

(No Model.)

3 Sheets—Sheet 1.

J. C. ANDERSON.  
BRICK KILN.

No. 424,245.

Patented Mar. 25, 1890.

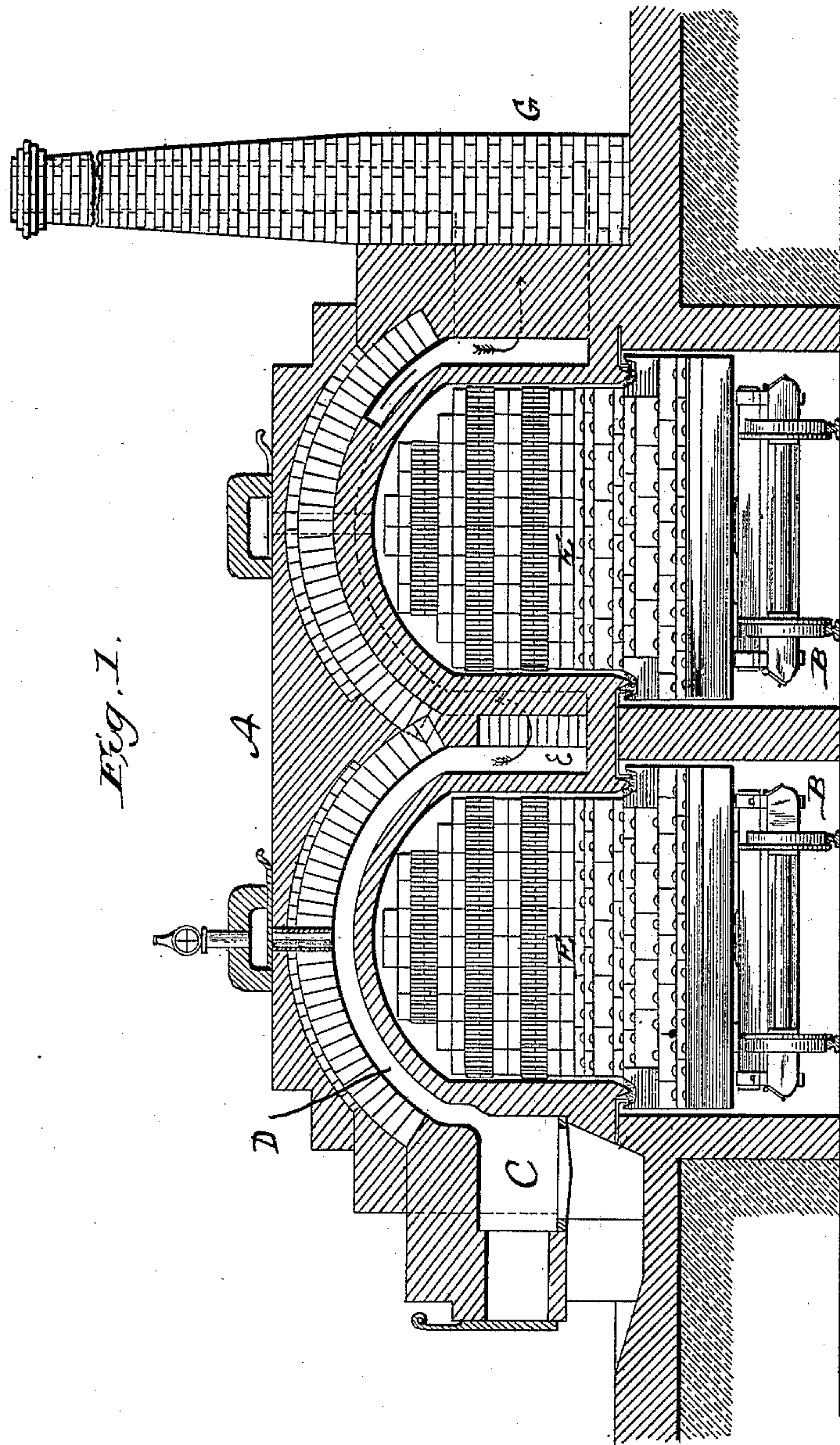


Fig. 1.

Witnesses—  
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H. M. Sterbick

Inventor  
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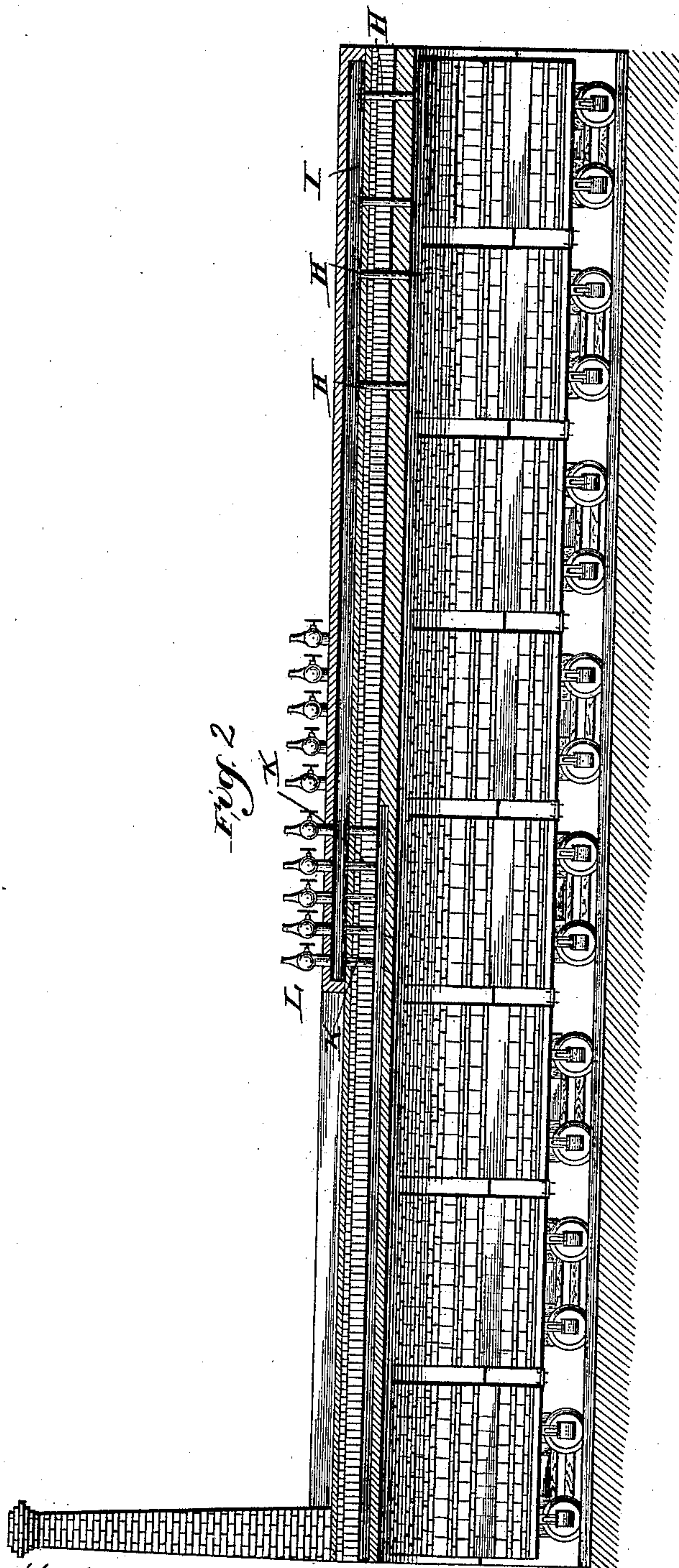
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J. C. ANDERSON.  
BRICK KILN.

3 Sheets—Sheet 2.

No. 424,245.

Patented Mar. 25, 1890.



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(No Model.)

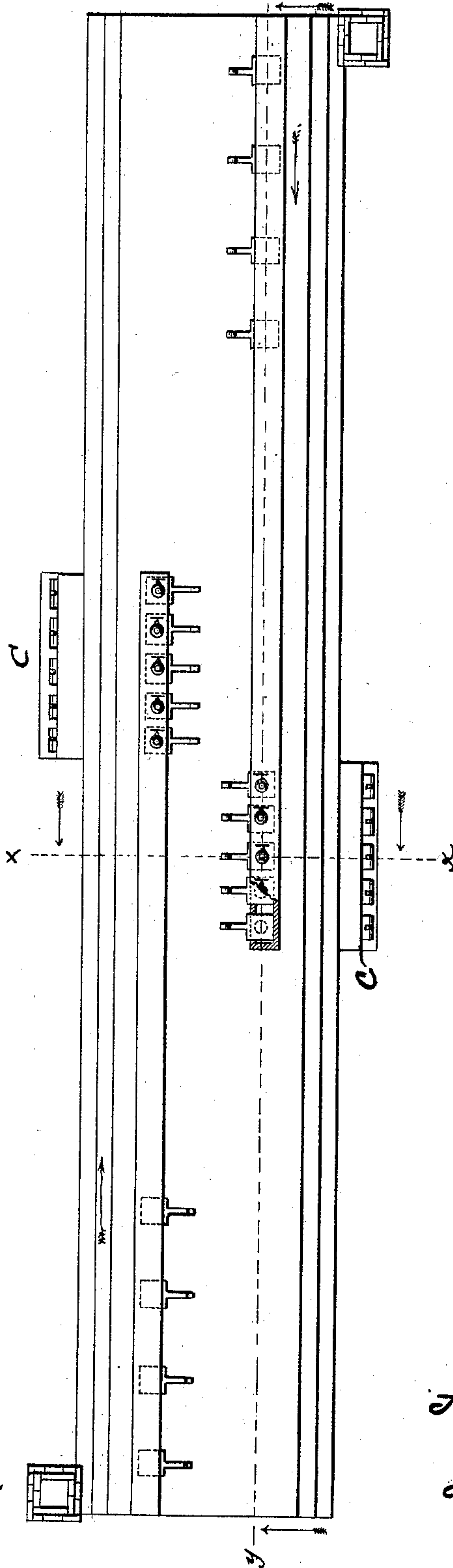
3 Sheets—Sheet 3.

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Fig 3



Witnesses:  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

## BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 421,245, dated March 25, 1890.

Application filed November 7, 1889. Serial No. 329,577. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. ANDERSON, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented new and useful Improvements in Kilns for Burning Brick and other Clay Bodies; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in kilns for burning brick and other clay bodies.

The object of my invention is to provide a kiln in which the water-smoke arising from the green brick in the initial burning is readily utilized or converted into hydrogen gas and used as a fuel in the final burning of the brick.

My invention consists in the devices, to be more fully hereinafter described, for collecting and bringing the water-smoke from the entrance end of each tunnel forming the kiln and injecting the same into the spaces between the double arches opposite each furnace, where it mingles with the products of combustion from the furnaces and with atmospheric air or oxygen and is consumed.

Referring to the drawings, Figure 1 is a vertical transverse sectional view of my improved kiln, taken on the line  $x x$  of Fig. 3. Fig. 2 is a longitudinal sectional view taken on the line  $y y$  of Fig. 3. Fig. 3 is a top or plan view.

The kiln proper with its double-arched tunnels, furnaces located on each side of the tunnels, flues leading from the furnaces through the spaces or flues of the arches over the articles to be burned, the flues leading to the stack, and the tracks and cars used for the support of the brick are of essentially the same construction as the kiln for which Letters Patent were granted to me March 6, 1888, No. 379,040, and only such reference will be made to the devices shown, described, and claimed in said patent as will be necessary for a complete understanding of this invention.

A indicates the kiln, which is composed of

two outer parallel walls and central or partition wall B, dividing the kiln into two longitudinal chambers or tunnels, each being covered by separate arches, which rest upon and are supported by the partition-wall B and the outer walls.

C are the furnaces, located in the outer walls of and occupying a position near the center of each tunnel, said furnaces being of the ordinary kind, having the usual grate-bars, ash-pits, doors, and draft-regulators.

That portion of the kiln occupied by the furnaces is double-walled, so as to form a fire-chamber or flue D, leading from each furnace and over the tunnel, and then through openings E in the central wall or partition B, and again over the top of the second tunnel and into the flue F in the outside wall of the kiln to the stack G, located at each end of the kiln for utilizing the heat of this side of the line of incoming cars. These walls or linings are composed of fire-brick or other refractory material; but the other portions of the kiln may be made of common brick.

As before intimated, the furnaces on each side of the kiln open into the spaces D in the arches of the tunnel. The bricks to be burned are protected from the branding effect of the flame by the lining or interior wall, the heat being transmitted to the articles to be burned, and burns them to the pottery-point, the milder portion or middle of the flame being thrown over to and around the other tunnel to raise the temperature of the bricks on the cars in this tunnel to a full red heat before this car is brought opposite the furnace, and in this manner the bricks are burned without coming in contact with the products of combustion, and renders this system specially desirable for burning special brick and brick on which it is desired to fix colored ornaments or decorations in metallic colors.

By reference to Fig. 3 it will be noticed that the furnaces are not opposite each other, although on opposite sides of the kiln, and that the middle portion of the flame passes over to and around the opposite tunnel to do the initial heating of the brick on the car located at that point, the brick on



said car being raised to a red heat, and that the final burning takes place on each car after it has passed the furnace in the opposite tunnel, it being understood that the two trains  
 5 of cars pass through the tunnels in opposite directions, and that as fast as the bricks on the cars lying in front of the furnaces are burned to the proper point the cars in both tunnels are pushed forward one step or the  
 10 distance of one car, thus allowing one car of burned brick to be taken from the exit end of each tunnel and a fresh car load of green bricks to be run into the entrance end of each tunnel.

15 The partition-wall B is provided with numerous perforations, through which the waste or escaping heat from the newly-burned brick passes to the cars on the track in the adjacent tunnel to heat the bricks on the cars  
 20 nearest to the furnaces to a red heat, and to dry and water-smoke the bricks on the cars nearest the ends of the tunnel.

The crown of the tunnel-arches near the end where the cars enter the kiln are provided  
 25 with numerous valved openings H, which lead from the interior of the tunnels to a horizontal flue I, located on top of the arches. These flues I, as before intimated, are located at each alternate end of the tunnels or the entrance ends of the tunnel and extend forward  
 30 to the jacketed spaces or flues D opposite each furnace, where they terminate, and at which point the outer arch of the kiln is provided with a series of openings K, which  
 35 form a communication between the flues or spaces D and the flues I.

The office or function of the flues I is to receive the water-smoke as it is generated from the green bricks at the entrance end of the  
 40 tunnels and convey it forward toward the furnaces, where it is injected into the spaces or flues between the double arches, where it comes in contact with the products of combustion from the furnaces and is consumed.  
 45 The water-smoke as it passes forward through the flues I is heated gradually and finally raised to a heat to decompose the same into hydrogen gas when it reaches the jacketed spaces or flues, and at which point atmos-

pheric air is admitted through the valved 50 openings L to mingle with the hydrogen and unite with the carbon of the coal while all enter into combustion and generate intense heat. The draft of the stack, together with the jets of air coming in through the openings 55 L, serves to draw forward the water-smoke.

It will be apparent from the devices just described that I am enabled to have full control of the water-smoke and utilize it to great advantage as a fuel in the burning process, 60 thus reducing the expense of burning brick to a minimum.

What I claim is—

1. A tunnel-kiln of the character described, having a horizontal flue communicating with 65 and leading from the entrance end of the tunnel to and communicating with the jacketed spaces of the arches back of the furnaces, whereby the water-smoke is conducted forward and mingled with the carbon from 70 the furnace at the point of combustion, as set forth.

2. A tunnel-kiln of the character described, having a horizontal flue connected with and leading from the entrance end of the tunnel 75 to and communicating with the jacketed spaces of the arches back of the furnaces, and ports for the admission of atmospheric air located in the horizontal or water-smoke flues near their inner ends, whereby the water- 80 smoke is mingled with air before it reaches or mingles with the carbon of the furnaces, as set forth.

3. In tunnel-kilns of the character described, the flues leading from the furnaces 85 over the tops of the tunnels, in combination with the water-smoke flues I, leading from the entrance end of the tunnel to and communicating with the first-mentioned flues, and the air-ducts L, communicating with the 90 flues I, as set forth.

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

J. C. ANDERSON.

Witnesses:

C. L. BEATTY,  
 J. F. ANDERSON.