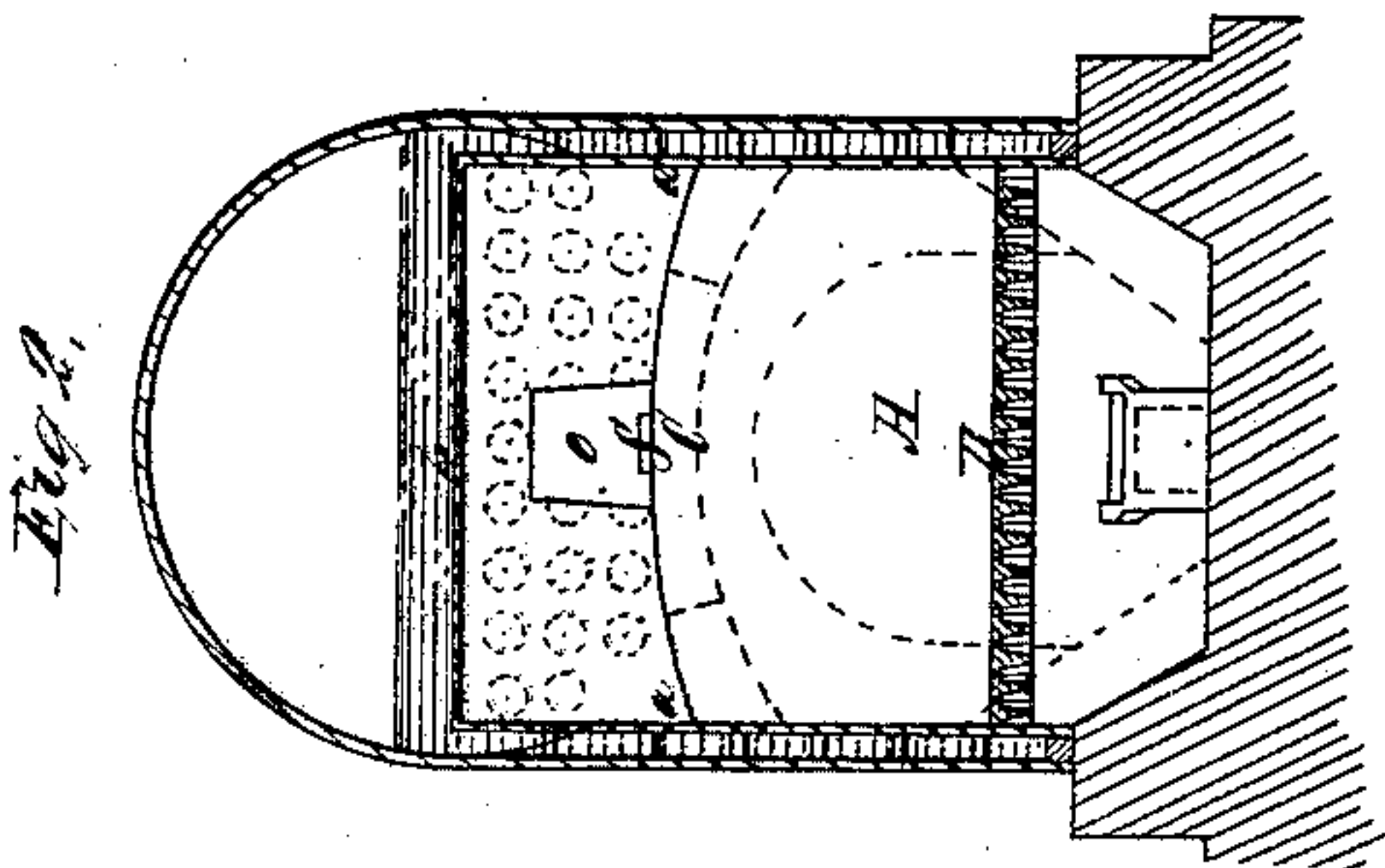
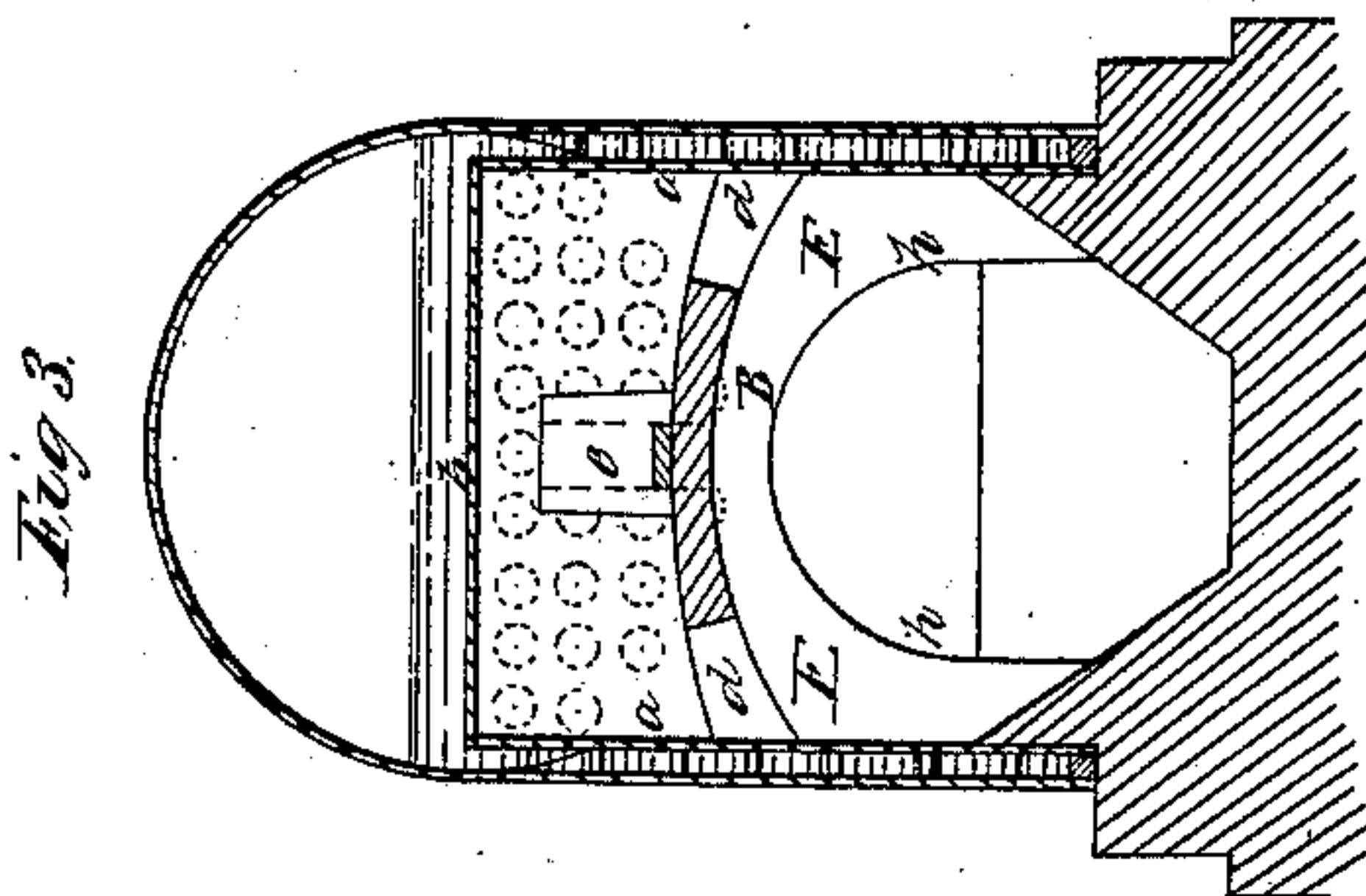
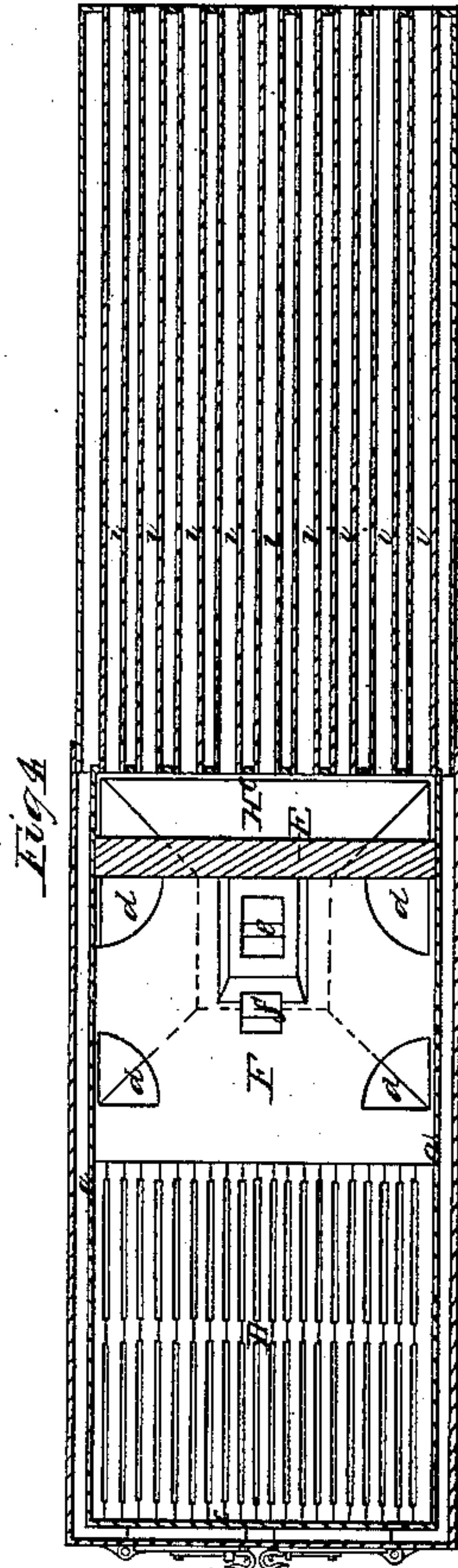
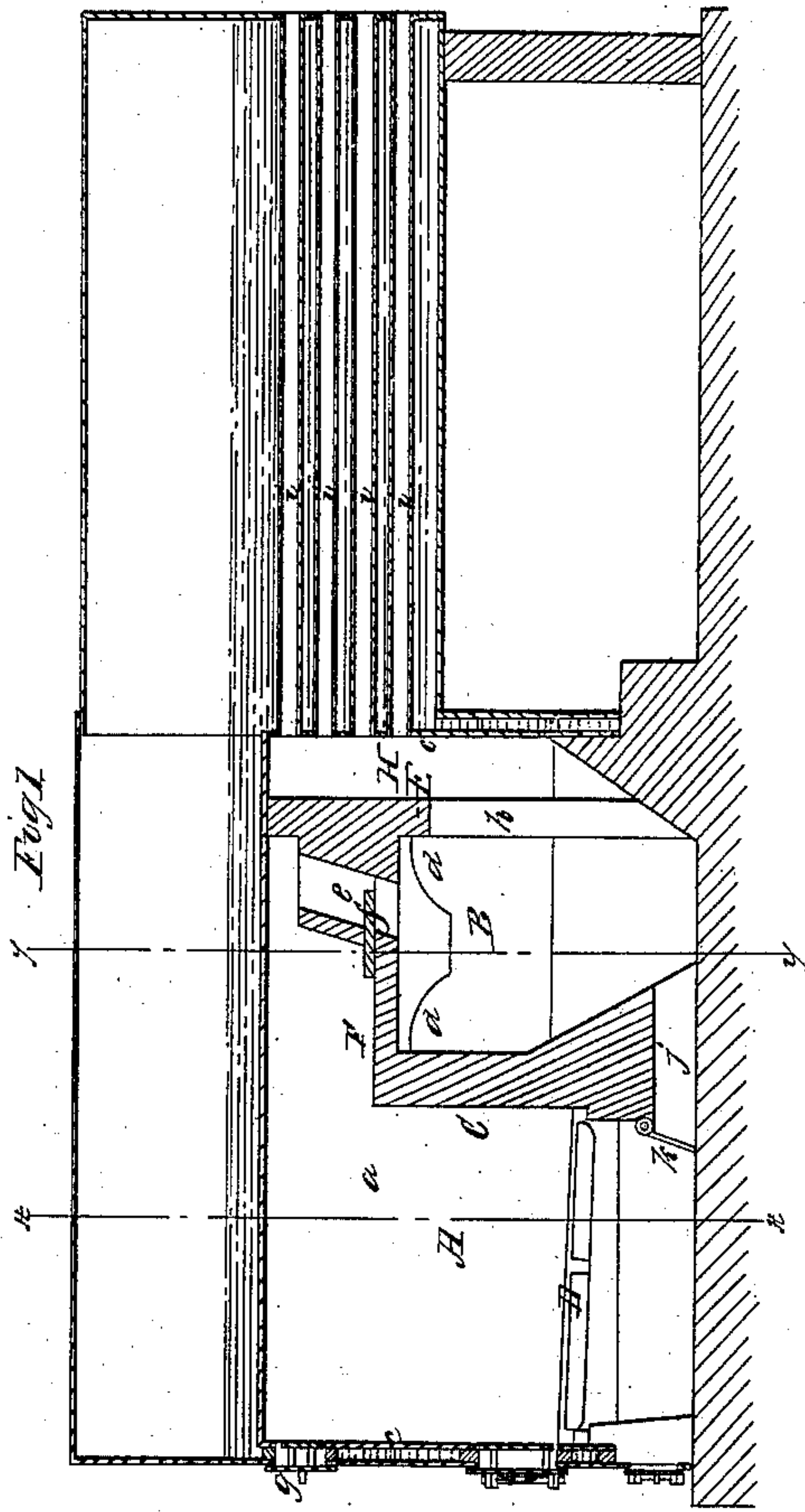


J. R. Robinson,

Steam-Boiler Furnace.

N^o 31,627.

Patented Mar. 5, 1861.



*Witnesses
J. W. Combs
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UNITED STATES PATENT OFFICE.

J. R. ROBINSON, OF BOSTON, MASSACHUSETTS.

STEAM-BOILER FURNACE.

Specification forming part of Letters Patent No. 31,627, dated March 5, 1861; Reissued May 14, 1861, No. 1,184.

To all whom it may concern:

Be it known that I, J. R. ROBINSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Steam-Boiler Furnaces, (No. 2;) and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a central longitudinal vertical section of a boiler with my improvement. Fig. 2, is a transverse vertical section of the same in the line $x^*. x^*$. of Fig. 1. Fig. 3, is a transverse vertical section of the same in the line $y^*. y^*$. of Fig. 1. Fig. 4, is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a certain novel construction of a gas-mixing-chamber arranged in rear of the fire chamber between the latter and the flue or flues or tubes of the boiler, and a certain novel system of openings of communication between the fire chamber and the said mixing chamber, whereby the mixing of the gases in the latter chamber is effected in a very perfect manner, and perfect combustion is obtained with but little excess of air.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The boiler represented to illustrate this invention is of the horizontal multitubular kind with a fire box. The inner portion a, b, c , which corresponds in its character with the fire box of an ordinary locomotive boiler is made of such greater length than an ordinary fire box in order that there may be included within it the fire chamber A, and the gas-mixing chamber B.

C, is the bridge erected across the rear of the fire chamber A, and extending upward about two thirds of the distance from the grate D, to the crown sheet b .

E, is a wall erected across the box a, b, c , at a short distance from the front tube sheet and extending upward to the crown sheet b , all across the same.

F, is an arch thrown across the box a, b, c , even with the top of the bridge and extend-

ing from the bridge back to the wall E. The space B, embraced between the bridge C, and wall E, under the arch F, constitutes the gas-mixing chamber.

d, d , are openings in the arch F, for the admission of the gases of combustion to the mixing-chamber B, said openings being constructed and arranged close to the sides of the box a, b, c .

e , is a trunk opening from the space above the arch F, into the chamber B. This trunk communicates with the chamber G, near the rear thereof and at the middle of its width, that is to say, at the crown of the arch, and it extends upward to near the top of the box a, b, c . The said trunk is fitted with a sliding damper or valve f , which can be opened and closed by a hook inserted through a door g , in front of the boiler.

h , is an arched opening in the middle of the wall for the passage of the gases from the mixing-chamber B, to the space H, in front of the tube sheet, from whence they pass into the tubes i, i .

Nearly the whole of the gases and uncombined air from the fire chamber A, enter the mixing-chamber B, by the side openings d, d , but the lightest portion thereof which ascends to the top of the fire chamber enters the mixing-chamber by the trunk e . The portions entering the openings d, d , on either side of the mixing-chamber with a rolling or eddy-like motion meet at the center of the chamber and become perfectly mixed, and the portions entering by the trunk e , being also delivered to the middle of the chamber are mixed with the other portions and a perfect combination and combustion is effected. The slide f , may be more or less opened according to the quantity which it is desired shall pass off through the trunk e , or according to the nature of the fuel. By the use of this trunk the lighter gases are prevented accumulating in the upper part of the fire chamber out of the circulation, and by the downward and slightly forward direction in which the gases enter the mixing-chamber by the said trunk the agitation and mixing of the whole of the gases in the said chamber is greatly aided.

j , is a hole through which ashes and dirt may be raked from the chamber B, into the

ash pit; and *k*, is a door for closing the said hole at all times, but when the ashes or dirt are being raked through it.

The same construction of the mixing-chamber and arrangement of openings from the fire box may be adopted in the setting of boilers having no fire boxes within them, the side walls of the setting, in such case supplying the place of the sides *a*, *a*, of the fire box.

What I claim as my invention and desire to secure by Letters Patent; is,

1. The gas-mixing chamber B, constructed

in rear of the bridge C, with a covering arch F, and openings *d*, *d*, in the said arch substantially as herein specified. 15

2. In combination with the chamber B, constructed as described, the trunk *e*, elevated above the said arch for the reception of the lighter gases substantially as herein specified. 20

J. R. ROBINSON.

Witnesses:

EDWIN M. CHAMBERLIN,
GEO. S. BOUTWELL.