

C. WHITE.
Hot-Air Furnaces.

No. 134,118.

Patented Dec. 17, 1872.

FIG. 1.

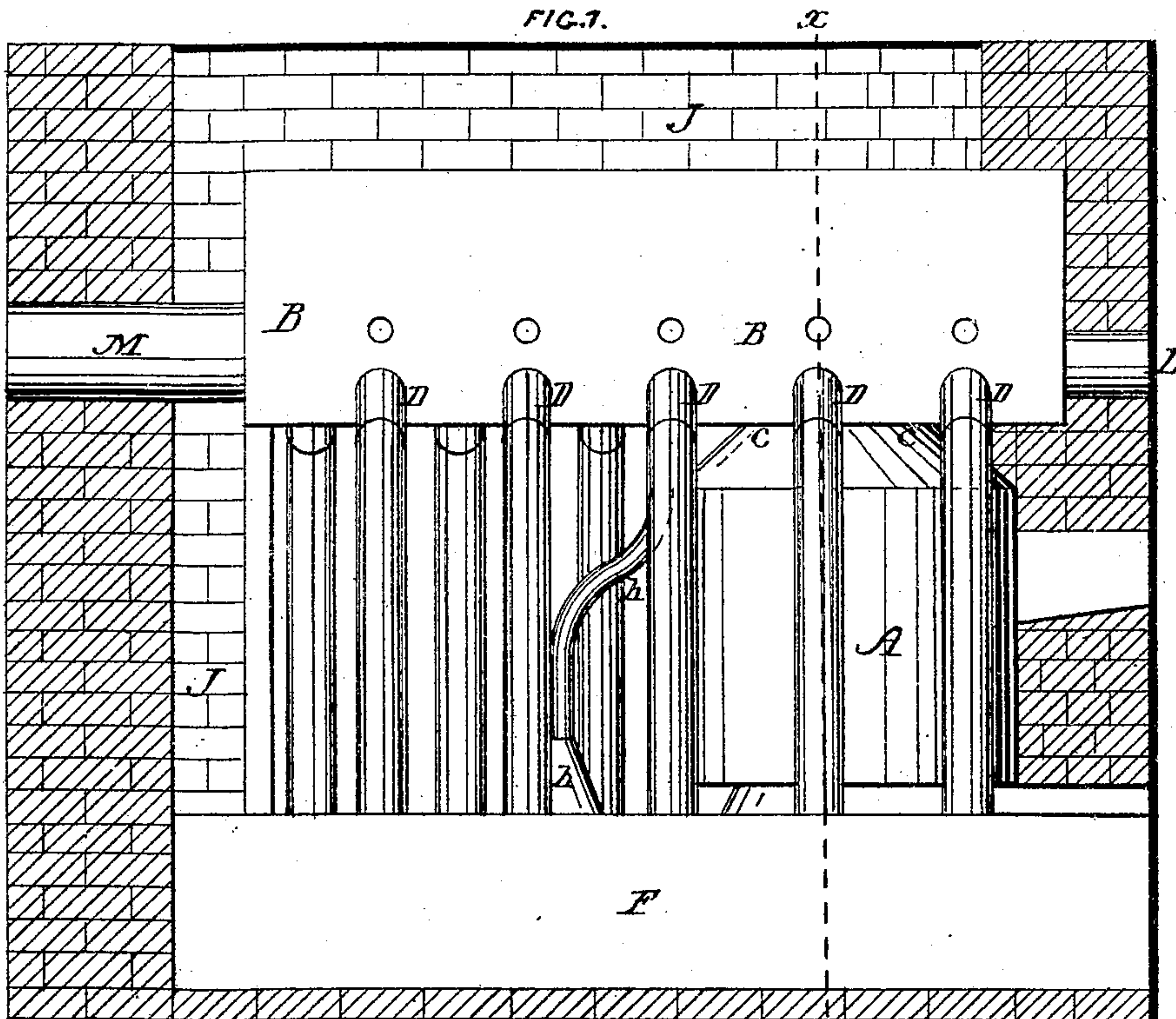
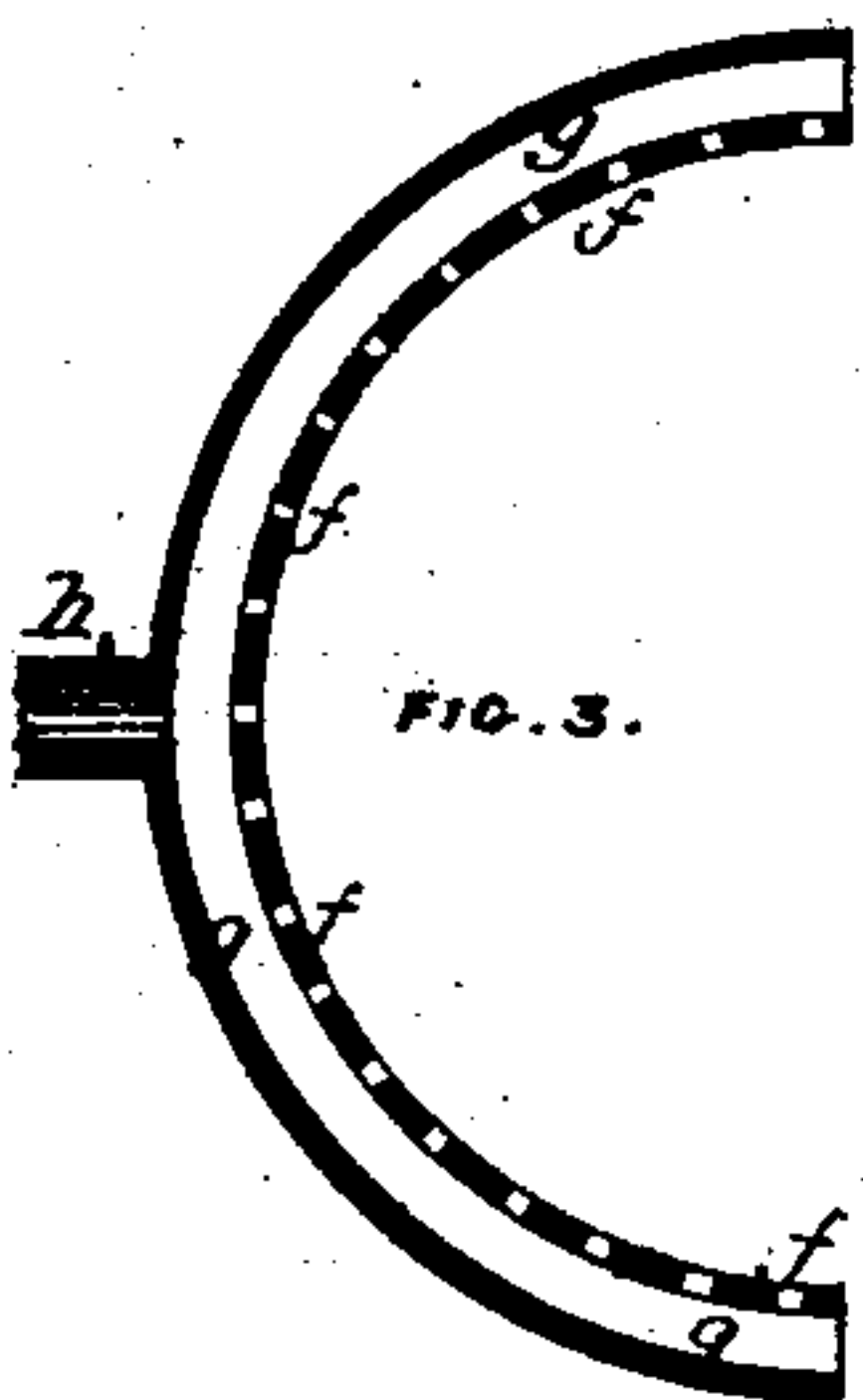
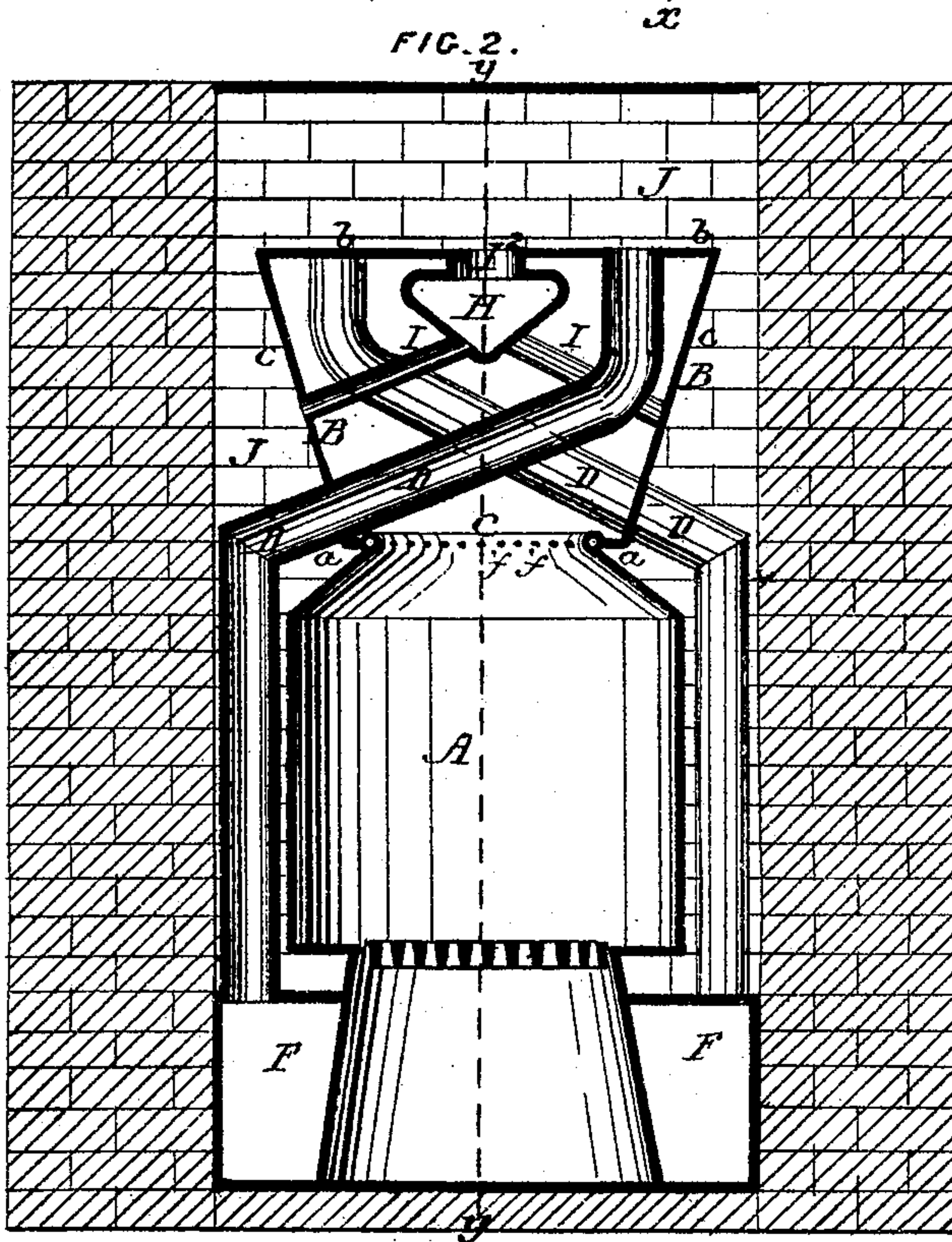


FIG. 2.



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FIG. 5.

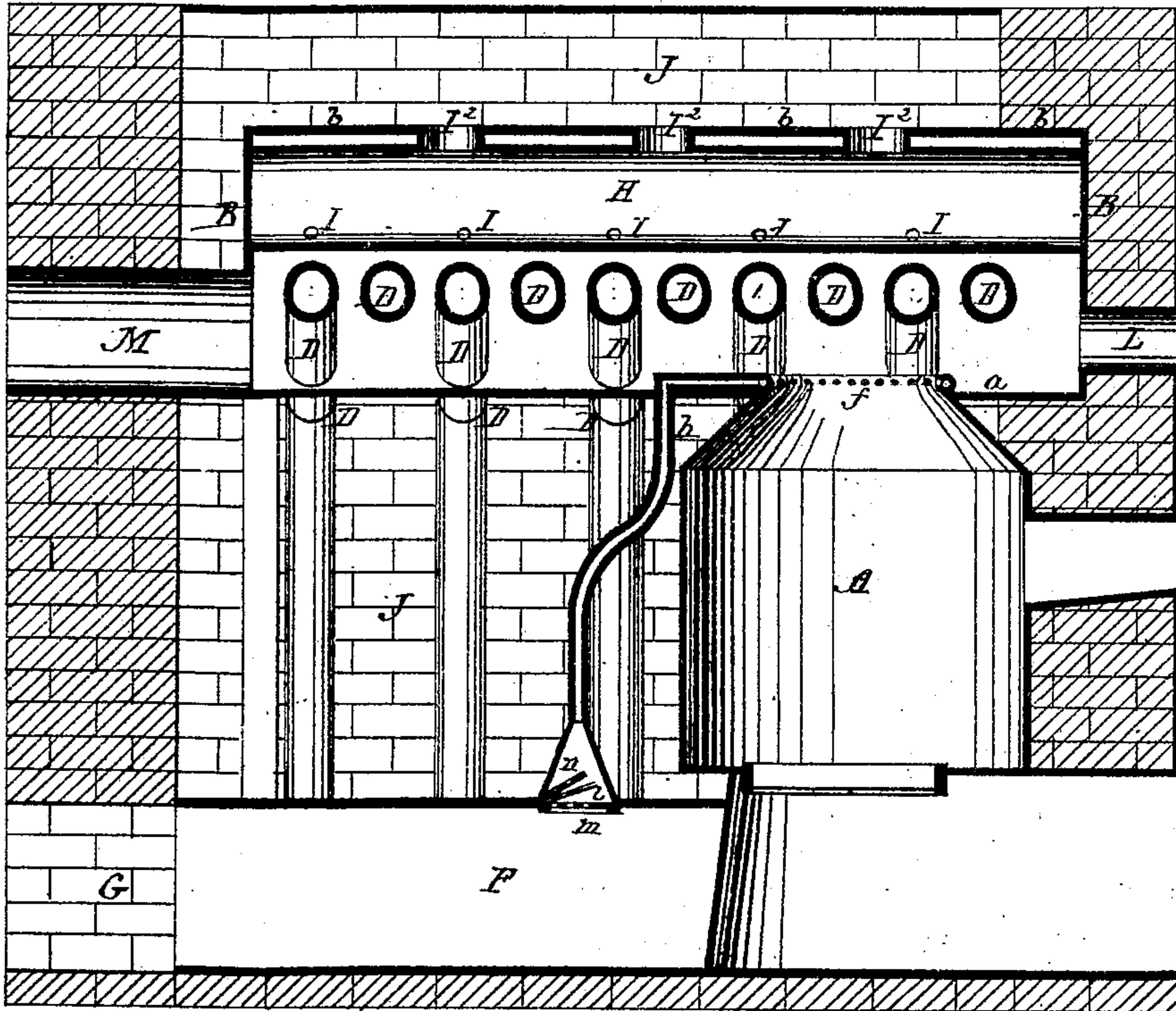
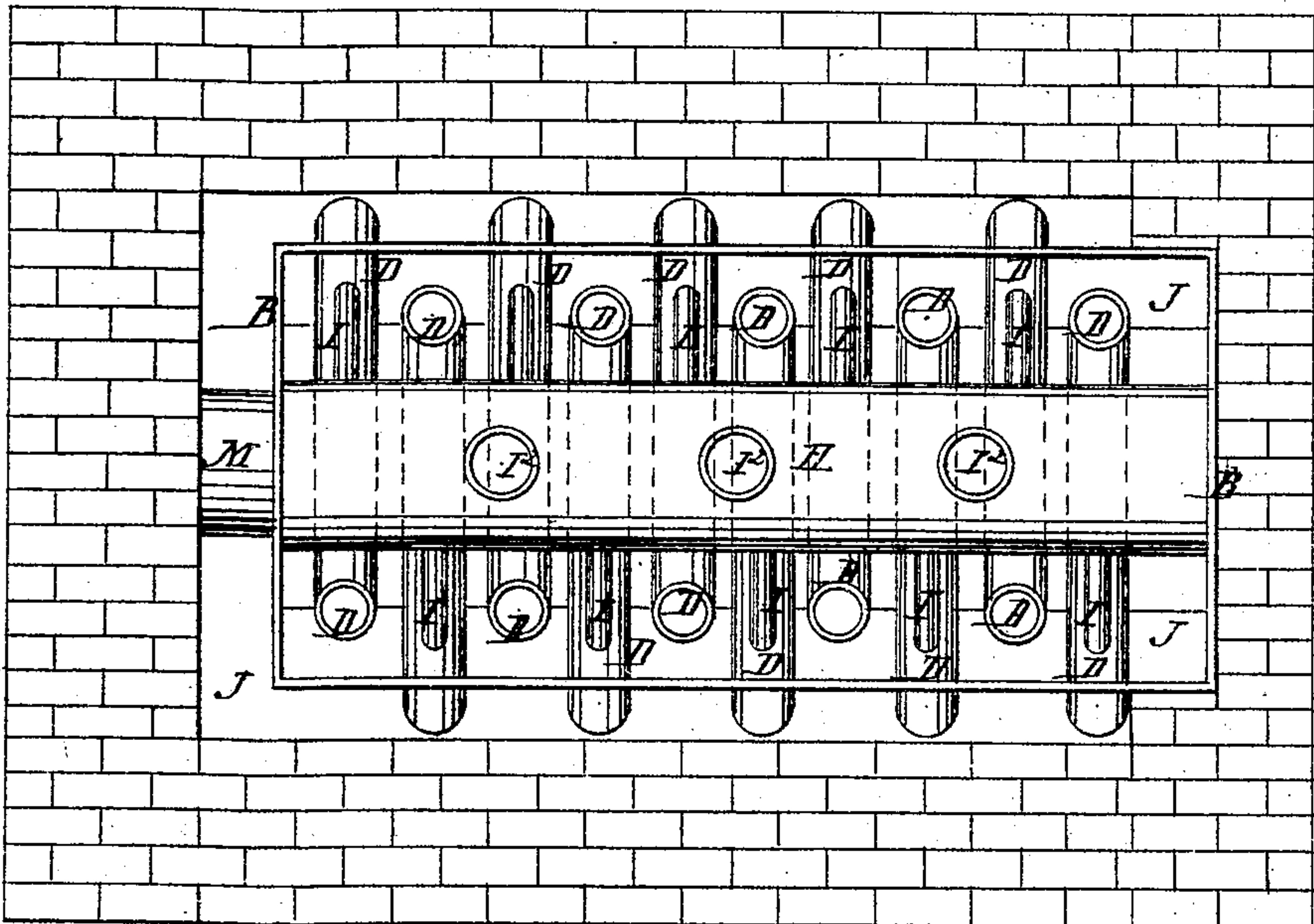


FIG. 6.



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CYRUS WHITE, OF WEST ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 134,118, dated December 17, 1872.

To all whom it may concern:

Be it known that I, CYRUS WHITE, of West Roxbury, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing.

This invention consists, first, in the employment of a chamber extended horizontally above the furnace and connected therewith, the said chamber being provided with transverse inclined pipes, connected with the external air and with the outer hot-air chamber of the heating apparatus, in combination with an inner chamber, situated within the passage or chamber above and connected with the furnace, the said inner chamber being connected, by inclined pipes, with the outer chamber of the heating apparatus, as hereinafter more fully set forth. The invention further consists in the employment of jet-holes in the furnace, arranged above the plane of combustion, in combination with a tube provided with a flap-valve having outer and inner perforated plates to allow the ingress of external air and prevent the escape of gases from the furnace, as hereinafter set forth.

In the accompanying drawing my improvements in heating apparatus are illustrated.

In Plate 1, Figure 1 is a side elevation of heating apparatus constructed and arranged according thereto, with masonry shown in section as surrounding the same; Fig. 2, a transverse vertical section in plane of line *x x*, Fig. 1; and Figs. 3 and 4, detail views, to be hereinafter referred to. In Plate 2, Fig. 5 is a central longitudinal vertical section in plane of line *y y*, Fig. 2, Plate 1; and Fig. 6, a plan view, showing more particularly the interior construction and arrangement of the chamber communicating with furnace.

A in the drawing represents a furnace which, in its several parts—fire-chamber, ash-pit, &c.—may be constructed as desired, the construction thereof forming no part of the present invention, except, as hereinbefore stated, in the arrangement of a series of jet-holes above the plane of combustion, which will be hereinafter referred to, and therefore needing no more particular description herein. B, a chamber, made, by preference, of wrought sheet-iron,

and of the form in cross-section, shown more particularly in Fig. 2, Plate 1. This chamber B is located in a horizontal position directly above the top C of the furnace A, and rests, by its bottom plate *a*, thereon, said bottom plate *a* being cut out correspondingly to the upper open end C of the furnace A, making a communication between furnace and chamber B. D, a series of pipes arranged in a vertical inclined position across the chamber B, opening out of the same both at the top plate *b* and side plates *c*, but alternating with each other—that is, the one pipe passing out of the top plate *b* at one side of the center line of the chamber and out of the side plate upon the other side of said center line, and the next pipe passing out of the top plate *b* at the same side of the center line of said chamber as the preceding pipe passed out of the side plate, and passing out of the side plate upon the same side of center line as the preceding one passed out at the top plate, and so on, as before described, for the first one, and then for the next to that, as before, indefinitely or to the extent desired, and within the limits of the chamber, the pipes, as it were, crossing each other, and all being closed in their extent through the chamber B to the same. These several inclined vertical pipes, where they pass out of the sides of the chamber B, are all extended vertically downward to a common box or chamber, F, located in a plane beneath the fire-pot furnace, which chamber F, at one end, G, opens into the external air. H, a chamber within chamber B, and at upper portion thereof. This chamber H extends the whole length of the chamber B, and, by vertically-inclined pipes I, communication is established between the outside of chamber B at its side plates *c*. These pipes I follow the course of the inclined pipes D hereinbefore referred to, and are, in each instance, directly over the same, as shown. I², pipes leading to supplementary chamber H, and making a communication between it at its upper side and the outside of chamber B. The chamber B, vertical pipes D, and cold-air chamber F are all incased or surrounded by an outer chamber, J, as shown. L, a door opening into front end of chamber B; and M, outlet at rear end of chamber B, to be connected in any suitable manner with the chimney or escape-flue. The purpose of the parts above

described is to secure the heating of air by the fire of furnace; and from the description given it is obvious that the products of combustion, in passing to the chimney, pass through the chamber B from end to end thereof, and thus more or less diffuse themselves therein about the inclined pipes D I, supplementary or inner chamber H, heating thereby the air contained in and supplied to them, respectively, by the cold-air supply-chamber and the outer chamber about chamber B, which, as heated, passes out into the outer chamber J, to be from there conducted, as desired, to any apartment or apartments. At and around the opening C of furnace into chamber B there is arranged a series of jet-holes, *f*, which holes open into a common passage, *g*, that, through a pipe, *h*, connects with the cold-air supply or chamber F. By these jet-holes cold air is supplied to and mingled with the flames, smoke, &c., arising from the fire-pot, and causing thereby an increased combustion thereof, so that in passing through the chamber B they will impart a greater amount of heat to the pipes arranged therein. The end of the pipe *h* for supplying the jet-holes *f* with air is provided with a flap-valve, *l*, disposed so as to swing between the outer perforated plate *m* and the inner inclined perforated plate *n*, partially crossing the pipe *h*. This flap-valve *l* prevents, in case of a back-

ward pressure by the gases in the chamber B, the escape of the gases into the cold-air box F, as then it would close upon the plate *m*, allowing at all other times the free flow of cold air.

From the arrangement described of the pipes within the chamber B it is plainly seen that the bottom of the chamber is free to be cleaned at any and all times, there being, in fact, no obstruction from front to rear of the chamber.

Having thus described my invention, I shall state my claims as follows:

1. The chamber B, provided with transverse inclined pipes D D, connected with the chambers F and J, and arranged as described, in combination with the chamber H and inclined pipes I I, substantially as and for the purpose set forth.

2. The jet-holes arranged above the plane of combustion of the furnace, in combination with the tube connecting with the chamber F, flap-valve *h*, and perforated plates *m n*, as and for the purpose set forth.

The above specification of my invention signed by me this 23d day of March, A. D. 1872.

CYRUS WHITE.

Witnesses:

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