D. G. BENDER.

CONCRETE FORMING APPARATUS.

APPLICATION FILED MAR. 9, 1917.

1,275,121.

Patented Aug. 6, 1918.

4 SHEETS—SHEET 1.

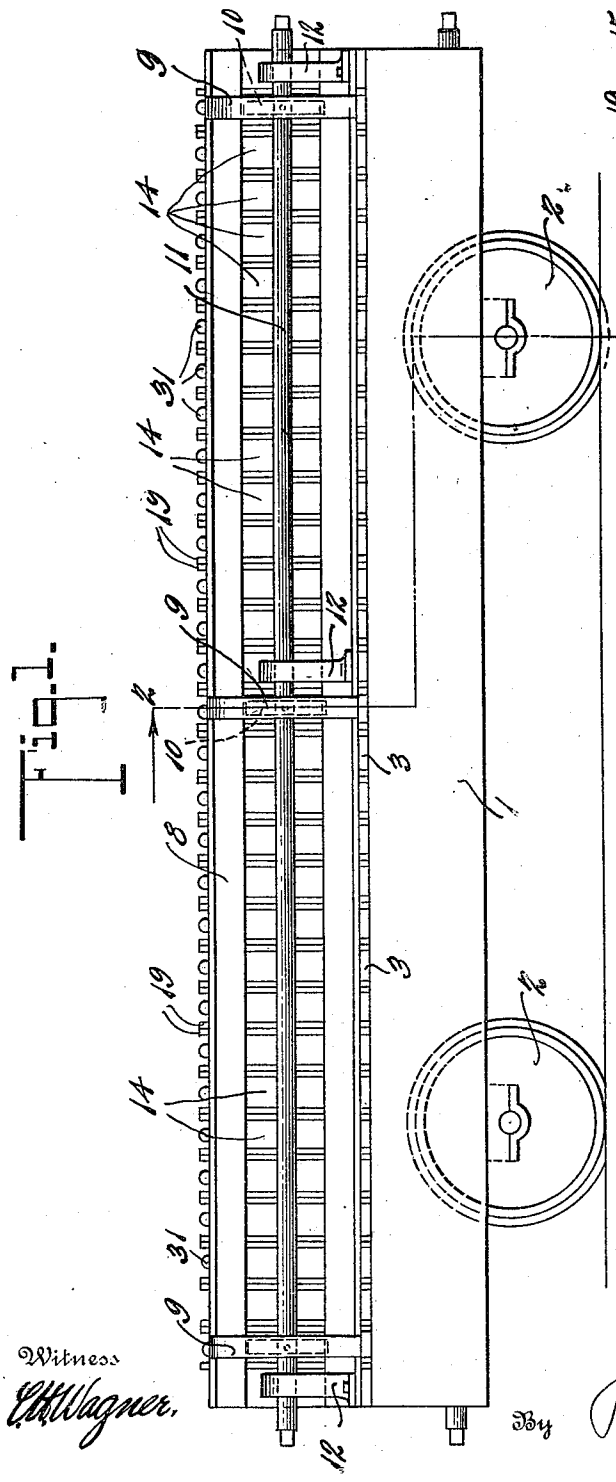


Fig. 1.

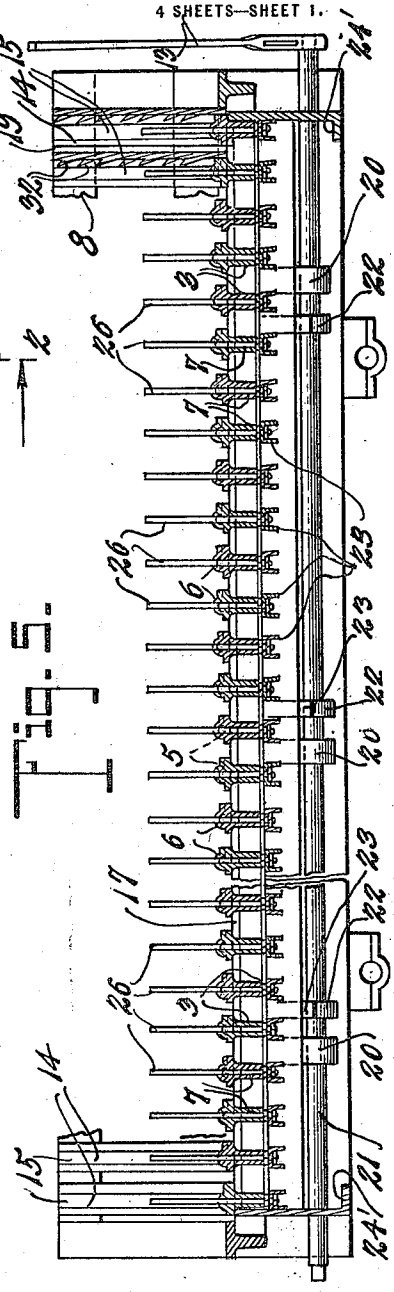


Fig. 5.

Witness

E. H. Wagner.

Inventor

D. G. Bender

By Robb & Robb

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

D. G. BENDER.

CONCRETE FORMING APPARATUS.

APPLICATION FILED MAR. 9, 1917.

1,275,121.

Patented Aug. 6, 1918.

4 SHEETS—SHEET 2.

Fig. 2.

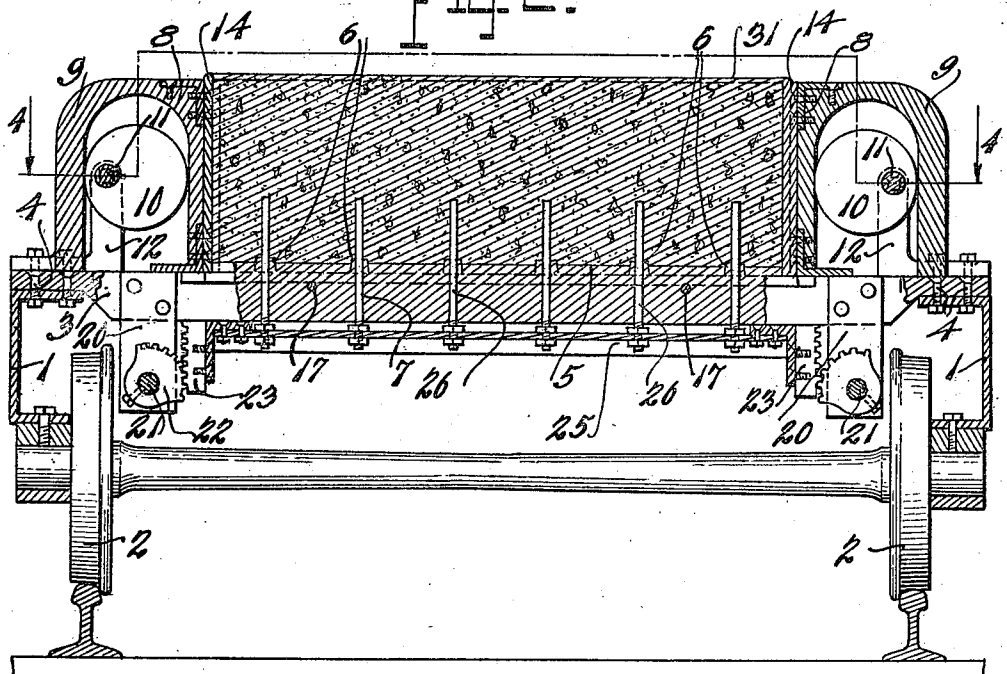
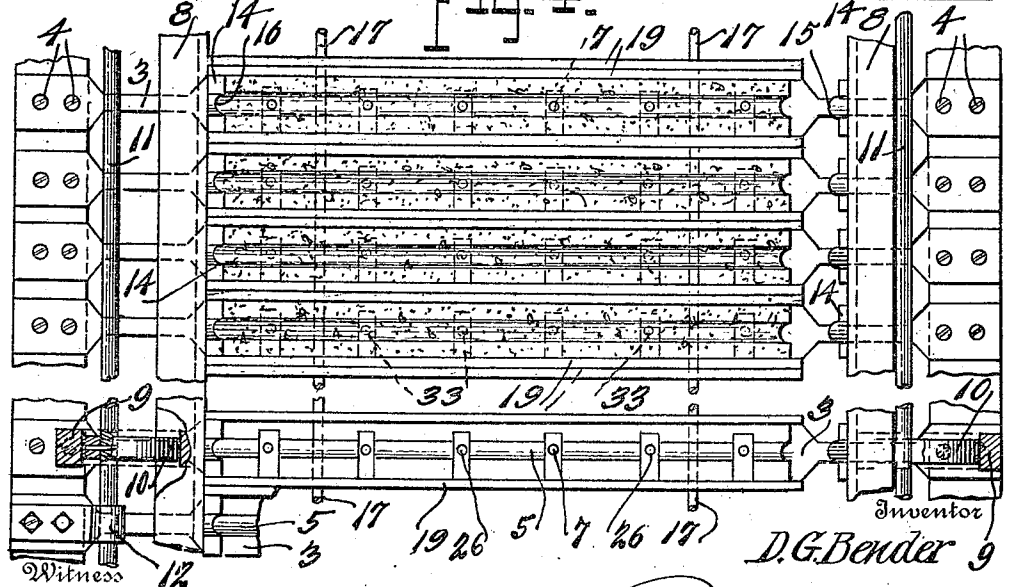


Fig. 4.



Witness
E. H. Wagner.

Inventor
D. G. Bender

By Robb & Robb
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

D. G. BENDER.

CONCRETE FORMING APPARATUS.

APPLICATION FILED MAR. 9, 1917.

1,275,121.

Patented Aug. 6, 1918.

4 SHEETS—SHEET 3.

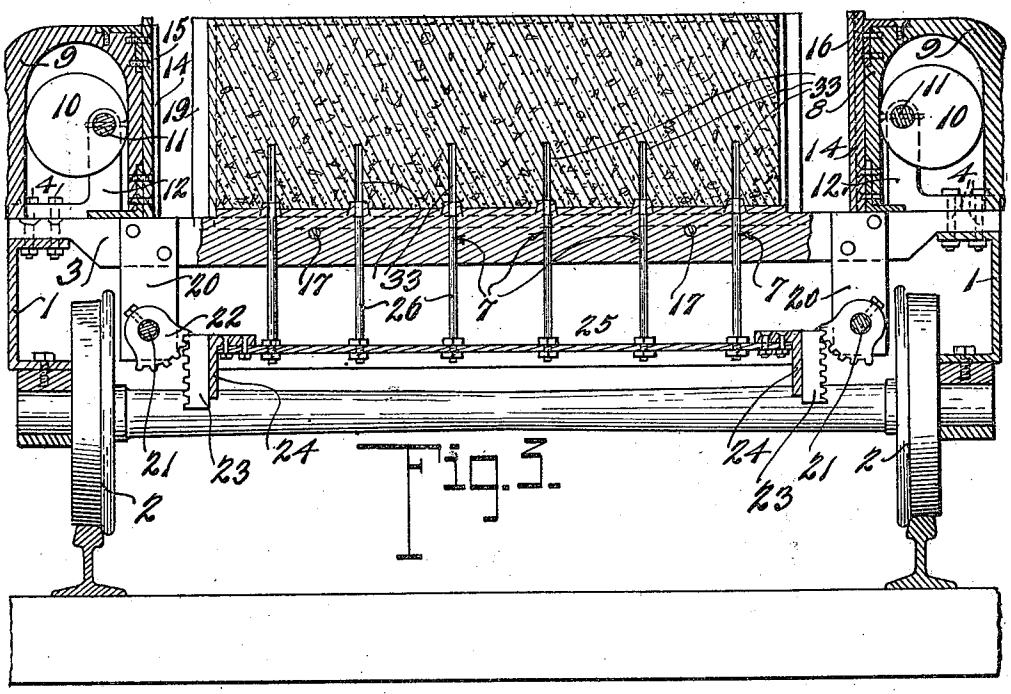


Fig. 1.

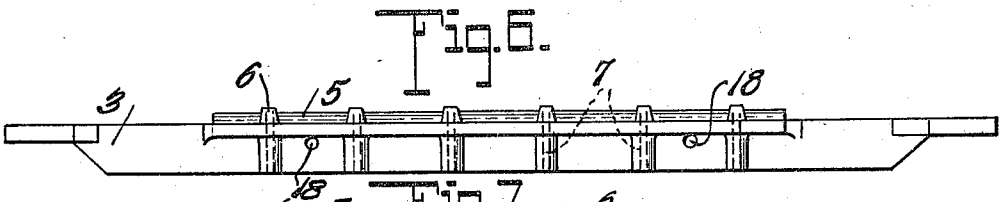


Fig. 6.

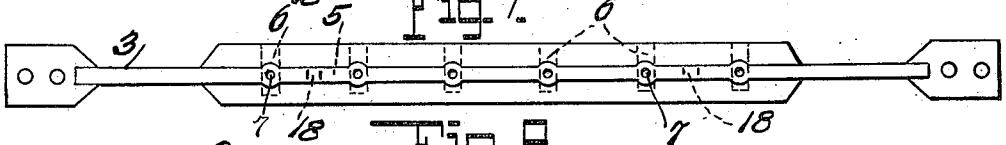


Fig. 7.

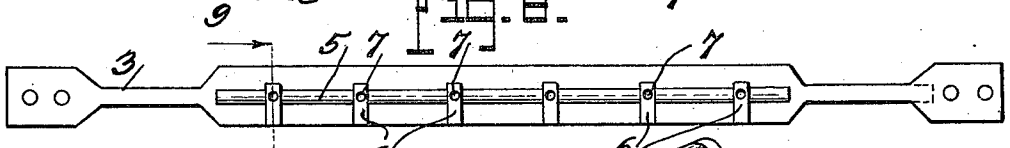


Fig. 8.



Fig. 9.

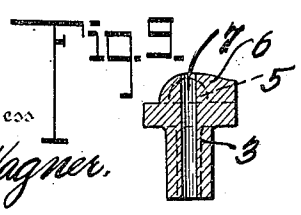
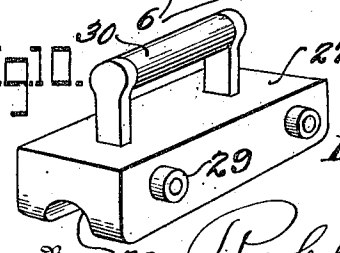


Fig. 10.



Witness

C. W. Wagner.

Inventor

D. G. Bender

By Robb & Robb

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

D. G. BENDER.

CONCRETE FORMING APPARATUS.

APPLICATION FILED MAR. 9, 1917.

1,275,121.

Patented Aug. 6, 1918.

4 SHEETS—SHEET 4.

Fig. 11.



Fig. 13.

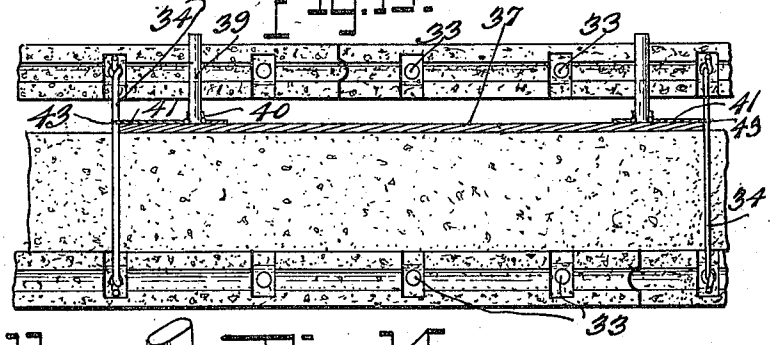


Fig. 12.

Fig. 14.

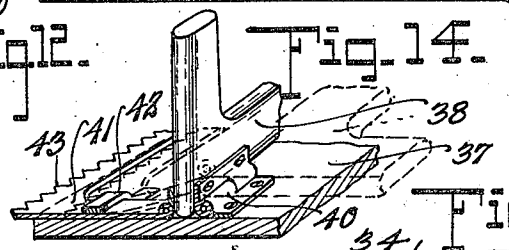


Fig. 15.

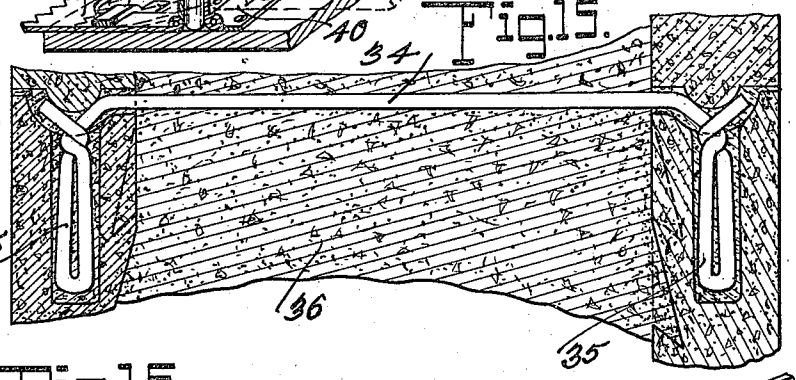


Fig. 16.

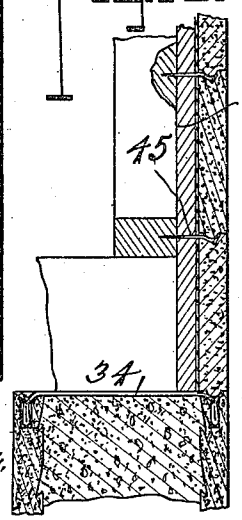
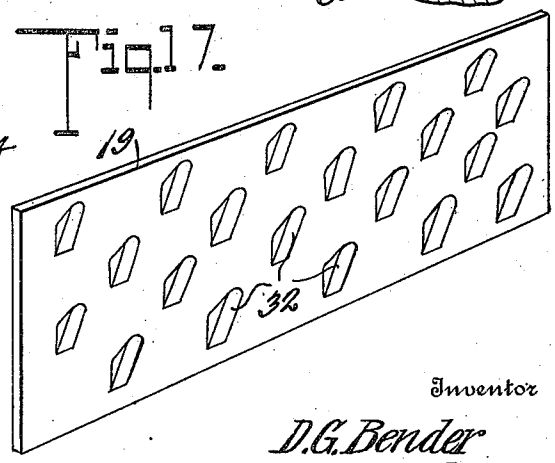


Fig. 17.



Witness

C. H. Wagner.

Inventor

D. G. Bender

By Robb & Robb

Attorneys

UNITED STATES PATENT OFFICE.

DAVID G. BENDER, OF BLUE ISLAND, ILLINOIS.

CONCRETE-FORMING APPARATUS.

1,275,121. Specification of Letters Patent. Patented Aug. 6, 1918.

Application filed March 9, 1917. Serial No. 153,697.

To all whom it may concern:

Be it known that I, DAVID G. BENDER, a citizen of the United States, residing at Blue Island, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Concrete-Forming Apparatus, of which the following is a specification.

This invention has to do with molding apparatus for forming in plurality concrete units or blocks simultaneously from slush material, said units being of such conformation as to facilitate quite materially the process of wall construction due to the ease with which the blocks may be assembled and that by labor not necessarily highly skilled in the art of masonry.

In its embodiment the apparatus comprises molding elements arranged upon a suitable support and movably mounted for disposition in coöperative relation with respect to other mold elements to thereby provide a complete mold form, means being employed for actuating said movable elements so as to provide for interlocking of the mold form or release of the other elements to permit of ready removal of the molded material.

It is further comprehended that the apparatus shall embody recess or groove forming instrumentalities by means of which the blocks may be tied together in wall construction and interlocked with the plastic material used as a filler or foundation therefor. The wall construction just referred to is an especially advantageous feature as will appear more fully hereinafter.

For a full understanding of the present invention, reference is to be had to the following description and the accompanying drawings, in which:

Figure 1 is a side elevation of an apparatus for forming the concrete units.

Fig. 2 is a transverse sectional view on the plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is a similar section to that referred to regarding Fig. 2, showing the side members moved outwardly and the molded material released.

Fig. 4 is a fragmentary sectional view taken about on the plane indicated by the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary longitudinal sectional view of the apparatus.

Figs. 6, 7 and 8 are side, bottom and top views respectively of the transverse mold supports or elements used in this device.

Fig. 9 is a sectional view on the line 9—9 of Fig. 8.

Fig. 10 is a perspective view of a finishing tool for the apparatus.

Figs. 11 and 12 are end elevations of a spacing member used in the construction of walls with my form of block.

Fig. 13 is a horizontal sectional view of a wall construction in which the spacing member is employed for forming an air space.

Fig. 14 is a fragmentary perspective view of this spacing member showing its locking element more clearly.

Fig. 15 is a fragmentary sectional view of a wall construction showing the application of the tie members.

Fig. 16 is a fragmentary sectional view showing the use of the blocks as a surface finishing wall covering.

Fig. 17 is a perspective view of a mold side element provided with recess forming projections.

Throughout the following detail description, and on the several figures of the drawings, similar parts are referred to by like reference characters.

In carrying out the construction of the molding apparatus comprehended by this invention, I preferably employ a wheeled support or car, which is readily movable after the material has been introduced into its component molds to a suitable shed or other place for the curing process of the molded material. Such car or truck consists of the side channel members 1 mounted upon suitable wheels 2 and connected by a series of transverse members 3, constituting bottom supporting means for material to be molded. These transverse members are most clearly shown in Figs. 6 to 9 of the drawings from which it will be noted that they are narrow metallic elements substantially T-shaped in cross section. The ends of these members are flattened and secured to side members 1 by means of fastenings 4 and on the surface each of said members is provided with a groove forming rib 5 as well as a series of lateral recess forming projections 6. The transverse bars 3 are also formed with a series of vertical passages 7 through which recess forming elements hereinafter to be described are adapted to pass in the use of the molding device.

These bars just described are attached to the truck frame in close spaced relation as shown in Fig. 4 and they form the bottom

mold element upon which the plastic material rests. Movably mounted upon the transverse members 3 are side members 8 of the car body to which are attached arch-shaped extensions 9. For the purposes of distinction these members 8 will be referred to as movable side members or wall members. Arranged in coöperative relation with respect to these extensions of each side, are the eccentric cams 10 mounted upon a shaft 11 suitably supported in turn by brackets 12. The shafts have their extremities squared so as to receive a suitable crank 13 such as illustrated in Fig. 5, whereby the shafts may be rotated to shift the side members 8 inwardly and outwardly upon their supports.

Secured to each of these side members 8 in spaced relation are the vertically arranged mold end elements 14, those at one side having groove forming ribs 15 and those at the other side of the apparatus having tongue forming grooves 16.

Extending longitudinally of the car are suitable rod members 17 which are received in openings 18 in the transverse bars 3 and these rods constitute supporting rests for the mold side members 19. These side members are arranged back to back in pairs between the spaced bars 3 as shown in Fig. 4 and when disposed in this position the end members 14 on the sides 8 hold them in operative relation for receiving the plastic material to be molded.

Mounted upon suitable brackets 20 at each side of the car is a shaft 21 provided with gear segments 22 which intermesh with racks 23 carried by an angle bar 24. Connecting these side angle bars 24 are a series of channel bars 25 each of which is provided with a series of pins 26 which as hereinbefore premised are adapted to be moved upwardly through the openings 7 in the transverse bar members so as to project into the mold compartment. This pin rack thus constituted is operable vertically by suitable means capable of rotating the shafts 21, downward movement being limited by stops or brackets 24′.

In the use of the apparatus above described, the car is run into convenient position with respect to some mechanical mixing device preferably from which the material in slush form may be introduced into the mold. The sides 8 are shifted inwardly on the supports whereupon the mold sides 19 may be slipped into position between the end mold elements 14 until they rest upon the longitudinal rods 17. Said mold sides are thus in locked operative position and when the pin rack has been moved into its upper vertical position the material is poured into the series of molds thus completely formed. The molds are then struck off by the usual straight edge whereupon I provide for the finishing of the upper surface of the units to be molded by means of a separate tool constructed as shown in Fig. 10. Said tool comprises a body 27 having its under surface formed with a groove 28 and suitable roller members 29 attached to its sides.

The rollers are seated upon the mold side elements and by means of the handle 30 are moved therealong so as to properly form the upper side of the mold with a tongue as indicated at 31. The car is now ready to be moved to the curing shed and after remaining a suitable period of time the molds may be removed. In the removal of molded blocks the sides are retracted and the pin rack lowered whereupon the blocks with their side members may easily be displaced one at a time.

In the molding of these units it is comprehended to employ a mold side such as is illustrated in Fig. 17 which is provided with suitable recess forming projections or spurs 32. These recesses are formed either at one or both sides of the block depending upon the requirements. Thus in removing the molds from the car the sides are displaced with the blocks and placed in inverted position upon the ground. By slightly tapping the mold sides they will be freed and disengaged from the surfaces of the blocks.

While I have referred to the molded units hereinbefore as "blocks," it will be apparent from the drawings that they are very narrow and are more in the nature of a veneer. These blocks are useful in wall constructions of different characters such as shown in Figs. 13, 15 and 16. In what I term the double wall construction shown in Fig. 13, these blocks are arranged in parallel rows and being provided with vertical recesses 33 at suitable intervals, tie members 34 are employed to connect the spaced rows together.

The tie member consists of a metal bar having its ends twisted and formed into a depending loop 35 which latter is driven into a recess. By brushing a cementitious solution on the edges of the blocks and filling the recesses 33 therewith superposed rows of the blocks with their tongues and grooves interlocked are easily built up without requiring any special skill or accuracy in setting. In fact the recesses 33 are sufficiently close so that it is not necessary for them to be accurately positioned opposite the openings of the blocks in the row spaced therefrom.

Between the spaced row of blocks the filler material is introduced as indicated at 36 which material, of course, fills in the recesses formed in the face of the blocks by the projections 32 above described, and thereby a very desirable interlocking of the formed blocks with the poured material is secured,

In some wall constructions it is desired to provide an air space and this I accomplish by the use of a spacing member 37 shown in Figs. 11 to 13, to one side of which are suitably connected vertically arranged cam members 38. Each cam member 38 is provided with an angular terminal 39 at its top and is connected to the spacing member 37 by suitable hinges 40. At the opposite side of the cam member is hingedly connected a flexible locking plate 41 held against the side 37 by guides 42. This locking plate is serrated at one edge as indicated at 43 so that when the cam members are operated they will engage with the tie members 34 interlocking the spacing member in position to sustain the filled material poured thereinto to form the wall construction shown in Fig. 13.

In Fig. 16 I have shown another use for the veneer blocks of my construction. After the formation of the foundation for a building and the construction of the siding 44 disposed thereon, the latter may be suitably finished with these veneer blocks, each block being held in position by large headed nails 45, the headed extremity of which is bent downwardly into the groove of the block and thus holds the block against the face of the siding.

The advantages and simplicity of the apparatus and wall construction hereinbefore described will be apparent to those skilled in the art to which the invention relates and I desire it to be understood that slight modifications could easily be made in the details of construction without departing from the spirit of the invention and within the scope of the appended claims.

Having thus described my invention, what I claim as new is:

1. In molding apparatus of the class described, the combination of a support including bottom supporting means for material to be molded, movable members mounted thereupon, means for moving said members into operative position, for sustaining material to be molded into units in molding position, stationary mold sides disposed between the movable members aforesaid, and mold ends carried by said movable members in spaced relation and movable by and with said members into position intermediate the mold sides whereby to hold said sides in position to receive the material to be molded.

2. In a molding apparatus of the class described, the combination of a support including bottom supporting means for material to be molded, wall members movably mounted thereupon, mold sides for each unit of material to be molded, arranged transversely between the movable wall members aforesaid upon the support and held in operative position by said movable wall members, and means for moving said wall members away from the mold sides without disturbance of said sides whereby to release the mold sides for removal with the contents of the mold.

3. In molding apparatus of the class described, the combination of a frame, side members movably mounted thereon, a series of mold elements attached to each side member, a pair of removable mold elements disposed transversely of the frame between each pair of mold elements on the side members, and means for moving said side members on the frame and the mold elements thereon into interlocking engagement with respect to the transverse removable elements for supporting the latter in molding position.

4. In molding apparatus of the class described, the combination of a support, side members thereon, mold ends mounted on said support side members in spaced relation, mold sides arranged back to back between the support side members, said ends being movable into position between pairs of said mold sides for holding them in operative molding position, and longitudinally arranged supports for said mold sides.

5. In molding apparatus of the class described, the combination of a support, a mold bottom, mold sides disposed at opposite sides of the bottom, means on said support for sustaining the mold sides, mold ends movable on said bottom into position between the mold sides for forming a complete mold, and means for moving the ends toward and from the mold sides comprising an arch member and a cam coöperative therewith.

6. In molding apparatus of the class described, the combination of a supporting frame, side members mounted thereon, spaced transversely arranged bottoms, mold sides adapted for disposition between the bottoms, longitudinally arranged supports below the bottoms on which the mold sides rest, and means engageable with the ends of the mold sides for holding the same in molding position on the rest supports and closing the ends of the molds.

7. A block molding machine for manufacturing a plurality of units from plastic material simultantously comprising mold bottoms, removable stationary transversely arranged mold sides coacting with said bottoms, tongue and groove forming mold ends movably mounted at each end of the mold sides for interposition between the respective mold sides to form a complete molding unit and means for moving said ends.

8. A block molding machine for manufacturing a plurality of units from plastic

material simultaneously comprising spaced mold bottoms, mold sides adapted for disposition between the bottoms, supporting rods extending transversely of the bottoms and constituting rests for the sides aforesaid, mold ends, supporting means common to the ends, and means for actuating the last mentioned means to move the ends into and out of coöperative position with respect to the sides.

In testimony whereof I affix my signature.

DAVID G. BENDER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."