

G. L. LANGER.
 BLOCK FORMING MACHINE.
 APPLICATION FILED MAY 4, 1908.

932,035.

Patented Aug. 24, 1909.
 4 SHEETS—SHEET 1.

Fig. 1

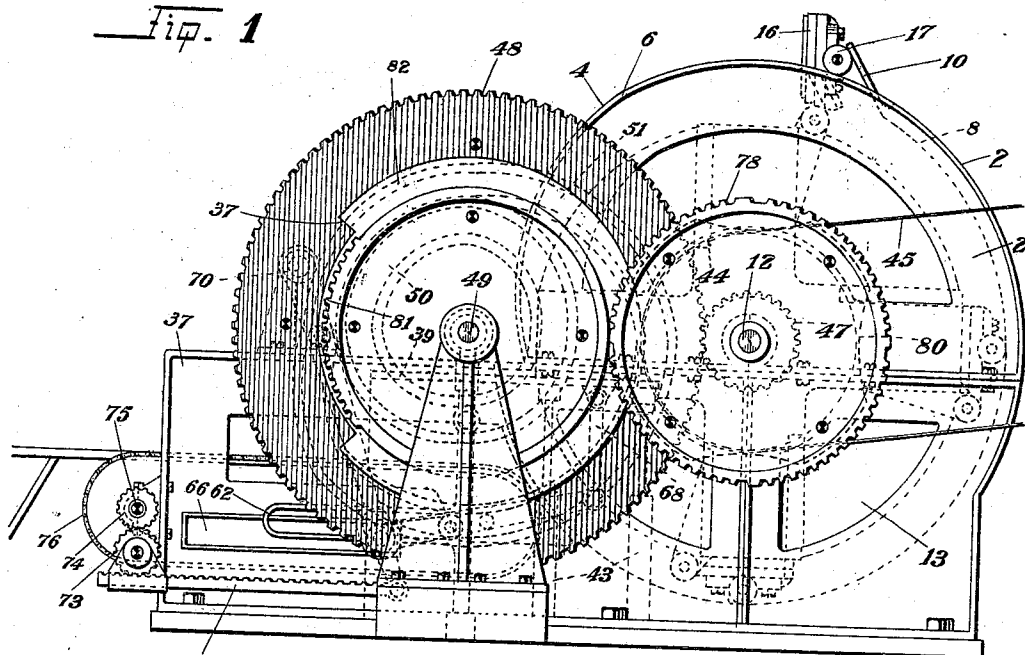
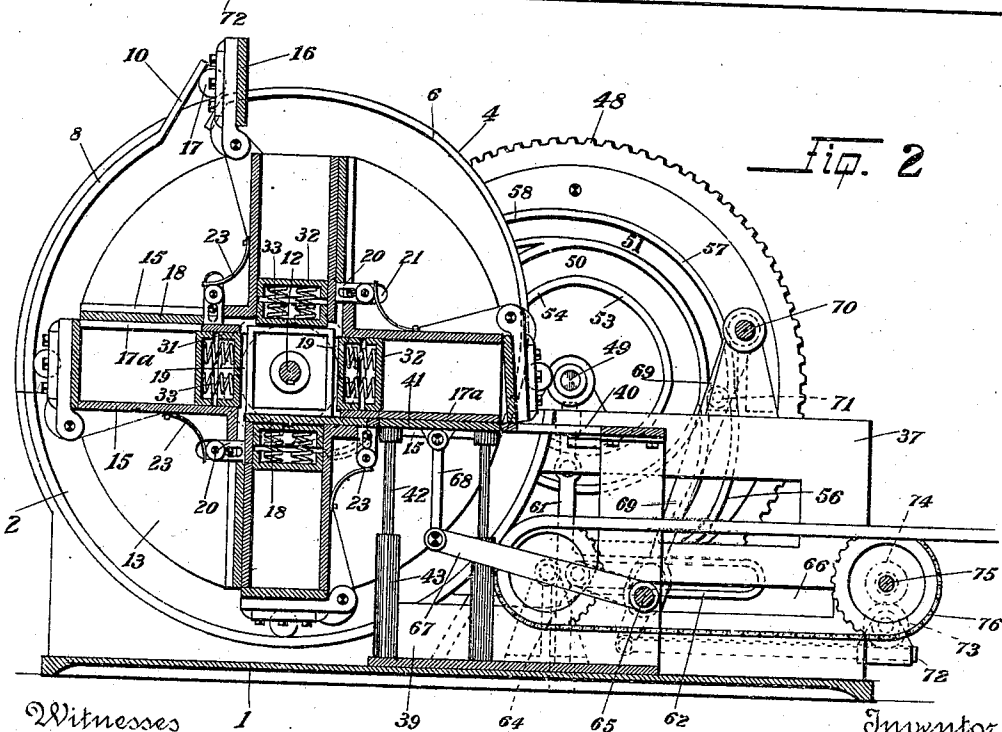


Fig. 2



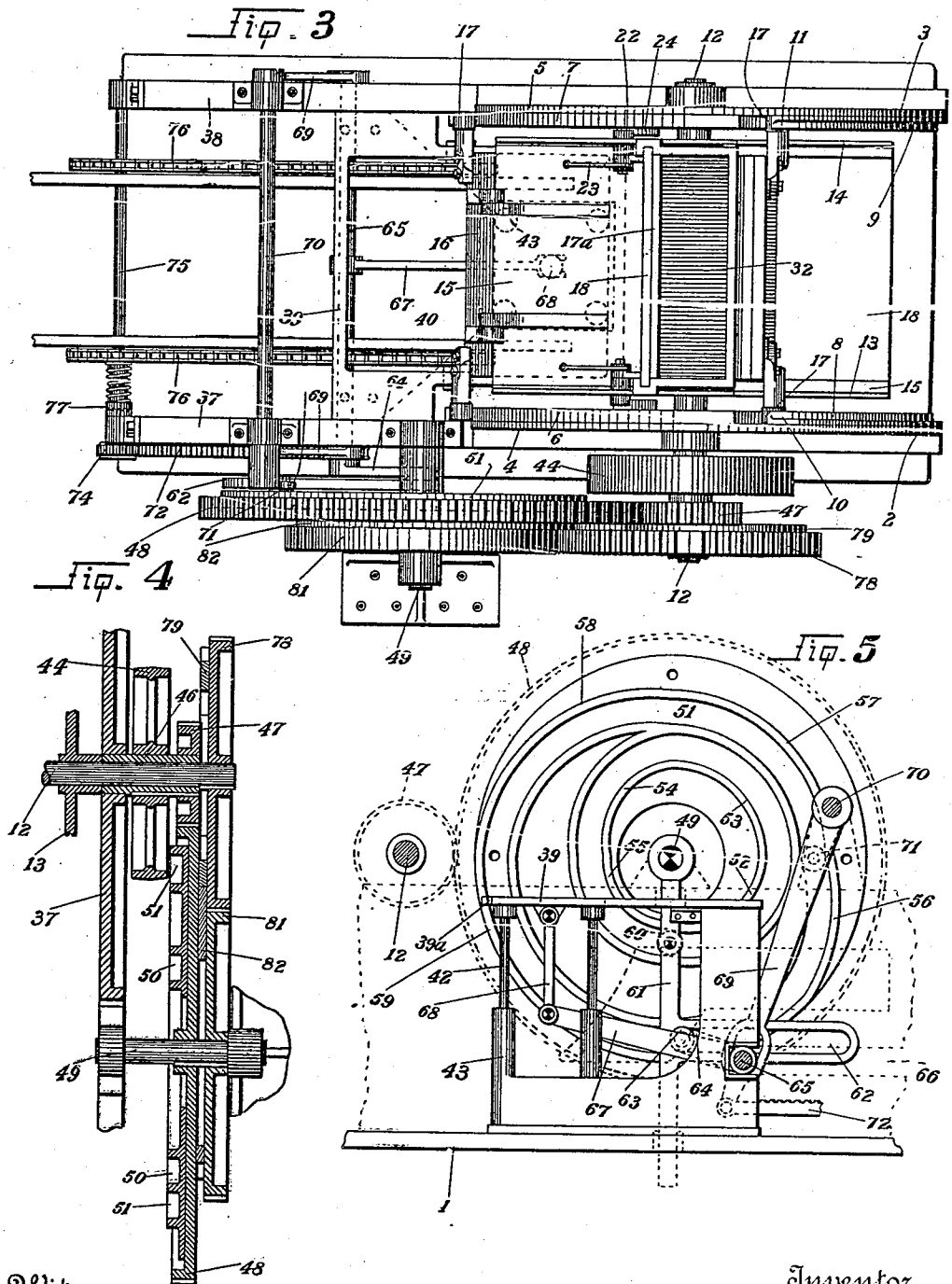
Witnesses
 Frank H. Carter
 Percy S. Webster.
 Inventor
 Gotthold L. Langer
 Percy S. Webster
 Attorney

G. L. LANGER.
BLOCK FORMING MACHINE.
APPLICATION FILED MAY 4, 1908.

932,035.

Patented Aug. 24, 1909.

4 SHEETS—SHEET 2.



Witnesses

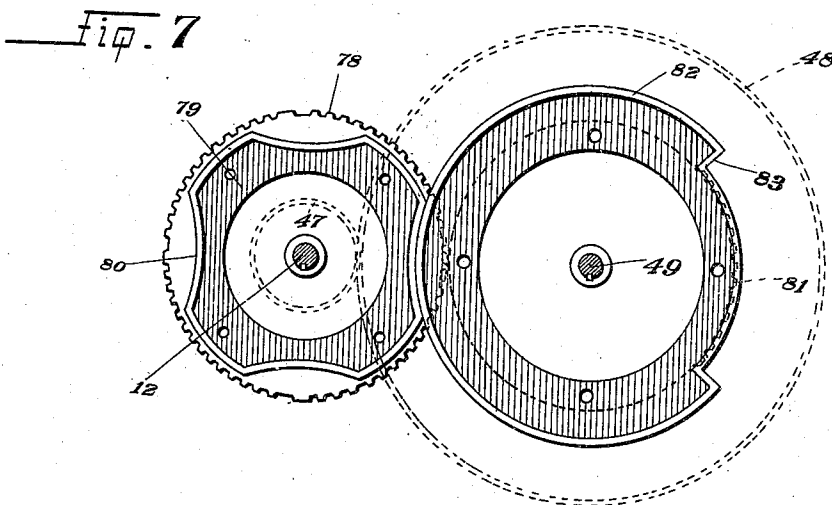
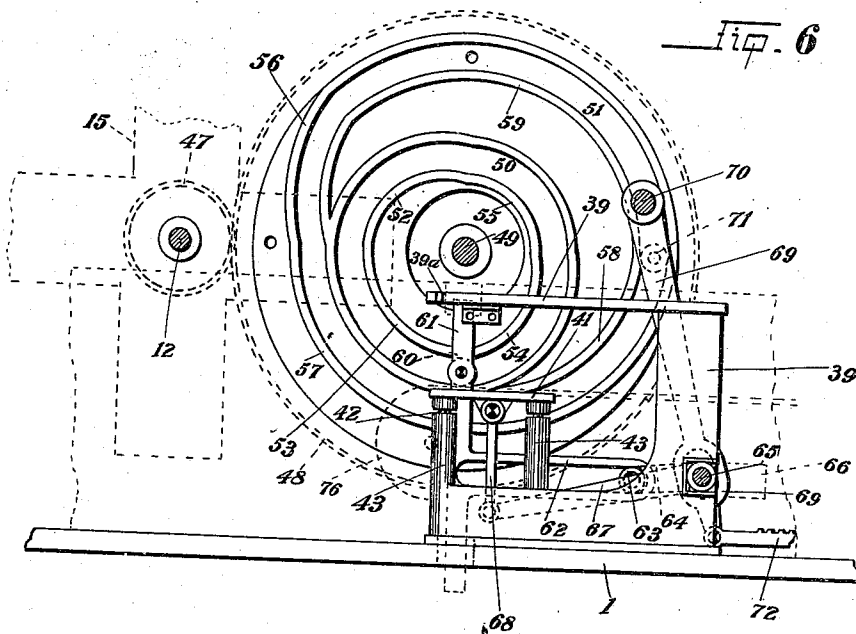
Frank H. Carter
J. W. Webster

Inventor
Gotthold L. Langer
By *Benny S. Webster*
Attorney

G. L. LANGER.
BLOCK FORMING MACHINE.
APPLICATION FILED MAY 4, 1908.

932,035.

Patented Aug. 24, 1909.
4 SHEETS—SHEET 3.



Witnesses
Frank H. Carter
J. D. Webster

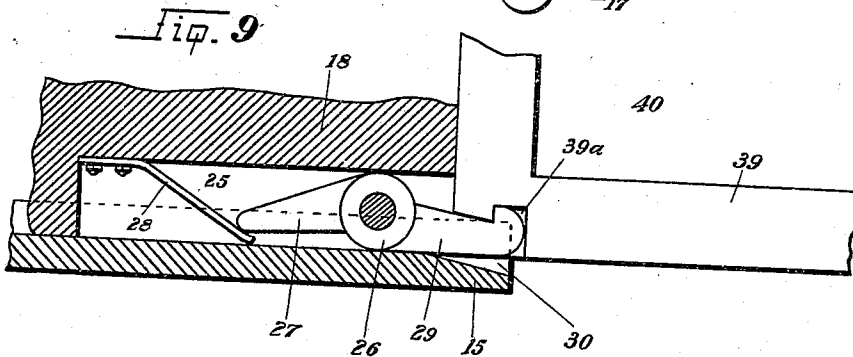
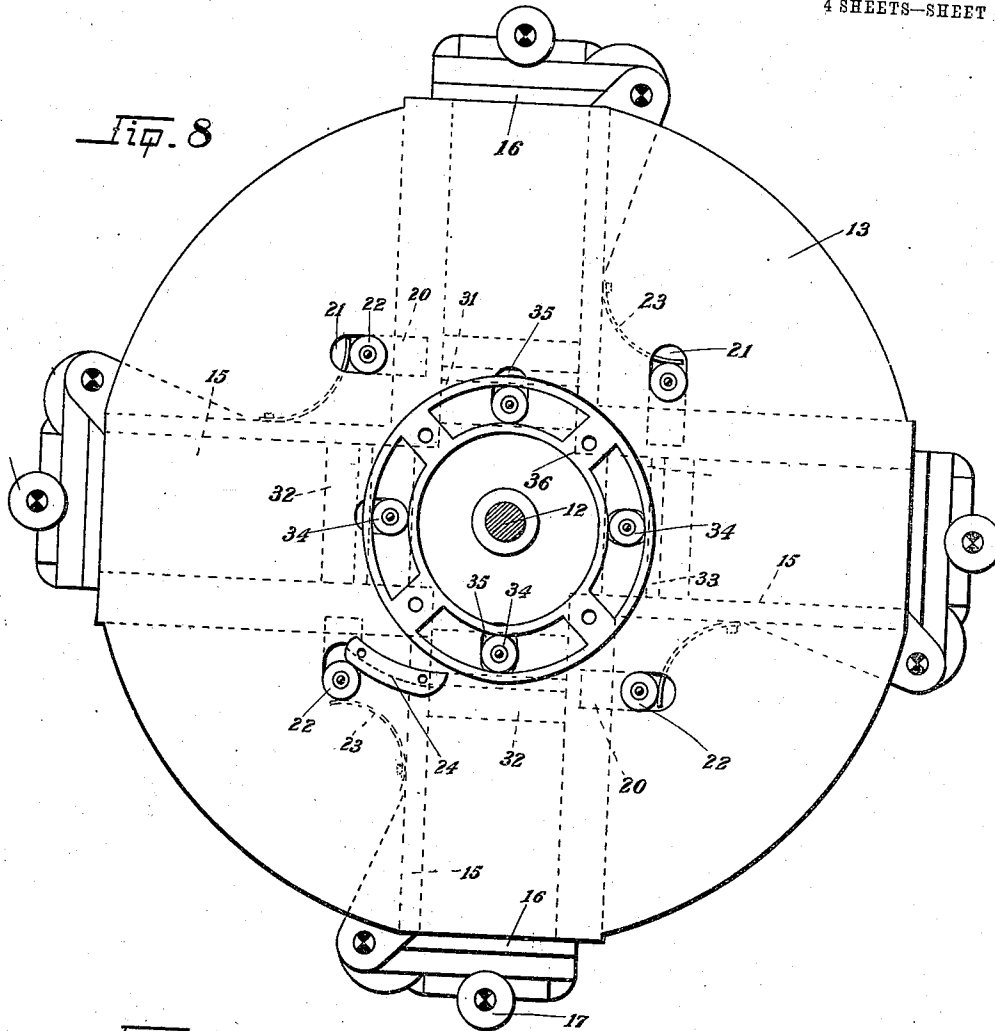
Inventor
Gotthold L. Langer
 By *Benny S. Webster*
 Attorney

G. L. LANGER.
BLOCK FORMING MACHINE.
APPLICATION FILED MAY 4, 1908.

932,035.

Patented Aug. 24, 1909.

4 SHEETS—SHEET 4.



Witnesses

Frank H. Carter
[Signature]

Inventor
Gotthold L. Langer
By *Beney S. Webster*
Attorney

UNITED STATES PATENT OFFICE.

GOTTHOLD L. LANGER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO ROY E. KEAGLE, OF LODI, CALIFORNIA.

BLOCK-FORMING MACHINE.

932,035.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed May 4, 1908. Serial No. 430,816.

To all whom it may concern:

Be it known that I, GOTTHOLD L. LANGER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Block-Forming Machines; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in machines used to press or form blocks of concrete or other material for building purposes, the object of the invention being to produce a machine wherein the five operations of filling the mold, pressing the concrete therein, discharging the pressed block from the mold and carrying said block away from the mold will all be done in the time required to perform but one of said functions; also to produce a simple and effective device for the purpose. This object I accomplish by means of a mold member having four molds disposed at substantially right angles to each other; a mechanism for rotating such mold mechanism; a means for pressing the material in said molds as said mold member rotates; a means for automatically opening and closing the respective covers of said molds as required as said mold member rotates; and an automatic means for emptying and carrying the pressed block from said molds. Also by such other and further construction and relative arrangement of parts as will more fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of the complete device. Fig. 2 is a vertical section of the device shown in the reverse position to that shown in Fig. 1. Fig. 3 is a top plan view of the complete device. Fig. 4 is a sectional view of an actuating gear mechanism. Fig. 5 is a side elevation of a block receiving and conveying mechanism. Fig. 6 is a view similar to Fig. 5 showing the parts in a different position. Fig. 7 is a side elevation of a gear locking mechanism.

Fig. 8 is a side elevation of the complete mold member. Fig. 9 is a fragmentary sectional view of a door locking and releasing mechanism.

Referring more particularly to the characters of reference on the drawings 1 designates the main frame of the device having two side frame members 2 and 3, said members being eccentric at their forward sides as at 4 and 5, and being provided with inwardly projecting rails or runways 6 and 7 following the periphery of said eccentric portion, said members 2 and 3 also being provided with inwardly projecting rails or runways 8 and 9 following the concentric periphery of said members 2 and 3 from the limits of the eccentric portions 4 and 5 respectively and having upward projections 10 and 11 respectively near the upper ends of said members 2 and 3 for the purpose that will appear.

Journaled in the members 2 and 3 is a shaft 12 on which is keyed a mold member formed of two plates 13 and 14 spaced apart and intermediate which are secured four molds 15 disposed at substantially right angles to one another as shown, each mold being provided with a top door or lid 16, each provided with rollers 17 adapted to bear over the runways 6 and 7 and under the runways 8 and 9, as will appear. Also each mold 15 is provided with sliding side door 18 adapted to slide into slots 19 at the bases of the next succeeding molds, when the pressed block is to be discharged, as will appear. Said doors are held in normal closed position by means of blocks 20 slidably disposed in slots 21 in the member 13 and provided with rollers 22 against which bear springs 23, said rollers being adapted to engage a cam 24 on the frame 2 when the pressed blocks are to be released, thus pulling the blocks 20 out of engagement with the doors 18 permitting them to be opened as will appear.

In one edge of each of the members 18 at the outer ends thereof is a cavity 25 in which is pivoted a disk 26 having an inwardly extending arm 27 against which a spring 28 bears and an outwardly extending catch 29 adapted under certain conditions to be forced by the spring 28 into a beveled mortise 30 in the corresponding outer edge of the mold 15, all as will appear.

Disposed in the bottom of each mold 15

are oppositely disposed pressing pistons 31 and 32 disposed between which are springs 33. On the pistons 31 are rollers 34 slidably disposed in slots 35 in the members 13 and 14 and running in eccentric runways 36 on the faces of the members 2 and 3, whereby the said pistons 31 and 32 will be forced outward as the molds rotate for the purpose of pressing the material in said molds and then returning to release pressure while block is being removed and then to normal position when a complete revolution is accomplished.

Forward from the members 2 and 3 are side guide frames 37 and 38 slidably disposed between which is a table frame 39 having a central slot 40 through which normally faces a table 41 upheld by standards 42 slidably disposed in guide sleeves 43 on the table frame 39. Said table frame and table is operated by the following mechanism and in a manner as will appear viz:—

44 designates the main drive pulley of the device having the usual drive belt 45, which pulley 44 is keyed onto a sleeve 46 freely turnable on the shaft 12. Secured on said sleeve 46 is a pinion wheel 47 intermeshing with a large pinion wheel 48 mounted on a shaft 49 on the inner face of which pinion wheel are formed eccentric runways 50 and 51, the runway 50 having four distinct curvatures, viz., 52, 53, 54 and 55 and the runway 51 also having a like number of distinct curvatures, viz.:—56, 57, 58 and 59, the curvatures 53, 55, 57 and 59 being concentric with the said wheel 48, all for the functions as will hereinafter appear.

Bearing in the cam 50 is a roller 60 having a vertical arm 61 having a projecting slotted arm 62 in which bears a roller 63 having an arm 64 connected with a shaft 65 extending across from side to side of the members 37 and 38 and is slidably disposed in slots 66 therein, and secured to such shaft 65 about the middle thereof is a lever 67 connected by a link 68 to the under side of the table 41.

Slidably mounted vertically on each end of the shaft 65 is a lever 69 secured at their upper ends to a shaft 70 journaled across the tops of the members 37 and 38, on one of which levers 69 is disposed a roller 71 bearing in the cam 51.

On the lower ends of the levers 69 are cog racks 72 which engage cog wheels 73 which in turn engage with other cog wheels 74 on a shaft 75 operatively connected with a chain conveyer 76 operating between the member 37 and 38 in substantial alinement with the outer edges of the table 41, there being a clutch mechanism 77 disposed on said shaft 75, whereby the outward travel of the racks 72 will drive said conveyer 76 forward and the inward drive of said racks will run free, all for the purpose as will appear.

Secured to the shaft 12 is a gear wheel 78

having the gears thereon divided into four equal segments, there being a cam 79 on the face of said wheel 78 having four equal curved jaws 80 disposed between each ending of said segments and each being intermittently concentric with the shaft 49 as the wheel 78 rotates.

On the shaft 49 is secured a quarter segmental gear 81 adapted to engage every revolution of the shaft 49 with one of the segments on the wheel 78, while the disk 82 is secured on the face of said wheel 81, said disk normally engaging one of the jaws 80 and having a blank portion 83 at the point where the gears on the segment 81 are disposed, so that when the power is applied to the pulley 44 it will be transmitted through the gears 47 and 48 to the segment gear 81, which as it revolves engages one of the segment gears on the wheel 78 and turns the shaft 12 and incidentally the molds 15 one quarter turn. For the sake of illustration we will presume that when the said quarter turn was made that the upper vertical mold 15 had its top lid open as shown in the drawing, which permitted it to be filled, and as said mold revolves the roller 17 on the mold runs under the runway 10, thus forcing and holding said lid closed. With the rotation of said mold the rollers 34 bearing in the eccentric runway 36 drive the pistons 31 and 32 outward, thus pressing the material within the molds, the springs 33 being of such tension as to give when a predetermined pressure is reached, thus avoiding breakage of parts, the full pressure being reached on a half revolution of the molds and full pressure of springs remaining another one-eighth revolution, the pistons 31 and 32 returning to normal at three quarters revolution so as to release the pressed block as will appear. The roller 17 at the same time engages the eccentric 4 and opens said door 16, also aiding in releasing said block. As a three quarter revolution of said molds is reached one of the rollers 22 engages the cam 24, thus releasing the corresponding block 20 from the rear of its corresponding door 18 and as the wheel 48 makes its second quarter turn as described the roller 60 bears in the eccentric curvature 52 and thus drives the rod 61 and incidentally the rod 64 and lever 67 downward, thus carrying the table 41 downward for the purpose as will appear, and at the same time the roller 71 bears in the concentric curvature 57 and thus performs no active function but after said wheel makes said second quarter turn and the gear 81 ceases engagement with the gear 78 and the molds are held stationary by means of the engagement of the disk 82 in one of the jaws 80, then the roller 71 engages the eccentric curvature 58, which action causes the levers 69 to slide the table frame backward away from the molds 15,

the roller 60 at the same time bearing in the concentric curvature 55, thus performing no active function, but it immediately strikes the curvature 54 which pulls the table 41 upward into its top position again and while this is going on the roller 71 bears in the concentric curvature 58 and performs no active function, but while said table is moving up the gear 81 again engages the gear 78, thus turning the mold another quarter turn and bringing another mold parallel to the table frame 39. The molds are then locked stationary by means of the cam 79 and disk 82, and then the roller 71 passes into the eccentric curvature 56 and drives the table frame and table underneath its corresponding parallel mold 15 and drives the door 18 backward into its slot 19, the table 41 taking the place of such door and receiving the pressed block and then by means of the operation heretofore described the table 41 travels downward to a lower plane than and thus deposits said block on the conveyer 76 by which it is carried away by the operation of such conveyer as described. When the frame 39 drives the door 18 open as described the hook 29 engages the notch 39^a and then when the frame 39 reverses its movement this hooked connection pulls the door 18 shut again, and then the spring 28 tilts the hook 29 into the beveled groove 30 thus releasing it from the notch 39^a. (See Fig. 9).

From the foregoing description it will be seen that I have produced such a device as substantially fulfils the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred embodiment of my invention, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:—

1. In a device of the character described, two standards spaced apart, an eccentric and a concentric cam runway on said standards, molds turnably disposed between said standards, top lids on said molds, rollers on said lids adapted to bear over said eccentric

cams and under said concentric cams, as set forth.

2. In a device of the character described, 55 a mold mechanism comprising molds, sliding doors in said molds, a receiving table and means for replacing said sliding doors with said receiving table, as set forth.

3. In a device of the character described, 60 a mold, a sliding door thereon, a table, means for causing said table to replace said door, and means for replacing said door to normal position again, as set forth.

4. In a device of the character set forth 65 two standards spaced apart, mold members rotatably disposed between said standards, sliding doors on said mold members, spring actuated blocks to maintain said doors in closed position, rollers on said blocks, and a cam on one of said standards engaging said rollers, as set forth. 70

5. In a device of the character described revolving mold members, sliding doors thereon having lateral grooves in their ends, 75 spring actuated hooks in said grooves, and a table member adapted to engage said doors and hooks.

6. A device of the character described comprising the combination of a mold member, a sliding door in said mold member, a reciprocating table frame adapted to operate said sliding door, such sliding door having a recess therein, a disk pivoted in said recess, a spring controlled arm on said disk, 85 a catch on said disk, and a notch in said table frame adapted to engage said catch.

7. A molding apparatus comprising a mold member, guide frames disposed near said mold member, a reciprocating table 90 frame disposed between said guide frames such table frame having a central slot, a table normally facing through said slot and carried by said table frame, means for reciprocating said table vertically independently of said table frame, said table frame being adapted to reciprocate under and away from said mold member. 95

In testimony whereof I affix my signature in presence of two witnesses.

GOTTHOLD L. LANGER.

Witnesses:

FRANK H. CARTER,
PERCY S. WEBSTER.