

(No Model.)

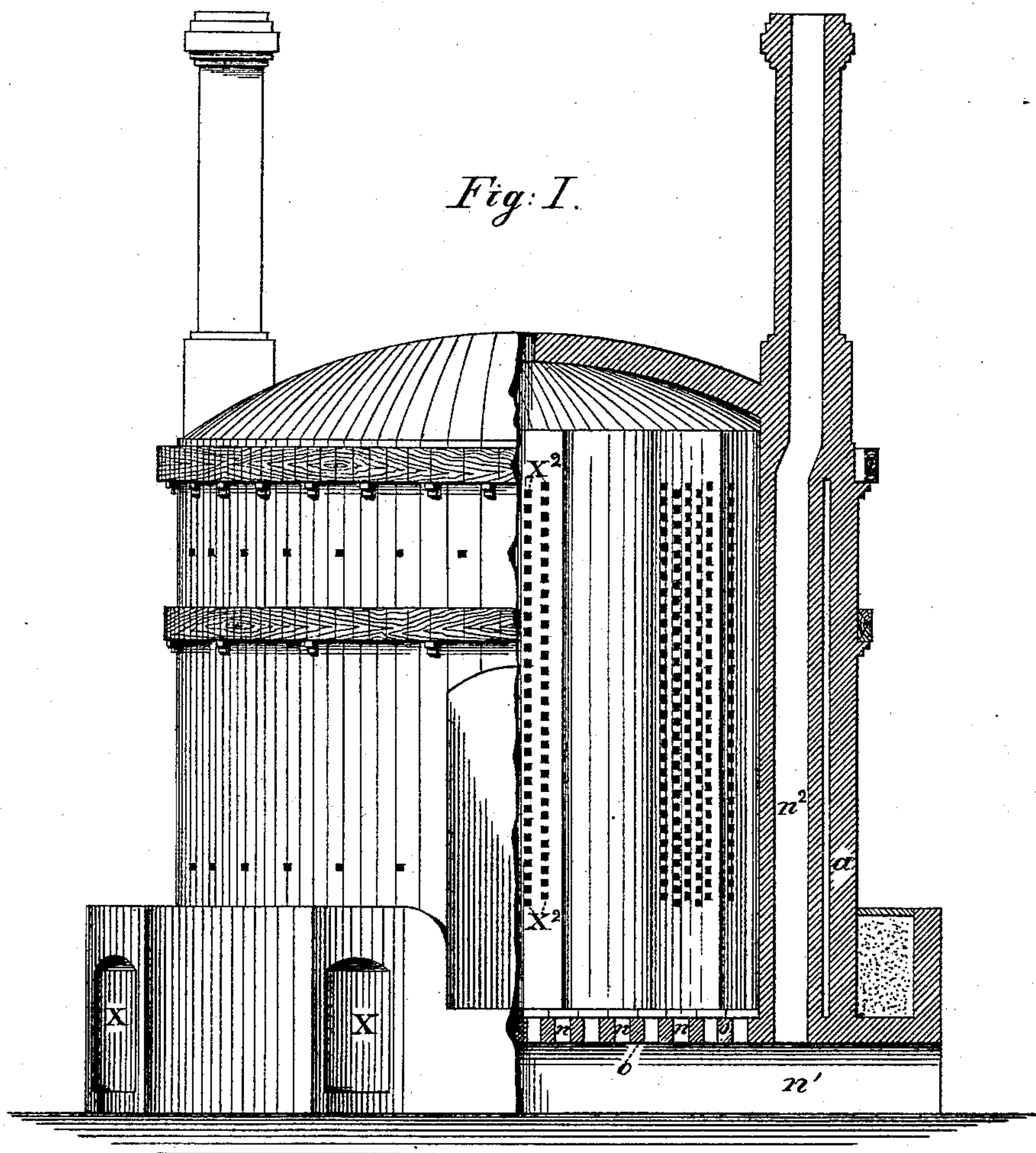
3 Sheets—Sheet 1.

D. LAEMMLE.

KILN FOR BURNING TILES, EARTHENWARE, &c.

No. 285,776.

Patented Sept. 25, 1883.



Witnesses:

L. Lautscher
S. R. Alden

Inventor:

David Laemmlé

(No Model.)

3 Sheets—Sheet 2.

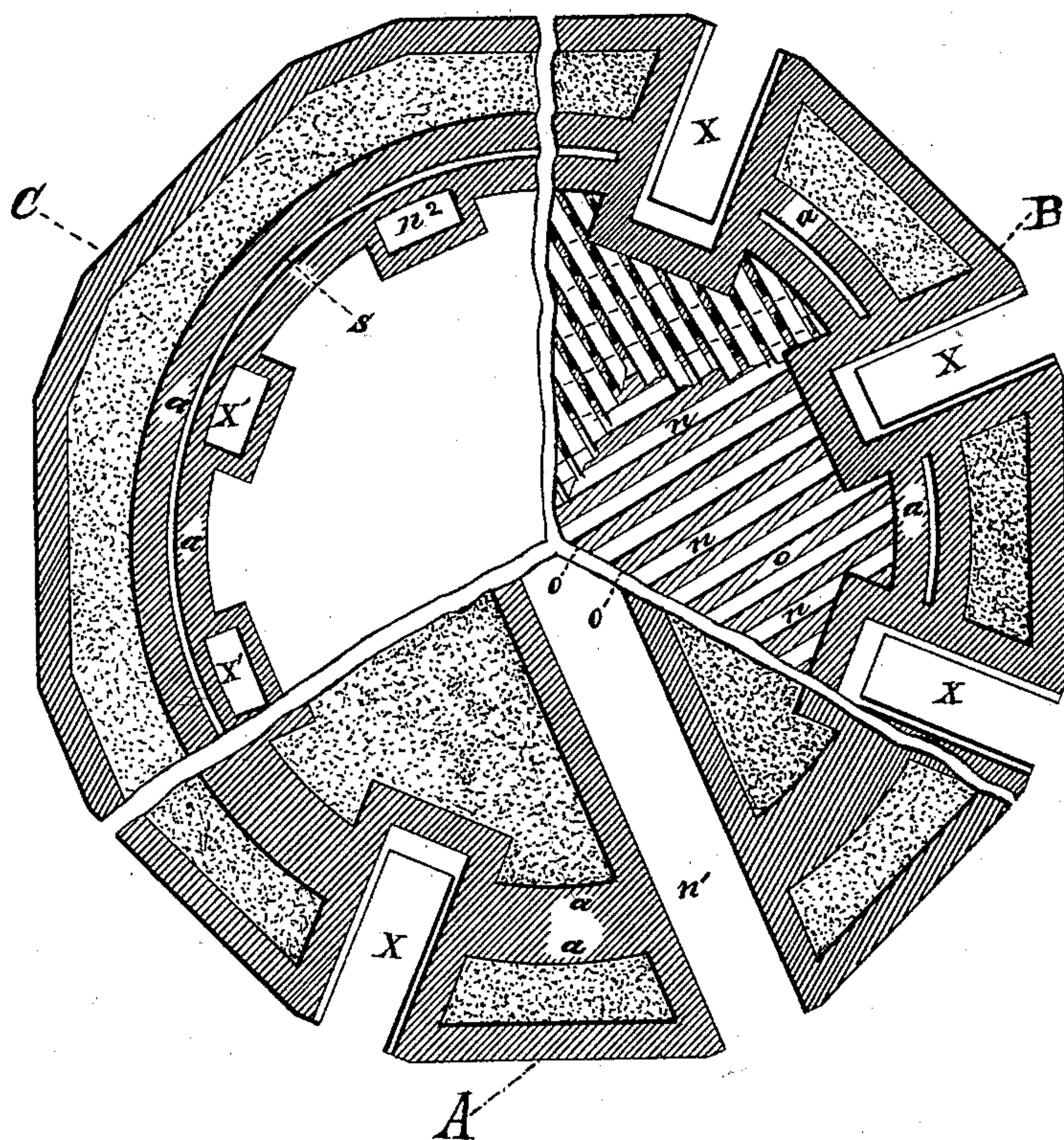
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Fig. II



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S. Laupher
S. R. Alden

Inventor:

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(No Model.)

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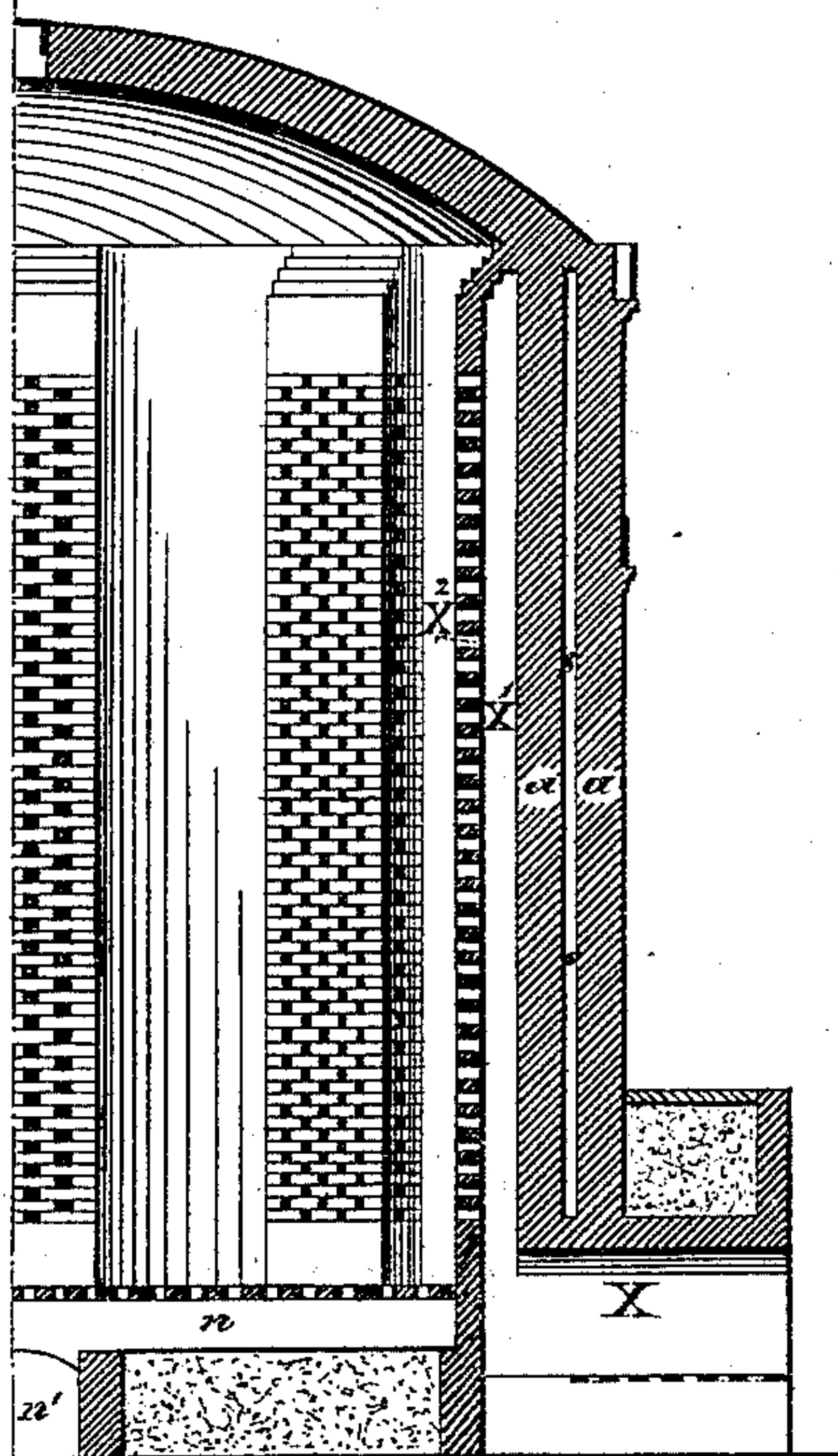
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Fig: 3.



Inventor:

David Laemmle

attest:

S. R. Alden

L. Sawyer

UNITED STATES PATENT OFFICE.

DAVID LAEMMLE, OF FORT WAYNE, INDIANA, ASSIGNOR OF ONE-THIRD
TO SAMUEL R. ALDEN, OF SAME PLACE.

KILN FOR BURNING TILES, EARTHENWARE, &c.

SPECIFICATION forming part of Letters Patent No. 285,776, dated September 25, 1883.

Application filed February 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID LAEMMLE, of the city of Fort Wayne, in the county of Allen and State of Indiana, have invented a new and useful Improvement in Kilns for Burning Tile, Earthenware, and all Articles Made of Clay, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure I is a perspective view of my improved kiln of the preferable style for burning tile and coarse pottery, with a section removed to show the interior.

Fig. II shows horizontal one-third sections A of the ground plan B on a level with the kiln-floor, and C on a level with the upper surface of outside wall of base of kiln. $a a$ is the double wall of the kiln proper with the space s between the outer and inner divisions. This double wall may, however, be built up solid to the floor, or even to the top of the kiln's base. n' is an opening or flue extending transversely across the entire base, and $x x$ are fire-places extending a short distance inside the double wall. Excepting fire-places and flues, the base is built up solid to the floor of the kiln, brick being the best material for all the walls, except inside walls of the kiln-chamber. The space between may be filled with earth or other suitable material, instead of brick. Across the base within the double wall are built narrow walls $o o$, arched across the flue n' and having narrow flues $n n$ between connecting with n' . Chimneys whose flues $n^2 n^2$ start from and open into n' are built up partly within the inner division of the double wall. For a floor bricks are laid loosely across the narrow walls $o o$ and intervening flues $n n$, leaving narrow spaces between bricks opening into and connecting with the latter. From the inner extremity of each fire-place x ascends a flue, x' , to the top of and partly within the inner division of the double wall. That portion of the wall of each of such flues which projects into the kiln-chamber is perforated at narrow intervals with openings $x^2 x^2$, except for a short distance above the fire-place and at the upper extremity; and these flues x' are so constructed at both the upper and lower extremities thereof

that the only inlet from the furnaces to the kiln-chamber are the perforations x^2 .

Fig. III is a perpendicular sectional view of one-quarter of the kiln, showing, especially, the connection between the furnaces x and the kiln-chamber through the flues x' and the openings x^2 . The inside walls of the flues x' may extend to the dome, or only as high as it is desired to have the openings x^2 ; but wherever these flues terminate they are closed at the top, so as to force all the hot air through the openings x^2 , which should not be lower than the top of the furnaces, and need not be carried higher than within one to three feet of the dome. The roof is erected upon the double wall, being drawn in a short distance from the periphery of the outer division of the double wall. The lateral thrust of the roof may be sustained by a band (preferably wooden) encircling the upper edge of the kiln. This band may be kept in position and at a sufficient distance to protect it from heat by offsets built out at intervals around the upper edge of $a a$ and base of roof. The relative position of the band with regard to the line of greatest pressure from lateral thrust of roof should be such as to receive the pressure as near the center of the band as possible.

The following measurements will serve for a fair-sized kiln for tile and coarse pottery: Each division of $a a$, eight inches thick; space s between divisions of $a a$, two inches; diameter of kiln-chamber, fourteen feet, and height, thirteen feet; roof, eight inches thick, and chimneys rising eight feet above it; fire-places of size to suit fuel; perforated flues and chimney-flues, ten inches by twenty-two inches; transverse flue n' , twenty-two inches wide by twenty-four inches high; cross-walls $o o$, four inches wide by eight inches high, with flues n four inches wide between them; openings x^2 in perforated flues, two inches square or larger, according to size of brick. The walls of flues x' are of fire-brick, and, except for burning material, requiring only a low degree of heat. The entire lining or inside wall of kiln and the flues x' and n^2 should be of fire-brick. The kiln is not necessarily circular, but may be made of any desired form, though for common-sized kilns the circular is preferred.

able to an oblong form. The walls of perforated flues x' and chimney-flues n^2 should be inside the space s of the double wall $a a$.

In filling the kiln-chamber with material to be burned it is so placed as to leave interstices for the passage of air both horizontally and vertically through the entire mass. The door being walled up, the aperture in the roof closed, as well as the ends of the flue n' , the hot air from the furnaces passes up the perforated flues x' , escaping into the mass of material to be burned through the openings x^2 with an upward tendency, but, having no escape at the ceiling, is reflected and passes down through the mass, escaping over the entire kiln-floor through its interstices into the flues n , thence into the flue n' , thence out the chimney-flues n^2 . When the kiln is burned and ready for cooling, the aperture in the roof is unclosed, as also the ends of the large transverse flue n' , thus creating a strong draft of outer air through the entire mass of burned material.

Constructing the chimney-flues within the wall of the kiln saves fuel and does away with the necessity for tall chimneys.

The kiln, owing to its double wall, may be constructed within or near buildings, and is much more durable than those in use heretofore. The evil effects of the lifting and cracking of kiln walls and roof, owing to the intense heat, are largely obviated by the walls being double in my kiln, and so constructed that while the outer division is little affected by expansion it holds the inner division and causes it to settle in place. If the height of the kiln is considerable, a second band may be placed below the first some distance, held by offsets extending through the space s to the inner division of the double wall. Just above the base of the kiln, and again a short distance below the upper band, a row of apertures is made in the outer division of the double wall, thus ventilating the space s .

Among the serious defects of kilns heretofore used are the following: Unequal distribution of heat through the kiln-chamber and consequent uneven burning of the ware placed therein; melting of ware in process of burning at the points where the heating medium enters the kiln-chamber, and consequent waste of ware and clogging of flues and waste of fuel and time in the process of burning.

My invention, which has for its object the cheap, rapid, and even burning of all articles made in whole or part of earth or clay, remedies the above defects.

The main features of my method of burning consist of introducing the heating medium into a kiln-chamber through small openings distributed over the sides of the kiln-chamber and forcing it evenly through the entire mass of material to be burned. To attain this a draft as nearly equalized as possible over the entire bottom is necessary, besides the closed ceiling and mode and place of introducing the heating medium. I create such a draft by the use of several chimney-flues starting at points opposite to or considerably removed from one another, two placed opposite, as in the foregoing description, being sufficient for ordinary kilns, in connection with a series of flues underlying the entire bottom of the kiln-chamber. Single chimneys, as used heretofore, cause an unequal draft over the bottom of the kiln-chamber, and consequent uneven distribution of heat. Building the inlet and chimney flues in and as part of the inner division of the double wall contributes also to the saving of fuel and even distribution of heat through the kiln-chamber.

I do not claim as novel furnaces, chimneys, open floor, transverse flues n , main flue n' , downdraft, closed ceiling to kiln-chamber, the arranging of material, (brick, tile, earthen and stone ware, china, &c.,) so as to leave interstices both horizontally and vertically through it, nor any other old and heretofore-known feature of my kiln or method of burning, but

I do claim and desire to secure by Letters Patent—

1. A kiln having perforated side flues closed at the top for the admission, and base-flues for the exit, of the heating medium, substantially as shown and described.

2. In a kiln, perforated flues closed at the top for admission of the heating medium, substantially as described.

3. In a kiln, perforated flues closed at the top and imperforate for some distance from the ceiling and from the floor of the kiln, for the purpose and substantially as set forth.

4. A double-walled circular kiln having perforated flues closed at top and imperforate for some distance from both ceiling and floor for the admission, and a system of base-flues in connection with chimney-flues constructed partly in the kiln-wall for the exit, of the heating medium, substantially as described.

DAVID LAEMMLE.

Attest:

S. R. ALDEN,
W. H. SHAMBAUGH.