

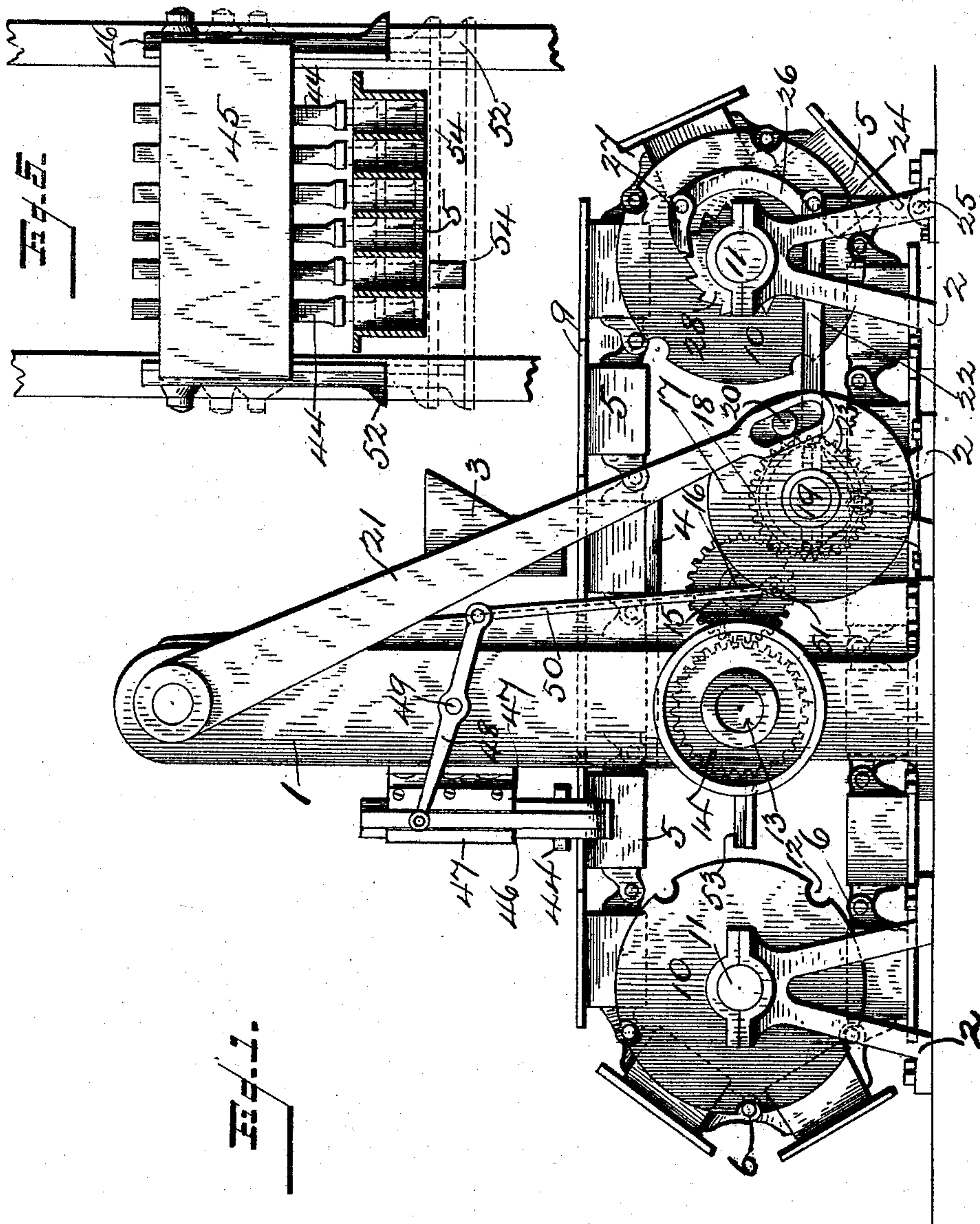
(No Model.)

3 Sheets—Sheet 1.

W. ACTON.
BRICK MACHINE.

No. 505,285.

Patented Sept. 19, 1893.



Witnesses

C. E. Hunt.
a. R. Brown.

Inventor
William Acton
By Chas. J. Gooch
Attorney

(No Model.)

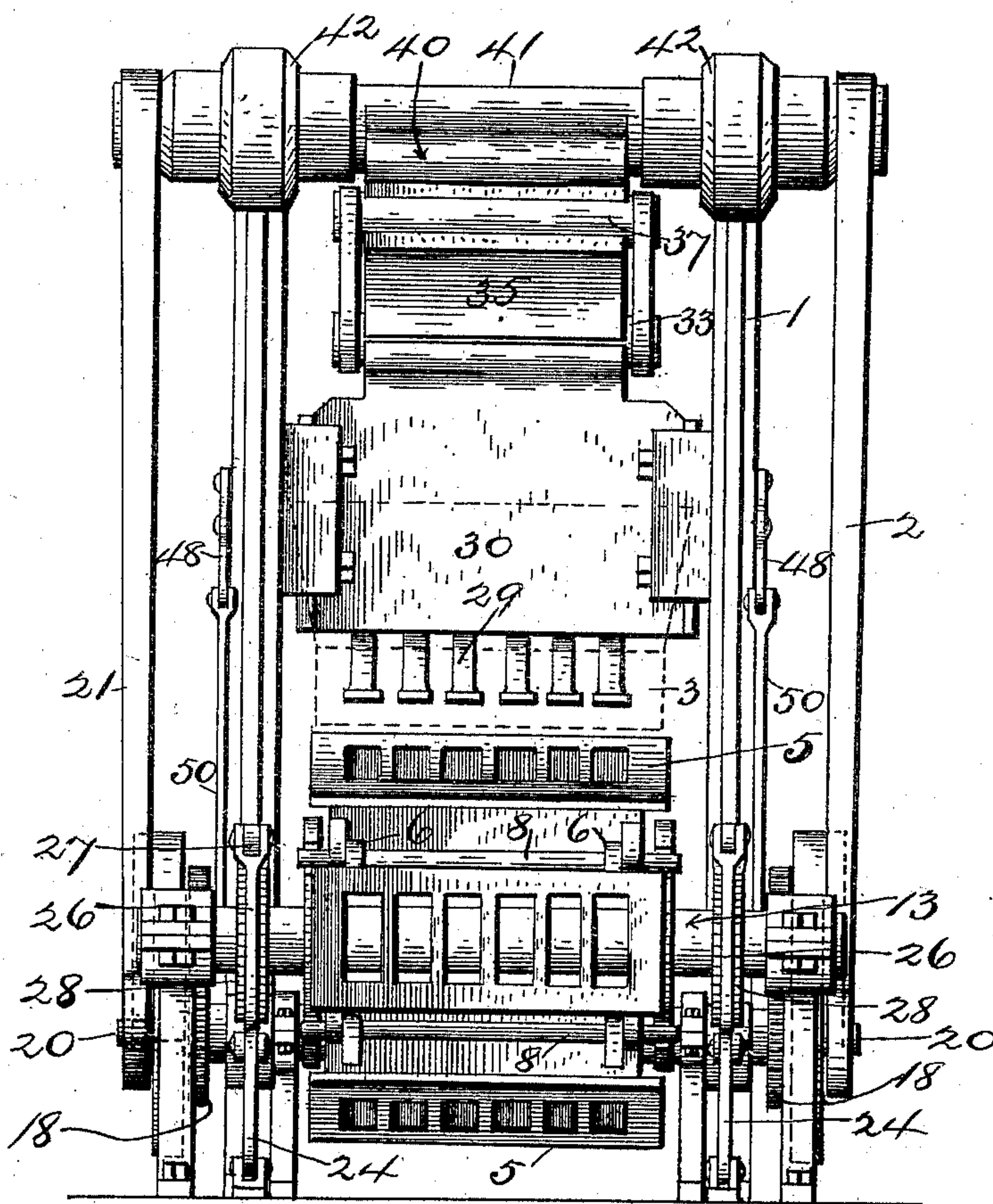
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Fig. 2.



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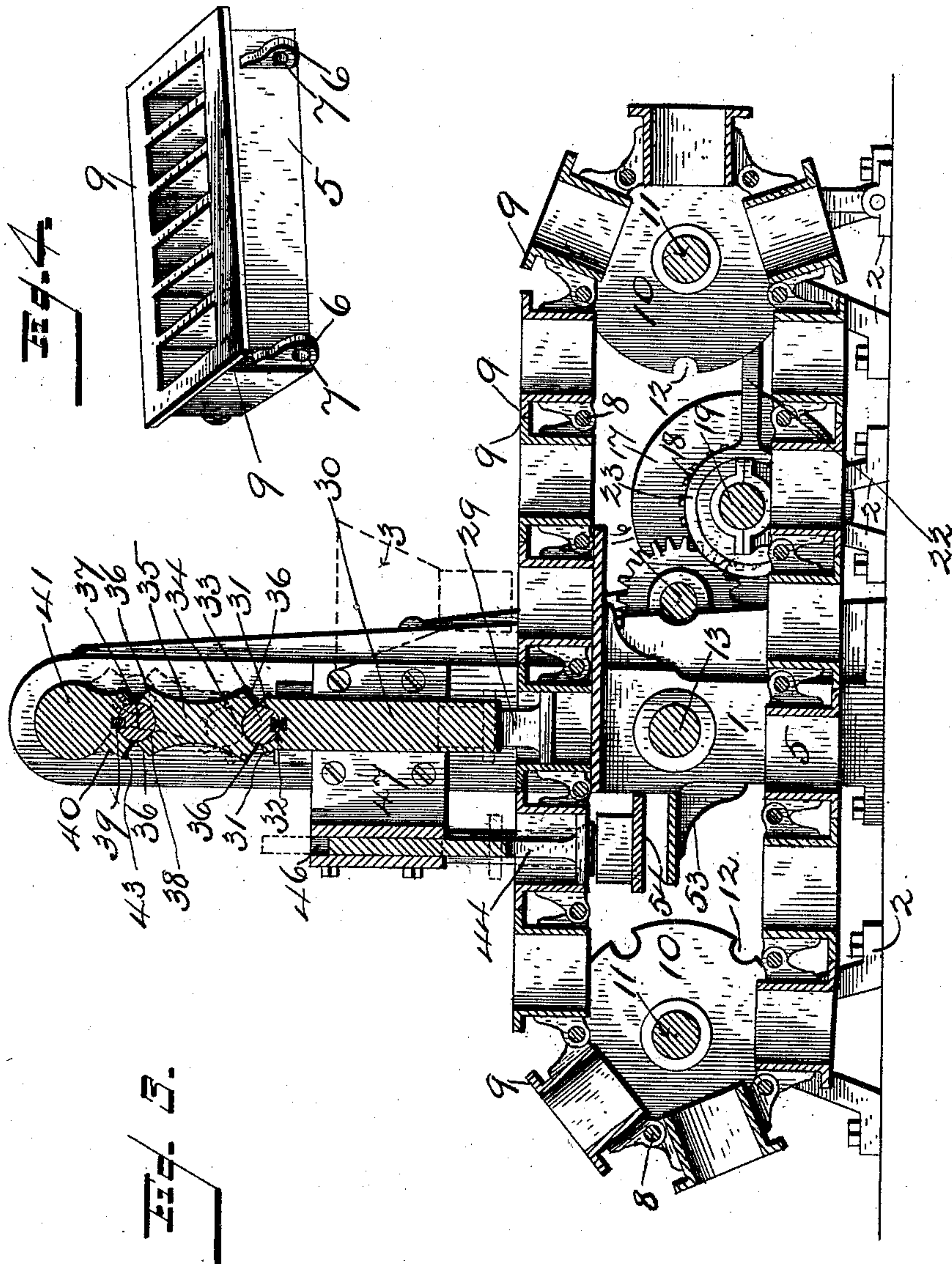
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UNITED STATES PATENT OFFICE.

WILLIAM ACTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THOMAS T. WOOD, OF
ST. JOSEPH, MICHIGAN.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 505,285, dated September 19, 1893.

Application filed October 31, 1892. Serial No. 450,542. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ACTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Bricks, Blocks, and Analogous Articles; 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.

This invention relates to improvements in machines for making bricks, blocks, and analogous articles.

My present improvements, as hereinafter set forth, have more especial reference to the molds, pressing and ejector devices and the mechanism for operating the same.

In the accompanying drawings Figure 1 represents a side elevation and Fig. 2 an end elevation of my improved machine. Fig. 3 represents a central longitudinal section thereof with the pressing and injector devices and their operating mechanism in reverse positions to that shown in Figs. 1 and 2. Fig. 4 represents a perspective view of one of my improved molds. Fig. 5 represents a detail view of the ejectors and brick or block-receiving board in operative positions.

This machine is especially designed for the manufacture of bricks and blocks for various purposes out of sand or clay while in a dry state though it will be manifest that it is equally applicable for manipulating moist material and other material than sand or clay used in the construction of bricks, blocks and analogous articles.

1 represents the framing of the machine, 2 the steps in which are journaled the shafts carrying the gearing and mold-conveyer wheels.

3 represents a hopper which may be supported in position in any suitable and known manner and 4 represents a table along which the molds travel and upon which they rest while being supplied from the hopper with the material to be pressed and while said material is being pressed into brick or block form within the molds.

5 represents the molds constructed according to my invention. In the form shown in

the drawings they are each represented as adapted to mold six bricks or blocks though, of course, they may be constructed to form a different number. At each side, adjacent to the respective ends, these molds are provided with outwardly-extending eyed-ears, 6, through the ears, 7, at the bottom of which are inserted rods or bars, 8, to connect, as clearly shown in Fig. 3, the adjacent pairs of molds of the series; by this arrangement a flexible link-coupling is formed connecting the series of molds in endless chain form. Around the upper edge of each mold is formed a horizontal flange, 9, by which construction, when the molds assume a horizontal position, the flanges of the adjacent molds abut against each other and constitute a continuous flat and close table-like surface and connection between the molds, insure the regular travel thereof and prevent any portion of the material dropping down between the mold and clogging and impeding the free movement of the mechanism.

10 represents drums, disks or wheels journaled on shafts 11 at each end of the machine and having in their periphery notches 12 within which the mold-connecting rods or bars, 8, are received. As the drums or disks, 10, rotate they carry round with them the molds engaged therewith thereby, in connection with the flanges 9 and couplings 6, 8, insuring the regular rotation of the endless series of molds.

13 represents the main driving shaft which is connected with any suitable source of power. (Not shown.) On this shaft are toothed wheels 14 which gear with gear wheels or pinions 15 on the shafts 16.

17 represents eccentric disks carried by shafts 19 and geared by toothed wheels or pinions 18 with the pinions 15.

20 represents eccentric pins extending from the face of the disks 17 with which engage the slotted lower ends of the plunger-operating levers 21 to be presently described.

22 represents arms having strap-connection 23 at the rear with the hubs 24 of the eccentrics 17, the forward ends of said arms being connected with vertical levers or arms 24 having pivotal bearings at their lower ends to permit of the oscillation thereof and the con-

sequent reciprocal movements of the thereto-connected arms 22. To the outer ends of said arms 22 are attached curved lever arms 26 carrying pivotal dogs or pawls 27 which engage with ratchets 28 keyed or otherwise secured to the drums or disks 10. The notches, 12, in said drums or disks, 10, the construction of the eccentrics and the movements of the ratchets are, in practice, so arranged and timed as to carry forward and present the molds for filling and pressing in unison with the movements of the pressing plungers and ejectors. As the eccentric disks rotate they cause the arms 22 to reciprocate which, in turn and through the medium of their connections, turn the ratchets and the thereto-connected mold-carrying drums.

29 represents the plungers for pressing the material in the molds. These are secured in any suitable manner in the cross-head 30 which has at its upper portion bevel edges 31 and a central curved recess 32 within which rests and rocks a roller 33 keyed at 34 to a toggle 35 having beveled top and bottom edges 36. 37 represents another roller seated within a recess or groove 38 in the upper portion of this toggle and keyed at 39 in a depending offset 40 of the rocking shaft 41 to which latter the upper ends of the plunger-operating levers, 21, are suitably attached. The edges of the offset 40 are also beveled as shown at 43. It will thus be seen that as the eccentrics 17 revolve an oscillating motion is thereby imparted to the levers 21 which, in turn, correspondingly rock the shaft 41 in its bearings 42 in the frame and upon the roller 37 keyed thereto and alternately bringing the bevel edges 43 into operative contact with the bevel edges at the top of the toggle, 35 and the bevel edges at the bottom of the toggle in contact with the bevel top of the cross-head, as indicated in dotted lines Fig. 3, and thereby permit of the ascent of the cross-head and plungers, and also of bringing the toggle 35 to a vertical position and thereby depressing the cross-head and plungers, as shown in full lines Fig. 3, to press the bricks or blocks within the molds.

44 represents the ejectors which are carried by a cross-head or frame 45 sliding in vertical grooves 46 in a plate or offset 47 attached to or formed integrally with the framing of the machine. To this cross-head or frame, 45, are attached, one at each side or edge, the front ends of lever arms 48 centrally pivoted at 49 on the machine framing, the rear ends of said lever arms, 48, being connected with reciprocating or rocking levers 50 eccentrically connected, as at 51, with the gear wheels 15 so that, as said gears rotate, an oscillatory motion is imparted to said levers 50 which, in turn, rock the levers 48 which vertically reciprocate the ejector-carrying frame.

52 represent followers which are secured to and reciprocate vertically with the cross-head or frame carrying the ejector.

At that period in the operation of the ma-

chine when the ejectors are about to impinge upon the bricks or blocks for the purpose of ejecting the same the followers will have reached a position where their lower ends are slightly below the bottoms of the molds the distance, in a straight line, between the bottoms of the molds and of the followers being equivalent to about that of the thickness of a sheet of paper; at that time the attendants raise from the stationary bracket 53, where it has heretofore been resting, a brick-receiving board 54 and press said board up against the lower ends of said followers; then, as the ejectors continue their descent and proceed to eject the bricks or blocks, said followers correspondingly press down the board 54; by this arrangement, the board descending correspondingly with the ejectors, no force or pressure is exerted upon the bottom or other portion of the bricks or blocks sufficient to injure the same. This is a considerable advantage as it prevents the articles becoming distorted or broken in ejection.

In machines for pressing bricks as at present constructed, the bricks are either raised from the molds and taken off by hand, or else allowed to drop onto conveyers; in either instance the method of delivery is cumbersome and subject to injure the brick.

By imparting to the ejectors a longer stroke than the pressing plungers, placing the conveyer board against the followers and so arranging said followers that they shall force the conveyer board down just ahead of the bricks or blocks as heretofore explained, a steady and easy delivery onto said board of said bricks or blocks without any jarring thereof is insured and they can at once be transported to the racks or dry house and can be handled much more rapidly and safely than under customary methods.

The operation of my improved machine will be readily understood by those skilled in the art. Power being applied to the driving shaft the clay, sand, or other material,—which it is preferred shall be in a dry or comparatively dry state (though material having any degree of moisture therein may be used in my machine with equal readiness), as I have found, in practice, that dry sand and clay can be readily and perfectly pressed into bricks and blocks by the mechanism herein described and such bricks and blocks maintain their shape and speedily harden,—is placed in the hopper and from thence fed in any known manner to the mold for the time being thereunder; when said mold is supplied with the necessary amount of material the endless chain of molds advances one step so as to bring the filled mold under the pressing plungers and another empty mold under the hopper; while this latter mold is being filled the pressing plungers are pressing the material within the first-named mold into bricks or blocks. By the time such pressing has been accomplished the mechanism described, which is in practice constructed to time the several movements in

unison to secure such regularity of operation, carries a third mold under the hopper for filling, advances the second mold to the pressing plungers, and advances the first-named mold to a position beneath the ejectors. By the time the respective molds are advanced to a position beneath the pressing plungers and ejectors, respectively, the eccentrics to which the plunger-operating levers and the eccentrics to which the ejector-operating levers are connected will have operated to cause said levers, through their connective mechanism, to depress said pressing plungers and ejectors, respectively. Immediately on said pressing and ejecting being accomplished the return oscillation of said levers will, while the next mold is approaching them, raise the pressing plungers and ejectors in readiness for a return downstroke. At the moment, or just before, the ejectors reach the tops of the bricks or blocks in the mold beneath them, the followers are depressed a short distance below the bottom of the said mold, whereupon the attendants, one on each side of the machine, raise the carrying board from the bracket and hold it against the bottoms of said followers; then as the injectors press the bricks or blocks out downwardly from said mold said followers correspondingly force down said carrying board thereby preventing any impingement or pressure of the bricks or blocks between the ejectors and the carrying board; the bricks or blocks are thus gently, and without jarring, delivered onto the carrying or conveyer board which, with the bricks or blocks thereon, is then carried to the racks or dry house. By this arrangement the articles are perfectly protected from injury in shape or otherwise and can be delivered from the machine and handled with greater safety and rapidity than is customary under other existing arrangements.

I claim—

1. A machine for molding or pressing bricks, blocks, and analogous articles, consisting of a suitable framing, hopper, and mold-supporting table, an operative shaft, an endless series of linked molds having meeting flanges at their upper portions, rotary disks or drums adapted to engage with and rotate said molds, a series of brick-pressing plungers, a rocking shaft and a toggle adapted to operate upon the cross-head carrying said plungers, levers connected with said rocking shaft, eccentrics connected with said levers and adapted to oscillate the same, ejectors, eccentrics, levers connected therewith and with the ejector-carrying frame and adapted to reciprocate the same, followers attached to the ejector-carrying frame and adapted to force down the brick-receiving and transporting board, and mechanism, substantially as described, connecting and operating said levers, disks and eccentrics, substantially as and for the purpose set forth.

2. A machine for molding or pressing bricks, blocks, and analogous articles consisting of a

suitable framing, hopper, and mold-supporting table, a series of linked molds having meeting flanges at their tops, rotary disks or drums having notched peripheries to engage with and rotate said molds, a series of vertically-reciprocating pressing plungers, toggle mechanism for actuating the plunger head or frame, a series of ejecting plungers, an independent brick-receiving and transporting board and a plurality of followers connected and reciprocating with the ejector mechanism and adapted to impinge upon and press down said brick-receiving board, substantially as and for the purpose set forth,

3. In a machine for molding or pressing bricks, blocks and analogous articles, the combination of a series of connected molds, pressing plungers and mechanism for vertically reciprocating the same, an independent brick-receiving and transporting board, vertically-reciprocating ejectors and followers connected with the ejector frame and adapted to impinge upon and press downward said brick-receiving board, substantially as and for the purpose set forth.

4. In a machine for pressing or molding bricks, blocks, and analogous articles, the combination with the molds and pressing mechanism of a brick-receiving board positioned beneath said molds, brick-ejector mechanism, and followers connected with said ejector mechanism and adapted to impinge upon said brick-receiving board in advance of the impingement upon the bricks of the ejectors and force down said board correspondingly with the downward movement of the ejectors, substantially as and for the purpose set forth.

5. A machine for pressing bricks, blocks, and analogous articles consisting of a series of flexibly-connected and multiple-chambered molds having open, unimpeded, tops and bottoms, notched disks or drums engaging with and rotating said series of molds, downwardly-acting pressing plungers located in a guide frame above the mold-chain, ejecting plungers located in a framing and operating in a plane and direction parallel with that of the pressing plungers, a loose brick-receiving and conveying board adapted to be held against the bottom of said molds while in their upper position, followers connected with said ejectors and adapted to press down said conveyer board in advance of the ejection of the bricks, and mechanism, substantially as described, for actuating said disks, plungers, and ejectors, substantially as and for the purpose set forth.

6. The combination with a series of flexibly-connected molds, notched disks engaging therewith and brick-pressing plungers and ejectors and the main driving shaft, of supplemental shafts 16 and 19, toothed gearing connecting said shafts, eccentric disks 17 carried by said shaft 19 and having eccentric pins 20, plunger-operating levers 21 having slotted lower ends engaging with said eccen-

tric pins 20, arms 22 having strap connection with said eccentrics, pivoted levers 24 connected with said arms 22, curved lever arms 26 having pawl and ratchet connection with
5 said notched disks, a cross-head 30, rocking shaft 41 connected with the plunger-operating levers 21 and a toggle connecting the cross-head and the rocking shaft, substantially as and for the purpose set forth.
10 7. In a machine for pressing bricks, blocks and analogous articles, a plunger-carrying cross-head having at its upper portion bevel edges and a central curved recess, a roller seated within said recess, a toggle having a
15 beveled bottom edge and a beveled and grooved top, a roller seated within the grooved upper portion of said toggle, a rock-shaft having a bevel edged depending offset keyed to the roller seated in the upper portion of the
20 toggle, plunger-operating levers connected at

one end with said rock-shaft, eccentrics connected with the other ends of said plunger-operating levers, and gearing actuating said eccentrics, substantially as and for the purpose set forth.

25 8. In a machine for molding or pressing bricks, blocks, and analogous articles, the combination with the pressing mechanism of vertically-reciprocating ejectors and followers connected therewith and adapted to im-
30 ping upon and force downwardly the brick-receiving and transporting board, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM ACTON.

Witnesses:

FRED. M. CALLENDER,
I. N. COLBURN.