C. C. ZEH.

Brick-Machine.

No. 212,166. Patented Feb. 11, 1879.

Fig. 1.

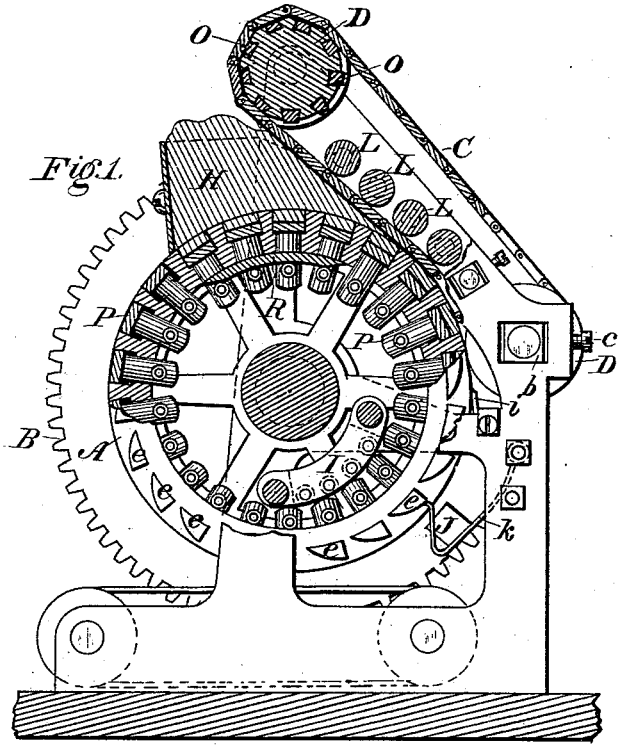


Fig. 2.

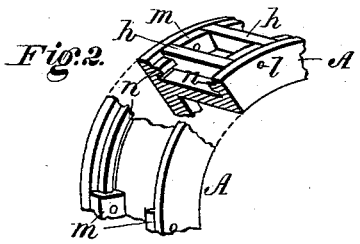
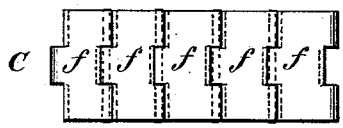


Fig. 3.



Witnesses:

Donn J. Twitchell.

Will W. Dodge.

Inventor:

Charles C. Zeh,

by Dodgerson

Attys.

UNITED STATES PATENT OFFICE.

CHARLES C. ZEH, OF TRENTON, NEW JERSEY, ASSIGNOR TO LEWIS CLEPHANE, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **212,166**, dated February 11, 1879; application filed October 26, 1878.

To all whom it may concern:

Be it known that I, CHARLES C. ZEH, of Trenton, in the county of Mercer and State of New Jersey, have invented certain Improvements in Brick-Machines, of which the following is a specification:

This invention consists of an endless belt, arranged to be pressed by a series of rolls against the face of a mold-wheel, by which the pressure is applied to the bricks from the outside inward, and by the arrangement of which, in relation to the mold-wheel, the clay is fed into the molds with certainty, and is compressed therein with great force.

It further consists in a peculiar manner of lining the molds with steel, a novel method of constructing the rolls around which the belt passes, and in a device arranged to strike upon the face of the bricks and render them perfectly plain or flat after they have been compressed and before being delivered from the molds, all as hereinafter more fully set forth.

Figure 1 is a side elevation of my improved machine, a portion being shown in section. Fig. 2 is a perspective view of a section of the mold-wheel, showing the manner of constructing and inserting the steel linings of the molds; and Fig. 3 is a face view of a section of the endless presser-belt, shown detached.

Many forms of brick-machines have heretofore been constructed in which a mold-wheel, either circular or polygonal, has been used, said mold-wheel being arranged to rotate in a vertical plane, and having the pressure applied by means of plungers arranged to press from the inside outward. They have also been made with a presser-wheel arranged to bear against the face of the mold-wheel, and thus press the clay into the molds from the outside; but, for various reasons, none of these have given entire satisfaction.

Where a machine is composed of a mold-wheel and a presser-wheel set face to face the two wheels can touch but at a single point; and as the convex surface passes from the mold where the brick is being pressed, not only is the face of the brick left slightly concave but the action of the presser-wheel has a tendency to force or draw the clay out at the lower edge of the mold, thus tending to produce a crack at the center of the brick, especially after it has been dried and burnt.

To obviate these and other objections, and to make a machine that will feed the clay into the molds with certainty and compress the bricks with great force, is the object of my present invention; and to that end I construct my machine as shown in the accompanying drawings, in which A represents the mold-wheel, mounted in a strong frame of any suitable construction, and having a series of plungers, P, located in the bottom of the molds, with their stem projecting inward, so as to strike upon a cam, I, as the wheel rotates, for the purpose of shoving the bricks out of the molds upon the carrier-belt below, as is usual in this class of machines.

A hopper, H, is arranged, as shown in Fig. 1, upon the top of the wheel, the periphery of the mold-wheel forming the bottom of the hopper, so that the clay enters directly into the molds as they pass under it, the clay at first entering the molds by gravity, and subsequently being forced in by the pressure of the belt, thereby insuring at all times a full supply of clay to each mold. I then provide an endless belt, preferably composed of a series of metal plates, *f*, hinged together, as represented in Fig. 3, though it may be made by securing a series of metal plates to the face of a heavy leather or rubber belt, or in any equivalent manner. These plates *f* are made of such a size as to fully cover the mouth of each mold, and they are so arranged that when placed against the face of the mold-wheel and made to rotate or move along with it the solid metal of a plate will come directly over each mold. This endless belt C, I pass around two rollers or shafts, D, having flanges at their ends to guide the belt and keep it in place, these rollers being located as represented in Fig. 1, or substantially so, and one or both of them being mounted in adjustable boxes *b*, as shown, with a set-screw, *c*, or equivalent means for adjusting them.

A set or series of rollers, L, is arranged to bear against the back side of the belt where it passes along next to the mold-wheel A, as shown in Fig. 1, which is also made adjust-

able by any suitable means, so that the belt can be adjusted to the face of the mold-wheel, as may be desired. In order to enable this belt, when composed of the metal plates, to be kept taut, and at the same time pass around the rolls D with ease, I form dovetailed grooves or recesses lengthwise in the face of the rolls D, and secure therein pieces of rubber or similar elastic material, as indicated by O, Fig. 1, these pieces being arranged at such distances apart that one shall bear against the center of each of the plates *f;* and they are made to project slightly beyond the periphery of the rolls, so that as the plates of the belt bear upon them they will yield slightly, and thus prevent excessive strain upon the joints of the plates.

In order to insure a flat surface to the bricks, I arrange a spring-arm, *k*, at a point below where the belt ceases its contact with the wheel, and on this I mount a flat-faced block or plate, J, as shown in Fig. 1. Upon the side of the wheel A, I arrange a series of cams, *e*, which, as the wheel rotates, successively force back the spring-arm *k*, and as they pass let the arm spring inward, causing the flat-faced block J to strike upon the face of the brick still in the mold, thereby giving it a plane or flat face. It will, of course, be understood that this striker J and the cams *e* must be so arranged that the striker will be exactly opposite the face of the mold at the time it delivers its blow; and, if necessary, both the cams and the striker can be made adjustable for that purpose.

The manner of inserting and securing the steel plates which form the sides of the molds is shown in Fig. 2. As there shown, the face of the mold-wheel is made with a groove a little wider than the mold is long, and on each side the flanges of this groove are provided with an inwardly-projecting rib, *n*, which extends entirely around the wheel. I then provide end pieces *m*, which have in their outer faces a groove curved to fit the rib *n*, so that said pieces can be set in place, and will be firmly held by the rib *n* against the outward pressure of the brick and the plunger. To prevent their being displaced laterally, a bolt or rivet, *l*, is inserted through the piece *m* and the flange of the wheel, as represented in Fig. 2.

The cross or division plates *h* have a notch cut in each end corresponding in size with the ribs *n*, as shown in Fig. 2, and they are inserted by placing them diagonally across the groove, locking the ends on the ribs *n*, and then shoving it to its place against the ends of the end plates *m*, and thus they can be filled in, one after the other, until the whole series of molds have been built up on the periphery of the wheel.

It is obvious that the ribs *n* may be dispensed with, in which case the division-plates *h* will be provided with a tongue or projection at each end to engage in a corresponding notch or recess made in the ends or end of each of the end-plates *m*, which latter, being held in place by the bolts *l*, will in turn hold in place the division-plates *h*. The great advantage of this arrangement is, that whenever it is desired for any reason to remove the plates *h* or *m* from any mold, all that is necessary is to take out the bolts which hold the end plates of that particular mold, when said end plates can be at once removed, thereby releasing the adjoining division-plates *h* also.

These parts, of course, will be made by machinery, the groove in the periphery of the wheel and the ribs thereon being turned so as to render them perfectly true and accurate. In like manner the steel plates *h* and *m* will be finished up by machinery, and as those for each mold are duplicates of all the others, it will be a simple and easy matter to construct and adjust them in place.

A scraper, *i*, is arranged at any suitable point to bear against the face of the mold-wheel to scrape off any superfluous clay that may adhere thereto. Cam R is also arranged to engage under pins in the stems of the plungers P to draw them back to the bottom of the molds as the latter come under the hopper, and thus insure the molds being open to receive the clay.

It will be seen by examining Fig. 1 that the space been the face of the presser-belt and the mold-wheel is V-shaped, so that the clay is being constantly pressed into the molds, and that the pressure constantly increases as the molds advance toward the belt. The belt and the wheel, both advancing together, also tend to carry the clay along with them, thus feeding it into the molds with absolute certainty and with great force. After the molds are thus filled they pass along, and the brick in each is successively pressed by the belt and the series of rolls L, thereby securing a most thorough and uniform compression of each brick. The faces of the bricks as they pass from under the belt are left flat and smooth, but in case they should not be so the blow or impact from the flat-faced striker J will render them so, and thus the bricks are formed in a most perfect manner.

If desired, the rolls D, or all the rolls, may be geared with the mold-wheel, so that the face of the mold-wheel and of the belt shall move at a uniform rate of speed; but in our experiments we have not found this necessary, as great pressure applied to the belt causes sufficient friction between it and the mold-wheel to cause them to travel together as desired.

Having thus described my invention, what I claim is—

1. In combination with the mold-wheel A, the endless belt C and a series of presser-rolls, said belt and rolls being arranged in relation to the mold-wheel, substantially as described, whereby the clay is forced into the molds, and the pressure thereon while in the molds is applied from the exterior, as set forth.

2. In combination with the mold-wheel A

and endless belt C, a series of presser-rolls, one or more of which is mounted in adjustable bearings, arranged to operate substantially as herein described.

3. In combination with the mold-wheel A, the striker or plate J, arranged to strike upon the face of each brick in the molds after they have been pressed, substantially as described.

4. The transverse plates *h*, arranged to be held in place by the ribs *n*, or by interlocking with the end plates, *m*, these latter being independently removable, whereby the plates of any separate mold may be removed without disturbing the plates of the other molds, substantially as described.

5. The rolls or rollers D, provided with the elastic projections O to form bearings for the plates *f* of the belt as they pass over it, substantially as described.

6. In a brick-machine, the combination of a mold-wheel, A, and an endless presser-belt, C, arranged substantially as shown and described, whereby an acute-angled throat is formed between them at the rear side of the hopper, for the purpose of more effectually forcing the clay into the molds, as set forth.

CHARLES C. ZEH.

Witnesses:
W. C. DODGE,
DONN I. TWITCHELL.