

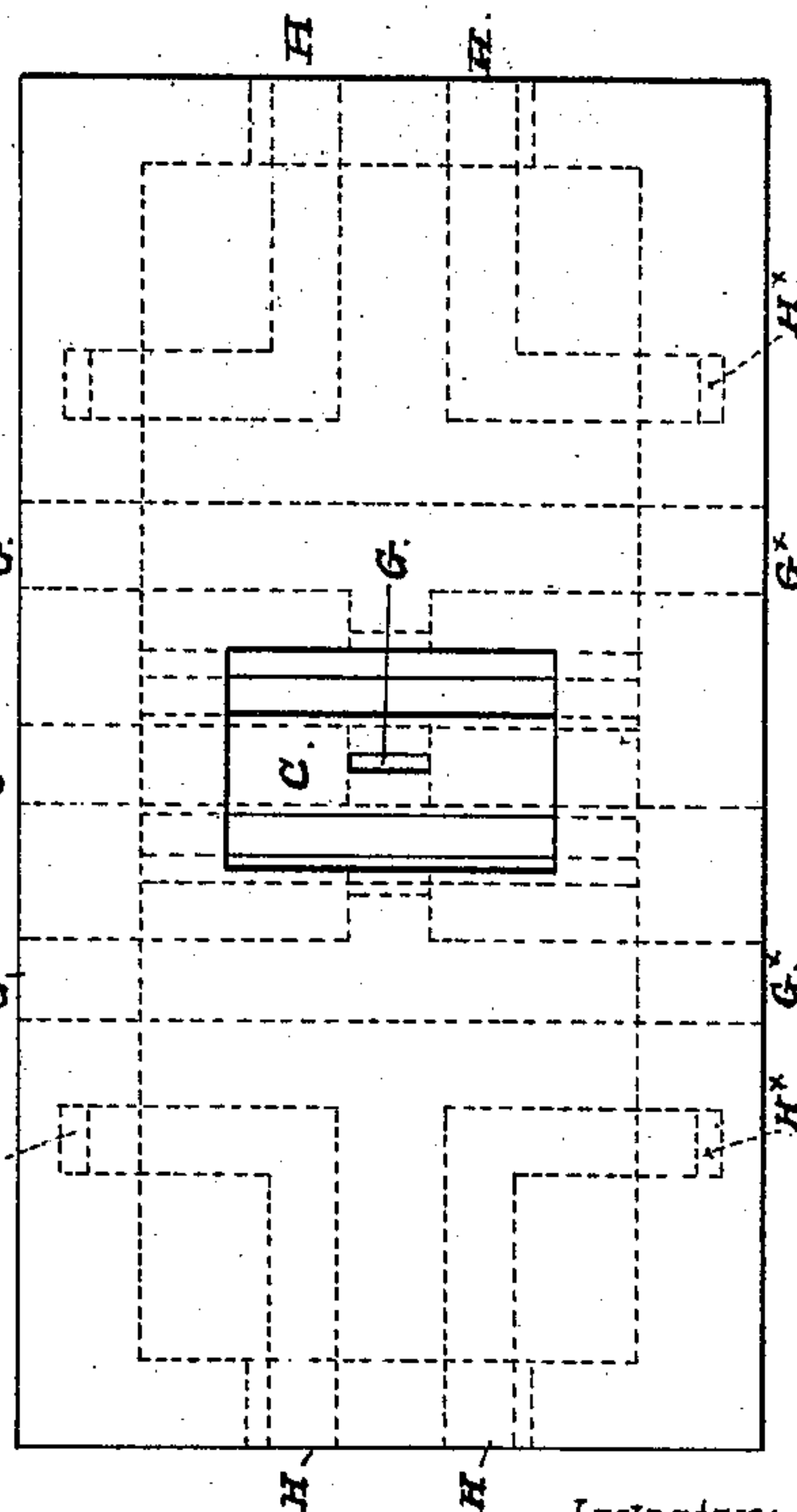
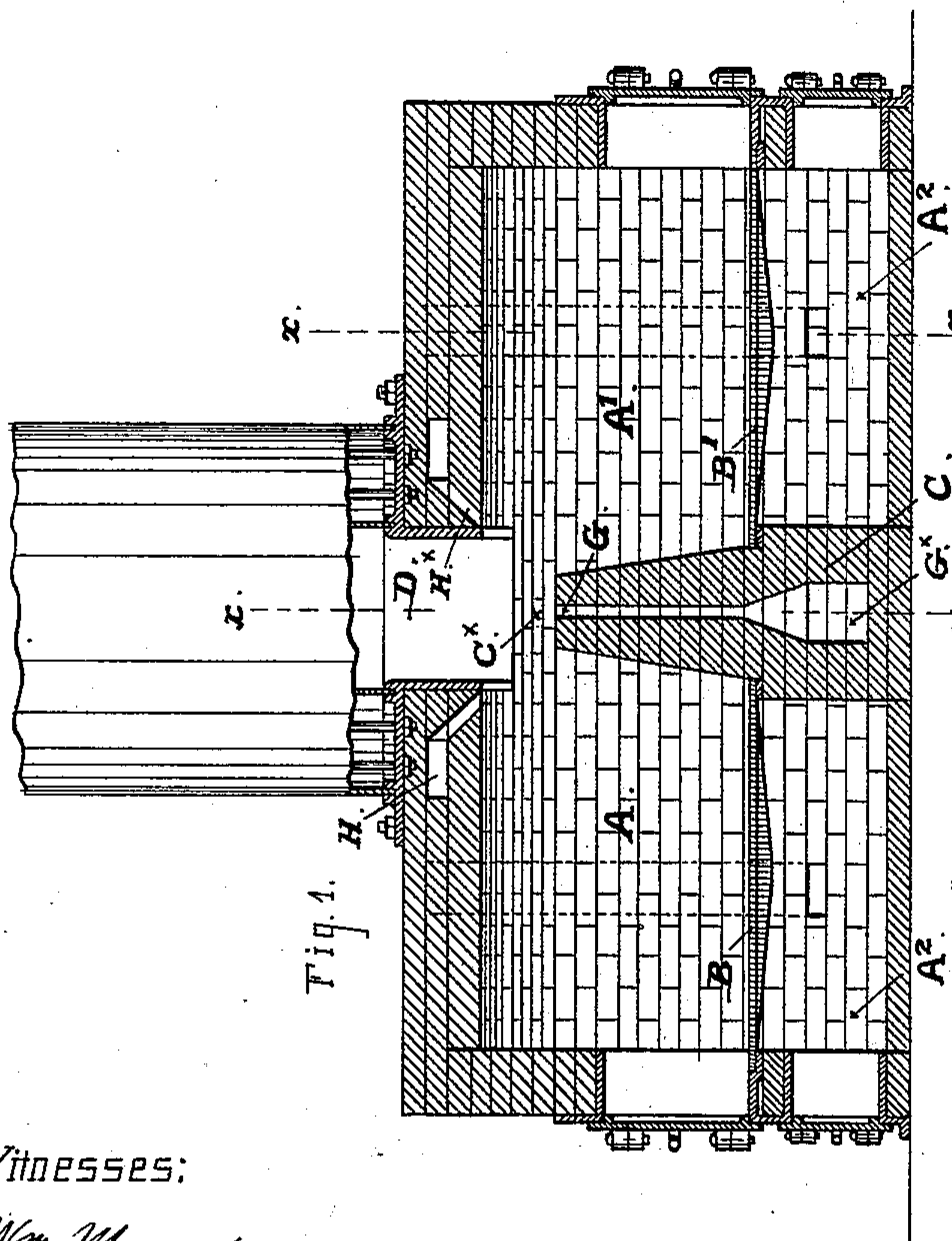
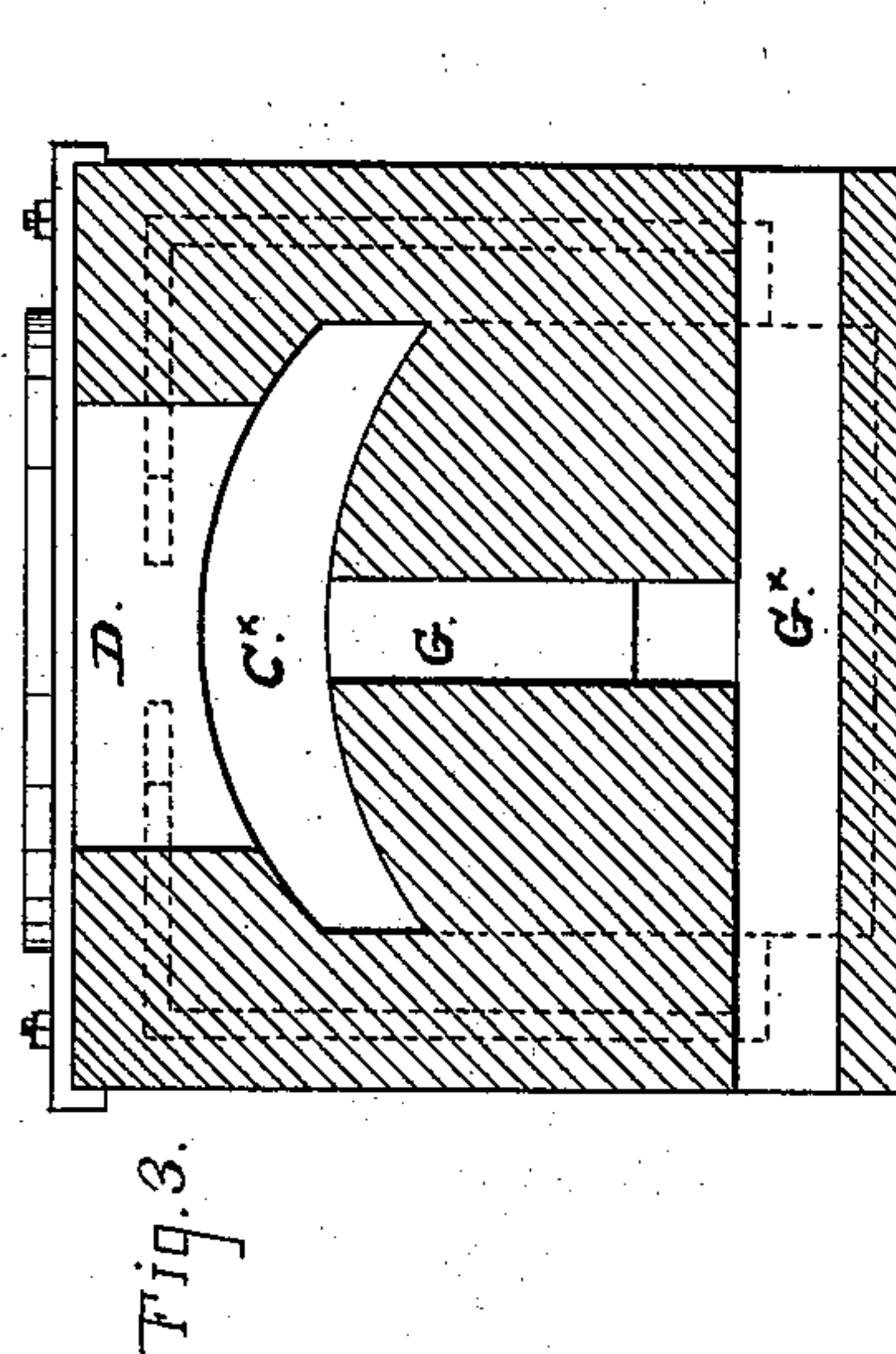
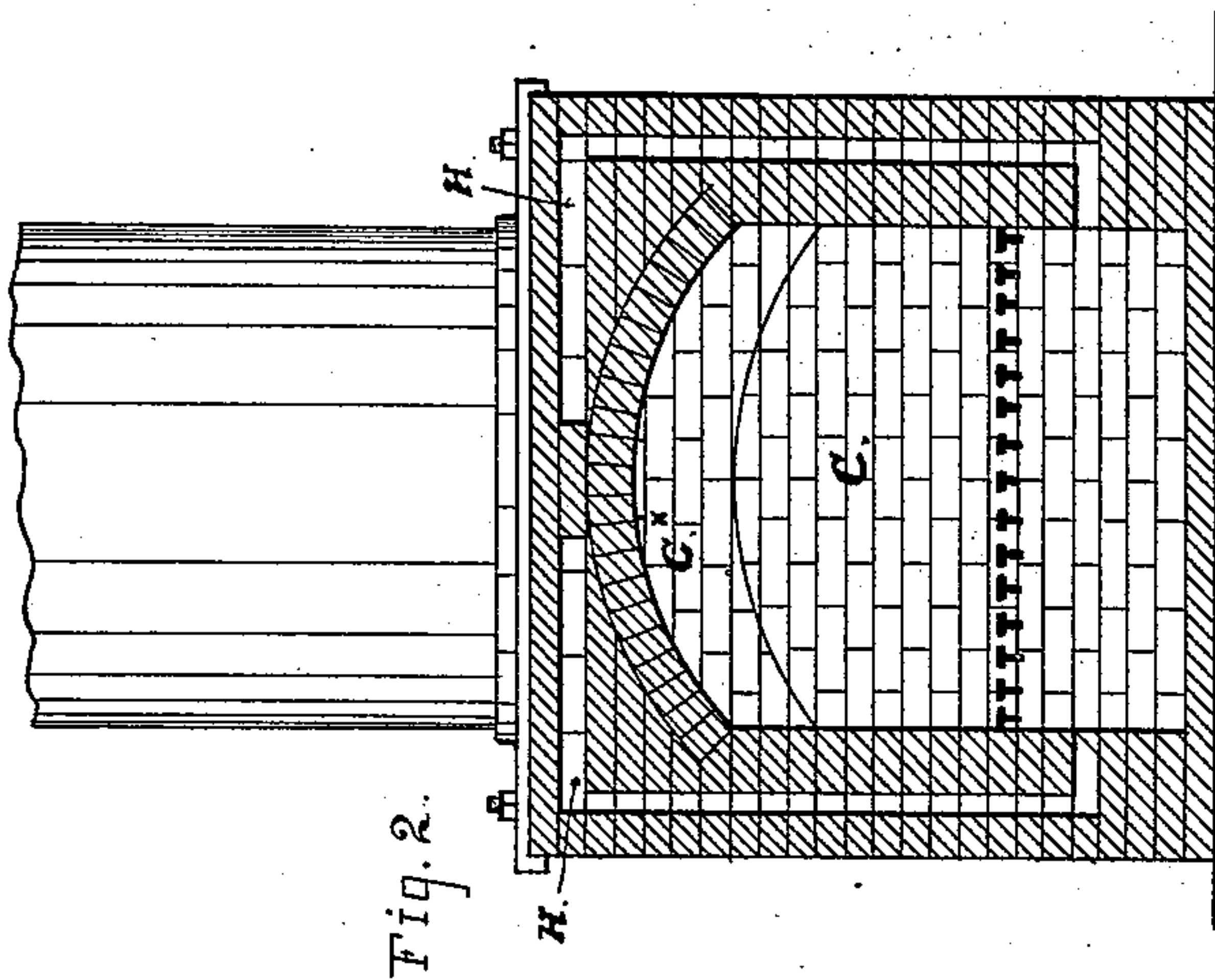
(No Model.)

2 Sheets—Sheet 1.

A. HEBERER.
FURNACE FOR STEAM BOILERS.

No. 464,155.

Patented Dec. 1, 1891.



Witnesses:

Wm. May Jr.
J. E. Ford

Inventor:

Fig. 4

Adam Heber

By Orin H. Osborn

his Atty's.

(No Model.)

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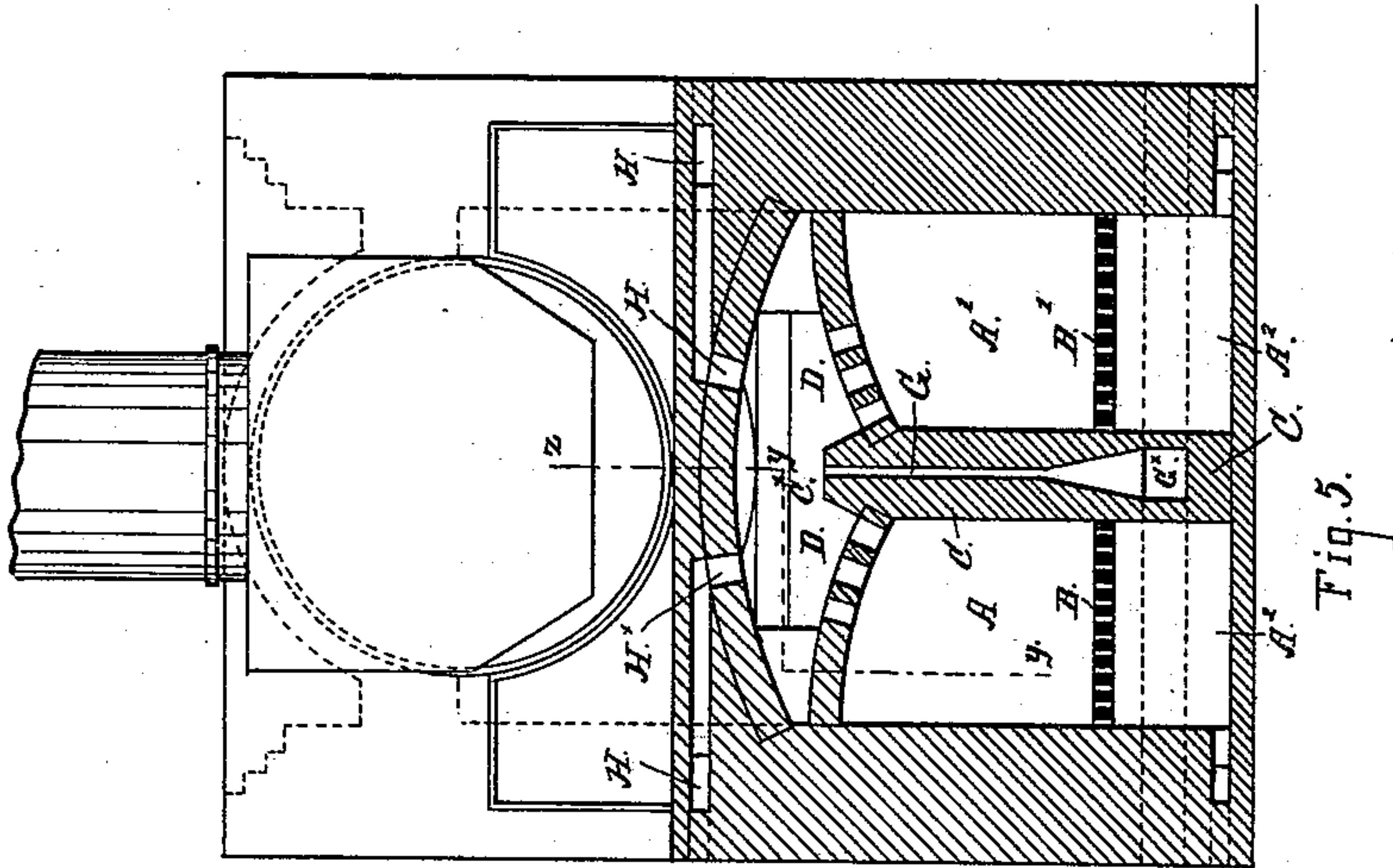


Fig. 5.

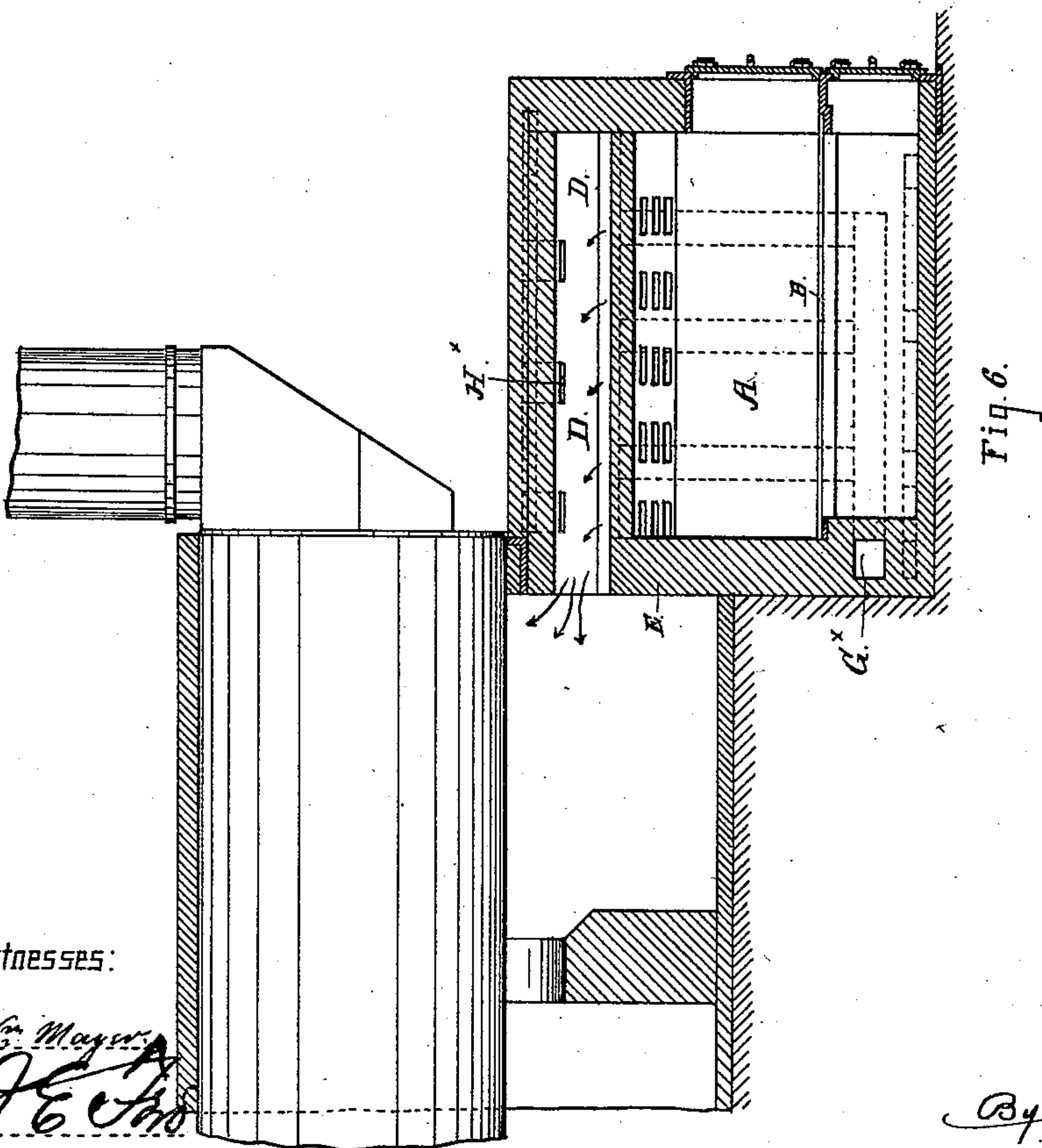


Fig. 6.

WITNESSES:

Wm. Mayers
J. E. Smith

INVENTOR:

Adam Heberer
By *Smith & Osborn*
his Atty's.

UNITED STATES PATENT OFFICE.

ADAM HEBERER, OF ALAMEDA, CALIFORNIA.

FURNACE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 464,155, dated December 1, 1891.

Application filed March 6, 1889. Serial No. 302,167. (No model.)

To all whom it may concern:

Be it known that I, ADAM HEBERER, a citizen of the United States, residing in Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Furnaces for Steam-Boilers, of which the following is a specification.

My invention relates to improvements in coal-burning furnaces for steam-boilers; and it has for its object to secure more complete and effective consumption of those portions of the fuel and products of combustion therefrom which are ordinarily lost or carried off in an imperfectly-consumed state in the furnaces most generally used and the methods of firing commonly employed at the present time.

These improvements are applicable both to steam-boilers of the horizontal and the vertical or upright kind, and they consist in certain novel construction and combination of twin furnaces or fire-boxes, as hereinafter explained.

The accompanying drawings illustrate the manner in which I construct and apply my invention to two different types or styles of boilers, Figures 1 to 4, inclusive, showing the construction which is adapted for upright boilers, and Figs. 5 and 6 representing the manner of applying the invention to a horizontal boiler.

Fig. 1 is a view in vertical longitudinal section of the furnace for an upright boiler. Fig. 2 is a transverse section taken through one of the fire-chambers on the line $x x$, Fig. 1. Fig. 3 shows a vertical section on the line $y y$, and Fig. 4 is a top view of the furnace, showing the air-heating passages in the walls. Fig. 5 is a cross-section taken in a vertical plane through the furnace that is arranged for use with a horizontal boiler, and Fig. 6 is a longitudinal section taken through this last-mentioned figure on the line $y y z$.

In that form of a furnace which I consider the best adapted for the upright boiler or generator the two fire-chambers are arranged on opposite sides of a dividing-wall that extends transversely across the furnace, and the openings to admit fuel and the apertures in the ash-pit are located at opposite ends of the furnace. This arrangement is varied for the horizontal type of boiler, and also in such

cases of application where the peculiar situation or surroundings may not permit convenient access at both ends or sides to the furnace-doors, and in these cases the two fire-chambers are placed side by side with the dividing-wall running longitudinally, and the openings for fuel and draft located in the same end of the furnace.

A A' are the two fire-chambers, and B B' their grate-surfaces. The dividing-wall C between them extends from the floor of the ash-pits A² A² up to within a short distance from the top of the furnace, leaving a clear space along the top edge of the wall, through which the fire and products of combustion from either chamber meet and combine with those from the other chamber. This passage or space C^x is also in communication with or delivers directly into the fire-space D, that extends through or beneath the boiler, the furnace for the horizontal boiler having a combustion-chamber D over the arched tops of the two fire-chambers for the full length of the middle dividing-wall with an outlet at the rear over the top of the bridge-wall E. Apertures in the roofs of the fire-chambers are provided along the sides next to the middle wall to deliver the gases and other products into the space D as nearly as practicable through the middle or over the dividing-wall. At this central portion of the space and running from front to rear along the top of the wall C is an air-inlet aperture G, leading upward from an air conduit or passage G^x, that opens to the outside atmosphere through the walls of the furnace. Similar air-conducting passages H H are formed in the top of the furnace with apertures H^x, delivering through the crown of the chamber D downward into the space, and additional passages are also arranged in the side walls to lead in air from the outside under the grate-surfaces. All these passages are designed not only to deliver air in a direct manner into the combustion spaces or chambers for effective combustion with the gases and products from the fuel, but also to raise the temperature of such jets or streams of air before they enter the furnace.

In the operation of this furnace the chambers A A' are fired alternately, so that while one is being charged with fresh fuel the other

is in such advanced stage of combustion that the heat and incandescent condition of its fuel assist in the thorough combustion of the gases and products from the fresh fuel as they pass over the dividing-wall. The smoke and products from one fire are thus caused to pass over and become consumed by the other fire, the operation being made more effective and complete by the introduction of air at the point of mixture or combustion. The air-conducting passages are carried in from the front through the brick-work, and are furnished with dampers for regulating the supply of air, if found necessary. The openings in the front of the fire-chambers and ash-pits are provided with suitable doors to close up the furnace when the fires are well under way, at which time the air for combustion is drawn into the furnaces through the air-passages before mentioned.

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

1. In a furnace of the kind described, the combination of the furnace masonry or housing, a central division-wall, hollow, as de-

scribed, separate feed and pit doors and separate grate-surfaces for each side of the central division-wall, a common combustion-chamber above said division-wall, and passages or ducts leading from the dome on each side of the exit-passage through the furnace, masonry to points beneath the grate-surfaces on the opposite sides of the division-wall, as set forth.

2. In a furnace of the kind described, the combination of the furnace masonry or housing having feed and pit doors at both ends, a central division-wall, hollow, as described, separate grate-surfaces on each side of the division-wall, a common combustion-chamber above said division-wall, and air-passages H^x and H , leading from the dome of the furnace on each side of the exit-chamber down beneath the grate-surface, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ADAM HEBERER. [L. S.]

Witnesses:

JOS. E. FORD,
CHAS. E. KELLY.