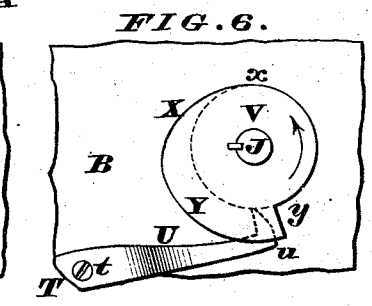
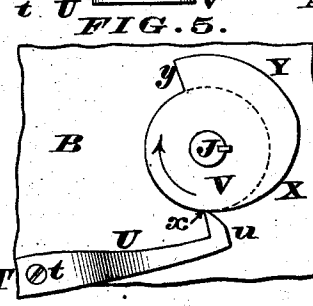
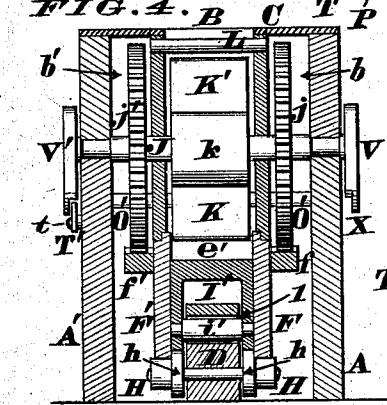
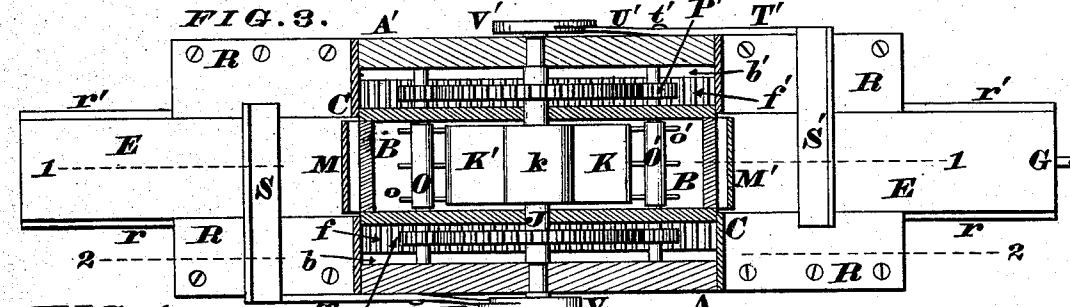
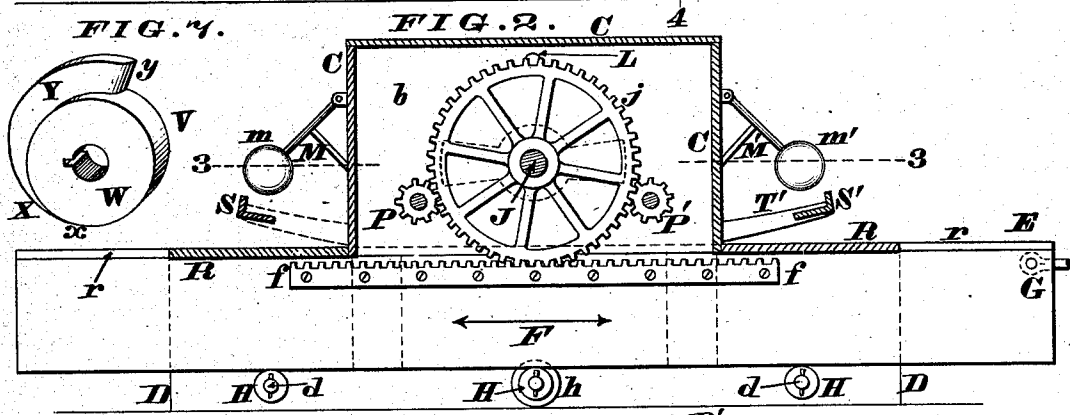
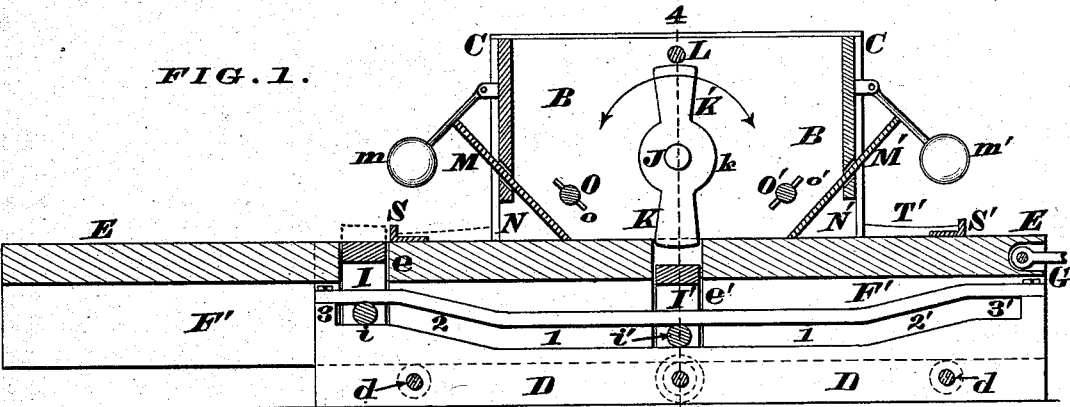


G. C. BOVEY.
Brick-Machine.

No. 159,634.

Patented Feb. 9, 1875.



Attest.
Jas. H. Layman,
Henry Tanner

George C. Bovey
By Hughes & Sons, Att'ys.

UNITED STATES PATENT OFFICE.

GEORGE C. BOVEY, OF CHILLICOTHE, OHIO.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **159,634**, dated February 9, 1875; application filed January 6, 1875.

To all whom it may concern:

Be it known that I, GEORGE C. BOVEY, of Chillicothe, Ross county, Ohio, have invented a new and useful Improvement in Brick-Machines, of which the following is a specification:

This invention relates to that kind of brick-machines for which Letters Patent were issued to me May 13, 1873; but, unlike the apparatus described in said patent, my improved machine is furnished with a reciprocating carriage containing only two molds, into which the pulverized untempered clay is alternately packed by means of a reciprocating rotary press-wheel, whose shaft carries a spur-wheel that gears with a rack secured to the aforesaid reciprocating carriage. This two-mold carriage is reciprocated directly by a pitman, which may be driven by a steam-engine or other motor, thereby enabling me to dispense with the complicated and expensive belt-shifting devices, which are necessary for the operation of the machine previously alluded to.

I further simplify the present machine by dispensing with the guiding-grooves that are shown upon the inner sides of the frame of the old apparatus, and impart the proper vertical reciprocation to the two plungers in their respective molds by means of a slotted plate that is located under the carriage and longitudinally of the machine.

In order to prevent any of the bricks being carried back into the hopper by the return movement of the carriage, I provide guards or fenders, which are arranged so as to be elevated by cams as soon as the bricks have been expelled from the molds. These fenders then drop down behind the bricks, and thus detain them upon the projecting ends of the carriage long enough to allow the attendants of the machine to remove them by hand.

Having thus indicated the leading features of my improved machine, I will now proceed to give a detailed description of the same, together with its mode of operation.

In the accompanying drawing, Figure 1 is a longitudinal section of my two-mold machine, taken at the line 1 1, the reciprocating carriage being shown as having just completed its stroke to the left. Fig. 2 is a longitudinal section of the machine at the line 2 2.

Fig. 3 is a horizontal section thereof at the line 3 3. Fig. 4 is a vertical section at the line 4 4. Figs. 5 and 6 are elevations, showing the two opposite positions of one of the cams that operates one of the guards or fenders of the machine; and Fig. 7 is a perspective view of the rear side of said cam detached from the shaft of press-wheel.

Of the above illustrations, Figs. 5, 6, and 7 are drawn on an enlarged scale.

A A' represent side plates, constituting the main frame of the machine, said plates being maintained a suitable distance apart, and parallel with each other by suitable bolts and stays. Secured to this frame, and at the mid-length thereof, is the hopper B, having on either sides of the same compartments *b b'*, for a purpose which will presently appear. *C* are plates or caps that prevent dust and clay entering said compartments. Occupying a position intermediate between the frame A A', and extending longitudinally of the machine, is a stout vertical plate or casting, D, which supports the reciprocating carriage, and also operates the plungers within the molds of the aforesaid carriage. This carriage consists essentially of a horizontal table or platform, E, having two downwardly-projecting flanges or wings, F F', and two chambers, *e e'*, which constitute the molds proper of the machine. Attached to one end of this carriage is a pitman or connecting rod, G, that is operated either by a crank or wrist-pin, driven by a steam-engine or other convenient motor. The aforesaid carriage should be so long as never to uncover the plate D, otherwise clay will be apt to work into the slot in said plate, and thereby impede, if not entirely prevent, the proper action of the plungers. The weight of this carriage is borne by rollers H, upon which the flanges F F' play, said rollers being journaled upon shafts *d*, disposed transversely of plate D. Of these rollers, the two upon the central shaft of the plate D are furnished with enlarged rims or annular flanges *h*, whose office will presently appear. The plate D is furnished with a slot, consisting of a central or horizontal portion, 1, and two inclined portions, 2 2', which latter communicate with the horizontal terminations 3 3' of said slot. Adapted to traverse this slot

are rollers $i\ i'$, which are journaled, respectively, in the lower ends of plungers $I\ I'$, the latter being fitted within the chambers or molds $e\ e'$ of the reciprocating carriage $E\ F\ F'$. Bolted to or cast with the side flanges, $F\ F'$, are racks $f\ f'$, with which gear spur-wheels $j\ j'$, that are secured to a shaft, J , disposed transversely of hopper B . This shaft carries a press-wheel, consisting of a stout hub, k , from which radiate, in diametrically opposite directions, two blades, arms, or pressers, $K\ K'$, that are adapted, at the proper moment, to enter the upper or open ends of molds $e\ e'$. Disposed through the hopper B , and in close proximity to the press-wheel, is a scraper, L , which prevents clay accumulating upon the ends of arms $K\ K'$. $M\ M'$ are inclined knives, which reduce the upper surface of bricks to a smooth and level condition before they emerge through the openings $N\ N'$ of the hopper. These knives are maintained in contact with the upper face of table E by means of weights $m\ m'$. In order to prevent clay packing in the lower corners of the hopper, and accumulating upon the aforesaid knives, I provide two shafts, $O\ O'$, armed with pins $o\ o'$, and having a rotary motion imparted to them by pinions $P\ P'$, which gear with the spur-wheels $j\ j'$, as clearly shown in Figs. 2 and 3. As the racks $f\ f'$, spur-wheels $j\ j'$, and pinions $P\ P'$ all operate within the closed compartments $b\ b'$, it will be readily understood that they are not liable to become clogged up with clay and dust. Securely bolted to the upper surfaces of the main frames $A\ A'$ are horizontal plates R , whose inner edges fit within grooves $r\ r'$ of the table E , and thereby act to maintain the mold-carriage in its proper relative position with reference to the machine, while, at the same time, said carriage is allowed to reciprocate in the manner explained. Located transversely of the machine are two guards or fenders, $S\ S'$, which are secured to the outer ends of levers $T\ T'$, the latter being pivoted to the machine at $t\ t'$. The inner ends, $U\ U'$, of these levers are elastic or yielding, and have a tendency to spring away from the sides of the machine whenever their spurs u are not subjected to the compressing action of cams $V\ V'$, which cams are keyed to the opposite ends of press-wheel shaft J . Each of these cams is provided with a cylindrical hub, W , an eccentric periphery, X , and a concentric flange or web, Y , which begins at the shoulder y and gradually dies out at the point x , where the eccentric periphery joins the hub.

The operation of my two-mold machine is as follows: The hopper B is first charged with damp pulverized untempered clay, and the engine, which operates the pitman G , is then started, thereby imparting a reciprocating motion to the two-mold carriage $E\ e\ e'$, and, as soon as said carriage has completed its full stroke to the left, the various parts of the machine assume the positions shown in Fig. 1. By referring to this illustration it will be seen that the shaft i of plunger I occupies the

portion 3 of the slotted plate D , and, consequently, said plunger is elevated and the brick expelled from mold e , as indicated by the dotted lines. The shaft i' of the other plunger, I' , occupies the lowermost portion 1 of the slotted plate, and, therefore, this plunger is depressed, so as to allow the arm K of press-wheel to force clay into the mold e' ; and, during this operation, said plunger rests upon the flanges h of the central rollers H , as shown in Fig. 4. By this arrangement these stout rollers sustain all the strain that is brought to bear upon the plunger by the action of press-wheel, and, therefore, there is no danger of the carriage being sprung while the molds are filling. It will also be noticed, the two fenders $S\ S'$ are resting upon the table E , so that the moment the carriage commences to move toward the right the guard S will prevent the expelled brick being carried back into the hopper and pressed a second time, which act would be liable to break the machine.

As the carriage continues to move to the right the roller i enters the incline 2, thereby gradually retracting the plunger I until said roller begins to traverse the portion 1 of the slotted plate, when the plunger is depressed as low as it ever descends, so as to allow sufficient room in the mold e for the reception of clay. When this mold reaches a position directly under shaft J the blade or arm K' of the press-wheel is then forced into said mold by the action of racks $f\ f'$ upon the spur-wheel $j\ j'$, which cause said wheel to perform a semi-rotation to the left. While the mold e is thus being brought into a proper position for the action of press-wheel $K\ K'$ the other mold, e' , is carried along toward the right end of the machine, and as it progresses the shaft i' first enters the incline 2', and then runs into the termination 3' of the slot. As this shaft i' ascends the incline 2' the plunger I' is elevated gradually and the pressed clay thereby expelled from the mold e' , the fender S' having been previously elevated by the rotation of its appropriate cam V' .

The above-described operations are repeated at every stroke of the carriage, the arm K of the press-wheel always entering the mold e' , while the arm K' acts upon the clay in the other mold, e .

The raising and lowering of the guards $S\ S'$ at the proper moment are effected as follows: The cam V is keyed to the shaft J in such a manner that the eccentric portion X does not begin to act upon the lever $T\ U$ until the mold e has been fairly brought within the hopper B , at which time said cam, by impinging against the spur u , elevates the guard S , and maintains it in this position until said mold again emerges from the hopper, and is freed of its contents, when the guard drops on account of said spur escaping over the termination y of the cam. The carriage then begins its retrograde movement, and the rotation of the cam is accordingly reversed, which act would cause a dead-lock to occur were it not

for the provision of the yielding portion U of the lever T.

By referring to Fig. 7, it will be seen that the shoulder *y* is chamfered off on the rear side of the cam, thereby causing the lever T to yield far enough to allow its spur *u* to be pressed back behind the web Y. In this position the spur *u* bears against the cylindrical hub W without operating the lever in any manner, but the moment the revolution of the cam brings said spur to the point *x*, where the eccentric flange X joins said hub, the limber end U instantly flies out, to be again acted on, as above described.

As the action of both cams is precisely alike no description of the one, U', is necessary.

In constructing this machine it is advisable to arrange the motor in such a manner that the pitman G will be perfectly horizontal at the termination of either stroke of the carriage, so as to insure the greatest exertion of power when the press-wheel is acting on the clay in the molds.

In the machine described in my patent of May 13, 1873, the plungers are shown as arranged to be elevated and depressed by grooves in the sides of the frame-work, but experience has demonstrated this to be a defect, as the plungers will not act properly unless these two sets of grooves are accurately in line with each other. Another objection to this arrangement is that the protruding ends

of the plunger-shafts are liable to break off and the grooves to become filled with clay. All of these objections I entirely overcome by using the slotted plate D, which will not sag down or spring; neither can clay enter its slot. It will also be noticed that ample room is afforded to allow the use of a roller of such diameter as to render its fracture an impossibility.

I claim as my invention—

1. A brick-machine consisting essentially of the frame A A', hopper B, slotted plate D 1 2 2' 3 3', reciprocating two-mold carriage E *e e'*, plungers I *i I' i'*, and reciprocating rotary press-wheel *k K K'*, motion being communicated from said carriage to the press-wheel by the racks *f f'* and spur-wheels *j j'*, or their equivalents, substantially as described.

2. The slotted plate D 1 2 2' 3 3', located beneath the reciprocating carriage E, for operating the plungers I *i I' i'*, and provided with rollers H, for supporting the flanges F F' of said carriage, substantially as explained.

3. The guard S, pivoted limber-lever T *t U u*, and eccentric V W X *x Y y*, as and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

GEO. C. BOVEY.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.