

(No Model.)

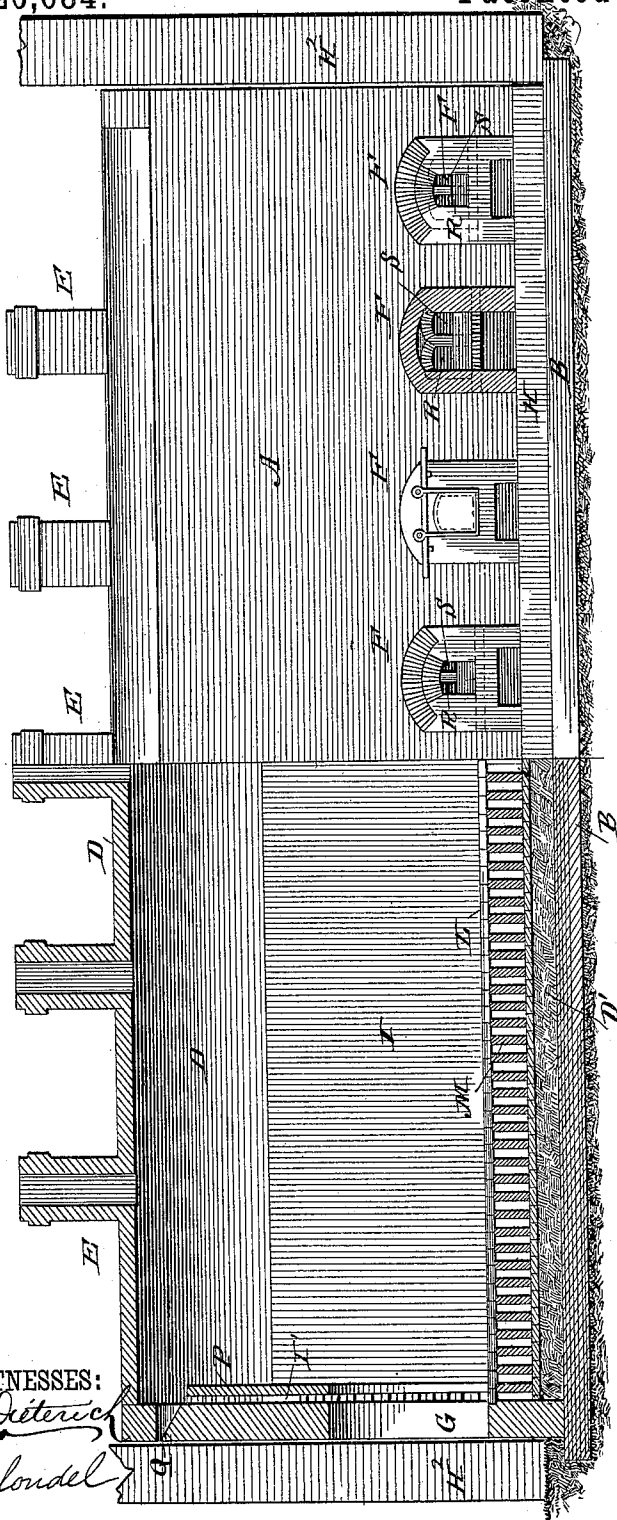
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J. B. GRISWOLD.
BRICK KILN.

No. 420,684.

Patented Feb. 4, 1890.

Fig. 1.



WITNESSES:

Fred G. Dietrich
W. D. Blondel

INVENTOR:

John B. Griswold

BY

Wm. J. G.

ATTORNEYS.

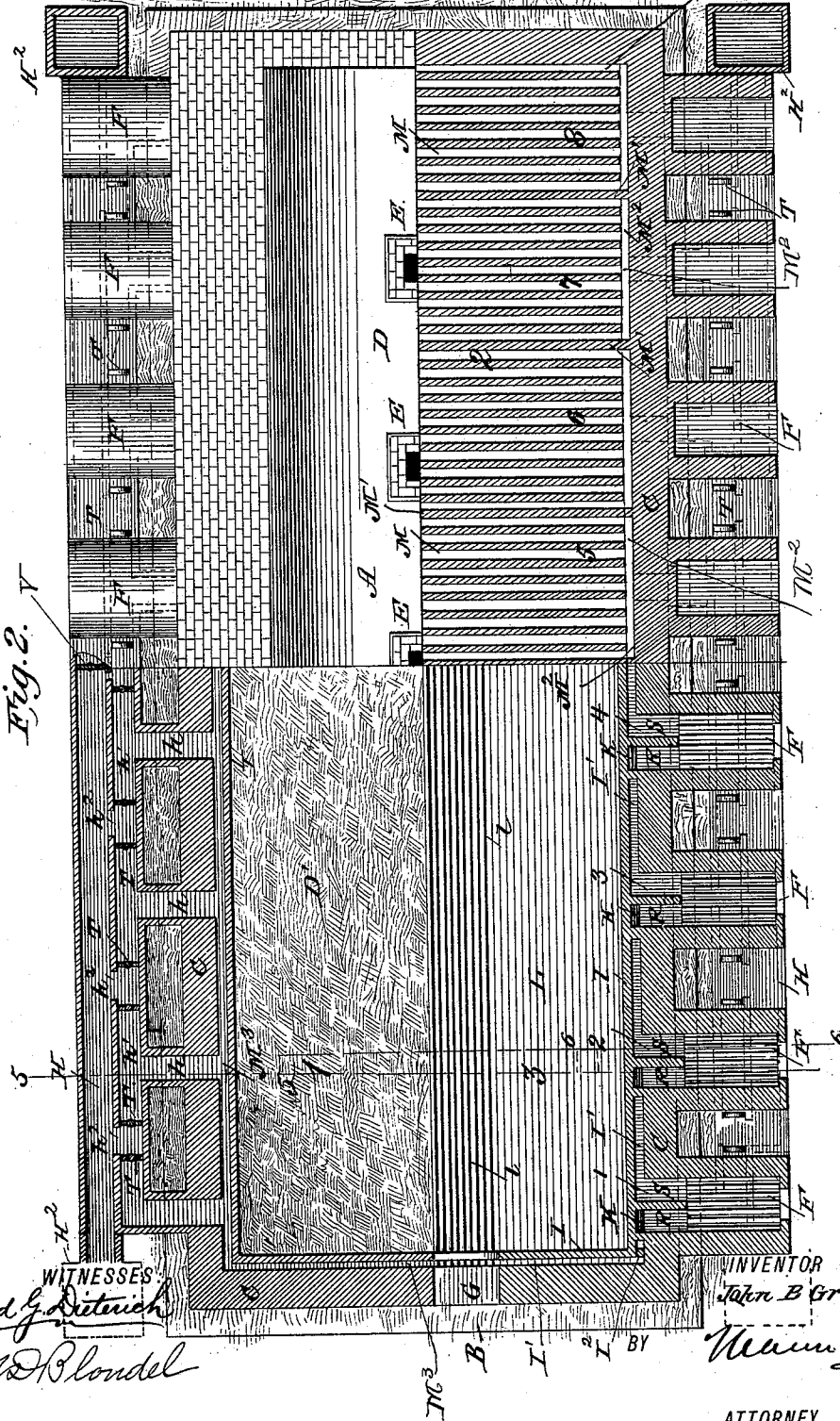
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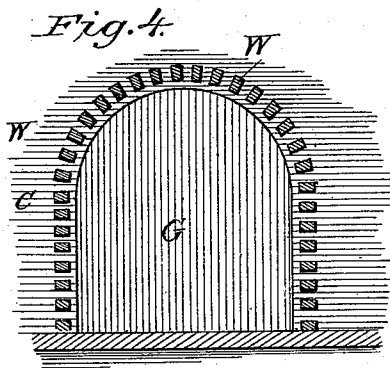
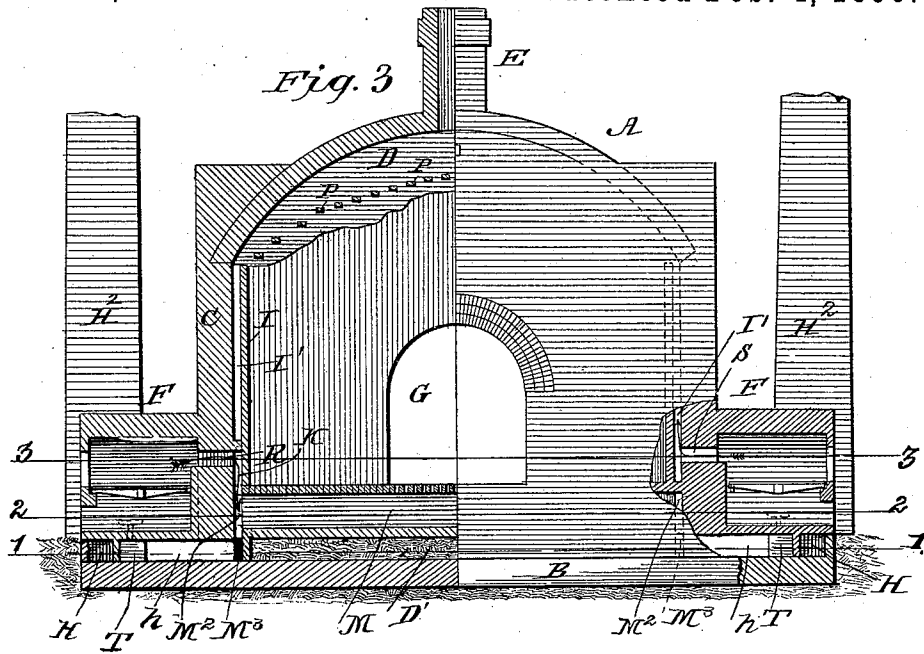
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Fred G. Dietrich
W. D. Blondel

INVENTOR
John B. Griswold
BY *Munroe*
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN B. GRISWOLD, OF ZANESVILLE, OHIO.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 420,684, dated February 4, 1890.

Application filed June 7, 1889. Serial No. 313,522. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. GRISWOLD, residing at Zanesville, in the county of Muskingum and State of Ohio, have invented certain new and useful Improvements in Brick-Kilns, of which the following is a specification.

The object of my invention is to construct a kiln for burning brick, tile, or other ceramic material in such a manner that a perfect combustion of the gases and fuel can at all times be insured, in which the products of combustion enter at the top or bottom, and in which alternate up or down drafts are secured from the same furnaces.

To this end my invention consists in certain features of construction and arrangement of parts, as will be hereinafter fully described in the annexed specification and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a front view of my improved brick-kiln, one half of the same being shown in elevation and the other half being in central vertical longitudinal section. Fig. 2 is a top plan view showing portions of the kiln in horizontal section, taken on the lines 1 1, 2 2, and 3 3, Fig. 3, said portions being designated by the numerals 1, 2, and 3, respectively. Fig. 3 is a transverse vertical section of my improved kiln, the furnaces being sectioned on the lines 5 5 and 6 6, Fig. 2, part of said kiln being shown in end elevation. Fig. 4 is a detail view hereinafter referred to.

In the accompanying drawings, A denotes the kiln, preferably of rectangular shape.

B denotes the ground foundation; C, the main walls; D, the ceiling; E, the chimneys, and F the furnaces.

G represents door-openings, of which there is one formed in each end of the kiln.

The bottom or base of the kiln is formed of three sections, of which D' is a filling of earth placed above the foundation B, upon which is mounted a series of transverse flues or openings M, forming a transverse chamber, which runs across the entire width of the kiln. Upon these flues is supported the floor L, which is provided with a series of longitudinal openings l, which extend over the

central portion and about one-third of the width of said floor.

A thin wall I is arranged within the kiln parallel with and close up to the main wall C, forming between it and said wall a vertical flue I', as shown. This wall extends up to a short distance from the ceiling D, and is connected with the walls C by cross-bricks P P, which are put in on the gable end, thereby making only the half fire-room on the gable-openings.

The lower portion of the kiln is formed in sections, and each section is provided with a furnace F at each end.

H H denote the flues, which are disposed one to each outer longitudinal side of the kiln, which connect with stacks H², arranged at each corner of the kiln, as clearly shown in Fig. 2. Each of the longitudinal flues H is provided centrally with cut-off valves V, which divide said flues into two sections each, and thereby cause each of the corner-stacks to create an equal draft at each end of the kiln.

The tops of the stacks H² may be provided with suitable dampers arranged to be closed from the ground, so that by closing one or more the fire can be sent in different directions, if desired.

In the drawings I have shown a kiln formed of eight sections, numbered 1 to 8, which sections may all be in use at one time, or any one of them may be used separately, in a manner as will appear later on.

Each of the furnaces F, which are formed upon the outer longitudinal faces of the wall C, is provided with two inlet or combustion openings R S, which pass through the main wall C, one of which S connects with the vertical flue I', while the other R connects with a downwardly-extending opening K, which connects with the transverse flues M beneath the floor L. The flues M are divided into sections by extending one of the walls M' of each section entirely across the kiln and connecting the same to the main walls C, as clearly shown in Fig. 2, thereby forming a short longitudinal channel M² at each end of and communicating with the flues M M, and with which the openings K communicate. The channels M² extend below the bed of the flues M, connect with flues or channels

M³, located beneath the flue-bed M, and furnaces F, said channels being connected by means of the short passages *h* with a longitudinal flue *h'*, which is provided with a series of openings *h*², which communicate with the main or draft flues H, as clearly shown in the drawings. A pair of cut-off dampers T are provided for each section, and are located to operate in the flue *h'*, whereby the draft for any one or all of the sections may be readily cut off.

As before stated, the inner wall I is extended entirely around the inside of the kiln, forming a chamber I'.

It will be observed by reference to part 3 of Fig. 2 that the end flues I' are connected with the slotted floor L. By this construction it will be seen that when the dampers are adjusted to operate the kiln on an updraft, in a manner hereinafter described, a portion of the products of combustion will pass up through the slotted floor into the end flues I' and discharge over the upper ends thereof into the kiln, thereby thoroughly heating the ends of the kiln. This wall is also connected with the main wall at the corners thereof, as shown at I², thereby cutting off communication between the side flues I' and the end flues I'. This construction is very essential, because if there were no division at said corners the products of combustion, when it is desired to use a downdraft, would pass into the side chamber I' from the opening S around into the end chamber down through the slotted floor into the flues M and H.

In constructing the thin inner wall I prefer to connect the end portions with the main wall C in the door by every other brick being partly laid in wall C and bound into the wall I, thereby leaving a series of spaces, through which the fire can pass up and down, and thus more effectually distribute the heat.

By reference to Fig. 4 of the drawings the manner of connecting the walls I and C will be clearly understood. While but one row of binding-bricks W are shown, it is manifest that any number of such rows may be employed and arranged in such a manner as to admit of broken passage-ways for the fire.

Each of the end walls I is provided with an opening registering with the doors G, and above the said walls are formed openings or sight-holes Q Q, as shown.

The operation of the kiln is as follows: After filling the kiln artificial walls are placed in the doors G and the openings in the wall I. The kiln, if desired, is started to operate on an updraft. The draft from flues H is cut off at the stacks H² and an upward draft produced through the chimneys E. The fires from the furnaces run down the openings K into the openings M across the same and mingle therein. The products of combustion then pass up through the openings *l* in the floor, burn the brick, and pass out the chimney E. All of the sections may at this time be in communication, if desired.

If, however, the kiln is all burned except one of the middle sections, the fires would be continued in the furnaces of said section, the dampers T being closed so as to locate the heat in this section. The products of combustion would then pass up into the kiln and through the middle chimney, the others having been closed by suitable dampers. If, however, it was found necessary to throw the draft through the kiln at an angle, the middle chimney could be closed and either of the end chimneys opened, which would work the fire at different angles either way, thus allowing the burner to work the fire anywhere it may be needed on the updraft. When it is desired to use the kiln on the downdraft, the chimney-drafts are cut off. The fire will then go up between the main wall and the thin wall out over the same, down through the brick, through slotted floor L into the flues M, and out through the flues H into the stacks, the dampers in said flues being open.

From the foregoing description, taken in connection with the drawings, the advantages of my improved kiln will be readily understood. Its construction is simple, and may be accomplished at a moderate cost, and by it the bricks in the entire kiln may be uniformly burned.

Having thus described my invention, what I claim as new is—

1. A brick-kiln consisting, essentially, of a main wall and top, an inner wall disposed parallel to the main wall and extending up to near said top, joined with the main wall at the corners, forming vertical side and end flues, furnaces connected with the said side flues, a bottom slotted longitudinally, transverse flues disposed below said bottom and communicating therewith, and draft-flues H H, connected with the said transverse flues, substantially as shown and described.

2. A brick-kiln consisting of a main wall and top, vertical flues I', opening at their tops into the kiln, a series of furnaces communicating with said flues I', a longitudinally-slotted floor L, transverse flues M, disposed below and connected with the floor L, and longitudinal draft-flues H, communicating with the flues M, substantially as shown and described.

3. A brick-kiln consisting of a main or body portion, a top provided with a series of exit-chimneys E, a floor L, having longitudinal openings, a transverse flue-chamber disposed below and communicating with said floor, said chamber formed in sections, each section provided with transverse flues M, furnaces connected with each section of the flues M, draft-flues H, communicating with said flues M, and dampers located in the flues H, whereby all of the flue-chambers M may be put in communication or each chamber be operated separately, substantially as and for the purpose described.

4. The combination, with the kiln-body provided with a continuous vertical flue at each

side of the interior thereof, opening at the top
into the kiln, a series of furnaces connected
with said flues, of a longitudinally-slotted floor
L, a transverse chamber located beneath said
5 floor formed in sections, each section pro-
vided with a series of transverse flues M M,
communicating at their ends, as at M², said
ends M² communicating with longitudinal
flues M³, disposed below the flue-chambers M,

draft-flues H, connected with said flues M³, to
provided with a series of dampers T, whereby
the draft may be cut off, substantially as and
for the purpose described.

JOHN B. GRISWOLD.

Witnesses:

J. W. LYLES,
J. T. PALMER.