(No Model.)

E. GURNEY.

BOILER.

No. 542,799. Patented July 16, 1895.

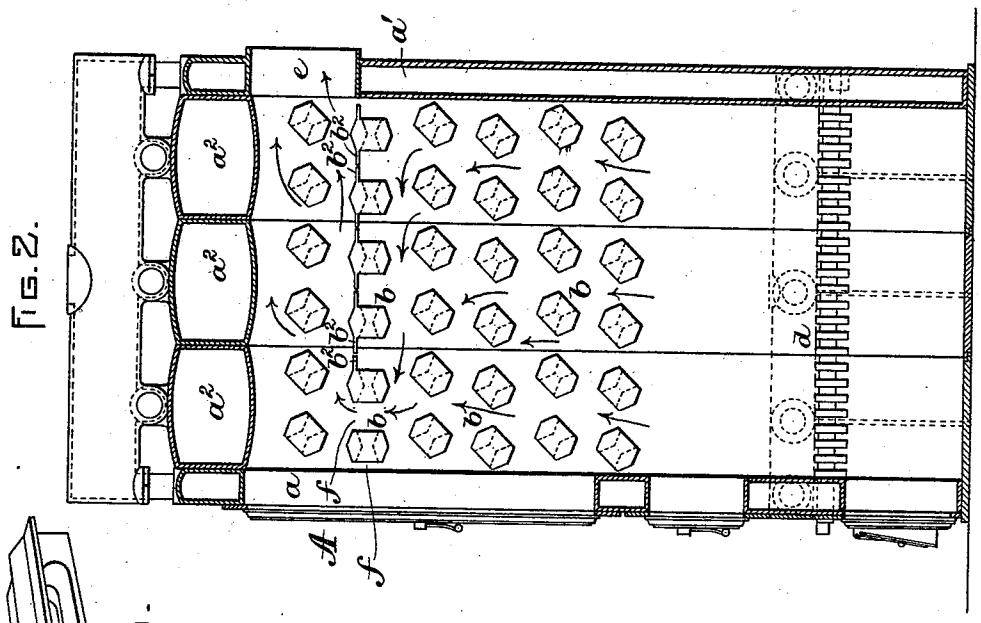

FIG. 2.

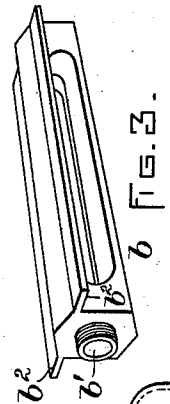

FIG. 3.

FIG. 1.

WITNESSES:
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UNITED STATES PATENT OFFICE.

EDWARD GURNEY, OF TORONTO, CANADA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 542,759, dated July 16, 1895.

Application filed March 1, 1895. Serial No. 540,189. (No model.)

To all whom it may concern:

Be it known that I, EDWARD GURNEY, of Toronto, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

This invention relates particularly to boilers for steam or hot-water heating purposes, and to that class of boilers comprising a shell or casing containing water or water and steam spaces and formed to inclose a fire-space, and tubes or loops projecting inwardly from said shell into the fire-space, said tubes being constructed to maintain a circulation of water from the shell into the fire-space and back.

The invention has for its object to enable some of the tubes or loops to form a baffle-plate or partition partially subdividing the fire-space and adapted to divert the products of combustion from a direct course between the grate and the outlet pipe or flue; and to this end it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a boiler provided with my improvements, a part of the shell being broken away. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a perspective view of one of the tubes or loops.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents the shell or casing which comprises the water and steam spaces of the boiler and the wall or inclosure of the fire-space. Said shell, as here shown, is composed of the flat front and back sections a a' and the arched intermediate sections a^2 a^2 a^2, all suitably secured together and provided with suitable fittings or attachments to permit the flow of steam or hot water from the upper portions of the sections and the return of water to the lower portions thereof. I do not describe said fittings, because they have nothing to do with my present invention.

To the inner walls of the sections a^2 are attached a plurality of loops or tubes b b, which are preferably what is known as "Bundy loops," each being a casting having an upper and a lower division separated by a central longitudinal opening, each loop having at one end a nipple b' or other means of attachment to the casing and being constructed so that when attached to one of the sections a^2 water will flow from the section through one of the divisions and back to the casing through the other division, the two divisions being located at different heights to provide for natural circulation. In practice I prefer to employ two groups of tubes or loops, the loops of one group extending from one side of the casing half-way across the fire-box, while the loops of the other group extend from the opposite side half-way across the fire-box, the outer ends of the loops meeting or nearly meeting. Some of the loops, and preferably the greater number, are separated by comparatively wide spaces, which afford free vertical passages between the loops for the products of combustion, as shown in Fig. 2. Other loops, and preferably those comprising a row near the upper portion of the fire-space, are provided with laterally-projecting longitudinal webs or flanges b^2 b^2, each of which is formed on the upper division of the tube and extends about half-way across the space between the tube on which it is formed and the adjacent tube in the same row, so that the said tubes and their flanges form a practically-continuous baffle-plate or partition extending partially across the fire-space and diverting the products of combustion from a direct course between the grate d and escape-opening e. One or more of the tubes or loops in the said row is or may be made without flanges, as shown in Fig. 2, to provide a contracted outlet at f f. I have shown one of the tubes provided with but one flange, and it will be obvious that each flanged tube may have but one flange, the same being double the width of the flanges here shown.

It will be seen that the flanged tubes or loops constitute a durable baffle-plate, the circulation of water through the flanged tubes absorbing heat rapidly from the flanges, so that they are protected from injury by the heat and are not therefore liable to be burned off or melted.

I form the flanges at the upper sides of the tubes or loops so that their upper surface will be practically flush with the upper surfaces of the tubes, thus avoiding the formation of pockets or depressions for the accumulation of ashes between the tube, and forming spaces

between the sides of the tubes in which the heat is retained by the flanges which are above said spaces.

I claim—

1. A boiler composed of assembled sections forming water and steam spaces inclosing a fire-space, and a plurality of water-circulating loops or tubes projecting from the walls of the sections into said fire-space, each comprising an upper and a lower division, some of said tubes being separated by spaces through which the products of combustion pass freely, while other tubes are provided with webs or flanges projecting laterally from the external surfaces of the upper division, said flanges with the tubes on which they are formed constituting a baffle-plate or partition.

2. A loop or tube adapted to be attached at one end to the shell of a boiler, comprising two divisions communicating with each other at their ends, and laterally projecting longitudinal webs or flanges formed on the exterior of the upper division, said webs being substantially flush with the upper side or surface of the tube.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 22d day of February, A. D. 1895.

EDWARD GURNEY.

Witnesses:
J. M. PAISLEY,
WM. T. ISAAC.