

(No Model.)

W. N. GRAVES.

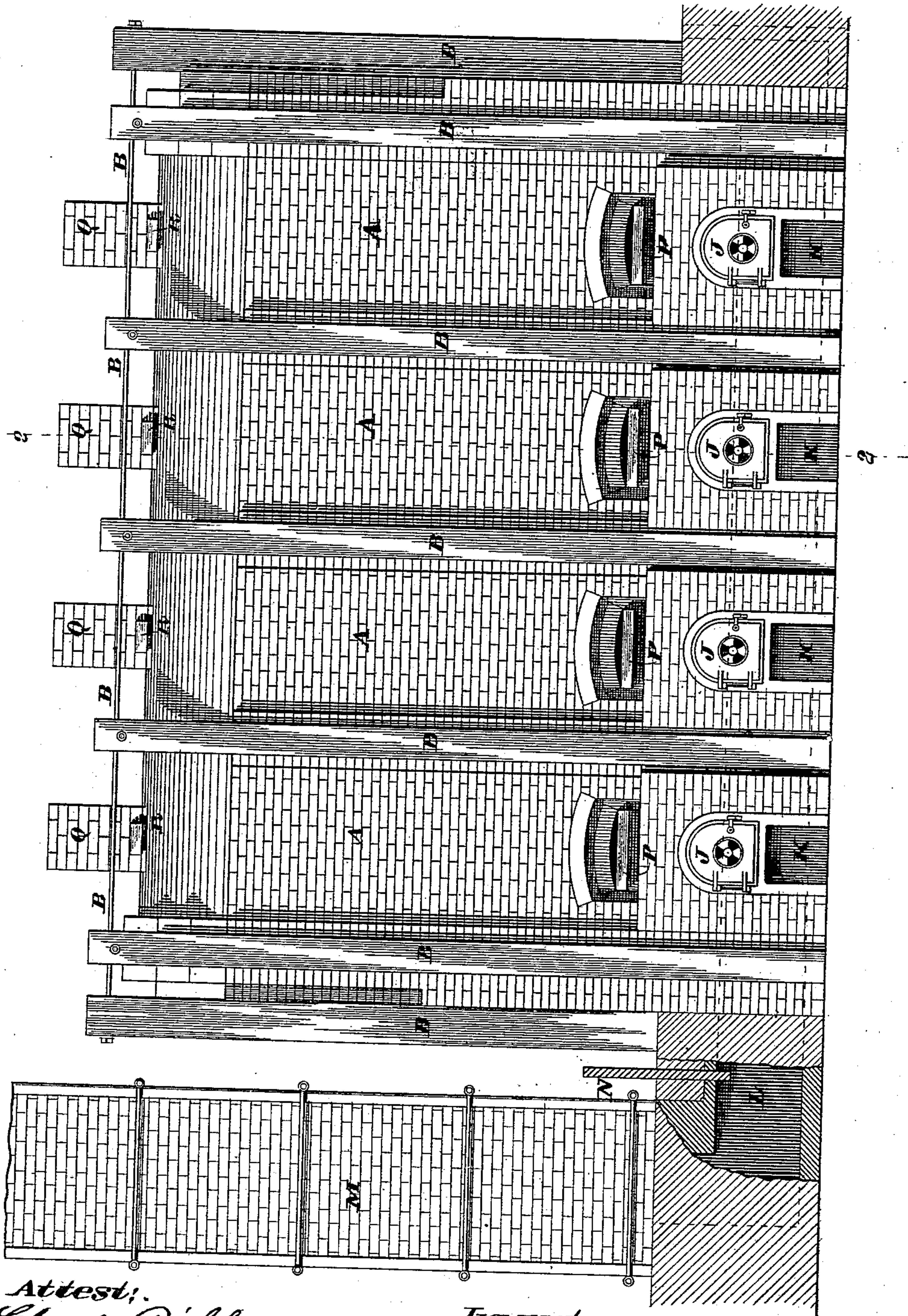
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BRICK KILN.

No. 277,421.

Patented May 8, 1883.

Fig. 1.



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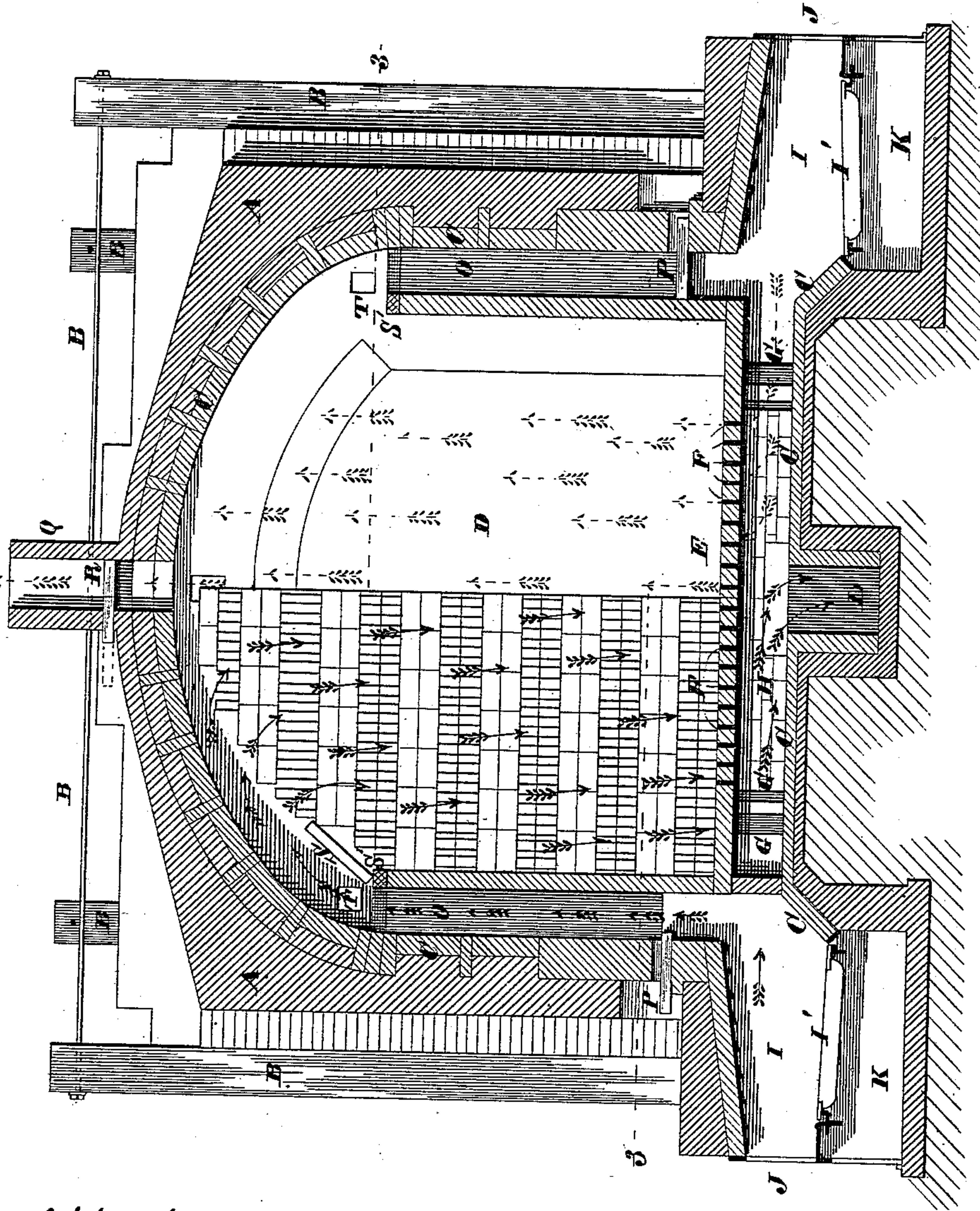
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BRICK KILN.

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Fig. 8.



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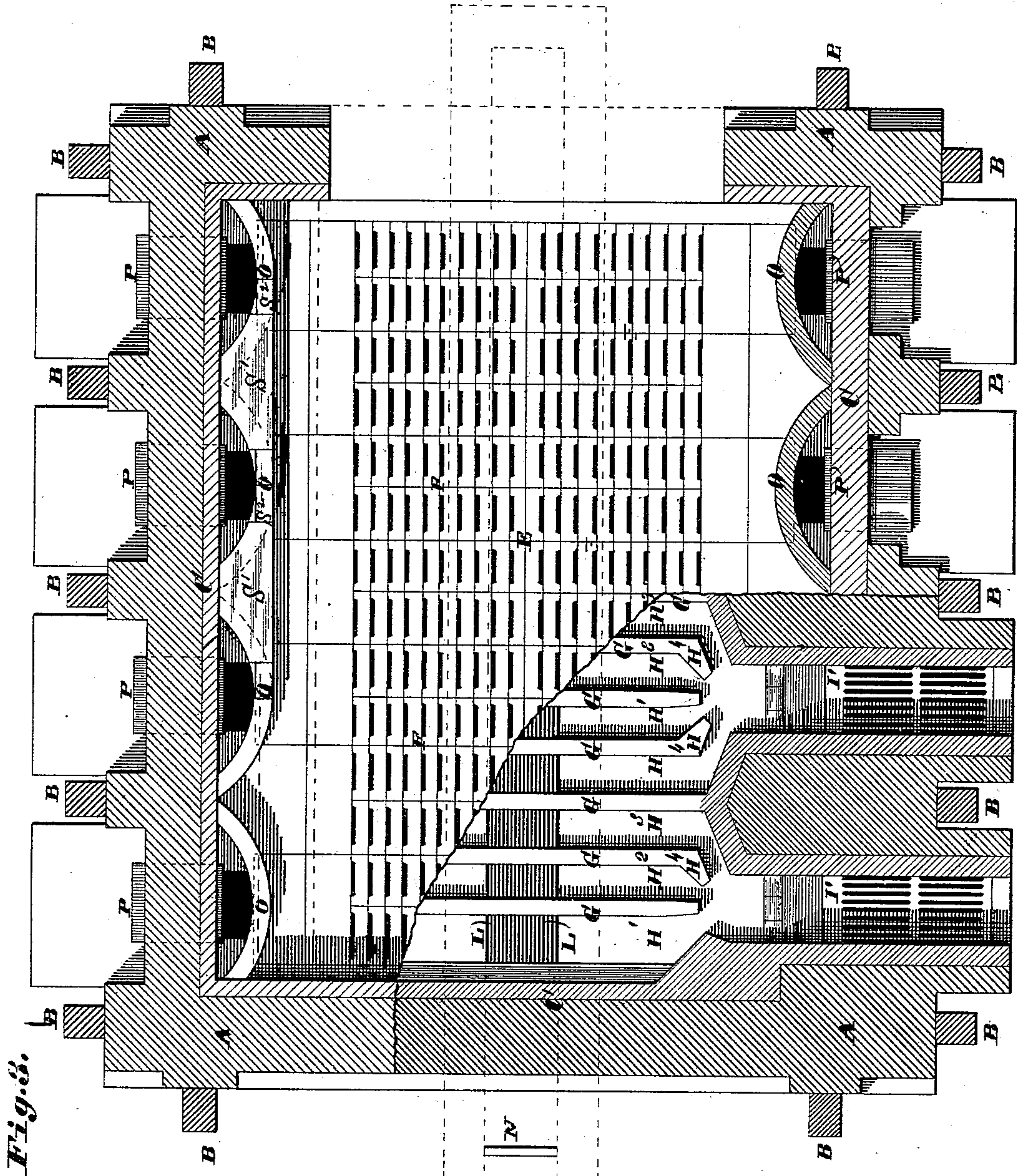
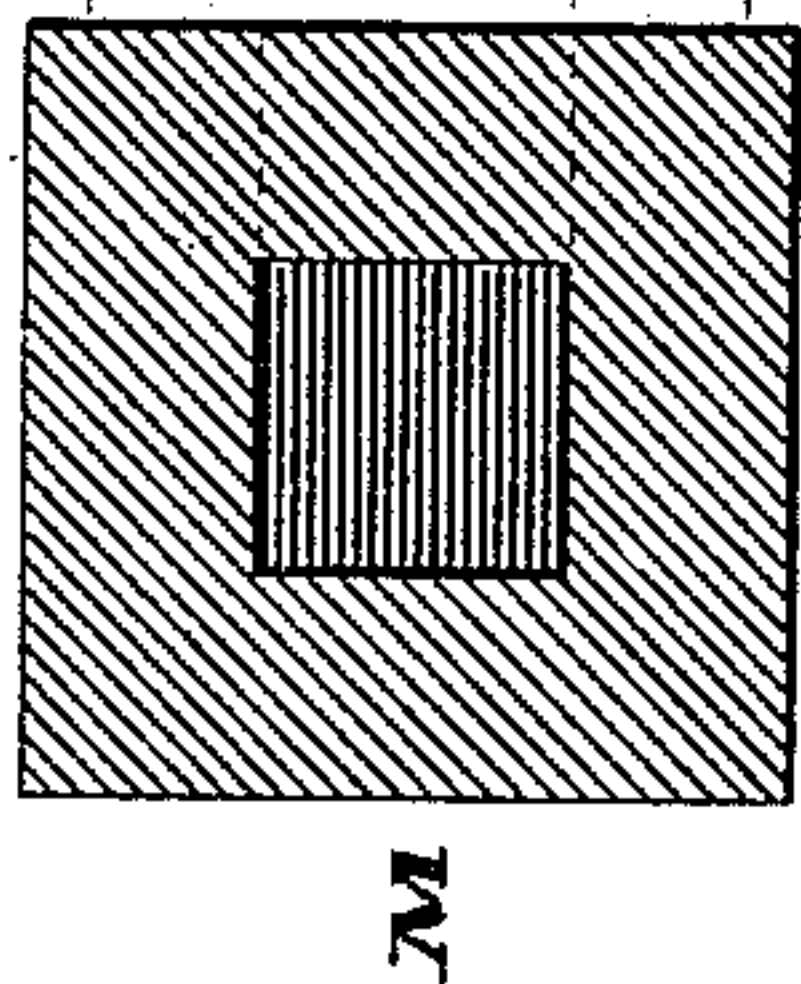


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIS N. GRAVES, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
THE HYDRAULIC PRESS BRICK COMPANY, OF SAME PLACE.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 277,421, dated May 8, 1883.

Application filed November 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIS N. GRAVES, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Brick-Kilns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

10 Figure 1 is a front elevation with a small portion of the escape-flue broken away. Fig. 2 is a vertical section taken on line 2 2, Fig. 1, showing one side of the kiln filled with bricks and the other side empty. Fig. 3 is a horizontal section taken on line 3 3, Fig. 2, with
15 part of the floor of the kiln broken away to show the distributing-flues beneath.

My improvement relates to those kilns which have an up and down draft through means of
20 suitable flues connecting with the same fire chamber or chambers, and flues beneath a perforated floor communicating with the main chimney and outlets on top of the kiln, the flues from the fire chamber or chambers and
25 outlets being provided with suitable dampers.

My invention consists, first, in the arrangement of the flues beneath the floor of the kiln; and, secondly, in a means for preventing the products of combustion taking the shortest
30 course from the tops of the vertical flues to the flues beneath the floor, as more fully described hereinafter.

Referring to the drawings, A represents the outer walls of the kiln, strengthened by ties B, as usual, and having the customary lining, C,
35 of fire-clay.

D represents the kiln or brick-chamber, with a floor, E, with passages F, forming a communication with flues beneath the floor. The
40 floor preferably consists of tile made from fire-clay, supported on walls or ribs G, which form the flues beneath the floor. (See Fig. 3.) Every fourth wall G joins with the sides of the kiln-chamber, forming one main flue for each fire-chamber, or each set of fire-chambers where
45 two series are used, as shown, and these main flues are subdivided by the intermediate walls G, which do not quite extend to the sides of the chamber, as shown in Fig. 3, thus forming
50 small distributing-flues H H' H² H³. Of these three intermediate walls, the two outer

ones have inturned ends H⁴, so that as much heat is deflected into the two outer flues, H H³, as passes directly into the two central flues, H' H².

I have shown a series of fire-chambers, I, at
55 each side of the kiln as the preferred form; but one series only may be used.

I' represents the grate-bars of the fire-chambers, and J the doors thereto.

K represents the ash-pits.

The flues H H' H² H³ communicate with a transverse flue, L, which connects with the chimney or uptake M. The communication
60 between the chimney and flue L is regulated or entirely closed, as desired, by a damper, N.

Each fire-chamber is provided with a flue, O, leading to or near the top of the kiln-chamber. These flues can be closed by dampers P.

Q are chimneys or outlets on top of the kiln, preferably one for each pair of fire-chambers
70 where two series are used, and these outlets can be regulated or closed by means of dampers R.

The operation of the kiln is as follows: Supposing it is first desired to have a downdraft, or, in other words, have the heat and products
75 of combustion pass from the top of the kiln-chamber down through the mass of bricks, the flues H H' H² H³ are closed by pieces of bricks and refuse matter thrown in through the fire-chambers, the dampers P of the flues O opened,
80 the dampers R of the chimneys Q are closed, and the damper N of the chimney M is opened. The fires then being started, the heat and products of combustion will pass up through the
85 flues O, down through the mass of bricks, through the openings F into the flues H H' H² H³, and from thence through the transverse flue L to the uptake or chimney M, as shown by full arrows, Fig. 2. Then, when an updraft is
90 desired, the flues H H' H² H³ are opened by the obstruction being removed, as by means of an instrument introduced through the fire-chambers, the dampers R of the chimneys Q opened, the dampers P of the flues O closed, and the
95 damper N of the chimney M closed. The heat and products of combustion then pass from the fire-chambers to the distributing-flues H H' H² H³, through the passages or openings F, and up through the mass of bricks, escaping through
100 the chimneys Q. The draft can thus be changed with very little trouble and in a short time as

many times as desired during the burning of a single kiln of bricks. The updraft is shown by dotted arrows, Fig. 2, on one side of the figure, the downdraft being shown on the other side by full arrows, as stated.

When a downdraft is used it is important that some means be employed to prevent the heat and products of combustion from taking the shortest course from the tops of the flues O to the flues H H' H² H³, to avoid overburning the bricks next to the flues O, and to cause an equal burning of the bricks throughout the kiln. Furthermore, as the bricks are being burned they shrink, forming a flue between them and the sides of the kiln-chamber, down which the heat and products of combustion would be drawn. To avoid these difficulties I place tile S, of suitable length, with their lower ends resting upon the upper edge of the outer walls of the flues O and their upper ends resting upon the bricks, as shown in Fig. 2. Thus the heat and products of combustion are compelled to pass up over the tile before they can descend. As the tile would not rest well if placed directly upon the tops of the semicircular flues O, I first place blocks, S', of fire-clay

on top of the flues, covering the V-shaped spaces between the flues, as shown in Fig. 3. The inner corners of the blocks are cut off, concave shape, so as not to obstruct the openings of the flues. A common brick, S², can be placed between the ends of the blocks S' to give a uniform height to the tile S. One of the blocks S' is shown removed in Fig. 3.

T represents peep-holes. (See Fig. 2.)

I claim as my invention—

1. In a brick-kiln, the distributing flues beneath the perforated floor of the kiln-chamber, formed by means of walls, part of which have inturned ends, substantially as shown and described, for the purpose set forth.

2. In a brick-kiln constructed to have a downdraft, the tile arranged to prevent the heat and products of combustion taking the shortest course from the tops of the vertical flues to the flues beneath the floor of the kiln-chamber, for the purpose set forth.

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Witnesses:

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GEO. H. KNIGHT.