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CONCRETE BLOCK MACHINE

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FIG. 1.

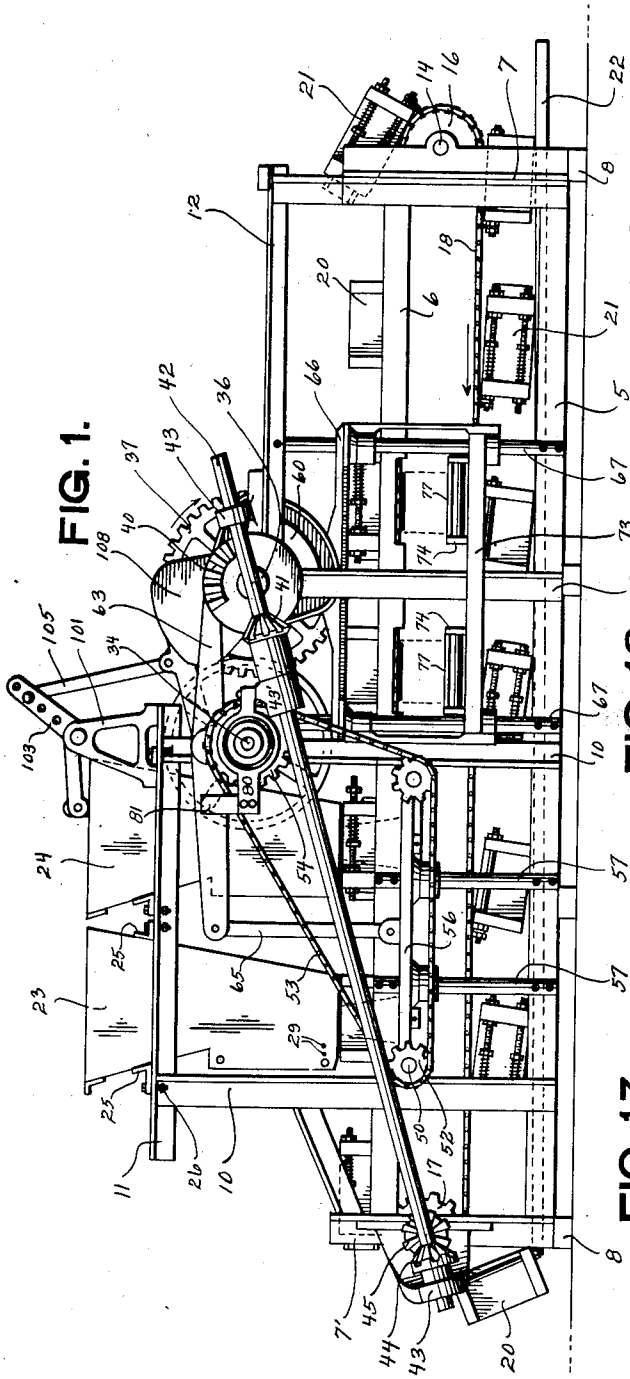


FIG. 19.

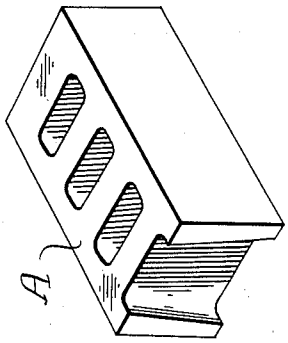



FIG. 18.

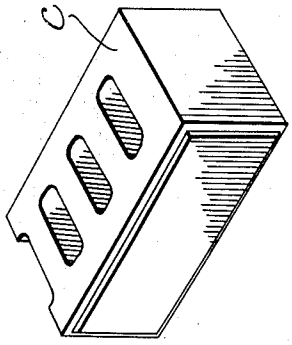
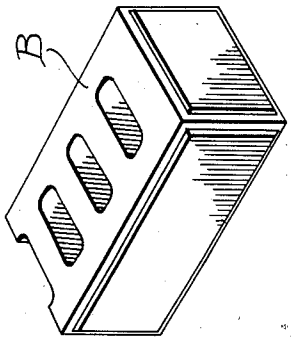



FIG. 17.




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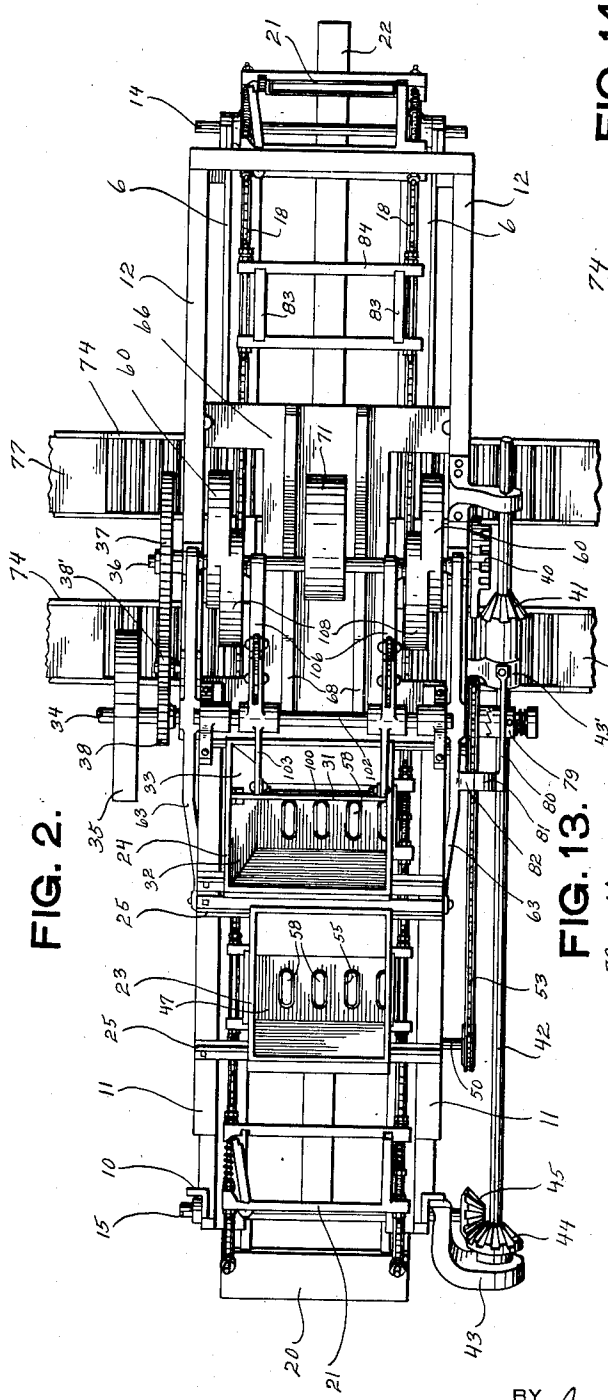


FIG. 2.

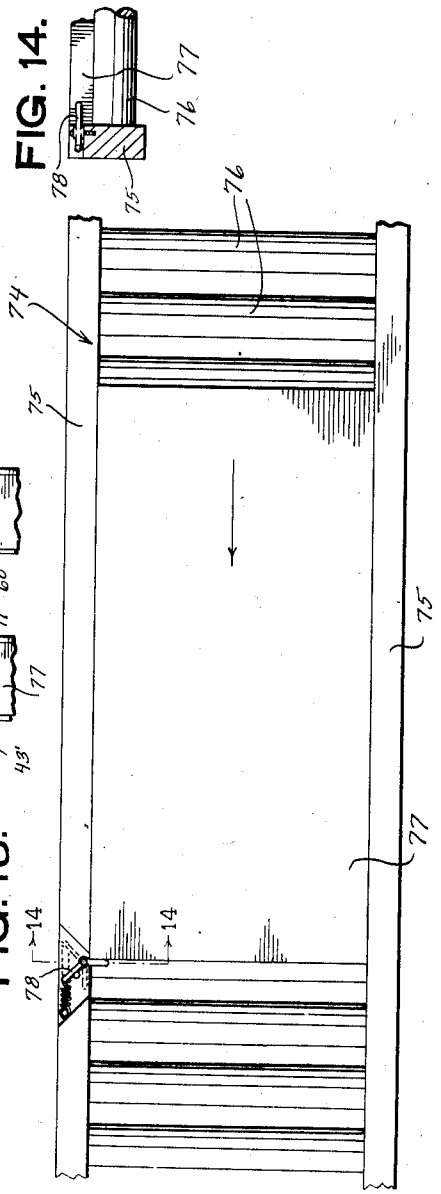


FIG. 13.



FIG. 14.

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FIG. 3.

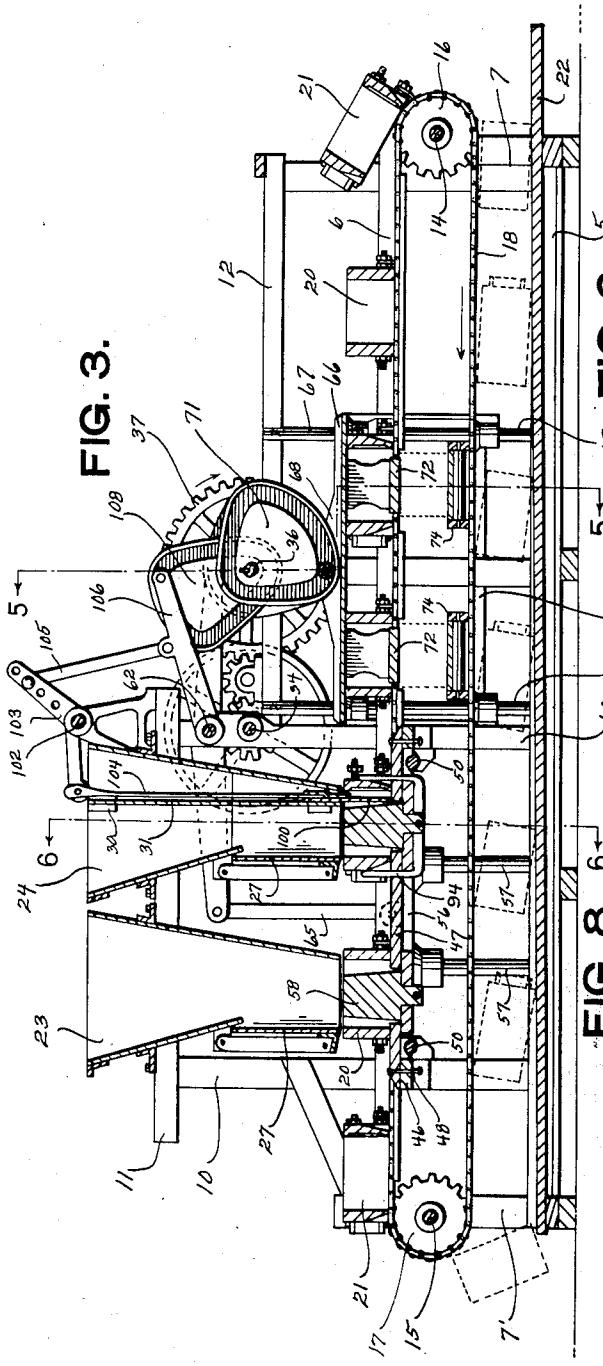


FIG. 9.

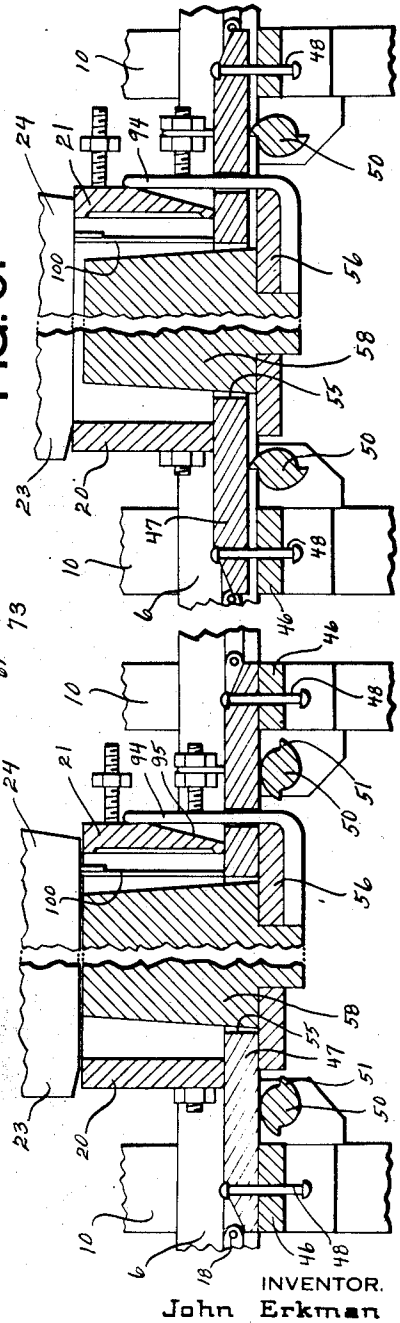


FIG. 8.

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FIG. 4.

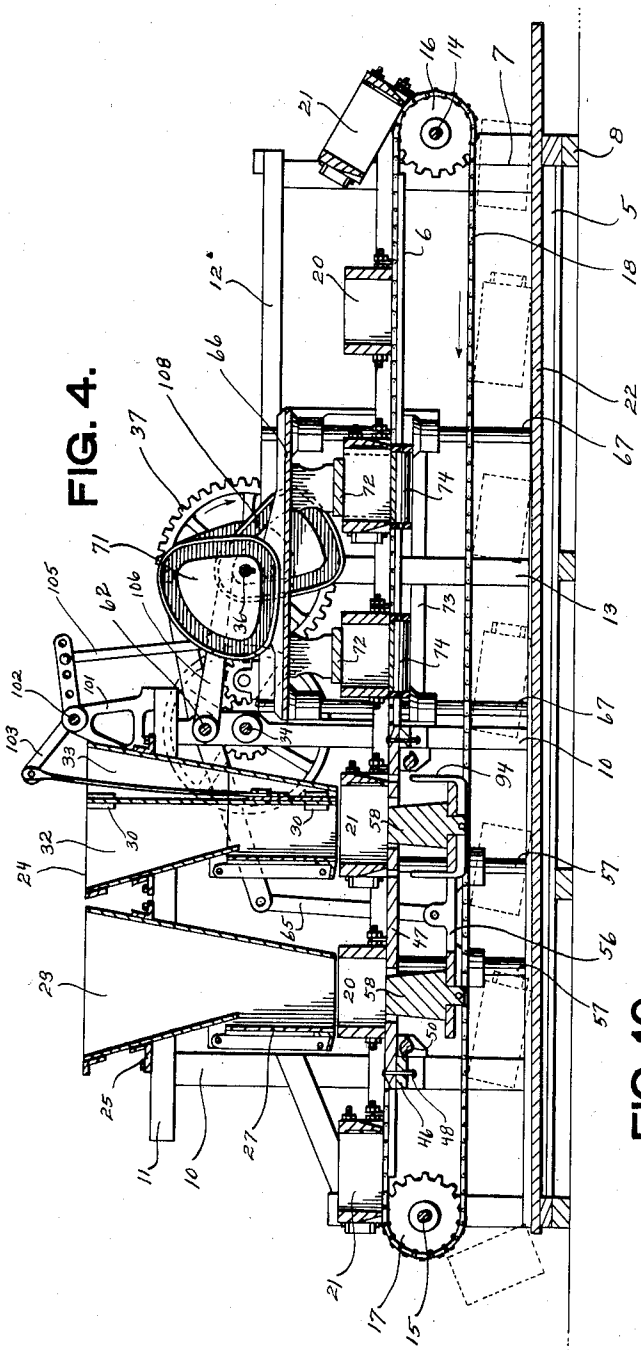


FIG. 12.

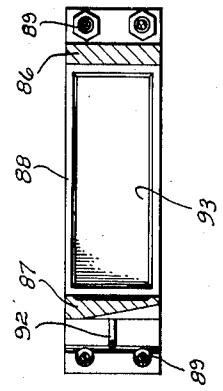


FIG. 11.

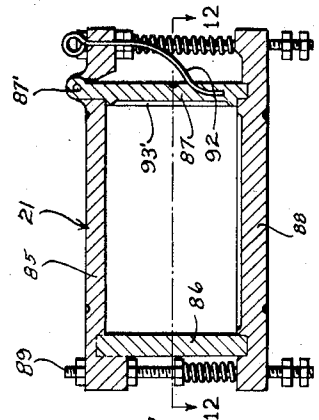
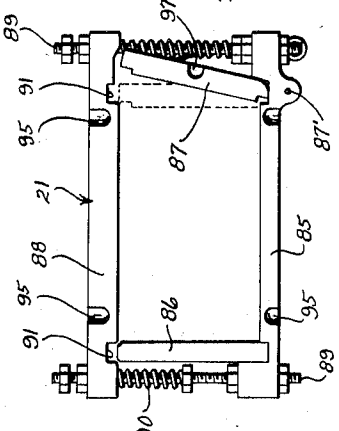


FIG. 10.



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FIG. 5.

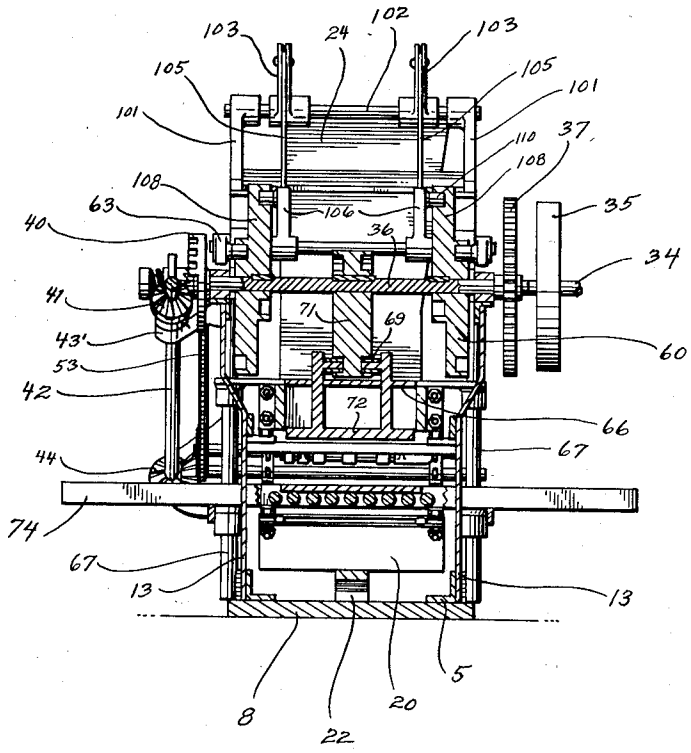



FIG. 15.

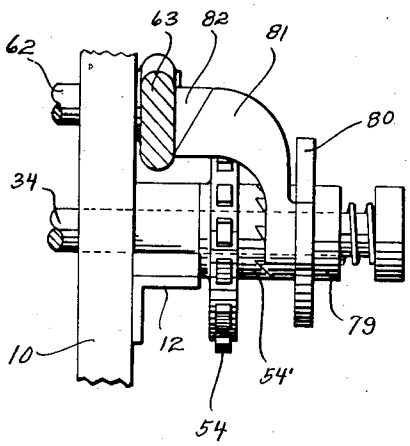
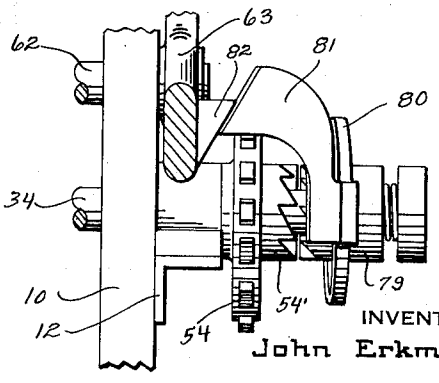



FIG. 16.




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FIG. 6.

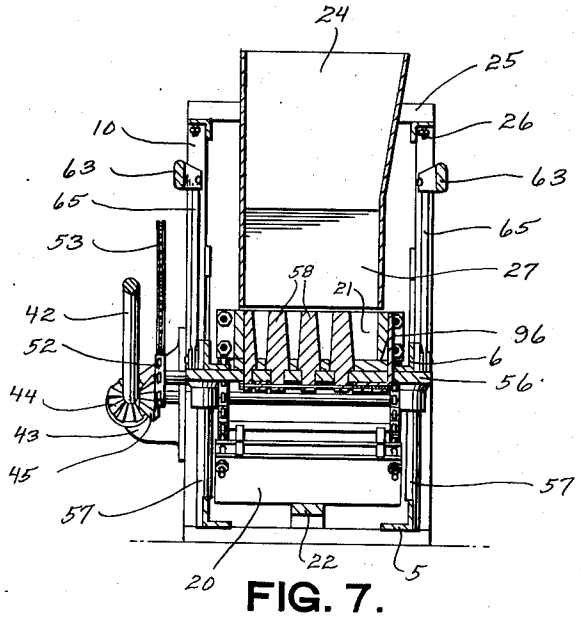
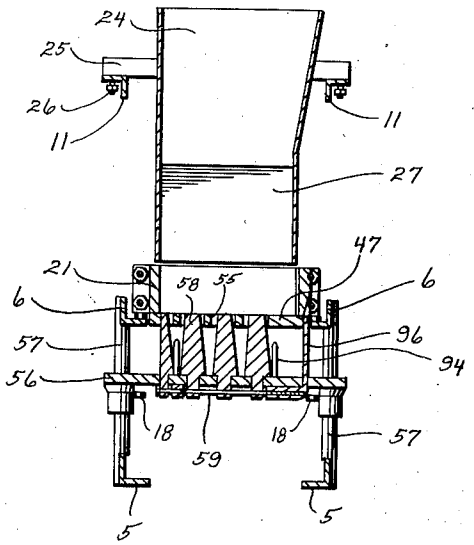



FIG. 7.




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FIG. 24.

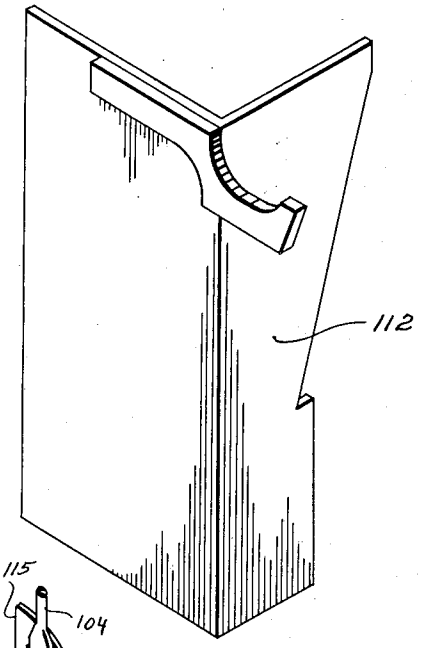
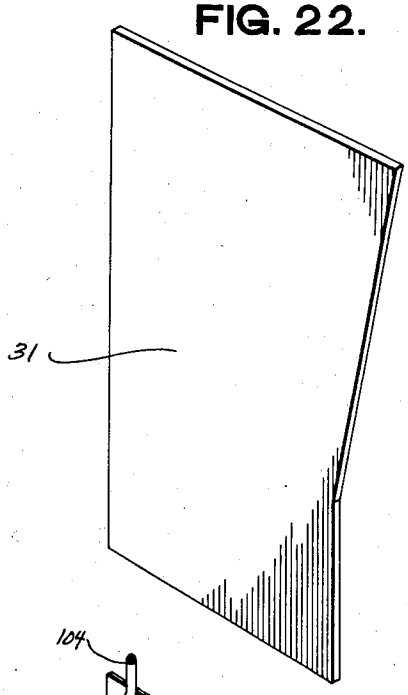



FIG. 22.



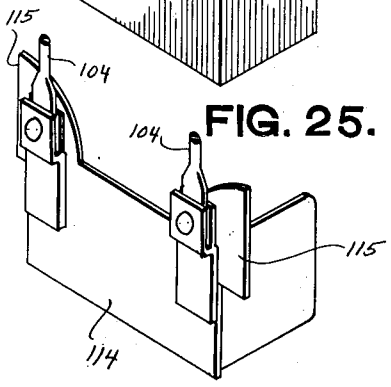




FIG. 25.

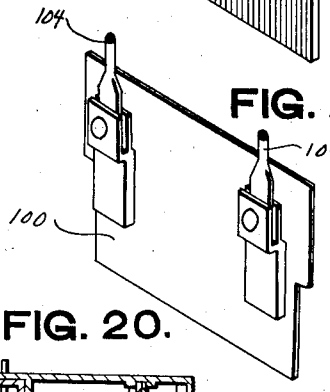



FIG. 23.

FIG. 20.

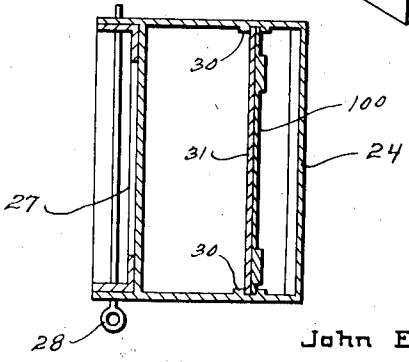
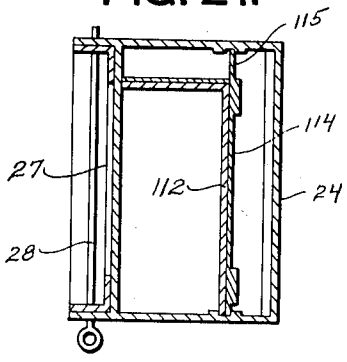



FIG. 21.




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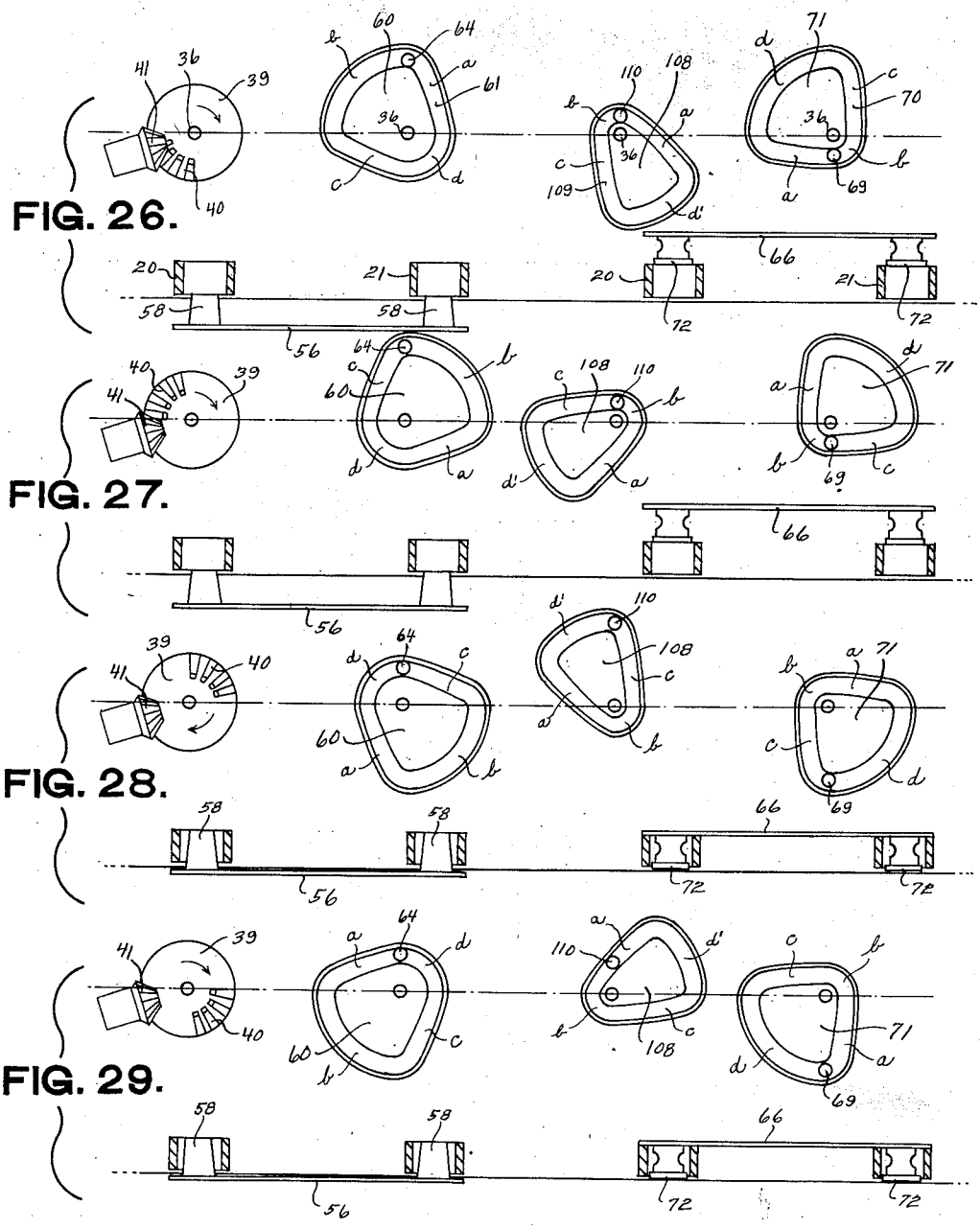



FIG. 26.

FIG. 27.

FIG. 28.

FIG. 29.

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# UNITED STATES PATENT OFFICE

1,982,730

## CONCRETE BLOCK MACHINE

John Erkman, Peru, Ind.

Application April 27, 1932, Serial No. 607,854

12 Claims. (Cl. 25—100)

The present invention relates to machines for the production of moulded masonry units such as building blocks, tile, partition slabs etc., and the primary object of the invention is to provide an automatic concrete block machine for making either hollow or solid blocks and wherein an endless series of moulds are automatically filled and the blocks automatically removed from the moulds in a continuous operation of the machine.

A further object of the invention is to provide a combination block machine wherein two types of blocks and of different sizes may be produced at one time.

A further object of the invention is to provide a concrete block machine wherein the filling and packing of the material in the moulds is accomplished by a jolting or jarring action and without any tamping of the material.

A further object of the invention is to provide an automatic concrete block making machine embodying improved means for the making of panelled face blocks over the present types of so-called "face down machines".

A still further object of the invention is to provide an automatic, combination concrete block making machine whereby concrete products of various sizes, shapes and configurations may be economically produced and without handling other than transferring of the green blocks for curing.

A still further object of the invention is to provide an automatic concrete block machine wherein the material receiving hoppers are subjected to a jolting action at timed intervals when the moulds are aligned with the hoppers.

Other objects and advantages of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification and in which drawings:—

Figure 1 is a view in side elevation of the machine, the parts being shown with the moulds in a filling position beneath the hoppers and the mould conveyor at rest to permit filling of the moulds and ejection of the green blocks from certain of the moulds.

Figure 2 is a top plan view of the showing in Figure 1.

Figure 3 is a longitudinal sectional view showing the parts in the position as in Figure 1.

Figure 4 is a longitudinal sectional view showing the cores lowered and the ejecting blocks raised to permit travel of the mould conveyor.

Figures 5 and 6 are vertical transverse sections substantially on the respective lines in Figure 3.

Figure 7 is a detail sectional view substantially similar to Figure 6 and showing the cores lowered.

Figures 8 and 9 are enlarged fragmentary sectional views taken longitudinally of the machine and showing the arrangement for imparting a jolting action to the moulds and hoppers while the moulds are in a receiving position below the hoppers.

Figure 10 is a bottom plan view of one of the panel face and corner block moulds, the mould being shown in its spread position.

Figure 11 is a sectional view thru the panel face and corner block mould shown in a closed position.

Figure 12 is a section on the line 12—12 of Figure 11.

Figure 13 is an enlarged fragmentary top plan view of one of the roller conveyors for receiving the green blocks from the moulds and showing the position of a pallet upon the conveyor.

Figure 14 is a fragmentary section on the line 14—14 of Figure 13.

Figures 15 and 16 are fragmentary detail views of the clutch arrangement for automatically controlling operation of the jolting means, Figure 15 showing the clutch engaged and Figure 16 showing the clutch disengaged.

Figure 17 is a perspective view of one form of concrete blocks formed by the machine, the block shown in Figure 17 being known as a panel face and corner block.

Figure 18 is a perspective view of a panel face block.

Figure 19 is a perspective view of a plain building block having one end squared and its opposite end cored out.

Figure 20 is a horizontal section thru the lower portion of a hopper partitioned to provide a panel face block as shown in Figure 18.

Figure 21 is a horizontal section thru a hopper partitioned to provide a panelled face and corner block as shown in Figure 17.

Figure 22 is a perspective view of a partition plate for making rock faced or panel faced blocks.

Figure 23 is a perspective view of the dividing gate or plate for use in moulding rock faced or panel faced blocks.

Figure 24 is a perspective view of the partition for making faced and corner blocks.

Figure 25 is a perspective view of the dividing gate for use with the partition shown in Figure 24.

Figures 26, 27, 28 and 29 are diagrammatic

views showing various positions of the cams for operating the core plate, ejector head and dividing gate and also the relation of the conveyor drive means at the various positions of the cams.

In the form of machine shown, the arrangement of hoppers and moulds is such as to produce in one complete cycle of operation of the machine, one panelled face block as shown in Figure 18 and one plain block as shown in Figure 19.

In the drawings and wherein similar reference characters designate corresponding parts thruout the several views, the machine comprises a main frame embodying a pair of parallel spaced apart lower rails 5 and a pair of parallel spaced part upper track rails 6 mounted at their front or forward ends upon front end standards 7 and at their rear ends upon rear end standards 7'. The lower rails 5 are connected by suitable cross ties 8 arranged at suitably spaced points along the rails. The track rails 6 are of angle shape and have their horizontal flanges extended inwardly to form a track way for the mould conveyor chains. Arranged adjacent the rear portion of the main frame is a hopper frame embodying four uprights 10 arranged two at each side of the main frame and extending above the track rails 6. These uprights 10 provide intermediate supports for the track rails 6 and the uprights at opposite sides of the track rails are connected at their upper ends by horizontal hopper supporting rails 11. The front end standards 7 project above the track rails 6 and form supports for the forward ends of mounting rails 12 having their rear ends supported by the foremost of the uprights 10. The horizontal mounting rails 12 are supported intermediate their ends by uprights 13.

Journaled at its ends in the front standard 7 is a conveyor shaft 14, while journaled in the rear standards 7' is a conveyor shaft 15. These conveyor shafts 14 and 15 are horizontally mounted at a location below the track rails 6 and slightly beyond the ends of the track rails. Mounted on the shaft 14 in alignment with the forward ends of the track rails 6, are idler sprockets 16, while mounted in fixed relation upon the shaft 15 in alignment with the rear ends of the track rails are drive sprockets 17 adapted for rotation by the shaft 15. Trained over companion pairs of the sprockets 16 and 17 are endless conveyor chains 18 the upper runs of which ride along the inturned flanges of the track rails 6. These conveyor chains 18 are adapted to travel in the direction of the arrows so that the upper horizontal run of the chains travel from the rear toward the front end of the machine. Hingedly connected along their leading edges to the conveyor chains 18 is a series of alternately spaced moulds 20 and 21 which will later be described in detail. These moulds 20 and 21 are spaced equi-distance apart thruout the length of the conveyor chains and are of an even number so as to act in pairs. The moulds when moving forwardly along the upper run of the conveyor chains have their ends resting upon the chains, while during the rearward movement of the moulds in an inverted position by the lower run of the conveyor chains, the moulds rest at one edge upon a longitudinal slide rail 22 supported in an inclined position longitudinally of the machine by the cross rails 8.

Supported between the rails 11 in spaced relation longitudinally of the machine is a pair of hoppers 23 and 24 for respective filling of the moulds 20 and 21 when aligned beneath the hoppers. In the example of the machine illustrated, the hopper 23 is intended to contain a mixture of coarse regular material for moulding of plain blocks, while the hopper 23 is intended to contain in the separate compartments thereof both coarse regular material and the facing material for moulding of a face block. The hoppers 23 and 24 are supported on the rails 11 by transverse rails 25 resting upon the rails 11 and connected thereto with a loose connection as by bolts 26 permitting limited vertical movement of the hoppers and restraining the hoppers against lateral movement. These material hoppers are of substantially like construction, each having a rectangular-shaped discharge opening at its lower end and are provided at the rear of their lower ends with a hinged door 27 which may be adjusted by means of the pin 28 and adjustment openings 29 for varying the width of the discharge opening in accordance with the size of moulds being used. Referring particularly to Figures 4 and 20, the hopper 24 is provided inwardly of its side walls with vertical guides 30 for receiving the edges of a partition plate 31 such as shown in Figure 22 whereby the hopper is divided into a compartment 32 for the coarse regular material for forming the body portion of the block and a compartment 33 for the facing material. The lower open ends of these hoppers 23 and 24 are in such relation to the upper edges of the moulds passing therebeneath as to be raised by the moulds during the jolting filling operation of the moulds in a manner to be subsequently described.

Journaled horizontally in the front uprights 10 of the hopper frame to extend transversely of the machine at an elevation above the forward travel of the moulds is a power shaft 34 preferably provided with a pulley wheel 35 for receiving power from any suitable source. Journaled in suitable bearings secured to the mounting rails 12 at the upper ends of the uprights 13 and extending parallel to the power shaft 34 is a cam shaft 36 provided at one end with a large gear 37 driven from a spur gear 38 fixed on the power shaft 34. An idler spur gear 38' is arranged between the gears 37 and 38 to reverse the direction of rotation of the cam shaft from that of the power shaft. Mounted upon one end of the cam shaft 36 is a sector gear 39 having a gear segment 40 formed on the outer face thereof for intermittently meshing with a bevel pinion 41 fixed upon a conveyor drive shaft 42. This shaft 42 inclines downwardly and rearwardly at the outer side of the machine frame, being journaled adjacent its ends in suitable bearings 43 and intermediate its ends in a bearing 43' which may be mounted upon the rear end portion of one of the mounting rails 12. The rear end of the shaft 42 carries a bevel pinion 44 which meshes with a bevel pinion 45 mounted on the conveyor shaft 15. Thus, continuous rotation of the power shaft 34 will, thru the gear segment 40 and bevel pinion 41, impart movement with a stop motion to the conveyor chains 18.

Supported beneath the hoppers 23 and 24 as at its front and rear ends upon cross bars 46 extended between transverse pairs of the uprights 10 is a jolting plate 47 upon which the moulds slidably rest when in a filling position beneath the hoppers. This jolting plate is arranged between the upper runs of the chains 18 and is loosely mounted at its ends in the cross bars 46 by suitable pins 48 permitting vertical movement

of the plate but restraining the plate against lateral movement. Journaled in the uprights 10 beneath each end portion of the jolting plate 47 are jolting shafts 50 provided with small cams 51 as shown more clearly in Figures 8 and 9. These rotatable shafts 50 thru the cams 51 act to vertically oscillate the jolting plate. Each shaft 50 is provided at one end with a sprocket 52 driven by a chain 53 trained over a clutch sprocket 54 rotatable upon one end of the power shaft 34.

The jolting plate 47 is provided with two transverse rows of core openings 55 which align one beneath each of the hoppers 23 and 24. Vertically movable beneath the jolting plate is a core plate 56 which is vertically slidable on suitable guides 57 extended from the base rails 5 to the track rails 6 between the uprights 10. The core plate 56 is provided with two transverse rows of preferably tapered cores 58 adapted to move upwardly thru the openings 55 in the jolting plate. These cores are readily removable to permit changing of the cores and may be held in position by a pin 59 as shown in Figure 7. When the core plate 56 is at its downward limit of movement the upper edges of the cores extend flush with the upper surface of the jolting plate 47.

Referring now to the operating means for imparting vertical movement to the core plate 56, the cam shaft 36 has fixed thereon a pair of core plate operating cams 60 provided at their outer or opposed faces with cam grooves 61. These cams 60 are arranged just inwardly of the mounting rails 12. Pivotally mounted intermediate their ends upon each of the forward uprights 10 as upon a rock shaft 62 is a rocker arm 63. Each rocker arm 63 is provided adjacent its forward end with a cam roller 64 for travel in the cam grooves 61. The rear ends of the rocker arms are connected by links 65 to the core plate 56. The cam grooves 61 are of such shape as to cause a stop motion or dwell of the core plate 56 at both its upward and downward limit of movement.

The filled moulds are moved in pairs from beneath the filling hoppers to an ejecting position forwardly of the jolting plate where the green blocks are automatically removed from the moulds. This ejecting means for the green blocks embodies an ejector head plate 66 vertically movable on guides 67 between the track rails 6 and mounting rails 12. The ejector head 66 is arranged directly below the cam shaft 36 and is provided at its upper side with webs 68 carrying rollers 69 for acting in the cam grooves 70 of a double faced cam 71 fixed to the center of the cam shaft 36. Rotation of the cam 71 acts to provide a stop motion or dwell of the ejector head at both its upward and downward limit of movement. Carried by the under side of the ejector head 66 is a pair of ejecting plates 72 adapted upon downward movement of the ejector head to remove the blocks from the moulds into position beneath the ejector head. Suspended from the ejector head at each side of the machine frame is a conveyor supporting rail 73 and these rails have vertical movement with the ejector head. The rails 73 form supports for a pair of roller conveyors 74 which extend transversely of the machine frame and have vertical movement between the upper and lower horizontal runs of the conveyor chains 18. These roller conveyors 74 are preferably formed with side rails 75 in which are journaled the ends of suitable rollers 76 which are arranged below the upper edges of the side rails. These transverse roller conveyors are adapted to receive suitable pallets 77 which receive the green blocks when ejected from the moulds. A yieldable stop 78 as shown in Figures 13 and 14 is preferably mounted in one of the conveyor side rails 75 for stopping the pallet at a position beneath the moulds. As will be noted in Figure 4, when the ejector head 66 is raised, the pallet 77 will be engaging the lower edges of the moulds to receive the green blocks when forced from the moulds by the ejecting plate. When the ejector head and roller conveyors are in a lowered position as in Figure 3, the pallets 77 containing the green blocks 80 move along the conveyors in the direction of the arrow in Figure 13 and other pallets moved into engagement with the yieldable stop 78 for receiving the next block ejected from the moulds.

Referring now to the means for intermittently imparting rotation to the jolting shaft 50, the sprocket 54 which is freely rotatable on the power shaft 34 is provided with a ratchet hub 54' for engagement by a clutch sleeve 79 slidably keyed to the outer end of the power shaft and normally spring urged toward the ratchet hub. Pivotally mounted at one end upon the bearing 43' for the conveyor drive shaft 42 is a yoke 80 having a swivel connection to the clutch sleeve 78. The opposite end of the yoke 80 is provided with an arm 81 having a beveled end as shown in Figures 15 and 16 to be engaged by a cam projection 82 carried by one of the rocker arms 63. With this arrangement, when the rear ends of the rocker arms are swung downwardly by the cams 60 the clutch sleeve 79 will be disengaged from the clutch hub 54' for stopping rotation of the jolting shafts 50 when the core plate 56 is lowered.

Referring now to the molds 20 and 21 which are alternately spaced upon the conveyor chains 18, the plain moulds 20 may be of rectangular-shape providing end walls 83 and side walls 84. The moulds 20 as before stated are for formation of the plain building block such as shown in Figure 19. The moulds 21 and which are shown in detail in Figures 10, 11 and 12 are of an expansible type for the formation of panelled blocks. The moulds 21 are constructed with a rear wall 85 having a fixed end wall 86 at one end and a pivoted end wall 87 at its oposite end. The front wall 88 is connected for parallel movement toward and from the rear wall 85 by means of coupling bolts 89 arranged two at each end of the walls beyond the end walls or plates 86 and 87. An expansion coil spring 90 encircles each coupling bolt 89 and acts to normally spread the walls 85 and 88. The wall 88 is provided at its inner side with locking grooves or channels 91 for receiving the ends of the walls 86 and 87 when the mould is contracted. A leaf spring 92 serves to swing the end wall 87 outwardly when released from its locking groove 91. The inner surface of the wall 85 is recessed as at 93, while the inner surface of the pivoted end wall 87 is recessed as at 93' and these recesses serve to provide panels on one face and one end of a block to provide a face and corner block as shown in Figure 17. When forming a panelled face block as in Figure 18, a plain pivoted end wall is substituted for the wall 87 by simply removing the hinge pin 87'. Thus, the plain moulds 20 are used for making a plain block as at A, Figure 19, while the expansible moulds 21 are used for making a paneled face and corner block as at B, Figure 17. Substitution of a plain end wall 87 in the expansible moulds 21 will permit making of panelled faced blocks as at C in Figure 18. The purpose of the expansible moulds

is of course to permit removal of the panelled blocks from the moulds by the ejector plate 72.

A locking device is provided for closing the moulds 21 when in a receiving position beneath the hopper 24 and this means comprises a pair of U-shaped members carried by the core plate 56 and providing upstanding fingers 94 having movement thru suitable apertures in the jolting plate 47. The walls 85 and 88 of the moulds 21 are provided with tapered recesses 95 which receive the fingers 94 for moving the walls 85 and 88 toward one another when the core plate is raised. An end wall closing finger 96 is also carried by the core plate to engage a tapered recess 97 provided in the outer side of the end plate 87, and this finger 96 is of greater length than the fingers 94 whereby the end plate 87 will be closed prior to closing of the walls 85 and 88 by the fingers 94.

Referring now to the arrangement whereby a facing material may be applied for making a face block, this means includes a vertically movable dividing gate or plate 100 having vertical movement in the lower guides 30 in the hopper 24. Supported upon the rear ends of the rails 11 as in brackets 101 is a shaft 102 for pivotal mounting of a pair of bell crank levers 103 having their rearwardly extending arms connected to the dividing plate 100 by the connecting rods 104. Adjustably connected with the forwardly extending arms of the bell crank levers are links 105 which have their lower ends pivotally connected to the intermediate portion of roller arms 106 pivoted at their rear ends upon the shaft 62. Fixed upon the cam shaft 36 is a pair of dividing plate operating cams 108 each provided with a cam groove 109 for receiving rollers 110 carried by the forward ends of the arms 106. These dividing plate cams 108 have their grooves so shaped as to provide intervals of stop movement to the dividing plate.

When the dividing plate 100 is lowered into one of the moulds 21 as in Figure 3, it serves to divide the facing material from the coarse material during filling of the moulds.

Referring particularly to Figures 21, 24 and 25, when a face and corner block such as at B is to be made, the flat partition plate 31 is removed and the right angular-shaped partition 112 placed in the hopper 24. The partition 112 will allow for the facing material to be extended about two sides of the moulds. An angle-shaped dividing gate 114 is also substituted for the dividing plate 100 and this gate 114 is raised and lowered into the moulds by the connecting rods 104. The gate 114 is provided with the fins 115 for sliding in the lower guides 30 of the hopper. Thus the machine may be easily converted for making either face blocks having the facing material only on one side thereof or making face and corner blocks having the facing material on two sides of the block.

In operation of the machine as a combination machine for producing in one continuous cycle of operation, one plain building block as at A in Figure 19, and one panelled face block as at C in Figure 18, the parts at the start of the cycle of operation will be in a position as shown in Figure 4. In this position, the cores 58 are lowered out of the moulds, the ejector head 66 raised out of the moulds and the dividing plate 100 withdrawn from the mould 21 which is aligning beneath the hopper 24. The cams 60, 108 and 71, and the sector gear 39 will be in a position as diagrammatically shown in Figure 26. The mould 21 aligning beneath the hopper 24 is in an expanded position. With a continuous drive imparted to the power shaft 34 by the pulley wheel 35, the cam shaft 36 will be rotating in the direction of the arrow, and considering Figures 1, 3 and 4, will be rotating in a clockwise direction. Considering Figure 26, with the cam shaft 36 rotating in the direction of the arrow, it will be seen that the rollers 64, 110 and 69 are at the limit of the throw portions "*a*" of their respective cams with the core plate 56 at its limit of downward movement and the ejector head 66 and dividing plate 100 at their upward limit of movement. The gear segment 40 has just engaged a bevel pinion 41 and as the cam shaft rotates thru a one-quarter turn, the conveyor chains 18 will be driven to an extent whereby the moulds aligning beneath the hoppers 23 and 24 will be moved forwardly to a position aligning beneath the ejecting plates 72 of the ejector head 66. The gear segment 40 extends for only one-quarter of the circumference of the gear 39 and during forward travel of the upper run of moulds, by a one-quarter turn of the cam shaft 36, no movement will be imparted to either the core plate 56, ejector head 66 and dividing plate 100 because of the cam rollers 64, 110 and 69 moving in the dwells "*b*" of their respective cams. Thus, the core plate, ejector head and dividing plate are held retracted from the moulds for a period of time permitting the filled moulds to move from beneath the filling hoppers to an ejecting position beneath the ejector head. Figure 27 shows the position of the cams and the gear segments at the limit of forward movement of the moulds from a filling to a discharging position. Figure 28 shows the position of the cams when the machine is in a condition for filling the moulds beneath the hoppers and ejecting the formed blocks by the ejector head 66.

At the next one-quarter revolution of the cam shaft 36 from the position in Figure 27 to the position in Figure 28, the cam rollers are moved along the throw portions "*c*" of their respective cams for imparting upward movement to the core plate and downward movement to the ejector head and the dividing plate. It will be noted that the throw portions "*c*" of the cams are equal, that is, impart the limit of throw movement to their respective cam rollers upon one-quarter revolution of the cam shaft 36. Thus, the core plate 56 is raised into the moulds at the same time that the dividing plate 100 is lowered into the mould 21 for making the faced block. At the upward limit of movement of the core plate the mould 21 is closed by the fingers 94 and 96, and just prior to the upward limit of movement of the core plate, the cam projection 82 permits engagement of the clutch sleeve 79 with the ratchet hub 54'. Engagement of the clutch sleeve 79 with the ratchet hub 54' imparts rotation to the jolting shafts 50 thru the chain 53 and causes a vertical oscillation of the jolting plate 47. The moulds resting upon the jolting plate 47 engage the bottoms of the hoppers 23 and 24 whereby the hoppers are vertically oscillated and the material caused to fall and pack in the moulds by a jarring action. This jarring action of the moulds and hoppers is continued thruout the dwell "*d*" of the core plate cam 60 and during which time the core plate is held in a raised position with the cores 58 projecting into the moulds.

The dwell "*d'*" of the cam 108 is less than the dwell "*d*" of the cam 60 and by observing Figure 29, it will be seen that the cam roller 110 has

moved along the throw portion "a" to a position adjacent the dwell "b." This formation of the cam 108 will cause the dividing plate 100 to begin raising from the moulds shortly after being fully lowered into the moulds so that the coarse material from the hopper compartment 32 will be bonded with the facing material from the compartment 33 by the jolting action. The dividing plate is fully withdrawn from the moulds by its cam 108 prior to completion of the jolting action and remains in a raised position thruout the dwell "b" of the cam 108. Just after the start of lowering movement of the core plate by the cam 60, the cam projection 82 on the rocker arm 63 engages the yoke arm 81 to disengage the clutch sleeve 79 and stop rotation of the jolting shaft 50. Thus the jolting action ceases during retraction of the cores from the moulds and prevents cracking of the formed blocks by any jolting action. Lowering of the core plate also retracts the fingers 94 and 96 and permits opening of the moulds 21. As the cam rollers 64 and 69 are moved along the throw portions "a" of their respective cams, the core plate will be lowered and the ejector head raised.

After a one-quarter rotation of the cam shaft 36 from the position in Figure 29, the cam, core plate, ejector head and dividing plate will be returned to the position as in Figures 4 and 26 and permit movement of the filled moulds from beneath the hoppers to a position beneath the ejector head. Thus it will be seen that the movement of the core plate 56, ejector head 66 and dividing plate 100 by their respective cams 60, 71 and 108 is such that the cores 58 remain in the moulds thruout substantially the entire time of the jolting action for filling the moulds, while the dividing plate 100 is raised in advance of retracting the cores so that bonding of the coarse and facing material is produced by the jolting action.

When the moulds are filled and the cores and dividing plate retracted, the bottoms of the hoppers serve to smooth off the material at the top of the moulds as the moulds are moved from beneath the hoppers to a position beneath the ejector head 66. The consistency of the material within the hoppers 23 and 24 and the tapered walls of the hoppers prevent the material from dropping from the hoppers when the moulds are removed. The material will also adhere to the walls 85 and 86 of the expansible moulds 21 when the moulds are opened and prevents the block from falling from the moulds.

When desiring to make only plain blocks, additional moulds 20 may be attached to the conveyor chains in place of the moulds 21. This also requires removal of the partition plate 31 together with the dividing plate 100 and its connecting rod 104 from the hopper 24.

From the foregoing it will be seen that a combination concrete block machine has been disclosed whereby two different types of blocks may be produced at the same time with one of the blocks being a faced block. It will also be observed that a machine of this character has been disclosed wherein the moulds are filled and the material packed therein by a jolting action and which jolting action is also applied to the material hoppers for causing feeding of the material from the hoppers into the moulds.

Changes in detail may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In a concrete block machine, an endless carrier, moulds mounted in spaced relation on the carrier, a hopper supported above a run of the moulds and having limited free vertical movement, means for successively aligning the moulds beneath the hopper, a jarring plate for supporting a mould when aligning beneath the hopper, and means for vertically reciprocating the jarring plate and causing the mould being filled to strike the hopper for jarring the hopper during filling of the moulds.

2. In a concrete block machine, an endless conveyor, moulds mounted in spaced relation along the conveyor, a jolting plate over which the moulds are slidably movable, a hopper mounted above the jolting plate and having limited vertical movement, and means for vibrating the jolting plate whereby said moulds when on the jolting plate engage the hopper to cause vibration of the hopper during filling of the moulds.

3. In a concrete block machine, endless carrier chains, a series of moulds mounted in spaced relation along the chains, means for moving the moulds with a stop motion, a jarring plate over which the moulds having sliding movement, a hopper supported above the jarring plate and beneath which the moulds are stopped, cores movable upwardly thru the jolting plate into the mould being filled, means for moving the cores, means for jarring the hoppers for filling the moulds, means for automatically stopping the jarring action prior to lowering of the cores from the moulds, and means for ejecting the blocks from the filled moulds, said ejecting means being out of engagement with the moulds at the time the cores are retracted to permit travel of the moulds by the carrier chains.

4. In a concrete block machine, an endless carrier, a plurality of moulds mounted on the carrier, means for imparting a stop motion to the carrier, a hopper mounted above one end of the carrier for filling the moulds when stopped therebeneath, means for jarring the hopper and the mould being filled, a core plate having cores movable upwardly into the mould being filled, means automatically stopping jarring of the mould and hopper upon lowering of the cores from the mould, a vertically movable ejector head arranged above the upper run of moulds and having ejector plates for forcing the blocks from the moulds, and a carrier for receiving the blocks from the mould and vertically movable with the ejector head.

5. In a concrete block machine, an endless carrier embodying spaced carrier chains having upper and lower horizontal runs, a plurality of moulds connecting the chains, means for imparting travel to the chains with a stop motion, a hopper beneath which the upper run of moulds are successively stopped, a jolting plate for supporting the moulds when aligning beneath the hopper, a core plate having cores vertically movable upwardly thru the jolting plate into the core being filled, means for imparting a jarring action to the jolting plate for a period of time while the cores are in the moulds, said jarring action being transmitted to the hopper by the mould being filled, an ejector head vertically movable above the upper run of moulds, an ejector plate carried by the ejector head for ejecting the block from the mould upon lowering the ejector head, operating means for the ejector head, and a roller conveyor extended transversely of the carrier chains between the upper and lower runs thereof and vertically movable with the

ejector head for receiving the blocks ejected from the moulds.

6. In a concrete block moulding machine, an endless carrier, a series of moulds mounted in spaced relation on the carrier, a hopper for filling the moulds, means for stopping the moulds beneath the hopper, cores vertically movable upwardly beneath the hopper and into the mould being filled, means for filling the mould by a jarring action when the cores are in the mould, means for ejecting the blocks from the moulds, a roller conveyor vertically movable with the ejecting means, pallets movable on the roller conveyor for receiving the blocks when ejected from the moulds, and a yieldable stop for positioning the pallets beneath the moulds in a position to receive the blocks.

7. In a concrete block machine, an endless carrier, a plurality of moulds arranged in spaced relation along the carrier, a horizontally supported plate forming a support for a mould when at a filling position, a hopper for filling the moulds, said hopper and said plate having limited vertical movement, jolting shafts mounted beneath the plate for causing raising and dropping of the plate to produce a jarring action, said jarring action being transmitted thru the mould being filled to the hopper, and means for rotating the jolting shafts to cause filling of the moulds.

8. In a concrete block machine, an endless carrier, a plurality of moulds mounted along the carrier, a jarring plate mounted beneath a portion of the upper run of moulds, over which the moulds are slidable, material hoppers mounted above the jolting plate longitudinally of the carrier, said hoppers having limited vertical movement, cores vertically movable upwardly thru the jolting plate into the moulds aligning beneath the hoppers, means for jarring the jolting plate to provide a jarring action to the moulds and hoppers while the cores are raised in the moulds, an ejector head provided with ejecting plates for removing the blocks from the moulds, and conveyor means vertically movable with the ejector head for receiving the blocks when removed from the moulds.

9. In a block moulding machine, a conveyor embodying endless carrier chains having upper and lower horizontal runs, a plurality of moulds mounted in spaced relation along the chains, hoppers mounted above the rear portion of the conveyor and beneath which the upper run of moulds is movable, means for operating the conveyor with a stop motion for stopping the moulds beneath the hoppers, cores vertically movable upwardly into the moulds aligning beneath the hoppers, raising and lowering means for the cores, means for filling the moulds by a jarring action while the cores are raised in the moulds, a vertically movable ejector head arranged forwardly of the hoppers for ejecting the blocks from the filled moulds, and roller conveyors vertically movable with the ejector head between the upper and lower runs of the conveyor chains for receiving the blocks ejected from the moulds.

10. In a combination block moulding machine, a conveyor embodying endless carrier chains having horizontal upper and lower runs, a series of alternately spaced expansible and solid moulds mounted on the carrier chains, front and rear hoppers supported above the upper run of the moulds, means for moving the conveyor with a stop motion for aligning the solid moulds below the rear hopper and the expensible moulds below the front hopper, a jolting plate supporting the moulds when aligning beneath the hoppers, a vertically movable core plate, series of cores carried by the core plate and movable upwardly thru openings in the jolting plate into the moulds, locking means carried by the core plate for closing the expansible moulds when being filled, jarring means for the jolting plate, the jarring action being transmitted to the hoppers by the moulds, a partition in the front hopper and providing separate compartments, a dividing plate guided at one face of the partition for lowering movement into the expansible moulds, means for lowering the dividing plate into the moulds as the cores are moved upwardly into the moulds, means automatically controlling jarring of the jolting plate whereby the jarring action continues thruout withdrawal of the dividing plate from the moulds and is stopped prior to withdrawal of the cores from the moulds, and means for simultaneously ejecting the blocks from the moulds when moved by the carrier chains to a position from beneath the hoppers.

11. In a combination block making machine, endless carrier chains having upper and lower horizontal runs, a series of alternately arranged solid and expansible moulds carried by the chains, a pair of front and rear hoppers for filling the moulds, stop motion drive means for the carrier chains for stopping the solid moulds beneath the rear hopper and the expansible moulds beneath the front hopper, cores movable upwardly into the moulds, fingers movable with the cores for closing the expansible mould, means for jarring the moulds and hoppers, a partition in the front hopper providing separate material compartments, a dividing plate for separating the materials in the expansible moulds and retractable from the moulds during the jarring action, and means for ejecting the blocks from the moulds, said expansible moulds automatically opening upon lowering of the cores.

12. In a combination block moulding machine, an endless carrier, solid and expansible moulds alternately arranged thruout the length of the carrier, jarring means for the moulds and hoppers, cores movable upwardly into the moulds aligning beneath the hoppers, a partition plate in the hopper for the expansible mould, a dividing plate movable into the moulds and slidably mounted at one face of said partition, means for imparting movement with a stop motion to the endless carrier, closing means for the expansible moulds when in a filling position, means for ejecting the blocks from the moulds, receiving means for the ejected blocks, cam controlled actuating means for operating the cores, dividing plate and ejector for retaining the same clear of the moulds during movement, and means controlled by the core actuating means to control the jarring means to stop the jarring action prior to withdrawal of the cores.

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