

N. B. HEAFER.
Brick and Tile Kiln.

No. 210,692.

Patented Dec. 10, 1878.

Fig. 1

Fig. 2

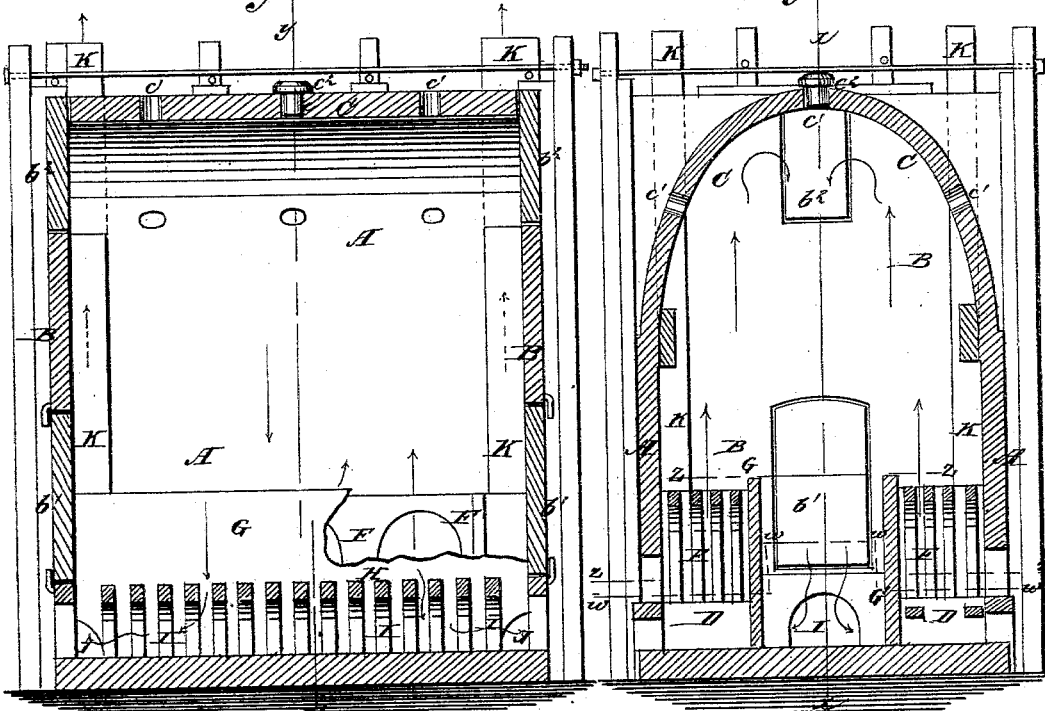
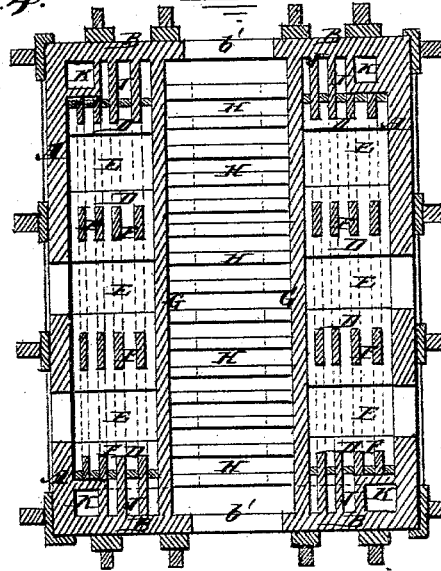
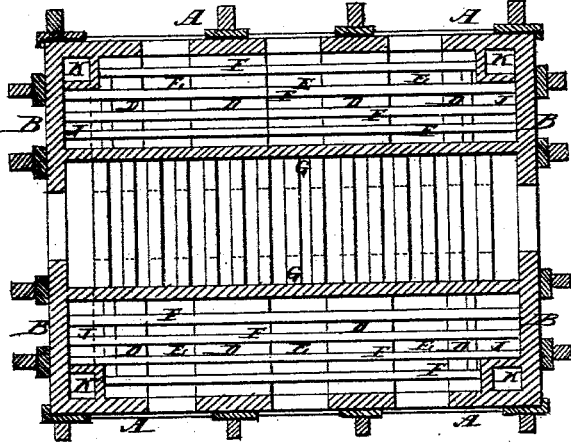


Fig. 4

Fig. 3



WITNESSES:

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NAPOLEON B. HEAFER, OF BLOOMINGTON, ILLINOIS.

IMPROVEMENT IN BRICK AND TILE KILNS.

Specification forming part of Letters Patent No. **210,692**, dated December 10, 1878; application filed August 24, 1878.

To all whom it may concern:

Be it known that I, NAPOLEON B. HEAFER, of Bloomington, in the county of McLean, State of Illinois, have invented new and Improved Tile-Kilns, of which the following is a specification:

Figure 1 is a vertical longitudinal section of my improved kiln, taken through the line *xx*, Fig. 2. Fig. 2 is a vertical cross-section of the same, taken through the line *yy*, Fig. 1. Fig. 3 is a detail section taken through the broken line *zzzz*, Fig. 2. Fig. 4 is a detail section taken through the line *wwww*, Fig. 2.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved kiln for burning tile, brick, pottery, or any other clay wares, which shall be so constructed that the heat shall pass directly through the wares in its upward course, and thus produce better results than it would if separated from them by a fire-wall or bag, as is usual in a down-draft kiln, and in which the draft can be so controlled by means of the chimneys as not to produce such a severe heat as would crack the ware during the heating-up process, and in which the ware in all parts of the kiln shall be burned equally, so that a piece taken out of any part of the kiln will serve as a sample of the whole.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

A represents the side walls, B represents the end walls, and C represents the top or arch, of a kiln. D are clamp-benches, which are built alternately with the furnaces E, and are made of such a length as to extend about one-third of the distance across the kiln, leaving a space of about one-third of the distance across the kiln between the inner ends of the opposite benches. These benches D form the side walls of the furnaces E, and consequently there must be one more bench than furnaces upon each side. From the benches D, as bases, are sprung arches F, which may be eight inches wide and eight inches deep, or of any other desired size. The arches should be about four inches from each other, and the first arch should be about four inches from the side wall, thus forming spaces through which

the products of combustion pass up into the kiln.

If desired the benches D may be omitted, and the arches F sprung from the ground, or from the ash-pit walls, if said walls are constructed as a part of the kiln.

The spaces between the convex sides of the arches are filled up to form a level floor to set the ware upon.

The doorways of the furnaces E may be in the side walls of the kiln-clamp, or they may be outside of the said side walls, as may be desired.

G are two fire-walls, extending from one end wall of the kiln to the other. The fire-walls G may be close to the inner arches, F, or about four inches from them, as may be desired. In the latter case one more fire-space will be formed from each furnace. With this construction the tendency of the products of combustion to pass into the middle part of the kiln is checked by the fire-walls G, and the said products are compelled to pass up through the fire-spaces between the arches F and through the ware upon the said arches. The products of combustion, as they rise, come in contact with the main arch C and follow it to its crown, where they pass down, spreading themselves among the ware in the middle part of the kiln, and then pass through the short cross-flues, H, between the fire-walls G, and enter the long flue, I. From the ends of the long flue, I, cross-flues J lead to the chimneys K, and conduct the products of combustion into said chimneys K. The chimneys K are built at or near the corners of the kiln, pass up through the arch C, and rise into the air as high as may be desired. In the arch, top, or cover C are formed a number of holes, *c*¹, which may be opened to serve as outlets for the steam developed during the first stages of the burning, which steam, if compelled to pass downward through the ware in the middle part of the kiln, would have a tendency to rot or injure the said ware. The holes *c*¹ also serve as feed-holes when it is desirable to furnish the fire with fuel at the top. The said holes are also convenient for inspecting the ware, and should be furnished with caps or covers *c*², so that they can be closed when desired.

In each of the end walls B are formed two

doors—one, b^1 , in the lower part, and the other, b^2 , in the upper part, of the said wall—the upper door, b^2 , being used for filling and emptying the kiln when the ware cannot be put in and taken out through the lower door, b^1 , conveniently.

If desired, the flue I may be made large, continued through both the end walls B, and provided with an opening at each end, so that a man may enter it to clean it and the cross-flues. With this construction the flue I may also serve as a furnace if it should be desired to use the kiln as an up-draft kiln. In this case the holes c^1 in the arch C should be opened.

With kilns constructed in this way less fuel will be required, as the heat is more completely utilized, owing to the number of times the products of combustion are compelled to pass through the wares.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A down-draft kiln provided with a set of arch-furnaces along each side wall, extending inward about one-third the breadth of the said kiln, and having fire-spaces formed through their arches, substantially as herein shown and described.

2. The combination of the arch-furnaces F, the fire-walls G, the cross-flues H, the longitudinal flue I, and the outlet cross-flues J with the four chimneys K, substantially as herein shown and described.

NAPOLEON B. HEAFER.

Witnesses:

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