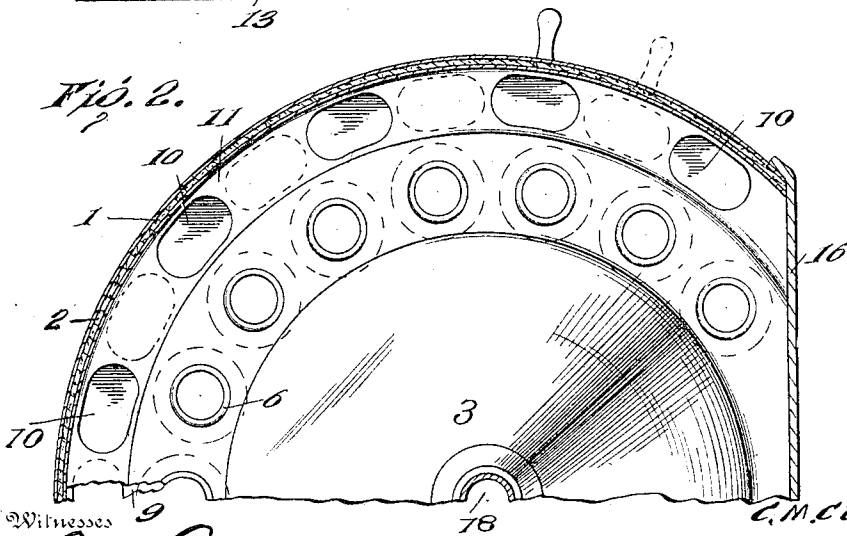
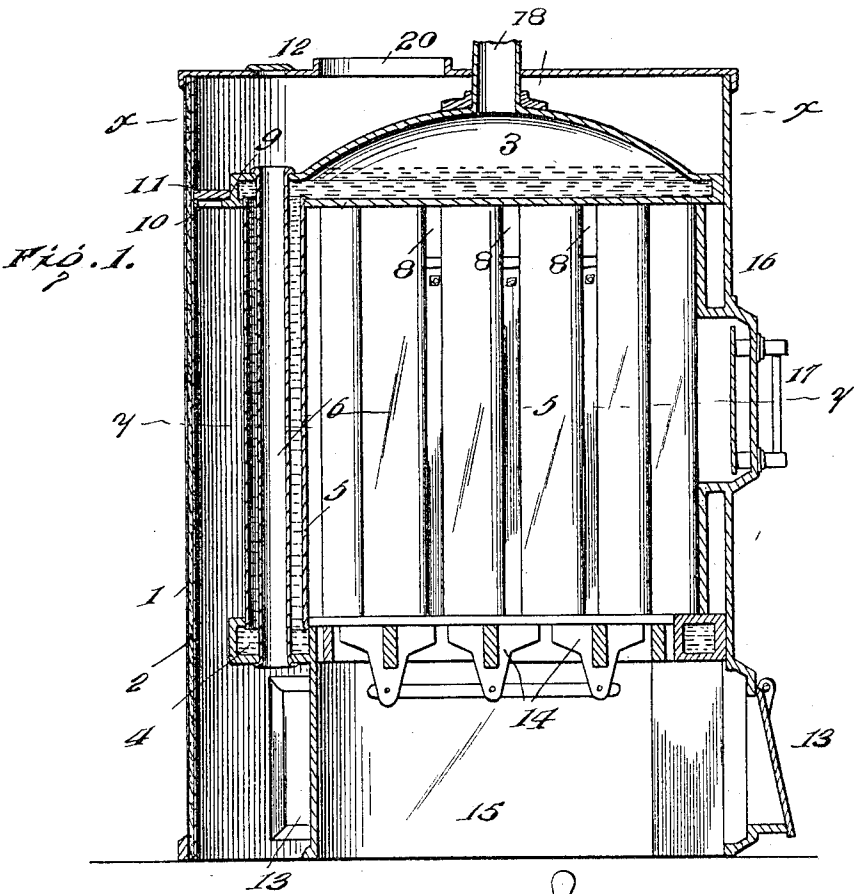


No. 818,667.

PATENTED APR. 24, 1906.

C. M. CLAUSEN.
HOT WATER HEATER.
APPLICATION FILED JUNE 22, 1905.

2 SHEETS—SHEET 1.



Witnesses

W. N. Woodson.

By

W. N. Woodson Attorney

Inventor

C. M. Clausen

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2 SHEETS—SHEET 2.

Fig. 3.

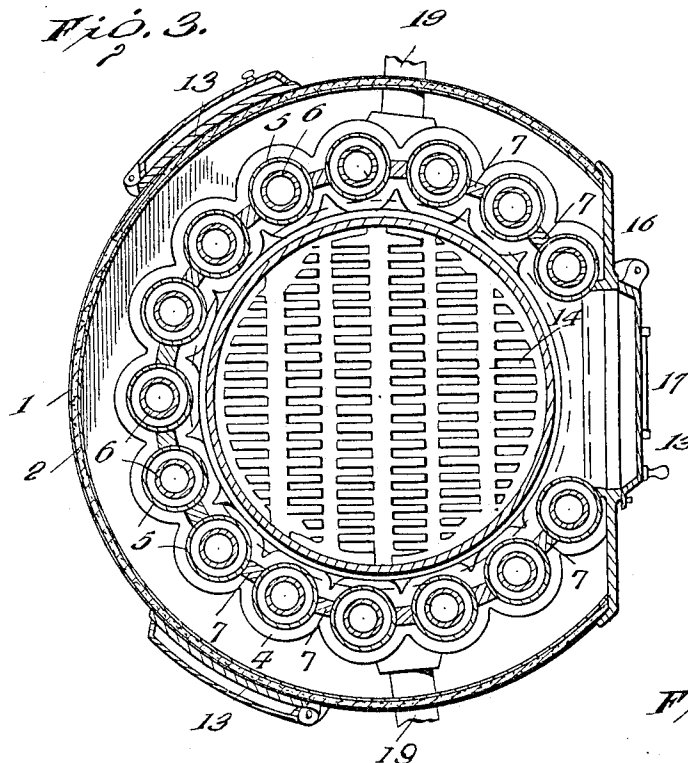


Fig. 4.

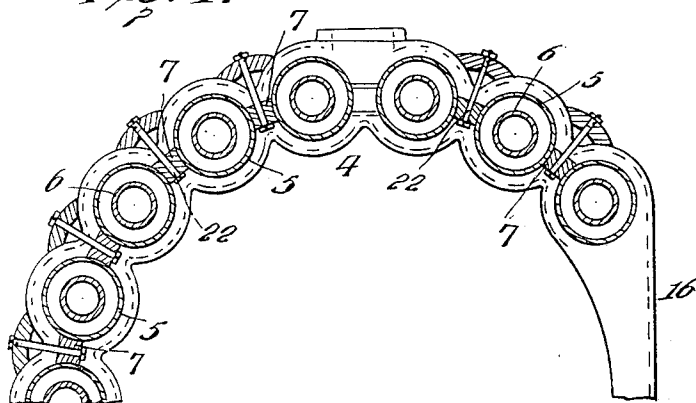
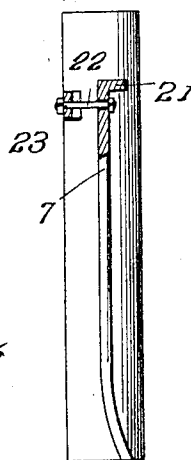


Fig. 5.



Inventor

C. M. Clausen.

Witnesses

J. H. Hume
J. H. Hume

By

W. H. Hume Attorneys

UNITED STATES PATENT OFFICE.

CARL M. CLAUSEN, OF ELKHART, INDIANA.

HOT-WATER HEATER.

No. 818,667.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed June 22, 1905. Serial No. 266,449.

To all whom it may concern:

Be it known that I, CARL M. CLAUSEN, a citizen of the United States, residing at Elkhart, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

This invention relates to improvements in steam-boilers or hot-water heaters of the flue and tubular type, and has for its object to produce a device of this character which will utilize to the greatest possible extent the heat generated in the combustion-chamber.

A further object is to construct a boiler in which access can be readily had to the flues for cleaning purposes, which is simple and durable in construction, and which can be manufactured at a comparatively small cost. To this end it consists, essentially, in arranging a series of tubes provided with inner flues, so as to form the walls of the combustion-chamber, the products of combustion passing around the tubes and then through the inner flues.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view through the device. Fig. 2 is a transverse sectional view on the line X X of Fig. 1, showing the construction of the damper. Fig. 3 is a transverse sectional view on the line Y Y of Fig. 1. Fig. 4 is a sectional view through the tubes, showing the method of attaching the partitions. Fig. 5 is a detail view showing the method of attaching the partitions.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The outer casing or wall comprises two sheet-metal plates 1, having a layer of asbestos 2 between them, which serves to prevent the radiation of heat to a very great extent. Within the outer casing is located the upper water-header 3 and the lower water-header 4 in the shape of an annular ring, which are connected by a series of spaced tubes 5. The sides of the lower water-header 4 are cut or corrugated so as to conform with the shape of the tubes and leave as small a ledge as possible for the accumulation of ashes. Flues

6 are located within the tubes 5 and a large heating-surface is thus obtained. The spaces between the tubes 5 are closed by partitions 7, which do not extend all the way up, but leave openings or passages 8 between their upper ends and the water-header 3. The lower ends of these partitions slant inwardly while the upper ends are bent around at 21 and shaped so as to engage the sides of the adjacent tubes and are held in place by bolts 22, which engage pieces of metal 23, bridging over the spaces between the tubes. A flange or partition 9 is situated between the upper water-header 3 and the outer wall and is provided with a series of openings 10, which co-operate with a similar series of openings in a sliding-plate 11 to form a damper which will enable a direct draft to be had when desired. Openings 12 are located in the outer casing immediately above the flues 6, so that ready access may be had thereto for cleaning purposes. Doors 13 are located in the outer wall, so that any dirt or ashes which may accumulate in the outer chamber between said wall and the tubes 5 may be easily removed. The grates 14 are suitably located on a level with the lower water-header 4, and the ash-pit 15 is placed thereunder. One side of the boiler is flattened or cut away at 16 and a metal plate secured thereto provided with an opening leading into the combustion-chamber and normally closed by the door 17. The numeral 18 designates the flow or lead pipe and 19 the return-pipe.

When the damper formed by the flange 9 and the sliding plate 11 is closed, the products of combustion pass through the passages 8 into the outer chamber, down and along the sides of the tubes 5, up through the flues 6, and finally pass out through the smoke-outlet 20 at a comparatively low temperature. If a direct draft is desired, the damper formed by the flange 9 and the sliding plate 11 is opened, when the products of combustion go through the passages 8, through the openings 10, and finally emerge through the smoke-outlet 20 without having to pass through the flues 6.

Having thus described the invention, what is claimed as new is—

1. A device of the character described comprising an outer casing, two water-compartments therein, a circular series of tubes connecting said compartments and arranged to form walls of the combustion-chamber, and having passages between them at their upper

ends leading from the combustion-chamber into the outer chamber between the outer casing and said tubes, flues situated within the tubes, a partition connecting said tubes
5 with the outer casing at the upper ends of the former and provided with direct-draft openings and a plate slidably mounted upon said partition and provided with corresponding openings designed to register with the
10 openings in the partition, as and for the purpose set forth.

2. A device of the character described comprising an outer casing, two water-compartments therein, a circular series of tubes
15 connecting said compartments and so arranged as to form the walls of a central combustion-chamber, said tubes having spaces between them at their upper ends constituting passages leading from the combustion-chamber into the outer chamber formed between said series of tubes and the outer casing, flues within said tubes, a circular partition
20 9 connecting the upper ends of said tubes with the outer casing and said partition being provided with a plurality of openings, and a horizontally-slidable plate 11 mounted
25 on said partition and provided with openings

designed to register with the openings in the partition, as and for the purpose set forth.

3. A device of the character described 30 comprising an outer casing, upper and lower water-compartments therein, a circular series of tubes connecting said compartments and provided at their upper ends with passages leading from the interior of the series into the
35 outer chamber formed between said series and the outer casing, flues within said tubes, the outer casing being provided with openings and closures therefor in vertical alignment with the upper end of said flues, a partition
40 connecting the upper ends of said tubes with the adjacent portion of the outer casing, and said partition provided with a plurality of openings, and a horizontally-slidable plate
45 mounted on said partition and provided with openings designed to register with the openings in the partition, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CARL M. CLAUSEN. [L. s.]

Witnesses:

AMIEL H. BIERMAN,
SYLASTER HIBSHMAN.