4 Sheets—Sheet 1.

C. S. BIGLER.

BRICK-MACHINE.

No. 172,864. Patented Feb. 1, 1876.

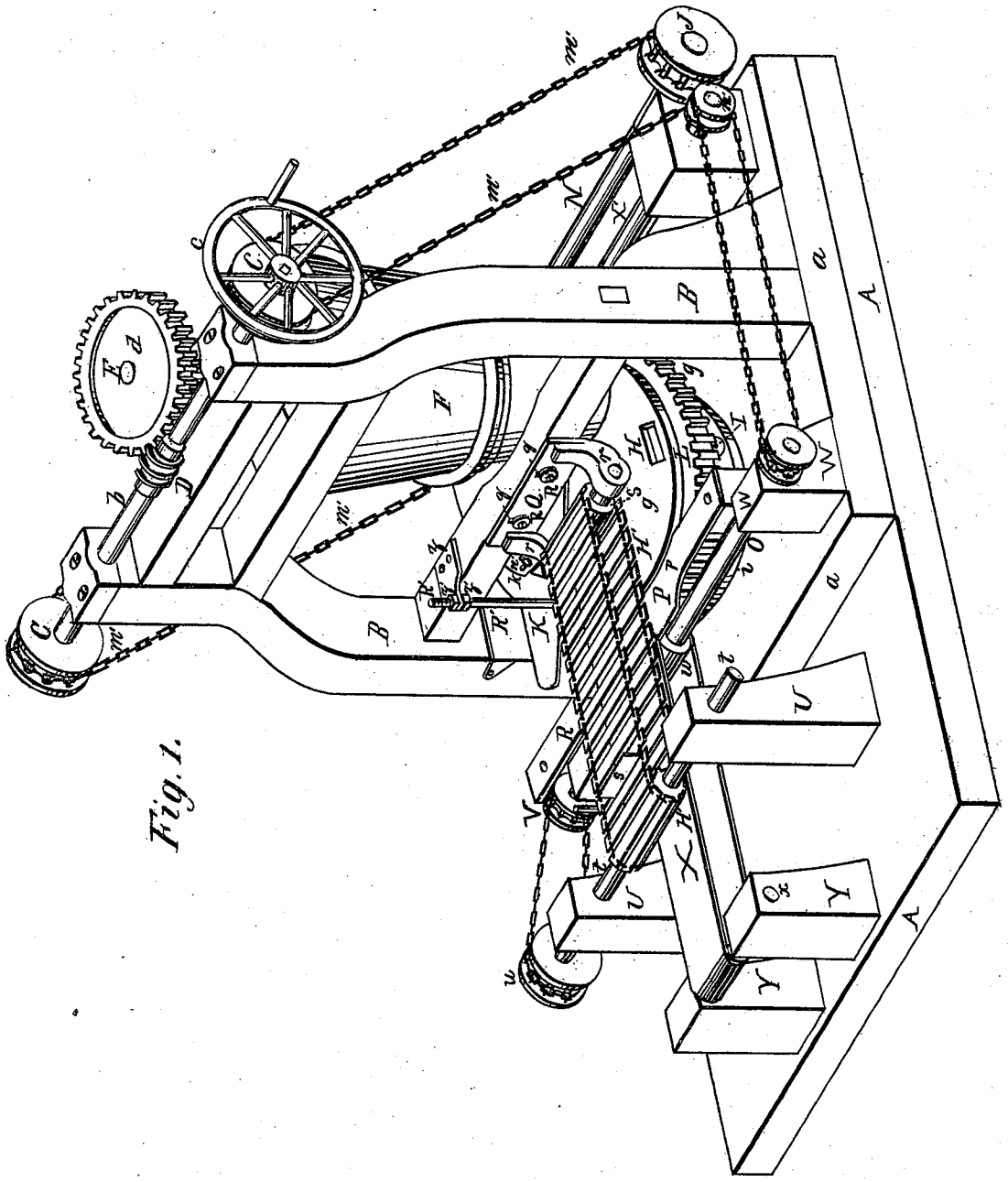

Fig. 1.

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Fig. 2.

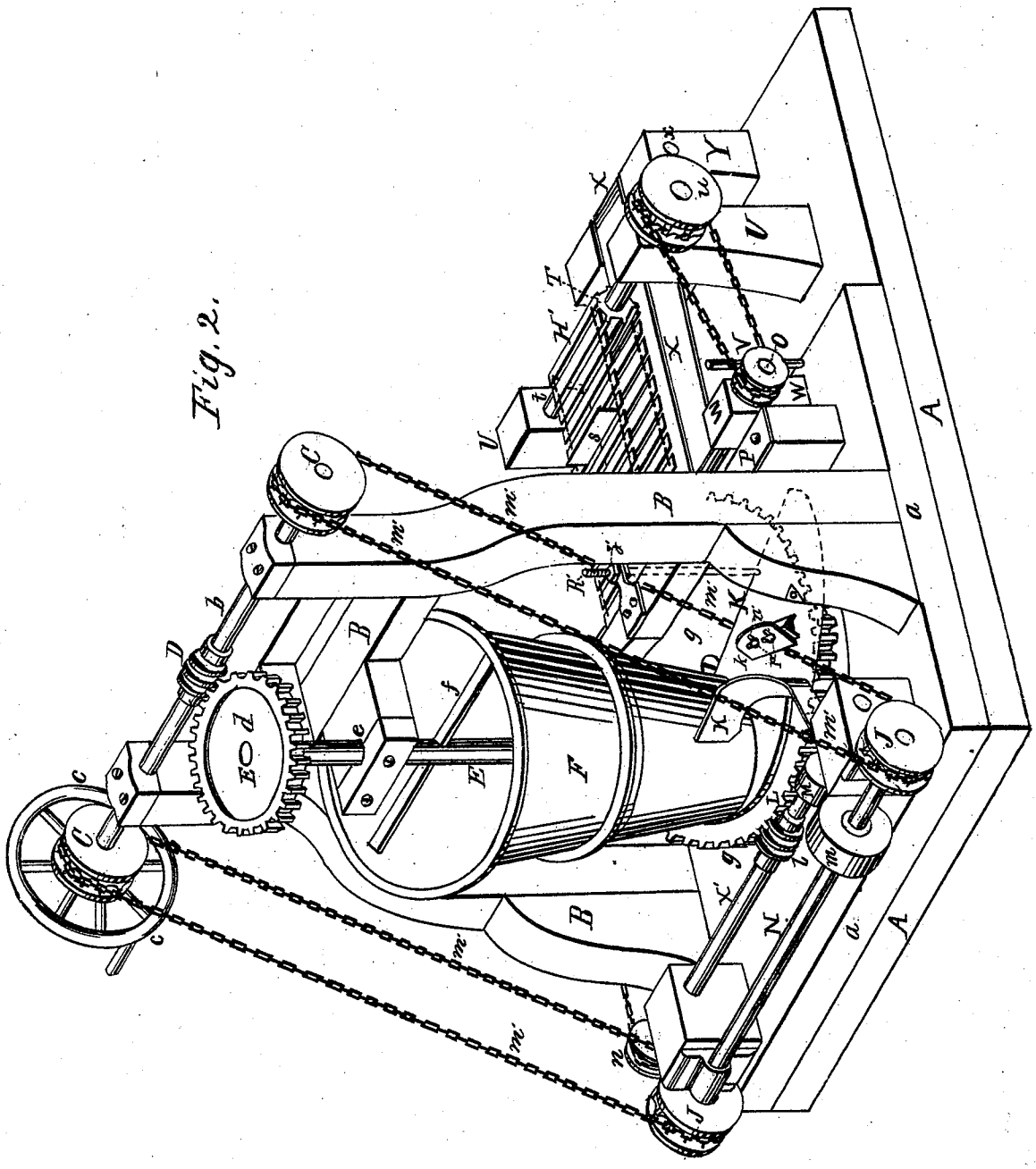

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Fig. 3.

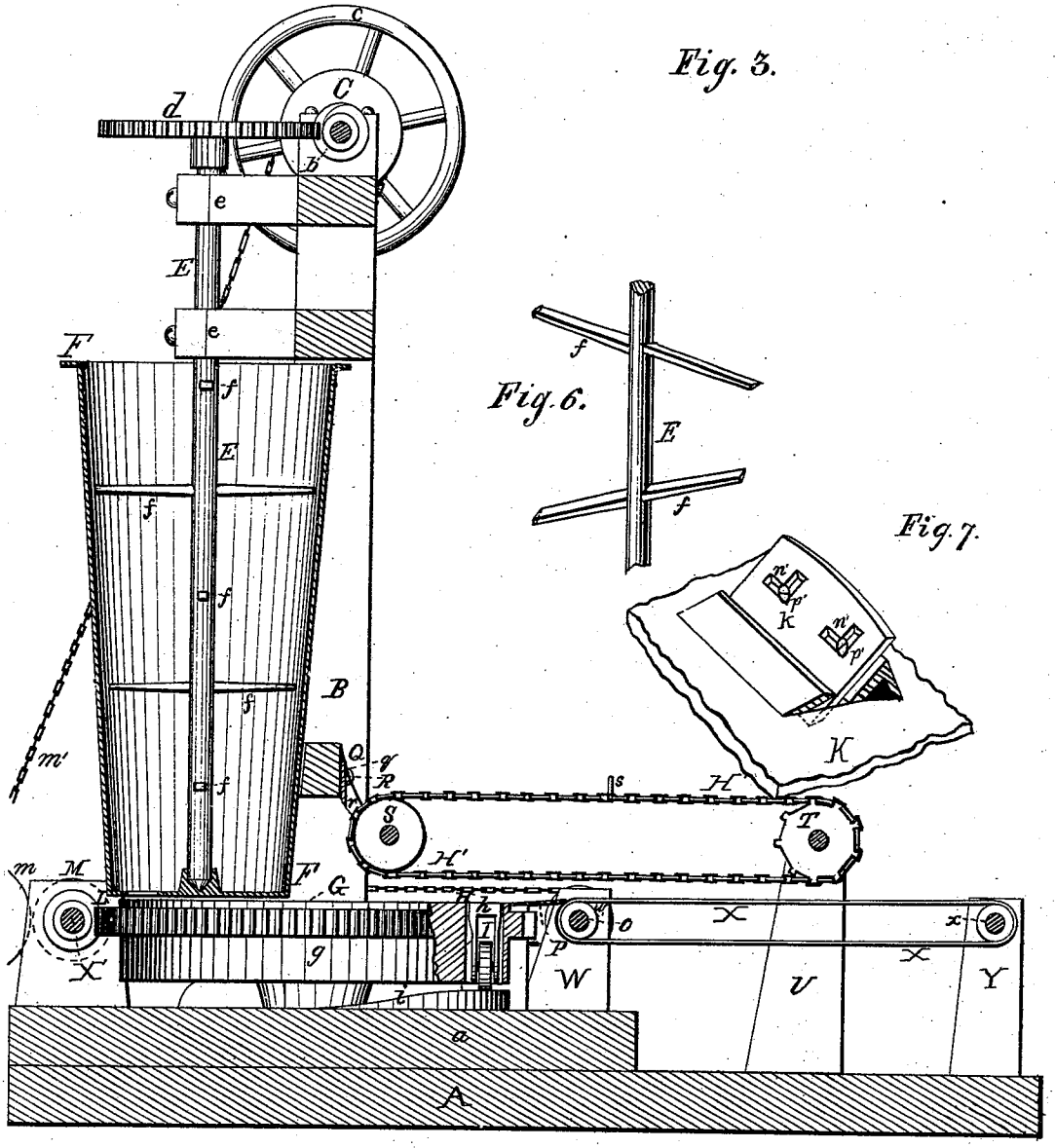

Fig. 6.

Fig. 7.

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BRICK-MACHINE.

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Fig. 5

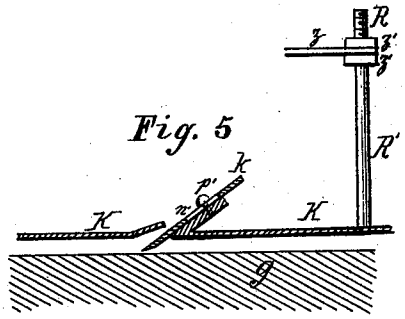
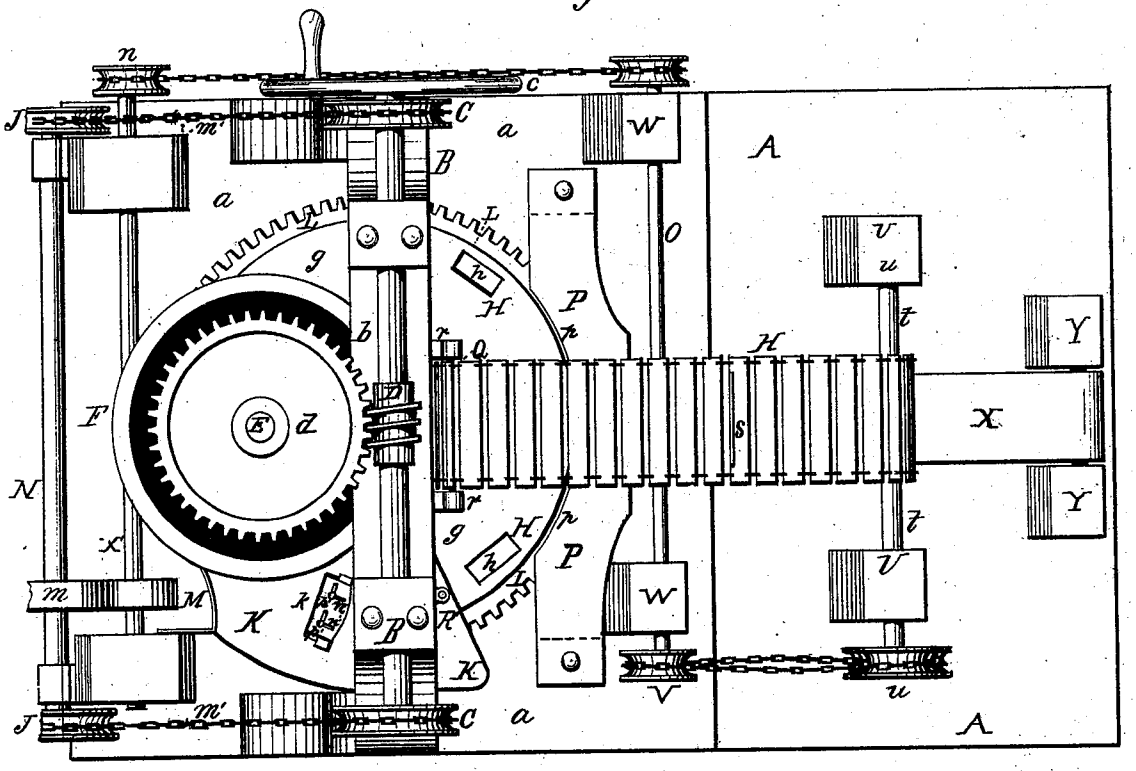


Fig. 4.



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UNITED STATES PATENT OFFICE.

CASPER S. BIGLER, OF HARRISBURG, PENNSYLVANIA.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **172,864**, dated February 1, 1876; application filed January 6, 1876.

To all whom it may concern:

Be it known that I, CASPER S. BIGLER, of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented a new and useful Improvement in Brick-Machines, of which the following is a specification, reference being had to the accompanying drawings:

The invention relates to certain improvements in machines for making brick; and consists in the devices hereinafter specifically designated.

The object of the invention is to produce a machine which will rapidly and properly mold and deliver bricks.

Figure 1 is a perspective view of a device embodying the elements of the invention. Fig. 2 is a similar view from the opposite side. Fig. 3 is a vertical central longitudinal section. Fig. 4 is a plan view. Fig. 5 is a detached view of the presser-plate K, plane, and adjustable standard. Fig. 6 is a detached view of mixing shaft and knives. Fig. 7 is a detached perspective view of a portion of the presser-plate, with the planing-knife.

A, in the accompanying drawings, represents a platform, to which is secured an auxiliary platform, *a*, having the vertical frame B, which sustains the shaft *b*, provided at each end with gear-wheels C, properly constructed to engage a chain-gearing. The shaft *b* has at one extremity a crank-wheel, C, through which motion is communicated to the shaft. Upon the shaft *b*, midway between the sides of the frame B, is rigidly secured the worm D, which engages the gear-wheel *d*, rigidly secured to the upper end of the vertical shaft E, which is sustained by the bearings *e* attached to the frame B. This shaft E is sustained by the bearings *e*, as to its upper parts, its lower extremity resting upon a block in the center of the bottom of the conical hopper F, the shaft occupying the vertical axial center of the hopper, and being provided on that part below the edge of the hopper with the mixing-knives *f*, arranged at right angles to the shaft, the length of the knives decreasing from top to bottom, so that their operation will effect, to as great an extent as possible, the contents of the hopper.

The knives, being drawn to an edge, will operate not only to mix, but also to press the clay down on the lower knives more rapidly than the molds can be filled. Thus the molds are abundantly supplied with clay.

The object of having the hopper conical is to contract the pressure of the material in it into as small a space as possible.

The hopper is properly secured in a vertical position against the frame B, its bottom being a single plate, except an aperture, *x''*, properly placed for the egress of the clay. Below the center of the frame, and properly secured by a central pivot, G, is placed the mold-table *g*, having the molds H of proper size to form the brick, and placed as nearly as possible to the edge of the upper surface of table, these molds being so placed that as the wheel revolves they pass under and are filled by the material escaping through the aperture in the bottom of the hopper. The bottom of the mold H consists of a loose plate, *h*, set in the recess, and movable therein by means of a traveling-wheel, I, secured upon its lower extremity. At a suitable place opposite the lower edge of the mold-table are provided the inclined ways *i*, so arranged that as the mold-table revolves the traveling-wheels I shall ascend and descend the ways, thereby elevating the upper surface of the loose plate *h* to the level of the upper surface of the mold-table. Now, when the traveling-wheels I are in contact with the auxiliary platform *a* the plate *h* is below the upper surface of the mold-table a distance equal to the thickness of a brick, and as the recess is filled by clay in passing under the hopper, and as the apex of the ways is sufficient to elevate the plate to the level of the upper surface of the mold-table, it is obvious that a molded brick will be gradually discharged from the recesses as the wheels I ascend the ways, and that the plates *h* will descend, allowing the mold to be refilled after passing the apex, which is placed in the longitudinal central plane of the device. Secured to one side of the frame, and arranged so as to nearly impinge the upper surface of the mold-table, is provided the presser-plate K provided with the plane *k*, which is adjustable laterally, vertically, and, in respect to its degree of inclination, by means of the angular slots *n'* and set-screws *p'*, shown and placed

so that its edge shall sweep that portion of the circumference of the mold-table occupied by the molds.

To the rear of the presser-plate is secured the vertical standard R′, the upper end of which passes through the ear *z*, secured on the lower cross-bar of the frame, the upper end of the standards being threaded and provided with the nuts *z′*, by the operation of which the relation of the presser-plate to the mold may be regulated.

The purpose of this part of the invention is to press the brick into the mold, as well as to smooth its upper surface.

The edge of the mold-table *g* is provided with the angular recess L, for the purpose hereinafter specified, and is geared and suitably arranged to engage the worm *l*, rigidly secured at the center of the driving-shaft, and working in bearings at each end, near one of which it is provided with the friction-wheel M, which co-operates with a larger friction-wheel, *m*, upon the driving-shaft N, mounted in bearings at each end, and provided with gear-wheels suitable to operate a chain-gearing, whereby these gears are connected with the gear-wheels *c* at each end of the shaft *b*. One extremity of the shaft N is provided with a gear-wheel, *n*, about which passes a chain-belt, connecting it with a suitable gear upon the end of the shaft O, working in bearings upon the opposite side of the machine. Adjacent and in front of the shaft last named is provided the rest-table P, supported upon each side by standards, and having at its center a concave section, *p*, the rest-table being so arranged that the concavity comes in close relation to the vertical wall of the recess L in the edge of the mold-table, and, further, so that the center of the concavity is in the vertical central longitudinal plane of the machine.

The purpose of the rest-table P is to receive the brick the instant it is swept from the surface of the mold-table by the operation of the sweeping-belt, and thus to determine almost instantly the rasping operation to which the brick is subjected by being moved over a moving surface, the peculiar conformation of the rest-table permitting it to be placed in close relation to the mold.

To the lower cross-bar connecting the sides of the frame B is secured the plate Q, adjustable vertically by means of the slots *q* and set-screws R, for the purpose of adjusting the height of the sweeping-belt, hereinafter described, in relation to the upper face of the mold-table *g*, so that the sweeps on the belt will properly clear the table *g*, and have a full bearing upon the edge of the molded brick. At each end of the plate Q are provided the pendent arms *r*, the lower extremities of which receive as bearings the ends of the roller S, over which passes the endless sweeping-belt H, provided at proper intervals with the vertical sweeps *s*, all so arranged that, as the belt H operates, the sweeps *s* shall come in contact with the molded brick the instant that the plate *h* becomes flush with the upper surface of the mold-table. Thus the operation of the sweep will remove the brick from the mold-table to the rest-table almost instantly, vastly reducing the rasping operation caused by moving the brick in one direction over a surface moving in another, this rasping operation being determined the instant the brick is swept upon the rest-table.

The other side of the sweeping-belt H passes over and is operated by the recessed roller T, mounted at the center of the shaft *t*, which operates in bearings upon the standards U, secured to the platform A, one end of the shaft *t* being provided with a gear-wheel, *u*, of suitable construction to operate the chain-belt, and of superior size to the similarly-constructed gear-wheel V, secured on the end of the shaft O, which works in bearings in properly-placed standards W, and is provided immediately below the sweeping-belt H with the roller *w*, over which passes the endless conveying-belt X, the upper surface of which passes in close relation to and upon a level with the center of the rest-table, the other end of the belt being sustained by the roller-shaft *x* mounted upon bearings in the standards *y*.

It is obvious that, as the gear which operates the sweeping-belt H is larger than that which drives the conveying-belt, the motion of the former belt will be less rapid than the motion of the latter. Thus the molded bricks are moved gradually from the mold-table to the rest-table, thence onto the conveying-belt, which, moving rapidly, conveys them off, avoiding the danger of contact with the sweeps.

The sweeping-belt may be provided with any number of sweeps desired.

The purpose of using the friction-rollers M *m* is to more perfectly control the operation of the device, so that when the clay in the hopper is stiff the movement of the mold-table may be slackened, when the molds will be allowed more time to fill.

It is obvious that a lever or other analogous means may be employed to effect this result, the shaft carrying the outer friction-wheel being provided with a feather, so that the wheel may be moved into or out of gear, as desired.

Operation: The movement of the worm and gear-wheels causes the mixing-shaft to be rotated in the hopper, wherein the proper material is now deposited, being therein suitably mixed. This operation communicates motion through the shaft and worm to the mold-table.

The clay, descending through the aperture *x″*, in the base of the hopper, enters into the recesses in the mold-table, and is therein carried around, that portion of the clay above the level of the table being smoothed off by the plane, after which the plate at the bottom of the recess begins to be elevated as its wheel comes in contact with the ascending way, the brick gradually emerging from the mold, the bottom of which is flush with the top of the mold-table when the mold is under the sweeping-belt, which, revolving one of the sweeps,

comes in contact with the brick, moving it from the mold-table to the rest-table, and thence onto the conveying-belt, which rapidly delivers it at the opposite side of the machine.

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

1. The presser-plate K, provided with the planing-knife *k*, which is made adjustable vertically, laterally, and in respect to its degree of inclination to the face of the mold-table, substantially as specified.

2. An adjustable presser-plate, provided with a planing-knife.

3. The combination of an endless sweeping-belt with an adjustable roller, serving to tighten the belt and adjust its relation to the mold-table, substantially as set forth.

4. The combination of an endless sweeping-belt, mold-table, and rest-table, as set forth.

5. The rest-table, for the purpose specified.

6. The combination of a movable mold-table with a stationary rest-table.

7. The mold-table provided with the annular recess L, in combination with the rest-table P, provided with the concave recess *p*, substantially as specified.

8. The combination of a sweeping-belt, mold-table, rest-table, and conveying-belt, substantially as described.

9. The combination of the recessed mold-table *g*, worm *l*, shaft X′, friction-wheels M *m*, chain-belt *m′*, gears J C, shaft *b*, worm D, and wheel *d*, substantially as expressed.

10. The auxiliary shaft N, provided with the friction-wheel *m*, in combination with worm-shaft X′, friction-wheel M, and mold-table *g*, for the purpose specified.

11. An endless sweeping-belt, provided with one or more sweeps, for the purpose of removing the brick from the horizontal mold-table, substantially as set forth.

12. The combination of a mold-table, operating horizontally, with an endless belt provided with sweeps, for the purpose specified.

13. The combination of an endless sweeping-belt, provided with one or more sweeps, with an endless conveying-belt, substantially as set forth.

14. An endless sweeping-belt, provided with one or more sweeps, in combination with an endless conveying-belt, the latter moving more rapidly than the former, substantially as described.

In testimony that I claim the foregoing improvement in brick-machines, as above described, I have hereunto set my hand this 30th day of December, 1875.

CASPER S. BIGLER.

Witnesses:

EUGENE SNYDER,

CHAS. SNYDER.