

United States Patent Office.

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Letters Patent No. 81,506, dated August 25, 1868.

IMPROVED BRICK-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM H. HOVEY, of Springfield, in the county of Hampden, and Commonwealth of Massachusetts, have invented a new and improved Brick-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a side elevation of said machine.

Figure 2 is a vertical sectional view of the same, the plane of section being indicated by the lines *y y* in fig. 4.

Figure 3, II, is a plan view of a portion of said machine, showing about one-half of the same.

Figure 3, I, is a horizontal sectional view of the remaining portion of the machine, the plane of section being indicated by the line *x x* in fig. 2.

Figure 4 is an end elevation of said machine.

Figure 5, I and III, shows, respectively, a front and side elevation of the plunger and piston, which moves in the mould, and

Figure 5, II and IV, shows vertical sections through I and III, the plane of section being indicated by the line *x x*.

My invention is designed to manufacture moulded brick of the kind which may be removed from the machine directly to the drying-sheds, and there "haked" up, as distinguished from the water-brick or "mud-brick," so called, which must be first spread in layers upon the ground, and then dried to a certain extent, before being piled together, which latter manufacture is therefore dependent upon the weather, and is consequently an uncertain and hazardous process.

The bricks in my machine being formed in smooth metallic moulds, and entirely by machinery, are perfect and uniform in shape and composition, and the whole process can be carried on without regard to rain or drought, and is therefore made a certain and constant manufacture during the brick-making season.

Said machine consists of a strong supporting-framework, of timber; two iron rolls, which revolve at different rates of speed; a table, which contains a set of metallic moulds, and has a reciprocating rectilinear motion beneath the rolls; two straight-edged steel bars, so placed as to act upon the rolls and the upper surface of the table as scrapers, and a curved sheet of metal, the lower edge of which finishes the upper side of the brick; a set of metallic plungers or pistons, which move up and down in the several moulds, being actuated by small wheels or followers moving upon or in reference to a flanged track, the surface of which is so formed as to operate the plungers when the table is moved backward and forward; and, finally, a gate, by which the moulded brick are deposited upon carrying-boards, on which they are removed to the drying-sheds and piled together, to remain until stacked in the kiln.

The minor parts, which are appurtenant to the main parts already detailed, are few and simple.

The two rolls are made of different diameters, and serve the double purpose of thoroughly grinding and working the clay and sand of which the brick are made, and also of pressing the prepared material into the moulds beneath. If the clay is of a refractory kind, a third supplementary roll may be used above the smaller of the other two, so that the clay and sand may be made to pass between this third roll and the larger one before they pass between the latter and the second roll.

The clay and sand may be shovelled into the top of the machine as dug from the ground, unless the clay is too wet, in which case it may be allowed to drain before using.

The table is operated directly from the shaft or gears of the main roll, and the whole apparatus is rendered simple and durable by the small number of parts, and their relative arrangement and operation.

The construction of my invention is as follows:

The framework consists of the long sills *S S* and cross-sills *S'*, posts *H H¹ H²*, on each side, stringers *I I*, and cross-pieces *I' I'*, the whole strongly made of timbers thoroughly jointed together, and with the upper timbers bolted to the lower sills, if necessary, to resist the upward strain upon the rolls.

A way, W, extends from the post H to H², on each side of the machine, upon which the table slides.

The larger roll A is cylindrical, and its shaft is supported in bearings attached to the stringers I.

The shaft of the other roll B, also a perfect cylinder, turns in bearings set in the posts H¹, and the two rolls are so set that the under faces are at the same distance from the face of the table.

Similar gear-wheels G G are keyed on each end of the shaft of A, one of which receives power from the small driving-gear g, while the other engages with the smaller gear-wheel G' on the shaft of the roll B, and thus imparts to it a quicker motion than that of A. By the unequal speed of the two rolls, a grinding as well as a crushing and mixing effect upon the clay and sand is produced. The rolls are so set that when the faces are at the nearest point of approach, a sufficient space is left for the prepared clay to pass through in proper quantities to supply the moulds beneath. The faces of the rolls are made smooth, and the rolls themselves may be made hollow, as shown, with supporting "spiders" extending inward to the shaft.

If the toughness of the particular clay used requires the application of a third roll, its bearings would be attached to the upper stringers I, and the clay would be passed between the latter roll and A before passing down between A and B.

The table is formed of two side pieces K, connected by girts, and having that part which passes beneath the rolls composed of a plane-plate, K', and a mould-bed, P'. As the downward pressure upon the table in a full-sized machine is considerable, the table will be cast entire, with the exception of the mould-bed, which should be made in a separate piece, for the purpose of renewing it, or substituting moulds of different size. A series of similar rectangular openings is formed in the mould-bed, which constitute the sides of the moulds, and the bed is made of iron, or, by preference, of brass, or other non-corrosive metal.

The side piece K projects beyond the closed part of the table, to form the supports h h, upon which the carrying-boards b are placed to receive the brick.

Strips k, fastened to the side pieces K, support the table on the ways W, and, if necessary, friction-rollers may be interposed, to make the traverse of the table easier.

A reciprocating rectilinear motion is imparted to the table by the crank-rods F F, which are attached to the main gears G G by the crank-pins a, and take hold of the rod E running through the end of the table.

To keep the clay in its proper place beneath the rolls, I place the two bars J J', (by preference, of steel,) which are rectangular in transverse section, between the lower face of the rolls and the surface of the table. These bars, which I denominate scrapers, are rigidly secured to the framework, to resist the pressure of the clay, and are set so that the scraping-edge of each will fall slightly back of the lowest point in the faces of the respective rolls, so as to scrape the surfaces more effectually than if placed directly beneath the cutters of the rolls. The lower faces of the bars are plane, so as to come in close contact with the plane-face of the table.

It is evident that when the machine is in operation, no clay can pass beyond the scrapers towards either end of the machine, except what is contained in the moulds.

As the pressed clay in the mould tends to expand and rise after passing under the scraper J', I place the curved metal plate C back of the roll A, its lower edge being made sharp, and faced with steel for durability. When the moulds move beneath this edge, any clay which rises above the top of the mould-bed will be shaved off by the lower edge of C, and the shavings will be carried around the roll A, and again mix with the clay at the top, and be thus worked over.

The plunger P is fully shown in fig. 5, the upper face being made to fit closely the moulds in the bed P', and the sides being carried down far enough to guide the plunger properly in its reciprocating movement.

Between the ears p p, the wheel R is pivoted, and two thinner wheels r r turn in studs set in the respective ears. The plunger may be made of cast iron, and, for durability, the upper surface may be faced with brass.

The track T is bolted to the cross-sills of the frame, and as many tracks are laid as the number of moulds or plungers. A flange projects on either side of the upper face of the track, and this face is extended from t to t¹, in a line parallel with the face of the table, and thence rises at an angle to t², from which point it extends to the end at t³, in a line parallel (when continued) to t t¹. The surface of this track may be varied, so as to cause the plunger to rise slightly when passing beneath the edge of the shaving-plate C. The plunger rides upon this track, and is made to follow the surface by the rollers r r below the flanges.

When the mould-bed is between the scrapers, the plunger will be depressed to its lowest point, and at this time the clay will be pressed into the moulds. After the moulds pass outward under the edge of C, the plunger begins to rise, the wheel R mounting on the inclined track t¹ t², and when the wheel reaches the level part, t² t³, the face of the plunger is even with the upper face of the mould-bed, and the brick is completely out of the mould.

To prevent the brick thus raised from passing back into the machine with the table, a gate, L, is provided, to the ends of which the straps o o are pivoted, these straps being in turn pivoted to the levers o' o' on the ends of the rock-shaft N. A tripping-lever, O, rigidly fastened to this rock-shaft, is carried back with every outward motion of the table by the pin j set in the side of the piece K. As it is moved back, the rock-shaft N is turned, and the gate is raised, so as to allow the moulded brick to pass out beneath. The pin j is so set that when the brick have passed a certain point, the pin slides over the tripping-lever, and allows the latter to fall back to its original position against a small spring, and the gate is thus allowed to descend behind the brick, and prevent their return into the machine. As the table moves back, it slides beneath the brick until they are deposited on the carrying-board b. The pin j then crowds the lever O against the spring until it passes over it, and the gate is then ready to be raised again when the table next moves outward. Other mechanical devices may be applied for operating the gate, with the same effect of preventing the return of the brick into the machine.

In the foregoing description of the nature and construction of my invention, the method of its operation has been mostly set forth. It will be seen, however, that the extreme point of the traverse of one edge of the mould-bed is to the edge of the scraper J, and it is, by the joint action of the two rolls, that the mould is per-

fectly filled. If only one roll is used, the end of the mould farthest from the roll would be filled, while the end of the brick nearest the roll would be left imperfect, but the double pressure from the two rolls fills both ends of the mould perfectly, and produces a perfect brick, which is completely filled out as to its angles and surface, and is uniform in composition throughout.

Having described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The rolls A and B, of different diameters, and in combination with the scrapers J J' and the vibrating table, having a reciprocating rectilinear motion, with or without the curved plate C, when operating substantially as described.

2. In combination with a table, having a reciprocating rectilinear motion, as described, a gate, L, for preventing the return of the moulded brick into the machine, and for depositing the same upon the carrying-board b, substantially as specified.

3. The combination and arrangement of the mould-bed P' and vibrating table having a reciprocating rectilinear motion, rolls A and B, scrapers J and J' and plate C, plungers P and tracks T, and the gate L, the whole arranged and operating substantially as described.

In witness whereof, I have hereunto set my hand, this twenty-eighth day of May, A. D. 1868.

WM. H. HOVEY.

Witnesses:

J. P. BUCKLAND,

E. J. SOMMER.