(No Model.) 2 Sheets—Sheet 1.

B. RETHERFORD.

BRICK KILN.

No. 306,960. Patented Oct. 21, 1884.

Fig. 1

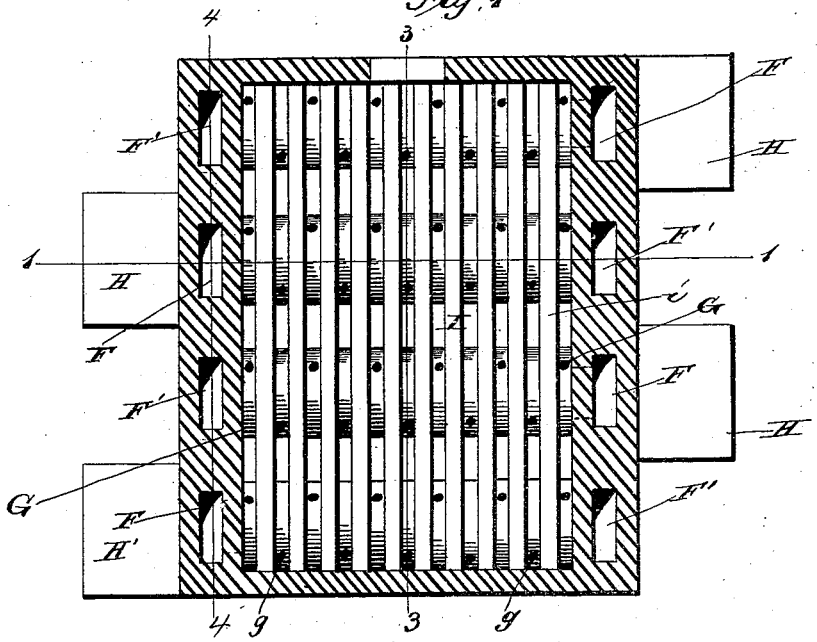
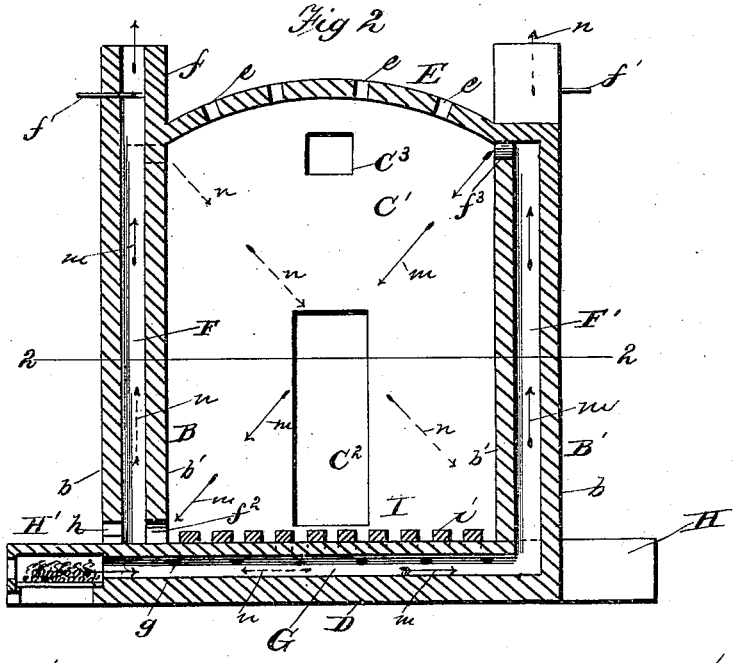


Fig 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

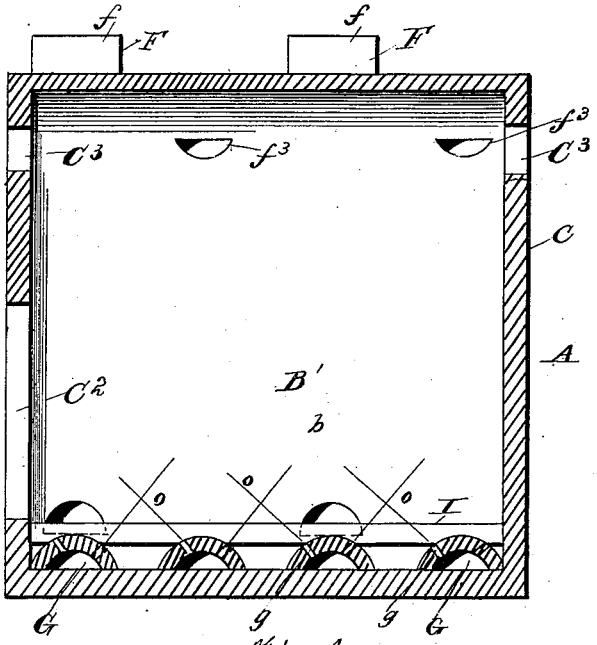
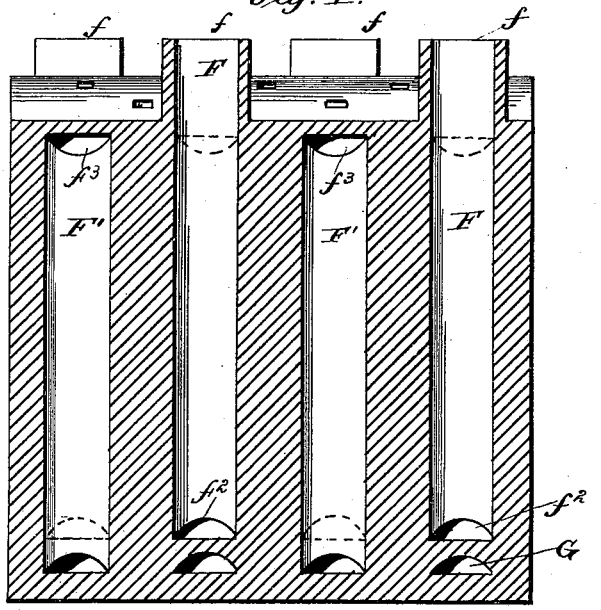


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENTON RETHERFORD, OF BRINGHURST, INDIANA.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 306,960, dated October 21, 1884.

Application filed July 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, BENTON RETHERFORD, a citizen of the United States, residing at Bringhurst, in the county of Carroll and State of Indiana, have invented certain new and useful Improvements in Brick-Kilns, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in brick and tile kilns, and has for its object the provision of a kiln wherein the products of combustion are conveyed from furnaces located on opposite sides of the kiln across the kiln, and thence upward to openings near the top of the kiln; thence obliquely across the kiln through the ware; thence into openings which connect with the chimneys, whereby the heat is made to take a tortuous course through the kiln by crossing and recrossing the same; and the invention consists in the construction, combination, and arrangement of parts, as hereinafter more fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a horizontal section of a kiln provided with my improvements, the view being taken on a line corresponding with the line 2 2 of Fig. 2. Fig. 2 is a transverse vertical section taken on the line 1 1 of Fig. 1. Fig. 3 is a longitudinal vertical section taken on the line 3 3 of Fig. 1, and Fig. 4 is a similar longitudinal section on the line 4 4 of Fig. 1.

Similar letters of reference in the several drawings denote like or corresponding parts.

Referring to the drawings, A designates a kiln, having side walls, B B′, end walls, C C′, floor D, and roof E. The side walls, B B′, are double—that is to say, have an outer wall, *b*, and an inner wall, *b′*—each of which is provided with a series (preferably four in number) of flues, F F′, extending from bottom to top thereof. (See Figs. 1 and 2.) Every alternate flue F is provided at its top with a short smoke-stack, *f*, open at the top for the escape of smoke, and provided with a damper, *f′*. The flues F are provided near their bottoms with apertures f^2, opening into the interior of the kiln above the floor thereof. Near the closed tops of the flues F′ are apertures f^3, which open into the kiln, as shown. The lower ends of the flues F′ connect with lateral flues G, that extend transversely across the kiln upon the floor thereof, and connect with furnaces H H′, preferably located on the outside of the walls B B′.

By reference to Fig. 1 it will be seen that the furnaces H H′ are arranged on opposite sides of the kiln, for reasons hereinafter more fully explained.

I designates a grate resting upon the arches of the lateral flues G, which have apertures *g* formed in the tops thereof between the bars *i* of the grate. (See Figs. 1 and 2.) These apertures are inclined in opposite directions, forming cross-currents of the heated air as it passes into the kiln from said lateral flues.

C^2 is a door in the end wall C′. C^3 C^3 are openings or windows to admit light and air to the interior of the kiln, for which purpose the roof E is provided with apertures *e*.

h are openings in the side walls for observing the condition of the ware while exposed to the fire.

The operation of my improved kiln is as follows: The brick or tile being placed upon the grate I, with proper interstices for the passage of the air-currents, the fires are lighted in the furnaces H H′, from which the products of combustion pass through the lateral flues, G, to the vertical flues F′, thence through the openings f^3 to the interior of the kiln, thence obliquely and across the kiln to the openings f^2 in the flues F, and thence through said flues to the external air.

In Fig. 2 the above-described course of the products is shown by the full-line arrows *m* in their passage from the furnace H′, the dotted lines *n* showing a similar passage of products of combustion from the next alternate furnace H.

While some of the heated air is passing through the flues as above described, some of it is escaping through the apertures *g* in the lateral flues G, such escaping currents crossing and recrossing, as shown by the lines *o* in Fig. 3.

By having the arrangement of furnaces and flues herein shown and described, advantage is taken of unfavorable currents of air outside of the kiln, whereby economy of heat and time and a more uniform burning of the tile or brick is obtained.

Modifications and alterations in the number of furnaces and flues and of the form and proportions of the parts composing my kiln can be made without departing from the principle or sacrificing the advantages thereof; and I would therefore have it understood that I reserve the right to make such changes as fairly fall within the scope of my invention.

I am aware that it is not broadly new to make a brick-kiln with furnaces located on one side thereof, from which the products of combustion traverse a tortuous course in one direction somewhat similar to that hereinbefore described.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A brick or tile kiln having furnaces located at opposite sides thereof, flues having apertures opening into the kiln through the grate I, thence extending upwardly and provided with openings at the top thereof, in combination with vertical flues which connect with the kiln on opposite sides and at the lower end thereof, substantially as described, for causing the products of combustion to pass in alternate currents from the top of one side wall to the bottom of the opposite side wall, as herein described.

2. A brick or tile kiln having double side walls provided with vertical flues, in which openings into the kiln alternate at top and bottom, in combination with horizontal transverse flue or flues, and furnaces located at opposite sides of the kiln and alternating in horizontal position with one another, substantially as described, and for the purpose set forth.

3. In a brick or tile kiln, the side walls, B B′, each having alternating flues F F′, provided, respectively, with apertures f^2 f^3 at their uppef and lower ends, which open into the kiln, in combination with the transverse flues G, having apertures g, which also open into the kiln, grate I, and furnaces H H′, located at opposite sides of the kiln and exteriorly to the walls thereof.

4. In a brick or tile kiln, the combination of the following elements: double side walls, B B′, each provided with flues F F′, having alternating closed and open upper ends, and apertures f^2 f^3, transverse flues G, provided with openings g, grate I, door C^2, openings C^3, h, and e, furnaces H H′, and dampers f', substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENTON RETHERFORD.

Witnesses:

AMOS R. WOODS,

D. R. BARBOUR.