(No Model.) 3 Sheets—Sheet 1.

S. L. SHELLENBERGER.

BRICK MACHINE.

No. 348,425. Patented Aug. 31, 1886.

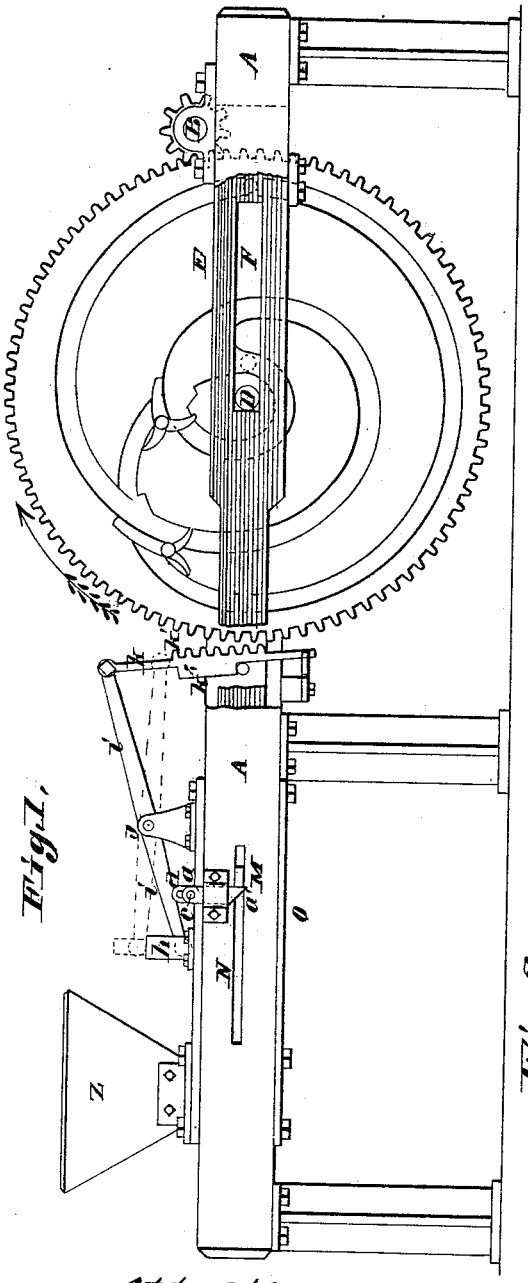

Fig. 1.

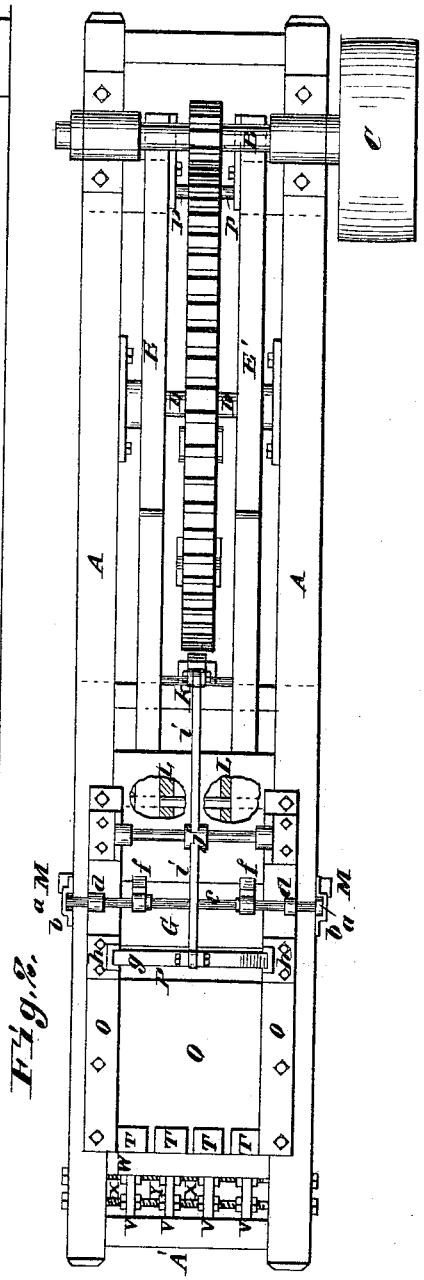

Fig. 2.

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Fig. 3.

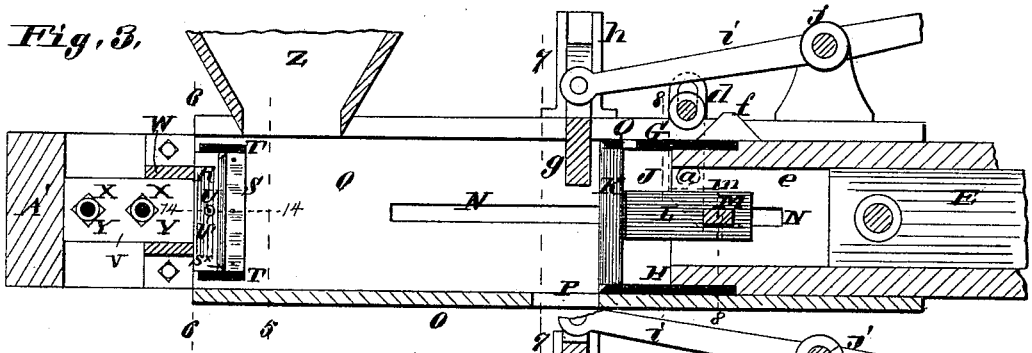

Fig. 4.

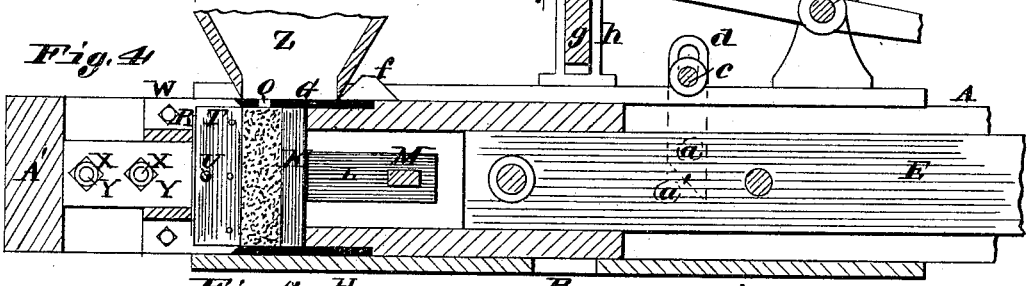

Fig. 5.

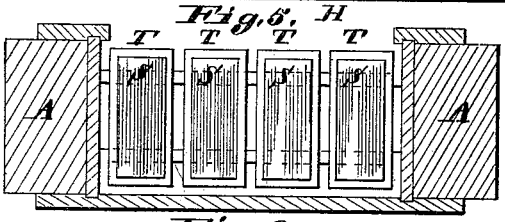

Fig. 7.

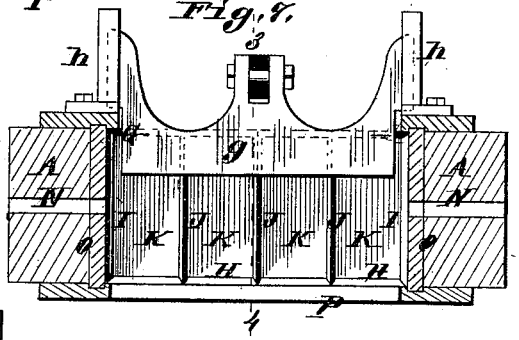

Fig. 6.

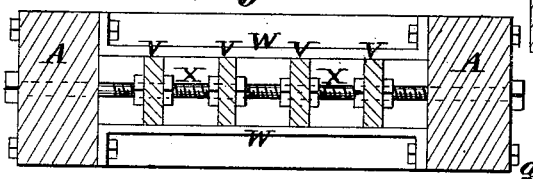

Fig. 8.

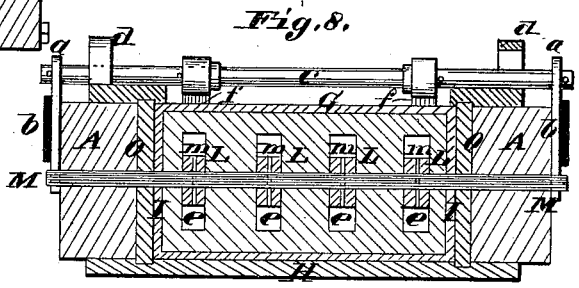

Fig. 9.

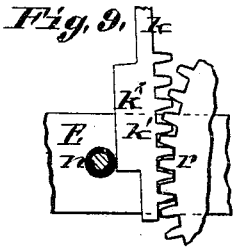

Fig. 10.

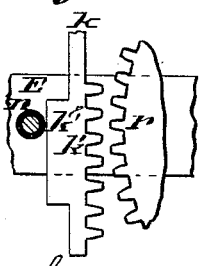

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Fig. 11.

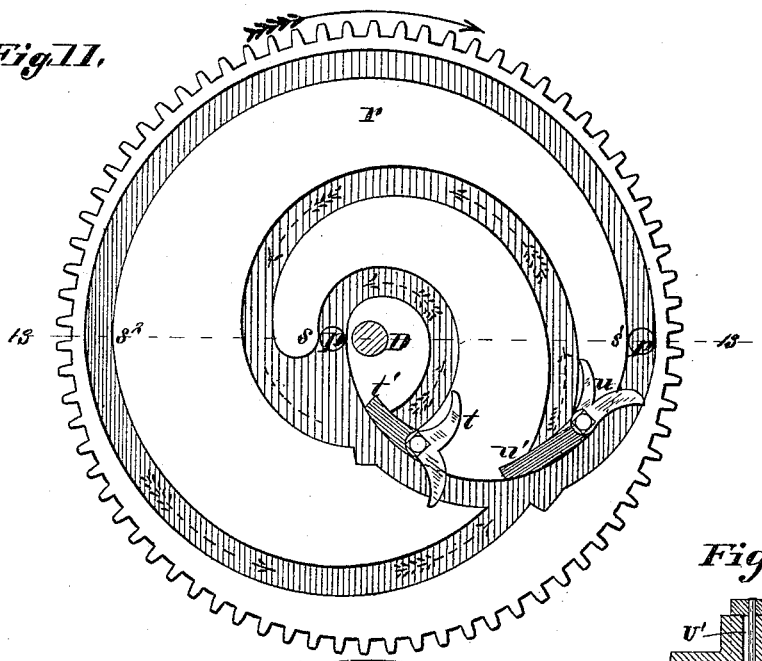


Fig. 14.

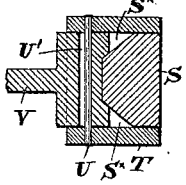


Fig. 12.

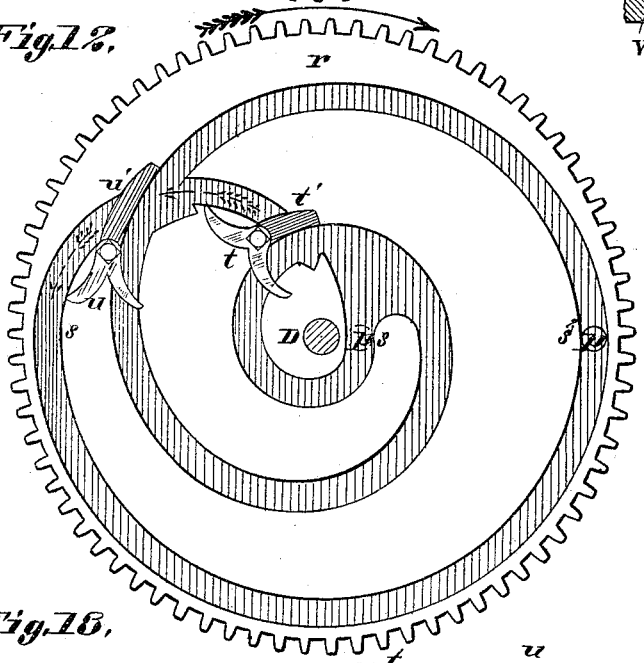
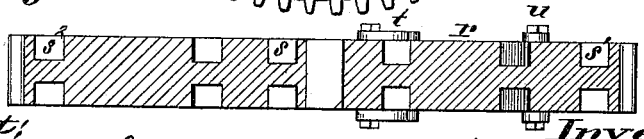


Fig. 16.



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Inventor;
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UNITED STATES PATENT OFFICE.

SAMUEL L. SHELLENBERGER, OF TYLER, TEXAS.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,425, dated August 31, 1886.

Application filed July 29, 1885. Serial No. 172,139. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. SHELLENBERGER, of the city of Tyler, county of Smith and State of Texas, have invented a certain new and useful Improvement in Brick-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a brick-machine; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

In this machine the molds are carried on a horizontal reciprocating frame, and act in conjunction with fixed plungers. The bricks are discharged downward on an off-bearing belt or other receiver, said receiver forming no part of the invention and not being shown. The movement of the mold-carriage will be described as caused by a cam-wheel of peculiar construction; but no claim is made therefor in this application, as I purpose to make claim for the same as a new mechanical movement or device for converting motion.

Figure 1 is a side view of the machine with part broken out. Fig. 2 is a top view plan. Fig. 3 is a detail vertical longitudinal section at III III, Fig. 7. Fig. 4 is a detail vertical longitudinal section at IV IV, Fig. 7. Fig. 5 is a transverse section at V V, Fig. 3. Fig. 6 is a transverse section at VI VI, Fig. 3. Fig. 7 is a transverse section at VII VII, Fig. 3. Fig. 8 is a transverse section at VIII VIII, Fig. 3. Fig. 9 is an enlarged detail side view, showing the pitman-rack, by which the brick-discharger is actuated in engagement with the cogs of the cam-wheel; and Fig. 10 is a similar view, except that the pitman is out of engagement with said wheel. Figs. 11 and 12 are enlarged side views of the cam-wheel and latches or pivoted guides in different positions. Fig. 13 is a diametric section of the cam-wheel at XIII XIII, Fig. 11. Fig. 14 is a section on the line XIV XIV, Fig. 3, showing the manner in which the rubber facings of the plungers rest against their supports or backings.

The frame of the machine may be of any suitable construction. It has side bars, A, on which the drive-shaft B has bearing. This shaft is shown with a pulley, C, to take a belt by which the machine is driven. A sprocket-wheel for a drive-chain or a cog-wheel may be used in place of the pulley, or the shaft be driven in any other manner, or wholly dispensed with and the power applied to the cam-wheel shaft D. Even the cam-wheel may be dispensed with and the carriage actuated by other means, as the operation of the molds is not dependent on any novel peculiarity of the actuating devices of the carriage, except that the movement should be slower when the pressure of the clay is taking place, and should cease during the discharge of the bricks after their expulsion from the molds. The carriage has side bars, E, which are longitudinally slotted at F for the passage of the cog-wheel shaft, which shaft acts as a guide for the rear end of the carriage. The molds are at the front end of the carriage, and should be made of steel, either cast in one solid piece or constructed of two or more pieces. There may be a single mold, or two or more, four molds being shown.

G is the top plate, H the lower plate, I the side plates, and J the division-plates, forming four rectangular molds having movable bottom plates, K. All of the bottom plates have rear or tail bars, L, through mortises in which a single transverse bar, M, passes, the ends of said bar working in slots N of the box O and side bars, A, in which the head of the carriage and molds work. The tail-bars are fixed in position on cross-bar M by pins or set-screws.

P is an orifice in the bottom of the box, through which the bricks are discharged after they have been ejected from the molds (by the outward movement of the bottoms K.) At the top of each mold is an orifice, Q, through which any surplusage of clay is discharged while the pressure is taking place. The plungers have each a rectangular cup, R, in which fits a rubber block, S, of which the main part of the plunger-face is formed, the rubber being inclosed in a rectangular ferrule, T, which is secured to the cup R by a bolt, U, passing through a transverse hole, U′, in the cup, of somewhat larger size than the bolt, so that the ferrule has a limited backward and forward movement on the cup. The central part of the rubber fits snugly in the cup; but nearer

the outside the rubber block does not fit tightly in the cup, a space, as at S^x, being left between them, so that when the pressure is on the clay the sides of the plunger fall back slightly, giving the face of the mold a somewhat rounded or convex form, and causing that side of the brick to be somewhat hollow or concave; then when the pressure is removed, the face of the plunger resumes its flat form and the brick is disengaged from the plunger. Each plunger has a tail-bar, V, which fits between the top and bottom bars of the transverse abutment W.

X are transverse bolts, which pass through the sides of the main frame and through the tail-bars V, and which have upon them nuts Y, by which the plungers may be nicely adjusted to the molds. The tail-bars have ends bearing against the end bar, A′, of the main frame. The edges of the molds are made flaring, as seen in Figs. 3, 4, and 7, to guide the plungers in their entrance and to keep the inside of the box O clear of clay by scraping it as the molds advance. The top of the box O may be open, as shown, or may be covered, except where the hopper Z (containing the clay) is placed. The hopper is so constructed that in the absence of the mold from beneath it the clay falls into the box O in sufficient quantity to form a pressing or batch of bricks, or a little over this amount of clay. Then when the mold-case comes forward, any surplusage more than the molds are capable of receiving may be forced backward into the hopper. The clay contained in the molds is compressed as the plungers enter them, and any surplusage escapes through the holes Q and lies on the top plate of the mold-case, and is scraped therefrom by the lower edge of the hopper as the carriage moves backward, and falls down into the box O, to be taken up in the next forward movement of the molds. As the carriage moves backward, the bar M passes beneath the inclined ends a' of the latches a, (see Figs. 1 and 8 and dotted lines in Figs. 3 and 4,) and arrives at the end of the slot N shortly before the carriage arrives at its rear position. The latches a work vertically in guides b and are attached to a bar, c, extending transversely over the machine-frame, said bar working in guides d. Upon the bar c are anti-friction rollers, which at the proper time are acted on by inclined blocks f on the carriage to lift the latches a and release the mold-bottoms, so that they may move forward. The arrangement is such that the forward movement of the mold-bottoms is arrested until the forward movement of the carriage has carried the mold-case forward on them and the molds are opened to receive the clay. It will be seen that the mold-case continues to move backward with the carriage, while the backward movement of the bottoms K is arrested, and the bricks are forced from the molds as the apposture P is reached. Where the clay is of an adhesive nature the bricks stick more or less to the bottoms K, and to detach the bricks I have a sash-block, g, which descends at this moment and slides the bricks vertically downward on the smooth faces of the bottoms K. The sash g moves in guides h. It is hinged to the lever i, which works on a fulcrum, j, and whose other end carries a pendent rack-arm, k, whose rack is engaged by the teeth of the cam-wheel b when the carriage is in its rear position, to throw the arm upward and the sash downward, for the purpose described.

To bring the rack k' into engagement with the teeth of the cam-wheel r, the carriage has a cross-pin carrying an anti-friction roller, n, which comes in contact with a block, k^2, as the carriage reaches its rear position. When the rack-arm has been thrown up sufficiently, the block k^2 is disengaged from the roller n and the rack is drawn out of engagement with the teeth of the wheel by a spring, o, or by the gravity of the arm, or by both. Then when the carriage again moves forward the roller n is drawn from beneath the block k^2, and the rack-arm descends and the sash rises.

As before explained, the carriage may be actuated by any preferred means. I will now describe the cam-wheel, which supplies an efficient means for this purpose, but which I make no claim for in this case. Upon the inner side of the side bars, E, of the carriage are studs p, which may be armed with anti-friction rollers, and which travel cam-grooves in the sides of the cam-wheel r. The form of the grooves is such as to give the required movements to the carriage by a continuous rotation of the cam-wheel, the movement of the studs in the groove being indicated by dotted arrows. It requires three rotations of the cam-wheel to give a whole forward and backward movement to the carriage, two rotations being required for the forward movement and one-half rotation for the backward movement, the carriage remaining at rest during one-half a rotation of the wheel while the bricks are being discharged and while the studs are traversing the part of the groove between the parts $S' S^2$, this part of the groove being concentric with the wheel. When the stud is passing in the groove from S to S′, the carriage is making its retrograde or rearward movement. When the stud is traversing the groove from S′ to S^2, the carriage is making its forward movement.

t and u are the switches, by which the stud is diverted from one part of the groove to another, as can be readily perceived by examination of the same in their different positions shown in Figs. 11 and 12. It may be seen that when the stud passes any switch it comes in contact with one of the curved horns and swings the switch over, so that the guide-tail t' or u', as the case may be, switches the stud into the other part of the groove and its next contact with the switch. For instance, when the stud is at s, Fig. 11, the rotation of the wheel being in the direction indicated by the arrow at the circumference, the stud will traverse the part of the groove S S′ along the curve extending in a nearly radial direction, the switches be-

ing in proper position for this, while if the stud were in this place and the switches in the position shown in Fig. 12, the stud would follow the other curve, and the wheel would take two and a half rotations before the stud would reach the point S'.

I have described the rubber block as fitted in a cup-formed holder, and made of such convex form at the back so as to leave a space between the rubber and holder near the edges, to allow the outer parts to fall back under pressure; but I do not confine myself to this exact construction. There are two purposes in this, one being to give the side of the brick a concave form; but another and more important purpose is to cause the face of the rubber to change its form under pressure, so that as it resumes its normal shape when the pressure is removed it shall disengage itself from the side of the brick, and any manner of constructing or supporting the rubber block which would accomplish this last result would contain an essential feature of my invention, whether spaces should be made in the rubber or between the rubber and the holder.

I am aware that movable mold-boxes are in themselves not new, and also that it is not new to cover the face of the plunger of a brick-machine with rubber, and do not claim such as my invention.

I claim—

1. In a brick-mold, the combination, with the horizontal box or trough O, which serves to support the clay, and a fixed plunger, of the mold-box reciprocating in said trough, substantially as set forth.

2. The combination, with a horizontal box or trough having an orifice in the bottom thereof, of a plunger, a mold-box reciprocating within said horizontal box and having a bottom plate movable independently thereof, and a stop for arresting the movement of the bottom plate as soon as its face passes the orifice in the horizontal trough, substantially as shown, and for the purposes set forth.

3. The combination of reciprocating mold-case, a movable mold-bottom having a guide-bar working in slots of the guide-frame of the case, and automatic catches to engage the guide-bar and prevent its movement with the carriage at the commencement of the forward movement of the carriage, substantially as and for the purpose set forth.

4. The combination, with the plunger, of a block of yielding material secured to the face thereof with a space between their contiguous faces, as and for the purpose set forth.

5. In a brick-machine, the combination, with a plunger, of a block of rubber secured thereto, with a space between the face of the plunger and the outer edge of the block of rubber, so as to permit the latter to yield when pressure is applied, as set forth.

6. The mold-plunger having a rubber block surrounded by a sliding metal ferrule and secured to a metal holder, and having space to allow the face of the block to change its form.

7. The combination, with the reciprocating mold with movable bottom and guide-bar, of latches arresting the forward movement of the guide-bar, and incline upon the mold case or carriage lifting the latches when the carriage has moved forward a given distance.

8. The combination, with a fixed plunger, of a horizontally-reciprocating mold-box having a bottom plate movable independently thereof for the purpose of ejecting the brick, as set forth.

9. The combination, with the box or trough O, and the sliding mold-box having the movable bottom K, of the stop *a*, for controlling the movement of the plate K, and a projection from the mold-box for controlling the position of said stop, as set forth.

10. The combination, with the sliding mold-box and the movable bottom plate, K, of the bar M, the stops *a*, the shaft *c*, and the blocks *f*, all constructed and arranged to operate as set forth.

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BENJN. A. KNIGHT.