

N. Sawyer,
Brick Machine

25 sheets, Sheet 1.

N^o 3,768.

Patented Sep. 27, 1844.

Fig. 4.

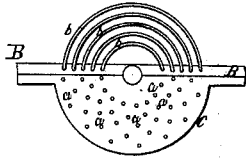


Fig. 1.

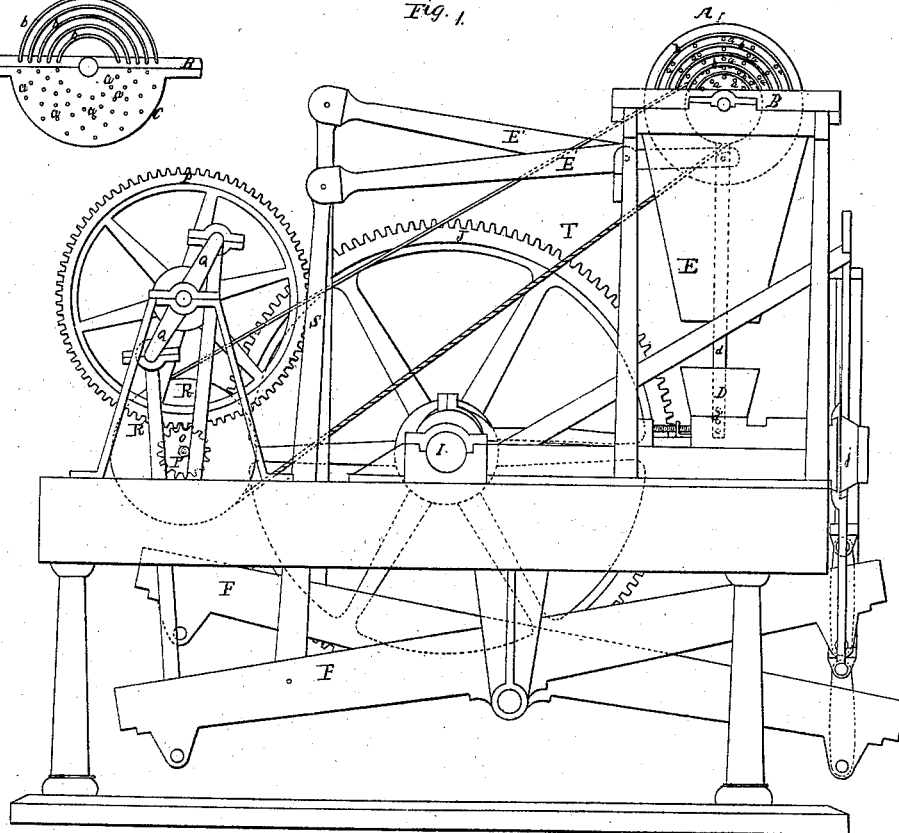
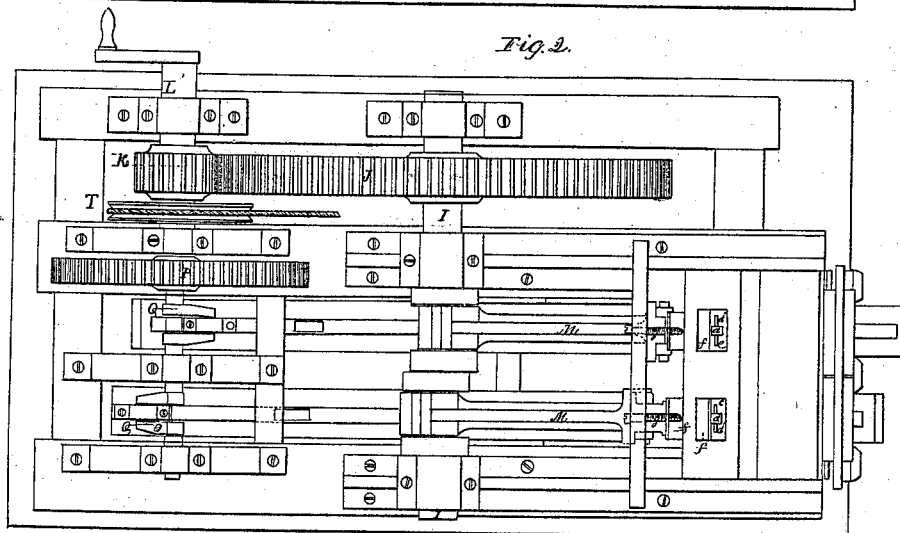
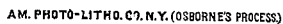


Fig. 2.



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UNITED STATES PATENT OFFICE.

NATHAN SAWYER, OF BALTIMORE, MARYLAND.

BRICK-PRESS.

Specification of Letters Patent No. 3,768, dated September 27, 1844.

To all whom it may concern:

Be it known that I, NATHAN SAWYER, of the city of Baltimore, in the State of Maryland, have invented a new and useful machine for pulverizing clay or brick-earth and for forming the same into bricks by means of a press constructed for that purpose; and I do hereby declare that the following is a full and exact description thereof.

In the accompanying drawings, Figure 1 is a side elevation; Fig. 2, a top view, with the pulverizer removed, and Fig. 3, an elevation of that end of the machine at which the bricks are pressed and delivered.

In each of these, as well as of the other, figures where like parts occur, they are designated by the same letters of reference.

The drawings are made on a scale of one inch to the foot.

In Fig. 1, A, is the pulverizer, which is to be surrounded by a hopper for containing the earth to be pulverized; this hopper is not represented in the drawings.

a, a, a, are teeth projecting from each side of a vertical revolving disk, A, constituting a part of the pulverizer.

b, b, are rods of iron, constituting semicircular guard pieces, the ends of which are firmly fixed to the platform, B, of the pulverizer, on which platform the hopper stands.

The disk, A, revolves between semicircular cheeks below the platform, B, shown at C, in Fig. 4, said cheeks being furnished with teeth like those of the disk; the semicircular rods, *b, b*, prevent the entrance of stones, of a size to be injurious, among the teeth of the pulverizer, which are so arranged as to pass between said rods. The disk, A, revolves with a speed of about 120 times in a minute; a velocity much exceeding this, has been found to be injurious, as it will cause much of the clay to be carried around by the teeth. The pulverized earth is supplied by it, at this speed, with sufficient rapidity for the action of the press. The pulverized material falls into the trough, D, by which it is conducted into the molding trunk, to be presently described.

E, is a funnel, leading from the pulverizer to the trough, and in the actual machine extending down to the latter. To cause the pulverized earth to pass into the molding trunk with certainty, as it might otherwise

arch, I employ rods, or pushers, which pass up and down vertically or horizontally within the funnel and trough; one of these is shown at *d*, continued by dotted lines up to the lever E', which is made to vibrate by its connection with the lever, F. The pusher, *d*, has pins, *d'*, at its lower end, to take hold of the pulverized earth.

The pressing, or condensing, of the pulverized earth is not to be effected in a mold of the ordinary construction, but in what I have above denominated a molding trunk, into which it falls from the trough, D, through an opening made for the purpose, in front of a piston by which its pressing, or consolidation, is effected. The molding trunk I make of cast-iron, and line it with plates of the same material ground perfectly smooth and true on their inner faces. The whole length of the molding trunk may be about thirty inches. It is rectangular, and toward its front end, where the molded brick is to be delivered, it has its sides parallel for about six inches in length, the opening being of the length and width of a brick. Immediately in the rear of this, its sides recede regularly from each other, say for a length of from twelve to eighteen inches; so as, in that part, to be funnel-formed; at the rear, or wider end, of this sloping part it may be about one fourth of an inch larger than at its fore ends; behind this sloping part, the trunk has its sides parallel, and within this part the pressing piston works, its stroke in the actual machine being about six and a half inches. Fig. 5, is a vertical, longitudinal section through the middle of one of the molding trunks.

G, is its rear end, into which the pulverized earth falls, through an opening, *e*, seen also in Fig. 2. This opening, which is surrounded by the trough, D, is regulated by a sliding shutter *f, f*, governed by a screw, *g*, so as to determine with exactness the quantity fed in. A piston, H, moves back and forth in the part, G, which, as above stated, has its sides parallel, and is in height about a fourth of an inch greater than the width, and in width about a fourth of an inch wider than the length of a brick. The part G', constituting its fore end, has also its sides parallel, and is of the width and height intended to be given to the brick.

The intermediate portion, G', slopes regu-

larly from the part G, to the part G''. The opening where the brick is delivered and leading to the outer end of one of these molding trunks is shown at G'', in Fig. 3. The piston H, having a stroke of about six inches and a half, leaves, when it is drawn back, a space more than sufficient to contain the quantity of pulverized earth to form one brick; a length of about five and a quarter inches having been found sufficient for that purpose; the quantity fed in is, however, easily and accurately regulated by means of the slide, f.

The taper form given to the part G', of the molding trunk causes the clay to pack gradually more and more closely as it passes along it, and the brick is thus consolidated without its being necessary to have any front bearing. A like effect might be produced by giving a greater length to the molding trunk, without sloping the part G'. This slope, however, not only saves room, but is advantageous in another point of view, as it causes a more general sliding of the particles against each other throughout the whole mass, and, consequently, intermingles and combines them the more effectually. This action, with the length of the channel along which the material has to pass, causes a very perfect separation of the air contained in the mass, so that the brick when delivered, is not liable to crack from the expansion of that which has been condensed by sudden pressure, as was the case in my former machine. To facilitate the escape of air, I have sometimes perforated the molding trunk with small air-holes, but this precaution is not by any means necessary, as the largest portion of it is discharged by the first pressure of the piston, H, which operates upon the pulverized clay for a distance of about three inches before it enters the inclosed part of the cavity of the molding trunk. Into this it passes about two and a half inches, by which the compressed material which is to constitute a brick, is also advanced about two and a half inches at the delivery end of the trunk.

The machine, as constructed and represented, is made for the pressing of two bricks, the parts described being doubled, and one piston retreating while the other is advancing. Any adequate power may be used to drive the machine.

I, I, is the main crank, or piston shaft, having on it a wheel, J, into which a pinion, K, on the driving shaft, L, gears. The shaft, I, carries two cranks which actuate the horizontal connecting rods M, M, that carry the pistons, H, Fig. 5, giving them a play of about six and a half inches.

The compressed clay, as it leaves the molding trunk, is to be cut off to the thickness of a brick by a vibrating knife fixed in a sliding gate at the fore end of the ma-

chine; this gate carries a second knife, which pares the face of the brick; and it likewise carries a shelf to receive the brick as it is forced out, from which shelf it is to be removed by hand. In Fig. 3, N, N, are the sliding gates, the inside cheek of one of which is shown in Fig. 6. The cutting and paring knives are made of sheet steel, say one eighth of an inch thick; g, g, is the knife that cuts the brick off; h, h, is the knife which is to pare the projecting clay which has been acted on by the cutting knife, so as to give a smooth surface thereto. The shelf, i, i, stands immediately above the paring knife, h, h, and its rear edge may be about three fourths of an inch from the end of the channel, in front of the molding trough through which the brick is delivered. The edges of the knives g, and h, are at the distance of the thickness of a brick from each other. This space, or distance, at the point of delivery of the bricks, is occupied by the frame-work, j, j, which stands immediately in front of the molding trough; the opening through this frame is of the same size with that of the fore end of the molding trough, and between it and said trough, the knife, g, g, passes while the knife, h, h, is immediately in front of it. The part of the frame, j, j, may be denominated the finishing mold, as it is of the exact dimensions of the brick, which is cut off, and pared within it.

The knife, g, g, has its edge about six inches below that of the knife, h, h, and it begins to cut off the brick while the part h, h, of the sliding gate sustains it in front, this part being solid. The edges of the knives are best placed obliquely, as they then cut the more easily and smoothly. As the crank moves round, and the knife g, g, has descended below the cut off brick, the piston being forced in, said brick is pushed out by the advancing clay, and is delivered on to the shelf at the proper time; it is then carried up on said shelf, from which it is to be removed by hand.

The sliding gates, N, N, are attached at their lower ends, by suitable shackles, to the vibrating levers F, F, which are moved in the following manner: The shaft, L, which carries the pinion, K, carries also at its inner end a second pinion, O, Fig. 1, which meshes into the wheel, P, Figs. 1, and 2. The shaft of the wheel P, carries two cranks Q, Q, which are respectively connected to the levers, F, F, by the rods, or shackles, R, R.

The levers E', E', that actuate the pushers, d, d, are made to vibrate by rods S, S, connecting them with the levers, F, F.

T, T, is a pulley and band by which the shaft of the pulverizer may be made to revolve.

Having thus fully described the manner

in which I construct my brick press, and shown the operation thereof, what I claim therein as new, and desire to secure by Letters Patent, is—

5 1. The manner of condensing the pulverized earth, or clay, by forcing it, by means of a piston, through a channel like that which I have denominated the molding trunk, which trunk may be made to vary
10 in the dimensions of its respective parts, in the manner herein set forth, or may be of the same dimensions throughout, but of increased length; it being so made, in either case, as that the friction of the clay against
15 the sides of the channel along which it must pass, shall suffice to cause the material to

be sufficiently condensed to give the required solidity to the brick.

2. I likewise claim the cutting off and paring the sides of the brick by means of 20 knives arranged and operating substantially as herein set forth.

3. I also claim the particular manner of constructing the pulverizer, by combining a revolving disk furnished with teeth on each 25 of its faces, with the guard bars, *b*, *b*, and the cheeks *C*, *C*, as set forth.

NATHAN SAWYER.

Witnesses:

WM. KIMMEL,
CHARLES F. MAYER.