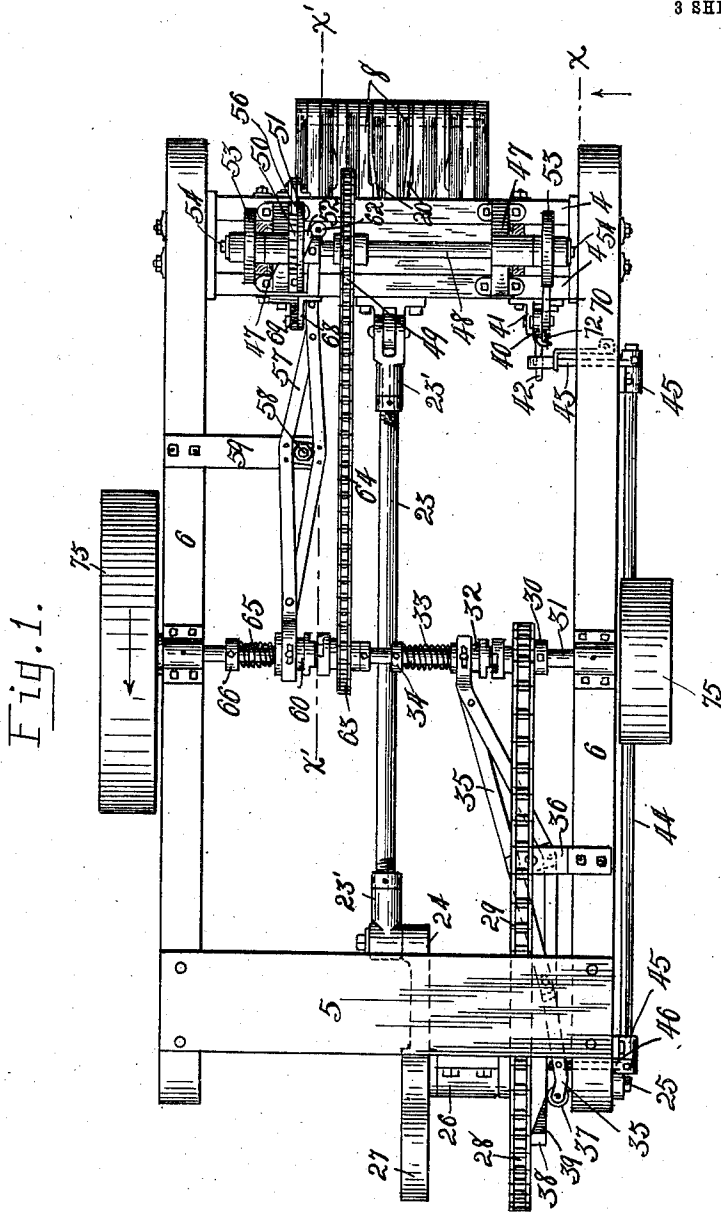


P. J. MEAD.
BRICKMAKING MACHINE.
APPLICATION FILED MAY 16, 1910.

986,584.

Patented Mar. 14, 1911.

3 SHEETS—SHEET 1.



WITNESSES:

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Philip J. Mead,
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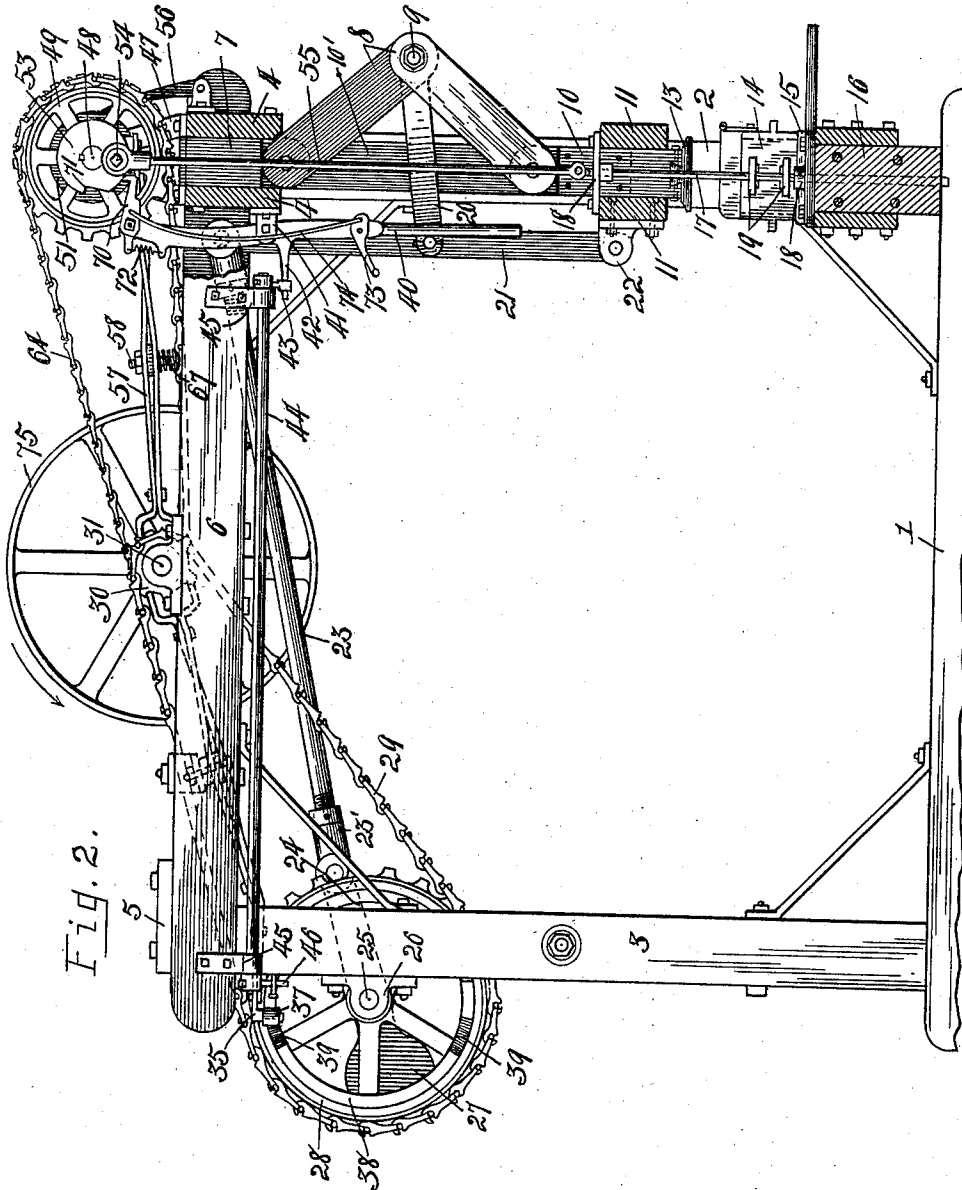


Fig. 2.

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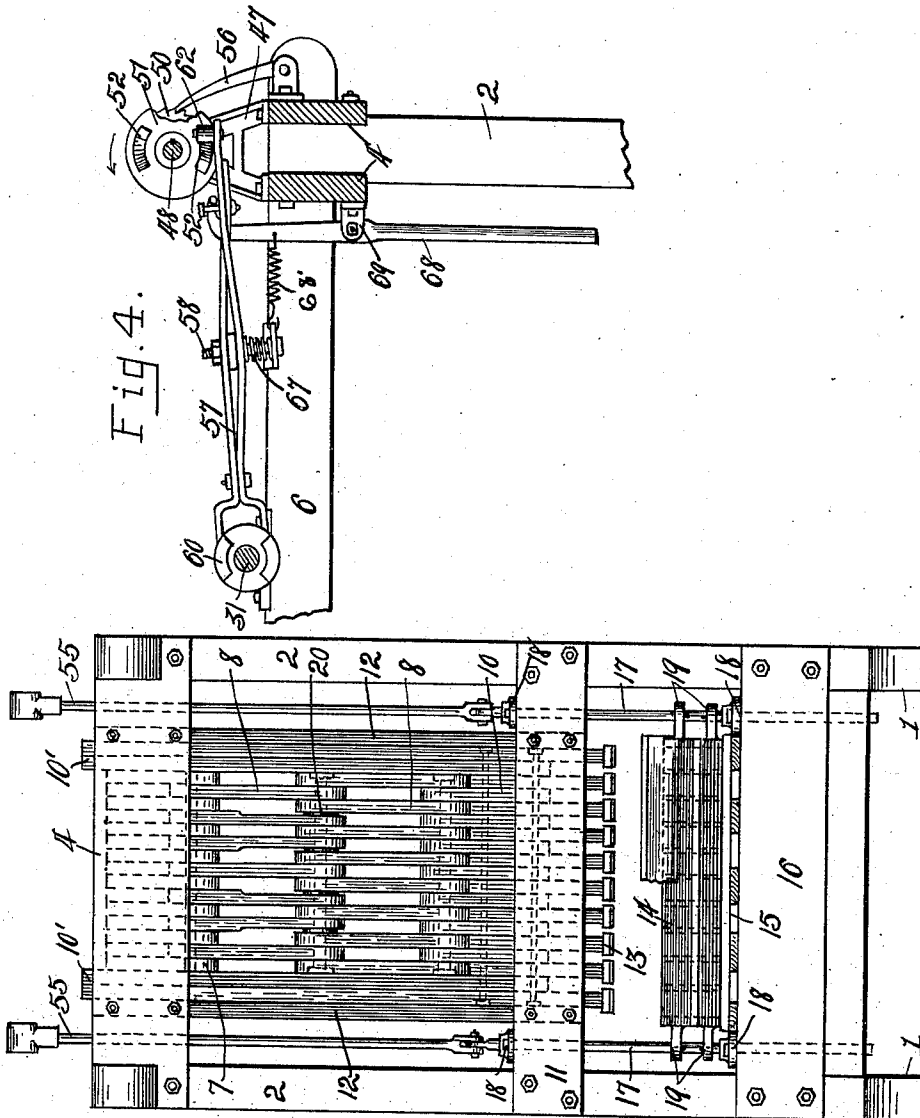
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

PHILIP J. MEAD, OF MORENCI, MICHIGAN.

BRICKMAKING-MACHINE.

986,584.

Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed May 16, 1910. Serial No. 561,764.

To all whom it may concern:

Be it known that I, PHILIP J. MEAD, a citizen of the United States, and a resident of Morenci, in the county of Lenawee and State of Michigan, have invented a certain new and useful Brickmaking-Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to machines of the class adapted for the molding and pressing of clay, concrete or other analogous material into bricks, blocks or the like, of desired size and form.

The object of my invention is to improve upon the machine described and claimed in United States Letters Patent No. 940,177, granted to me on November 16th, 1909, whereby to make such machine power operative and largely automatic in its operations, thus increasing the machine output and enhancing its practicability and commercial value.

The invention is fully described in the following specification, and a preferred embodiment thereof illustrated in the accompanying drawings, in which,—

Figure 1 is a plan view of the machine. Fig. 2 is a side elevation thereof with a part in section on the line x in Fig. 1. Fig. 3 is a front elevation of the machine with portions broken away, and Fig. 4 is a sectional view of a portion of the machine on the line $x' x'$ in Fig. 1.

Referring to the drawings, the machine frame is shown as comprising the base 1, the forward and rear sets of uprights 2 and 3, respectively, the cross-pieces or beams 4, 4 connecting the upper ends of the forward uprights, the cross-piece or beam 5 connecting the upper ends of the rear uprights, and the side-beams 6, 6 connecting the upper ends of the front and rear upright.

The front cross-pieces 4, 4 are horizontally spaced and have blocks or other suitable means 7 secured therebetween and adjacent their central portions to the under side of which the upper ends of the upper ones of the sets of toggle links 8 are pivoted. The upper and lower sets of such links are pivotally connected at their inner ends by a rod

9, and the links of the lower set pivotally connect at their lower ends to the plunger 10, which is guided for vertical reciprocatory movements by the cross-pieces 11, 11 arranged on opposite sides of the upright 2. Projecting upwardly from the ends of the plunger 10 are the guide-bars 10' which are disposed at opposite sides of the sets of links 8 and have their upper ends working through guide openings between the cross-pieces 4. Connecting the cross-pieces 4 and 11 without the guide-bars 10' are the fixed guides 12 between which the plunger and connected parts work.

Plunger-shoes or tamping members 13 project downwardly from the under side of the plunger 10, and when lowered with the plunger work within the registering brick or block molding compartments of a mold or matrix 14 of suitable form to compress material therein. The mold 14 is intended to rest upon a removable board or pallet 15, which in turn rests upon a mold bed or base 16 connecting the lower portions of the uprights 2. Rods 17, 17 are guided for vertical-reciprocatory movement at the ends of the mold 14 by suitable guides 18 carried by the cross-pieces 11 and the bed 16, and are attached to ears 19 projecting from the ends of the mold 14 to cause the mold to raise and lower with such rods. The rods 17 are reciprocated by means hereinafter described.

The rod 9, which pivotally connects the inner ends of the sets of links 8, is connected by a plurality of links 20 to a vertical lever 21, which is fulcrumed at its lower end to a bracket 22 secured to the outer side of the rear cross-piece 11 (Figs. 1 and 2) and has its upper end pivotally attached to the forward end of a pitman or connecting rod 23. The rear end of this pitman is attached to a crank-arm 24 projecting from a shaft 25, which is journaled in suitable bearings 26 carried by the rear upright portion of the frame. The crank-arm 24 has a counterweight 27 projecting from its inner end to serve to resist a lowering of the opposite end of such arm when in the position shown in Figs. 1 and 2.

A sprocket-wheel 28 is mounted on the shaft 25 and is connected by a sprocket-chain 29 to a smaller sprocket-wheel 30 mounted loosely on a drive-shaft 31, which is journaled in suitable bearings upon and transversely of the side-bars 6 of the frame. A clutch-sleeve 32 is feathered to the shaft 31

at one end of the hub of the sprocket 30 and is influenced to normally move into clutch engagement with such hub by a coiled compression spring 33 on the shaft, such spring
 5 having its opposite end thrust against a collar 34 fixed to the shaft. A shift-lever 35 is fulcrumed adjacent its center to a bracket 36 projecting from one of the side beams 6 and has one end in operative en-
 10 gagement with the clutch-sleeve 32, while its opposite end is provided with a roll 37 which normally travels on the outer edge of an annular flange 38 secured to one side of the sprocket-wheel 28, such flange serving
 15 to hold the lever 35 in clutch-released position, as indicated. The lever 35 in the present instance is made of spring metal and when it is desired to engage the clutch-sleeve 32 and sprocket 30 the roll-end of
 20 such lever is sprung to radially throw it out of register with the edge of the flange 38 to permit an oscillation of the lever under the influence of the spring 33 and a consequent engagement of the clutch. The clutch being
 25 engaged, a disengagement of the same is effected at predetermined points in the rotation of the shaft 25 due to the flange 38 being provided with notches 39 at proper points thereon the bottoms of which incline
 30 outwardly in a direction opposed to the direction of rotation of the shaft 25 whereby the roll 37 is permitted to spring within a notch 39 which moves into register therewith and the inclined bottom of such notch acts
 35 on the roll to move it and the shift-lever to clutch releasing position, thus stopping the rotation of the shaft 25.

To release the roll 37 from engagement with the edge of the flange 38 to permit an
 40 engagement of the clutch-sleeve 32 with its sprocket-hub, the operator works a control-lever 40, which projects downwardly from and is fulcrumed to a bracket 41 on the outer side of the rear one of the cross-pieces 4.
 45 This lever is of the bell-crank type, as it has an arm 42 projecting rearwardly therefrom adjacent its fulcrum, the free end of which arm works in an eye in the outer end on an arm 43 projecting horizontally from
 50 a rock-shaft 44. The shaft 44 is journaled longitudinally of one of the side-beams 6 of the frame in bearings 45 secured thereto and has an arm 46 projecting horizontally from its rear end and under the rear end of
 55 the shift-lever 35 whereby upon a raising of the outer end of such arm by a rocking of the shaft the rear end of the shift-lever is lifted to raise the roll 37 thereon above the flange 38 to permit a movement of such lever
 60 to engage the associated clutch. It is evident that a turning of the shaft 25 imparts oscillation to the lever 21 through the medium of the crank-arm 24 and pitman 23 and a consequent straightening and break-
 65 ing action of the toggle-links 8 to raise and

lower the plunger 10. The throw of the toggle-links 8 can be adjusted to a nicety by a turning of the pitman rod 23 in the sockets 23' in which its ends are threaded. As one end of the pitman rod is right threaded 70 and the other left threaded, a turning of the rod will cause a lengthening or shortening of the pitman.

Journalled in suitable bearing standards 47 rising from the forward cross-piece 4 is 75 a shaft 48, which is disposed longitudinally of such pieces and carries a sprocket-wheel 49, a ratchet-wheel 50, a disk 51 having cam-lugs 52 on one side thereof, and at its ends the disks 53 having wrist-pins 54 project- 80 ing from the outer sides thereof. Pitmen 55 connect the wrist-pins 54 with the subjacent rods 17 attached to the ends of the mold 14, whereby a turning of the shaft 48 effects a raising and lowering of the mold. 85 A pawl 56 is pivoted to one end of the cross-pieces 4 and coacts with the ratchet-wheel 50 to prevent a back-turning of the shaft 48.

57 designates a shift-lever, which is fulcrumed to a pivot 58 rising from a bracket 90 59 and has one end in shifting engagement with a clutch-sleeve 60 feathered to the drive-shaft 31, and its other end carrying a roll 62. This roll is normally disposed in the path of revolution of the cam-lugs 52 95 on the disk 51 and is adapted to cooperate with such lugs, when in engagement with either, to shift the lever 57 to throw the clutch-sleeve out of engagement with the clutch and of the hub of the sprocket-wheel 100 63, which sprocket is carried by the shaft 31 and drives the sprocket-wheel 49 through the medium of the chain 64. A coiled compression spring 65 acts on the clutch-sleeve 60 to influence its engagement with the 105 sprocket-wheel 63 and has its outer end thrust against a collar 66 fixed to the shaft 31. The shift-lever 57 is normally held with its roll 62 in the path of revolution of the cam-lugs 52 by a coiled compression-spring 110 67, which is mounted on the pivot 58 with such lever.

A vertical control-lever 68 is fulcrumed to a bracket 69 secured to the rear side of the inner cross-piece 4 (Figs. 1 and 4) and 115 has its upper end angled forwardly at one side of the forward end portion of the shift-lever 57 and thence over the top of such lever in engagement therewith. It is thus evident that upon an oscillation of the 120 lever 68 in one direction its angled end will act on the lever 57 to move it so as to lower the roll 62 from engagement with the associated lug 52 and permit a shifting of the lever 57 and a movement of the clutch- 125 sleeve 60 into engagement with the hub of the sprocket 63. Upon a release of the lever 68, the lever springs back under the action of the spring 68' into position for its roll 62 to ride outwardly on the next cam-lug 130

52 to again shift the lever 57 to disengage the clutch.

The control-lever 40 has its upper end projected above its fulcrum and carries a dog 70 at its free end, which dog has its nose yieldingly bearing against the periphery of the associated disk 53 to adapt it to be engaged by a notch 71 in such disk at a predetermined point in a rotation of the disk, as hereinafter more fully described. A spring 72 acts on a dog 70 to hold it in engagement with the disk. Upon an engagement of the notch 71 with the dog the lever 40 is automatically thrown to rock the shaft 44 to effect a tripping of the lever 35 and a consequent engagement of the associated clutch to throw the plunger actuating parts into action. A lever 73 is carried by the handle portion of the lever 40 and connects with the dog 70 through the medium of the rod 74, whereby such dog may be moved out of notch engaging position by a movement of the lever in one direction.

75 designates a pulley on either end of the drive-shaft 31.

The operation of my machine is as follows: The mold 14 having been filled with the material to be pressed into the bricks or blocks being formed, the operator throws the control-lever 40 to the rear and effects a rocking of the shaft 44 whereby to cause the arm 46 projecting from the rear end thereof to move upwardly under the rear end of the shift-lever 35 to spring such end of the lever out of position for its roller 37 to ride against the flange 38 of the sprocket-wheel 28, thus permitting the clutch-sleeve 32, actuated by the spring 33, to move into clutch engagement with the hub of the sprocket-wheel 30. Upon an engagement of the clutch-sleeve and sprocket, rotation is communicated to the shaft 25 through the medium of the chain 29 and sprocket-wheel 28. As the shaft turns, the crank-arm 24 thereon draws the pitman 23 to the rear, which in turn rocks the connected lever 21 to the rear and effects a straightening of the toggle links 8 to lower the plunger shoes or tampers 13 within the mold 14 to compress the material therein. When the shaft 25 has completed a little more than half a revolution, or has moved the pitman 23 sufficiently to impart a full down stroke of the plunger 10 and raise the plunger slightly to remove the pressure of the same from the formed bricks or blocks to prevent the crushing of the same when the mold is raised, a notch 39 in the flange 38 of the sprocket-wheel 28 moves into register with the shift-lever roll 37 to permit such roll to spring therein and coast with the inclined bottom of the notch to effect a stopping of the rotation of the shaft by shifting the lever 35 to release the associated clutch. The operator now moves the control-lever

68 so that the roll 62 on the end of the shift-lever 57 will be drawn downwardly out of engagement with the raised end of the cam-lug 52 on the disk 51, thus permitting the attached clutch sleeve 60 to move under the influence of the spring 65 into clutch engagement with the sprocket-wheel 63. The rotation of the sprocket-wheel 63 is communicated to the shaft 48 through the medium of the sprocket-chain 64 and sprocket-wheel 49, and as the shaft 48 turns the wrist-pins 54 will be caused to revolve and raise the pitmen 55, rods 17, and attached mold 14. Upon a movement of the lever 68 to release the roll 62 from an engaged lug the operator immediately releases such lever to permit it and the roll 62 to return to normal position. When substantially a half revolution has been communicated to the shaft 48 and wrist-pins 54, a cam-lug 52 on the disk 51 moves into engagement with and forces the roll 62 outwardly thus moving the lever 57 to shift the clutch-sleeve 60 to disengage the sprocket 63.

At a predetermined point in the partial revolution of the shaft 54 which effects a raising of the mold 14, the notch 71 in one of the disks 53 engages and moves the dog 70 to throw the lever 40 so as to rock the shaft 44 and cause a release of the roll 37 from the edge of the flange 38 to permit the clutch-sleeve 32 to move to engage the sprocket 30, as above described. As the shaft 25 is thus thrown into driving connection with the shaft 31, such shaft completes the revolution previously started and moves the pitman 23, lever 21, links 20 and toggle-links 8 to raise the plunger 10 to elevated position, thus completing a cycle of operations of the machine. The operator now removes the pallet 15 with the molded bricks thereon and then places another pallet on the bed 16 preparatory to lowering the mold 14 thereon. To lower the mold 14, it is only necessary to move the control lever 68 to disengage the roll 62 from the engaged cam-lug 52 on the disk 51 to permit an engagement of the clutch sleeve 60 and sprocket 63. As the sleeve and sprocket are thus engaged, rotation is communicated to the shaft 48 to lower the mold 14. When the mold has been completely lowered, the driving mechanism is thrown out of driving engagement with the shaft 48 due to the roll 62 coasting with a cam-lug 52 on the disk 51. It is apparent in the operation of this machine that upon a down stroke of the plunger 10 the actuating parts continue their movements a sufficient distance to release the full pressure of the plunger upon the formed bricks, for if this were not done the bricks would be crushed upon a raising of the mold. The plunger, however, is not raised sufficiently to entirely release its

pressure upon the bricks, thus preventing the edges of the bricks from being chipped off by a raising of the mold. By rendering the pitman 23 longitudinally adjustable as shown, the pressure of the plunger upon the molded bricks can be adjusted to a nicety.

I wish it understood that my invention is not restricted to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

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

1. In a machine of the class described, the combination with a mold and a plunger movable to compress material therein, of drive means, mechanism actuated by said drive means to reciprocate the plunger, means automatically operative at a predetermined point in a cycle of operations of such mechanism to throw the same out of driving connection with said drive means, means actuated by said drive means for raising and lowering the mold, means automatically actuated upon an elevating of the mold to break the driving connections between said drive means and mold actuating means, and means automatically actuated by a movement of said mold actuating means to throw said mechanism into driving connection with the drive means to move the plunger to inoperative position.

2. In a machine of the class described, the combination of a mold, a plunger, a drive-shaft, mechanism connecting the drive-shaft and plunger and operative by a turning of the shaft to reciprocate the plunger, a clutch influenced to normally connect said drive-shaft and mechanism, a shift-lever associated with such clutch, said mechanism having a part for acting on the lever at a predetermined point in a cycle of operations of the mechanism to shift the lever to release the clutch, and means which is manually operative to release the lever from such part.

3. In a machine of the class described, a mold, a reciprocatory plunger for coöperating with the mold to form bricks, toggle means attached to and movable to reciprocate the plunger, a drive-shaft, a counter-shaft, connection between the drive and counter-shafts for communicating rotation from one to the other, a revoluble part on the countershaft having connection with the toggle means to operate the same when the shaft is rotated, a clutch influenced to normally engage the drive-shaft and said shaft engaging means, a shift-lever for such clutch having connection with a part of said shaft connecting means whereby it is moved to disengage the clutch at a predetermined point in a cycle of operations of the machine, and means which is manually oper-

ative to move the shift-lever to permit an engagement of the clutch.

4. In a machine of the class described, the combination with a reciprocatory plunger, and toggle means for operating the same, of a drive-shaft, a counter-shaft, a revoluble part, drive means connecting said shafts, a clutch influenced to normally engage the drive-shaft and drive means, said drive means having a rotatable part on the counter-shaft provided with an annular flange having tapered-bottom notches therein, a shift-lever engaging such clutch and coacting with said flange to normally retain the clutch out of driving engagement, manually operated means for moving said lever out of engagement with the flange to permit an engagement of the clutch, said clutch being automatically disengaged when a flange notch moves into register with the flange coacting part of the lever, a member revolubly carried by the shaft, a lever connected to the toggle links and a pitman connecting said member and toggle lever to operate the toggle upon a rotation of the counter-shaft.

5. In a machine of the class described, the combination with a mold, and a plunger, of drive means, mechanism in clutch controlled connection with said drive means for reciprocating the plunger, mechanism in clutch control connection with the drive means for reciprocating the mold, means for throwing the plunger operating mechanism into operation, means for throwing the mold operating mechanism into operation, said first mentioned means and plunger operating mechanism having parts which coöperate to automatically disengage the driving means of such mechanism at a predetermined point in a cycle of operations, and said mold operating mechanism and second mentioned means having parts which coact to automatically throw the plunger operating mechanism into operation at a predetermined point in a cycle of operations of the mold operating mechanism.

6. In a machine of the class described, the combination with a mold, of drive means, a shaft, connection between said shaft and mold whereby the mold is raised and lowered upon a rotation of the shaft, means for communicating rotation from said drive means to said shaft, a clutch influenced to normally engage said drive means and connecting means, a shift-lever, and means revoluble with the shaft to automatically operate the shift lever to release the clutch at predetermined points in a revolution of the shaft.

7. In a machine of the class described, the combination with a mold, of a driven shaft having crank and pitman communication with such mold to raise and lower the same upon a rotation of the shaft, a drive-shaft,

clutch connections between said shafts, means manually operative to permit a driving engagement of said drive-shaft and clutch controlled means, and a part revoluble with
5 said first mentioned shaft for coacting with a part of said manually controlled means whereby to automatically break the driving connection between said shafts at predetermined points in a rotation of the driven
10 shaft.

8. In a machine of the class described, the combination with a mold, and a cooperating plunger, of a drive-shaft, mechanism in clutch-controlled connection with said drive-
15 shaft for reciprocating the plunger, a clutch influenced to normally engage said shaft and mechanism, a shift-lever associated with such clutch and normally acted on by a part of such mechanism to hold the clutch in released position, said part and shift-lever
20 being adapted to coact to effect a disengagement of such clutch after said mechanism

has imparted a compressing stroke to the plunger and started on its return stroke, whereby the plunger acts on a compressed
25 article with only a portion of its compressing force, means for manually controlling such shift-lever, mechanism actuated by said drive-shaft to raise the mold, a clutch influenced to normally engage said mecha-
30 nism and shaft, automatically operative at a predetermined point in a cycle of operations of such mechanism to disengage the clutch whereby to hold the mold in elevated
35 position, and means for manually controlling the movement of said-clutch controlling means.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

PHILIP J. MEAD.

Witnesses:

C. W. OWEN,
E. E. THOMAS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
