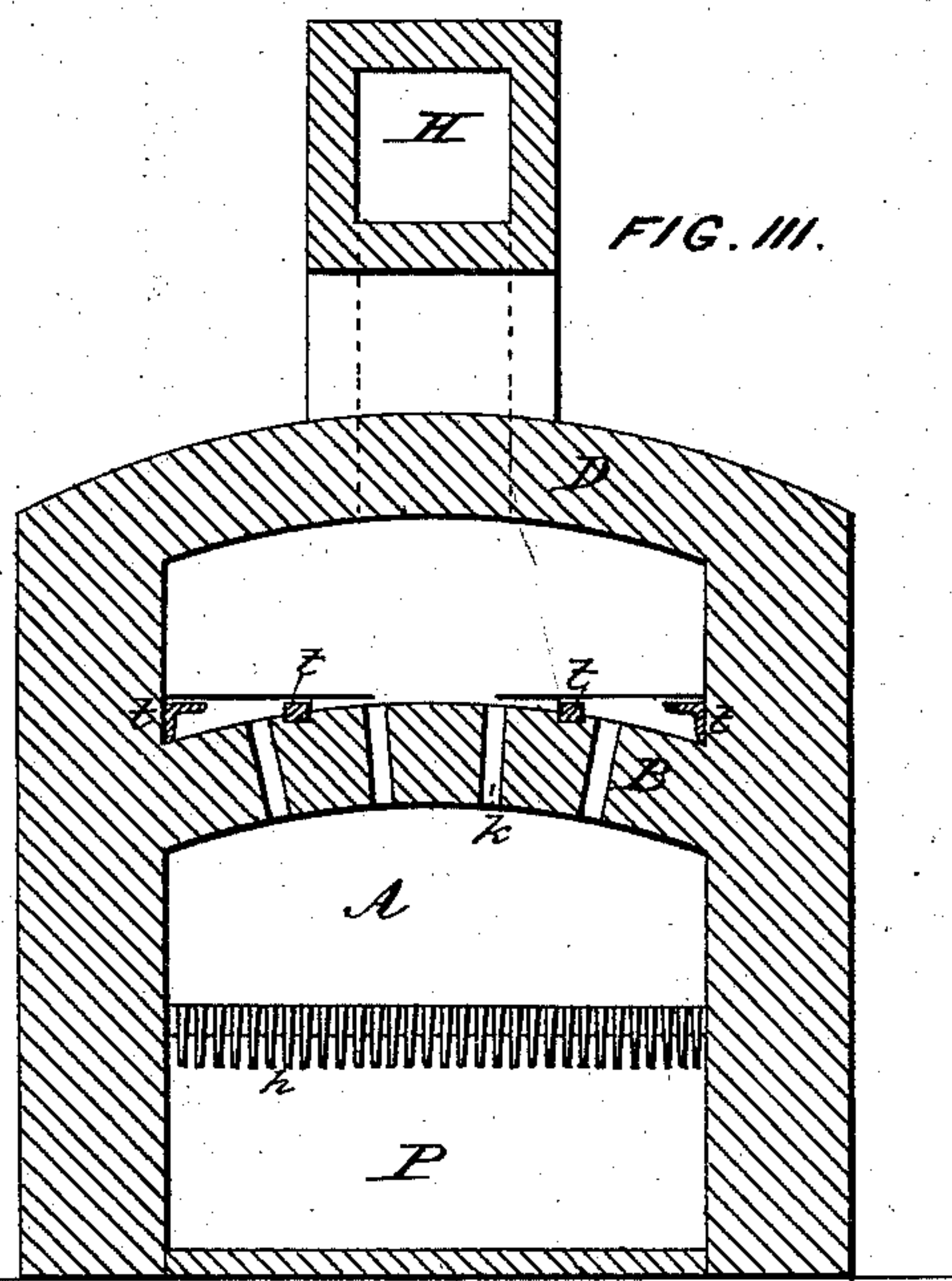
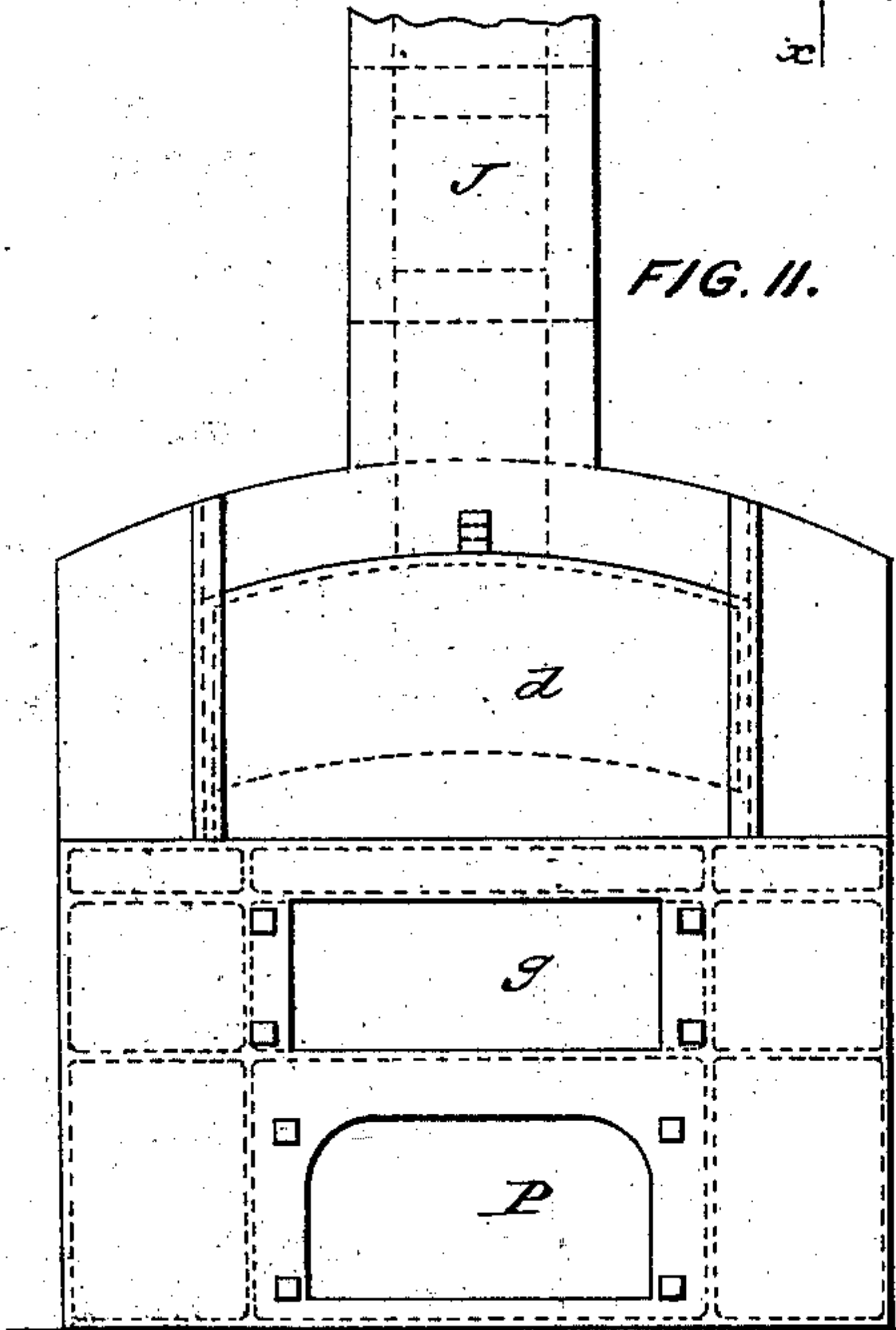
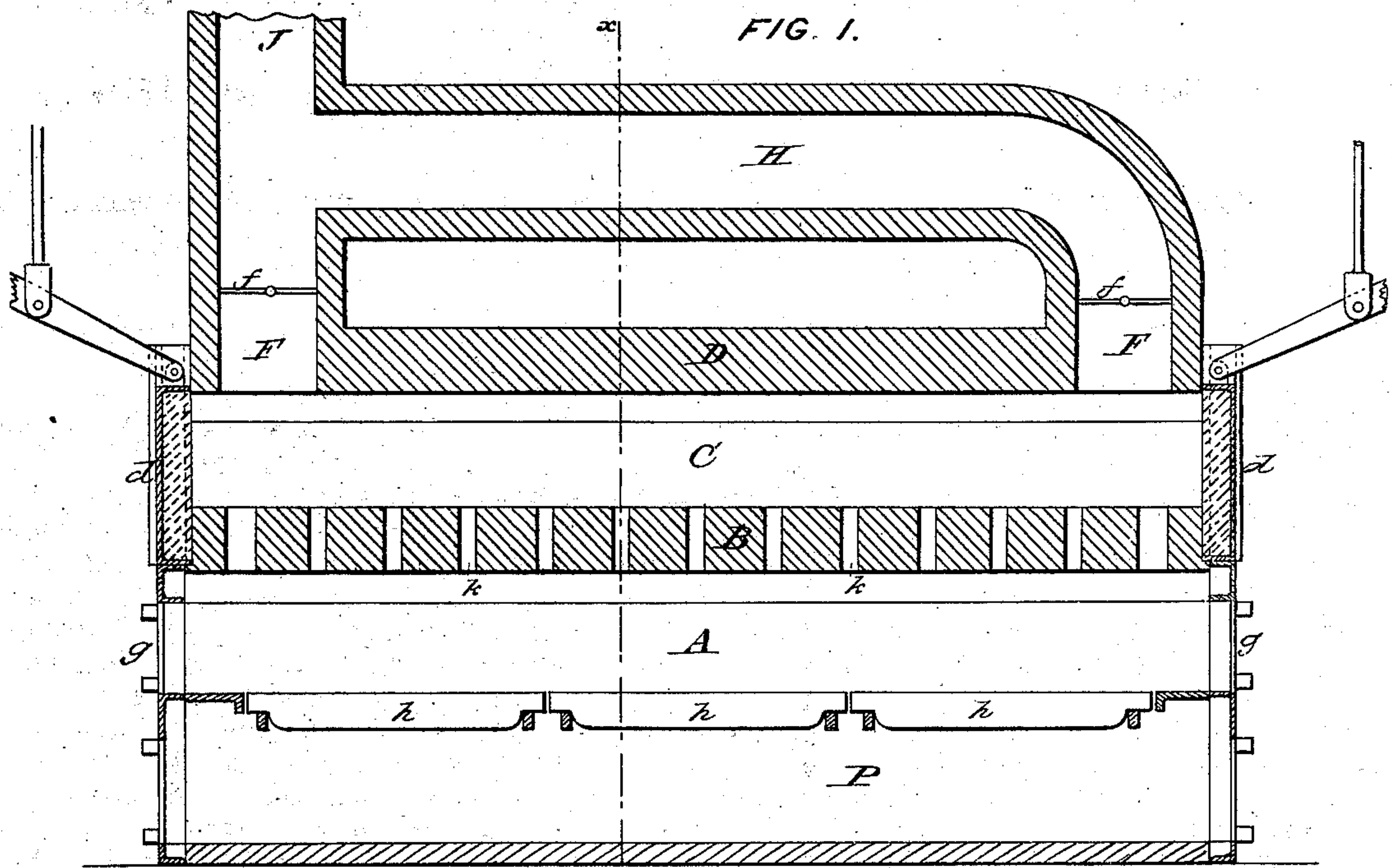


**C. MARSHALL.**  
**Furnaces for Heating and Annealing Sheet-Metal, &c.**

No. 154,334.

Patented Aug. 25, 1874.



WITNESSES:

*Alfred Marshall*  
*Henry F. Martin.*

INVENTOR:

*Caleb Marshall*



# UNITED STATES PATENT OFFICE

CALEB MARSHALL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FURNACES FOR HEATING AND ANNEALING SHEET METAL, &c.

Specification forming part of Letters Patent No. 154,334, dated August 25, 1874; application filed July 22, 1874.

*To all whom it may concern:*

Be it known that I, CALEB MARSHALL, of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Metallurgic Furnace for Heating Sheet Metal; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 shows a longitudinal vertical section, Fig. 2 an end view, and Fig. 3 a cross-section in the line *x x* of Fig. 1.

In patent No. 114,956, issued to me, dated May 16, 1871, I have described a process for removing scale from iron, and otherwise treating it during the operations of annealing, finishing, and coating.

In carrying on the several operations named in said patent, a heating-furnace is required. The object of my present invention is to provide a new and improved furnace for that purpose.

The metal being generally in the form of sheets, and requiring the same uniform treatment in all parts, it is necessary that the heat be evenly distributed, and regulated at will to any required degree. The heating-chamber must be kept as free as possible from flame, smoke, dust, and sulphur, and should, in no part, become too highly heated. The accomplishment of these ends is the result of my invention.

The following description will enable others skilled in the art to construct my invention, and, by reference to the specification of my former patent named above, to use it in carrying out the improvements described in said patent in a more efficient manner. The furnace is also applicable in carrying out other processes and operations, such as annealing, tempering, coating metals, enameling, and the like.

In the drawings, A is the fire-chamber, covered by a perforated arch, B, above which is

the chamber or oven C, in which is placed the plates, sheet-iron, or other article to be treated. D is the crown-arch or roof of the oven. Flues F F, provided with dampers *f f*, rise from each end of the oven, and lead to separate chimneys, or by a back-flue, such as shown at H, connect with a common chimney, as shown at J. At each end of the furnace are two doors, the upper, *d d*, being the ordinary lifting or working door, such as used in heating and other furnaces, and the lower, *g g*, suitable doors for charging fuel into the fire-chamber. Grate-bars *h h h* extend the entire length of the furnace, but a fire-box at each end, or even a fire-box at only one end, with suitable arrangement of flues and dampers, so as to distribute the heat, would answer. I prefer, however, the arrangement shown.

The perforations *k k* in the arch of the fire-chamber permit the products of combustion to enter the oven, and distribute them evenly; and the interposition of the perforated arch between the fire-chamber and the oven prevents any excess of temperature at any part which would injure the articles to be heated.

On the floor of the oven are placed supports *t t*, made preferably of wrought-iron, on which rests the sheet-iron or other article, as shown at *w w*. Beneath the grate-bar is the ash-pit. P.

The arrangement shown gives a free combustion of the fuel, an even distribution of the heat in the oven, and easy means of controlling the temperature at all times. If the oven is too hot in either end, a proper adjustment of the damper will equalize it, and, by closing or opening them, the heat is controlled.

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

1. A furnace for heating metal plates, sheet-iron, and other metallic articles, provided with a fire-chamber and a heating-oven with a perforated arch between, arranged so as to operate substantially as described.

2. The combination of the fire-chamber, the perforated arch, and heating-chamber, having flues F F and dampers *f f* at each end.

3. The oven or heating-chamber C provided with a perforated floor, supports *t t*, and flues F F, and back-flue H.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

CALEB MARSHALL.

Witnesses:

ALFRED MARSHALL,

HENRY F. MARLIN.