No. 828,767. PATENTED AUG. 14, 1906.

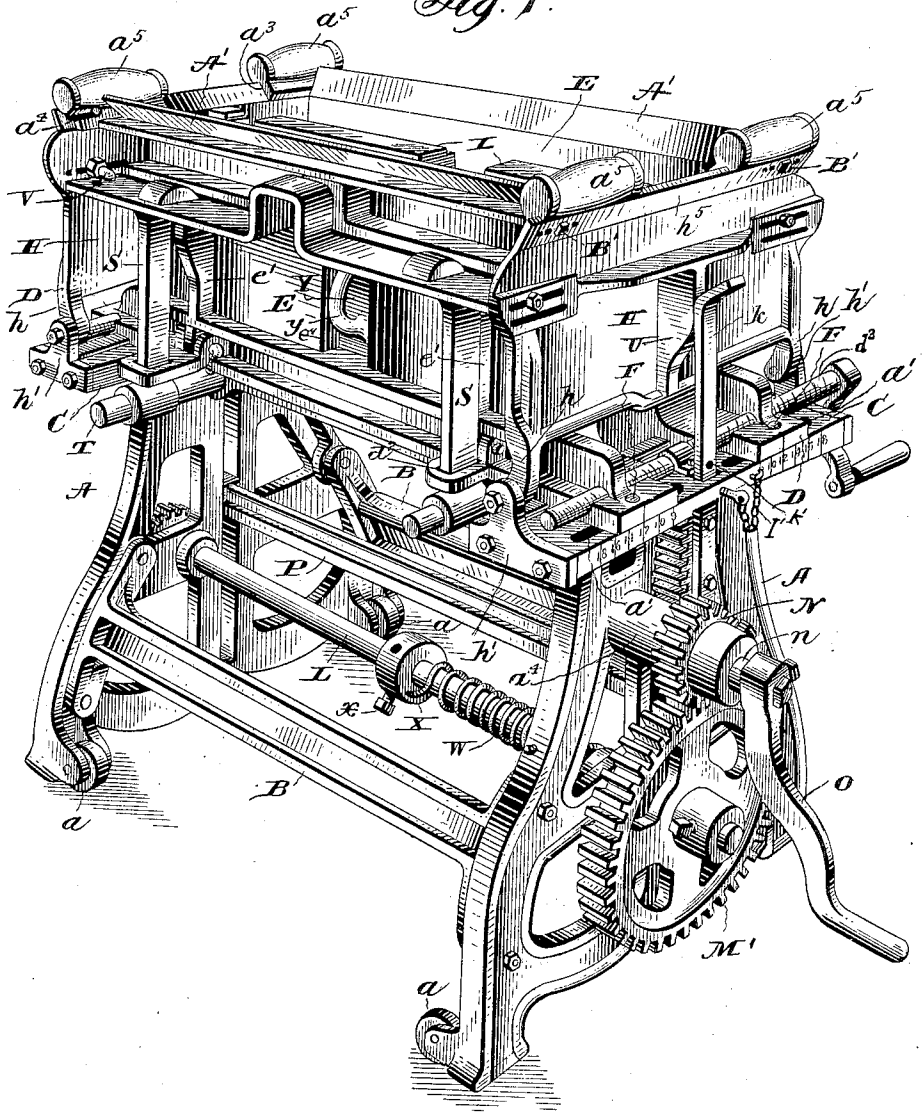
H. S. PALMER.

MACHINE FOR MAKING CONCRETE BLOCKS.

APPLICATION FILED AUG. 14, 1905.

6 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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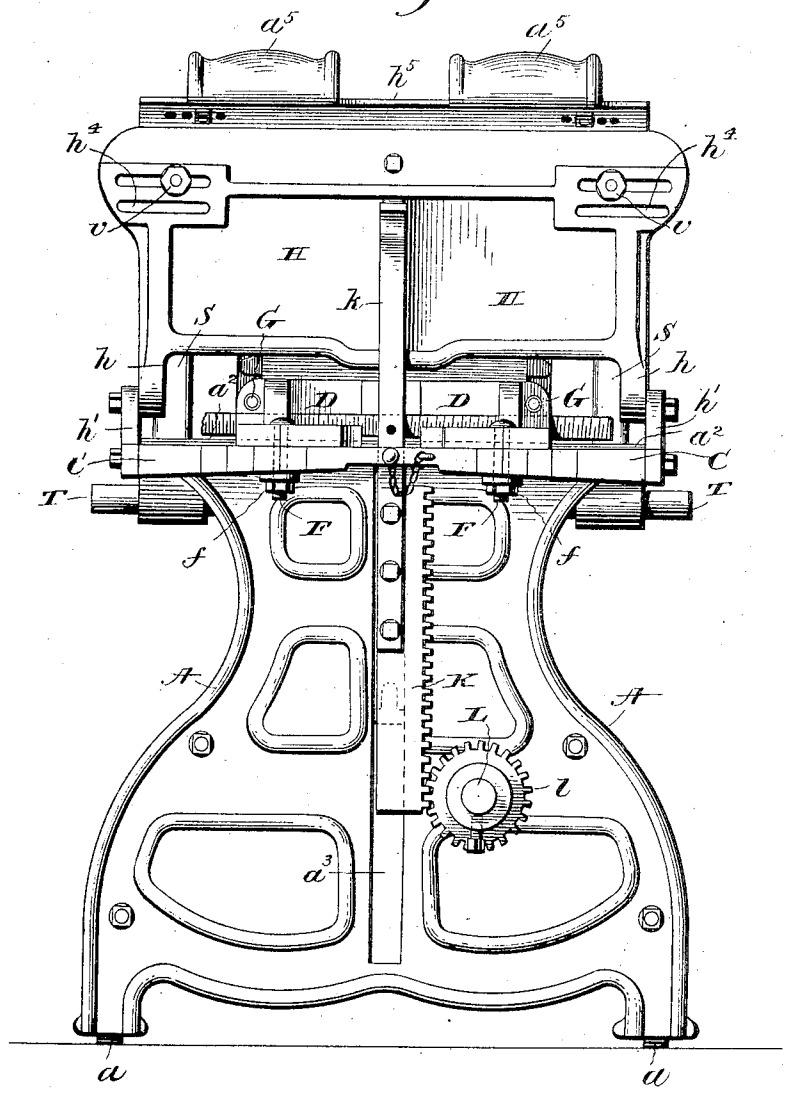
6 SHEETS—SHEET 2.

Fig. 2.



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6 SHEETS—SHEET 3.

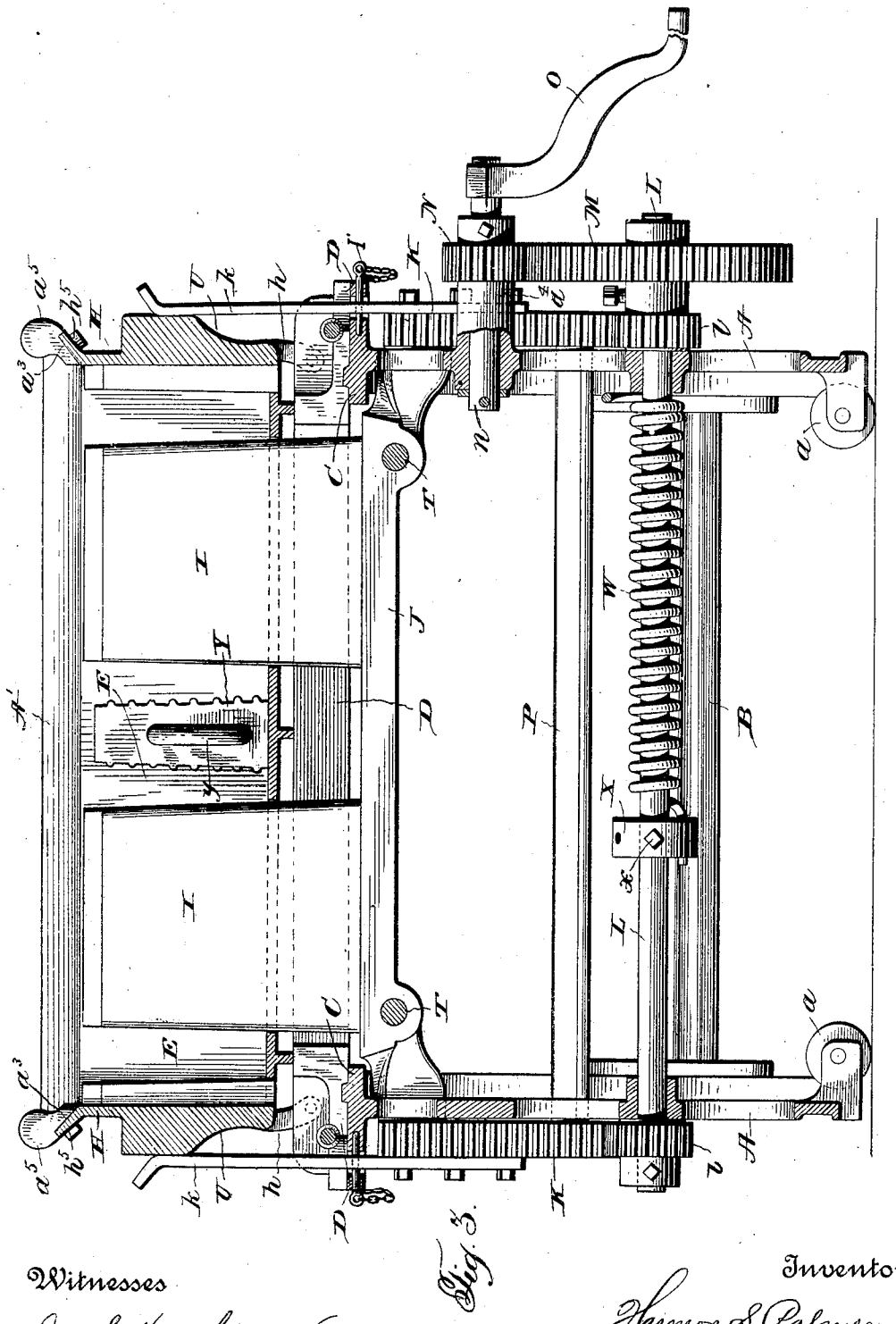

Fig. 3.

Witnesses

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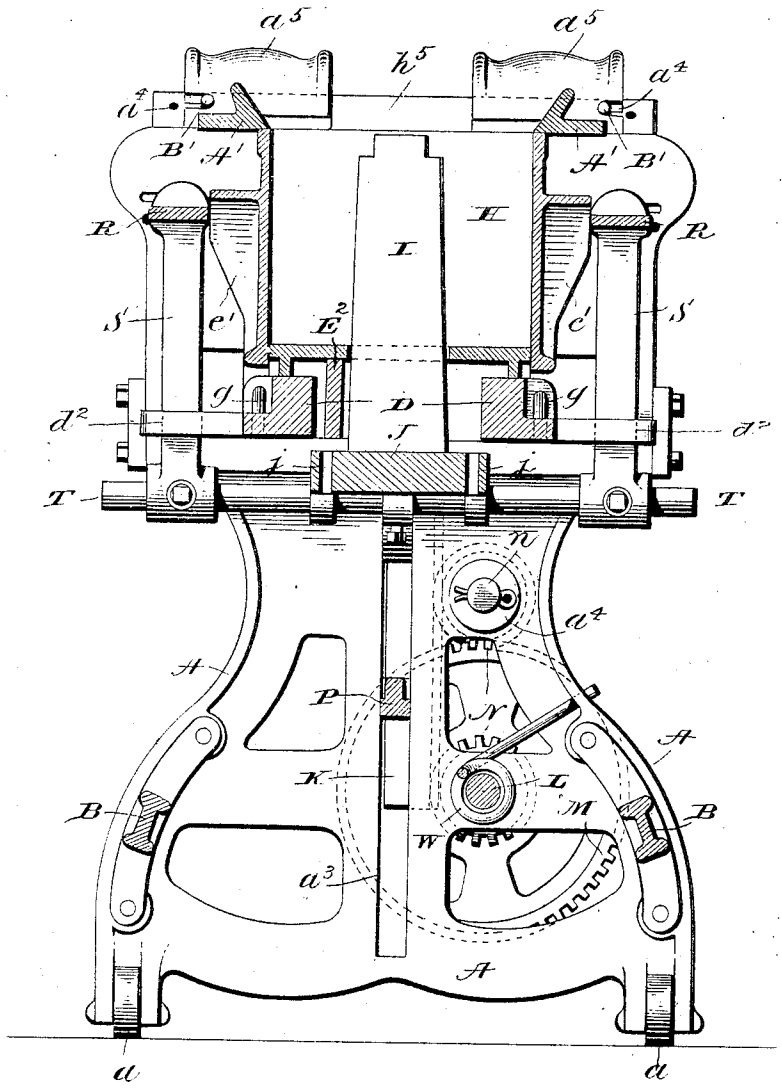
6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

Fig. 5

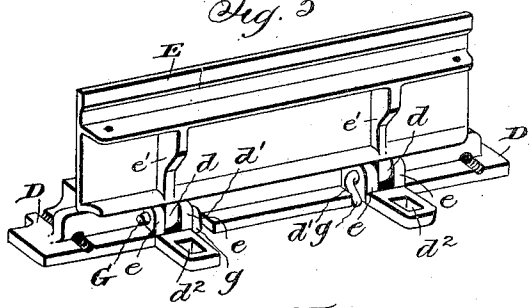


Fig. 6.

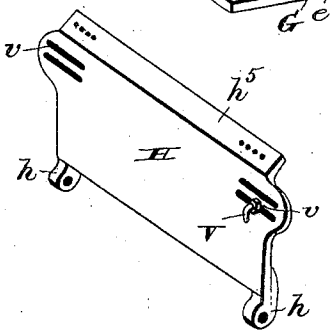


Fig. 7.

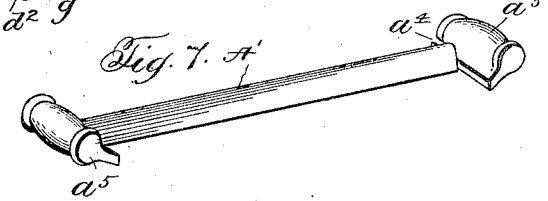


Fig. 8.

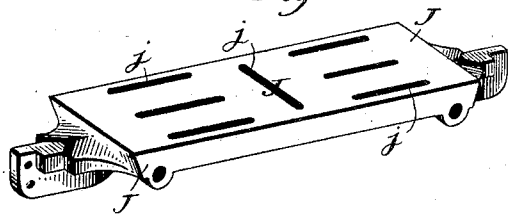


Fig. 16

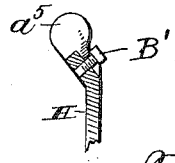


Fig. 9.

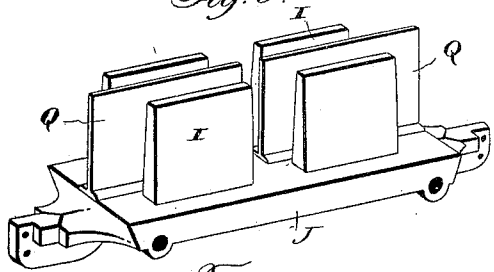


Fig. 17.

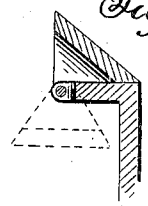
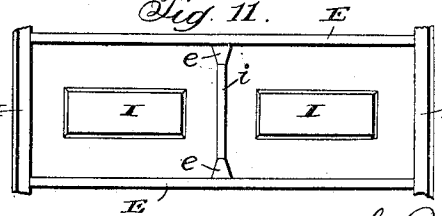


Fig. 11.



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6 SHEETS—SHEET 6.

Fig. 10.

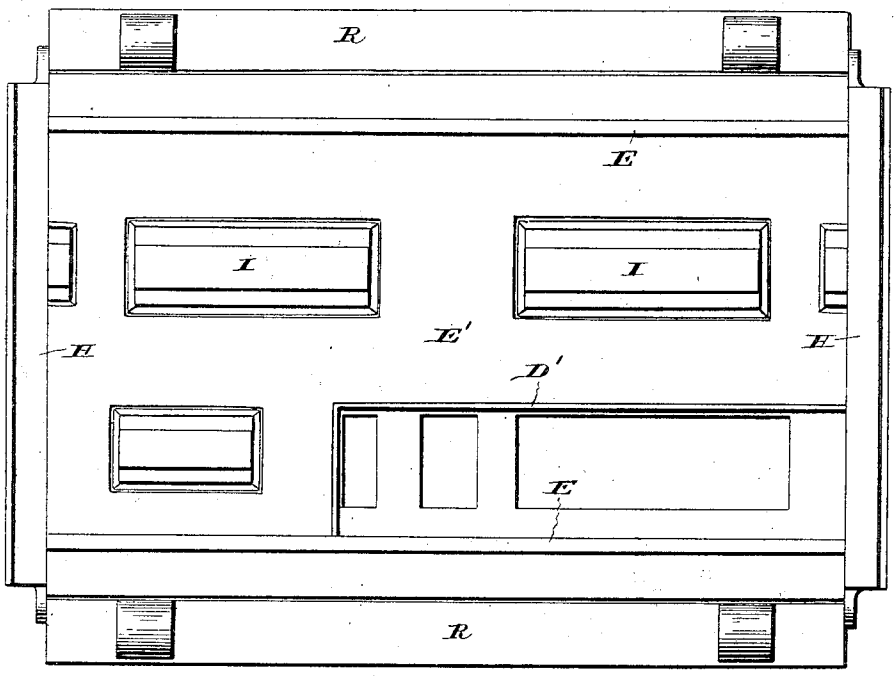


Fig. 12.

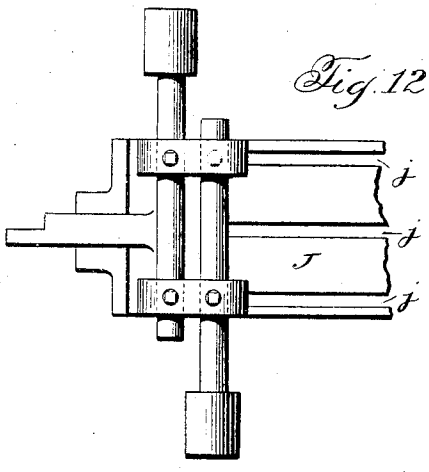


Fig. 13.

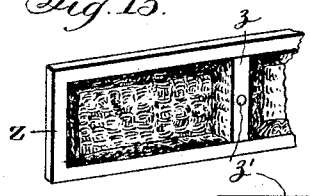


Fig. 14.

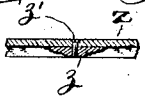
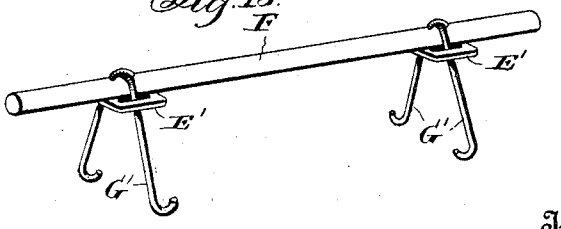


Fig. 15.



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UNITED STATES PATENT OFFICE.

HARMON S. PALMER, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR MAKING CONCRETE BLOCKS.

No. 828,767. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed August 14, 1905. Serial No. 274,193.

To all whom it may concern:

Be it known that I, HARMON S. PALMER, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Machines for Making Concrete Blocks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of an automatic machine embodying my invention, the mold-box being shown closed. Fig. 2 is an end elevation, the end shown being the one opposite that appearing in Fig. 1. Fig. 3 is a vertical longitudinal section of the same; Fig. 4, a vertical cross-section thereof; Fig. 5, a perspective view of one of the hinge-bars and its side plate separated from the rest of the machine; Fig. 6, a perspective view of one of the end plates of the machine removed therefrom. Fig. 7 is a perspective view of one of the combined hopper and striker-off bars. Fig. 8 is a similar view of the core-carrier. Fig. 9 is a like view of the same when provided with a longitudinal division or partition plate when the machine is to be used for making several narrow blocks. Fig. 10 is a top plan view of the machine arranged for making corner-blocks. Fig. 11 is a top plan view of a machine adapted for making two short blocks in the same mold; Fig. 12, a detail bottom plan view of a portion of the core-carrier and an arrangement of two adjustable rods instead of one for supporting the mold-side-actuating devices; Fig. 13, a detail perspective view of a portion of a mold side for making rock-face blocks having a detachable piece or section for forming several panels on the block; Fig. 14, a horizontal section thereof; Fig. 15, a detail perspective view of a block-lifter which may be used for removing the finished block from the machine; Fig. 16, a detail view in section of the upper portion of one of the end walls of the mold with the combined material guide or hopper and leveling device; and Fig. 17 is a detail view in section, showing a form of material guide or hopper which I may employ.

The object of my invention is to provide improvements of practical importance in machines for manufacturing concrete building or other blocks, and my aim primarily has been to provide a machine of this description which will be as automatic as possible, to the end that the number of workmen required shall be reduced, although certain features of my invention will be found applicable to and valuable in machines that are not automatic, and in construing and determining the scope of the claims this fact is to be borne in mind.

The type of machine in which I have embodied my invention is one for making hollow blocks of concrete, wherein are employed a mold-box having movable walls for forming the outer sides of the block and cores for forming the passages or chambers in the block, this being a well-known type of machine and one exhibited in numerous patents which have been issued to me.

In the embodiment of my invention shown in the accompanying drawings the machine has a supporting structure that consists of a pair of substantially similar legs A, which are connected by two longitudinal comparatively light bars B, which are bolted to the legs near the bottom thereof at the front and back of the machine, respectively, the supporting structure of the machine being thus a simple and light one. Wheels or rollers *a* are provided on the legs to facilitate the shifting of the machine from one place to another. Each of the legs A has at its top a horizontal flange or table C, upon which rest two similar and parallel bars D, that are continuous from one leg to the other and to each of which is pivoted, on a horizontal axis, one of the two mold-box side plates E. To enable the side plates E to be adjusted toward and from each other to adapt the machine for making blocks of different width, the two bars D, to which they are respectively pivoted, are adjustably connected to the leg flanges or tables, and for this purpose each leg table or flange is provided with a slot *a'*, that extends transversely of the machine, for each of said side-plate-carrying bars, and a bolt F is attached to the bar that projects down through the appropriate slot and on the under side of the table or flange has a nut *f*, by which the bar may be clamped to the table or flange. The bolt-engaging portion of the under side of the table or flange is inclined, as shown, downward and outward from the center of the machine for the purpose of preventing lateral outward movement of the side plates under the strain of the forming or tamping of the block in the mold, it being evident that the engagement of the nuts on the bolts with such inclined surfaces will most effectually

restrain the side plates from outward movement. As each side plate is carried by but a single bar or part, it will be evident that the operation of adjusting the side plate may most easily and quickly be performed. To preserve the position of the plate-carrying bar in being shifted from one point to another, a guide-rib a^2 is preferably provided on the top of each leg table or flange, which engages a groove in the under side of the bar, and to simplify and to render the accurate adjustment of the side plates easy a gage or scale is provided on the outer edge of the table or flange of each leg with graduations spaced apart the distances required for the different width of blocks to be made, and on one of the tables or flanges the graduations are numbered with numbers corresponding to the transverse dimensions of the blocks to be made. On the contiguous end of each of the side-plate-carrying bars a line or pointer is provided for coöperation with the index or scale. It will be seen that by the employment of these scales the adjustment of the sides of the mold may be most easily and yet accurately accomplished, and as a scale or index is provided at each end of the machine perfect parallelism of the side plates is assured.

If preferred, the shifting of the hinge-bars D may be done by power by providing a transversely-extending shaft d^3, having right and left threads to engage the correspondingly-threaded openings in the respective bars, on one end of which shaft a crank or hand-wheel is mounted, by which it may be revolved, the shaft of course being swiveled in suitable bearings to prevent it moving longitudinally and to compel the movement of the hinge-bars when it is revolved.

The side plates E are detachably pivoted to their supporting-bars, so that side plates of one configuration can be substituted for side plates of another configuration, the pivoting means consisting of two hinge-lugs e at the bottom of each side plate near the ends thereof and a pair of lugs d for each hinge-lug e, the latter being placed between the pair, and a pivot-pin G, passing through the set of lugs e and d and having at one end a radial extension or arm g, adapted to be moved into and out of a notch d' in the bar D, said extension or arm when by the turning of the pin it is disengaged from the notch leaving the pin free to be withdrawn from the lug and when it is seated in the notch preventing the withdrawal of the pin. Not only is this hinge construction a simple and entirely efficient one, but it is valuable because it so greatly facilitates the removal and replacement of a side plate.

In addition to the two side plates E the mold-box has two end plates H, between which the two side plates are situated, and each of said end plates has near each end and at its bottom a hinge-lug h, pivoted to a bracket h' on the contiguous leg table or flange, and the length of each end plate is such, together with its position with reference to the ends of the two side plates, that the one pair of end plates serves for all the blocks that may be made within the capacity of the machine irrespective of the width of such blocks, which of course is a feature of great practical value, since if extra end plates were required for each width of block to be made it would add greatly to the cost of the machine and render its use inconvenient.

The side and end plates of the mold-box are automatically opened and closed, and the means by which this is accomplished is fully described hereinafter.

For the support of the cores I, which may be any number desired, a core-carrier J is employed that consists of a bar that extends lengthwise of the machine and at its end passes through vertical slots a^3 in the respective legs A. On the outer side of each leg A said core-carrier is provided with a vertical rack K, with which meshes a pinion l upon a longitudinal shaft L, turning in bearings in the legs A and having fixed to it on the outside of one of the legs a gear-wheel M, which meshes with a pinion N. The pinion N is mounted on a short or gudgeon shaft n, journaled in an extended hub or boss a^4 on the contiguous leg A, and on the outer end of said shaft is mounted a removable crank O, by which the shaft and the pin may be revolved, and thus power transmitted to the shaft L to actuate the core-carrier and racks. The racks near their lower ends are connected by a stiffening or brace bar P. The core-carrier is shown as provided with several series of holes j for the attachment of cores or other machine members thereto and in different positions or relations, according to the nature of the work to be done. Thus when a single hollow block is to be made only cores are attached to the core-carrier. Should, for example, it be desired to make several separate blocks at the same time, then by means of the holes at the transverse center of the core-carrier one or more plates Q, (shown in Fig. 9,) having a length equal to the length of the desired blocks, may be bolted to the core-carrier to separate the mold-box into longitudinally-extending compartments, and cores for forming the chambers or openings in each of the narrow blocks, which may thus be made, are attached to the core-carrier by the holes at either side of the center thereof. Should it be desired to form a considerable number of small solid blocks or bricks at one time, this can be done by bolting to the core-carrier in lieu of the cores a plate having a number of thin vertical walls or partitions separated by spaces corresponding to the thickness of the bricks, a bottom plate or follower, such as is hereinafter more fully re-

ferred to, being used to support the bricks, that is provided with slots for the respective partitions.

The upper surface of the core-carrier adjacent each leg A is inclined downwardly and inwardly, the downward inclination being from the transverse center of the core-carrier in each direction, so that should any concrete or block material drop upon these portions of the core-carrier they will at once slide therefrom and away from the gearing, so that all liability of the latter being choked or clogged by the concrete or block material is obviated.

I utilize the core-carrier for automatically operating the mold-box sides and ends, so that when the core-carrier is raised to lift the cores or other parts carried thereby into position in the mold-box the sides and ends may be raised into closed position, and when the core-carrier descends its descent will at the same time be attended by the lowering or opening outward of the mold-box sides and ends. For raising the two side plates or swinging them upward on their hinges to a closed position one or more, preferably two, ribs *e'* are provided on the outer side of each plate, whose outer edges have an inclined or cam-like formation, with which ribs a longitudinally-extending bar R, that is connected with the core-carrier, so that it is raised and lowered therewith, engage when said bar R ascends. The bar R is bolted near its ends to two posts or uprights S, which at their lower ends are attached, respectively, to horizontal rods T, secured to the core-carrier. The rods T are preferably made of shafting, because thereby a cheapening of the cost of manufacture of the machine is secured. This is so because such shafting is stock material, and for attaching the rods to the core-carrier it is necessary merely to bore or drill holes through the core-carrier, an operation that can easily and inexpensively be done on an ordinary drill, to the face-plate of which the core-carrier may be readily bolted, the holes for the rod, since the latter consist of standard shafting, being of standard size. The connection between the bars R and the core-carrier must of course be adjustable to enable the positions of the bars R to be changed, according to the width of the block to be made, and where, as shown in Figs. 1 to 5 of the drawings, a single rod T is employed at each end of the core-carrier and passed through the latter to opposite sides thereof such adjustment is provided for by slidably mounting the posts or uprights upon the rods and securing them in the desired adjusted position by set-screws. To avoid separate manipulation of the posts or uprights in changing the adjustment of the machine, I pass each through a hole or slot *d'* in the side-plate-supporting bars D, so that when the latter is shifted it will move with it the posts or uprights thus attached to it. In some instances it may be desirable to avoid the undue protrusion of the ends of the rods T at the sides of the machine, and to obviate this instead of employing a single rod at each end of the core-carrier for two posts on opposite sides thereof a separate rod for each post may, as shown in Fig. 12, be employed and the two rods placed alongside of each other, each in its own bearings on the core-carrier and each being adjustable independently of the other to adjust the position of the side-plate-operating bars R, the adjustment in this case being effected by moving the rods and not by moving the posts or uprights thereon, the latter being fixed to the rods.

For lifting the end plates H there is fastened to the core-carrier or to each rack-bar K a vertical rod *k*, whose upper end is adapted to engage and coact with a cam-rib U on the end plate similar to the cam-ribs on the side plates. The opening of the mold-box by the swinging downward of the side and end plates is effected by gravity and takes place as the closing-bars descend. For the purpose of insuring the downward swinging of the side and end plates when they are free to swing downward by the descent of their lifting devices the center of gravity of each of these plates is placed at a point well outside of a plane passing vertically through their pivots, and this in part is produced by the presence of the cam-ribs on the outer sides of the plates and by other longitudinally-strengthening ribs on the outer side of the plates near the tops thereof. To firmly lock the side and end plates of the mold-box in their closed position, so that they will be able to withstand the strains in forming the block, I provide in each end of each side-plate-lifting bar R a hole, and vertically in line therewith when the end plates are closed there is a vertical pin or projection V on each end plate, which as the lifting-bar rises enters the contiguous hole, and thus both the end plates and the side plates are restrained most firmly against any tendency to move outward or open. The pin or projection V has at its upper end a right-angle shank which is threaded and passes through a hole in the end plate, and there is a nut *v* on said shank on each side of the end plate, by which the pin or projection is securely fastened in place. The pin or projection is thus adjustable to compensate for wear, and the hole in the end plate in which it is placed is in the form of a horizontal slot, so that it may be adjusted laterally to suit the adjustment of the mold-box for different blocks. To supplement the action of the nuts in holding the pins or studs from lateral movement outwardly, the side surfaces (preferably the outer side surfaces) of the end plate with which the nut on the outer side of said plate engages is inclined outwardly and laterally in a direction away

from the end plate, so that a wedging or crowding of the nut thereagainst is produced by any tendency of the pin outward. The pins or projections also serve as stops to arrest the ascent of the cores at the proper level, and I avail myself of this function for the manufacture of blocks having passages to extend only partially through them, and to do this I provide a second slot h^4 in the end plates nearer the plate-axis, in which the pin or projection V may be placed, and when it is so placed the cores will not rise to a height which would place their tops level with the top of the mold-box, and therefore the concrete or block material placed in the mold-box will overlie the tops of the cores.

It will be understood that the cam-ribs on the mold-box plates have such form that there may be a continued ascent of the lifting-bars R after the mold-box plates have been moved to proper position to close the mold to enable the engagement of the holes of said bars and the pins or projections T without any disturbance of the position of the mold-walls. This form of the cam-ribs is also important, because when the mold is to be opened the cores will be lowered a short distance to free them from the newly-formed block before the side and end walls begin to open, so that injury to the newly-formed block by cracking it be avoided, which might be caused by first taking away its support by the mold-walls.

The lifting of the cores and the upward swinging of the mold-walls to close the machine may be done by a manual operation; but preferably I construct the machine so that the closing thereof is done automatically. I do this by providing the machine with a spring which acts upon gearing to lift the core-carrier. This spring may be applied in any desired way; but a very good way to employ it is to give it the form of a coil or helical spring W, encircling the shaft L, one end of the spring being attached to some stationary part of the machine and the other to a collar X on said shaft. The collar X is rotatable upon the shaft to enable the tension of the spring to be adjusted as may be found necessary, the collar being provided with a number of holes in its periphery adapted to receive a bar or lever by which it may be easily turned. A set-screw x is provided for securing the collar when the spring has been placed under the desired tension. The mold sides when the mold is fully open lie substantially horizontal, and when in this position the point of engagement therewith by the bars R and k is so close to the axis of said sides that the weight of the sides is sufficient to hold them against the lifting tendency of the spring W, and this enables the newly-formed block, resting upon a removable bottom plate of usual construction, to be removed without the provision of any special holding means to keep the mold-walls and the cores in their lowered position. A slight movement of the operating-crank is all that is necessary to release the locking of the spring, as I have just described, and thereupon the spring will act to automatically close the mold-box. The spring W is also of use, and an important one, in that as it offers resistance to the opening of the mold-box it prevents such sudden and violent opening thereof as might result in the cracking and injury of the newly-formed block.

It is desirable sometimes to make several blocks at the same time which are shorter than the length of the mold and to give to their inner ends in the mold a configuration that is not possible where a vertically-movable transverse division-plate or core is employed. I adapt my machine for this work by providing it with a removable core or division-plate that may be inserted into the mold-box and withdrawn therefrom by a horizontal movement, one of the mold side plates beingprovided with a slot or opening e^4, through which said horizontally-movable core or division-plate Y may be passed, said core or division-plate being provided upon its outer end with a handle y, by which it may be manipulated. It will be seen that after the mold-box is closed the horizontally-removable core Y may be placed therein, and after the molding of the blocks it is withdrawn before the cores and mold-walls are operated to open them. By reason of its horizontal movement the ends of the blocks which are formed by its sides may be given a configuration—such, for example, as a horizontally-ribbed one—which would be impossible by the employment of a vertically-movable core or partition-plate. The advantage of withdrawing the core Y before opening the mold is that the same core may be immediately used in the manufacture of other blocks, whereas if the core were left in position until after the mold-box is opened it would have to remain with the newly-formed blocks until they had set sufficiently to enable the core to be removed, and this of course would necessitate the employment of a great number of such cores. The web or neck of stone that unites two blocks thus made can easily be cut or removed. When several short blocks are thus made in one mold, it may be desirable to provide for each block its own removable bottom plate. Instead of the longitudinally-removable core being used to make two short blocks the construction illustrated in Fig. 11 may be used, where a thin core or projection i is attached to the core-carrier, and on the inner side of each side plate there is a rib e, which reaches to said core or projection to complete the separation of the mold.

As a matter of precaution a lock is preferably provided to prevent the accidental descent of the cores and the opening of the

mold-box, which, as shown, may consist of a pin I′, adapted to pass through a hole in one of the legs A and either one of two holes k' in one of the end-wall-lifting rods k, holes being provided because of the employment of the machine for making blocks with holes or passages all the way through them from top to bottom and blocks with such holes or passages extending only partially through them.

In producing blocks with what is known as the "rock-face" finish it is desired sometimes to have narrow fillets or smooth portions at intervals dividing the rock-finish surface into sections of rock-finish, and to enable my machine to be used for making blocks having a side with a uniform rock-finish from end to end, as well as one interrupted by the use of fillets, I detachably secure to the inner side of the side plates of the machine which are formed to produce a rock-finish extending from end to end of the block pieces or sections Z, having raised narrow smooth portions z for producing the smooth fillet-strips on the face of the block, these pieces or blocks Z having adjacent the smooth raised portion portions that have a rough or rock face configuration that merge into the adjacent similar configuration of the side plates and having their portions that abut against the latter conforming thereto. Screws or bolts z' are provided as a convenient means for the detachable connection of the pieces or blocks Z to the side plates.

Each of the end plates of the mold is provided with an upwardly and outwardly inclining flange h^5 at its upper edge, which constitutes a hopper-like extension or guide for the block material being placed in the mold-box, and for each of the side plates of the mold-box there is provided a longitudinally-extending bar A′, having an inclined surface, which when the bar is placed in proper position above or over the upper edge of its side plate when the latter is in its vertical position inclines upward and outward and constitutes a guide or hopper-like portion for said side plate. At each end said bar A′ has a transverse groove a^3 to fit over the flange of the end plate of the mold-box, and it is provided also at each end with an open-ended slot a^4 for engagement by a pin or stud B′, attached to the end-plate flange in a position to gage or fix the position of the hopper-bar properly with reference to its side plate. Said pin or stud is preferably in the form of a screw or bolt, and of course it is adjustable to different positions, according to the adjustment of the mold-box, for making blocks of one width or another, a series of holes being provided in said flange for this purpose. Said screws or bolts are used, as shown in Fig. 16, when the machine is to be shipped or transported to clamp or fasten the hopper-bars to the end plates. At each end the hopper-bars are provided with handles a^5, by which they may be placed in and removed from position and by which one or the other may be slid across the top of the mold-box, being guided by the end-plate flanges h^5 after the block material has been placed and tamped in the mold-box, so that the hopper-bar thus serves as a striker-off or trowel to remove the surplus material and level off or smooth the top of the newly-formed block. Instead of using the bars A′ for the hopper the construction which is shown in Fig. 17 may be used, which consists of a bar A^2, having an inclined material-guiding surface and which is pivoted to the outer edge of a horizontal flange on the side plate, so that it may be swung or turned on its pivots from a position in use to a position out of use, leaving the top of the mold-box free from obstruction, so that the block material may be leveled off or smoothed.

My machine is adapted for making what are known as "corner-blocks," which are blocks having an angle or L-shape form, and when such blocks are to be made the hinge-bars of the side plates are adjusted a distance apart equal to the width of the block to be made plus a corner extension and then an angle or L-shape plate D′ is placed within the mold-box to form the inner sides of the corner-block. It will be seen that by this arrangement the automatic opening and closing of all four walls of the mold-box is not interfered with, and no change of walls is necessary. The bottom plate E′, that is used when corner-blocks are made, in view of the wide separation of the hinge-bars which is necessary when making a corner-block, may be supported or sustained against the strains to which it is subjected by a supplemental bar E^2, placed beneath it and resting upon the legs A, or it may be given the form shown in Fig. 10, where it is provided with strengthening or reinforcing ribs or bars e^2, that give it a general rectangular form instead of an L shape or angle form. To form a chamber or passage in the angle or L of the corner-block, the core-carrier, as in my Patent No. 727,427, May 5, 1903, will be provided with a lateral extension or bracket at the proper point for a suitable core, which is detachably connected thereto, so that when corner-blocks are not to be made said core may be removed.

For lifting the newly-formed block from the machine I employ a lifter of well-known construction, consisting of a pole or bar F′, having at each end a handle and hooks G′ depending thereform, the hooks being an inverted-V shape, and one or both legs of each pair of hooks being passed through a slotted plate E′, which limits the swing of the hooks, so that the latter are always kept in position for use, as they are not when, as has been the case heretofore, they have been free to swing on their pivotal connections with the handle-bar.

For the provision upon the blocks of an

ample mortar-receiving surface at the top thereof, and yet without unduly using material, the tops of the cores are rabbeted or cut away, so as to provide on the interior of the blocks at the top thereof overhanging ledges or projections.

As I have already indicated, some features of my invention may be used in machines that are not automatic, and I also desire to state that in many instances the particular construction which is found in the machine which I have selected to illustrate my invention may be departed from without involving any departure from the scope of my invention.

Having thus described my invention, what I claim is—

1. In a machine for making artificial blocks, the combination of a support, a mold-box, having a wall that is movable to open and close the box, a single adjustable bar upon which said wall is movably mounted, and a removable bottom plate that rests upon said bar.

2. In a machine for making artificial blocks, the combination of a suitable support, a mold-box having pivoted walls, a single bar for each of said walls, adjustably mounted upon said support, whereby the distance between such walls may be varied, and a removable bottom plate supported by said adjustable bars.

3. In a machine for making artificial blocks, the combination of a support, a mold-box having pivoted walls, a single adjustable bar for each of said pivoted walls, and a removable bottom plate supported by said bars.

4. In a machine for making artificial blocks, the combination of a support, a mold-box having a pair of pivoted side walls, a pair of adjustable bars, one for each of said side walls, which is pivoted thereto, a removable bottom plate supported by said bars, and a core or cores, a space being provided between said bars for the accommodation of the core or cores.

5. In a machine for making artificial blocks, the combination of a support, a mold-box having a pair of pivoted side walls, a pair of adjustable bars, one for each of said side walls, which is pivoted thereto, a removable bottom plate supported by said bars, and a vertically-movable core or cores, a space being provided between said bars for the accommodation of the core or cores.

6. In a machine for making artificial blocks, the combination of a mold-box having adjustable elements to adapt it for making blocks of different sizes, holding devices for the adjustable elements, and coöperating surfaces on such holding devices, inclined one relative to the other, to lock or bind the same from movement in the direction in which they are shiftable for adjustment.

7. In a machine for making artificial blocks, the combination of a suitable support, adjustable wall-supporting bars on said support, and clamping devices for said bars engaging said support, the engaging surfaces of the support and clamping devices being inclined.

8. In a machine for making artificial blocks, the combination of a pair of legs, mold-box walls, bars supporting said walls, resting on said legs, and bolts and nuts for clamping the bars to the legs, the nut-engaging under side of the legs being inclined.

9. In a machine for making artificial blocks, the combination of a mold-box having pivoted walls, a vertically-movable core carrier, horizontal rods secured in holes in the core-carrier, and vertical wall-engaging bars supported by said rods.

10. In a machine for making artificial blocks, the combination of a mold-box having pivoted walls, a vertically-movable core-carrier, rods secured in holes in the core-carrier, and vertical wall-engaging bars supported by said rods, and adjustable horizontally thereon.

11. In a machine for making artificial blocks, the combination of a mold-box having pivoted walls, a core-carrier, racks attached to the core-carrier at each end, bars attached to said racks to engage certain of the pivoted walls, rods in the form of shafting attached to the core-carrier, posts rising from said rods, and wall-engaging bars on said posts.

12. In a machine for making artificial blocks, the combination of movable mold-walls, which move in directions that intersect, means for moving them to closed position, and automatic means supplemental to said closing means comprising two coöperating members both of which are supplemental to said closing means, for locking them in a closed position, and unlocking them.

13. In a machine for making artificial blocks, the combination of movable mold-walls, which move in directions that intersect, means for moving said walls to a closed position which includes a movable bar, and a locking device for the walls into and out of engagement with which said bar moves when moved into and out of mold-closing position, respectively.

14. In a machine for making artificial blocks, the combination of movable mold-walls, which move in directions that intersect, means for moving them to a closed position, which includes a bar for engaging one of said walls, and a lug or projection on another wall that interlocks with said bar when the walls are moved to their closed position.

15. In a machine for making artificial blocks, the combination of a pair of movable mold-walls, bars that engage and actuate said mold-walls, a second pair of movable

mold-walls, movable toward and from the ends of the first pair, means for actuating the second pair, and lugs or projections on the walls of the second pair that engage with said bars.

16. In a machine for making artificial blocks, the combination of a pair of movable mold-walls, bars that engage and actuate said mold-walls, a second pair of movable mold-walls, movable toward and from the ends of the first pair, means for actuating the second pair, and adjustable lugs or projections on the walls of the second pair that engage with said bars.

17. In a machine for making artificial blocks, the combination of a pair of movable mold-walls, adjustable toward and from each other, bars that engage and actuate said mold-walls, a second pair of movable mold-walls, movable toward and from the ends of the first pair, means for actuating the second pair, and adjustable lugs or projections on the walls of the second pair that engage with said bars.

18. In a machine for making artificial blocks, the combination of a mold-box having movable walls, a core or cores, means whereby the separation of the core or cores from the newly-formed block may be effected, and adjustable means shiftable to and fixed in definite positions for determining the position of the core or cores within the mold-box, whereby the extent of the passages or chambers produced by the core or cores may be varied.

19. In a machine for making artificial blocks, the combination of a mold-box having movable walls, a core or cores, means whereby the separation of the core or cores from the newly-formed block may be effected, a stop device carried by a mold-wall and coacting with a member of the core-operating means to arrest the movement of the cores, and shiftable to and fixed in definite positions to stop the cores in different positions within the mold-box, whereby the extent of the passages or chambers produced by the cores may be varied.

20. In a machine for making artificial blocks, the combination of a mold-box having movable walls, a movable core or cores, a part connected with the latter that coacts with one of said walls, and a wall-locking device that coacts with said part, and shiftable to different positions to vary the position of the core or cores with reference to the mold-box in the block-forming position of the parts.

21. In a machine for making artificial blocks, the combination of a pair of swinging mold-walls, a bar for each of the same to control the movement thereof, a second pair of swinging mold-walls, means for actuating the same, lugs or projections on the second pair of walls, adjustable to different positions vertically to coöperate with said bars, and a movable core or cores connected with said bars.

22. In a machine for making artificial blocks, the combination of a mold-box having a pivoted wall, a shiftable support on which said wall is pivoted, an operating device for said wall, and connections between said device and said support, whereby said device may be shifted when the support is shifted.

23. In a machine for making artificial blocks, the combination of a mold-box having movable walls, and a wall-locking device consisting of a pin having a threaded shank passing through a wall with nuts on opposite sides of the latter on said shank, and a reciprocating part having a hole with which said pin coacts.

24. In a machine for making artificial blocks, the combination of a mold-box having a pivoted wall, a shiftable bar on which said wall is pivoted, an actuating device for said wall, posts supporting said device, and connections between said posts and said bar, whereby when the bar is shifted the posts are shifted.

25. In a machine for making artificial blocks, the combination of a pivoted mold-box wall, a bar to which the same is pivoted, and a pivot-pin detachably connecting the wall and bar having a laterally-extending portion that engages a notch in said bar.

26. In a machine for making artificial blocks, the combination of a mold-box having a movable member or members, a shaft, gearing between the shaft and said member or members through which power from the shaft is transmitted thereto, and a spring connected with the shaft, placed under tension when it is rotated to open the mold-box, and which acts to rotate said shaft to close the mold-box.

27. In a machine for making artificial blocks, the combination of a vertically-movable core-carrier, movable mold-box walls, a shaft from which power is taken to actuate said core-carrier and said walls, and a spring acting to rotate said shaft in one direction.

28. In a machine for making artificial blocks, the combination of a vertically-movable core-carrier, vertically-swinging walls, parts connected with the core-carrier for actuating said walls, a shaft, gearing between the latter and the core-carrier, and a coil-spring mounted on said shaft that is placed under tension when the shaft is turned to lower the core-carrier and open the mold.

29. In a machine for making artificial blocks, the combination of a mold, means for opening the same, a device for storing energy when the mold is opened, said device being restrained from action when the mold is fully open, and means for releasing said device to permit it to act.

30. In a machine for making artificial blocks, the combination of a mold, means for opening the same, a device for storing up energy, and a spring placed under tension when the mold-box is open, said spring being restrained from action when the mold-box is fully open, and means for releasing said spring to permit it to act.

31. In a machine for making artificial blocks, the combination of a mold-box, a material guide or hopper, the latter comprising bars unconnected with each other and movable to and from position for use, and means for holding said bars in fixed positions adjacent to certain of the mold-walls, whereby they serve as guides to direct the material into the mold-box.

32. In a machine for making artificial blocks, the combination of a mold-box having movable side and end walls, a material guide consisting of a bar lying parallel with a side wall, and slidably supported on the end wall, and means to hold said bar in a fixed position adjacent to said side wall for guiding material thereby into the mold-box.

33. In a machine for making artificial blocks, the combination of a mold-box having four walls, two material-engaging bars independent of each other, adapted for coöperation with two of such walls, and situated at the top thereof to guide the material into the mold-box, and supports for said bars on the other two walls.

34. In a machine for making artificial blocks, the combination of a mold-box, consisting of four walls, two of which have upwardly and outwardly inclining flanges at their upper ends, and a bar for each of the other walls having portions to engage said flanges.

35. In a machine for making artificial blocks, the combination of a mold-box, consisting of four walls, two of which are adjustable to vary the size of the blocks to be made, a material-guide, consisting of a bar that is movably mounted, and an adjustable stop for said bar.

36. In a machine for making artificial blocks, the combination of a mold-box, a slidable bar mounted at the top thereof, and stop-pins for said bar, adapted also to secure the bar from movement, said pins being reversible to change their relation to the bar according to the function they are to perform.

37. In a machine for making artificial blocks, the combination of a mold-box, a bar slidably mounted on and supported by the top of the box, and stop pins or projections on the box to engage the bar to fix its position.

38. In a machine for making artificial blocks, the combination of a mold-box, consisting of four walls, two or which are provided at their upper ends with guiding-flanges, a bar slidably mounted on said flanges, and stop-pins on said flanges for said bar that also serve to secure the same to said flanges.

39. In a machine for making artificial blocks, the combination of a mold-box, adjustable bars to support certain of the walls thereof, a bottom plate to support the block to be formed that rests upon said bars, said bottom plate having supporting or strengthening means for the support thereof when said bars are adjusted wide apart.

40. In a machine for making artificial blocks, the combination of a mold adapted to be opened and closed, operating mechanism therefor comprising a reciprocable rod or bar having several holes, a relatively stationary part having a hole to aline with any one of the holes in said rod or bar, and a pin adapted to pass through the alining holes, locking the operating mechanism from movement.

41. In a machine for making artificial blocks, the combination of movable mold-walls, a movable core or cores, parts moving with the core or cores to actuate the movable mold-walls, cam-ribs on the mold-walls for engagement by said parts, said cam-ribs having a formation which permits movement with the core or cores of their parts which cooperate with said cam-ribs, without causing movement of the mold-walls during a portion of the time of movement of the cores, and a mold-locking device comprising two coacting members, one of which moves with the cores to effect the engagement and disengagement of said members.

42. In a machine for making artificial blocks, the combination of a mold-box, a pair of adjustable parallel bars to which a pair of the mold-walls are attached, a removable bottom plate for the mold supported by said bars, and a supplemental bar between the adjustable bars for supporting the removable bottom plate.

43. In a machine for making artificial blocks, a mold-wall having a configuration to produce a rock-face finish on the block, a detachable piece or section for said wall, extending transversely of the wall, having a raised portion to form a surface different from that formed by the face of the mold-wall and having contiguous to the latter a portion similar in configuration to that of the wall, whereby an appearance resembling several panels may be produced.

44. In a machine for making artificial blocks, a mold-wall having a block-forming surface for the purpose of the production of a rock-face finish on the surface of the block, and a piece or section conforming to such surface and detachably connected to the wall, provided with a raised, smooth portion, and having contiguous to the latter a portion similar in configuration to that of the wall.

45. In a machine for making artificial blocks, a mold-wall having a dished or reëntrant face for producing the desired configuration of the block-surface, and a piece or section smaller in size than said face and having on its inner side a surface conforming to and fitting such reëntrant face and detachably connected to the wall, the configuration of the block-surface being produced in part by the reëntrant face of the mold-wall and said detachable piece or section.

46. In a machine for making artificial blocks, the combination of a mold-box having end walls and adjustable side walls, and a material guide or hopper having members supported by said end walls and adjustable toward and from each other to vary the size of the hopper.

In testimony that I claim the foregoing I have hereunto set my hand.

HARMON S. PALMER.

Witnesses:

CHAS. J. WILLIAMSON,

JOSEPHINE L. LAWLOR.