

(No Model.)

2 Sheets—Sheet 1.

R. G. HOLBROOK.
HEATER.

No. 593,659.

Patented Nov. 16, 1897.

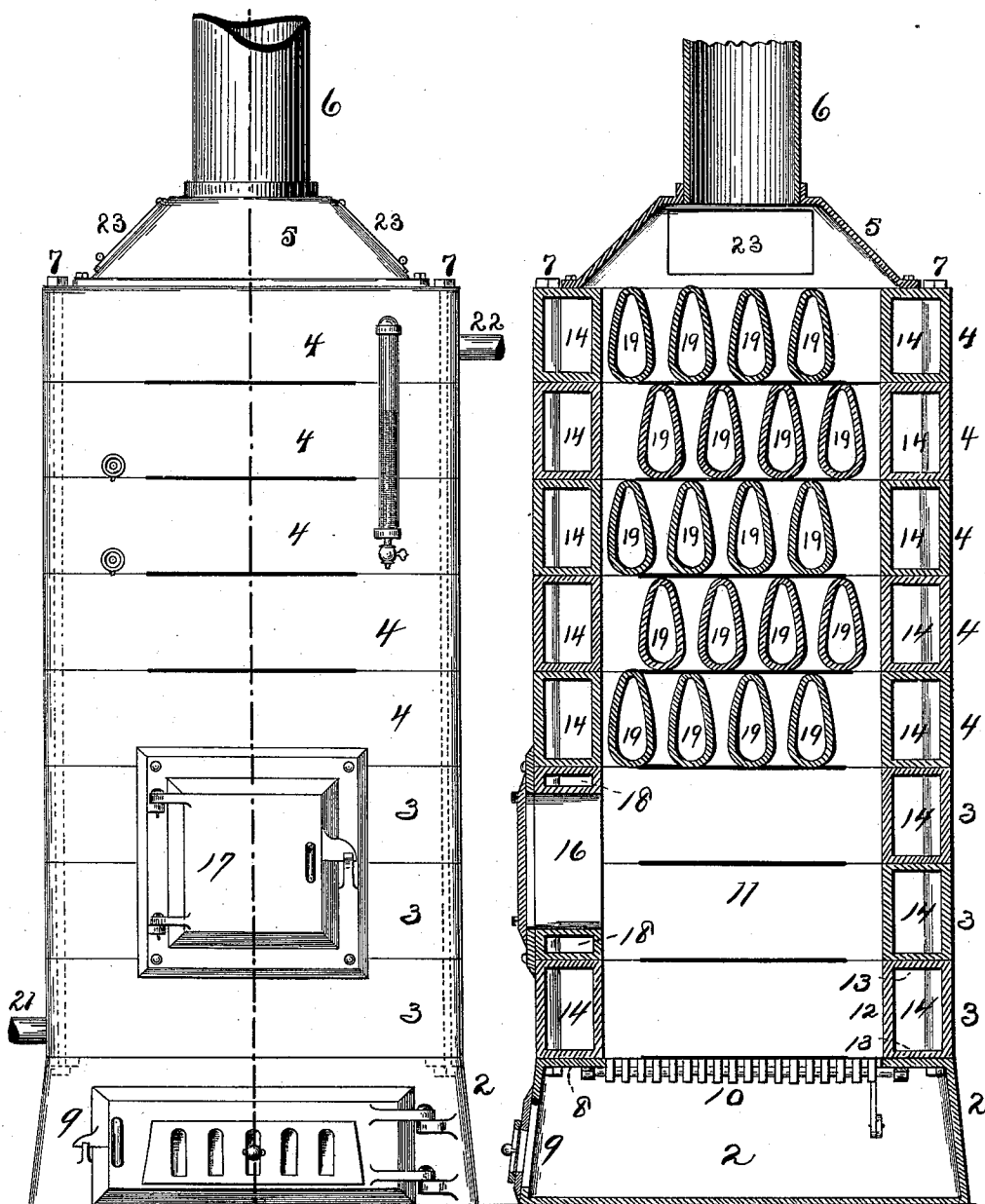


Fig. 1.

Fig. 2. Robert G. Holbrook.

WITNESSES:

Charles H. Marwin
Mary A. Franklin

INVENTOR

BY

Smith & Denison
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

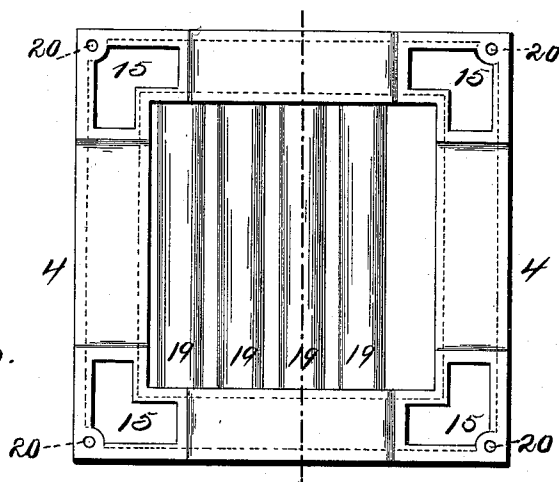


Fig. 4.

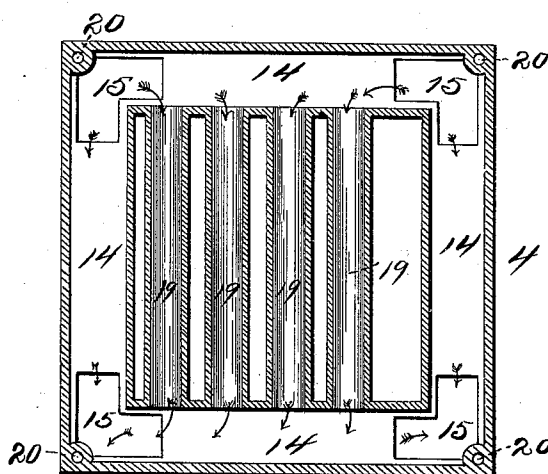


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT G. HOLBROOK, OF OSWEGO, NEW YORK.

HEATER.

SPECIFICATION forming part of Letters Patent No. 593,659, dated November 16, 1897.

Application filed July 12, 1897. Serial No. 644,175. (No model.)

To all whom it may concern:

Be it known that I, ROBERT G. HOLBROOK, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Heaters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to heaters or boilers for steam or hot-water heating.

My object is to produce a boiler built up of hollow sections, each section comprising a hollow body, here shown as rectangular in form, the sides being interiorly connected to create a continuous opening within and around said body and through its sides and corners, each section being also provided in its corners with suitable openings in vertical alinement, whereby when the sections are mounted one upon another their corner-openings coincide and create vertical flues interior to the heater thus created and also directly and interiorly connect the chambers of the respective sections at the corners, permitting free circulation vertically from one section to another and horizontally through the sides of each. The sections for that part of the boiler above the fire-box and combustion-chamber are provided with transverse horizontal flues connecting two opposite sides interiorly, the flues of two adjacent sections being staggered or set so that each flue will be under or over the space between two flues of the adjoining section. The lower sections, without transverse flues, create a water-leg around the fire-box subdivided horizontally, and at the same time having the subdivisions vertically connected. The bottom of the lowermost section and the top of the uppermost section are made solid. A suitable ash-pit is also provided, which supports the superstructure and grate. The sections are secured together by dry bolts through their corners. A suitable water-inlet pipe, which can be the return-pipe of a hot-water system, is suitably connected to the lowermost section, and a suitable discharge-pipe for hot water or steam is suitably connected to the uppermost section. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the heater.

Fig. 2 is a vertical section thereof on the dotted line in Fig. 1. Fig. 3 is a top plan of a section provided with flues. Fig. 4 is a horizontal section thereof. Fig. 5 is a vertical section thereof on the dotted line in Fig. 3.

The boiler consists of superposed sections 2 3 4, a top 5, smoke-pipe 6, and securing-bolts 7 through the corners of the sections. The section 2, comprising a base and ash-pit combined, consists of suitable side walls and an inward horizontal flange 8 upon each wall and is provided with a suitable door 9, and 10 is a suitable grate suitably mounted therein. The sections 3, comprising the fire-box 11, each consist of suitable vertical sides 12 and a top and bottom 13, integral therewith, creating a chamber 14, continuous around said section. Each section is provided in the corners with suitable openings 15, opposite each other or in vertical alinement, whereby vertical flues are created which vertically connect the several sections and to which each section is laterally connected at each corner. Part of the lower sections are constructed to create a fuel-fed opening 16, closed by a suitable door 17, and as this opening is through the water-chamber in two of the sections connections 18 are created above and below the opening connecting the parts of said chamber on each side of said opening, through which the water circulates from one side to the other. The sections 4 are constructed like the sections 3, excepting that they are provided with transverse flues 19, opening at their ends into the water-chamber. These flues are usually arranged or the sections are erected so as to be staggered or in alternation, as shown. They are preferably egg-shaped in cross-section and of an exterior height equal to the height of the section. The top and bottom of the sections are suitably faced off, and suitable packing is used to make the joints tight. The bolts 7 are inserted through holes 20, which are separated from the water-chamber, so that they are always dry. A suitable water-inlet pipe 21, which can also be a return-pipe from a heating system, is suitably connected to the lower section, and 22 is a suitable steam or hot-water exit or discharge pipe suitably connected to the uppermost section.

It will be seen that the sections can respectively be cast in one piece, with or without the

flues; that the upper sections can be all alike, with the flues at one side, so to speak, substantially as shown, and then by turning a section half-way around its flues will be staggered or in alternation; that the lower sections constitute water-leg walls around the fire-box; that they are connected vertically at the corners by sectional flues, and that their water-chambers are laterally connected to and by said flues; that the upper sections and their water-chambers are connected vertically and laterally by vertical sectional flues in vertical alinement with the water-leg vertical flues, and their water-chambers are also connected by transverse horizontal flues, whereby, first, free vertical and lateral circulation is established through the water-leg sections, and, secondly, free vertical, lateral, and transverse circulation is established through each upper section and from one section to another, and that the several sections are all secured together by dry bolts in that the bolts do not pass through any water flues or chambers.

The egg-shaped flues are preferable because they increase the area of the heating-surface and because they are more readily cleaned exteriorly by opening the doors 23 in the top 5 and shoveling in some gravel, which, rattling down, thoroughly cleans off the soot and dust which may have accumulated thereon.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A boiler comprising a base and sections

erected thereon and upon each other and all connected at their corners by openings creating continuous vertical flues and having internal water-chambers connected to each other and to said flues and connected vertically by said continuous flues and in the lower part of the boiler constituting sectional water-leg walls around the fire-box, the water-chambers in the upper sections being also connected horizontally by transverse flues whereby free lateral, vertical and transverse circulation through and between said sections is created.

2. A boiler comprising a base and hollow sections erected thereon and upon each other, each provided with a continuous water-chamber around it, and having multiple internal openings in vertical alinement creating multiple continuous sectional vertical flues connecting said water-chambers to each other and to the adjoining section or sections, the lower sections creating sectional and connected water-legs around the fire-box, and the upper sections being also provided with transverse horizontal flues connecting water-chambers on opposite sides, whereby free vertical, lateral and transverse circulation is created in or through said sections and from one said section to another.

In witness whereof I have hereunto set my hand this 8th day of July, 1897.

ROBERT G. HOLBROOK.

In presence of—

J. H. GILL,

CHARLES A. BURNS.