

(No Model.)

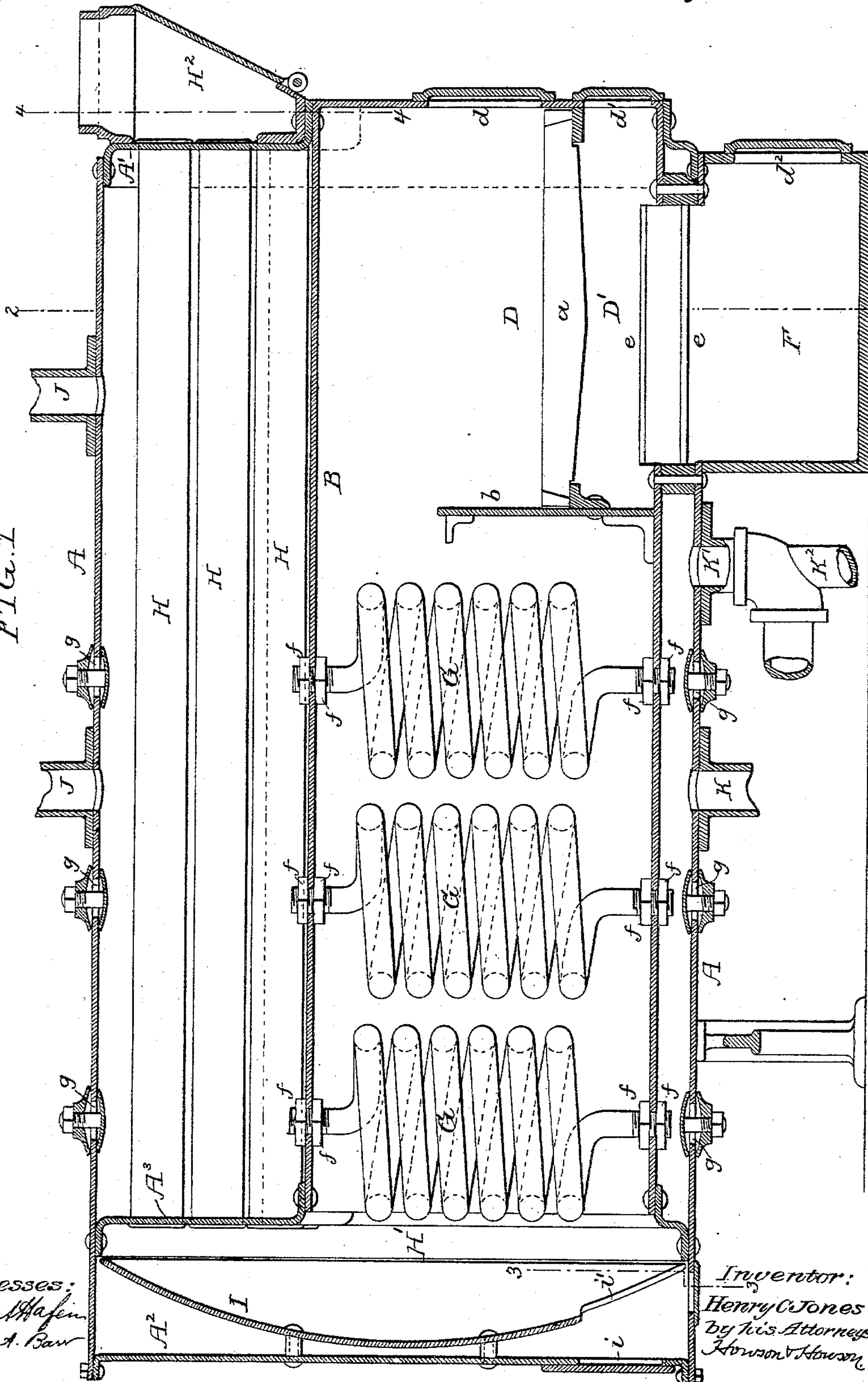
2 Sheets—Sheet 1.

H. C. JONES.  
STEAM BOILER.

No. 563,665.

Patented July 7, 1896.

FIG. 1



Witnesses:  
Ernest H. Hagen  
Wm. A. Baw

Inventor:  
Henry C. Jones  
by his Attorneys  
Howson & Howson

(No Model.)

2 Sheets—Sheet 2.

H. C. JONES.  
STEAM BOILER.

No. 563,665.

Patented July 7, 1896.

FIG. 2.

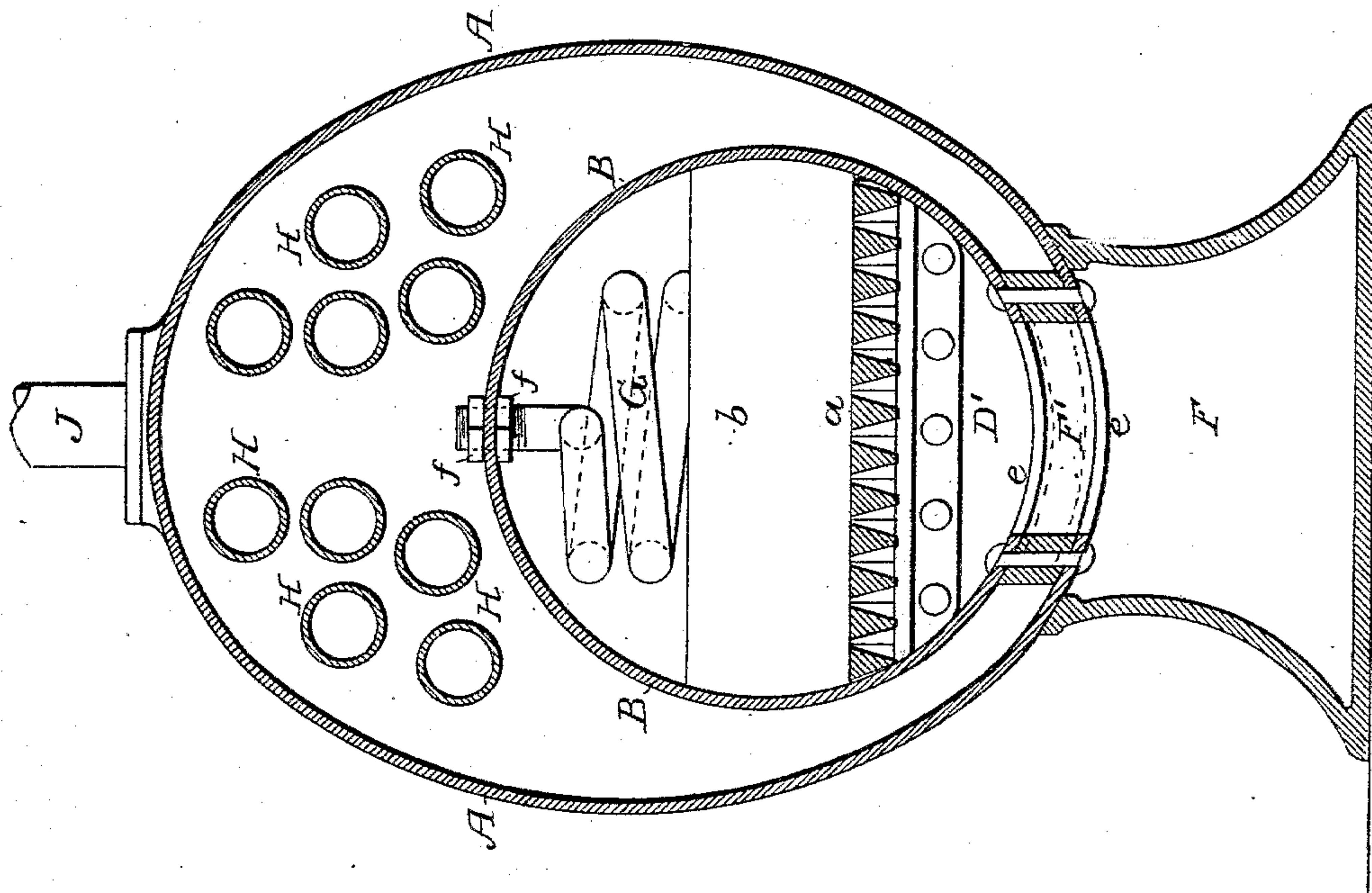


FIG. 4.

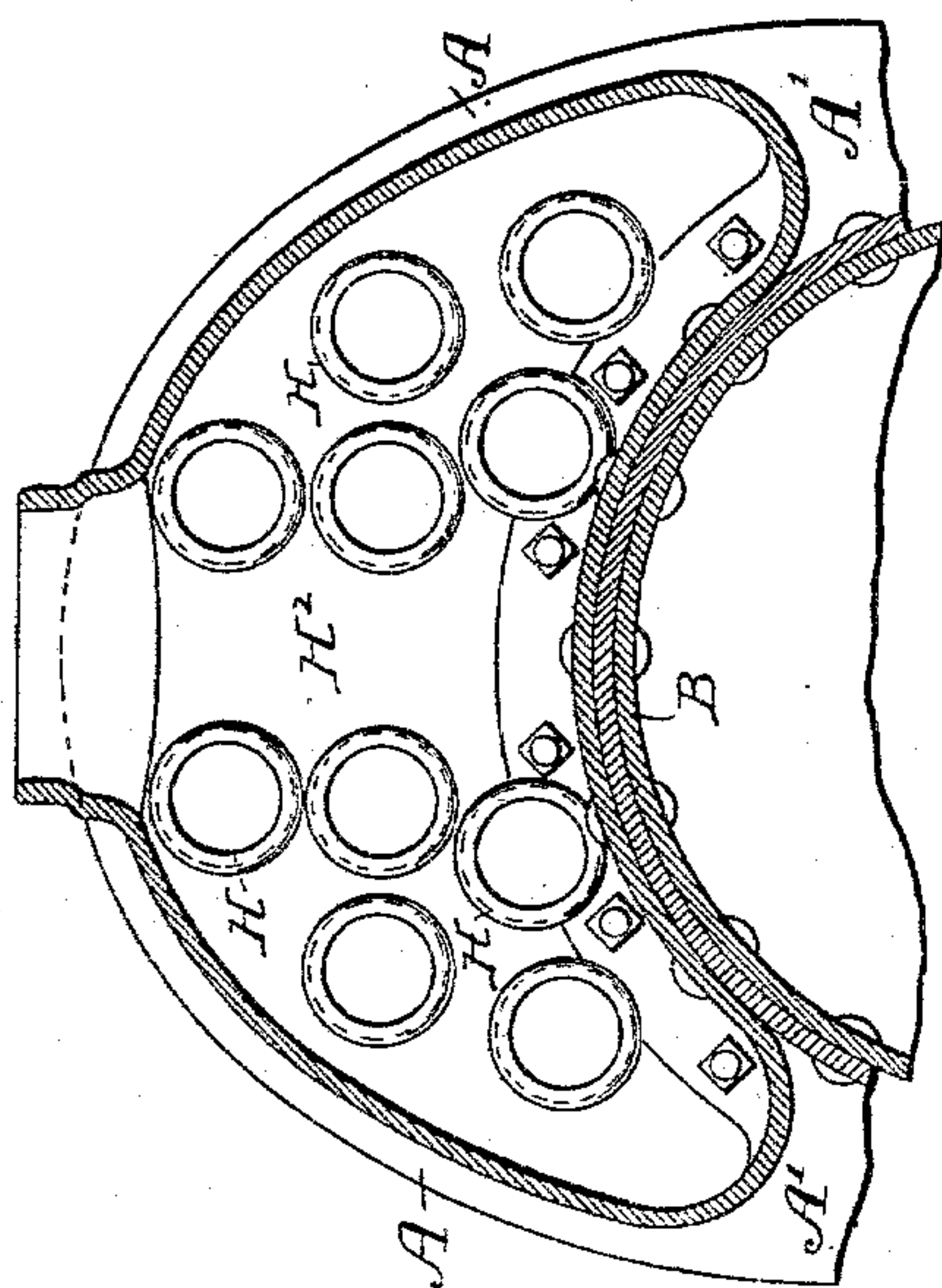
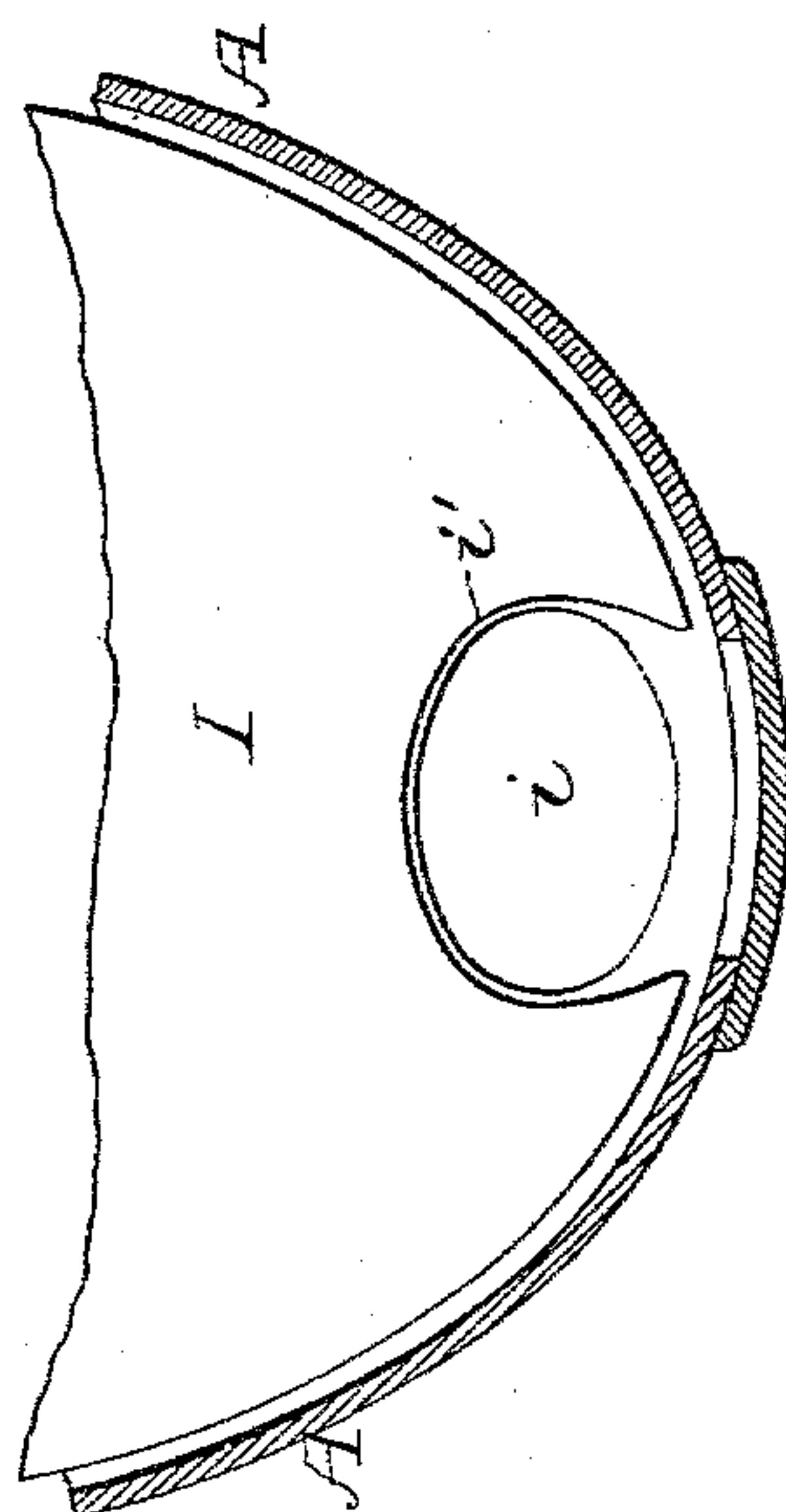


FIG. 3.



Witnesses:  
*Ernest Hafen*  
*Will. A. Ban*

Inventor:  
*Henry C. Jones*  
by his Attorneys  
*Howson & Howson*



# UNITED STATES PATENT OFFICE.

HENRY C. JONES, OF WILMINGTON, DELAWARE, ASSIGNOR TO THE HILLIS  
& JONES COMPANY, OF SAME PLACE.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 563,665, dated July 7, 1896.

Application filed September 30, 1895. Serial No. 564,150. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. JONES, a citizen of the United States, and a resident of Wilmington, Delaware, have invented certain  
5 Improvements in Steam-Boilers, of which the following is a specification.

One object of my invention is to so construct a steam-boiler that while it has ample water capacity its lateral dimensions will be such  
10 that it can be easily taken through a door or cellar-way of average width in a building, a further object being to provide an extended water-heating surface and to insure rapid circulation of water in the boiler, a still further  
15 object being to provide an extended storage capacity for the ashes, so that the latter need not be removed at frequent intervals, and a final object being to provide for readily cleaning the various tubes and flues of the boiler.  
20 These objects I attain in the manner herein-after set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a steam-boiler constructed in accordance with my invention. Fig. 2 is a transverse section of the  
25 same on the line 2 2, Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3, Fig. 1; and Fig. 4 is a transverse section on the line 4 4, Fig. 1.

30 The outer shell A of the boiler is of oval form, having its longer axis vertical, the opposite ends of the shell being closed by heads A' A<sup>2</sup>, the front head being flanged for the reception of the front end of the flue B, the  
35 rear end of which is secured to the flanged internal head A<sup>3</sup> near the rear end of the boiler. In the front end of the flue B is the fireplace or furnace D, having grate-bars a and transverse bridge-walls b, which, as shown,  
40 are of metal, but which may be of fire-brick, if desired.

In the front plate of the flue are the usual feed-opening d and an opening d', the latter communicating with the draft-chamber D' beneath the grate.

45 Beneath the front end of the shell A of the boiler is a hollow supporting-foot F, having an opening d<sup>2</sup> in the front end of the same, and this hollow supporting-foot communicates with the draft-chamber D' through a  
50 neck F', interposed between the shell A of the

boiler and the shell of the flue B and surrounding the openings e e', formed in these parts. Extending across the flue B from top  
to bottom of the same are a series of tube- 55 coils G, these tube-coils having vertical terminations secured, respectively, to the upper and lower portions of the flue-shell by means of nuts f, and in the outer shell A of the  
boiler in line vertically with the vertical ter- 60 minations of these tube-coils are hand-holes g, provided with suitable detachable covers.

Extending through the upper portion of the boiler from the front head A' to the internal  
head A<sup>3</sup> are a series of return-tubes H, which 65 communicate with the flue-chamber H' at the rear of the boiler and with the smoke-chamber H<sup>2</sup> at the front end of the same, and in the flue-chamber H' at the rear of the boiler is mounted a baffle-plate I, which tends to  
70 project the products of combustion issuing from the flue B upward and forward into the rear ends of the return-tubes H. This baffle-plate also serves to prevent direct access of  
75 the products of combustion to the rear head A<sup>2</sup> of the boiler, and hence protects the same and prevents any tendency to warp it, the  
baffle-plate itself constituting a segment of a sphere, so as to best resist any warping tendency when subjected to varying temperatures. 80

In the rear head A<sup>2</sup> of the boiler in line with the lower portion of the flue B is an opening i, provided with a suitable cover, and in  
the lower portion of the baffle-plate I is an opening i', so that ready access can be had to 85 the interior of the flue B for the purpose of cleaning the same.

The rear head A<sup>2</sup> is outwardly flanged and is held in place by bolts and nuts, so that it can be readily disconnected and withdrawn, 90 carrying with it the baffle-plate I, when it is desired to gain access to the tube-coils G or return-tubes H for cleaning purposes, and the tube-coils can be readily placed in or removed from the flue B, the internal securing-nuts f 95 being accessible from the interior of the flue and the external securing-nuts being likewise accessible through the hand-holes in the upper and lower portions of the shell A of the boiler.

The hollow supporting-foot F at the front  
end of the boiler has considerable cubic ca- 100



capacity, and hence it forms an ash-pit which provides for a comparatively large accumulation of ashes, this being a feature of considerable importance in that class of steam-boilers intended for heating houses, assembly-rooms, or the like, where frequent removal of small quantities of ashes is likely to prove objectionable. If, as is ordinarily the case, the draft-chamber D' beneath the grate also constitutes the ash-pit, the space for the reception of ashes would be so small that frequent cleaning out of the same would be necessary. Furthermore, the accumulation of ashes therein would choke the flow of cold air to the grate, and would cause the latter to burn out much more rapidly than when the draft-chamber is free from ashes, as in my improved boiler.

By making the outer shell of the boiler in oval form, with its longer axis vertical, the lateral dimensions of said shell can, without unduly decreasing the water-space of the boiler, be so limited that the boiler can be readily taken through a door or cellar-way of ordinary width, this being a matter of considerable importance in boilers intended for house-heating, as it enables me to provide a wrought iron or steel boiler of high efficiency instead of the sectional cast-iron boilers usually employed for this purpose. I find also that boilers of ample size for house-heating and for withstanding the moderate pressures required in that class of work can be provided with oval shells without the necessity of any system of internal stays, the pressure not being sufficient to cause any appreciable change in the oval form of the shell.

The tube-coils G in the flue B serve to very materially increase the heating-surface of the boiler and provide for rapid circulation of the cool water from the bottom of the boiler to a point above the flue when it is subjected to high heat, while the introduction of the circular flue B into the lower portion of the oval outer casing A so contracts the water-space around said flue as to insure the rapid flow of the water in contact with the surface of the flue and a correspondingly rapid heating of said water.

The boiler has at the top the usual steam-discharge pipes J, and at the bottom a return-pipe K and blow-off pipe K', the latter being

provided in the present case with a pipe K<sup>2</sup> for supplying fresh water as desired.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of the boiler having an internal flue with fireplace therein, both the flue and boiler shell having therein openings beneath the grate, a casing extending from the flue to the shell around said openings so as to form a discharge-neck extending through the boiler-shell, and a hollow supporting-leg communicating through said neck with the draft-chamber beneath the grate so as to form a chamber for the accumulation of ashes, substantially as specified.

2. The combination of the outer shell and internal flue of the boiler, with tube-coils located in said flue, and having vertical terminations secured to the upper and lower portions of the flue-shell, substantially as specified.

3. The combination of the outer shell and internal flue of the boiler, with the tube-coils located in said internal flue and having threaded vertical terminations at top and bottom, with nuts applied to said threaded terminations and located respectively on the inner and outer sides of the flue-shell, substantially as specified.

4. The combination of the outer shell of the boiler, the internal flue and the return-tubes, with the rear head of the boiler having an opening in line with the lower portion of the flue, and a baffle-plate having a corresponding opening therein, substantially as specified.

5. The combination of the outer shell of the boiler, the internal flue and the return-tubes, with the rear head of the boiler, and the baffle-plate constituting a segment of a sphere and located in front of said rear head, whereby warping of the plate is prevented when subjected to varying temperatures, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY C. JONES.

Witnesses:

FRANK E. BECHTOLD,  
JOS. H. KLEIN.

It is hereby certified that the name of the assignee in Letters Patent No. 563,665, granted July 7, 1896, upon the application of Henry C. Jones, of Wilmington, Delaware, for an improvement in "Steam-Boilers," was erroneously written and printed the "Hillis & Jones Company," whereas said name should have been written and printed the *Hilles & Jones Company*, and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 21st day of July, A. D. 1896.

[SEAL.]

JNO. M. REYNOLDS,  
*Assistant Secretary of the Interior.*

Countersigned:

S. T. FISHER,  
*Acting Commissioner of Patents.*