

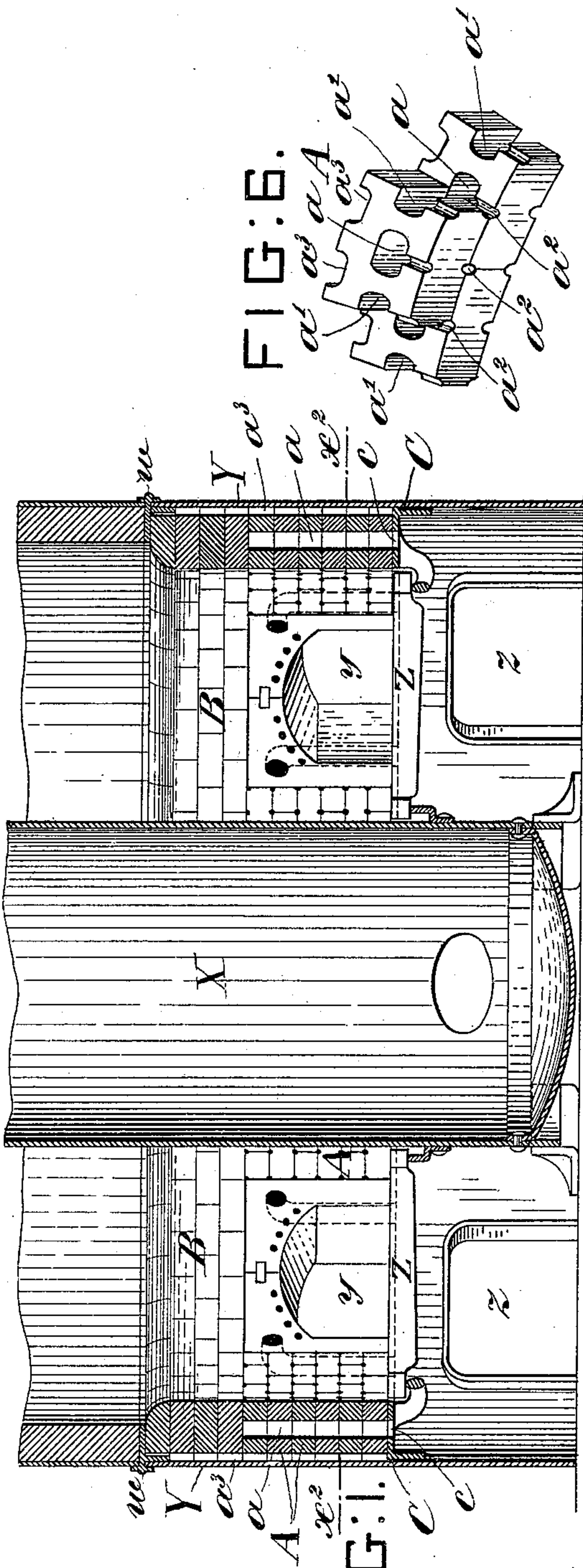
(No Model.)

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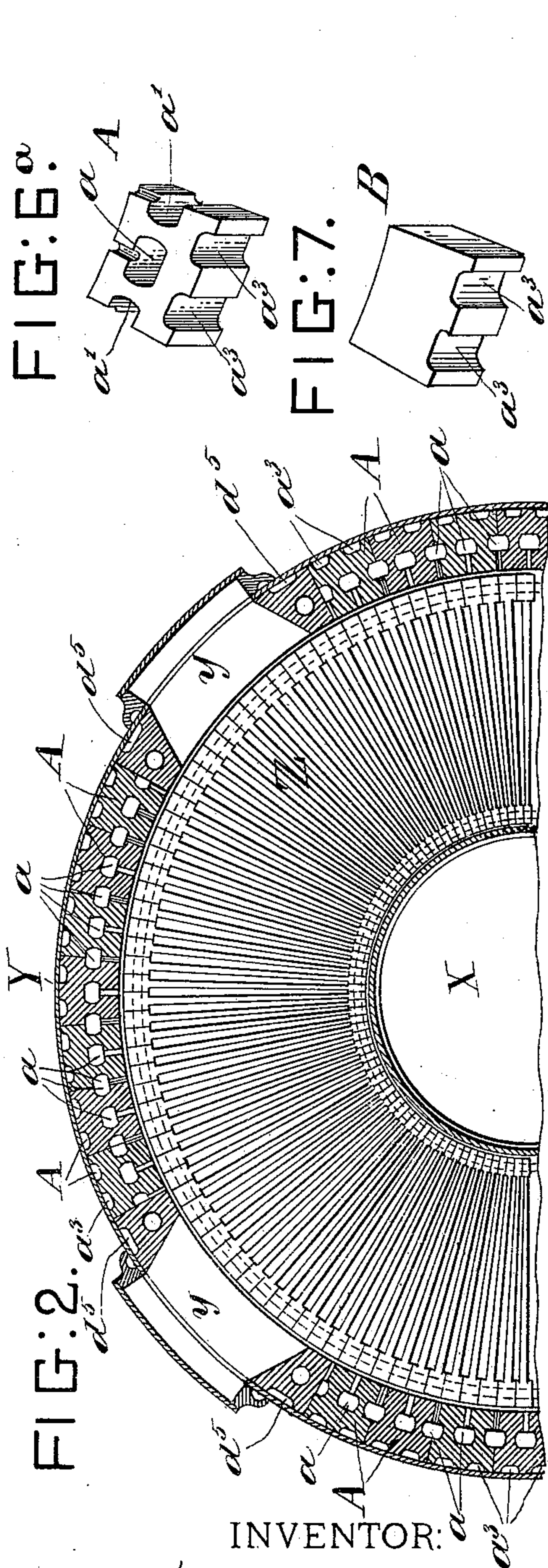
T. F. MORRIN.
FURNACE FOR STEAM GENERATORS.

No. 566,924.

Patented Sept. 1, 1896.



WITNESSES:
J. H. H. H. H.
Peter A. Ross.



INVENTOR:
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(No Model.)

2 Sheets—Sheet 2.

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FIG:3.

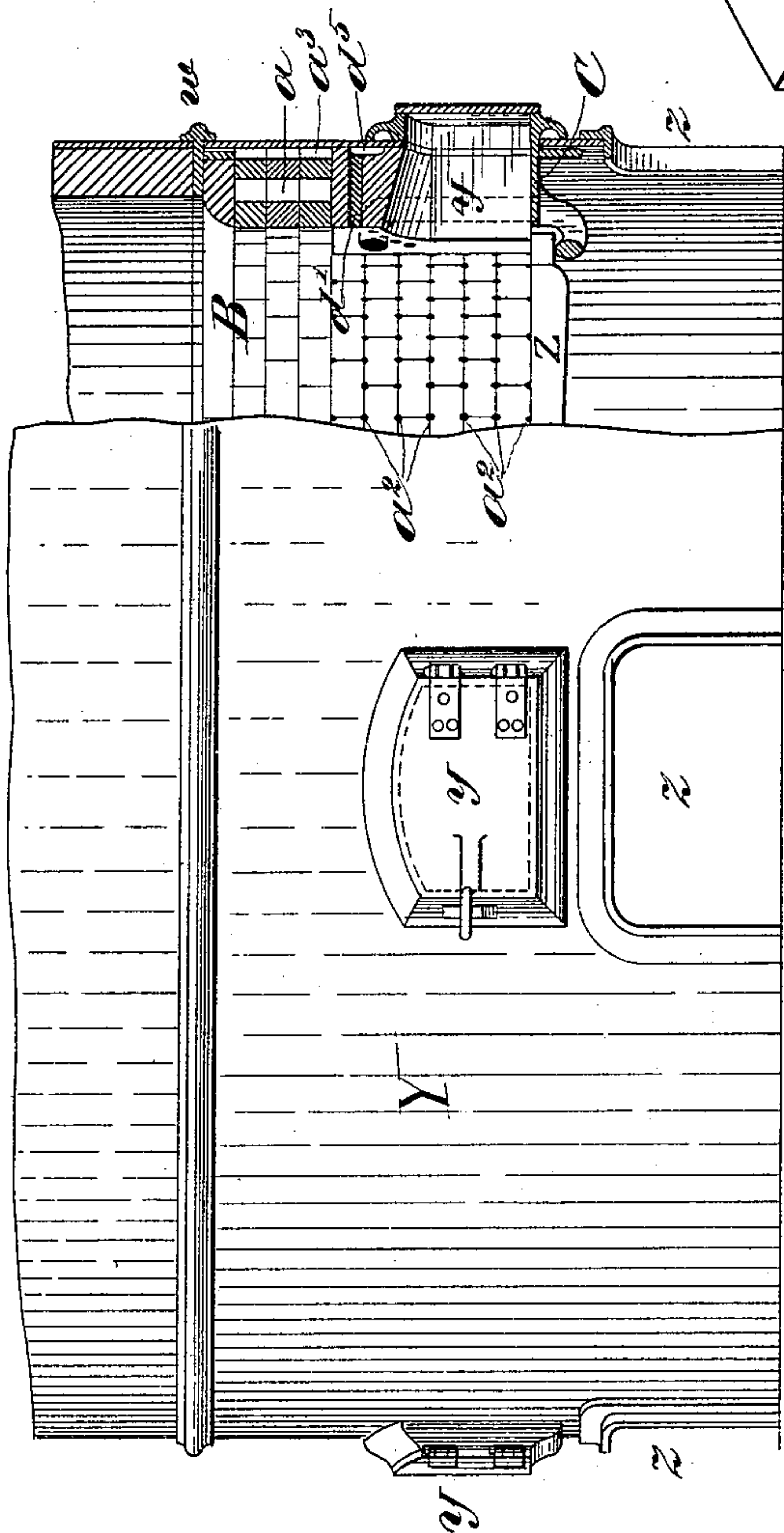


FIG:8.

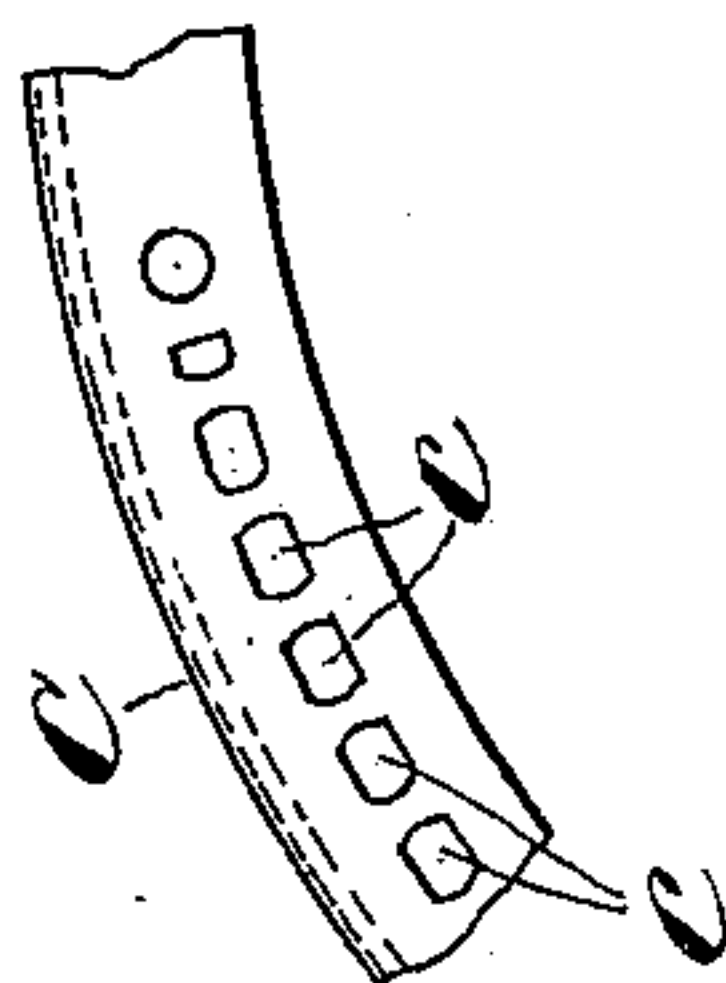


FIG:5.

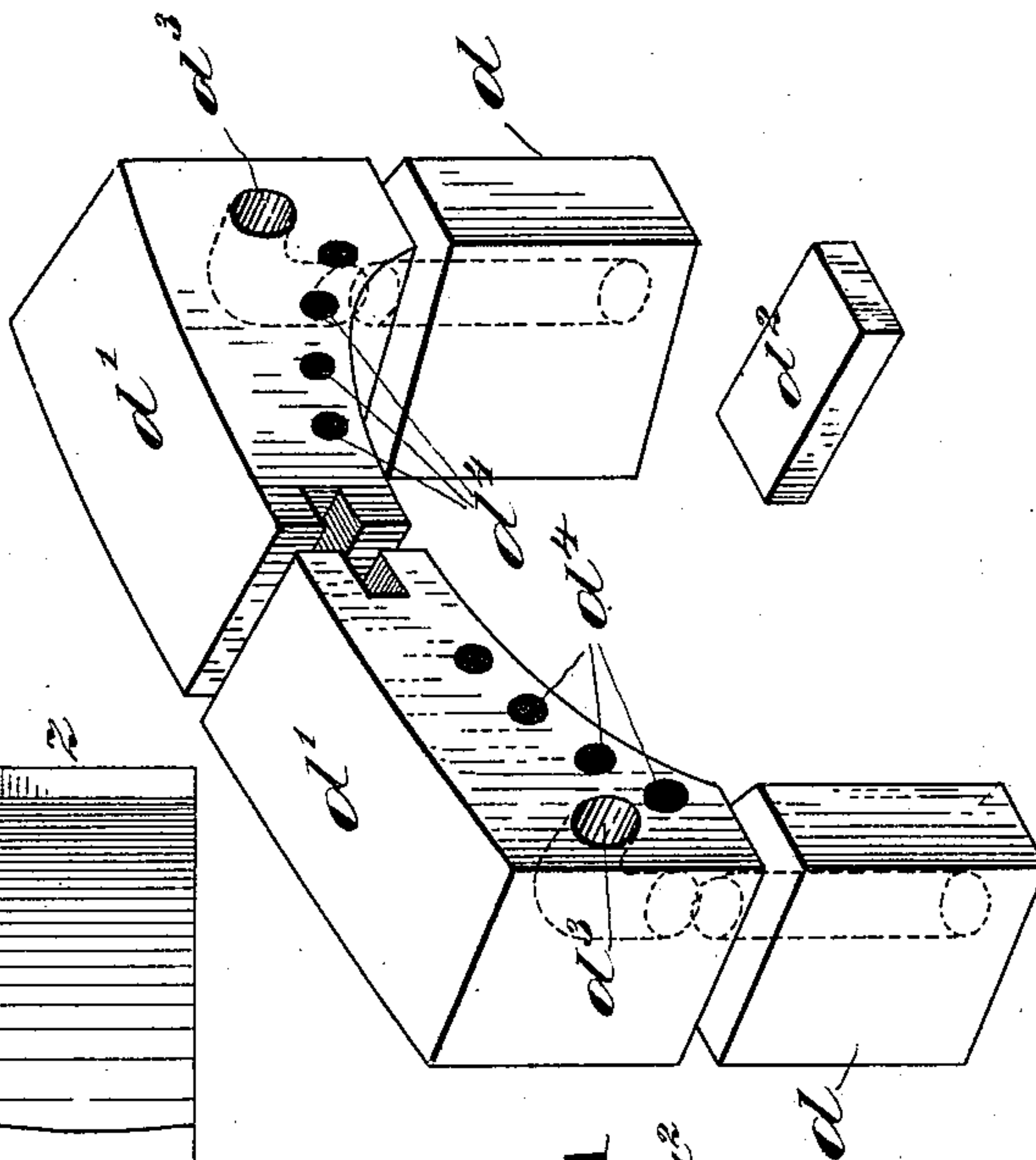


FIG:4.

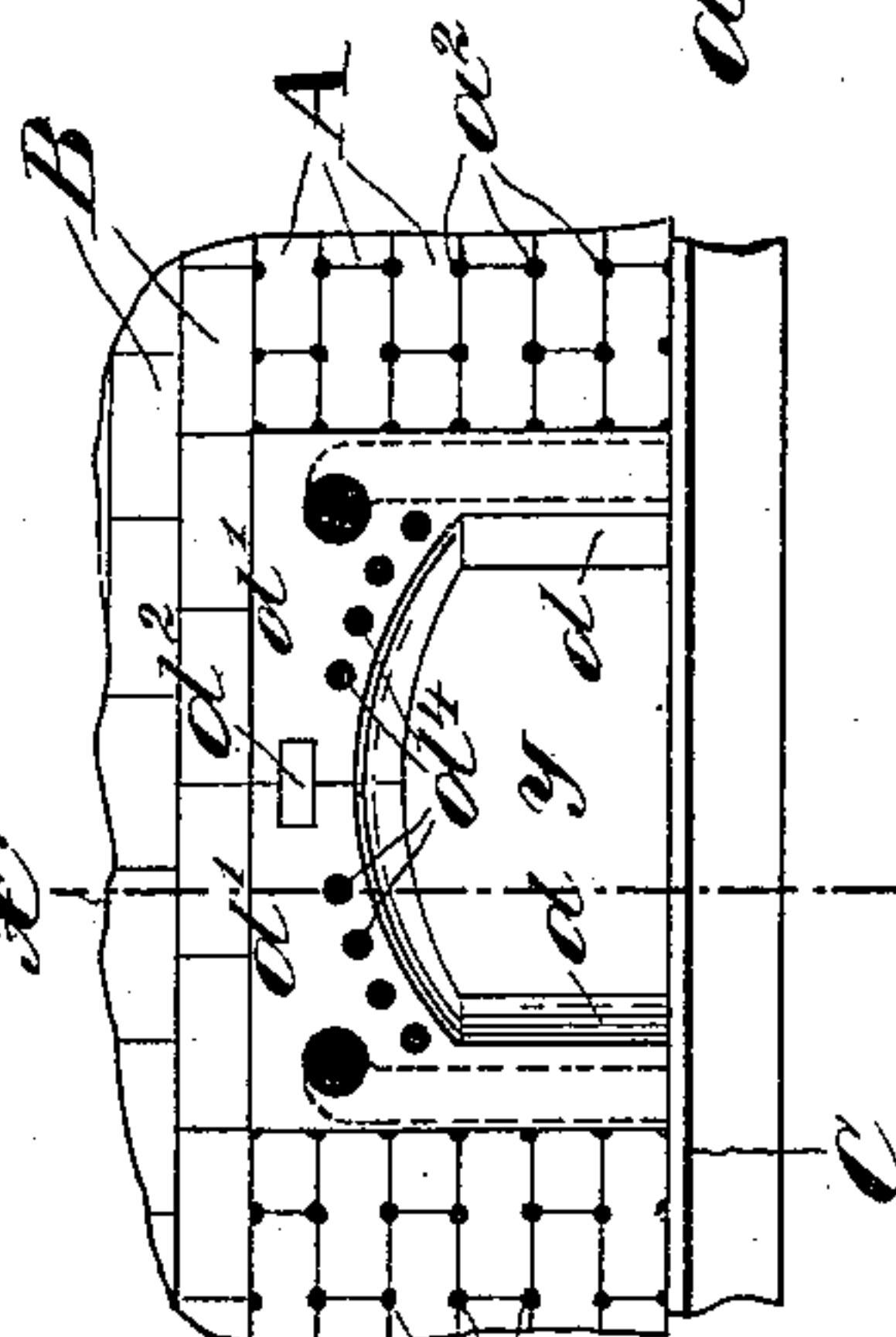
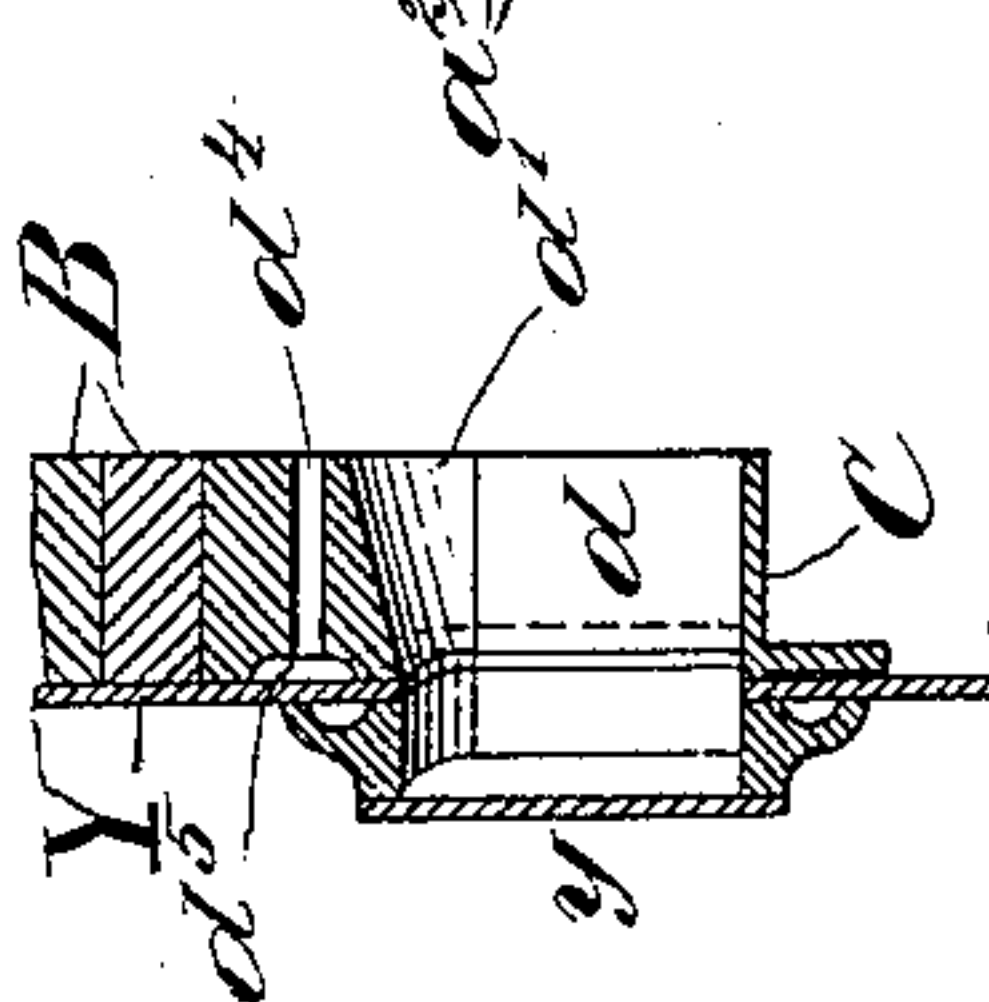


FIG:4.



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THOMAS F. MORRIN, OF JERSEY CITY, NEW JERSEY.

FURNACE FOR STEAM-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 566,924, dated September 1, 1896.

Application filed April 22, 1896. Serial No. 588,548. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. MORRIN, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Furnaces for Steam-Generators, of which the following is a specification.

This invention relates mainly to the construction of the tiles or lining-bricks for furnaces of steam-generators; and the object is, in the main, to adapt the furnace for burning soft coal with the production of a very little or no smoke, or, in other words, the more perfect combustion of the fuel.

As herein shown, my invention is represented applied to the annular furnace of an upright boiler or steam-generator of a well-known kind.

In the accompanying drawings, Figure 1 is a vertical diametrical section of the furnace. Fig. 2 is a horizontal section of one-half of the same, taken in the plane indicated by line x^2 in Fig. 1. Fig. 3 is a side elevation of the furnace broken away at the right to show one of the charging-doors in section. Fig. 4 is an inside face view of one of the furnace-doors, and Fig. 4^a is a vertical section in the plane of line x^{4a} in Fig. 4. Fig. 5 is a perspective view, on a larger scale than the principal views, showing the four parts or tiles which form the door-casing. Figs. 6 and 6^a are perspective views of one of the apertured tiles used in the circular wall or lining of the furnace. Fig. 7 is a view similar to Fig. 6^a of one of the non-apertured upper tiles of the furnace-wall. Fig. 8 is a plan view of a fragment of the ring-bracket on which the lining-tiles rest.

X represents the upright generator, Y the outer cylindrical metal casing, and Z the annular grate or fire-bed. These may be all of the usual kind. As here shown, there are four ash-doors z in the casing below the grate and four charging-doors and door-openings y in the furnace, arranged above the respective ash-doors.

My invention resides in the refractory lining of the casing Y from the grate up to the top of the furnace at w , and the purpose is, in the main, to so construct this lining that it will provide numerous equally-distributed

twyers for supplying hot air to the furnace about its sides in quantity sufficient to combine with the free carbon from the fuel and prevent the formation of smoke. Another feature of the invention is to interpose air between the hot lining and the relatively thin metal casing Y to keep down the temperature of the latter.

The lining of the furnace is made up of tiles A (seen in Figs. 6 and 6^a) up to about the top of the charging-door casings, and from that point up to the line w of tiles B. (Seen in Fig. 7.) The tile A has extending through it from one of its bedding-faces to the other a flue or passage a , and at its respective ends it has half-flues a' , which, when the tiles are laid side by side, as in Fig. 2, form full flues a with the half-flues in the adjacent tiles. Thus each tile A has in it one full and two half-flues, and when the tiles are laid in courses, so as to break joints, these flues a form continuous flues extending up through the wall to the superposed tiers of non-apertured tiles B. The lower tier of tiles A rests on a metal flange-ring or ring-bracket C, fixed to the casing, and in this flange-ring are apertures c , Fig. 1, which are spaced so as to register with the flues or apertures in the tiles A, in order that air from the ash-box below the grate may pass up into the flues a in the tiles. Leading from each flue in the tiles, at each course of tiles, is a lateral jet-passage or twyer a^2 , which opens into the furnace. For convenience in molding the tile A the flues a^2 are formed by grooves in the faces of the said tiles. Preferably the twyer a^2 will be formed one half in the face of one tile and the other half by quarter-round grooves at the corners or end angles of the tile. This construction is illustrated in Fig. 6, which shows a tile A superposed on and breaking joints with two other like tiles. The air in passing up through the flues a becomes heated and escapes into the furnace in jets all about its walls through the twyers a^2 .

In the outer faces of the tiles A are formed grooves a^3 , which form flues or air-spaces within the inclosing casing Y, and the air therein forms a non-conducting medium which protects the casing from heat transmitted through the tiles. These grooves a^3 are also provided in the tiles B, (see Fig. 7.)

so that the said air-spaces are made to extend up to the top of the furnace-wall or lining. Where the charging-openings are formed in the furnace-walls, these openings
 5 are framed by casings, (see Fig. 5,) each of which is composed of four specially-formed tiles; that is, there are two like side posts or tiles d d and two tiles d' d' , fitted together to form the lintel or arch. These latter mem-
 10 bers may be locked or keyed at the crown of the arch by a brick or tile d^2 , (seen detached in Fig. 5,) which fits into keyways in the abutting faces of the members or tiles d' . In the tiles d and d' , at each side of the door-casing,
 15 is formed a flue d^3 , through which air passes up from the ash-box into the furnace. There are or may be also a series of air-inlets d^4 through the tiles d' for the admission of air to the furnace. By preference the frame or
 20 casing about the charging-door will be so proportioned as to height that it shall extend just to the top of the courses of tiles A, and the members d d' of said casing may have in their outer faces recesses or grooves d^5 (seen
 25 in Figs. 2 and 4^a) corresponding to the grooves a^3 in the lining-tiles A and B to provide non-conducting air-spaces between the door-casing tiles and the outer metal casing of the furnace. The grooves a^3 in the tiles B are
 30 not very important, as these tiles are not exposed to such intense heat as the tiles below, and therefore said grooves may be omitted from the tiles B without detriment.

Having thus described my invention, I
 35 claim—

1. A boiler-furnace having an outer metal casing circular in plan and lined with tiles between the doors, said tiles being laid in tiers and having in them flues a , open to re-
 40 ceive air at the bottom and lateral branches or twyers, a^2 , in each tile extending from each flue into the fire-box from every tile, and each

of said doors having a tile-casing provided also with flues and twyers, substantially as set forth.

2. A tile A, for the lining of a boiler-furnace, having in it a central flue a , half-flues a' at its ends, and six grooves, to form twyers a^2 , formed at its corners and at its middle, three in each face, and extending from the
 50 flues to the inner edge of the tile, substantially as herein described.

3. A tile A, for the lining of a cylindrical boiler-furnace, having a central flue a , two half-flues a' , one at each end, six grooves, to
 55 form twyers a^2 , three in each face of the tile and extending from the flues to the inner edge thereof, and two grooves a^3 in the outer edge of the tile, substantially as and for the purposes set forth.

4. A lining-tile for the fire-box of a furnace having a central flue a and half-flues a' , one at each end, proportioned as described, whereby when the said tiles are built up in tiers to break joints the half-flues in one tier will
 65 register with the full flues of the next adjacent tier, and having lateral grooves from said flues to the inner faces of the tiles to form twyers a^2 , substantially as set forth.

5. A door-casing for the lining of a furnace
 70 consisting of two like tiles d , forming side posts and two tiles d' , forming the arch, said tiles having in them the flues d^3 , open at their lower ends for the admission of air and opening at their upper ends into the furnace, sub-
 75 stantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THOMAS F. MORRIN.

Witnesses:

HENRY CONNETT,
 PETER A. ROSS.