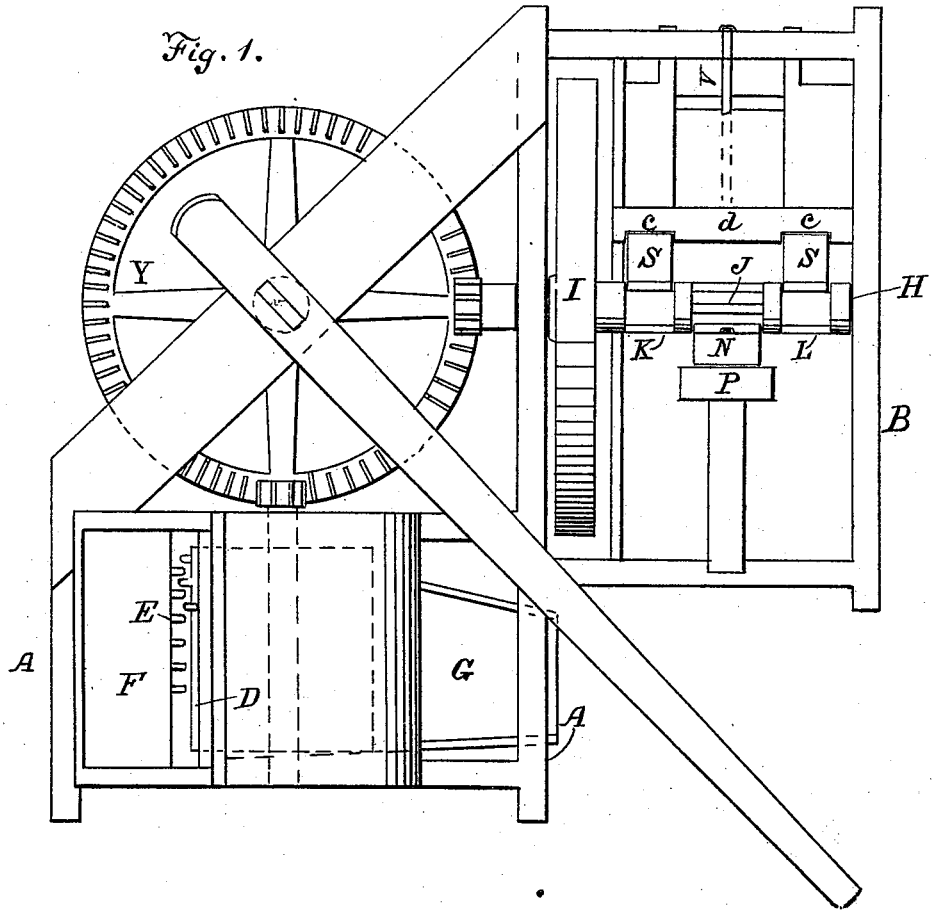
Z. X. SMITH.
Brick-Machine.

2 Sheets—Sheet 1.

No. 211,481. Patented Jan. 21, 1879.

Fig. 1.



Witnesses:
John O'Donoghue
Theo. Mungen

Inventor:
Lewis X. Smith
by H. J. Ennis
his Attorney.

Z. X. SMITH.
Brick-Machine.

No. 211,481. Patented Jan. 21, 1879.

Fig. 2.

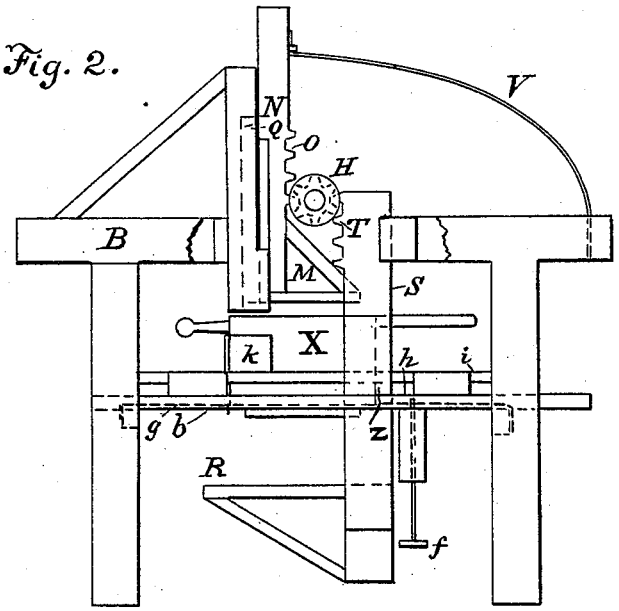


Fig. 3.

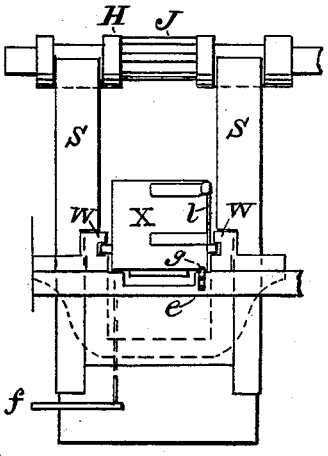


Fig. 4.

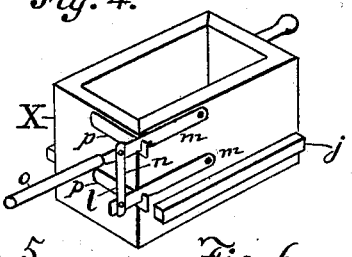


Fig. 5.

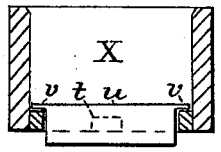
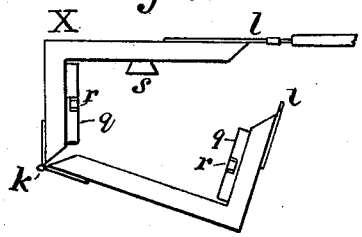


Fig. 6.



Witnesses:
Wm. O'Donnohue.
Theo. Mungen.

Inventor:
Zeno X. Smith
by H. J. Ennis
his Attorney.

UNITED STATES PATENT OFFICE.

ZENO X. SMITH, OF WITTENBERG, NORTH CAROLINA.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **211,481**, dated January 21, 1879; application filed June 4, 1878.

To all whom it may concern:

Be it known that I, ZENO X. SMITH, of Wittenberg, in the county of Alexander and State of North Carolina, have invented certain new and useful Improvements in Brick-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a plan view of the machine. Fig. 2 is a side view of that part containing the mold and adjacent parts. Fig. 3 is an end view of the mold and connecting parts. Fig. 4 is a perspective view of the mold. Figs. 5 and 6 are section and plan views of the mold.

This invention relates to machines for making brick; and consists of an ascending and a descending platen, each having an upright or uprights provided with teeth, arranged upon opposite sides of a segmentally-toothed shaft, in such a manner as to permit a mold containing loosely-ground earth to be placed between the platens for the purpose of being pressed into brick form.

It further consists in a mold hinged at one corner, and having a fastening at the diagonally-opposite corner, provided with a projecting bottom, made to slide upwardly within the mold, for the purpose of pressing the brick from both the lower and upper sides at the same time.

It further consists of a mold adapted to be opened at the corner, and having a projecting bottom capable of sliding upwardly within the same, provided with internal adjustable strips, for the purpose of adjusting the bottom of the mold to suit different kinds of clay.

It further consists in improvements in the construction of the machine, which will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings similar letters of reference indicate like parts of the invention.

A is the frame which supports the mill for grinding the clay, which is placed in the hopper in the condition in which it is taken from the bank, which condition presents a brick as soon as pressed ready for the kiln, unless the clay has been too much moistened by rain, when the brick should be hecked before being placed in the kiln. In either event the expense of a yard for sun-drying the brick is avoided.

B is the frame which supports the mechanism for pressing and forming the brick. A toothed cylinder, D, meshing with teeth E beneath the hopper F, is employed to grind the clay, which is fed to the hopper F and conveyed to the mold by the chute G. A shaft, H, having a balance-wheel, I, and three sets of segmental teeth, J, K, and L, has its bearings upon the frame B.

The descending platen M has its upright N provided with teeth O, which engage with the segmental teeth J of the shaft H. The upright N of the platen M works in ways in an upright, P, at its rear, and a shoulder, Q, limits its ascent, while the teeth O J limit its descent.

The ascending platen R is secured to a frame, the uprights S of which are provided with teeth T, which engage with the segmental teeth K and L of the shaft H. The uprights S work in slots in the horizontal pieces *b b*, and in ways *c c* in the cross-piece *d*. A spring, V, raises to place the descending platen when the teeth O become disengaged from the segmental teeth J. The ascending platen drops to place by its own weight when the teeth T become disengaged from the segmental teeth K and L.

Ways W are supported by cross-pieces *e e* in the frame B, and upon these ways W the mold X is slid to place between the platens M and R.

A spring-stop, Z, provided with a foot-lever, *f*, is used to stop the mold X at the proper place to permit the descending platen M to enter the mold; and a spring-stop, *g*, over which the mold passes, prevents said mold from leaving its position by sliding backward.

The ways W consist of two lower rails, *h*, and two upper rails, *i*, between which strips *j*, on opposite sides of the mold X, near its lower edge, enter to guide the mold, and to hold it in the ways W until it has been removed.

The mold X is rectangular in form, and is intended to contain but one brick at a time. It is provided at one corner with a hinge, *k*, and at the diagonally opposite corner with a

fastening, *l*, consisting of two parallel notched strips, *m*, pivoted to the side of the mold, connected by a bar, *n*, and provided with a handle, *o*, said notched strips *m* being arranged to engage with keepers *p*, secured to the adjoining end piece of the mold X.

On the inside of the mold, and at the lower edges of the ends, are two slotted strips, *q*, having set-screws *r*, to permit of a vertical adjustment of the strips *q*. On the interior, and at the lower edge of one of the sides of the mold X, is a tongue, *s*, which is intended to fit a corresponding groove, *t*, in the edge of the loose bottom *n* of the mold.

Shoulders *r* are made at each end of the bottom *u*, which rest upon the adjustable strips *q* when the bottom *u* is in place in the mold.

The lower face of the loose bottom *u* projects beyond the lower edges of the sides and ends of the mold X, so that the ascending platen R will move it upwardly into the mold-frame when the mold is in a position to be acted upon by the platens M and R.

The shafts H and the shaft of the toothed cylinder D are placed at right angles to each other, and are provided with cogs, which engage with the horizontal face-wheel Y upon the vertical shaft *w*, to which the sweep *x* is attached.

The machine may be made wholly of iron, or the frame may be made of wood and the balance of iron. One horse is sufficient to work the machine, and in this instance should be driven to the left. Six or eight molds, constructed as herein described, should be provided for each machine, and six men should be employed to turn out from twelve to fifteen thousand bricks per day.

The clay, just in the condition that it is taken from the bank, should be shoveled into the hopper F, to be ground by the toothed cylinder D, and conveyed by the chute G to the mold X, which should be placed at the bottom to receive it, and, when filled, the top of the mold should be beveled off, and the mold put upon the ways W and pushed over the spring-stop *g*, and until it strikes the spring-stop Z, at which time the platen M will descend, and the platen R will ascend and press upon both top and bottom to form the brick. A man in attendance for that purpose operates the foot-lever *f*, and shoves the mold X out to make room for the next mold. The mold X must be then opened to remove the brick, which is so tightly pressed into the mold that it cannot be otherwise removed. The brick thus produced has clear sharp corners, and is equally as good as the best pressed brick; besides, it may be made from clay that cannot be worked at all in the ordinary manner.

The same quantity of clay will not produce bricks of uniform thickness where the quality of the clay varies, and the quantity must be determined by experiment.

By making the strips *q* on the interior of the mold X vertically adjustable, the bottom *u* may be adjusted to permit the mold X to hold a greater or less quantity of loose clay, as may be required, so that when pressed the bricks may be of uniform thickness, although made from clay differing in quality from that of which others have been made.

Having thus described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In a brick-machine, a descending platen, M, having the upright N, provided with the spring V and teeth O, substantially as and for the purpose set forth.

2. In a brick-machine, an ascending platen, R, having its uprights S provided with teeth T, meshing with the teeth upon the shaft H in such a manner that when the full power of compression is reached a further partial revolution of the shaft I allows the platen R and uprights S to fall back to their first position by gravity, substantially as and for the purpose set forth.

3. The brick-mold X, hinged at one corner, and having the fastening *e* at the diagonally-opposite corner, provided with the loose projecting bottom *u*, substantially as and for the purposes set forth.

4. The brick-mold adapted to be opened at the corner, provided with the internal adjustable strips *v* and the loose bottom *u*, substantially as and for the purposes set forth.

5. In a brick-machine, the descending platen M, having the upright N, provided with the teeth O, spring V, and shoulder Q, in combination with the upright P, substantially as and for the purposes set forth.

6. In a brick-machine, the spring-stop Z, provided with the foot-lever *f*, in combination with the ways W, substantially as and for the purposes set forth.

7. In a brick-machine, the grinding-mill and the pressing-machine arranged at right angles one to the other, and driven by the single face-wheel Y, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ZENO XENOPHILUS SMITH.

Witnesses:
R. Z. LINNEY,
J. P. MATHESON.