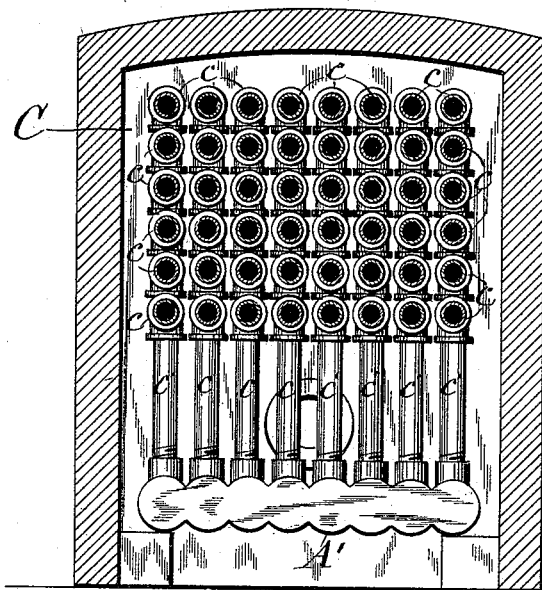
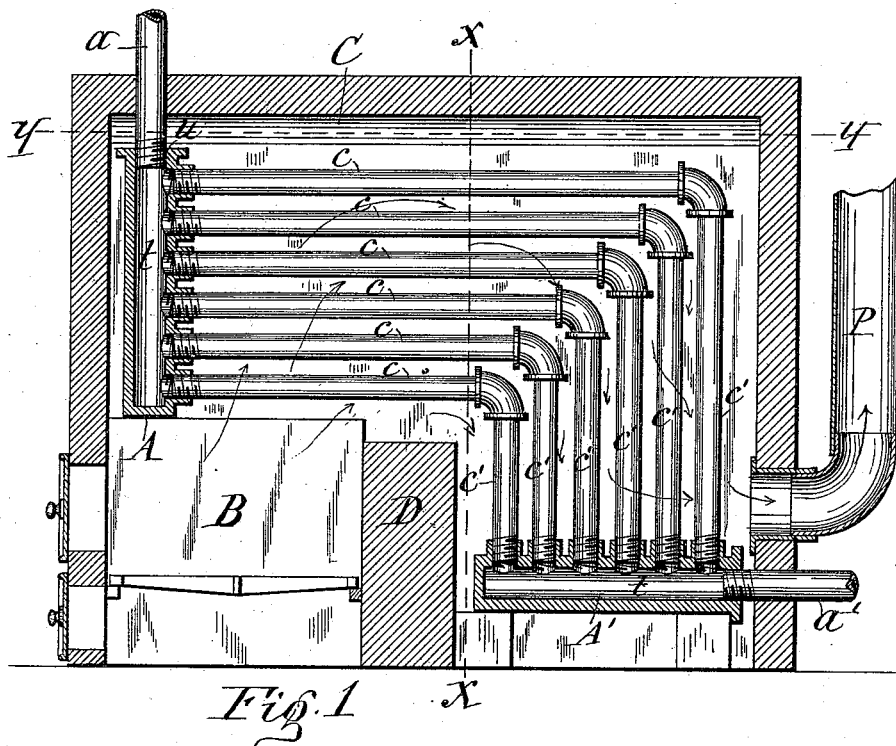


D. MUNSON.
HOT WATER BOILER.

No. 523,860.

Patented July 31, 1894.



WITNESSES:

C. L. Bendixon
J. J. Laass

Fig. 2

INVENTOR:

Daniel Munson
By C. Laass
his ATTORNEY

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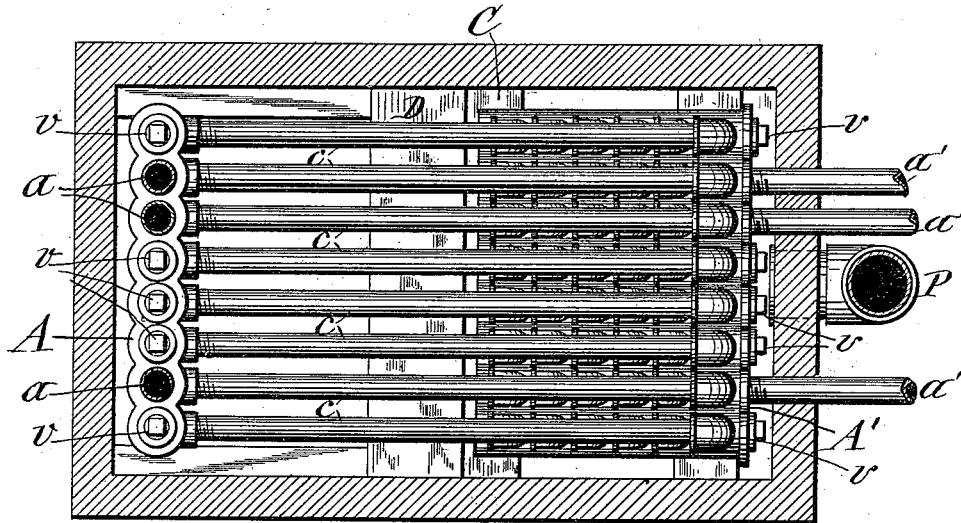


Fig. 3

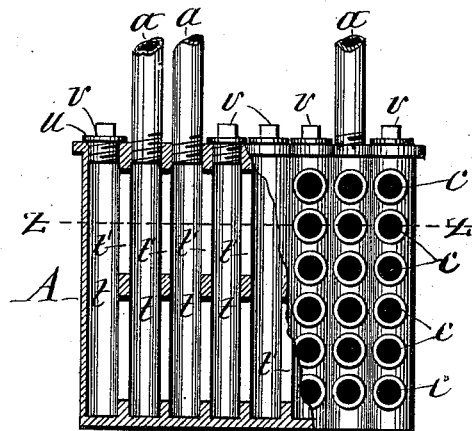


Fig. 4

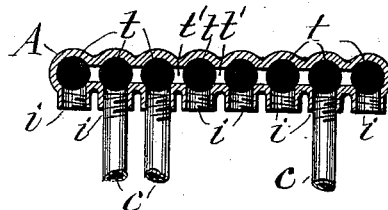


Fig. 5

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his ATTORNEY

UNITED STATES PATENT OFFICE.

DANIEL MUNSON, OF SYRACUSE, NEW YORK.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 523,860, dated July 31, 1894.

Application filed March 12, 1894. Serial No. 503,221. (No model.)

To all whom it may concern:

Be it known that I, DANIEL MUNSON, 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 is designed chiefly for heating
10 ing water to be circulated through radiators located in the apartments of a building to be heated.

The invention consists first in an improved organization of the species of boilers which
15 have a series of water-heating pipes which extend horizontally from a header at the front of the combustion chamber toward the rear, and thence downward to another header in the rear lower part of the combustion chamber.

20 My said improvements embodying a novel construction of the headers of the boiler and disposition of said headers in relation to the fire-box and smoke-exit-pipe, whereby a hot water receiving and mixing chamber is exposed directly to the products of combustion
25 over the fire-box and presents a broad straight continuous wall across the front of the combustion chamber, said header is thus effectually impinged by the fire and protects the
30 front wall proper of the combustion chamber from the heat. The hot water-distributing pipe or pipes are attached directly to said header and thus promotes the circulation of the water through the boiler by the rapid expansion of the water in said header and free
35 escape of the heated and expanded water from the same, while the header at the opposite end of the boiler consists of a chamber forming a solid partition horizontally across
40 the rear end of the combustion chamber beneath the smoke-exit located in the rear wall of the combustion chamber. The bottom of this latter header is thus isolated from the products of combustion and therefore maintained comparatively cool, which materially
45 facilitates the influx of the return water from the radiators. The two headers thus constructed and arranged in relation to the combustion chamber and smoke-exit pipe materially increase the efficiency of the boiler
50 designed to heat water to be distributed to radiators located in the apartments of the build-

ing to be heated, all as hereinafter more fully described and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a vertical longitudinal section of a boiler embodying my invention. Fig. 2 is a vertical transverse section on line—X—X—in Fig. 1. Fig. 3 is a horizontal transverse section on line
—Y—Y—in Fig. 1. Fig. 4 is a detached face view of one of the heads of the boiler, a portion of one of its broad sides being broken away to show the internal construction of said head and Fig. 5 is a transverse section on
55 line —Z—Z— in Fig. 4.

Similar letters of reference indicate corresponding parts.

—C— represents the combustion chamber which incloses the boiler, —B— denotes the
70 fire-box which is separated from the rear portion of the combustion chamber by the bridge-wall —D— and —c—c'— represents the series of water-heating pipes which extend horizontally from the upper part of the combustion
75 chamber —C— rearward and thence downward to the lower rear portion of the same and are connected at opposite ends to the headers —A—A'—.

In order to more effectually promote the
80 circulation of the water through the boiler and increase the efficiency of the boiler, I form each of said headers of a row of tubes —t—t— united by solid continuous walls and with
85 ports —t'—t'— in their adjacent sides to permit fire communication between said tubes and free circulation of the water throughout the header. Said headers are thus made to constitute perfect partitions across the interior of the combustion chamber. The walls
90 of the headers are corrugated to conform to the contour of the interior of the joined tubes —t—t— and thus increase the heating surface of the headers.

The header —A— I place directly over the
95 front portion of the fire-box —B— so as to cause said header to be impinged by the fire and thus effectually heat the water contained in the header. The pipes —a— which conduct the heated water to the radiators in the
100 apartment of the building to be heated, I attach directly to the top of said header.

The rear header —A'— is extended horizontally across the lower portion of the com-

bustion chamber and the smoke-exit pipe —P— is connected to the rear wall of the combustion chamber immediately above the said header and thus isolates the bottom of header 5 from the products of combustion and maintains said header comparatively cool.

The water return pipe or pipes —a'— are connected to the header —A'— and by keeping the latter much cooler than the main portion of the boiler, the influx of the return water to said header is facilitated. 10

In the operation of the boiler, the return water becomes thoroughly distributed throughout the header —A'— so that all the pipes 15 —c—c'— are equally charged with the water which by the rapid expansion of the water in the front header —A—, is caused to rapidly pass from the cooler rear head —A'— through the pipes —c—c'— to the header —A— in 20 which the water becomes thoroughly mixed while further heated and is thence distributed to the radiators by the pipe or pipes —a—.

In order to permit the boiler to be adjusted for supplying an increased number of radiators when desired, I form each of the tubes 25 —t—t— of the headers with a screw-threaded orifice —u— for the attachment of either a screw-threaded plug —v— or a pipe —a—.

—i—i— represent screw-threaded nipples 30 for the attachment of the pipes —c—c'—.

What I claim as my invention is—

1. In combination with the combustion chamber —C—, fire-box —B— and pipes —c—c'— arranged as shown, the hot water receiving and mixing header —A— and return 35

water receiving header —A'— consisting of hollow partitions formed with continuous solid walls and disposed respectively vertically directly over the fire-box to be exposed to the fire and extending across the combustion chamber and horizontally across the 40 lower portion of the rear of the fire-box, and the exit-pipe —P— extending from the rear wall of the combustion chamber immediately above the rear header and isolating the bottom of said header from the products of combustion each of said headers being provided with a plurality of orifices for attaching thereto more or less removable plugs and hot water distributing pipes and cold water return pipes and thus permit the said boiler to 45 be adapted for heating directly more or less radiators as set forth. 50

2. In combination with the combustion chamber —C— and pipes —c—c'—, the headers —A—A'— each cast in one piece and consisting of a row of tubes —t—t— united by solid continuous walls and provided with communicating ports —t'—t'— in their adjacent sides and with screw-threaded orifices 55 —u—u— in the ends of the tubes for the attachment of either plugs or pipes substantially as described and shown. 60

In testimony whereof I have hereunto signed my name this 7th day of March, 1894. 65

DANIEL MUNSON. [L. S.]

Witnesses:

JOHN J. LAASS,

C. L. BENDIXON.