

(No Model.)

4 Sheets—Sheet 1.

A. BURT.
HOT WATER BOILER.

No. 532,139.

Patented Jan. 8, 1895.

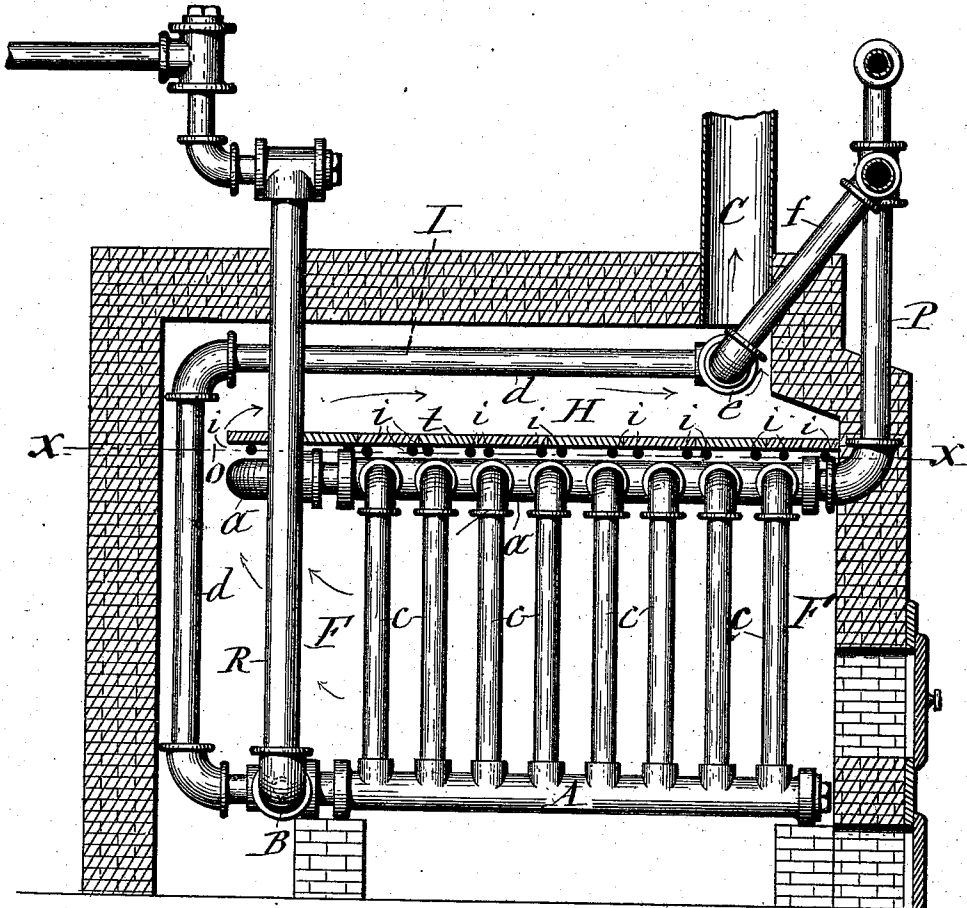


Fig. 1

WITNESSES:

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INVENTOR:

Albert Burt
By E. L. Luss
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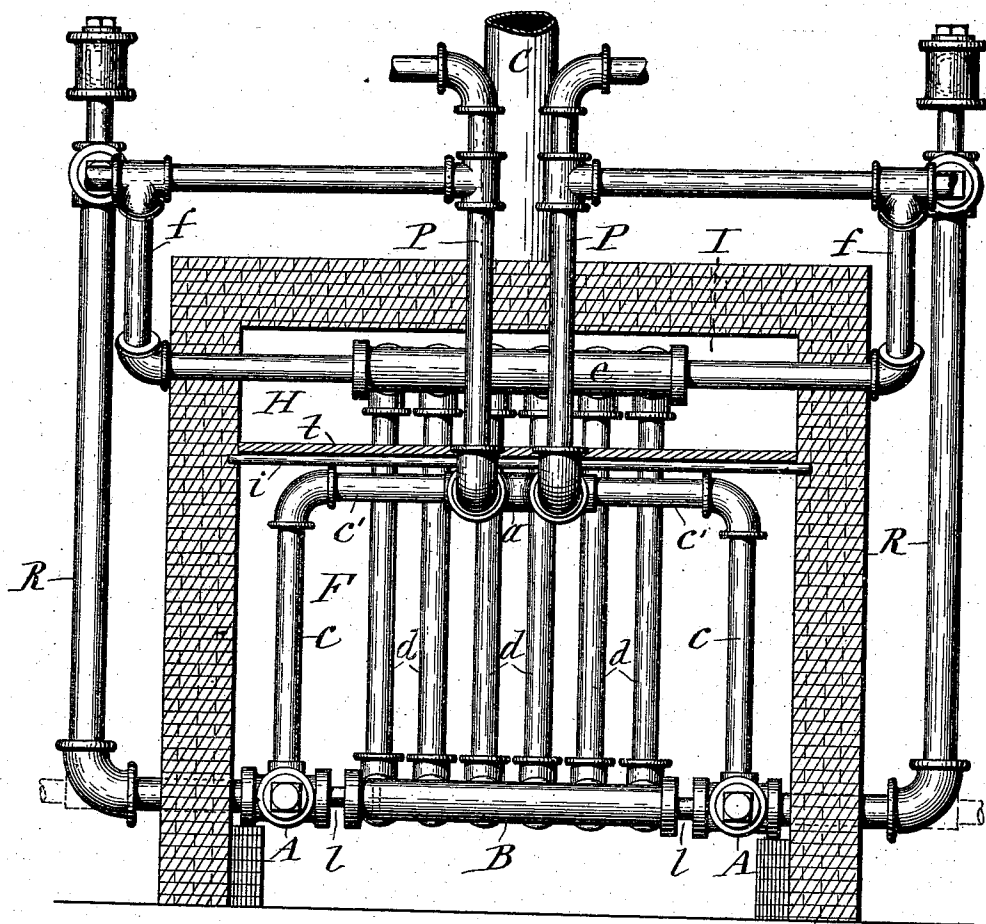


Fig. 2

WITNESSES:

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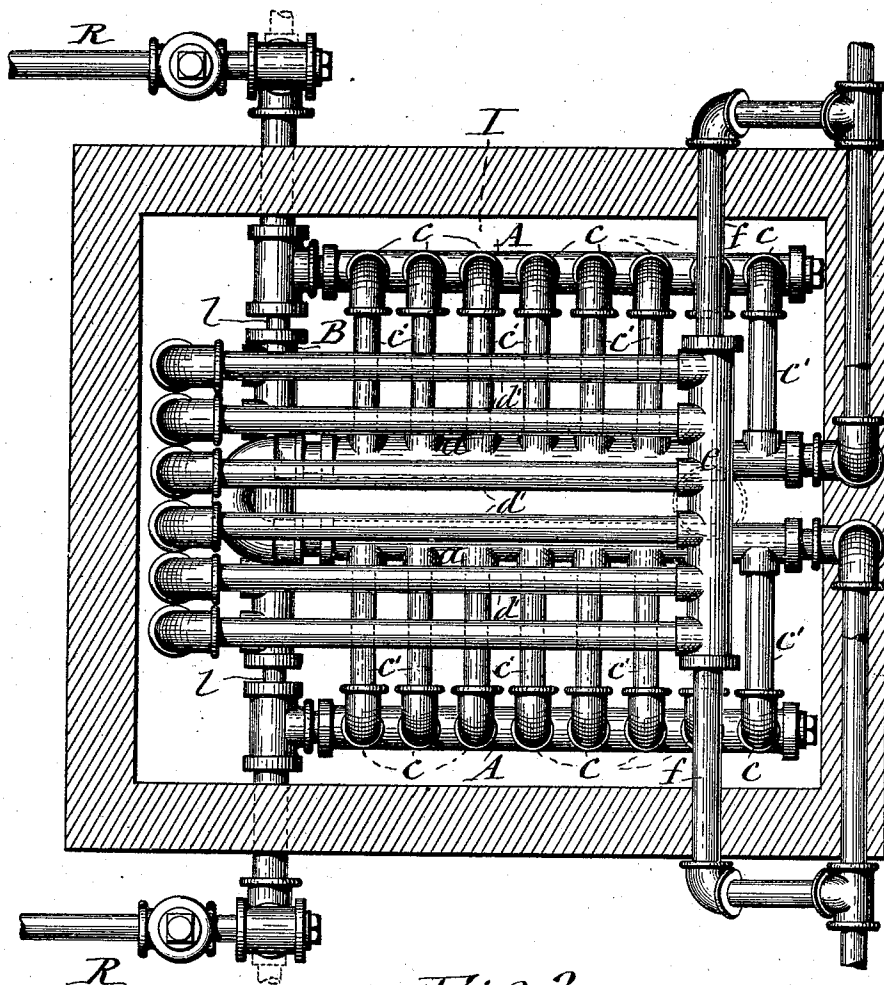


Fig. 3

WITNESSES:

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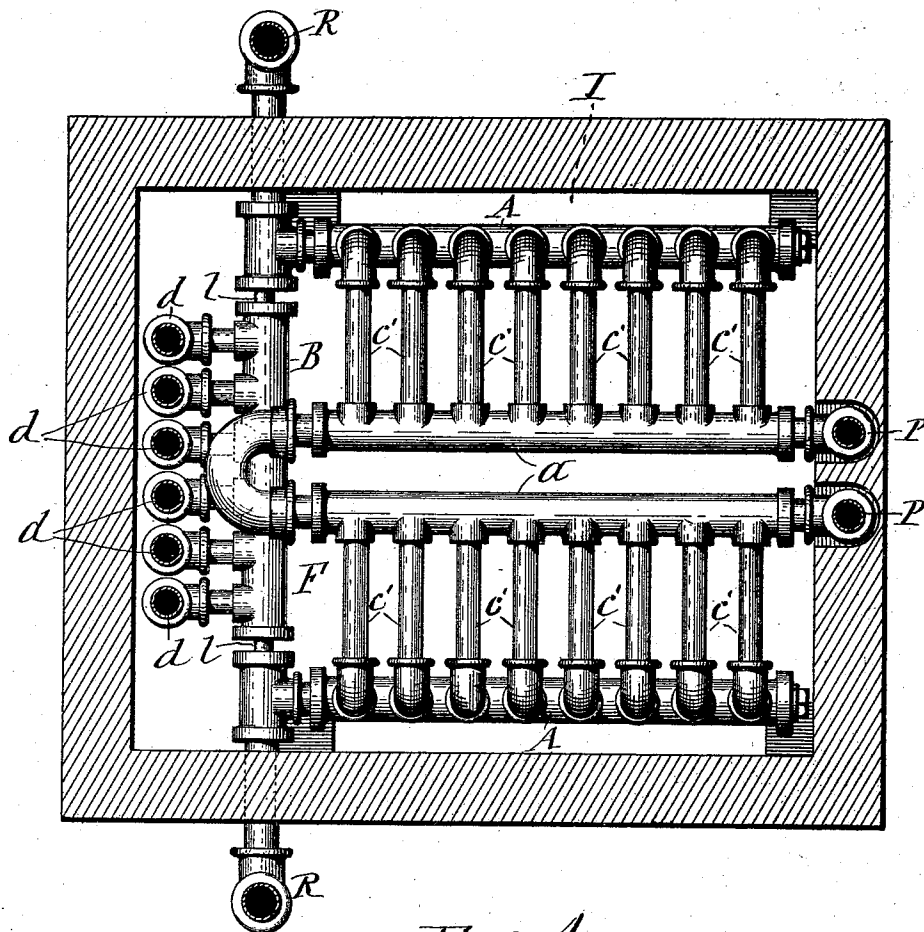


Fig. 4

WITNESSES:

C. E. Robinson,
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INVENTOR:

Albert Burt
By E. L. Lass
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UNITED STATES PATENT OFFICE.

ALBERT BURT, OF SYRACUSE, NEW YORK, ASSIGNOR TO ANNA J. BURT,
OF SAME PLACE.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 532,139, dated January 8, 1895.

Application filed March 19, 1894. Serial No. 504,128. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BURT, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful
5 Improvements in Hot-Water Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of hot
10 water boilers which are composed of pipes arranged in a combustion chamber and containing water to be heated.

The invention consists in an improved combination of said water-heating pipes which
15 are surrounded by the products of combustion so as to become more effectually heated thereby and permit free circulation of the water through them.

The invention also consists in the combination with the combustion chamber and the fire-box having its crown composed of a series of water pipes, of a fire-proof floor over said
20 pipes forming a flue for the products of combustion in the upper part of the combustion chamber.

The invention furthermore consists in the combination with the aforesaid combustion chamber and fire-box having its crown composed of a series of horizontal water pipes, of
25 an additional series of water pipes above said crown, and a fire-proof floor between the two series of pipes forming a return flue for the products of combustion all as hereinafter more fully described and specifically set forth
30 in the claims.

In the annexed drawings Figure 1 is a side elevation of a boiler embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a top plan view and Fig. 4 is a horizontal transverse section on line —X—X—
35 in Fig. 1, the combustion chamber or walls inclosing the boiler being shown in section in each of said figures.

Similar letters of reference indicate corresponding parts.

—I— represents the combustion chamber which is provided with the smoke-exit pipe
—C— at the top of its front end.

—F— denotes the fire-box which is composed of the headers —A—A— extending
40 along opposite sides of the base of the fire-

box and united with the header —B— extending across the rear end of the fire-box. From the side-headers —A—A— rise the two rows of pipes —c—c— forming the sides of the
55 fire-box, and from the upper ends of said pipes extend horizontally two rows of pipes —c'—c'— partway across the top of the fire-box and connected to the loop —a— which is disposed with its limbs in a horizontal plane
60 and lengthwise over the central portion of the fire-box to conduct in said direction the water collected in the loop —a— from the aforesaid pipes, said horizontal pipes and loop forming the crown of the fire-box.

—R—R— represent the pipes which return the water, after its circulation through the radiators in the compartments of the building to be heated, back to the heating pipes. Said return pipes are connected to opposite
70 ends of the header —B— from whence the water flows into the headers —A—A— and thence through the pipes —c— and —c'— to the loop —a—, and in this circulation the water becomes effectually heated by the products of combustion impinging the said pipes
75 and loop. From the two ends of said loop, extend upward the hot-water distributing pipes —P—P— from whence the hot water is conducted by suitable pipes to the radiators
80 in the compartments to be heated.

The heating capacity of the boiler I have further augmented by connecting to the rear head —B— a series of vertical pipes —d—d—
85 which extend to an elevation some distance above the pipes —c'—c'— and form the back of the fire-box —F—. From the upper ends of the pipes —d—d— extend forward the pipes —d'—d'—, the front ends of which are connected to a header —e— which extends
90 across the combustion chamber. To opposite ends of this header are attached the pipes —f—f— which extend upward and are connected to the pipes —P—P— so as to communicate therewith.

In order to insure the flow of a portion of the return water to the side headers —A—A—, I partly choke the connection of the pipes
—R—R— with the back-head —B— between said header and side-headers —A—A— as
100 shown at —l—l—.

I further increase the efficiency of the boiler

by forming the return flue —H— between the two sets of pipes —c'— and —d'— by extending across the combustion chamber immediately over the pipes —c'— and loop —a—, the metallic rods —i—i— and placing thereon a tile floor —t— which extends from the front end of the interior of the combustion chamber to within a short distance from the rear end thereof leaving thereat an opening —o— to allow the products of combustion to pass from the fire-box —F— into the return flue —H— which conducts said products of combustion to the exit-pipe —C— on the front end as indicated by arrows in Fig. 1 of the drawings. By this tortuous passage the escape of the products of combustion is retarded and the pipes in the combustion chamber are more effectually heated.

Having described my invention, what I claim is—

1. The combination of the headers —A—A— and —B— extending along the sides and rear end of the base of the fire-box, the return-pipes —R— communicating with said headers, the two rows of pipes —c—c—c— rising from the side-header, the transverse pipes —c'—c'—c'— extending from the upper ends of said vertical pipes part-way across the top of the fire-box, the loop —a— disposed with its limbs in a horizontal plane and lengthwise over the central portion of the fire-box and connected to the two rows of transverse pipes to collect the water from the sides of the fire-box and conduct said water lengthwise over the center of the fire-box, the pipes —P—P— extending upward from the ends of the loop, the series of pipes —d—d— extending from the back-header to an elevation above the loop —a—, the pipes —d'—d'— extending from the upper ends of the pipes —d—d— to the front end of the combustion chamber, the header —e— extending across the combustion chamber and connected to the ends of the pipes —d'—d'—, and pipes —f—f— extending from the ends of the latter header to the pipes —P—P— as set forth.

2. In combination with the combustion-chamber and fire-box having its crown composed of a series of water-containing pipes, a fire-proof floor over said pipes forming a flue for the products of combustion in the upper part of said combustion chamber as set forth.

3. In combination with the combustion-chamber having its exit-pipe at the top of its front end, and the fire-box having its crown composed of a series of water-containing pipes, a fire-proof floor over said pipes extending from the front end of the combustion-chamber partway toward the rear end thereof and forming the return flue —H—, substantially as set forth and shown.

4. In combination with the combustion-chamber having its exit-pipe —C— at the top of its front end and the fire-box having its crown composed of horizontal pipes, the rods —i—i— extending across the combustion chamber above the aforesaid pipes, tile-floor —t— supported on said rods and extending from the front end of the combustion-chamber partway toward the rear end thereof substantially as set forth and shown.

5. In combination with the combustion-chamber —I— and fire-box —F—, the headers —A—A— and —B— extending along the sides and rear end of the base of the fire-box, the return pipes, —R— communicating with said headers, the two rows of pipes —c—c—c— rising from the side-headers, the transverse pipes —c'—c'—c'— extending from the upper ends of said vertical pipes, partway across the top of the fire-box, the loop —a— disposed with its limbs in a horizontal plane and lengthwise over the central portion of the fire-box and connected to the pipes —c'—c'—, the pipes —P—P— extending upward from the ends of the loop, the pipes —d—d— extending from the back-header —B— to an elevation above the aforesaid loop, the pipes —d'—d'— extending from the upper ends of the pipes —d—d— to the front end of the combustion-chamber, and communicating with the pipes —P—P—, and the tile-floor —t— over the aforesaid loop —a— and transverse pipes —c'—c'— and extending from the front end of the combustion-chamber partway toward the rear end thereof and forming the return flue —H— substantially as set forth and shown.

In testimony whereof I have hereunto signed my name this 10th day of March, 1894.

ALBERT BURT. [L. S.]

Witnesses:

J. J. LAASS,

C. L. BENDIXON.