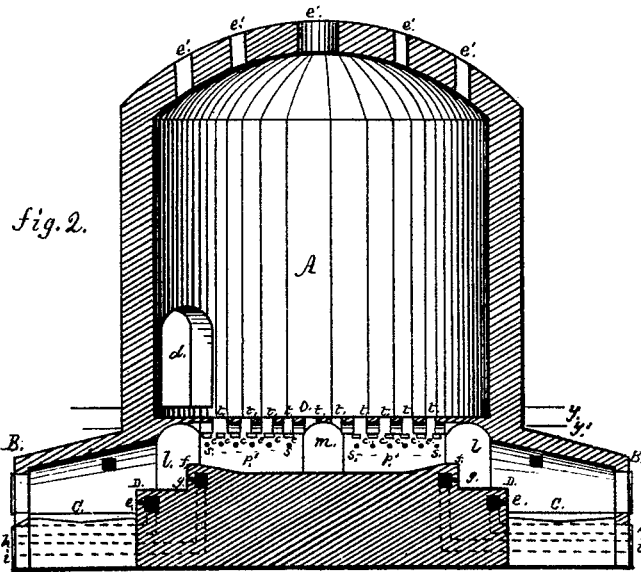
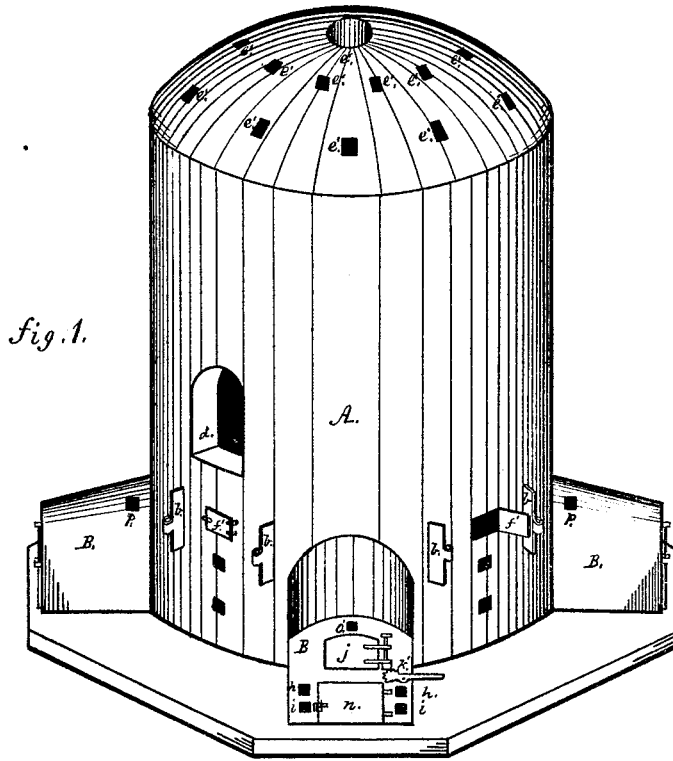


W. S. COLWELL.  
POTTERY-KILNS.

No. 183,140.

Patented Oct. 10, 1876.



Witnesses  
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Fig. 3.

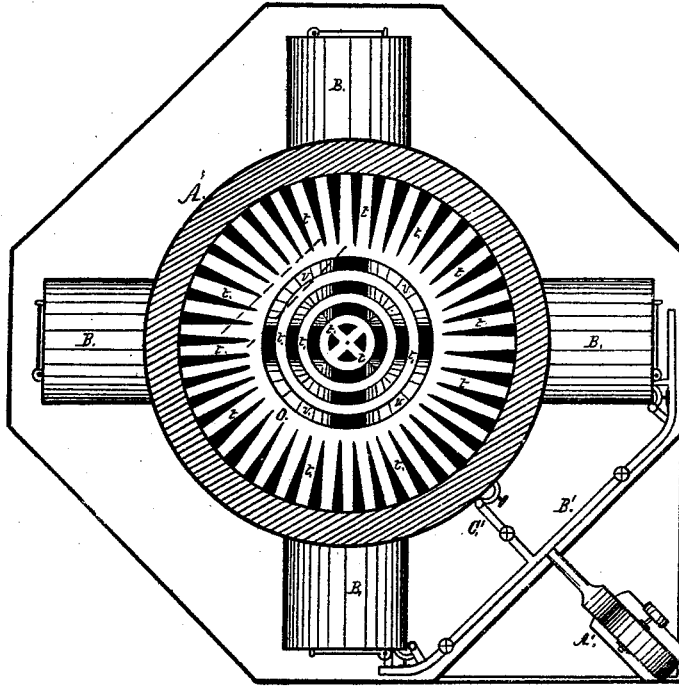
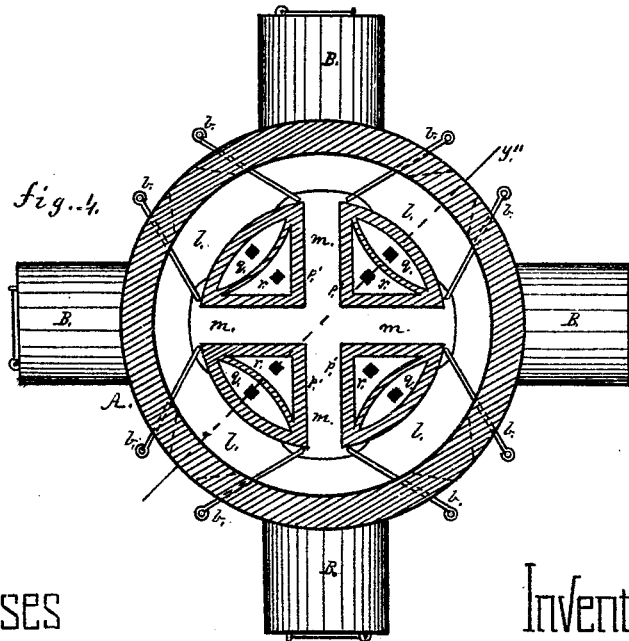


Fig. 4.



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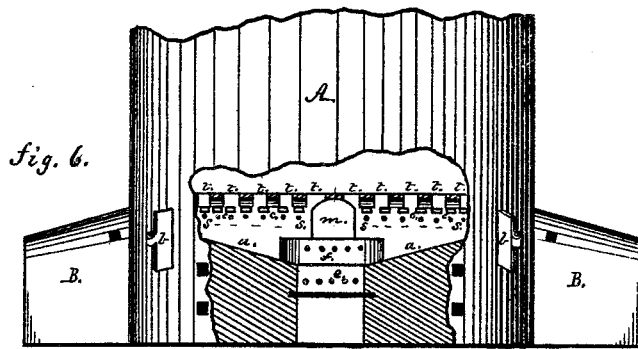
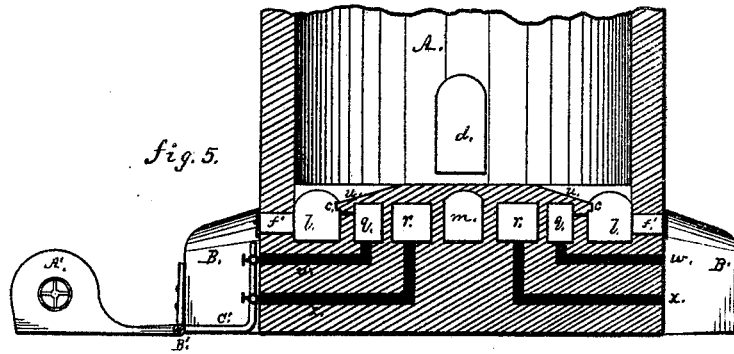
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# UNITED STATES PATENT OFFICE.

WILLIAM S. COLWELL, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN POTTERY-KILNS.

Specification forming part of Letters Patent No. 183,140, dated October 10, 1876; application filed September 4, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM S. COLWELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Pottery-Kilns; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My improvement relates to the construction of furnace and kilns for drying, baking, and burning pottery-wares; and consists in so constructing the furnace and kiln, and so combining them together, that the wares placed in the kiln can be dried, baked, and burned with uniformity in all parts of it, and the surface of the wares glazed or vitrified, giving a uniform color to them, and imparting to the wares an even vitreous body, said results being accomplished through the medium of the furnace, kiln, fuel, and heat, operating as hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a perspective view of my improvement in pottery-kilns. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section of the kiln at line *y* of figure. Fig. 4 is a horizontal section of the kiln at line *y'* of Fig. 2. Fig. 5 is a vertical section of the kiln at line *y''* of Fig. 4. Fig. 6 is a side view of the kiln, representing a portion of the wall of a furnace cut away for the purpose of showing the face of the bridge-wall and flame and heat spreaders. Fig. 7 is a section of the bottom, at the point between the dotted lines 2 in Fig. 3.

In the accompanying drawings, A represents the kiln, and B the furnace connected therewith. The furnaces are each provided with a grate, C, and a hollow bridge-wall, D, having a series of openings, *e*, for the outflow of air, which commingles with the flame and gases passing from the furnace. Beyond the bridge-wall D is a hollow spreader-wall, *f*, having a series of openings, *g*, for the outflow of air, which commingles with the flame and gases after passing over the bridge-wall D, and while entering the flues *l* and *m*. To the

right and left of the hollow spreader-wall *f* are spreaders *a*, which incline upward toward the bottom *o* of the kiln. The spreaders *a* form the bottom of the circular flue *l*. The bridge-wall D is supplied with air through the medium of flues *h*, and the spreader-wall *f* is supplied with air through the medium of flues *i*. (Indicated by dotted lines in Fig. 2.) The furnace fire-chambers are each furnished with a door, *j*, susceptible of being elevated vertically by a ratchet-lever, *k*, the object of elevating the doors being for the purpose of causing a current of cold air to pass under the lower edge of the door and over the surface of the fire, so that the air flowing out through the openings *e* of the bridge-wall D and the openings *g* of the spreader-wall *f*, and the inflowing current of air under the door and over the surface of the fire, will cause counter-currents which will thoroughly commingle the air and the gases of the furnaces as they pass into the flues *l* and *m* of the kiln A. The ash-pit of each of the furnaces B is provided with a door, *n*, which door is used for cutting off or regulating the supply of air to the fire-grates C. The furnaces B are furnished with openings *o'* and *p*, (commonly called peep-holes,) which are for the purpose of observing the condition of the fire, flame, and heat in the furnaces and flues *l* and *m*. Through the medium of the openings *o'* the operator can, in this case, look through the furnaces and flues *m* into the opposite furnace.

The openings *p* enable the operator to observe the condition of the circular flues *l*, which are provided each with two sliding gates or valves, *b*, which are used for regulating the flow of heat through the flues *l* and for directing it at will to the flues *m* and toward the center of the kiln. The bottom *o* of the kiln A is supported upon a series of hollow piers, *p'*, each of which is divided into two compartments, *q* and *r*, which are supplied with air through the medium of flues *w* and *x*. The flue *w* conveys air into the compartment *q*, and the flue *x* conveys air into the compartment *r*. The compartments *q* and *r* communicate with the flues *l* and *m* by means of small openings *s* near the top of the walls of the piers *p'*. The openings *s* are protected by projections *c*, which will prevent the glaz-

ing matter which often flows down through the openings in the bottom *o* of the kiln from closing them. The flues *l* and *m* are crowned with arches (shown in Fig. 2) which help to support the bottom *o* of the kiln A. In the bottom *o* of the kiln A are a large number of openings, *t*, which communicate with the flues *l* and *m*. Under the bottom *o* are spreaders *u* and *v*, which are inclined upward from the side walls of the flues *l* and *m* toward the under surface of the bottom *o*. By means of this arrangement of spreaders *u* and *v* the flame and heat which enter the flues *l* and *m* are evenly distributed to the openings *t* in the bottom *o*, thereby transmitting said flame and heat with uniformity to all parts of the interior of the kiln. The top or crown of the kiln A is provided with a series of vents, *e'*, for the escape of the gases and heat. *d* represents the door leading into the kiln, and is used when placing the wares into the kiln or taking them out of it. *f'* represents a series of openings, furnished with doors, which openings communicate with the circular flues *l*, and are used for "salting" the kiln, and are also used for examining the condition of the flues *l*. In kilns used for burning large and heavy wares a blast device may be used in combination with the furnaces and the flues *h*, *i*, *w*, and *x*, as indicated in Figs. 3 and 5, in which A' represents a fan (but other blast-generator may be used) connected to a pipe, B', which encircles the kiln, and from branches C' lead to the furnaces B, and to the flues *h*, *i*, *w*, and *x*. The branch pipes C' should be furnished with valves for regulating the flow of air to the furnaces and flues.

By combining a blast with the kiln, as hereinbefore described, the heat can be increased to any desired degree and forced up in it, and so packed that it will be uniform in all parts of it, which is the desideratum long desired in the process of burning or baking pottery-ware, for by causing the heat to be evenly distributed throughout all parts of the kiln, the wares will be evenly burned or baked, and the color and glazing will be uniform—results which cannot be obtained in the absence of a uniform degree of heat in all parts of the kiln. The other advantages derived from the construction of the furnaces and kiln hereinbefore

described, and the application of an air-blast, will be apparent to the skilled operator of pottery-kilns without further description. My improvements are adapted to furnaces, kilns, and blasts having either up or down draft, and are also adapted to the use of any of the known fuels.

Having thus described my improvements and their advantages, what I claim as of my invention is—

1. In a pottery-kiln, the furnace B, in combination with the circular flues *l* and the flues *m*, substantially as herein described, and for the purpose set forth.

2. In a pottery-kiln, a blast-generator, in combination with the air-chambers *q* and *r*, said chambers communicating with the flues *l* and *m*, substantially as herein described, and for the purpose set forth.

3. In a pottery-kiln, a blast-generator in combination with the flues *l* and *m*, substantially as herein described, and for the purpose set forth.

4. In a pottery-kiln, the hollow piers *p'* having air-flues *w* and *x* and compartments *q* and *r*, in combination with the flues *l* and *m*, substantially as herein described, and for the purpose set forth.

5. In a pottery-kiln, the circular flues *l*, provided with valves *b*, in combination with the flues *m*, substantially as herein described, and for the purpose set forth.

6. In a pottery-kiln, the spreaders *a* and *f*, in combination with the flues *l* and *m*, substantially as herein described, and for the purpose set forth.

7. In a pottery-kiln, the spreaders *u* and *v*, in combination with the apertures *t* in the bottom *o*, substantially as herein described, for the purpose set forth.

8. In a pottery-kiln, the projections *c* for protecting the openings *s* communicating with the compartments *q* and *r*, substantially as herein described, and for the purpose set forth.

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