(No Model.) 5 Sheets—Sheet 1.

C. J. HOLMAN.

BRICK KILN.

No. 532,154. Patented Jan. 8, 1895.

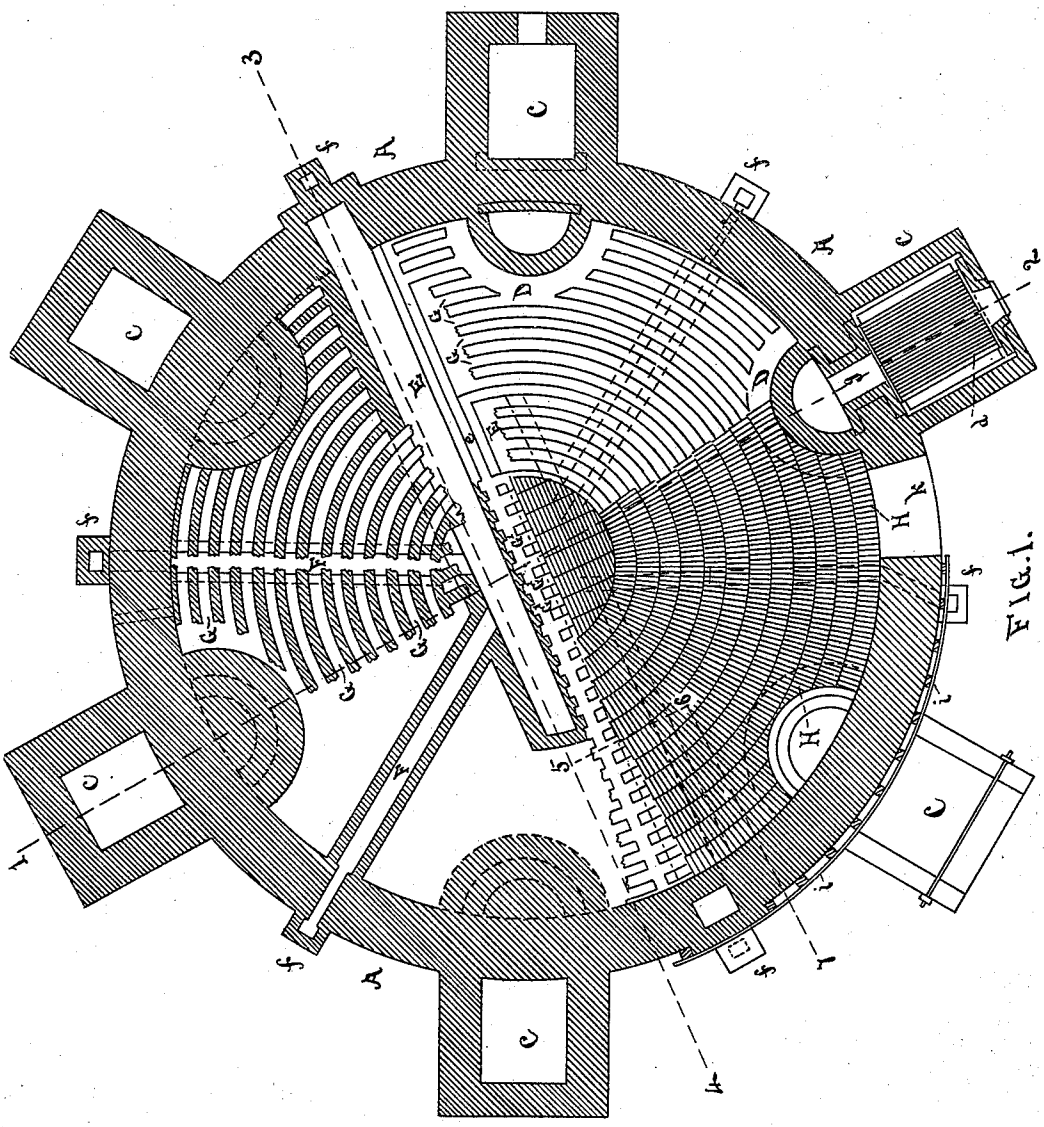

FIG. 1.

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F. W. Lohr

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A. B. Gardiner
ATTORNEY.

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5 Sheets—Sheet 2.

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BRICK KILN.

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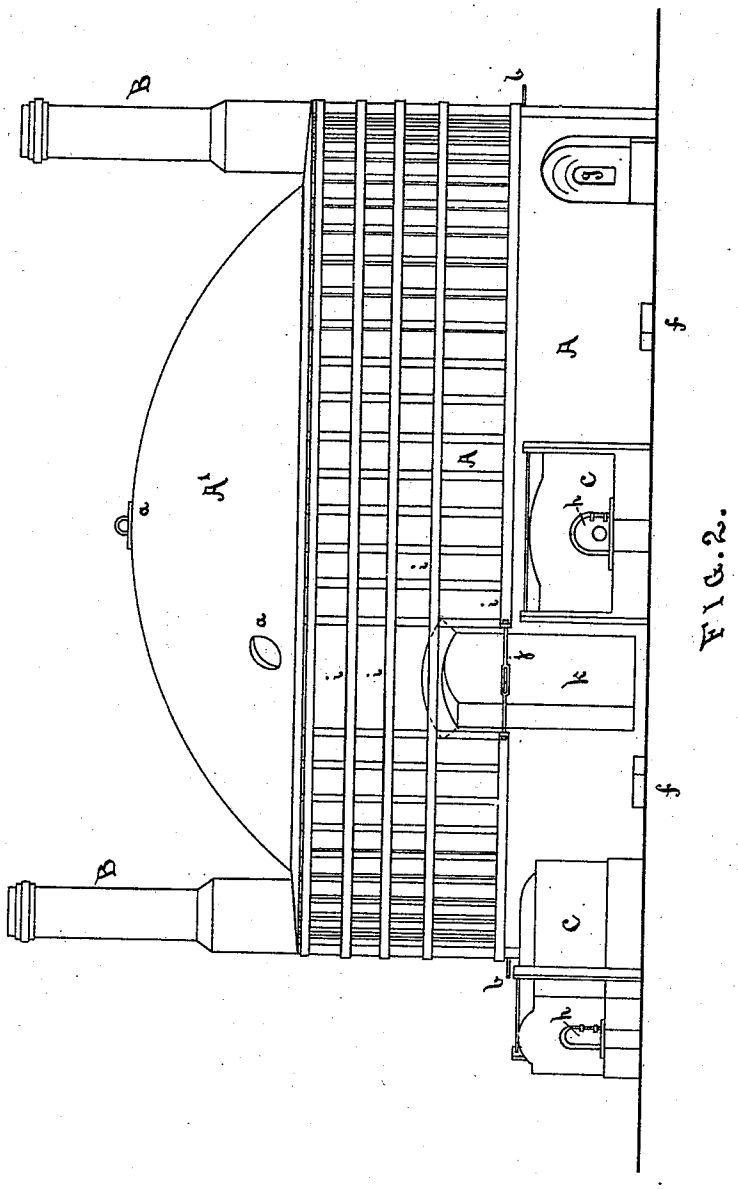

FIG. 2.

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(No Model.)

5 Sheets—Sheet 3.

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BRICK KILN.

No. 532,154.

Patented Jan. 8, 1895.

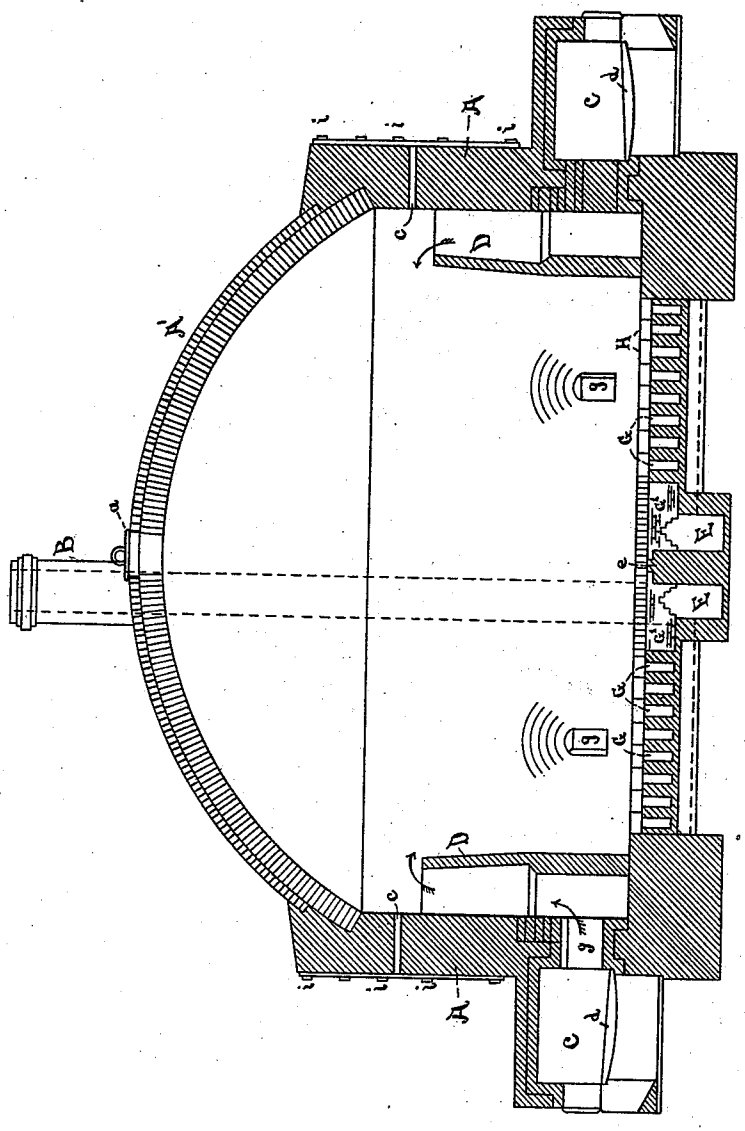

FIG. 3.

WITNESSES:
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(No Model.)

5 Sheets—Sheet 4.

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BRICK KILN.

No. 532,154.

Patented Jan. 8, 1895.

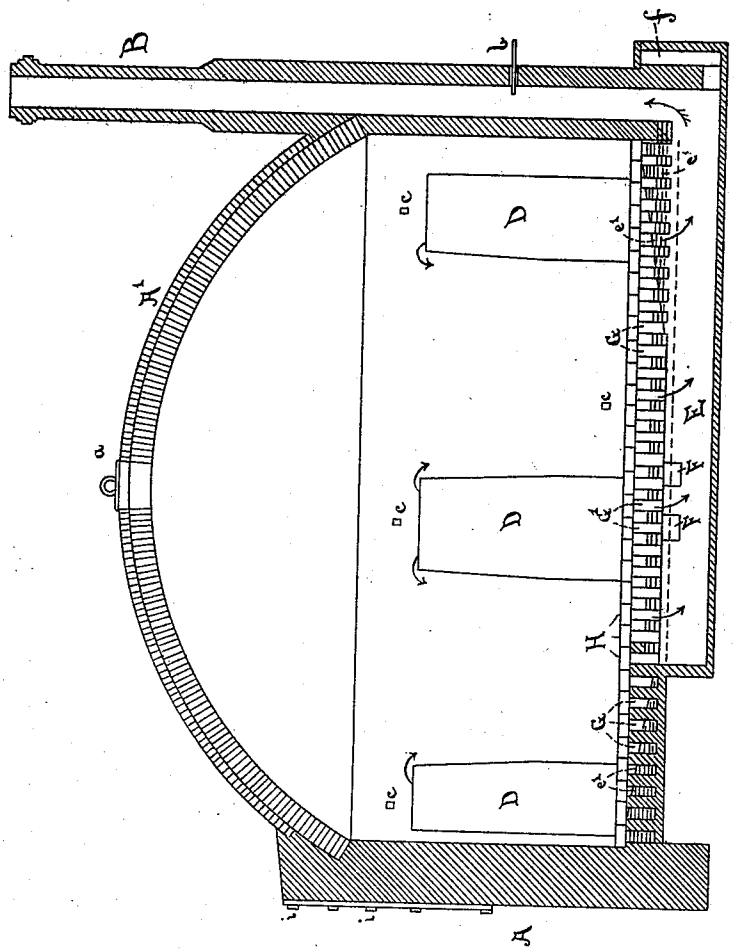

FIG. 4.

WITNESSES:
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(No Model.) 5 Sheets—Sheet 5.

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BRICK KILN.

No. 532,154. Patented Jan. 8, 1895.

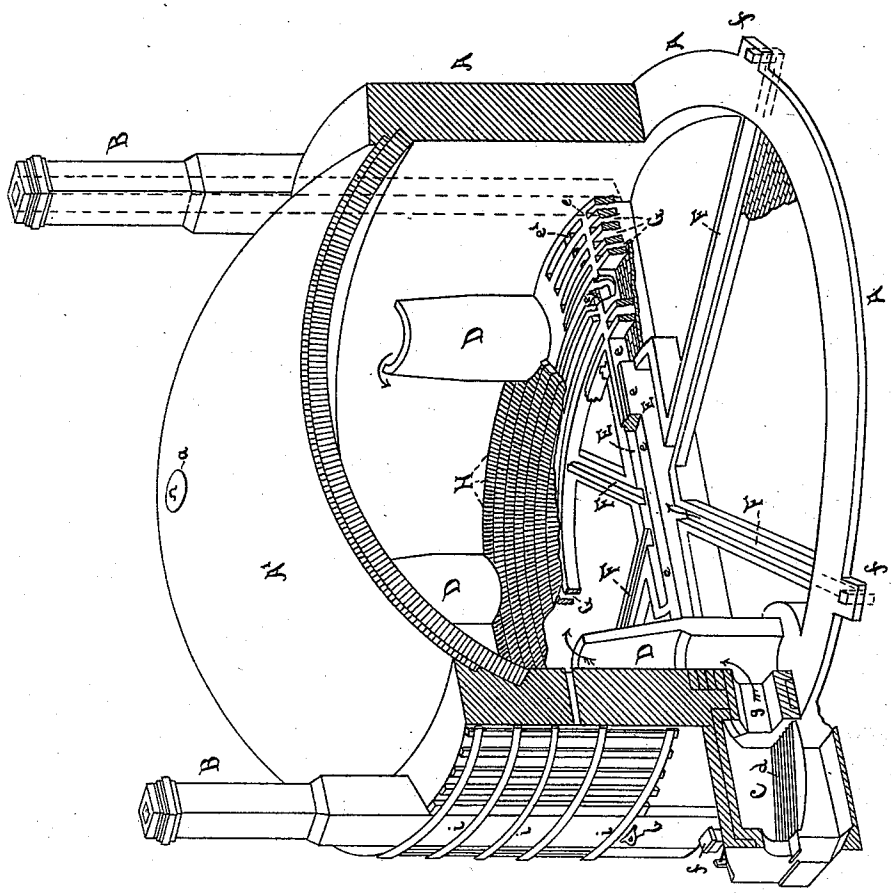

FIG. 5.

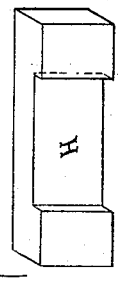

FIG. 6.

WITNESSES:
Geo. H. Graves
F. H. Lohr

INVENTOR
C. J. Holman
per H. B. Gardiner
ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES J. HOLMAN, OF SERGEANT BLUFFS, IOWA.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 532,154, dated January 8, 1895.

Application filed August 6, 1894. Serial No. 519,553. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HOLMAN, a citizen of the United States, residing at Sergeant Bluffs, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Brick-Kilns; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains 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.

My invention relates to brick kilns having the down draft feature, and its object is to provide a new and improved kiln which is simple in construction, effective and durable in operation, and serves to burn the bricks effectively and uniformly throughout. This improved kiln is preferably made in circular form. It is well known that the weakest part of kilns is at the center, and that in most kilns now in use the tendency of the heat is toward the outside, while a great part of the heat passes directly to the chimneys. In my improved kiln the draft is conducted through the brick at all points of the kiln, and to the center before reaching the main flues leading to the chimneys in the outside walls, which results in the utilization and equal distribution of all the heat.

Reference is now had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts throughout the several views.

Figure 1 is a quarter section plan view, in which the quarter section bounded by lines 1 and 3 is taken about two feet above the bottom of the outside walls of the kiln, and shows the walls of the concentric flues in section. That bounded by lines 2 and 3 is taken at the top of the concentric flues, and about two feet and ten inches above the bottom of the outside walls. That bounded by lines 2 and 4 shows the top of the floor and is taken about three feet and two inches above the bottom of the outside walls. That bounded by lines 4 and 1 is taken below the bottom of the concentric flues and about sixteen inches above the bottom of the outside walls, and shows the walls of one of the quarter flues in section. Fig. 2 is a view of kiln in exterior elevation, showing furnaces, door, iron bands, and at one point the furnace left off to indicate the manner of building outside wall ready to receive the furnace. Fig. 3 is a cross-sectional view of kiln on line 1—2, Fig. 1, the bag walls of two of the furnaces being omitted. Fig. 4 is a cross-sectional view of kiln on lines 3—5 6—7, Fig. 1. Fig. 5 is a perspective view of kiln, partly in section, showing construction of flues and floor and section through furnace. Fig. 6 is an enlarged view of floor brick showing section removed to permit the draft to enter the circular flues beneath.

Referring now to the illustrations, A represents the outside walls of the kiln inclosing the chamber; A′, the roof, and B B the chimneys in the outside walls, one chimney being at the outer extremity of each of the two main flues.

C C C, &c., are the furnaces, there being six shown in the drawings, located at the outside of the kiln and midway between the outer extremities of flues running across the kiln, as will presently be described.

D D D, &c., are semicircular walls, called bag walls, built in the chamber in front of the openings of the furnaces. These walls prevent the draft from entering the nearest concentric flues by forcing it upward before it can enter the bricks. They also exclude cold drafts which might enter the chamber when the furnace doors are opened.

E E are the two main flues which lead to the chimneys through the center of the kiln at the bottom, each of said flues extending about two thirds of the distance across the kiln and lapping past the other at the center. This creates a double flue at the center and greatly increases the draft at that point.

F F F F are flues leading from the outside wall through the concentric flues to the main flues at the center, and, with the main flues, dividing the kiln into six nearly equal parts. The flues F F, &c., are called quarter flues.

G G G G, &c., constitute a system of concentric, or ring, flues located directly beneath the floor of the kiln and leading into the quar-

ter flues. The quarter flues cut through the ring flues, but being deeper than the latter extend somewhat below them.

The ring flues open into the quarter flues at all their intersections. At the center of the chamber the cross flues G′ G′ G′, &c., take the place of the ring flues, and extend directly across the kiln beneath the floor and over the main flues at right angles to the latter, as shown in Figs. 1 and 5, but unlike most of the ring flues open into the main flues directly. The concentric flues which cross the main flues where the latter lap at the center open into the main flues from both sides, but those nearer the circumference of the kiln where the main flues do not lap, enter the main flues from alternate sides. A narrow wall, *e′*, is built in the openings of these flues and slopes from near the floor at the outside wall to the bottom of the ring flues near the center. Thus a small portion of the draft enters the main flues without reaching the center and tends to equalize the heat throughout the kiln, as the quarter flues are much farther apart at these points, while the sloping walls gradually shut off the draft toward the circumference and cause it to increase as it nears the center.

H H H H, &c., is the floor of the kiln, which is composed of bricks laid upon the walls of the ring flues, the bricks having cut-out portions through which the draft from the furnaces enters the flues beneath.

a a a are iron covers for openings in the roof of the kiln.

b b are sliding dampers in the chimneys. By closing one of the dampers all the heat from that side of the kiln can be made to pass over the center, as all the draft is led to the flues on the side of the open chimney. This is sometimes done to draw all the heat over the center, and places the kiln more fully under control of the burner.

c c c c are peep holes entering the walls at different heights and enable the burner to gage the temperature of the heated brick.

d d are the grate bars of the furnaces.

e is the wall between the two main flues and is called the "dead wall." This wall extends upward to the floor of the kiln and separates the cross flues G′ G′, as shown in Fig. 3.

f f f f are the outer openings of the quarter flues. These flues extend without the wall of the kiln where they turn upward and open into the air. They are covered during the burning of the brick, when the covers may be removed to permit the kiln to more rapidly cool.

g g g g are the openings from the furnaces into the kiln.

h h h h are iron doors opening into the furnaces.

i i i are iron bands encircling the outer wall, and *j*, Fig. 2, shows a screw in one of the bands for tightening the same.

k is an open space in the wall through which the kiln may be entered to place and remove the brick.

It will be noticed that the greater part of the draft at the circumference of the kiln enters the ring flues and is conducted around the kiln to the quarter flues, thence to the main flues at the center, through which it passes to the chimneys. The center being naturally the weakest part of the kiln, the heat after being distributed through the brick, is concentrated at that point by means of the quarter flues, the main flues lapping at the center and creating a double flue, and by the cross flues entering directly the main flues.

I am aware that there are kilns now in use having concentric flues leading directly into main flues and main flues leading from the center of the kiln to chimneys on the outside, but I know of none possessing the advantages above set forth.

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

1. The combination with a chamber, furnaces at the outer walls of the chamber, open floor and chimneys, of concentric flues beneath the chamber floor, and main flues extending partly across the kiln, lapping past each other and forming a double flue at the center and leading to chimneys in the outer wall, substantially as described.

2. The combination with a chamber, furnaces at the outer wall of the chamber, bag walls, open floor and chimneys, of concentric flues beneath the chamber floor, flues leading from said concentric flues and extending radially from the circumference of the kiln to main flues at the center, and main flues extending partly across the kiln, lapping each other at the center and leading to chimneys in the outer wall, substantially as described.

3. The combination with the chamber, furnaces, bag walls, open floor and chimneys, of concentric flues beneath the chamber floor, quarter flues leading from the concentric flues and extending radially from the circumference of the kiln to main flues at the center, main flues extending partly across the kiln, lapping each other at the center and leading to chimneys in outer wall, and cross flues at the center of the kiln beneath the chamber floor and leading directly into said main flues, substantially as described.

4. The combination with a chamber, furnaces, bag walls open floor and chimneys, the furnaces located at the outer walls of the chamber between flues extending across the kiln, of concentric flues extending around the kiln beneath the chamber floor, quarter flues leading from the concentric flues and extending from the circumference of the kiln to main flues at the center, main flues extending partly across the kiln, lapping each other and forming a double flue at the center and leading to chimneys in the outer wall, a

wall separating said main flues and extending upward to the floor of the chamber, cross flues at the center of the kiln beneath the chamber floor and leading directly into the main flues on each side of said wall, the concentric flues which cross the main double flues leading directly into said flues on each side of said wall, and those at the outside of the main double flues having openings into said main double flues on alternate sides, and a wall in said openings of said concentric flues sloping from the outside wall of the kiln downward to the bottom of the concentric flues near the center, substantially as described.

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

CHARLES J. HOLMAN.

Witnesses:
H. C. GARDINER,
F. W. LOHR.