

(No Model.)

2 Sheets—Sheet 1.

A. HEBERER.
STEAM BOILER.

No. 395,780.

Patented Jan. 8, 1889.

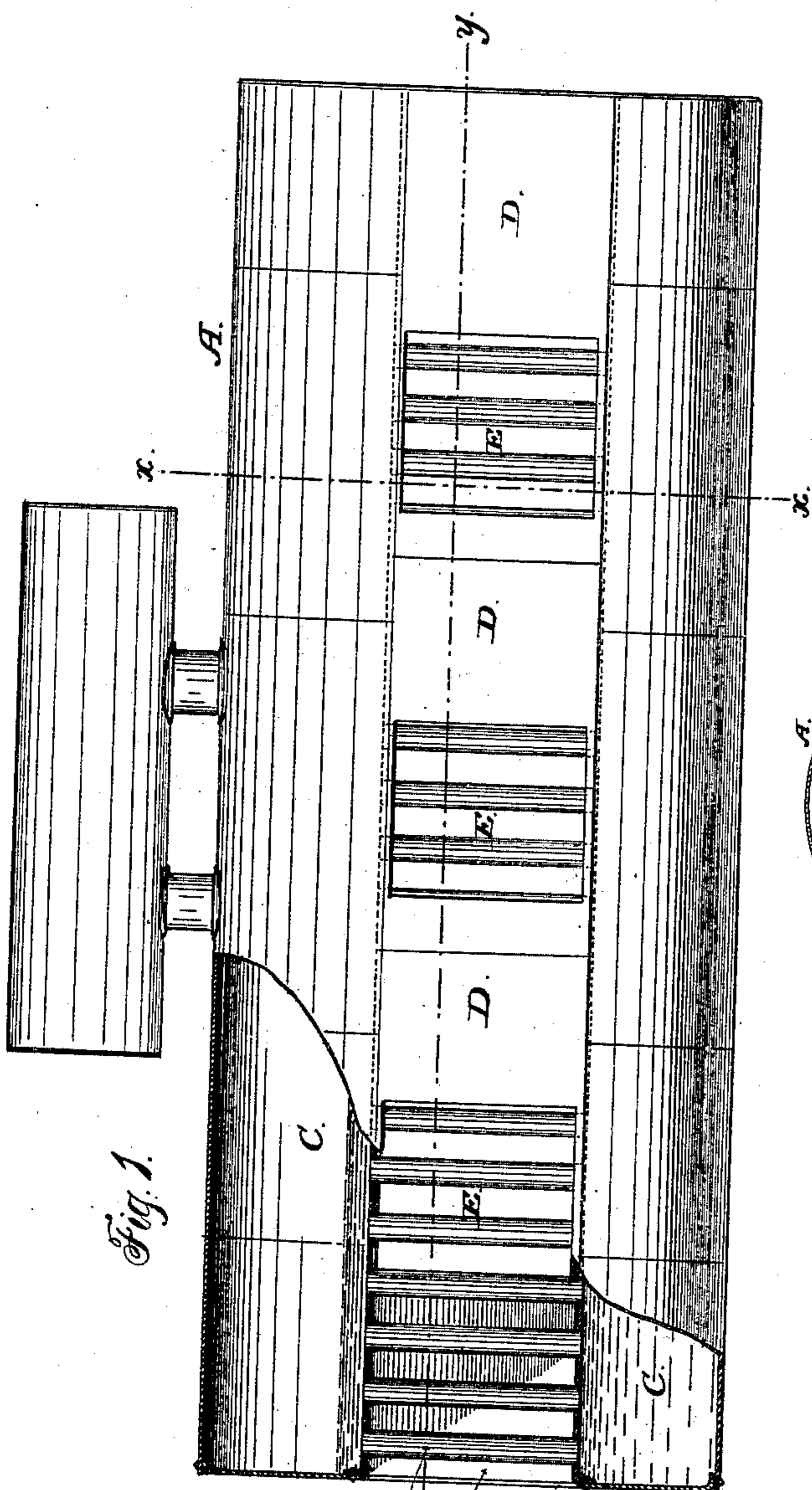


Fig. 1.

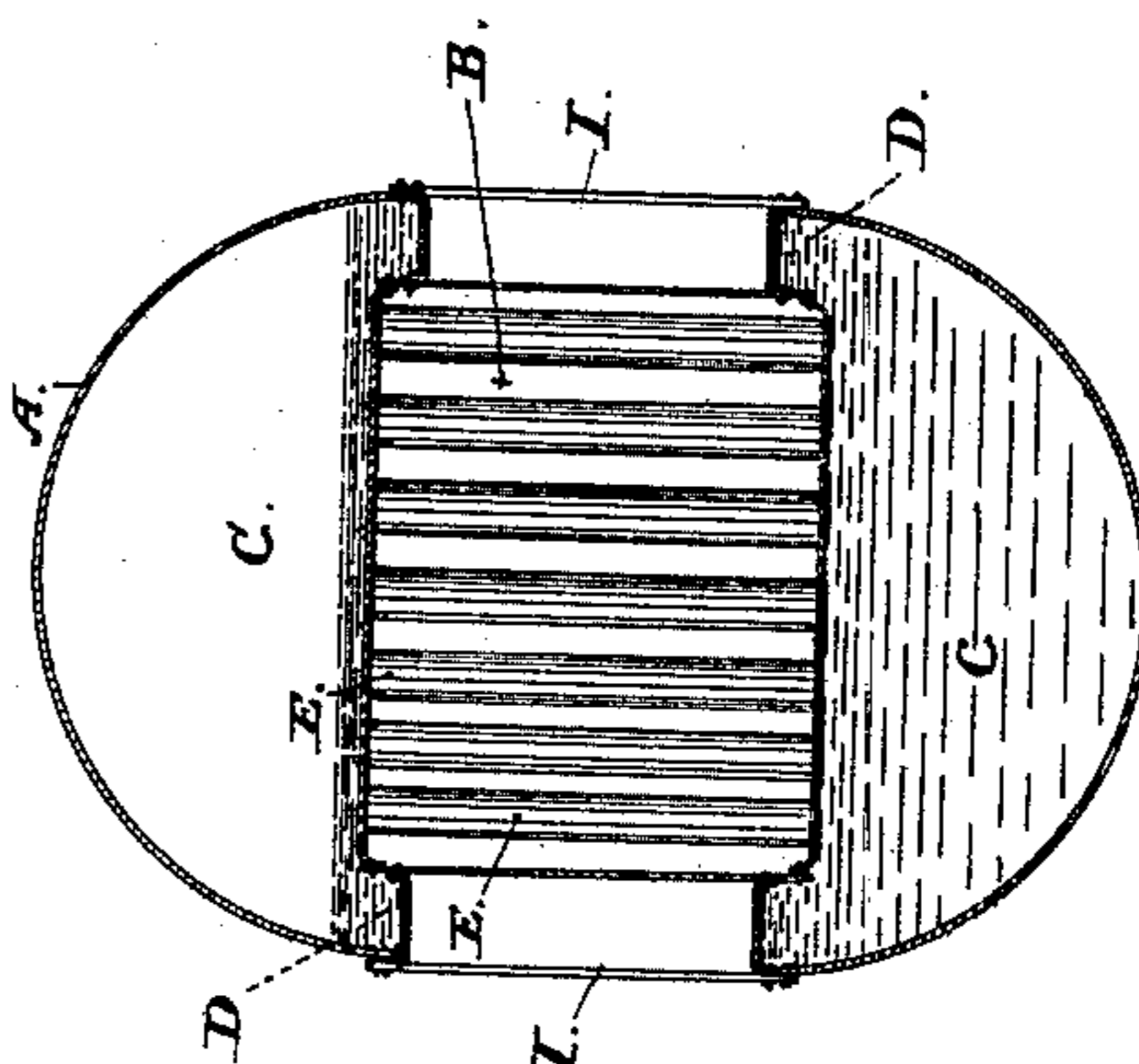


Fig. 2.

Witnesses:

E. Patten.

R. H. Peck.

Inventor:

Adam Heberer

By Smith & Town
his Atty.

(No Model.)

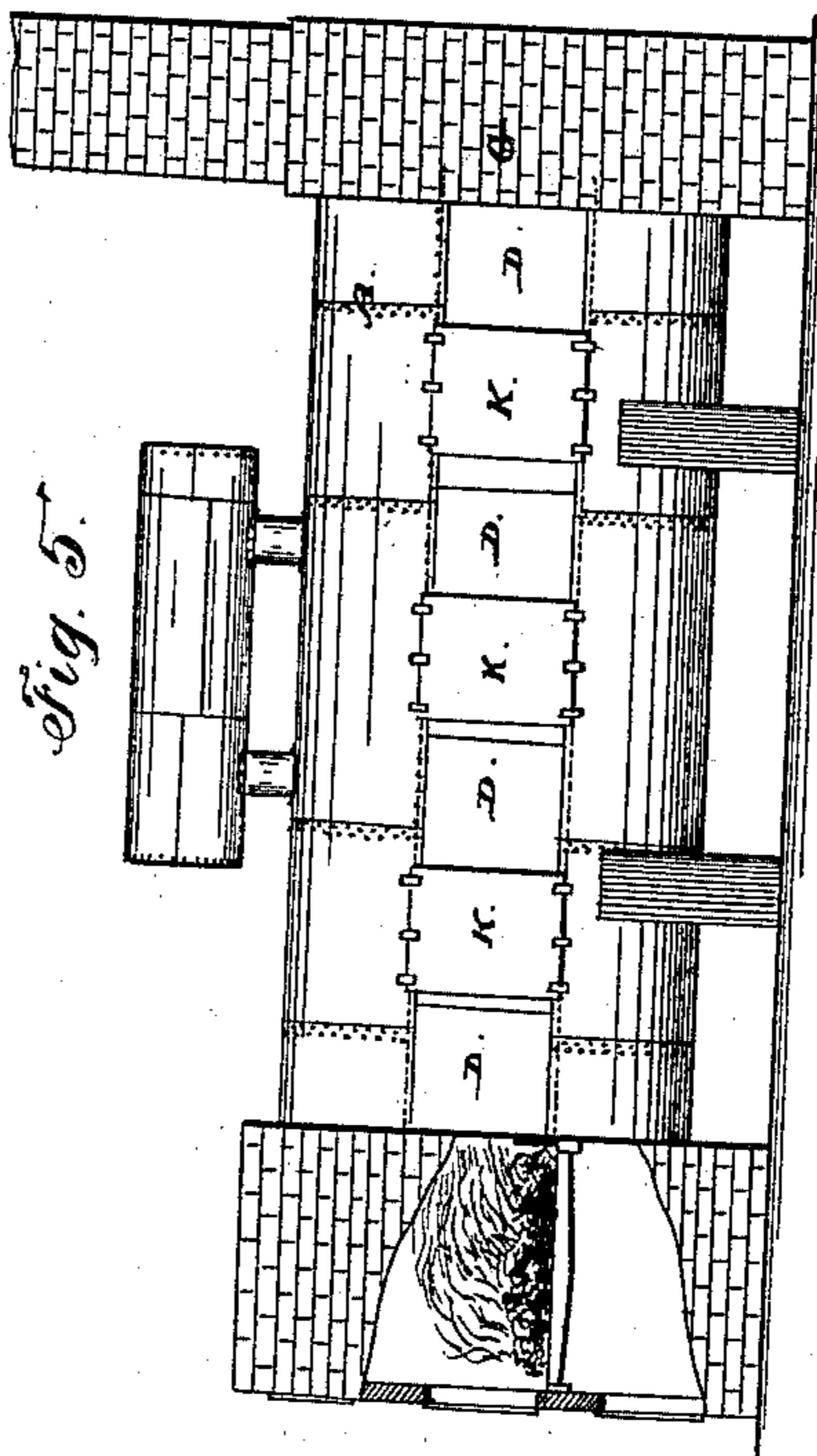
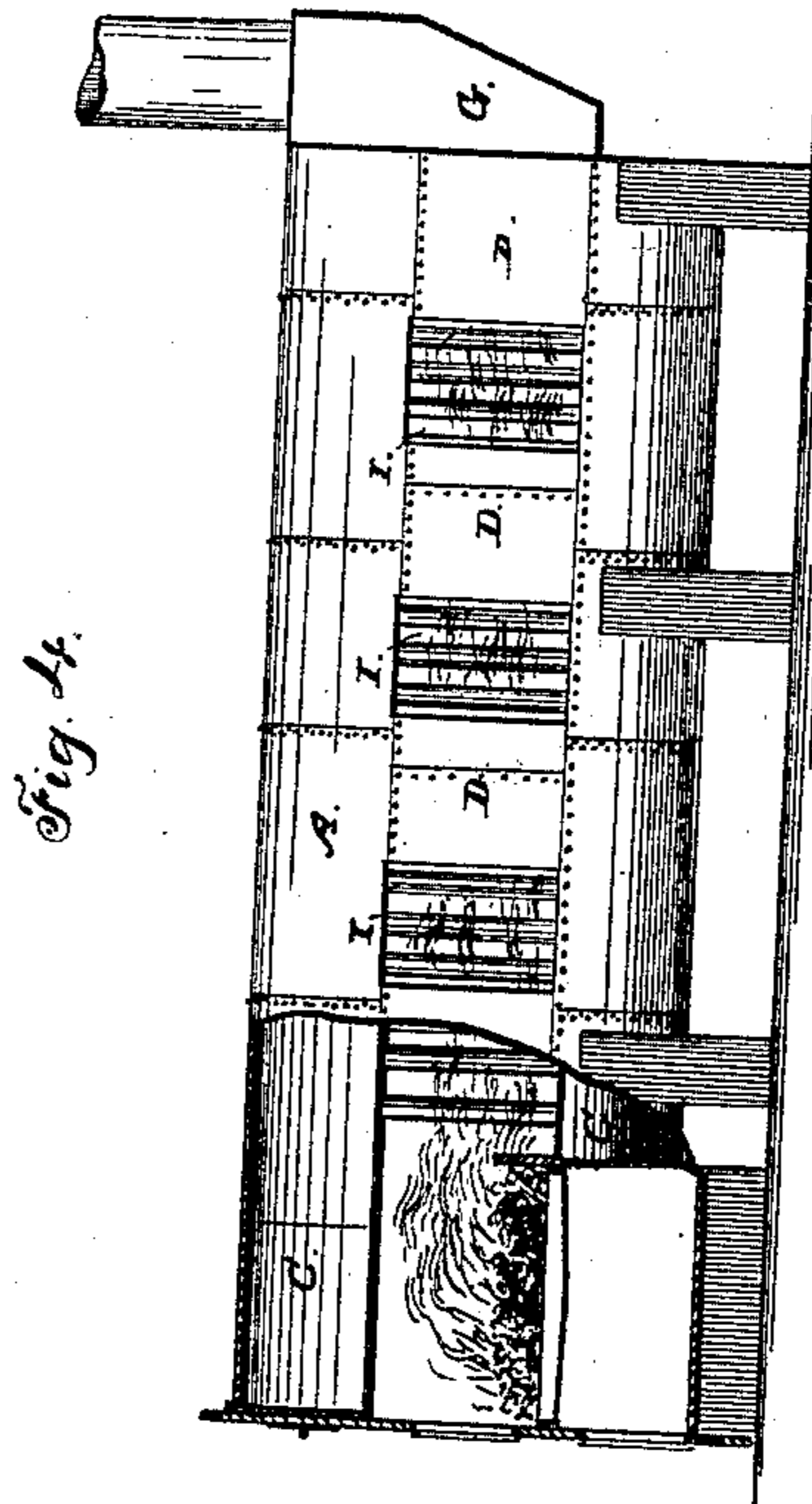
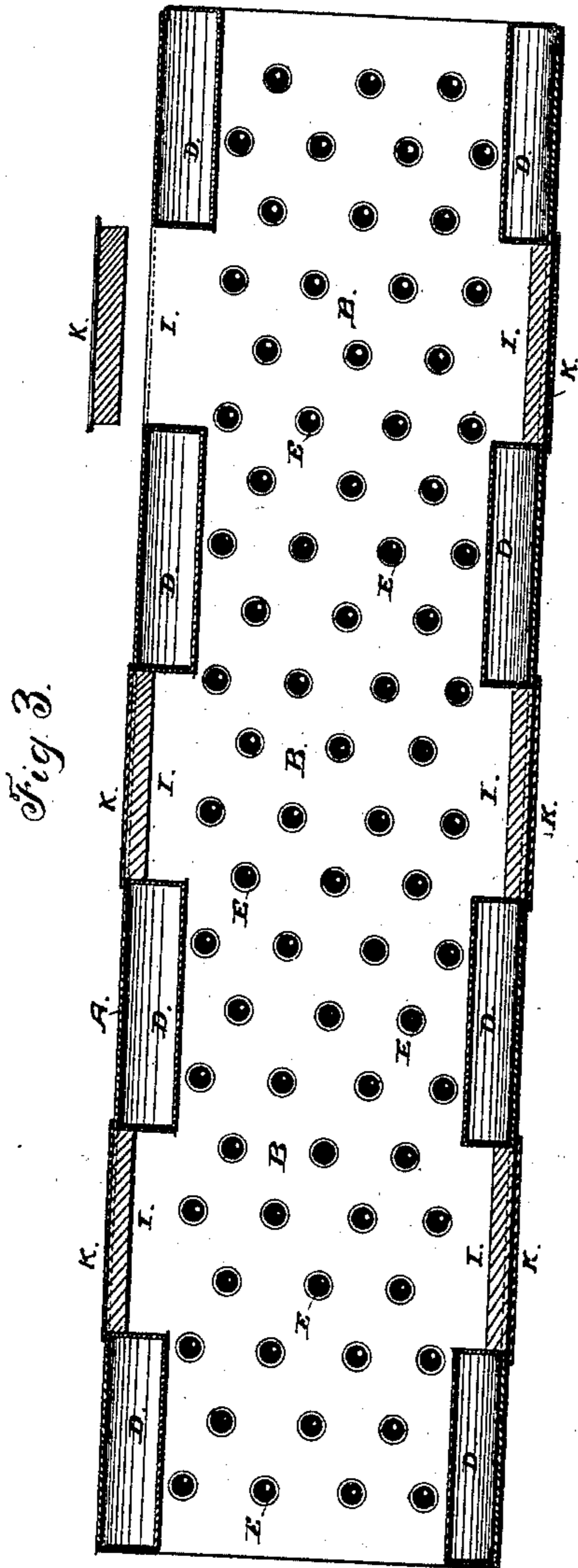
2 Sheets—Sheet 2.

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Witnesses:
E. Patten,
R. H. Peat.

Inventor:
Adam Heberer,
By Smiley Johnson
his atty.

UNITED STATES PATENT OFFICE.

ADAM HEBERER, OF ALAMEDA, CALIFORNIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 395,780, dated January 8, 1889.

Application filed May 16, 1888. Serial No. 274,076. (No model.)

To all whom it may concern:

Be it known that I, ADAM HEBERER, a citizen of the United States, residing in the city of Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Tubular Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings, that form part of this specification.

My invention relates to improvements in steam boilers or generators of the horizontal tubular kind; and it consists in a certain novel construction and combination of central fire space or chamber and surrounding water spaces and passages, substantially as hereinafter fully described, and the production of an improved boiler having great heating capacity and other features and qualities of value.

The following description explains the nature of my said invention and the manner in which I have constructed, combined, and applied the same in producing my improved boiler, the accompanying drawings being referred to by figures and letters.

Figure 1 is a side elevation of a boiler constructed in accordance with my invention, portions of the outer shell being broken away to show the inside. Fig. 2 is a cross-section taken at about the line *x x*, Fig. 1. Fig. 3 is a longitudinal section taken horizontally at about the line *x y*, Fig. 1. Figs. 4 and 5 represent constructions of fire-box for the boiler.

In carrying out my improvements I construct a shell or body, A, substantially of cylindrical shape in its cross-section, and in the center I form a fire chamber or passage, B, for the full length of the body and of rectangular shape in vertical cross-section, these parts being formed of plates laid and riveted in the usual manner well known to boiler-makers. The width of the fire-chamber is less than the diameter of the outer shell, and the proportions of the two parts in the vertical measurements are such that the room or space above and also beneath the fire-chamber is substantially of a semi-cylindrical shape in vertical section. These water-spaces are seen at C C in the drawings. They connect with each other through a series of spaces or passages

arranged and constructed separately between the vertical sides of the fire-chamber and the sides of the outer shell, and as the shell is flattened at the sides to make the walls of these passages parallel the outline of the body in vertical cross-section becomes oblong or somewhat oval, as will be seen in Fig. 2.

D D D are the vertical water-passages connecting the top and bottom chambers. Between the passages D D, along the sides of the boiler, are openings which lead directly into the fire-chamber, as will be more fully described.

Extending through the fire-chamber and connecting the two spaces C C together is a number of upright tubes, E E, that are fixed in the usual way at top and bottom in the sheets of the fire-chamber and in close order from end to end of said fire-chamber, which preferably extends the full length of the chambers C. To present these tubes in the most effective manner to the fire I set them in staggered rows, so that the tubes in one row shall not be covered by those in the preceding row, and the flames and gases in passing from end to end of the fire-chamber shall as far as possible be brought in contact with the sides and the greater portion of the tube-surface, and not against the front of the tubes principally. By setting the tubes in alternate order the fire passes circuitously through the rows from the fire-box end to the smoke-chamber G at the opposite end.

The fire-chamber is fixed and supported in place by suitable bolts and braces; but as the manner of setting and bracing the same in the shell will be understood by the practical boiler-maker, no particular mode of construction in that respect is given in the drawings, to be followed in carrying my improvements into actual use.

Such number and disposition of bolts and braces will be employed as the judgment of the practical builder may consider necessary.

The grate-surface can be formed directly within the shell, as illustrated in Fig. 4, or it can be arranged at the end in a brick-work setting, as shown in Fig. 5. In either form the fire-chamber will be a continuation of the fire box or space directly through the center of the boiler, and the water-space of the boiler surrounds the same on all sides. This con-

struction, therefore, enables me to dispense with brick-work or other setting along the sides, and only legs or piers under the boiler need be used.

5 To facilitate cleaning, suitable man-holes and hand-holes are provided in the heads of the boiler, and for cleaning the fire-chamber openings I I are provided in the outer shell at the sides, through which access can be had to the
10 tubes across the fire-space, so that the surfaces can be reached and thoroughly cleaned. The openings I are closed by plates or doors K K, lined on the inside with a course of fire-brick or tiles.

15 In the operation of this improved boiler, the working water-line should stand over the top sheets of the fire-chamber, but leaving ample steam-room in the upper part of the space with which the steam-drum is connected.

20 Suitable feed-water pipes, gages, blow-off cocks, and other necessary attachments are supplied for proper working; but as these are not parts of my said improvements I have not described nor shown them.

25 The advantages obtained in these improvements include great capacity for making steam and freedom from scale deposits, and consequent cleanliness.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. A steam boiler or generator having a central fire chamber or passage, water-chambers C C above and beneath the fire-chamber, a series of separate vertical connecting-passages, D D, 35 on each side between the fire-chamber and outer wall, and upright tubes E E, extending through the fire-chamber and connecting the said vertical chambers above and beneath the fire-chamber with each other, substantially as 40 described.

2. In a steam boiler or generator, an outer shell or body, A, a central fire-chamber, B, generating-chambers C C above and beneath the fire-chamber, upright tubes E E, a series of 45 separate vertical connecting passages, D D, along the sides of the fire-chamber connecting the generating-chambers C C, and openings I I at the sides through the outer shell between the end walls of passages D D, in combina- 50 tion, substantially as described.

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

ADAM HEBERER. [L. s.]

Witnesses:

CHAS. D. WHEAT,
EDWARD E. OSBORN.