Jan. 8, 1924. 1,480,058

W. GOLDIE

MULTIPLE CEMENT BLOCK MOLDING APPARATUS

Filed May 29, 1922 2 Sheets-Sheet 1

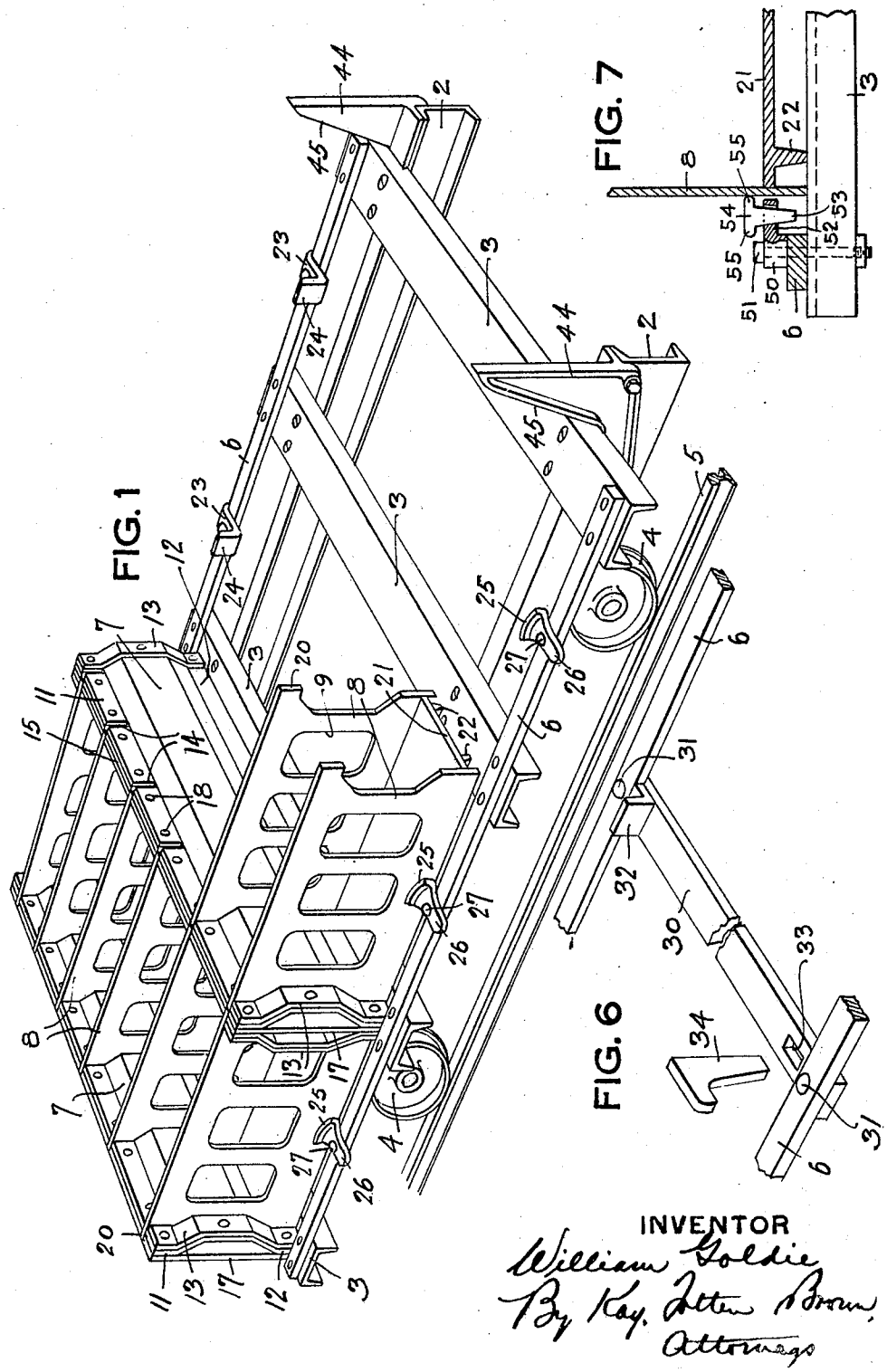


FIG. 1

FIG. 7

FIG. 6

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FIG. 2

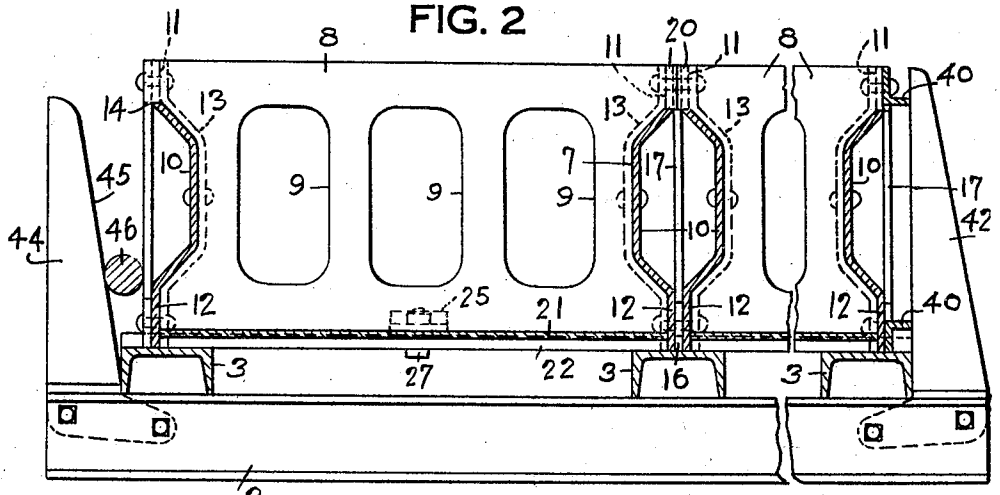


FIG. 3

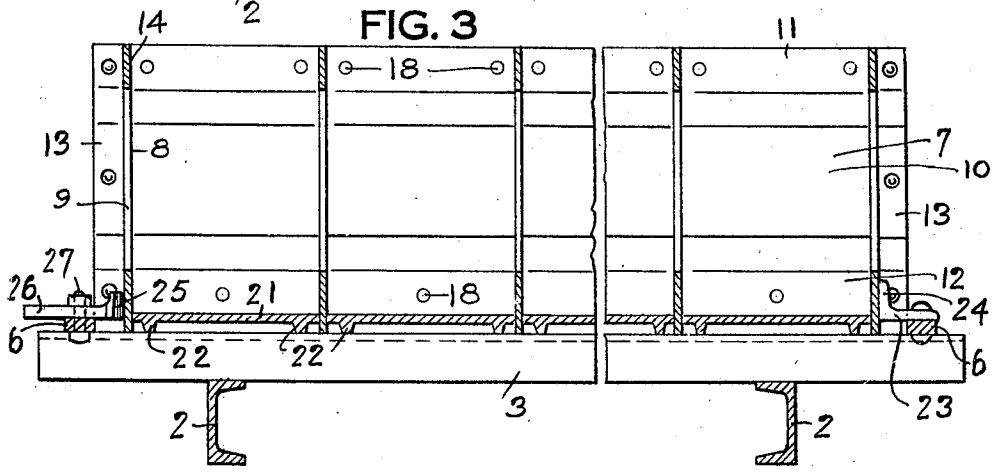


FIG. 4

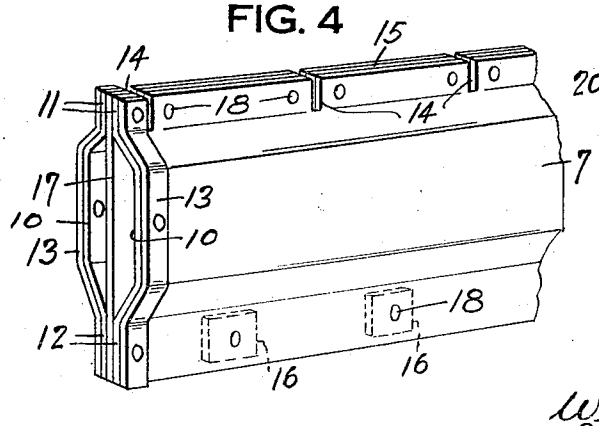
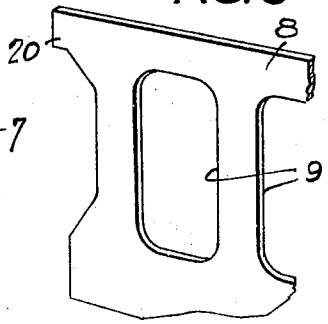


FIG. 5



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UNITED STATES PATENT OFFICE.

WILLIAM GOLDIE, OF WILKINSBURG, PENNSYLVANIA.

MULTIPLE CEMENT-BLOCK MOLDING APPARATUS.

Application filed May 29, 1922. Serial No. 564,382.

To all whom it may concern:

Be it known that I, WILLIAM GOLDIE, a citizen of the United States, and resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Multiple Cement-Block Molding Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the manufacture of cement blocks, and it has special reference to multiple molds for molding a number of such blocks at the same time.

One object of my invention is to provide an improved set of block molds wherein all of the internal joints of the mold cells shall be held rigid and under compression during the molding operation, thereby preventing the escape of liquid from the molds.

Another object of my invention is to provide an improved car of simple and rugged construction, and designed to support a multiple block mold of the kind described herein, this car being provided with means for adjustably and rigidly holding the longitudinal elements of the block molds, and for preventing these longitudinal elements from yielding under the pressure developed when the cement aggregate is tamped in the molds.

The wet process of making cement blocks consists in mixing crushed rock or gravel, sand, cement and water, placing the mixed aggregate in a mold, and tamping the aggregate. The cement is so finely pulverized that it forms a thin liquid with the water, and this liquid tends to escape through any crevices or openings that may exist in the walls or joints of the mold.

Multiple molds have been constructed for molding blocks of this kind in which transverse elements, provided with enlargements for molding the end cavities in the blocks, have been mounted on a car or truck, and have been joined by vertical longitudinal plates, the ends of which were received in slots formed in the enlargements of the transverse mold elements. Such a multiple mold construction has the disadvantage that the ends of the longitudinal plates are received loosely in the slots without any provision for compressing the joints between the longitudinal and transverse mold elements, and between the longitudinal elements and the plates or pallets which form the bottoms of the molds. Also, the outer longitudinal plates tend to bend outwardly when the mold charges are tamped, because the longitudinal plates are made of thin metal and are supported only at their ends. Crevices are therefore produced, through which some of the cement liquid is able to escape from the mold cells, which not only impairs the mold blocks by removing part of their binder, but also fouls the mold elements and the car which carries them. Furthermore, the longitudinal plates are usually perforated for the reception of the core molds that form the air chambers in the finished blocks, particularly in the middle portion which has no support at this point such as they have at each of their ends and one of the principal objects of my invention is to compress and securely lock the longitudinal plates to the bottom plates, as shown in the accompanying drawings.

According to my present invention, I provide a multiple mold consisting, as in prior multiple molds, of transverse walls extending the full width of the set of molds and joined by longitudinal partition plates, these transverse and longitudinal elements being preferably mounted on a car or truck. The molds of my present invention differ from prior constructions in the manner in which the transverse and longitudinal elements are secured together, and also in the provision of additional means for compressing the longitudinal plates and preventing them from bending or buckling.

The means for connecting the transverse elements to the longitudinal plates consists, as herein specifically shown, of slots formed at the upper edges of the transverse elements, these slots being of the proper width to receive the projecting upper corners of the longitudinal plates. The lower edges of the longitudinal plates are not secured to the transverse members, but are clamped between the floor plates or pallets, and between clamping means carried by the car or other support which carries the molds.

Longitudinal bars are carried by the car or other mold support and serve to position the transverse mold elements, the ends of which fit between these longitudinal bars. These longitudinal bars also carry the means for preventing bending of the outer longitudinal partition plates. The means which I prefer to employ for this purpose consists

of cams carried by the longitudinal bars midway between transverse supporting channels, and adapted to bear against the outer longitudinal partition plates at one side of the car. The opposite longitudinal bar carries rigid stops or lugs which engage the outer sides of the longitudinal partition plates directly opposite to the cams. Each cam, when forced against the adjacent longitudinal partition plate, compresses one entire series of longitudinal plates and pallet boards against the fixed stop on the opposite longitudinal bar.

Another means for preventing bending of the longitudinal elements may consist of transverse bars extending beneath the longitudinal elements and beneath the floor plates, and each carrying an upstanding lug which engages the outer lower edge of one of the outside longitudinal plates in each set. The ends of these transverse bars are secured to the above mentioned longitudinal bars which are secured permanently to the framework of the car, and wedging means are provided for forcing the longitudinal partitions toward the upstanding lugs.

In the accompanying drawings, Fig. 1 is a perspective view, with parts of the mold omitted, showing a car carrying a set of block-molds constructed in accordance with my invention; Fig. 2 is a longitudinal vertical sectional view; Fig. 3 is a transverse vertical sectional view; Fig. 4 is a perspective view of a portion of one of the transverse mold elements; Fig. 5 is a perspective view of a portion of one of the longitudinal mold elements; Fig. 6 is a perspective view of a portion of the car, showing a modified form of device for transversely compressing the longitudinal partitions; and Fig. 7 is a fragmentary vertical section of another modification.

Fig. 1 of the drawing shows a car composed of longitudinal sills 2 connected by the transverse inverted channel bars 3 and provided with wheels 4 running upon tracks 5. Two longitudinal bars 6 are secured permanently to the channels 3 and are spaced apart the proper distance to receive between them a set of vertical transverse mold members 7, the lower edges of which rest upon the transverse channels 3 of the car. The transverse mold elements 7 are connected by vertical longitudinal partition plates 8 which, as shown, are provided with the usual openings 9 to receive core members, not shown.

The transverse mold elements which extend the full width of the multiple mold and fit between the longitudinal bars 6 are constructed, as shown, for molding blocks having end cavities corresponding in size and shape to half of one of the internal cavities of the blocks, although it will be understood that my invention may also be employed in molding solid blocks. When cored blocks are to be made, the transverse mold elements are of two kinds, those at the ends of the car being similar to one-half of the intermediate transverse elements. Each of the half sections of an intermediate transverse partition consists of a plate having an integral enlargement 10 to form the end cavities in the blocks, and having a vertical flange 11 above the enlargement 10, and a vertical flange 12 below the enlargement 10 and in vertical line with the upper flange 11. Strips 13 are secured to the ends of the plate and conform to the shape of the enlargement 10 and the flanges 11 and 12, these strips 13 being provided to form shoulders for holding the outer longitudinal partitions in place.

At intervals along the upper flange 11 are notches 14 to receive projections from the upper corners of the longitudinal partition plates. When two of the plates just described are assembled to form one of the intermediate transverse partitions, filler strips 15 are preferably inserted between the two upper flanges 11, these strips being of proper length to leave open the vertical slots 14. Filler pieces 16 are also provided between the opposed lower flanges 12, and in order to lighten the construction these lower filler pieces may consist of washers or short sections of strip material. Additional vertical filler strips 17 may be provided at the ends of the plates to provide greater rigidity. The two opposed plates with the filler pieces 15, 16 and 17 are secured together by means of rivets 18 extending through the flanges 11 and 12 and through the interposed filler pieces.

While the exact dimensions of the parts are not material to my invention, it may be stated that the plates which form the halves of the transverse partitions may be pressed from sheet steel $\frac{1}{8}$ of an inch in thickness, and that the strips 13 and the filler pieces 15, 16 and 17 may suitably be made from steel strips $\frac{1}{4}$ of an inch in thickness.

The longitudinal partition plates 8 are provided at their upper corners with projections 20 of proper length to occupy one-half of the notches formed in the upper edges of the transverse partition plates.

The bottom of each mold section is closed by means of a floor plate or pallet 21 provided with supports such as feet 22 resting upon the transverse channels 3 of the car, or with angle bars serving the same purpose of raising the pallets 21 above the channel bars 3.

As shown in Fig. 1, one of the longitudinal bars 6 carried by the car is provided with fixed stops 23 which are permanently riveted or otherwise secured to the longitudinal bar, and are located about midway between the transverse channels 3. These

stops, as shown, consist of L-shaped pieces, suitably of spring steel, having vertical portions 24 for engaging the outside longitudinal partitions.

The other longitudinal bar 6 carries a set of cams corresponding in number and position to the fixed stops 23. Each of these cams consists of a hardened rounded head 25 and a tail portion 26, and is mounted loosely upon a pin 27 carried by the bar 6. The bar carrying the cams may, if desired, be widened beneath the cams, so as to form enlarged seats for these cams.

The alternative means for preventing outward movement of the longitudinal partitions is shown in Fig. 6, and consists of a set of bars 30 having their ends secured, by rivets 31 or otherwise, beneath the longitudinal bars 6 midway between the transverse channels 3. Near one end of each of the bars 30 is an upstanding lug 32 similar to the lugs 23 described above, and projecting inwardly from the adjacent bar 6 a distance equal to the width of the end strips 13 of the transverse partitions 7, so as to engage the outer longitudinal partition 8. Near the opposite ends of the bars 30 are openings 33 to receive wedges 34, the vertical edges of which rest against the outer longitudinal partitions on the side opposite to the lugs 32. When the wedges 34 are driven into the openings 33, they force all the longitudinal walls, and the pallets between them, toward the lugs 32, thereby exerting transverse compression upon all of the longitudinal partitions and bottom pallets.

A device which may be substituted for the cams of Fig. 1 for transversely compressing the longitudinal partitions is shown in Fig. 7 and consists of a set of blocks 50 secured by means of bolts 51 or otherwise to the longitudinal bars 6 and having projections 52 extending inwardly toward the adjacent longitudinal partition 8. Each of the projections 52 is provided with an opening through which extends a wedge member 53 having a head 54 provided with rounded projections 55, one of which extends somewhat beyond the projection 52 of the block 50. The wedge member 53 is preferably made symmetrical, so that either of its projections 55 will operate to engage the partition plate 8 with a wedging action when the wedge is forced down through the opening in the projection 52. The projection 52 is raised above the level of the bar 6 so as to bring the portions 54 of the wedge 53 to about the level of the pallets 21, which is the weakest point on the plate 8 and is the point where the plate has the greatest tendency to bend outwardly when the mold charges are tamped. This construction has the further advantage that the wedges 53 are not likely to be removed and lost when the apparatus is not in use, since it is only necessary to force up these wedges slightly, without removing them from their openings, in order to release the partition plate 8.

The transverse walls at the ends of the car are formed from one only of the plates 7. To one or both of these end plates are secured transverse angle bars 40 and a pair of upstanding arms 42 carried by the sills 2 of the car engage the bar 40, at one end of the car. At the other end of the car is a pair of upright arms 44 carried by the sills 2 of the car and provided with beveled edges 45. A bar 46, or other wedging member, is received between the arms 44 and the vertical strips 17 of the end plate 7. This end plate need not be provided with the angle bars 40, unless it is desired that the end plates 7 be interchangeable. This end construction is old in the art, and no novelty is claimed for it herein, said construction being shown only for the purpose of completely illustrating the car and its attachments.

In assembling the mold sections upon the car described above, one of the end walls having the angle bars 40 is placed upright upon the end channel 3 adjacent to the upright arms 42, and a set of longitudinal plates 8 is set upright upon the transverse channels 3 with the projections 20 from their upper corners received in the notches of the end plate. A set of pallets 21 is then placed between the longitudinal walls 8, and one of the double transverse walls 7 is set up on the second transverse channel 3 with its notches 14 engaging the projections 20 of the longitudinal plates that have already been set in position. Another set of transverse plates and pallets is set up on the opposite side of this transverse wall, and the assembly proceeds in this manner until all of the walls and floor pallets have been placed in position. When the last transverse wall has been placed, the bar 46 or other wedging element is dropped between the uprights 44 and the end plate 7, thereby exerting longitudinal compression on the whole system of transverse and vertical walls. The cams 25 are then tightened or the wedges 34 are driven into the openings 33, according to the construction employed, and each cam or wedge compresses its set of longitudinal partitions 8 and pallets 21 against the opposite stop 23 or 32. The upper ends of the longitudinal plates 8 are held by the engagement of their corner projections 21 in the slots 14, and the lower portions of the plates 8 are clamped between the pallets 21 and the shoulders formed by the end strips 13 of the transverse partitions.

It will be seen that when the set of molds is assembled in the manner just described, all of the internal joints are compressed and held rigidly against movement in any di-

rection, lengthwise movement being prevented by the wedging member 46, and transverse movement being prevented by the cams 25 and the stops 23 or by the wedges 34 and the lugs 32. When the cement aggregate is placed in the molds and is tamped therein, the pressure in each mold section is resisted by these longitudinal and transverse compressions, and the joints of the molds are thus kept tight. This is especially important in the case of the outer longitudinal partitions 8, which are made of relatively thin metal and tend to bend outwardly unless prevented from so doing by means such as the cams or clamping bars described above.

The claims appended hereto refer to transverse mold elements and longitudinal mold elements. It will be understood that the expression "transverse mold elements" refers to the elements of a mold between which the remaining elements, herein called "longitudinal elements" are positioned, irrespective of whether the transverse elements extend in the direction of the shorter dimension of the mold or in the direction of the longer dimension of the mold.

As stated above, my invention may be employed either in making cored blocks, as in the construction shown in the drawing, or for making solid blocks, in which case the enlargements 10 of the transverse walls are omitted, as well as the core openings 9 in the plates 8. The mold elements and the compression means, while preferably mounted upon a car or truck, may be mounted upon any other suitable support. It will also be understood that various other changes in the construction and arrangement of parts may be made without departing from my invention, the scope of which is indicated in the appended claims.

I claim as my invention:

1. A car for block molds comprising means for supporting transverse mold elements and also for supporting longitudinal mold elements extending between said transverse elements, means for exerting longitudinal pressure upon said elements and means applied locally to the outer longitudinal mold elements at portions between their ends for exerting transverse pressure upon the portions of said longitudinal elements between their ends.

2. A car for block molds comprising transverse supports adapted to support mold elements, longitudinal members carried by said supports, and means carried by said longitudinal members for exerting transverse pressure upon longitudinal mold elements.

3. A car for block molds comprising transverse supports adapted to support mold elements, a pair of longitudinal members carried by said supports, fixed stops carried by one of said longitudinal members, and wedging means carried by the other longitudinal member and adapted to exert pressure toward said stops.

4. A car for block molds comprising transverse supports adapted to support mold elements, a pair of longitudinal members carried by said supports and spaced apart the length of the transverse mold elements, and means carried by said longitudinal members for preventing relative transverse movement of the longitudinal mold elements.

5. A car for block molds comprising transverse supports adapted to support mold elements, a pair of longitudinal members carried by said supports and spaced apart the length of the transverse mold elements, fixed stops carried by one of said longitudinal members, and wedging means carried by the other longitudinal members and adapted to exert pressure toward the said fixed stops.

6. A car for block molds comprising transverse supports adapted to support mold elements, a pair of longitudinal members carried by said supports and spaced apart the length of the transverse mold elements, fixed stops rigidly secured to one of said longitudinal members, and cams pivotally mounted upon pins carried by the other longitudinal member opposite to said fixed stops, the said cams being adapted to exert pressure toward the said fixed stops.

7. A car for block molds comprising transverse supports adapted to support mold elements, longitudinal members carried by said supports, transverse bars carried by said longitudinal members between said transverse supports, each of said bars having upstanding lugs adjacent to one of said longitudinal members for engaging the outer sides of longitudinal mold elements, and wedges extending through openings in said bars and adapted to exert pressure toward said upstanding lugs.

8. A multiple block mold comprising bottom, longitudinal and transverse members forming a plurality of cells, means for applying longitudinal compression to said members, and other means for applying local compressing force to the portions of the outer longitudinal members between their ends.

9. A multiple block mold comprising a plurality of spaced transverse vertical members, a plurality of longitudinal vertical members disposed between said transverse members, bottom members within the cells formed by said vertical members, means for applying longitudinal compression to said members and means for exerting transverse compression upon said longitudinal members, said transverse compression being applied locally to the outer longitudinal members between the ends thereof.

10. A partition member for multiple block molds comprising a plate having a horizon-

tal enlargement for molding end cavities, vertical flanges above and below said horizontal enlargement, and spaced slots formed in the said upper vertical flange for receiving portions of other vertical partitions.

11. A transverse partition member for multiple block molds comprising a plate having a horizontal enlargement for molding end cavities, vertical flanges above and below said horizontal enlargement, spaced slots formed in the said upper vertical flange for receiving portions of vertical longitudinal partitions, and strips secured to the ends of said plate to form shoulders for engaging the outer longitudinal partitions.

12. A partition member for multiple block molds comprising a pair of similar plates each having a horizontal enlargement for molding end cavities, and having vertical flanges above and below said horizontal enlargement and spaced slots formed in the said upper flange for receiving portions of other vertical partitions and filler pieces interposed between said plates.

13. A transverse partition member for multiple block molds comprising a pair of similar plates each having a horizontal enlargement for molding end cavities, and having vertical flanges above and below said horizontal enlargement and spaced slots formed in the said upper flange for receiving portions of vertical longitudinal partitions, filler pieces interposed between said plates, and strips secured to the ends of said plate, to form shoulders for engaging outer longitudinal partitions.

14. A multiple block mold comprising a plurality of spaced transverse vertical partitions provided with spaced slots at their upper edges, longitudinal vertical partitions having portions received in said slots, bottom plates or pallets disposed in the cells formed by said vertical members and adapted to clamp said vertical members between them, means for exerting longitudinal compression on said members, and means for exerting transverse compression upon said longitudinal members.

15. A multiple block mold comprising a plurality of spaced transverse vertical partitions provided with spaced slots at their upper edges, longitudinal vertical partitions having projections received in said slots, bottom plates or pallets disposed in the cells formed by said vertical members and adapted to clamp said vertical members between them, means for exerting longitudinal compression on said members, and means for exerting transverse compression upon said longitudinal members, the said transverse compression means comprising a fixed stop disposed at one side of each set of longitudinal partition members and wedging means disposed at the other side of said set of longitudinal members and adapted to compress said longitudinal partition members, and the bottom pallets between them, toward the said fixed stop.

16. A car for block molds comprising transverse supports adapted to support mold elements, a pair of longitudinal members carried by said supports and spaced apart the length of the transverse mold elements, fixed stops carried by one of said longitudinal members, and wedging means carried by the other longitudinal members and adapted to exert pressure toward the said fixed stops, said wedging means comprising blocks carried by said second longitudinal member, and each having a projection extending inwardly, and a wedge member extending through an opening in said projection and having a head adapted to engage an adjacent longitudinal partition plate.

In testimony whereof I, the said WILLIAM GOLDIE, have hereunto set my hand.

WILLIAM GOLDIE.