2 Sheets—Sheet 1.

W. S. COLWELL.

BRICK-KILN.

No. 187,217. Patented Feb. 13, 1877.

fig. 1

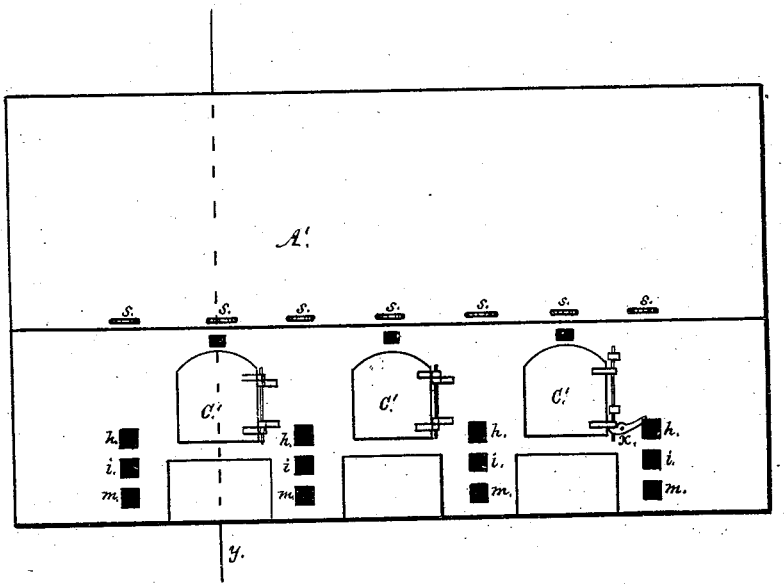
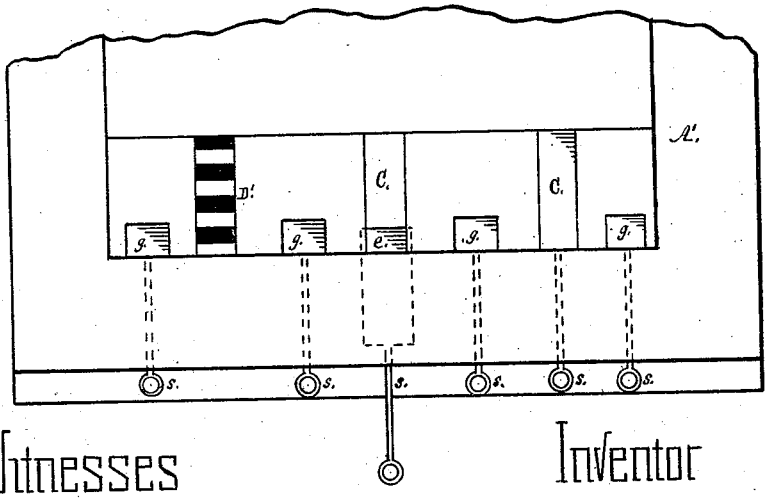


fig. 2.



Witnesses

A. L. Johnston

A. H. Johnston.

Inventor

William S. Colwell.

By J. J. Johnston.

his attorney.

2 Sheets—Sheet 2.

W. S. COLWELL.

BRICK-KILN.

No. 187,217. Patented Feb. 13, 1877.

Fig. 3.

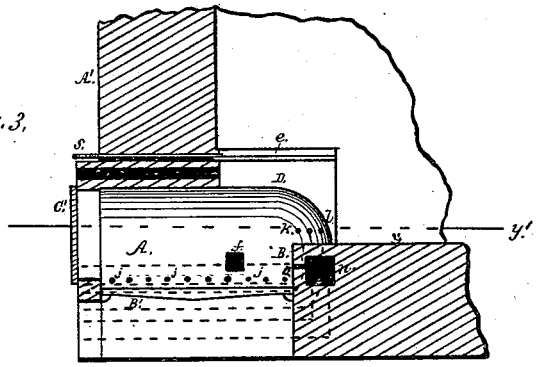


Fig. 4.

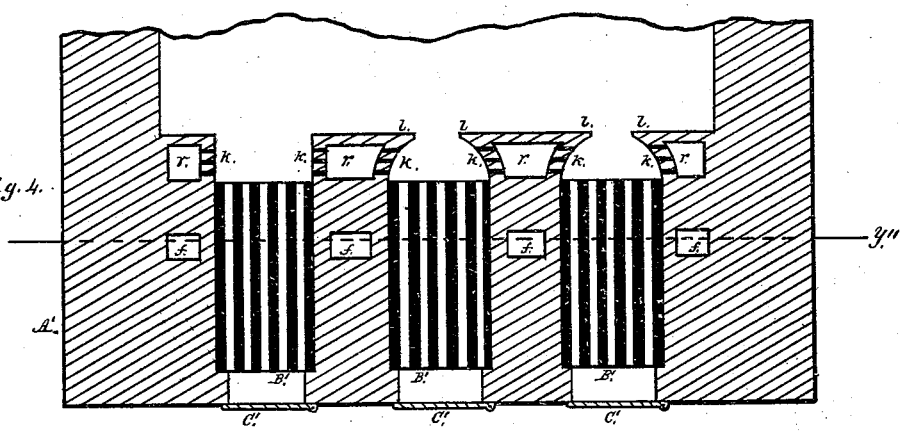
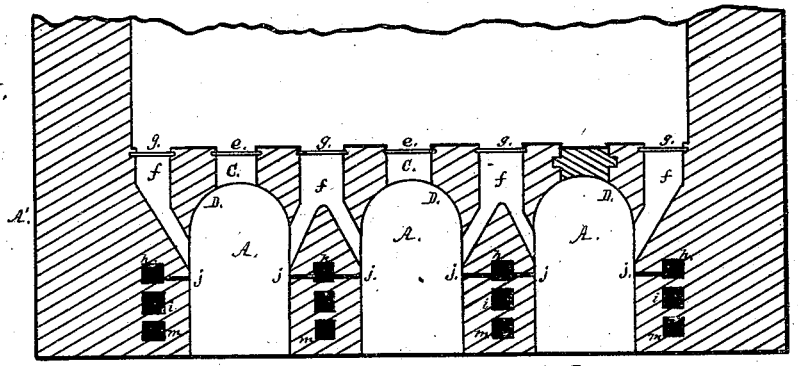


Fig. 5.



Witnesses

A. E. Johnston.

A. H. Johnston.

Inventor

William S. Colwell.

By J. J. Johnston.

his attorney.

UNITED STATES PATENT OFFICE.

WILLIAM S. COLWELL, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **187,217**, dated February 13, 1877; application filed November 27, 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 certain new and useful Improvement in Furnaces for Brick-Kilns; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in furnaces for brick-kilns, and consists in the combination of a series of air-flues with the fire-chamber which communicate with the arches of the kiln, by means of flues and openings so arranged with relation to the fire-chamber that the heat can be controlled, directed, and distributed at the will of the operator, said furnace being constructed in and within the walls of the kiln.

To enable others skilled in the art with which my invention is most nearly connected to construct and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a front elevation of my improvement in furnaces for brick-kilns. Fig. 2 is a top view or plan of the same. Fig. 3 is a vertical section of the same, at line *y* of Fig. 1. Fig. 4 is a horizontal section of the same, at line *y'* of Fig. 3. Fig. 5 is a vertical section of the same, at line *y''* of Fig. 4.

The object of my present improvement in furnaces for brick-kilns is to provide a cheap and efficient means for burning brick constructed of clay which does not easily yield to the action of heat—that is to say, in the language of brick-burners, "hard to burn." The unburned brick next to the front walls of the kiln, when constructed of clay which is hard to burn, requires a very great heat, having velocity, and it is of the utmost importance that the heat be applied in a very direct manner with the shortest travel, so that the interstices between the brick, and between them and the kiln-walls, will be filled with an active and penetrating heat. To this end I construct the furnace in and within the kiln-walls, and furnish the crown of the furnace or fire-chamber with openings and flues that will allow the heat from the fire-chamber to travel directly up the inner face of the kiln-walls, and fill the interstices next to said wall with heat having velocity and penetrating power, which is greatly increased by commingling cold air with the gases of the furnace in manner and by the means hereinafter described.

In the accompanying drawings, A' represent the kiln-walls, which are of the ordinary construction. The fire-chamber A is provided with a grate, B', door C', susceptible of being raised by a pivoted lever, as indicated at *x*, for the purpose of admitting a flow of air under the lower edge of the door and over the surface of the fire on the grate. The bridge-wall B is provided with an air-chamber, *n*, which communicates with the fire-chamber A by means of openings *o*. Air is conducted into the chamber *n* by the flues *m*. Air is conveyed into the fire-chamber by means of the flues *n* and openings *j*, which form a series of communications between the flues *h* and the chamber A. At the back end of the fire-chamber A, and above the bridge-wall B, are two curved and converging walls, *l*, in each of which is an air-chamber, *r*, which communicates with the rear part of the fire-chamber A by means of small openings *k*. Air is conducted into the chambers *r* through the medium of the flues *i*. The crown D of the fire-chamber A extends above the floor *y* of the kiln, and is provided with an opening, C, having a valve, *e*, operated by a rod, *s*. By means of this opening and valve the flow of heat can be regulated with relation to the brick next to kiln-walls, in conjunction with the opening C and valve *e*. The fire-chamber A is furnished with flues *f*, having valve *g*, which flues and valves are for like purpose as that of opening C and valve *e*. By making a series of openings instead of a single opening in the crown D, as indicated at D' in Fig. 2, the valve *e* may be dispensed with; but as I propose making this arrangement the subject of another application for Letters Patent I will not here further describe it. By the arrangement of air-flues communicating with the fire-chamber, air is commingled with the gases of the furnace, which results in complete combustion, and generates an intense heat, which is

distributed by means of the opening C, flues *f*, and controlled by valves *e g*, for the purpose herein specified.

Having thus described my improvement, what I claim as of my invention is—

1. In a furnace for brick-kilns, the fire-chamber A, bridge-wall B, crown D, extending above the floor of the kiln, and having an opening, C, provided with a valve, *e*, the whole being constructed and arranged with relation to the interior of the kiln and its walls, substantially as hereinbefore described, and for the purpose set forth.

2. In a furnace for brick-kilns, the fire-chamber A, hollow perforated bridge-wall B, opening C in the crown D, furnished with a valve, *e*, and flues *f*, having valves *g* constructed and arranged with relation to the interior of the kiln and its walls substantially as hereinbefore described, and for the purpose set forth.

3. In a furnace for brick-kilns, the fire-chamber A, hollow perforated bridge-wall B, opening C in the crown D, furnished with a valve, *e*, flues *f* having valves *g*, and flues *h* and *i* communicating with the fire chamber A by means of perforations *j* and *k*, constructed and arranged with relation to the interior of the kiln and its walls substantially as hereinbefore described, and for the purpose set forth.

4. In a furnace for brick-kilns, the fire-chamber A, hollow perforated bridge-wall B, opening C in the crown D, furnished with a valve, *e*, flues *f*, having valves *g*, flues *h* and *i* communicating with the fire-chamber A, and the converging walls *l* at the rear end of the fire-chamber, constructed and arranged with relation to the interior of the kiln and its walls substantially as hereinbefore described, and for the purpose set forth.

W. S. COLWELL.

Witnesses:
JAMES J. JOHNSTON,
A. H. JOHNSTON.