(No Model.) 4 Sheets—Sheet 1.

W. C. VANNEMAN.

BRICK MACHINE.

No. 476,705. Patented June 7, 1892.

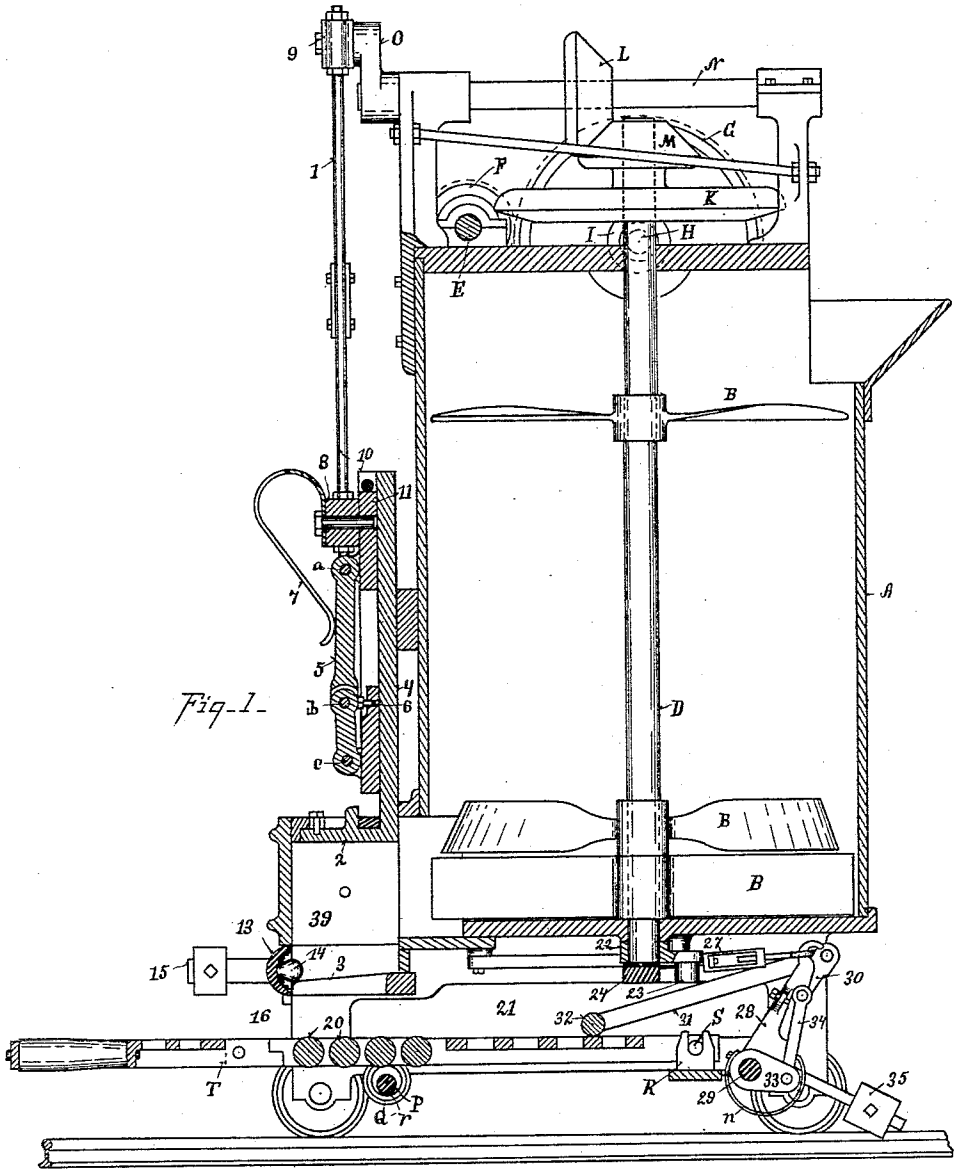

Fig-1-

Witnesses
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T. Simmons

Inventor
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By his Attorneys Wood & Boyd

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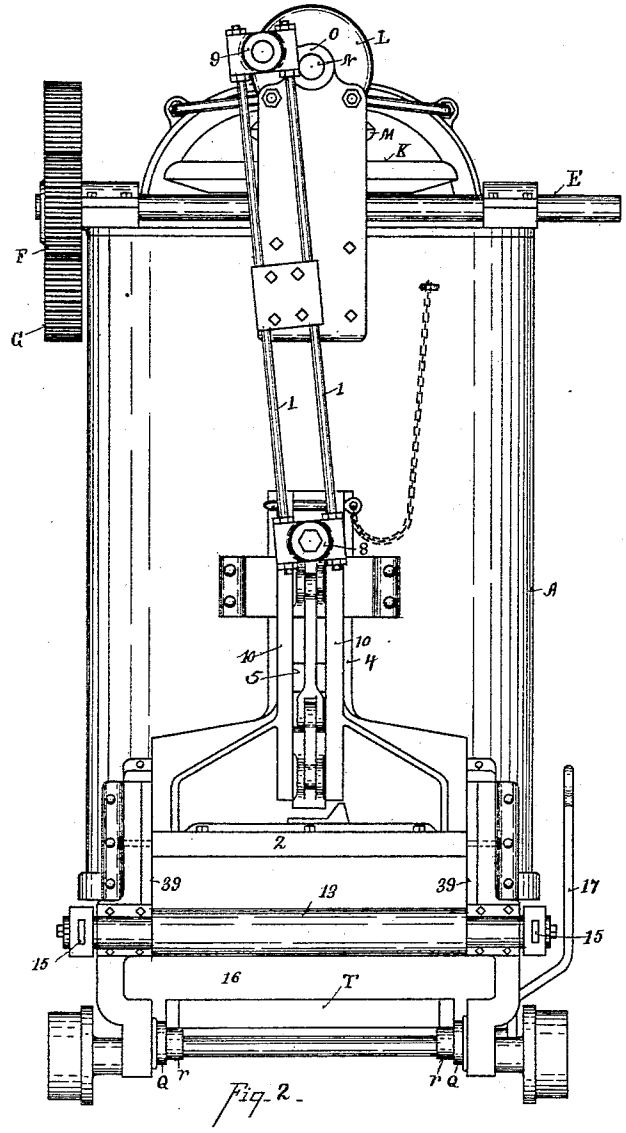

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

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BRICK MACHINE.

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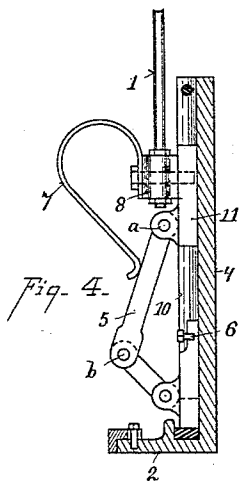

Fig. 4.

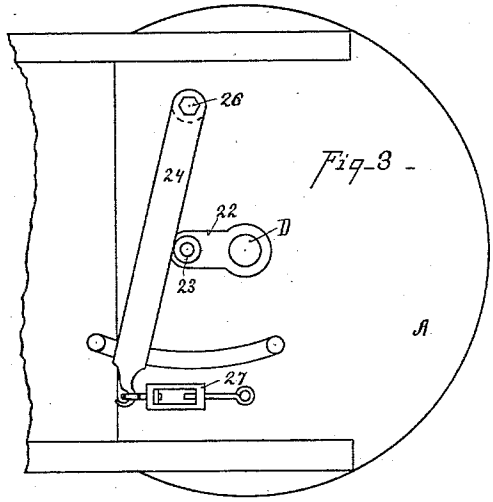

Fig. 3.

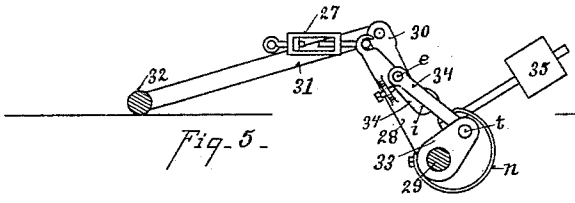

Fig. 5.

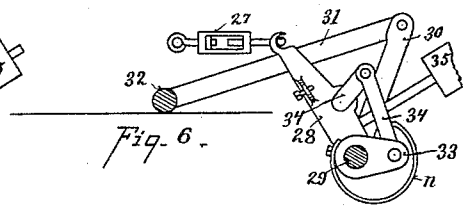

Fig. 6.

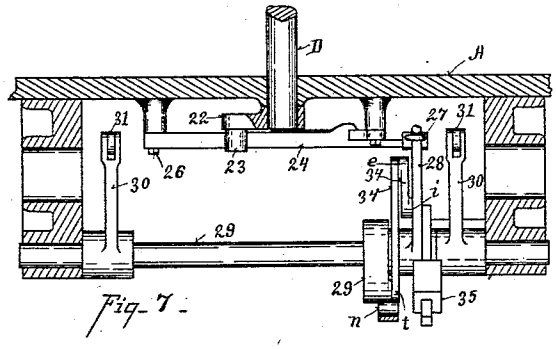

Fig. 7.

Witnesses
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W. C. VANNEMAN.

BRICK MACHINE.

No. 476,705. Patented June 7, 1892.

Fig. 8.

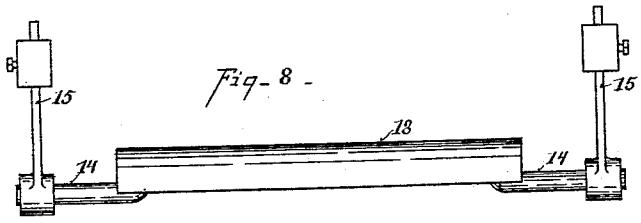


Fig. 9.

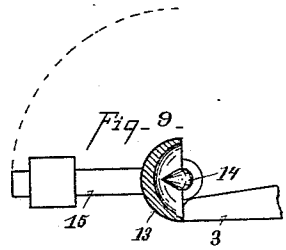


Fig. 10.

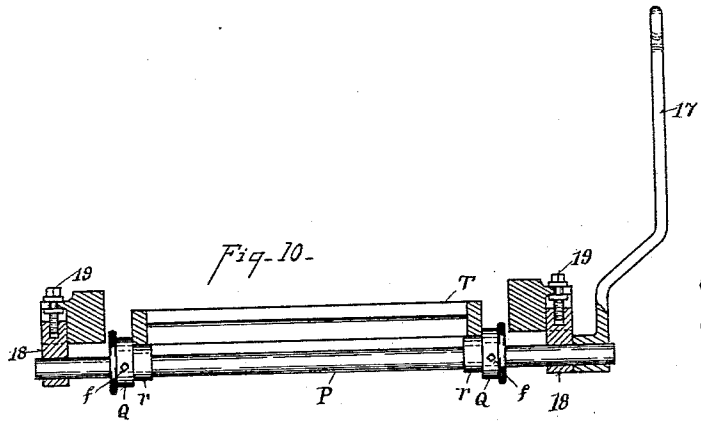


Fig. 11.

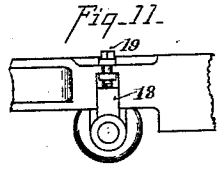
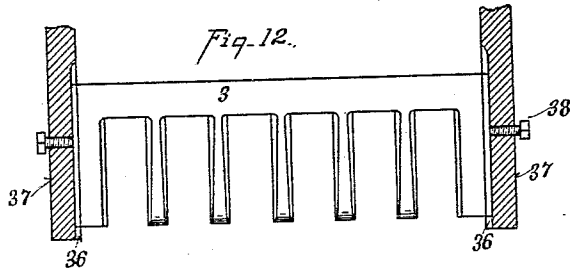


Fig. 12.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM C. VANNEMAN, OF ANDERSON, INDIANA.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,705, dated June 7, 1892.

Application filed October 31, 1891. Serial No. 410,526. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. VANNEMAN, a citizen of the United States, and a resident of Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification.

One of the objects of my invention is to drive the plunger by mechanism which will yield and unship the connection of the driving mechanism with the plunger, so as to prevent breakage of the same.

Another object of my invention is to provide the die-box with a yielding section, so that the molds may be drawn out without breaking the same when the stones or other rigid objects project above the top of the molds.

Another object of my invention is to employ feeding or mold-moving mechanism which will unship in case the molds are accidentally caught and allow the mold to stop, avoiding all danger of breaking the molds or the driving and mold-feeding mechanism.

The various features of my invention are fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central vertical section of my improvement. Fig. 2 is a front elevation of Fig. 1. Fig. 3 is a bottom plan of the cylinder and the part of the mold-feeding mechanism. Fig. 4 is a detail view of the plunger. Figs. 5 and 6 are detail views of the mold-feeding mechanism. Fig. 7 is an end elevation of Figs. 5 and 6. Fig. 8 is a side elevation of the stone-gate. Fig. 9 is a central vertical section of Fig. 8. Fig. 10 is a detail view of the mold-adjusting mechanism. Fig. 11 is an end view of Fig. 10. Fig. 12 is a top plan view of the die.

A represents the mixing-cylinder, and B the mixing-blades secured to the shaft D, which is driven by the following parts mounted upon the top of the mixing-cylinder.

E represents the main shaft, which carries a pinion F, driving pinion G on shaft H. I represents a spur-gear mounted on said shaft H and meshing with and driving the bevel-gear K.

L M represent bevel-gears for driving shaft N, upon which is keyed the crank O, which operates the pitman 1. Thus the mechanism for driving the mixing-shaft D and the pitman 1 for operating the plunger are driven from the top of the shaft D and the mold-feeding mechanism is driven from the bottom of said shaft and attached to the under side of the cylinder A, as will be hereinafter explained.

2 represents the plunger, which is driven downward to force the clay through the die 3 into molds held underneath the same. The said plunger is attached to the cross-head 4, and the pitman or connecting-rod 1 is connected to the cross-head 4 by a toggle-joint 5, which is composed of two links hinged to the centers *a b c*.

6 represents a set-screw against which the joint of the link 5 strikes to prevent it movings too far inward. If the center *b* is brought into right lines between the centers *a c*, the links are upon the dead-center and will not trip; but by adjusting the set-screw 6 so as to have the center *b* slightly out of the dead-line then when the plunger 2 strikes an unyielding obstacle it will trip and the links assume the position shown in Fig. 4, which will allow the crank O to revolve without moving the plunger 2 and the cross-head 4.

7 represents a spring attached to the head 8 of the connecting-rod bearing against the upper portion of link 5, which yieldingly holds them in the tripping position. The pitman is composed of duplex rods 1, secured to the head 8 by nuts at the lower end. 9 represents a similar head journaled on the crank O, to which the connecting-rods are similarly secured, passing clear through the heads, thereby allowing the connecting-rod to be lengthened or shortened to vary the stroke of the plunger at will.

10 represents guides attached to the front face of the cross-head 4, between which moves the sliding block 11, to which the link and head of the connecting-rod are respectively attached. It will be seen that the movement of this block 11 and the connecting-rods 1 are positive and make their full stroke so long as the crank O revolves; but the plunger may be arrested in its descent by the tripping of the links, as shown in Fig. 4, whenever the plunger meets with undue resistance, thereby preventing breakage of any of the parts.

In the manufacture of brick from ordinary

clay small stones or unyielding obstacles are frequently found, which are not reduced by the mixing-blades of the pug-mill. These obstacles are pressed into the mold by the plunger 2. If they project above the top of the molds, either the molds or the plunger-box are apt to be broken by these unyielding obstacles. To obviate this difficulty, I provide a stone door 13, which is preferably a concave piece of metal hung on the stud-shafts 14.

15 represents weighted arms, which are normally in a horizontal position, as shown in Fig. 1, holding the stone-door vertical. The molds are drawn out in the space 16 under the stone-door, and if a stone projects up between the dies 3 and should strike the lower edge of the stone-door the weighted arm 15 would rise, making the opening larger, and allow the molds to pass out freely, the weights bringing the stone-door back into position. This automatic yielding to undue strain and coming back into position avoids danger of breaking either the molds or dies of the boxes. This concave door 13 extends some distance above the die 3 and down to the lower edge of the same, making a sufficient opening for the removal of the die 3, which is supported upon guides and held in position by set-screws 38, as shown in Fig. 12, thus making a convenient means for interchanging the die, as well as allowing for a discharge of stones out the stone-door opposite the die, which door is concave in shape for two purposes, first, to allow small stones to pass into the concavity, and, second, to cut the charge off at the top, so as to size it for the die 3, and also the lower edge strikes the charge-off as it leaves the die 3 and passes into the mold. This construction also assists in drawing stones or obstructions into the concavity of the gate or door. The molds are supported upon the table T. The table is hinged at its rear end to brackets R by the gudgeon-pins S. The front end of the table is supported upon an eccentric-shaft P, carrying eccentrics Q *r*, set upon either side of the table, as shown in Fig. 10.

17 represents a crank-arm attached to the shaft P for rocking the same to raise or lower the table by the sweep of the eccentrics.

I have shown two eccentrics side by side, *r* representing the small eccentric and Q the larger ones. The adjustment of the eccentrics is accomplished by loosening the set-screw *f* and moving the eccentric on shaft P.

In order to provide a further adjustment of the table, the eccentric-shaft P is journaled in adjustable brackets 18, which are raised and lowered vertically by the screw-bolt 19. By this means the table T may be raised or lowered to suit any size of mold desired, and it is readily lowered to allow the table to be dropped to remove the molds by hand when the machine is not in operation.

20 represents frictional rollers, on which the molds rest.

21 represents an opening in the frame, through which the molds are introduced onto the table. The molds are fed or moved forward on the table by means of the following mechanism. (Shown in Figs. 1, 3, 5, 6, and 7.)

22 represents a crank-arm on the bottom of the main shaft D; 23, a friction-roller journaled on the end of the crank-arm.

24 represents a swinging arm pivoted at 26 to the bottom of the cylinder.

27 represents a connecting-link hooked to the crank-arm 28, which crank-arm loosely journals upon the rock-shaft 29. This link is made of the shackle form to provide for adjustment.

30 represents crank-arms journaled on shaft 29.

31 represents links carrying the roller 32, which roller comes in contact with the molds and pushes them forward on the table. Arm 28 is locked to shaft 29 by means of crank 33 and links 34. These parts are in position for conveying motion to the mold when they are connected up, as shown in Fig. 1, in which position the centers *e i t* of the connecting-link mechanism are nearly in line. The spring *n*, bearing against the link-arm 34, prevents its tripping; but if the mold moved by the roller strikes unyielding obstacles the spring *n* will yield and the link 34 will trip, allowing the arm 28 to oscillate loosely upon the shaft 29 without transmitting motion to shaft 29 and the crank-arms 30 and links 31, so that the crank 22 (see Fig. 3) will revolve and move the swinging arms 24 and 28, which will move their full strokes without imparting motion to the shaft 29. These parts operate in a similar manner to the link-driving mechanism of the plunger; but as the motion is taken at right angles to the plane of the molds the link and crank mechanism are employed as more convenient to change the direction of motion, the tripping or link mechanism 34 making a lock connection between the mold-driving mechanism and the crank 22. By these means if the molds are accidentally caught by any undue obstruction the mold-driving mechanism will be unshipped without danger of breaking the parts.

35 represents a weighted arm for automatically bringing the links 34 back into position, as shown in Fig. 5, after the parts have been tripped.

In Fig. 12 I have shown a detachable die 3, which is introduced into position or removed therefrom through the stone-door 13.

36 represents ways formed in the sides 37 of the die-box, and 38 set-screws tapping through said ways into the die-frame 3. By means, therefore, of the ready-opening stone-door 13 the dies may be readily changed by slackening the set-screws 38 and moving the die forward on its ways 36. This is very important, as it allows the dies to be readily changed in size, and in case of breakage they can be adjusted accurately in position so as to register with the molds.

39 represents reinforcing or lining plates

for the molding-box. The plunger coming in contact with these plates rapidly wears them off, and it is essential that they be easily changed or adjusted in case of wear. This may be done by packing behind the plates or by readily removing the same and introducing new ones.

It will be observed that the yielding motion is made independent of the pitman and as an attachment thereto, and that the cross-head is supported upon the frame of the machine, and that the link connection is made between the cross-head and the sliding block 11. Therefore the weight of the yielding unshipping mechanism is not suspended by the pitman-rod and crank-pins, which is an improvement over other devices proposed to be employed for accomplishing the same result.

Having described my invention, what I claim is—

1. In a brick-machine, in combination with the molding-box, the concaved stone-door 13, hung upon stud-shafts, the removable die 3 adjacent to the stone-door opening, through which the same may be removed, substantially as specified.

2. In combination with a brick-machine having the vertical-moving plunger, the table T, suspended upon the centers S, and the shaft P, carrying the adjustable eccentrics Q and *r*, substantially as specified.

3. In a brick-machine, the combination of the brackets R, the table T, suspended near its rear end on centers S, supported in said brackets, and the shaft P, having eccentrics Q *r*, substantially as described.

4. In a brick-machine, the combination, with the cylinder A and shaft D, having crank 22, of the pivoted arms 24 and 28, the mold-moving mechanism 30 31, and the tripping-link mechanism 34, substantially as described.

5. In combination with the crank-driving mechanism 22 and the mold-moving mechanism 30 31, the crank-arms 28, journaled loosely upon the shaft 29, and the link mechanism 34 for locking said arm to the shaft 29, substantially as specified.

6. In a brick-machine, the combination of the removable die 3, the concaved stone-door 13, having stud-shafts 14, provided with weighted arms 15, the plunger 2, the cross-head 4, carrying said plunger, the pitman 1, and yielding mechanism between the pitman and the cross-head, substantially as described.

7. In a brick-machine, the combination of the cylinder A, having the shaft D, provided with a crank 22, the mold-moving mechanism driven by said crank, the table T, suspended on centers near its rear end, and the shaft P, provided with eccentrics Q *r*, substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM C. VANNEMAN.

Witnesses:
J. B. CLEMANS,
A. S. MCCALL.