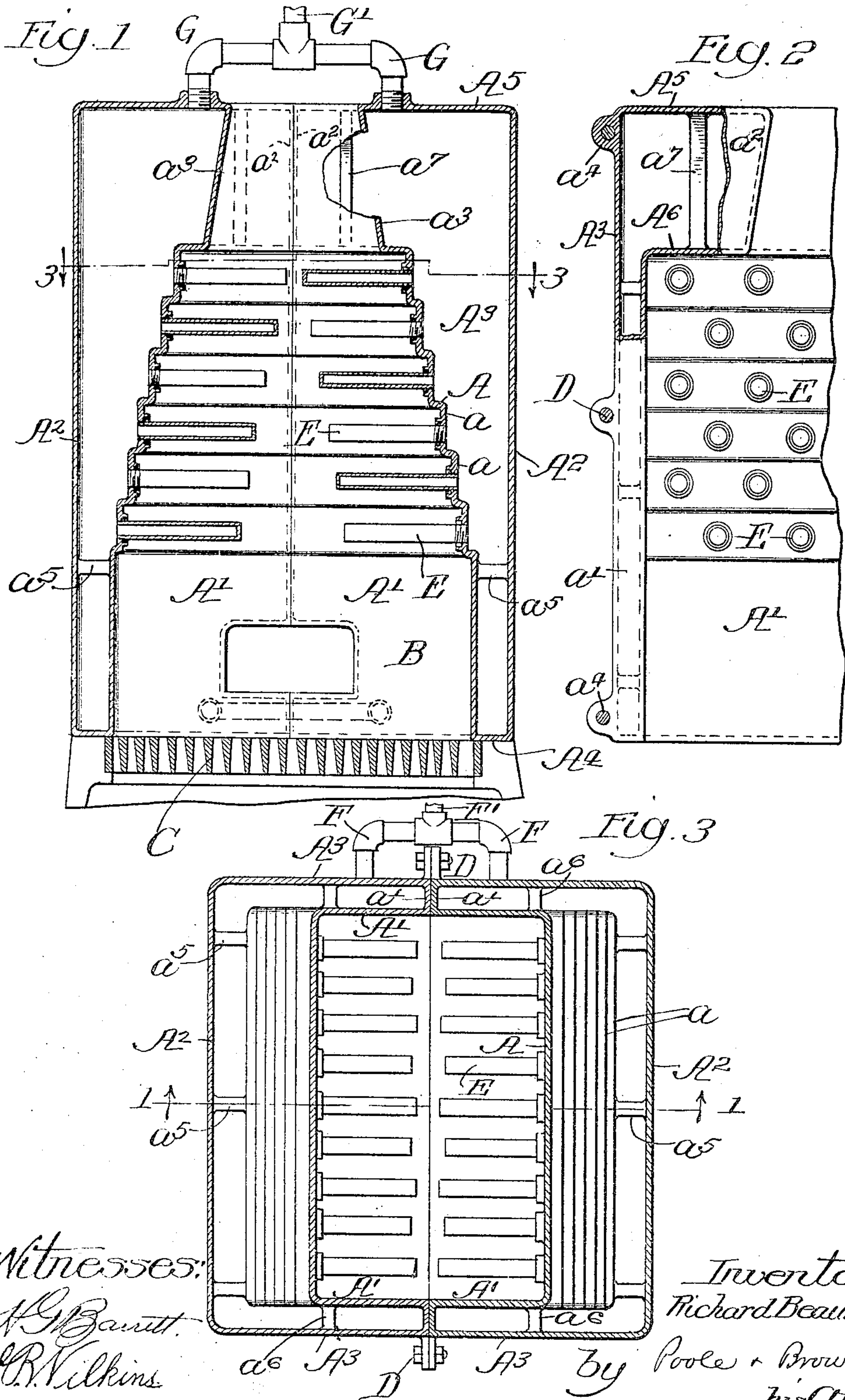


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PATENTED DEC. 26, 1905.

R. BEAUMONT.
WATER HEATER.

APPLICATION FILED JUNE 1, 1905.



Witnesses:
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UNITED STATES PATENT OFFICE,

RICHARD BEAUMONT, OF KANKAKEE, ILLINOIS.

WATER-HEATER.

No. 808,335.

Specification of Letters Patent.

Patented Dec. 26, 1905.

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To all whom it may concern:

Be it known that I, RICHARD BEAUMONT, a citizen of the United States, and a resident of Kankakee, in the county of Kankakee and State of Illinois, have invented certain new and useful Improvements in Water-Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to boilers or heaters such as are employed for steam or hot-water heating systems of that class consisting of two hollow cast-metal sections, each of which is complete in itself and which together form an inclosure constituting a fire-box or combustion-chamber.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a view in central vertical section of a boiler or heater embodying my invention, taken on line 1 1 of Fig. 3. Fig. 2 is a detail inside face view of one-half of one of the sections of the boiler. Fig. 3 is a plan section taken upon line 3 3 of Fig. 1. A boiler embodying my invention consists, mainly, of two hollow integral cast-iron sections, each consisting of an inner side wall A, two inner end walls A' A', an outer side wall A², outer end walls A³ A³, a bottom wall A⁴, an outer top wall A⁵, and an inner top wall A⁶. At the lower parts of the sections the inner and outer walls A' A² are vertical and parallel with each other and form water-legs which surround or inclose the fire-box or combustion-chamber B, beneath which is located the fire-grate C. Above their vertical lower parts the inner side walls A A of the two sections are inclined and converge inwardly toward each other, the inclined parts consisting of vertically-arranged stepped or offset parts a a, joined by horizontal connecting portions. The inwardly-inclined portions of the said inner side walls terminate at a considerable distance below the top wall A⁵ and are joined to the horizontal inner top wall A⁶, which forms the top wall of the fire-box or combustion-chamber. The inner and outer end walls A' A³ of the sections are parallel with each other and are joined by transverse walls a', which when the two sections constituting the boiler are connected together meet each other face

to face, as clearly seen in Fig. 3. At the upper parts of the sections the connecting-walls a' are made continuous with vertical walls a², extending from the inner top wall A⁶ to the outer top wall A⁵ at the side portions of the sections. At their inner margins said walls a² a² are united to concave inner wall-sections a³ a³, located centrally between the ends of the sections and which likewise extend from the inner top wall A⁶ to the outer top wall A⁵. Said concave wall-sections a³ a³ together constitute an outlet-passage for the top of the fire-box or combustion-chamber through which smoke and products of combustion pass therefrom.

The two boiler-sections made as described may be united to each other in any suitable or desired manner, devices for this purpose herein shown consisting of bolts D D, inserted through ears or lugs a⁴ a⁴, formed upon the outer faces of and projecting outwardly from the outer end walls A³ of the sections, as clearly seen in Figs. 2 and 3.

Attached to the inclined or stepped portion of the inner walls A A of each section are a plurality of horizontal water-tubes E, closed at their inner ends and extending from the said walls A inwardly into the fire-box, so as to substantially fill the upper part of the fire-box. Said tubes are arranged in horizontal rows along the vertical wall-sections a a, are of equal length, and are spaced at substantially uniform intervals between the inner end walls A' A' of the sections. The external water-tubes in each row are parallel with the adjacent end walls A' A' and the tubes are parallel with each other. Preferably the water-tubes in alternate rows are offset laterally from each other, as shown in Fig. 2. Said water-tubes E may be connected with the side walls A by means of any suitable form of screw-joints. In the particular construction shown the screw-threaded apertures formed in the said walls to receive the screw-threaded outer ends of the tubes are surrounded by inwardly-projecting annular flanges, and a filling of heat-resisting cement is inserted between the said flanges and the screw-threaded portions of the tubes to protect the same from the effects of heat.

As a further improvement I provide between the inner and outer walls A' A² horizontal connecting members or stays a⁵, which are cast integral with said walls. I also provide like integral horizontal stays a⁶ between the inner and outer end walls A' and A³. I also

provide integral vertical stays between the inner top wall A⁶ and the top wall A⁵, the same being indicated by *a'* in Figs. 1 and 2.

The two hollow boiler-sections are shown 5 as provided at the lower part thereof with supply or inlet pipes F F', connected with a common supply-pipe F'. At the top of the boiler each section is provided with outlet-pipes G G', and said pipes are joined to a 10 common outlet-main G'. When the boiler is used as a water-heater in a hot-water circulating system, the pipes F' and G' will constitute the outgoing and return mains of the system, and when the boiler is used for a 15 steam-heating system the pipe G' will constitute the steam-supply main and the pipe F' the return-main for water of condensation.

One advantage obtained by the construction described and shown is that the said inner side 20 walls A A, provided with the inwardly-extending water-tubes, when arranged to converge toward the top of the boiler, as described, make the water-spaces much wider at the upper part of the boiler than at the 25 lower part thereof and of gradually-increasing width from below upward with the result of facilitating the circulation of the water in the boiler and enhancing the heating effect, it being manifest that the globules of steam from 30 the tubes are free to rise directly upward from the outer open ends of the tubes in each row, and free upward movement of the steam is permitted from the outer ends of the said tubes toward the top of the boiler, while 35 ample space is afforded for the descent of the cooler water along the cooler outer walls of the boiler exterior to the rising current adjacent to said inner walls. A further advantage is gained by the converging side walls A A, for 40 the reason that the products of combustion rising from the fuel resting on the fuel-grate at the bottom of the fire-box are concentrated and act more directly upon the said inclined walls than would be the case if the side walls 45 were vertical or parallel. An advantage is also gained by making the interior of the fire-box of rectangular form and arranging the

water-tubes parallel with the end walls of the fire-box and with each other, for the reason 50 that by this construction the water-tubes in each row may be made of the same length and will at the same time substantially fill the space between the end walls, with the result of water-tubes having a large aggregate area 55 of heating-surface for contact with the heated products of combustion, while cost of construction is lessened because all of the tubes may be alike or of the same size.

I claim as my invention—

1. A sectional cast-metal boiler consisting of 60 two hollow sections having inner walls arranged to form a fire-box, the inner end walls of the sections being parallel with each other, and the inner side walls of the sections being stepped and inclined inwardly from the bot- 65 tom toward the top of the sections, and a plurality of water-tubes closed at said inner ends, and arranged in horizontal rows and secured in the vertical parts of said stepped inner walls in parallel relation with each other and 70 with the inner end walls of the sections.

2. A sectional cast-metal boiler consisting of two hollow sections having inner walls arranged to form a fire-box, the inner end walls of the sections being parallel with each other, 75 and the inner side walls of the sections being stepped and inclined inwardly from the bottom toward the top of the sections, and a plurality of water-tubes closed at said inner ends, arranged in horizontal rows and secured in 80 the vertical parts of said inner walls in parallel relation to each other and to the inner end walls of the sections, said sections being provided with integral stays joining the flat parallel parts of the inner and outer walls of 85 the sections with each other.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 27th day of May, A. D. 1905.

RICHARD BEAUMONT.

Witnesses:

ALFRED BEAUMONT,
DAVID HERTZ.