

Dec. 30, 1941.

B. LIEBOWITZ

2,268,044

BLOCK MOLD

Filed June 3, 1939

3 Sheets-Sheet 1

Fig. 1

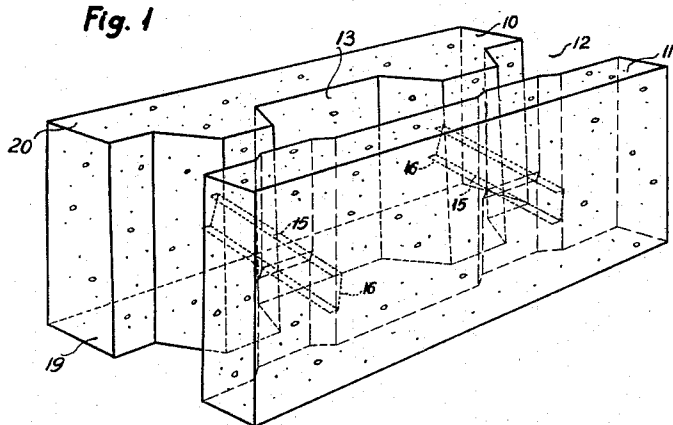


Fig. 2

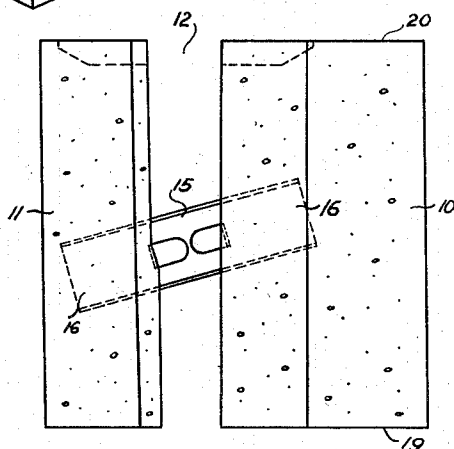
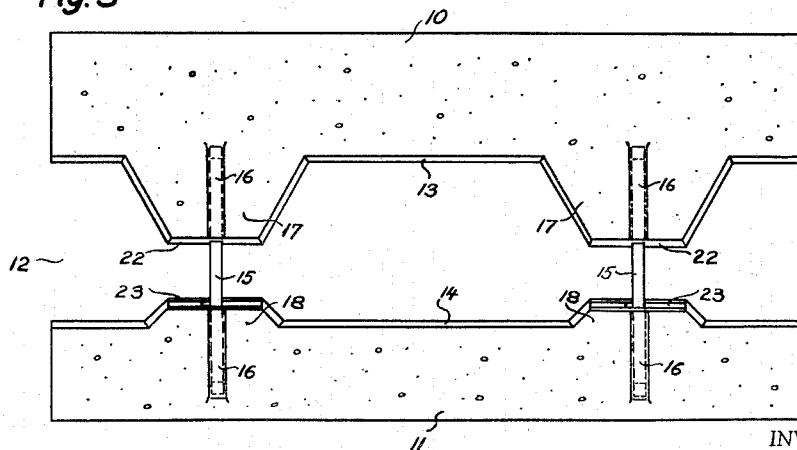


Fig. 3



BY

INVENTOR.
Benjamin Liebowitz.

J. A. O'Neil.
AGENT

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B. LIEBOWITZ

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Fig. 7

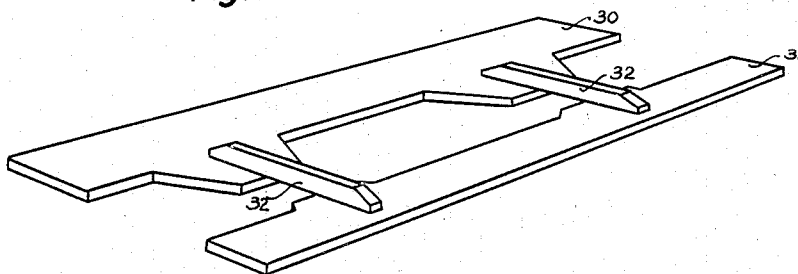


Fig. 4

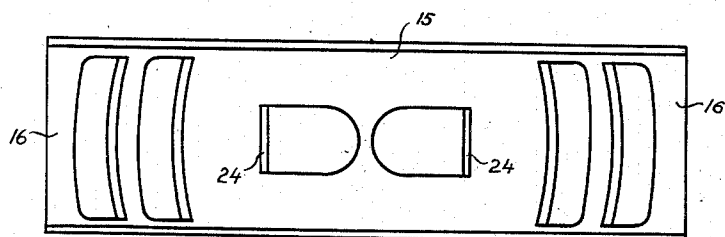


Fig. 5

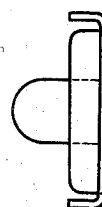


Fig. 6

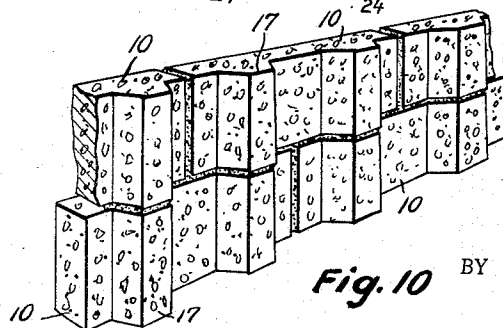
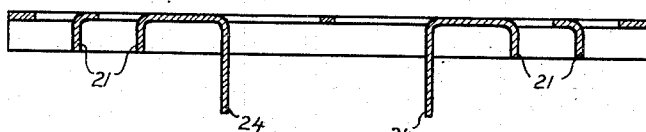


Fig. 10 BY

INVENTOR.
Benjamin Liebowitz.

J. A. Vann.
AGENT

Dec. 30, 1941.

B. LIEBOWITZ

2,268,044

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Filed June 3, 1939

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Fig. 8

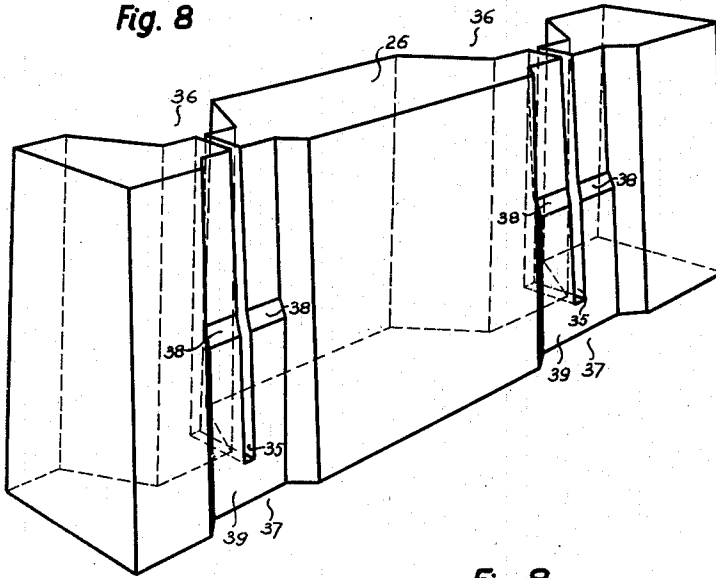
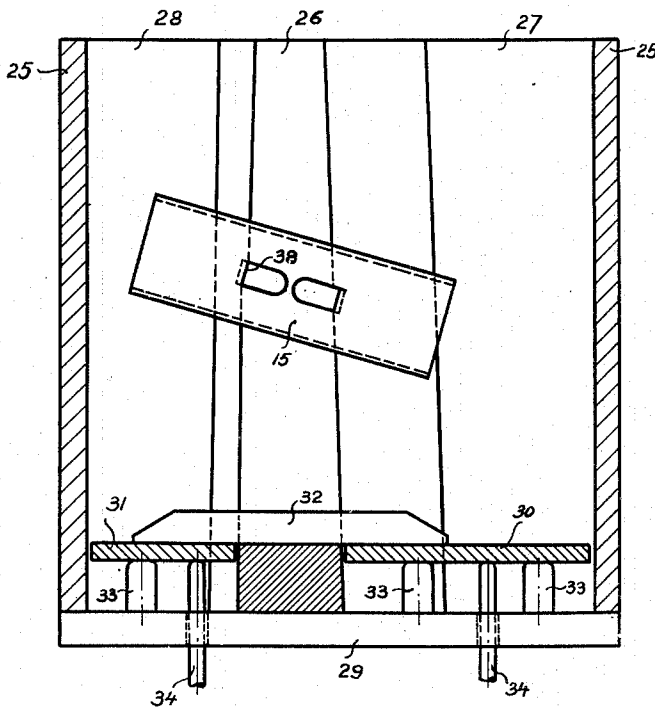


Fig. 9



BY

INVENTOR.
Benjamin Liebowitz.

C. A. Quinn
AGENT

UNITED STATES PATENT OFFICE

2,268,044

BLOCK MOLD

Benjamin Liebowitz, New York, N. Y.

Application June 3, 1939, Serial No. 277,154

6 Claims. (Cl. 25—121)

This invention relates to a building block, and more particularly to a precast unitary wall block of concrete or cinder aggregate or the like.

Walls made of the conventional concrete building blocks, either cored or solid, are not entirely satisfactory in that they do not afford proper insulation against heat and cold, and, furthermore, they do not adequately prevent seepage of water or moisture through the wall. It is well recognized that it is impractical to apply plaster directly on the inside of the masonry wall made of conventional blocks, as the plaster will show damp spots which tend to ruin it.

One construction that has heretofore been employed to overcome these defects of the conventional block is to construct a double wall of relatively narrower blocks arranged in parallel relation with an air space therebetween, the blocks of the two walls being tied together by wires laid during the building of the wall into the joints at intervals. Such double walls, while they improve the heat insulating properties and tend to prevent seepage of water and moisture, are relatively expensive in labor and wasteful in material.

One reason for the inefficient use of material which characterizes such construction is that the wires which connect the two walls are slender in comparison with their length as a beam; these wires cannot transmit any appreciable vertical load to the outer wall from the inner wall on which the joists usually rest. Hence the inner wall must carry substantially the entire vertical load, and the outer wall, structurally, serves to reinforce the load carrying inner wall only against buckling.

It is an object of my invention to provide an efficient precast building block comprising two spaced longitudinal load-carrying members connected together by transverse load-transmitting connecting bar or bars, which block can be shipped, handled and set into the wall as a unit in the manner of the conventional building block.

Another object is to provide a building block for wall construction which will afford a high degree of heat insulation and will effectively prevent transmission or seepage of water or moisture through the wall.

A further object is to provide a building block of the character described which can be readily fabricated in existing high production block casting machines, without substantial increase in cost.

A still further object is to provide a building block of such construction that the connecting bar or bars may be easily and properly located and molded therein.

Another object is to provide a method of, and a block casting machine for, manufacturing precast unitary building blocks of said type, by which the connecting bars may be easily and properly located and their ends molded in a pair of spaced concrete members.

In my copending patent application Serial No. 170,541, filed October 23, 1937, I have described a building block of concrete or the like comprising two spaced longitudinal members connected at intervals by integrally cast transverse webs of relatively small cross-sectional area and by metal reinforcements traversing the tops of the webs. I have found, however, that the integrally cast transverse webs even though they have a very small cross section area, still afford opportunity for the transmission of moisture through the walls.

A main feature of my present invention consists in employing as the sole connection between the spaced longitudinal block members one or more preformed bars of substantially impervious material, for instance metals such as steel or iron, or wood or molded material such as Bakelite or other artificial substances.

According to a preferred embodiment of my invention the spaced block members are rigidly connected by one or more transversely arranged iron or steel channel members, as will be described.

Other objects, advantages and features of my invention will be apparent to those skilled in the art from the following description thereof, reference being had to the accompanying drawings, in which:

Figure 1 is a perspective view of the block;
Figure 2 is an end view of the block;
Figure 3 is a top plan view of the block;
Figure 4 is a plan view of a connecting channel iron;

Figure 5 an end view of a connecting channel iron;

Figure 6 a cross-sectional view of a connecting channel iron on line I—I of Figure 4;

Figure 7 is a perspective view of the pallet used in the casting mold;

Figure 8 is a perspective view of the core used in the casting mold;

Figure 9 is a cross-sectional view of the form or mold in which the block is cast with the channel iron in place,

Figure 10 is a perspective view of a part of a building wall.

Referring now to the drawings, my improved building block comprises two substantially parallel spaced longitudinal load-carrying members 10 and 11, having an air space 12 therebetween. Preferably, though not necessarily, one of these members is wider than the other, and the wider one, which in this instance is represented by the reference character 10 constitutes the inner wall and serves as the main load-carrying member. The opposed faces 13 and 14 of the two members 10 and 11 are slightly tapered to facilitate removal of the block from the core.

The members 10 and 11, which are made of concrete or cinder aggregate or the like are connected at intervals, as shown in Figs. 2 and 3 by transverse channels 15. These channels may be disposed inwardly from the ends of the block and may be spaced from each other as seen in Fig. 3. The end parts 16 of the channels 15 are firmly embedded in the concrete members 10 and 11.

Channels of the length necessary to connect the load-carrying members 10 and 11 having a sufficient air space 12 therebetween might not receive adequate anchorage or afford sufficient strength, and might cause trouble in casting, handling and shipping the block. Therefore it is desirable to give the channel additional anchorage and the block additional strength by means of additional integrally cast vertical prismatic projecting parts 17 and 18, in which the end parts 16 of the channels 15 are firmly embedded.

In order to avoid any appreciable heat conduction from one member to the other and in order to minimize cost, the connecting channels should have a minimum cross-sectional area. In the particular embodiment of the invention illustrated in the drawings, the combined cross-sectional area of the two steel channels is less than 0.2 percent of the face area of the block. While I have shown a block having two connecting channels, it is to be understood that one or more than two channels may be used depending upon the size of the block.

I may arrange the connecting channels 15 in such a way that they are inclined with respect to the parallel load-bearing surfaces 19 and 20 of the concrete block members 10 and 11, instead of parallel thereto. Thus it is possible to place the building block in such manner that the connecting channels 15 are embedded in the outer wall members 11 at a lower level than in the inner wall members 10 and therefore transmission of water across the channels from the outer to the inner wall is prevented.

Figs. 4, 5 and 6 show various views of a connecting channel iron 15. As shown the channel 15 is provided at its end parts 16 with punched holding flaps 21. These end parts are firmly embedded in the concrete members 10 and 11 at the concrete projecting parts 17, hereby rigidly connecting together said concrete members. Furthermore, as shown in the Figs. 4, 5 and 6, adjacent to the opposed faces 22 and 23 of the projecting parts 17 and 18 locating tongues 24 are formed in the channels 15. These tongues 24 are formed as shown by punching and bending; they serve to hold the connecting iron channel 15 in position during casting of the blocks, as will be described; they may also serve for locating the connecting channel 15 substantially symmet-

rically with respect to the opposed faces of the block members 10 and 11.

In molding the block, I employ a high production casting machine of conventional design but I use a core and a pallet of special construction. A conventional mold in which the block is cast is shown in Fig. 9. This consists of a hollow metal rectangular form 25 open at top and bottom. According to my invention a core 26 of cast iron or other suitable material partitions the form 25 into two chambers 27 and 28. Both the form 25 and the core 26 are supported on a frame work 29.

The pallet shown in Fig. 7 comprises two flat metal plates 30 and 31 rigidly connected by metal straps 32. The metal straps 32 are tapered vertically to permit of easily separating the pallet and block when the latter has been molded and has set. The pallet-plates 30, 31 constitute the bottoms of the chambers 27 and 28 in which the members 10 and 11 are cast. Said plates 30 and 31 are supported on the usual supporting pins 33 mounted on the framework 29. The plates 30, 31 fit into the molding form 25 with the clearance necessary to permit of their easy insertion and ejection. The usual ejecting pins 34 are provided for ejecting the plates 30 and 31 together with the block when the latter has been cast.

The core 26 as shown in Fig. 8 tapers vertically and has slits 35 extending downwardly from its upper surface for a distance approximately corresponding to the full height of the separate molding chambers 27 and 28. These slits 35 serve for inserting the connecting straps 32 of said pallet plates 30 and 31 as well as for inserting the channels 15 connecting the block members to be cast. Recesses 36 and 37 are provided in the core 26 corresponding to the integrally cast projecting parts 17 and 18 of the block members 10 and 11.

As shown in Fig. 8 a step 38 is provided in each of the tapering faces 39 on one side of core 26. This step 38 serves for supporting the connecting channel 15 in the position shown in Fig. 9, prior to and during the casting process. As shown in Figs. 8 and 9 the core 26 is thinner above the step 38 and thicker below the step than the spacing between the locating tongues 24 of the channel 15. Thereby the connecting channel 15, when inserted in the slit 35 slides downwardly to the step 38 and is supported by the step prior to and during the casting process. The asymmetrical step arrangement shown holds the channel 15 in the inclined position mentioned above. It will be understood, however, that the inclined position of the channel, although advantageous, is not essential and that the step device may be modified in an obvious manner to form a symmetrical arrangement which will hold the channels 15 in level position.

It will be seen on comparing Figs. 1 and 9 that the block is cast upside down, that is to say, its position in the mold is just the reverse of that in which it is ordinarily used in building a wall. However, if desired, the block may be used in the same position as cast, but this is less advantageous from the standpoint of water or moisture transmission through the finished wall.

The casting procedure is as follows:

The molding form 25 is first fitted up with the core 26. A complete pallet is then dropped into the form 25, the straps 32 of the pallet fitting into the slits 35 of the core, so that the

pallet drops unhindered until it rests upon the supporting pins 33.

Then the channels 15 are dropped in the slits 35 and fall automatically into the position shown in which they are supported by the steps 38. Then concrete or the like is poured in the form and tamped in the usual manner. Excess aggregate is removed and the pallet and block together are then ejected by means of the ejecting pins 34 and removed from the machine. The mold is now ready to receive the pallet and channels for the next block. The block that has been cast is left to set, after which the pallet is separated from the block, all in the usual manner.

There will be a tendency during the casting process for the aggregate to enter the slits 35 in the core 26 and to form webs going across from one block member to the other. Such webs of concrete or cinder aggregate would tend to defeat one of the main purposes of this invention by providing a path for moisture conduction. However, by making the channel members 15 and the corresponding slits 35 narrow (about $\frac{1}{4}$ " to $\frac{3}{8}$ " wide) in comparison with their length, and by avoiding the use of an aggregate that is too fluid, the slits 35 will not tend to fill with aggregate and the only effect of said slits will be to cause a fin to form on the inside face of each of the block members 10 and 11. In this way a conducting path for moisture is avoided. Moreover, if by any chance, some of the fins should bridge across the air space, they will be so thin and brittle as to be easily removed.

Figure 10 shows a part of a wall built of blocks made according to my invention. I have here shown only one wall of the double wall formed by my block. It will be seen that when the block members 10 are laid up in conventional way, they lie in such manner that the projecting parts 17 stand one upon another and form reinforcing columns over the whole height of the wall. These projecting parts give the wall such additional strength, that it is possible to make the block members themselves relatively thin.

The connecting channel or bar 15 of my invention serves many purposes. It is formed as a rigid cantilever beam whose depth is of the same order of magnitude as its exposed length. Moreover, the anchorage or embedding of the channel 15 in the block members 10 and 11 is of strength corresponding to the strength of these beams. This construction permits of safe handling of the blocks during manufacture, transport and construction of the walls. But more, when the blocks have been laid up into a wall and when as usual, the joists rest on the inner wall, the bars or channels 15 are capable of transmitting some of the vertical load to the outer wall so that the outer wall can actually assist in the load-carrying function. This allows more efficient use of the aggregate material and hence lowers the cost of the block.

In reading the claims, it will be understood that relative positions of portions of the block are those corresponding to the upright position in which the block is normally used, as shown in Fig. 1.

What I claim is:

1. In a block casting machine for the manufacture of precast building blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting bars, a molding form, a core adapted to

partition said molding form into two spaced molding chambers, at least one slit in said core adapted to receive a connecting bar, and means on one face of said core substantially adjacent each slit adapted to support said connecting bar in inclined position during the casting process and to permit removal of said connecting bar integrally with the block after completion of the casting operation.

2. In a block casting machine for manufacturing precast unitary building blocks, said blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting bars, a molding form, a core in said molding form adapted to partition it into separate molding chambers for a pair of said spaced block members, a removable pallet adapted to cooperate with said core and molding form, said pallet comprising two pallet plates connected by straps and adapted to form bottoms for the separate molding chambers, and vertical narrow slits in said core, each of said slits adapted to receive a connecting strap of said pallet plates and to receive one of said connecting bars, said slits adapted to permit removal of said connecting bar integrally with the block after completion of the casting operation.

3. In a block casting machine for manufacturing precast unitary building blocks, said blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting bars, a molding form, a core in said molding form adapted to partition it into separate molding chambers for a pair of spaced block members, a removable pallet adapted to cooperate with said core and molding form, said pallet comprising two pallet plates connected by straps and adapted to form bottoms for the separate molding chambers, vertical narrow slits in said core, each of said slits adapted to receive a connecting strap of said pallet plates and to receive one of said connecting bars, and means on the core substantially adjacent each slit adapted to support said connecting bar during the casting process and to permit removal of said connecting bar integrally with the block after completion of the casting operation.

4. In a block casting machine for the manufacture of precast building blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting bars, a molding form consisting of a hollow form open at top and bottom, a core in said molding form adapted to partition said molding form into two spaced molding chambers, both said form and said core supported on a frame work, a removable pallet adapted to cooperate with said core and molding form, said pallet comprising two pallet plates connected by straps and adapted to form bottoms for the separate molding chambers, said pallet supported by supporting pins, ejecting pins adapted to eject said pallet and the block after forming, vertical narrow slits in said core, each of said slits adapted to receive a connecting strap of said pallet and to receive one of said connecting bars, and means on the core substantially adjacent each slit adapted to support said connecting bar and to permit removal of said connecting bar integrally with the block after completion of the casting operation.

5. In a block casting machine for the manufacture of precast unitary building blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting bars, a molding form, a core adapted

to partition said molding form into two spaced molding chambers, a pallet adapted to cooperate with said molding form and core and to be moved within said molding form in vertical direction, said pallet comprising two pallet plates adapted to form bottoms for the separate molding chambers, at least one vertical narrow open slit in said core, said slit being adapted to receive one of said connecting bars, and means cooperating with said slit and being adapted to support said connecting bar during casting, said slit and supporting means permitting placing and supporting of said connecting bar during casting and its removal integrally with the cast block without removing the core.

6. In a block casting machine for the manufacture of precast building blocks comprising spaced longitudinal block members of concrete or cinder aggregate connected by transverse connecting

bars, a molding form, a core in said molding form adapted to partition it into separate molding chambers for a pair of said spaced block members, a removable pallet adapted to cooperate with said core and molding form, said pallet comprising two pallet plates connected by straps and adapted to form bottoms for the separate molding chambers, and vertical narrow slits in said core, each of said slits extending downwardly from the upper surface of said core for a distance approximately corresponding to the full height of said spaced molding chambers and being adapted to receive a connecting strap of said pallet plates and one of said connecting bars, said slits permitting removal of said connecting bars integrally with the block after completion of the casting operation.

BENJAMIN LIEBOWITZ.