Tyrrell & Williams.

Brick Machine.

No. 11,817. Patented Oct. 17, 1854.

Fig. 1

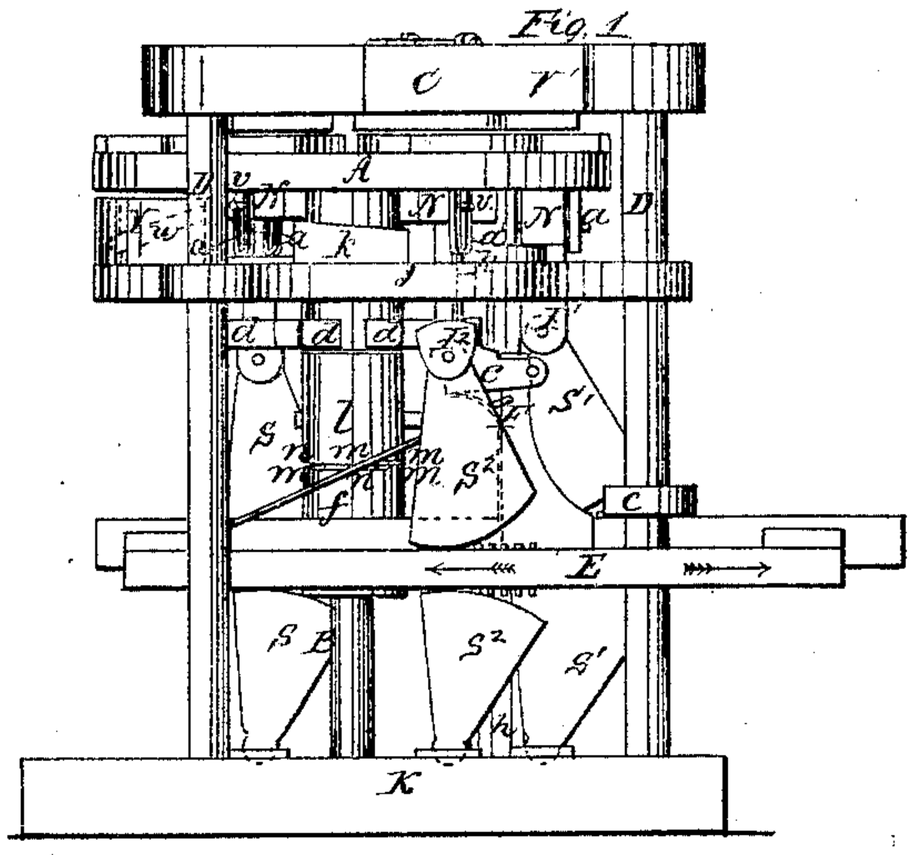


Fig. 2

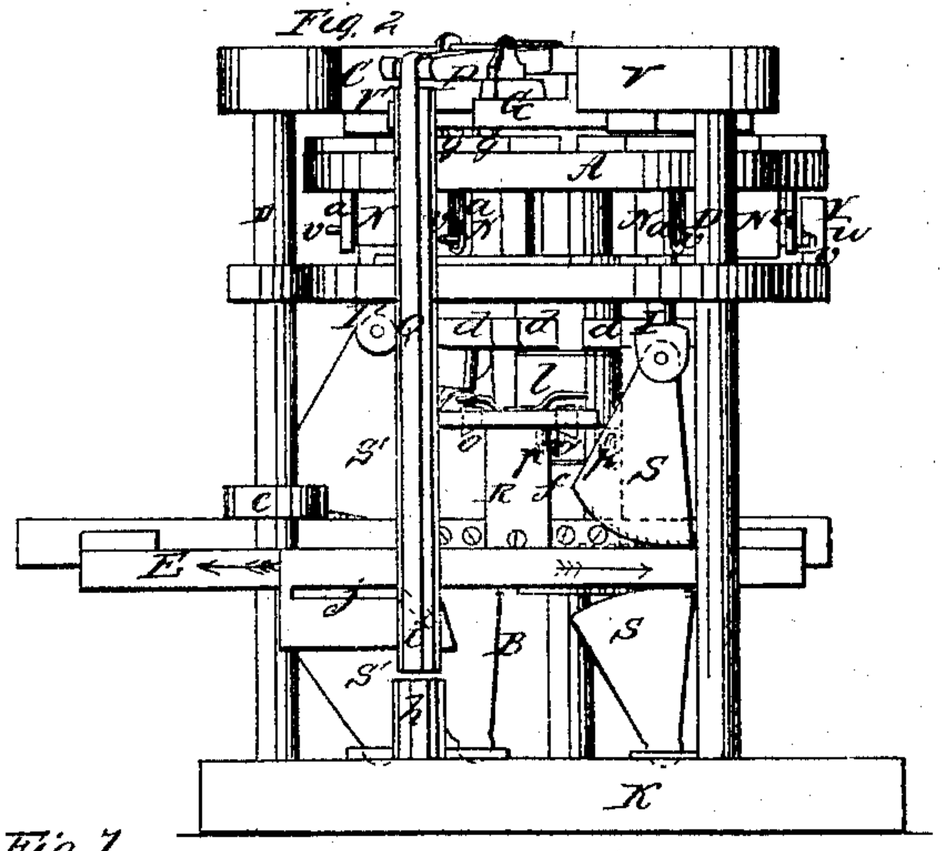


Fig. 7

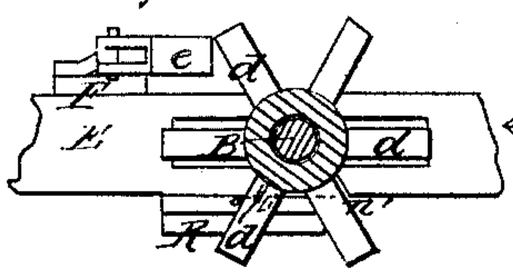


Fig. 6

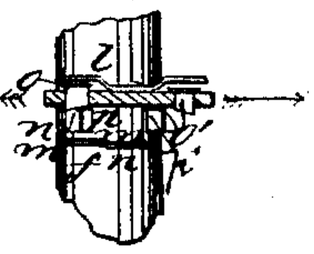


Fig. 4.

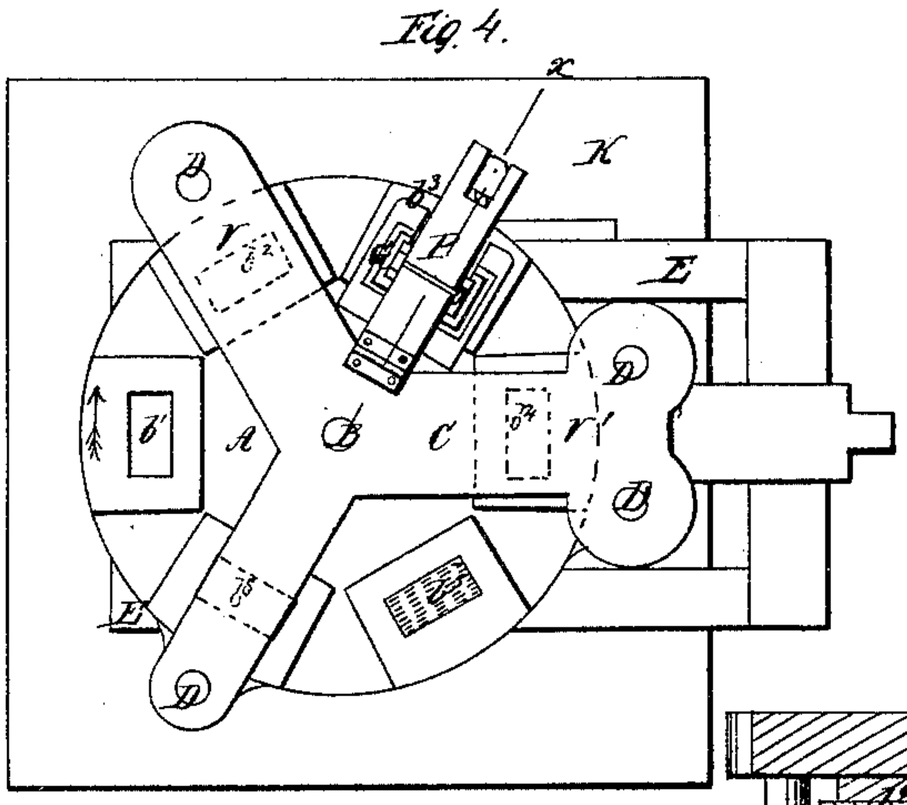


Fig. 5.

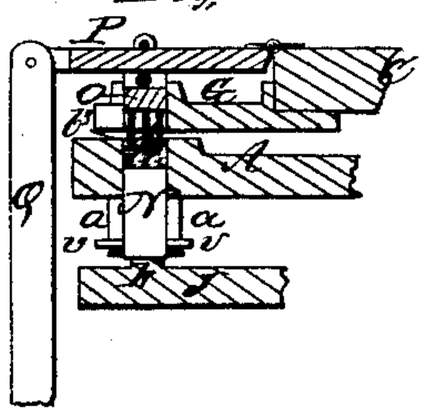
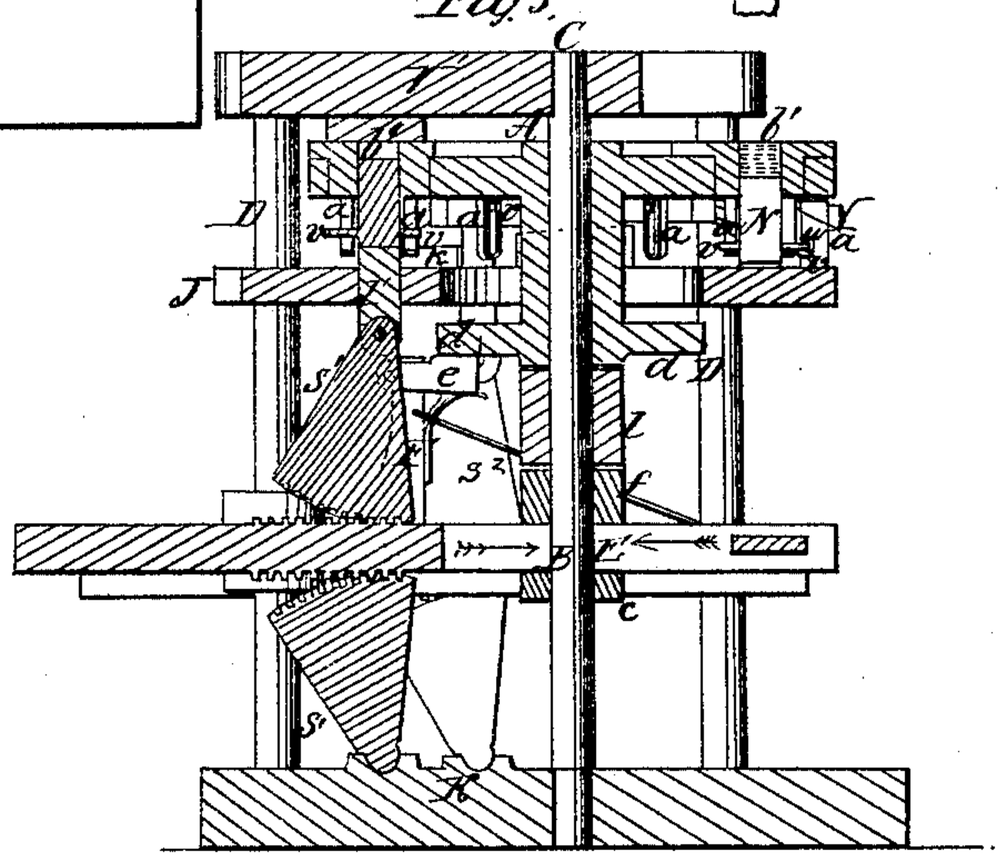


Fig. 3.



UNITED STATES PATENT OFFICE.

E. D. WILLIAMS, OF WILMINGTON, DELAWARE, AND T. TYRRELL, OF YORK, PENNSYLVANIA.

BRICK-PRESS.

Specification of Letters Patent No. 11,817, dated October 17, 1854.

To all whom it may concern:

Be it known that we, E. D. WILLIAMS, of Wilmington, in the county of Newcastle and State of Delaware, and T. TYRRELL, of York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Making Bricks; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1, is a view of one side of a brick machine, constructed according to our machine. Fig. 2, is a view of the opposite side to that shown in Fig. 1. Fig. 3, is a longitudinal vertical section looking from the same side as Fig 2. Fig. 4, is a plan. Fig. 5, is a section in the line *x*, in Fig. 4. Fig. 6, is a side view, partly in section, of the mechanism for raising the mold table. Fig. 7, is a plan of the mechanism by which the rotary motion of the mold table is produced

Similar letters of reference indicate corresponding parts in the several figures.

The machine which forms the subject of this invention, consists of a horizontal wheel or mold table, which contains a number of molds and receives intermittent rotary motion under a number of fixed heads, which heads, during the intermissions of the motion of the wheel or mold table, close the molds while a number of pistons attached to the wheel or table come into operation to press the clay.

Our invention relates first, to certain means of providing for the escape of air from the clay before the final pressure to finish the brick takes place; and secondly in certain means of giving the mold wheel a slight movement in the line of its axis to remove the molds and the clay contained therein from contact with the fixed heads during the revolution of the mold wheel for the purpose of obviating unnecessary friction.

To enable those skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A, is the horizontal rotating mold table or wheel which is made of cast iron in one or more pieces, and is bored at its axis to fit so as to turn freely upon a fixed vertical shaft B, and is supported by a collar *f*, which is firmly secured to the shaft. The lower end of the fixed shaft B, is secured in the bed plate K, and the upper end in a strong cast iron head piece C, which is supported and attached to the bed plate, by posts D, D. The table A, is represented as having six molds b^1, b^2, b^3, b^4, b^5, b^6, all of which are open at top and bottom, and made capable of being detached for the purpose of substituting others of different form, or renewing them when worn out. These molds are so arranged that when one is under the head V, another will always be under the head V^1, and a third between the two heads. Each mold has attached to it the piston N, by which the clay is pressed into it, the said piston entering it at the bottom, and working freely within it, and having its movement in the mold guided by guides *a*, *a*, which are secured to opposite sides of the mold, and receive studs or projections, *v*, *v*, on the sides of the piston; these guides also serve to support the piston when not in operation, and prevent it from ever being withdrawn entirely from the mold.

The pressure is given to the pistons for compressing the clay in the molds and forcing out the finished brick by means of three pressers I, I^1, I^2, which work through guides in a horizontal plate J, which is secured to the posts D, D, and forms a part of the framing of the machine. These pressers are connected to the axes of the upper ones of three pairs of sectors, S, S, S^1, S^1, S^2, S^2, the lower sectors all working in bearings in the bed plate. The sectors S, S, and presser I, are placed directly under the head V, and the sectors S^1, S^1, and presser I^1, directly under the head V^1, and the sectors S^2, S^2, and the presser I^2, one placed at a distance in advance of the sectors S^1, S^1, and presser I^1, equal to the distances between the molds on the wheel. The sectors are all operated upon to give the pressure to their respective pressers and pistons by means of a horizontal frame E, which works horizontally between the faces of the several pairs of sectors, the pressure being produced by the eccentricity of the upper sectors. The descent of the pistons, by their own weight, after passing the pressers, is prevented by ways *k*, *k*, provided upon the plate J, for them to rest upon.

The frame E, in addition to its serving to transmit motion necessary to actuate the pressers, serves also to transmit the necessary rotary motion to the mold table or

wheel A, to bring all the molds in regular succession to the proper position for filling, and afterwards present each one to the successive operations of the several pressers for compressing the clay therein and expelling the finished brick. The latter motion is given by means of an arm F, attached to the frame E, and carrying a spring dog *e*, which operates upon arms *d*, *d*, whose number corresponds with that of the molds attached to the hub of the mold wheel. The dog *e*, is only operative when the frame E, moves in the direction of the red arrow, shown in Figs. 1, 2, 3, and as the pressure is given by the sectors during the opposite movement in the direction of the black arrow, it will be seen that the movement of the frame in one direction, moves the mold wheel, and the return movement brings the pressers and pistons into operation, while the mold wheel remains stationary. The frame E, is kept in its horizontal position by means of collars *c*, *c*, on the shaft B, and on the posts D, D.

Midway between the heads V and V′, attached securely to the head piece, is a box G, whose interior is of about the same size as that of the molds. This box has a perforated bottom through which works a number of pins *g*, *g*, which are secured in a block O, which fits to work freely in the box, and is connected with a lever P, of the second order which is connected at one end with the head piece C, and at the other with the upper end of an upright rod Q, whose lower end works in a guide *h*, on the bed plate, and which carries a stud *i*, see Fig. 2, which fits in a slot *j*, in the side of the frame E. By the movement of the frame with the stud *i*, in the slot *j*, the rod Q, is caused to operate upon the lever P, to raise and lower the block in its box, and protrude and withdraw the pins *g*, *g*, through the bottom of the box G. The bottom of the box is on a level with the faces of the heads V, V′, and the pins *g*, *g*, are protruded far enough through it to pass the greater part of the way through the partly pressed brick which is supposed to be contained in the mold which is brought under the box. The object of these pins is to perforate and allow the escape of any air that may be confined within the clay, and which, if left there, would cause the brick to crack.

It is necessary that when the mold table or wheel is brought to a stand still for the clay in the molds to receive pressure, that the top faces of the molds should be brought into very close contact with the faces of the fixed heads *b*, *b*′; but if the molds fitted as closely when the time arrived for turning the wheel or table, the friction between the mold and the clay therein and the fixed heads, would be so great as to render it, with any reasonable amount of power, impossible to turn it; besides which great unnecessary wear would be produced. In order to obviate this, the wheel has a slight rising and falling motion, which is produced by a loose collar *l*, fitted to the shaft B, between its hub and the tight collar *f*, which supports the wheel. The lower face of the collar *l*, and the upper face of the collar *f*, which are in contact, have a number of corresponding gradual prominences *m*, *m*, see Fig. 6, and intervening depressions *n*, *n*; and when the collar *l*, is turned to such a position as to bring its prominences opposite the prominences on the collar *f*, the wheel is lifted and the molds forced hard up against the heads; but when the collar *l*, is turned to bring its prominences opposite the depressions in the collar, the wheel falls of its own gravity, enough to allow the molds to clear the heads. This movement, in a full sized machine, need not be more than one sixteenth or one eighth of an inch, and therefore may be effected at a very trifling expense of power. The collar *l*, receives the necessary motion for this purpose, by means of two spring dogs *o*, *o*′, which are attached to a standard R, carried by the frame E, and act upon two projections *p*, *p*′, on one side of the collar. Every time the movement of the frame E, in the direction of the black arrow, to cause the pressure, takes place, the dog *o*, in an early stage of the movement, passes the projection *p*, and turns the collar *l*, so as to bring its prominences opposite those of the collar *f*, and thus raise the wheel; and in an early stage of the return movement, the dog *o*′, acts upon the projection *p*′, and turns back the collar *l*, to bring its prominences opposite the recesses in the collar *f*, and thus allows the wheel to descend. The dogs *o*, *o*′, are made of such form, that the one which is inoperative during each movement of the frame, will pass the projection which is to be acted upon during the next movement, as illustrated in Fig. 6, where the dog *o*, is passing the projection *p*, and slipping over without moving the collar.

To describe the operation of making bricks in this machine, we will first suppose that the table A, is stationary, and that the mold *b*′, is being filled with clay from a hopper placed above or by any other suitable means, that mold being represented in the drawings in the position for filling. While the mold *b*′ is filling, the frame E, will be advancing in the direction of the black arrow shown in Figs. 1, 2, and 3, and the several pressers will be in operation; but during the return movement of the frame the filled mold is brought by the action of the dog *e*, on one of the arms *d*, *d*, and the consequent movement of the wheel A, to the position of b^2, which is between the head V, and the presser L, and during the

next advancing movement of the frame E, the presser I, is brought into operation by the sectors S, S, and gives the first pressure to the clay. The action of the dog *e*, during the next return movement of the frame E, carries the mold from b^2 to b^3, which is directly under the perforator or pricker O, and the next advancing movement of the frame causes the perforator or pricker to be pulled down by the action of the slot J, on the stud *i*, and the clay to be pricked or perforated to allow the escape of air. The return of the frame brings the mold from the position of b^3, to the position of b^4, where it is between the head V′, and the presser I, and the next advance of the frame E, causes the final pressure to be given by the action of the sectors S′, S′. The return of the frame next brings the mold to the position of b^5, which is over the presser I^2, and the next advance of the frame brings the sectors S^2, S^2, into operation on the presser I^2, and raises the top of the piston to a level with the top face of the mold, and thus expels the brick from the mold to be taken by a person who stands ready for that purpose. The next two movements of the frame carry the mold to the proper position to be refilled with clay, and in order that the descent of the piston may be insured, one of the studs or projections *v*, on the piston is made to travel down a groove *w*, in a piece Y.

Every movement of the frame E, back and forth, turns out a finished brick, as while one mold is being filled, the clay in another is receiving the first pressure, in a third is being perforated, in a fourth is receiving the final pressure, and from a fifth, the finished brick is being expelled, one mold only, viz., that in the position shown by b^6, being idle at a time.

This machine possesses many advantages over most of the machines in use, among which may be named, first, no registering of the molds and pistons is necessary, as when revolving molds and fixed pistons or plungers are employed, the pistons in this machine never entirely leaving the molds. Second. It provides for the escape of air from the clay, and thereby enables bricks made from dry clay to be submitted to a pressure sufficient to produce sharp corners without danger of cracking.

What we claim as our invention, and desire to secure by Letters Patent, is:—

1. The employment, placed between the mechanism which produces the first, and that which produces the final pressure, of a perforating apparatus consisting of a number of pins *g*, *g*, which are protruded through the bottom of a box or its equivalent G, and which is otherwise arranged, and operated substantially as herein described, to perforate or prick the partly pressed clay to allow of the escape of air which may be contained therein before the final pressure, as herein set forth.

2. We do not claim giving to the revolving mold wheel a movement in the direction of the line of its axis for the purpose herein set forth, but We claim—2nd., the particular method herein described of giving the said movement by means of the loose collar *l*, fitting to the shaft and having prominences and depressions corresponding to similar depressions and prominences on a fixed collar *f*, and having projections *p p′* on its sides to come in contact with spring dogs *o*, *o′*, attached to the framing, the whole combined arranged and operating as herein set forth.

E. D. WILLIAMS.
T. TYRRELL.

Witnesses:
EDWARD H. PENTZ,
GEORGE M. SHETTER.