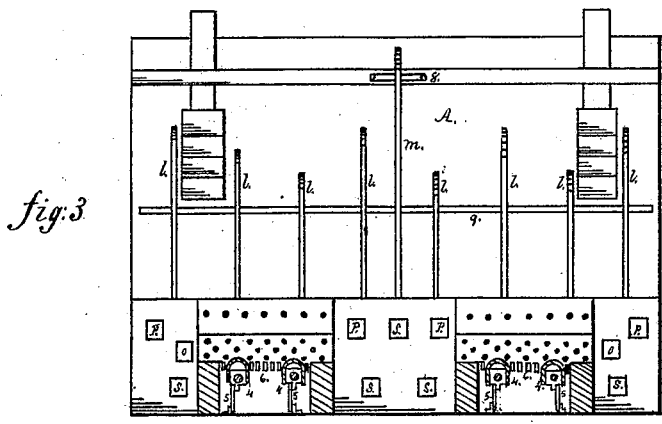
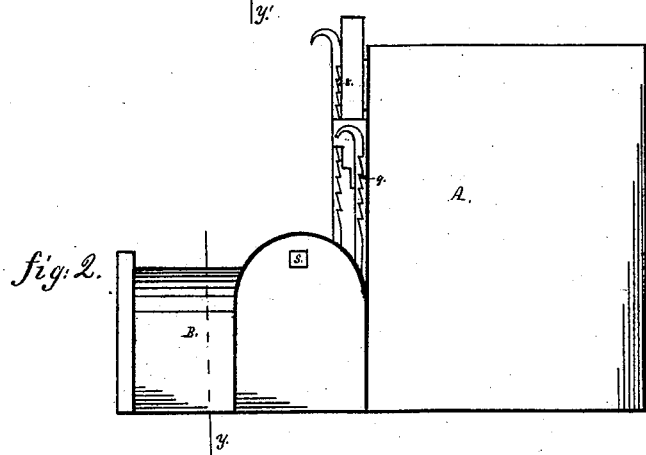
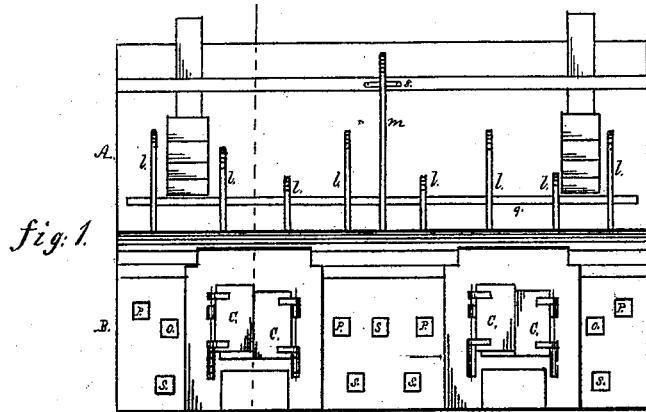


W. S. COLWELL.
Furnace for Brick-Kilns.

No. 167,826.

Patented Sept. 21, 1875.



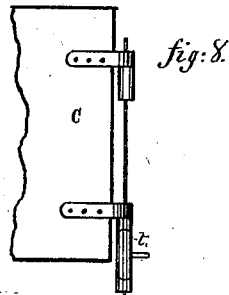
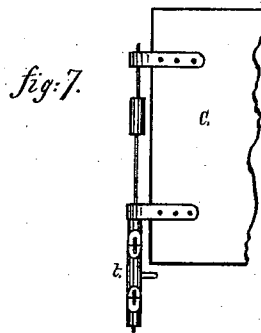
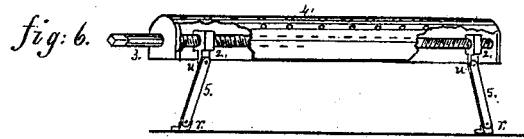
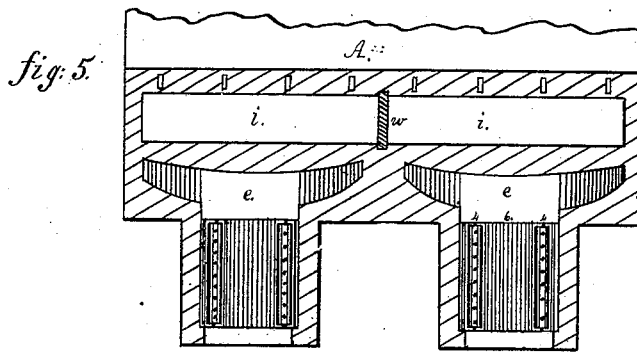
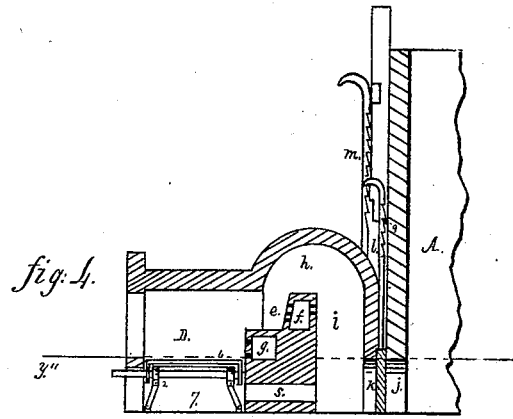
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A C Johnston

Inventor:
W. S. Colwell

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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. **167,826**, dated September 21, 1875; application filed May 19, 1875.

CASE B.

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 purposes; 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 things to be heated; and consists in the combination of a series of air-distributers with relation to the fire-chamber, flame-chamber, and distributing-chamber, the latter provided with an adjustable partition, whereby the heat of the furnaces may be separated or united at the will of the operator, and the heat of one or more furnaces caused to act on any desired part of the kiln.

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 brick-kilns or other thing. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse and vertical section of the same at line *y* of Fig. 2. Fig. 4 is a longitudinal and vertical section of the furnace at line *y'* of Fig. 1. Fig. 5 is a horizontal section of the furnace at line *y''* of Fig. 4. Fig. 6 is a perspective view of the air-distributer for the grate, and of the device used for elevating and depressing it. Figs. 7 and 8 represent sections of the fire-doors of the furnace, and the means used for elevating them, so as to admit air under their lower edges.

In the accompanying drawings, A represents an ordinary brick-kiln, to which is connected my improved furnace B, having a fire-chamber, D, flame-chamber *e*, and flame and heat distributing chamber *i*, with which communicate air-flues *f* and *g*, whereby cold air, in contradistinction to hot air, is distributed in jets, and commingled with the results of combustion in such manner as to form a series of counter-currents with relation to the ingoing

current of flame and gas from the fire-chamber D, thereby securing complete combustion of them and the generation of an intense heat. The grate 6 of the furnace D is provided with air-distributers 4, constructed of cast or sheet metal, furnished with a large number of small perforations. This air-distributer 4 is placed on a shaft, 3, having right-and-left-handed screw-threads thereon, and furnished with screw-nuts 2, to which is attached and pivoted at *u* bars 5, the lower ends of which are pivoted to pieces *r* secured to the floor of the ash-pit 7. By rotating the shaft 3 in one direction, the screw-nuts 2 are caused to travel from each other, thereby elevating the air-distributer 4 with relation to the plane of the grate-bars; and, by rotating the said shaft in an opposite direction, the screw-nuts 2 will travel toward each other, and thereby depress the air-distributers 4 with relation to the plane of the grate-bars. By the use of the air-distributer 4, air is distributed to the fire on the grate-bars in any desired quantity, so as to increase or diminish the consumption of fuel, and thereby increase or diminish the heat of the furnace. The heat-distributing chamber *i* is provided with an adjustable partition, *w*, which, through the medium of the notched rod *m* attached to it, can be raised or lowered at the pleasure of the operator. The notched bar *m* catches on the piece 8, thereby holding the partition *w* in an elevated position. The partition *w* is used for dividing the chamber *i* into compartments with relation to the furnaces B, so that the heat of one or more of the furnaces may be made to act on any desired part of the kiln A, or the heat of one furnace confined and directed to that part of the kiln opposite to the furnace used. The chamber *i* communicates with the fire-arches *j* of the kiln A, and the arches *j* are furnished with dampers K, furnished with notched rods *l*, which catch on the projecting rib 9 on the side of the kiln. By the use of the dampers K and adjustable partition *w* the operator has perfect control of the heat of a single furnace, or of a number of furnaces, and can at pleasure apply the heat of it or them to any one part or all parts of the kiln A. The flow of heat into and through

the fire-arches *j* will depend on the position of the dampers *K*—that is to say, the communication between the chamber *i* and fire-arches *j* can be increased by raising, and diminished by lowering, the dampers *K*. The openings *O* are inlets for air to the flue *f*, and the openings *P* are inlets for air to the flues *g*. The openings *s* are used for viewing the condition of the interior of the furnace, its chamber, and the fire-arches of the kiln *A*.

The devices used in connection with the pintles of the hinges of doors *C* are fully described in my application bearing even date with this, and marked Case *C*; therefore, I will simply say that, by turning the part marked *t*, the doors *C* can be regulated so as to admit air under their lower edge, and over the surface of the fire on the grate *6*. The flame and smoke pass into the chamber *e*, where they become commingled with air passing from flue *g* in jets, and in their ascent upward into the arch *h* a second series of jets of air from flue *f* is commingled with the ascending flame, smoke, and gas, and in their passage down into the distributing-chamber *i* a third series of jets of air is commingled with the descend-

ing flame and gases, and complete combustion with intense heat follows. The air distributed by the distributors *4* of the grate *6*, and by admitting air under the lower edge of the door over the surface of the fire on the grate *6*, perfect combustion of the fuel, with economy of it, follows.

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

1. The furnace *B*, having fire-chamber *D*, flame-chamber *e*, distributing-chamber *i*, air-flues *f* and *g*, arranged, as specified, with relation to said chambers, so that three different series of air-jets are commingled with the results of combustion.

2. The distributing-chamber *i*, provided with an adjustable partition, *w*, in combination with two or more furnaces and a kiln, the fire-arches of which are provided with dampers, substantially as herein described, and for the purposes set forth.

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Witnesses:

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