

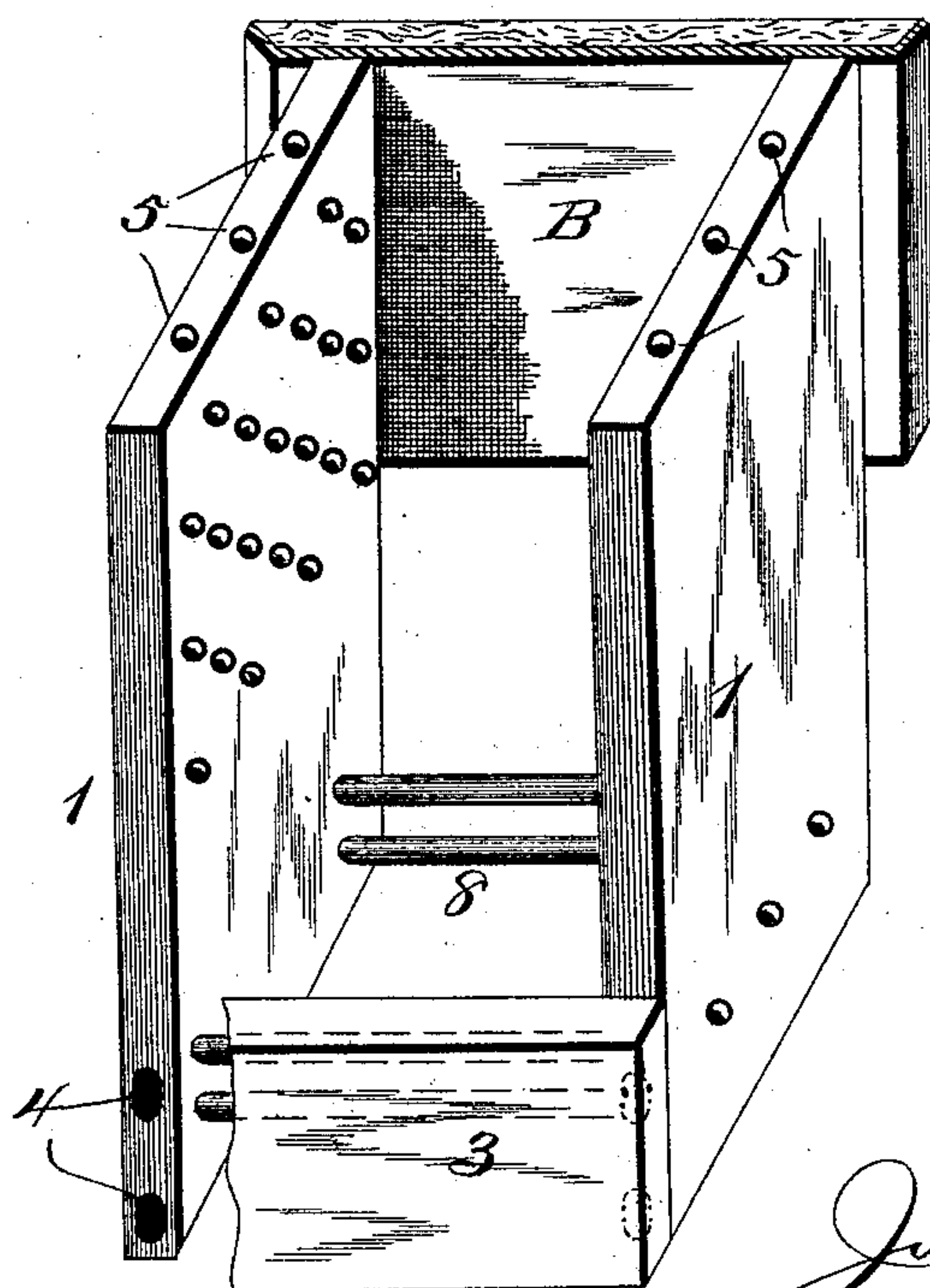
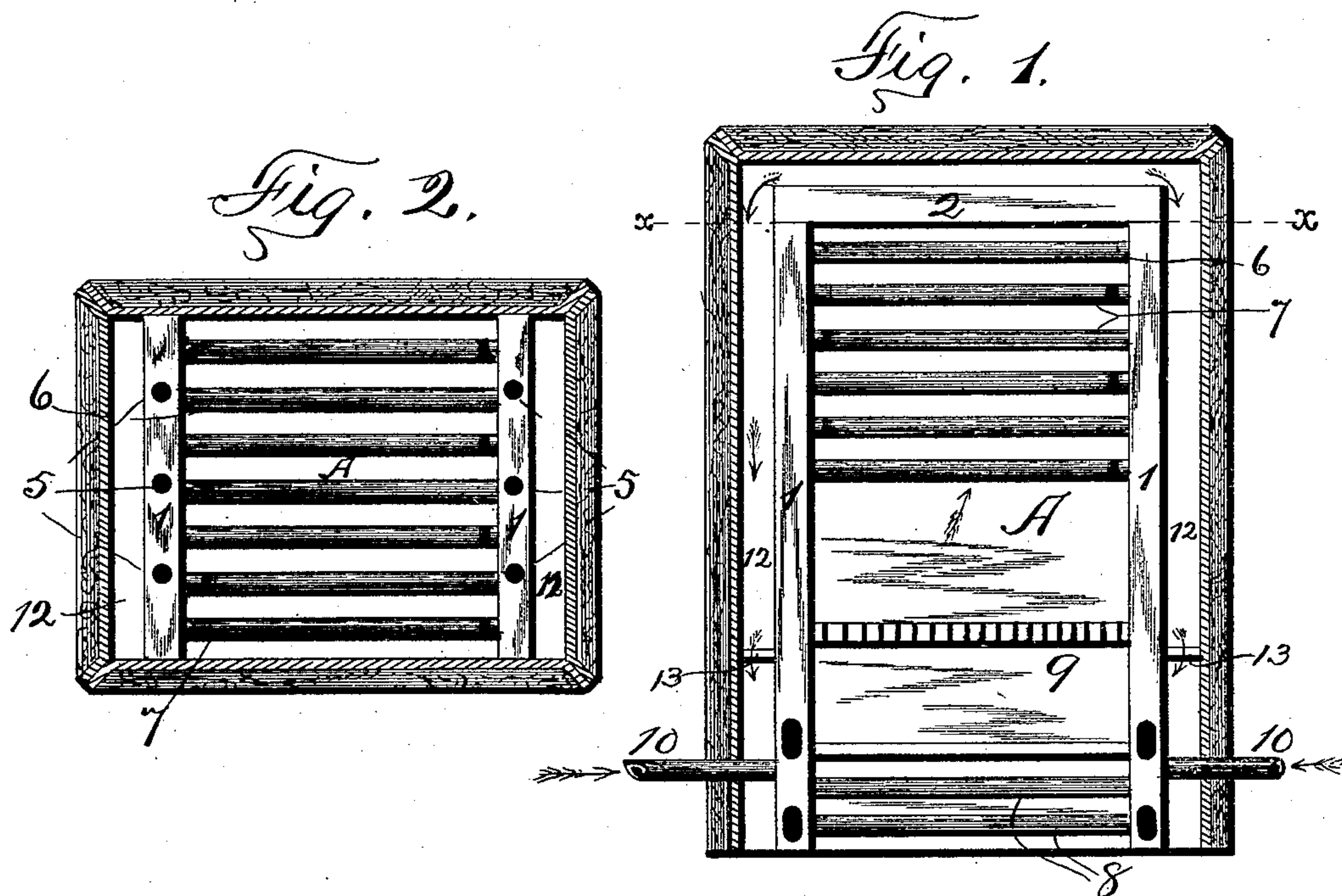
(No Model.)

3 Sheets—Sheet 1.

J. LAPP.
BOILER.

No. 452,379.

Patented May 19, 1891.



Witnesses
H. P. Denison
Silas J. Hogan.

Inventor
John Lapp
By his Attorneys
Smith & Denison

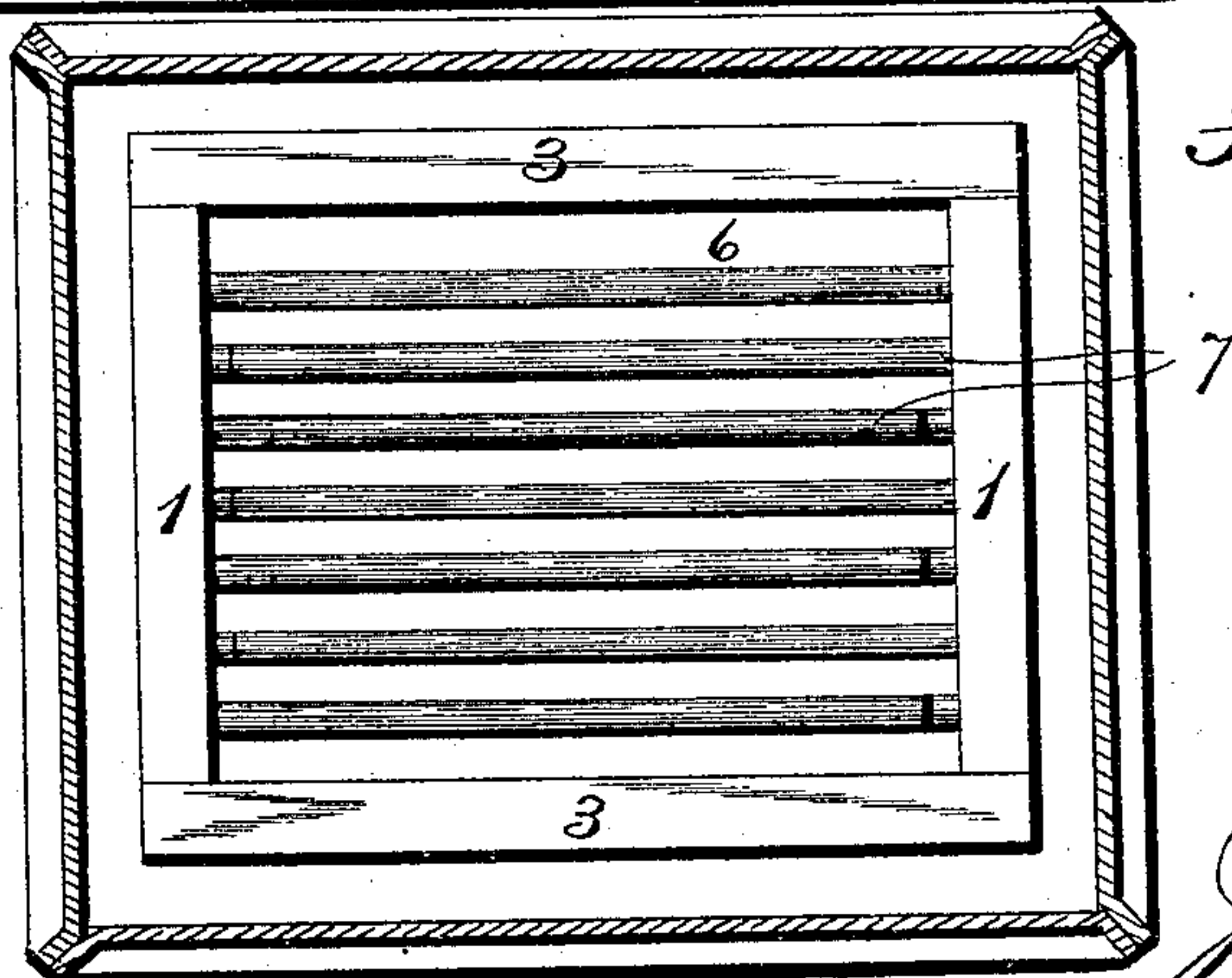
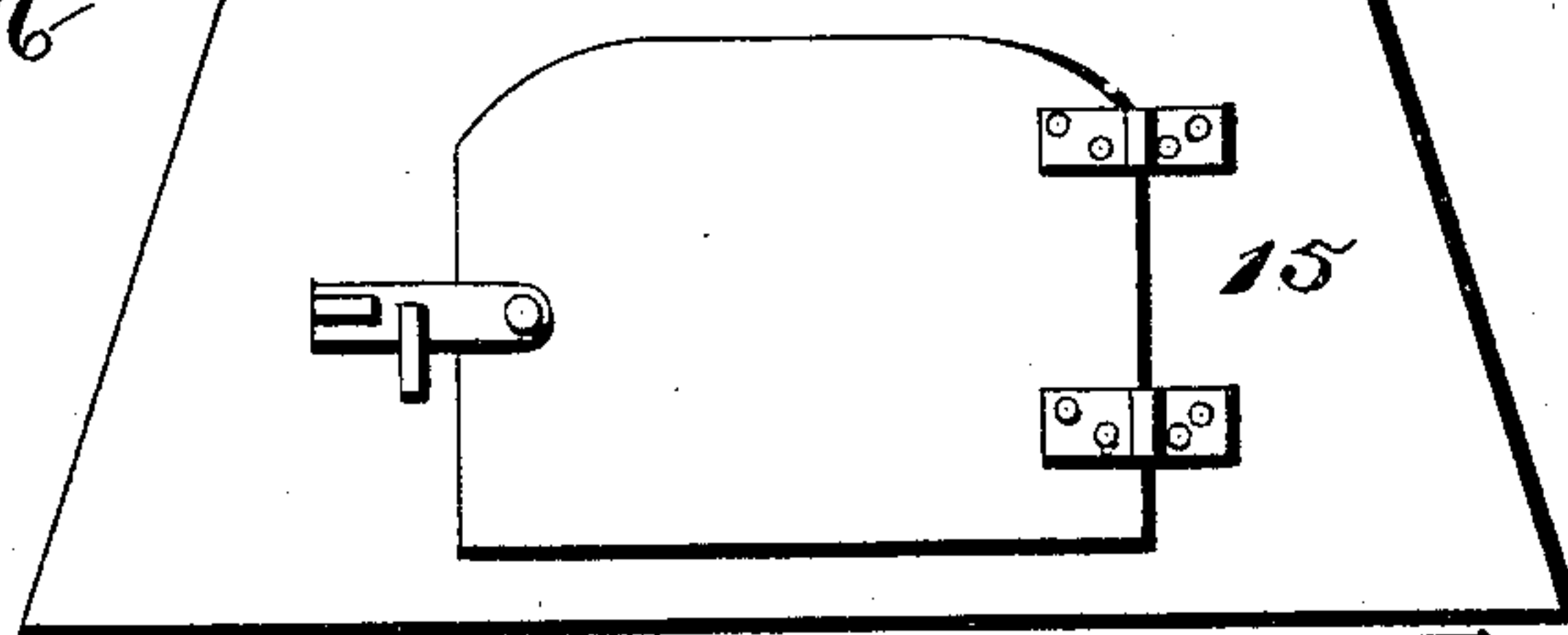
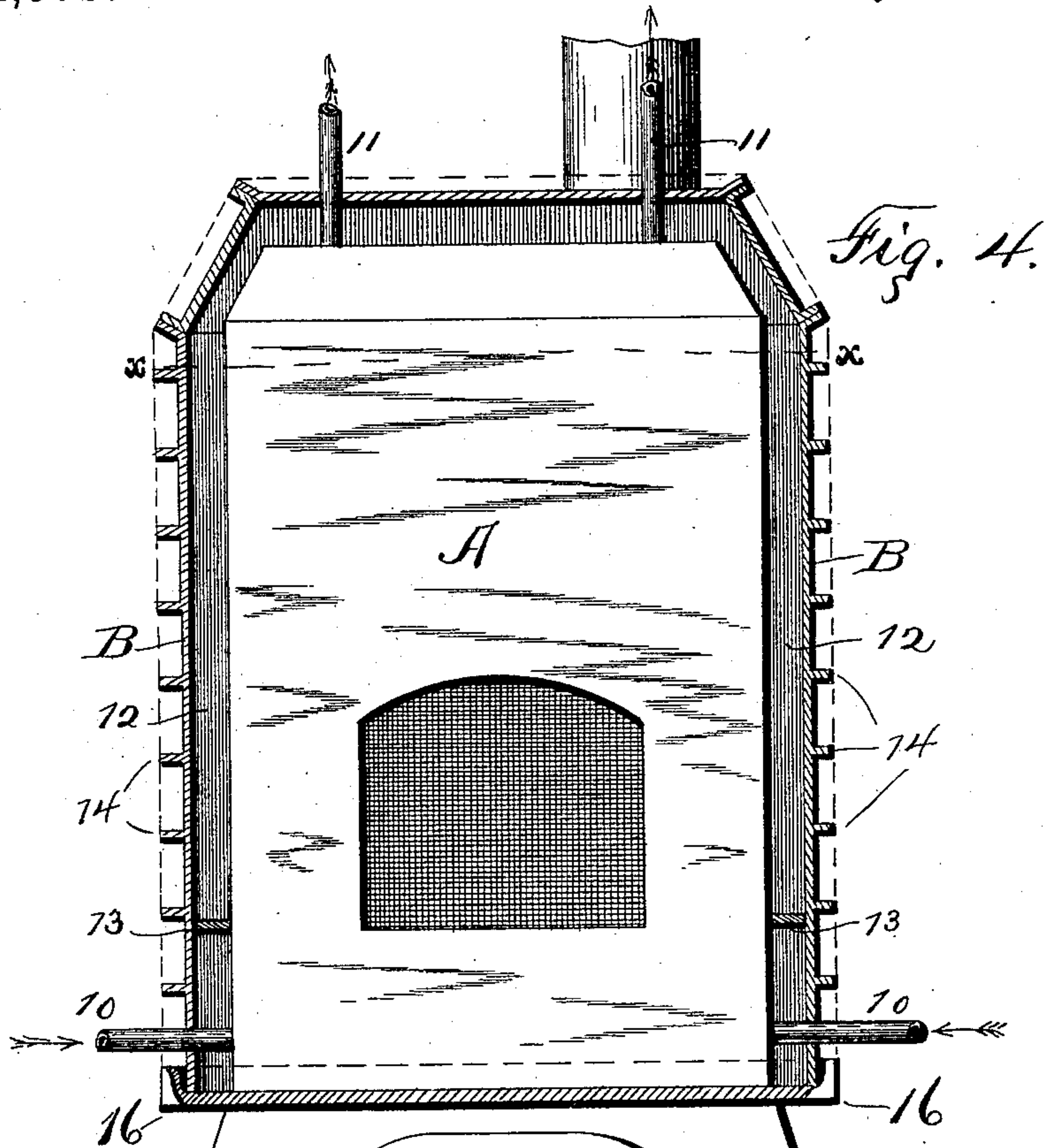
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J. LAPP.
BOILER.

No. 452,379.

Patented May 19, 1891.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 7.

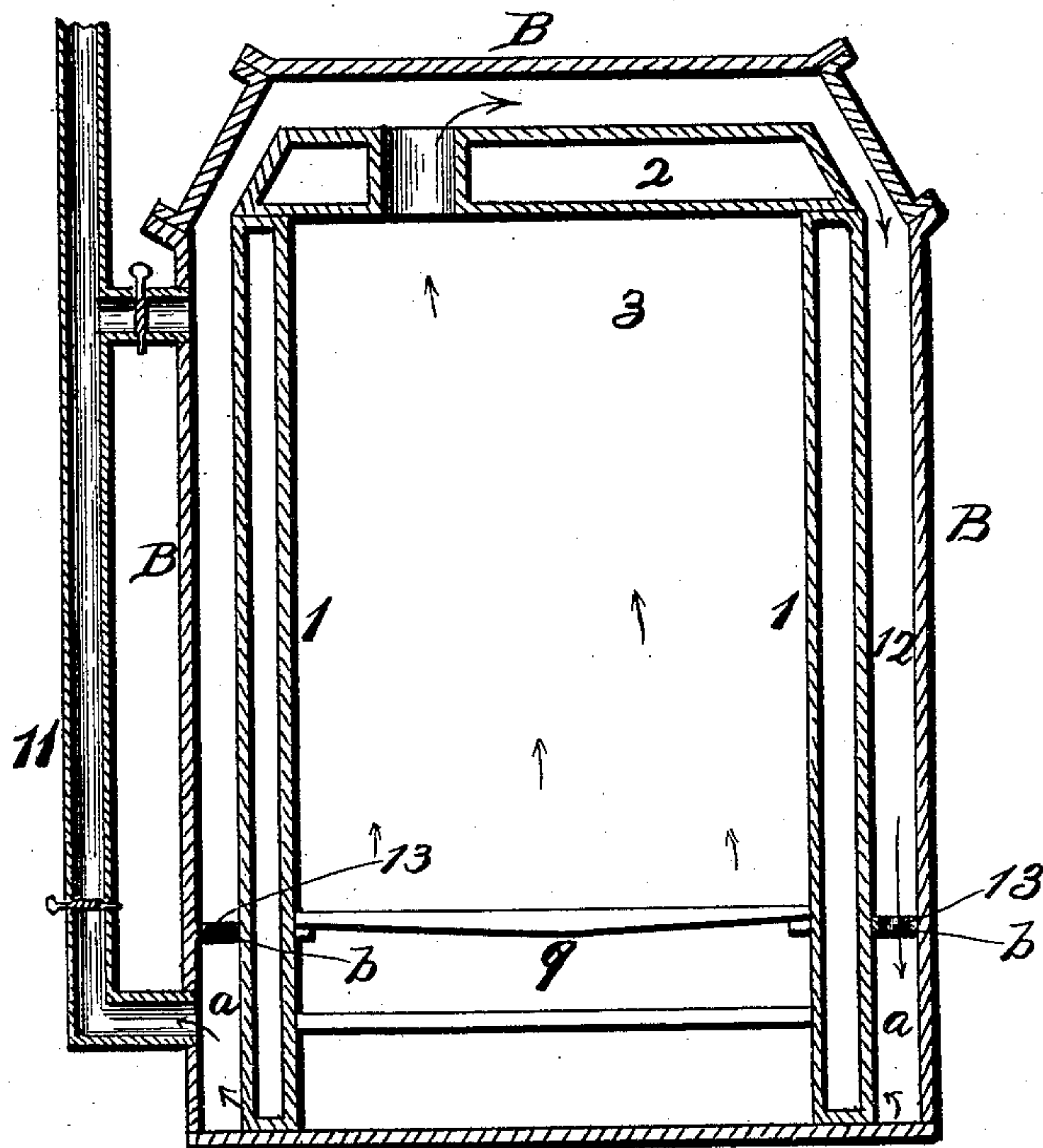
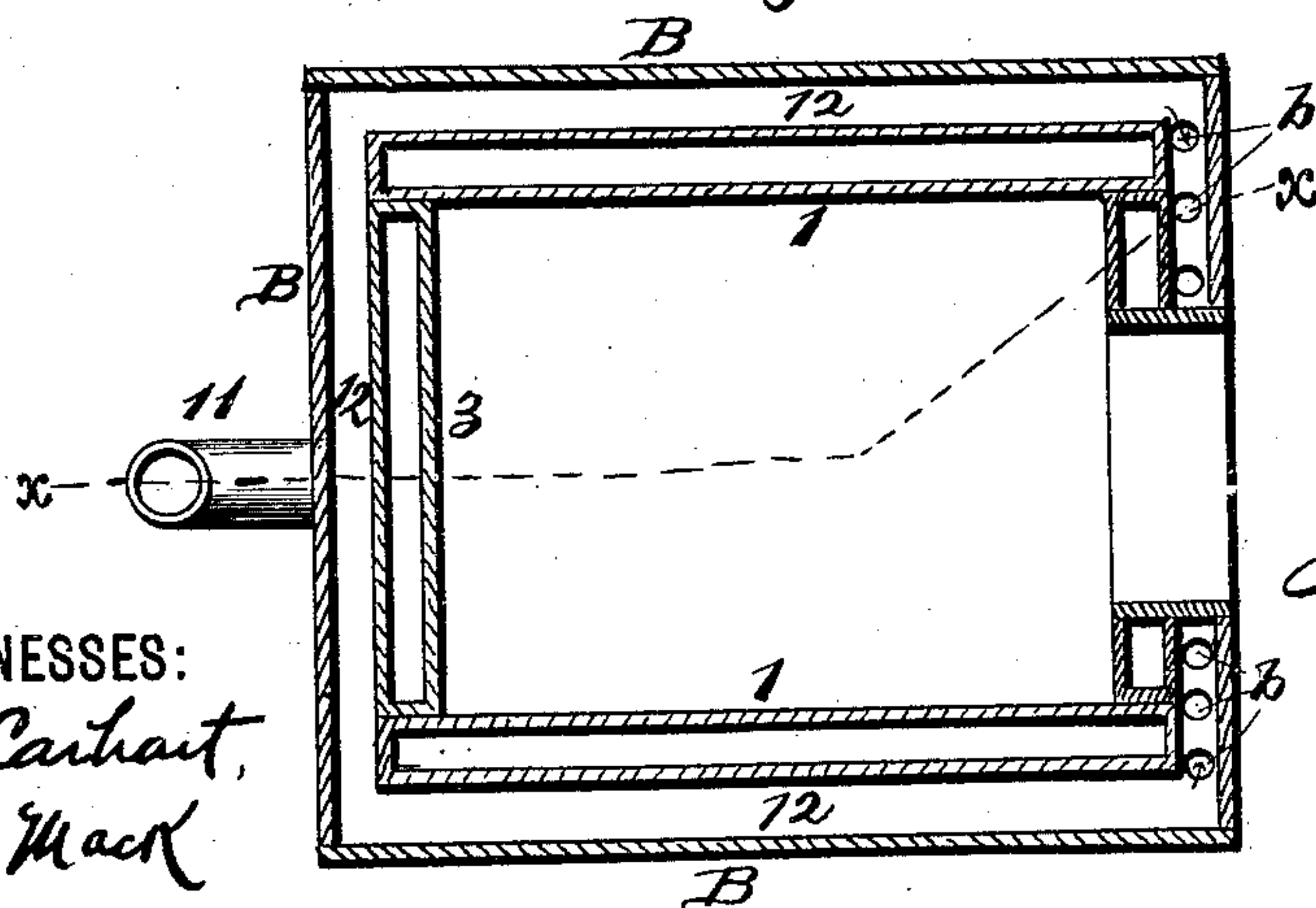


Fig. 6.



WITNESSES:
H. A. Carhart,
E. V. Mack

John Lapp
INVENTOR

BY *Smith & Denison*
his ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN LAPP, OF HONEOYE FALLS, NEW YORK.

BOILER.

SPECIFICATION forming part of Letters Patent No. 452,379, dated May 19, 1891.

Application filed December 30, 1889. Serial No. 335,360. (No model.)

To all whom it may concern:

Be it known that I, JOHN LAPP, of Honeoye Falls, in the county of Monroe, in the State of New York, have invented new and useful
5 Improvements in Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to boilers, and especially to their adaptation to hot-water-heating apparatus, and to that class in which the body of the boiler is constructed with hollow sectional sides and top and hollow ends, all communicating with each other directly
15 through their edges or sides, and also by transverse water-tubes above and below the grate and fire-pot.

My object is to establish a more perfect circulation of hot water through the sides and
20 ends and top or between them by connecting them directly through their edges or edges and sides, and to more perfectly protect the boiler against outward radiation and waste of heat.

My invention consists in the novel features of construction hereinafter described, and specifically set forth in the claim annexed.

It is constructed as follows, reference being had to the accompanying drawings, in
30 which—

Figure 1 is an elevation showing the front removed and the outer casing in section. Fig. 2 is a transverse section on line *x x* in Fig. 1. Fig. 3 is an isometrical elevation showing the
35 top and most of the outer casing removed and with the front boiler-section only extending part way up. Fig. 4 is a front elevation showing the casing in section and the boiler mounted upon a base. Fig. 5 is a transverse
40 section on line *x x* in Fig. 4. Fig. 6 is a horizontal transverse section on the line of the lower side of the door. Fig. 7 is a vertical longitudinal section on line *x x* in Fig. 6.

A is the boiler consisting of the hollow
45 sides 1, hollow top 2, and hollow ends 3, all of cast-iron or sheet metal. The sides when end sections are used are connected thereto by ports 4 in the sides, coinciding with like ports in the ends, and the sides are connected to

the top by ports 5, coinciding with the like 50 ports in the top.

Transverse water-tubes 6 and 7 are secured in the sides above the fire-pot, the water-tubes 6 extending part of the way across and the water-tubes 7 extending clear across to in- 55 crease the communication between the sides.

Water-tubes 8 are secured in the sides below the grate 9, extending clear across, and they establish a cross circulation below the grate or below the grate and ash-pit. 60

At 10 I show the inlet-pipes entering the sides near the bottom, and 11 are the exit-pipes from the top.

B is the outer casing consisting of flanged plates of cast metal bolted together apart from 65 the sides and top, creating a diving-flue 12, provided with a reversing horizontal partition 13, creating a reverse-flue *a*, which extends back beneath the shelf or partition to the smoke-pipe from the opening or openings *b*, con- 70 necting the flue 12 and the flue *a*. These plates are provided with fins or webs 14, which aid in holding the asbestos or non-conductor fitted in place upon the outer faces of the plates. 75

In Fig. 2 I show no hollow front or back sections.

In Fig. 4 I show the boiler mounted upon a base 15, which constitutes the ash-pit, and the boiler and casing are supported by a 80 bracket-flange 16 upon the top of the base.

What I claim is—

The combination, in a boiler, of a grate and fire-pot, vertical hollow sides and tubes closed upon their free ends projecting inwardly from 85 the sides, a jacket inclosing the sides and top, and a horizontal partition between the jacket and sides and extending nearly the whole width of the sides, creating a reverse-flue between the fire-pot and smoke-pipe and inlet 90 and outlet pipes.

In witness whereof I have hereunto set my hand this 27th day of December, 1889.

JOHN LAPP.

In presence of—

J. D. MARTIN,
A. M. HOLDEN.