(No Model.) 2 Sheets—Sheet 1.

J. A. HOLLENBECK.

WATER HEATER.

No. 588,431. Patented Aug. 17, 1897.

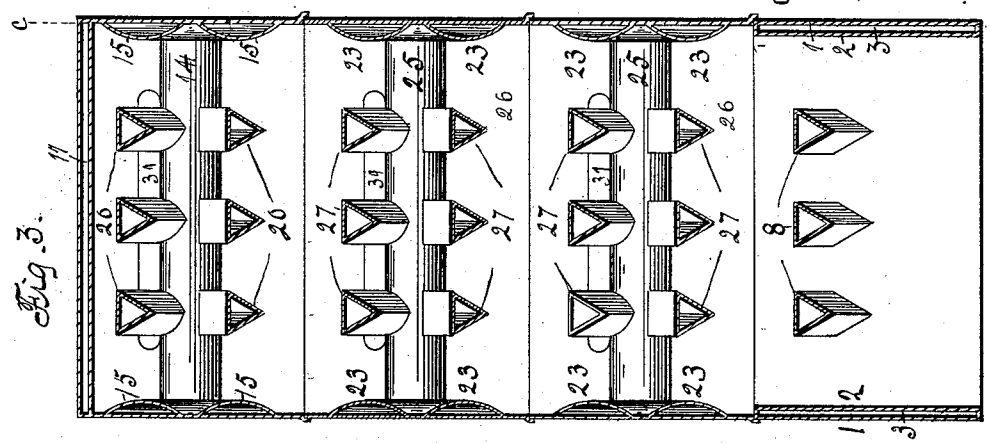


Fig. 3.

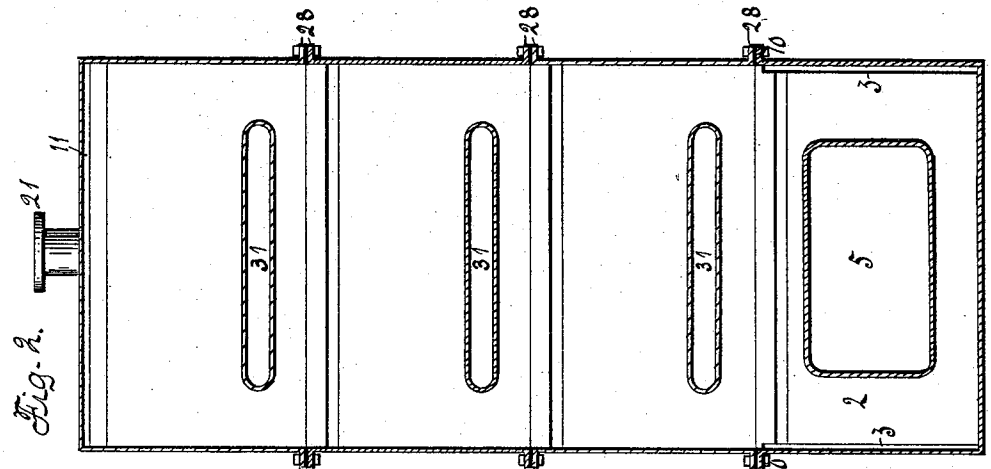


Fig. 2.

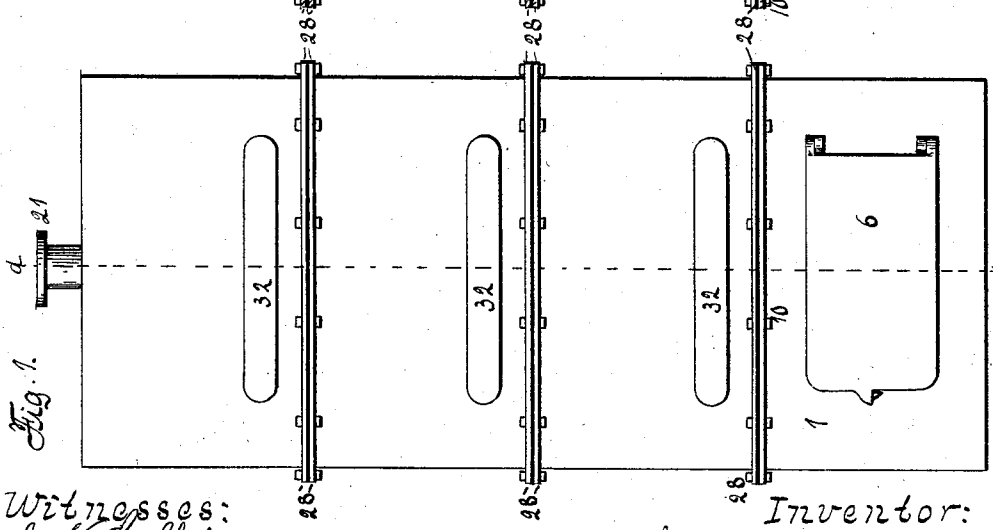


Fig. 1.

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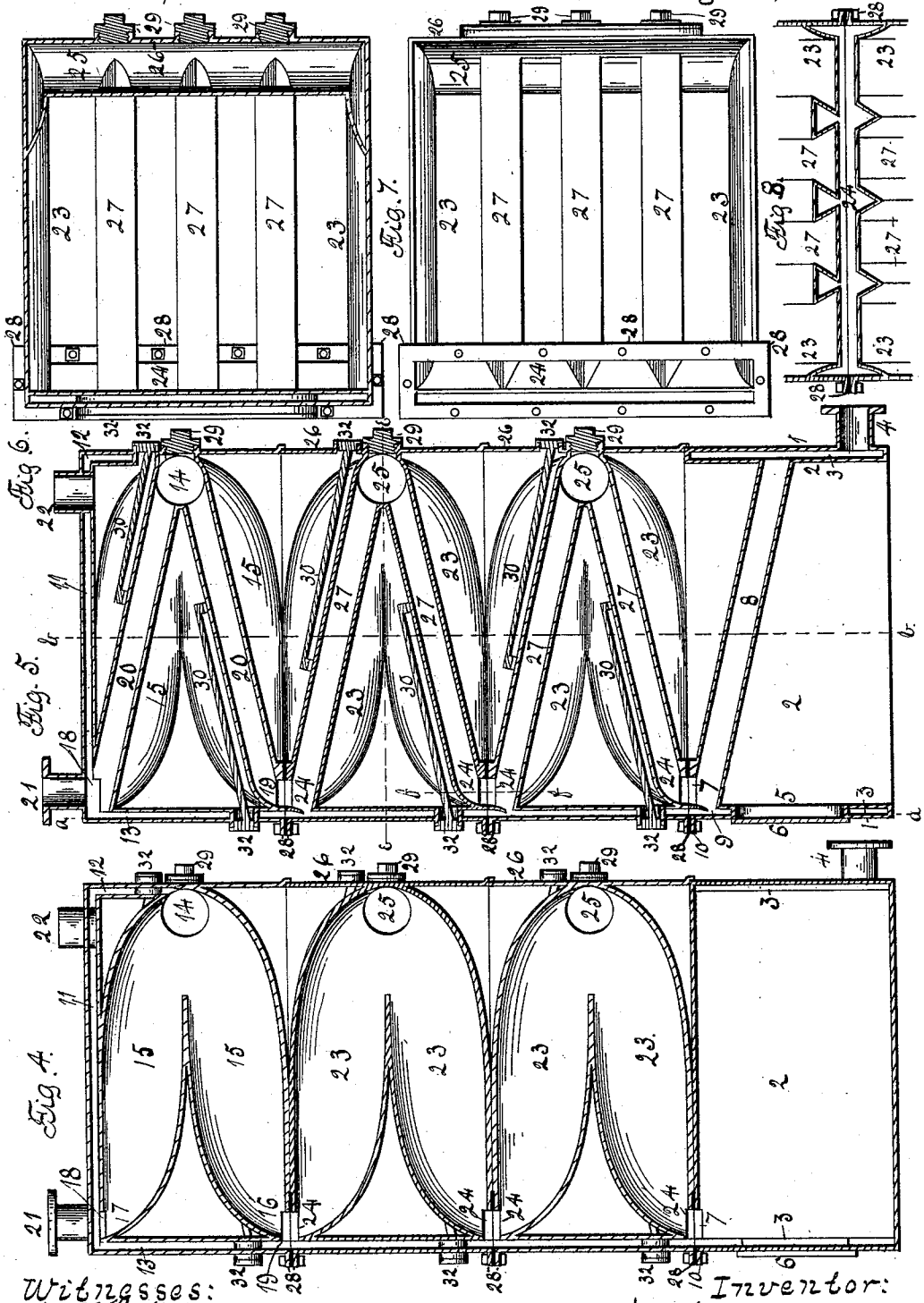
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(No Model.) 2 Sheets—Sheet 2.

J. A. HOLLENBECK.

WATER HEATER.

No. 588,431. Patented Aug. 17, 1897.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JACOB A. HOLLENBECK, OF ROCKFORD, ILLINOIS.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 588,431, dated August 17, 1897.

Application filed January 11, 1897. Serial No. 618,905. (No model.)

To all whom it may concern:

Be it known that I, JACOB A. HOLLENBECK, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

The object of this invention is to construct a water-heater of sections having an irregular water-passage and a return water-passage extending along the front of the heater and in the details of construction.

In the accompanying drawings, Figure 1 is a face elevation of my improved heater. Fig. 2 is a vertical section through the cold-water passage on dotted line *a*, Fig. 5. Fig. 3 is a vertical central section on dotted line *b*, Fig. 5. Fig. 4 is a vertical section on dotted line *c*, Fig. 3. Fig. 5 is a vertical lengthwise central section on dotted line *d*, Fig. 1. Fig. 6 is a horizontal section on dotted line *e*, Fig. 5. Fig. 7 is a plan view of one of the intermediate sections. Fig. 8 is a vertical section on dotted line *f*, Fig. 5.

The heater is composed of a bottom section comprising the fire-box, a top section, and one or more intermediate sections suitably joined together.

The bottom section has an outer wall 1 and an inner wall 2, joined together at the top and bottom, forming a water-space 3. A water-inlet 4 communicates with the water-space at the rear side of the section. An opening 5 is formed in the front of the section and closed by a door 6. The water-space of this section surrounds this opening. Near the front of this section is formed a horizontal water-space 7, communicating with the water-spaces at the sides of the section. A series of waterways 8 communicate with the water-space at the rear side of the lower section and extend diagonally upward toward the front of the section and communicate with the horizontal waterway 7, also with the water-space at the front of the section, through the opening 9, extending transversely of the section. A flange 10 extends across the front of the section a short distance on each side and in rear of the horizontal waterway 7. Holes are formed through this flange. This lower section is placed upon an ash-box supporting a grate, which are not shown in the drawings.

The top section is composed of a double top, forming a horizontal water-space 11, a portion of the rear end being double, forming a vertical water-space 12, the front being double, forming a vertical water-space 13. These three water-spaces communicate with each other. A tube 14 extends transversely of the section, about midway of its length and at its rear wall, the rear water-space 12 communicating therewith. Each of the side walls is provided with waterways 15, having an inlet-opening 16 near the front at its lower end and a discharge-opening 17 near the front at the top of the section, also communicating with the tube 14 at its ends. Two horizontal waterways 18 and 19 extend transversely of the section, the former at the upper end of the section and the latter at the lower end, the waterway 15 communicating with the top water-space 11 at its end, a series of waterways 20, connected at their lower ends with the horizontal water-space 19, extends diagonally upward and rearward and communicating with the tube 14, and from the tube they extend diagonally forward and upward and communicate with the horizontal waterway 18 and also with the vertical water-space 13 of this section. A water-discharge opening 21 communicates with the top water-space 11 of the top section, and a smoke pipe or outlet 22 extends through the top of the top section, communicating with the interior of the section.

Each intermediate section is substantially the same as the top section, with the exception of the top and rear water-spaces, each having the side waterways 23, top and bottom horizontal waterways 24, the tube 25, extending transversely of the section along its back wall 26, and the diagonally-extending waterways 27, communicating with the horizontal waterways 24 at their ends and at their center communicating with the tube 25. Each end of the intermediate section and the lower end of the top section has a flange 28, corresponding with the flange 10 of the bottom section, also having holes therethrough. One or more of these intermediate sections are placed upon the bottom section, and the top section

is placed upon the top intermediate section, and packing material corresponding to the shape of the flanges is placed between the flanges, and the flanges bolted together, as shown at Fig. 6.

The water being admitted through the opening 4 into the lower section will fill the water-spaces and waterways thereof and will pass through the meeting horizontal openings of the bottom and first intermediate section into the waterways, tube, and front outer space of the first intermediate section, thence through the other intermediate section and through the water-spaces and waterways of the top section and be discharged through the opening 21 in the top section, thus forming a water-circuit through the various sections of the heater, and fire being started in the lower section the heat and smoke will pass around the waterways and against the water-space of the different sections, imparting the required heat to the water, and the smoke will pass out through the outlet-opening 22.

It will be noticed that the sections are held together only at their front ends, which is a great saving of packing material and time in setting up the heater, also allowing expansion and contraction of the sections independently of each other, thereby preventing breaking of the parts.

An opening is formed in each of the tubes of the top and intermediate sections, which is closed by a screw-threaded plug 29, through which access may be had to the diagonally-extending waterways for the purpose of cleaning them.

Over the waterways of the top and intermediate sections is located a baffle-plate 30, which is inserted through an opening 31, formed in the front and rear walls of the sections, being connected to a cover 32 for the opening, as shown at Fig. 5, these baffle-plates being omitted in some views to more clearly show the construction of the other parts. These baffle-plates prevent a direct draft of the heat through the chamber.

It will be noticed that the series of waterways are triangular in cross-section, the point being placed downward in order that greater heating-surface may be presented to the fire.

The front of each section being formed with vertical waterways and openings from each section into this waterway if the water is not of the required temperature to pass to the radiators it will pass down this vertical waterway to be heated to the proper temperature.

I claim as my invention—

1. In a water-heater, the combination of a series of sections each formed with a vertical waterway extending along one side and communicating with each other and of waterways extending in a diagonally-upward direction, the sections joined together only at that portion having the vertical waterways.

2. In a water-heater, the combination of a series of sections suitably joined together, each section having a front vertical waterway communicating with the sections above and below, the top and intermediate sections provided with a tube at their rear walls, and waterways communicating with the tube and with the waterways of the sections above and below it.

3. In a water-heater, the combination of a series of sections suitably joined together, the top and intermediate sections provided with waterways extending from the front lower end to the rear and returning to the front upper end and an opening at the rear end for cleaning the ways.

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Witnesses:
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