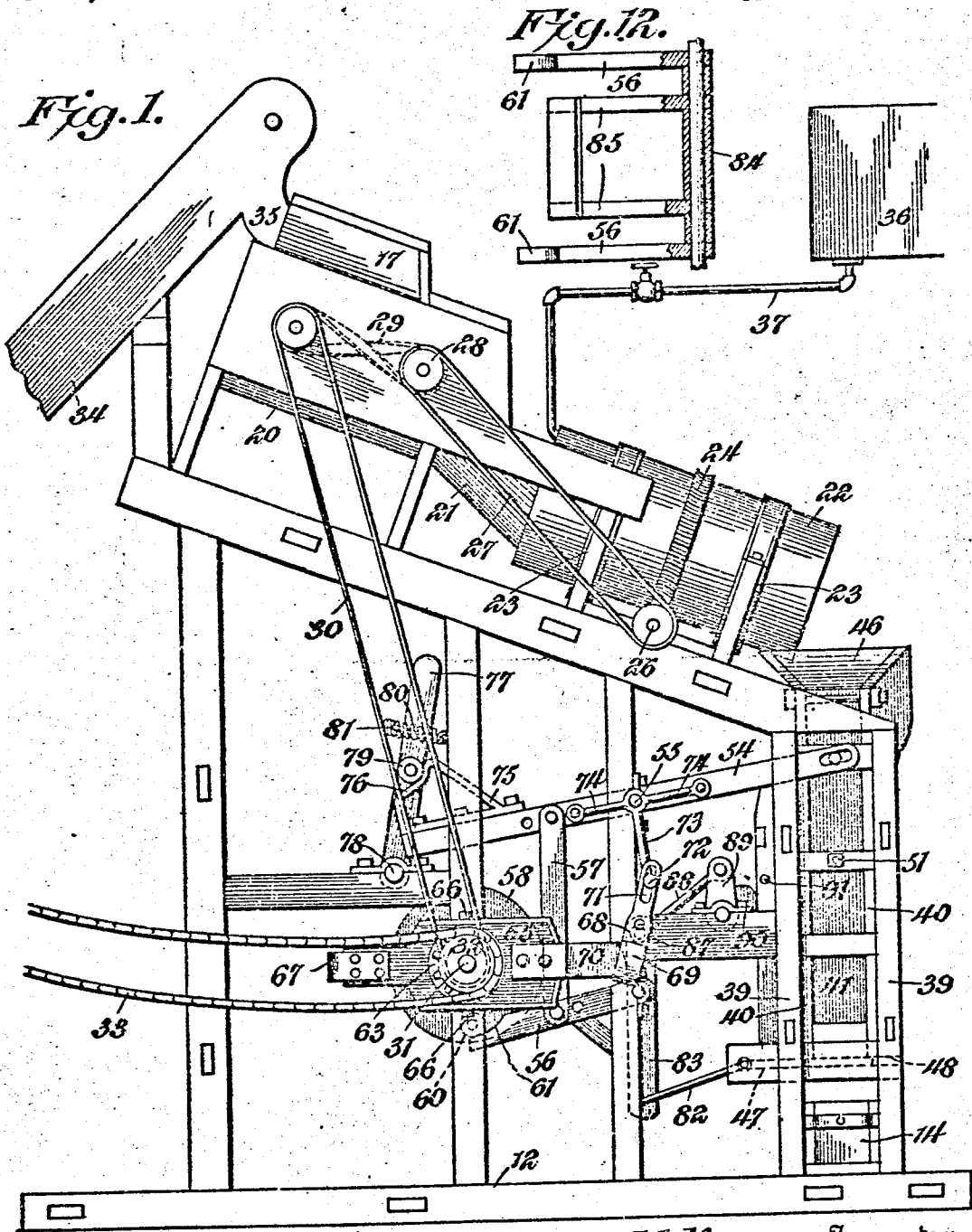


J. A. MoNAMARA.
CONCRETE MOLDING MACHINE.
APPLICATION FILED SEPT. 7, 1907.

Patented Oct. 5, 1909.

4 SHEETS-SHEET 1.

935,678.



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Witnesses

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By

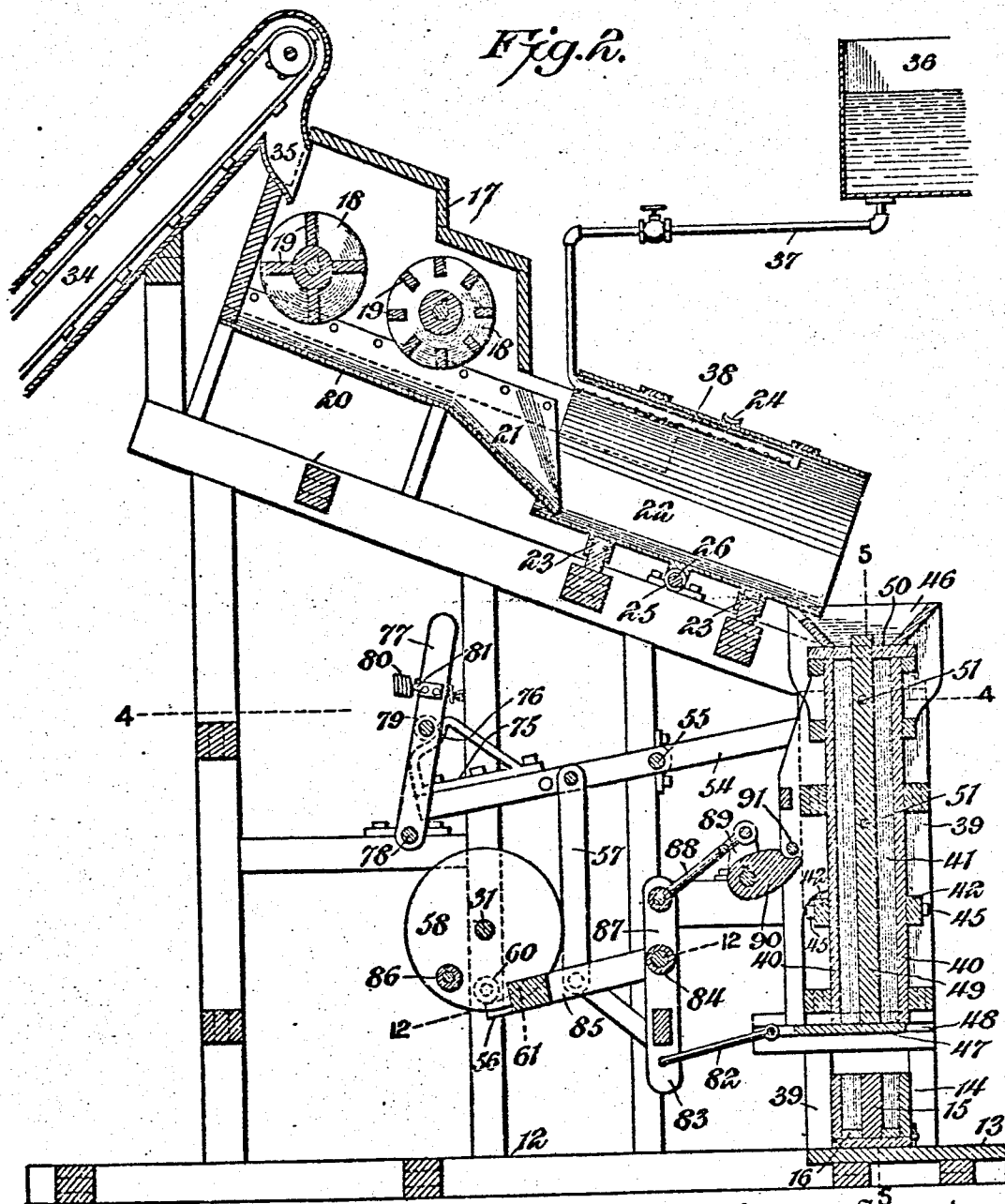
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 3.

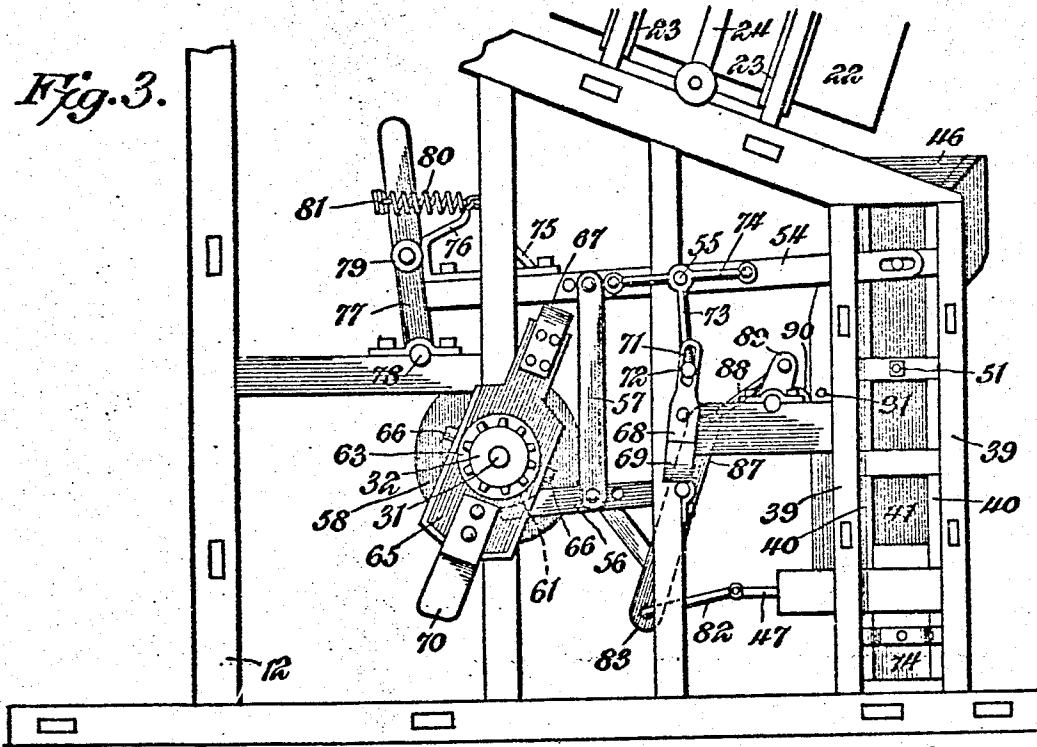


Fig. 7.

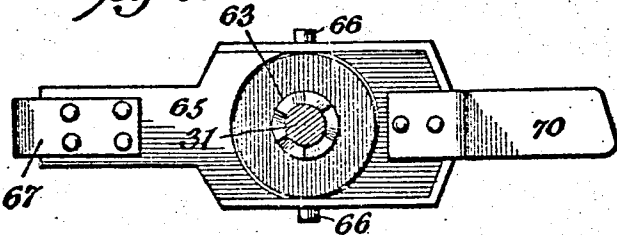


Fig. 8.

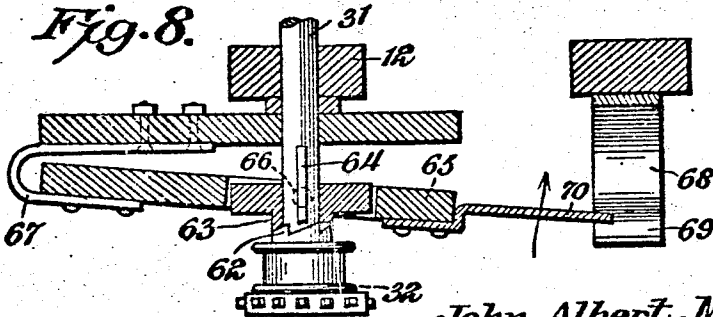
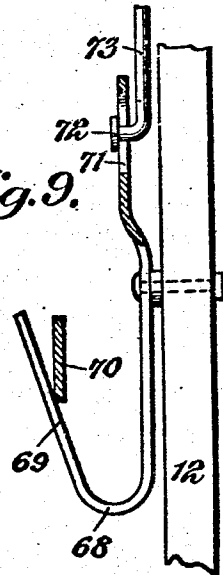


Fig. 9.



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935,678.

Patented Oct. 5, 1909.

4 SHEETS-SHEET 4.

Fig. 4.

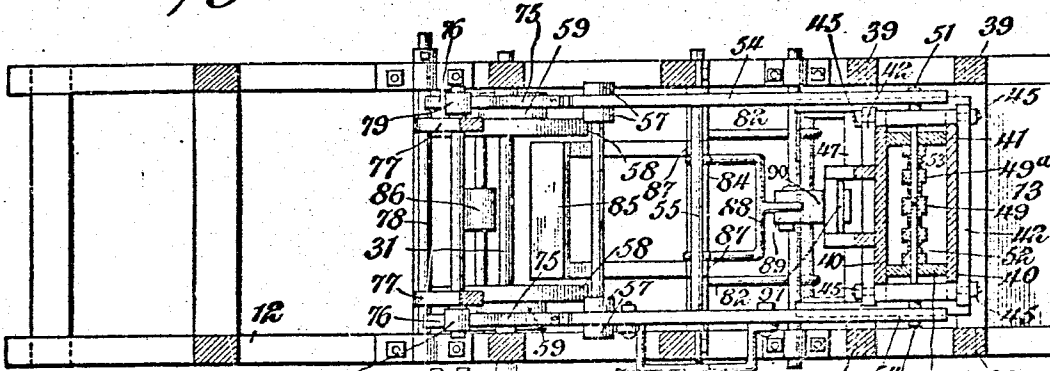


Fig. 5.

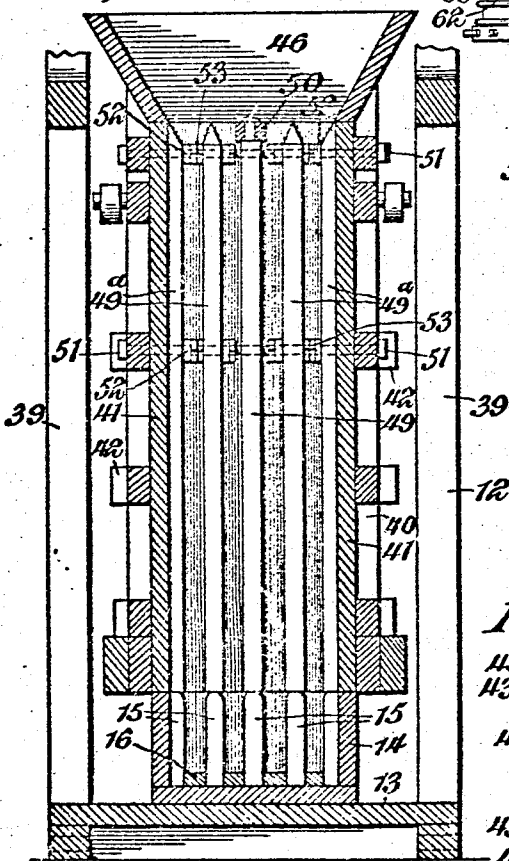


Fig. 10.

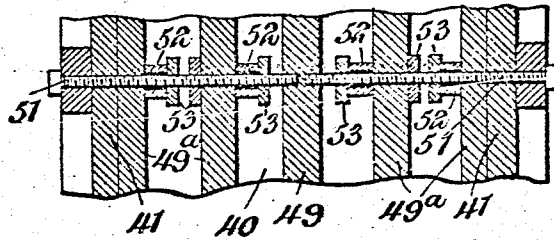


Fig. 6.

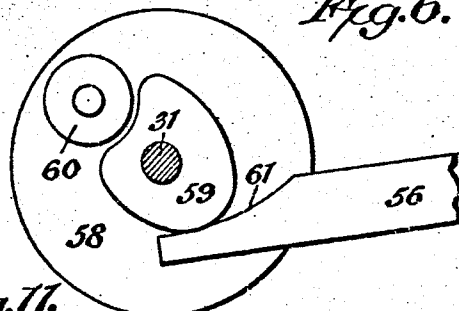
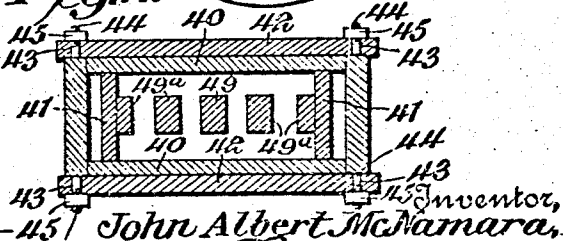


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN ALBERT McNAMARA, OF BURLINGTON, WISCONSIN.

CONCRETE-MOLDING MACHINE.

935,678.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed September 7, 1907. Serial No. 391,842.

To all whom it may concern:

Be it known that I, JOHN ALBERT McNAMARA, a citizen of the United States, residing at Burlington, in the county of Racine and State of Wisconsin, have invented a new and useful Concrete-Molding Machine, of which the following is a specification.

This invention relates to means for molding articles of a cementitious nature, such as concrete blocks, bricks, and the like.

The primary object of the present invention is to provide novel means which will thoroughly compact the material prior to and upon its delivery into the molds, said means also forming smooth water-proof surfaces upon the articles that will secure a highly effective finish.

A further object is to provide means which will form the material into the shape of the mold or receptacle and produce core openings therein prior to the introduction of such material into the mold, said means being adjustable to various sizes of molds.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical longitudinal sectional view therethrough. Fig. 3 is a side elevation of a portion of the mechanism, but illustrating the parts in a position to deliver into a mold. Fig. 4 is a horizontal sectional view through the machine, substantially on the line 4-4 of Fig. 2. Fig. 5 is a vertical sectional view on the line 5-5 of Fig. 2. Fig. 6 is a detail view of a portion of the elevating means for the forming mold. Fig. 7 is a face view of one of the clutch members. Fig. 8 is a horizontal sectional view through the clutch. Fig. 9 is a detail sectional view through the clutch operating mechanism. Fig. 10 is a detail sectional view through the holding means for the core of the forming mold. Fig. 11 is a horizontal sectional view through the forming mold. Fig. 12 is a detail sectional view on the line 12-12 of Fig. 2.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a suitable frame 12 is employed having in the lower portion thereof, a platform 13 on which the molds are placed. One of these molds is illustrated and is designated 14. It is pro-

vided with suitable cores 15 and a removable pallet 16.

Mixing and feeding mechanism for the mold is mounted on the frame. In the embodiment disclosed, a casing 17 is employed, in which are mounted rotatable stirrer members 18 revoluble in opposite directions and having radial blades 19. The bottom of the casing is in the form of a trough 20 having a spout 21 delivering into the upper end of an inclined rotatable drum 22. The drum is suitably mounted on roller bearings 23, and has a worm gear 24 engaged with a driving worm 25. A shaft 26, carrying the worm, is belted, as shown at 27 to a pulley 28 carried by one of the stirrer shafts, and the two stirrer shafts are connected by a crossed belt 29. A driving belt 30, connected to the stirrer shaft, is journaled on a driven shaft 31, and is connected to a sprocket wheel 32 also journaled on said shaft. The sprocket wheel is operated from any suitable source of power by means of a sprocket chain 33.

An elevator for the material is shown at 34, and has at its upper end a spout 35 delivering to the upper stirrer member 18. A water reservoir 36 has connected thereto a pipe 37 provided with a perforated portion 38 located within the drum.

The lower or delivery end of the drum is located a considerable distance above the mold supporting platform 13, and interposed between said platform and the drum, is a holder for the material that constitutes a forming mold. For this purpose, guide standards 39 rise from the corners of the mold supporting platform 13, and slidably mounted on said guide standards is said holder or forming mold. This mold consists of side walls 40 with end walls 41 located between the side walls and adjustable toward and from each other. Braces 42, carried by the side walls, project beyond the opposite edges thereof, and have openings 43 that receive the ends of tie bolts 44 bridging the space between said side walls. Clamping nuts 45 are threaded upon these tie bolts, and thus serve to effectively secure the walls in coöperative relation. At the same time, by loosening the nuts 45, it will be evident that the end walls 41 can be moved toward and from each other to vary the size of the holder or forming mold. This mold carries at its upper end a hopper

46, which receives the material from the drum, and directs it into the holder or mold. The bottom of said mold or holder is located over the mold receiving platform 13, and is spaced therefrom a distance sufficient to permit the introduction of a mold beneath it and upon the platform. The bottom constitutes the delivery end of the holder or mold, and is controlled by a closure in the form of a sliding gate 47 operating in guide-ways 48 carried by the lower end of the holder or mold. Cores 49 and 49^a are located in the forming mold, and in line with the cores 15 of the finishing mold. The central core 49 is suspended by a cross piece 50, and the cores 49^a are located on opposite sides thereof. The cores 49^a are held in place by bolts 51 passed through the end walls and threaded into the opposite sides of the center core, as illustrated in Fig. 10. Each of the cores 49^a has collars 52 projecting from one side thereof and surrounding the bolts 51, and nuts 53 screwed upon the bolts, serve to maintain the cores 49^a in fixed positions. With this arrangement, it will be evident that the cores may be adjusted, and if desired one or more can be readily removed. Consequently when different molds are employed in the machine, the holder or forming mold can be modified to correspond thereto.

The holder or forming mold, while of the same cross sectional area, as the finishing mold 14, is of considerably greater height than the same, and has a vertical movement between the top of a mold placed beneath it and the lower end of the drum 22. For the purpose of effecting this movement, spaced levers 54 are fulcrumed between their ends, as shown at 55 on the frame, and have their outer ends pivotally connected to the upper portion of the forming mold. Other levers 56, fulcrumed at their forward ends, have link connections 57 with the rear arms of the upper levers 54. Fixed upon the shaft 31 are rotatable driven heads 58 provided with cams 59 and cam rollers 60. These cams and cam rollers successively engage with the rear ends 61 of the levers 56. Consequently it will be evident that if the heads are revolved, the cams and cam rollers 60 operating on the levers 56, will move the same downwardly. This downward movement will be transmitted to the levers 54 and thus cause the forming mold to be elevated toward the feeding means or drum 22.

In order to connect the driven shaft 31 to the driving member or sprocket wheel 32, the mechanism disclosed more particularly in Figs. 7 and 8 is employed. The combined sprocket wheel and pulley has at its inner end a clutch member 62, and another clutch member 63, feathered as shown at 64 upon the shaft 31, is movable into and

out of coaction with the member 62. This movement is effected by means of a swinging arm 65 having pin connections 66 with the clutch member 63, said arm being rotatable with the shaft 31, and having a spring connection 67 therewith. The spring connection aforesaid serves to urge the clutch member 63 into coaction with the clutch member 62, and it will be evident that when the members are in coacting relation, as disclosed in Fig. 8, the shaft 31 will be revolved with the driving wheel 32. Consequently the heads will be rotated, and the mold elevated. When elevated, however, it is necessary that the rotation of the heads be stopped, and for this purpose, a combined stop and clutch actuating device, in the form of a hook 68 is pivoted between its ends on one of the standards of the frame, and has an outer inclined track 69 movable into the path of movement of an extension 70 on the arm 65. The upper end of the stop hook 68 is provided with a slot 71, and the offset terminal 72 of a depending arm 73 is engaged in the slot. This arm, as shown particularly in Figs. 1 and 3, has outstanding fingers 74 secured to one of the levers 54. With this arrangement when the levers 54 are swung to elevate the mold, the inclined tracks 69 will be moved into the path of movement of the extension 70. Consequently as said extension strikes the track, it will be moved inwardly, thus swinging the arm in the same direction against the tension of the spring 60 and carrying the clutch member 63 out of coaction with the clutch member 62, thereby releasing the driven shaft 31 from the driving member 32. When the parts are released, as above described, it is desirable to lock the mold elevated until a predetermined amount of material has been deposited therein and the following mechanism is employed for this purpose. The rear ends of the levers 54 are provided with brackets 75 having inclined tracks 76, and swinging locking arms 77 pivoted upon the frame, as shown at 75 have rollers 79 that operate on the tracks when the mold is elevated, as illustrated in Figs. 1 and 2. Springs 80 having adjustable connections 81 with the arm 77 serve to urge the rollers upon the track and hold them thereupon until the weight of the material in the mold is sufficient to overcome the tension of the springs, whereupon the rollers and arms will be forced rearwardly and the mold permitted to drop, as herein-after explained.

Automatic mechanism is employed for effecting the operation of the gate 47. This gate has link connections 82 with the depending arms 83 of bell crank levers, and these levers are carried by a sleeve 84 and have rearwardly extending arms 85 disposed in the path of movement of a roller 86 jour-

naled to and between the heads 58. It will thus be evident that as the heads are revolved, the roller 86 striking the rear end of the arm 85 of the bell crank will move the same downwardly, thus swinging the arm 83 in a direction to cause the gate 47 to slide to its closed position. The roller 86 is preferably disposed slightly in advance of the cam rollers 60 mounted on the outer sides of the heads 58. The said bell cranks furthermore have upstanding arms 87, and links 88, connected thereto, are connected to upstanding ears 89 of a trip 90. This trip has its forwardly extending end disposed in the path of movement of a pin 91 carried by the forming mold. Therefore upon the downward movement of said forming mold, the trip 90 will be swung, consequently drawing upon the links 88, swinging the depending arms 83 rearwardly, and causing the gate 47 to open.

The operation of the machine is as follows: The material in proper proportions and in dry condition is carried upwardly by the elevator 34 and delivered through the spout 35 upon the upper revolving mixer 18. This mixer throws it upon the lower oppositely revolving mixer so that the material is thoroughly commingled and is delivered by the spout 21 into the drum 22. Here it is moistened and again mixed, finally passing from the lower end of the drum 22 into the top of the forming mold. Assuming the mold in elevated position, as illustrated in Figs. 1 and 2, it will remain in said position until the weight of the material placed therein, together with the weight of the mold is sufficient to overcome the tension of the springs 80, whereupon, as already described, the rollers 79 will be forced rearwardly and the mold will drop. In the meantime, a finishing mold 14 has been placed upon the platform 13 directly below the lower end of the forming mold, and as the said forming mold drops, the pin 91 striking the trip 90 will cause the gate 47 to open. The result is that the material will drop with considerable force into the finishing mold and fill the same. The downward movement of the forming mold will of course swing the levers 54 and this will carry the stop hook 68 out of engagement with the extension 70 of the arm 55. Therefore the spring 67 will act to carry the clutch member 63 into coaction with the clutch member 62, and the driven shaft 31 will be clutched to the driving wheel 32. The heads 58 will therefore be rotated, and thus the roller 86 will engage the rear arms 85 of the bell crank, swinging the same to close the gate. Immediately afterward the cam 59 and cam holder 60 will engage the rear end 61 of the levers 56, swinging the same downwardly and elevating the forming mold. Upon this movement, the locking rollers 79 will reengage upon the

track 76 and as the stop hook 68 is now positioned in the path of movement of the extension 70, the clutch will be operated to disconnect the driving and driven members. The mold will thus be locked until the feeding means has again delivered a sufficient quantity to force the rollers from the track against the tension of the springs which tension can be regulated as desired by hooking more or less of the coils to the arms.

One of the features of importance in the machine is the above described forming mold. It is preferably constructed of sheet metal, and it will be evident that it contains a quantity of material sufficient to form a number of the blocks or other articles. Each time it falls therefore the material dropping with considerable force will be compacted, and furthermore the action of the material against the smooth sides will cause the surfaces to assume a smooth polished appearance and make them substantially waterproof. It will also be observed that the openings will be formed for the cores so that inner as well as outer surfaces of the above character will thus be produced. At the same time, the mechanism is entirely automatic, the only manual labor required being the introduction and removal of the finishing molds.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a molding mechanism of the class described, the combination of a feeding mechanism having a fixed point of discharge, a forming mold disposed under the same and movable in the line of fall of the material from the feeding means and having a hopper to receive the said material, said mold being divided into compartments open at their upper and lower ends, a fixed finishing mold divided into compartments communicating with those of the forming mold, and means for actuating the forming mold back and forth between the fixed mold and feeding means to compress and deliver the material to the finishing mold.

2. In a molding mechanism of the class described, the combination of a rotary feeding conduit having a fixed point of discharge, a forming mold open at both ends and mounted for vertical movement under the discharge end of the conduit, a fixed finishing mold arranged under the lower end

of the forming mold to receive material therefrom, and a valve carried by the forming mold to close the lower end thereof.

3. In molding mechanism of the character set forth, the combination with a finishing mold, of a forming mold located above and having a cross sectional area substantially equal to that of the finishing mold, means for moving the forming mold with respect to the finishing mold to compress the material placed therein, and means for governing the passage of material from the forming mold to the finishing mold.

4. In molding mechanism of the character set forth, the combination with a finishing mold, of a forming mold located above and having a cross sectional area substantially equal to that of the finishing mold, means for effecting a vertical movement of the forming mold toward and from the finishing mold to compact the material placed therein, and means for governing the passage of material from the forming mold to the finishing mold.

5. In a molding mechanism of the class described, the combination with a finishing mold, of a forming mold located above and having a cross-sectional area substantially equal to that of the finishing mold, said forming mold being of a greater height than the finishing mold, means effecting a vertical movement of the forming mold toward and from the finishing mold to compact the material placed therein, and means for governing the passage of the material from the forming mold to the finishing mold.

6. In molding mechanism of the character set forth, the combination with a finishing mold having a core therein, of a forming mold located above the finishing mold and having a core located in line with the core of said finishing mold, means for feeding material into the forming mold, and means for governing the passage of the material from the forming mold to the finishing mold.

7. In molding mechanism of the character set forth, the combination with a finishing mold having a core therein, of a vertically movable forming mold located above the finishing mold and having a core disposed in line with the core of said finishing mold, means for feeding material into the top of the forming mold, means for controlling the passage of the material from the bottom of the forming mold into the finishing mold, and means for effecting a vertical reciprocatory movement of the forming mold to compact the material placed therein.

8. In molding mechanism of the character set forth, the combination with a finishing mold support, of a vertically movable forming mold located above the support, means for feeding material into the top of the forming mold, a gate located in the bottom

of the forming mold, means for effecting a vertical movement of the forming mold toward and from the support to compact the material placed therein, and means for operating the gate to deliver the packed material from the bottom of the forming mold into a finishing mold placed upon the support.

9. In molding mechanism of the character set forth, the combination with a finishing mold support, of a vertically movable forming mold located above the same, said forming mold comprising relatively adjustable walls and removable cores, means for feeding material into the top of the forming mold, a gate located in the bottom of the forming mold, means for effecting a vertical movement of the forming mold to compact the material placed therein, and means for operating the gate to deliver the packed material from the bottom of the forming mold into a finishing mold placed upon the support.

10. In molding mechanism of the character set forth, the combination with a supporting frame, of a mold supporting platform carried thereby, vertical guides rising from said platform, a vertically movable forming mold slidably mounted in the guides, feeding means located on the frame and delivering into the top of the forming mold, means for controlling the passage of the material from the bottom of the forming mold, and mechanism for effecting a vertical movement of the forming mold toward and from the mold supporting platform.

11. In molding mechanism of the character set forth, the combination with a movable forming mold, of means for moving the same, means for directing material into the forming mold, means for automatically locking the forming mold against movement until a predetermined amount of material has been placed therein, and means for delivering a portion only of the material from the forming mold.

12. In molding mechanism of the character set forth, the combination with a forming mold movable in opposite directions, of means for moving the same in one direction, means for directing material into the forming mold, means for permitting the discharge of a portion only of said material, and means for automatically locking the forming mold against movement in an opposite direction, said means being automatically movable to an inoperative position by the weight of material in the mold.

13. In molding mechanism of the character set forth, the combination with a vertically movable forming mold, of means for delivering material into the top of the same, means for successively discharging amounts of material less than the complete amount in the mold from the bottom of said forming mold, means for elevating the said forming

41
mold, and a lock for automatically holding the forming mold against downward movement until material of a predetermined weight has been placed therein.

5 14. In molding mechanism of the character set forth, the combination with a vertically movable forming mold, of means for elevating the same, means for directing material into the forming mold, means for
10 automatically locking the forming mold in its elevated position until a predetermined amount of material has been delivered thereto, and means for delivering a portion only
15 of such material from the forming mold when the same is unlocked.

15 15. In molding mechanism of the character set forth, the combination with a finishing mold and a forming mold movable into and out of coaction with said finishing mold,
20 of automatic means controlling its movement, a movable closure for the forming mold, and mechanism operated by the automatic movement controlling means for effecting the movement of the closure.

25 16. In molding mechanism of the character set forth, the combination with a finishing mold and a forming mold, movable into and out of coaction with each other, of a lever connected thereto, a spring engaging
30 the lever to prevent movement of the forming mold until material of a predetermined weight has been placed therein, a closure for the bottom of the forming mold, and means actuated by the lever for actuating said
35 closure.

17. In molding mechanism of the character set forth, the combination with a finishing mold and a forming mold movable into and out of coaction with the finishing mold,
40 of automatic means controlling its movement and including a lever connected to the forming mold, and means actuated by the lever for controlling the discharge of material from the forming mold.

45 18. In molding mechanism of the character set forth, the combination with feeding means, of a forming mold vertically movable toward and from the feeding means, a lever having an inclined track, means connected
50 to the lever to elevate the forming mold toward the feeding means, a swinging locking arm having a roller which operates on the track and holds the forming mold elevated until a predetermined amount of material has been placed therein, a closure for
55 the bottom of the forming mold movably mounted on said mold, and automatic means operated by the lever for moving the closure on the movement of the forming mold.

60 19. In molding mechanism of the character set forth, the combination with a movable forming mold, of mechanism for moving the same in one direction, driving means for said moving mechanism having a clutch
65 connection therewith, and automatic means

for disconnecting the said mechanism from the driving means when the forming mold reaches a predetermined position.

20. In molding mechanism of the character set forth, the combination with feeding means, of a forming mold movable toward
70 and from the same, mechanism for moving the forming mold toward the feeding means, driving means for said mechanism having a detachable connection therewith, and auto-
75 matic means for disconnecting said mechanism from the driving means when the forming mold reaches a cooperative position with respect to the feeding means.

21. In molding mechanism of the character set forth, the combination with a movable forming mold, of mechanism for moving the same in one direction, driving means for said mechanism, a clutch for connecting
80 and disconnecting the driving means and moving mechanism, and automatic means for operating said clutch to disconnect the mechanism from the driving means when the
85 forming mold reaches a predetermined position.

22. In molding mechanism of the character set forth, the combination with a mold movable in opposite directions, of mechanism for moving the mold in one direction, driving means detachably associated with the
90 moving mechanism to operate the same, means for disconnecting the moving mechanism from the driving means when the mold reaches a predetermined position in one direction, and means for connecting the
95 moving mechanism and driving means when the mold reaches a predetermined position in another direction.

23. In molding mechanism of the character set forth, the combination with a mold
105 movable in opposite directions, of mechanism for moving the mold in one direction, driving means for said mechanism, a clutch for connecting and disconnecting the moving mechanism and the driving means, means
110 for operating the clutch to disconnect the moving mechanism from the driving means when the mold reaches a predetermined position in one direction, and means for operating the clutch to connect the driving means
115 and moving mechanism when the mold reaches a predetermined position in an opposite direction.

24. In molding mechanism of the character set forth, the combination with feeding means, of a mold vertically movable toward and from the feeding means, mechanism for moving the mold toward said feeding means, driving means for the moving mechanism, a clutch for connecting the
120 driving means to and disconnecting it from the moving mechanism, means for operating the clutch to disconnect the mechanism from the driving mechanism when the mold reaches a predetermined position in its
125

8

movement toward the feeding means, and means for operating the clutch to connect the moving mechanism and driving means when the mold reaches a predetermined position away from the feeding means.

25. In molding mechanism of the character set forth, the combination with feeding means, of a mold vertically movable toward and away from the feeding means, mechanism for effecting the movement of the mold toward the feeding means including a rotatable driven member, a rotatable driving member for operating the driven member, a clutch for connecting the driving and driven members, said clutch including a rotatable actuating device, and a stop movable into and out of the path of movement of the actuating device to effect the movement of the clutch in order to connect and disconnect the driving and driven members.

26. In molding mechanism of the character set forth, the combination with feeding means, of a mold vertically movable toward and from the feeding means, a lever connected to the mold, a rotatable driven member for swinging the lever to move the mold toward the feeding means, a rotatable driving member, a clutch for connecting the members, an arm for moving the clutch, a spring for moving the arm in one direction, and a stop movable into and out of the path of movement of said arm to move it in an opposite direction.

27. In molding mechanism of the character set forth, the combination with a vertically movable mold, of a lever connected to the mold, a rotatable cam member for swinging the lever, a rotatable driving member, a clutch for connecting the driving and cam members, including an arm, means for automatically moving the arm in one direction to connect the members, and a stop operated by the lever and movable into and out of the path of movement of the arm for moving said arm to disconnect said members.

28. In molding mechanism of the character set forth, the combination with a mold movable in opposite directions, of mechanism for raising the mold, automatic means for disconnecting said mechanism from the mold, when raised and a lock for holding the mold raised against movement in an opposite direction until a predetermined amount of material has been placed in said mold.

29. In molding mechanism of the character set forth, the combination with a vertically movable mold, of a swinging lever connected to the mold, mechanism connected to the lever for moving the mold in one direction, said mechanism including a rotatable driven member, a rotatable driving member, a clutch connection between the members, means for operating the clutch to disconnect the members when the mold has

reached a predetermined position, and a lock for holding the mold in said predetermined position.

30. In molding mechanism of the character set forth, the combination with feeding means, of a mold vertically movable toward and from the feeding means, a lever connected to the mold, mechanism for moving the mold toward the feeding means, including a rotatable crank member, a rotatable driving member, and a clutch detachably connecting the members, said clutch including an actuating arm, a stop operated by the lever and movable into and out of the path of movement of the arm to disconnect the driving and crank members when the mold has reached a predetermined position with respect to the feeding means, and an automatic lock that engages the lever when the mold reaches said position to hold it against movement away from the feeding means, said lock being movable to an inoperative position when a predetermined amount of material has been placed in the mold.

31. In molding mechanism of the character set forth, the combination with a mold, of mechanism for feeding material thereto, said mechanism including means movable with respect to the mold for compacting the material prior to its introduction into the mold.

32. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, and a forming mold having a movement between the feeding means and the mold support and with respect thereto to compact the material delivered thereto by the feeding means prior to its passage to a mold placed upon the support.

33. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, and a forming mold having a movement between the feeding means and mold support and with respect to the same, said forming mold having an open top to receive the material from the feeding means and having a bottom discharge and a movable gate controlling said discharge.

34. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, a forming mold having a movement between and with respect to the feeding means and the mold support to compact the material delivered thereto by the feeding means prior to its passage to a mold placed upon the support, and means for effecting the movement of the forming mold between the feeding means and the support.

35. In a molding mechanism of the character set forth, the combination with a fixed finishing mold, of a movable forming mold aligned therewith and having two dimensions

41 the same as the finishing mold and having its third dimension greater than that of the finishing mold, a core extending in the direction of the third dimension of the forming mold for forming the material into separate sections, means for simultaneously feeding material into the spaces of the forming mold at opposite sides of the core, and means for feeding separate sections of material from the forming mold into the finishing mold.

36. In molding mechanism of the character set forth, the combination with a fixed finishing mold, of a movable forming mold, aligned therewith and having its length and breadth the same as the finishing mold, the thickness of said forming mold being greater than that of the finishing mold, means for effecting the movement of the forming mold toward and from the finishing mold, means for closing the bottom of the forming mold as it moves from the finishing mold, means for feeding the material into the forming mold, and means for effecting the discharge of said material in sections into the finishing mold.

37. In molding mechanism of the character set forth, the combination with feeding means, of a mold support located below the same, a mold movable between the feeding means and mold support, said mold having an inlet in its top and having a bottom discharge, a sliding gate controlling the discharge, means for sliding the gate to open position upon the downward movement of the mold, and means for closing the gate upon the upward movement of said mold.

38. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, a mold having a vertical movement between the mold support and the feeding means, said forming mold having a bottom discharge, a sliding gate controlling the discharge, a swinging lever connected to the gate, means for swinging the lever in one direction upon the elevation of the mold, and means operated by the mold to swing the lever in an opposite direction upon the downward movement of the mold.

39. In molding mechanism of the character set forth, the combination with a vertically movable mold having a bottom discharge, of a sliding gate controlling the discharge, a lever connected to the gate, a rotatable member for swinging the lever in one direction, and a trip actuated by the mold for swinging the lever in an opposite direction.

40. In molding mechanism of the character set forth, the combination with a vertically-movable mold having a bottom discharge opening, of a sliding gate controlling the discharge from said opening, and means having separate connections with the mold

and gate for elevating the mold and closing the gate, and allowing the same to fall and opening the gate.

41. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, a mold movable vertically between the mold support and feeding means, a sliding gate constituting the bottom of said forming mold, a lever having a plurality of arms, one of which is connected to the gate, means for elevating the mold, another of said arms being engaged by the elevating means, and a trip disposed in the path of movement of a portion of the mold and connected to another arm of the lever.

42. In molding mechanism of the character set forth, the combination with a mold support, of feeding means located above the same, a vertically movable mold operating between the mold support and feeding means, a lever connected to the mold, rotating means for swinging the lever to elevate the mold, a gate constituting the bottom of said mold, a lever connected to the gate and having a portion disposed in the path of movement of the rotating means, a trip connected to the lever and having a portion disposed in the path of movement of the mold, and a spring lock engaging the first mentioned lever for holding the mold elevated until a predetermined amount of material has been placed therein.

43. In molding mechanism of the character set forth, the combination with a mold, of mechanism for feeding material thereto including means for compacting such material and forming core openings therein prior to the introduction of the material into the mold, and means for controlling the passage of material from the compacting and core opening means into the mold.

44. In molding mechanism of the character set forth, the combination with a mold, of feeding means including material carrying means movable toward and from a predetermined position, mechanism for thus moving said material carrying means, and means for automatically disconnecting the material carrying means from the moving mechanism when said carrying means reaches such position.

45. In molding mechanism of the character set forth, the combination with movable carrying means having a discharge opening, of a movable closure for said discharge opening, operating means connected to the closure and automatically operated by the carrying means on its movement to effect the movement of the closure, and mechanism connected to said operating means for moving the carrying means.

46. In molding mechanism of the character set forth, the combination with a vertically-movable mold having a bottom discharge

charge opening, of a reciprocatory gate operating transversely to the mold and controlling said opening, and means connected with the gate and having a portion disposed in the path of movement of the mold for closing said gate on the upward movement of the mold, and opening said gate to discharge the contents when the mold has reached its lowermost position.

10 47. In molding mechanism of the character set forth, a forming mold, means for raising the mold and allowing it to drop to compact the material therein, means for delivering a section of molded material from within the forming mold when the latter

falls to its lowermost position, means for preventing the passage of more material therefrom upon the raising of the mold, and means for delivering a fresh supply of material into the upper end of the mold when the latter is in its uppermost position, equal in amount to the material discharged from the mold on that reciprocation.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN ALBERT McNAMARA.

Witnesses:

JOHN T. BRASCH,
HENRY N. STANG.

Hoban, 656.656, 11/12/01 (25-42)

Romick, 852.579, 5/7/07 (25-2)

Italy, 762.007, 6/7/04. (25-Hyp. Dr.)

Duffendorf, 852.934, 5/7/07 (25-56)

Emery, 777.086, 12/13/04 "

Arson, 372.600, 11/1/87 (25-37)

Coleman, 702.634, 6/17/02 (72-Weigh. Elec. Contr.)

Gabley, 343.763, 6/5/86 (72-Weigh. Misc.)

Harold, 440.355, 1/11/90 "

Cagnie, 829.012, 8/21/06 (25-61)

Curran, 632.284, 9/5/99 (73-Misc.)

Coffey, 37.348, 1/6/63 (25-46)

" 289.422, 12/4/83 "

Adams, 694.388, 4/8/02 (Gag. Dig.)