

E. W. BINGHAM.
BRICK-KILN.

No. 178,715.

Patented June 13, 1876.

Fig. 1.

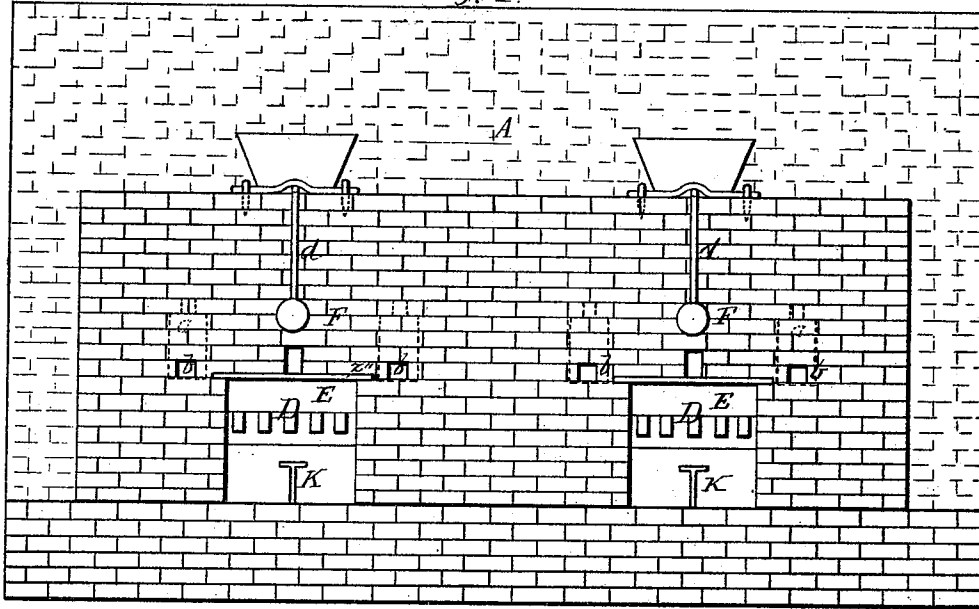
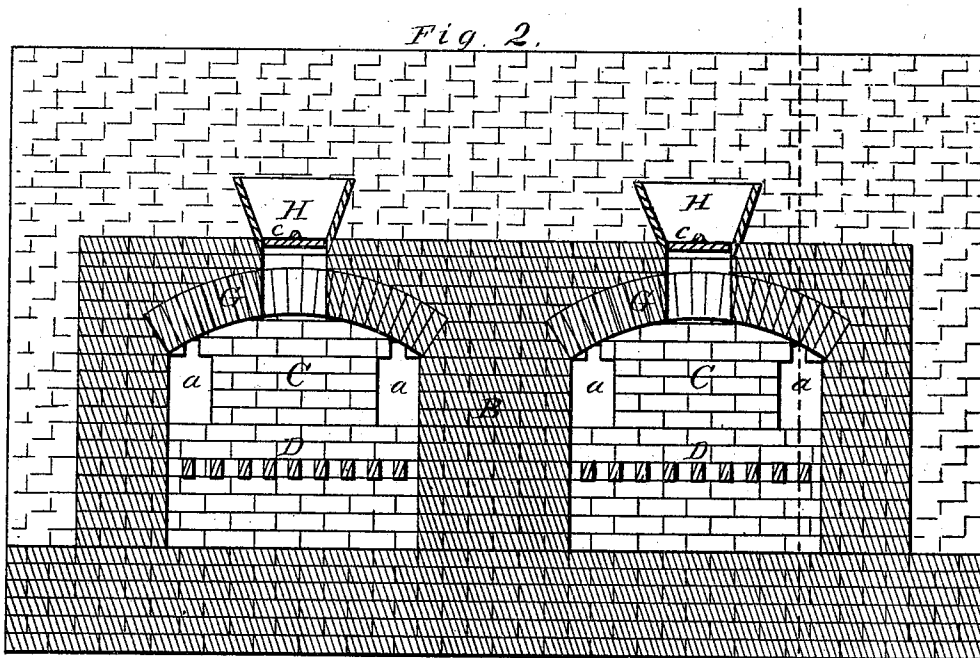


Fig. 2.



WITNESSES

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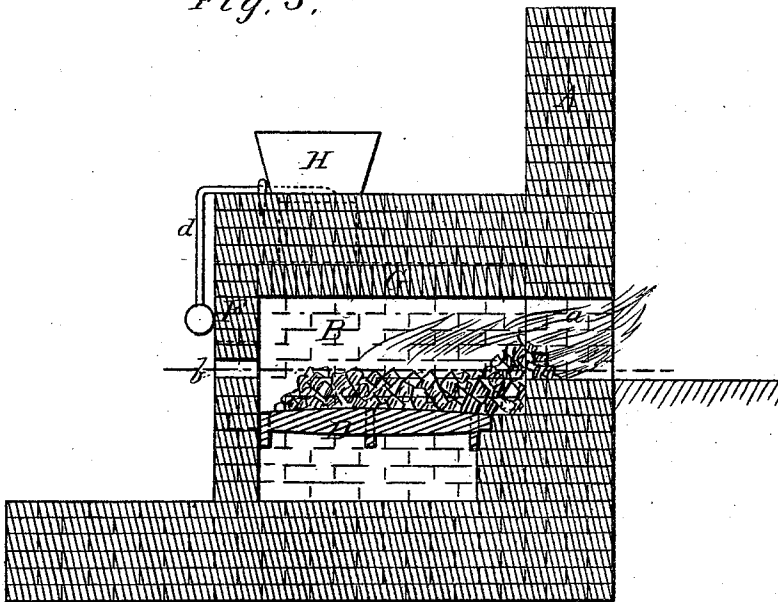
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Fig. 3.



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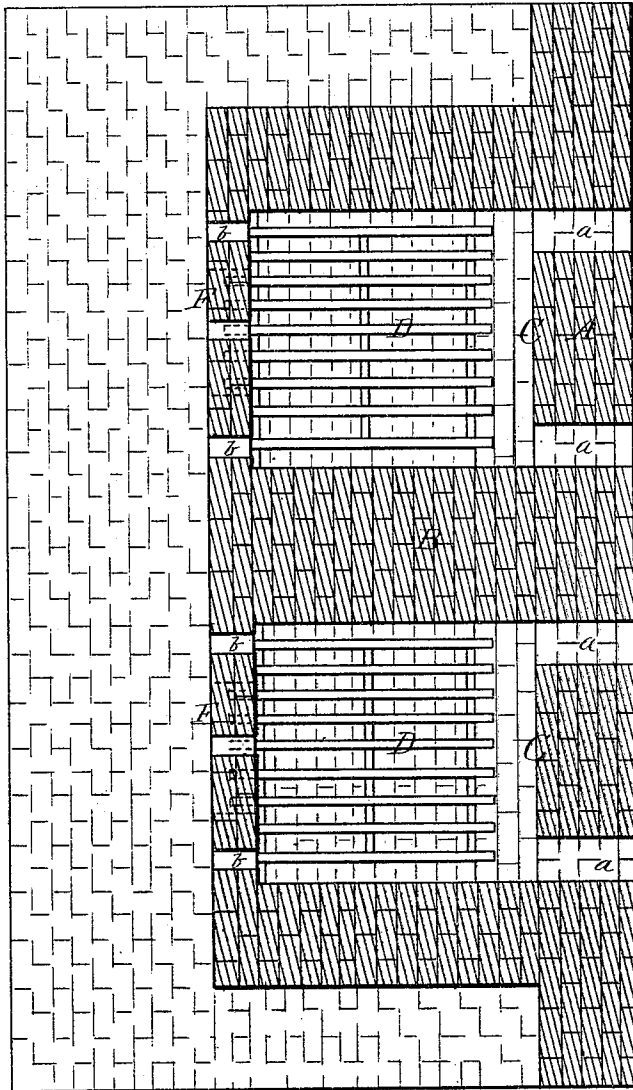
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Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD W. BINGHAM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. 178,715, dated June 13, 1876; application filed May 6, 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.

Figure 1 of the drawings is a representation of a front view of the side wall of a kiln, showing the firing-chambers. Fig. 2 is a vertical section of the firing-chambers parallel with the kiln-wall. Fig. 3 is a vertical section through the furnace and kiln-wall, at right angles to the latter; and Fig. 4 is a horizontal section through the eyes of the kiln.

This invention has relation, mainly, to the construction of kilns for burning brick and tile; and it consists, mainly, in forming a series of separated fire-chambers immediately adjacent to the kiln-wall on the outside, in such a manner that the rear of each furnace or firing-chamber will be formed by so much of the exterior face of the kiln-wall as connects two or three of the eyes or openings to the arches of the kiln at the bottom of said wall; in the construction and novel arrangement of rake-holes opposite to said eyes in the front walls of the firing-chambers, to facilitate the regulation and control of the draft into the arches by banking the coal at the eyes; in the combination, with a kiln and firing-chambers of the character described, of suitable steam-jets, to facilitate the burning of semi-bituminous and other slack coals; and, finally, in the mode of damping the heat in the arches by the proper heaping of the coal at the eyes between the fire and said arches, all as herein-after fully shown and described.

The object of the present invention is mainly the production of a kiln of economical structure and operation, in which the fire-chamber will be sufficiently removed from the ware to prevent the spoiling of the nearer bricks in the arches by irregular heat, and, at the same time, sufficiently close to secure in the kiln the benefit of a flame heat to the uppermost

layer, in which the draft can be easily regulated, and cheap fuel can be used, and, finally, in which the brick or other ware can be uniformly burned in all parts of the pile.

In the accompanying drawings, the letter A designates the side walls of the kiln proper, between which the green ware is piled in the usual manner. The kiln is of the usual rectangular form, having eyes *a* or openings through the kiln-wall to the arches in the green bricks at the base of the kiln, the eyes being arranged at the usual distance apart, each eye leading into an independent arch.

B designates the side walls of the furnaces or firing-chambers, which abut against the exterior face of the kiln-wall A in such a manner as to inclose between the two side walls of each chamber two eyes, and the kiln-wall section between and over them to the arched top of the fire-chamber, said wall-section forming the rear wall C of each furnace.

D represents the grate in each firing-chamber, upon which the coal is placed. This grate is about on a level with the floor of the kiln, and is designed to extend to or nearly to the eyes *a*.

In practice the side walls of these furnaces will be about five feet in length, so that the dimensions of the grates employed will not be too small to enable a steady fire to be preserved, nor too large for economy of construction and convenience of working. In fact the ordinary boiler-grates for steam-boilers will answer a very good purpose with little or no change.

E designates a narrow opening in the front wall F of the furnace, independent of the door or chute therein, and above the front edge of the grate, extending along the same from side to side, and bounded above by a supporting-plate, *g*, to facilitate the cleaning of the latter without admitting an objectionable quantity of atmospheric air. The front walls of the firing-chambers are designed to be provided with suitable draft openings or flues, which may run in and through the walls in any desired direction. Opposite and in line with each of the eyes *a* of the kiln-wall is arranged an opening, *b*, in the front wall of the firing-chamber. These openings or rake-holes *b* are usually about five feet distant from the

opposite eyes *a*, and are designed to serve mainly for the introduction and use of an iron coal-rake of suitable length to be easily handled in operating at the end of the grate next the kiln-wall.

The object of this construction is, therefore, to facilitate the banking or heaping of the coal in and against the eyes *a* in such a manner as to close them partially or wholly for a short time, with dampers of coal between the fires and the arches, and to remove the coal-dampers when necessary for the proper regulation of the draft. *G* indicates the arched top of the firing-chamber, which, in these furnaces, is of moderate height and well proportioned, and arranged for durability and economy of construction. The side walls *B*, upon which these arches rest, are arranged in the intermediate furnaces of the series, to be common to two of the firing-chambers, so that the pressure of the arches is mutually sustained. The side walls *B* and the arched top *G* completely separate each firing-chamber from the other fire-chambers and kiln-arches. Therefore, it is not possible for a few of the series of kiln-arches, when raised to a higher heat for the time being, to obtain control of the series of furnaces, and, by drawing the heated products of combustion to themselves, overburn their contents. *H* represents a coal-chute, arranged at the top of each furnace for feeding the coal in upon the grate. This chute may be provided with a tilting valve, *c*, balanced by a weighted arm, *d*, and hinged in front to open with an inclination toward the middle and rear of the grate, where the coal is preferably deposited.

Sometimes it may be advisable to arrange the coal-chute in the front of the furnace.

K indicates a steam-jet, which may be introduced into each furnace to facilitate the con-

sumption of semi-bituminous slack coals. This fuel is economical, and serves an excellent purpose in this kiln, producing, with a steam-blast, sufficient flame to be effective in the uppermost layers of the ware, and being easily banked for damping in regulating the draft through the eyes *a* between the fires and the arches of the kiln.

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

1. In a kiln, the process of damping the heat in the kiln-arches by heaping the coal at the eyes between the fire and said arches, substantially as specified.

2. The steam-blast opening *K*, in combination with a kiln-wall, *A*, having eyes *a* separated from each other by kiln-wall spaces *C*, and leading into the kiln-arches, and a furnace inclosing two of said eyes *a* and the kiln-wall space *C*, substantially as specified.

3. The fire-chamber *D*, abutting against the kiln-wall, and inclosing two spaced horizontally-arranged eyes, *a*, each eye leading into its own separate kiln-arch, and the kiln-wall section *C* between said eyes forming the back of the fire-chamber, combined and arranged substantially as specified.

4. The rake-holes *b*, formed in the front of a furnace, in line with the eyes *a*, leading into the kiln-arches, in combination with a furnace inclosing two of the said kiln-eyes and the kiln-wall space *C*, intermediate thereto, 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:

F. I. MASI,

WALTER C. MASI.