

Jan. 28, 1958

C. G. DAVIS

2,821,005

CEMENT BLOCK MAKING AND FORMING PRESS

Filed Feb. 1, 1954

4 Sheets-Sheet 1

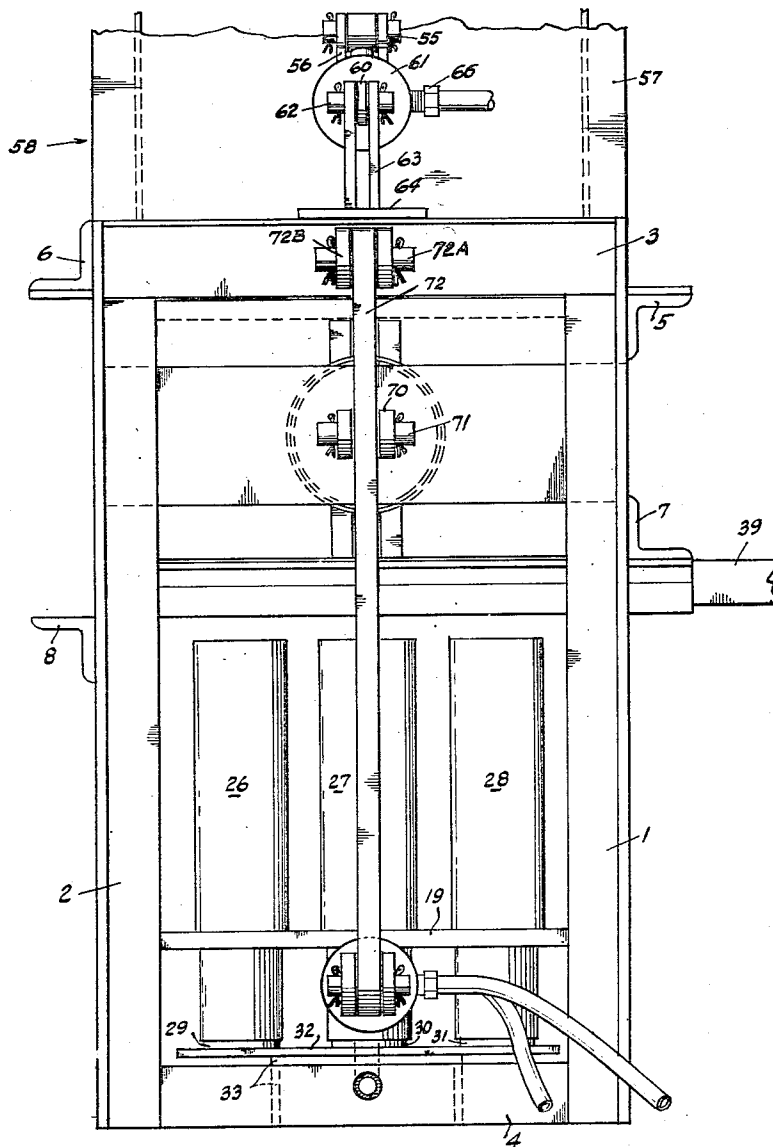


Fig. 1

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4 Sheets-Sheet 2

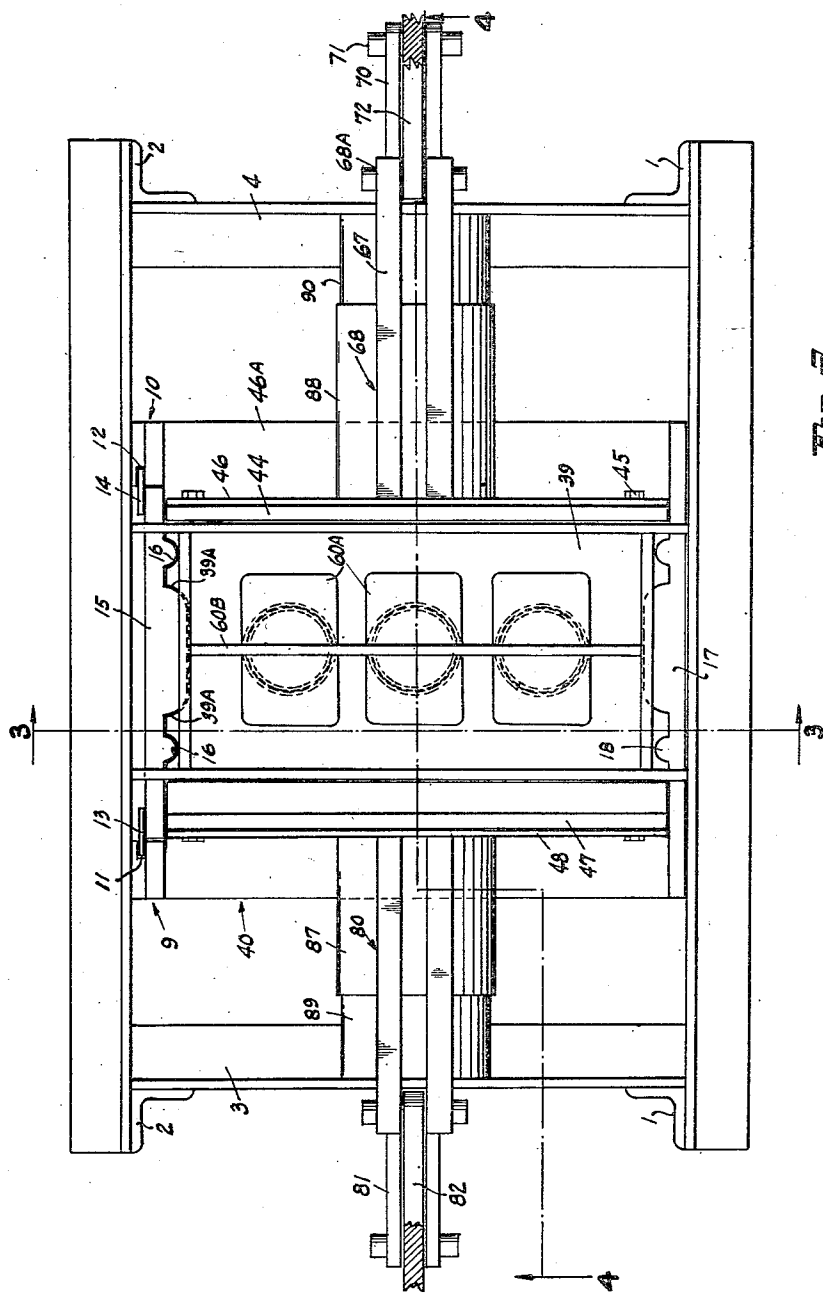


Fig. 2

Jan. 28, 1958

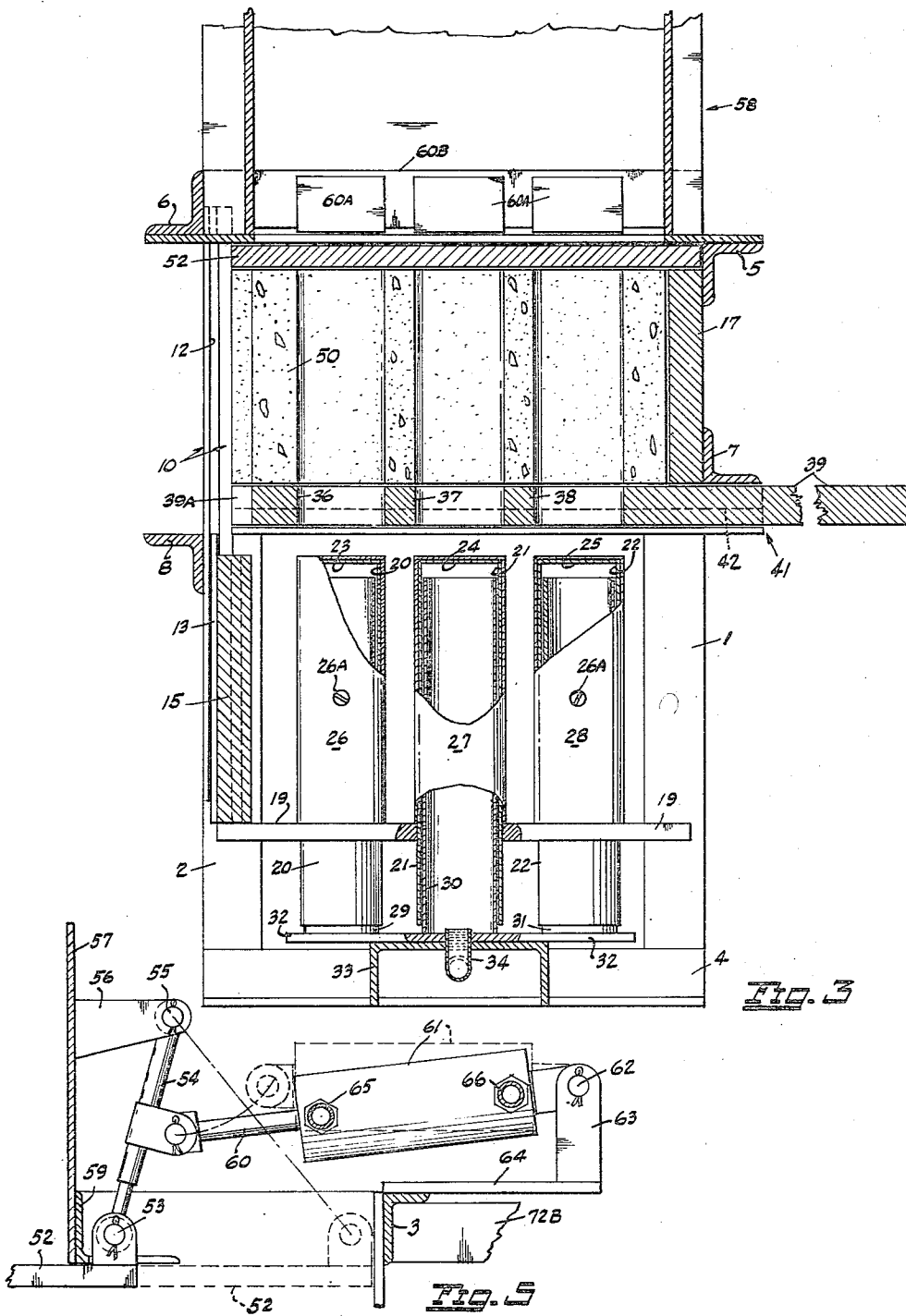
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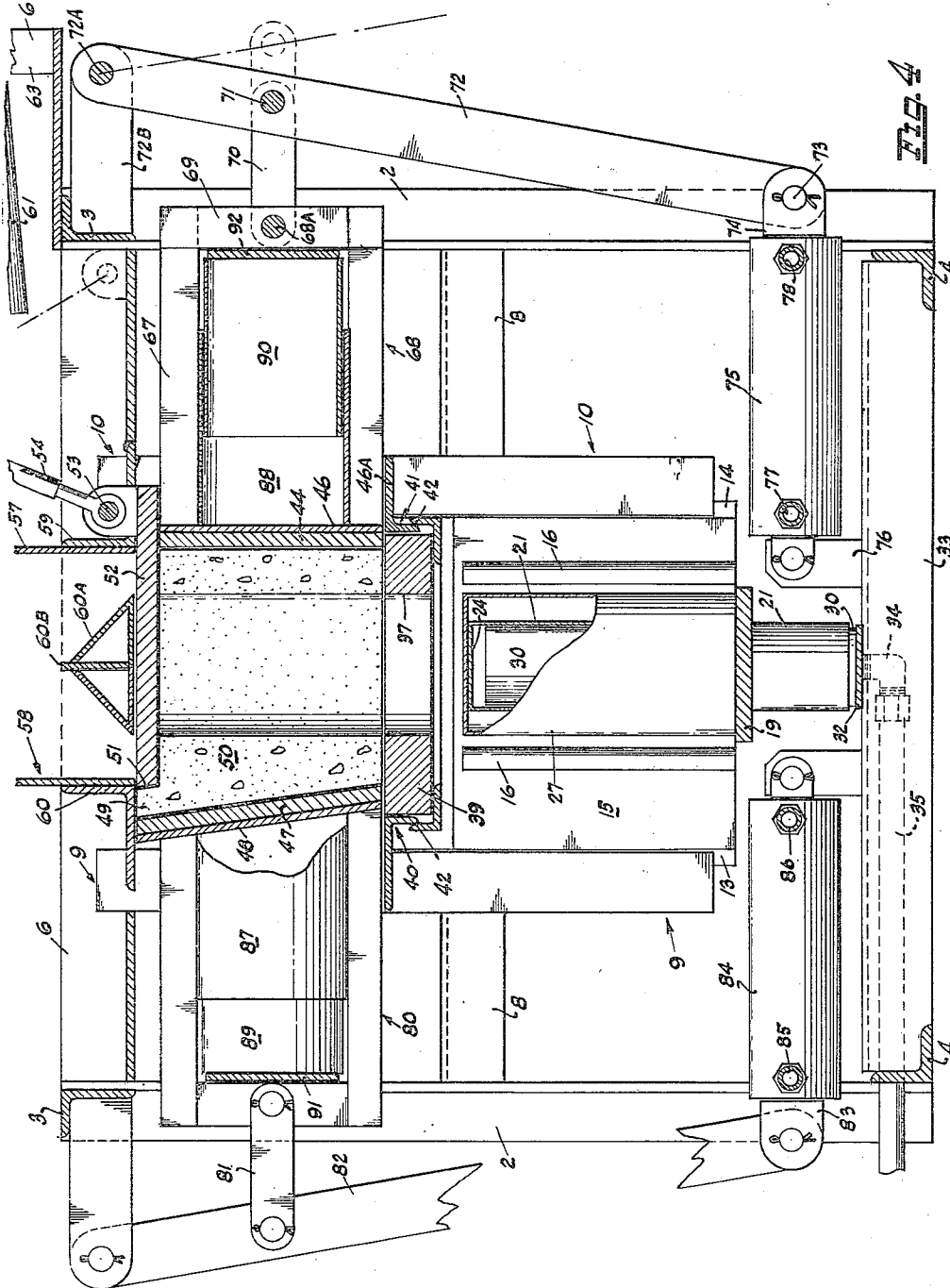
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4 Sheets-Sheet 3





1

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CEMENT BLOCK MAKING AND FORMING PRESS

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1 Claim. (Cl. 25—41)

This invention relates to improvements in apparatus for making and forming building blocks.

Among the principal objects of the invention are:

To provide a pressure actuated mold manually controllable by a single operator for producing compressed cement blocks and the like for use in building construction; and

To provide an apparatus through the medium of which the blocks can be made quickly, accurately, and with a minimum amount of labor.

The foregoing and other objects will appear as my invention is more fully hereinafter described in the following specification, illustrated in the accompanying drawings, and finally pointed out in the appended claim.

In the drawings:

Figure 1 is an end view of a block making and forming apparatus made in accordance with my invention with fragments of a hopper and a pallet broken away.

Figure 2 is a top plan view of Figure 1 with a cover plate removed and with some parts of the control mechanism omitted.

Figure 3 is a sectional end view taken approximately along the line 3—3 of Figure 2.

Figure 4 is a sectional front view taken approximately along the line 4—4 of Figure 2.

Figure 5 is a detail view of pressure-actuated means for a movable top plate of the mold.

Referring now more particularly to the drawings:

The invention comprises a framework made up of front and rear corner members indicated at 1 and 2, respectively, interconnected at their top and bottom ends by transverse end members 3 and 4, respectively, and front and rear longitudinal members 5 and 6, respectively. The front and rear corner members are also interconnected intermediate their ends by longitudinal members 7 and 8 arranged on two different horizontal planes as shown.

Secured to the rear member 8 by welding or by bolts or the like are two pairs of vertical guide plates generally indicated at 9 and 10. Each pair of plates has a vertical guide slot formed between them as at 11 and 12, respectively, to slidably support flanges 13 and 14 secured to and extending laterally from a vertically movable rear end plate 15 of the mold. The front or inner face of the plate 15 is formed with laterally spaced apart vertically arranged projecting surfaces 16 to form corresponding impressions in the corresponding end of a molded block which are formed in the mold in an inverted position as shown in Figures 3 and 4.

Permanently secured to the front horizontal members 5 and 7 is a fixed front plate 17 for the mold also having projecting surfaces 18 formed on its inner face. As best shown in Figures 3 and 4, the movable rear end plate 15 is secured to the rear end of a lifting plate 19 through which extend and to which are secured in any suitable manner the lower portions of three core-supporting cylinders 20, 21 and 22 closed at their top ends as at 23, 24 and 25. Hollow molding cores 26, 27 and 28, which may

2

be of oval shape or of any other desired shape in cross-section, also closed at their top ends are removably secured by set screws 26A to the core-supporting cylinders for vertical movement therewith. The core-supporting cylinders are slidably mounted in piston-cylinder relationship on fixed vertical cylinders 29, 30 and 31 open at their top ends as shown and closed at their bottom ends by a platform 32 to which they are secured. The platform is permanently secured to a base in the form of an inverted channel member 33 which is secured at both of its ends to the bottom transverse members 3 and 4 of the frame.

The platform 32 and the top of the base channel member are suitably apertured for the attachment thereto of a fitting 34 to which is attached one end of a fluid pressure supply line 35 whose opposite end is attached to any approved type of manually actuated pressure control valve (not shown) connected to a source of supply. Pressure directed to the interior of the fixed cylinder 30 will, of course, lift the plate 19, molding cores 26, 27 and 28 and the end plate 15 upwardly into their operative mold-forming positions. The other two fixed cylinders 29 and 31 serve as guides for their respective cores and their supporting cylinders during any up and down movement thereof. In moving upwardly the molding cores extend through, and their lower portions seal off, openings 36, 37 and 38 formed in a pallet 39 which is slidably mounted on a support in the form shown which comprises two pairs of opposing angle irons 40—41, each pair being joined together as at 42 throughout their length and secured at one of their ends to the underside of the longitudinal member 7 of the frame and at their opposite ends to the guide plates 9 and 10 for the end plate 15 of the mold.

One side of the mold comprises a vertical plate 44 removably secured as at 45 to a backing plate 46 slidably mounted therewith for lateral movement upon the flange 46A of the top angle iron of the pair indicated at 41. The opposite side of the mold is provided with a diagonally arranged plate 47 and backing plate 48, both being of greater height than that of the opposite side plate 44 for the purpose of forming the outer surface of a projecting flange 49 throughout the length of one edge of a molded block 50. This flange will, of course, extend downwardly when the finished block is removed from the mold and its position herein shown is reversed. The inside surface of the flange 49 is formed by one edge 51 of a movable top plate 52 for the mold. The top plate is pivotally attached (see Figures 4 and 5) as at 53 to one end of a telescopic arm 54 whose opposite end is pivotally attached as at 55 to the outer end of a bracket 56 secured to one wall 57 of a hopper generally indicated at 58 and supported by angle irons 59 and 60 extending transversely of the frame and secured at their ends to the guide plates 9 and 10 and to the top horizontal members 5 of the frame. Material flowing from the hopper into the mold will be distributed by downwardly diverging hoods 60A secured to a bar 60B secured at both of its ends to the bottom end members of the hopper 58. The telescopic arm is pivotally attached to one end of a connecting rod 60 provided with a piston (not shown) operatively disposed within a fluid pressure cylinder 61 pivotally attached as at 62 to a bracket 63 mounted upon a plate 64 secured to one of the transverse end members 3 of the frame. This cylinder is provided with alternate pressure inlet-outlet fittings 65 and 66 connected to any approved type of manually actuated control valve (not shown). Movement of the connecting rod 60 in one direction to the right as viewed in Figure 5 will draw the top plate to one side and thus open the mold cavity for the admission of cement or other block-making material from the hopper 58. Movement of the connecting rod in the opposite direction

3

will, of course, close the top of the mold as shown in Figures 3 and 4. The corresponding movement of the plate 52 into a mold-closing position is limited by its pivotal connection 53 to arm 54 coming into contact with the angle iron 59 so that the opposite edge of the plate will stop in spaced relation to the top of the diagonal wall 47 thus allowing the molding material to form the bottom surface of the block and the downwardly projecting flange 49 as aforesaid. The top plate 52 of the mold is also slidably supported along the parallel top elements 67 of a frame generally indicated at 68 whose inner end is secured to the backing plate 46 of the side plate 44 and whose outer end is connected as at 68A by a vertical element 69 of the frame to one end of a pair of links 70 whose opposite end is connected as at 71 to a lever 72. The top end of the lever 72 is pivotally attached as at 72A to a pair of arms 72B secured to and extending outwardly from the frame member 3. The bottom end of the lever is pivotally connected as at 73 to a connecting rod 74 of a piston (not shown) within a fluid pressure cylinder 75 which is pivotally attached at one of its ends to a bracket 76 mounted upon the base channel member 33. The cylinder 75 is provided with alternate pressure inlet-outlet openings 77 and 78, respectively.

A companion frame 80 on the opposite side of the mold is secured at its inner end to the diagonal backing plate 48 of the diagonal side plate 47 and at its outer end to a link 81 connected to a lever 82 which is connected respectively at its top and bottom ends to the other cross member 3 and to the connecting rod 83 of the fluid pressure cylinder 84 which is also provided with alternate inlet-outlet openings as indicated at 85 and 86, respectively, and pivotally mounted on the base channel member 33, as shown.

For guiding and stabilizing the side plates of the mold during their inward and outward movement I secure to each one end of cylinders indicated at 87 and 88 within which are telescoped cylinders 89 and 90, respectively. The cylinders 87—88 are also secured to the top and bottom members of their respective frames 80 and 68. The cylinders 89—90 are secured at their outer ends to supporting plates 91—92, respectively, which are secured to the front and rear corner members 1 and 2 of the main frame as shown.

The top of the apparatus is provided with a protective covering plate indicated at 94 which can be secured to the front and rear corner members in any approved manner.

The operation of the invention is as follows:

To make the mold ready to receive cement, concrete or the like, the pallet 39 is placed on its support 40—41 and moved rearwardly into the position shown in Figure 3 wherein the openings 36, 37 and 38 in the pallet will be vertically aligned with the molding cores 26, 27 and 28 and space will be provided at the rearward end of the pallet for the upward passage of the rear end wall 15 into its proper position. The rear end of the pallet is formed with indentations 39A to complement the projecting surfaces 16 formed on the front face of the rear end plate. The molding cores and the rear end wall are moved upwardly simultaneously by the lifting plate 19 upon directing fluid pressure to the interior of the cylinder 30 upon manipulation of the pressure control valve as aforesaid. Following this, the side plates 44—47 are moved toward each other and held in proper spaced relation through the medium of their respective guiding and stabilizing cylinders, associated frames, links and actuating levers 72—82, all of which are pulled inwardly by operation of the pistons and connecting rods of their respective fluid pressure cylinders 75—84 upon proper manipulation of the manually actuated pressure control valves for the cylinders aforesaid.

With the parts of the mold in the positions just described

4

and with the movable top plate 52 in an open position as shown in dotted lines in Figure 5, cement or other material, as aforesaid, is fed from the hopper into the mold and distributed by the distributing hoods 60A to fill the mold evenly, including the spaces between the molding cores 26, 27 and 28. The cover plate 52 is then moved into a closed position by operation of its fluid pressure cylinder and interconnecting mechanism. This movement of the cover plate will level off the corresponding surface of the cement within the mold and force any excess thereof upwardly within the confines of the upper portion of the side wall 47, the under surface of the bottom flange of the angle iron 60 and the inner edge 51 of the cover plate to form the flange portion 49 of the block. The material being molded can be compressed to a high degree by further inward movement of the side walls of the mold until the limit of such movement is reached when the pistons within the cylinders 75—84 reach the end of their inward stroke and the levers thereby assume the positions shown in Figure 4.

When the block becomes hard enough to be removed from the mold, reverse operation of the various fluid pressure cylinders will draw the mold forming elements away from the block thus leaving it and the pallet upon which it rests free to be removed for the insertion of a new pallet for the next block.

While I have shown a particular form of embodiment of my invention I am aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

I claim:

Apparatus of the class described comprising a frame, a pallet support mounted within the frame, a pallet slidably mounted upon the support for insertion into the frame to form a bottom wall for a mold and for removal from the frame with a finished block disposed thereupon, core receiving openings formed in the pallet, a fixed vertical end wall for the mold mounted within the frame, an opposite vertical end wall and a plurality of molding cores mounted upon a lifting plate for simultaneous vertical movement into and out of mold-forming positions, a vertical side wall and an opposite side wall diagonally arranged with respect to the pallet and extending to a greater height than said side vertical side wall, both of said side walls being slidably mounted within the frame for movement toward and away from each other into and out of mold-forming positions respectively, a cover plate for the mold slidably mounted within the frame for horizontal movement into and out of a mold-forming position, individual manually controlled fluid pressure-actuated means operatively connected to said side walls and to said cover plate for moving them horizontally into and out of mold-forming positions and to said lifting plate for moving said end wall and molding cores mounted thereon into and out of mold-forming positions, and abutment means carried by the frame in the path of movement of said connection of the fluid pressure-actuated means to said plate to limit said horizontal movement of the plate toward said diagonal side wall whereby space will be provided between the adjacent edge of the plate and said extended portion of said diagonal wall to provide space for molding a flange entirely along the corresponding edge of a block being molded.

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