

(No Model.)

2 Sheets—Sheet 1.

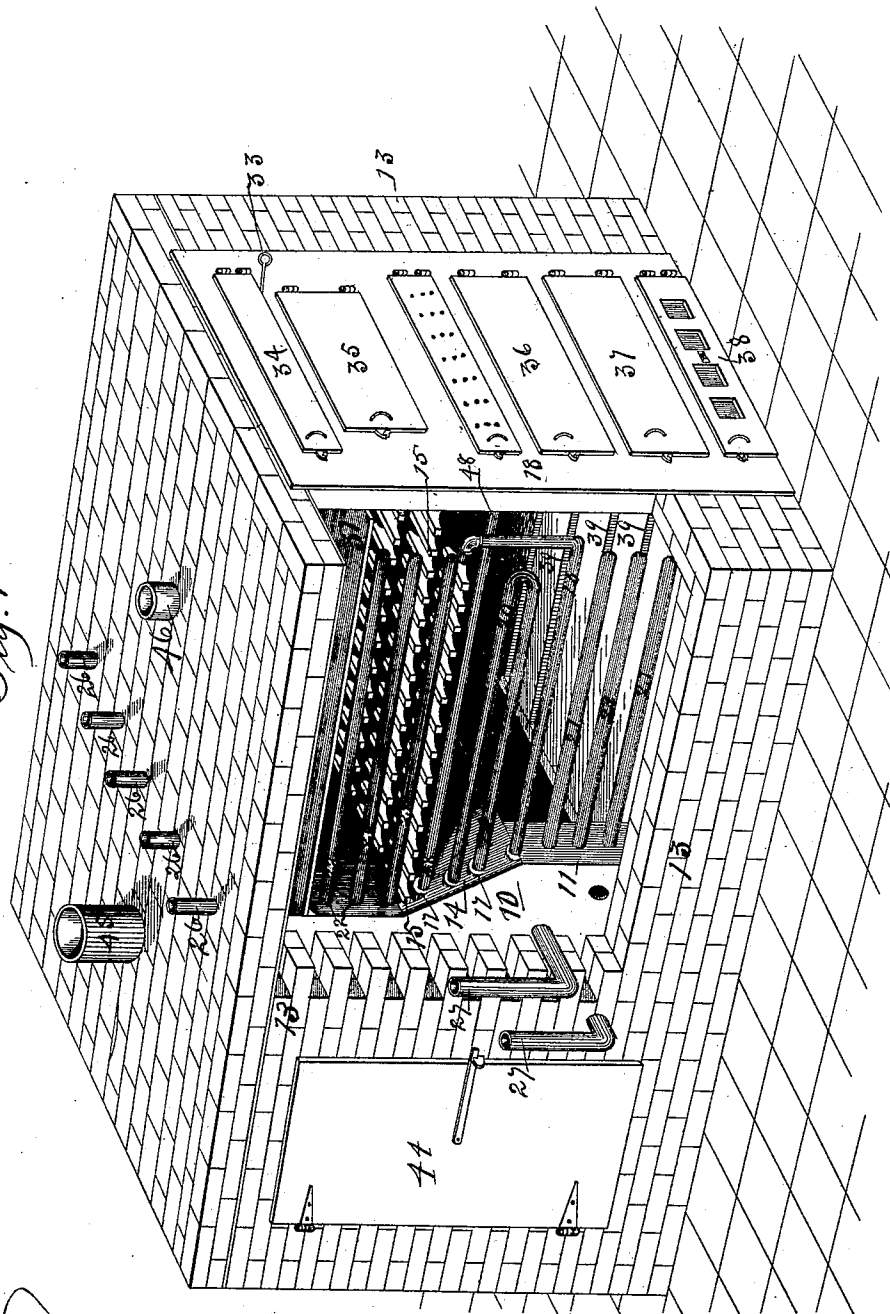
J. T. ROBBINS.

WATER HEATER FOR WARMING BUILDINGS.

No. 496,004.

Patented Apr. 25, 1893.

Fig. 1



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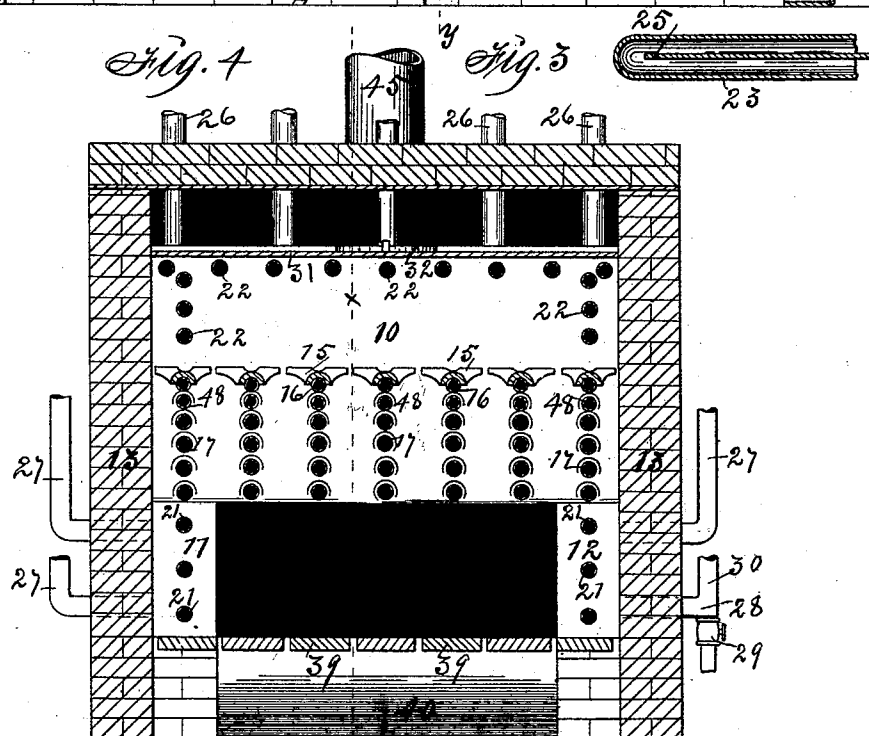
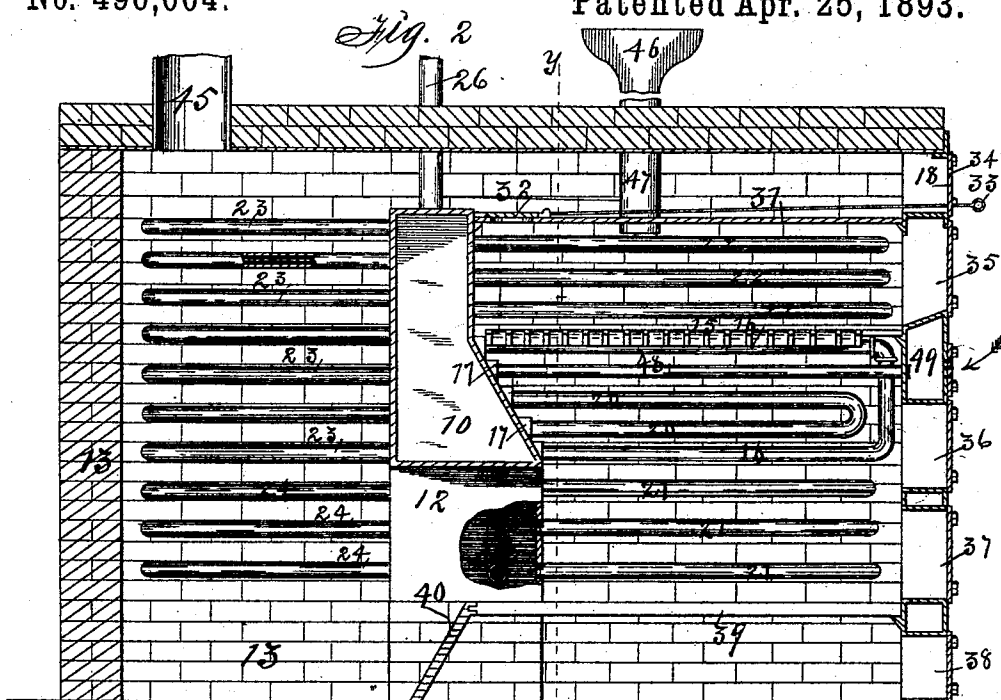
Inventor: Joseph T. Robbins.
By Thomas G. Orwig, Attorney.

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UNITED STATES PATENT OFFICE.

JOSEPH T. ROBBINS, OF NEWTON, IOWA.

WATER-HEATER FOR WARMING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 496,004, dated April 25, 1893.

Application filed February 20, 1892. Serial No. 422,213. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH T. ROBBINS, a citizen of the United States of America, residing at Newton, in the county of Jasper and State of Iowa, have invented a new and useful Water-Heater for Warming Buildings, of which the following is a specification.

My invention has for its object the provision of means, in a furnace, whereby the fuel is supported above the tubes, and the products of combustion are led downward therefrom around the said tubes beneath the water reservoir, and in escaping pass upward in the rear of the said reservoir and around other tubes, thus providing a sinuous path for the smoke and heat which insures the greatest heating efficiency at the least possible expense for fuel.

My invention consists in the arrangement and combination in a furnace, of a water reservoir, a plurality of water tubes having connection with and extending laterally from said reservoir, a fire grate located near the top and forward of the said reservoir, and a draft opening beneath and to the rear of the reservoir, through which draft opening the products of combustion escape to the draft flue.

My invention consists further in the details of construction and combination of parts hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawings, in which:

Figure 1 is a perspective view of the furnace, portions of the casing being broken away. Fig. 2 is a vertical longitudinal sectional view on the indicated line xx of Fig. 4, a portion of one of the water tubes being shown in section. Fig. 3 is an enlarged detail longitudinal sectional view of a portion of a water tube. Fig. 4 is a transverse vertical sectional view on the line $y-y$ of Fig. 3 looking toward the rear of the furnace.

In the construction of the furnace as shown the numeral 10 designates a reservoir supported on tubular legs 11, 12, within and transversely of a brick casing 13. A portion 14, of the front wall of the reservoir is inclined and fire grates 15 are located horizontally in the plane of the top side of the portion 14, the bars composing said grates being supported on coiled water tubes 16, the open rear ends

of which communicate with the said reservoir. The open ends of the coiled tubes 16, are inserted in screw-threaded lugs, 17, formed in the portion 14, of the reservoir and the body portion of said tubes is extended forward from the reservoir nearly to the front 18, of the furnace. Coiled water tubes 20 are secured to screw-threaded lugs in the portion 14 of the reservoir and are extended forward therefrom within and parallel to the coils formed by the tubes 16. Straight water tubes, 21, are fixed to the tubular reservoir legs 11, 12, and communicating with the interior thereof extend forward in horizontal planes nearly to the front of the furnace casing. Other water tubes 22, are fixed to and communicate with the reservoir and extend forward from said reservoir at points above and on either side of the grates 15. Other water tubes 23, and 24 are fixed to the rear side of the reservoir and tubular reservoir legs respectively, which latter tubes extend rearward from their points of attachment nearly to the rear wall of the furnace casing. Each of the water tubes 21, 22, 23, and 24 is provided with a horizontal longitudinal partition 25, (Fig. 3) which provides a free circulation of water through the tube. Education pipes 26, communicate with the top portion of the reservoir and are extended through the roof of the casing 13. Return pipes 27 lead through the side walls of the casing 13 and communicate with the boiler legs 11, 12. A feed pipe 28 is extended through the side wall of the casing 13 and communicates with the leg 12, of the boiler. A check valve 29, is mounted in the feed pipe 28 and controls the flow of water from the reservoir, by means of the pipe 30 the feed pipe may be used for a return pipe when the valve 29 is closed. A roof plate 31 is located between the top of the casing 13 and the grates 15, and is secured to the front wall of the boiler and also to the walls and front of the said casing. One or more of the tubes 22 may be used for conveying and vaporizing water under the plate 31. A draft opening in the rear portion of the plate 31, permits a direct draft from the grate, said opening being controlled by a sliding damper 32, manually operated by means of the damper rod, 33, which latter is extended through the

front 18. Access is had to the space above the plate 31, by way of the door 34. A fuel door 35, located in the front 18, provides communication with the grates 15. Access is had to the water tubes below the grates 15 through the doors 36, 37, and 38, which latter door may also be used when it is desired to remove ashes from the ash grates, 39 which are each fixed at one end to the front 18 and at the other end to the inclined partition 40, in the lower portion of the furnace. An ash pit is thus provided below the ash grates 39, to which entrance is had through the door 38. A register 42, in the door 35, provides a draft to aid in the combustion of the fuel. A register 43, is provided in the door 41, through which air is admitted to promote the combustion of the fuel falling on the lower grate 39. Access is had to the chamber and tubes in the rear of the reservoir through the door 44.

The numeral 45 designates a pipe adapted to be used as a smoke flue.

The numeral 46 designates a closet trap and 47 is a discharge pipe leading from said trap to the fire grates 15.

Air distributing tubes 48 extend forward from the reservoir 10 into a chamber 49 in the front wall.

In the practical operation of my invention the fuel being in process of combustion on the grates 15, the course of the air is downward through the grates 15, through the opening between the reservoir legs 11 and 12, upward among the tubes 23, 24, and thence out by way of the flue 45.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States therefor, is—

1. In a water heater furnace, the combination with a reservoir supported on downward extensions thereof adapted to serve as legs, of fire grates located near the top of said reservoir and a draft way beneath said reservoir through which latter the products of com-

bustion are led to a smoke flue, together with a casing within which the reservoir and grates are inclosed.

2. In a furnace for heating water, a water reservoir extending vertically between furnace walls, a grate extending horizontally forward from the top portion of said reservoir, water tubes extending forward from said reservoir in planes above the grate and water tubes extending forward from said reservoir in planes below said grate, and an opening provided in the lower portion of said water reservoir, all arranged and combined to operate in the manner set forth for the purposes stated.

3. In a furnace, a water reservoir having water-circulating tubes extending forward in horizontal planes, a grate extending forward between said water tubes at the upper portion of the reservoir, a grate extending forward below said water tubes, an opening extending rearward through said reservoir between the two grates, and water-circulating tubes extending rearward from said water reservoir for the purposes stated.

4. A reservoir furnace comprising an inclosing casing, a reservoir supported on legs within said casing, a fire grate located in the upper portion of said casing forward of said reservoir, water tubes communicating with and extending laterally from said reservoir an ash grate located in the lower portion of said casing, a roof plate above the said grate, a draft opening in said roof plate controlled by a manually operated damper, and a draft way below the said grate through which draft way the products of combustion pass downwardly and rearwardly to the smoke flue, together with means of ingress to the casing.

JOSEPH T. ROBBINS.

Witnesses:

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THOMAS G. ORWIG.