2 Sheets. Sheet 1.

A. Sabbaton,

Brick Press.

No. 5,586. Patented May 16, 1848.

Fig. 3.

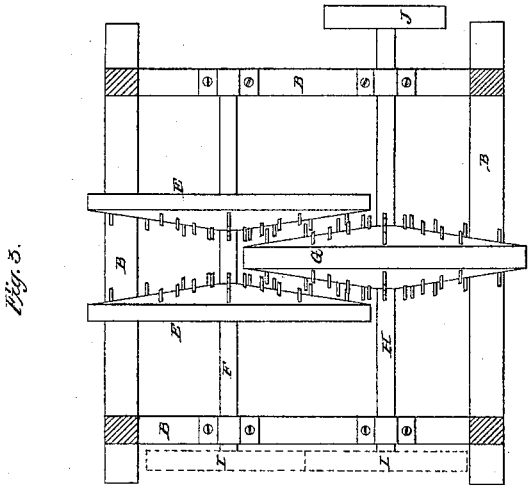

Fig. 2.

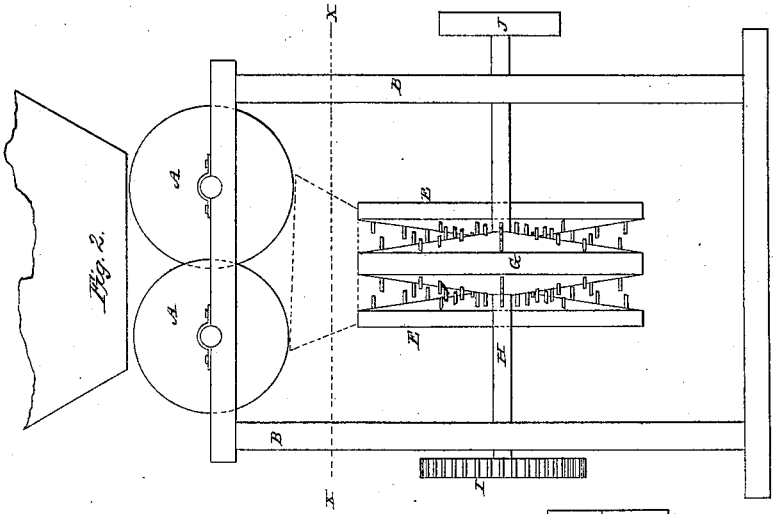

Fig. 1.

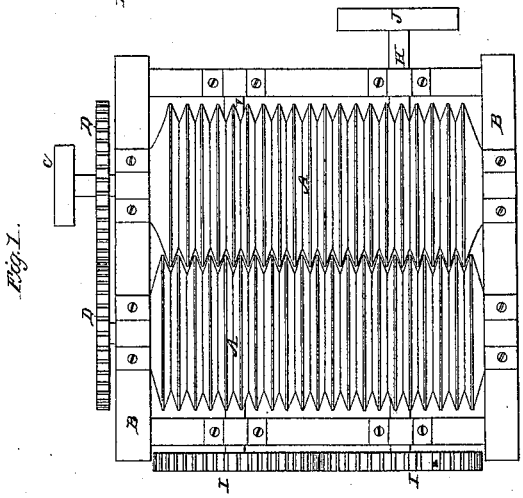

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Fig 6. 22.

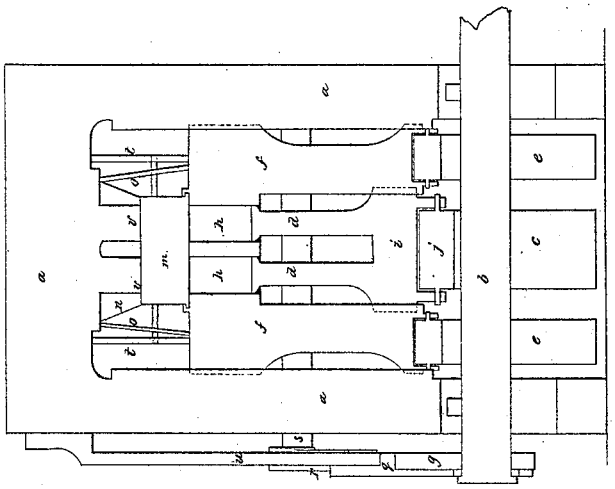


Fig 5.

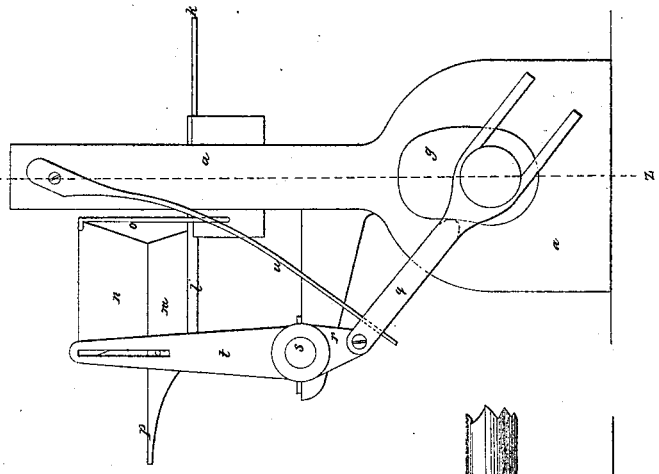


Fig 4.

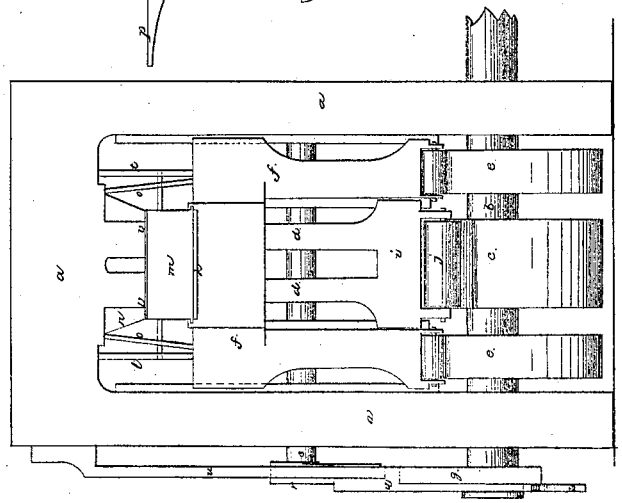
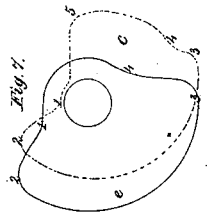


Fig 4.



UNITED STATES PATENT OFFICE.

ALFRED SABBATON, OF READING, PENNSYLVANIA.

BRICK-MACHINE.

Specification of Letters Patent No. 5,586, dated May 16, 1848.

To all whom it may concern:

Be it known that I, ALFRED SABBATON, of Reading, Berks county, in the State of Pennsylvania, have made new and useful Improvements in Machinery for Pulverizing Clay and Making Brick; and I do hereby declare that the following is a full, clear, and exact description of their nature and construction, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a plan of the machine for pulverizing clay; Fig. 2, an elevation; Fig. 3, a horizontal section taken at the line *x*, *x* of Fig. 2; Fig. 4 is a front elevation of the machine for molding and pressing brick; Fig. 5 a side elevation; Fig. 6 a vertical section taken at the line *z*, *z*, of Fig. 5, and Fig. 7, an elevation of one of the cams for moving the molds, and of the cam for moving the followers of the press, the latter being represented in red lines.

The same letters indicate like parts in all the figures.

Clay has been reduced heretofore by passing it between two cylinders the surfaces of which move with unequal velocities to have a grinding or rubbing action, and then pulverized by teeth projecting from the periphery of a cylinder and acting between and in connection with the teeth of a concave. But this mode of operation is defective, because the clay is too apt to pass from the cylinders in a sheet which the teeth of the cylinder and concave below do not properly pulverize. This difficulty I have remedied by the first part of my invention, the nature of which consists in so grooving the surfaces of the two cylinders as to have the grooves of the two fit and run into one another, and thereby to break up the clay as it passes through between them and prevent the forming of a sheet of clay, and then pulverizing it by causing it to pass between three disks, two of which are attached to, and turn with one shaft, and the other on a separate shaft and playing petween the other two disks, the faces of the disks being flat cones with teeth projecting therefrom, so that the teeth of one shall play between those of another in curved lines.

The second part of my invention relates to the machine for molding and pressing brick from dry clay, and consists in giving to the mold during the operation of pressing a movement in the direction of the motion of the followers to prevent the clay from being more compressed on the side acted upon by the followers than on the other which would be the case if the clay had to be forced in stationary molds and pressed against stationary platens. The object contemplated, viz, that of giving an equal density to the clay on both faces of the brick to prevent them from warping when baked or burned, has been accomplished by giving equal motions to the followers and platens; but this renders the machine complex and costly and much more liable to derangement.

Of the machine for reducing and pulverizing clay.—In the accompanying drawings (A, A) represent two parallel metal rollers the surfaces of which are grooved in the direction of the periphery, the grooves of the one fitting or meshing into the grooves of the other. The journals of these rollers run in boxes at the top of an appropriate frame (B) and one of the rollers receives motion from some first mover by a belt running onto a pulley (C) on the end of the shaft, and this communicates motion to the other roller by the two cog-wheels (D, D,) one being of greater diameter than the other, that the periphery of one roller may move faster than the other and slip in it, to give a grinding action; or this end may be attained by having the wheels of equal size and making one roller of greater diameter than the other. The clay, as it is dug from the earth is supplied to the rollers through a hopper of the usual construction, (represented by red lines) and by the rotation of the rollers it is gradually drawn through, squeezed, by the bight of the rollers, and partially ground by the motion of one roller being greater than the other, and by the inclined faces of the grooves as they revolve; these motions and the grooves effectually preventing the clay from forming into a sheet. As the clay is delivered from the rollers it is conducted by another hopper below, (represented by dotted lines) between the surfaces of three disks, two of which (E, E) are attached to, and rotate with a shaft (F) and the other (G) attached to and rotating with another and parallel shaft (H) placed on the same horizontal plane with the other, and the two placed so near together as to have the

disk (G) work between the other two, with its periphery running to the shaft of the other two. The shafts of these disks are geared together by two cog wheels (I, I,) of equal diameter, and one of them receives motion from some first mover by a belt running onto a pulley (J,). The two surfaces of the disk (G) are flat cones, and the corresponding faces of the other two disks (E, E) are of the same form, and these faces are armed with teeth that project therefrom in lines parallel with the shafts; they are arranged in radial rows, and at such distances apart that as the disks rotate the teeth on the disk (G) shall gradually approach the teeth on the other two disks, pass them and then repass and leave them until they come around again. And in addition to this any given point on the surfaces of the disks gradually approach the other and then recede, and therefore the ends of the teeth of any one disk gradually approach to and recede from the surface of the opposite disk, these motions being due to the conical form of the surfaces. In this way and by these peculiar motions of the disks and teeth the clay is thoroughly pulverized, and when it leaves the disks it is in a proper condition for being pressed into brick. It is not only properly reduced and pulverized but entirely clear of stones, for such small stones as might escape the attention of the attendant will be thoroughly reduced by the grinding motion of the two rollers.

It will be obvious from the foregoing that the two parts of this machine for reducing and pulverizing clay may be separated and the clay transferred from one to the other, but the work is facilitated by having them united, and placed one above the other. Instead of having two disks on one shaft, there may be one only on each shaft, but by having two on one shaft the capacity of the machine is doubled, and it will be obvious that the disks may be made flat instead of conical and retain some of the advantages of my invention, but the effect will be more perfect with the conical form.

Of molding and pressing brick.—In Figs. 4, 5, and 6 of the accompanying drawings (*a*) represents a frame properly adapted to the purpose, at the lower part of which there is a horizontal shaft (*b*) which receives motion in any desired way. On this shaft there are three cams within the frame and one outside by which all the required motions are given. The one in the middle (*c*) gives the required motions to the followers (*d*, *d*), the two each side of it (*e*, *e*) operates the mold-frame (*f*), and the one outside (*g*) gives the required motions to charge the molds with clay. The molds (*h*, *h*) are formed in a frame (*f*) that slides vertically on ways in the standards of the frame, and the lower ends of the side pieces of the mold frame are provided with rollers to run on the cams (*e*, *e*) that give to the molds the required motions up and down.

The followers (*d*, *d*) are properly fitted to slide in the molds, and they are all connected together at the lower end by a bar (*i*) the ends of which slide on ways in the mold-frame; and this bar is provided with a roller (*j*) that rests on the middle cam (*c*) which gives the required motions to the followers to press the brick. The top of of the mold-frame forms a table (*k*, *l*,) on a level with the upper edge of the molds, and extending in front to receive the brick when delivered from the molds, and back to form a bed for the filling case (*m*) to slide on. This filling case is square and contains the quantity of clay required to fill the molds. When thrown back in the position represented in the drawings it is on the table (*l*) and under a hopper (*n*) which is sustained by standards (*o*, *o*,) of the mold frame that it may move with them; but when a set of brick have been pressed and the mold frame is let down the filling case is moved forward to push the pressed brick onto the front table (*k*) and to deliver the clay which it contains to the molds, the clay at the same time being retained in the hopper by a board or table (*p*) attached to the back edge of the filling case. The required motions are given to the filling case by the cam (*q*) which at the required time acts on the rod (*q*) which is jointed to an arm (*r*) of a rock shaft (*s*) that is provided with two other arms (*t*, *t*,) that have slots in them that receive pins projecting from the sides of the case, so that by these connections, whenever the rock shaft is vibrated by the cam (*g*) in one direction, the case is moved from the hopper to the molds, and then moved back, so soon as the form of the cam will permit, by the tension of a spring (*u*).

The form of the two mold frame cams (*e*, *e*) and the follower cam (*c*) is represented in Fig. 7 where it will be seen that from the point 1 to 2 they suddenly run out from the center for the purpose of carrying the molds and the followers up toward the inverted planes (*v*, *v*) that are attached to the under part of the top cross piece of the frame, and then from the point 2 to 3, a little more than a third of the circumference, they gradually enlarge, the one (*c*) to force up the followers to compress the clay, and the others (*e*, *e*) more gradually to give to the mold-frame in the same space of time about one half the amount of motion given to the followers, so that the pressure given by the followers will not have to move the clay in the mold and overcome the friction which would necessarily make the brick more dense on the under than the upper part, but by this arrangement the

same effect is produced as if the mold were kept stationary and the platens and followers moved together and in opposite directions to press the brick. At the point 3 the two mold frame cams suddenly approach the shaft to permit the mold frame to descend and leave the brick between the followers and platens, the follower cam being continued concentrically to the point 3 and a little beyond the point 3 of the other two, that the mold frame may commence to move down first; and then from the point 3 the follower cam suddenly runs toward the axis to the point 4 to let the followers down to a level with the upper edge of the molds, and from this point this cam runs in a concentric direction to the point 5 to keep the followers up to a level with the upper edge of the molds until the brick are pushed off onto the table (*k*) by the motion of the filling case given by the cam (*g*) which is located on the main shaft so as to give the motions at the required period and to hold the filling case over the molds while the followers are let down by the depression in the follower cam from the point 5 to 1, the place of beginning, and then the cam (*g*) permits the filling case to be forced back by the tension (*u*) or by any other desired means.

From the foregoing it will be seen that all the motions required are obtained by the rotation of a single shaft carrying all the cams, the parts subject to strain being all in vertical lines above this shaft, and therefore in the best condition to resist the strain.

The number of molds can be increased or diminished at pleasure, taking care when the number is increased to give such an increased strength to the parts as to enable them to resist the increased force.

Having thus fully described the nature of my invention what I claim as new in the machinery for the preparation of the clay, and which I desire to secure by Letters Patent is—

1. Reducing the clay by the action of two rollers grooved in the direction of their periphery and meshing or running in each other, as described, the periphery of one of the rollers being made to move with greater velocity than the other as described.

2. I claim pulverizing the clay by passing it between the faces of two disks turning on different axes, and armed with teeth substantially as described, the clay being acted upon and pulverized by the peculiar motion of the teeth on the two disks gradually approaching one another until they reach a plane passing through the axes of the two disks, and then gradually receding as described.

3. I claim making the faces of these disks, in this combination and for this purpose, conical substantially as described whereby the action on the clay is improved as described.

4. And lastly in the machine for molding and pressing brick, I claim giving to the molds during the operation of pressing, a motion in the direction of the motion of the followers substantially as described, whereby the brick are pressed equally, and made of equal density on both faces to prevent warping when being baked, as described.

ALFRED SABBATON.

Witnesses:
CHS. M. KELLER,
J. M. THAYER.