

No. 750,635.

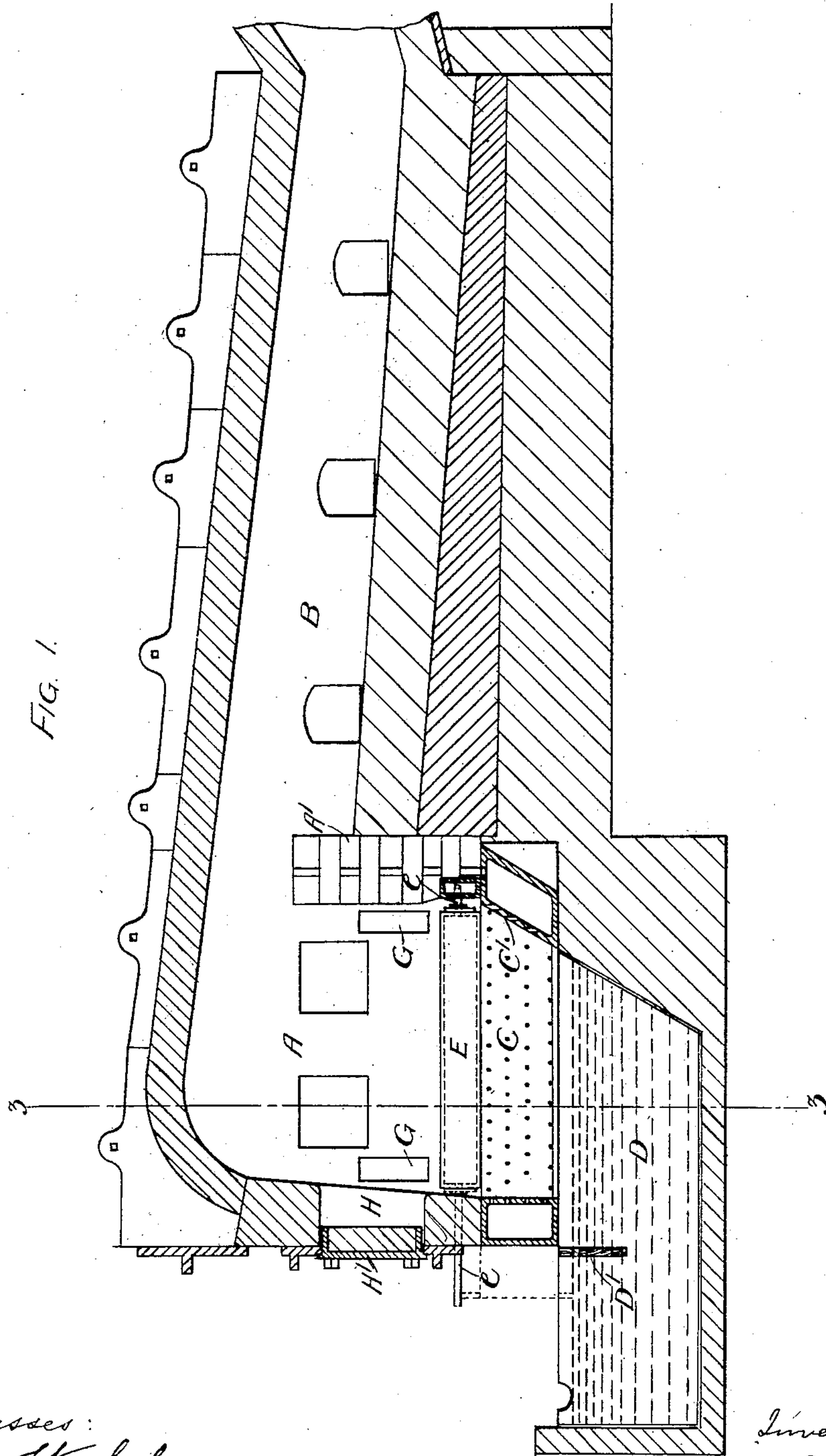
PATENTED JAN. 26, 1904.

G. GARRETT.  
FURNACE.

APPLICATION FILED FEB. 26, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:  
Helen Hechler.  
Henrietta Fellman.

Inventor:  
George Garrett.  
By H. H. de Vas  
Attorney.

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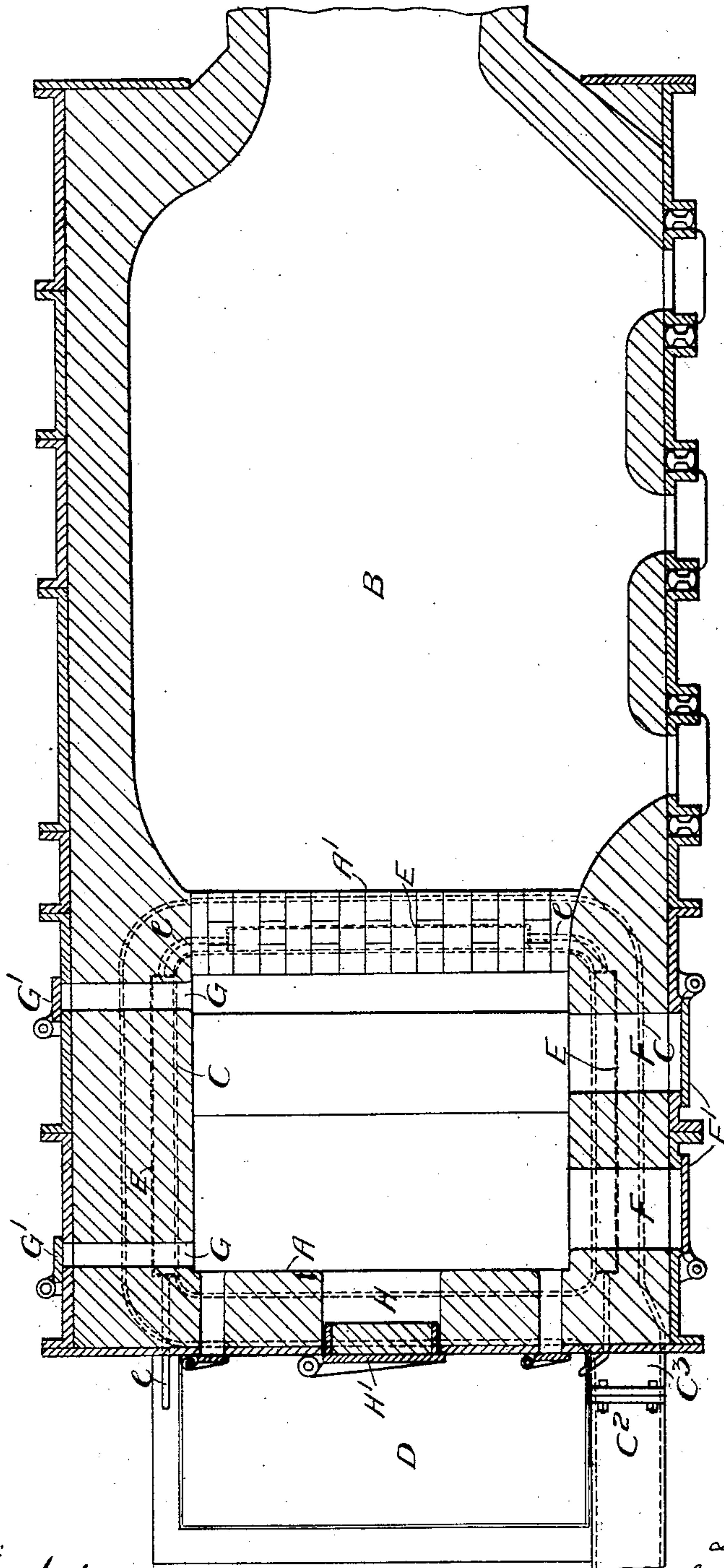
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NO MODEL.

4 SHEETS—SHEET 2.

FIG. 2.



Witnesses:  
*Helmut Hecksler.*  
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4 SHEETS—SHEET 3.

FIG 3.

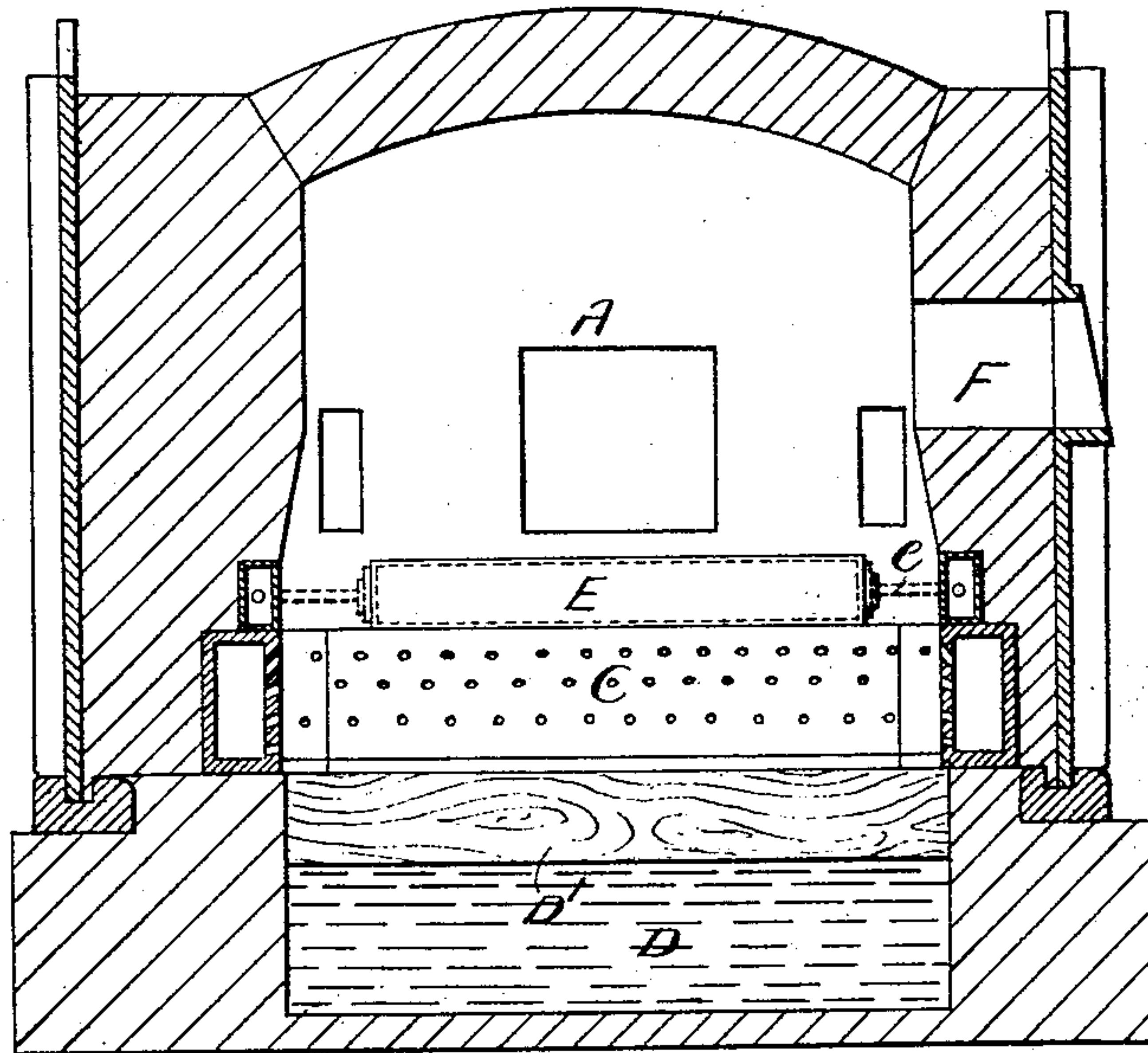


FIG 7.

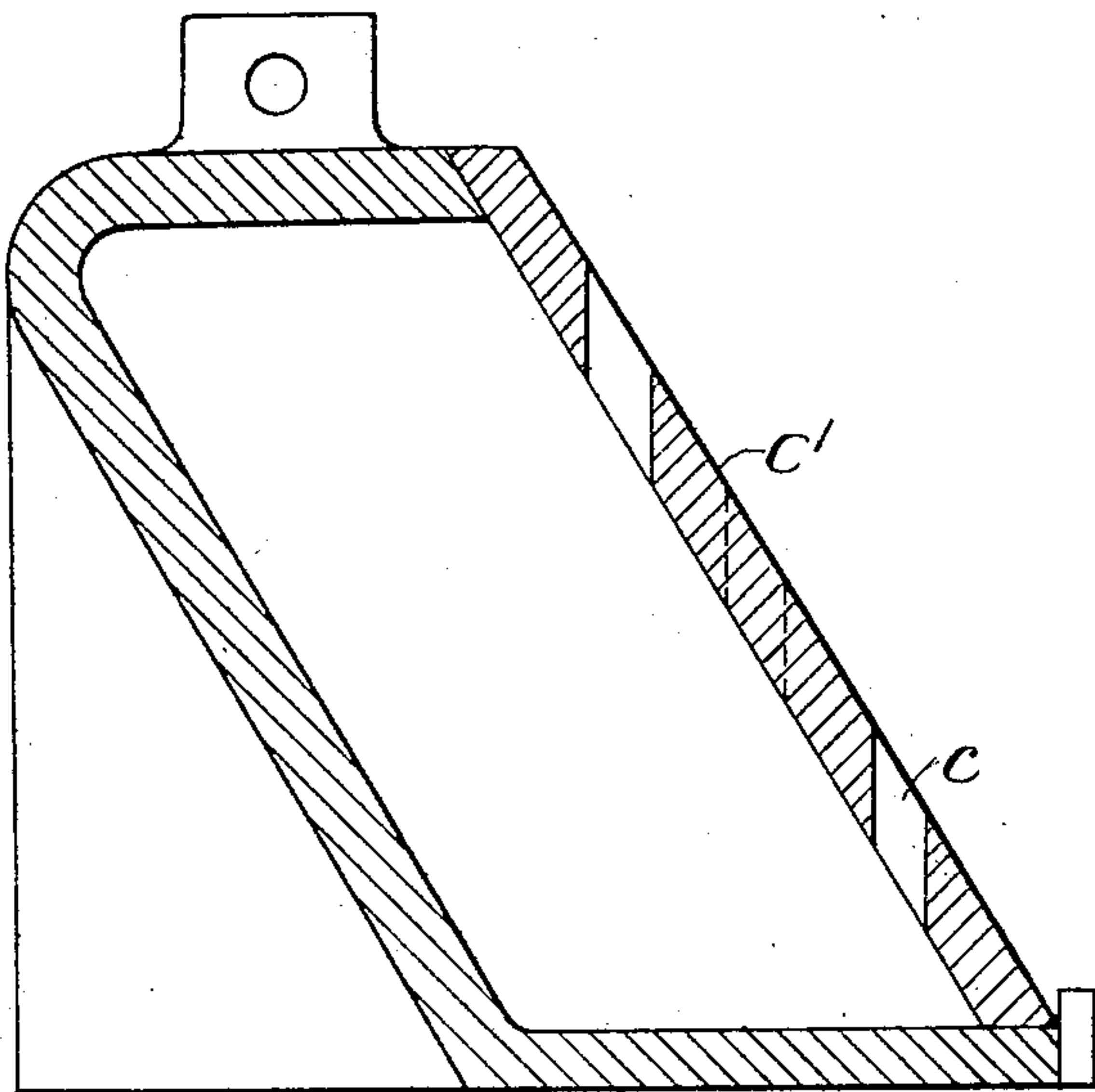
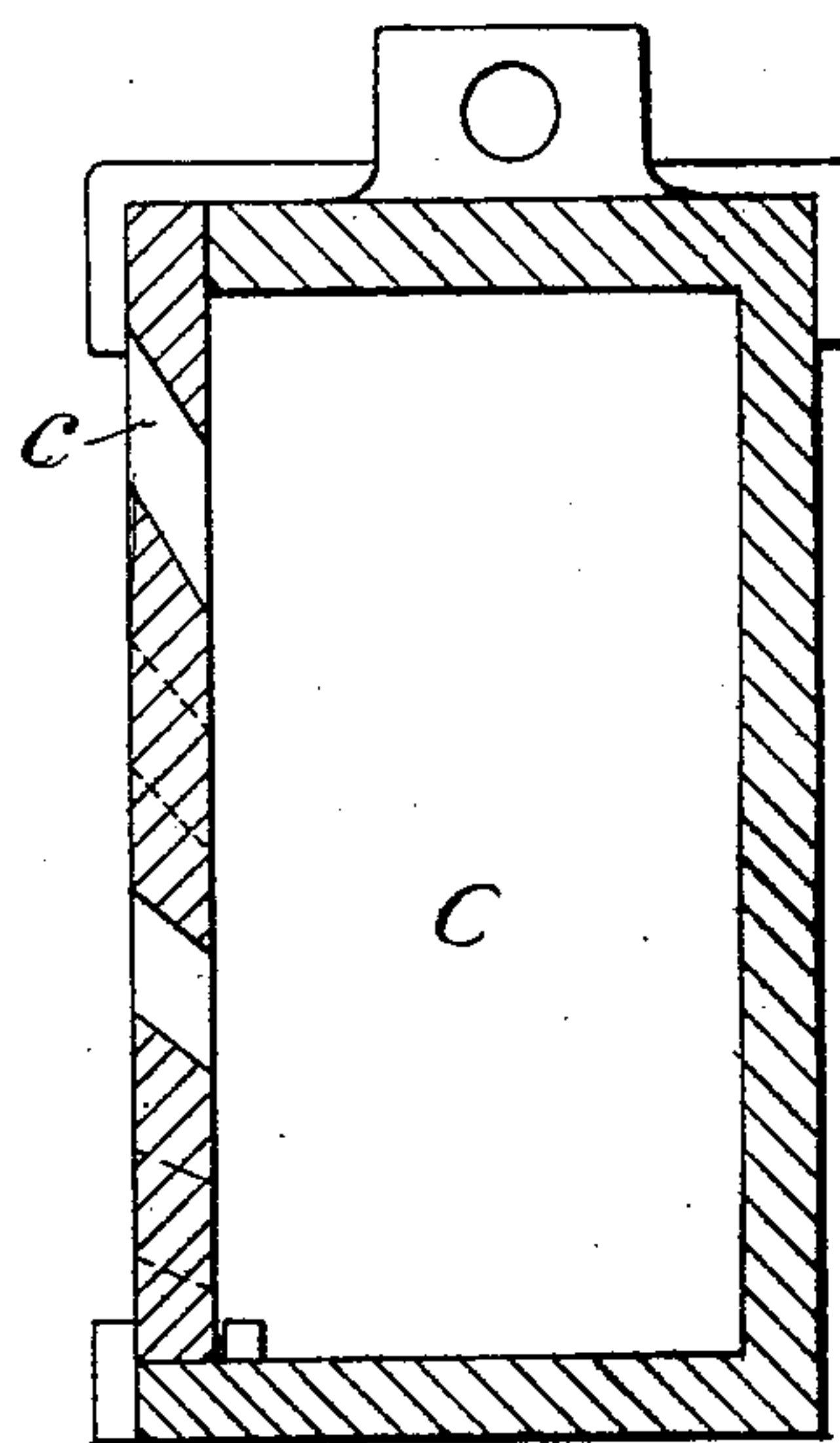


FIG 6.



Witnesses:  
Oscar Hechler.  
Hammer Feltman

Inventor:  
George Garrett.  
By *W. H. Voss*  
Attorney. -



No. 750,635.

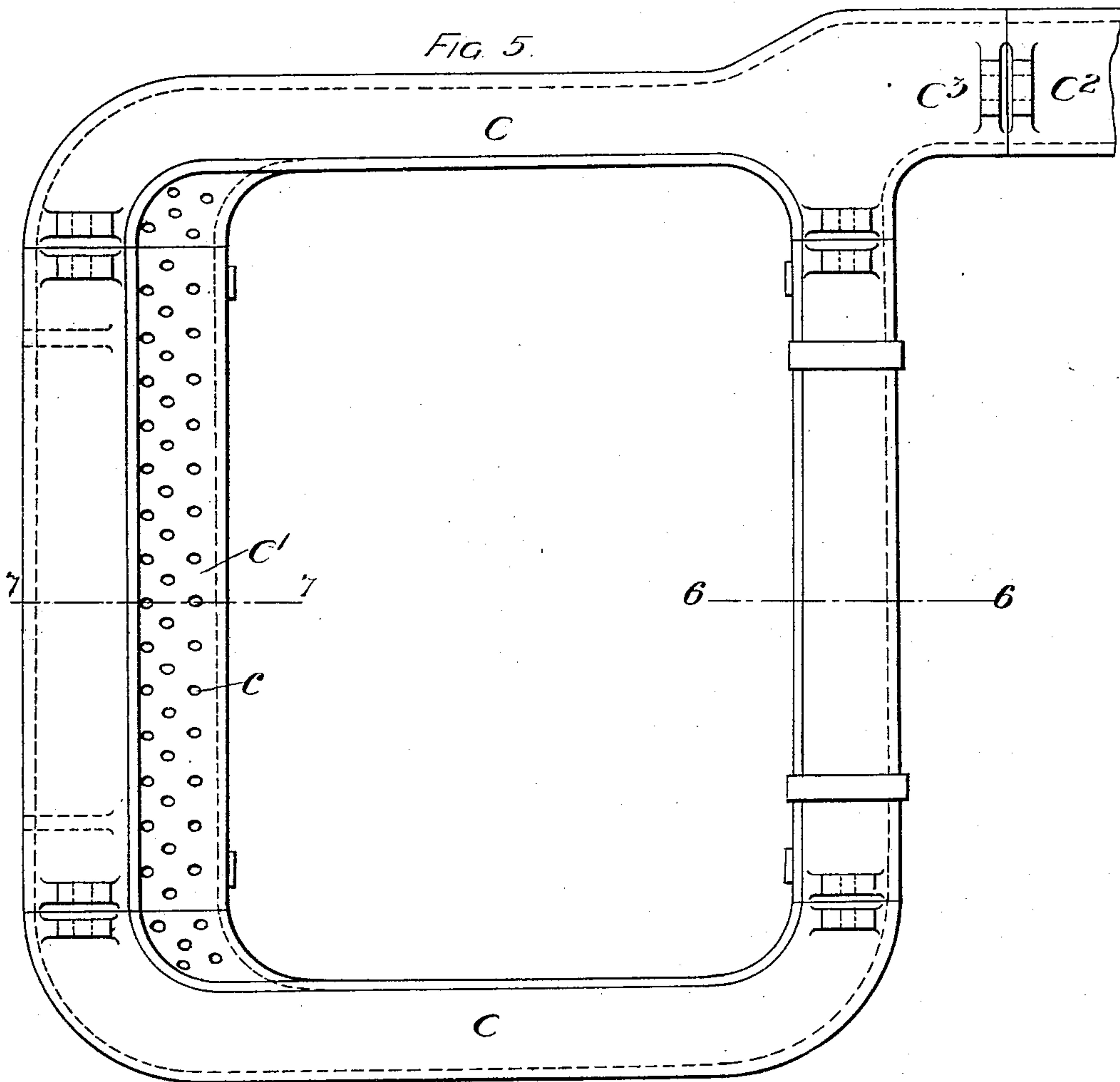
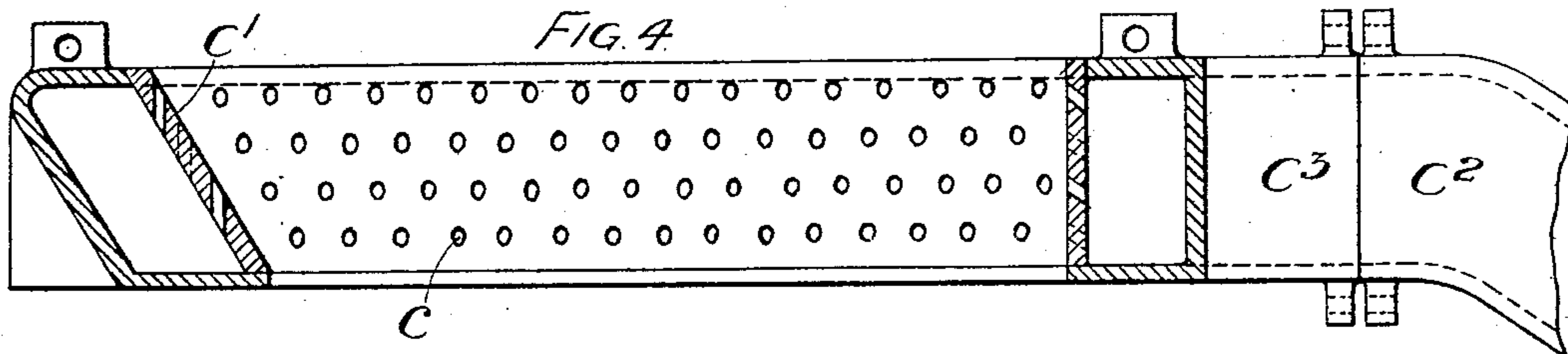
PATENTED JAN. 26, 1904.

G. GARRETT.  
FURNACE.

APPLICATION FILED FEB. 26, 1903.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses:  
Isabel Hochster.  
Charlotte Feltman

Inventor:  
George Garrett.  
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Attorney.

# UNITED STATES PATENT OFFICE.

GEORGE GARRETT, OF COATBRIDGE, SCOTLAND.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 750,635, dated January 26, 1904.

Application filed February 26, 1903. Serial No. 145,143. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE GARRETT, a subject of the King of the United Kingdom of Great Britain and Ireland, residing at Laird street, Coatbridge, Lanarkshire, Scotland, have invented certain new and useful Improvements in Furnaces, (for which application for patent has been made in Great Britain, No. 28,613, dated the 27th of December, 1902,) of which the following is a specification.

This invention relates to heating-furnaces, such as reverberatory furnaces, having a producer or combustion chamber whose base or bottom is formed by a water-pan and in which the combustion of coal or other fuel takes place on the injection of air through a perforated grate over the pan. The grate is usually formed of a number of grate-bars which interfere with the free descent of the ash and clinker resulting from the combustion of the fuel. I obviate that objection according to my invention by dispensing with the ordinary grate-bars and making the grate in the form of a tubular casing to approximate to the rectangular or other contour in plan of the combustion-chamber and locate it under the front and side walls and the bridge of said chamber, so as to support or constitute the base of said walls. This casing is of approximately rectangular cross-section under the front and side walls; but the rear portion under the bridge is preferably of rhomboidal section or has its inner face inclined. The inner sides are each perforated, the perforations being at varying angles, so that the air-blast which is led from a fan or blower through an air-inlet connected to the tubular casing is thence directed upward through the perforations into the fuel within the combustion-chamber. There is thus no obstruction offered to interfere with the free descent of the ash and clinker which drops into a water-pan placed under the combustion-chamber and furnished with a seal-board.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of part of a reheating-furnace to which my improved firing-grate or air-box is shown applied. Fig. 2 is a horizontal section thereof,

and Fig. 3 is a transverse vertical section as at the line 3 3 in Fig. 1. Fig. 4 is a vertical sectional elevation, and Fig. 5 is a plan, of the air-box or grate detached from the furnace; and Figs. 6 and 7 are cross-sections, to a larger scale, taken, respectively, at the lines 6 6 and 7 7 of Fig. 5.

As shown by the drawings, the furnace or fuel-chamber A and the flame-chamber B may be of the ordinary construction; but the base of the furnace instead of being furnished with grate-bars to support the fuel is formed by a hollow casing or air-box C, upon which the brickwork walls of the furnace rest, and under said air-box and extending forward of it is located a water-pan D, wherein the ash from the fuel consumed in the furnace collects. The air-casing C approximates in plan to the rectangular contour of the fuel-chamber, which is built over it, and while it is of approximately rectangular cross-section under the front and side walls A its rear portion under the bridge A' is of rhomboidal section, as particularly indicated at Fig. 7, and has its inner face C' inclined. The sides of the air-box facing inward to the fuel-chamber are perforated, the perforations *c* being at varying angles, but in general inclining upward, so that the air-blast may be directed upward through them into the fuel within the chamber A. Air for this purpose is led into the air-casing C from a fan or blower by an air inlet-pipe C<sup>2</sup>, connected to a flanged opening C<sup>3</sup> at one side of the casing C.

Water-boxes E are fitted in the side walls of the furnace A over the air-casing C and are connected by circulating water-pipes *e* to prevent or lessen the formation of clinker on the side walls.

Firing-doorways F, furnished with hinged doors F', are provided in one of the side walls of the furnace, and in the opposite side wall clinker-doorways G are formed and fitted with doors G', while a cleaning door-opening H and door H' and additional clinker-doorways are formed in the front wall A. These smaller doorways permit of the insertion of suitable tools for breaking off clinker which may adhere to the walls A.

The water-pan D is furnished with a seal-



board D', dipping into the water therein to prevent entry of extraneous air through the ash which collects in the pan, and which ash is periodically removed by means of a shovel.

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

10 In a heating-furnace the combination with a fuel-inclosing chamber of a hollow air-casing located under and serving as a support for the side walls thereof, the said casing being formed

with perforations on its inner face and being furnished with a pipe connection to an air-blower and water-boxes located over the air-box in the side walls of the furnace.

15

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORGE GARRETT.

Witnesses:

WALLACE CRANSTON FAIRWEATHER,  
JOHN MORTON.