

(No Model.)

3 Sheets—Sheet 1.

P. GONDER.  
BRICK KILN.

No. 523,275.

Patented July 17, 1894.

Fig. 1.

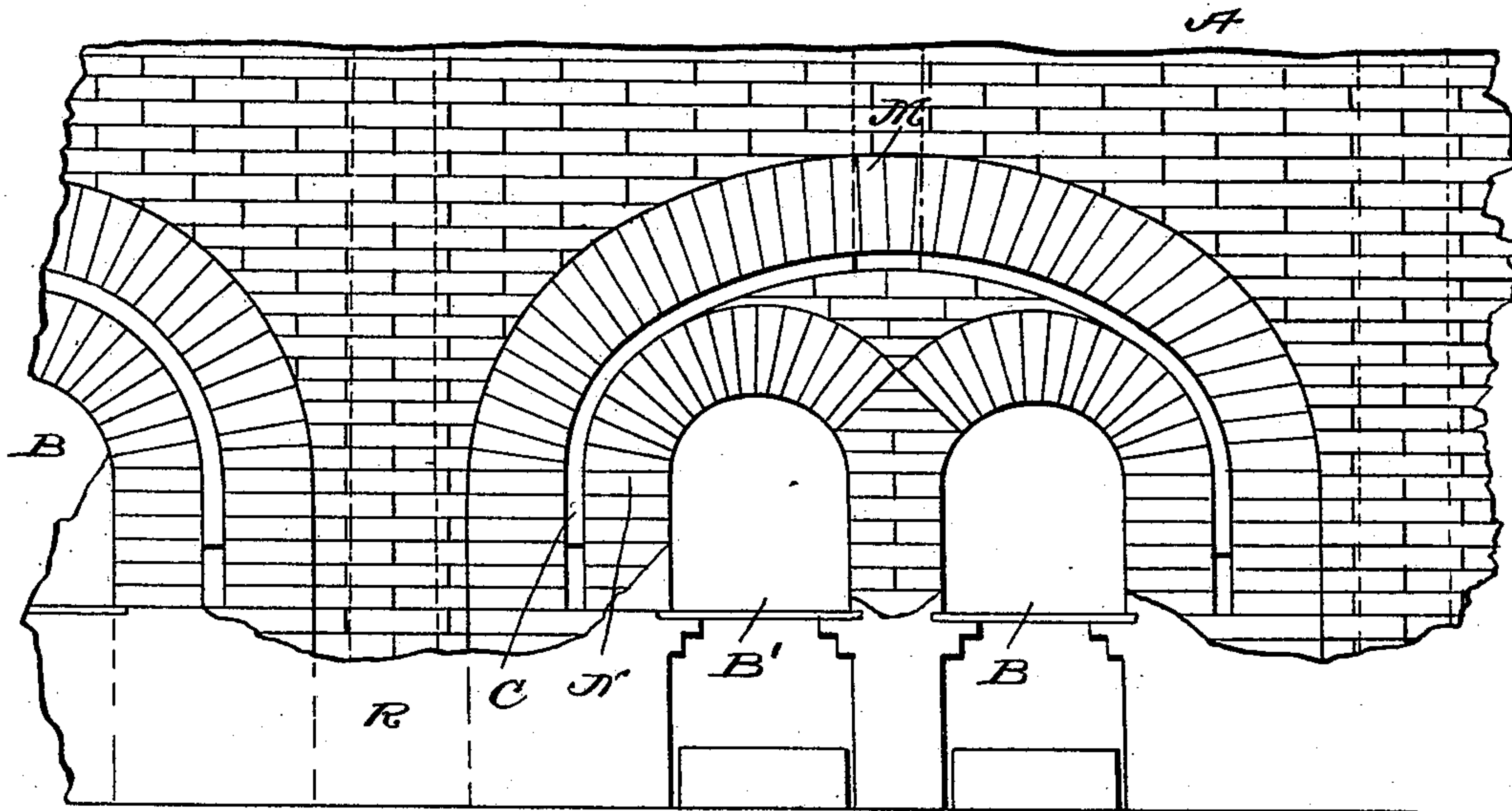


Fig. 2.

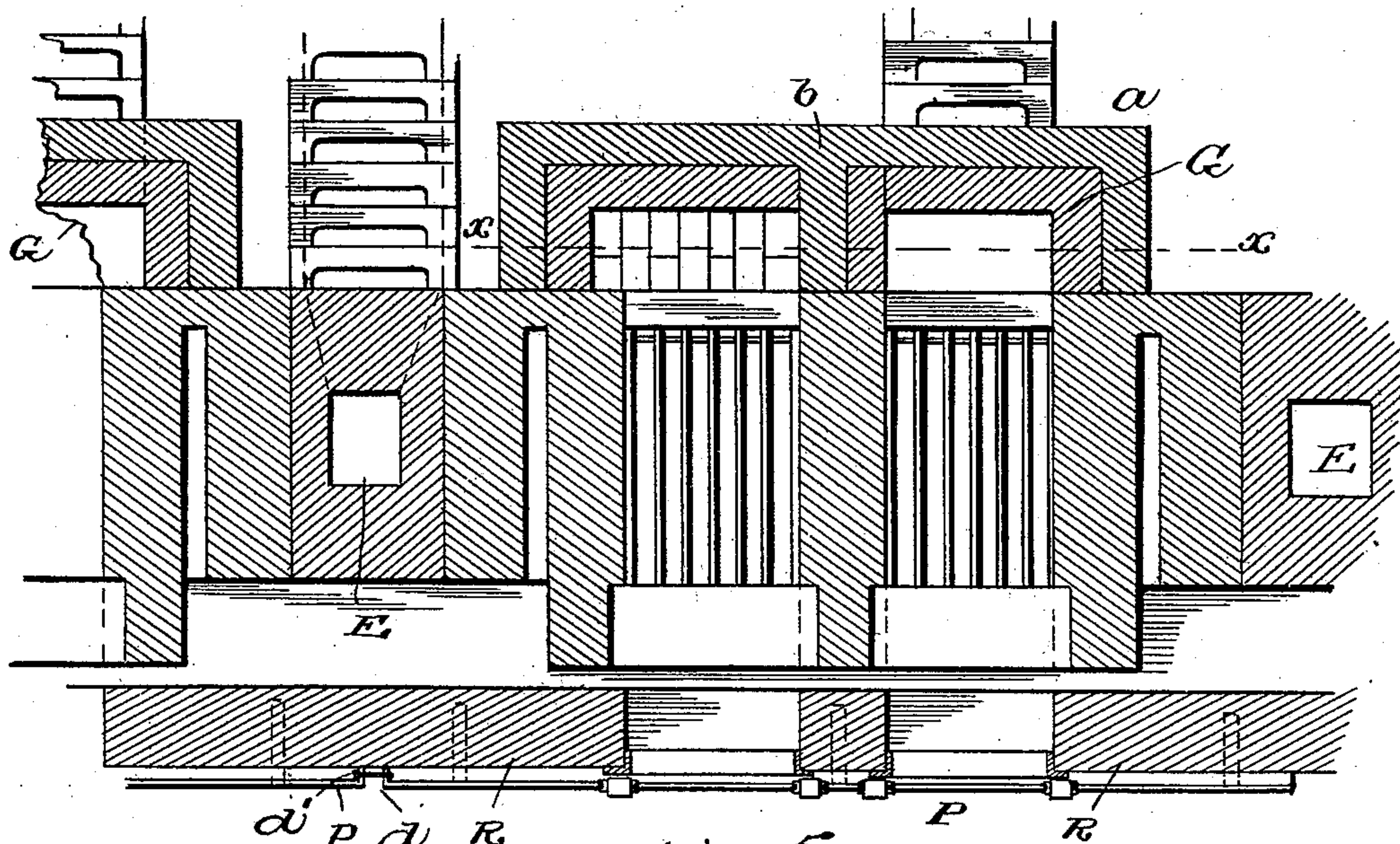


Fig. 5.



Inventor

Philip Gonder

Witnesses

Thor W. Riley

by Fred W. Board  
Attorney



(No Model.)

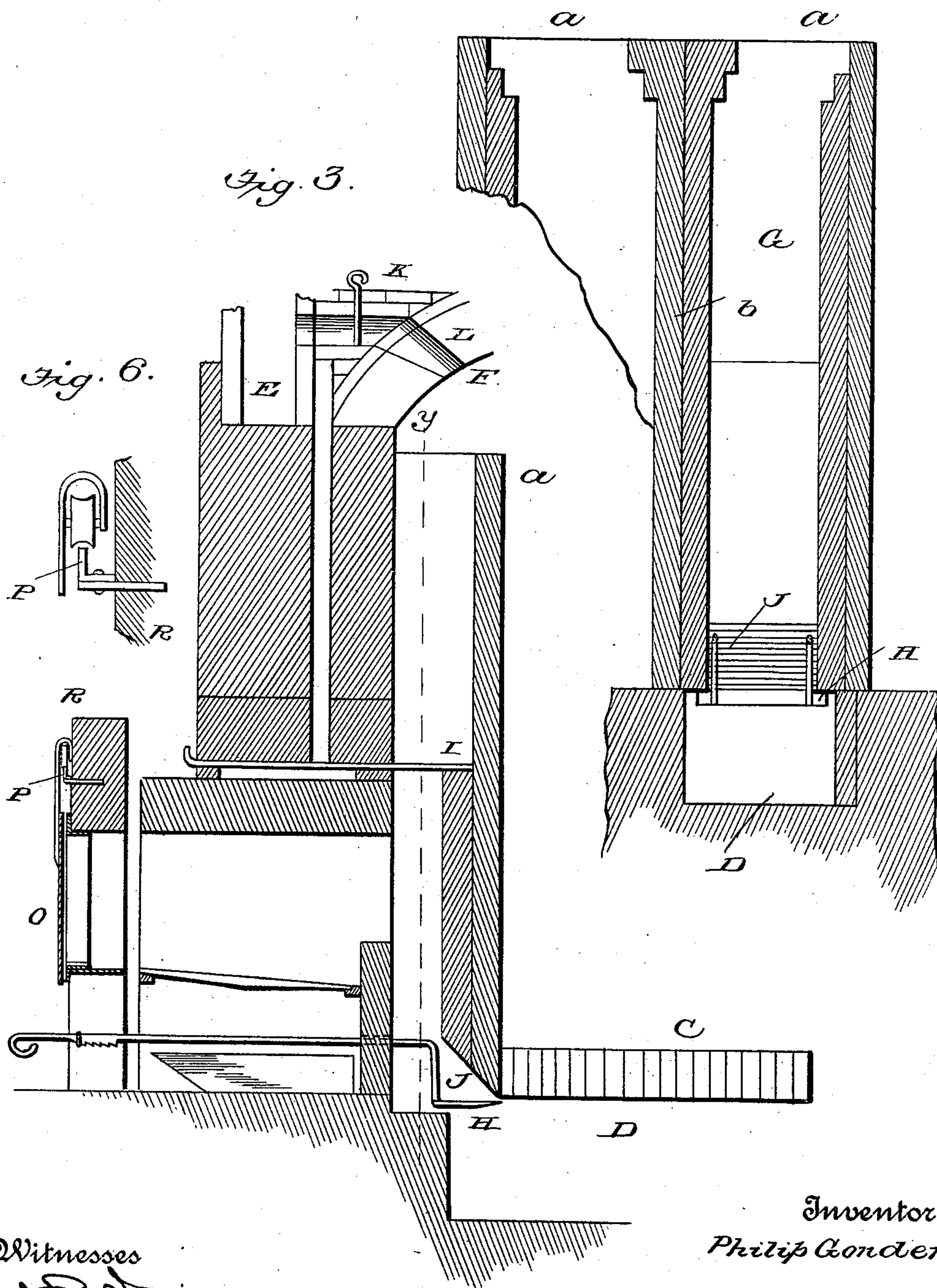
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Fig. 4.



## Witnesses

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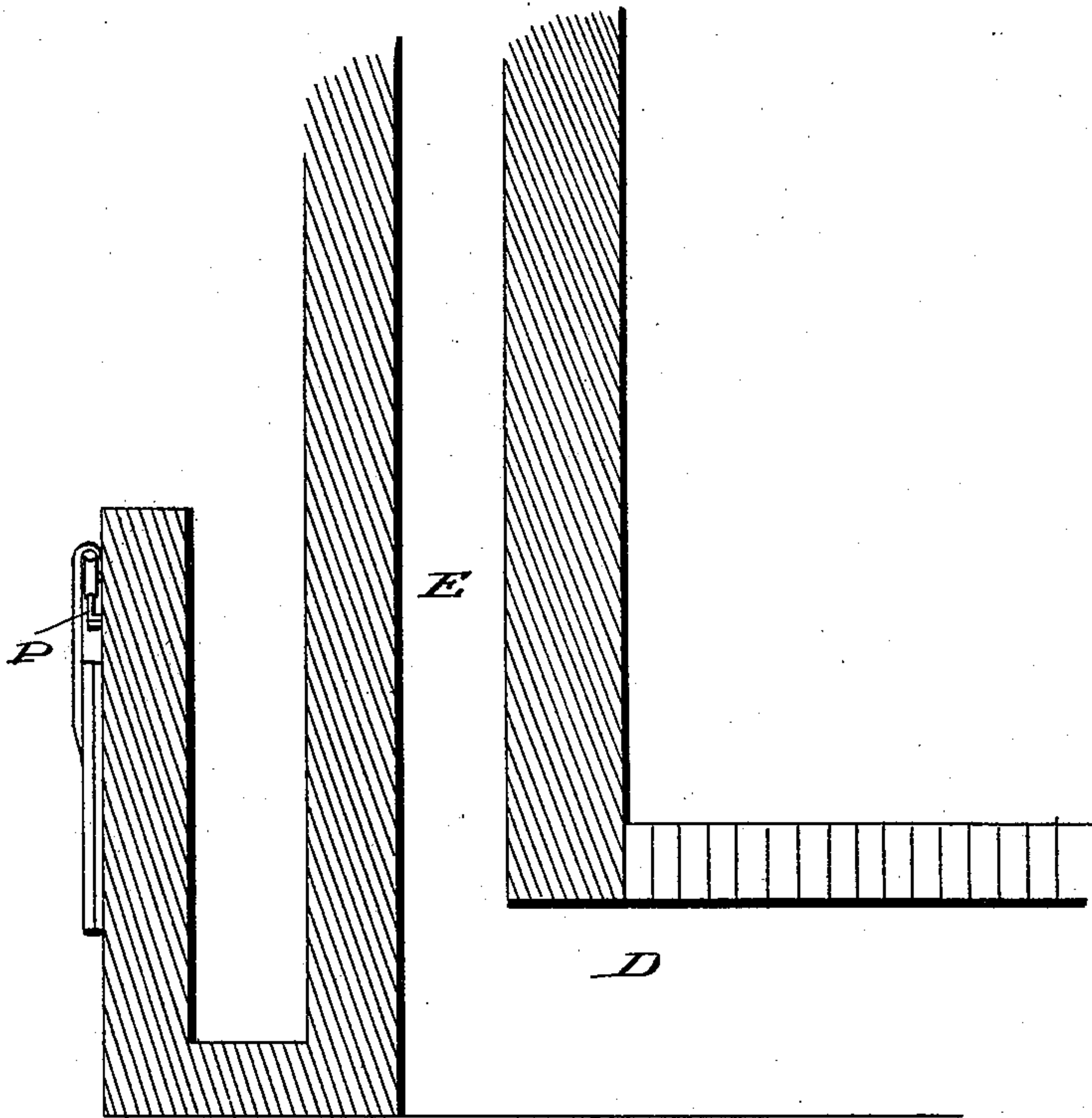
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BRICK KILN.

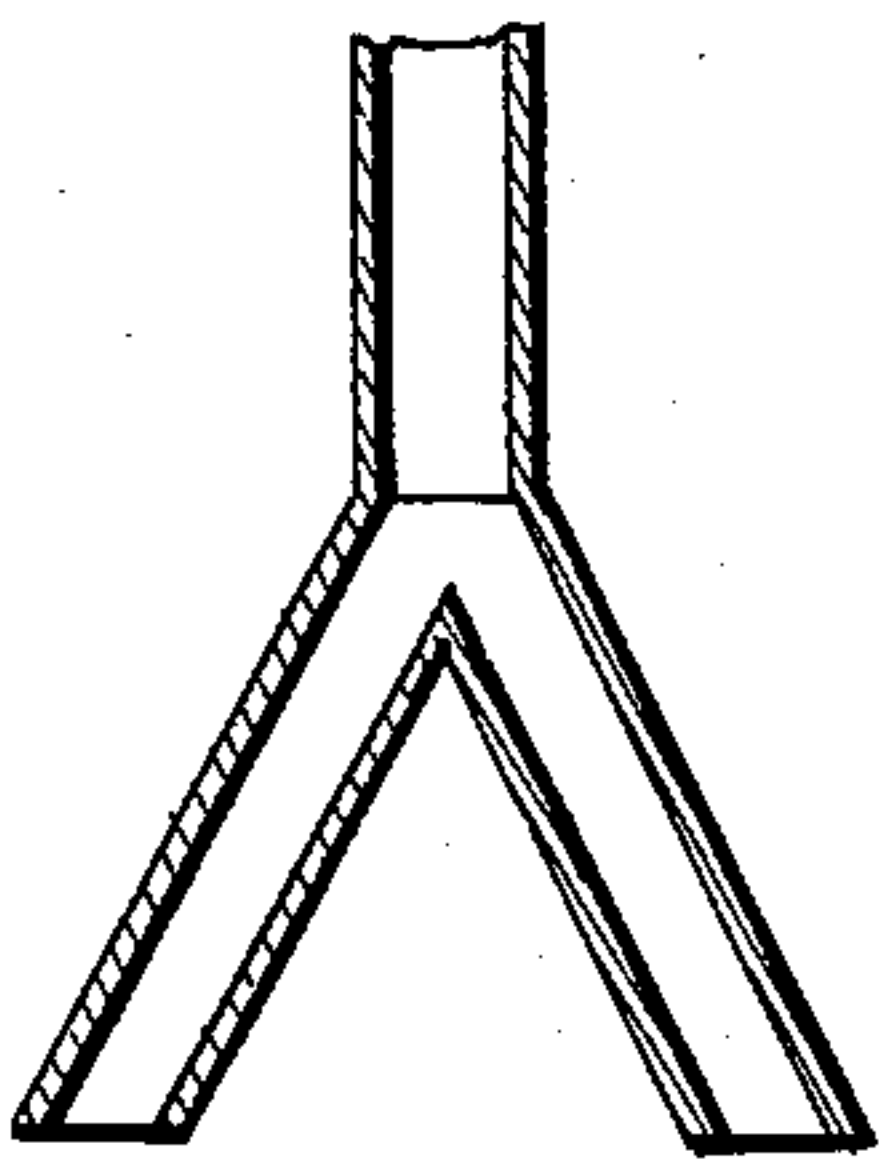
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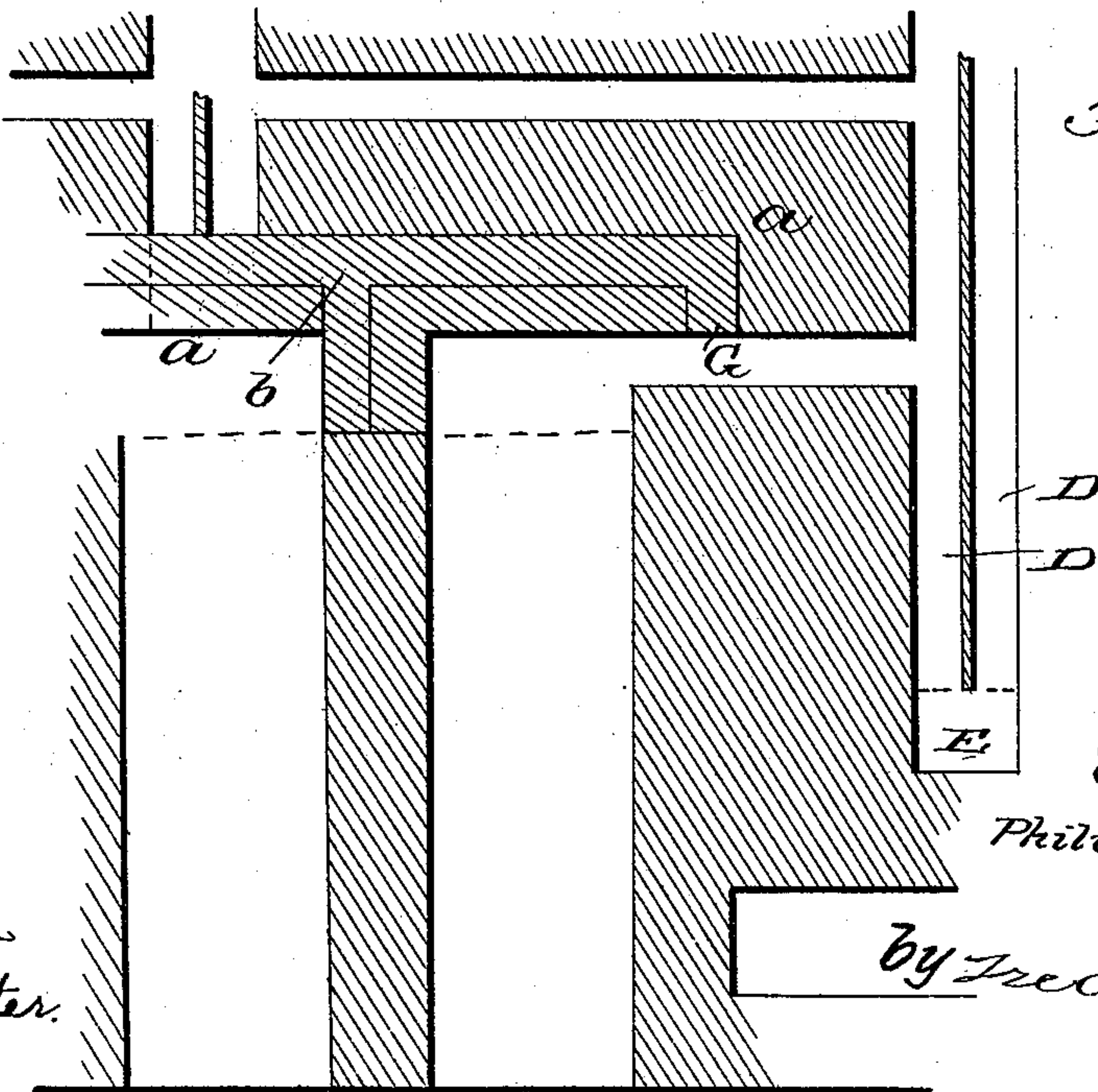
*Fig. 7.*



*Fig. 9.*



*Fig. 8.*



Witnesses  
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Attorney



# UNITED STATES PATENT OFFICE.

PHILIP GONDER, OF CANTON, OHIO.

## BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 523,275, dated July 17, 1894.

Application filed February 2, 1894. Serial No. 498,888. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP GONDER, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have  
5 invented certain new and useful Improvements in Brick-Kilns; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of  
10 this specification, and to the letters of reference marked thereon, in which—

Figure 1, is a view, showing a portion of one of the kiln walls provided with the furnaces. Fig. 2, is a horizontal section, showing the location of the grate bars, and illustrating the  
15 location and arrangement of the bag walls. Fig. 3, is a vertical section of one of the furnaces, showing the arrangement of the dampers and flues. Fig. 4, is a vertical section  
20 through line *y y*, looking toward the kiln chamber. Fig. 5, is a view, showing meeting ends of the rails. Fig. 6, is a view showing the door hanger properly located. Fig. 7, is a diagram, showing the connection between the  
25 flues D and E. Fig. 8, is a diagram, showing how the under flue D is connected by means of short flues. Fig. 9, is a view showing the manner of connecting two flues together.

The present invention has relation to brick  
30 kilns, and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.  
35

In the accompanying drawings A, represents the kiln wall, which is constructed in the ordinary manner and of any desired height, reference being had to the height of the kiln  
40 proper.

In the drawings but one side of the kiln is illustrated, or rather a portion of one side, but it will be understood that the kiln proper is to have four walls if a rectangle kiln is constructed, but if a circular kiln is constructed,  
45 then in that event the wall A forms the periphery of the kiln.

The object of the present invention is to locate in the kiln walls, and also in the arch  
50 or furnace walls twin furnaces, such as B and

B', one of said furnaces being arranged for both up and down draft, and the other for down draft only, and as shown in the drawings the furnace B is the one intended for the up and down draft furnace, and the furnace B' the down draft furnace only.  
55

Below kiln floor C, is located the main flue D.

In Fig. 3 but one flue is illustrated, but it will be understood that there are to be as many flues D as there are twin furnaces B  
60 and B', said flues connecting with the vertical flues E, which vertical flues are built in the kiln walls in the ordinary manner, and extend to the top of the kiln walls.

Directly in front of the inner ends of the  
65 furnaces B and B', and within the kiln chamber are located the bag walls *a*, which extend upward to within a short distance of the bottom or under side of the crown F.

For the purpose of separating the flues, or  
70 in other words providing a flue, or vertical chamber for each of the furnaces B and B', the partition wall *b* is provided, which partition wall is located and arranged substantially as illustrated in Figs. 2 and 4.  
75

For the purpose of shunting or spreading the flame and heat, the top or upper ends of the flues or chambers G are inclined away from each other as illustrated in Fig. 4. The  
80 object and purpose of so constructing the chambers G, is to provide for the better distribution of the heat, as it will be understood that the greatest amount of heat will be received into the kiln chamber proper, directly above the flues or chambers G.  
85

It will be understood that by providing the twin furnaces B and B', that a uniform heat can be created by alternate firing of the furnaces B and B', as it will be understood that as the one furnace is losing heat, the fired  
90 furnace will increase or generate heat, thereby producing substantially a uniform heat by the use of the twin furnaces B and B'.

When it is desired to provide, down draft only for each or all of the twin furnaces B  
95 and B' the damper H is closed as illustrated in Fig. 3, and the damper I is opened so as to clear the flue or chamber G, in which said damper is located, thereby causing the heat to first go up through the flues or chambers  
100



G, and thence down through the brick located in the kiln chamber proper from whence the heat is conveyed through the flues D to the flues E. When it is desired to provide  
 5 both down and up drafts, the damper H is opened so as to clear the throat J and the damper I closed, which causes the heat to pass down through the throat J into the flue D, and thence up through the brick contained  
 10 in the kiln chamber proper. When the up draft furnace is to be used the damper K is opened, which clears the flue L, and permits the heat and smoke to enter the flue E.

For the purpose of properly supporting the  
 15 kiln wall A above the twin furnaces B and B', the arches M, are provided which arches are separated from the furnace arches N by means of the air space c, by which arrangement the furnaces B and B' can be repaired  
 20 without disturbing in any manner the kiln walls.

By providing the twin furnaces B and B', the heat generated by the furnaces will be divided, and as it is conveyed upward through  
 25 the flues or chambers G, which chambers are also divided by means of the partition b the heat will strike the bottom or under side of the crown F, by which arrangement the crown is less liable to become injured or burned out  
 30 directly above the furnaces.

It will be understood that the down draft furnace B is to be permanently closed just below the inner end thereof by brick work as illustrated in Fig. 2, by which arrangement  
 35 no damper is to be employed inasmuch as the furnace B' is never to be used as an up draft furnace.

For the purpose of making it clear in reference to the up and down draft, the down  
 40 draft furnace is the one in which the heat is first conveyed upward to the top of the kiln chamber, and thence downward through the brick designed to be burned.

In the up draft furnace the heat is first  
 45 conveyed downward to below the kiln floor and thence upward through the brick designed to be burned.

For the purpose of closing the furnace openings, the sliding doors O are provided,  
 50 which sliding doors are supported upon the rails P, which rails are secured to the outer furnace walls R, which furnace walls extend to about the top of the arches M, and for the purpose of providing for repairing the track  
 55 O, said track is formed in sections, one section being used for each set of twin furnaces B and B', and the sections united together at their ends by means of the right angled portions d, and the clamping bolts d'.

For the purpose of providing for the expansion and contraction of the track sections, the clamping bolts d' are formed of  
 60 sufficient length to allow the right angled portions d to come and go.

65 In use the up draft furnace should be fired

first, which causes the brick contained in the bottom of the kiln chamber to become thoroughly water smoked or dried, after this is accomplished which thoroughly water smokes or dries all the brick contained in the kiln  
 70 chamber, all of the furnaces may be used as down draft furnaces. If in the event the heat becomes excessive at the top of the kiln chamber, the down draft furnaces may be brought into use, thereby bringing the de-  
 75 sired amount of heat to the bottom of the kiln to properly vitrify the brick contained in the lower portion of the kiln chamber proper.

It will be understood that by my peculiar  
 80 arrangement I am enabled at will to convey heat to the top of the kiln chamber and to the bottom, thereby providing against excessive heating at the top or the bottom, and at the same time to produce at either point  
 85 the desired amount of heat to properly burn the brick, by this arrangement I am enabled to reach all of the brick contained in the kiln chamber to properly burn, and vitrify without danger of overheating or melting the  
 90 brick.

By locating the furnaces B and B', side by side, and one of said furnaces being an up-draft furnace only, said furnace can be fired for the purpose of water smoking the brick,  
 95 and the down draft furnace need not be fired until the water smoking has been accomplished, after which the down draft furnace is fired, and the up draft furnace converted into a down draft furnace by the changing of  
 100 the dampers. By this arrangement of the furnaces I am enabled to burn the brick within the kiln more uniformly and to a better advantage, and at the same time I am enabled to so regulate the heat by the alternating fir-  
 105 ing of the furnaces, that no part of the kiln will become over heated, but a uniform heat is created or produced within the entire body of the kiln. This advantage cannot be reached to any degree of satisfaction where a single  
 110 furnace is employed, and the single furnace used both as a down and up draft furnace, as it is impossible to successfully distribute the heat.

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

1. In a brick kiln the combination of kiln walls and a kiln chamber, and flues, the furnaces B and B' located side by side, and in  
 120 close proximity to each other, and leading through the kiln walls in pairs, one of each pair of said furnaces being a down draft furnace only, and the other a combined up and down draft furnace, substantially as and for  
 125 the purpose specified.

2. The combination of kiln walls and a kiln chamber, the furnaces B and B', formed in pairs, and located side by side, and leading through the kiln walls, and opening in close  
 130



proximity to each other, and the flues or chambers G, formed in pairs, substantially as and for the purpose set forth.

- 5 3. The combination of the furnaces B and B', the flues or chambers G formed in pairs having their top or upper ends inclined away from each other, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

PHILIP GONDER.

Witnesses:

E. A. C. SMITH,  
F. W. BOND.