(No Model.)

2 Sheets—Sheet 1.

B. ETIENNE.

HOT WATER BOILER.

No. 518,592. Patented Apr. 24, 1894.

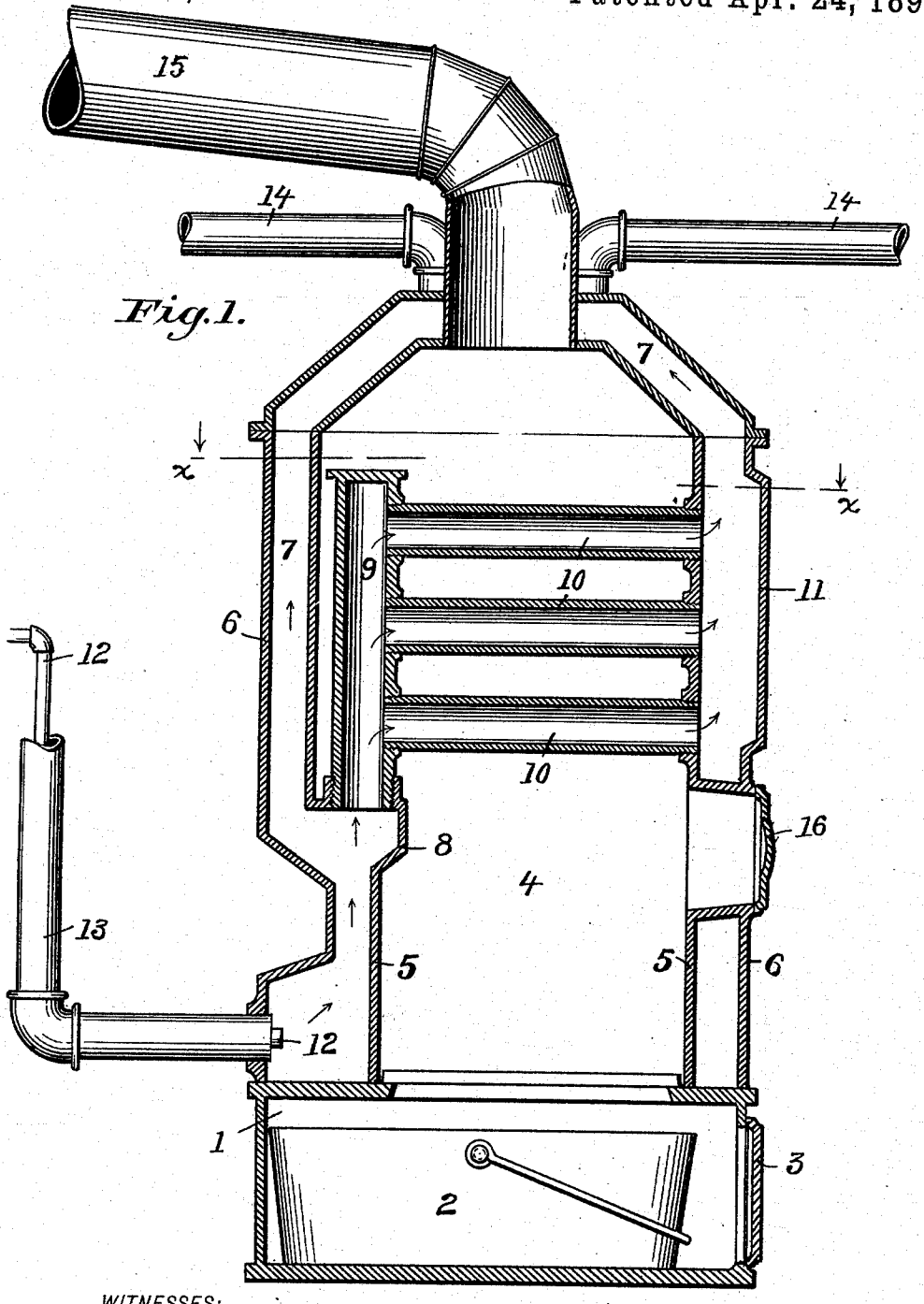

Fig. 1.

WITNESSES:

C. M. Newman

Wm. F. Maddox

INVENTOR

BRUNEAU ETIENNE

BY

C. M. Newman

ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

B. ETIENNE.

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Fig. 2.

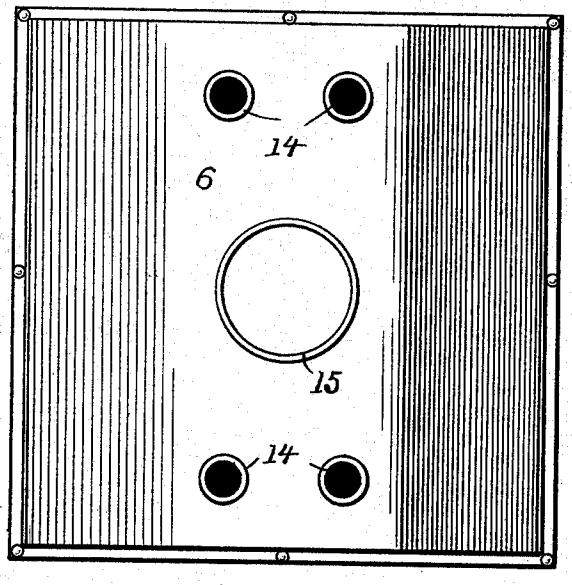


Fig. 4.

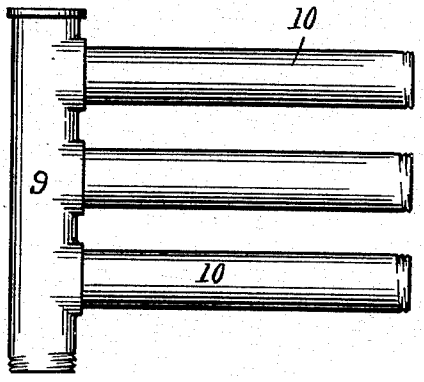
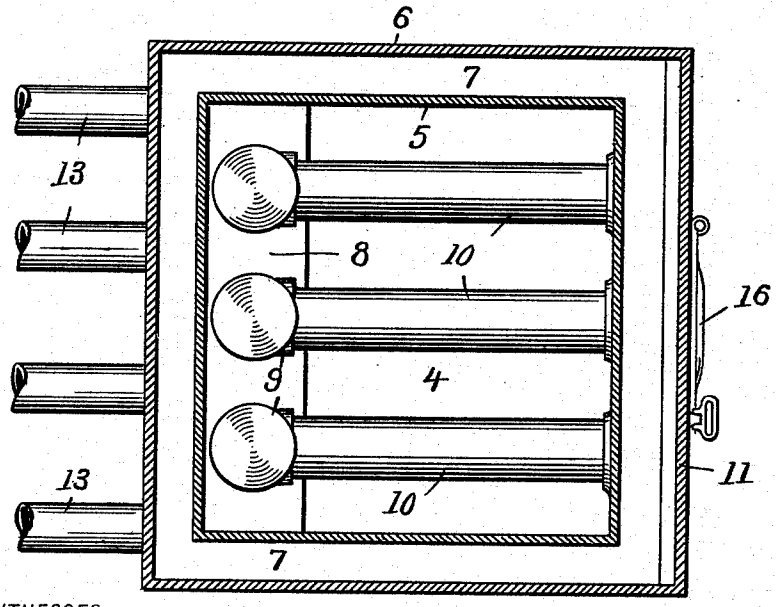


Fig. 3.



WITNESSES:

C. M. Newman

Wm. I. Walkley

INVENTOR

BRUNEAU ETIENNE

BY

C. M. Newman

ATTORNEY.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BRUNEAU ETIENNE, OF WATERBURY, CONNECTICUT.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 518,592, dated April 24, 1894.

Application filed July 19, 1893. Serial No. 480,964. (No model.)

To all whom it may concern:

Be it known that I, BRUNEAU ETIENNE, a subject of the Queen of Great Britain, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Hot-Water Boilers, of which the following is a specification.

The object of this invention is to produce a hot water furnace which shall be simple, durable and inexpensive, also one in which a great amount of heating surface is secured, and one in which a perfect circulation of water may be relied upon.

This furnace is designed particularly for dwelling purposes, and would be connected with the various rooms in a dwelling by pipes, to any well known hot water radiator. Any desired number of radiators may be connected and supplied with hot water.

In the accompanying drawings forming part of this specification—Figure 1 is a central vertical section of my furnace. Fig. 2 is a top plan view, the pipes being omitted. Fig. 3 is a cross section on the line *x x* of Fig. 1 looking in the direction of the arrows, and Fig. 4 is a side elevation of one set of the heating tubes detached.

I preferably construct this furnace square as shown, as I find in practice that it enables me to secure better results, both in construction and as a heat producer.

1 is a base and ash pan receptacle, and also serves to support the furnace proper.

2 is an ash pan within the receptacle and may be removed by means of a door 3.

4 is the fire chamber and may be provided with a lining of fire brick (not shown) if desired. The heater proper consists of an inner and outer casing 5 and 6, said inner casing 5 surrounding the fire and forming the fire chamber. Between the inner and outer casing is formed the water reservoir 7 in which the water is heated together with several series of tubes through which the water passes. These tubes are directly exposed to the fire, and are arranged to have the flames pass between them. Upon the inner casing and across the rear thereof I form an inwardly extending angular enlargement 8 having a horizontal portion across its breadth which I provide with holes for the purpose of connecting vertical pipes 9 which in turn are connected with the opposite side of the reservoir 7 through a series of horizontal cross pipes 10. In the drawings I have shown four vertical pipes 9 each having a series of three of the cross pipes. Of course the exact number is immaterial since any number can be used as well. In the front of the furnace and directly in the path of the cross pipes 10 I form an enlargement in the reservoir as at 11 by extending the outer casing. The purpose of this is to admit of a free circulation of water through the cross pipes and into the water reservoir when it would be again heated and pass upward.

12 indicates a cold water supply pipe which I introduce into the boiler through one of the return pipes 13, from the radiators. It will be seen that both the cold water supply and the return water from the radiators are introduced into the boiler at practically the same places. From here the water is free to circulate around the boiler as well as in a vertical direction. In the latter event it would rise in a direct line with the vertical tubes 9 and would mostly pass through them and become heated and travel to the top of the boiler, and off again to the several radiators through the pipes 14. Any number of these pipes can be connected as will be seen, as well as an equal number of return pipes.

15 denotes the smoke pipe. This is of usual construction.

16 is the door through which the fuel is supplied to the furnace.

It will be seen that this furnace is constructed principally in three sections, the base forming one section, the central portion and top the other two sections. Being constructed in this manner it is easily set up.

Having thus described my invention, I claim—

1. In a furnace, the combination with a fire chamber, of a heating reservoir surrounding the latter, consisting of an inner and outer lining, the former provided with an inwardly extending angular enlargement, and the latter drawn in to conform with said enlarge-

ment a series of vertical tubings and horizontal cross pipes extending across the fire chamber and connecting with opposite sides of the heater reservoir for the purpose of conveying water therein, substantially as shown and described.

2. The combination, in a furnace, of an outer and inner casing, a fire chamber within said casing, a water reservoir surrounding the fire chamber, an enlargement at the rear and bottom of said reservoir, in which the supply is received, a narrow passage above said enlargement to insure the passage of the water through a series of vertical tubes and horizontal pipes, in connection with an enlargement 11 upon the front and top of said reservoir, all as shown and for the purpose specified.

Signed at Waterbury, in the county of New Haven and State of Connecticut, this 26th day of June, A. D. 1893.

BRUNEAU ETIENNE.

Witnesses:
WILSON H. PIERCE,
C. S. GAYLORD.