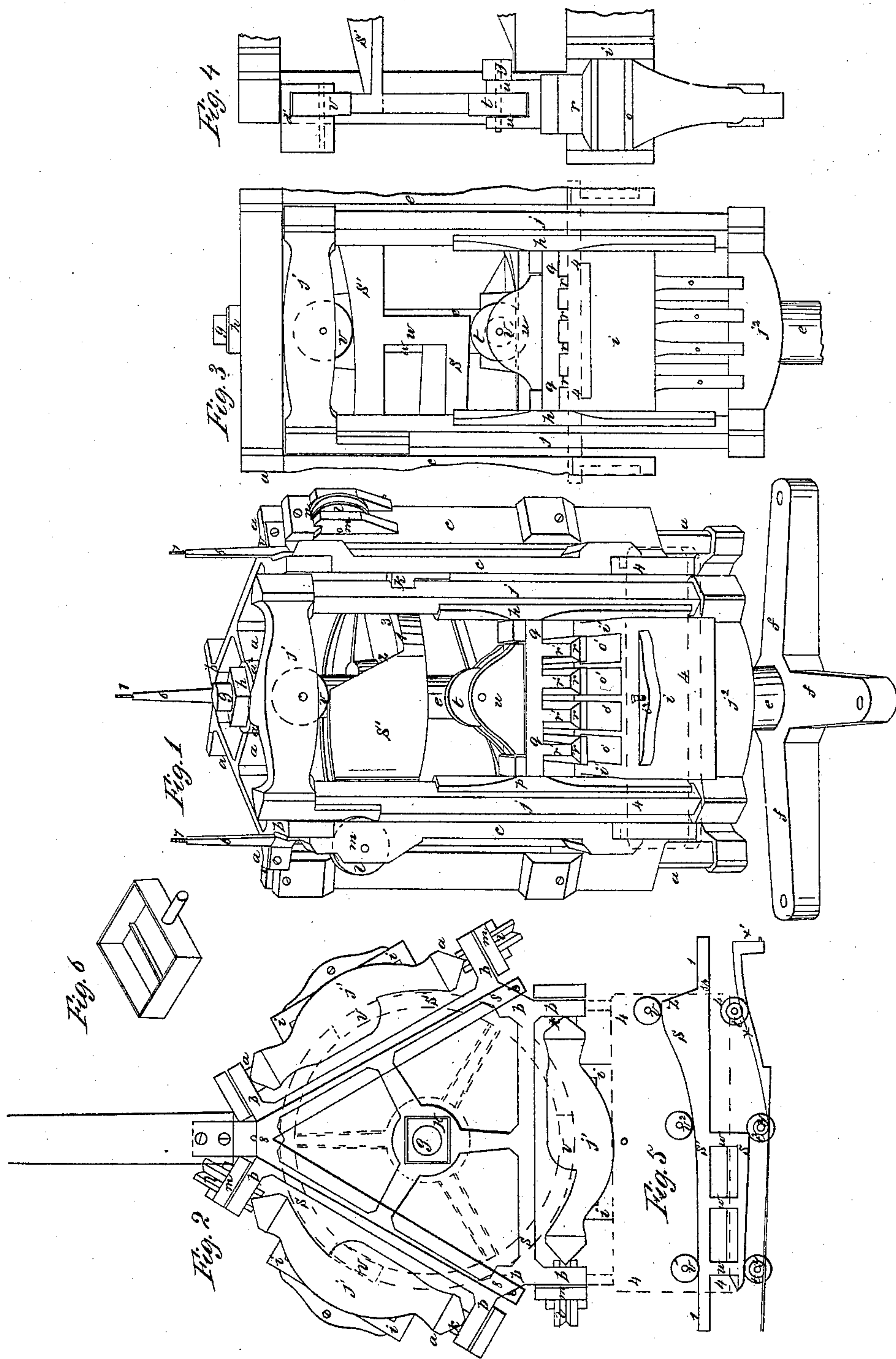


S. Ustick,
Brick Machine.

N^o 1,045.

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UNITED STATES PATENT OFFICE.

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BRICK-PRESS.

Specification of Letters Patent No. 1,045, dated December 28, 1838.

To all whom it may concern:

Be it known that I, STEPHEN USTICK, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Machine for the Purpose of Molding and Pressing Brick from Dry Clay; and I do hereby declare that the following is a full and exact description thereof.

I construct a shaft, which is to be permanently fixed in a vertical position, and of sufficient strength to sustain all the working parts of the machine. Attached firmly to this shaft are two segments of cylinders, which I denominate cam wheels, as, although they are in general stationary, they are intended to perform the office of cams, in a manner to be presently described. The upper and lower faces of these wheels, at their peripheries are so formed as, by elevations and depressions upon which friction wheels are to roll, to raise and depress the pistons, or followers, by which the pressing is to be effected, and to give to the pulverized clay, which is deposited in the molds, the pressure necessary to consolidate the earth.

The stationary part of the machine, above named, is to be surrounded by a polylateral frame work which is to be made to revolve around the center shaft, and is to have on each of its sides an apparatus consisting of a brick mold, or set of molds, the pistons, or followers, by which the pressing is to be effected, together with such accessory parts as are necessary to complete the operation. The molds in which the pressing is to be effected are open both above and below, there being two followers to each mold, one of which is made to rise as the other descends, so as to exert an equal pressure both below and above. The lower pistons constitute the effective bottom of the mold when it is being charged with the pulverized clay, and after coöperating with the upper pistons in pressing the brick, they are made to operate as lifters, rising to the upper surface of the mold, and presenting the brick ready for removal, as the upper piston is withdrawn.

In the accompanying drawings Figure 1, is a perspective view of the machine. Fig. 2, is a top view, the red lines showing the periphery of the upper cam wheel, and the arms connecting it with the shaft. Fig. 3,

is a vertical projection of one side of the machine. Fig. 4, a sectional view in a vertical line down the middle of Fig. 3, in the plane of the axis of the shaft. Fig. 5, is a representation of the peripheries of the cam wheels, supposing them to be cut and opened out, for the purpose of showing the elevations and depressions upon which the friction wheels are to roll, and by which the pistons are to be raised, or otherwise operated upon.

In Fig. 1, *e*, is the lower end of the vertical shaft, rising from the center of the base *f*, *f*. The upper end of this shaft is shown at *g*¹, the nut *h*, bearing on the center part of the revolving frame *a*, *a*, *a*, and keeping it in place; *a*¹, *a*¹, are arms connecting the frames with the hub *a*². When placed in a suitable building the upper end *g*¹, of the shaft, may be firmly attached to it. The lower part of the revolving frame is connected with the shaft *g*¹, *e*, *g*, by means of a similar hub and arms. In the drawing the revolving frame is represented as triangular, and, consequently, as carrying 3 sets of the pressing apparatus; but the number of sides may be varied to any extent which may be found convenient. The vertical pieces *c*, *c*, are the sides or cheeks within which the sliding gates *j*, *j*, work up and down, for purposes to be presently explained. These cheeks are represented as connected together at the respective angles of the revolving frame, by means of cramps *b*, *b'*, but these may be made all in one piece, or connected together in any other mode which may be preferred. The sliding gates are formed of two vertical pieces *j*, *j*, and two cross pieces, or a head and tail block *j*¹ and *j*². The guide piece *k*, has a V groove in it to receive one edge of the sliding frame, and the opposite edge is received in a groove in the friction roller *l*, which revolves in a mortise in one of the cheeks *c* which is widened out, as shown at *m*, to receive it. The front of the brick mold is seen at *i*, and its upper edges at *i*¹; it is firmly fixed by its back part to the revolving frame; it stands centrally within the sliding frame *j*, *j*, to the lower block of which, *j*², the rods of the lower pistons, or followers, are attached.

In Fig. 3, the frame *j*, *j*, is represented as having descended to its lowest point, show-

ing the rods o, o, o , of the pistons attached to the blocks j^2 , the pistons themselves being hidden within the molds.

In Fig. 1, the sliding frame is shown as elevated, o^1, o^1, o^1 , being the faces of the lower pistons, standing flush with the tops of the molds, that being the situation which they occupy when they have acted as lifters to deliver the bricks from the molds, and allow of their being removed by hand.

To operate the sliding frame j, j , a friction roller v , is placed in its upper cross-piece, or head-block j^1 , which is made sufficiently thick, and has a mortise in it to receive and allow it to revolve on a stout center pin. In the revolution of the revolving frame the roller v , runs upon the upper side of the fixed cam wheel s, s' , and it is manifest that in so doing it will cause the sliding frame to rise, descend, or remain stationary, in obedience to the elevations, depressions, or horizontal direction, of the upper surface of said wheel.

In Fig. 1, the lower pistons being at their greatest elevation, the friction roller v , is also on the most elevated part of the cam wheel, and about to descend the rapid inclination z , to the level 1, 1, (Figs. 1 and 5) when the pistons form the bottoms of the molds, which are then ready to be charged with the pulverized clay. The pistons continue at rest until the friction wheel v , is brought to the situation v^1 , Fig. 5, by which time the molds are charged and the pressing then commences by the forcing of the elevating part of the cam wheel from v^1 , to v^2 , Fig. 5, while at the same time, the upper pistons are made to descend, in a manner to be presently shown; the pressure being completed, the passage of the cam wheel from v^2 , to v , raise the bricks to the top of the molds, as already described.

The upper pistons r, r, r , are attached to a second vertical sliding frame, situated between, and sliding within, the vertical pieces j, j , of the first sliding frame;— p, p , are the grooved cheeks of the second sliding frame, fitted to, and sliding against, the inner edges of j, j , formed with an angle, or in any other suitable shape, to receive them. A cross piece q, q , is solidly united to the slides p, p , and comes below it; the upper pistons, or followers, r, r, r , appended to the rods r^1, r^1, r^1 . Between two cheeks u, u , is embraced the friction roller t , the office of which is similar to that of roller v , on the first sliding frame, namely, to operate the pistons, and press the brick; this roller t , is acted upon by the under side of the same cam wheel, which actuates the lower pistons, as will be readily understood by an examination of Fig. 5, where s is a part of the cam wheel which acts upon the upper side of the friction roller t . The part s , is shown as attached to s^1 ; by connecting pieces w, w ,

but the whole may be in one solid piece; this cam wheel is also in part, shown in Fig. 3. The friction wheel in its passage from t^1 , to t^2 , is acted upon by the inclination of the part s , and depresses the pistons r, r , while the action of the roller v , in its passage from v^1 , to v^2 , is elevating the piston o^1, o^1 , the two acting, simultaneously, in reversed directions.

In order to charge the molds with the pulverized clay it is necessary to elevate the pistons r, r , to the height of some 5 or 6 inches above them. To effect this there is a second friction wheel y , Fig. 4, behind the friction wheel t , and revolving upon the same axle; this rolls upon a second cam wheel, having an elevation on it, similar to that on s^1 , which raises the piston o^1 , to the tops of the molds;—a portion of this second cam wheel is shown at x , Fig. 1, the pistons r, r^1 , being in that figure elevated above the mold; the line x , also in Fig. 5, serves to show this elevation; as also may x , Fig. 4, represent it, just as the roller is about to pass upon it.

When the roller y , as shown at t^3 , Fig. 5, arrives at the termination of the elevation x , it reaches the perpendicular line x^1 , formed by cutting away the cam wheel, and the pistons r, r , fall upon the clay in the molds;—both pistons are then in the situation to be acted on by the pressing portion of the cam wheel s, s^1 . The second cam wheel x , is of less diameter than the first, being, of course, adapted to the lessened circle in which the roller y , revolves. The inclination of that portion of the cam wheel s, s^1 , by which the pressing is effected should not be regular, but gradually diminishing as the pressure proceeds, so that it may operate like that combination of progressive levers, denominated the toggle joint, acting with increased force as the condensation increases.

In front of the brick molds, and level with their upper edges, there is a horizontal table, or platform, upon which the pressed bricks may be withdrawn from the molds, and upon which the pulverized clay is placed, with which the molds are to be fed. The red line, marked 4, 4, (Figs. 1, and 5,) represents the outline of this table, and the red line, 4, 4, Fig. 3, shows its edge. The ledge i^2 , on the front of the brick molds, is for the purpose of sustaining it.

In the drawing, the molds are shown as intended to press 4 bricks, at each operation, but as very great force is required to condense the dry clay, it is believed that it will be found most advantageous not to press more than two at once; but the same principle is applicable to a single brick, or to any number, which it may be found convenient to press. Some kinds of clay will require more pressure than others; and in this particular, experience must be the only guide.

The clay may be pulverized by means of

suitable rollers, or in any of the known ways. In feeding it into the molds, I at present use a charger such as that shown in Fig. 6, which is made to hold the proper quantity; 5 is filled, while resting upon the table, and then passed over the molds. I sometimes arrest the pistons, or followers, o^1 , o^1 , in their descent, at a point, where a proper space will be left in the molds for filling them 10 flush with the surface; and I subsequently allow the pistons o^1 , o^1 , to descend to the bottom before the pistons r , r , fall upon the clay; and this I effect by covering a portion of the level part 1, Fig. 1, with a circular 15 strip 3, of the necessary length and thickness.

As it is requisite that great stability should exist in every part of the machine, I make the whole, or the principal parts, of the 20 frame, the molds, and whatever is susceptible of being so made, of cast iron.

In the drawing, the revolving frame is shown as when made to operate by horse power, No. 5, Fig. 2, being a lever, or sweep, 25 to which the animal may be attached; the vertical pieces 6, 6, 6, Fig. 1, having nuts and screws at 7, 7, 7, by which to attach the arms 8, 8, Fig. 2, to which arms the lever 5, is fastened. The machine may, however, be 30 made to revolve by any of the known means of producing such motion.

I have hitherto spoken of the outer frame and its appendages, as being made to revolve; but should it be preferred to have the 35 outer frame, and the molds stationary, this may be effected by fixing this frame firmly to a foundation in the ground, or in any suitable building, and causing the center

shaft, with the cam wheels, to revolve in a reversed direction; all the requisite move- 40 ments of the sliding frames, and pistons will then take place in the same manner, and upon the same principle, as when actuated by the revolution of the outer frame.

Having thus fully described the construc- 45 tion and operation of my machine for pressing bricks from dry clay, I do hereby declare, that I do not claim to be the first to have pressed bricks, simultaneously, on both sides, or to have manufactured them from 50 dry clay; both of these things having been before accomplished, but by means essentially different from that herein described.

What I do claim, therefore, is—

The manner in which I have combined, 55 and arranged the respective parts of my machine, to produce this effect, as set forth; that is to say, I claim to be the inventor of a polylateral machine furnished on each side with two vertical slides carrying pistons, or 60 followers, for pressing both sides of the bricks simultaneously; said frames being operated upon by circular cam wheels, either by the revolution of the outer frame, or of the shaft and cam wheels the whole construct- 65 ed and operating, substantially, as herein described. It is to be understood, also, that although I generally make my machines polylateral, a single press may be made on the same principle, and is therefore, included 70 as of my invention.

STEPHEN USTICK. [L. s.]

Witnesses:

JNO. WALKER,
JOHN BURNS.