

(No Model.)

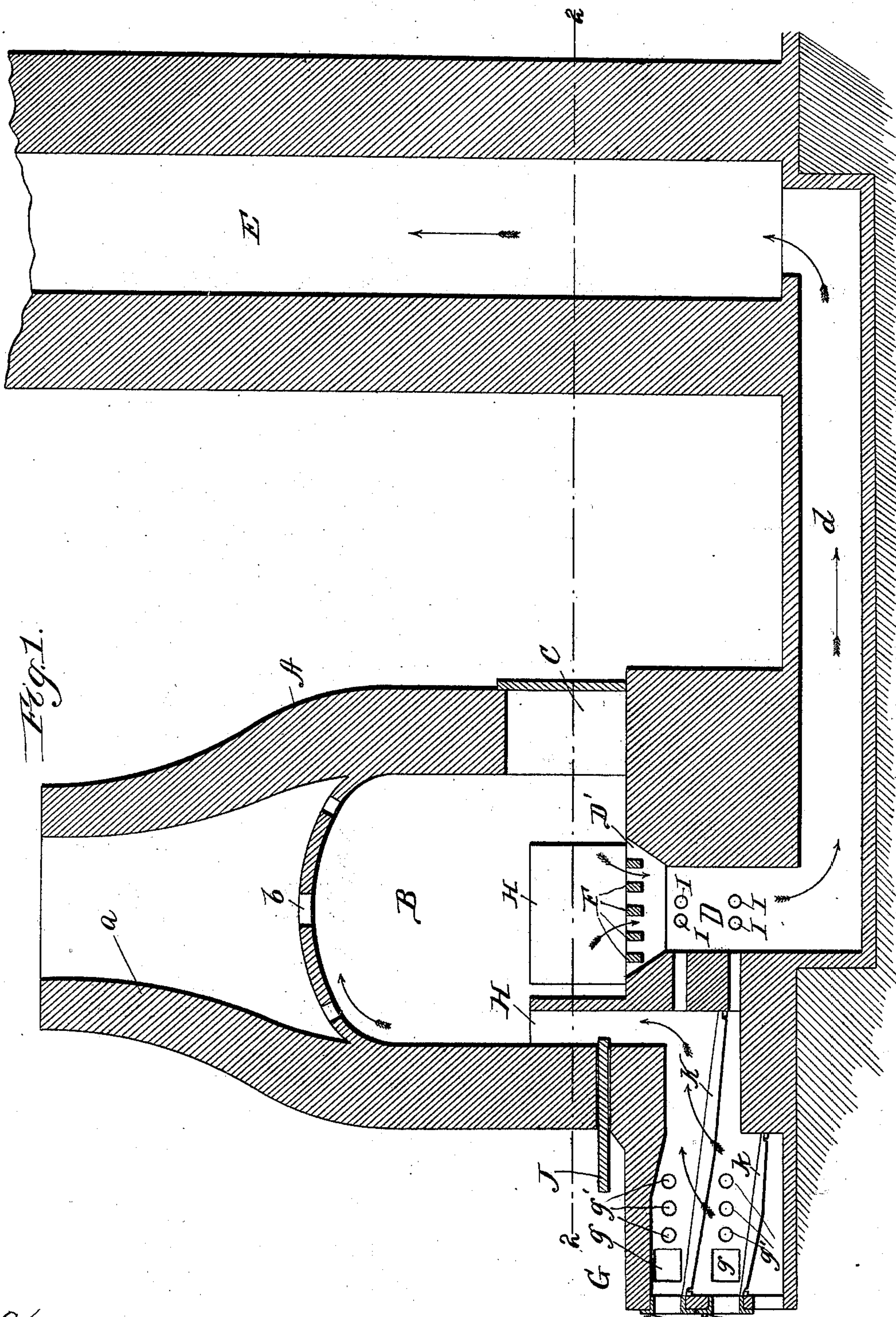
2 Sheets—Sheet 1.

T. POLIVKA.

KILN FOR BAKING BRICKS, TILES, POTTERY, &c.

No. 519,344.

Patented May 8, 1894.



Witnesses:
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(No Model.)

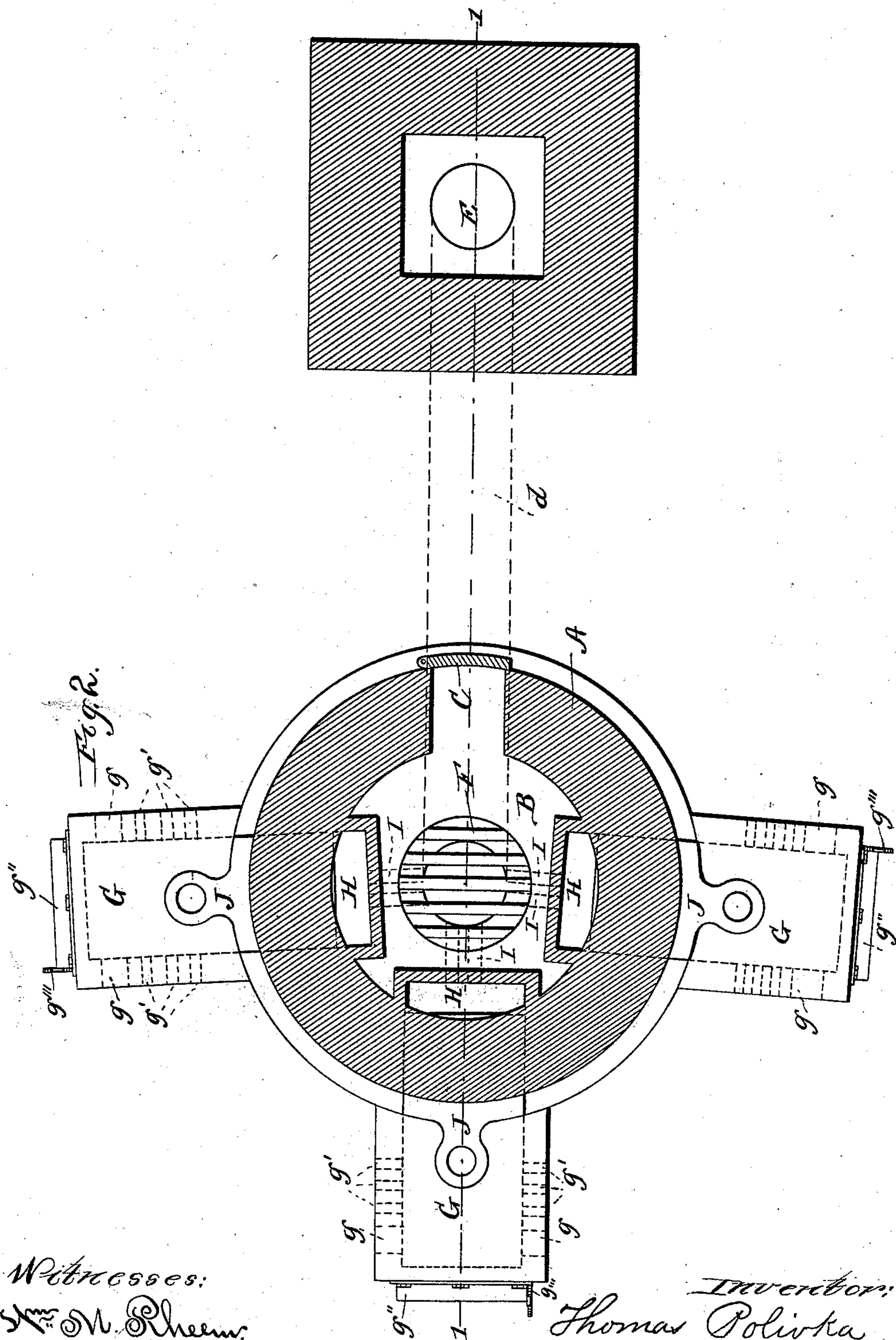
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Patented May 8, 1894.



Witnesses:
 Geo. N. Rheem.
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UNITED STATES PATENT OFFICE.

THOMAS POLIVKA, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE AMERICAN MOSAIC BRICK AND TILE COMPANY, OF SAME PLACE.

KILN FOR BAKING BRICKS, TILES, POTTERY, &c.

SPECIFICATION forming part of Letters Patent No. 519,344, dated May 8, 1894.

Application filed August 27, 1892. Serial No. 444,269. (No model.)

To all whom it may concern:

Be it known that I, THOMAS POLIVKA, a subject of the Emperor of Austria-Hungary, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Kilns for Baking Bricks, Tiles, Pottery, &c., of which the following is a full, clear, and exact specification.

My invention relates to kilns for baking tiles, bricks, pottery, and in short, for general purposes, but the invention is more particularly designed for use in burning or baking fancy or ornamental tiles and other like delicate articles, which need to be guarded with great care against the damaging effects of the smoke issuing from the furnace or fire box of the kiln, especially when the fire is first started, or immediately after coaling up.

Heretofore, so far as I am aware, kilns employed for this purpose have been so constructed that the smoke, or heavy products of combustion emitted from a fresh fire, is compelled to come in direct contact with the articles placed in the kiln to be burned or baked in its passage through the kiln to the uptake, or stack. This of course results in discoloration of the articles and other damage to them, producing an unmarketable product.

A still further defect of the prior construction is that the tiles or articles nearest the opening between the fire box or furnace and the oven are subjected to a much higher degree of heat than the others, and this inequality in the temperature of the oven is so great that it often results in the complete destruction, for all useful purposes, of the articles nearest the fire, while on the other hand, those farthest from the fire are apt to be not fully baked.

It is desirable, as is well known in the art, to employ long, low fire boxes or furnaces for heating these kilns. Heretofore, these furnaces or fire boxes have been fed from the front end, thus necessitating the pitching of the fuel a great distance inward in order that a proper proportion thereof may be lodged at the back or rear end of the grate. This results not only in extra labor and difficulty for the fireman, but stirs up the fuel and produces dust and more than usual smoke, which

of course are detrimental to the articles in the oven, as before explained.

One of the objects of my invention, therefore, is to so improve the construction of kilns that the smoke and heavy products of combustion may be drawn into the stack or uptake without retarding the draft, or compelling the smoke, &c., to pass through the oven.

Another object of my invention is to uniformly distribute the heat throughout the oven, whereby the articles in different parts thereof may not be subjected to unequal degrees of temperature.

Another object of my invention is to provide for the addition of fuel at, and the management of the fire from, the side of the fire box or furnace.

With these ends in view, my invention consists in certain features of novelty in the construction, combination and arrangement of parts, by which the said objects and certain other objects, hereinafter described, are accomplished, as fully explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a vertical, longitudinal section of my improved kiln, taken on the line 1, 1, Fig. 2. Fig. 2 is a plan section, taken on the line 2, 2, Fig. 1.

Like signs of reference indicate like parts in both figures of the drawings.

In carrying out my invention, I provide the kiln with an upwardly extending flue, which leads from the firebox or furnace, and extends a considerable distance above the floor of the oven; and from some suitable point within the oven, but below the summit of this upright flue, I lead a discharge flue which has communication with the uptake or stack. By this arrangement, I compel the heat to first rise in the oven, and then descend, before coming into close relation with the tiles or other articles in the kiln, and in this way I equalize the temperature of the oven, and avoid overburning or baking of the articles. I also provide the furnace or fire box with a by-pass flue-passage, which establishes communication between the uptake or stack and the fire box or furnace, independent of the upright flue leading into the oven, and I pro-

vide the said upright flue with means whereby it may be closed, so that the smoke or other products of combustion may be drawn into the discharge flue, and thence into the uptake, without necessarily passing through the oven, or coming in contact with the articles therein. These parts may be of any well known or suitable construction, and composed of the material ordinarily used in this art, or of any other suitable material.

As shown in the drawings, A is the kiln proper, provided with an oven, B, having a suitable door or port, C, for admission of the articles to be burned. The kiln A is provided preferably with a short stack, *a*, and the crown of the oven B is provided with apertures, *b*, in order that a portion of the heat which accumulates under the crown, and which otherwise would become very intense, and result in the destruction of the crown, may escape into the stack, *a*.

D is the discharge flue, which preferably extends downwardly from a point at or near the center of the floor of the oven, and is connected in any suitable manner, as by means of an underground flue, *d*, with the uptake or stack, E. In order that the articles to be burned may be placed directly over the entrance to the discharge flue D, the mouth of the latter is provided with a number of grate bars, F, or any other suitable supports, that will serve to sustain the articles in the oven, and at the same time permit of the passage of the heat into the flue. In order that the capacity of the discharge flue may not be decreased by the presence of these bars, F, across its end, such flue may be provided with a flaring mouth, D', whereby the spaces or openings between the bars F in the aggregate will amount to the entire cross section of the discharge flue proper.

The kiln may be provided with any desired number of fire boxes or furnaces for supplying the oven with heat. As shown in the drawings, I employ three of these furnaces or fire boxes, each of which is placed in communication with the oven by means of the upright flues, H. These upright flues H extend from the rear portion of each fire box or furnace upward into the oven B a considerable distance above the floor thereof, and they are so arranged around and adjacent to the wall of the oven that the products of combustion as they arise from such flues, and strike the upwardly concaved crown of the oven will be deflected downward upon the articles in the kiln into the discharge flue D, and thence pass on to the uptake. An advantageous manner of arranging these flues H when but three fire boxes or furnaces are employed, is to place one of them opposite the door C, and the other two on intermediately opposite sides of the oven, so that the products of combustion arising from the latter two will meet at the crown of the oven, and hence be deflected downward, immediately over the flue D, while the products of combustion from the

other one of the flues H will be intercepted in a greater or less degree by this downward current, and caused to travel along therewith. By the employment of these flues H leading upward into the oven, I avoid subjecting the articles in the oven to the direct influence of the heat and the flame, as the latter issues directly from the furnace or fire box, and consequently the damage to the articles resulting from this cause is prevented.

I provide the by-pass passage or flue before mentioned for permitting the smoke or other products of combustion to pass directly into the discharge flue without passing through the oven, by forming perforations or passages I through the rear walls of the fire boxes, directly into the discharge flue D; and as a means of cutting off communication between the furnaces and the oven, I provide each of the flues H with a damper or valve J, whose outer end is accessible to the fireman or attendant, whereby he is enabled at the proper time to slide such dampers inward, and completely close the flues H, and compel the products of combustion to pass directly into the discharge flue D *via* the flues I, whence they are drawn downward into the flue *d*, by virtue of the superior draft of the uptake E. Thus it will be seen that when the fires are first started, or immediately after coaling up, when the smoke is apt to be heavy, any one or all of the flues H may be closed, and the oven kept clear or free from the smoke or other products of combustion that would be apt to damage the articles therein.

Each of the fire boxes or furnaces may be provided with a double grate, that is, with one grate arranged above the other, which should be composed of fire clay. The upper grate, K, is preferably very long, as shown, while the lower one, *k*, is arranged under the forward end of the other, but need not be so long. The fire on the grate *k* will render the fuel on the grate K highly combustible, by reason of the fact that the products of combustion in greater part from the lower grate will pass through the fuel on the upper grate, and consequently generate gases therein. If desired, a number of the flues, I, may be formed through the rear wall of the furnace below the upper grate K, thus providing for a more direct escape of the products of combustion from the grate *k* when the flue H is closed. I prefer to arrange these furnaces or fire boxes G around the base of the kiln proper, extending outward in a substantially radial direction therefrom, so as to be enabled to provide each of them in both of its side walls with doors or ports, *g*, through which fuel may be pushed to any desired points throughout the length of the grate bars, thus avoiding the necessity for pitching the fuel from the front end of the furnace the whole length thereof, as heretofore. One of the doors *g* may be provided on each side, just above each of the grates, K, *k*, and each wall, if desired, may be provided with poker holes, *g'*. The front wall

of each furnace or fire box may also be provided with a long door, *g''*, opposite each grate, for the provision of abundant draft. Each of these doors may be provided with a rack and dog, *g'''*, of well known construction, for holding the door open to any desired extent.

While I have shown but three fire boxes or furnaces, it will of course be understood that my invention is not limited to this precise number, for a less number, or as many as can be arranged around the base of the kiln might be employed without departing from the spirit of my invention. And it should also be understood that while I have described these fire boxes or furnaces as being radially arranged, they nevertheless might be arranged otherwise.

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

1. A kiln, comprising an oven and a stack, a flue-passage leading from the bottom of the oven to the stack, a furnace communicating with the interior of the oven and containing a plurality of grates placed one above another, and by-passages leading from the furnace at points above and intermediate of the grates and also communicating with the stack-flue at points beneath the oven, substantially as set forth.

2. A kiln, comprising an oven and a stack, a flue-passage leading from the bottom of the oven to the stack, a furnace communicating with the interior of the oven and containing a plurality of grates placed one above another, by-passages leading from the furnace

at points above and intermediate of the grates thereof and also communicating with the stack-flue at points beneath the oven, and a damper for cutting off communication between the furnace and the interior of the oven, substantially as set forth.

3. A kiln, comprising an oven and a stack, a plurality of furnaces communicating with the interior of the oven, a plurality of dampers for cutting off communication between the furnaces and the oven, a plurality of grates placed one above another in each furnace, a flue-passage leading from the bottom of the oven to the stack, and a plurality of by-passages leading from each furnace at points above and intermediate of its grates and communicating with the stack flue at points below the oven, substantially as set forth.

4. In a kiln, the combination with the oven of a fire box or furnace extending outwardly from said oven at the base thereof, and being provided with fuel ports or doors in its side walls, substantially as set forth.

5. In a kiln, the combination with the oven, of a fire box or furnace, having communication with said oven, means for closing said communication, upper and lower grates in said fire box or furnace, and a discharge flue leading from said oven and having direct communication with said fire box, or furnace above and below the upper grate, substantially as set forth.

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