

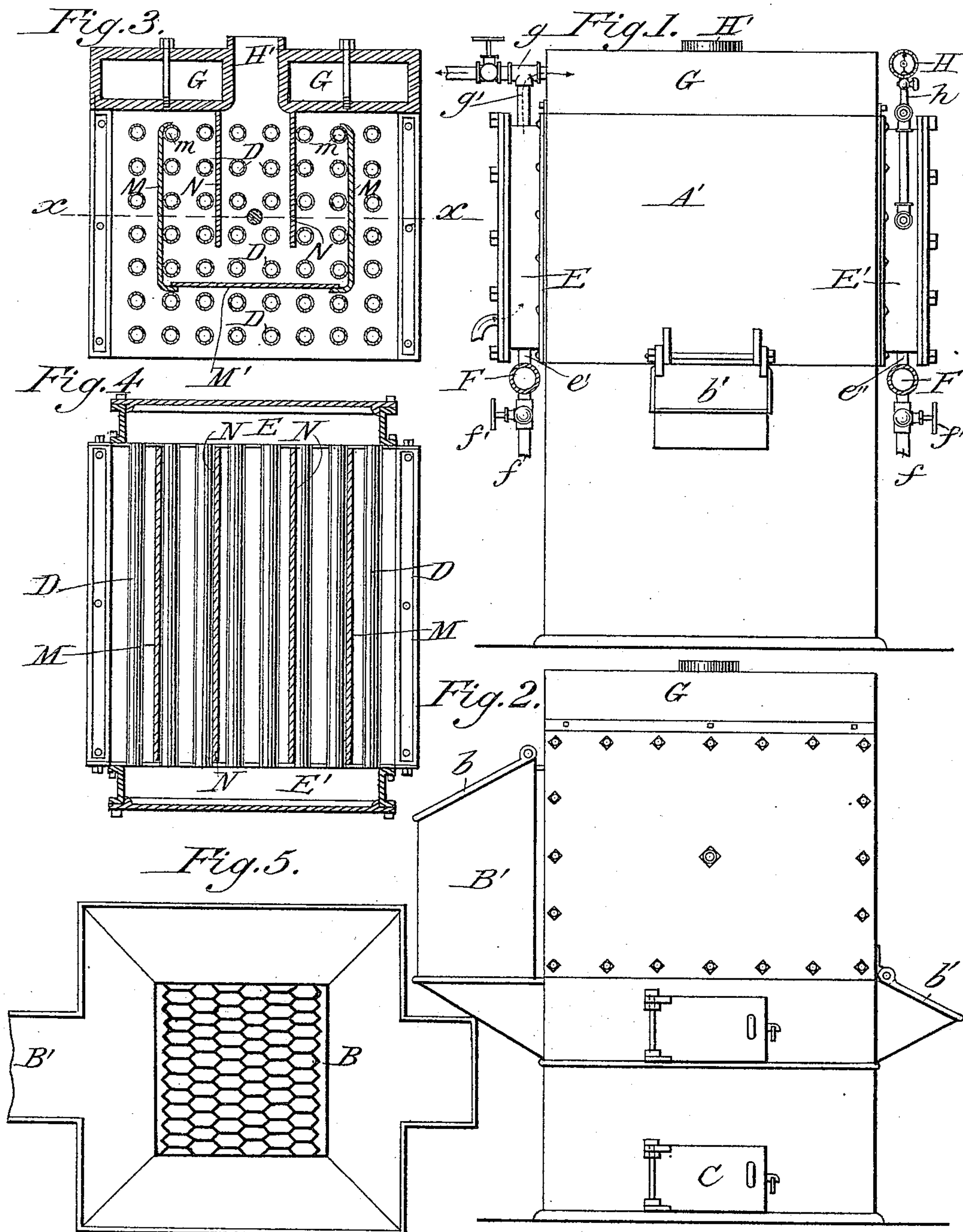
(No Model.)

2 Sheets—Sheet 1.

L. ANDERSON.
HEATING FURNACE.

No. 440,237.

Patented Nov. 11, 1890.



Attest:

J. H. Schott
Geo. Chandler

Inventor
Louis Anderson
by M. T. E. Chandler & Co.
Attys

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Fig. 6.

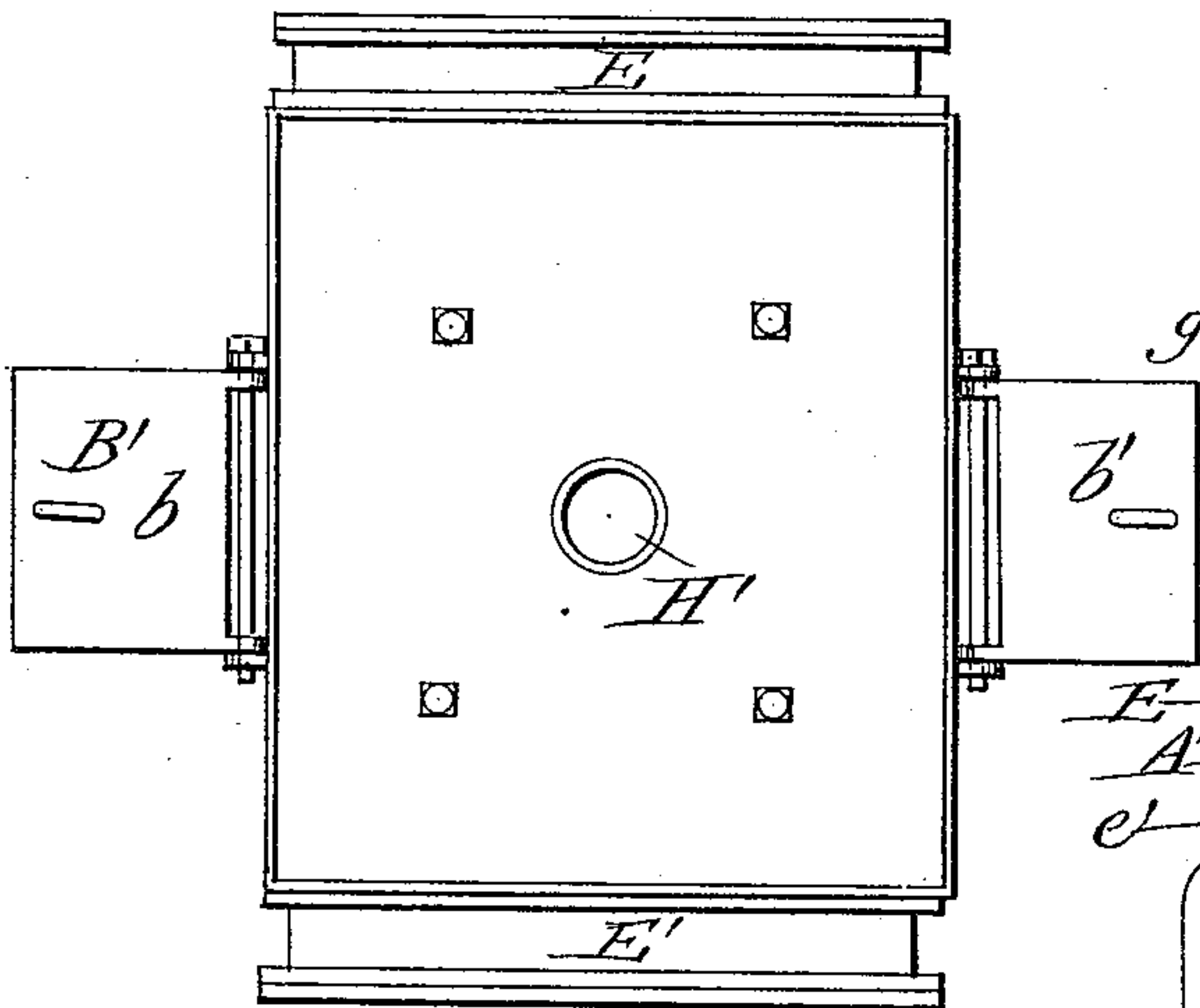


Fig. 8.

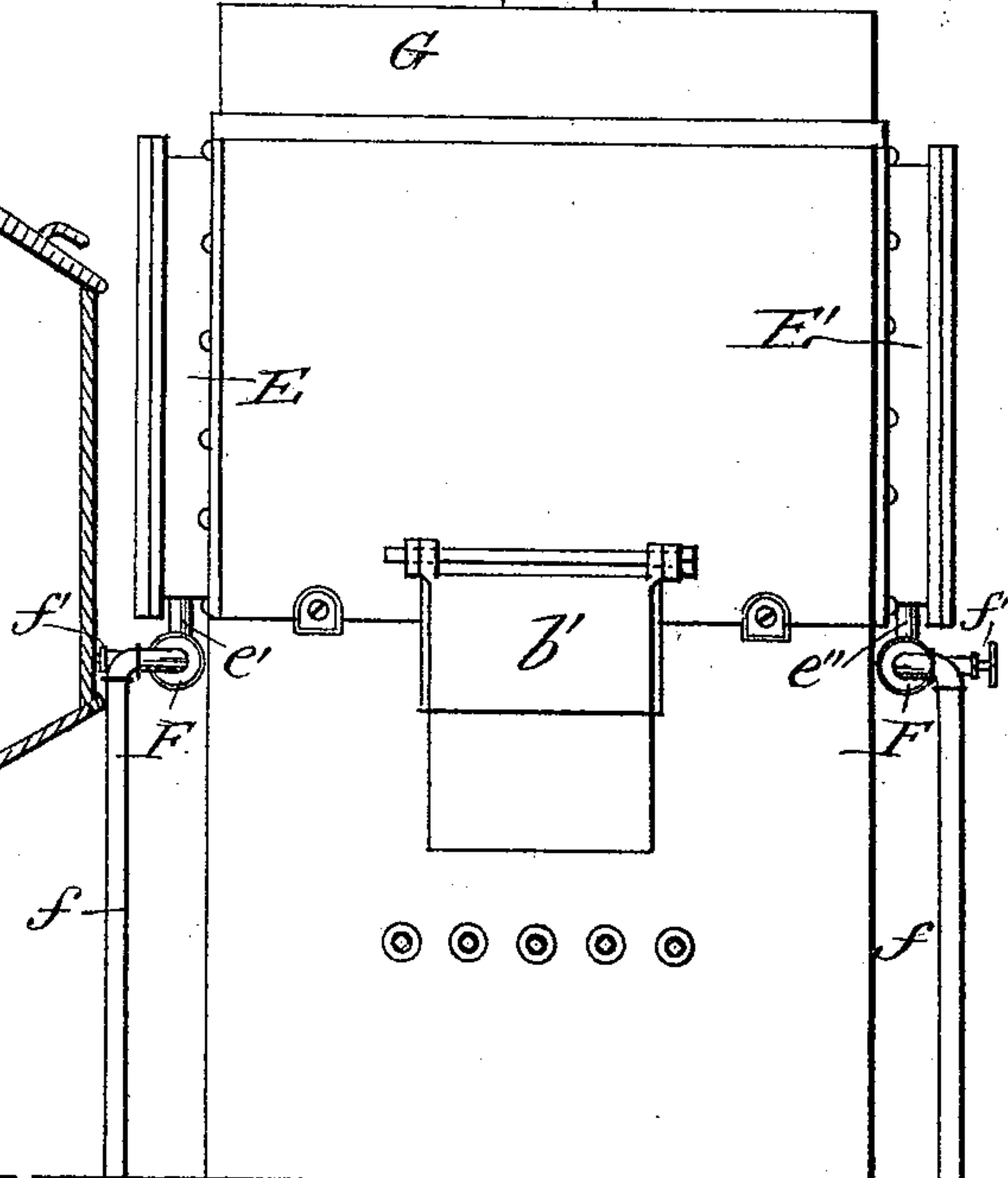
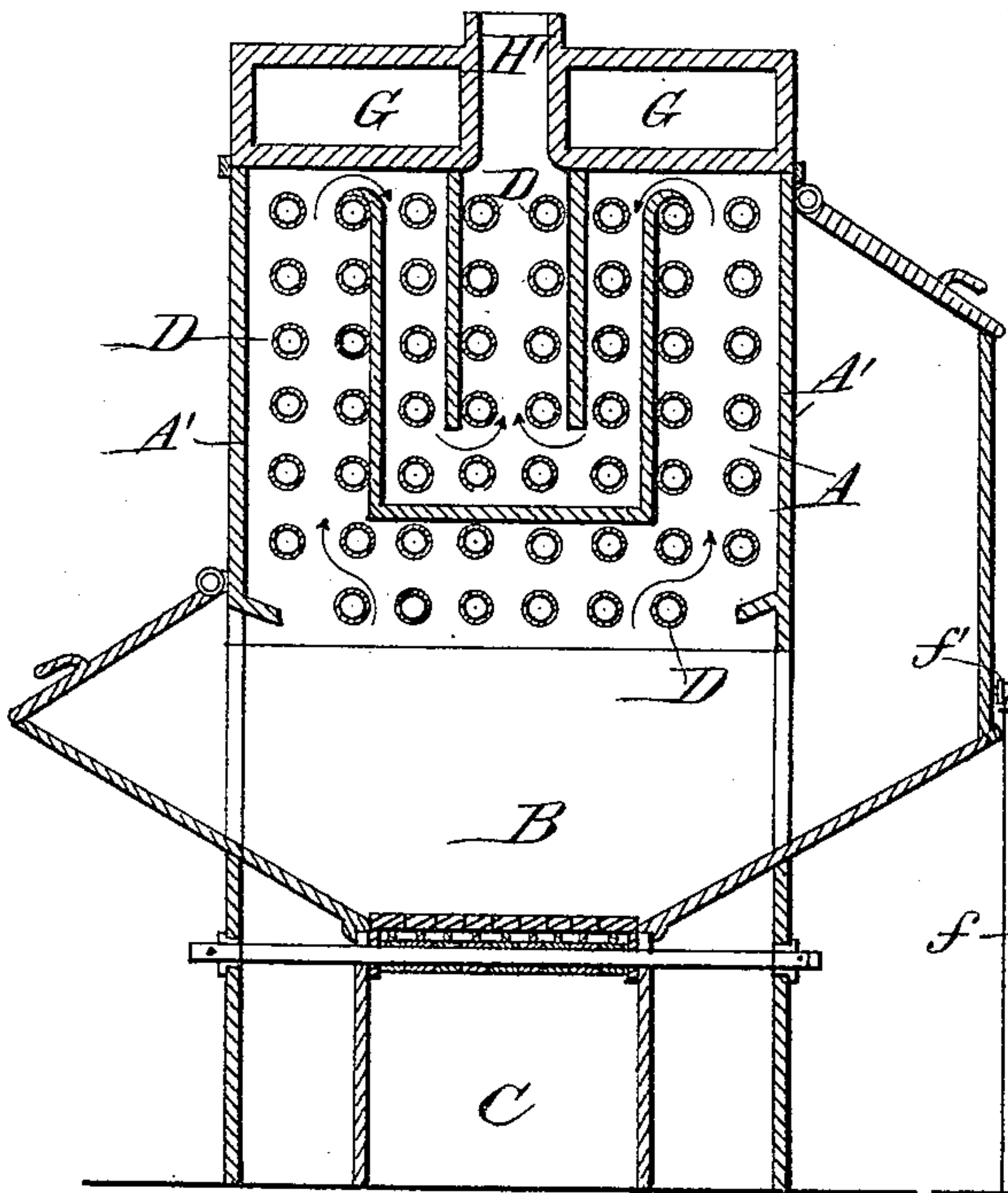
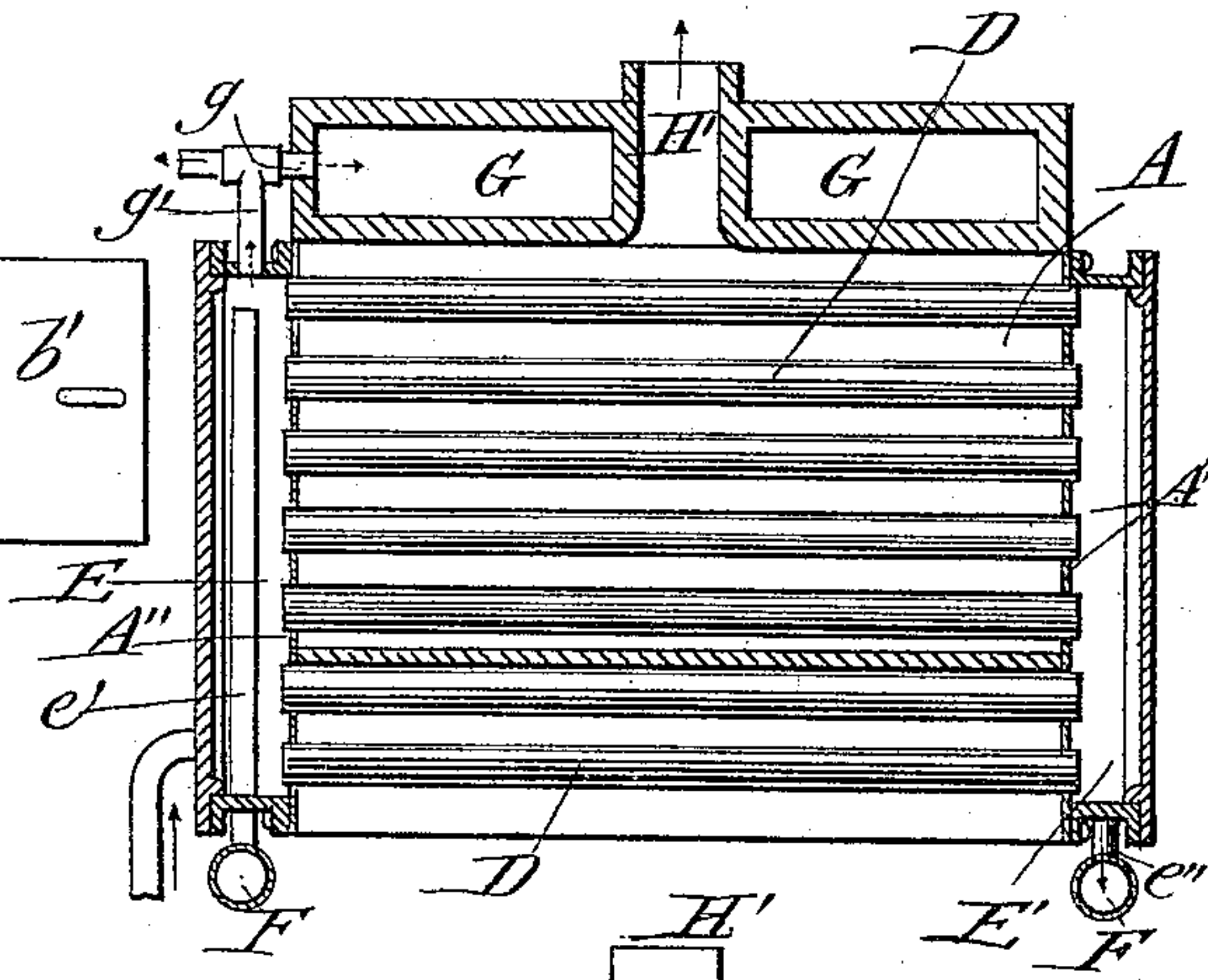


Fig. 7.

Fig. 9.

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UNITED STATES PATENT OFFICE.

LOUIS ANDERSON, OF CHICAGO, ILLINOIS.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 440,237, dated November 11, 1890.

Application filed May 21, 1890. Serial No. 352,646. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Heating Furnaces, of which the following is such a full, clear, and exact description as will enable those skilled in the art to which it appertains to make and use the same, 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 improvements in that class of generators used in supplying steam to a circulating system for heating purposes.

The object of the invention is to provide a means for constructing a steam-generator so that the generating-chamber, the superheating-chamber, and all parts subjected to great strain and requiring considerable strength may be made separately and of such material as is suitable for the purpose, while the combustion-chamber or furnace proper, not having to withstand the pressure of the steam, may be made of cheaper material, and the whole so combined as to give easy access to the different parts for repairs and replacement of said parts. By this means it is obvious that the cost of the device as a whole will be much lessened without impairing its strength and durability, and at the same time present a neat and attractive appearance.

The invention has also for its object the novel construction, arrangement, and combination of parts, as will be hereinafter fully set forth, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a front elevation of a furnace embodying the invention. Fig. 2 is a side elevation of the same, the mud-drums being removed. Fig. 3 is a transverse vertical section through the generating-chamber. Fig. 4 is a horizontal section on the line $x x$ of Fig. 3. Fig. 5 is a horizontal section through the furnace below the water-tubes. Fig. 6 is a plan view. Fig. 7 is a transverse

vertical section of the entire generator. Fig. 8 is a longitudinal section through that part inclosing the water-tubes. Fig. 9 is a front elevation showing certain parts not shown in Fig. 1.

Referring to the drawings by letter, A designates the steam-generating chamber, B the combustion-chamber, and C the ash-pit. The shell of the generating-chamber has a rectangular shape, and consists of the sides $A' A'$ and the flue-sheets $A'' A''$. Between the flue-sheets are mounted the water-tubes D, having their ends secured in said sheets in any suitable manner. The circulating-chambers $E E'$ are secured to the outside of the flue-sheets and have the water-tubes projecting into them for a short distance. The pipe e' extends into the circulating-chamber E nearly to the top of the same and connects at its lower end with the mud-drum F, and serves to carry off any foreign matter which may be floating on the surface of the water. The lower part of the chamber E' is connected with a pipe e'' , leading to a similar mud-drum, and serves to carry off any heavy sediment which might settle to the bottom of the generating-chamber. Pipes f , having suitable stop-cocks f' , are provided, so that said drums may be "blown off" or cleaned. A pipe h , leading from the circulating-chamber E' , connects with a steam-gage H to indicate the pressure of the steam.

To the top of the shell of the generating-chamber is secured the superheating-chamber G, which forms the top for the same, and has passing through it the chimney H' . This superheating-chamber is connected with the circulating-chamber E by means of the pipes $g g'$. The pipe g also leads to the circulating system with which it is to be used.

The combustion-chamber B, the upper part of which is the steam-generating chamber, is provided with a coal-magazine B' , which is provided with a door b . This magazine may be made integral with the furnace or it may be made detachable, and is of such a size and so arranged as to give a steady supply of fuel to the fire for a comparatively long length of time. On the other side of the furnace a door b' is provided, through which fuel can be also supplied, but only enough to fill the fire-box.

To the water-tubes *m m* are hung the deflectors *M M*, which extend the whole width of the combustion-chamber and have attached to their lower ends the deflector *M'*. These three deflectors *M M M'* may be made integral, as shown in Fig. 7, or they may be made of separate sheets of metal, the lower one *M'* resting upon the upturned edges of the others, as shown in Fig. 3. In the chamber formed by the deflectors *M M M'* are deflectors *N*. These latter deflectors are attached to the under side of the top of the generating-chamber and extend downward nearly to the deflector *M'*, forming a flue between them somewhat wider than the width of the chimney to which it leads.

Fire is started in the fire-box and the heat and other products of combustion will pass upward through the flues between the sides of the generating-chamber and the deflectors *M M*, thence downward between the deflectors *M* and *N*, striking against the deflector *M'*, and then upward between the deflectors *N N* to the chimney. By this system of flues much more of the heat is utilized than if it passed directly to the chimney. By this means the water in the tubes is heated and some of it is converted into steam, and which passes upward through the pipes *g' g* to the superheating-chamber or to the circulating system.

The shell of the generating-chamber may be cast in one piece or built up of sheets, as also may the superheating-chamber, which forms the top of the said chamber, which is attached in any suitable manner to the combustion-chamber. The sides of the latter may be made of material inferior to that used in the construction of the generating-chamber, having no pressure of steam to withstand,

and consequently the cost will be greatly reduced.

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

1. In a steam-generator, the combination of the generating-chamber, the water-tubes mounted therein, the circulating-chambers secured to the flue-sheets of the said generating-chamber, the superheating-chamber secured to the said generating-chamber and forming the top of the same, connected with one of the circulating-chambers and surrounding the flue leading to the chimney, and the deflectors supported within the generating-chamber by the water-tubes, substantially as and for the purpose specified.

2. In a steam-generator, the combination of the circulating-chambers, the mud-drums, and the pipes connecting said chambers with said drums, one of said pipes projecting into its respective chamber nearly to its top and the other of said pipes connecting with the bottom of its respective chamber, substantially as shown and specified.

3. In a steam-generator, the generating-chamber, the water-tubes mounted therein, the deflectors *M M*, vertically supported by said tubes, the deflector *M'*, supported by said deflectors *M M*, and the deflectors supported between said deflectors *M M*, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto set my hand, this 9th day of May, 1890, in the presence of two witnesses.

LOUIS ANDERSON.

Witnesses:

GUST OLSON,
MILES F. CHANY.