W. S. COLWELL.

Furnace for Brick-Kilns.

No. 166,749. Patented Aug. 17, 1875.

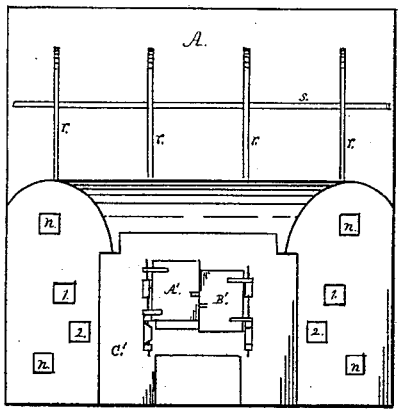

fig: 1.

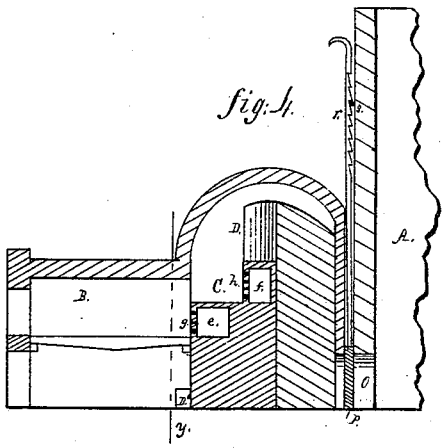

fig: 4.

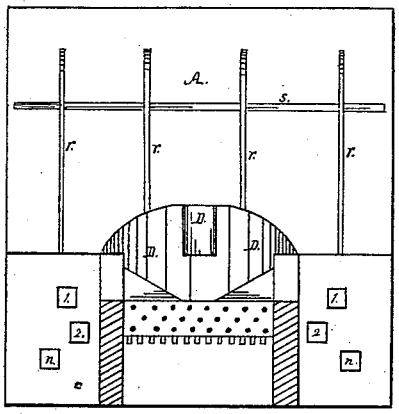

fig: 2.

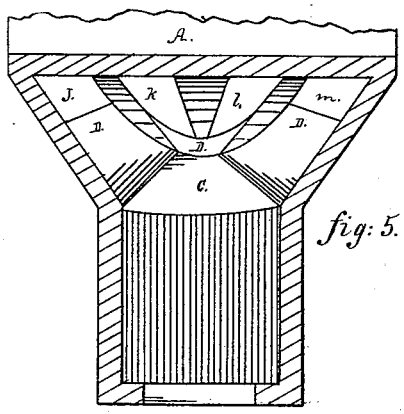

fig: 5.

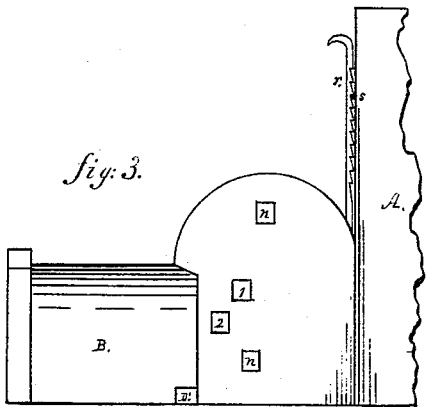

fig: 3.

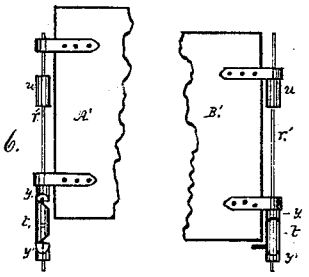

fig: 6.

Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM S. COLWELL, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN FURNACES FOR BRICK-KILNS.

Specification forming part of Letters Patent No. **166,749**, dated August 17, 1875; application filed May 19, 1875.

CASE C.

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 Furnaces for Brick-Kilns and other things; 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 invention relates to an improvement in furnaces for brick-kilns and other purposes; and consists in providing the furnaces with a flame and heat chamber, spreaders, distributing-flues, and air-distributers, so constructed and arranged with relation to the fire-chamber of the furnace that cold air in contradistinction to hot air is distributed in jets forming counter-currents to the currents of the flame and heat in their passage to the fire-arches of the kiln. My invention also consists in providing the hinges of the furnace-doors with eccentrics for raising the doors, so as to admit the desired current of air under their lower edge, and over the upper surface of the bed of fire on the furnace-grate.

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 front elevation of my improvement in furnace, when combined with a brick-kiln. Fig. 2 is a transverse section at line *y* of Fig. 4, representing the crown removed. Fig. 3 is a side elevation of my improvement in furnaces for brick-kilns. Fig. 4 is a vertical section of the same. Fig. 5 is a horizontal section of the same. Fig. 6 is a detailed view of the furnace-doors.

In the accompanying drawings, A represents an ordinary brick-kiln, the mouths of the fire-arches *o* of which are furnished with dampers *p*, to which are secured notched rods or stems *r*. On the sides of the kilns A are secured projecting bars or ribs *s* for the notched rods or stems to catch on for the purpose of holding up the dampers *p*. The furnace B is provided with a flame and heat chamber, C, spreaders D, and flues J *k l m*, which communicate with fire-arches *o* of the kiln A. *e* and *f* are air-flues, which are provided with a large number of small openings, *g* and *h*. The openings 1 lead into the air-flue *f*, and the openings 2 lead into the air-flue *e*. The openings *n* are for the purpose of observing the condition and working of the furnace, and its chamber and flues. The pintles *r'* for the hinges of the doors A' and B' are furnished with stops *u* and eccentrics *t*, which turn on the pintles *r'*. The ends of the eccentrics are beveled or furnished with inclines, and the pieces *y* and *y'* have corresponding bevels or inclines. The pintles *r'* are secured in a fixed position in the pieces *y'*, which are cast on the front plate C' of the furnace. The pieces *y* are loose on the pintles. By turning the eccentric *t*, its end acting on the inclines of the pieces *y* and *y'*, will force the pieces *y* up against the hinges of the doors A' and B', raising them up on the pintles *r'*, as indicated by door A' in Figs. 1 and 6.

By this arrangement of the eccentrics *t*, and the parts connected therewith, the doors A' and B' can be raised to any desired degree for admitting a current of air under them, and over the surface of the fire in the furnace. In the side walls of the furnace at the back end of the ash-pit, and under the grate, are openings D'. Experience has demonstrated that these openings D' cause the fire on the back end of the grate to burn much better, and instead of a dead body of fuel being at the back end of the grate next to the grate-bars, which is usually the case, the fire will be bright and lively.

The operation of my improvement is as follows: The flame and heat of the furnace passing into the chamber C, the cold air, in counterdistinction to heated air, passing from the flues *e f* through openings *g* and *h* will form a counter-current, which, acting against the ingoing flame and heat, will cause complete combustion, and result in production of an intense heat, which, passing down into the flues J *k l m*, will enter the fire-arches and from them distribute through the kiln. By raising the doors A' and B' so that a current

of air will pass under their lower edges, and over the fire in the furnace, it will make the combustion of the fuel more complete, adding much to the heat of the furnace. The operator, by lowering the dampers opposite flues *m l*, can direct the entire flame and heat of the furnace down through flues J *k*, or by lowering the dampers opposite the flues J *k* the heat and flame will pass down through flues *l m*, or all the heat and flame may be directed down a single flue.

It will be readily seen that by the manipulation of the dampers *p* the heat may be distributed through the flues and through the kiln, as may be required, and at the pleasure of the operator.

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

1. The furnace B, provided with chamber C, spreader D, and flues J *k l m*, and air-flues *e f*, with openings *g h*, substantially as herein described.

2. The furnace B, having chamber C, spreaders D, flues J *k l m*, air-flues *e f*, with openings *g h*, in combination with the dampers *p* and fire-arches *o*, substantially as herein described, and for the purpose set forth.

3. The doors A′ B′, provided with pintles *r′*, having eccentrics *t*, pieces *y y′*, and stops *u*, in combination with the furnace B, whereby the doors are adjustable for admitting a current of air under them and over the fire in the furnace, substantially as and for the purpose hereinbefore described and set forth.

W. S. COLWELL.

Witnesses:

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N. B. HATCH.