(No Model.) 2 Sheets—Sheet 1.

S. P. CRAFTS.

BRICK MACHINE.

No. 303,709. Patented Aug. 19, 1884.

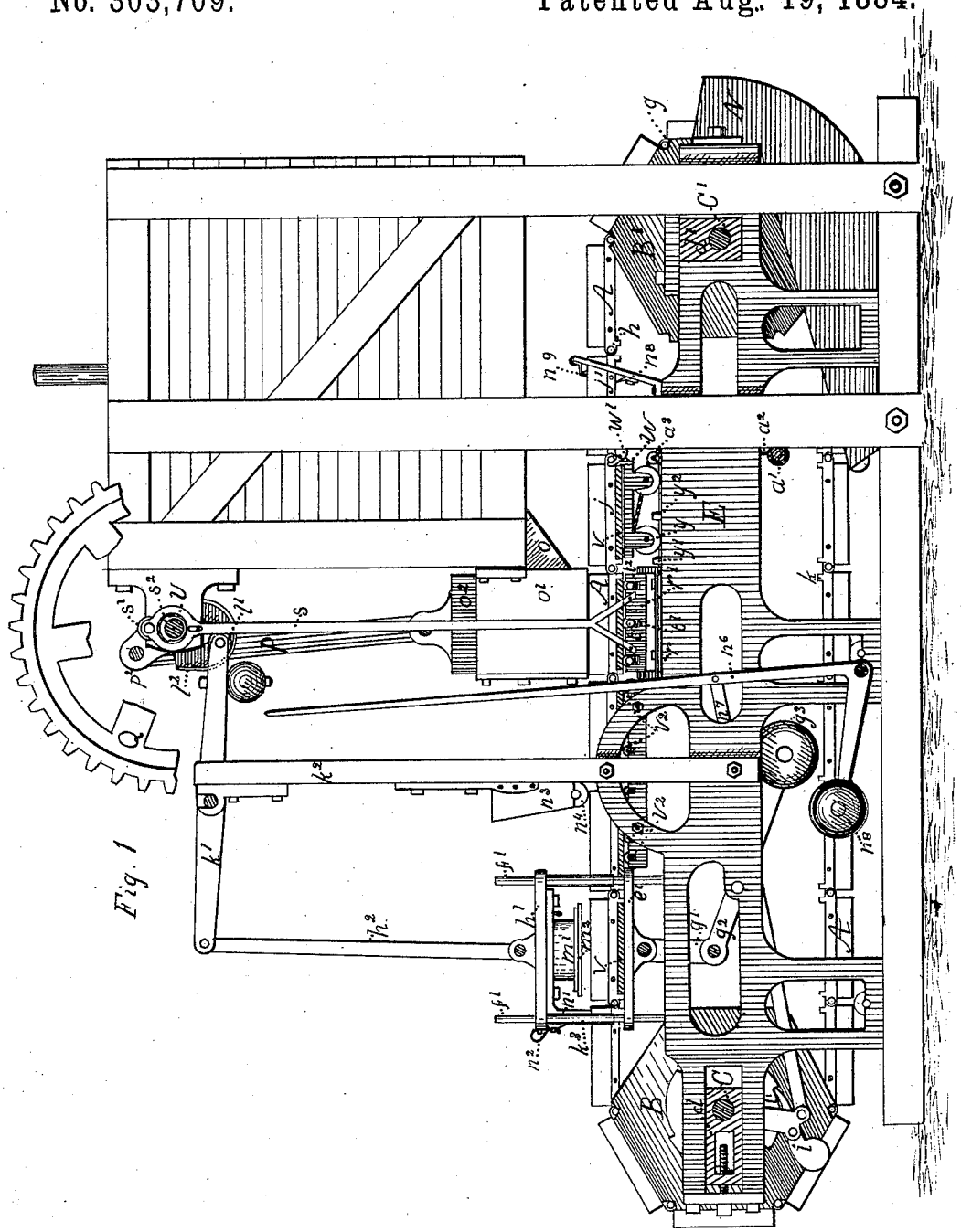

Fig. 1

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

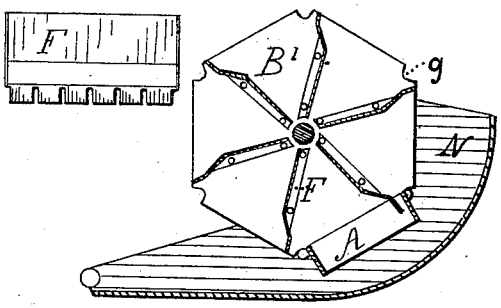


Fig. 2

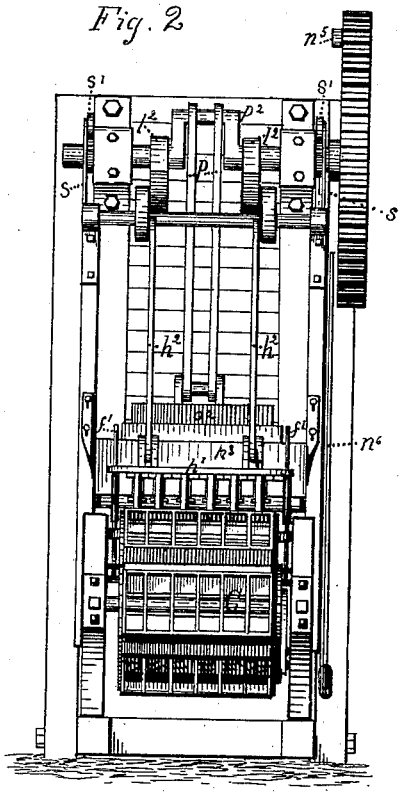


Fig. 4

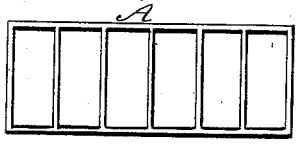


Fig. 5

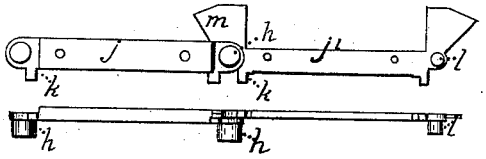


Fig. 6

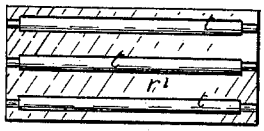


Fig. 7

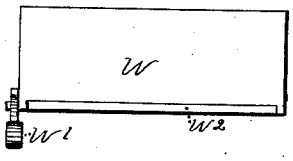


Fig. 8

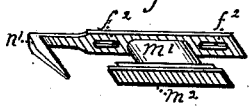
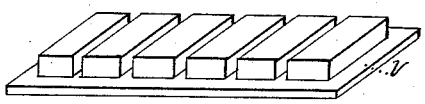


Fig. 9



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UNITED STATES PATENT OFFICE.

SAMUEL P. CRAFTS, OF HAMDEN, CONN., ASSIGNOR TO SARAH A. CRAFTS, OF SAME PLACE, AND HENRY H. OLDS, OF NEW HAVEN, CONN.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 303,709, dated August 19, 1884.

Application filed April 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL P. CRAFTS, of the town of Hamden, in New Haven county, and State of Connecticut, have invented new and useful Improvements in Brick-Machines, of which the following is a specification.

My invention relates to improvements in brick-machines, whereby the bricks are formed in bottomless molds arranged in an endless chain; and the object of my improvements is to form the bricks, properly sanded, upon pallets, which serve as temporary bottoms for the molds, and which can be removed from the molds with the bricks upon them ready to be carried to the drying-sheds.

The invention consists in the means, hereinafter more fully described, for sanding the molds; in the construction of the mold-links; in the mechanism for placing and holding the pallets in position under the molds; in the means for sanding and smoothing the upper surfaces of the brick, and in the mechanism for removing the pallets from the molds with the brick upon them. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine; Fig. 2, a front elevation; Fig. 3, a cross-section of the sanding apparatus and a view of plate F; Fig. 4, a plan view of a mold; Fig. 5, views of the hinge-links of the molds; Fig. 6, a plan of the suspended press-table; Fig. 7, a plan of the pallet-table. Fig. 8 is a view of one of the mold-wipers, and Fig. 9 is a pallet shown as it is taken from the machine with the bricks upon it.

The endless chain of bottomless molds, A, is supported upon four plates, B B′, which are secured in pairs to the two shafts C C′, which revolve in suitable bearings, *d d′*, in the frame E of the machine. Each mold in the chain consists of six brick-forms, (more or less,) arranged as shown in Fig. 4. The plates B′ are connected rigidly together on the shaft by transverse radial plates F, riveted at the ends to the plates B′. In the edges of the plates B B′ equidistant notches *g* are cut for the reception of the projections *h* upon the links of the molds, by which means the rotation of one pair of plates by the pawl *i* and ratchet-wheel *i′*, secured upon the shaft with the plates, moves the endless chain. The brick-molds are hinged together in the chain by links *j j′*, Fig. 5, fastened to their ends. A projection, *l*, is formed upon each end of every alternate link, and received in corresponding socket projections, *h*, in the ends of the remaining alternate links. By this construction of the links the chain may be disconnected by removing any two opposite socket-links *j*. Upon the lower edges of the links, considering the molds as right side up when in the upper part of the chain, are projections *k*, to hold the pallets in place under the molds, and on the upper edges of the links *j′* (but not shown in Fig. 1) are projections *m*, which correspond in height to the upper surface of the molds and bridge the space between the molds. The projections *k* need not be formed integral with the link, but may be fastened to the corners or sides of the molds. The wear of the link-joints is compensated by tightening the chain by means of the adjustable bearing *d* in the front end of the frame.

To the rear of the frame is bolted a scooped-shaped vessel, N, through which the chain is drawn. The mold-sand is contained in the scoop N, and adheres to the damp inner surfaces of the molds as they pass through. More or less sand is scooped up by the molds and carried above the center of the chain, and this sand, in falling back upon the plates F, Fig. 3, which are bent and notched at their outer edges to project within the molds, is directed against the forward inner surface of the molds, which otherwise somewhat shield themselves from the sand. The superfluous sand adhering to the upper and lower surface of the molds is removed by the scraper-bar n^8, fixed under the chain and brush scraper n^9, fixed above the chain to upright supports in the frame E. The frame E is securely fastened to the frame of an ordinary clay-grinding mill, so that the outlet O for the tempered clay is nearly over the middle part of the chain. The outlet is inclosed by a rectangular case, O′, in which a plunger, O^2, operates by means of the connecting-rods P, and crank P^2, formed in the

shaft U, which is supported in bearings bolted to the mill and driven by the gear-wheel Q. The bottom of the case O′ is coincident with the top surfaces of the molds, and has openings corresponding to the number of brick-forms in a mold in the chain, and of corresponding size and shape. Directly under the press O^2, and arranged under the molds in guides r, fastened to the frame, is a press-table, r', suspended from the shaft U by means of connecting-rods S, with their attached rollers S′ bearing upon the cams S^2. The shape and position of the cams upon the shaft are such that the table rises just before the plunger descends, clamping the mold with the pallet under it rigidly up under the press, but releasing it as soon as the plunger ascends. The upper part of the rod S is formed in a ring or eye of suitable elastic material encircling the shaft, which, by elongating when pressure is applied, permits the lengths of the rod to vary sufficiently to conform to differences in the thickness of the pallets.

A series of rollers, t, Fig. 6, are arranged in lengthwise grooves t' in the press-table, and supported in vertically-sliding bearings resting upon springs t^2, which force the rollers up against the pallets V, and support the pallets when the molds are moving forward. Similar yielding rollers, V^2, are placed in the frame to supports the pallets after they have left the press-table and until removed from the machine. The pallets are introduced under the molds between the projections k by sliding them lengthwise upon the table w, situated just rearward of the press. The table is mounted upon rollers y, that track in a groove in the frame, and a weighted hook, w', turns upon a pin in the side of the table, and is engaged by the projections h just before the molds come to rest, moving the table forward with the chain, so that a suitable guide, w^2, Fig. 7, upon the table will always coincide with the projections k when the molds are at rest. As the molds move forward after the pallet is inserted, the table is carried with it until the roll y is resisted by the stop y', when the weighted hook tips and releases the table, which is returned to position against the stop y^2 by the weight a', suspended from the table by a cord, a^2, passing over the roll a^3.

Near the forward end of the machine, under the top part of the chain, a platform, e', is arranged to slide vertically upon four rods, f', fastened in the frame. A link, g', connects the table with one end of the beam g^2, journaled in the frame and supporting a weight, g^3, at its other end. Over the chain, and sliding upon the rods f', is a similar platform, h', connected by a rod, h^2, with one end of a beam, k', journaled upon an upright post, k^2, bolted to the frame. A roll, l', is attached to the other end of the beam and fits a grooved cam, l^2, upon the shaft, imparting reciprocating motion to the platform. The bearings k^3 of the upper platform occupy nearly all the space between the two platforms and serve to push the lower platform downward.

To the under side of the platform h' are fastened a series of mold-wipers, m', of the form shown in Fig. 8, and equal in number to the forms in a mold. Rectangular pieces of leather, m^2, or other flexible material, exactly fitting the forms in the mold, are fastened to the bottom of the wipers, and clean the forms as they pass down through them. The bolt-holes f^2 in the flanges of the wipers are elongated, so that the wipers can slide endwise a certain amount, and the vertical projections n' are somewhat longer than the body of the wipers. The platform begins to descend just before the mold stops, and the projections enter the next preceding mold, and when in this position the wipers are exactly over the forms, and will enter them accurately independent of where the mold may stop. When released on the upward movement of the platform, the wipers are returned rearward by the springs n^2. Instead of springs, weights may be arranged to return the wipers in place.

A sand-hopper, n^3, with a roll, n^4, fitted at its outlet, is bolted to the upright post, with the roller resting upon the surfaces of the molds, and a stream of sand issues from the hopper in advance of the roll and is rolled into the brick, giving them a smooth fine surface. The supporting-roll immediately under the sand-roller is not fitted in movable bearings like the neighboring rolls; but the sand roller and hopper, by being bolted loosely to the upright, is allowed a slight vertical movement to conform to different thicknesses of the pallets.

Constructed as above described and shown, the operation of my machine is as follows: The prepared clay issues from the grinding-mill into the case O′, and is forced by the plunger O^2 into the mold A, under which a pallet, V, has previously been inserted by means of the table w. While the clay is being forced into the forms, the press-table, by means of the cam S^2, clamps the pallet and mold against the case. As soon as the plunger begins to ascend, the press-table is liberated, and as the shaft revolves, a roller, n^5, Fig. 2, upon the wheel Q, engages the lever n^6, journaled to the side of the frame, and connected by a rod, n^7, to the ratchet, and moves the lever forward, revolving the chain. When the roll passes a certain distance, it disengages from the lever, which then returns to its first position by the action of the weight n^8 upon the horizontal part of the lever. The movement of the chain brings another mold under the press, the mold being first sanded in passing through the vessel N. As the full mold passes forward after leaving the press, the rolls t hold the pallet up against the molds and prevent the brick from falling out. As the molds pass under the sanding-roller n^4, the upper surface of the brick receives a smooth sanded finish. When a mold enters between the platforms h' e', the lower platform rests against the pallet by action of the weight g^3. The upper platform, h', operated by a cam, l^2, begins to descend just before

the mold comes to rest, and the projections n' enter the next preceding mold, bringing the wipers m' over the forms, and as the platform descends farther the bottoms of the bearings k^3 engage the platform e', forcing it downward with the pallet and bricks upon it, the bricks sliding from the forms by action of gravity, and the wipers m' following them closely and cleaning the forms. When the platforms have reached their lowest position, they remain stationary long enough to permit an operator to remove the pallet and bricks, when the platforms return in readiness for the next mold.

I am aware that prior to my invention brick-machines have been made in which the molds were arranged in an endless chain, and also that a sand-hopper with a roller for sanding the bricks is old in brick-machines. I therefore do not claim the same broadly; but

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

1. In a brick-machine, the combination of an endless chain of bottomless molds with a scooped-shaped vessel, N, holding the sand through which the molds are drawn in the revolution of the chain, and thereby partially sanding their inner surfaces, substantially in the manner described.

2. The combination of the plates B′, fixed upon a shaft, C′, and the transverse radial plates F, fastened between them, and so arranged as to direct the mold-sand, in the revolution of the chain, against the forward inner surface of the molds, in the manner substantially as described.

3. The combination of a chain of bottomless brick-molds with a sanding device composed of plates B′, fixed on a shaft, C′, and transverse radial plates F, so arranged as to direct the sand against the forward inner surface of the molds, and the scooped-shaped vessel N, for the purpose substantially as set forth.

4. The combination of a chain of brick-molds having projections k, with a pallet-table, w, supported on rollers y, provided with yielding hooks w', and so weighted as to move backward and forward in grooves on the frame, substantially in the manner and for the purpose described.

5. In a brick-machine, the combination of the pallet-table w, rollers y, weighted hooks w', weight a', cord a^2, and roller a^3, as and for the purpose specified.

6. In a brick-machine, the combination of the endless chain of bottomless molds A with the movable pallet V, as and for the purpose specified.

7. The combination of an endless chain of bottomless brick-molds with a pallet serving, while in the chain, as a bottom for a mold, upon which the bricks are formed and with it removed from the machine, in the manner substantially as described.

8. A press-table, r', having rollers t, supported upon springs t^2, and operated by means of the yielding rods S, and attached rollers S′, bearing upon the cams S^2, substantially in the manner and for the purpose specified.

9. The combination of the press-table r', having rollers t, supported upon springs t^2, and operated by means of the yielding rods S, and attached rollers S′, bearing upon the cams S^2, and the plunger O^2, operated by means of rods P and crank P^2 in the case O′, with a chain of bottomless molds and a pallet forming a temporary bottom for a mold, in the manner and for the purpose substantially as set forth.

10. In a brick-machine, the combination of the sand-hopper n^3 and roller n^4 at its outlet, so arranged as to sand and smooth the top surface of the bricks, in the manner substantially as described.

11. The combination of a chain of brick-molds, a pallet or pallets forming a temporary bottom for the molds, and the yielding rolls V^2, holding the pallets up against the under side of the molds, substantially as described.

12. The movable platform e', sliding vertically under the chain on the rods f', and so hinged on a weighted beam, g^2, as to receive the brick from the mold, substantially as described.

13. The combination of the platform e', link g', beam g^2, journaled on the frame, and weight g^3, as and for the purpose specified.

14. In a brick-machine, wipers m', having rectangular pieces of flexible material m^2, exactly fitting the forms in the mold, fastened to their bottoms, and provided with vertical projections n', springs n^2, and elongated bolt-holes f^2 in their flanges, as and for the purpose specified.

15. The combination of the platform h', sliding with its bearings k^3 vertically on the rods f', the rod h^2, the journaled beam k', roll l', and grooved cam l^2 upon the shaft, as and for the purpose specified.

16. The combination of the platform e', sliding vertically on the rods f', by means of rod and weighted beam, a pallet, a chain of bottomless brick-molds, and the platform h', having a series of mold-wipers bolted loosely to its lower side over the chain, and operated by rods and beams from the shaft, the whole being constructed, arranged, and operating together in the manner and for the purpose substantially as described.

SAMUEL P. CRAFTS.

Witnesses:
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DAVID K. ANDREWS.