(No Model.) 2 Sheets—Sheet 1.

C. A. WYMAN.

BRICK MACHINE.

No. 305,728. Patented Sept. 23, 1884.

Fig. 2
on y-y

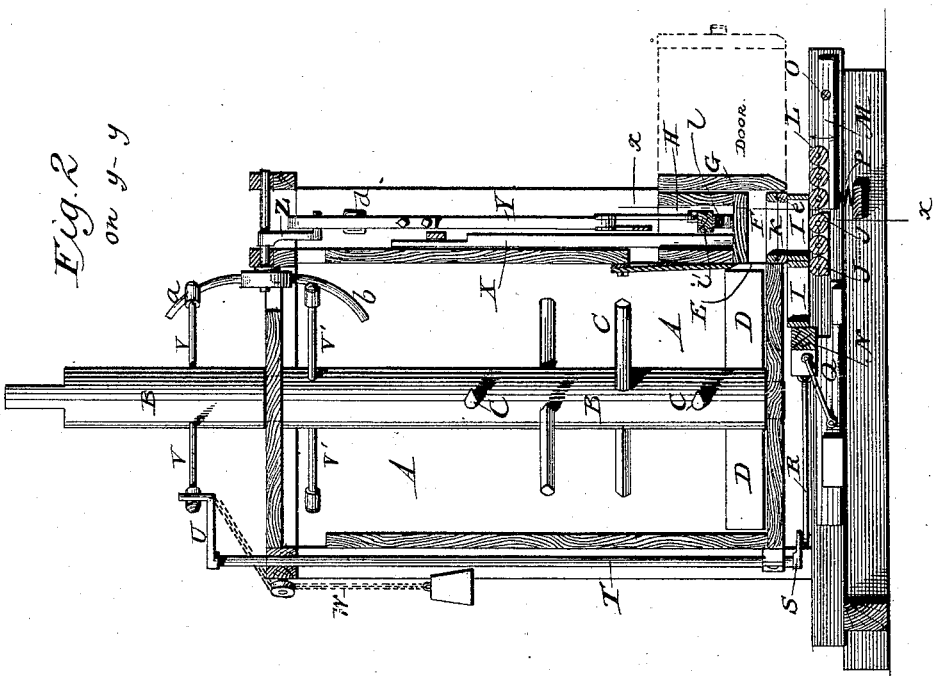
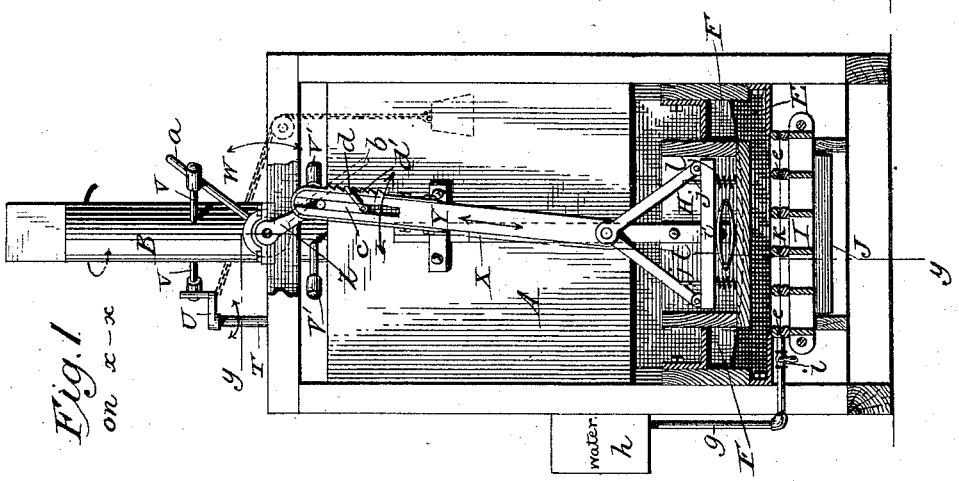


Fig. 1
on x-x



Attest

Sidney P. Hollingsworth

Harry Shipley

Inventor

Charles A. Wyman

By his attorney

Philip T. Dodge.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

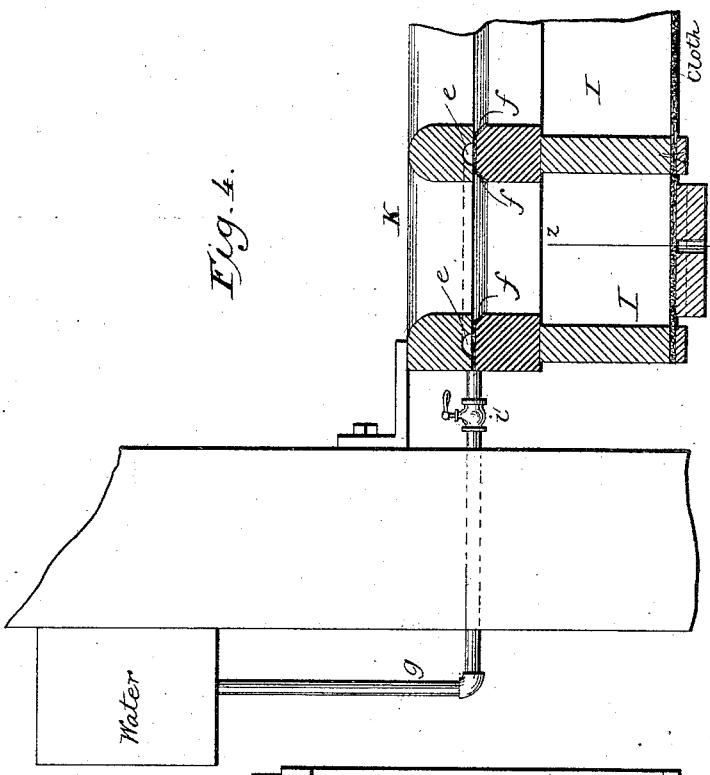


Fig. 5. on x-x

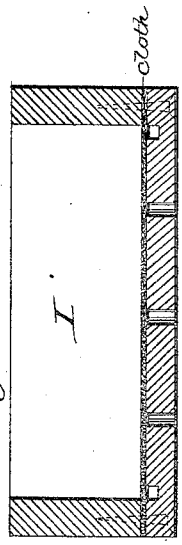
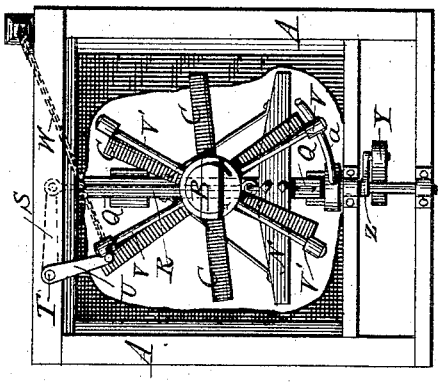


Fig. 3



Attest:

Sidney P. Hollingsworth

Harry Shipley

Inventor:

Chas. A. Wyman

By his attorney

Philip T. Dodge.

UNITED STATES PATENT OFFICE.

CHARLES A. WYMAN, OF HUTCHINSON, MINNESOTA.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,728, dated September 23, 1884.

Application filed September 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. WYMAN, of Hutchinson, in the county of McLeod and State of Minnesota, have invented certain Improvements in Brick-Machines, of which the following is a specification.

My invention relates to that class of machines wherein the clay, properly mixed in a tempering-box or pug-mill, is delivered laterally from the foot of the same into a side chamber, from which it is driven by a descending plunger downward through a grated frame into molds and passed through the machine.

The invention relates to various details of construction, which will be hereinafter described.

Referring to the accompanying drawings, Figure 1 represents a front elevation of my improved mill, one side of the same being shown partially in section on the line *x x* of Fig. 2. Fig. 2 represents a vertical section of the mill on the line *y y*, Fig. 1. Fig. 3 is a top plan view illustrating the mechanism for imparting motion to the plunger, and the devices for advancing the mold-frame. Fig. 4 is a vertical section on an enlarged scale, showing the construction of the grated frame through which the clay is delivered to the mold, and the means for damping the surface of the clay in its passage through the same, the bottom of the body being broken away to expose the parts thereunder. Fig. 5 is a vertical cross-section through the mold-frame, showing the cloth lining therein to prevent adhesion of the clay.

Referring to the drawings, A represents an upright body or chamber sustained by a suitable frame-work, and containing a central vertical shaft, B, which is provided with arms C, for the purpose of properly mixing and working the clay, and also at the lower end with flat arms or blades D, by which the delivery of the clay through the lateral outlet E is effected.

On the outside of the body, at its base and opposite the outlet E, I form a clay-receiving chamber, F, the outer side of which is closed by means of a door, G, hinged or otherwise suitably attached in such manner that it may be readily opened or removed to permit the inspection of the interior of the chamber. The outlet-opening E from the body into the receiving-chamber, as shown in Fig. 5, is enlarged vertically toward the two sides of the machine, or, in other words, in a direction at right angles to that in which the clay is delivered through it. This enlargement of the passage at its sides permits the clay to pass with freedom into the ends of the receiving-chamber beneath the pressure-plunger therein. By this construction the clay is permitted to completely fill the chamber under all circumstances, and is permitted to return from the chamber into the body of the machine in the event of its offering an excessive resistance to the pressure-plunger, hereinafter referred to.

In the chamber I mount a vertically-reciprocating plunger, H, the office of which is to force the clay downward into the molds below. This plunger is made, as in Fig. 1, of a horizontal length less than that of the clay-receiving chamber F, which extends entirely across the side of the machine. Owing to this difference in length between the plunger and the chamber, it will be seen that as the plunger is forced downward it will fill but a portion of the chamber, the chamber extending beyond both ends of the plunger, and affording space to receive the surplus clay, thus permitting the clay to escape and pass backward into the mill in the event of an excessive pressure being encountered by the plunger.

In the bottom of the chamber F, I secure a grated frame, K, the openings in which will correspond with the cells in the mold-frames I, of which there will be a suitable number. A space or passage exists beneath the bottom of the mixing-chamber and of the grated frame, in order to admit of the molds being passed freely thereunder. The molds are supported while in position beneath the grated frame by rolls K, mounted in a fixed frame. The mold, after being filled, is forced horizontally from under the grated frame and out of the machine, being sustained in its outward passage by rolls L, mounted in a vertically-yielding frame, M, commonly known as a "delivery-table." This frame M is hinged near its outer edge at O, and is sustained at its inner end by means of spiral springs P, or other yielding

supports, the object of which is to admit of the mold-frame sinking or yielding in the event of its containing stones or other solid substances which encounter the edge of the grated frame, this yielding action of the mold-frame relieving the same from the strain and preventing the danger of breakage which would otherwise be encountered.

For the purpose of advancing the mold-frames intermittingly through the machine, and of causing each frame as it is brought into position to eject the one previously filled, I locate in the base of the frame a reciprocating presser head or bar, N, attached to and carried by a horizontal bar, Q. The movement of the presser-head is effected, as shown in Fig. 3, by means of a pitman, R, connected to an arm, S, on the lower end of a vertical rock-shaft, T, this shaft being mounted in bearings in the main frame, and provided at its upper end, as in Figs. 1 and 2, with a second crank-arm, U, which is acted upon at suitable intervals by arms V, secured rigidly to the main shaft B. In the course of their rotation the rotary arms V, acting upon the crank-arms U, cause the intermediate parts to advance the presser-head N, and force the mold previously inserted in front of the same forward to a position beneath the grated frame. After the rotary arm has passed the crank-arm, the parts are restored to their original positions, preparatory to the introduction of the next mold-frame, by means of a weighted chain, W, attached to a crank-arm, and passing over suitable guiding-pulley, as represented in the several figures.

Referring to the pressure-plunger H, it will be seen, on reference to Figs. 1 and 2, that it acts downward closely through an opening in the top of the clay-receiving chamber F, and that it is guided and prevented from tipping out of position by means of a vertical standard, X, secured rigidly thereto and working in suitable guides on the main frame. The vertical movement of the plunger is effected by means of a pitman, Y, secured thereto and actuated at its upper end by means of a vertical vibrating crank, Z, this shaft being provided on the inner end with an upwardly-extending arm, *a*, and a downwardly-extending arm, *b*, which are acted upon, respectively and alternately, by the arms V and V′, radiating from the main shaft, as shown in the various figures, the arm V acting upon the arm *a*, causing the crank-arm to be depressed, so that it serves through the pitman Y to depress the plunger in a positive manner. After the arm V is carried in its course of rotation out of action the arm V′ in turn encounters the depending arm *b*, the effect of which is to turn the crank upward, and thereby effect the lifting action of the plunger.

In practice it is necessary to provide a means of varying the pressure exerted by the plunger, for which purpose I adopt the peculiar arrangement of parts represented in Figs. 1 and 2. The upper end of the plunger-operating pitman Y is slotted vertically and provided with a block, *c*, secured adjustably in said slot by means of a clevis, *d*, which is pivoted to the block and arranged to engage with a notched plate, *d′*, on the outer edge of the bar. The crank in its downward movement acts upon the block *c*, thereby causing the depression of the pitman and plunger. It follows, consequently, that by adjusting the block *c* vertically within the pitman the crank may be caused to depress the plunger to a greater or less distance, as may be required.

Difficulty being frequently experienced on account of the tenacity with which the clay adheres to the grated frame in its passage to the mold, I provide means of moistening the surface of the clay during its passage through the said grated frames. The construction to this end is plainly represented in Figs. 1 and 4. The mold-frame is provided with a water-passage, E, extending horizontally through its various bars, and also provided with narrow strips of cloth or other pervious material, *f*, the inner edges of which communicate with the water-passage, while the opposite edges are extended outward through slots provided for the purpose in position to encounter the surface of the clay as it descends through the frame. The water-passages are connected by a pipe, *g*, with an elevated reservoir, *h*, or other source of supply, the pipe being preferably provided with a regulating-cock, *i*.

Under the above arrangement the water supplied to and filling the channels *e* keeps the fabric in a moist condition, the fabric in turn communicating its moisture to the surface of the descending clay, which is thus permitted to pass into the molds easily, and in such manner as to completely fill the corners and angles, thereby insuring the production of the brick with sharp corners and edges.

The pitman by which the plunger is depressed may be pivoted directly to the plunger, or connected, as shown in the drawings, to a bar, *i′*, which will be in turn connected by guides *j* and springs *l* with the plunger, this arrangement constituting a yielding connection between the pitman and plunger, whereby the parts are relieved in the event of excessive resistance being encountered by the plunger—as, for example, from the presence of stones or other refractory substances thereunder.

The operation of the machine is as follows: The mold having been inserted endwise through the side of the machine and moved forward by the advance of the carrier-head N to a position directly beneath the grated frame, the carrier-head recedes, leaving a space between it and the mold-frame for the introduction of the next mold-frame, which is in turn advanced by the pressure-head to take the place of the first, which, having been in the meantime filled with clay, is forced forward by the second frame, and thus delivered through the machine. The plunger having been raised, the spiral blades fill the chamber below the

same with clay, after which the plunger descends, forcing the same forward through the grated frame and causing it to fill the mold-frame, the surplus clay escaping past the ends of the plunger into the chamber, and, if necessary, through the opening into the mixing chamber or mill.

Referring to Figs. 4 and 5, it will be seen that my mold-frames are provided with fixed bottoms, the inner surfaces of which are covered with cloth or equivalent fibrous material. The fixed bottom is provided with numerous holes or channels, through which air may enter from the outside to fill the vacuum produced in the act of discharging the brick.

In practice it is found that the molds thus provided with fixed bottoms and with cloth linings give excellent results as regards the sharpness of the bricks produced therein. They not only permit the brick to fill perfectly the corners and angles, but also permit their discharge without danger of mutilation.

The present invention is restricted to those matters and things which are hereinafter claimed, and as to all matters which may be described or shown, but which are not claimed, the right is reserved to make the same the subject of a separate application.

I am aware that brick-molds of various forms have been provided with linings of cloth or woven material, and I make no broad claim thereto.

Having thus described my invention, what I claim is—

1. In a brick-machine, the combination, substantially as described, of the pug-mill, the clay-receiving chamber connected therewith by a passage, E, increasing in size toward the two sides of the machine, and a pressure device acting in said chamber.

2. The combination, substantially as set forth, of the pug-mill, the pressure-plunger, and the clay-receiving chamber connected with the pug-mill by a passage, E, said chamber and passage being extended transversely of the machine beyond the sides of the plunger, whereby any excess of clay is permitted to escape and return through the ends of the passage to the mill.

3. In a brick-machine, the combination of the pug-mill, the clay-receiving chamber connected therewith by the passage E, of increasing area toward the two sides of the machine, and the pressure-plunger of a size smaller than the receiving-chamber, arranged to act downward through the top of said chamber.

4. In combination with the clay-receiving chamber and the pressure-plunger, the grated frame, the stationary mold, sustaining-rolls thereunder, and the yielding rolls, whereby the mold-frame is permitted to sink, as and for the purpose described.

5. In combination with the vertical driving-shaft and the horizontally-projecting arms thereon, the vertical rock-shaft T, having its upper end provided with a crank-arm adapted to be actuated intermittingly by the arms of the main shaft, and its lower end provided with a second crank connected to a reciprocating mold-carrying head.

6. In combination with the main shaft and its arms, the pressure-plunger, its pitman, the crank for operating said pitman, and the two arms for operating said crank, connected thereto and adapted to be operated alternately by the arms upon the main shaft, substantially as described.

7. In combination with the pressure-plunger and its operating-crank, the pitman slotted at the upper end to receive the crank, and provided with a vertically-adjustable bearing for the crank-arm.

8. In combination with the pressure-plunger, the pitman attached thereto and provided with the slot in its upper end, the slide mounted within the pitman, the clevis and plate for locking said slide, and the crank having a free motion within the slot above the slide.

9. In a brick-machine, a grated frame, K, through which the clay is delivered, consisting of the upper and lower sections, having their contiguous surfaces grooved to form water-channels *e*, in combination with the porous material *f*, inserted and confined between the upper and lower sections, as shown, the inner edge of the material communicating with the water-channel, and the outer edge with the openings through the frame.

10. In combination with the mold-moving frame, the pitman attached thereto, the crank-arm attached to said pitman, the vertical rock-shaft, the second crank upon the upper end of said shaft, the rotary arm tending to move the last-named crank-arm in one direction, and the weighted chain and pulley acting to move said arm in the opposite direction.

11. In a brick-machine, the combination of the plunger, the pitman, the interposed spring, the crank, and the adjustable bearing between the crank and pitman.

12. The improved mold for a brick-press, consisting of the rigid frame, the bottom applied firmly thereto, and provided with perforations or channels for the admission of air, and the cloth surfacing secured to the bottom of the mold and covering the air-inlets, as described and shown.

CHARLES A. WYMAN.

Witnesses:
KEE WAKEFIELD,
O. D. HUTCHINSON.