March 26, 1929. J. H. BESSER 1,706,647

MOLD BOX

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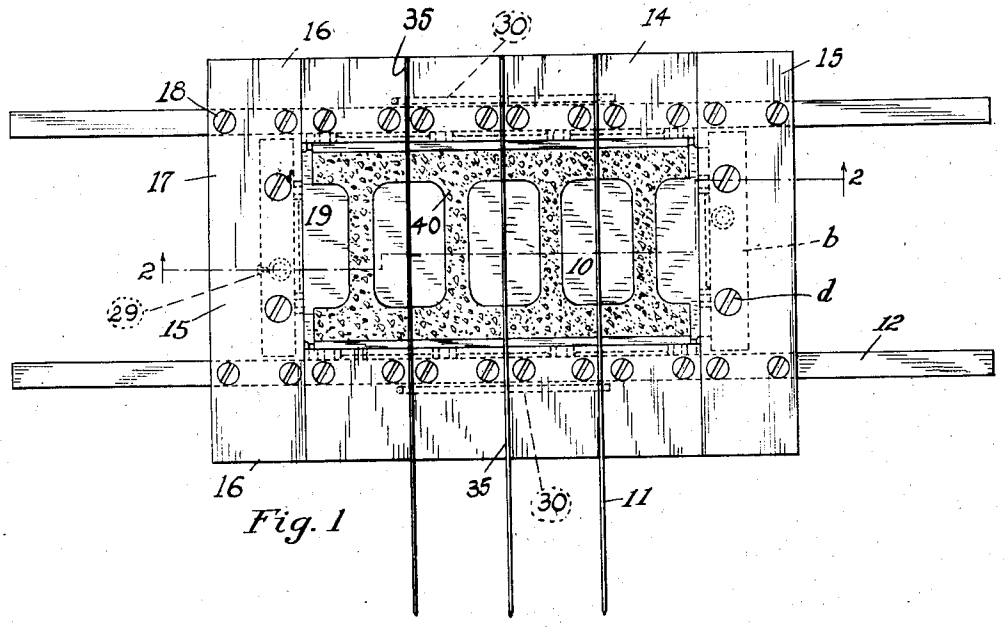


Fig. 1

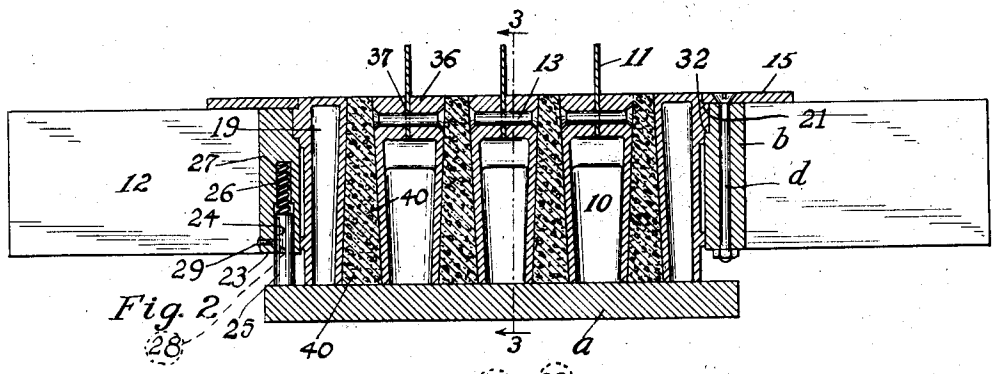


Fig. 2

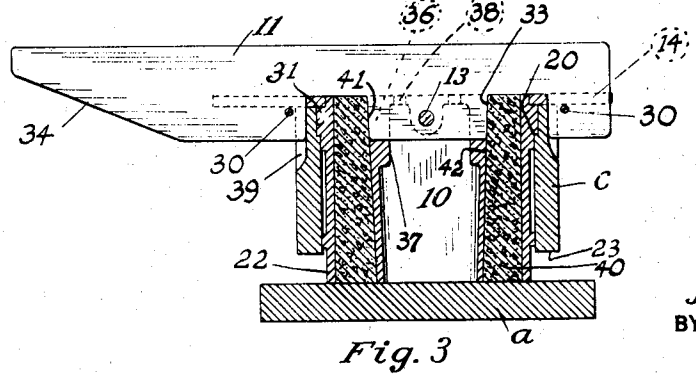


Fig. 3

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MOLD BOX

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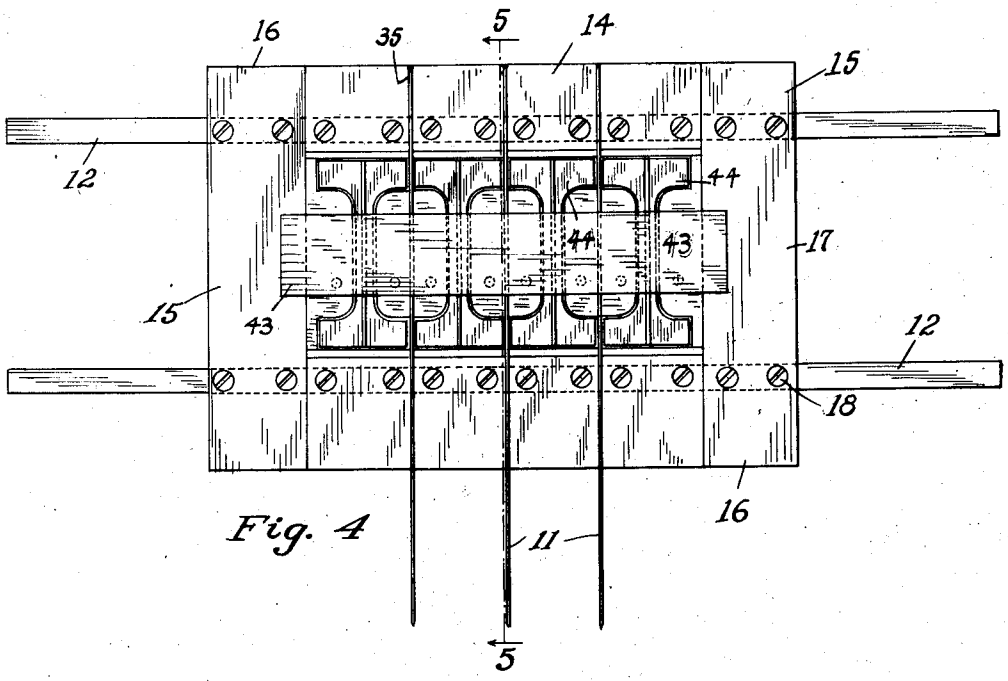


Fig. 4

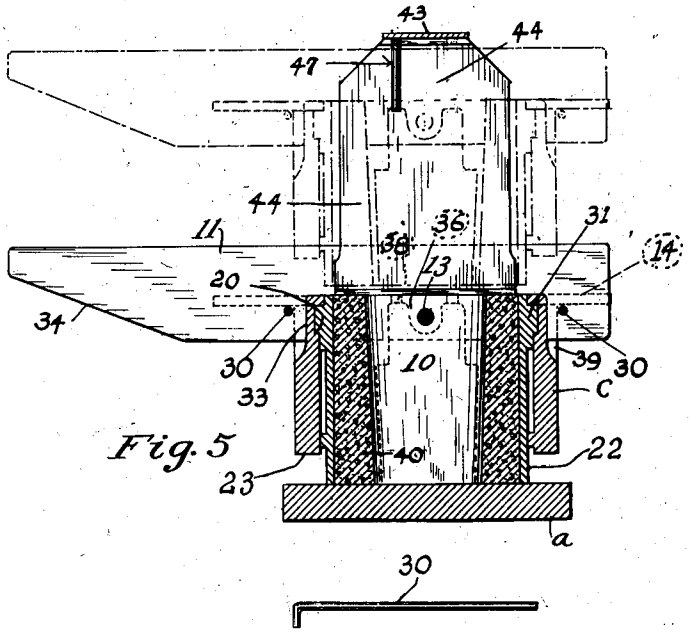


Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE.

JESSE H. BESSER, OF ALPENA, MICHIGAN, ASSIGNOR TO BESSER MANUFACTURING COMPANY, OF ALPENA, MICHIGAN, A CORPORATION OF MICHIGAN.

MOLD BOX.

Application filed August 5, 1926. Serial No. 127,272.

My invention relates to mold boxes for molding blocks or other cement or concrete or clay products, especially those of hollow form, and usually of rectangular or other quadrilateral shape in general, and further, my invention is especially adapted to molding operations in which it is desired to remove the molds away from the finished blocks, and in doing so, remove the cores from the blocks at the same time, and providing means for holding the block down while the mold and cores are removed.

It is a special object of my invention that the mold box and cores may be removed from hollow blocks without injury to the latter by such removal. To this end, it is my purpose to provide spaced cores which are suspended from means supported by the upper edges of the mold.

It is a further object of my invention to provide hollow cores having open lower ends and closed upper ends, and supports secured to the closed ends of the cores, so that lifting the supports will raise the several cores.

It is also a further object to provide cross supports each of which is secured to a core, the supports extending over the edges of the walls of the mold box and their upper edges projecting above the mold, so that lifting the mold box will raise the said cross supports, and thereby the cores suspended therefrom as well as the upper edges of these supports being available for certain guiding functions later to be explained. It is further an object to make the exterior contour of the cores tapering inward from the upper end or the end of attachment to the supports, downward toward the pallet, so that the cores carried by said supports may the more readily be removed from the body of the block and pallet.

A further object of my invention is to provide a means having the cross contour of the block for resting upon the latter while the mold and cores carried thereby, are removed. It is an object of my invention to provide a mold box carrying within the same, cores removable from the block, the walls of the mold box being shallower than the cores themselves, and the relative position of the parts being such that when the cores rest on the pallet, the walls will be held up above the pallet.

A still further object is the provision of a spring-pressed plug carried within the body of certain walls of the mold and normally tending to bear downward upon the pallet, so that any vibration of the mold and pallet due to tamping material in the mold will not be permitted to cause any lateral movement of the pallet underneath the mold and block, the continuous pressure of the plug or plunger upon the pallet serving to avoid such movement.

A further object of my invention is the provision of spaced, cross supports each carrying therefrom a core to be used in the mold box, and a stripping element comprising spaced stripper members whose spaces therebetween are guided by their position relative to the upper edges of said supports which project above the upper edges of the mold.

With these and other valuable objects in view, as later to be explained, my invention consists of the construction and functions explained in the following description, recited in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of the mold box with the cores therein, and the spaces therebetween filled with the block material;

Figure 2 is a transverse, vertical section of the same taken on the broken line 2—2 of Fig. 1;

Figure 3 is a transverse, vertical section taken in the plane indicated by the line 3—3 of Fig. 2;

Figure 4 is a plan view of the filled box with a stripper device having individual weight units resting on the upper surface of the several sections of the block;

Figure 5 is a transverse, vertical section of the entire device of Fig. 4, in the plane indicated by the line 5—5 of that view, and with the mold box, blades and cores shown in raised position in dotted lines, and

Figure 6 is a view of a locking pin.

In the several views of my structure, the mold and blocks are shown resting on an imperforate pallet *a*. The mold box has elongated side walls or plates *c* and intermediate end walls *b*. These side walls *c* are provided with plain end extensions 12 by which the mold box may be lifted either away from the completed block, or into position for receiving moldable material therein. Within the side walls *c* of the mold I have provided thin vertical strips or linings 22 that are of a depth as measured from their upper edge

toward the pallet just equal to the height of the finished block. These strips are provided with protuberances 31 by which the strips are suspended from the walls *c*, as will be later explained. I provide a cut-out notch on the inner surface of the walls *c* and near their upper edge, thus providing a shoulder 20 properly spaced from the upper edges of the walls *c*.

The protuberances 31 of the strips 22 fit into said notches above the shoulders 20, so that the strips are carried by the walls *c*. Resting upon the upper edges of the wall plates *c* are side plates 14 and end plates 15 all of which are substantially parallel to the supporting pallet *a*. The thickness of these plates 14 and 15 together with the height of the wall plates *b* and *c*, are such that the upper surface of the plates 14 and 15 is level with the upper surface of the finished block, and also level with the upper end of the cores, later to be described, when the cores rest upon the pallet.

The plates 15 extend at their ends 16 far beyond the side walls *c*, and their side edges 17 extend over and beyond the edges of the end plates *b*. The outer side edges of the plates 14 are just in alinement with the ends of the plates 15, the result being a rectangular upper surface of the entire mold. The end wall plates *b* are secured by bolts *d* to the plates 15, and plates 14 and 15 are secured to the bars *c* by bolts or screws 18, so that lifting bars *c* by their ends 12, will lift the plates 14 and 15 and thereby the wall plates *b*. Lifting the extensions 12 of the bars *c* will therefore, raise the box walls and their cover plates.

It is one of the purposes of my invention to provide suitable means for suspending the cores—both the inner cores 10 and the end half-cores 19, from the upper part of the box walls. I do this by providing a cut-out notch near the upper end of the wall plates *b* on their inner surface thus providing a shoulder 32, as seen in Fig. 2. The parts 19 have also a notch to receive therein the inner edges of the plates 15, and cores 19 have protuberances 21 fitting above 32, so that lifting wall plates *b* will raise the cores 19 with them. The suspension of the cores 10 is provided for by other means.

The intermediate cores 10 are carried by suspension from cross bars 11 shown in Figs. 1 to 5. These supporting bars are mounted vertically transverse of the mold box and resting upon side members *c* and 22. The bars 11 have smooth upper edges for guiding certain stripper heads to be used therewith and therefore project above the mold, but lower edges provided with spaced rectangular notches 33 for a purpose to be later explained. One of the ends of each bar extends for a considerable length beyond the nearest notch 33 and has an oblique lower edge 34 which serves well to avoid interference with a former finished block that may have been placed temporarily at one side of the mold. The bars are further provided with openings spaced apart to receive therein pins 13 and 30, the latter fitting snugly beneath the plates 14, and pins 13 attaching the bars to the cores 10. To permit these bars 11 to be inserted into the side plates 14, the latter are slotted at 35 to receive said bars to a limited depth therein.

The cores 10, of which there are as many as there are to be hollow openings in the complete block 40, have open bottoms and closed upper ends 36, except that a transverse slot 37 is provided centrally across the greater dimension of the core of the width of the support 11 to receive the latter in said slot when it is locked therein by the cross pin 13, as before explained. A further exception to the end 36 being wholly imperforate, lies in the arrangement of a small perforation 38 in the upper end of the core to permit entrance of air thereinto or therefrom. A plurality of such perforations 38 may be provided if it is desired. In Figs. 3 and 5 it is clearly shown that the outer surface of the plates *c* adjacent their upper end is slotted at 39 to guide the supports 11 in position on the walls *c* and insure their proper spacing therein. The notches 33 are therefore, of the exact width to receive therein the upper ends of *c* and 22, as well as the thickness of the upper edge of the block wall, so that the edge 41 of the notches 33 is in exact alinement with the outer surface 42 of the core 10. The support bars 11 will therefore, accurately mount the cores 10 in exact relative position, but will also, by the plates 14 and their slots 35, be positioned properly relative to each other.

It is to be especially noted that the lower edges 23 of the parts *b* and *c* are normally raised somewhat above the pallet, since the parts 22 as well as the several cores 10 and 19 rest upon the pallet, and the cores and parts 22 hold the mold as a unit in raised position as shown in Figs. 2 and 3. As a special construction of great novelty and value, I have provided the lower edges of the end wall plates *b* with at least one cylindrical opening 24 for receiving therein a movable plunger 25. Above the opening 24 an opening of reduced size 26 communicates with the opening 24, and a coiled, compression spring 27 is mounted in 26 and exerts a downward pressure upon the end of a movable plunger 25 which normally extends out of the opening 24 a portion of its length. A slot 28 is provided lengthwise of the plunger and receives therein the end of a pin 29 in the wall *b* which construction tends to guide the movement of the part 25 within limits in either direction. See Fig. 2.

This serves satisfactorily to avoid unde-

sirable lateral movement of the mold unit upon the pallet, which without such special construction is apt to result from the vertical vibration of the mold and cores upon the pallet when the molded material is being tamped in the mold. The continuous downward pressure of these plungers 25, of which there may be one in each end plate *b*, but of a yielding nature, overcomes such lateral movement. Used in combination with the the mold box and cores and the guiding supports 11 for the cores, I have provided a useful element for assisting the removal of the block from the mold and cores consisting of a stripper member which includes a supporting plate 43 having a length greater than the distance between the ends of the mold including the end half-cores 19. From this plate is suspended therefrom and attached thereto in spaced relation from each other, a plurality of stripper heads 44 whose transverse contour is substantially that of the sections of the finished block, the sections referring to the portions of the block divided by the intermediate cores. My stripper element is especially intended for hollow blocks, and therefore is essential for removing mold and cores from such blocks without injury to the product. It is well known that a solid molded product may be readily held in stationary position while the mold walls are removed from the product. It may be even considered a simple matter to apply a weight of primitive form to a brick, for example, and then loosen the mold walls from around the brick. It is appreciated, however, that quite a different problem arises when the difficulty of removing the outer walls, as well as a plurality of cores spaced apart, from the block having the plurality of cavities therein occupied by the cores while molding, is encountered.

The mold box here illustrated and which is the result of my invention is shown as comprising a mold for molding a block having three spaced intermediate cavities 45 and end depressions 46 which are used in positioning ends of such blocks in registration, so that the end depressions will result in substantially the same form of cavity. A corresponding convex half-core 19 is therefore required for the purpose, and this construction further complicates the operation of removing the mold and cores from the finished block.

Since the illustrated block is to have three inner cavities, three intermediate cores 10 will be needed, two end cores 19, and this will result in four "sections" of the block which will be practically duplicates. For this reason, an equal number—four—of stripper heads 44 are provided for the purpose. These heads 44 are arranged in alinement by being spaced apart the exact thickness of the core supports 11, whereby the several heads, of contour like that of the block sections, and when the heads are guided by the support bars 11 between them, will rest in exact registration upon the several sections of the block. The several support bars 11 will hold the heads 44 in exact lateral position each on its particular section, and the position of the entire stripper element may be determined by the relative position thereof between the upper ends of the vertical members 22, thus positioning the stripper exactly on the block and about the several core members. This function of the cross bars 11 as guiding elements is of great importance, aside from their support function.

The height of the heads 44 will be somewhat greater than the distance between the top of the pallet or other support and the upper edge of the bars 11. When this is done, the mold box can obviously be raised to a height that will fully clear the molded block remaining on the pallet, without causing the bars 11 to contact the under side of the bar or plate 43. The plate 43 with its heads 44 will therefore, remain upon the block sections to retain them in stationary position upon the pallet, while by lifting the extensions 12, and thereby the walls *c*, the entire mold together with the cores 10 and 19 will be lifted from the block and its pallet; and the danger or risk of injury to the product by the operation will be almost negligible.

After so removing the mold and cores, the stripper may be readily removed as it will be no longer needed for that unit, and the mold and cores may well be positioned on another pallet, while the molded block and its pallet may be deposited wherever convenient. It is my purpose to provide the plate 43 with one or more pins 47 which shall be in registration with the apertures 38 when the stripper element is deposited on the block. As seen in Fig. 5, this pin 47 will enter the aperture 38 when the mold and cores are raised for removing the mold from the block. This provides for opening such aperture each time the block is molded. This avoids deleterious results from the possible creation of a vacuum in the cores when the apertures are filled by accidental deposit of material on the cores.

The arrangement of the imperforate pallet *a* as a support for the mold box, including the cores, and providing the pallet of a size extending beyond the lower edges of the mold plates, it is evident that the same pallets may be used for molding blocks of different size without change. The larger pallets may be utilized for molding blocks of any form or size that are within the outline of the pallets. The size and number of cores to be used with these pallets may readily be varied, as will be at once understood. Further,

the cores may be of relative larger interior cross section than would be possible without the use of the stripper mechanism herein specified, and the resulting thickness of block wall about the different cores may be thereby reduced because of the satisfactory and positive operation of the stripper mechanism disclosed. This is because the substantially entire upper surface of the block, despite its very irregular and curved outline, is covered by the stripper sections 44 which hold the entire block stationary upon the pallet while the mold and cores are being raised from the pallet. All of this perfected arrangement of parts which are well adapted to work together, results in a very delicate and uninjured product which without this mold box and attachments has been quite impossible of attainment hitherto.

Operation:—As above disclosed and described, the mold box is assembled with the members 22 attached to the side walls *c* by the connected parts 20 and 31, and the plates 14 resting upon the top of the walls *c*. The end walls *b* attached to the plates 15 are then placed at the ends of the mold, and the end cores 19 attached by positioning the shoulders beneath the inner edges of 15, as shown in Fig. 2. The inner cores 10 are then positioned within the walls of the mold, the supports 11 being secured to the cores by seating the members 11 in the slots 37 of the cores. The notches 33 of the supports 11 will then prevent endwise movement of the supports 11, and the slots 37 will avoid lateral movement of the supports and the cores 10 carried by them. The supports are very positively and accurately positioned therefore and the cores suspended definitely as well. All the parts here mentioned are now seated upon the pallet with the walls 22 and the cores 10 and 19 contacting the same, while the walls *b* and *c* are held in slightly elevated position by the rods *d* and screws 18, respectively. Then the plungers 25 spring-pressed by 26 tend to prevent relative travel of the mold parts on the pallet.

The moldable material is now tamped in condensed condition in the mold about the various core members. After this is effected, it is my purpose to lift the mold and cores off the block while the latter remains stationary on the pallet. To do this, I now lift the bar or plate 43 having one more head 44 than there are inner cores 10, secured thereto and spaced apart just sufficient to permit the supports 11 to be inserted between the said heads 44. By this arrangement, it is evident the stripper element including the heads, as well as the bar, may be readily lifted manually into position over the filled mold. The heads are accurately positioned upon the several sections of molded material by the guiding function of the upper extending edges of the supports 11. When once the heads are in position, the entire mold and cores therein may be lifted upward toward the plate 43 by lifting upon the ends of the extensions 12, as before explained. When the mold and attached parts are raised sufficiently, the pallet and the finished block thereon may be readily removed, and the mold placed on another pallet ready for another and similar operation.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is—

1. A mold having side and end walls, cores carried within said mold, and means, including spaced parallel upper guiding edges for positioning stripping devices upon the finished block, resting upon the upper edges of certain of said walls for suspending said cores therefrom.

2. A mold having an open bottom and side and end walls, cross bars having upper parallel and spaced guiding edges extending above the mold walls, resting upon the upper edges of certain of said walls, and means for suspending from said bars, cores within said mold.

3. A mold having side and end wall plates, the side plates extending past the ends of the end plates and having the same height from the pallet upon which the mold normally rests, and inner side plates of greater height than the first-mentioned plates and mounted separately upon the shallower side plates.

4. A mold comprising outer side and end plates of equal height, deeper inner plates detachably secured to the shallower side plates, and end half-cores detachably secured to the end plates.

5. A mold comprising main side and end plates of equal height, and deeper side plates detachably secured on the inner surface of the main side plates and extending both above and below the corresponding edges of the main side plates.

6. A mold comprising wall plates some of which are deeper than others, a support for said mold, and the shallower plates having means in their lower edges for exerting a yielding pressure downward upon the surface of the support.

7. A mold comprising wall plates some of which are deeper than others, a pallet of greater area than the mold for supporting the same, and the shallower plates having a spring-pressed plunger seated in an opening therein, and exerting a force downward upon the surface of said pallet.

8. A mold comprising side and end walls, an open bottom and top, vertical plates attached to certain of said walls, and side and end plates arranged in a single plane at right angles to the vertical plates and resting upon the upper edges of said walls, and about the upper opening of the mold.

9. A mold comprising side and end walls, an open bottom and top, vertical plates attached to certain of said walls, and side and end plates arranged at right angles to the vertical plates and about the upper opening of the mold, and resting upon the upper edges of the said walls, but having an upper surface common with the upper edges of said vertical plates.

10. A mold having side and end walls and an open bottom, cross bars resting upon or above the edges of certain of said walls, the latter having spaced slots for receiving said bars therein, and cores suspended from said bars.

11. A mold having vertical side and end walls and an open bottom and top, side and end plates arranged at right angles to the vertical plates and about the upper opening of the mold, cross bars resting upon the edges of certain of said walls, the latter having therein spaced slots for receiving said bars, and means for attaching cores to said bars so that the cores will be suspended within the mold.

12. A mold having an open bottom and side and end walls, cores for positioning within said mold, cross bars resting upon the edges of certain of said walls and having in its lower edges notches for receiving therein the upper ends of certain of said walls, and said cores having in its upper ends cross slots for receiving therein the bar edges between said notches.

13. A mold having an open bottom and side and end walls, cores for positioning within said mold, cross bars resting upon the edges of certain of said walls, said cores having in its upper ends cross slots into which the bars closely fit, and means for attachment of the cores and bars.

14. A mold having an open bottom, and side and end walls, cores for positioning within said mold, cross bars resting upon the edges of certain of said walls and having in their lower edges notches for receiving therein the upper ends of certain of said walls, and the said cores carried by said bars.

15. In combination, a mold box having open top and bottom and side and end walls, a support for receiving the mold box thereon, spaced core members suspended from the top edges of certain of the mold walls, and a stripper element comprising spaced stripper heads each having the transverse outline of a block section molded about a core and an elongated bar having said heads attached to one surface of the bar in proper relation to rest upon the several block sections to retain the same upon the support while the mold box may be lifted therefrom.

16. In combination, a mold box having open top and bottom and side and end walls, a support for receiving the mold box thereon, spaced core members suspended within the mold, spaced cross bars resting upon or above the edges of certain of said walls and having means for attaching thereto the said cores, and a stripper element comprising spaced heads each having the usual outline of a block section molded about a core, and an elongated bar having the said heads attached to one surface of the bar in proper relation to rest upon the several block sections to retain the same upon the support while the mold box may be lifted therefrom, the several stripper heads being laterally separated from each other sufficiently to receive the said cross bars therebetween.

17. The structure of claim 16 in which certain of the wall plates are provided with spaced slots for receiving the said cross supports therein to guide the supports, so that the latter may guide the stripper heads into active position upon the block sections.

18. The structure of claim 16 in which certain of the wall plates are provided with spaced slots for receiving the said supports therein to guide the cross supports, and the height of the stripper heads is greater than the distance from the base support to the top of the cross bars.

19. The structure of claim 16 in which the top of the cores have at least one aperture therein, and said elongated stripper bar is provided with a pin for entering said apertures when the mold and cores are raised.

20. A mold having side and end walls, vertical plates attached to certain of said walls and projecting above said walls, and a core carried upon the upper edges of said plates.

21. A mold having side and end walls and an open bottom, vertical cross bars extending above the top of the mold and resting upon or above the upper edges of certain of said walls, and cores suspended from said bars.

22. A mold having side and end walls and an open bottom, spaced vertical cross bars extending above the top of the mold, and their ends beyond the said walls, and cores positioned within said mold and suspended from said bars.

23. A mold comprising outer side and end walls of equal height, deeper side plates detachably secured to the inner surface of the shallower side walls, and end half-cores detachably secured to, and extending above the upper edge of, the end walls.

24. A mold comprising outer side and end walls of equal height, end half-cores detachably secured to the end walls but extending both above and below the edges thereof, intermediate cores of equal length with said end cores, and means resting upon or above the upper edges of certain of said

walls, from which said intermediate cores are suspended.

25. A mold comprising side and end walls, spaced cores within said mold and secured to the inner surface of certain of said walls but extending upwardly beyond the upper edge of said walls, and plates arranged in a single plane at right angles to the mold walls, said plates resting upon the upper edges of said cores with their upper surfaces in the same plane with the upper edges of the cores and of the upper surfaces of the finished block.

26. The combination of a mold box having open top and bottom and side and end walls, a support for receiving the mold box thereon, spaced hollow core members suspended within the mold, a stripper head comprising spaced members each having the usual outline of a block section molded about a core, and an elongated bar having the said stripper members attached to one surface of the bar in relative position to rest upon the several sections to hold the latter upon the support while the mold box is lifted up therefrom, and means for permitting entrance of air into the cores when the mold and cores are raised.

27. The combination of a mold box having open top and bottom and side and end walls, spaced hollow core members suspended within the mold, a stripper element comprising spaced heads each having the usual outline of a block section molded about a core, means for holding the said spaced heads in relative position to rest upon the several block sections to hold the latter down on their support while the mold box is raised therefrom, and means for permitting entrance of air into the core members when the mold and cores are raised.

In witness whereof I have hereunto set my hand and seal this 30th day of July, 1926.

JESSE H. BESSER.