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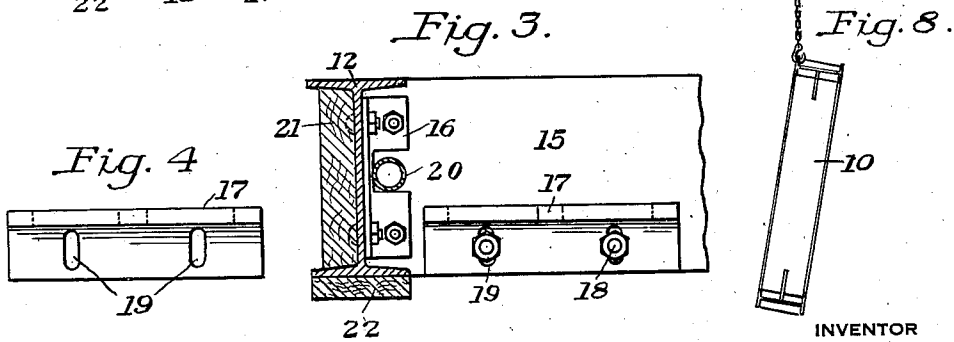
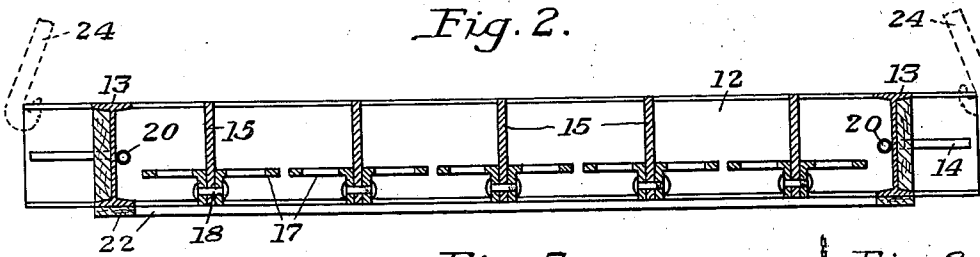
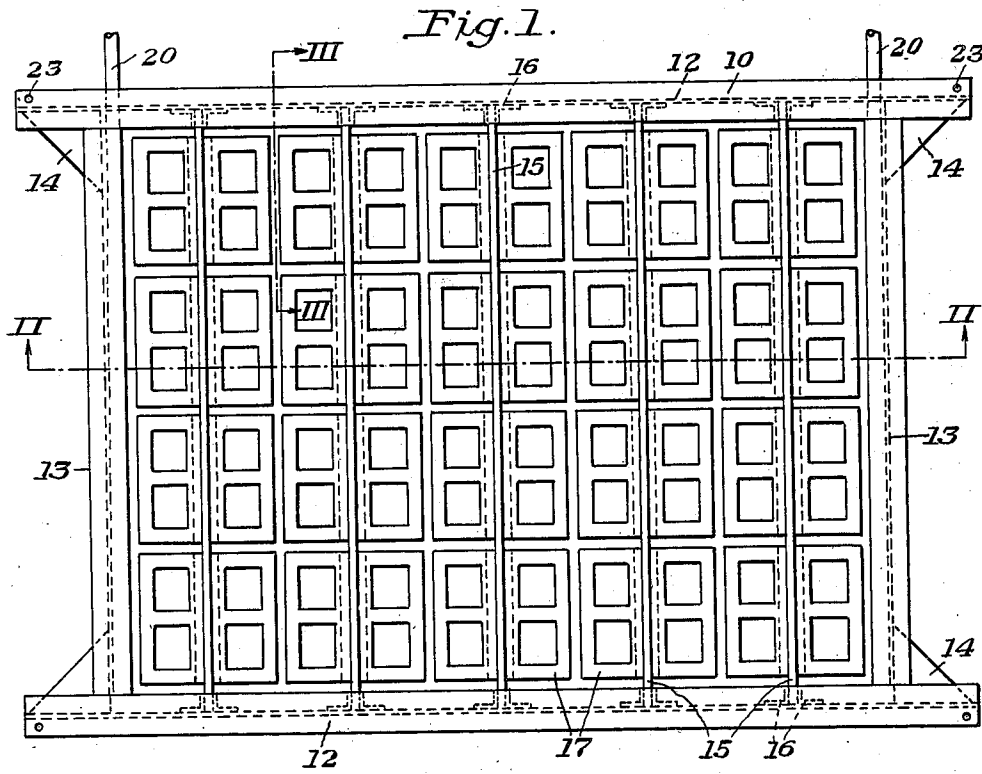
A. HENDERSON

2,261,736

GANG MOLD

Filed Aug. 21, 1939

3 Sheets-Sheet 1



INVENTOR
Albert Henderson
by his attorneys
Stebbins, Blenko & Parmelee

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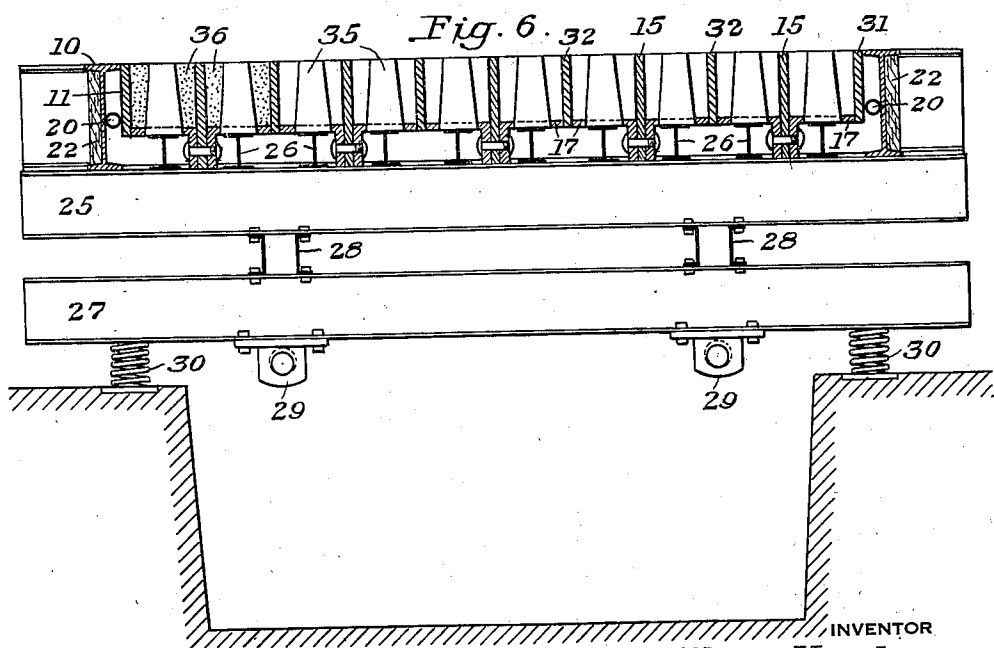
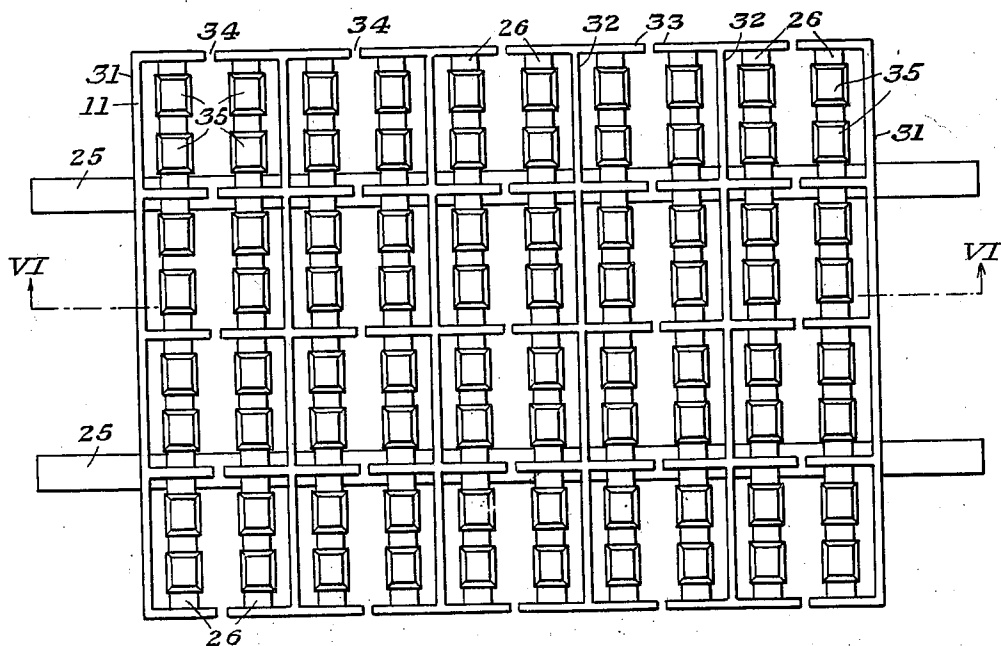
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Fig. 5.



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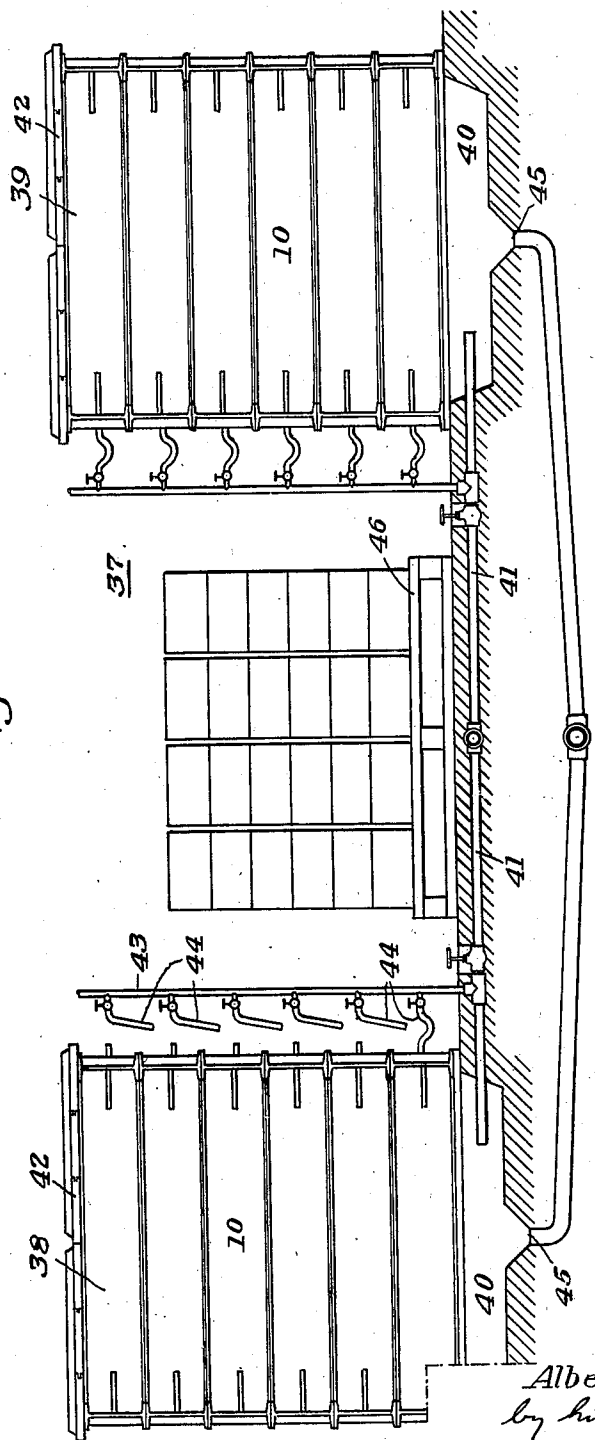
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Fig. 7.



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UNITED STATES PATENT OFFICE

2,261,736

GANG MOLD

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Application August 21, 1939, Serial No. 291,122

5 Claims. (Cl. 25—121)

This invention relates to the manufacture of concrete articles such as blocks, or the like, and particularly to a method and apparatus whereby such articles may be manufactured expeditiously and in quantities.

Numerous methods and apparatus for manufacturing blocks or the like have been known heretofore but all of them with which I am familiar require a large amount of apparatus for producing large quantities of blocks because the methods practiced are slow, particularly in the setting or curing stage. It is an object of my invention, therefore, to provide a method of making blocks or the like characterized by quick operation. A further object is to provide a simple and relatively inexpensive apparatus for practicing the method.

In a preferred embodiment, the apparatus comprises a plurality of box-like liftable mold members including pallets or mold bottoms adapted to cooperate successively with a relatively fixed mold member having cores thereon. The two members have interfitting portions providing a multiplicity of individual molds when the liftable member is disposed upon the fixed member.

When the mold members have been assembled and filled, they are subjected to vibration. The nature of the mix employed is such that the blocks are self-sustaining after vibration so that the liftable member may be raised immediately, bringing the blocks with it. It is then deposited in a suitable location, preferably on a stack of similar members, after which the top of the upper member is closed and steam admitted to the curing chamber defined by the stacked box-like mold members. After curing, the blocks are removed from the liftable frame members and the latter are then ready to be assembled again with the fixed member.

The following detailed description of the apparatus and method refers to the accompanying drawings illustrating the aforementioned preferred embodiment and practice. In the drawings,

Fig. 1 is a plan view of the box-like liftable mold member;

Fig. 2 is a transverse section taken along the line II—II of Fig. 1;

Fig. 3 is a partial section taken along the line III—III of Fig. 1;

Fig. 4 is an elevation of a detail;

Fig. 5 is a plan view of the relatively fixed mold member mounted on a vibrator;

Fig. 6 is a transverse sectional view taken through the assembled liftable and fixed mold

members, along the plane of line II—II of Fig. 1 and VI—VI of Fig. 5;

Fig. 7 is a side elevation showing the liftable mold members stacked to form curing chambers; and

Fig. 8 is a diagrammatic side elevation showing the disposition of the liftable mold members to facilitate unloading.

Referring now in detail to the drawings, I provide a box-like liftable mold member 10 and a relatively fixed mold member 11 adapted to be assembled together by lowering the former over the latter to provide a gang mold having a multiplicity of individual molds. The member 10 is composed of side walls 12 and end walls 13 which may conveniently be I-beams. The side and end walls are connected by gusset plates 14. Intermediate cross walls 15 extend between the side walls 12 and are disposed in spaced relation therealong. The cross walls 15 may be secured to the side walls 12 by angles 16 or in any other convenient way. Pallets or mold bottoms 17 are secured to opposite sides of the cross walls 15 by bolts 18. As shown in Fig. 1, the pallets 17 are arranged in pairs spaced along the length of the walls 15. The pallets have flanges through which the bolts 18 extend. Slots 19 in the flanges permit the pallets to be adjusted vertically of the walls 15. Pipe connections 20 extend through the side walls 12. A layer of insulation 21 is applied to the side and end walls. A compressible cushion strip 22 is applied to the bottom flanges of the beams forming the side and end walls 12 and 13. Holes 23 at the ends of the side walls are adapted to receive crane hooks as shown at 24.

The relatively fixed mold member 11 comprises a pair of spaced beams 25 having transverse beams 26 secured thereto. The beams 25 are supported on a vibrating table composed of beams 27 and cross channels 28. Rotary eccentrics 29 on the beams 27 cause vibration thereof which is transmitted to the remainder of the fixed mold member. The beams 27 are mounted on springs 30 to permit vibration thereof.

The beams 26 support a grid 31 formed of plates which is adapted to cooperate with the cross walls 15 and pallets 17 of the liftable mold member to define a plurality of individual molds. The grid 31 includes cross walls 32 and end walls 33 extending at right angles thereto. The ends of the end walls 33 associated with adjacent cross walls 32 are spaced apart as at 34 to permit entry of the cross walls 15 of the mold member 10. The cross walls 32 and end walls 33,

furthermore, enter the spaces between the pallets on adjacent cross walls 15 of the mold member 10 or the spaces between the pallets or the side and end walls 12 and 13 thereof. It will be apparent that when the mold member 10 is lowered on the member 11, as shown in Fig. 6, a multiplicity of individual molds will be provided, the side walls of which are defined by the cross walls 15 and 32, the end walls 33 and the pallets 17.

Cores 35 are secured to the beams 26 in appropriate positions to form voids in the blocks molded in the individual molds.

In practicing the method of the invention, the individual molds are filled with concrete as indicated at 36, after the liftable mold member 10 has been lowered over the fixed member 11. When the mold members have been so disposed, the pallets 17 rests on the beams 26 and the end walls 13 of the liftable member 10 rest on the beams 25. The filling of the molds may be accomplished in any convenient manner, either by a bucket carried on an overhead crane or a traveling hopper moved along above the length of the gang mold. After the molds have been filled, they are subjected to vibration to compact the concrete in the individual molds. As already explained, the rotary eccentrics 29 effect this vibration. Any suitable driving means may be provided for the eccentrics. During vibration, the compressible strips 22 serve to cushion the side and end walls of the liftable member 10. The pallets 17 rest directly on the beams 26, however, and are thereby subjected to the full effect of the vibration.

The amount of settling of the concrete to be expected on vibration of the molds depends on the nature of the aggregate, varying inversely with the density of the latter. For this reason, the pallets 17 are adjustable vertically by means of the slots 19, so that the blocks after vibration will have the desired height.

It is usually desirable to subject the tops of the molded blocks to compression after vibration, as the vibration tends to loosen the upper layer of concrete in the individual molds. This may be accomplished by any convenient means not shown.

Instead of using a vibrating table to support the gang mold, I may install eccentrics in a series along the bottom of the gang mold in order to insure that the contents of all the individual molds will be subjected to the same amount of vibration regardless of whether it is the first or the last to be poured. To this end, the beams 26 may be mounted for individual vibration.

After vibration and compression of the concrete, the liftable member 10 with the cross walls 15 and pallets 17 is raised from the fixed member 11, bringing the molded blocks with it. The concrete mix is of such character that the blocks are self-supporting after vibration. The molds are tapered to facilitate freeing the blocks therefrom. The liftable member 10 is raised by a crane and is then transferred to a curing platform 37 (Fig. 7). Here a plurality of liftable members 10 are piled one on the other in stacks as shown at 38 and 39 over wells 40. A steam line 41 is installed in the curing platform and extends into the wells 40. After the stacks of liftable members have been built up to the desired height, removable covers 42 are disposed on the top member. The side and end walls of the liftable members, with the covers 42, form

curing chambers in which the molded blocks are supported in spaced relation so that steam admitted from below circulates therearound. Branch steam lines 43 are provided with detachable connections 44 adapted to be connected to the pipes 20 extending from the liftable members 10 so that steam may be admitted directly into each member, if desired. The wells 40 have drains 45 to carry away condensate.

With the arrangement illustrated, the curing may be accomplished in a relatively short time, i. e., about sixty minutes. At the end of that time, the liftable members 10 may be unloaded and again disposed on the fixed member for a further molding operation. If the blocks are relatively light in weight, they may be manually removed from the stacked liftable members and deposited on carriers 46 which may then be removed by crane to a storage space. It will be understood that each of the members 10 is removed from the stack as it is unloaded.

If the blocks are too heavy to permit them to be removed conveniently from the members 10 while the latter are in horizontal position as shown in Fig. 7, the unloading may be greatly facilitated by swinging the movable members up on one edge as illustrated in Fig. 8, by means of a crane. The blocks slide down the pallets 17 to the lower side wall and may then be easily removed by hand to a storage pile.

It will be apparent that the invention provides a method and apparatus whereby the manufacture of concrete blocks or the like may be greatly expedited. Enough liftable members 10 are provided for each fixed member 11 to permit continuous use of the latter. In other words, the liftable members 10 are disposed successively on the fixed member and after filling are removed to the curing platform. The time required for thus building up one of the stacks on the platform will be approximately equal to the time required for curing and unloading a stack previously built up. In this way, a continuous movement of the liftable members from the vibrating table to the curing platform and back is maintained. The insulation around the sides and ends of the liftable mold members prevents excessive loss of heat during curing. The compressible strip around the bottom of each liftable member serves as a gasket to seal the joint between the members when stacked.

Although I have illustrated and described but a preferred embodiment and practice of the invention, it will be recognized that changes in the construction and procedure disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A gang mold comprising a liftable member including a series of spaced, parallel partitions, and a series of pallets secured to each of said partitions in spaced relation therealong, and a fixed member including a series of spaced, parallel partitions each having a series of end walls extending laterally therefrom and spaced therealong, the partitions being so positioned along said members that when the liftable member is disposed on the fixed member the partitions of the two members alternate with each other, and the partitions on the liftable member fit between adjacent end walls.

2. Apparatus for making concrete articles of rectangular shape comprising a plurality of groups of vertical mold walls, each including a side wall and two end walls, and a removable

mold wall forming the other side wall for all said groups thereby defining a plurality of individual molds, and pallets for said molds secured to said removable mold wall.

3. Apparatus for making concrete articles as defined by claim 2 characterized by said groups of vertical mold walls being mounted on a fixed member, and cores on said fixed member extending upwardly within the molds defined by said walls.

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4. Apparatus for making concrete articles as defined by claim 1, said liftable member having outer side walls defining a curing enclosure for articles molded therein after it has been removed from the fixed member.

5. Apparatus as defined by claim 1 characterized by cores on said fixed member extending through said pallets and a vibrating frame supporting said fixed member.

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