No. 663,141. Patented Dec. 4, 1900.

W. WALKER & H. W. CROFT.

FORMING CLAY BLOCKS.

(Application filed Mar. 29, 1900.)

(No Model.)

Fig. 1.

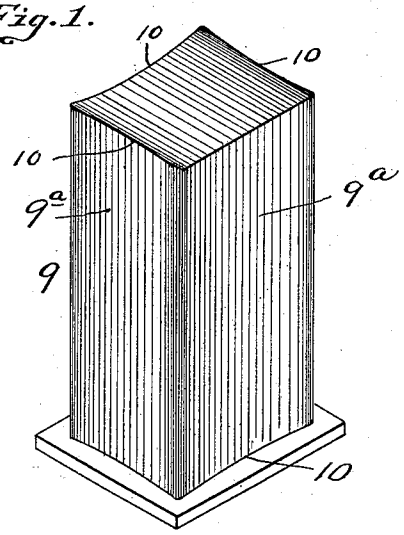


Fig. 2.

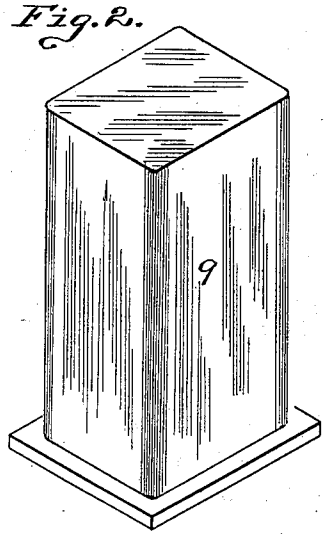


Fig. 3

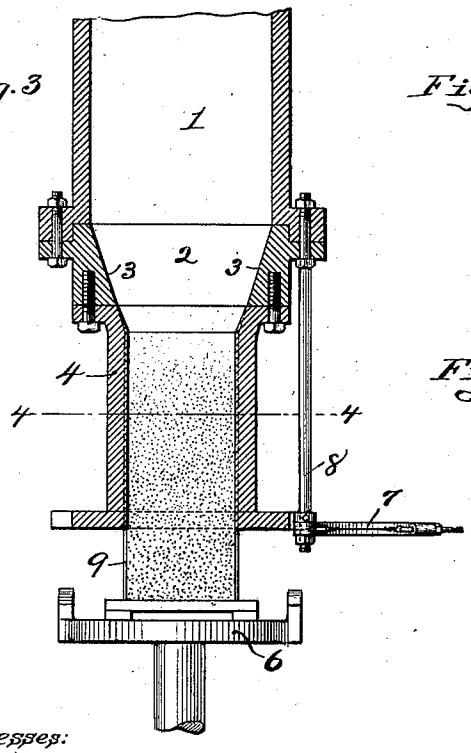


Fig. 4.

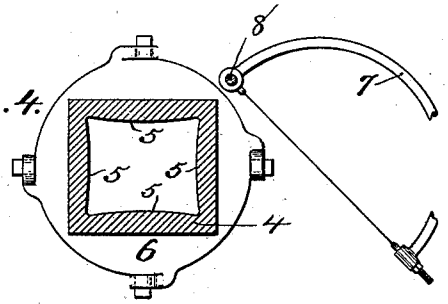
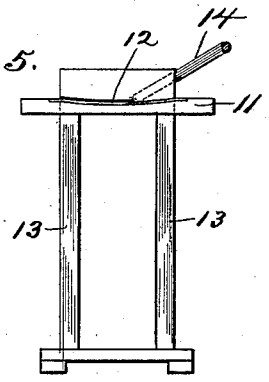


Fig. 5.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM WALKER, OF ALLEGHENY, AND HARRY W. CROFT, OF PITTSBURG, PENNSYLVANIA.

FORMING CLAY BLOCKS.

SPECIFICATION forming part of Letters Patent No. 663,141, dated December 4, 1900.

Application filed March 29, 1900. Serial No. 10,636. (No specimens.)

To all whom it may concern:

Be it known that we, WILLIAM WALKER, a resident of Allegheny, and HARRY W. CROFT, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Forming Clay Blocks; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to the manufacture of clay blocks or bricks, its object being to produce the same with flat or parallel faces, so that such blocks or bricks will fit close to each other in the building or lining of furnaces, hearths, &c. These blocks or bricks have heretofore been made by forming them with flat parallel faces in dies conforming exactly to the finished block to be produced; but it is found that after the block leaves the die the sides assume a slightly-convex shape, so that the blocks will not fit close to each other, as is particularly desirable in connection with the building of glass-furnaces, blast-furnaces, hearths, and like work, where it is important for the blocks to fit closely to prevent flux materials from working into the joints. This defect is particularly noticeable in heavy large blocks containing a large mass of clay. The reason for this is not absolutely understood, though it is believed to arise from the air occluded in the mass of clay and brought under compression in passing through the die and which gradually thereafter expands and changes the form of the block. Heretofore in order to make such blocks or bricks fit close to each other it was found necessary to grind their surfaces to a straight line after the material was dry. This, however, destroys the natural glaze given the material in the die and not only weakens the blocks, but also diminishes their power to resist the action of flux materials.

The object of our invention is to overcome this defect in the making of such clay blocks or bricks; and it consists in forming them with slightly-concave faces and then permitting them to expand in the drying or burning to form practically straight or flat faces to the block.

Our invention has been found to be especially advantageous in connection with the making of large heavy fire-clay blocks, and the manufacture of such blocks has therefore been illustrated in describing the invention.

To enable others skilled in the art to practice the invention, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a perspective view of a block made in accordance with our improvements, indicating its shape as it passes through the dies, the concavity of the sides of the block being somewhat exaggerated. Fig. 2 is a perspective view of the same block with the sides expanded to form flat sides. Fig. 3 is a longitudinal section of the press and die used for forming the blocks, showing the convex sides of the die which form the concave sides of the block. Fig. 4 is a cross-section of the die on the line 4 4, Fig. 3. Fig. 5 is a view in side elevation of the stool used in forming a concave end face on the block.

As a means for producing the blocks we employ the ordinary fire-clay press 1, having the bowl 2 at the base thereof, with gradually-tapering sides 3, and the die or nozzle 4 secured thereto. The clay is forced down into the bowl and through the die by any suitable means. The sides of the die are made slightly convex, as at 5, the degree of convexity depending upon the width and thickness of the blocks and the bulk of clay present, it being practical to ascertain just what is the proper amount of convexity to be given to the die to produce the flat sides on a block of given bulk. For example, with a stiff body of clay a convexity of three thirty-seconds of an inch in a width of about fourteen inches is found to be substantially correct in order to produce the straight sides or faces of the blocks, though of course this is to be varied as found necessary. On leaving the die the formed block or brick is received on the receding table 6, as is usual in this type of machine, and when of sufficient length is cut off by the wire knife 7, secured to the rock-shaft 8, journaled on the side of the die and press.

In making blocks in accordance with our improved method the clay is brought to the proper consistency and is fed to the press and forced into the bowl 2 and through the die or nozzle 4, the blocks 9 being cut therefrom

when of the proper length. In passing through the die 4 the convex faces 5 of the latter give the side faces 9^a of the blocks a slightly concave form, as shown at 10, Fig. 1, and inasmuch as the die 4 is of considerable length the pressure of the convex faces 5 of the die on the side faces of the blocks is continued for such a length of time that the form of the block will become fixed, so that there is no danger of the sides of the block bulging out as soon as the block emerges from the die. After the blocks are so formed they are placed on a suitable drying-floor and permitted to dry before baking, and it is found that in the drying they expand through the occluded air under compression in the blocks or from some other cause, so that the concave faces 10 are brought out practically parallel or flat. It is found possible by our method to form blocks with much flatter side faces than was possible with the old method.

In some cases it is found desirable to form the block with concave end faces as well as concave side faces. As a convenient means for doing this a frame or "stool," as it is called, is slipped over the block, as shown at Fig. 5. The stool comprises a horizontal rectangular frame 11, provided with concave top surfaces, as shown at 12, the frame having four legs 13 depending therefrom. The stool is slipped over the block, as shown, and by means of a wire knife 14, guided on the concave surfaces 12, the upper end of the block is cut off to form the desired concave end face. This face is then smoothed down with a paddle or other suitable tool to give the desired glaze to the finished block.

In the drying of the blocks they become set ready for burning and remain of practically the same shape throughout the burning operation, and the blocks so produced have sides or ends which are practically flat or parallel.

No claim is made herein for the apparatus herein described, as that forms the subject-matter of a separate application, Serial No. 20,687, filed June 18, 1900.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The improvement in the art of making fire-clay or like blocks, consisting in forming the blocks with one or more slightly-concave faces, maintaining said block in such form for such a period of time that its shape shall become fixed, and then drying or burning the same, the degree of concavity being such that the expansion of the block in drying or burning will form substantially flat or parallel faces.

2. The improvement in the art of making fire-clay or like blocks, consisting in forming the blocks under pressure with one or more slightly-concave faces, maintaining such pressure for such a period of time that the form of the block shall become fixed, and then drying or burning the same, the degree of concavity being such that the expansion of the block in drying or burning will form substantially flat or parallel faces.

3. The improvement in the art of making fire-clay or like blocks, consisting in forming the blocks under pressure with opposing side faces slightly concave, and then drying or burning the same, the degree of concavity being such that the expansion of the block in drying or burning will form substantially flat or parallel faces.

4. The improvement in the art of making fire-clay or like blocks, consisting in forming the blocks under pressure with slightly-concave side faces, cutting off one end to form a slightly-concave end face, and subsequently permitting them to expand in drying or burning to form substantially flat or parallel side and end faces.

5. The improvement in the art of making fire-clay or like blocks, consisting in forming the blocks under pressure with slightly-concave side faces, cutting off one end to form a slightly-concave end face, smoothing said end face to impart the desired glaze, and subsequently permitting them to expand in drying or burning, forming substantially flat or parallel side and end faces.

In testimony whereof we, the said WILLIAM WALKER and HARRY W. CROFT, have hereunto set our hands.

WILLIAM WALKER,
HARRY W. CROFT.

Witnesses:
HARRY G. WISEMAN,
ROBERT C. TOTTEN.