

G. NIMMO.
KILN FOR CRUCIBLES.

No. 444,153.

Patented Jan. 6, 1891.

Fig. 1.

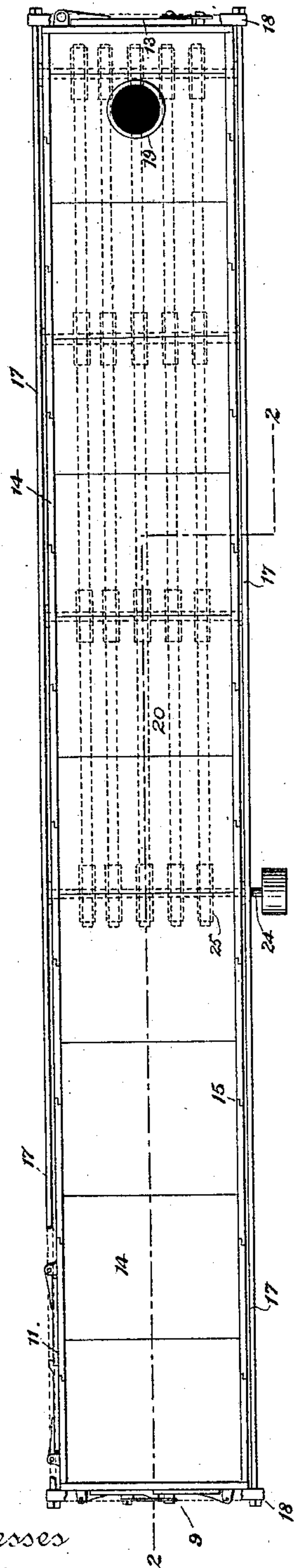
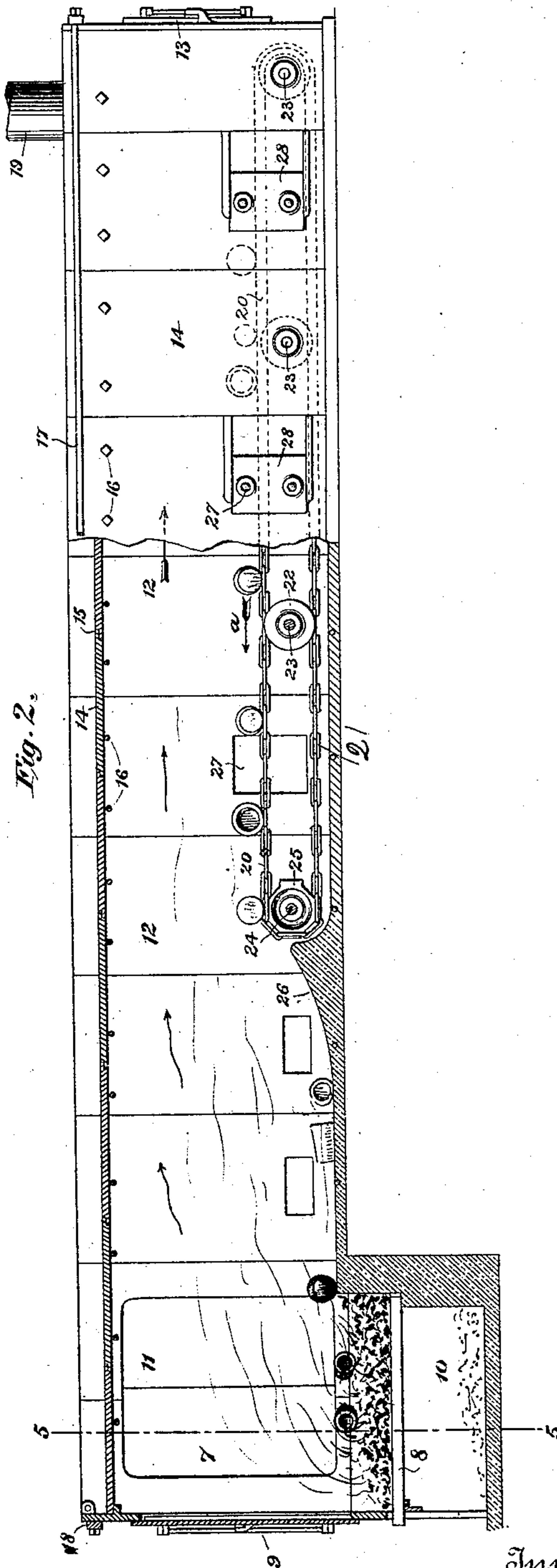


Fig. 2.



Witnesses
Geo. W. Dreck.
Sam'l. T. Macpeak.

Inventor
George Nimmo.
By his Attorney
Forbes & Forbes

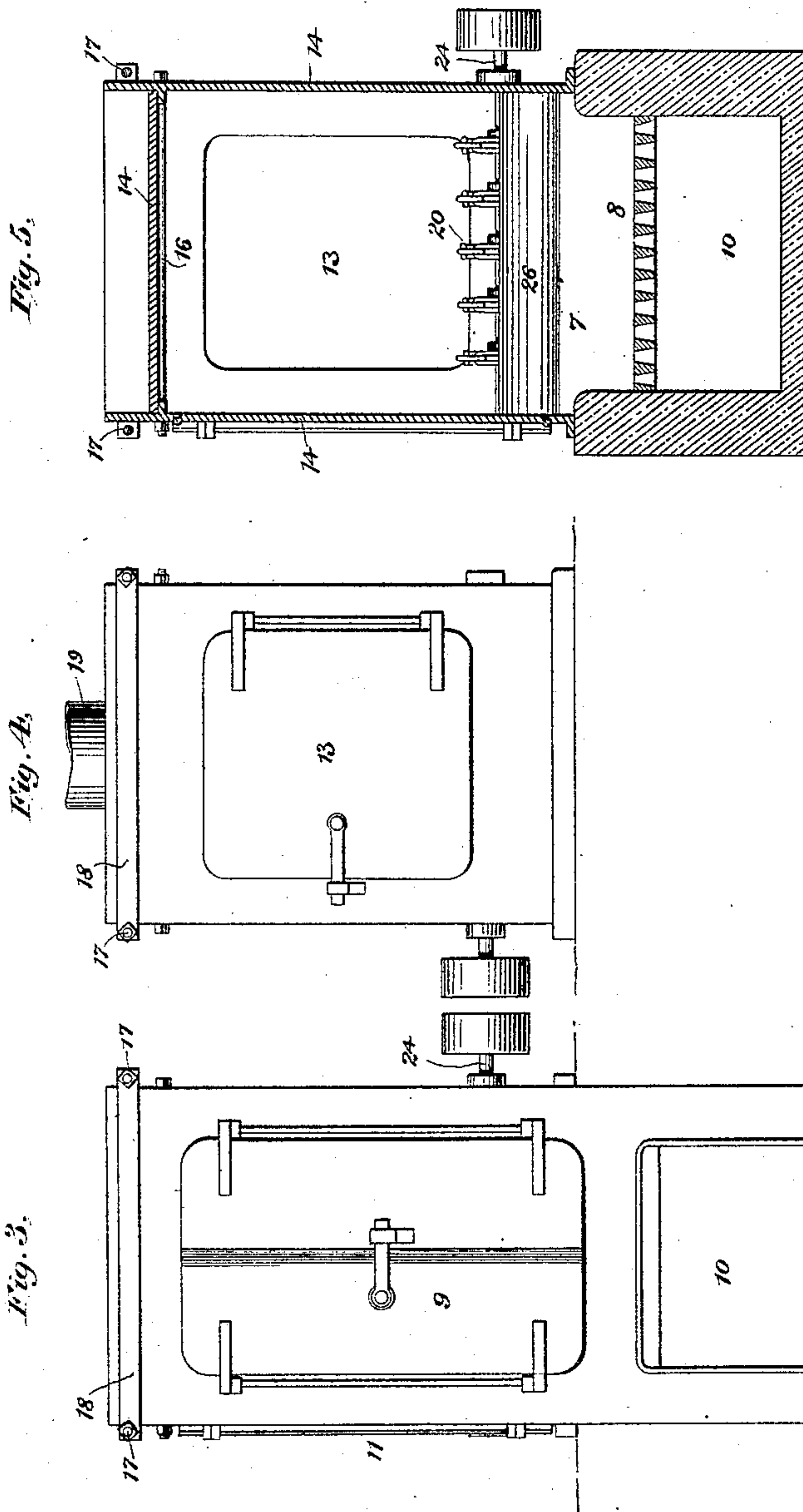
(No Model.)

2 Sheets—Sheet 2.

G. NIMMO.
KILN FOR CRUCIBLES.

No. 444,153.

Patented Jan. 6, 1891.



Witnesses
Geo. W. Dreck
Saml. T. Macpeak.

Inventor
George Nimmo.
By his Attorneys
Fowler & Fowler

UNITED STATES PATENT OFFICE.

GEORGE NIMMO, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO THE
GEORGE NIMMO COMPANY, OF NEW JERSEY.

KILN FOR CRUCIBLES.

SPECIFICATION forming part of Letters Patent No. 444,153, dated January 6, 1891.

Application filed December 17, 1889. Serial No. 334,024. (No model.)

To all whom it may concern:

Be it known that I, GEORGE NIMMO, a citizen of the United States, residing at Allegheny city, county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Kilns for Baking and Burning Crucibles, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the drawings forming part of this specification.

My invention relates to kilns for baking and burning crucibles, pots, and the like.

The old brick-constructed form of crucible-kiln has to be made of such a large size as to require much space, is expensive to build, and is slow in its operation. In its use the crucibles are made in large quantities, dried in the air, then carefully introduced in the kiln, and stacked therein with seggars to separate them. After the kiln is so charged or filled it is closed up and fired, and the crucibles are baked and burned while stationary in stacks. The kiln is then shut down or stopped in operation, partially taken apart, and the lot of burnt crucibles removed. Thus it necessitates the labor and expense of accumulating a sufficient lot or number of crucibles to fill the kiln before firing, as well as necessitating much labor in stacking and unstacking the crucibles in the kiln. Moreover, the heat and fire cannot be distributed so uniformly as to bake and burn each crucible alike. Consequently it produces some articles which are not up to the standard. With such a kiln a week's time is required to properly stack, bake, and burn and remove the crucibles, and it is practically impossible to bake and burn a crucible of any desired size at short notice.

I overcome the aforesaid objections by my improved kiln, a type of which is illustrated in the accompanying drawings, wherein—

Figure 1 is a top plan view of a kiln made after the manner of my invention. Fig. 2 is a side view of the same in section on planes indicated by line 2 2, Fig. 1. Figs. 3 and 4 are enlarged views of the respective ends of the kiln. Fig. 5 is an enlarged view in section on the line 5 5, Fig. 2.

Referring to the drawings, 7 designates a

fire or fuel chamber provided with a fire-door 9 and a grate 8, having an ash-pit 10 below the same. The foundation or substructure of the fuel-chamber may be constructed in any suitable manner, and in addition to the fire-door I provide this chamber with a suitable door 11, through which the burned ware may be conveniently removed from the chamber by means of implements when the same has been burned or fired to a proper degree.

From one side of the fuel-chamber, preferably the rear, extends the heating or baking chamber 12 in free communication therewith, in order to allow the flame and heat to readily pass into the baking-chamber, and the baked crucibles to be easily thrown by the conveyer into the fire. The baking-chamber is preferably disposed horizontally, and is made comparatively long and narrow. It is provided at its end distant from the fuel-chamber with a door or gate 13, through which the unbaked pottery or crucibles may be introduced therein and placed upon the conveyer.

The sides and top of both the fuel and baking chamber are constructed of detachable portable sections 14, consisting of plates or slabs of material adapted to the requirement of a kiln. The meeting edges of these plates are suitably tongued and grooved, as at 15, and the plates forming the sides of the chamber are detachably held together by means of tie-rods 16 16, extending between the plates transversely of the chamber. The top plates 14 are laid upon and supported by the tie-rods 16, though any other suitable way of sustaining them may be adopted. The kiln is braced longitudinally by long binding-rods 17 17, which extend the length thereof and hold the cross-bars 18 18 firmly against the ends of the kiln, respectively. This construction admits of the easy removal and transplanting of practically the entire kiln. The bottom of the baking-chamber 12 may be constructed of masonry or suitable heat-resisting material, or, if preferred, may be made in sections similar to the walls and top of the chamber, thereby also admitting of easy removal.

The smoke-pipe 19 for carrying off the products of combustion is located, preferably, at

the extreme or distant end of the baking-chamber 12, so as to compel the flame, heat, and products of combustion issuing from the fuel-chamber to pass through this chamber, thereby economizing the heat, simplifying the construction, and rendering the kiln very efficient.

The heating-chamber 12 being comparatively of great length, the end thereof that is distant from the fire-chamber will of course be of lower temperature than any other point of its length, the temperature in the chamber gradually increasing as the fuel-chamber is approached. By virtue of this arrangement a dried or prepared crucible introduced at the distant or cool end of the baking-chamber 12 may be gradually subjected to increasing temperature, and thereby gradually and uniformly baked by moving it slowly along said chamber toward the fuel-chamber, passing it through the flames issuing therefrom, and then depositing it directly onto the burning fuel or coals. Thus by my invention the article to be baked and burned is carried gradually to the fire through gradually-increasing temperature, and in carrying out this important feature of the invention I place a conveyer 20 within the baking-chamber 12 for slowly conveying the crucibles from the cool end of the baking-chamber up to the burning fuel and delivering them directly onto the same. The conveyer herewith shown consists in a series of endless belts or chains 21, suitably disposed and mounted on idler-pulleys 22, supported on shafts 23, which are set across the chamber with their ends resting in the sides thereof. The conveyer-chains receive their motion from a suitably-driven shaft 24 through sprocket-wheels 25, and all of them move at the same rate of speed, their upper portions traveling in the direction of the adjacent arrow *a*. This conveyer extends a little short of the fuel-chamber 7, and between its end and the fire-chamber is arranged an incline or chute 26, over which the crucibles pass from the conveyer to the burning fuel when they are thrown from the end of the conveyer by the motion thereof. Any suitable form of a conveyer may be used, and any suitable motor may be employed for driving the same.

Any of the crucibles may be readily inspected and reached by tools to adjust them and remove damaged or broken crucibles at any point of their passage through the baking-chamber by means of suitably constructed and arranged openings, such as 27, formed in the sides of the chamber, and provided with sliding covers 28, which are to be operated by hand to uncover the opening to permit visual inspection, manipulation, or removal of any of the crucibles near the particular opening.

In the operation of the kiln the conveyer is kept in slow motion in the direction of the arrow *a*, and the fuel in the chamber 7 is kept burning. The crucibles in an unbaked condition are placed upon the conveyer at the

end thereof near the door in the baking-chamber, and are slowly carried by the conveyer toward the burning fuel. In their slow passage they are thoroughly and uniformly dried and evenly baked, so that by the time the other end of the conveyer is reached they are in condition to be passed through the flames, and then placed directly onto the burning fuel and burned, and this is accomplished by means of the conveyer dropping the crucibles onto the chute, down which they pass directly onto the burning fuel, from which they may be removed by suitable implements after they have been burned a sufficient time.

In practice I am accustomed to allow the crucibles after being deposited on the burning fuel to remain thereon until they are baked or burned to the degree of heat required. When the crucibles have been burned to such a degree, I then remove them from the fire.

The important advantages of the invention are that the unbaked crucibles may be raised gradually from a low temperature to a very high one in such a slow and gradual manner that they may be thoroughly dried and uniformly baked before reaching the fire itself, and that a great number of crucibles can be baked and burned in a few hours—three to four—from the placing of the first lot in the kiln, and also the great facility with which the crucibles may be inspected, manipulated, and removed at any point of their progress through the kiln. Another important advantage is that since the crucibles are burned one after another, and not simultaneously in a lot, the first ones burned can be withdrawn and examined to ascertain if the kiln is working properly. If any defect be found, the operation may be stopped, and thus the making of a lot of defective and worthless articles prevented.

Having thus described my improvements in kilns for baking and burning crucibles and the like, what I claim as my invention, without limiting myself to the construction shown, is—

1. A kiln for baking and burning crucibles, comprising a long narrow baking-chamber having a chimney and a charging-door at one end, a fuel-chamber in the opposite end of the baking-chamber communicating freely therewith, and a traveling conveyer within the baking-chamber for slowly moving the crucibles along the chamber from its charging end and delivering them to and upon the burning fuel in the fuel-chamber, whereby the crucibles are baked in their passage through the baking-chamber, and are then deposited directly onto the burning fuel and burned, substantially as described.

2. A kiln for baking and burning crucibles, comprising a long narrow baking-chamber having a chimney and a charging-door at one end, a fuel-chamber in the opposite end of the baking-chamber communicating freely therewith, a traveling conveyer within the

baking-chamber for slowly moving the crucibles therethrough from the charging end, and a chute or incline in the baking-chamber at the delivery end of said conveyer, whereby
5 the crucibles are baked as they are carried slowly through the baking-chamber by the conveyer, and are then delivered upon the chute, whence they pass onto the burning fuel, where they are burned, substantially as de-
10 scribed.

3. The hereinabove - described method of baking and burning crucibles, which consists in feeding the crucibles into one end of a

long baking-chamber and baking them while being conveyed slowly therethrough to the 15 opposite end, and then depositing said crucibles directly onto the fuel in the fire-chamber and burning them, substantially as described.

In testimony whereof I have hereunto set my hand, this 22d day of November, 1889, in the 20 presence of the two subscribing witnesses.

GEORGE NIMMO.

Witnesses:

GEO. WHITEFORD,
JOHN A. BLAIR.