

F. MACARTHY.

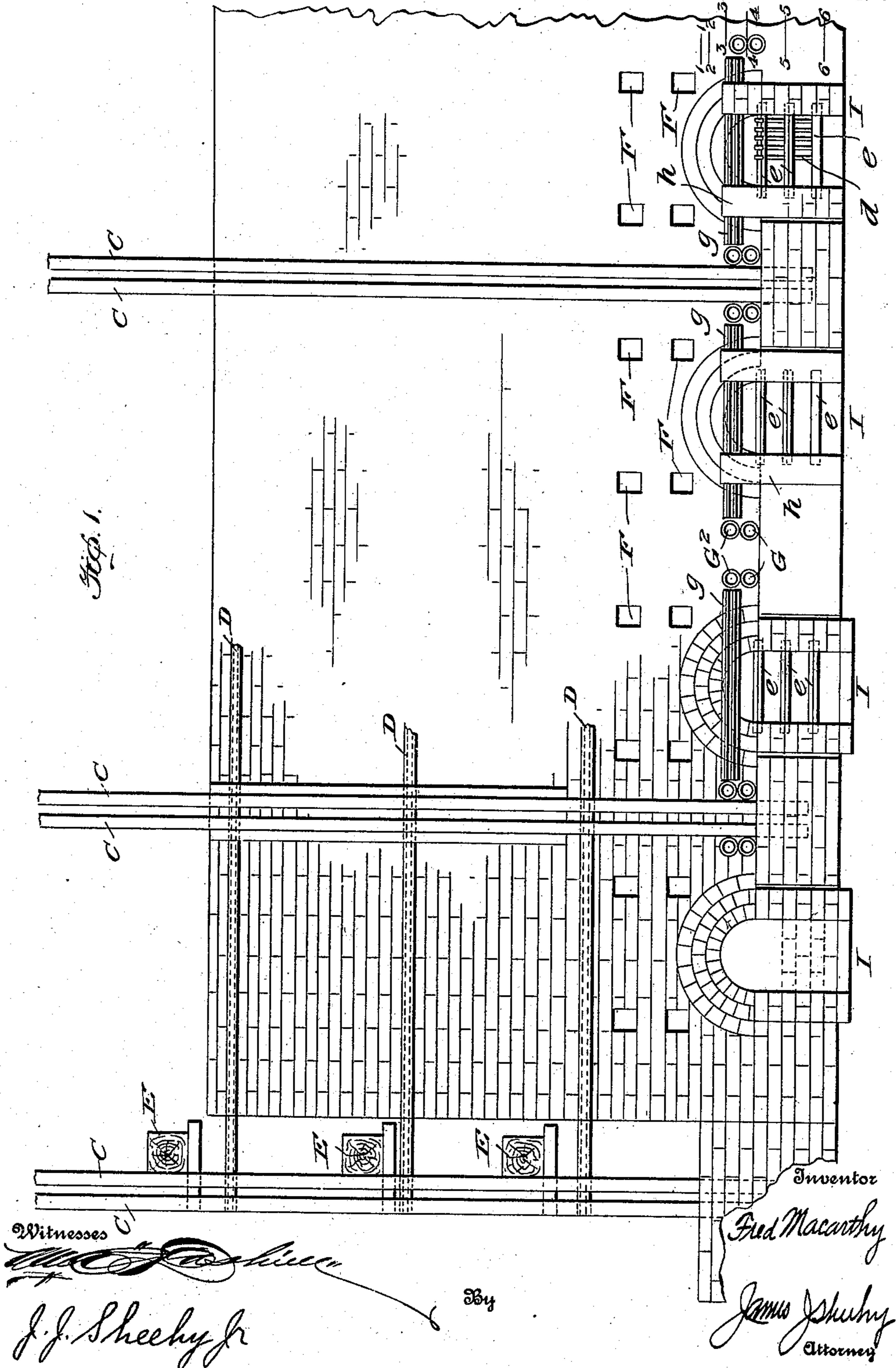
KILN.

APPLICATION FILED AUG. 19, 1908.

919,902.

Patented Apr. 27, 1909.

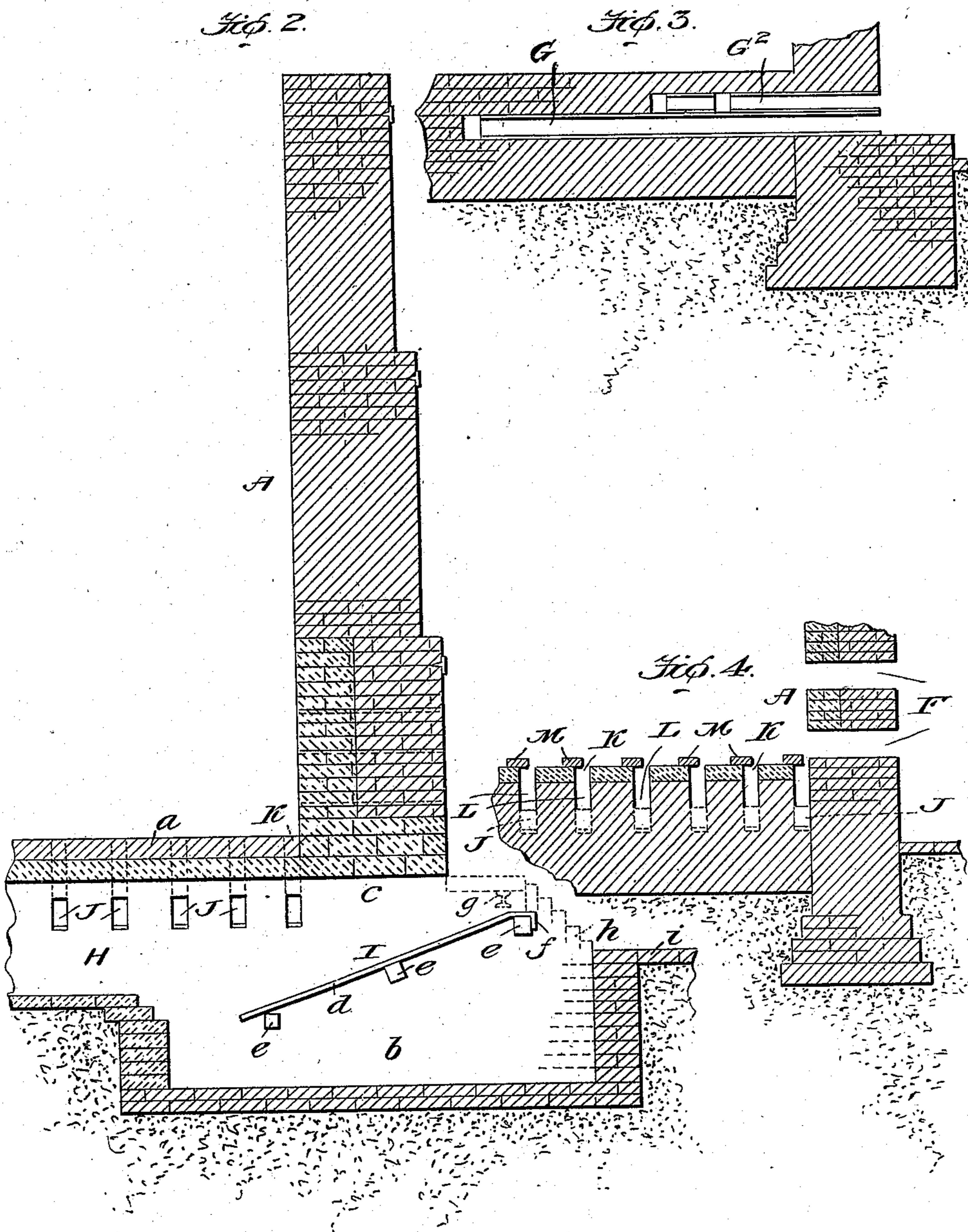
3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.



Witnesses

[Signature]

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By

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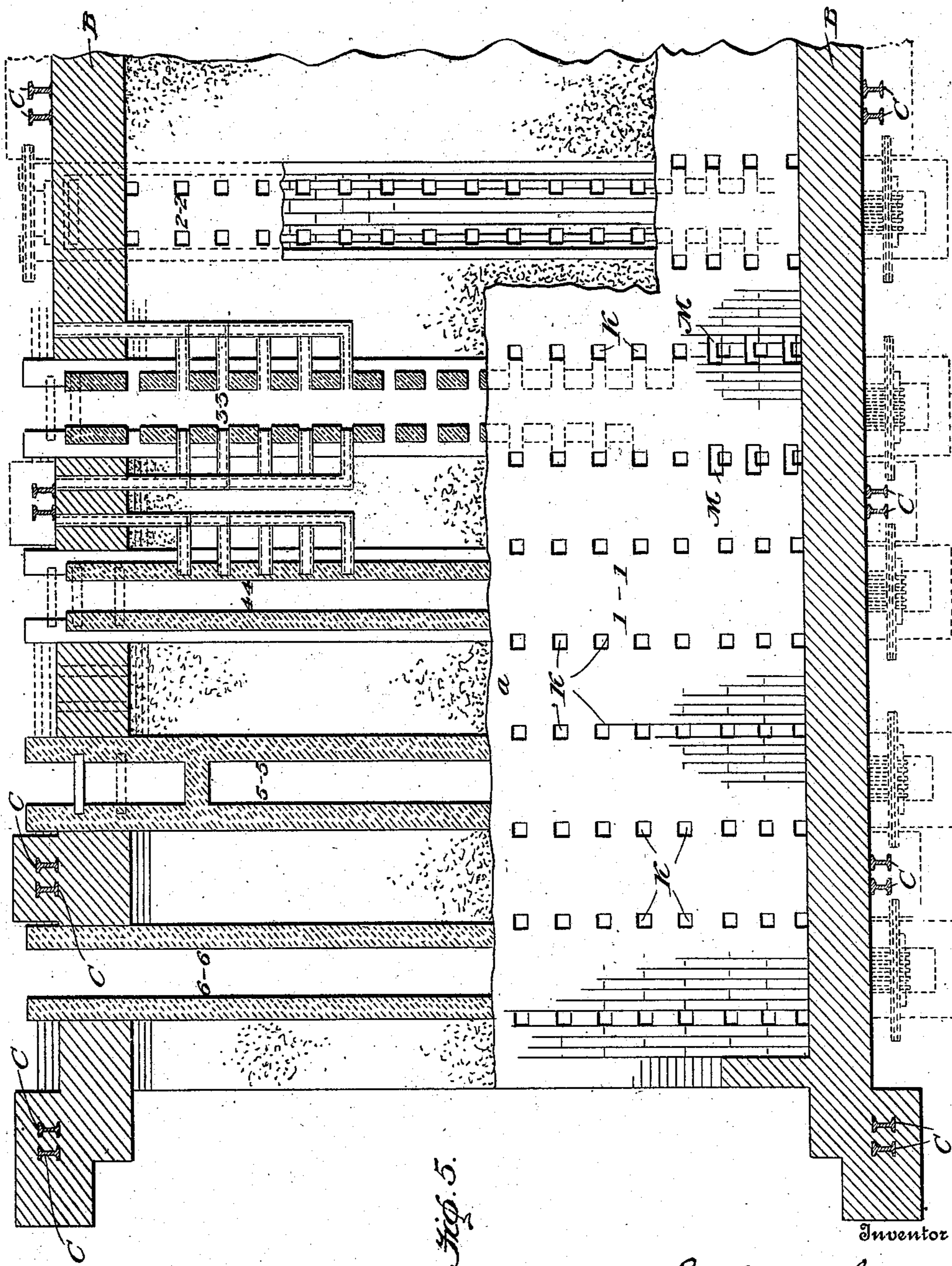
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3 SHEETS—SHEET 3.

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Witnesses

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UNITED STATES PATENT OFFICE.

FRED MACARTHY, OF SAYREVILLE, NEW JERSEY, ASSIGNOR OF ONE-HALF TO SAYRE & FISHER COMPANY, OF SAYREVILLE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KILN.

No. 919,902.

Specification of Letters Patent.

Patented April 27, 1909.

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To all whom it may concern:

Be it known that I, FRED MACARTHY, subject of the King of England, residing at Sayreville, in the county of Middlesex and State of New Jersey, have invented new and useful Improvements in Kilns, of which the following is a specification.

My invention pertains to kilns, and more particularly to up-draft kilns, and one of its objects is the provision of a kiln embodying advantageous means whereby attendants are enabled to avoid undue burning or firing of any of the wares in the kiln by controlling the disposition of the heat and products of combustion and distributing or directing the same to various parts of the chamber containing the wares.

Another object of the invention is the provision in a kiln, of furnaces, advantageously arranged, relative to the other parts of the kiln, with a view of contributing to the strength and durability of the kiln as a whole and the facility and convenience with which the kiln may be operated.

Other objects and advantageous features of the invention will be fully understood from the following description and claim when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a fragmentary side elevation, showing one side of a kiln constructed in accordance with my invention. Fig. 2 is a detail vertical section taken in the plane of one of the flues which respectively extend between furnaces at opposite sides of the kiln. Fig. 3 is a detail vertical section taken through two of the cold-air ducts comprised in my improvements. Fig. 4 is a detail section showing the openings in the floor of the kiln chamber and the dampers for controlling said openings. Fig. 5 is a broken view comprising a plurality of horizontal sections taken in the planes indicated by the lines 1—1, 2—2, 3—3, 4—4, 5—5, and 6—6, respectively, of Fig. 1.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which:

A is a chamber of the kiln, in which are placed the bricks or other wares to be burned or fired.

B B are the sides of the kiln, and C C are I-beams, and D D, T-irons, forming permanent supports for the sides of the kiln, while

E E are timbers, forming temporary end supports during firing. The elements C, D and E are preferably employed, and I would have it understood that I do not restrict myself to the use of the same.

The opposite sides B of the kiln are provided with openings F for observation purposes and for the introduction and manipulation of damper-moving irons (not shown), and through said sides extend cold-air ducts G G², hereinafter referred to at length.

Extending under the floor *a* of the chamber A are parallel flues H, at the ends of each of which are furnaces I. These furnaces are identical in construction and therefore a detailed description of the one shown in Fig. 2 and at the right of Fig. 1 will suffice to impart a definite understanding of all. By reference to the said figures, it will be seen that the furnace has an ash-pit *b* and a fire-space *c* between which are arranged inclined grate bars *d*, laid on transverse supporting bars *e*, and having hooks *f* at their upper and outer ends, engaged with the outer and uppermost of the supporting bars *e*. It will also be seen that the furnace has a transverse bar *g* disposed in its wall extensions *h*, and designed to serve as a rest for slice bars, clinking bars, leveling tools and the like, used during the firing of the kiln; and it will further be noted that the construction of the furnace is such that the ash-pit can be carried considerably below the adjacent paving *i*, and that the spaces between the several ash-pits are filled up to the paving level, thus contributing to the strength and durability of the kiln as a whole and obviating the necessity of using a depressed firing pit much lower than the floor *a* of chamber A.

It will be gathered from the foregoing that the use of the inclined grate bars extending upwardly to within a short distance of the top of the furnace arch, and the filling of the spaces between the furnaces, render the structure strong and durable as the parts most affected by expanding brick-work, due to high temperature, are supported by the surroundings.

Openings J are provided in the side walls of the flues H, and openings K in the floor *a* of chamber A, and between the said openings J and K extend leaders or passages L, this in order to permit heat and products of combustion to pass freely from the flues H to the chamber A at different points throughout

the area of the latter. The openings K are controlled by dampers M, of fire-clay or other material suitable to the purpose. Any desired number of the said dampers M may be employed, and as will be readily understood by reference to Figs. 4 and 5, each damper is adapted to be adjusted independently of the others through the medium of an iron introduced through one of the before mentioned openings F.

As best shown in Figs. 1 and 3, the cold-air ducts G and G² are arranged one above the other, and pairs of said ducts are arranged between the flues H; the lower and preferably longer duct G of each pair being connected by lateral branch ducts with the openings J in the side walls of the flues H, and the upper and preferably shorter duct being connected by lateral branch ducts with the leaders or passages L at points between the said openings J and the openings K in the chamber floor a.

In the practical use of my novel kiln, the fires are lighted in the furnaces I in the ordinary manner, whereupon the products of combustion will be drawn from the furnaces to the openings J in the side walls of the flues H, from whence said products will pass through the leaders L and openings K into the chamber A. Initially the dampers M are placed as dictated by the judgment of the party having charge of the kiln—i. e., the openings K may be left entirely open or they may be partially covered or some may be left entirely open and others may be entirely closed. I have found by experiment, however, that it is best in starting the kiln to entirely close the openings K with the exception of the ones nearest the side walls B for one-third of the distance across the width of the kiln on each side of the longitudinal median line of the kiln, thus leaving but one-third of the number of openings K uncovered for the passage of the products of combustion into the chamber A. As the temperature in the kiln rises and the heat begins to show itself in the eyes or arches formed by placing unburned bricks or other wares over the openings K, the dampers M are so regulated as to force the heat to any part of the kiln within reach of the particular row or rows of openings K being dealt with. Then in the event of any particular part of the kiln tending to develop an unduly high temperature, dampers M are positioned to

close certain of the openings K and the cold-air ducts G G² adjacent to said part are opened to admit cold-air to the flue H with which they communicate. From this it follows that the person in charge of the kiln is enabled at all times to control the temperature in different parts of the chamber A and in that way prevent superheating or overfiring any of the wares in said chamber.

In addition to the practical advantages hereinbefore ascribed to my novel kiln it will be appreciated that the same does not embody any costly iron castings such as the door frames ordinarily used at the faces of the furnaces, and is otherwise simple and inexpensive in construction.

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

An updraft kiln comprising a chamber having sides B and a floor and also having openings in its floor and said sides B, dampers arranged on the floor of the chamber and adapted to be moved by means introduced through the openings in the sides B, parallel flues extending horizontally directly below the floor of the chamber, conduits extending laterally outward from the sides of the flues and upwardly and connecting the flues and the said openings in the floor of the chamber, pavings arranged outside of and adjacent said sides B and in a plane below that of the chamber floor, furnaces arranged in alinement and direct communication with the ends of the flues and extending partly inside and partly outside said sides B; each of said furnaces including an outer ash-pit extending considerably below the paving and open at its upper side, an inner fire space, and an inclined grate arranged between said ash-pit and fire space and extending outside the said sides B, and fillings between the ash-pits, extending up to the level of the pavings, and cold air ducts extending inwardly alongside the furnaces and flues and having lateral branches communicating with the said conduits.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRED MACARTHY.

Witnesses:

GEO. F. HENDRICKSON,
C. H. CRENNING.