

R. B. COOPER.
HOLLOW CHANNEL BRICK AND WALL CONSTRUCTION.
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1,347,533.

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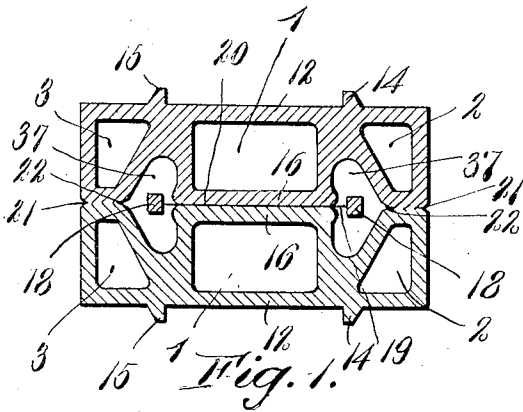


Fig. 1.

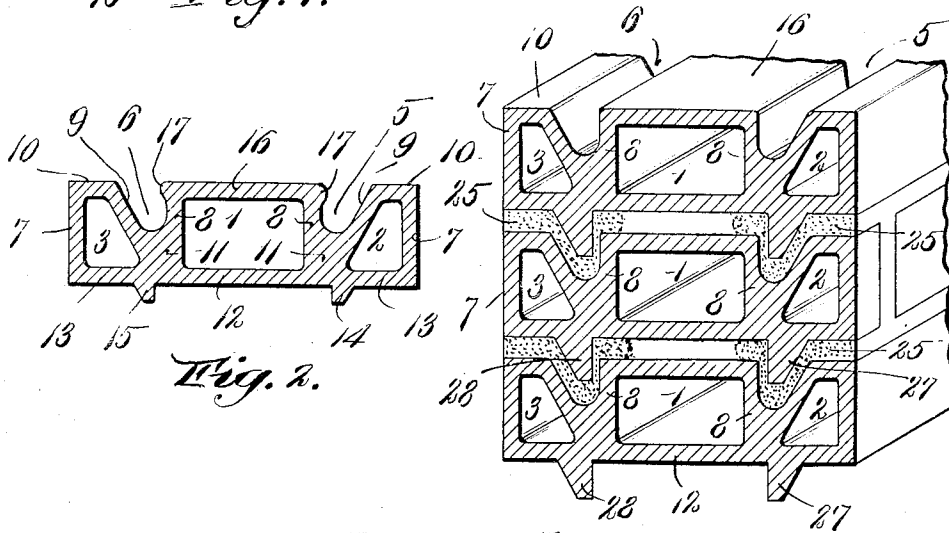


Fig. 2.

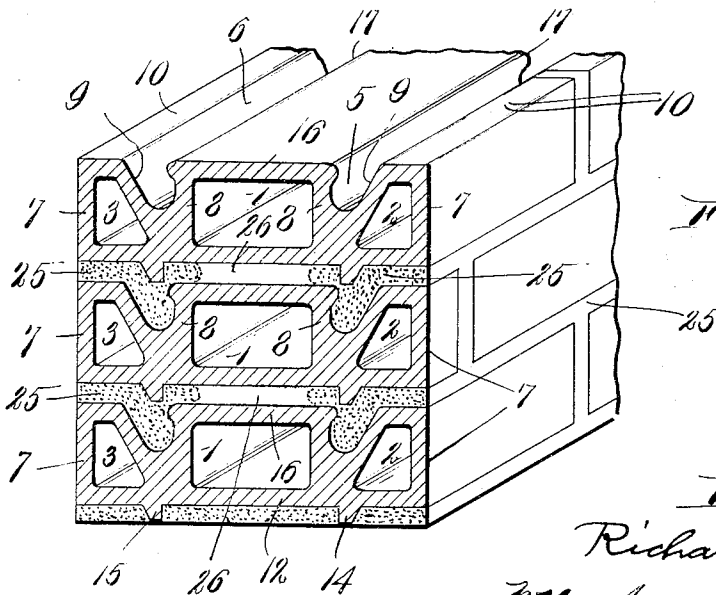


Fig. 3.

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UNITED STATES PATENT OFFICE.

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HOLLOW CHANNEL-BRICK AND WALL CONSTRUCTION.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RICHARD BLAIR COOPER, a citizen of the United States, and resident of New York, New York, (whose post-office address is 2925 Bainbridge avenue, Bronx, New York city, New York,) have invented an Improvement in Hollow Channel-Brick and Wall Construction, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is an improved and novel form of hollow channel brick and of hollow wall construction built therefrom.

In the manufacture of hollow brick for building units, particularly in a brick sized building unit, adapted to match up with common brick and to interlock therewith at corners, piers, and the like in a wall, it is most important to have such hollow brick sized building units of proper strength, as well as of light weight, and also to so design such building units as to produce a moistureproof wall with central air spaces interrupting the horizontal mortar courses. It is also most important, in brick of this type, to provide means whereby the brick can be economically manufactured, safely handled for drying, kiln burning, and readily transporting from the place of manufacture to the place of building. In the type of channel brick, illustrated by the prior U. S. Patents to A. Hardoncourt, Jr. No. 1,068,388, issued July 27, 1913, and to J. P. B. Fiske, No. 1,250,295, issued December 18, 1917, considerable difficulty has been experienced in practice, because the channel brick of said patents were lacking in strength at the points where strength was required, *i. e.* at the outer parts of the ribs and at points throughout the wall where the body portion of the brick joined the wall sections at each wall face,—and also such prior channel brick were wasteful of mortar. Important objects of the present invention therefore are to obviate the difficulties experienced in practice with such prior channel brick and to so proportion and design a hollow building unit, of brick size at its outer faces, of light weight, of great strength, and capable of being quickly, easily, and economically built into a wall, producing a hollow "twin wall" with inner

air spaces interrupting the horizontal mortar courses throughout the wall. A further important object of my present invention is to provide such a channel brick for a building unit, that will be economical of the mortar and will also prevent waste of the mortar,—by reducing the capacity of the mortar receiving channel and by providing means which will eliminate the danger of the mason filling up the central air space of the wall, while also giving increased strength to the channel brick and to the resulting wall construction. In the type of channel brick and twin wall illustrated in said Fiske patent, the vertically extending ribs or riblike portions in each wall section were free standing and not braced, being liable to warp in drying and burning, utilizing a great deal more mortar in the twin wall than was needed, and therefore in my present improved type of channel brick I provide pairs of riblike members for each wall section of brick and also a bracing member partially filling the space between such riblike portions, to save mortar and simultaneously divide the space between the ribs into a hollow air space and a mortar receiving channel which also strengthens and reinforces one or both of these riblike members in each wall section. I prefer to arrange this bracing member to reinforce the outer riblike portion, constituting the face of the brick near its upper edge and to reinforce adjacent the inner riblike member at the junction of the same with the body portion of the brick furthermore reinforcing the entire structure of the wall, where the wall sections are united by the horizontally extending body portions of each brick;—this being a weak point in the prior channel brick and walls, as already briefly explained.

An additional important feature of my present brick to facilitate its use in building a wall, as well as to give added strength to the inner ribs in each twin wall portion, is the provision for a central hand hold and also a broad bearing surface, so that the mason in positioning a channel brick in the wall can press down on the same centrally while still having a good grip on the brick by the hand hold, thus straightening, alining and settling the same into the mortar bed of the lower adjacent course of brick. This central portion, flush with the wall por-

tions, enables my channel brick to be piled and transported like common brick. To this end also, I prefer to form this part with slightly overhanging ridges, or undercut edges, which give an easy grip, interlock with the mortar and partially fill the mortar channel—thus reducing the mortar required. In my improved type of hollow channel brick, I provide a lug which acts efficiently as a moisture check in the wall, producing an interlock when desired, and which lug may be of just the ordinary thickness of the mortar course, so as to eliminate the operation of removing same, at corners, when interlocking the hollow brick with common brick or when laying the lowermost course of brick. This lug also may be of any desired size to substantially fill and interlock with the mortar channels in the lower course of the channel brick. These lugs are important and needful, serving to hold or space the channel brick from the off-bearing belt of a brick-making machine during the process of manufacture.

Referring to the drawings wherein I have illustrated two forms of my improved channel brick and wall construction;

Figure 1 is a view in cross section, illustrating the preferred form of manufacturing this type of channel brick as a duplex or double block to be afterward divided into two separate channel brick;

Fig. 2 is a cross sectional view of the single channel brick;

Fig. 3 is a fragmentary perspective view, partly in cross section, of my improved wall construction.

Fig. 4 is a fragmentary perspective view, also partly in cross section, illustrating a modified form of brick and wall with an enlarged interlocking lug.

While I prefer to form my improved type of channel brick as a double block, as shown in Fig. 1, for convenience in manufacturing and safety in drying, burning, stacking, and transporting, yet it is perfectly feasible in my type of channel brick, to form the same as a single brick, since the vertically extending riblike members are braced and strengthened, thus preventing the same from warping or being distorted, during the various processes of manufacture. This is a considerable advantage, as in many types of channel brick, it is impractical to make the same excepting as a double block, whereas I can employ either a double or single die.

Referring to the drawings and as shown in Fig. 2, my improved channel brick comprises two wall sections, each having vertically extending ribs and inclosing three hollow air spaces 1, 2, and 3, while providing mortar-receiving channels 5 and 6. Each wall section includes an outer riblike member 7 and an inner riblike member 8 together with a bracing member 9, the latter united

at its upper edge with the outer rib 7, giving a comparatively broad mortar-receiving surface 10 and slanting across to the base of the other rib 8, giving a considerable mass of brick material, as indicated at 11 and yet with a suitable depth for the thumb and fingers of the mason, while leaving the mortar-receiving channels 5 and 6 open, thus forming the inclosed spaces 2 and 3. The body portion of my brick includes the horizontally extending part of plate 12, which may be considered as uniting the two wall sections, joining them at their strongest part, viz. 11, or said body portion 12 may be considered as extending throughout the entire width of the channel brick from one outer rib 7 to the other, including the lowermost webs 13, 13, of each wall section, from which the lugs 14 and 15 extend, the latter constituting both a moisture check and interlocking means, and also holding the brick off the belt during manufacture. Inner webs 8, 8, are strengthened and united by a web 16, preferably having the edges slightly overhanging at 17, 17, to give a better grip or hand hold. This top member 16 may be extremely thin and of just sufficient strength to firmly brace the inner riblike members 8, 8, and to provide the broad bearing surface desirable, when the mason is forcing and settling the brick into the mortar bed in the wall.

It will thus be seen that my novel type of channel brick provides a brick sized building unit of extremely light weight, great strength and capable of being built into a hollow wall with interrupted mortar joints, moisture checking lugs, interlocking devices, and with both inner and outer wall sections braced, the bracing member for each wall section reducing the size of the mortar-receiving channels.

I prefer to form this type of brick as a double or duplex block, as shown in Fig. 1, wherein the cored sections in the die which form the two mortar-receiving channels 5 and 6, of Fig. 2, designated at 37 in Fig. 1, are provided with projecting portions 18, 18 just beyond the face of the die and carry between them the wire 19 to form the cut 20 between the web sections of each brick. I also score the edges of the double block at 21 and 22 to facilitate their subsequent splitting apart after drying, burning, and transporting to the building where used. This arrangement allows the double brick to be held united during all the processes of manufacture and during subsequent transportation, the integral portion of the block left between the scoring 21 and 22 serving to hold the same together, but permitting instant and accurate splitting after the double block is burned. The small lugs 14 and 15 furthermore do not project sufficiently to endanger their being dam-

aged during transportation, as the blocks would ordinarily be rested upon the end surfaces, particularly if larger lugs, as shown in the modification of Fig. 4, were employed.

The improved channel brick of Figs. 1 and 2, when built into a wall, as shown in Fig. 3, thus provide strong wall sections at each outer face of the wall, giving a typical twin wall structure and yet with a minimum of mortar 25 filling the channel recesses, said mortar being interrupted by the inner air spaces 26 and the top webs 16 preventing any waste of mortar by filling up the inner air spaces between the inner ribs 8 and 8. The lugs 14 and 15 respectively serve to solidify and interlock with the mortar in the channels 5 and 6; often the short lugs projecting only to an extent equal to the thickness of the horizontal mortar courses, and serving to deflect any moisture which may seep through the face of the mortar downwardly into the recesses 5 and 6 and constituting an efficient moisture check, as well as an interlock.

As illustrated in Fig. 4, I have shown a modified form wherein the lugs are enlarged, here designated at 27 and 28, approximately filling the mortar recesses 5 and 6 and providing a still more efficient interlocking wall construction, as well as displacing mortar and giving a substantial uniform depth for the zigzag mortar course around the lugs 27 and 28, as shown. In this modified form also, I illustrate the top plate 16 without the overhanging finger grips 17, it being clearly understood that these latter are optional, an efficient hand hold being obtained by the depth of the mortar channels 5 and 6, either with or without the projecting, overhanging edges 17, as in my preferred form illustrated in Figs. 1, 2, and 3.

In both forms there is produced a strong, light, hollow channel brick and a hollow wall construction of great strength and of substantially twin walls at each face with a bracing member for the vertically extending riblike portions of each wall section, this bracing member furthermore strengthening both ribs of each wall section and saving mortar. The inner webs 8 are strengthened not only by the bracing members 9 and the increased mass of brick material at 11, 11, but also by the top plate 16, said plate furthermore serving to give a suitable pressure surface to the mason when forcing the channel brick into position and preventing mortar filling up the central air spaces. The entire channel brick, also, can be laid crosswise, or common brick can be interlocked therewith at any point desired, with the form shown in Fig. 2. When the larger lugs 27 and 28 are employed, these can easily be removed by the blows of the

trowel. I desire to utilize my novel type of channel brick in a wall structure, positioned as shown in Figs. 3 and 4, but it will be understood that these channel brick may be laid in reverse position, *i. e.* upside down, the relatively small and shallow mortar channels 5 and 6 being capable of completely filling with mortar in inverted position, whereas if said channel were of much greater depth, this inverting in the wall might be objectionable as tending to leave undesired air spaces in the wall sections. In either position, however, the wall portions are braced, the space between the outer and inner rib or riblike part in each wall is divided by a bracing member into an air space and a mortar channel, the latter just the right depth for a convenient thumb and finger hold on the middle gripping portion, and the mortar-receiving capacity reduced. Also the outer rib face of each brick is protected from the mortar, eliminating the danger of "peeling" due to freezing, and giving a wedge shaped mortar mass which is solidified by the lug of the next brick. My improved channel brick or block, as well as the wall constructed with the same, thus combines all the advantages of a light, hollow, brick sized building unit having open channels to receive the mortar and for the building of a "twin wall" together with the added advantages of hollow wall sections in the "twin walls", and a strong braced construction throughout. I also believe that the novel process of manufacturing a double block, such as shown in Fig. 1, wire cutting a portion, *i. e.* the central portion, by leaving thin outer webs integral, is a new method of manufacture and I wish to claim this feature also.

My present invention is further described and defined in the form of claims as follows:

1. Hollow wall construction consisting of a plurality of channel brick adapted to be laid horizontally, each brick having three horizontally extending air spaces, each outer air space being formed by a vertical riblike face of the brick and an inner bracing member forming an open mortar-receiving channel between said bracing member and the wall of the central hollow portion, mortar in said channels, projecting lugs extending from the superimposed channel brick extending into said mortar, and horizontally extending air spaces interrupting the mortar joints transversely of the wall in addition to the hollow central portion of each channel brick.

2. Hollow wall construction consisting in twin walls comprising channel brick adapted to be laid horizontally, each brick having a wall portion in each of the twin walls, each wall portion including two vertically extended ribs and a bracing web extending

from one of the ribs of each pair into the space between the pair and dividing said wall portion into an open mortar-receiving channel and a horizontal air space, and mortar filling each channel and bonding adjacent courses of brick.

3. Hollow wall construction consisting in twin walls comprising channel brick adapted to be laid horizontally, each brick having a wall portion in each of the twin walls, each wall portion including two vertically extended ribs and a bracing web extending from one of the ribs of each pair into the space between the pair and dividing said ribs into an open mortar-receiving channel and a horizontal air space, a middle bracing web uniting the inner ribs of each brick and adapted to interrupt the horizontal mortar courses, and mortar in said channels.

4. Channel brick of the kind described comprising a hollow wall portion at each side of the brick united by a central hollow portion and forming three parallel air spaces, each wall portion having a bracing web from the outer wall face inclined inwardly to the central portion and leaving an open mortar-receiving channel.

5. Channel brick of the kind described comprising a hollow wall portion at each side of the brick united by a central hollow portion and forming three parallel air spaces, each wall portion having a slanting web uniting the upper edge of the outer wall portion with the inner and lower part of the adjacent central portion, and leaving an open mortar-receiving channel between said central portion and the inclined face of said slanting web.

6. Channel brick of the kind described comprising a hollow wall portion at each side of the brick united by a central body portion, each wall portion comprising a pair of spaced vertically extending ribs and an inclined bracing web extending from the upper part of one rib downward toward the lower part of the other rib, and forming with the former rib an air space and with the latter rib an open mortar receiving channel.

7. A channel brick of the kind described having a body portion with a wall section at each edge, each wall section comprising a horizontal bottom web, two vertically extending, spaced ribs, and a bracing web between said vertical ribs dividing the space therebetween into a mortar receiving channel and an air space.

8. A channel brick of the kind described having a horizontal body plate and a wall section at each edge, each wall section comprising a pair of vertically extending, spaced ribs, and a bracing web between the vertical ribs of each pair dividing the space therebetween into a mortar receiving channel and an air space, and a horizontal top

web connecting the tops of the inner ribs of the two pairs of ribs.

9. A channel brick of the kind described comprising a body portion with a central projecting hand hold and a wall section near each edge of the body portion, said wall sections including two vertically extending ribs and a web bracing said ribs and dividing the space between them into a mortar-receiving channel and an air space, the central hand hold including the inner ribs of the wall sections and a horizontal web.

10. Channel brick of the kind described comprising a body portion and three projecting hollow portions extending at right angles to said body portion and forming two open channels, all three portions being substantially equal in height, and the central portion having ridges overhanging the channels.

11. Channel brick of the kind described comprising a body portion and twin wall portions at opposite faces, each wall portion including a pair of vertically extending ribs and a bracing web from the top of the outer rib to the base of the inner rib, strengthening the brick at the base of the mortar channel portion.

12. Channel brick of the kind described comprising a body portion and twin wall portions at opposite faces, each wall portion including a pair of vertically extending ribs and a bracing web from the top of the outer rib to the base of the inner rib, forming a broad mortar bearing for said outer rib and a finger gripping depth adjacent the inner rib, the inner ribs being united, in addition to the body portion and having overhanging ridges projecting into the channels to reduce and interlock with the mortar and increase gripping of the central hand hold.

13. A channel brick of the kind described, comprising a plurality of vertically extending wall sections, a horizontal member joining said sections, each wall section comprising a pair of spaced vertically extending rib-like members, and a bracing member extending from one of the ribs of each pair and projecting into the space therebetween, said space serving as a mortar recess.

14. A channel brick of the kind described, comprising a plurality of vertically extending wall sections, arranged in pairs of rib-like members, a horizontal reinforcing member joining the inner ribs of said pairs, and a bracing member for the outer rib of each pair projecting into the recess formed between said rib-like members whereby the mortar receiving capacity of the recess is reduced.

15. A channel brick of the kind described, comprising a plurality of wall sections, arranged in pairs of rib-like members, a horizontal member connecting the inner ribs of said pairs, and an integral part of the outer

rib of each pair extending from adjacent name to this specification in the presence of
the top of the rib to the base and inclosing two subscribing witnesses.
an air space therebetween, the space between
the integral part of the outer rib and the
5 adjacent inner rib forming a mortar chan-
nel.

RICHARD BLAIR COOPER.

Witnesses:

ROBERT CUSHMAN,
JAMES R. HODDER.

In testimony whereof I have signed my