E. W. BINGHAM.

Brick-Kiln

No. 204,651. Patented June 11, 1878.

Fig. 1

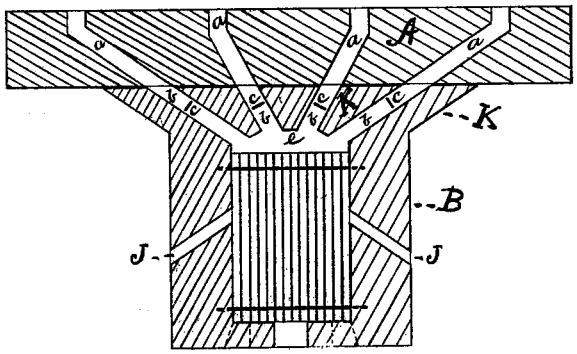


Fig. 2.

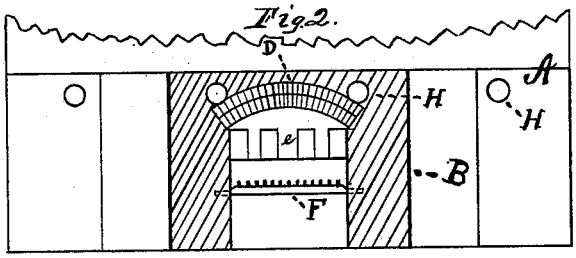
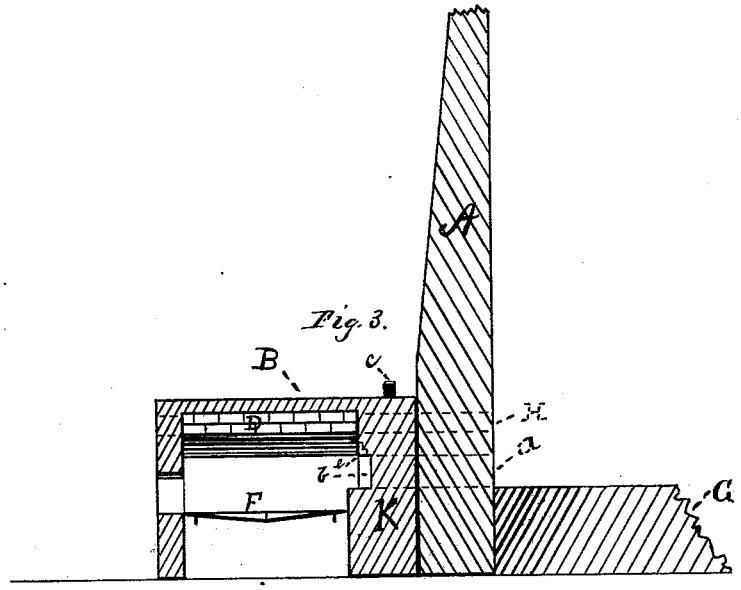


Fig. 3.



WITNESSES

J. Walter Fowler,

Wm H Shaw

INVENTOR

Edward W. Bingham

By

Attorney

UNITED STATES PATENT OFFICE.

EDWARD W. BINGHAM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **204,651**, dated June 11, 1878; application filed May 13, 1878.

To all whom it may concern:

Be it known that I, EDWARD W. BINGHAM, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Brick-Kilns, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a horizontal section through the eyes of the kiln. Fig. 2 is a vertical transverse section through the furnace. Fig. 3 is a vertical longitudinal section through the furnace and kiln-wall.

The object of my invention is to furnish a superior style of kiln and furnaces in connection therewith for burning brick and tile.

It consists, mainly, in forming a series of bent or curved eyes or flues through the main side walls of a kiln, in connection with a series of corresponsively bent or curved flues in the rear walls of a furnace constructed adjacent to the kiln-wall, so that one furnace of small width may fire a section of kiln of much greater expanse.

It also consists in forming bent eyes in the side walls of a kiln and bent or spreading flues in the rear walls of a furnace constructed adjacent to the kiln-wall, in such a manner as to enable dampers to be introduced and operated in the flues between the furnace-chamber and the kiln-arches in an advantageous manner.

It also consists in forming the rear end of the furnace-chamber concave or rounded, in such a manner that several arches situated to the rear and to the side of the furnace may be more equally heated than by furnaces of similar construction, but with straight walls across their rear ends, where several flues are brought into the rear end of the furnace-chamber. Forming the rear end of the furnace-chamber concave results also in this advantage over the ordinary construction, that it avoids all sharp points or angles in the masonry-work, which are naturally liable to injury, and are troublesome to construct.

In this kiln the brick to be burned are set in the ordinary way, with arches extending across the kiln from side wall to side wall in the bottom of the pile. These arches serve for distributing the heated gases discharged into their mouths through bent kiln-wall eyes and flues from furnaces situated adjacent to the outer sides of the kiln-walls.

Kilns have been designed with furnaces constructed against the outer side of the kiln-wall, so that a section of the kiln-wall forms the rear wall of the furnace-chamber. Such a construction is described in patent granted to E. W. Bingham, Reissue No. 7,504, dated February 13, 1877. The disadvantage in such construction is that when the furnace-chamber is of the most economical width it is capable of inclosing but two kiln-wall eyes, and the other eyes are necessarily brought through the side walls of the furnace and under the skew-backs or supports of the arch or crown of the furnace-chamber. The weight of the arch is liable to break through the covering of these side eyes. The draft entering the doorway and front of the furnace has a tendency from its momentum to pass across the mouths of the side eyes and enter the rear or middle eyes, so as to overheat these eyes and kiln-arches, and not sufficiently heat the side eyes.

Other kilns have been designed with straight eyes through the kiln-wall, but with bent or curved flues extending beyond and centering in a furnace-chamber spaced a short distance from the outer face of the kiln-wall; but such constructions, if employed to burn a considerable expanse of kiln, necessitate the removal of the furnace-chamber to so great a distance from the burning-chamber of the kiln that a large amount of heat is lost, besides resulting in other drawbacks.

This construction is designed to combine the advantages of both these old styles of construction without their disadvantages, besides producing results in the burning and advantages in the construction and operation not to be obtained from either of the others alone.

In this improved kiln the furnace is constructed adjacent to the outside face of the kiln-wall, with front, side, and rear walls of its own, the rear wall preferably hollowed out so as to give a rounded form to the upper and rear part of the furnace-chamber. Spreading flues, either bent or curved, extend from the rear end of the furnace-chamber to the outer ends of the bent or curved eyes in the kiln-

wall which lead into the mouths of the kiln-arches. Like furnaces and walls are constructed on the opposite side of the kiln, the side walls of the kiln being spaced from each other about twenty-six feet for the reception of the brick to be burned.

In the drawings, A designates one of the two vertical side walls of a kiln. *a a* are the bent eyes located within the kiln-wall. *b b* are the diverging flues in the rear wall K of the furnace B. *c c* are the dampers, preferably operated from above, for regulating the draft from the furnace into the kiln-arches. *e* is the rounded rear end of the furnace-chamber. D is the arch or crown over the furnace-chamber. F is the grate, situated about nine inches below the floor of the kiln. G is the floor of the kiln, made solid with earth, and paved. H are the peep-holes for observing the temperature of each particular kiln arch. J are the rake and draft regulating holes. The doorway and rake-hole openings in the furnace, also the peep-holes, are each provided with suitable doors. The holes through which the dampers *c* are operated may be used for admitting a current of cool atmospheric air into some particular flue and kiln-arch, as is sometimes found desirable in the course of burning.

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

1. In a kiln for burning brick, the combination of a furnace-chamber having its end nearest the kiln rounded with several curved or bent flues each leading into a particular kiln-arch, substantially as shown and described.

2. In a kiln, the combination of the furnace B with its diverging flues *b* and the bent or curved kiln-wall eyes *a* leading into a particular kiln-arch, substantially as shown and described.

3. In a kiln, the combination of a furnace built adjacent to the outside of a kiln-wall, and having the spreading flues *b* through its rear wall, with a kiln-wall having the bent or curved kiln-wall eyes *a*, each furnace-flue and its corresponding kiln-eye leading into a separate kiln-arch, substantially as shown and described.

4. In a brick-kiln, the combination, with a furnace-chamber separated from the kiln-wall by a rear wall, K, and having the flues *b*, of the bent kiln-wall eyes *a*, whereby said furnace may be made to burn several kiln-arches, substantially as shown and described.

5. The combination of a furnace built adjacent to the outside of a kiln-wall, and having the end of its chamber nearest the kiln-wall rounded, with two or more curved or bent flues connecting said furnace-chamber with two or more separate kiln-arches, 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:
S. S. KIRK,
T. WALTER FOWLER.