June 17, 1930. C. M. EBERLING 1,765,064

BUILDING BLOCK MACHINE

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Fig. 2

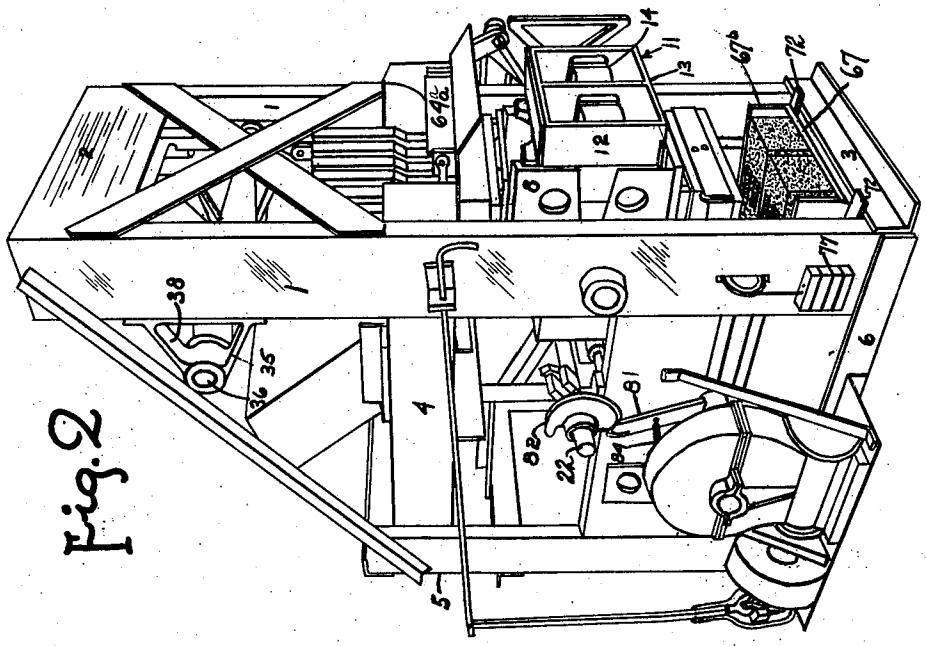
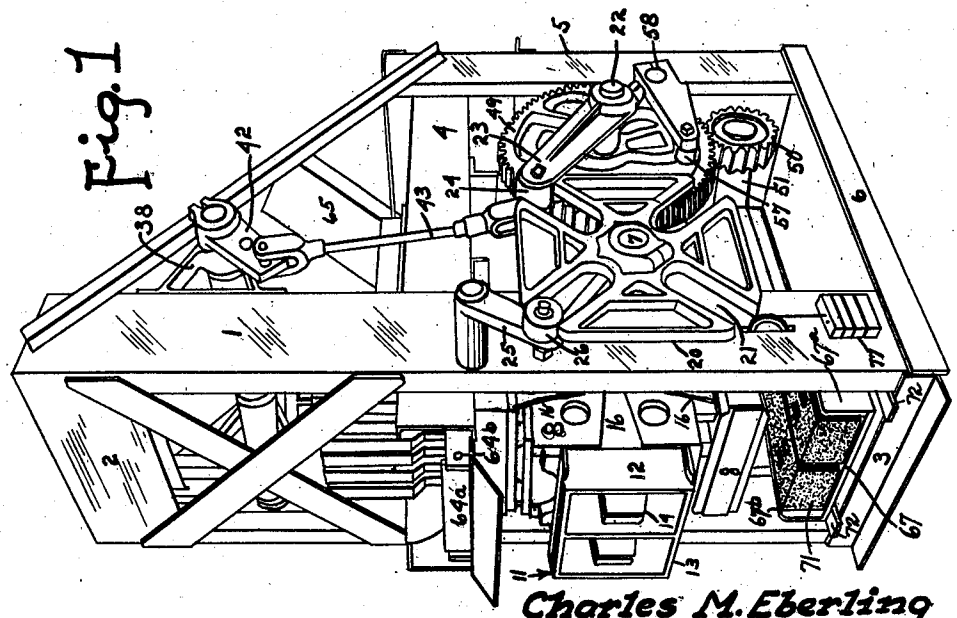


Fig. 1



Charles M. Eberling
Inventor

by Smith and Freeman
Attorneys

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BUILDING BLOCK MACHINE

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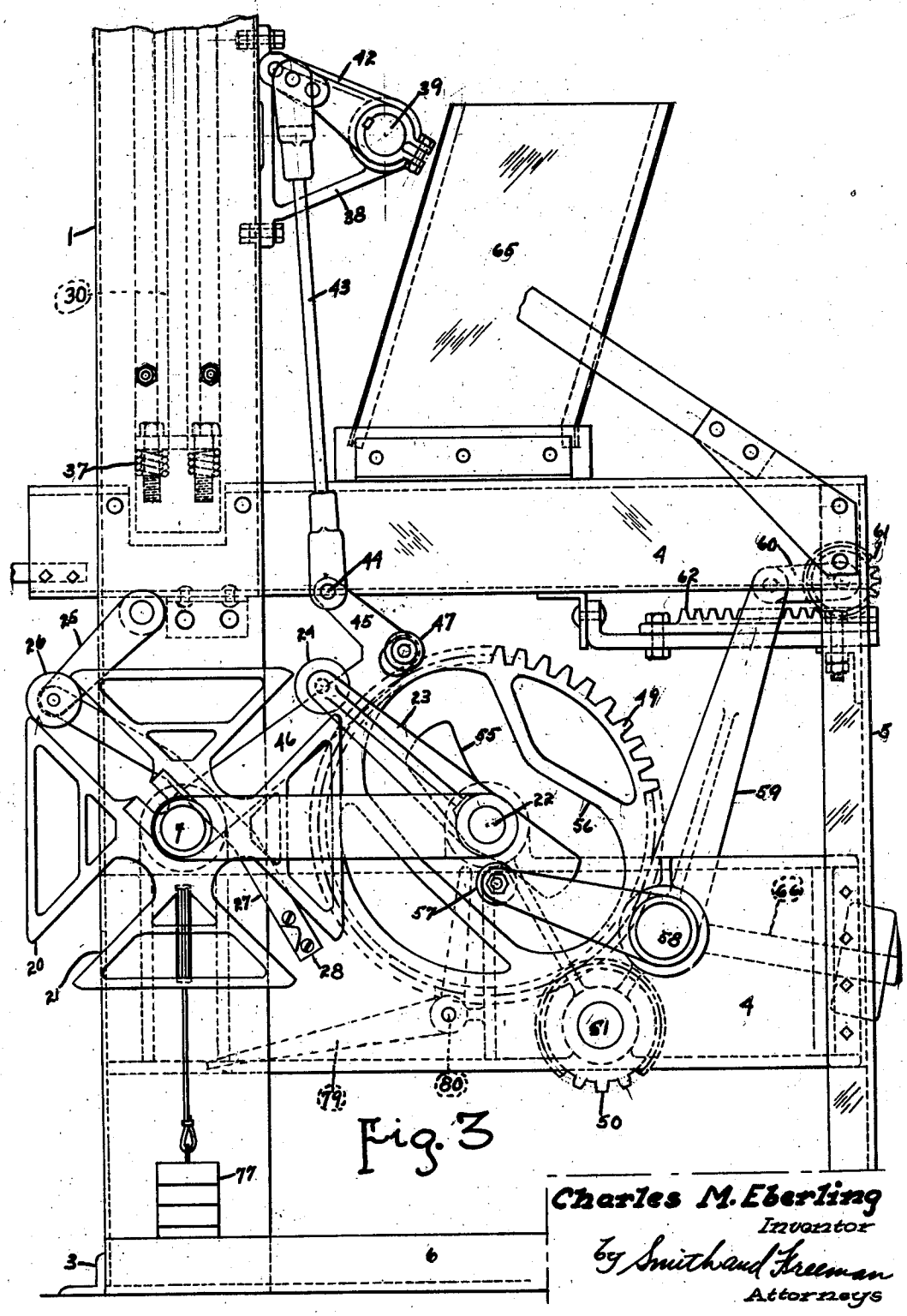


Fig. 3

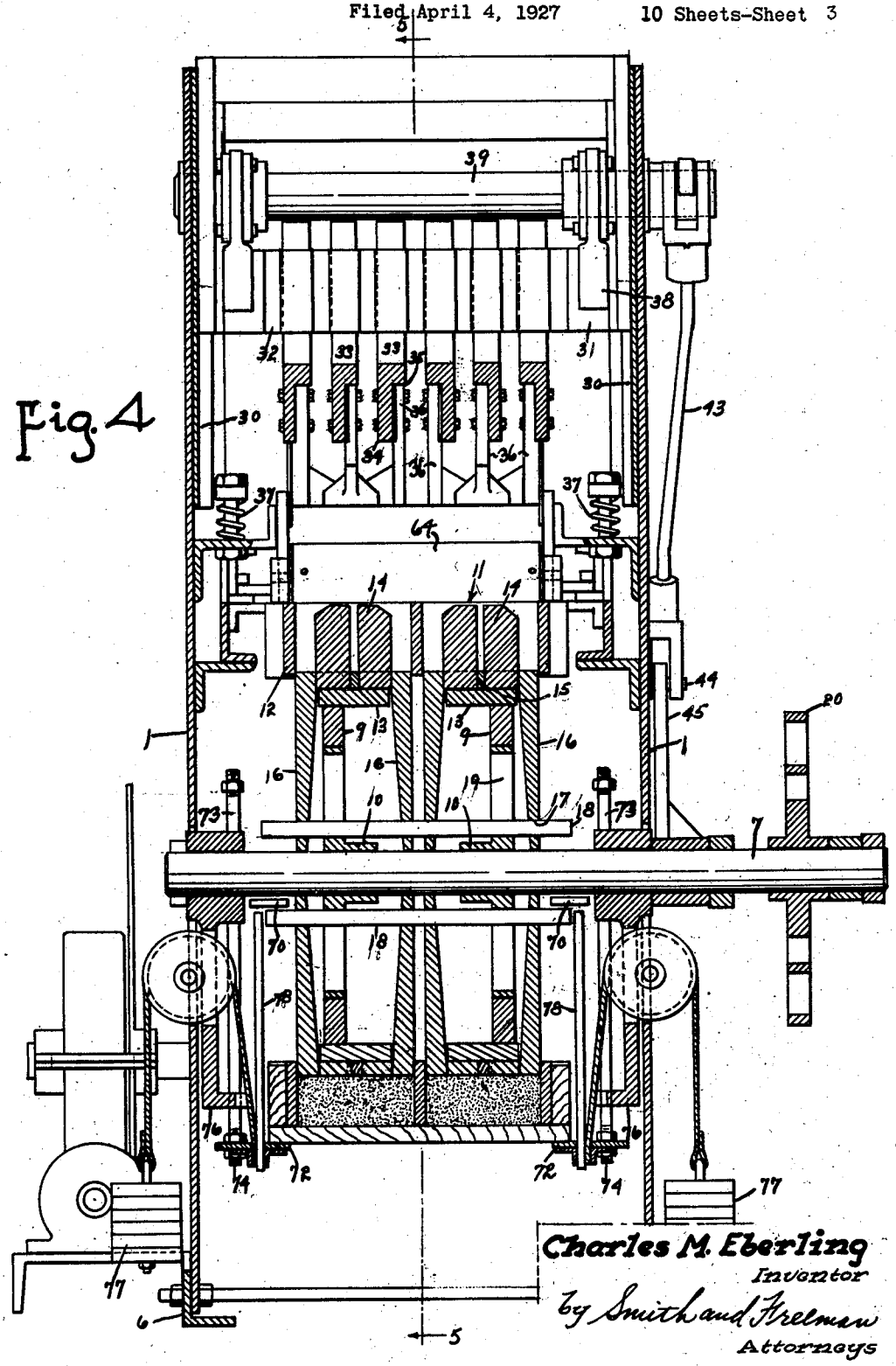
Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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BUILDING BLOCK MACHINE

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Fig. 4



Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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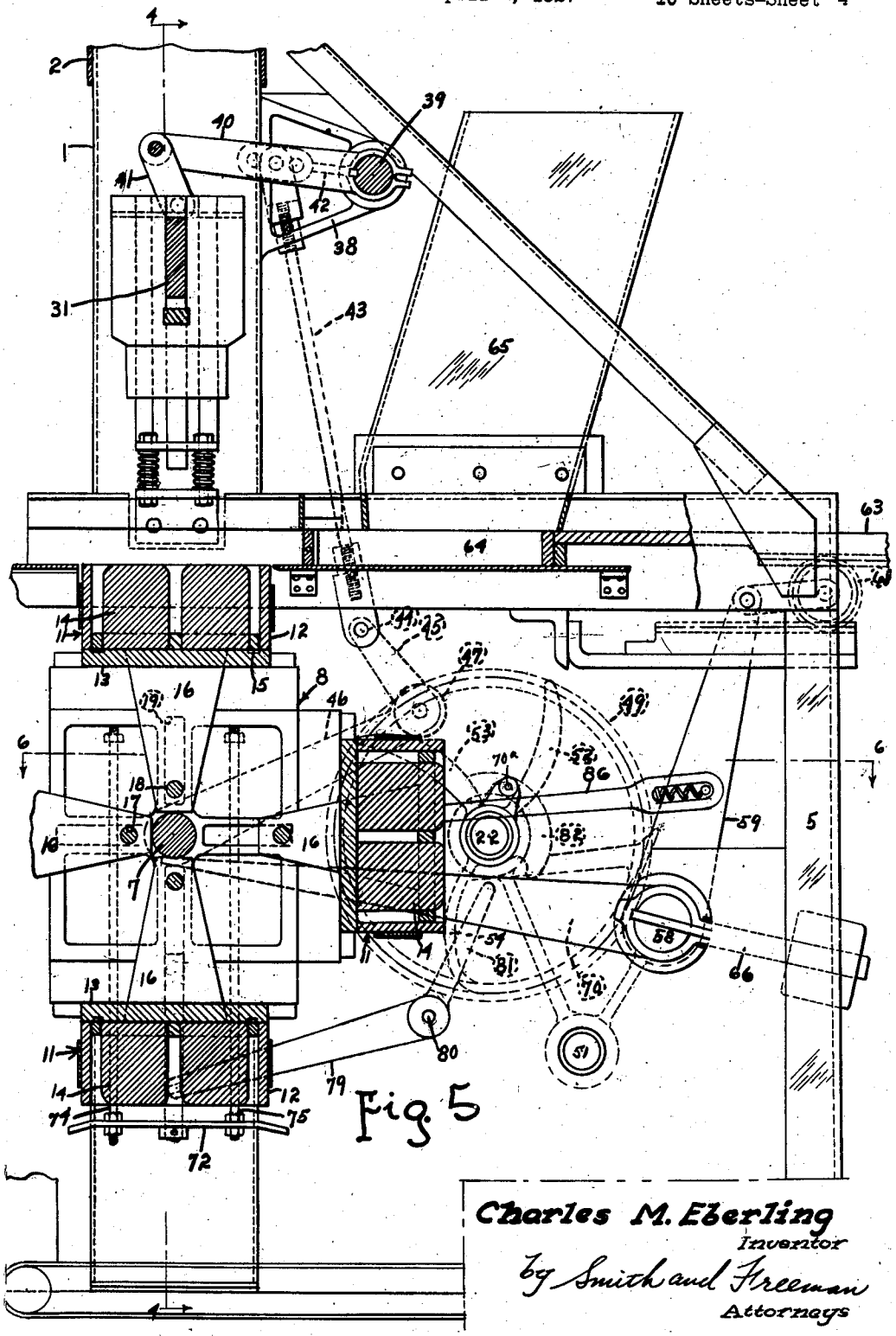


Fig 5

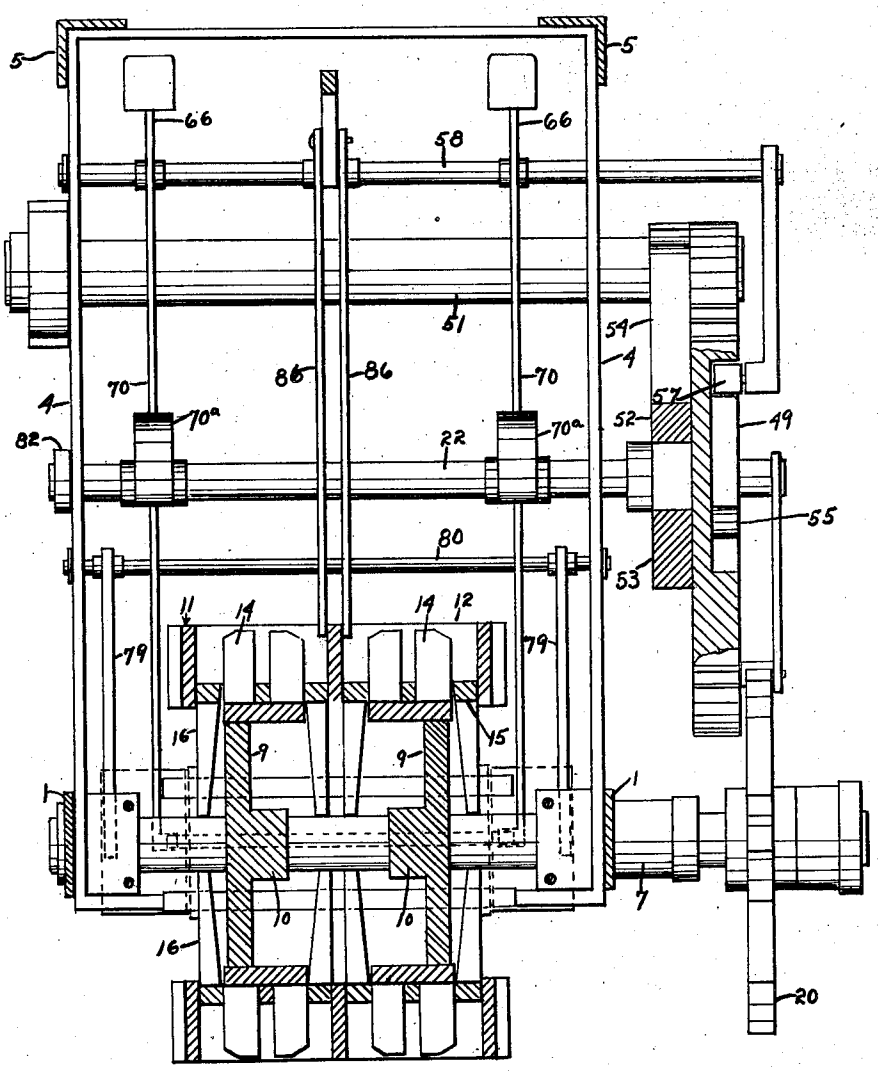
Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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Fig. 6



Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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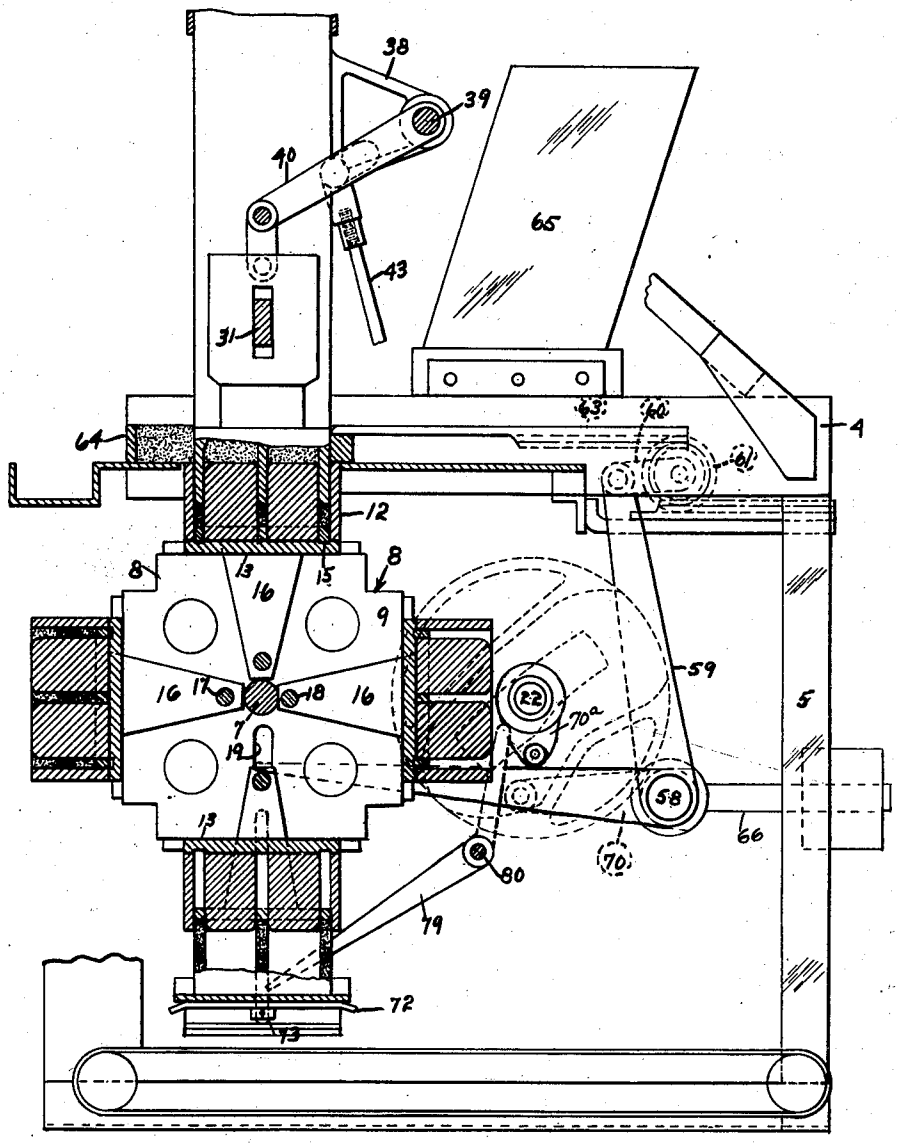


Fig. 7

Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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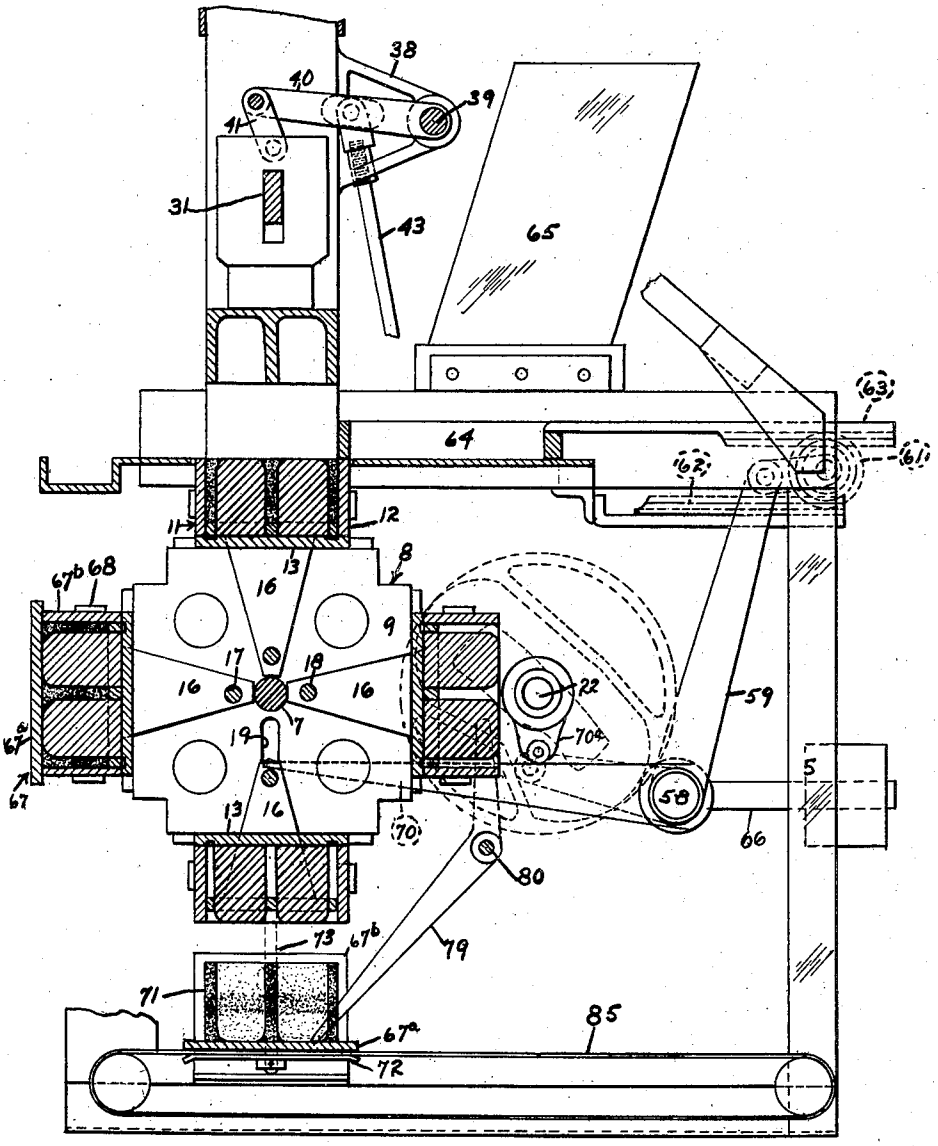


Fig. 8.

Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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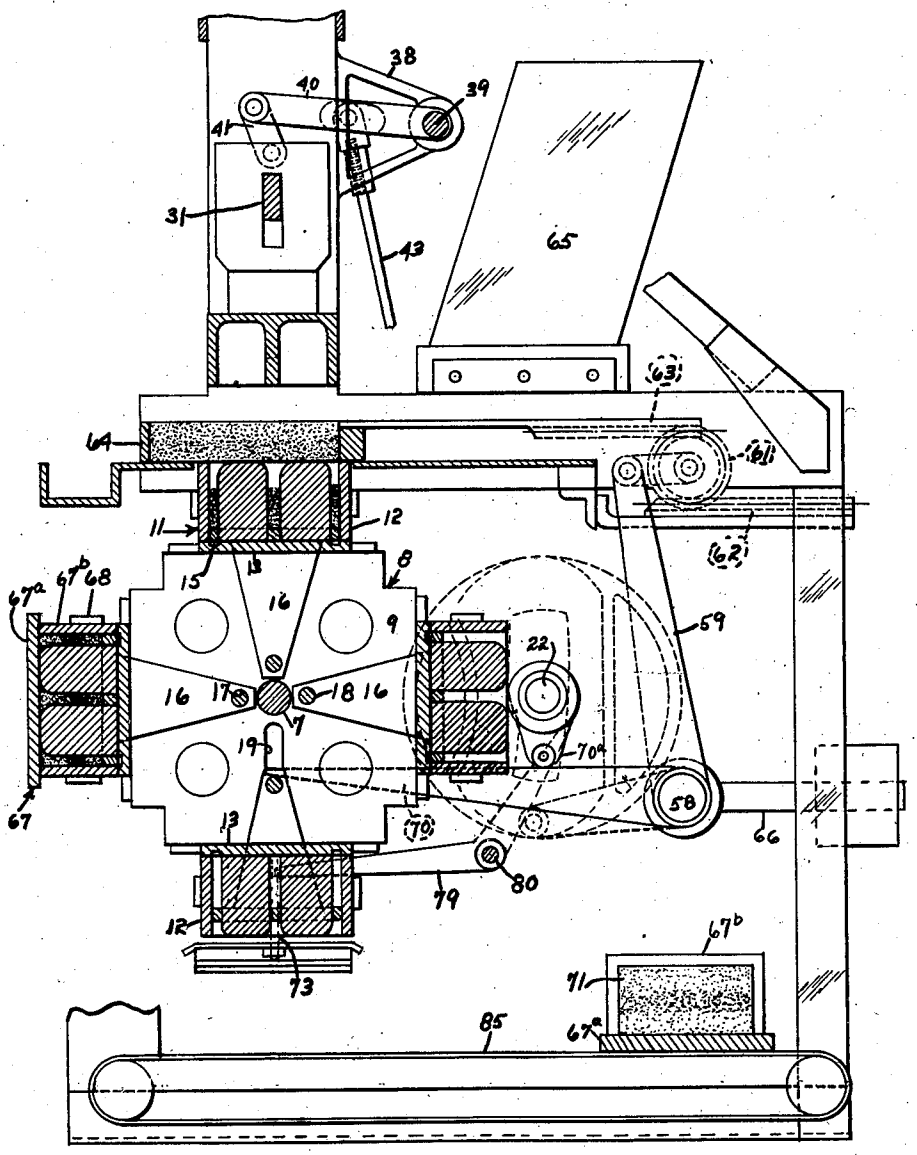


Fig. 9

Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

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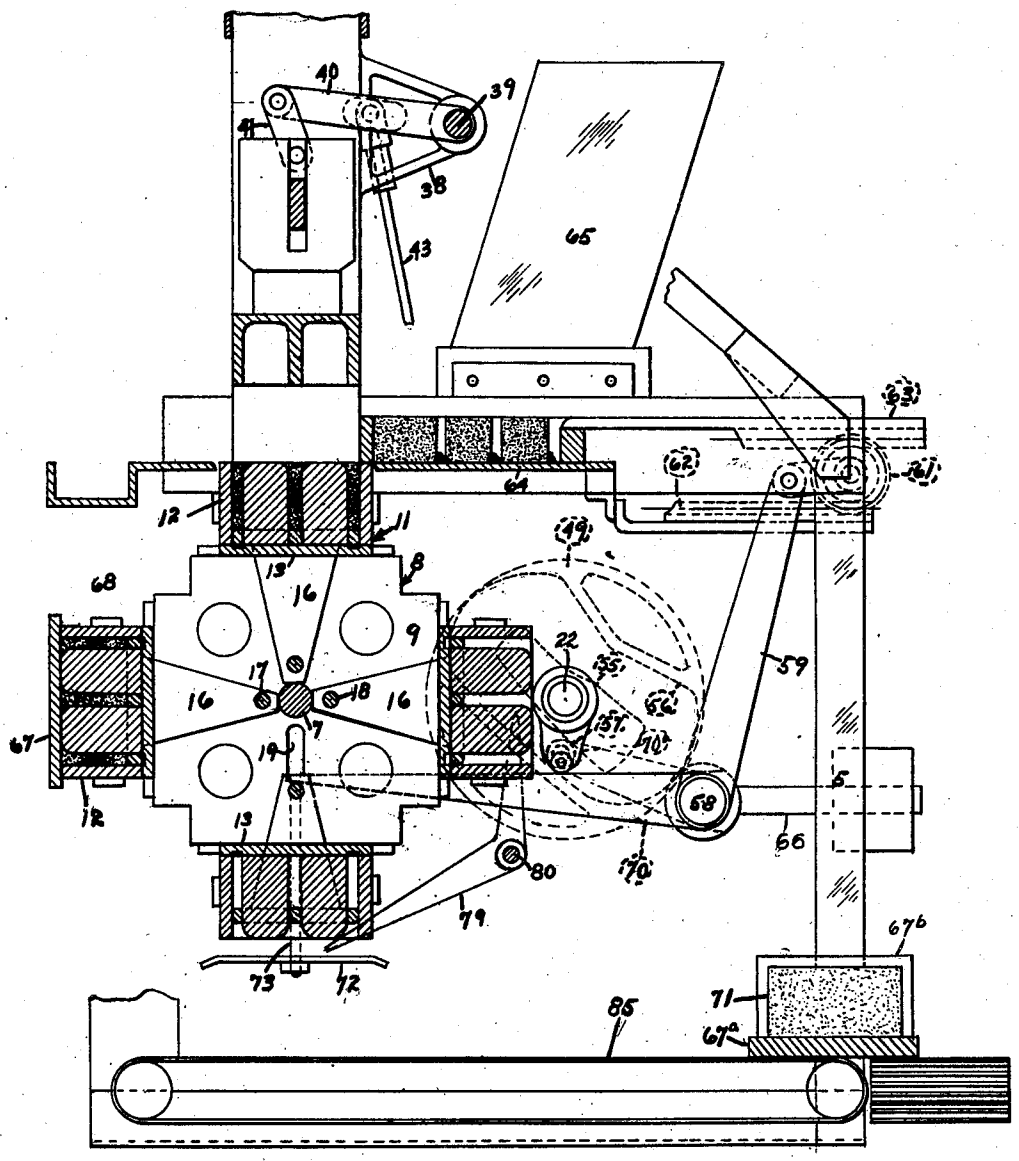


Fig. 10

Charles M. Eberling
Inventor
By Smith and Freeman
Attorneys

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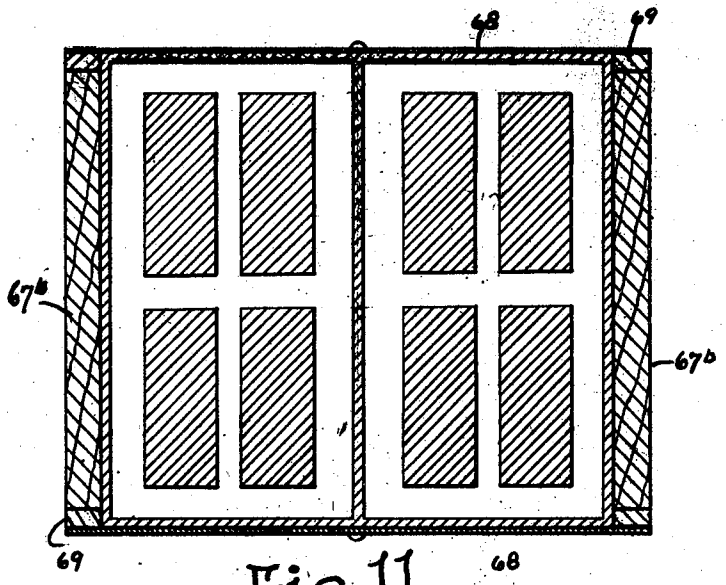


Fig. 11

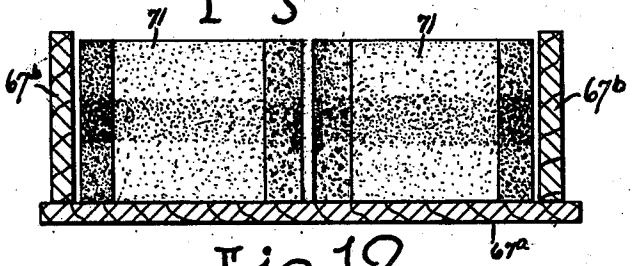


Fig. 12

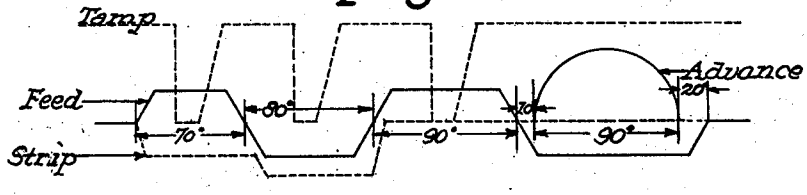


Fig. 13

Charles M. Eberling
Inventor
by Smith and Freeman
Attorneys

Patented June 17, 1930 1,765,064

UNITED STATES PATENT OFFICE

CHARLES M. EBERLING, OF CLEVELAND, OHIO

BUILDING-BLOCK MACHINE

Application filed April 4, 1927. Serial No. 180,638.

This invention relates to concrete block making machinery, and has special reference to machines for the molding of concrete into tiles, blocks, bricks, and the like building elements, and the objects of the invention are the provision of a practically automatic machine of this character which shall have great certainty and rapidity of operation; which shall produce a tile or element of maximum strength at the points where requisite combined with maximum porosity at points where porosity is desirable; which shall produce tile, blocks, and building elements of maximum size and minimum weight combined with adequate strength for practical purposes; which shall have improved facilities for handling the molds and ejecting the completed articles; and which shall have improved provisions for timing the operation of the different elements; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying this specification and forming a part of this application I have shown one embodiment of my invention, and in these drawings:

Figures 1 and 2 are perspective views of the preferred form of machine;

Figure 3 is a side elevation of the machine drawn to larger scale;

Figure 4 is a vertical sectional view corresponding to the line 4—4 of Figure 5;

Figure 5 is a central sectional view of the machine corresponding to the line 5—5 of Figure 4;

Figure 6 is a horizontal section on the line 6—6 of Figure 5;

Figures 7, 8, 9, and 10 are views of the operating parts of the machine showing their relation at different steps of the operation;

Figure 11 is a transverse section showing application of a pallet to the mold;

Figure 12 is a sectional view through a tile containing the present improvements, while

Figure 13 is a diagram illustrating the cycle of operations.

My improved machine comprises generally a rotating member which carries the different molds, a feeding device whereby a mixture of raw materials is fed to the molds, a tamping mechanism whereby such mixture is compressed in the molds, a stripping mechanism whereby the compacted material is ejected from the molds, an off-bearing mechanism whereby the completed articles are removed from the machine, and timing mechanism whereby all the foregoing activities are correlated.

The embodiment of my invention disclosed herein comprises a frame having at one end, hereinafter denominated the front, a pair of spaced uprights 1 connected at the top by a cross bar 2 and at the bottom by a cross-bar 3. Horizontal channel members 4 connect the uprights 1 intermediate of their height with rear vertical uprights 5 and the lower ends of the uprights 1 and 5 are connected by bars 6. Journaled in the front uprights is a massive horizontal shaft 7 on which is secured a four-sided carrier 8 consisting of two longitudinal spaced spare frames 9 having hubs 10 secured to the shaft between the uprights 1. Tightly bolted to the four sides of the carrier 8 are molds 11 which comprise essentially rectangular frames 12, constituting side walls, and a bottom member 13 to which are generally fastened inside the mold frame 12 a plurality of metallic cores 14 separated from the side of the mold and from each other by the spaces which are eventually to be filled by the plastic mixture. The bottom of the rectangular cavity thus produced is equipped with a stripping plate 15, one for each tile and each stripping being provided at each end with an integral arm 16 which extends inwardly past the adjacent frame 9 towards the shaft 7. In the present embodiment there are two of these stripping plates for each mold, and consequently four arms 16 on each side of the carrier 8 as shown in Figure 4. These stripping plates 15 form in effect the bottom of the mold and when in receiving position the inner ends of the arms 16 preferably rest upon the shaft 7 as shown in Figures 7 to 10, so as to

receive the entire blow of the tampers. The ends of the arms 16 near the shaft 7 are formed with apertures 17 for the reception of rods 18 and the plates 9 are formed with radially extending slots 19 for the passage of the rods 18, thus guiding the stripper plates 15 in their motion and preventing them from completely leaving the mold space.

Carried by the outer end of the shaft 7 is a star wheel 20 having four radial slots 21 and cooperating with other parts of a Geneva movement serving to rotate the platen and its mold intermittently and hold the same firmly with first one and then another uppermost.

Journaled in the machine frame at the rear of and parallel to the shaft 7 is a main shaft 22 having secured to its outer end a radial arm 23 provided at its extremity with a roller 24 adapted to enter the slots 21 of the star wheel 20 and rotate the Geneva movement. Pivoted to the upright adjacent to the star wheel 20 is an arm 25 having at its extremity a roller 26 similar to the roller 24 and adapted to enter the slots 21 successively in locking relation. Suitable provisions are made for displacing the locking roller 26 at the instant the platen is to be advanced, and conveniently comprises a reciprocable rod 27 connected at one end to the free end of the arm 25 and having its end 28 projecting into the path of the roller 24 in such manner as to be engaged thereby at the instant of the entrance of the roller 24 into a slot 21 thus disengaging the roller 26 at the proper instant. If desired, I may employ one of these star wheels 20 on each end of the shaft 7 but for purposes of convenience of illustration I have omitted one of the same from the present drawings.

Secured to the inside faces of the uprights 1 are vertical rails 30 on which are slidably mounted the vertically reciprocable cross head 31. The cross head 31 comprises in this case a horizontal rectangular bar 32 on which are loosely hung a plurality of massive tampers 33, each consisting of two parts split vertically and bolted over the bar 32 in such manner as to be raised thereby, and fall therewith, yet to possess a certain amount of freedom of movement relative to the cross bar in order to minimize breakage. The lower ends 34 of the tamping members 33 are shouldered at 35, for the reception of the tamping heads 36 which are bolted thereto. This construction is adapted to enable the use of tamping heads of varying shapes to conform to the particular shapes of the cores which vary with the shape of the mold, the nature of the concrete and the use to which the articles are to be put. Preferably a cushion spring device 37 is provided at the lower end of each rail, sufficiently low down not to be engaged by the cross head in the ordinary operation of the device when the tamping heads are arrested by contact with material in the mold, but in a position to arrest the movement of the cross head in case the same should be allowed to drop without any material in the mold.

Carried by the uprights at one side of the crosshead 31 are brackets 38 in which is journaled the horizontal rockshaft 39 from which project the radial arms 40 articulated by links 41 to the cross head 31. Also projecting from one end of this rockshaft is an operating arm 42 whose free end is articulated to a rod 43 whose opposite end is pivoted at 44 to the upright projection 45 of a lever 46 pivoted loosely on the shaft 7 and having at its free end a roller 47. Mounted on the shaft 22 is a massive gear wheel indicated generally at 49, and driven by a pinion 50 carried by the drive shaft 51. Formed on the inner face of the gear wheel 49 are a plurality of cams 52, 53, and 54 which cooperate with the roller 47 to thereby raise the arm 42 and with it the cross head and allow it to drop periodically.

The outer face of the gear wheel 49 is formed with irregularly shaped cams 55 and 56 adapted to engage a roller 57 mounted on one end of a rockshaft 58 pivoted to the frame members 4 and the other end 59 of which is connected by a link 60 to a pinion 61 engaging between a rack bar 62 mounted on the machine frame and a similar rack bar 63 carried by a sliding material charger 64 by means of which the charger 64 is reciprocated from a position under the material hopper 65 to a position over the mold box 12. The cams 55 and 56 are so shaped and arranged that with each revolution of the gear wheel 49 the charger is carried from a position under the hopper 65 over the mold box 12 and partly retracted over the mold box 12 then fully retracted under the hopper 65 and again projected over the mold box 12 pausing over the mold box during each passage, and finally retracted to a position under the hopper 65.

The movements of the sliding charger 64 and of the tamper cross head 31 are so timed that each time the charger 64 is positioned over the mold box 12 the cross head 31 and its depending tampers 33 descend and force a portion of the material in the charger 64 downwardly into the mold box 12. In each movement in the filling of the mold box 12 the first descent of the tamper is on a charger entirely filled with material, the second descent of the tamper 33 takes place after the return of the charger 64 from the full projected portion when the molds are only partly full and the third descent of the tamper 33 takes place after the charger 64 has been again entirely filled and advanced. The charger, when first advanced, is entirely filled with a continuous flat sheet of

the damp, plastic, cement mixture, and the first blow of the tampers carries the preponderating quantity of this mixture into the mold, a small portion of such mixture being excluded by reason of the obstruction offered by the core prints. As soon as the tamper is withdrawn, the charging frame is also withdrawn, leaving in the mold all the mixture not previously forced therein by the tamper. During the time that this charger is withdrawn the tampers again fall, and inasmuch as their force is this time expended upon the comparatively small amount of cement mixture the same is compacted more densely. The tamper is next elevated by the cam 53, and the charger then advanced, after which the tamper is dropped through the charger, as shown in Fig. 13, which this time fills the mold to, or slightly above, the brim, after which the tamper is raised and the charger withdrawn when the plate 64 which constitutes its forward edge removes surplus material from the top of the mold leaving the block in a finished but rough-surfaced condition. Consequently, the weight of the cross head and tampers being constant the force of the first blow does not compact the material in the mold box 12 so closely as does that of the second blow which is applied to a thinner layer of material and the third blow of the tamper being applied to a full charger does not produce as great a compression of the last layer as is given to the intermediate layer. This results in producing a building block having relatively porous surfaces where porosity is most desired and an intermediate band of more highly compressed and consequently stronger material where strength is most needed.

When the mold has thus been filled with compressed material the charger is retracted which causes the front gate 64[a] of the charger 64 to cut off any excess material projecting from the mold and draw the same beneath the hopper for the next charge. At this time the arm 23 carried by the shaft 22 is in position to enter a slot 21 of the star wheel 20 and further rotation of the shaft 22 carries the star wheel and its connected shaft around for one-quarter of a revolution. This brings the freshly molded block to the front of the machine where it is in position to have a pallet 67 applied over the open face of the mold box 12. This pallet consists of a bottom board 67[a] and an upright 67[b] at each end thereof. These uprights are spaced to overlap the end walls of the mold box 12 and their edges are engaged by pads 69 carried by a pair of spring bars 68 secured at their centers to the side walls of the mold box 12 and extending beyond the ends thereof, best shown in Figure 11; this holds the bottom of the pallet securely against the face of the tile. The attendant has ample time to apply this pallet during the filling of the next mold box and upon the next succeeding quarter turn of the platen the mold carrying the completed block is disposed directly beneath the shaft 7.

Loosely journaled on the rockshaft 58 are a pair of arms 70 carrying counterweights 66 and extending forwardly one on each side of the platen, and adapted to engage the ends of the rod 18 carried by the arms 16 of the stripper plates 15 when the mold is disposed below the shaft 7. These arms pass below the shaft 22 which is provided with two cams 70[a], one for each stripper arm, preferably having anti-friction rollers at their ends, and swinging at the desired instant to depress the arms 70 and with it the rod 18 and stripper plate and completed tile, the pallet being forced out from between the springs 68 at the same time. This movement brings the pallet into contact with two supports 72, carried by upright rods 73 as shown in Figures 7–10, or a plurality of rods 74, 75 as shown in Figure 5, mounted to slide in brackets 76 carried by the front uprights 1 of the machine frame and normally maintained in raised position by counterweights 77.

The supports 72 are provided with vertically extending bars 78 which also engage with the free ends of the arms 70 whereby the supports are forced downwardly.

The purpose of these counterweights is to restrain the tile against falling and becoming broken and their weight is preferably greater than that of the tile and pallet. The travel of the arms 70 is necessarily restricted by the fact that the rod 18 is limited by the ends of slots 19, and this motion is not enough to carry the tile completely out of contact with the rotor. To accomplish this I provide a pair of arms 79 carried by a rockshaft 80 secured between the cross bars 4 of the machine and having an arm 81 arranged to cooperate with a cam 82 carried by the shaft 22 and against which it is held by means of a contractile spring 84 whereby the supports 72 carrying the pallet 67 and the completed block 71 are carried further downwardly until the pallet is disposed upon an endless carrier 85 by which it is conveyed away. Thereupon the platen is rotated one step while the arms 79 are still depressed to hold the carriers 72 out of the way, after which both the arms 79 and carrier 72 are raised by the counterweights 77.

Pivotally secured to arm 59 of the rockshaft 58 are pusher bars 86 which pass above the shaft 22 in position to engage the stripper frame 15 when the mold 11 is in a position facing the shaft 22 and being projected forwardly by rocking of the arm 59 act to return the stripper frames 15 to their seats in the bottom of the mold box 12.

To provide against injury to the machine in case the front gate 64[a] of the charger 64 encounters an obstruction of more than usual size in removing excess material from the completed block the front gate 64[a] is secured between the side walls of the charger 64 by frangible pins 64[b] which break if any considerable pressure is applied to such front gate.

As shown in Figure 13 the cycle of operation is as follows: The advance of the mold occurs during a 90° movement of the main shaft 22 while the tampers and strippers are both elevated. After a 10° dwell a forward movement of the charger begins occupying a second 90° turn of the shaft, the tamper being dropped once between the advance and retraction of the charger. The charger is now retracted during 80° of rotation of said shaft and the tampers are dropped a second time, the strippers also being actuated during this interval. The charger is again advanced during 70° of rotation, and the tampers dropped through the charger a second time, making three times in all. A dwell of 20° completes the cycle.

From the above disclosure it will be obvious to those skilled in the art that I have provided a new and improved concrete block machine of very large capacity in which the movements necessary to turn out a completed block are carried on practically automatically and one in which the completed block has a porous surface where porosity is most desired and has a central band of greater density thereby providing a block having greater strength at the point where most needed.

It therefore will be apparent to those skilled in the art that the embodiment of my invention herein shown and described accomplishes not only the principal object of my invention but many others.

From the above disclosure it also will be obvious to those skilled in the art that the embodiment of my invention herein shown and described may be variously changed and modified without departing from the spirit of my invention or sacrificing the advantages thereof, and it therefore will be understood that the disclosure herein is illustrative only, and that my invention is not limited thereto. It will also be understood that I do not limit myself to making blocks of any one size, shape, or material, since various sizes and shapes of mold box can be used and other plastic materials charged therein.

I claim:

1. In a concrete block machine: the combination of a quadrilateral rotatable carrier, four radial molds on said carrier, four stations about said carrier for filling, pallet-applying, block-ejecting, and mold-restoring, in the order named, and means for intermittently rotating said carrier by 90° steps to present each mold successively to said four stations.

2. In a concrete block machine: a rotatable shaft, a mold, a charger, a tamper, and a single wheel on said shaft having cams on different parts thereof, whereby said charger, and tamper are presented to said mold in synchronized relation, one intermediate of the other.

3. In a concrete block machine: the combination of a mold, a reciprocable charger movable back and forth over the same, and adapted to deliver unequal amounts of concrete mixture thereto at different strokes, and a tamper synchronized relative to the movements of said charger.

4. In a concrete block machine: the combination of a mold, a charger comprising a hollow reciprocable frame, a tamper, means for successively presenting said mold to, and removing it from, said charger and tamper, means for operating said tamper both through said frame, and after the withdrawal of said frame.

5. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, a pallet having upstanding end portions, and spring bars carried by said mold for engaging the end portions of said pallet to maintain the face portion of said pallet in position over said mold.

6. In a concrete block machine: the combination of a polygonal carrier, a mold on each face of said carrier, stations for filling, pallet-applying, block-ejecting, and mold-restoring, to which said carrier moves successively; a stripper, means for operating said stripper at a station removed from said filling station, and means operating at a station intermediate the stripping and filling station to restore the stripper.

7. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft; a pallet having upstanding end portions, and means carried by said mold for engaging the end portions of the pallet, to maintain said pallet in position over said mold.

8. In a concrete block machine: the combination of a mold, and means for tamping concrete mixture material in said mold, and means for feeding such mixture into said mold intermediately of the strokes of said tamping means, and means causing the feeding of mixture in smaller increments to the mold when half full than at other times whereby the density of the block is varied at different points.

9. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, a pal-

let having upstanding end portions, and means on said mold for engaging said upstanding portions and thereby to hold the face portion of said pallet disposed over the open face of said mold.

10. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, a pallet having upstanding end portions, means for feeding material to said mold, and means on said mold for engaging said upstanding portions and thereby to hold the face portion of said pallet disposed over the open face of said mold.

11. In a concrete block machine: the combination of a polygonal carrier, means for rotatably mounting the same, a mold carried by each face of said carrier projecting radially therefrom, means for rotating said carrier step by step for advancing said molds therearound, means for charging plastic material into one of said molds, and means for simultaneously discharging a completed block from another of said molds, and means for causing a dwell of each mold at a point between the charging, and discharging stations, to permit the application of a pallet thereto.

12. In a concrete block machine: the combination of a rotatable polygonal platen, a radially extending mold carried by each face of said platen, means for intermittently rotating said shaft, a sliding charger for feeding material to said mold, a tamper for compressing material in said mold, a station for applying a pallet to said mold after the filling of said mold, a stripper to discharge a completed block onto said pallet, a station for restoring said stripper after such discharging, and means operative during the dwell of said mold at that station to restore said stripper into position to receive another charge.

13. In a concrete block machine: the combination of a mold, a tamper for compressing material in said mold, a sliding charger synchronized to make a first pause above said mold when said charger is filled with material, a second pause when said charger is withdrawn for more material, and a third pause when said charger is filled with material; tamper actuating means for causing said tamper to descend during each pause, whereby a block having outer less compact layers and a central more compact layer is produced.

14. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft; a tamper for compressing material in said mold; a sliding charger synchronized to make a first pause above said mold when said charger is filled with material, a second pause beside said mold after having discharged the residue of the first charge of material into said mold, and a third pause when said charger is filled with material; tamper actuating means for causing said tamper to descend during each pause, whereby a block having outer less compact layers and a central more compact layer is produced, and means for stripping said block from said mold.

15. In a concrete block machine: the combination of a rotatable shaft; a radially extending mold carried by said shaft; means for intermittently rotating said shaft; means for locking said shaft against rotation, a tamper for compressing material in said mold; a sliding charger synchronized to make a first pause above said mold when said charger is filled with material, a second pause beside said mold after having discharged the residue of the first charge of material into said mold, and a third pause when said charger is filled with material; tamper actuating means for causing said tamper to descend during each pause, whereby a block having outer less compact layers and a central more compact layer is produced, and means for removing said block from said mold.

16. In a concrete block machine: the combination of a rotatable shaft; a radially extending mold carried by said shaft; means for removing a completed block from said mold: and means for depositing said block on an endless carrier comprising: rods slidable in brackets affixed to the machine frame, means for receiving a pallet carrying said block supported by said rods and downwardly slidable with said rods, and counterweights to return said supports after said pallet has been disposed on said carrier.

17. In a concrete block machine: the combination of a rotatable shaft; a radially extending mold carried by said shaft; means for intermittently rotating said shaft; means for removing a completed block from said mold; and means for depositing said block on an endless carrier comprising: rods slidable in brackets affixed to the machine frame, means for receiving a pallet carrying said block supported by said rods and downwardly slidable with said rods, and counterweights to return said supports after said pallet has been disposed on said carrier.

18. In a concrete block machine: the combination of a rotatable shaft; a radially extending mold carried by said shaft; means for intermittently rotating said shaft; means for feeding material to said mold; means for removing a completed block from said mold; and means for depositing said block on an endless carrier comprising: rods slidable in brackets affixed to the machine frame, means for receiving a pallet carrying said block supported by said rods and downwardly slidable with said rods and counterweights to return said supports after

said pallet has been disposed on said carrier.

19. In a concrete block machine: the combination of a rotatable shaft; a radially extending mold carried by said shaft; means for intermittently rotating said shaft; means for feeding material to said mold; means for tamping material into said mold, means for removing a completed block from said mold; and means for depositing said block on an endless carrier comprising: rods slidable in brackets affixed to the machine frame, means for receiving a pallet carrying said block supported by said rods and downwardly slidable with said rods, and counterweights to return said supports after said pallet has been disposed on said carrier.

20. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, means for feeding material to said mold, a reciprocable cross head carrying a tamper for compressing material in said mold, a cammed wheel and rockshaft operatively connected to said crosshead for reciprocating said crosshead, and means for stripping said block from said mold.

21. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, a tamper for compressing material in said mold, a sliding charger synchronized to make a first pause above said mold when said charger is filled with material, a second pause when said charger is partially filled with material, and a third pause when said charger is filled with material; and tamper actuating means for causing said tamper to descend during each pause, whereby a block having outer less compact layers and a central more compact layer is produced.

22. In a concrete block machine: the combination of a mold, a tamper for compressing material in said mold, a sliding charger synchronized to make a first pause above said mold when said charger is filled with material, a second pause beside said mold after having discharged the residue of the first charge of material into said mold, and a third pause when said charger is filled with material, tamper actuating means for causing said tamper to descend during each pause, whereby a block having outer less compact layers and a central more compact layer is produced.

23. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, a tamper for compressing material in said mold, a sliding charger synchronized to pause twice above said mold and once beside said mold during the filling of said mold and tamper actuating means synchronized to cause descent of the tamper during each pause of said charger.

24. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, means for intermittently rotating said shaft, a sliding charger for feeding material to said mold, a gear wheel for intermittently rotating said shaft, cams carried by one face of said gear wheel for reciprocating said charger a plurality of times during each rotation of said wheel, and other cams carried by the other face of said gear wheel for causing a descent of said tamper a plurality of times during each rotation of said gear wheel.

25. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, tamper means for successively tamping the mixture carried in said mold, a sliding charger for supplying the mixture to said mold, and means for sliding said charger so constructed and arranged that said charger pauses twice above said mold for permitting said tamper means to tamp said mixture in said mold through said charger, and said charger pauses once beside said mold for permitting said tamper means to tamp said mixture in said mold independently of said charger.

26. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, tamper means for successively tamping the mixture carried in said mold, a sliding charger for supplying the mixture to said mold, and a cam and rockshaft means for sliding said charger so constructed and arranged that said charger pauses a plurality of times above said mold for permitting said tamper means to tamp said mixture in said mold through said charger, and said charger pauses once beside said mold for permitting said tamper means to tamp said mixture in said mold independently of said charger.

27. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried by said shaft, tamper means for successively tamping the mixture carried in said mold, means for intermittently rotating said shaft, a sliding charger for supplying the mixture to said mold, and means for sliding said charger so constructed and arranged that said charger pauses twice above said mold for permitting said tamper means to tamp said mixture in said mold through said charger, and said charger pauses once beside said mold for permitting said tamper means to tamp said mixture in said mold independently of said charger.

28. In a concrete block machine: the combination of a rotatable shaft, a radially ex-

tending mold carried by said shaft, tamper means for successively tamping the mixture in said mold, means for intermittently rotating said shaft, a sliding charger for supplying the mixture to said mold, and cam and rock shaft means for sliding said charger so constructed and arranged that said charger pauses twice above said mold for permitting said tamper means to tamp said mixture in said mold through said charger, and said charger pauses once beside said mold for permitting said tamper means to tamp said mixture in said mold independently of said charger.

29. In a concrete block machine: the combination of a rotatable shaft, a radially extending mold carried on said shaft, a sliding charger for supplying material to said mold, tamper means for tamping material in said mold a plurality of strokes, said tamper means being so positioned and arranged that the first advance of said tamper means is through said charger, the second advance of said tamper means is directly into said mold, while the third advance of said tamper means is through said charger, whereby a block having its outer layers of relatively porous material and a central layer of relatively dense material is produced.

30. In a concrete block machine: the combination of a mold, a sliding charger for supplying material to said mold, tamper means for tamping material in said mold a plurality of strokes, said tamper means being so positioned and arranged that the first advance of said tamper means is through said charger, the second advance of said tamper means is directly into said mold, while the third advance of said tamper means is through said charger, whereby a block having its outer layers of relatively porous material and a central layer of relatively dense material is produced.

In testimony whereof I hereunto affix my signature.

CHARLES M. EBERLING.