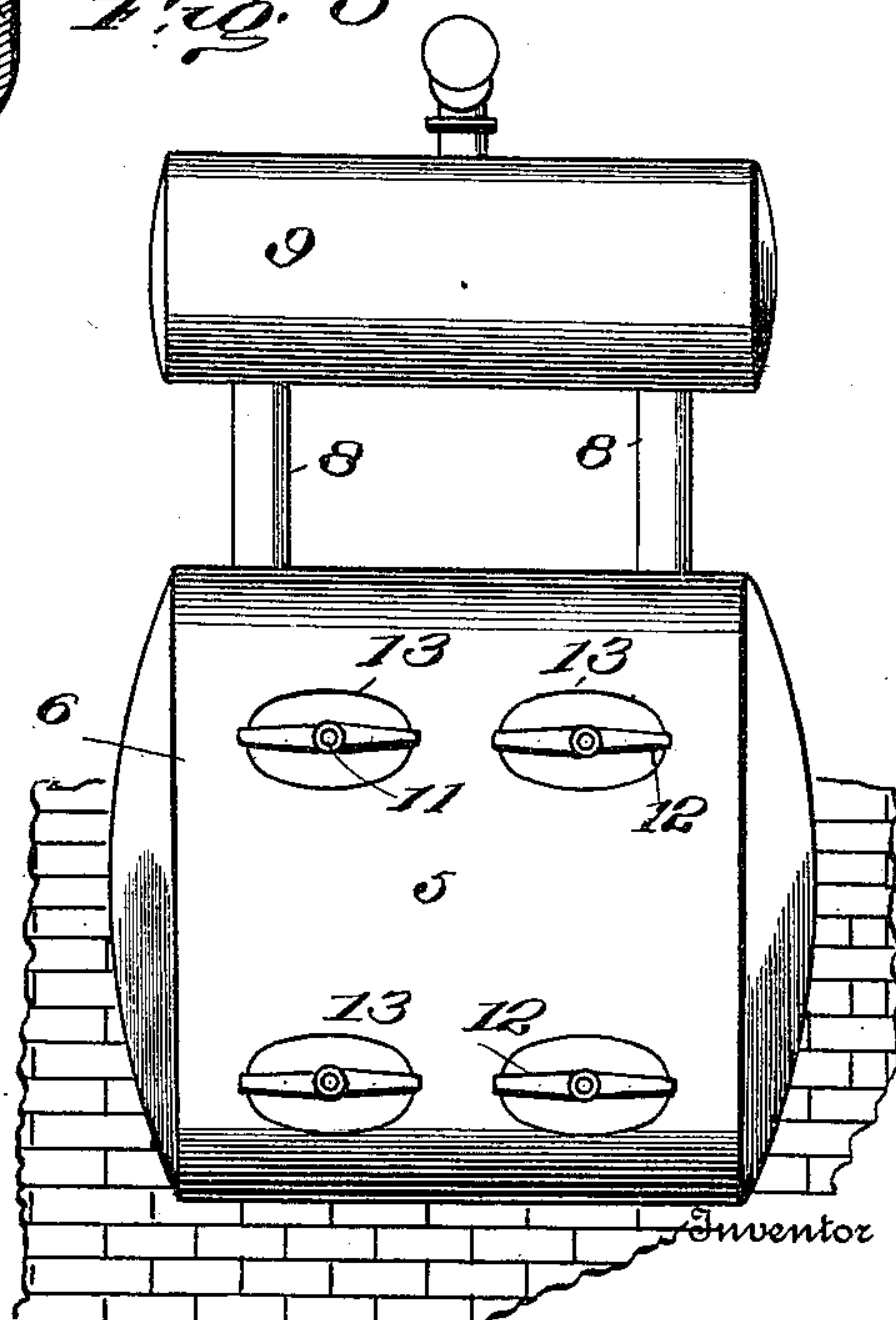
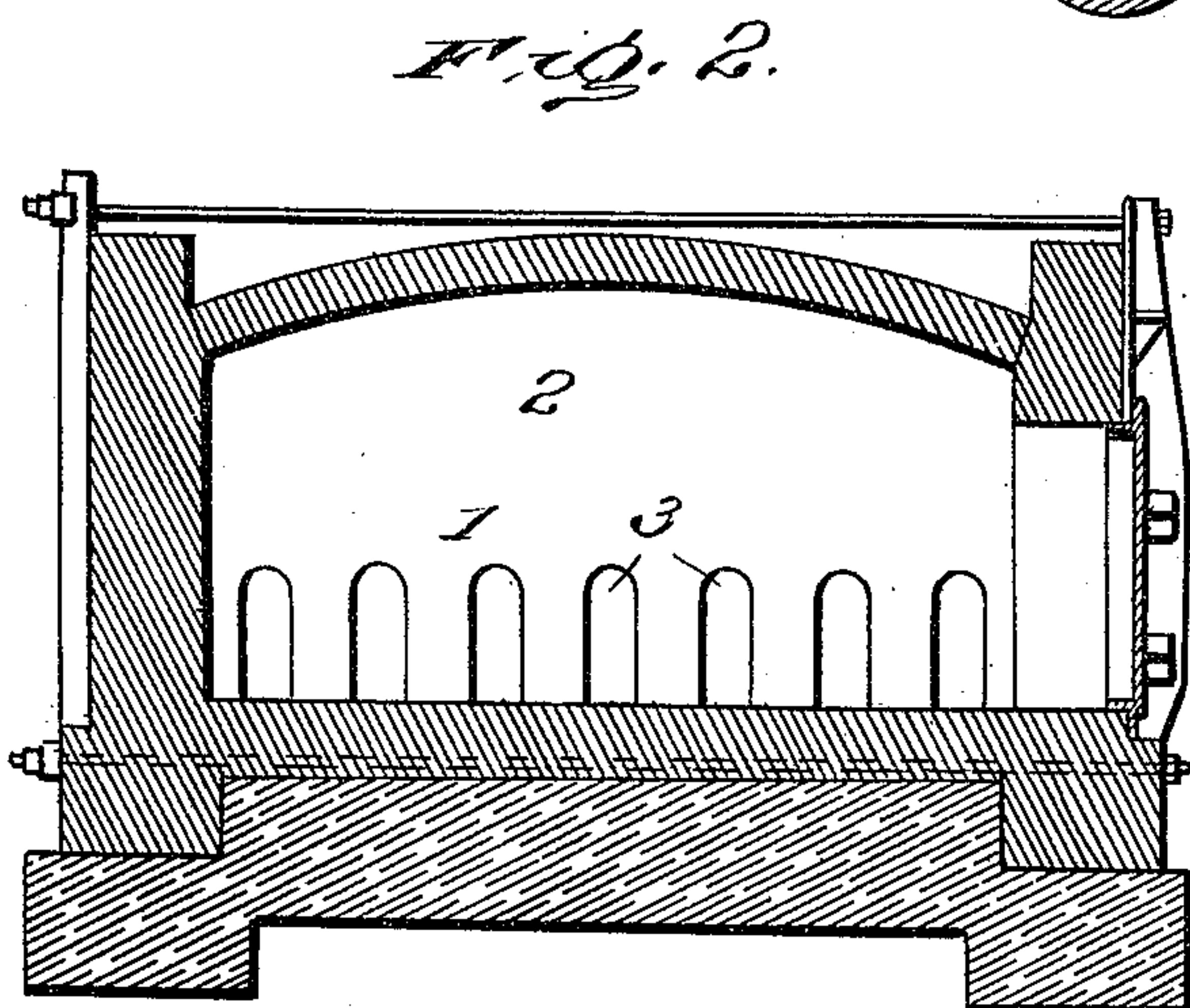
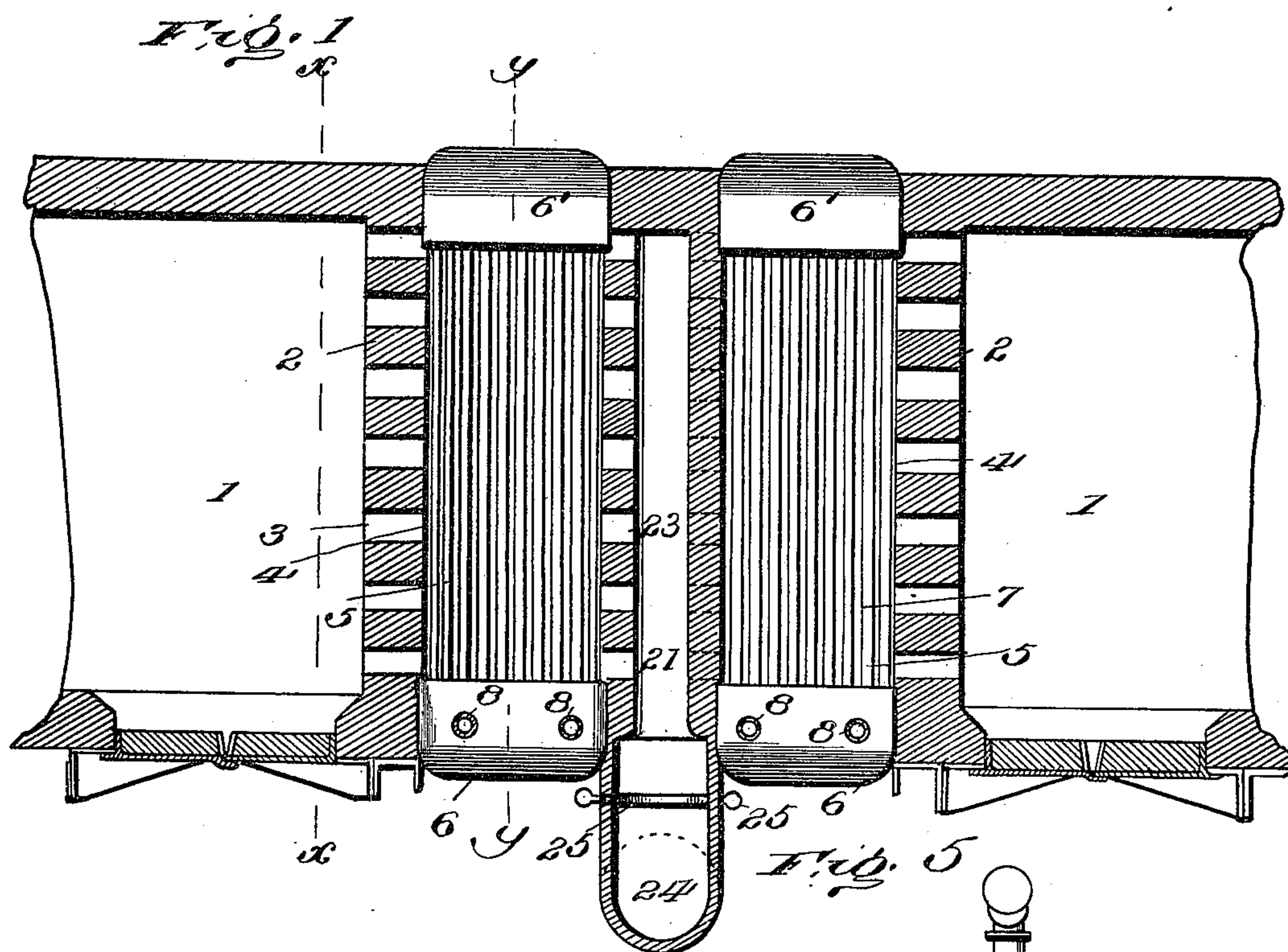
Patented Nov. 8, 1898.

M. A. CASTOE.
BOILER FURNACE.

(Application filed Dec. 20, 1897.)

(No Model.)

2 Sheets—Sheet I.



Witnesses

For Invee
Alfred Robertson

Martin A. Castoe
By *J. W. Robertson*
Attorney

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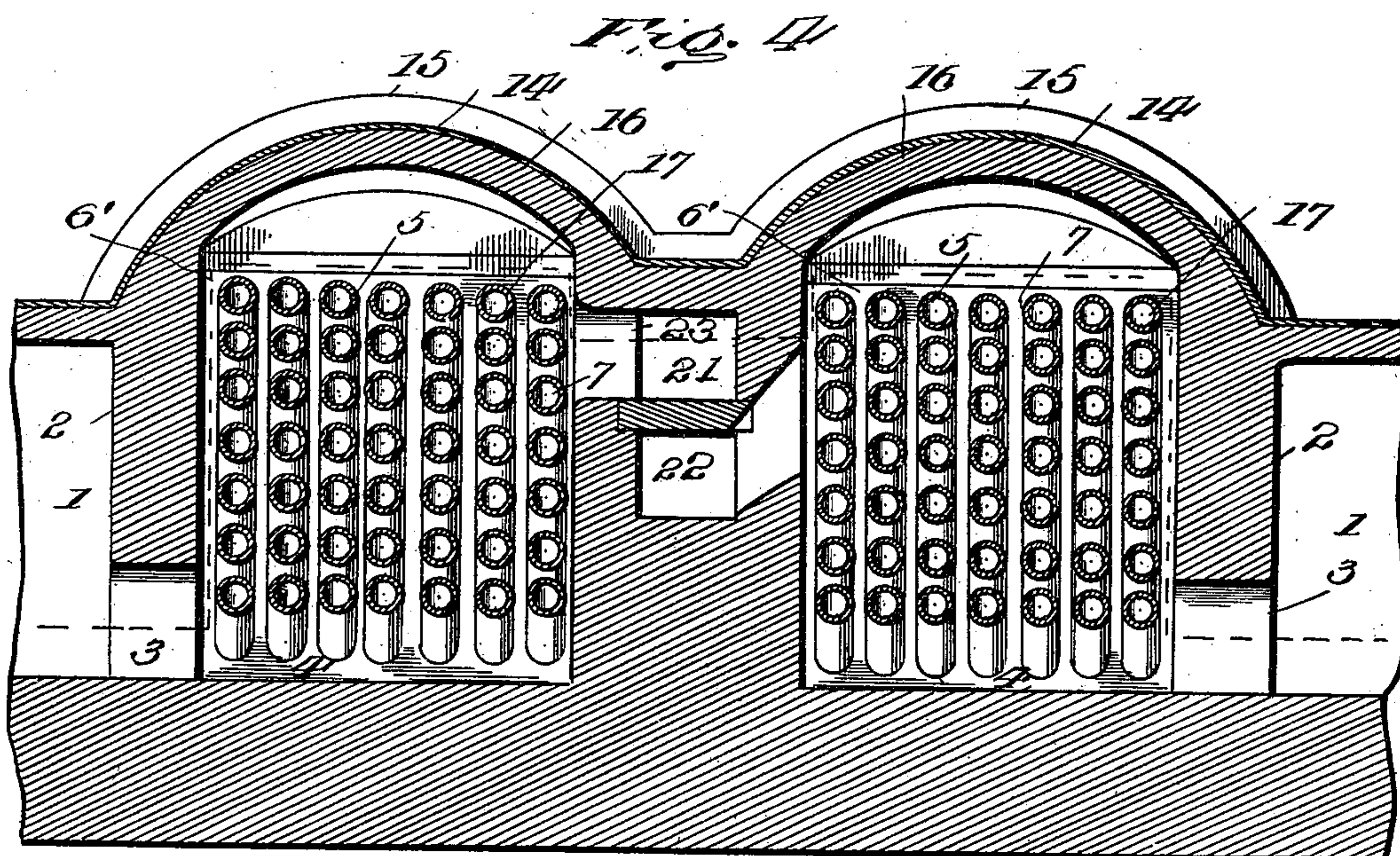
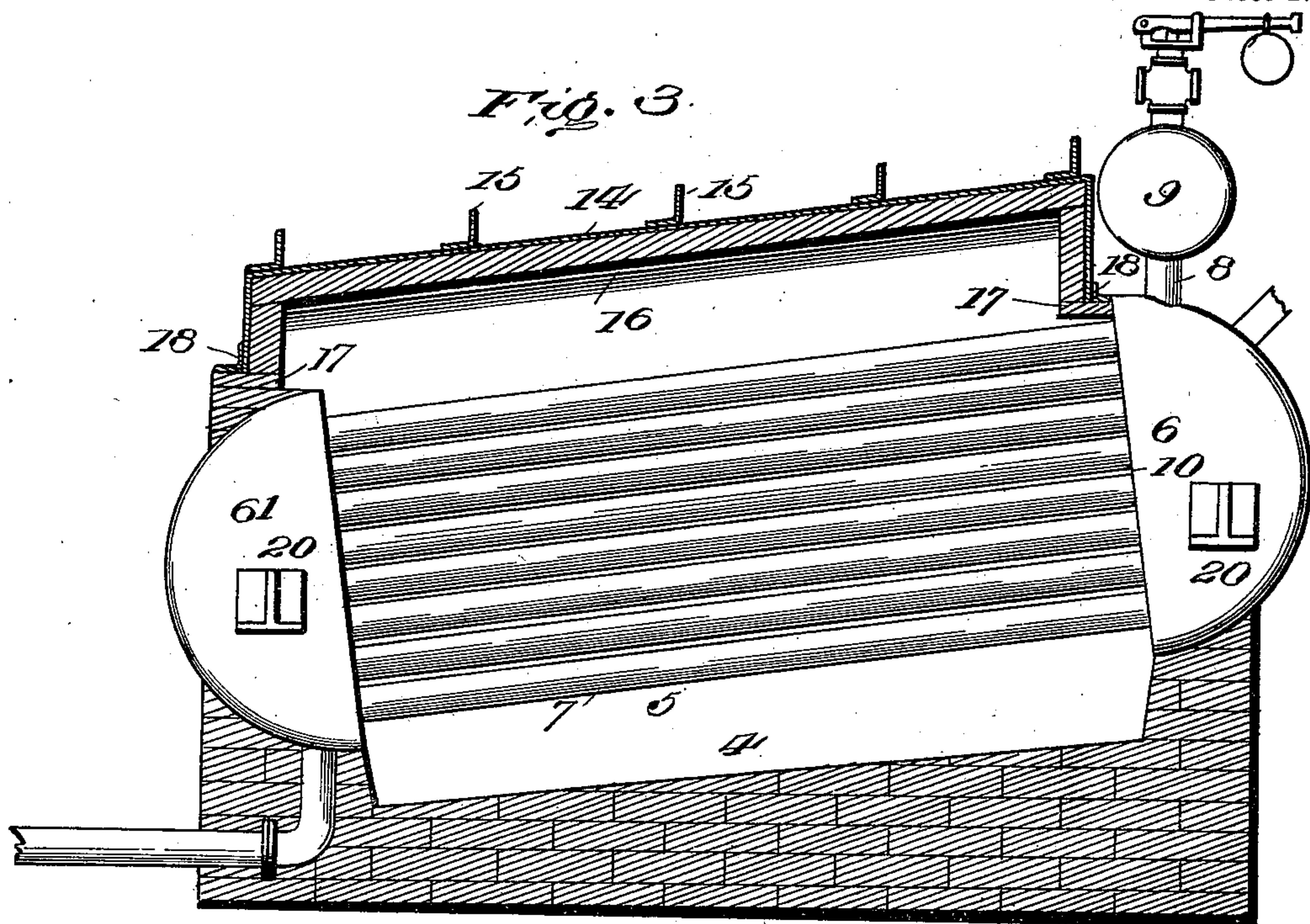
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2 Sheets—Sheet 2.



Witnesses

Alfred Robertson.

Inventor

Martin A. Castoe
By J. W. Robertson

Attorney

UNITED STATES PATENT OFFICE.

MARTIN A. CASTOE, OF BELLAIRE, OHIO.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 613,968, dated November 8, 1898.

Application filed December 20, 1897. Serial No. 662,638. (No model.)

To all whom it may concern:

Be it known that I, MARTIN A. CASTOE, a citizen of the United States, residing at Bellaire, in the county of Belmont and State of Ohio, have invented certain new and useful Improvements in Boilers and Furnaces Therefor, of which the following is a specification, reference being had to the accompanying drawings.

10 This improvement is designed to provide a means of utilizing the waste gases of annealing and similar furnaces by setting in the end of such furnace steam-boilers peculiarly adapted for the situation.

15 To this end the invention consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described and then definitely claimed at the end hereof.

20 In the accompanying drawings, Figure 1 is a horizontal section showing parts of two furnaces with my boilers set therein. Fig. 2 is a vertical section through the line $x x$, Fig. 1. Fig. 3 is a similar view through the line $y y$ in Fig. 1. Fig. 4 is a cross-section through the boiler and its setting. Fig. 5 is an end view of the boiler.

Referring now to the details of the drawings by numerals, 1 1 represent two furnaces 30 of any desired kind, having at their ends partitions 2 2, with passages 3 3 running into the boiler-pits 4 4, in each of which is set a boiler 5, having semicircular ends 6 6', connected by water-tubes 7. Rising from the top of the 35 end 6 are two short tubes 8, which connect the steam-drum 9 with the boiler. To the tube-plate 10 are fixed stays 11, whose other ends are secured to an outer semicylindrical plate 12, provided with manholes 13 to allow 40 of the removal or insertion of the water-tubes or for repairing or cleaning them. There are four manholes in the front end of the boiler and two in the rear end, which last are set centrally, so that all the tubes can be readily 45 got at for cleaning or repairing.

Over the boiler is set an arch of composite material, it being partly brick and partly iron. It consists of a shell of heavy sheet-iron 14, which is stiffened by angle-iron 15 and is lined 50 with bricks 16. Cross-bars 17 are set at each end and rest upon the brick setting.

At 18 are shown small angle-irons by which the shell and cross-bars are firmly secured together. At the sides of each head are secured brackets 20, which rest upon the brick- 55 work and form the main support for the boiler.

I prefer to arrange two boilers and furnaces as indicated in Fig. 1, as room is economized thereby; but I may use a single furnace and boiler where only one furnace is employed. 60

Between the boiler-pits are formed two flues 21 and 22, the former communicating with left-hand pit by the passages 23 and the other flue with the other pit by similar passages and both of them running to the stack 65 24. Near the stack I set dampers 25, by which I can shut off the draft, as required, in the annealing-furnace. I deem this position of the dampers as an important feature, because if they were set between the boilers and the 70 furnaces the boilers would be cut off from the heat remaining in the furnaces and they would not thus make steam, whereas if the boilers are left in communication with the furnace they will make steam for a considerable time 75 even after the draft is shut off by the dampers.

From the above it will be seen that by my arrangement of the furnace and boiler the waste heat from the furnace is utilized to the 80 utmost, because the heat that is usually wasted in these furnaces passes between the tubes of the boiler and imparts its heat to the water contained therein, and thus rapidly makes steam. 85

What I claim as new is—

1. The combination with an annealing or similar furnace having a flue at right angles to the same, a pit for a boiler between the flue and the furnace, passages between the fur- 90 nace and the pit and between the pit and the flue, and a steam-boiler set in said pit, substantially as described.

2. The combination with an annealing or similar furnace having a flue at right angles 95 to the same, a boiler-pit between the flue and the furnace, passages between the furnace and the pit and between the pit and the flue, a horizontal water-tube boiler in said pit, a smoke-stack at the end of the flue, and a dam- 100 per between the boiler and the stack, substantially as described.

3. The combination of two annealing or
similar furnaces, two flues one over the other
arranged between said furnaces, boiler-pits
between the furnaces and the flues, boilers
5 set in said pits, and passages from the fur-
naces to the pits and from the pits to the flues,
substantially as described.

In testimony whereof I affix my signature,
in the presence of two witnesses, this 18th day
of December, 1897.

MARTIN A. CASTOE.

Witnesses:

F. S. MASON,

A. M. Y. BOYD.