

(No Model.)

2 Sheets—Sheet 1.

R. F. ROBISON.
BRICK MACHINE.

No. 419,972.

Patented Jan. 21, 1890.

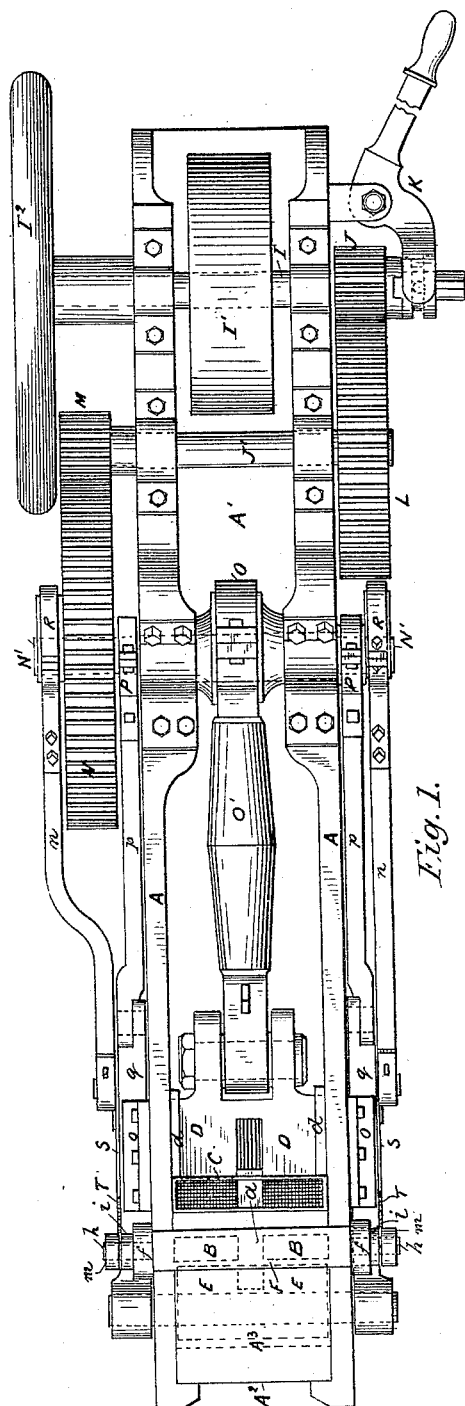


Fig. 1.

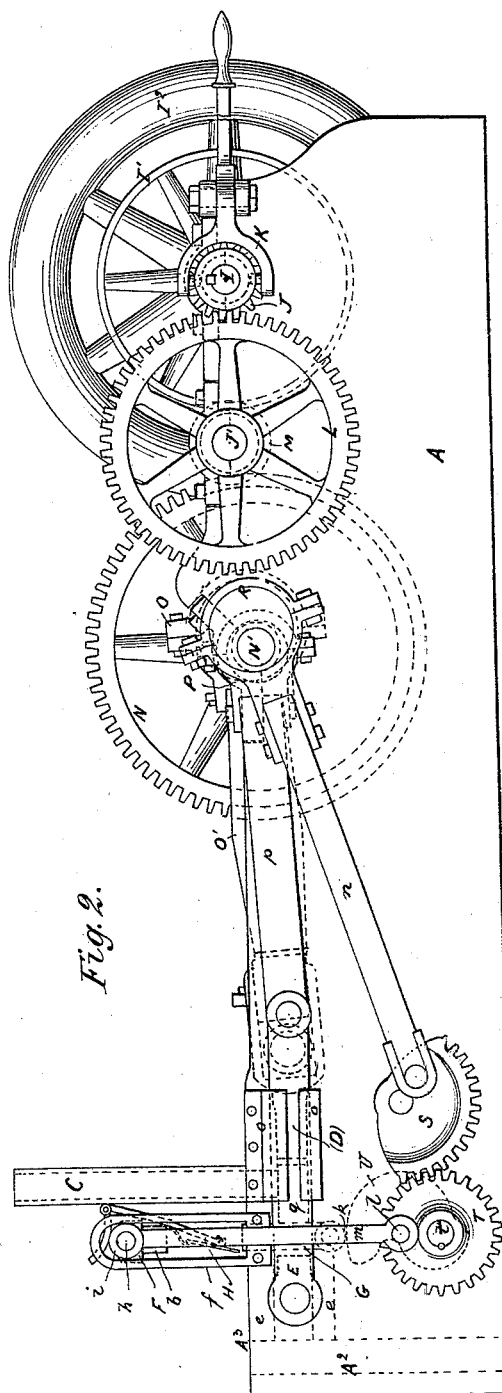


Fig. 2.

Witnesses:

John Berg
C. A. Berg

Inventor:

Robert G. Robinson

(No Model.)

2 Sheets—Sheet 2.

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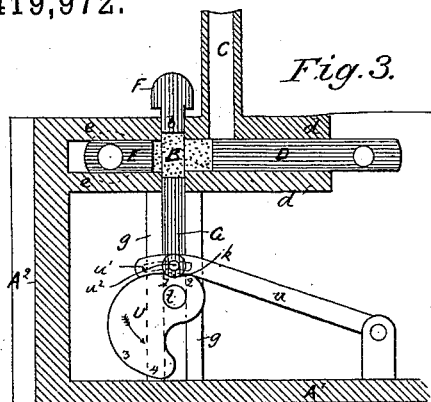


Fig. 3.

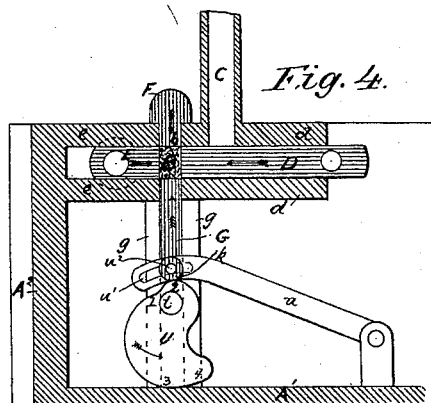


Fig. 4.

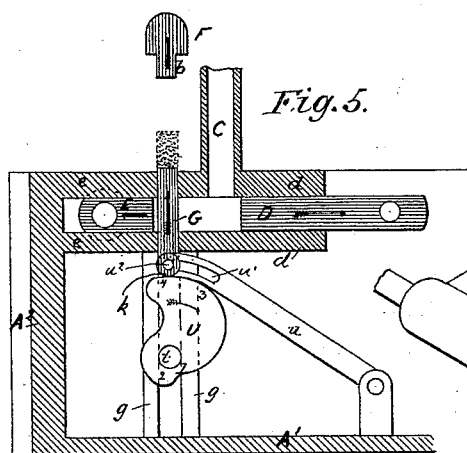


Fig. 5.

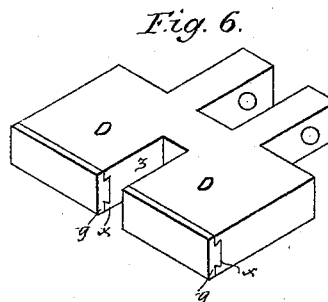


Fig. 6.

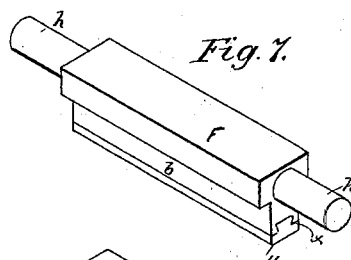


Fig. 7.

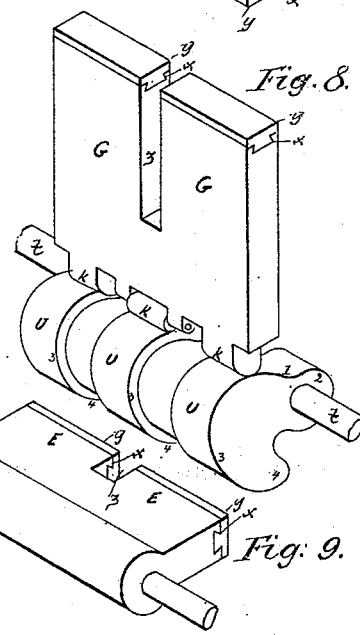


Fig. 8.

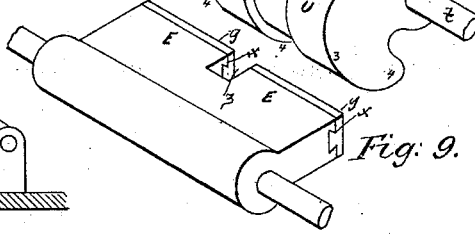


Fig. 9.

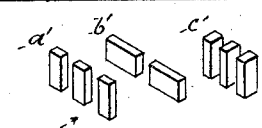


Fig. 10.

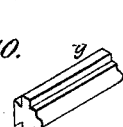


Fig. 11.

Witnesses:
John D. ...
...

Inventor:
Robert F. Robison

UNITED STATES PATENT OFFICE.

ROBERT F. ROBISON, OF KANSAS CITY, KANSAS.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 419,972, dated January 21, 1890.

Application filed October 18, 1889. Serial No. 327,416. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. ROBISON, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification.

My invention relates to that class of brick-machines where, through the exertion of powerful pressure upon dry material—such as clay—a brick thoroughly homogeneous in its components is formed.

In a patent previously granted to me, No. 399,698, and bearing date March 19, 1889, a horizontally-reciprocating presser forms the brick at the end of every respective stroke within a certain mold. The present invention forms an improvement upon this style of machines by employing a counter reciprocating presser working horizontally, and also employing vertically, in counter direction, a pressure upon the molding clay by means of a top cover and bottom follower, thereby subjecting the brick simultaneously to four distinct pressures, each pressure force being directed toward the core of the brick. By this means I can form a solid homogeneous brick, perfectly smooth with sharp edges, which latter feature is not accomplished with brick-machines of other make. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view. Fig. 2 is a side elevation of my machine. Figs. 3, 4, and 5 illustrate in vertical sections a part of my mechanism for forming the brick. Figs. 6, 7, 8, and 9 show in perspective detail views the presser, the cover, the follower, and the counter-presser employed in my machine. Fig. 10 illustrates three modified positions of the brick as delivered from my machine; and Fig. 11 illustrates an adjunct which, attached to certain portions of my machine, especially to the ends of the plunger, follower, or top lid, will be the means of producing ornamental or molded bricks of various shape.

Similar letters refer to similar parts throughout the several views.

The sides A, the bottom A', and the end A² form together the supporting-frame. The molding-compartments B B, lying side by side, are placed near the end A². A feed-hopper C

communicates with all of the molding-compartments and is placed suitably above the same. A series of horizontally-reciprocating pressers D D, one for each of said compartments B B, run on bearings or ways *d*, fixed to the inner sides of the main frame A.

The feed-hopper C above the molding-compartments is filled with the clay or dirt after the same has been properly pulverized, and when the pressers D D are moved backward the pulverized clay is fed into the compartments by its own weight. When the pressers are moved forward to press the clay into bricks, they cut off communication between the hopper and the molding-compartments and the discharge of clay is temporarily stopped. The feed-hopper C being constructed of proper size, every backward movement of the presser will allow the same amount of material to enter the compartments, and thereby insure equal density and quality of the brick. Fig. 3 of drawings illustrates this position of pressers D D. A counter-presser E E is located diametrically opposite to the pressers D D, and works horizontally between bearings *e e*, fixed to the inner sides of frame A. Its movements are so arranged that this counter-presser E E will reciprocate in an opposite direction to presser D D. Figs. 3, 4, and 5 illustrate the respective movements of D and E. The object is to exert an equal pressure to the clay from two opposite sides. A top cover F and a follower G are employed in conjunction with the above-named agencies to complete by means of their vertically-reciprocating movements the pressure forces acting against the clay. The follower G runs between bearings *g g* on the inner sides of main frame A, while the top cover F is guided by means of two guideways *f f*, one of which is fastened to each side of the main frame and extending upwardly above the same. A projecting pin *h*, with roller *i* attached to the latter, works within the guideways *f f*. This top cover F has a downwardly-extending projection *b*, which fits snugly into the top opening of the molding-compartments B B. The under side of *b* forms, when completely depressed, one side of the mold, while the ends of presser D D and counter-presser E E form at the completion of their inward stroke two of the remaining sides of the brick. The follower

G reciprocates vertically and exerts at stated times a pressure force diametrically opposite to that of the top cover F, and in doing so forms the fourth side of the mold. The remaining two sides of the molding-compartment are formed, respectively, by the inner sides of the main frame A and the central partition *a* between two adjoining compartments B, which partition *a* practically forms a part of frame A. The follower has to perform another function in addition to compressing the brick material—that is, after forcing the brick within the mold, and while the presser and counter-presser are receding horizontally and the top cover is arising vertically, the follower G pushes the brick upwardly out of the mold and places the same slightly above the top of main frame A, as shown in Fig. 5. The swinging fingers H H (shown in Fig. 2) and actuated by means of top cover F will then move the brick from off the follower onto the receiving-table A³, and the sequence of operation is complete.

The mechanism for operating the several moving parts is as follows: I is the main driving-shaft, carrying a pulley I' and fly-wheel I². A pinion J runs loosely upon this shaft I, and can be made to rotate by means of the clutch mechanism K. A spur-wheel L, which gears onto pinion J, is keyed to the intermediate shaft J', which latter carries on its other extremity the pinion M, which latter gears into the spur-wheel N, which transmits motion to the shaft N'. An eccentric O, placed upon the center of shaft N', transmits a crank movement to the pressers D D by means of eccentric-rod O'. Keyed to both ends of shaft N', near the outer sides of frame A, are the eccentrics P P, which, by virtue of eccentric-rods *p p* and connecting-rods *q q*, reciprocate horizontally the counter-pressers E E. Suitable guides *o o* for the connecting-rods *q q* are provided on the outer sides of frame A. Another series of eccentrics R R are keyed to the same shaft N' and at the very extremities of the same, and transmit rocking motion by means of eccentric-rods *n n* to the segment-gear S S, placed at the outer sides of frame A. This segment-gearing S S partly rotates the gear-wheel T T, which latter, by means of connecting-rods *m m*, pivoted at *l l* thereto, reciprocates vertically the top cover F. The gear-wheels T T are secured to the shafts *t t* of the cam-lever U U U, placed within the main frame A, beneath the follower G. This cam U will rotate in unison with gear-wheels T T, and, impinging against the under side *k* of follower G, will lift the latter vertically. Four distinct motions are given to the follower G by the peculiar construction of the cam U, as illustrated in Figs. 3, 4, and 5. In Fig. 3 the lower part of follower G rests against the depression 1 of cam U, and places thereby the follower G at its lowest position—that is, during the term of receiving the dirt or clay into the molding-compartment. At Fig. 4 the cam U has com-

pleted its movement as far as necessary in the direction of the arrow shown on drawings, and the point *k* of follower G rests on the projection 2 of lever U. This brings the top of follower G on a level with the bottom of the pressers D and E, and hereby compresses the dirt or clay vertically upward as much as was designed to be done by the follower G. In Fig. 5 the cam U has revolved into the opposite direction after the completion of its former movement. The point *k* of follower G rests now on point 3. This brings the follower, as well as the finished brick resting thereon, slightly above the main frame A, and the swinging fingers H, heretofore referred to, move the brick onto the receiving-table. In order to hold the brick for a short time in this stationary position the point *k* of follower G is permitted to travel on the segment form of cam U from point 3 to 4, which points are radially of equidistance to center *t*. The point 4 once reached, the movement of cam U in the direction of the arrow shown in Fig. 5 is completed, a reverse motion takes place, and the follower G will drop down by its own weight, following the outlines of cam U, until the position 1 of Fig. 3 is reached again.

It is obvious that instead of allowing the follower G to drop by its own weight any known device—such as a pin attached to the cam U working within a slot prepared for its reception in follower G—may be employed to operate the downward movement of the follower.

In order to guide the vertical motion of the follower G, I have shown in the drawings a guide-arm *u*, pivoted to bottom A' of main frame. The other end is provided with a slot *u'*, into which a pin *u²* works, which latter forms a part of follower G.

As those parts of the molding-compartment B B which actuate directly against the clay are subject to breakage or damages by reason of the accidental introduction of impure substances—such as stones, gravel, &c.—I have designed the ends of pressers D D, counter-pressers E E, top cover F, and follower G to be made interchangeable—that is, while the main body of these features are preferably made of heavy cast-iron, the same are provided with a dovetailed slot *x*, into which fit snugly the end plates *y y*, which are made of steel, gun-metal, or other hard unyielding material, and which may by these means be easily replaced by the substitution of like end plates.

In Fig. 10 I have shown perspective three different positions in which I can form the bricks with my machine. The dotted arrow indicates the position of the pressure force of the pressers D D. The three other forces will assume a position exactly identical with the ones presented hereinbefore and bearing the same relation to the force of pressers D D. By arranging the molding-compartment so as to set the bricks on the narrow end, as in

a' and c' , Fig. 10, a larger number of bricks can be compressed at each stroke without increasing the width of the machine proper than by setting the bricks on the long end, as shown in b' , Fig. 10. The latter form of molding-compartment has been adopted in the previous illustrations throughout. The slit z in the pressers D and E and follower G is for the purpose of readily admitting the central partition a of main frame A.

By substituting a molded form of end plate, such as shown in Fig. 11, any convenient form of molded brick can be formed by means of my invention.

I claim—

1. In a brick-making machine, a molding-compartment having an open top and a feed-hopper above said compartment communicating therewith, in combination with a horizontally-reciprocating presser moving in said compartment and beneath said hopper, said presser constituting one end of said compartment and controlling the communication between said compartment and hopper, a vertically-reciprocating cover which opens and closes the open top of said compartment, a vertically-reciprocating follower which reciprocates crosswise of the compartment beneath said cover, and which lifts the finished brick out from said compartment, and a horizontally-reciprocating counter-presser, said counter-presser constituting one end of said compartment, all of these four features—the presser, the counter-presser, the top cover, and the follower—exerting simultaneously pressure forces against the brick to be formed within said compartment, substantially as herein set forth.

2. In a brick-making machine, the brick-forming mechanism thereof, in combination with a shaft N' , having eccentrics O, P P, and R R keyed thereto, which actuate said mechanism, a spur-wheel N on said shaft, a rotating drive-shaft I, a pinion J thereon, and an intermediate shaft J' , with pinion M and spur-wheel L fastened thereto, said pinion M meshing with spur-wheel N, and pinion J meshing with spur-wheel L, substantially as set forth.

3. In a brick-making machine, the brick-forming mechanism thereof, an eccentric-shaft N' , with eccentrics O, P P, and R R thereon, which actuate said mechanism, a spur-wheel N on said shaft, a pinion M, gearing therewith and keyed to the intermediate shaft J' , having a spur-wheel L fastened to the same, which gears with a pinion J, provided with clutch mechanism K, in order to bring the entire mechanism into or out of connection with the rotating drive-shaft I, respectively, as and for the purpose herein described.

4. In a brick-making machine, a molding-compartment, a horizontally-reciprocating presser, a reciprocating counter-presser, a vertically-reciprocating follower moving crosswise of said compartment, and a reciprocating top cover, in combination with a rotating eccentric-shaft carrying a series of eccentrics with eccentric-rods connecting the eccentrics with said presser and counter-presser, and an oscillating segment-gear meshing into a gear-wheel, which latter actuates by means of a cam-lever the follower, and a connecting-rod pivoted to said gear-wheel, and connected at its other end with the top cover, in order to raise and lower the same, substantially as set forth.

5. In a brick-making machine, a molding-compartment having an open top, a reciprocating presser moving in said compartment, a counter-presser, and top cover, in combination with a follower operated by means of a cam-lever U, having a projection 2, which, when acting against the end k of follower G, will bring the top of follower G on a level with the bottom of the presser and counter-presser, and thereby subjecting the brick within the molding-compartment to a vertical pressure, as and for the purpose herein set forth.

6. In a brick-machine, and in combination with each other, a molding-compartment having an open top, a presser, a counter-presser, a follower, the latter actuated by means of a cam-lever V, and so arranged that after the completion of the pressure force exerted vertically by the projection 2 of said cam the return movement of cam U will elevate the follower, with the finished brick resting thereon, to the level of the receiving-table by means of the cam-segment 1 to 3, and then holding the brick in a suspended stationary position by reason of cam-segment 3 to 4 acting against the point k of follower G, substantially as set forth.

7. In a brick-making machine, a molding-compartment having an open top, a vertically-reciprocating cover, a follower, a horizontally-reciprocating presser and counter-presser, each one of these pressure-exerting agencies provided with a dovetailed slot at their respective ends, for the purpose of receiving end plates of flat or molded form, so as to be made interchangeable at these points, so as to enable the operator to make flat or molded bricks at his will, substantially as shown and described.

ROBERT F. ROBISON.

Witnesses:

CHAS. F. GILBERT,
ERNEST KESHAGEN.