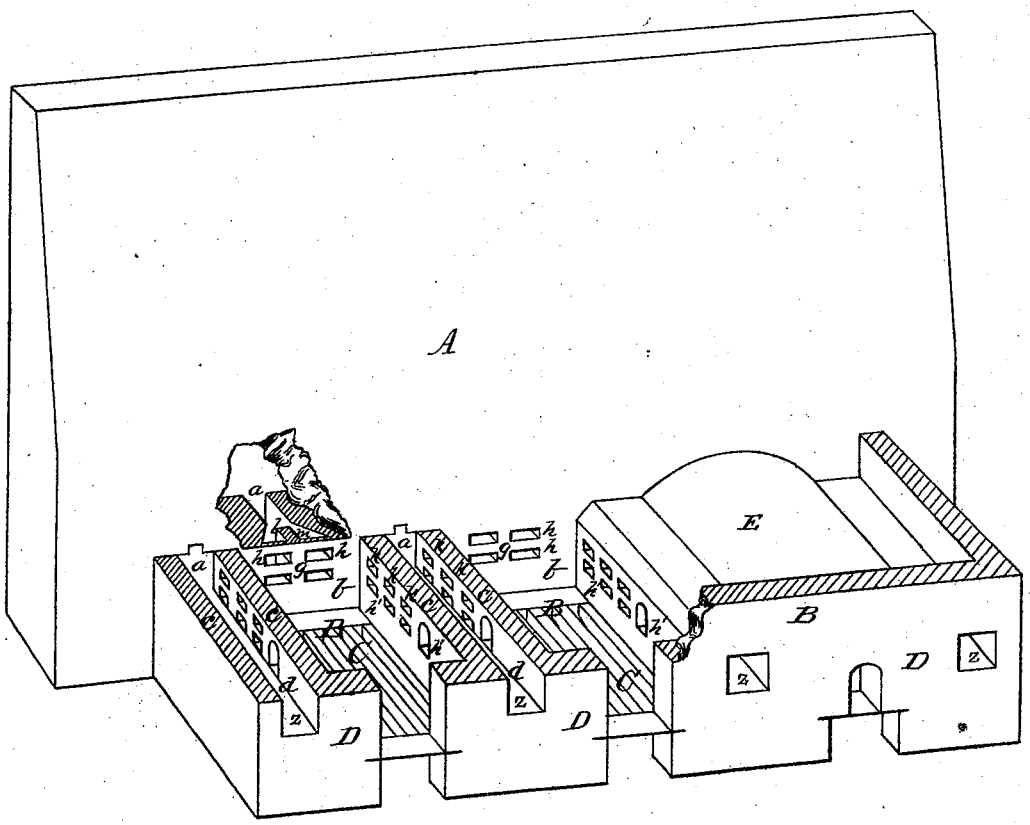
E. W. BINGHAM.

BRICK KILNS.

No. 185,068. Patented Dec. 5, 1876.



WITNESSES

Villette Anderson;
F. J. Masi.

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EDWARD W. BINGHAM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **185,068**, dated December 5, 1876; application filed June 19, 1876.

To all whom it may concern:

Be it known that I, EDWARD W. BINGHAM, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and valuable Improvement in Brick-Kilns; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The figure of the drawing is a representation of a perspective sectional view of a lateral wall of the kiln with furnaces.

This invention has relation to kilns; and it consists in the construction and novel arrangement, in connection with a furnace built against the exterior side wall of a kiln, and having eyes through said wall leading into the kiln-arches, of perforated, pigeon-holed, or reticulated diaphragms or walls between the furnace-chamber and said kiln-arches; of passages through the side walls of a series of furnaces built side by side, at right angles to and against the exterior wall of the kiln, said passages being covered with straight or arched tops, forming the supporting skew-backs for the arched tops of the furnaces; and of lateral flues, communicating with the fire-chambers of said furnaces, and leading directly to the kiln-eyes; also, in the novel combinations of the parts of a kiln referred to, and the modifications thereof, as hereinafter shown and described.

In the accompanying drawings, the letter A designates one of the side walls of the kiln, having eyes *a* leading into the kiln-arches, near its base-line. B B represent the furnaces, built side by side against the wall A, and C C the grates thereof.

In the construction illustrated in the drawings the rear wall of the furnace is formed by the kiln-wall, as shown at *b*, and between the furnaces, or at the sides of the fire-chambers, are built double walls *c* or passages *d* in the furnace-walls, separating the fire-chambers from each other. These passages extend from the front wall D of the furnace to the eyes *a* of the kiln-wall, as shown in the drawings. Between the fire-chamber of each furnace and the kiln-arch in the rear thereof which it is designed to heat is erected a wall or diaphragm, *g*, which is provided with a pigeon-holed arrangement of perforations or passages, *h*, preferably long in the horizontal direction, and narrow from above below, through which the flame, heat, and incandescent gases find their way into the arch of the kiln. These perforations or passages may be made through the walls *c* of the lateral passages *d* between the furnaces, and in this manner several eyes may be connected with each furnace.

The passages *h'* in the dividing-walls between the fire-chambers may be constructed of any shape or size, but preferably as shown in the drawings. They are covered with arched or straight tops *k*, to form supports for the skew-backs for the arched tops E of the furnaces. Dampers may be provided in the passages *d* to regulate the surplus heat and the direction thereof, and thereby the several furnaces can be kept at an even temperature, as the extra heat can be directed into some furnace or adjoining kiln-arch, where the temperature is comparatively low. A further advantage in these perforated walls is exhibited when the furnace-door is opened. Then there is not, as there would otherwise be, a rush of cold air through the fire-chamber directly into the kiln-arch, because a portion of the ingoing blast is drawn through the side passages into the other furnaces, or into the flues *d*, whereby it becomes heated and consumed. This beneficial effect is independent of the advantages derived from the flues *d*, as it arises where solid walls are arranged between the fire-chambers, with passages *h'* through them from fire-chamber to fire-chamber. In this manner the fire-chambers are enabled to be shortened from front to rear, thereby bringing the kiln-eyes within convenient distance of the front of the furnace. In the rear of the fire-chamber the reticulated partition *g* is constructed between said fire-chamber and the eye of the kiln-wall. This diaphragm *g* is usually built up with the kiln-wall and forms a part of it, and, having but little thickness, is supported in rear by a bracing-column, *l*, built up in the expansion *m*, in the front of the eye, and dividing it into two branches which lead to the passages in the diaphragm. One or two of these eyes may be arranged at the back of each furnace, and, at the same time,

the fire-chambers on each side may serve the eye-passages *d* in the dividing-walls between the furnaces, or the furnaces may be detached from each other, so that each furnace shall feed its own rear and side eyes, and no kiln-arch shall communicate with more than one furnace; but for ordinary use the construction illustrated, with rear eyes and eye-passages on the sides of the furnace, is preferred.

The heat of the kiln is regulated by banking coal, clinkers, &c., on the grates against the apertures of the eyes in the rear of the furnaces, and by choking up the side flues *d*, between the fires and the kiln-eyes, with broken fire-brick or other suitable non-combustible material, purposely placed therein, and manipulated through openings *z* in the front wall of the furnace, or other suitable position, to facilitate the operation.

The Y-shaped eye in rear of the furnace is designed to effect an increase of the draft from the contracted rear end, whereby the flames of the incandescent gases will be caused to jet far into the interior of the kiln.

I do not herein broadly claim the combination, with a furnace, of the side flues and the communicating passages.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a vertical kiln-wall and an exterior furnace built against the same, of the reticulated or perforated diaphragm or wall between the fire-chamber and the eyes of said kiln-wall, substantially as specified.

2. The combination, with a kiln-furnace built against the kiln-wall and inclosing one or more eyes formed therein, of lateral flues, having each an eye, *a*, leading into an independent kiln-arch, and the passages *h'* in the side walls of the furnace, connecting the said flue with the furnace, substantially as specified.

3. In combination, with a series of furnaces built against the kiln-wall, and the intermediate smoke-flues *d*, opening into the kiln-arches, the furnace side walls having openings *h'* leading immediately from the furnaces into the said flue, whereby every furnace communicates directly with the adjacent ones, as and for the purpose specified.

4. In a kiln having its furnace built against the kiln-wall, the eye having branches in its furnace end, separated by a supporting-column, and faced by a perforated diaphragm supported by said column, substantially as specified.

5. In a kiln, the combination, with an exterior furnace, of the Y-shaped kiln-wall eye, having a reticulated or perforated facing-wall or diaphragm next the furnace-chamber, substantially as specified.

6. In combination with a series of furnaces built against the kiln-wall, and having one or more eyes opening into the kiln-arches, and the intermediate lateral flues *d*, opening each into an independent kiln-arch, the furnace side walls having openings *h'* leading from the furnaces into the said flues, substantially as specified.

7. The combination, with a kiln-furnace built against the kiln-wall, of lateral flues leading into the eye of said wall, and external openings in said flues for manipulating broken fire-brick or other material in damping, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

EDWARD W. BINGHAM.

Witnesses:
WALTER C. MASI,
F. J. MASI.