(No Model.) 2 Sheets—Sheet 1.

A. GUDEMAN.

BRICK OR TILE KILN.

No. 533,058. Patented Jan. 29, 1895.

Fig. 1

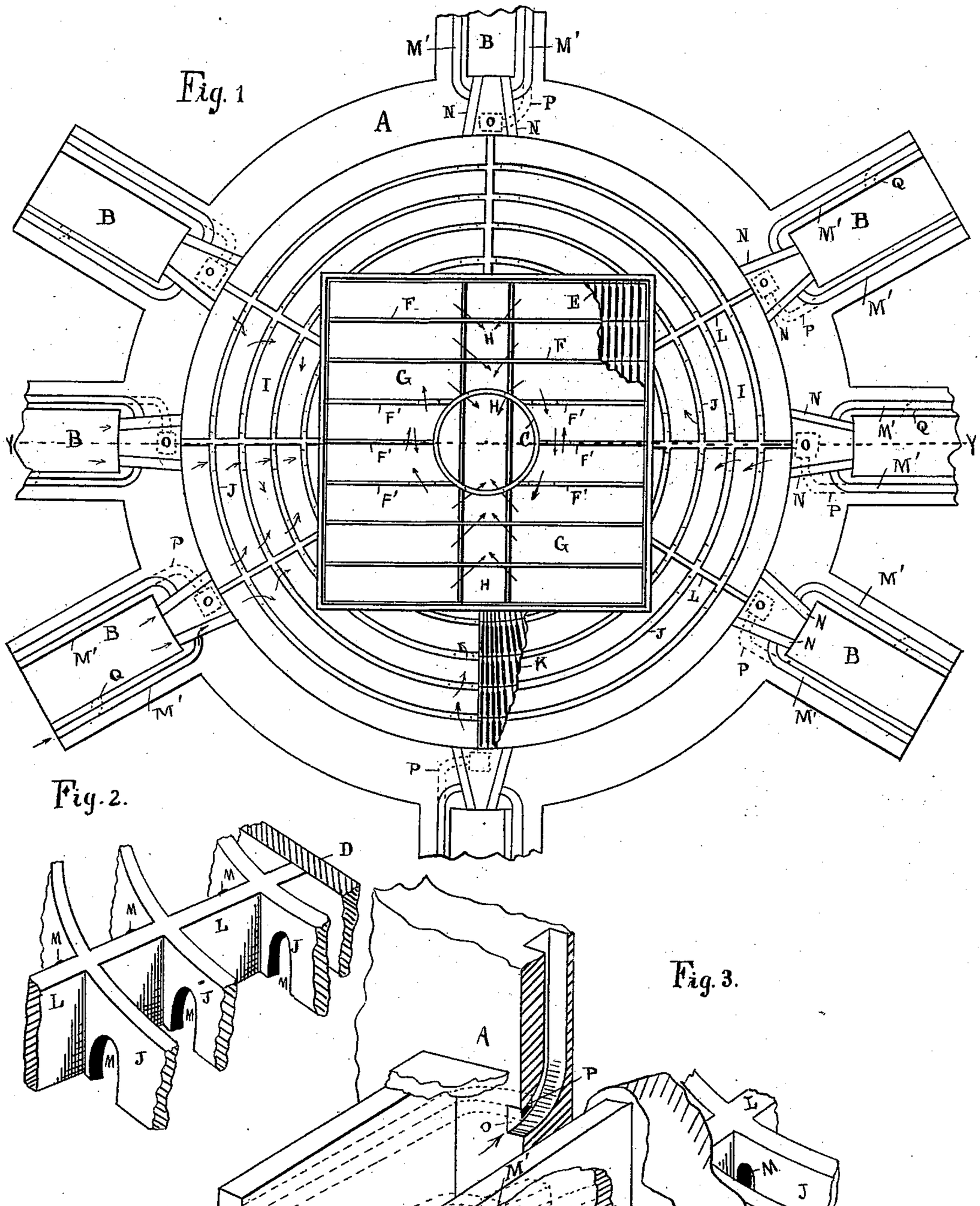

Fig. 2.

Fig. 3.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

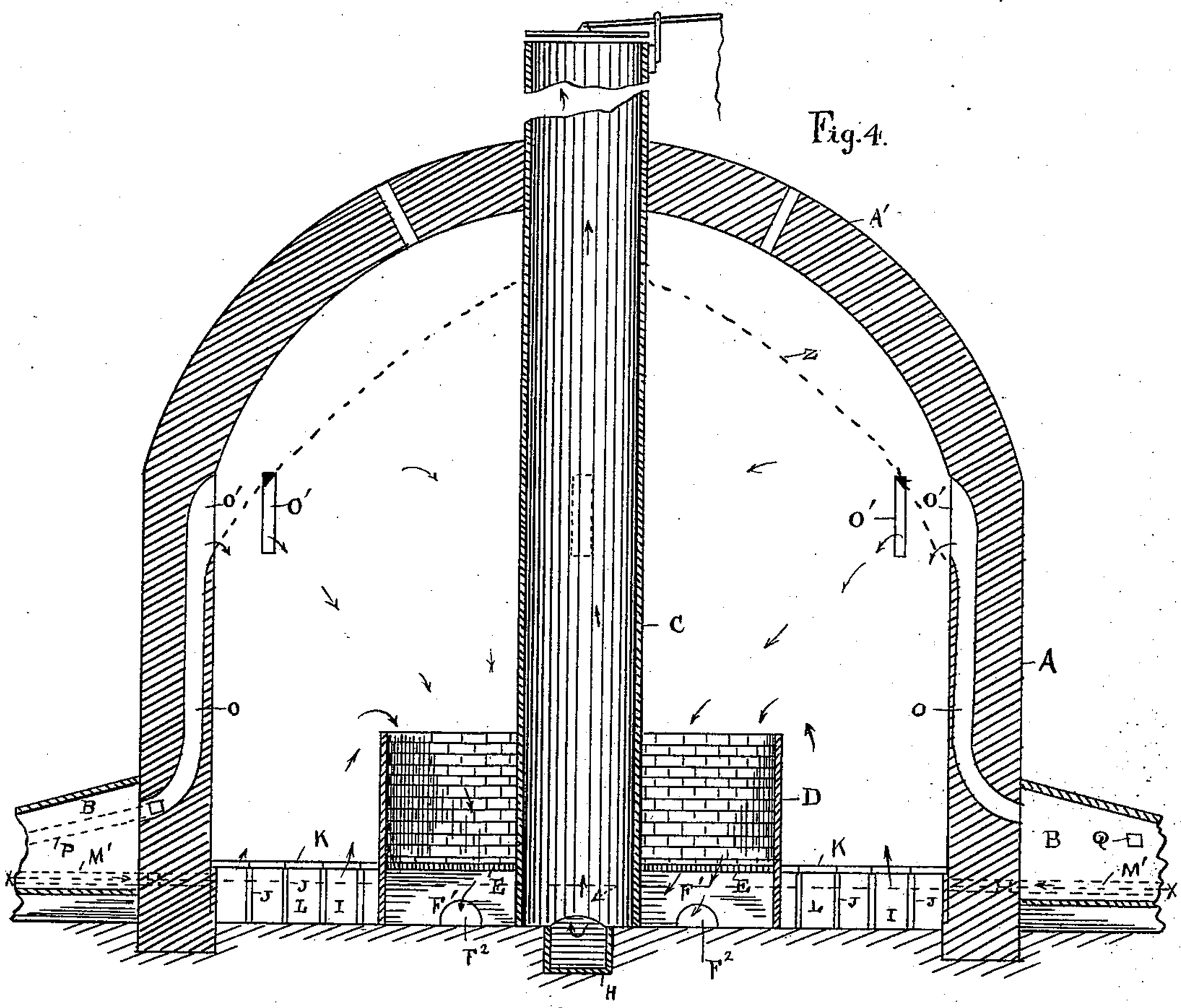
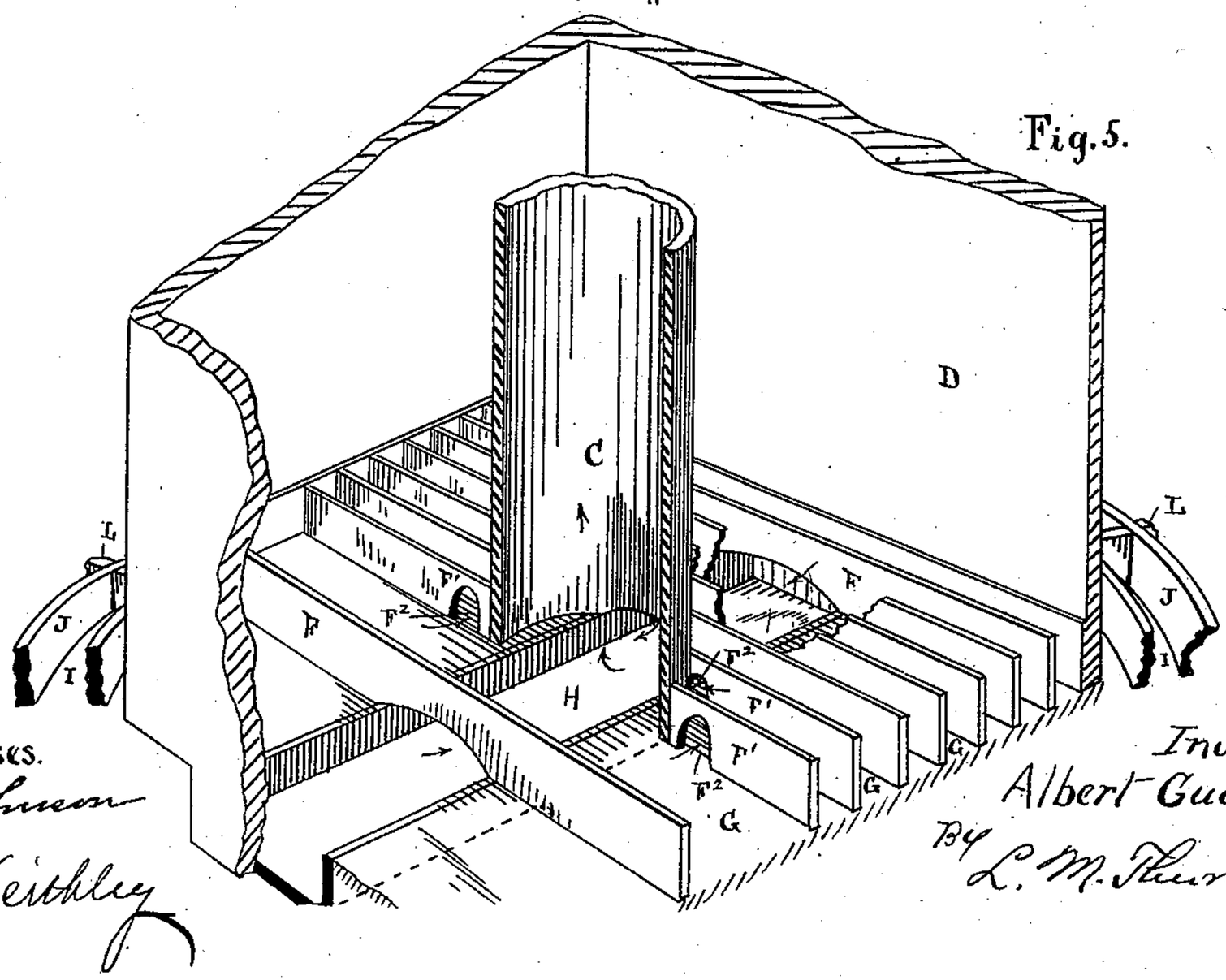


Fig. 5.



Witnesses.
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A. Keithley

Inventor
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UNITED STATES PATENT OFFICE.

ALBERT GUDEMAN, OF EUREKA, ILLINOIS.

BRICK OR TILE KILN.

SPECIFICATION forming part of Letters Patent No. 533,058, dated January 29, 1895.

Application filed May 11, 1894. Serial No. 510,839. (No model.)

To all whom it may concern:

Be it known that I, ALBERT GUDEMAN, a citizen of the United States, residing at Eureka, in the county of Woodford and State of Illinois, have invented certain new and useful Improvements in Brick or Tile Kilns; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to kilns for burning brick, tile and all other kinds of earthenware.

The object of my invention is to provide a kiln in which the heat is carried to the work to be burned, both from the top of the kiln and the bottom, so that equal distribution of heat is attained and the consequent burning of the ware at the top and bottom alike. It is with the intention of overcoming these objections and providing a kiln which shall have an up, and down draft simultaneously that this kiln was devised.

In the drawings presented herewith, Figure 1 represents a horizontal section of the kiln taken on line *x x* Fig. 4, as constructed by me. Fig. 2 is a perspective view of a portion of a series of curved flues used in the kiln. Fig. 3 is a perspective view of a fire box showing its position adjacent to the kiln and also showing a series of flues made therein and their connection with the flues of the kiln. Fig. 4 is a sectional elevation of the kiln on the line *y y* Fig. 1; Fig. 5, a perspective view of a series of flues, smoke stack and a central draft chamber all in part section.

In the several figures, A represents the wall of the kiln which in this case is made circular as shown but which may be made square or rectangular or of any shape desirable to best suit the work to be done. The top of the kiln is arched over at A′ as in ordinary devices of this class. The walls are set into the ground to get a firm foundation, and around the walls are arranged at convenient intervals a number of fire boxes B which communicate with the kiln by suitable flues to be hereinafter described.

At the center of the kiln is a smoke stack C which is built from the ground up through the dome A′ to the outside air. A central draft chamber D is also built from the ground up into the kiln for a distance about equal to a third of the height of the kiln. This chamber D surrounds the stack C so that drafts rising from the lower portion of the kiln must pass up over the walls of the said chamber and down and thence into the stack. Within the draft chamber D a flooring E of tiling is used which is raised above the surface of the ground as shown by means of vertical walls of brick or other material F and F′. These walls with the tile flooring laid upon them form the flues G. The middle walls F′ are broken by the smoke stack C against which they abut as shown in Fig. 1. A central draft flue H is built below the ground level as shown in Fig. 4 and which occupies a position at right angles with the flues G and passes under all of said flues and under the stack C. The said flue is walled up at either end so that only the said flues G and the stack C can communicate therewith.

The stack is arched over just above the flue H at diametrically opposite sides so that a free passage is attained from the said flue to the stack. The walls F are also arched over for the same purposes. The central walls F′ reaching only to the stack are arched as shown at F^2 to allow an air passage, as they do not communicate directly with the flue H.

A portion of the flue tiling is shown at E in Fig. 1 in which open spaces are formed as in tiling for this purpose through which the heat is allowed to pass.

Now between the outer walls A of the kiln and the draft chamber D are a series of flues I of substantially the same curve as the walls A. The flues are formed by the walls J which may be of the same height as those described for the chamber D, and upon the walls are laid tiling as shown at K which are also formed to allow heat to pass therethrough. It will be seen that the walls J are not continuous but are broken by the corners of the chamber D. The fireboxes B are arranged around the wall of the kiln and each are built on a line drawn from the center of the kiln to the circumference.

From a point on a line with the center of each fire box B and inside the wall A of the kiln, a wall L is built toward the center of the kiln between the walls J and this wall abuts against the walls of the chamber D. The walls J on either side of the radial walls L are

arched over as shown at M. By the use of the arches M each flue I may communicate with its neighbor, it being understood that each section of flues within the radial walls L is isolated from the section adjoining it.

Having described the interior construction and arrangement of the kiln I will now proceed to describe the flue arrangement of the walls of the fire box and the flues of the kiln wall A and the relation which the flues bear to one another.

In the wall A are two horizontal flues N N which pass entirely through the wall and form a communicating passage from the fire box to the flues I under the tile flooring K. The flues are located just above the grate of the fire box and one being on either side of the radial wall L as shown in Figs. 1 and 3. Now built in each side wall of the fire box is a flue M′ which communicates with the said flues N substantially as shown in plan in Fig. 1 and by dotted lines in Fig. 3.

Within the wall A of the kiln a vertical flue O is built which opens at its lower end into the fire box, while its upper end terminates in the enlarged mouth O′ opening into the upper portion of the kiln. In one of the walls of the fire box just above the flue M′ is a flue P which enters the vertical flue O at one side as shown in Fig. 1 by dotted lines and also in Fig. 3 by dotted lines.

In the wall of the fire box above the flue M′ and opposite the flue P is a short flue Q which opens into the fire box as shown. Each of the openings of these flues is proaided with a plug *a* for closing or opening them.

The operation of the kiln may be understood from the following: The setting or material to be burned is placed within the kiln as usual and reaching up as shown by dotted line Z in Fig. 4. The fire then being started the products of combustion are carried through the flues N N in the wall A into the entire section of flues I through the arches M, thence upward through the perforated tile flooring K and the material being burned, and down through the chamber D and the material set therein and on down through the tile flooring F into the flues G, thence to the stack C through the flue H. Simultaneous with this action the products of combustion also enter the vertical flue O, entering the kiln near the top, passing downward through the setting into the chamber D and out of the stack C by the flues G and H. By this means the burning of the top and bottom of the setting is done at the same time. Should the draft through the vertical flue O be stronger than necessary, in that the burning of the top of the setting is going on too fast, it is only necessary to remove the plug *a* of the flue P, thus admitting a draft from the outside air to the flue O, which causes the heat from the fire box to enter more strongly to the flues N for the under burning. Should the burning of the top setting be too slow the plugs *a* of the flue M′ are withdrawn and the flue P closed, which has the effect of dampening the heat flow to the under side, giving the top more heat. The flue Q may also be used in connection with the flue P in regulating the draft to the flue O and supply draft to the flues N N.

This kiln it will be seen far surpasses any which have been brought out.

I do not limit myself to the exact construction herein shown as the parts may be varied in different ways and still acquire the best of results. As an instance of this change, it may be desired to build a number of kilns to connect with one common smoke stack so that the center smoke flue C may be removed and the under flues H extended beyond the kiln and connect with the said stack.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a brick kiln the combination of the outer circular wall A, the fire boxes B B ranged at regular or irregular intervals around the outer circumference of said walls A, a series of radial walls L extending from a point opposite the center of said fire boxes within and abutting against said wall A, and extending toward the center of the kiln, a central draft chamber D located within and at the center of the kiln, said chamber being built from the ground up into the kiln substantially as described, the said radial walls L abutting against the walls of the said chamber D, a series of curved walls J conforming with the curve of the outer wall A and located between the radial walls L, and provided with the openings M, a perforated floor resting upon the walls L and J and abutting against the walls of the chamber D, a series of parallel walls F and F′ built upon the ground within the chamber D the ends of said walls abutting against the walls of said chamber and provided with openings F^2, a perforated flooring resting upon said walls F and F′ and forming the flues G, a draft flue H built in the ground below the walls F and F′ at right angles to said walls, said flue H opening into the flues G between the walls F and F′ and a smoke flue C located over the flue H and flues G substantially as and for the purposes described.

2. In a brick kiln, the combination of the outer walls A, having a series of vertical flues O formed therein at intervals, a series of flues N N formed in the said wall below the line of the entrance of said flues O, the fire boxes B ranged around the outer circumference of the said walls A, the flues P in the walls of said fire boxes and opening into the flues O, the flues M′ M′ entering the flues N N substantially as shown, the flues Q opening through the walls of the fire boxes into the interior of said fire boxes, a central draft chamber built from the ground up into the kiln substantially as described, a series of radial walls L abutting against the inner circumference of the wall A between the flues N N and extending toward the center of the kiln and abutting against the walls of the said chamber D,

a series of curved walls J conforming with the curve of the outer wall A and located between the radial walls L and provided with the openings M, a perforated floor resting upon the walls L and J and abutting against the wall A and the walls J of the chamber D, a series of parallel walls F and F′ built upon the ground within the chamber D, the ends of said walls abutting against the walls of the said chamber D and provided with the openings F^2, a perforated flooring resting upon said walls F and F′ and forming flues G, a draft flue H built in the ground below the walls F and F′ at right angles to said walls, said flue H opening into the flue G below the walls F and F′ and a smoke flue C located over the flue H and flues G substantially as and for the purposes set forth.

3. In a kiln for burning brick and tile the combination of the wall A having a series of vertical flues O formed therein, a series of horizontal flues N N formed in the said wall below the line of the entrance of the said flues O, the fire boxes B having the flues P entering the flues O, the flues M′ M′ entering the flues N N and the flues Q opening into the interior of the fire box, a series of flues I located under the floor K, a central draft chamber D having a series of flues G under the floor E, a central horizontal flue H located beneath the said flues G and a smoke flue C located over said flue H substantially as set forth and described whereby an up and down draft is secured simultaneously.

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

ALBERT GUDEMAN.

Witnesses:
C. JOHNSON,
A. KEITHLEY.