(No Model.) 2 Sheets—Sheet 1.

J. M. LAING.

WATER HEATER.

No. 526,496. Patented Sept. 25, 1894.

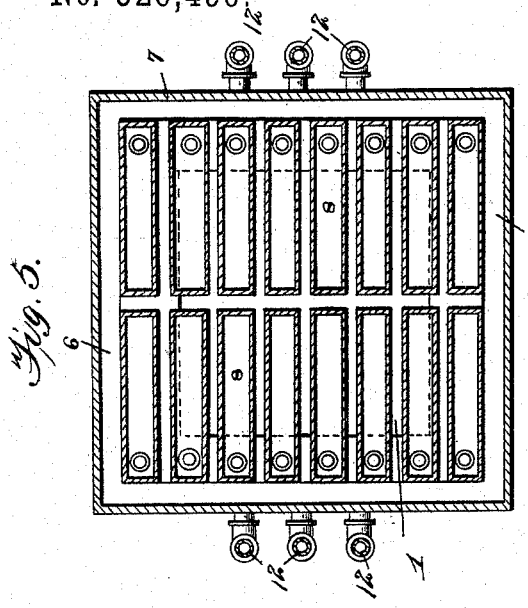

Fig. 3.

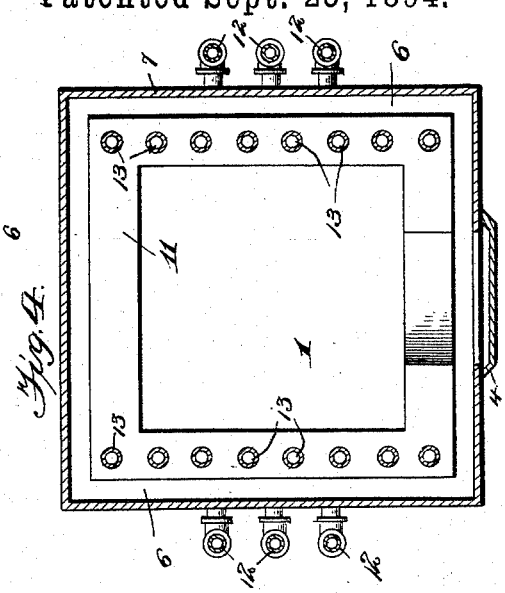

Fig. 4.

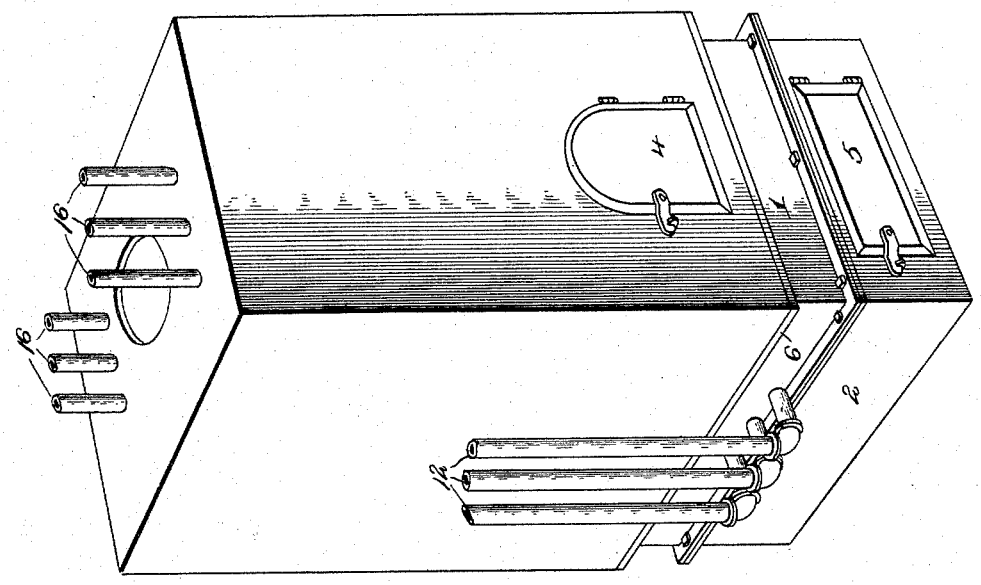

Fig. 1.

Inventor

James M. Laing,

Witnesses

By his Attorneys.

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

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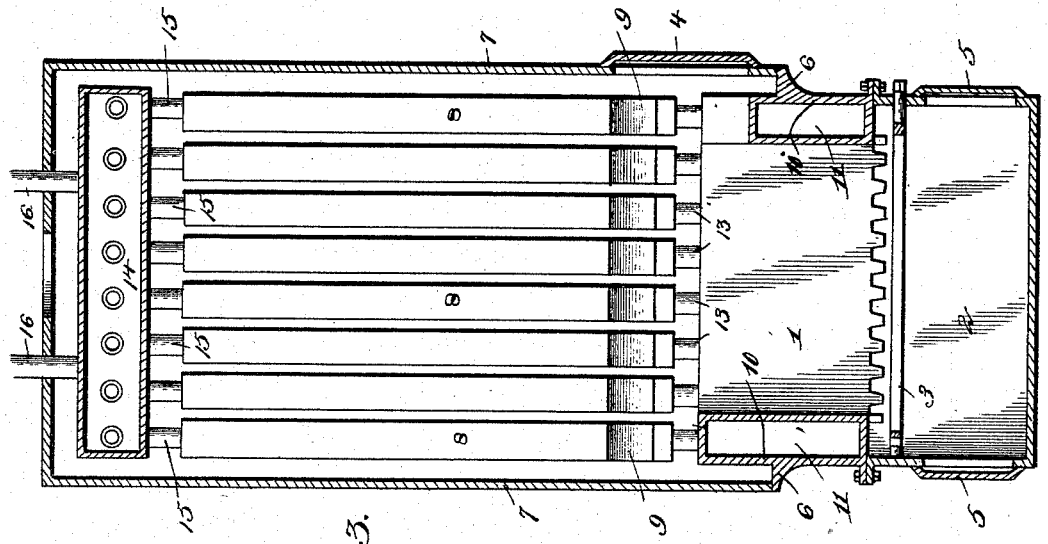

Fig. 3.

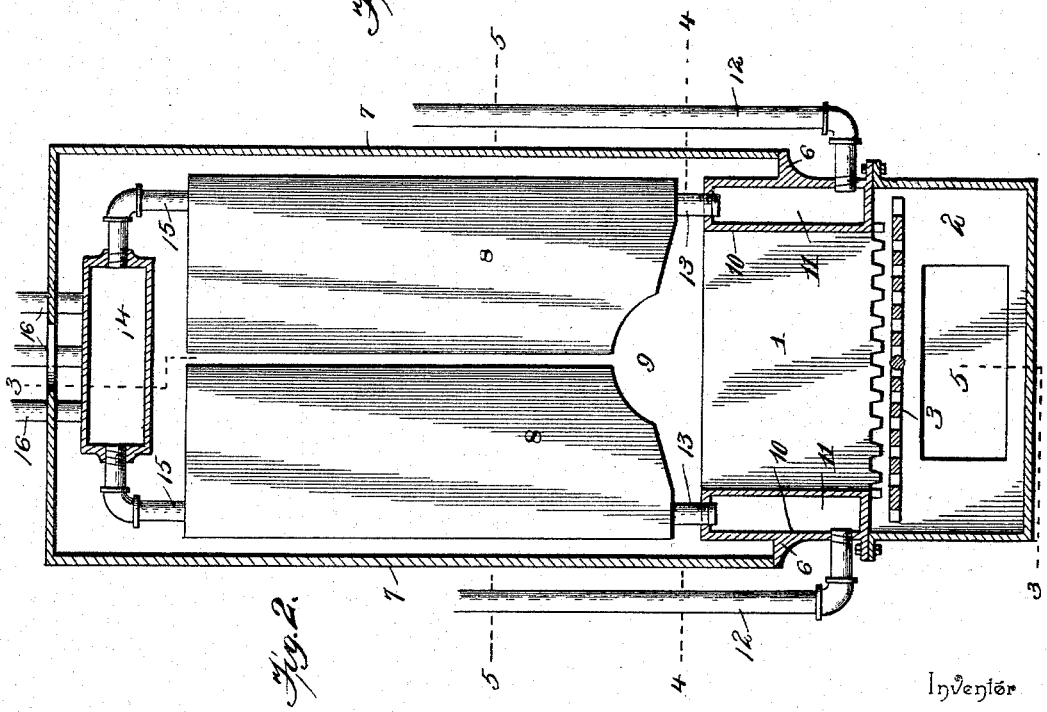

Fig. 2.

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UNITED STATES PATENT OFFICE.

JAMES M. LAING, OF BAY CITY, MICHIGAN.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 526,496, dated September 25, 1894.

Application filed April 18, 1894. Serial No. 508,015. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. LAING, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented a new and useful Water-Heater, of which the following is a specification.

My invention relates to water heaters, and has for its object to provide a heater with a maximum heating surface, whereby all of the heat produced by the fuel may be utilized to provide for a free circulation of the water through the various chambers composing the heater; and to provide means whereby the parts of the device may be readily disconnected and replaced without displacing the other members of the structure.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings: Figure 1 is a perspective view of a heater embodying my invention. Fig. 2 is a vertical central section of the same. Fig. 3 is a vertical section upon a plane at right angles to the plane of Fig. 2, as shown by the line 3—3 of Fig. 2. Fig. 4 is a horizontal section on the line 4—4 of Fig. 2. Fig. 5 is a similar view on the line 5—5 of Fig. 2.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates the fire-pot, 2 the subjacent ashpit, and 3 the interposed grate; the fire-pot being provided with a fuel-door 4 and the ash-pit with opposite similar doors 5, whereby access may be had thereto.

The fire-pot is provided with an outstanding lateral flange 6 which serves as a support for the casing or shell 7, and within this casing or shell is arranged a nest of heating boxes or chambers 8, which are out of contact with the containing casing or shell and with each other. In the construction illustrated in the drawings, these heating boxes or chambers are arranged in two parallel series, each containing eight boxes or chambers, and the horizontal sectional shape thereof is such that their outer narrow sides are in a common plane adjacent to the containing casing or shell. The bottoms of the heating boxes or chambers are inclined upward toward their inner sides, and are concaved or hollowed to form an intermediate space 9 in alignment with the fuel-door, before described.

The fire-pot is surrounded by a jacket 10 forming a water compartment 11, which is in communication with the inlet pipes 12, tapping the same at its opposite sides, and the superjacent heating boxes or compartments are severally in communication with the compartment 11 by means of the vertical conductors 13.

Arranged above, and spaced from the upper ends of the heating boxes or chambers, is a distributing chamber or reservoir 14, with which said boxes or chambers severally communicate by means of the connecting pipes 15. The outlet or distributing pipes 16 connect with the top of the distributing chamber or reservoir.

This being the construction of the improved heater, the operation thereof is as follows: The water descending through the inlet or supply pipes 12 enters the water jacket around the fire-box and after becoming partially heated ascends to the heating boxes or chambers to give place for water at a lower temperature. The water rises through the said boxes or chambers 8 until it reaches the superjacent distributing chamber or reservoir, from whence it passes to the point of use through the distributing pipes 16. The products of combustion rise from the fire-box and circulate freely between the heating boxes or chambers, in direct contact with their surfaces, all of which are exposed to the action thereof, and when said products reach the under surface of the distributing chamber they are spread and impart their remaining heat thereto.

By this construction all parts of the surfaces of the heating boxes or chambers are exposed to the action of the heat from the fire-box, and the narrowness of said boxes or chambers brings the water in contiguity with said surfaces, whereby the greater portion of the heat is utilized.

The construction, as will be obvious, is simple, and the independent arrangement of the boxes or chambers, and the fact that each box or chamber extends to the outside of the

series to which it belongs, facilitate the removal for cleaning or replacement of any box or chamber without disturbing the other members of the structure.

It will be understood, furthermore, that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim—

A water heater comprising a fire-box, a surrounding water jacket provided with an exterior lateral flange 6, a casing resting upon said flange, twin series of parallel spaced heating boxes or chambers 8 arranged vertically above the fire box with their outer sides flush with the outer walls of the water jacket, and their inner walls in proximity to each other, the lower ends of said boxes or chambers being rounded or concaved to form a space 9 communicating with the fire-box, a fuel door being arranged in the casing opposite one end of this space 9, pipes connecting the boxes or chambers severally with the water jacket, and in that pipe communicating with the water jacket, a distributing chamber or reservoir arranged above the plane of the upper ends of the heating boxes or chambers and adjacent to a central outlet opening in the top of the casing, pipes connecting said reservoir with the heating boxes or chambers, and distributing pipes communicating with the reservoir, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES M. LAING.

Witnesses:
GEO. REILLY,
GEO. E. CARROLL.