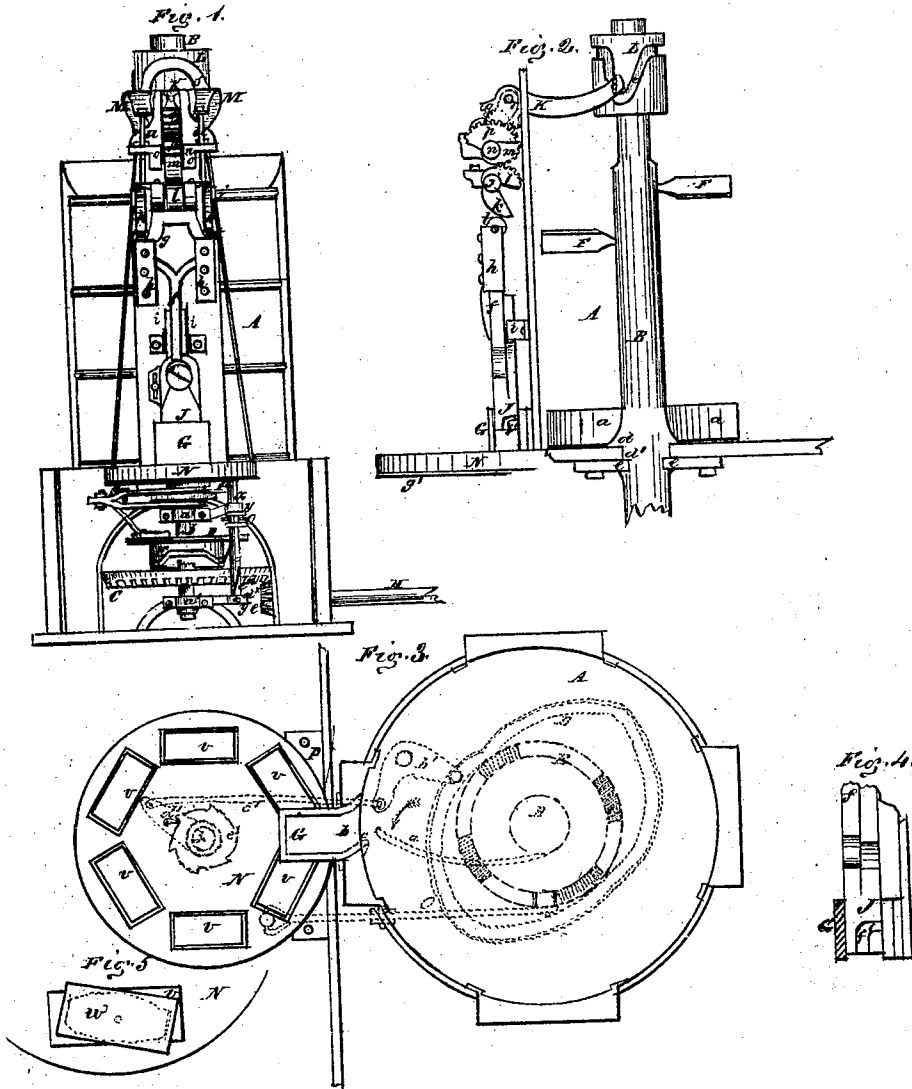


C. H. Williams,

Brick Machine

No. 101,690.

Patented Apr. 5, 1870.



Witnesses.  
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# United States Patent Office.

CARMI HENDERSON WILLIAMS, OF RHINEBECK, NEW YORK.

Letters Patent No. 101,690, dated April 5, 1870.

## IMPROVEMENT IN BRICK-MACHINES.

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, CARMI HENDERSON WILLIAMS, of Rhinebeck, in the county of Dutchess and State of New York, have invented a new and improved Machine for Molding and Pressing Bricks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to that class of brick-machines in which one or more horizontal rotating mold-wheels are employed; and

It consists in a peculiar means for operating the mold-wheels, plungers, and discharging devices, as hereinafter set forth, whereby a very compact machine is obtained, and one capable of molding and pressing perfectly a large number of bricks in a given time.

The invention also consists in a novel means for admitting of the escape of the surplus clay from the press boxes at each descent of the plungers, so that an excess of clay may be admitted in the former, and a requisite amount, at all times pressed into the molds to form perfect bricks.

The invention also consists in a peculiar construction of the outlet clay passages from the mud-mill, whereby the tempered clay from the latter into the press-boxes is greatly facilitated in its passage.

The invention further consists in a means to resist the upward pressure of the mud-mill shaft, caused by the downward pressure of the arms of said shaft upon the clay.

In the accompanying sheet of drawings—

Figure 1 is an elevation of my invention.

Figure 2, a vertical section of the greater portion of the same.

Figure 3, a horizontal section of the same, taken just above the mold-wheel.

Figure 4, a detached view of the plunger and press-box in section, the line of section passing vertically through the center.

Figure 5, a plan view of a portion of the mold-wheel.

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

A represents the receptacle in which the clay is tempered, that is to say, ground or well mixed with water to the proper consistency to be molded into bricks. This receptacle, internally, is of cylindrical form, and it may be made of cast-iron in any proper way.

B is a vertical shaft placed centrally in A, and extending down below it a suitable distance with a bevel-wheel, C, keyed upon it, and also cams D and E.

To the shaft B, within the receptacle A, there are

attached flat blades, F, the axes of which are in horizontal planes, but are somewhat oblique or inclined transversely to produce as the shaft B rotates, a downward pressure on the clay.

On said shaft, just above the bottom of the receptacle, there are two wipers or curved arms, *a a*, which discharge the tempered clay from the receptacle A through passages *b* into the press-boxes G. These arms *a a* rotate or move with their convex surfaces in a direction toward the passages *b*, as indicated by the dotted arrow in fig. 3, and the inner portions of said passages are curved so that the action of the arms upon the clay will be about at right angles to the orifices of *b*. This will be clearly understood by referring to fig. 3.

One side of the passages *b* extends or projects a trifle within the receptacle, as shown at *c*. By this arrangement the discharge of the clay from the receptacle A into the press-boxes is greatly facilitated.

The lower part of the shaft B is provided with a shoulder *d* to rest on the bottom of the receptacle, and form a bearing for the shaft, and, in the latter, just below the bottom of the receptacle, there is made, circumferentially, a groove, *d*, in which a plate, *e*, secured to the under side of the bottom of the receptacle is fitted. This plate and groove enables the shaft B to resist the upward pressure caused by the downward pressure of the blades F upon the clay, as the shaft B rotates. This will be fully understood by referring to fig. 2.

The receptacle A and shaft, B, with its blades and wipers or arms, constitute what is generally termed a mud-mill, and the parts herein described do not differ essentially from those in general use, with the exception of the curvature of the inner parts of the outlet passages *b*, and the means employed for resisting the upward pressure of shaft B.

All the working parts of the machine receive their motion from the shaft B which is rotated by a bevel pinion, *e'*, on a horizontal driving shaft, H, gearing with the bevel-wheel C on the lower end of B. There are designed to be four press-boxes G around the receptacle A, at equal distances apart, although only one is represented, that being sufficient, as they are all precisely alike.

J represents the plunger of the press-box, which is represented, and *f*, the plunger-rod, having a small frame, *g*, at its upper end, which works between guides *h h* attached to the exterior of the receptacle A.

In addition to these guides there are supplemental ones, *i i*, between which the lower part of the plunger-rod works.

In the frame *g* there is a horizontal shaft, *j*, which is allowed to turn freely in its bearings, and has a cam, *k*, on each end of it, shown in figs. 1 and 2, and also

has upon it at its center, a toothed or geared eccentric sector, *l*, which works into a corresponding eccentric sector *m*, on a shaft, *n*, above it, the latter shaft being fitted in fixed bearings *o* at the exterior of the receptacle A.

The sector *m* has a toothed segment, *p*, attached to or forming a part of it, and this segment works into a corresponding segment, *q*, at the outer end of a lever, K, having its fulcrum at *r* above the sector *m*, said fulcrum being fixed or having its bearings immovable.

On the upper end of the shaft B there is a cam, L, formed by having a serpentine groove, *s*, made in a cylinder, and the inner end of the lever K, which is provided with a roller, works in the groove *s*.

The cam L works the lever K up and down as the shaft B rotates, and said levers, owing to the geared segments *p q*, communicate a rock motion to the shaft *n*, and geared eccentric sector, *m*, the latter, in consequence of working into its fellow sector *l*, below, forces down the plunger J which is raised during the reverse movement of the sectors by the cams *k k*, which bear upon friction rollers *t t* in the upper ends of the guides *h h*.

The raising of the plunger is assisted by springs M at the top of the receptacle B, the outer ends of said springs being connected by rods *u* to the frame *g*, (see fig. 1.)

The springs M prevent play and back lash; cause an equitable movement of the plunger, and accelerate its upward movement, while in order to economize in time, is quicker than the downward movement, the groove *s* in cam L being made of a form to effect that result.

The four levers K of the four plungers all fit in the groove *s* of the cam L, and the two plungers at opposite sides of the receptacle, which are in the same plane, move simultaneously up and down, while the other two, which are in a plane at right angles with the two first mentioned, move simultaneously in an opposite direction, that is to say, move upward, while the others move downward, and *vice versa*.

The plungers have two dwells or short periods of rest, one at the termination of their downward movement, and the other at the termination of their upward movement, the groove *s* being made of such a shape as to admit of this.

During the dwells at the termination of the downward movement of the plungers, the mold-wheel N is rotated the distance of one mold, the filled mold passing from underneath the press-box J, and an empty one passing underneath it.

During the dwells at the termination of the upward movement of the plungers, the wipers or curved arms *a a* force the tempered clay through the passages *b* into the press-boxes underneath the raised plungers, the molds having the clay pressed into them during the descent of the plungers.

The mold-wheels N are of circular form, the molds *v* being made in the wheel of the ordinary rectangular shape at equal distances apart, and extending entirely through, the bottom of the molds of each wheel being formed by a rectangular plate, *w*, on the top of a vertical shaft, *x*, which is allowed to slide freely up and down in its bearings *y* a certain distance.

The axis *x* of the mold-wheel is fitted in bearings *a'* attached to the base of the machine.

The mold-wheel is turned the proper distance at each movement by means of the cam D, the shape of which is shown clearly in fig. 3 by dotted lines, a bell-crank, *b'*, connecting-rod *c'*, pawl and arm, *d'*, and ratchet, *e'*, on the axis *x*, (see figs. 1 and 3.)

The shaft *x*, which has the plate *w* on top, has two motions given it, one an up and down movement communicated by the cam E, and a lever, O, and a slight turning movement which is produced by a pin, *d*, in its lower bearing *y* passing into a spiral slot or groove, *e*, in the shaft, (see fig. 1.)

The upward movement of said shaft occurs at the cessation of each movement of the mold-wheel, to enable the plate *w* to force upward and outward the pressed brick, the slight turning movement taking place at the termination of the upward movement of *x*, so that the plate *w* may turn the brick a trifle around, that its corners may lap over the edges of the mold to prevent the brick slipping back therein, and allow the mold-wheel to carry it around to the point of discharge, (see fig. 5.)

In each mold a thin plate is inserted, which is retained in place by the beveled or inclined sides of the molds. These plates facilitate the handling or carrying off the bricks from the mold-wheels.

The plungers J are provided with a curved opening or passage, *f'*, which enables any excess of clay in the press-box to pass up and back into the outlet passages as the plungers descend, (see fig. 4.) By this means the bricks are pressed with a uniform density, and the plungers relieved from all unnecessary strain.

The mold-wheels N have each a plate, *g'*, underneath them to prevent the plates above referred to from falling out, and the mold-wheels directly underneath the press-boxes G, work over a horizontal bed, P. These beds project from the base of the machine, and are solid castings and efficiently support the mold-wheels at the point required, (see more particularly fig. 3.)

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The cams D E on shaft B, in combination with one or more mold-wheels N, and the discharging device composed of the shaft *x* and plate *w*, all arranged to be operated from shaft B, substantially as shown and described.

2. The lever K, with its toothed segment *q*, in combination with the segment *p*, geared sectors *l m*, cams *k k*, and springs M M, all being arranged for operating the plungers J, substantially as set forth.

3. The curvatures at the inner portions of the outlets *b*, through which the clay is forced from the receptacle A into the press-boxes G, in combination with the curved arms or wipers *a a* on shaft B, and the inward projecting sides *c* of the outlet-passages *b*, substantially as and for the purpose set forth.

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Witnesses:

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