May 7, 1968 C. L. WILLIAMS 3,381,345

APPARATUS FOR PRODUCING CONCRETE BLOCKS

Filed April 13, 1965 3 Sheets-Sheet 1

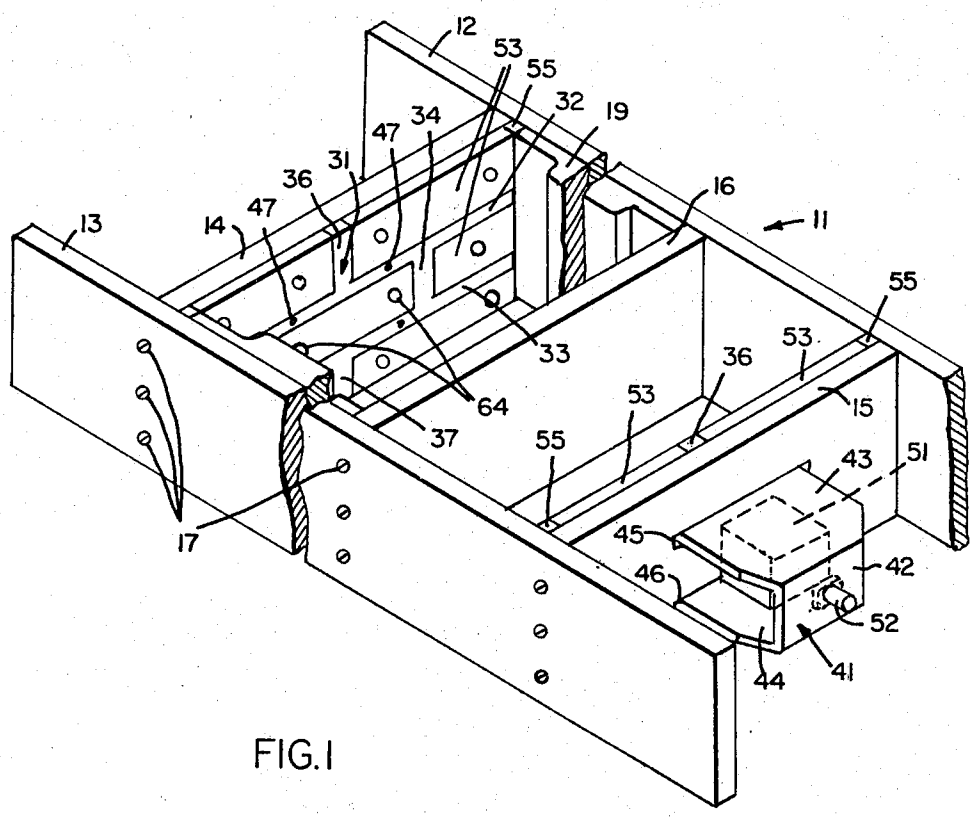



FIG. 1

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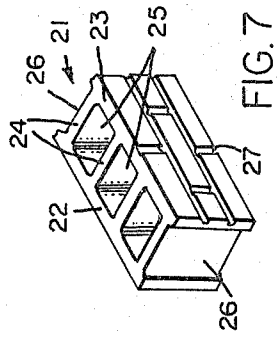



FIG. 7

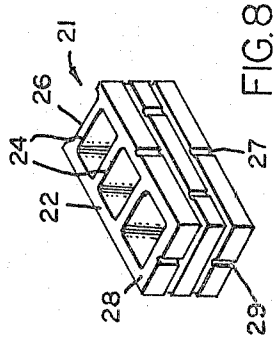



FIG. 8

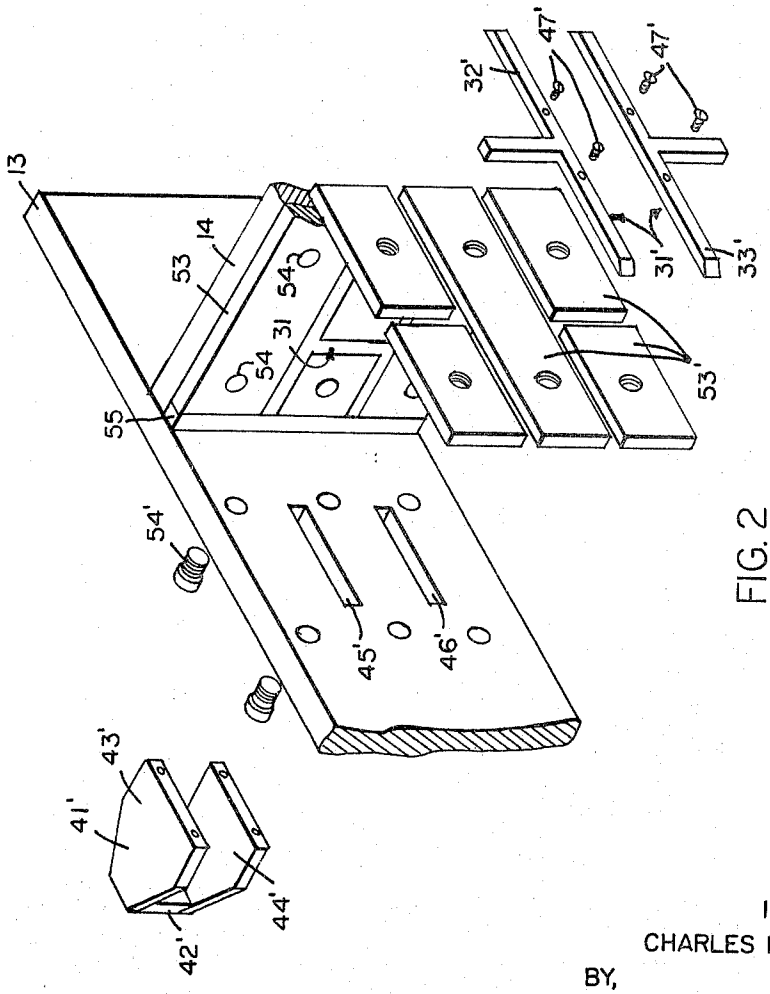



FIG. 2

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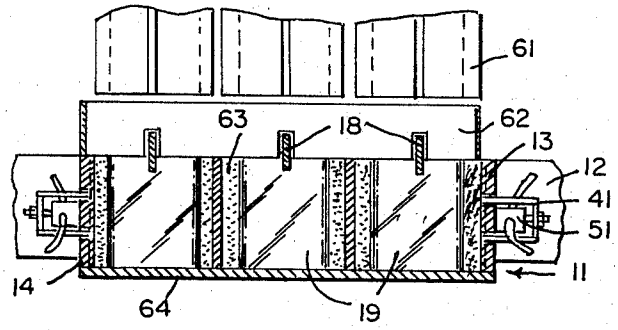



FIG. 3

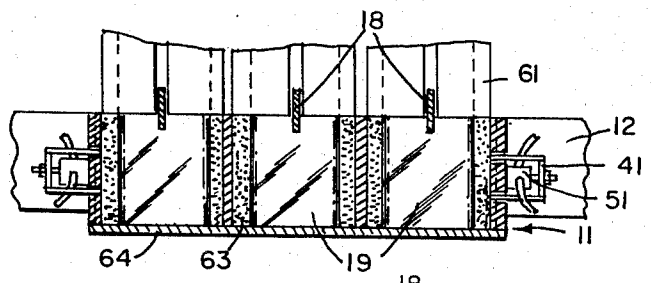



FIG. 4

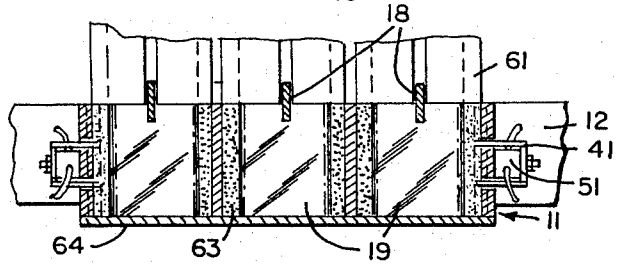



FIG. 5

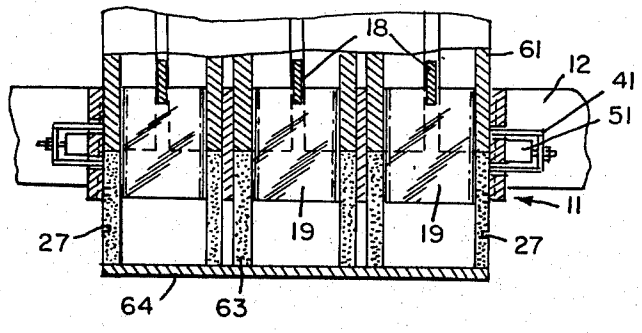



FIG. 6

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# APPARATUS FOR PRODUCING CONCRETE BLOCKS

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3 Claims. (Cl. 25—41)

## ABSTRACT OF THE DISCLOSURE

An embossing means for embossing a decorative design into a face of a concrete block including a reciprocal branding means associated with a side wall of the mold consisting of an assemblage of outstanding elements forming the design to be embossed on the corresponding face of the concrete block; a plurality of filler elements attached to the side wall and occupying the spaces between the outstanding elements of the branding means; and power means associated with the said side wall to move said branding means between a normal retracted position wherein the branding means remain adjacent the side wall and an extended position wherein the branding means are forced toward the interior of the mold.

This invention relates to apparatus for producing concrete blocks having an embossed face or a plurality of embossed faces. It particularly relates to an attachment for a conventional concrete block-making machine which makes it possible to produce in such a machine during its normal operating cycle concrete blocks in which at least one of the faces is embossed with a decorative design.

Concrete blocks are a useful and widely used means for building load-bearing and facing walls for all types of construction. They are strong, relatively inexpensive and easy to use. A wall constructed of concrete blocks can be assembled in a short time at a low labor cost.

One disadvantage of a concrete block wall is that it is generally considered to be unattractive. For this reason where architectural appearance is of importance it is common to face a concrete block wall with a skim coat of stucco, plaster, cement or the like, or to use the concrete block wall as a support for a conventional wood or metal siding. Any such attempt to disguise the appearance of the wall adds appreciably to the cost and reduces the over all utility of concrete block wall construction.

It is the purpose of the present invention to provide those faces of concrete blocks which are to be exposed within a wall with integral facing designed to give the assembled wall a pleasing appearance, and to obscure the normal monotonous appearance of such walls. It is a further purpose of this invention to provide means adapted to apply such an integral facing to the block during the normal operating cycle of a modern high capacity concrete block-making machine.

In a high capacity block-making machine blocks are formed, usually three at a time, in an open top mold box. The mold box is essentially a four-sided metal frame provided with transverse dividers or partition plates to form the individual block mold, and with a suitable number and arrangement of cores to form the corresponding desired cavities in the finished blocks. The cores are suspended from suitable bridging members which extend across the mold box from the top of the frame element on one side to the top of the frame element on the other. A removable platen which is yieldingly held in position against the bottom of the mold box by suitable piston arrangement provides a temporary and replaceable bottom for the molds.

In operation after a platen is placed in position next to the bottom of the mold box a pre-measured charge of a



stiff (low slump) portland cement concrete mix is charged into the mold box from a sliding frame member which in its alternate position receives the pre-measured charge from a suitable mixing apparatus. After the charge is received the charging frame is slid out of position and the mold box is vibrated to compact the charge. A set of stripper head shoes is then forced down on the top of the compacted charge to further compress and compact it. Finally the retaining force imposed on the holding means holding the platen in position is reduced and the now formed concrete blocks are forced out through the bottom of the mold in place on the platen by the further movement of the stripper head shoes. The platen holding the formed blocks in position is removed and a new platen is placed in position in the mold box and the cycle is repeated. The formed blocks remain on the platen on which they were formed until the concrete cures.

It will be appreciated from this brief description of the mode of operation of a typical concrete block-making machine that the machine is capable of a high rate of production under semi-automated conditions. Once a supply of concrete mix is established it is only necessary to provide the machine with a means for supplying empty platens and a means for carrying the filled platens away. It will further be appreciated that any means for treating a face of a concrete block which in any way interferes with the normal operation of the machine, or which requires individual handling of a block after the block has been stripped from the mold and placed on the platen is inherently uneconomic.

It is an object of this invention to provide a conventional concrete block-making machine with means for decorating one or more faces of certain blocks made therein which means are operable during the normal operating cycle of the machine.

It is a further object of this invention to emboss one or more faces of a concrete block with a decorative design while such block is being formed during the normal operating cycle of a concrete block-making machine.

These and ohter objects of the present invention will become more apparent from the specific description which follows, and from the drawing in which:

FIG. 1 is a perspective view of a typical concrete block-making mold box (simplified for the purpose of clarity) in which the means of the present invention has been installed.

FIG. 2 is a perspective view partially in section and partially exploded showing a mold box provided with a second arrangement of the means of the present invention.

FIGS. 3 through 6 are successive views showing in sectioned elevation the essential components of a conventional block-making machine equipped with the means of the present invention in the various stages of the sequent of the method of the present invention.

FIG. 7 is a perspective view of a block made according to the present invention provided with an embossed side face.

FIG. 8 is a perspective view of a block made according to the present invention provided with both an embossed side face and an embossed end face.

Referring to the drawing, and particularly to FIGS. 1 and 2 thereof, the mold box **11** is indicated diagrammatically by means of the side walls **12** and **13** and end walls **14** and **15**, arranged perpendicularly thereto. Mold box **11** may be divided into a plurality (normally three) of individual block forming molds by means of an appropriate number of dividers or partition plates **16** which extend between side walls **12** and **13** parallel to end walls **14** and **15**. End walls **14** and **15** and partition plates **16** are attached to side walls **12** and **13** by means of suitable fastening means indicated diagrammatically as bolts **17**.

The individual molds are normally provided with a plurality of central core elements suspended from a bridge member 18 (see FIGS. 3–6) which extends in the case of each mold between side walls 12 and 13 above the mold itself. In addition block end cores may be provided appropriately fastened to side walls 12 or 13. For clarity of illustration none of the core pieces have been shown in FIGS. 1 or 2 except for block end core 19. Likewise the mold box 11 itself has been simplified to the bare essentials so that while mold box 11 as shown is typical of the mold boxes used in all common block-making machines. It is not intended to be illustrative of the particular mold box used in any such machine.

The embodiment shown in FIG. 1 is designed to emboss a decorative design on one side wall of each of the outside blocks formed in mold box 11. Such a block 21 is illustrated in FIG. 7. It will be noted that block 21 in common with all typical common concrete blocks is provided with two elongated side walls or faces 22 and 23 connected at intervals by webs 24. The internal apertures 25 between webs 24 are formed by the internal core members and the end aperture 26 byeond webs 24 are formed by end core members 19 as block 21 is produced in mold box 11. In the particular block illustrated in FIG. 7 face 23 is provided with a plurality of embossings 27 arranged generally in two horizontal lines extending the width of face 23 with a plurality of vertical lines which both connect the two horizontal lines and extend from one or the other to the edge of the block to give face 23 the appearance of a segment of a wall formed of common brick. It will be understood throughout this specification that while the specific embodiment of the present invention is shown in the form of a brick face block the particular form is merely illustrative and any design that is desired may be embossed on the face of a block merely by rearranging the block embossing members.

Returning then to FIG. 1 the inner surface of each of end walls 14 and 15 of mold box 11 is provided with an embossing member 31 which to form the particular face embossment shown in FIG. 7 comprises two horizontal bars 32 and 33, two spaced vertical bars 34 joining bars 32 and 33 and two centered vertical bars 36 and 37 extending outwardly from horizontal bars 32 and 33 respectively. Each of bars 32 through 37 are square sided and square ended and as shown all lie on a common plane. Embossing member 31 may be formed in one piece or may be formed by joining individual bar elements together in the desired configuration as by welding. Likewise where the particular design to be embossed on the face of a block requires it embossing member 31 may be formed of a plurality of unconnected pieces.

Embossing member 31 is mounted on a yoke member 41 which comprises saddle 42 and two depending arms 43 and 44. Arms 43 and 44 pass through a cooperating slot 45 and 46 provided in end wall 14 or 15 of mold box 11. Arms 43 and 44 and the cooperating slots 45 and 46 are so spaced that the ends of arms 43 and 44 contact the rear side of bars 32 and 33 respectively to which they are attached by fastening members such as screws 47. It will be understood, of course, that the number, location and arrangement of yoke arms 43 and 45 and the cooperating end wall slots 45 and 46 will depend upon the particular configuration of embossing member 31.

Saddle 42 of yoke member 41 is attached to plunger 52 of piston 51 which in turn is attached to the rear side of end wall 14 or 15. Piston 51 may be mechanically, pneumatically or electrically activated. It is designed normally to retain the rear of embossing member 31 in contact with the face of end wall 13 or 14 and when actuated to retract plunger 52, thereby forcing embossing member 31 out of contact with end wall 14 or 15, as the case may be, toward the center of the corresponding mold portion of mold box 11.

Filler blocks 53 are provided to fill in the interstices remaining between bars 32 and 37. Filler blocks 53 may be of the same thickness as embossing member 31 so that the exposed face of end wall 14 or 15 which comprises blocks 53 and embossing member 31 presents a flat planar surface when embossing member 31 is in its normal retracted position. Filler blocks 53 are fastened to end wall 14 or 15 by means of suitable fastening member such as bolts 54. A spacer 55 may be provided at the corner between end walls 14 or 15 and side walls 12 or 13, to occupy the space between the projections of end core 19 and the projection of the exposed faces of end walls 14 or 15. Normally the stroke of embossing member 31 is less than the thickness of filler blocks 53 to minimize the possibility of any of the charge becoming entrapped between embossing member 31 and end wall 14 or 15. To prevent the build-up of any such entrapped portion of the charge behind embossing member 31 wiping means may be provided between filler blocks 53 and the adjacent portions of embossing member 31, or end wall slots 45 and 46 may be extended and enlarged.

In the second embodiment shown in FIG. 2 mold box 11 is provided with embossing members 31 and 31' adapted to operate against a side face and an end face of a block to form a block for use in exposed corners, such as that illustrated in FIG. 8. In this embodiment an end core 19 is removed and replaced by an assembly comprising embossing member 31' and filler blocks 53'. Thus as shown in FIG. 8 the resulting block instead of having an end aperture 26 at one end, is provided with an end wall 28. End wall 28 is provided with embossings 29.

Since in the particular embossed pattern shown at the end of the block shown in FIG. 8 there are no vertical lines connecting horizontal bars 32' and 33' embossing member 31' remains in two separate pieces. One is attached to the upper arm 43' of yoke 41', the other to the lower arm 44' of yoke 41'. In all other respects the embossing member shown for the side wall 12 or 13 is identical to the one shown for end walls 14 or 15 of mold box 11. The only modification is that either the ends of horizontal bars 32 and 33 in the case of embossing member 31, or the end of horizontal bars 32' and 33' in the case of embossing member 31' are shortened sufficiently to avoid contact when both embossing members are in their extended embossing position. Since the exposed faces of the mold walls provided with the embossing means of the present invention are flat and planar except when embossing member 31 or 31' as the case may be, is actuated the faces or blocks made in such molds are likewise flat and planar except when the embossing member is so actuated.

The mode of operation is illustrated diagrammatically in FIGS. 3 through 6. In FIG. 3 the mold box 11 modified as shown in FIG. 1, is shown with the stripper head 61 in an elevated position and with feed tray 62 in the feeding position. A charge of concrete mix indicated at 63 has been inserted into the mold box 11 where it is supported on platen 64. Embossing members are in their normal retracted position.

In FIG. 4 feed tray 62 has been retracted as stripper head 61 has been lowered into compressing contact with the charge 63. During this sequence the mold box 11 is subjected to a vibrating motion to further compact charge 63.

During the compaction cycle as illustrated in FIG. 5, pistons 51 are actuated, driving embossing member 31 into that portion of charge 63 adjacent end walls 14 and 15.

As soon as the embossing stroke is complete, embossing members 31 are returned to their normal retracted position and the now formed and embossed blocks 21 are forced out of mold box 11 in place on platen 64 by the continuous stroke of stripping head 61.

It will be noted in the three mold set up shown only the two end blocks are embossed, and that the block formed in the central mold is unembossed.

The embossing means shown in FIGS. 1 and 2 can be substituted directly for the existing side or end walls of the mold blocks of existing block molding machines without in any way altering the machine or its mode of operation. It would be possible, if desired, to provide similar embossing means cooperating with partition plates **16** if it were for example, desired to emboss both side walls of a block. To emboss both side faces of standard blocks it would be only necessary to eliminate the third and middle block, and to use the space normally used for the mold for this middle block for the mounting of the embossing means drive means. Likewise other possible arrangements may be obtained by either altering the size of the block or the size of the machine.

I claim:

**1.** Means for embossing a decorative design into a face of a concrete block during the formation thereof in a block mold of the type having stationary walls, an open top and a removable bottom wherein the formed block is removed from the mold by forcing the same from the top between the side walls onto the removable bottom; said embossing means comprising

reciprocal branding means associated with a side wall and having a normal retracted position adjacent said side wall,

said branding means comprising a plurality of elements outstanding from said side wall arranged in the decorative design to be embossed into the face of the concrete block,

a plurality of filler block members attached to said side wall and adapted to occupy the spaces along said side wall not occupied by said branding means,

the face of said branding means and the faces of said filler block members exposed toward the interior of said mold all forming a common substantially



uninterrupted smooth surface when said branding means is in its normal retracted position,

and reciprocating power means associated with said side wall adapted to move said branding means from the normal retracted position to a position where the exposed face of said branding means extends into the interior of the mold beyond the surface presented by said filler block members.

**2.** Means for embossing a decorative design into the face of the concrete block as claimed in claim **1** wherein said side wall associated with said embossing means is provided with at least one slot positioned to cooperate with said branding means, and wherein said power means comprises a reciprocal movement producing device associated with the rear of said side wall and a connecting means passing through said slot and connecting said device to said branding means.

**3.** Means for embossing a decorative design into the face of a concrete block as claimed in claim **2** wherein at least two said slots are provided, wherein said connecting means comprises a yoke having arms passing through each said slot and a saddle member connecting said arms and wherein said piston is connected to said saddle member.

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