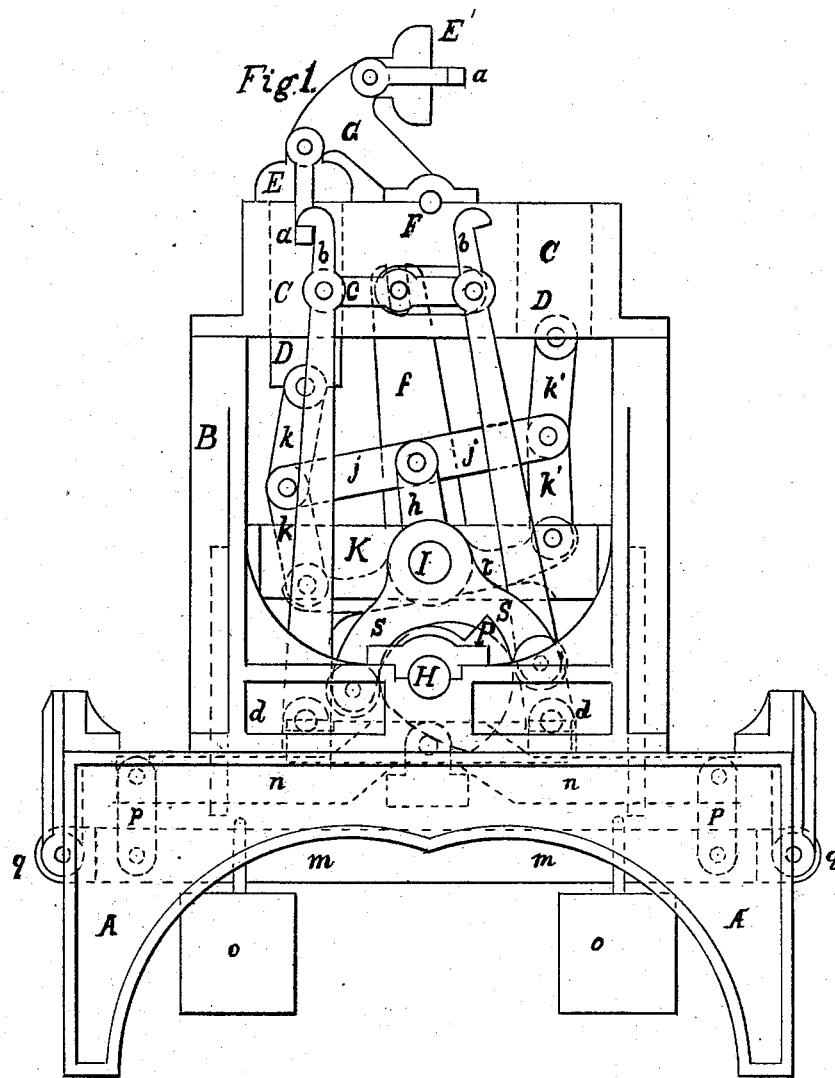


C. STILWELL.
Brick-Machine.

No. 217,423.

Patented July 8, 1879.



ATTEST.

Daniel H. Leck
Eugene H. Hensella

INVENTOR.

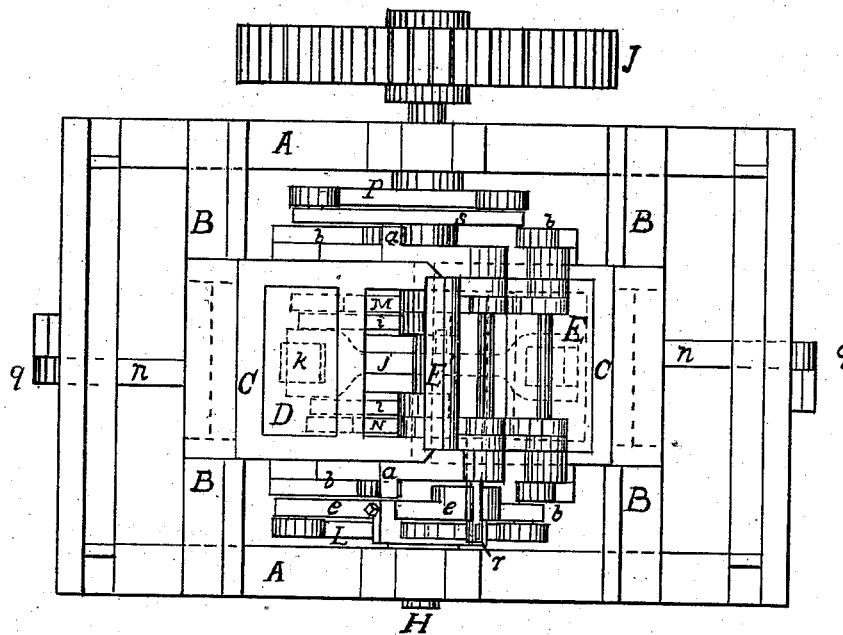
Charles Stilwell

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Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES STILWELL, OF MORRISTOWN, NEW JERSEY.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **217,423**, dated July 8, 1879; application filed April 11, 1879.

To all whom it may concern:

Be it known that I, CHARLES STILWELL, of Morristown, Morris county, in the State of New Jersey, have invented a new and useful Improvement in Machines for Pressing and Finishing Bricks; and I hereby declare that the following is a full and exact description of my invention, reference being had to the accompanying drawings, with letters of reference marked thereon, in which—

Figure 1 is a front elevation; Fig. 2, a rear elevation; Figs. 3, 4, and 5, elevations of detached parts, and Fig. 6 a plan.

My invention is intended for the pressing of roughly-formed and partly-dried bricks; and consists, chiefly, in devices and combinations for automatic movements, and the production of pressure to accomplish the desired end, so that the product, after having been burned in the usual way, will be smooth, hard, of nearly uniform dimensions, and in all respects fit for the facing of front walls and for similar purposes.

In the drawings, A is a bed-plate, and B B a frame carrying the several parts of the machine. To the top of the frame B B are secured two mold-boxes, which are preferably cast in one piece, and serve also as an entablature to carry the mold-covers E E', which are mounted upon the vibrating frame G, which is so formed and contrived that the respective mold-boxes C C may be alternately covered and uncovered by the covers E E' in consequence of the simple vibration of the frame G upon its shaft, borne by the entablature.

When a brick-blank is placed by an attendant in one of the mold-boxes C and the machine put in motion by connection with a steam-engine or otherwise, a cover will be automatically brought over one of the mold-boxes C, and be securely held in position, while other devices will cause the plunger, forming the bottom of a mold-box, to rise in the mold-box and press the brick-blank between the cover and the plunger and against the sides and ends of the box to give the blank the required shape and finish, after which the cover will be automatically released and raised, and the plunger will rise through the mold-box, carrying before it the brick formed and finished, ready for removal to the kiln.

The required movements of the different parts in the proper directions and sequence and to the proper extent are effected by means of cams mounted upon the revolving shaft H, which shaft is carried in bearings upon the frame B B. The motions are transmitted from the cams to the several parts by means of forked levers mounted upon a fulcrum-shaft, I, which shaft is carried in bearings upon the cross-pieces K.

For the purpose of making the frame G vibrate or rock so as to cover and uncover the mold-boxes C C, the cam L is secured upon the shaft H, and the movements derived from the cam L are communicated to the frame G through the forked lever e e and pin r, fixed in the frame G, the forked ends of e e being armed with rollers bearing upon the cam L. The shaft H is to be rotated in the direction indicated by the arrow in Fig. 2, and the cam L is of such shape that the frame G will be thrown over to one side, carrying a cover, E or E', over its mold-box, and remain in that position for a considerable time—for instance, while the shaft H makes the sixth part of a revolution. The next movement of these parts will be the bringing of the lever e e and frame G to vertical positions, so as to uncover both mold-boxes C C and allow the attendants to take out the pressed bricks and put in blanks. The frame G will afterward be thrown over, so as to cover the opposite mold-box, the operation of pressing and changing blanks and bricks being performed alternately on opposite sides of the machine.

Immediately after the frame G has been thrown over, so that one of the covers, E or E', is over and upon its mold-box C or C, the parts are secured to resist the pressure required upon the brick-blank by means of the hooks a a attached to each cover E, which hooks a a engage with the hooked upper ends of the bars b b upon each side.

There are two pairs of hook-bars, b b, and each one is secured to the bed-plate A at d d by means of lugs and pins in such a way that the hooked ends of the bars b b may swing so far as will allow the respective hooks to engage with or release the corresponding hooks a a. Near the upper ends of the bars b b they are connected together in pairs by the bars C

C, and the pairs are connected together by a bar which goes through a slot in the entablature, and also through and engages with the slot T in the forked lever *ll*, which lever and its cam N are shown in Fig. 3, for the reason that the lever *ll* is behind the lever *ee* in Fig. 2, and therefore not seen *in situ*.

The shape of the cam N is similar to that of the cam L, but differs from it in that the time of throwing the lever *ll* over to the extreme of its range comes later than the time of throw for the lever *ee*, and the time for the return of the lever *ll* to a vertical position comes earlier than the time for the like return of the lever *ee*, so that the mold-box on either side will be covered, the cover latched or secured in place, and so held while pressure is delivered upon the brick blank, and the cover unlatched sooner than the frame G requires to be restored to a vertical position.

The levers *ee* and *ll* are loose upon the fulcrum-shaft I, and the cams L and N are keyed fast upon the revolving shaft H.

To prevent inconvenience from lost motion, and the rattling of the rollers upon the lever *ee* against the cam L, and to bring about a quicker restoration of the frame G to a vertical position than would result from the sole action of the cam L, the spring *g* is applied to the lever *ee* and the frame G through the pin *r* and a clamp upon *ee*, and so adjusted that the spring *g* is neutral when the frame G is upright, but tends to resist the inclination of it in either direction, so that when the frame G is thrown over the resilience of the spring *g* holds the lost motion throughout this immediate organization all one way, and tends to bring the frame G to a vertical position so soon as the cover is unlatched, after the pressure has been delivered upon the brick-blank.

D D are plungers working in the mold-boxes C C, the tops of the plungers forming bottoms for the mold-boxes. The plungers D D are so worked by mechanism hereinafter described that they alternately rise to the top of the mold-boxes, to discharge the pressed bricks, and descend more than the thickness of a brick-blank. The first part of the upward movement of a plunger, D, is slow, and is effected by means of toggle-levers, so as to deliver the requisite pressure upon the brick-blank. This slow and powerful movement ceases when the plunger has risen so far as to have the proper thickness of a brick between the top of a plunger, D, and a cover, E, and the plunger descends for a short distance to free the latching apparatus from stress, at which time the hooks *aa* and *bb* are disengaged by the action of the cam N and lever *ll*, and immediately afterward the frame G is brought to a vertical position by the action of the spring *g*, cam L, and lever *ee*, and then the upward movement of the plunger D is resumed and continued until the top is nearly or quite level with the top of the mold-box C. The opposite plunger D has similar but reverse motions.

The intermittent upward and downward strokes of the plungers D D are effected by the instrumentality of the cams M and P upon the shaft H, and through systems of levers, which I now proceed to explain.

Upon the fulcrum-shaft I is keyed the double arm *t*. (Shown by broken lines in Figs. 1 and 2, and separately in Fig. 5.) The fork S S is also keyed to the shaft I, and is armed with rollers to engage with the cam P, which cam is keyed upon the shaft H, so that the cam P, through the fork S S and shaft *t*, gives a rocking motion to the arm *t*, and this rocking movement in one direction is effected during the time that the frame G stands in a vertical position, the cam P being shaped, set, and proportioned to that end. The plungers D D are connected to the respective ends of the arm *t* by the toggle-levers *k k k' k'*; but the functions of these levers are simply the functions of connecting-rods, if considered only in relation to the action of the cam P and its transmissive appendages. At the ends of the arm *t* are the props *t' t'*, made in one with the arm *t*, which props come alternately in contact with and rest upon the levers *nn*, which levers have fulera upon the bed-plate A, and are connected by links *pp* with the levers *mm*, which levers *mm* have fulera *qq* and carry the weights *oo*, which weights are adjustable along the levers *mm*, and all so arranged that when a greater pressure than is desired comes upon a lever, *n*, through a prop, *t'*, the corresponding weight *o* will be raised, and the machine guarded against overstrains.

For the purpose of giving the plungers D D the alternate slow and powerful movements, which begin the desired upward strokes, the cam M upon the shaft H is provided, and the movements derived from the cam M transmitted to the toggle-levers *k k k' k'* through the forked lever *iih*, mounted upon the shaft I, as shown in Fig. 4, the upper end of the lever *h* engaging with the cross-bar *jjj*, which cross-bar is attached at either end to the toggle-levers *k k k' k'*, as shown, so that the vibrations of the lever *iih*, caused by the cam M, will produce the simultaneous extension and contraction of the pairs of toggle-levers *k k k' k'*.

The cam M is so shaped, proportioned, and set that the extension of a pair of toggle-levers, *k k* or *k' k'*, will occur when the corresponding prop *t'* upon the arm *t* rests upon a lever, *n*, and when the corresponding plunger D is at the lower part of its stroke, and also while the corresponding cover E is down upon its mold-box and the latch-hooks *aa* and *bb* engaged, so that the pressure resulting from the extension of the toggle system is delivered upon the brick-blank to give it the required shape and consistence.

The throw of the cam M is such that the toggle-levers *k k* and *k' k'* are moved a little past the position of greatest extension at each stroke, whereby the plunger attached is slightly lowered after the pressure has been delivered, and the latch-hooks *aa* and *bb* left free for disen-

gement before the beginning of the long upward movement of the plunger, which results from the action of the cam P, takes place, which long upward movement is for the purpose of ejecting the pressed brick from the mold-box C.

The shaft H will be driven by a gear-wheel. (Indicated by broken lines J in Fig. 2 and in full lines in Fig. 6.)

The combination of the cam L, lever *e e*, and frame G, carrying the covers E E', accomplishes the covering and uncovering of the mold-boxes C C automatically and at the proper times.

The combination of the spring *g*, lever *e e*, and frame G conduces to the smooth and quiet working of the machine.

The combination of the cam N, lever *l l*, bars *b b*, and hooks *a a* accomplishes the securing of the covers E E' when the pressure is delivered upon the brick-blank, and the release of the covers E E' automatically and at proper times.

The combination of the toggle-levers *k k k'*, cross-bars *j j*, lever *h i i*, and cam M with the plungers D D causes the requisite pressure to be delivered upon the brick-blank, and the release of the latch-hooks *a a* and *b b* from stress automatically and at proper times.

The combination of the cam P, fork S S, shaft I, arm *t*, and toggle-levers *k k k' k'* causes the plungers D D to make the ejecting strokes, and brings the parts into proper positions for the application of pressure to the brick-blanks automatically and at the proper times.

The combination of the props *t' t'* upon the arm *t* with the levers *n n* and *m m* and weights *o o* affords a means of guarding the machine from breakage by accidental undue pressure upon a brick-blank.

I claim—

1. The combination of the cam L, lever *e e*, and vibrating frame G, carrying the covers E E', substantially as and for the purposes described.

2. The combination of the spring *g*, lever *e e*, and frame G, substantially as and for the purposes described.

3. The combination of the cam N, lever *l l*, bars *b b*, and hooks *a a*, substantially as and for the purposes described.

4. The combination of the toggle-levers *k k k' k'*, bars *j j*, lever *h i i*, and cam M with the plungers D D, substantially as and for the purposes described.

5. The combination of the cam P, fork S S, shaft I, arm *t*, and toggle-levers *k k k' k'*, substantially as and for the purposes described.

6. The combination of the props *t' t'* upon the arm *t* with the levers *n n*, levers *m m*, and weights *o o*, substantially as and for the purposes described.

CHARLES STILWELL.

Attest:

DANIEL H. LEEK,
EUGENE KINSELLA.