

July 27, 1954

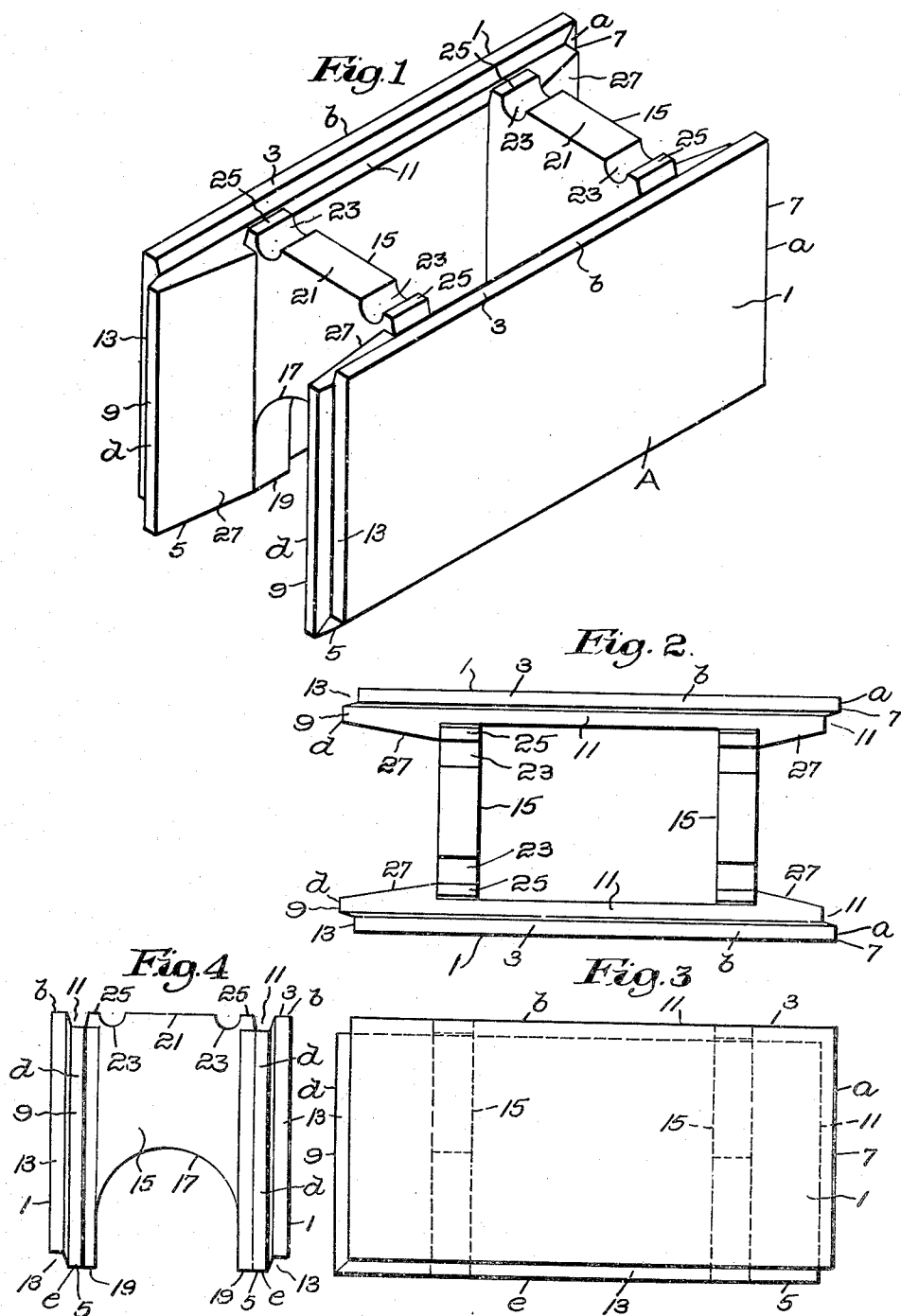
A. PERRETON

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Filed Feb. 7, 1948

5 Sheets-Sheet 1



Inventor:
Arnold Perreton.
By Emory Booth, Townsend Miller, & Wheeler
Attys

July 27, 1954

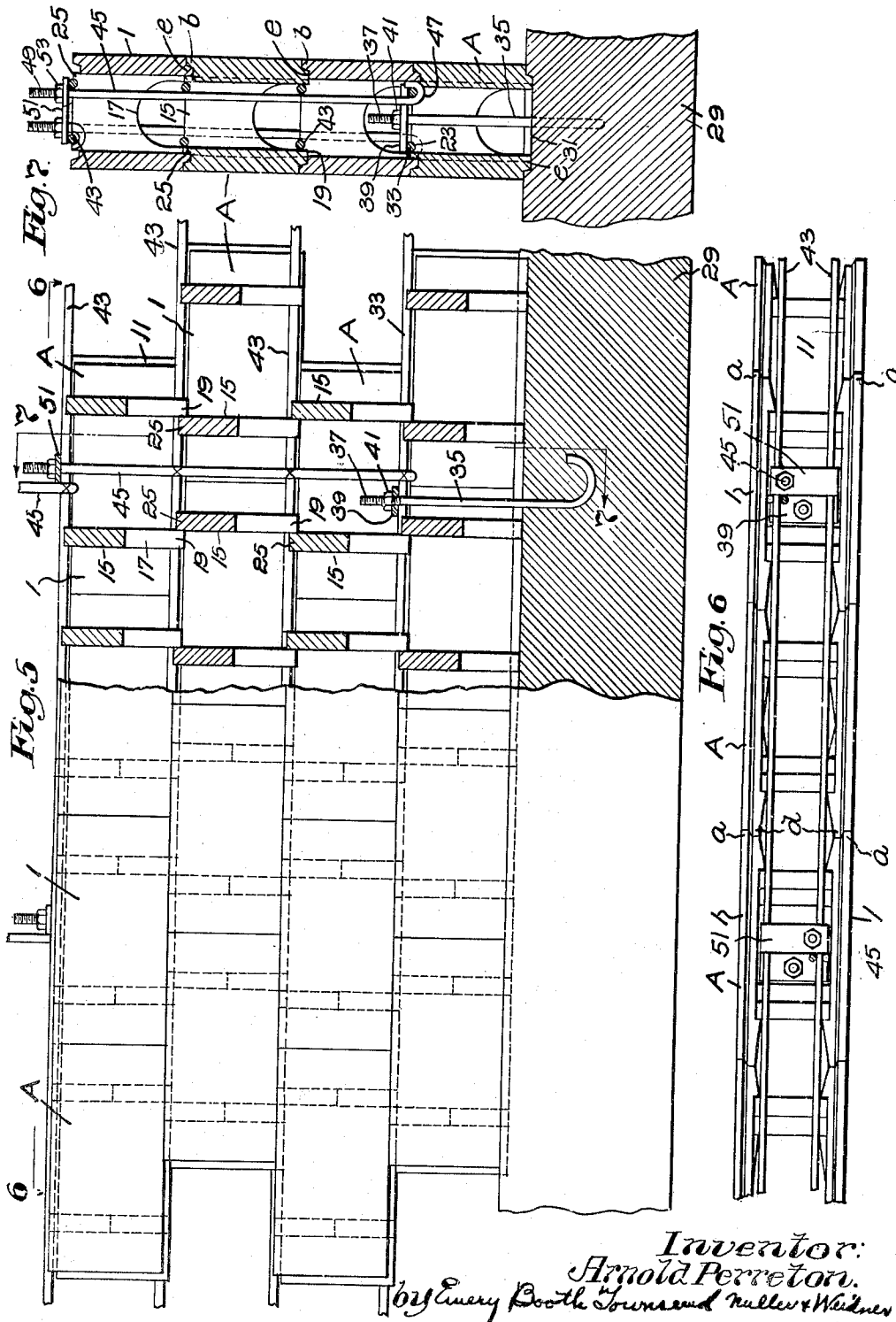
A. PERRETON

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Filed Feb. 7, 1948

5 Sheets-Sheet 2



Inventor:
Arnold Perretton.
by Emory Booth Townsend Miller & Widner
Attys

July 27, 1954

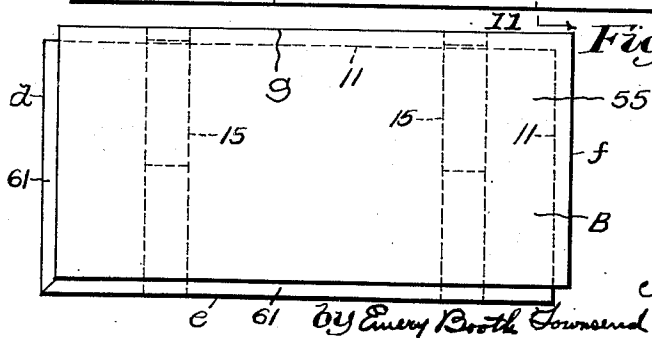
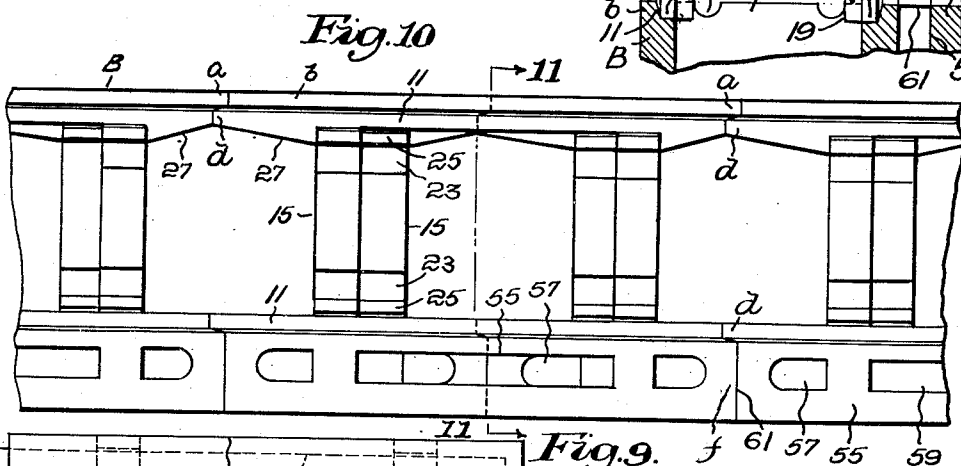
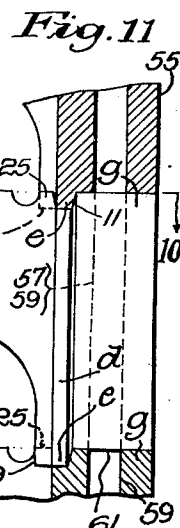
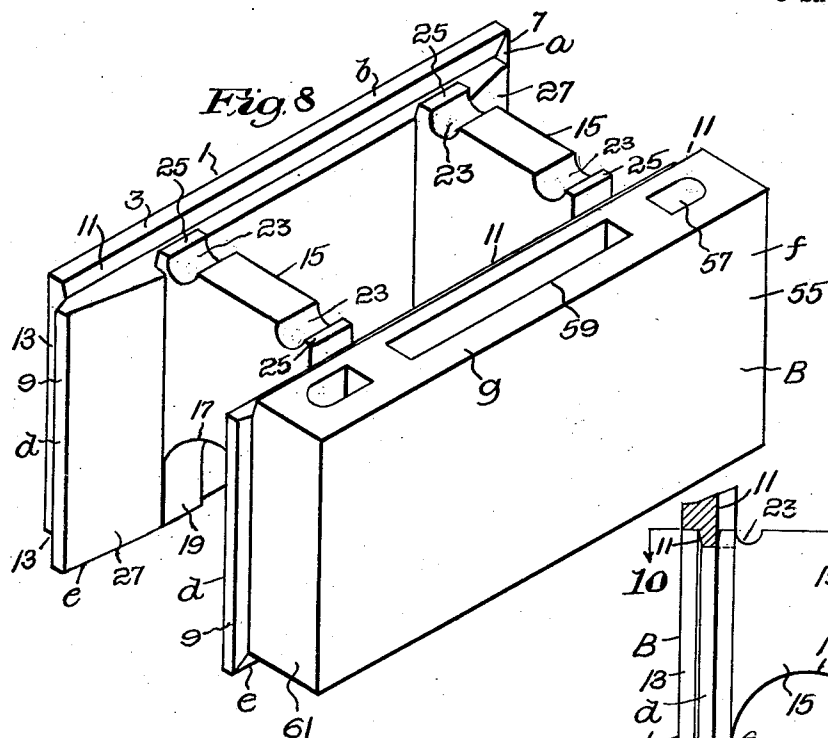
A. PERRETON

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Filed Feb. 7, 1948

5 Sheets-Sheet 3



Inventor:
Arnold Perretton.
By Emory Booth Townsend Miller & Weidner Attys

July 27, 1954

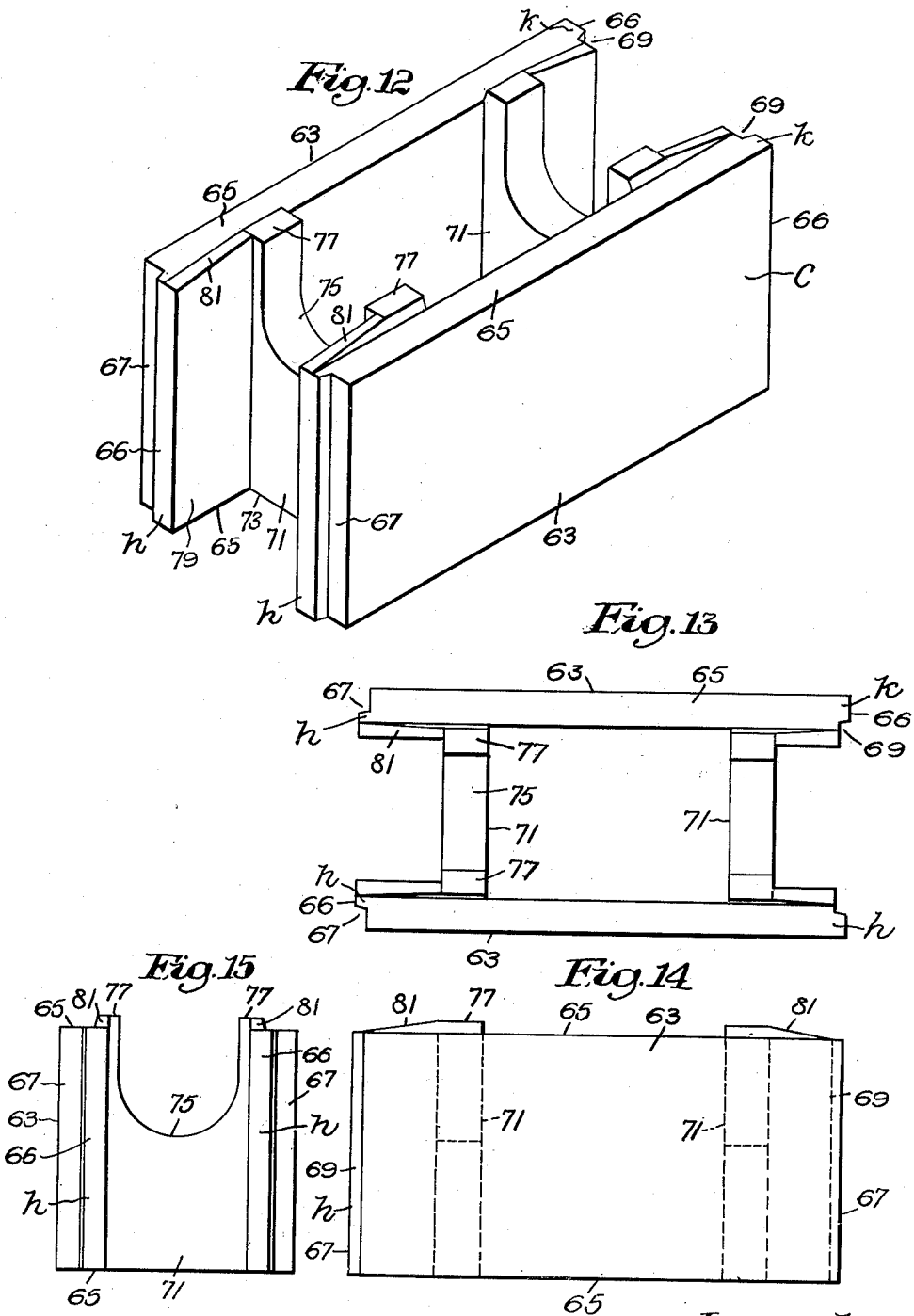
A. PERRETON

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Filed Feb. 7, 1948

5 Sheets-Sheet 4



Inventor:
Arnold Perreton
by Emory Booth Townsend, Miller & Weidner
Attys

July 27, 1954

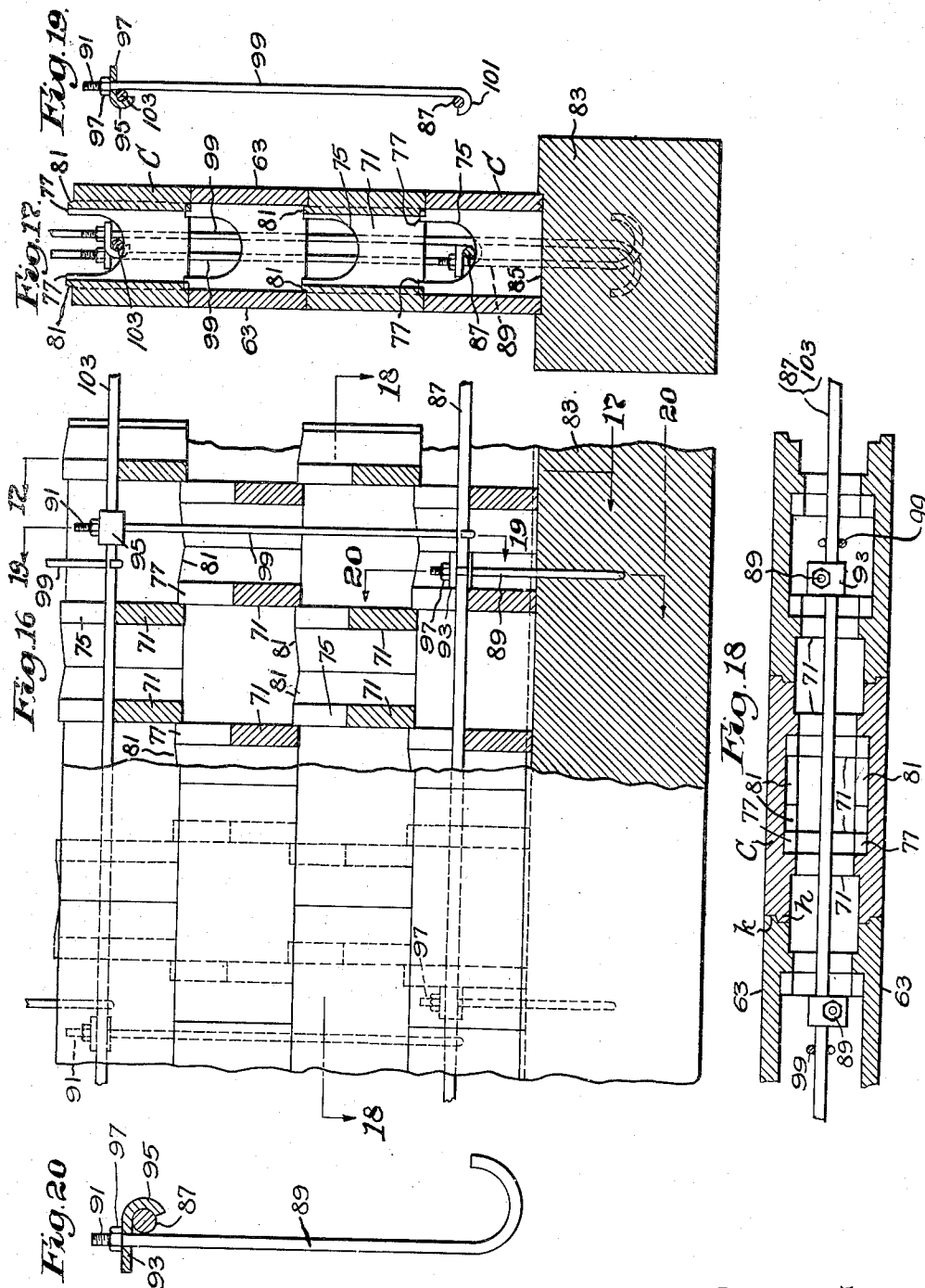
A. PERRETON

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Filed Feb. 7, 1948

5 Sheets-Sheet 5



Inventor:
Arnold Perreton,
by *Ernest R. Booth, Townsend Miller & Weidner*
Attys.

UNITED STATES PATENT OFFICE

2,684,589

INTERLOCKING HOLLOW BUILDING BLOCK

Arnold Perreton, Concord, N. H., assignor to
Formbloc, Inc., Boston, Mass., a corporation of
Massachusetts

Application February 7, 1948, Serial No. 6,853

1 Claim. (Cl. 72-41)

1

My invention relates to concrete and like wall constructions of the type in which a wall is built of hollow blocks, and the hollows of the wall thus formed filled with wet concrete or the like, which latter when it hardens forms in conjunction with the blocks a substantially integral structure.

The present invention, which constitutes an improvement on the walls and blocks of my co-pending application Serial Number 725,052, filed January 29, 1947, now abandoned, has among its objects the provision of blocks of durable construction readily formed by molding operations with use of a minimum of cores, and the provision of improved means for reinforcing the walls and rendering them plumb.

The invention will, however, be best understood from the following description when read in the light of the accompanying drawings of several embodiments of the invention selected for illustrative purposes, while the scope of the invention will be more particularly pointed out in the appended claim.

In the drawings:

Fig. 1 is an isometric view of a molded cement block according to the invention;

Fig. 2 is a plan view of the block according to Fig. 1;

Fig. 3 is a side elevation of the block according to Figs. 1 and 2;

Fig. 4 is an end elevation of the block according to Figs. 1, 2 and 3 as viewed from the left of those figures;

Fig. 5 is an elevation of a wall built of blocks according to Figs. 1 to 4 prior to pouring the concrete or the like into the hollows of the wall, with parts in section;

Figs. 6 and 7 are, respectively, sections on the lines 6-6 and 7-7 of Fig. 5;

Fig. 8 is an isometric view of a modified form of cement block according to the invention;

Fig. 9 is a side elevation of the block according to Fig. 8;

Fig. 10 is a fragmentary plan view of a wall built of the blocks according to Figs. 8 and 9, corresponding to a section on the line 10-10 of Fig. 11 with parts omitted, and prior to pouring the concrete or the like into the hollows of the wall;

Fig. 11 is a section on the line 11-11 of Fig. 10, with parts omitted;

Fig. 12 is an isometric view of a further modified form of cement block according to the invention;

Fig. 13 is a plan of the block according to Fig. 12;

Fig. 14 is a side elevation of the block according to Figs. 12 and 13;

Fig. 15 is an end elevation of the block ac-

2

cording to Figs. 12, 13 and 14 as viewed from the left of those figures;

Fig. 16 is an elevation of a fragment of a wall built of the blocks according to Figs. 12 to 15, with parts in section, and prior to pouring the concrete or the like into the hollows of the wall; and

Figs. 17, 18, 19 and 20 are, respectively, sections on the lines 17-17, 18-18, 19-19 and 20-20 of Fig. 16, with parts omitted in Figs. 19 and 20.

Referring particularly to Figs. 1 to 7 of the drawings, the cement blocks A comprise opposite spaced side walls 1 having top edges 3, bottom edges 5, and opposite end edges 7 and 9, opposite edges being parallel with each other and adjacent edges being at right angles to each other.

As illustrated, the side walls 1 of the block A at their upper pair of edges 3 and at their pair of end edges 7 are grooved at their inner sides, as indicated at 11, to form at the edges 7 the end flanges a and at the edges 3 the longitudinally extending flanges b. These walls at their lower pair of edges 5 and their pair of end edges 9 are grooved at their outer sides, as indicated at 13, to form at the edges 9 the end flanges d and at the edges 5 the longitudinally extending flanges e. These flanges are adapted to fit into the grooves 11 and 13 of adjacent blocks, as illustrated in Figs. 5, 6 and 7, to form so-called "ship-lap" joints, with the result that each of the opposite outer faces of the stretches of the wall built of the blocks A lies continuously in a vertical plane.

As further illustrated, each block A is formed with a pair of webs 15 integral with its opposite side walls 1, these webs being in spaced relation to each other and the opposite ends of the block. As shown, each web is deeply recessed at its lower edge, as indicated at 17, and presents at opposite sides of those recesses corner portions 19 having lower faces in the same plane as the bottom edges 5 of the side walls. The upper edge 21 of each web is shown as lying in the same plane as the upper edges 3 of the side walls of the block. These upper edges of the webs are grooved, as shown at 23, adjacent the side walls, the portions 25 between these grooves and the groove 11 being of approximately the same width as the web corner portions 19 immediately below them.

Preferably the flanges a, b, d and e, and the web portions 25, are slightly tapered in a vertical direction, as indicated in Figs. 1 to 4, at their sides facing the medial vertical planes of the side walls 1 to facilitate assembling the blocks.

Preferably, and as illustrated, in the block A the portions of the side walls 1 between the end edges 9 and 7 and the adjacent webs are thickened, as indicated at 27, to reinforce those por-

tions so as to prevent their breakage when the blocks are being handled during shipment and in the field, these thickened portions being preferably tapered from the end edges 9 and 7 where they are thinnest to the webs where they are thickest.

The blocks A according to Figs. 1 to 4 may be readily assembled to form a hollow wall, as shown by Figs. 5, 6 and 7. It will be observed that the flanges *e* at the lower edges of the block side walls *f* interlock with the flanges *b* at the upper edges of the side walls of adjacent blocks, and that the flanges *a* at one of the end edges of the block side walls interlock with the flanges *d* at the end edges of the adjacent abutting blocks, in each case to form a so-called "ship-lap" joint as above explained. It will also be observed that the adjacent end webs 15 of each two abutting blocks of each course of blocks lie between the two webs 15 of the blocks immediately above and below them, so that the portions 19 and 25 of the webs coact to cause the abutting blocks to be held in abutting relation.

In building the wall illustrated by Figs. 5, 6 and 7 the lower course of blocks is laid on the foundation 29 formed with a groove 31 of such width as to receive and fit the lower flanges *e* of those blocks. Horizontal tie rods 33 are then laid in the grooves 23 in the webs 15 of these blocks. In the foundation are embedded suitable anchor bolts 35 which have screw-threaded ends 37 projecting above the tie rods 33. On the latter are then laid plates 39 having perforations through which the screw-threaded ends of the anchor bolts extend, nuts 41 screw-threaded on the anchor bolts at the upper sides of these plates serving to force the plates toward the tie rods so as securely to clamp the lower course of blocks to the foundation. As each course of blocks is laid, further horizontal tie rods 43 may be positioned in the grooves 23 of the webs 15 of those blocks. As shown, vertical tie rods 45 are provided having hooked ends 47 engaging the lower tie rods 33, these tie rods 45 having screw-threaded ends 49 passing through perforations in plates 51 resting upon tie rods 43 positioned several courses above the lowermost course of blocks. Bolts 53 screw-threaded on the ends of the tie rods 45 may be used to draw the plates 51 against the horizontal tie rods upon which they rest so as to clamp together the courses of blocks traversed by the tie rods 45. As the wall is built, further vertical tie rods 45 may be positioned in the wall and hooked to the tie rods 43 adjacent the plates 51 so as in the same way to clamp further courses of the wall together and to the courses of the wall below them. It will be observed from Fig. 7 that the vertical tie rods 45 are shown as alternately staggered with respect to the sides of the wall, which permits such tie rods to be placed under sufficient tension by means of the bolts 53 as the wall is built to correct out-of-plumbness in the wall. After the wall is built of the blocks the concrete or the like may be poured into the hollows of the wall, the recesses 17 in the webs forming openings for permitting passage of the wet concrete past the webs.

The block B and wall according to Figs. 8 to 11 are exactly like the block A and wall according to Figs. 1 to 7, except that for one side wall *f* of the block A is substituted a thicker side wall 55, which latter is formed with vertically extending through passages 57 and 59, and except that the thickened tapered portions 27 are omitted in this thicker side wall as unnecessary. The

thicker side wall 55 of the block B, like the side wall *f* of that block, is consequently formed with flanges *d* and *e*. This thicker side wall also is formed with grooves 61 corresponding to the grooves 13 of the side wall *f* except that the grooves 61 are wider, and is further formed with flanges *f* and *g* corresponding to the flanges *a* and *b*, respectively, of the side wall *f* except that the flanges *f* and *g* are thicker. In the assembled wall the passages 59 of each block register with the passages 57 of the blocks immediately above and below them, as is indicated in Figs. 10 and 11, to form air insulating passages preventing "sweating" of the wall surface in situations where such sweating is likely to occur.

The block C according to Figs. 12 to 15 is shown as provided with opposite spaced side walls 63 having upper and lower longitudinally extending edges 65 and opposite end edges 66. In this block only the end edges of the side walls are grooved, one end edge of each side wall being grooved at the outer side of said wall as indicated at 67, and the other end edge at the inner side of said wall as indicated at 69. These grooves 67 and 69 form flanges *h* and *k* which in the assembled wall interlock with the flanges of abutting blocks of the same course of blocks, as shown in Fig. 18, to form "ship-lap" joints.

The blocks C, as shown, are further provided with spaced webs 71 the lower edges 73 of which are flush with the lower edges 65 of the block side walls. The upper edges of the webs, as shown, are formed to present wide deep recesses 75 and, adjacent each side wall 63, a portion 77 which projects above the top edge 65 of that wall. Each side wall between each web and the adjacent end edge 66 is thickened, as shown at 79, to reinforce that portion against breakage. At its upper edge each side wall at its inner side is formed to provide a flange 81 projecting above the edge 65, which flange is of gradually increasing height from the end edge to the web. When the blocks are laid one upon the other, as shown in Figs. 16 and 17, the flanges 81 and adjacent portions 77 of the webs cooperate with the side walls *f* of the blocks immediately above them to interlock the blocks against transverse movement.

As shown in Fig. 16, the webs 71 adjacent the abutting ends of each two blocks of each course are in closely adjacent relation to and lie between the two webs 15 of the blocks immediately above and below them, causing the projecting portions 77 of the two webs of each block to cooperate with the lower portions of the webs of the end-to-end abutting blocks immediately above them so that these two webs of each block hold such abutting blocks in abutting relation.

Similarly to the wall hereinbefore described, the lower course of blocks C is laid upon a foundation 83, the lower end portions of the blocks of this course being fitted into a groove 85 in the upper surface of the foundation. Horizontal tie rods 87 may be then laid in the recesses 75 of the webs 71 of the blocks and secured to anchor bolts 89, the lower ends of which bolts are embedded in the foundation. As best shown in Fig. 20, these anchor bolts have upper screw-threaded ends 91 extending through perforations in plates 93, these plates having hooked ends 95 fitting over the horizontal tie rods 87 so that the latter are securely retained between the sides of the anchor bolts and such hooked ends. Nuts 97 screwed on the ends 91 of the anchor bolts serve to draw the plates 93 toward the foundation and thereby act

to secure the lower course of blocks to the foundation.

Vertical tie rods 99 may be provided for clamping courses of blocks resting upon the lower course to the latter and each other. These tie rods 99, as best shown by Fig. 19, have hooked ends 101 engaging the lower tie rods 87. At their upper ends the tie rods 99 are screw-threaded and pass through perforations in further plates 93 the hooked ends 95 of which engage further horizontal tie rods 103 positioned in the recesses 75 of courses of blocks above the lowermost course of blocks. In an obvious manner, by use of the nuts 87 screw-threaded on the upper ends of the tie rods 99 the courses of blocks between the tie rods 103 and 87 may be clamped to each other. Further vertical tie rods 99 may be employed for clamping courses of blocks above the tie rods 103 to each other and to the courses of blocks below them. Preferably the vertical tie rods 99 positioned along the stretch of the wall are placed between the horizontal tie rods and the side walls of the blocks so that the vertical tie rods are positioned at a side of the vertical medial plane of the wall, these vertical tie rods being in staggered relation with respect to such plane as indicated in Fig. 17. In this way by tightening the nuts on the vertical tie rods the courses of the wall when out-of-plumb may be brought into plumb. After the wall is built of the blocks the wet concrete or the like may be poured into the hollows of the wall, the recesses 75 in the webs permitting passage of concrete past the webs.

It will be understood that within the scope of the appended claim wide deviations may be made from the form of the invention described without departing from the spirit of the invention.

I claim:

A molded block that can be filled with a mass of concrete or the like, for concrete wall constructions having an inner monolithic wall, and wherein such wall constructions have a plurality of superimposed abutting courses of like blocks with the blocks of each course in endwise abutting relation and positioned in staggered relation to the blocks of the two immediately adjacent courses, said block comprising spaced parallel side walls having flat outer sides and flat upper and lower edges, each of which edges operatively is in a single plane extending entirely throughout its width and length; the vertical end edge of each side wall at one end of the block having a notch opening on the outer side of such wall and extending for the full vertical height of such edge, and the vertical end edge of each such wall at the opposite end of the block having a like notch opening on the inner side of said wall, whereby to form at the opposite vertical ends of said walls vertical grooves and projections which are so disposed that said grooves may receive the projections of like blocks abutting endwise therewith; a pair of spaced parallel flat-sided imperforate vertical webs integral with said side walls and extending from one of said walls transversely thereof to the other for holding said walls in spaced relation, each of which webs where it joins each side wall having an upwardly projecting portion extending entirely above the adjacent flat upper edge of such wall and terminating in a horizontal flat, rectangular surface, the portions of the upper edges of said webs between said flat, rectangular surfaces extending downwardly to approximately the horizontal median line of said block to form, when the block is assembled in a wall with a like superimposed block, a wide, deep

opening having approximately half of its vertical extent almost as wide as the space between said parallel side walls, for the free passage of concrete entered into the space between said side walls; each side wall having a thickened portion at its inner side adjacent each of its ends which is integral therewith and the adjacent web and extends from said web to the adjacent end only of said wall at its inner side, which thickened portion of the wall at its lower edge is in the same plane as the flat bottom edge of the wall, and at its top, projects above the flat upper edge of the wall and is integrally joined to the adjacent side of the upwardly projecting portion of the adjacent web for reinforcing such portion of the web, such thickened portion that projects above the flat upper edge of the wall having an elongated upper edge of width substantially equal to the thickness of said thickened portion, which edge extends from said flat rectangular surface to a line lying in the same plane as said upper edge of the wall; the webs being spaced inwardly from the adjacent ends of the block at such distances that the block may span the joint between the abutting ends of two like blocks of an abutting superimposed course of blocks with said upwardly projecting portions of both the webs and thickened portions of the side walls of the block adjacent one of its ends being received in the space between the lower portions of the webs of one of said two like blocks and the upwardly projecting portions of both the webs and thickened portions of the side walls of the block adjacent its other end being received in the space between the lower portions of the webs of the other of said two like blocks, the lower horizontal surfaces of the webs being out of contact with any part of the blocks in a subjacent course but supported by said inner monolithic wall when such blocks are filled and with said upwardly projecting portions of the webs of the block substantially in laterally abutting relation with those webs of said two like blocks which are adjacent the abutting ends of said two like blocks for holding such abutting ends against separation, and with the outer sides of said upwardly projecting portions of both the webs and thickened portions of the block substantially contacting those portions of the inner sides of the side walls of the two like blocks that are between the webs of said two like blocks, the bottom surfaces of the webs and the side walls being in the same plane.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
378,838	Hiatt	Feb. 28, 1888
575,209	Bruckner	Jan. 12, 1897
836,017	Douglas	Nov. 13, 1906
1,153,900	Fairbank	Sept. 21, 1915
1,410,588	Myers	Mar. 28, 1922
1,652,743	Smith	Dec. 13, 1927
1,970,414	Brown	Aug. 14, 1934
2,106,177	Hultquist	Jan. 25, 1938
2,247,614	Lingenfelter	July 1, 1941

FOREIGN PATENTS

Number	Country	Date
10,180	Great Britain	of 1900
63,287	Switzerland	Dec. 7, 1912
176,031	Great Britain	of 1922
677,922	Germany	June 8, 1939
704,622	France	of 1931