

No. 895,565.

PATENTED AUG. 11, 1908.

J. HOUSER.
AUXILIARY WATER HEATER.
APPLICATION FILED JUNE 3, 1907.

Fig. 1.

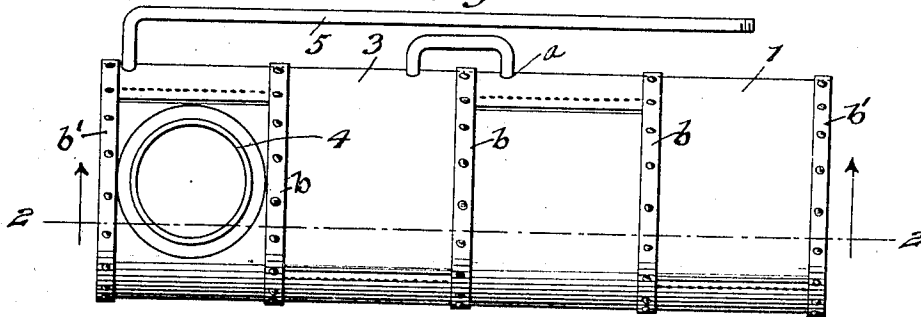


Fig. 2.

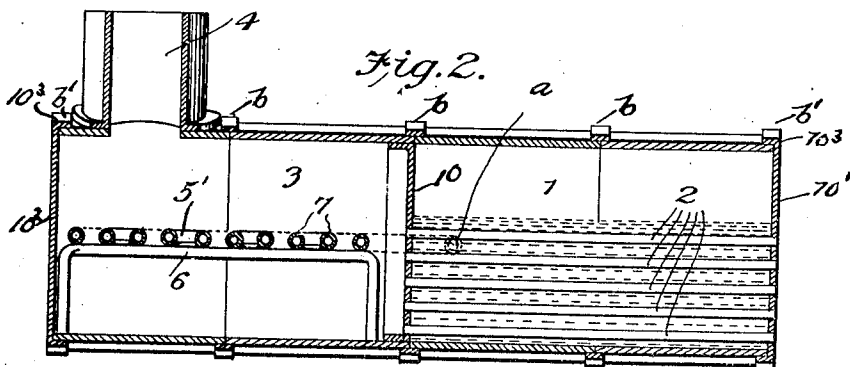
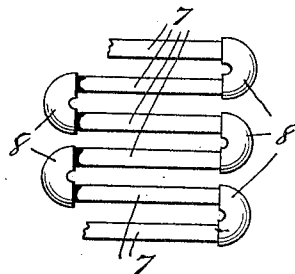


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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AUXILIARY WATER-HEATER.

No. 895,565.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed June 3, 1907. Serial No. 376,994.

To all whom it may concern:

Be it known that I, JACOB HOUSER, a citizen of the United States, residing at Medford, in the county of Grant, Oklahoma, have
5 invented certain new and useful Improvements in Auxiliary Water-Heaters for Steam-Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled
10 in the art to which it appertains to make and use the same.

My invention has relation to water heaters for steam boilers, and it consists in the construction and arrangement of parts, as
15 will be hereinafter described and particularly pointed out in the claim.

In the accompanying drawings,—Figure 1 is a plan view of a boiler provided with my auxiliary water heater; Fig. 2 is a longitudinal sectional view cut on the line 2—2 of
20 Fig. 1 looking in the direction indicated by the arrows; Fig. 3 is a detail view of a slightly modified form of the water heater, showing its intermediate portion built up of
25 a number of hollow tubes connected at adjacent ends by return couplings.

As shown in the drawings, the numerals 1, 2, 3 and 4 indicate respectively the water chamber, heat flues, and smoke box and
30 stack of a stationary steam boiler.

5 indicates the auxiliary water heater which is preferably made from one continuous piece of hollow tubing communicating at one end with the water chamber of the boiler
35 extending forwardly on the outside of the same to a point near the inner end of the smoke box through which its intermediate portion 5' extends in a zigzag form or fashion. One end of the latter formation of said
40 tube is connected to the boiler, as at *a*, the opposite end thereof being bent back and forth laterally in opposite directions with respect to the axis of the boiler to form a plurality of parallel tubes, the free end of said
45 heater extending out of the front end of the smoke box and thence rearwardly along the outside of the boiler so that it may be connected with a source of water supply when it is desirable to replenish the supply of
50 water in the boiler. An upright support 6 of preferably inverted U-shaped form is arranged in and longitudinally of the smoke box under the water heater to support or maintain it in position.

Should I find it desirable in the construction and application of the invention I may

build up the intermediate portion of the heater, or in other words, that portion extending through the smoke box of the boiler of a number of hollow pipes or tubes 7 connected at their adjacent ends by return
60 couplings 8. This method of building up the intermediate portion of the heater enables it to be applied with greater facility in position. The intermediate or zigzag portion of the
65 heater being arranged in the smoke box or in any other suitable position whereby it is subjected to the heating action of the products of combustion from the furnace, is maintained at a high degree of temperature as long
70 as there is fire in the furnace. When it becomes necessary to replenish the supply of water in the boiler the free end of the heater is connected with the source of water supply and the water caused to pass through the
75 entire length of the heater before passing into the water chamber of the boiler.

By employing my improved auxiliary heater in connection with a steam boiler the products of combustion are utilized twice in
80 raising the water to the required degree of temperature, and it necessarily follows that the fuel consumption is reduced to a minimum.

While I have shown and described my improved auxiliary heater in connection with a stationary steam boiler, I have done so merely for the sake of this specification, as it may be applied to a locomotive or any other
85 steam boiler.

I wish it to be understood that my boiler is constructed in sections and at the joints of each section is provided bands *b*, arranged on the outside of said joints of the sections and bolted thereto so as to provide means
90 for securing said sections together, the front and rear plates 10' and 10², respectively, of the heating and smoke chamber are flanged as at 10³ so as to overlap the ends of the said heating and smoke chambers, said flanges
95 being also provided with bands *b'*, which are bolted thereto and to the flanges of the plates, and to ends of the heating and smoke chambers. Between the heating and smoke chambers I provide a perforated flanged
100 partition 10, which reinforces the meeting ends of the water and smoke chambers and also serves to support the inner ends of the heat flues 2 in said perforations, the outer ends of these flues being secured to perforations formed in the rear plate 10' of the
105 heating chamber.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

5 A structure of the character described comprising sectional heating and smoke chambers, an auxiliary water heater composed of a series of pipes located in the smoke chamber having a support for the same, an inlet pipe secured to the end of one
10 of said pipes, and an outlet pipe secured to the end of another of said pipes, said sections of heating and smoke chambers having their meeting ends secured together by hands, the outer ends of the heating and
15 smoke chambers being provided with flanged plates which overlap said ends and having bands bolted thereto and to said ends of the water and smoke chambers, the plate of the water chamber being perforated, a perfo-

rated flanged partition secured to the inner
20 surface of the water and smoke chambers therein provided with perforations, said partition serving to reinforce the water and smoke chambers and also serving as a support for the inner ends of the heating pipes
25 which are connected to the perforations thereof, the outer ends of said pipes being connected to the perforations in the rear plate of the heating chamber, substantially as specified. 30

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JACOB HOUSER.

Witnesses:

J. P. BECKER,
J. B. HASTY.