

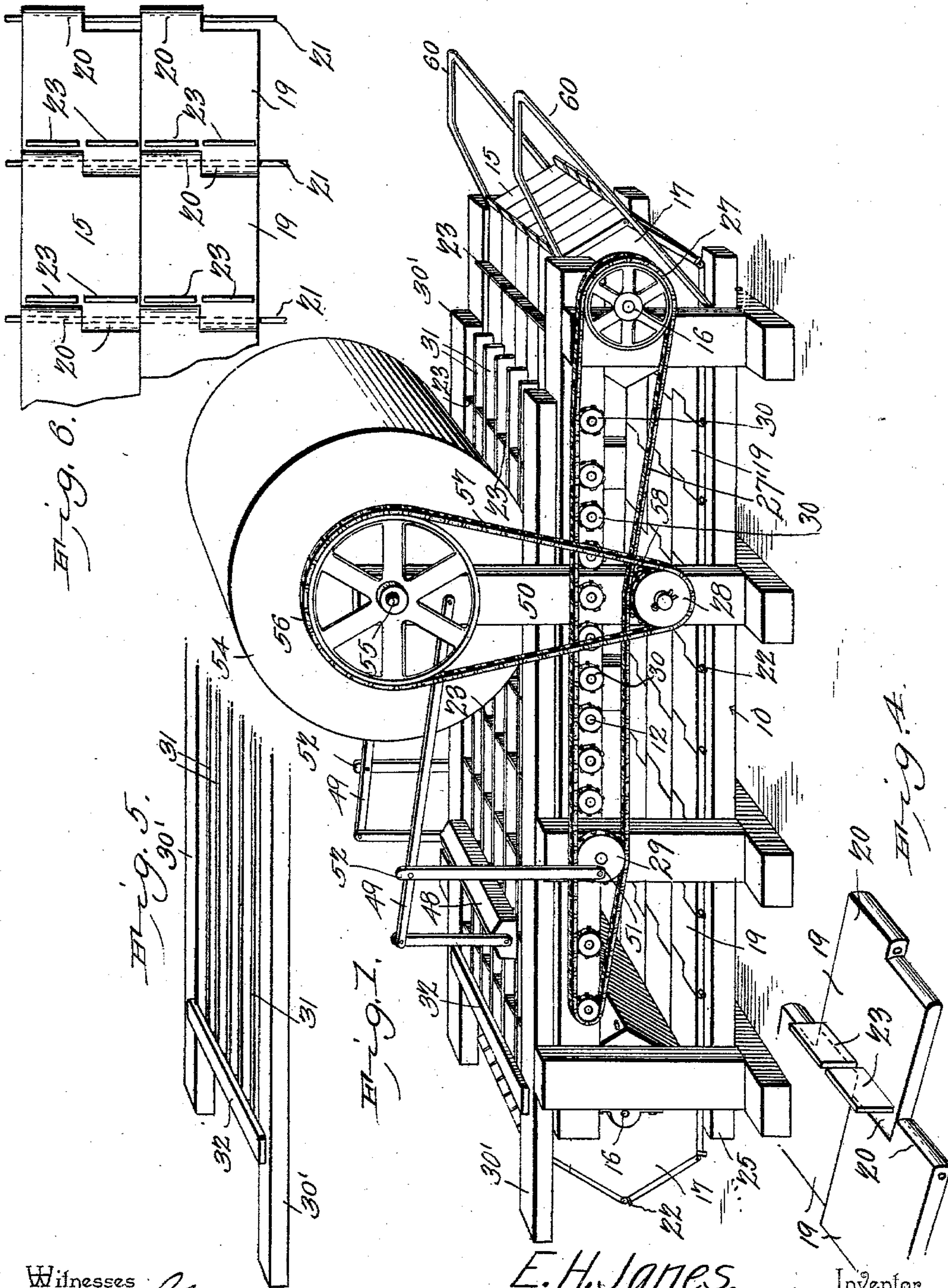
No. 720,928.

PATENTED FEB. 17, 1903.

E. H. JAMES.  
BRICK MAKING MACHINE.  
APPLICATION FILED JULY 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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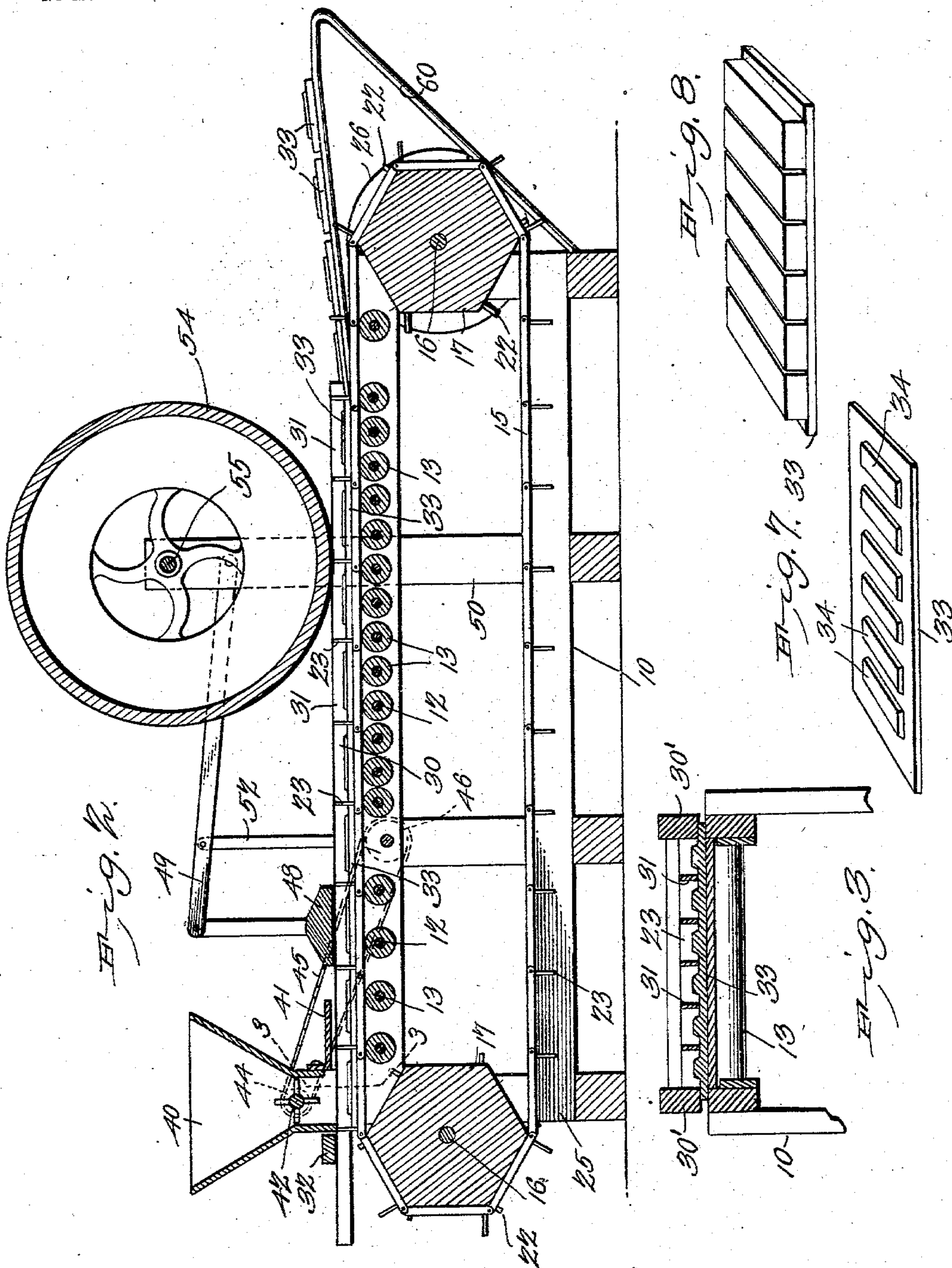
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# UNITED STATES PATENT OFFICE.

ELMER H. JANES, OF LANSING, MICHIGAN.

## BRICK-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 720,928, dated February 17, 1903.

Application filed July 14, 1902. Serial No. 115,472. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER H. JANES, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented a new and useful Brick-Making Machine, of which the following is a specification.

My invention relates to certain improvements in machines for the manufacture of bricks or blocks from plastic material, and has for its principal object to provide an improved mechanism especially adapted for the manufacture of bricks from concrete or similar mixtures in which cement is employed as a binding agent.

A further object of the invention is to construct a machine of this class in which the bricks during the process of manufacture will be continuously troweled to condense the material of which the brick is formed and to provide a smooth dense surface on the brick.

A still further object is to provide for the manufacture of the brick on moldboards which are delivered from the machine together with the brick, so that the latter may be carried to any convenient point for drying or setting without danger of breakage.

A still further object of the invention is to provide for the automatic delivery of the moldboards from the machine, the bricks being automatically removed from the shaping-molds and supported in spaced relation on the moldboards.

A still further object of the invention is to provide for the thorough tamping and pressing of the material into the molds in order to solidify and condense the material of which the bricks are formed.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a brick-making machine constructed in accordance with my invention. Fig. 2 is a longitudinal sectional elevation of the same. Fig. 3 is a transverse sectional elevation, on an enlarged scale, on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of a por-

tion of the conveyer-belt, showing the end plates of the brick-mold. Fig. 5 is a similar view of the elongated plates forming the side elements of the brick-mold. Fig. 6 is a detail view, on an enlarged scale, of a portion of the belt. Fig. 7 is a detail perspective view of one of the moldboards. Fig. 8 is a similar view of a moldboard, showing a number of bricks arranged on the moldboard as delivered from the machine.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The general framework 10 of the machine is substantially rectangular in form and comprises in part a pair of longitudinally-disposed parallel beams or bars having journals for the support of a number of transversely-disposed shafts 12, each shaft being provided with a small roller 13 for the support of an endless belt 15, which serves to carry the bricks from the hopper or feed end of the machine to the discharge end.

At each end of the machine are suitable shafts 16, supporting polygonal cylinders 17, each face of the cylinders being of a length approximately equal to the length of a brick and adapted to receive one of a series of transversely-disposed belt-sections. (Shown in Fig. 6.) The belt is preferably formed of a plurality of similarly-shaped plates 19, each of a width equal to or slightly greater than the combined width of two bricks and of a length equal to the length of a single brick. Each plate is provided at opposite ends with projecting portions 20, which interfit the corresponding recess portions of adjacent sections, so that the separating-line between two adjacent series of sections in the width of the belt may be staggered and form a plurality of pivot ears or lugs each provided with an opening through which extends a pivot-pin 21, running from side to side of the belt and projecting slightly beyond the edges thereof, the ends of the pins being engaged by projecting fingers 22 on the two cylinders 17 in order to transmit power to the belt or prevent the latter from slipping. To each of the plates 19 is secured a pair of plates 23, preferably bent at right angles to form a lower flange for convenience in riveting or otherwise securing to the plate 19. The several



plates 23 of each series extend in the same plane in a direction transversely of the machine, each plate being spaced from the next adjacent plate for a distance sufficient to permit the entrance of the elongated plates which form the side members of the mold. The plates 23 serve to shape the ends of the bricks, and their upper edges are arranged at a distance from the surface of the belt equal to the combined thickness of the moldboard and the brick to be manufactured. The upper run of the belt is supported on the rollers 13, and the lower run is supported by opposite parallel bars 25, forming a portion of the side frames of the machine. The shaft 16 at one end of the machine is provided with a belt or gear wheel 26, to which motion is transmitted from any suitable source of power, and on said shaft is also secured a sprocket-wheel 27, around which passes a link belt 27', also running over a pair of sprocket-wheels 28 and 29 and engaging with sprocket-wheels 30, of which one is secured to the outer end of each of the shafts 12, the proportion of the gears being such that the several rollers 13 have a surface speed equal to that of the cylinders 17 and the belt.

At the opposite sides of the machine are side bars 30', extending parallel with the line of the belt and acting as molds for the side edges of the outer rows of brick. The molding-surfaces for the intermediate rows are formed of thin metallic strips 31, which are connected together at the feed end of the machine by a transversely-disposed cross-bar 32. The side plates are of a height equal to the thickness of the bricks and are arranged in parallel lines in the spaces between adjacent end plates 23, the latter serving as guides for the free ends of the plates and preventing any lateral movement thereof. These strips or plates are smooth-surfaced and remain stationary, the bricks once molded being traveled along by the belt, with their sides in intimate contact with the surfaces of the strips and resulting in a continued troweling action, which smooths and polishes the faces of the bricks, the surface which is exposed in the subsequent use of the brick for building purposes being condensed, smoothed, and polished, the bricks, even if made of coarse material, presenting a better appearance than bricks of more expensive material manufactured by the ordinary molding process. The moldboards are each of a character illustrated in Fig. 7, each board being of a length somewhat greater than the width of the belt and of a width exactly equal to the length of a brick. The surface of the board may be smooth, or for the formation of bonding-recesses the upper face of the board may be provided with upwardly-projecting cores 34 in order to form shallow recesses in the lower faces of the bricks. These boards are introduced at the feed end of the machine, being placed on the feed-belt between the rows of plates 23 and being guided under the strips 31, the hopper,

and the compression devices to the discharge end, where they are delivered from the machine, together with the bricks, the latter being supported on the board in the manner shown in Fig. 8. In order to afford suitable space for the passage of the ends of the boards, the side bars 30 are provided with undercut recesses, as shown in Fig. 3.

At the feed end of the machine is a hopper 40, mounted directly above the several brick-molds formed by the molded boards and plates 23 and 31. The hopper is supplied with a suitable concrete or other mixture from which the bricks are to be formed, and at the discharge end of the hopper is a slide 41 to govern the quantity of material fed to the molds. The material is fed to and pressed down into the mold by a feed-roller 42, having a supporting-shaft projecting outside the end of the hopper and provided with a sprocket-wheel 44, driven by a link belt 45 from a sprocket-wheel 46, mounted on the same shaft with the sprocket-wheel 29.

48 designates a tamping-block extending across the series of molds and carried by arms 49, pivoted at their rear ends to vertical standards 50, forming part of the framework of the machine. On the sprocket-wheel 46 and the sprocket-wheel 29 at the opposite side of the machine are crank-pins 51, connected by rods 52 to the arms 49, the arrangement being such that a vertical movement is imparted to the tamping-block in order to pack the material more firmly in the molds. The final compression of the material into the molds is accomplished by a pressing-cylinder 54, carried by a shaft 55, adapted to journals in the standards 50. The shaft 55 is provided with a sprocket-wheel 56, driven by a link belt 57 from a sprocket-wheel 58, mounted on the same shaft with the sprocket-wheel 28. The cylinder serves to fully compress the concrete or similar material within the molds and results in the bricks being dense and compact. In some cases it will not be necessary to impart positive motion to the pressure-cylinder, as the latter may be driven by contact with the upper surface of the molds and the material maintained therein. As the plates 31 are stationary, the bricks are highly polished and their surfaces condensed, so that by the time the ends of the plates 31 are reached said bricks will be sufficiently compressed and the cement will have set to an extent sufficient to prevent the bricks losing their shape and coming into contact with each other. After leaving the strips or plates 31 the sides of the bricks are unsupported, but their ends are held for a short time by the end plates 23.

At the delivery end of the machine are two skeleton frames 60, each in the form of a bar having its opposite ends secured to the frame, the bars being spaced for a distance somewhat greater than the width of the belt, but less than the length of the moldboard. The upper portion of each bar is arranged in an inclined plane, the lower end of each bar ex-



tending to a point below the horizontal plane in which the moldboards travel during the molding of the bricks. As the moldboards near the delivery end of the machine their opposite ends come into contact with the inclined bars 60, the boards being still engaged and moved by the plates 23. The result of this movement is that the moldboards are gradually raised from contact with the plates 23 and are forced up on the delivery-frame 60, each board containing a row of spaced bricks arranged in the manner shown in Fig. 8 and in convenient position to be carried to a drying-point and discharged from the moldboards without the necessity of handling each separate brick. In practice the moldboards may be of sufficient thickness and the upward inclination of the receiving-bars 60 be so slight as to prevent injury to the bricks by contact with a following mold member 23.

In lieu of forming a plurality of bricks the device may be arranged for the manufacture of single bricks of larger size where necessary, and the device may further be employed for the manufacture of bricks from clay or other materials.

While the construction herein described and illustrated in the accompanying drawings is the preferred form of the device, it is obvious that various changes in the form, proportions, size, and minor details of the structure may be made without departing from my invention.

Having thus described my invention, what I claim is—

1. In a machine for molding bricks or blocks, the combination with moldboards adapted to support the bricks, of an endless belt, movable molding devices carried thereby and spaced for the reception of the moldboards and adapted to engage with and traverse the moldboards from the receiving to the discharge end of said machine.

2. In a machine for molding bricks or blocks, the combination with stationary molding devices, of an endless belt, movable molding devices carried thereby and spaced from each other for the reception of moldboards, moldboards carried by the belt, and receiving-bars on which the moldboards and finished bricks are delivered by the movement of the endless belt, substantially as specified.

3. The combination in a brick-making machine, of the movable belt having mold-plates, a moldboard supported on the belt during the manufacture of the brick, stationary mold-plates arranged on lines parallel with the direction of movement of the belt, and means for removing the moldboard with the molded brick from the machine.

4. The combination in a brick-machine of the stationary and movable molding elements for shaping the vertical walls of the brick, a removable moldboard adapted to support the brick during the molding process, and means for removing the moldboard and molded brick from the machine.

5. The combination in a brick-machine, of an endless belt having mold-plates, a moldboard supported on the belt and removable therefrom together with the finished brick, and stationary molding-plates supported by the frame of the machine and adapted to shape and smooth the surface of the bricks as the latter are traveled through the machine.

6. The combination in a brick-machine, of movable mold-plates adapted to partially shape and to traverse the brick through the machine, stationary shaping or molding plates with which the bricks are held in frictional contact during the movement through the machine, and moldboards of a width equal to the distance between said movable mold-plates and adapted to be traversed through and delivered from the machine by said movable mold-plates.

7. The combination in a brick-machine, of a traveling belt formed of a plurality of pivotally-connected plates, molding-plates carried thereby, said plates being arranged in spaced relation transversely of the belt, removable moldboards arranged between the plates and forming the bottom element of the mold, and stationary side plates arranged parallel with the direction of travel of the belt and serving to shape the side walls of the bricks.

8. The combination in a brick-machine, of the movable belt comprising a plurality of interfitting and pivotally-connected plates, of the polygonal cylinders for driving the belt, intervening belt-supporting devices, spaced mold-plates carried by the belt, the removable moldboards arranged between said plates, stationary mold-plates carried by the machine and adapted for sliding contact with the bricks, and means for automatically removing the moldboards from the mold elements carried by the machine.

9. The combination in a brick-machine, of the movable belt having a plurality of rows of spaced mold-plates, stationary mold-plates arranged in spaces between the movable mold-plates and guided thereby, and removable moldboards adapted to fit between the movable mold-plates and extending transversely of the movable plates at points under the stationary mold-plates, substantially as specified.

10. The combination in a brick-machine, of the movable belt, the molds, driving and guiding cylinders for the belt, rollers for supporting the upper run of the belt, sprocket-wheels carried by said rollers, a sprocket-wheel connected to the driving-cylinder, and a link belt connecting the sprocket-wheels of the rollers to the cylinder sprocket-wheel, substantially as specified.

11. The combination in a brick-machine, of the movable belt, mold-plates carried thereby, stationary mold-plates, removable moldboards carried by the belt and having their opposite ends projecting beyond the sides of the belts and a delivery-frame comprising in-



clined bars arranged on each side of the  
frame of the machine and projecting beyond  
the end of the movable belt, said bars being  
adapted to engage with the projecting end  
5 portions of the moldboards and elevate the  
moldboards from the belt, substantially as  
specified.

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

ELMER H. JANES.

Witnesses:

HENRY M. GARDNER,  
CECILE KING.