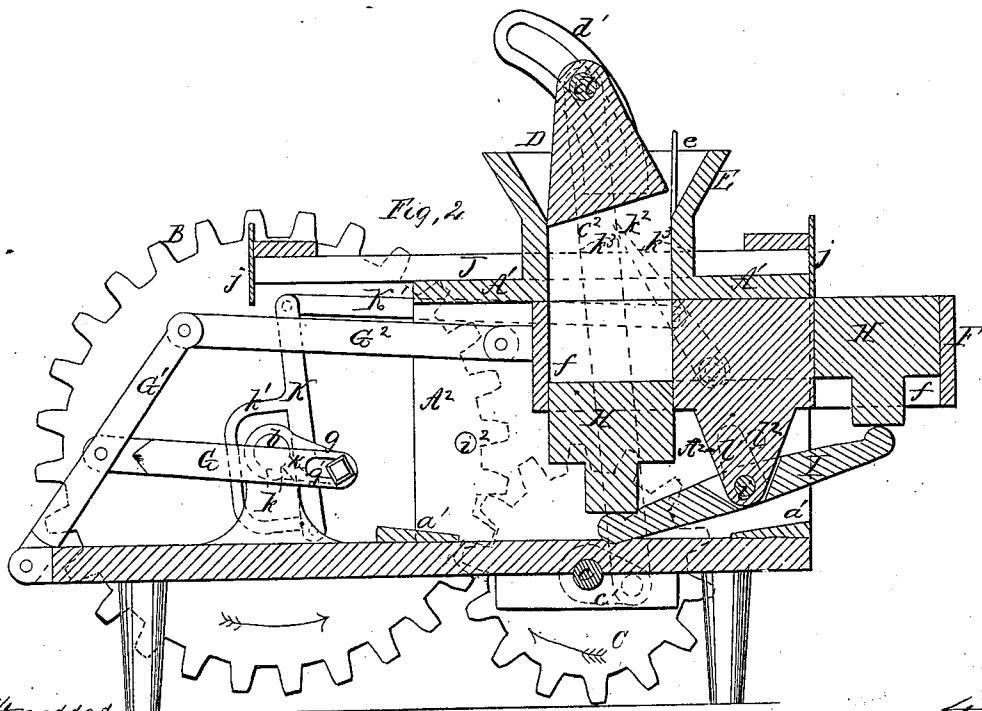
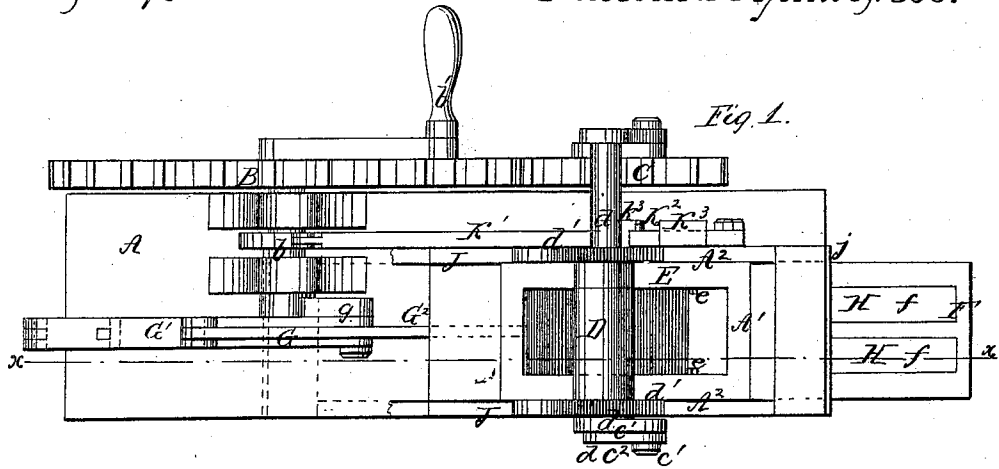


# P. J. Smith, Brick Machine.

N<sup>o</sup> 77,224.

Patented Apr. 28, 1868.



Witnesses,  
Goodwyn,  
Jno B. Rayton

Inventor,  
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by his Atty  
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# United States Patent Office.

PETER J. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 77,224, dated April 28, 1868.

## IMPROVED BRICK-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, PETER J. SMITH, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Making Bricks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a plan or top view of a machine embracing my improvements, and

Figure 2 a vertical longitudinal section through the same, at the line  $x x$  of fig. 1.

It is the object of my invention to produce smooth, firm bricks by automatic mechanism; and to this end the improvements herein claimed consist—

First, in a novel construction of the device for removing the bricks from the machine as they escape from the mould.

Second, in a novel method of combining a reciprocating mould, a piston, and an oscillating lifting-beam, with a plate arranged above the mould, and an inclined plane to act upon the lifting-beam, whereby the bricks are compressed in the mould during its reciprocation.

Third, in a novel method of combining an open-ended box or frame, a reciprocating mould-frame, pistons, a hopper and a plunger, with a reciprocating clearer, which sweeps off the finished bricks discharged from the mould.

In the accompanying drawings, which show one convenient way of carrying out the object of my invention, the mechanism is shown as mounted in a strong frame, consisting of a bed-plate, A, two side plates A<sup>2</sup>, and a top plate, A<sup>1</sup>. These parts form a box, (open at both ends,) in which the moulding-apparatus reciprocates horizontally. This frame is supported in any proper manner at the requisite height.

A horizontal driving-shaft,  $b$ , is mounted in suitable bearings near one end of the frame, across which it extends transversely. This shaft may be driven by a crank,  $b'$ , or in any other well-known way. A spur-wheel, B, on this shaft, drives a corresponding pinion, C, on a crank-shaft,  $c$ , mounted in suitable bearings underneath the frame, beyond which it projects at each side.

The top plate A<sup>1</sup> has an opening in its centre, over which a hopper, E, is placed. This hopper has a flaring mouth and parallel sides.

A sector-shaped plunger, D, which works snugly in the body of the hopper, swings freely on a cross-head,  $d$ , vibrating in curved guides  $d'$ , attached to the sides of the hopper. Each end of the cross-head is connected with a crank,  $c'$ , on the crank-shaft  $c$  by a pitman,  $c''$ . The plunger is guided in its descent into the hopper by vertical bars  $e$ .

A moulding-frame, F, is arranged to reciprocate horizontally in the frame on suitable ways, and carries a set of moulds,  $f$ , at each end. The top of the moulding-frame reciprocates in close contact with the under side of the top plate A<sup>1</sup>. The moulding-frame is reciprocated by means of a crank,  $g$ , on the driving-shaft  $b$ . This crank has a slight degree of play in a slot,  $g'$ , in a pitman, G, pivoted to the centre of a vertically-rocking radius-bar, G<sup>1</sup>, the lower end of which is pivoted to the bed-plate A, while the upper end is pivoted to one end of a link-rod, G<sup>2</sup>, the other end of which link-rod is pivoted to the mould-board.

Plungers or pistons H are arranged to play freely in the moulds  $f$ . These plungers rest loosely on a rocking-carrier, I, pivoted centrally to the under side of the moulding-frame by a shaft,  $i$ . A tripping-arm,  $i'$ , on this shaft, strikes against stops or studs  $z$ , on the side plates A<sup>2</sup>, when the moulds reach the end of their stroke, and rock or reverse the carrier.

In order to carry the moulded bricks away from the moulds, I use a double-acting reciprocating skeleton sliding frame or clearer J, sliding on the top plate A, embracing the hopper, and having an overhanging lip or flange,  $j$ , at each end to push off the completed bricks, as they are thrown up by the moulds. This clearer is reciprocated by means of tappets or wipers  $k$ ,  $k'$ , on the driving-shaft  $b$  which work in a cam-guide or loop,  $k''$ , on a radius-bar, K, pivoted at its lower end to the bed-plate, and at its upper end to a pitman, K', which is

pivoted to a shifting-lever,  $k^2$ , rocking vertically on a stud on one of the side plates  $A^1$ , parallel to which it moves. The upper end of this shifting-lever works between studs  $k^3$ , on the clearer, placed somewhat farther apart than the thickness of the shifting-lever, for the purpose of allowing the lever to move a short distance without moving the clearer.

The mode of operation of the machine is as follows: Supposing the parts to assume the position shown in the drawings, and the driving-wheel to revolve in the direction indicated by the arrow, the hopper is to be supplied with suitably-tempered clay in any well-known way.

The hopper having been supplied with clay sufficient to fill the moulds beneath it, the plunger descends and forces the clay into the moulds. During the descent of the plunger, it will be observed that the crank  $g$  and tappets  $k^4$  are moving forward and upward, and consequently, as the clearer  $J$ , and moulding-frame  $F$  are at the extremity of their forward movement, they remain stationary while this movement takes place. After pressing the clay in the moulds, the plunger rises rapidly, as its cranks  $c'$  are on the quick part of their upward sweep.

The plunger rises and moves backward in its guides so as to tip its front edge, and thus leave room for a new supply of clay to enter the moulds while making a very short stroke. By the time the bottom of the plunger rests above the top plate  $A^1$ , the crank,  $g$ , has reached the back part of the slot  $g'$ , and as this crank is now on the quick part of the backward sweep, the moulding-frame is drawn rapidly backward, while the plunger-cranks being just on their centres, hold the plunger nearly stationary.

As the moulds are drawn back, the carrier  $I$  strikes an incline,  $a'$ , on the bed-plate, and is slightly raised, thus forcing up the pistons  $H$ , and compressing the bricks in the moulds against the under side of the top plate  $A^1$ .

The pistons  $H$  rest loosely on the carrier or lifting-lever, but are not connected with it, by which mode of construction the carrier slides across the ends of the pistons without forcing them to one side, as it would do if they were rigidly connected.

As soon as the moulds have emerged from the box  $A^2$ , the tripping-lever  $t^1$  strikes the pin  $t^2$ , and rocks the carrier  $I$ , thus forcing up the pistons and expelling the moulded bricks.

The other set of moulds is now under the hopper. The plunger descends rapidly to force the clay into them, but the moulding-frame remains stationary a moment as the crank  $g$  passes its dead-centre, and also moves backward in its slot  $g'$ .

The tappet  $k$  now acts upon the rear side of its loop  $k^1$ , and, through its connecting-link rods  $K'$ , moves the clearer  $J$  quickly backward. The flange  $j$  of this clearer pushes the bricks from the moulding-frame on to a table or upon an endless-apron or other contrivance, for conveying them away. The same process is repeated during the reverse movement of the moulding-frame.

It will thus be seen that at each stroke of the moulding-frame, a set of compressed bricks is made. It is obvious that the number of moulds may be varied to suit the requirements of the work to be done; and also that the details of construction of the several parts may be somewhat modified, without departing from the subject of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The reciprocating double-acting skeleton clearer  $J$ , arranged and operating substantially as set forth.
2. The combination, substantially as set forth, of a reciprocating mould, a piston, and an oscillating-carrier, with a top plate,  $A^1$ , and an inclined plane,  $a'$ , whereby the bricks are compressed during the discharge-movement of the mould, as set forth.
3. The combination, substantially as set forth, of an open-ended box, a reciprocating mould-frame, pistons  $H$ , a hopper,  $E$ , and a plunger,  $D$ , with a reciprocating clearer, which sweeps off the bricks discharged by the moulds.

In testimony whereof, I have hereunto subscribed my name.

PETER J. SMITH.

Witnesses:

WM. B. DAYTON,  
JOHN A. C. J. SMITH.