

W. H. HOVEY.

Improvement in Brick-Machines.

No. 129,411.

Patented July 16, 1872.

FIG. 1

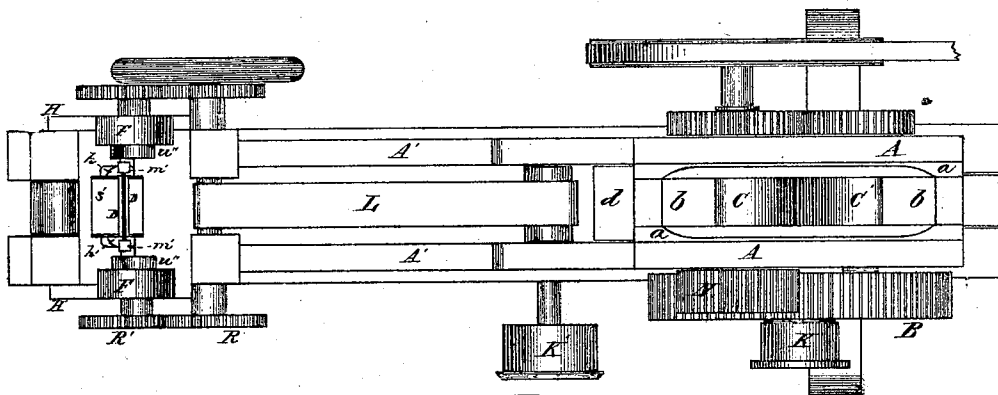
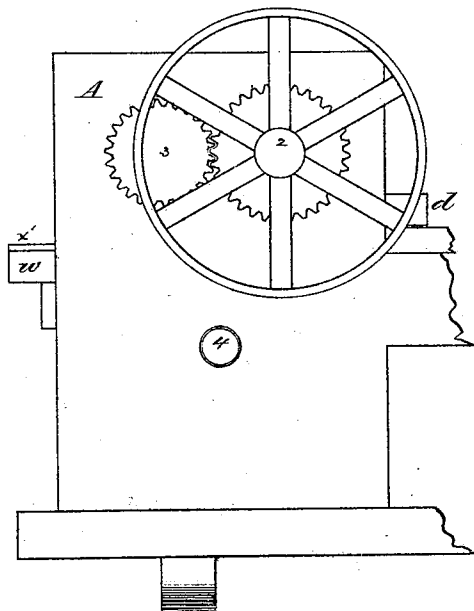


FIG. 3



Witnesses,
J. A. Curtis,
E. E. Howard

Inventor,
William H. Hovey

W. H. HOVEY.

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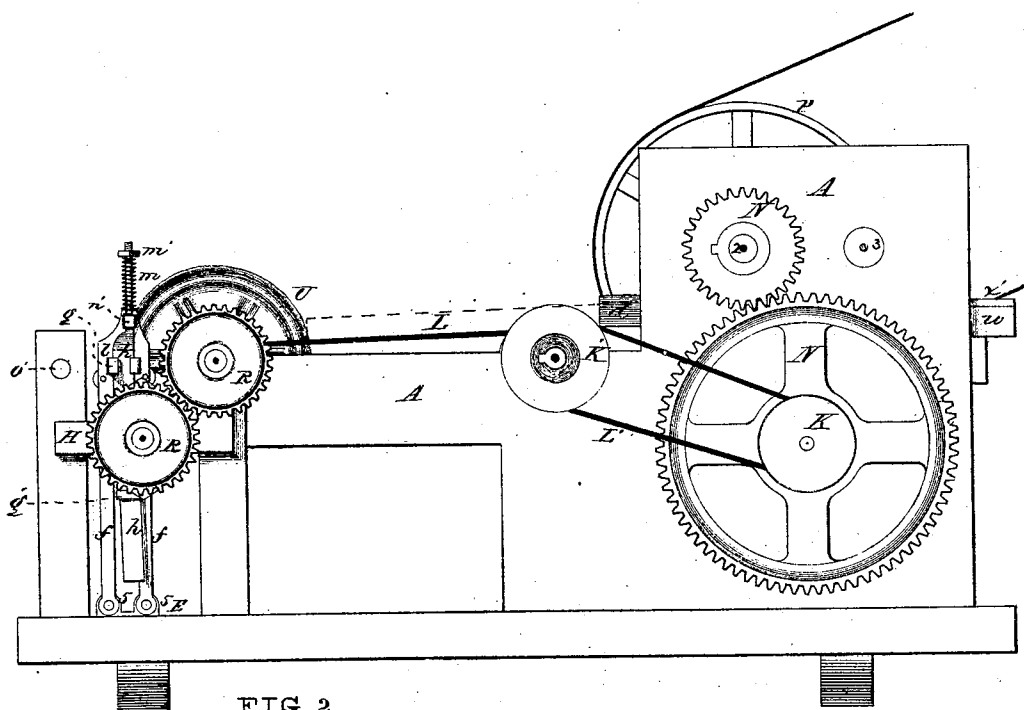
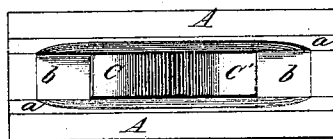


FIG. 2

FIG. 4



Witnesses, *L. A. Curtis.*
E. E. Howard

Inventor,
William H. Hovey

W. H. HOVEY.

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FIG. 7

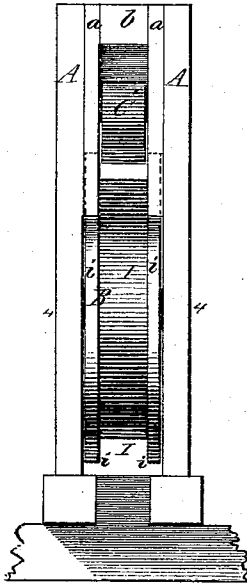


FIG. 6

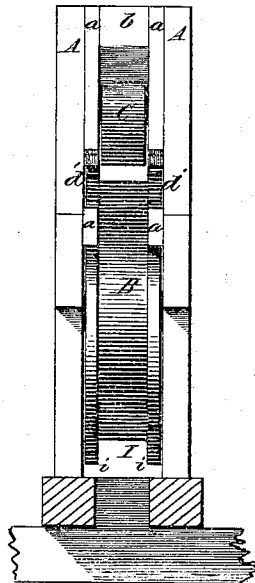


FIG. 5

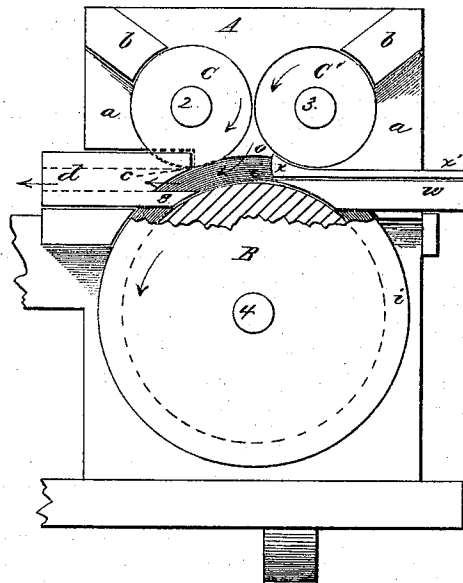


FIG. 8

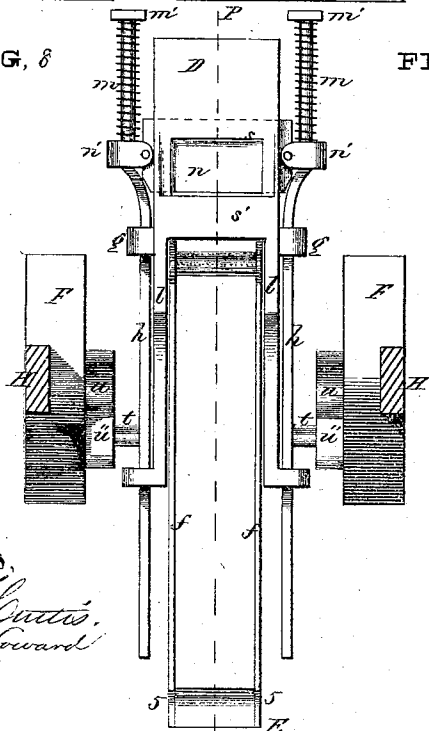


FIG. 9

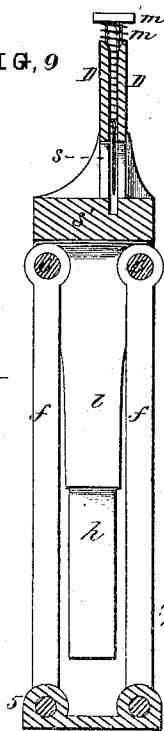
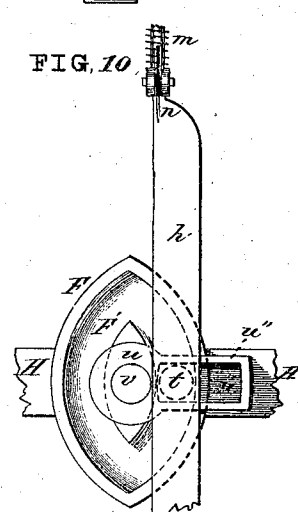


FIG. 10



Witnesses,
J. H. Curtis.
G. E. Howard

Inventor,
William H. Hovey

UNITED STATES PATENT OFFICE.

WILLIAM H. HOVEY, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. 129,411, dated July 16, 1872.

To all whom it may concern:

Be it known that I, WILLIAM H. HOVEY, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Machines for Making Bricks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification and to the letters of reference marked thereon, in which—

Figure 1 is a plan view of my invention. Fig. 2 is a side view of the same. Fig. 3 is another side view of a portion of the same, showing the gearing of the two grinding-wheels. Fig. 4 is a plan view of the hopper. Fig. 5 is a longitudinal vertical section through the hopper, showing the arrangement of the working parts. Fig. 6 is a front view of the end of the machine containing the grinding and forming wheels. Fig. 7 is a rear view of the same. Fig. 8 is a front view of the reciprocating knife and the mechanism which carries it. Fig. 9 is a vertical section through line P; and Fig. 10 is an inside view of the cam, showing the connection with the knife-carrier.

My invention relates to a machine for making bricks; and it consists, first, of a series of wheels arranged within a casing, which operate, first, to grind the clay, or to reduce it to a proper condition to be formed into bricks; and which operate, second, by their friction, to force the clay in a continuous prismatic column through a mold. As the column of clay comes from the mold, it passes onto an endless apron or belt, and is carried along to a reciprocating knife, which operates in a vertical direction, and its carriage reciprocates in a horizontal direction, and the knife-carriage has an aperture therein, through which the column of clay passes as it moves along from the endless apron; and the knife-carriage is caused by a cam mechanism to move back half the length of a brick while the column of clay is passing through the aperture therein, and as it starts forward again the knife is caused by the cam mechanism to make a downward stroke across the aperture while the carriage moves forward with the same velocity as the column of clay is moving, and the knife is caused to cut off the column of

clay while it is moving. The knife then moves back half a length of a brick as before, and, the knife and carriage repeating their movements, just the length of a brick is cut from the column of clay. The bricks as they leave the carriage are carried off by an endless apron to any distance desirable.

That others skilled in the art may be able to make and use my invention, I will proceed to describe its construction and operation.

In the drawing, A represents a frame, one end of which has two sides extending up, forming two sides of a hopper. At this end of the machine three rollers, C, C', and B, are arranged, having their bearings 2, 3, and 4 in the two sides of the frame. The large wheel B has two projecting flanges, *i*, one on each side, which form a channel or groove, I, between, shown clearly in Figs. 5 and 6, and the two wheels C and C' are of a width to correspond with the width of said channel I, and said wheels are so arranged in their bearings that their peripheries just meet the peripheries of the flanges *i* or just fit between the latter, and form the fourth side to the channel I. The part A of the casing has a lining, *a*, placed therein around the hopper and rollers of the same thickness as the flanges *i*, and this lining fills up all the spare space on each side of the wheels C and C', as shown in Figs. 5 and 6. The two pieces *b* placed between the sides form the two ends of the hopper. A piece, *x*, having its inner end turned upward in the point *x* and fitting well between the flanges *i* is placed therein, with a piece, *w*, placed below it, fitting the convexity of the periphery of the wheel B, and also fitting well between the flanges *i*. This piece *w* keeps the point *x* up against the periphery of the wheel C' and both the pieces *x* and *w* are thus secured in place firmly. A rectangular box or die, *d*, is fitted in the lining *a* in front of the wheels, said box having the two sides fitting well the recess *d'* in the lining *a*, and whose sides are of the same thickness as the lining, and as that of the flanges *i* also, and the inner ends of the die *d* are made concave and fit against the periphery of the flanges *i*. The inner end of the top of the die is also made concave to fit the convex periphery of the wheel C, the inner end of the top of the die being formed into the point *c*, shown in Fig.

4, operating to scrape off anything that may adhere to the periphery of the wheel C. The lower side of the mold *d*, at the inner end, is formed concave and having a point at the end, as shown at *e*, Fig. 4; said point fitting well between the flanges *i*, and also fitting well the periphery of the wheel B at the base of the channel I. Suitable geared wheels are applied to the journals 2 and 3 at one end, and at the other end the toothed wheel N, upon the journal 2, carries the toothed wheel N' upon the journal 4, upon which is a pulley, K. An endless apron L extends from a roll placed just in front of the die *d* to another roll placed at the other end of the machine, and a belt, L', carried by the pulleys K and K', assists in carrying the endless apron L. At the forward end of the machine four bars, *f*, are pivoted at 5 5, and at the upper end these bars are pivoted to the carriage *l*, upon which are made the sockets or guides *g g'*, in which are fitted the uprights *h*, so as to move freely therein in a vertical direction. The details of the construction of this part of the machine are shown more fully and in larger scale in Figs. 7, 8, and 9. The carriage *l* has a platform or table, *s'*, thereon, and two plates, D D, extending above the table *s'*, with an aperture, *s*, through the said plates, as shown in Figs. 7 and 8. The uprights *h* terminate at the top in spindles or rods, upon which are placed spiral springs *m*, and the links *n'* are placed upon the lower part of said rods, the upper ends of which rods have a screw-thread and a nut, *m'*, turned thereon. The links *n'* are pivoted to the knife *n* placed between them, and also between the two plates D D, and the springs *m* at the lower ends bear upon the links *n'*, and at the upper ends against the nuts *m'*, and the knife *n* is free to move up and down between the plates D. To each upright *h* is firmly attached a pin, *t*, and the pieces H, which are attached to the frame, support the cams F. These cams, one on each side, consist of an elliptical-shaped groove or channel, F', which are somewhat pointed at their lower ends, in order that the knife may perform its cutting movement as soon as possible after it enters the clay, said cams having through the center a spindle or journal, *v*, to the outer end of each of which is secured a toothed wheel, R', and upon the inner end of this journal is secured a piece, *u*, having the arm *u''*, in which is made a slot, *u'*. The pin *t*, which is secured to the upright *h*, extends through the slot *u'* into the channel F' of the cam, and said pin may have a small tube fitted loosely thereon to serve as a roller to diminish the friction of the pin in the cam. Another roll may be placed at a convenient distance from the knife-carriage, around which the endless apron or belt L passes, and a toothed wheel, R, is secured thereto, which carries the toothed-wheel R', and another roll is placed at *o'*, and still another at any distance beyond, around both of which an endless apron passes to carry the bricks off after being cut. The wheels C, C', and B are made to re-

volve, at different degrees of velocity, by a suitable arrangement of toothed wheels, so that their peripheries shall rub or grind anything which passes between them, although the two wheels C and C' reduce the clay to the proper degree of fineness and consistency, and the wheel B, in connection with the others, acts upon the clay to force it through the die *d*, and it should revolve at such a rate of speed as to force the clay through the mold as fast as the two wheels C and C' supply it, but no faster.

Having thus described the construction of the invention, I will now describe its operation:

The clay is placed in the hopper A and first passes in between the wheels C and C', which reduce it to a fine and plastic condition, and the wheels, C C', and B revolve in the direction indicated by the arrows thereon. The clay, after passing in between the wheels C and C', is cleared from the wheel C' by the pointed or sharp-edged piece *x*, and is prevented by that from passing to the rear, and the friction of the periphery of the wheel B against the clay in the space *o* causes it to move in the direction indicated by the arrows. The channel I in the periphery of the wheel B gives a prismatic form to the column of clay as it passes through; and the column thus formed is finished and completed by being forced out through the die or box *d*, in the direction indicated by the arrows. As the column of clay issues from the die *d* it passes on to the endless apron L and is carried along thereon, its own weight upon the apron tightening the latter upon the rolls and causing them to revolve, and the roll nearest the knife *n* gives motion to the toothed wheel R, and that carries the wheel R. As this latter revolves the arm *u''* also revolves and carries the pin *t* around in the channel F'. As the pin *t* passes either up or down in approaching the ends of the groove F' it moves out toward the end of the arm *u''* in the slot *u'*, and when it approaches a point midway between the ends of the channel F' the pin passes to the inner end of the slot *u'*, as shown in Fig. 9. The pins *t*, in passing from the extreme upper end of the cam F to the lower end, and vice versa, give a vertical movement to the upright *h* carrying with it the knife *n*, which moves up and down between the plates D D, passing downward in front of or through the aperture *s* in a vertical direction, as shown clearly in Figs. 7 and 8; and the motion of the pins *t*, in passing from one side of the cam F around to the other side, gives a horizontal movement of the carriage *l* and its adjuncts, said carriage vibrating to and fro upon its pivoted arms *f*. The prismatic column of clay passes from the endless apron L through the aperture *s* of the knife-carriage, and the said carriage, in moving forward, moves with the same speed as the column of clay, and the knife, in descending, cuts off the clay, and the severed portion is delivered upon another moving endless apron

and is carried away. The carriage then moves back half the length of a brick, and the clay, at the same time, moves forward half the length of a brick, through the aperture *s* in the knife-carriage. The carriage then starts forward again at the same speed as the moving clay, the knife descends again and cuts off another piece of the clay of just the length of a brick, which is carried off as before, and so on.

In practice it may be found more expedient to continue the apron *L* on beyond the knife-carriage, and passing it through the aperture *s* therein, and having it pass over a roll placed beyond the knife-carriage and passing back beneath it, and having the knife cut through the clay and upon the belt.

If a stone or other hard substance should happen to be in the clay at the point of severance, the knife, in striking it, would remain stationary and the springs *m* would be pressed upward against the nuts *m'*, allowing the knife to yield. The nuts may be turned either up or down upon a thread made upon the upper ends of their rods to give any desired degree of pressure upon the knife.

The uprights, in their upward and downward movements, slide freely through the sockets *g g'*, which gives the knife a perfectly vertical movement to cut the clay at right angles to its length, and also gives the carriage *l* a perfectly horizontal movement, so that the table *s* may be always horizontal and its upper side parallel with the column of clay as it passes along upon it. The flanges *i* upon the wheel *B* might be omitted, and instead the lining *a* might be secured to the inside of the casing *A* to fill the space occupied by the flanges *i*, and the wheel *B*, which would have a plain periphery, might revolve at a higher rate of speed, if necessary, to force the clay out through the die *d*. I prefer, however, to use the wheel *B*, with the flanges thereon, to insure the proper forcing out of the clay through the molds, and to assist in

giving the brick its proper form in length. The enlarged or pointed end *x* of the piece *x'* should be forced in between the wheels *C'* and *B* to a point inside a line drawn from the center of the bearing 3 to the center of the bearing 4, as the peripheries of said wheels are nearest each other at that point, and as the point *x* wears away, the piece *w* is forced in a little and the piece *x'* drawn out, bringing the point *x* against the periphery of the wheel *C'*, and both are secured in that position.

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

1. The combination of the rollers *C, C'*, and *B*, constructed and operating substantially as and for the purpose described.
2. I claim the combination of the rollers *C, C'*, and *B* with the piece *x'* having the point *x* thereon, all constructed and operating substantially as described.
3. I claim the die *d*, the inner end of which is fitted to the wheels *C* and *B*, and operating in connection therewith, substantially as and for the purpose set forth.
4. I claim the reciprocating carriage *l*, held in a vertical position while moving horizontally by means of the pivoted levers *f f* and the uprights *h* in the sockets or guides *g g'*, substantially as described.
5. I claim the uprights *h* having the pins *t* secured thereto, which operate through the slotted arm *u''* and in the cam *F*, substantially as described.
6. I claim the vibrating knife *n* attached to the uprights *h*, and moving between the plates *D D*, and regulated in its pressure by the springs *m* and nuts *m'*, substantially as set forth.

WILLIAM H. HOVEY.

Witnesses:

T. A. CURTIS,
CLARENCE E. BUCKLAND.