H. C. Bull,

Brick Machine.

No. 52,674. Patented Feb. 20, 1866.

Fig. 1.

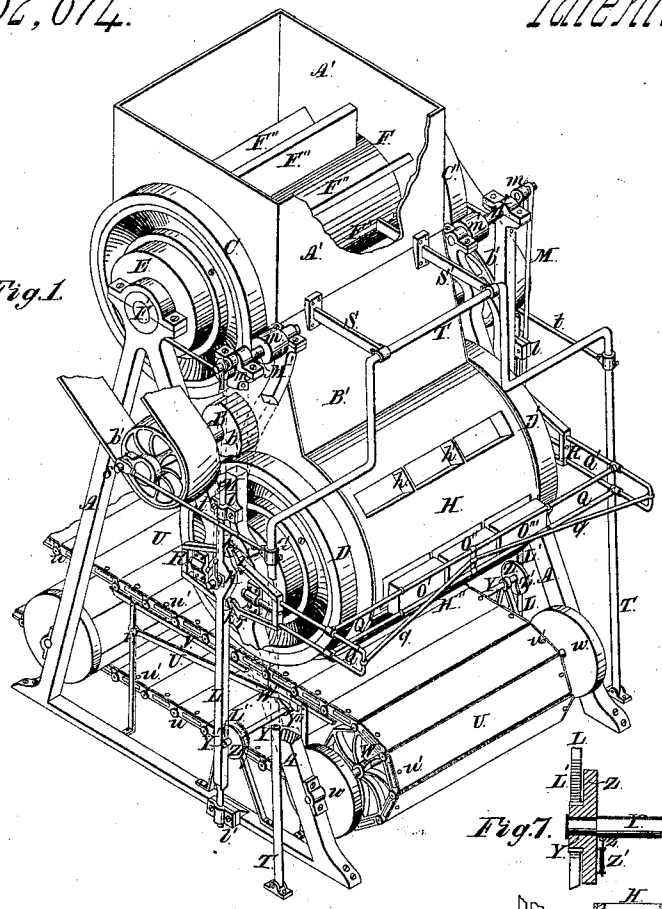


Fig. 6.

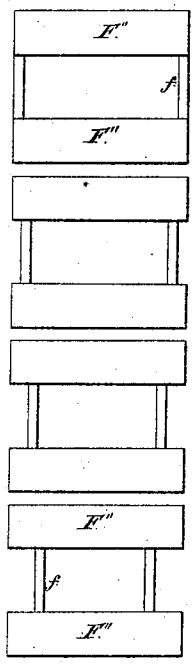


Fig. 7.

Fig. 3.

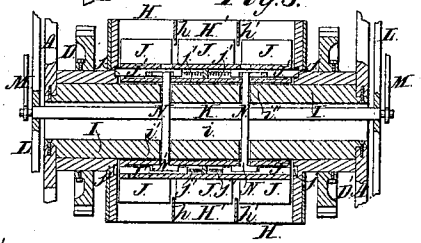
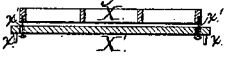


Fig. 8.



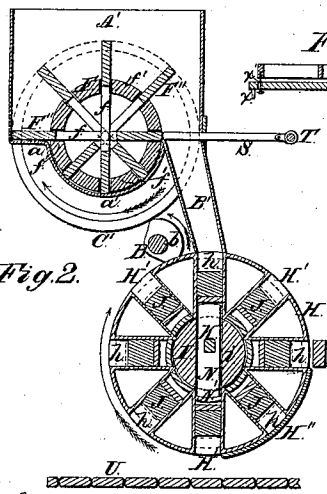


Fig. 2.

Fig. 5.

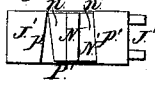
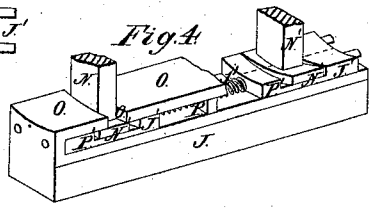


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY C. BULL, OF LOUISVILLE, KENTUCKY.

IMPROVED BRICK-MACHINE.

Specification forming part of Letters Patent No. **52,674**, dated February 20, 1866.

To all whom it may concern:

Be it known that I, HENRY C. BULL, of Louisville, Jefferson county, Kentucky, have invented certain new and useful Improvements in Machines for Making Bricks; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

The first part of my invention relates to an improved feed-wheel for drawing the tempered mud from the hopper and forcing it down into the molds, which are contained within a suitable mold wheel or cylinder.

The second part of my invention relates to a mold-wheel provided with a number of radial compartments, which constitute the molds, and also to certain devices for expelling the molded clay from said wheel and delivering it into a movable mold placed upon an endless carrier.

The third part of my invention pertains to a portable mold in which the bricks are removed from the endless carrier and taken to the yard to be sun-dried before before being burned in the kiln.

Figure 1 is a perspective view of a brick-machine embodying my improvements. Fig. 2 is a transverse section through the feed and mold wheels. Fig. 3 is a longitudinal section through the mold-wheel. Fig. 4 is a perspective view, on an enlarged scale, of one of the plungers with its keys and other accessories. Fig. 5 is a plan of one of said keys. Fig. 6 is a side elevation, showing the mode of constructing the feed-wheel buckets. Fig. 7 is an enlarged view of the device for supporting the endless carrier when the pressure is brought to bear upon the same. Fig. 8 represents a longitudinal section through my improved carrying-off mold.

A is a frame-work of the machine, in which there is journaled the horizontal driving-shaft B, said shaft being provided with two segment-pinions, *b b*, and two driving-pulleys, *b′ b′*. The segment-pinions *b b* communicate an alternate intermittent rotary movement to the spur-wheels C C′ and D D′, of which the spur-wheels C C′ are secured to the boss E of the feeding-wheel F, while the spur-wheels D D′ are attached to the horizontal projection G of the mold-wheel H.

F′ is the shaft to which the boss E of the feed-wheel F is attached, and said feed-wheel revolves within a rectangular hopper, A′, into which the tempered clay is delivered from a suitable pug-mill placed immediately over the hopper.

The hopper A′ has a horizontal ledge, *a*, and concave bottom *a′*.

The feed-wheel F is armed with a number of movable buckets provided with blades F″, and the blades of each pair of buckets are connected to one another by the arms *f*, which play in radial slots *f′* in said feed-wheel. This feed-wheel revolves in the direction shown by the red arrow in Fig. 2, and when one of the projecting blades F″, has reached a horizontal position it is forced back, by devices which will be hereinafter explained, and the opposite blade of this bucket rests on the horizontal ledge *a* of the hopper A′.

The intermittent rotary movement of the feed-wheel F forces a uniform quantity of clay from the hopper A′, down the inclined chute B′, into the radial molds contained in the mold-wheel H.

The hollow mold-wheel H is provided with a number of longitudinal and radial compartments, H′, and said mold-wheel revolves around an internal fixed cylinder, I, having a longitudinal slot, *i*, and transverse slots *i′ i″*. The radial compartments H′ are divided in three equal subdivisions, by means of the partitions *h h′*, said subdivisions being equal to the length of an ordinary brick.

H″ is a guard-plate extending one-fourth of the way around the outside of the mold-wheel, for the purpose of retaing the clay within the molds until the compartments containing the clay have reached a position directly under the axis of the mold-wheel H.

J J J, &c., are a series of movable plungers, which play within the radial compartments H′, and said plungers are retained in their position within the compartments H′ by means of bolts J′, which are forced into sockets *j* on the inside of the mold-wheel H, and the bolts J′ are retracted by devices which will be hereinafter explained.

K is a shaft, which is confined to a vertical path within the longitudinal slot *i* by means of the guide-rods L L, whose upper and lower ends are rounded and play within the boxes *l l′*. Motion is communicated to the shaft K by the pitman M M, whose upper ends are at-

tached to the cranks *m m* of the shafts M′ M′, and said shafts are secured to the pinions *m′ m′*, which gear with the spur-wheels C C′.

N N are two keys, connected at right angles to the shaft K, and said keys have a vertical motion within the transverse slots *i′ i″*. These keys are provided at their lower ends with cross-heads N′ N′, having converging shoulders *n n′*, which serve to operate the bolts J′ of the plungers J.

The interior face of each of the plungers J is compassed by a plate, O, (see Fig. 4,) having a recess, P, between it and the exterior portion, J, and the bolts J′ are secured within said recess. The plate O is provided with two transverse slots, *o o*, of sufficient width to enable the keys N N to traverse them.

Each of the bolts J′ have sockets P′, whose shoulders *p p′* diverge toward that end of the recess which first receives the cross-heads N′ N′, and when the shoulder *n* impinges against the shoulder *p* the bolts J′ are retracted; but when the shoulder *n′* comes in contact with the shoulder *p′* the bolts are forced out so as to engage with the pockets *j*, and there they are securely held by the springs *j′*.

O′ O″ O‴ are three exterior plungers, which are employed for the purpose of imparting an additional pressure to the clay contained in the radial molding-compartments H′ as soon as the revolution of the mold-wheel brings the compartments to a horizontal position.

The plungers O′ O″ O‴ are attached to a transverse frame, Q, having braces *q*, and their frames and braces have their ends connected to the side bars, Q′ Q′, of a cross-head, R. The cross-head R has a rectilinear motion imparted to it by the wedges *k k′* of the shaft L being brought to bear alternately against the inclined shoulders *r r′* of the cross-head at each and every stroke of said shaft L.

S S′ are fingers, which are pivoted to the upper part of a vibratory yoke, T, said yoke being operated by the pitmen *t t*, which derive their motion from the cranks *s s* attached to the ends of the main driving-shaft B.

U is an endless carrier having anti-friction rollers *u*, which run upon a railway, V, and said carrier is propelled by the octagonal wheel W. The wheel W may be driven by a band extending from the projection G of the mold-wheel to the pulley *w*; but I prefer to use gearing, in order to have a positive motion communicated from the mold-wheel to the endless carrier. The slats which compose the endless carrier have apertures *u′* at each end for the insertion of the pins *x x* of the movable mold X.

In order to prevent the sagging down of the endless carrier when the pressure is brought to bear upon the top of it, I provide the following device: placed directly under the center of the mold-wheel H is a shaft, Y, having suitable journal-bearings at each end and provided with loose pinions Y′, which gear with racks L′ L′.

Z is a disk attached to the loose pinion Y′ and provided on its inner face with a spring-catch, Z′, which engages with a projection, *z*, on the shaft Y.

Y″ is a cam attached to the shaft Y, and when the latter is rotated in the direction indicated by the red arrow the cam forces a beam, W′, up against the under side of the endless carrier and retains it there as long as the pressure is bearing on the top of said carrier. The beam W′ is secured to the free end of a vibratory lever, U′, and whose other end is pivoted at *v* to a standard, which supports the railway V.

The movable mold which rests upon the endless carrier U is composed of an ordinary body or frame, X, divided into three equal divisions, corresponding in size to those of the mold-wheel H; but, instead of being constructed with a fixed bottom, as is customary, I provide a movable bottom, X′, having apertures near each end, through which are inserted the short guide-rods *x′ x′*, said rods being secured to the body of the mold, and are provided with heads, which prevent the bottom from being detached from the body of the mold. This movable bottom admits the air to the back of the clay contained in the mold and causes the clay to leave the mold more readily when the latter is inverted.

Operation: The machine being supposed to be in the position represented in Figs. 1 and 2, with the hopper A′ full of tempered clay and one of the compartments H′ of the mold-wheel H being directly under the mouth of the inclined chute B′, the power is then applied to the driving-shaft B. The segment pinions *b b* are first brought in gear with the spur-wheels C C′, compelling them to make one-eighth of an entire revolution, and carrying the feed-wheel F around with them an equal distance. This partial revolution of the feed-wheel causes the extended blades F″ of the buckets to force a definite quantity of tempered clay down the inclined chute B′, and packs it firmly into that compartment or mold which is stationed under the delivering end of said inclined chute. The pinions *b b* now communicate motion to the spur-wheels D D′, when said wheels and the mold-wheel H, also, perform one-eighth of a revolution, and simultaneous with this movement the cranks *s s* bring the fingers S S′ into play, so as to force the blades F″ of the buckets back from their extended position and enable them to clear the concave bottom *a′* of the hopper A′. At the third movement of the mold-wheel H the compartment H′, which was first to receive the clay, arrives at a horizontal position, at which time the clay receives an additional pressure from the external plungers, O′ O″ O‴, and after passing this point the clay is prevented from dropping out of the mold-wheel by means of the guard-plate H″.

During the time that the mold-wheel is making one-half of an entire revolution the plungers J J J are retained in a fixed position within the compartments H′ of said wheel by

means of the bolts J′, which are forced into pockets *j* by the springs *j′*; but when the mold-wheel has performed one-half of a revolution and the plungers J have arrived at a point directly under that where they were filled, the converging shoulders *p* of the plunger-bolts J′ are brought in contact with the tapering shoulders *n* of the cross-heads N′, and said plunger-bolts are instantly withdrawn from their sockets. At this moment the crank *m* performs a revolution and compels the guide-rods L L to descend, and with them the shaft K and keys N N, thus depressing the plungers J from their fixed position and forcing the clay which was adhering to them into one of the movable molds which had previously been placed upon the endless carrier. Simultaneous with this depression of the plunger J the beam W is forced up against the under side of the endless carrier U by means of the cam Y″, and thus prevents said carrier from being injured by the pressure which is brought to bear upon it. The continued revolution of the crank *m* elevates the guide-rods L L, and with them the shaft K, keys N N, and the accompanying plunger J, and as the mold-wheel H revolves the shoulder *p′* impinges against the shoulder *n′* of the cross-head N′, and thus forces the bolt J′ into the pockets *j*, where it is retained by the springs *j′*. The plunger J, being now released from the cross-head N′, is confined in a proper position within its compartment H′, and as the mold-wheel H revolves the plunger is carried along with it, and as soon as it arrives at a position directly under the mouth of the inclined chute B′ it is again filled with clay, when the above-described operation of pressing the clay by the exterior plungers, O′ O″ O‴, and of forcing it out into the movable mold X, is repeated, and thus each and every compartment H′ is consecutively filled with clay, pressed from the outside, and finally emptied into the movable mold.

I claim herein as new and of my invention—

1. The feed-wheel F, armed with a series of movable blades, F″, operating as and for the purpose described.

2. The mold-wheel H, provided with the radial compartments H′, and revolving around a fixed central cylinder, I, substantially as set forth.

3. The arrangement of plungers J and their described accessories or equivalents, in combination with keys N and cross-heads N′, or their equivalent devices, for the purposes specified.

4. The fingers S S′, or their equivalents, for shifting the movable blades of the feed-wheel in the manner described.

5. The arrangement of exterior plungers, O′ O″ O‴, for imparting an additional pressure to the clay, as set forth.

6. The frame Q, braces *q*, side bars, Q′ Q′, cross-head R, and their accessories for operating their exterior plungers, O′ O″ O‴, substantially as set forth.

7. The arrangement of racks L′ L′, pinions Y′, spring-catch Z′, shaft Y, and cam Y″, for the purpose described.

8. The mold X, having a movable bottom, X′, as described.

In testimony of which invention I hereunto set my hand.

HENRY C. BULL.

Witnesses:
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