A. Hall,

Brick Machine.

No 5,128. Patented May 22, 1847.

Fig. 3.

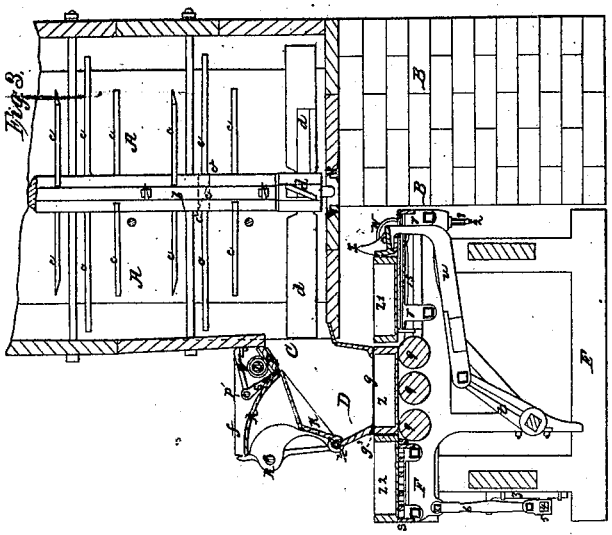


Fig. 4

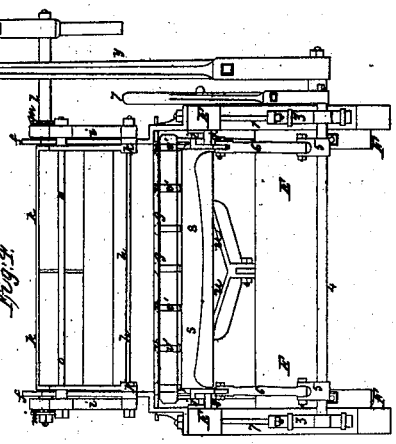


Fig. 1

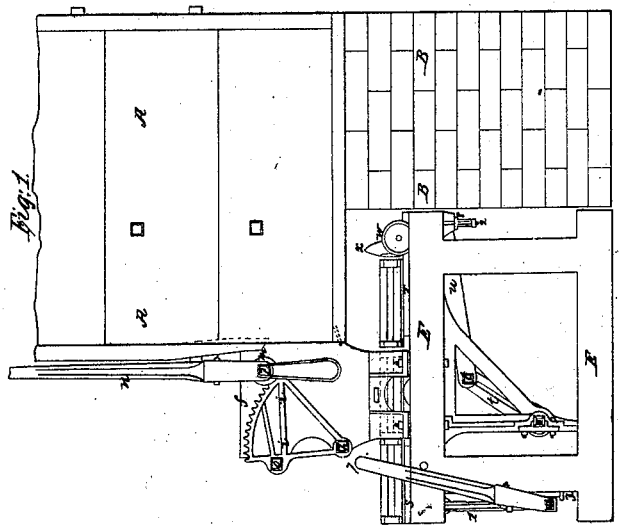
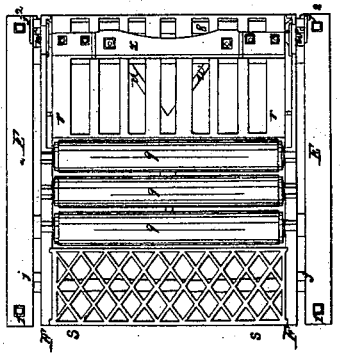


Fig. 2.



UNITED STATES PATENT OFFICE.

ALFRED HALL, OF COXSACKIE, NEW YORK.

BRICK-PRESS.

Specification of Letters Patent No. 5,128, dated May 22, 1847.

To all whom it may concern:

Be it known that I, ALFRED HALL, of Coxsackie, in the county of Green and State of New York, have invented new and useful Improvements in Machines for Making Brick, Tiles, &c., and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the pug mill and molding machine; Fig. 2 is a plan of the frame and carriage of the molding machine; Fig. 3 is a sectional elevation; and Fig. 4 is a front view.

The same letters indicate like parts in all the figures.

The nature of my invention consists in a peculiar construction of machinery to be worked by hand and horse power for producing in an expeditious and efficient manner bricks, tiles and other articles from earthy or plastic materials. The molding machine I propose to place in direct communication with the pug mill in order to keep up a regular and continuous supply of clay to the molds.

In the accompanying drawings (A A) is the pug mill set on brick work (B, B); at the bottom of the mill is a metal step (*a*) in which a vertical shaft (*b*) works. This shaft is supported at its upper end by a framing attached to the top of the mill and is furnished with a lever to which horse power is applied for turning the same. Around the shaft (*b*) a number of horizontal cutters or knives (*c*, *c*, *c*) are set radially; the inner ends of the knives are chamfered off so that the ends of two opposite knives may enter the same socket as shown by the dotted lines (*c'*) Fig. 3; when thus arranged they are secured in their proper position by clenching as shown in the sectional elevations at (c^2). At the lower end of the shaft (*b*) are four radial plates (*d d*) extending horizontally from the shaft each pair crossing the other at right angles. These plates extend nearly to the sides of the pug mill and are for the purpose of sweeping the clay (as the shaft rotates) into the chamber of the molding machine; their faces are set obliquely to the shaft (*b*), as shown at Fig. 3. (*d*) (D) is the chamber which receives the clay or other plastic material from the pug mill and for this purpose fits close over the opening (*c*) as will be hereafter described. The sides of the chamber are formed by two iron plates (*f*, *f*) bolted to a strong frame (E, E) which supports the various parts of the molding machine. The shape of these plates will be best seen by referring to the elevation Fig. 1. (*g*, *g*) is a cast iron grating connected to the side plates (*f*, *f*) and forms the bottom of the chamber (D), Fig. 3. The construction of this grating consists of a rectangular frame with cross bars or divisions equal in number to the bricks or tiles to be produced at one working, or rather with the number of compartments in the molds which are succssively placed beneath it. (*h*) is a horizontal shaft which has its bearings in the side plates (*f*, *f*), Fig. 4, and is intended to carry the quadrant brackets (*i*, *i*) which are each provided with a segment rack. The shaft (*h*) also forms the fulcrum of peculiarly formed pressing plate (*k*, *k*) which extends the whole width of the chamber (D) and forms a partial covering thereto. This plate is intended to rise and fall in order to force the clay in the chamber (D) through the grating (*g*) into the molds, but it will be seen that when forced down it never entirely closes the opening C, so that there is always a free passage for the clay back into the mill before the pressure becomes so great as to cause it to break. To prevent the escape of clay over the pressing plate a segment piece is provided which will be in close connection with a fixed scraper hereafter mentioned. (*l*), Fig. 4, is a shaft having its bearings in the side plates (*f*, *f*) and upon it two pinions (*m*, *m*) are mounted, these pinions gear into the segment racks on the brackets (*i*, *i*), and are actuated by a hand lever (*n*) keyed on the same shaft; (*o*) is a rod which passes through lugs or ears on the quadrant brackets (*i*, *i*) and the pressing plate (*k*) and is intended to attach them together in order that their movements (when the pinion wheels (*m*, *m*) are caused to revolve) may be simultaneous; these segments are connected with the pressing plate as far back as possible, so that the full motion can be given to the said plate without making slits in the side plates, as has been heretofore customary by simply cutting out the plates (*f*) on the back edge, by which I dispense with the slides used in my former

press without leaving openings for the escape of the clay at the sides (*p*) is a board secured to the plates (*ff*) and is intended to cover the opening between the presser plate (*k*) and the side of the pug mill (*p'*) is a rod having its bearings in the plate (*f*, *f*) and serves to carry the scraper (*s'*) which extends the whole width of the chamber (D), and is for the purpose of cleaning off the clay from the segmental portion of the pressing plate (*k*) at certain periods of the operations of the machine. The rod (*p'*) also supports the catches or hooks (*y*) which hook into a staple in the pug mill and thus hold the chamber (D) firmly thereto.

Within the frame work (E, E), (which may be termed the stationary frame work) an adjustable framing (F) is suspended in the following manner: pendant from the upper part of the frame work (F) are four bolts (1, 1) and (2, 2) tapped at their lower ends and furnished with nuts. The bolts (1, 1) support the brackets (3, 3) which slide in guides, (see front view, Fig. 4), and these brackets form bearings for a horizontal shaft (4) upon which two sockets (5, 5) are keyed which receive and support the arms (6, 6) attached to the framing (F), and at the right hand end of the shaft a lever (7) is keyed as shown in the drawing. The bolts (2, 2) at the other end of the frame work (E) support a cross bar (8) which carries the inner end of the framing (F). This framing is attached to and forms one with the cast iron beds or gratings (*r*) and (*s*), (see Fig. 2.) which support the molds for forming the bricks, tiles, or other articles. Between these beds or gratings anti-friction rollers (*q*, *q*, *q*) are loosely mounted, as shown in sectional elevation Fig. 3, the top of the rollers being on a level with the upper surface of the beds. At the lower part of the framing (F) are bearings to receive a horizontal shaft which carries a vibrating lever (*t*), to the upper end of which a lever (*u*) is jointed which branches out into the form of a V and turns up at its ends at right angles; this is bolted to an axle (*x*) having on it a pair of guide wheels (*w*, *w*); these wheels are each provided with a flange which runs upon a rail (15) see Fig. 3, that is attached to the inside of the upper face of the framing; these rails (15) are curved downward on their upper edge as shown in the figure, the curvature being such as to prevent the forward portion of the axle or cross bar (*x*) from rising or falling as it is moved forward by the arm (*t*) as would otherwise be the case from its connection with the arm (*t*) on a vibrating shaft, for it will be perceived the curvature of the rail so corresponds with the curvilinear motion of the end of the arm (*t*) as to always keep the front part of the axle or carriage *x* that bears against the mold on the same level. This is actuated by a lever (*y*) shown only in Fig. 4. To the ends of the V shaped lever (*u*) a cross bar (*x*) is bolted; (*y*) is a lever for actuating the lever (*t*) and the parts connected therewith.

Having described the various parts of the machinery whereby I am enabled to mold bricks, tiles, and other articles, I will now proceed to describe the action of the same. Rotary motion being given to the vertical shaft (*b*) of the pug mill, the plates (*d*, *d*) will force the clay through the opening (C) into the chamber (D) and supporting the mold to be placed upon the rollers (*q*) in the position shown at Fig. 3, the hand lever (*u*) is brought down forward, which giving rotary motion to the pinions (*m*, *m*) in gear with the segment racks, will bring down the pressing plate (*k*) and force the clay into the compartments of the mold; when a sufficient pressure has been put on the clay by this means, the workman then pulls down the lever (*y*) (letting go at the same time the hand lever (*n*)) which action will cause the lever (*t*) to advance and draw forward the lever (*u*), and with it the cross bar or axle (H). This bar (guided in its course by the wheels (*w*) will push forward a mold previously placed in front of it as at (*z'*) Fig. 3 and drive that mold to the position of the mold (*z*) now full of clay from under the grating (*g*) in escaping from which the superfluous clay will be removed by the inner edge of the inclined side of the gratings (g^3). The full mold will then arrive at the position on the framing of the mold (z^2) from whence it is ready to be carried to the drying ground. By throwing up the lever (*y*) the bar (H) will recede to its former station and another empty mold being placed before it the same movement will be repeated after the mold last pushed under the grating (*g*) is filled with clay as before described. If by any accident a stone or other hard substance should get into the clay and stop the proper action of the molding machine it is only necessary to depress the lever (7) on the shaft (4) which will bring down the framing (F) a sufficient distance for the mold to be released.

I would here remark that in order to insure the molding of perfect bricks it is necessary to make the cross bars of the grating (*g*) so that that face of the bars which is nearest the center of the grating shall project farther over the divisions of the molds than their opposite face and thus the free lateral course of the clay is regulated which will prevent the sand from being swept from the sides of the molds, as shown at (*v*, *v*), Fig. 4, by dotted lines (*v'*) being the partitions of the molds.

To prevent the oscillation of the inner

framing (F) projecting pins are provided which abut against the stationary frame work (E) as will be seen in the plan at (*j*, *j*), Fig. 2. It is obvious that by employing molds of a suitable shape and a grating (*g*) corresponding thereto my improved machine may be made to produce bricks and tiles of various shape.

In conclusion I wish it to be understood that I do not limit myself to the exact construction of apparatus above described for molding bricks as many parts may be modified without departing from the nature of my invention.

What I claim as my invention and desire to secure by Letters Patent is—

1. The combination of the press with the pug mill, as above set forth so that while the clay is being pressed into the mold it shall at all times have a free opening into the mill by which much of the danger of breaking the parts is obviated.

2. I also claim the curved railway in combination with the movable carriage *x* for forcing in the molds, so that said carriage shall have its front at the same level at all times.

3. Lastly I claim the method of constructing the press so that the side plates do not require to be made with a slot in them, by carrying the shaft that connects the press with the segments back so as to be free to act as herein specified, without passing below the point the press plate moves back to.

ALFRED HALL.

Witnesses:

WILLIAM E. LEETE,

JOHN B. BRONK.