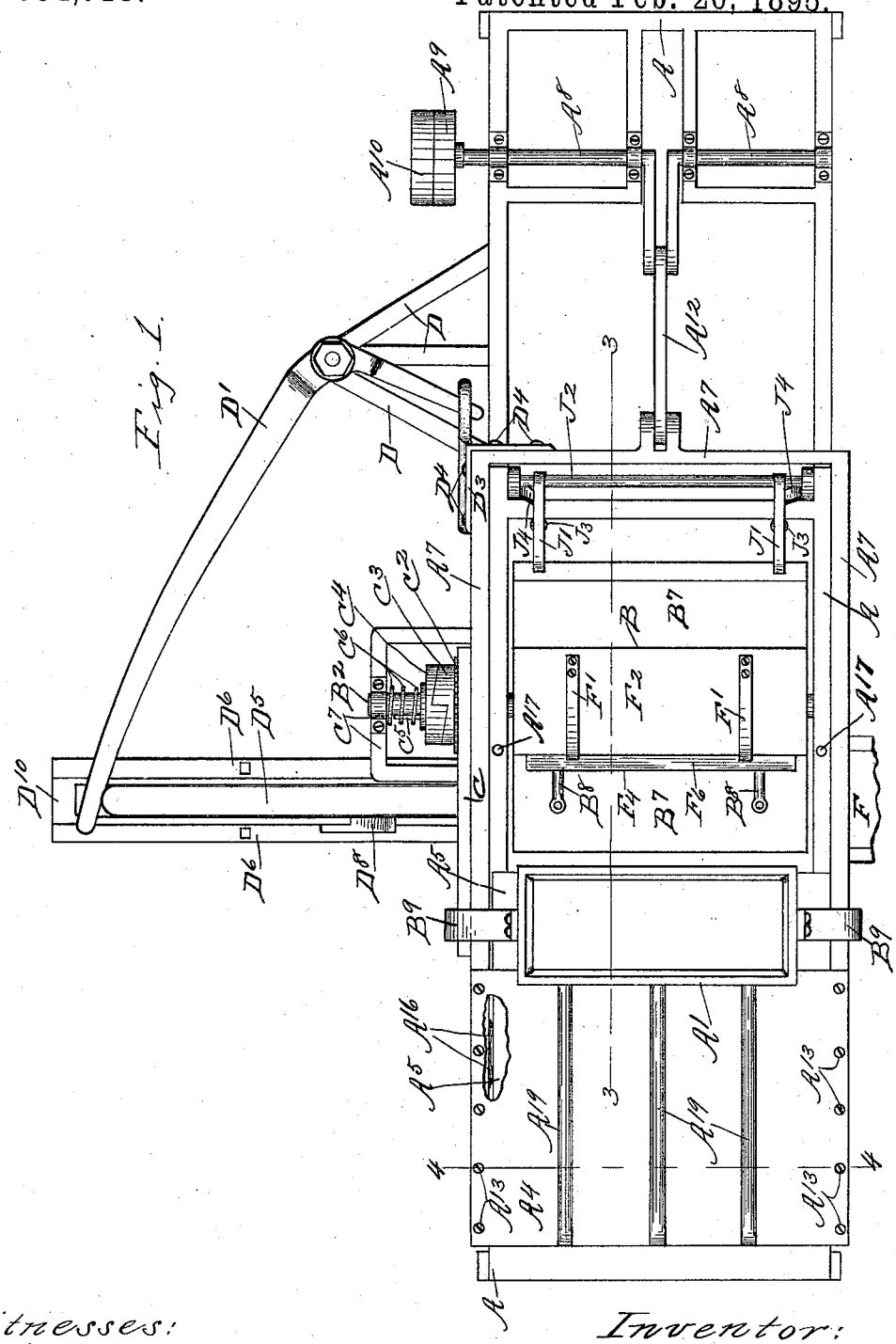
(No Model.) 4 Sheets—Sheet 1.

E. GORMAN.

BRICK MOLD SANDING MACHINE.

No. 534,713. Patented Feb. 26, 1895.

Fig. 1.



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(No Model.)

4 Sheets—Sheet 2.

E. GORMAN.

BRICK MOLD SANDING MACHINE.

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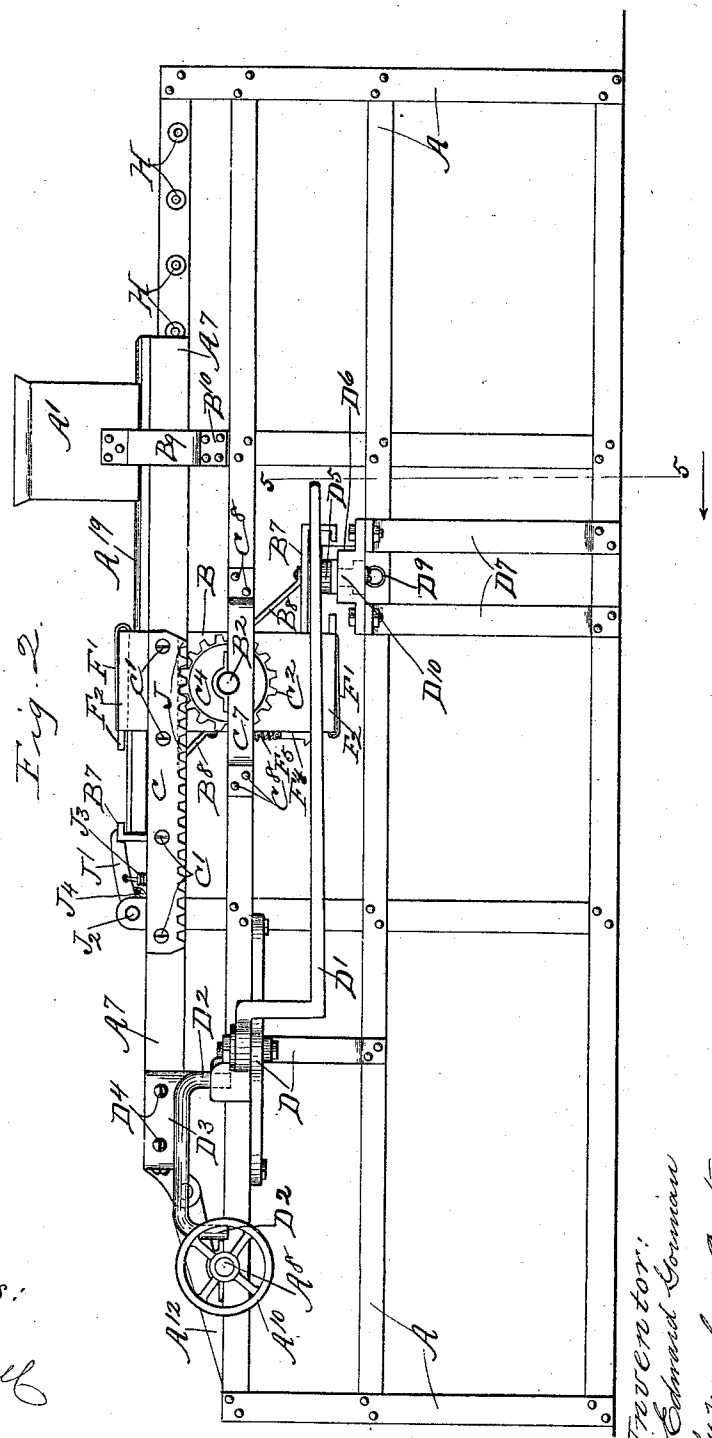

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

E. GORMAN.

BRICK MOLD SANDING MACHINE.

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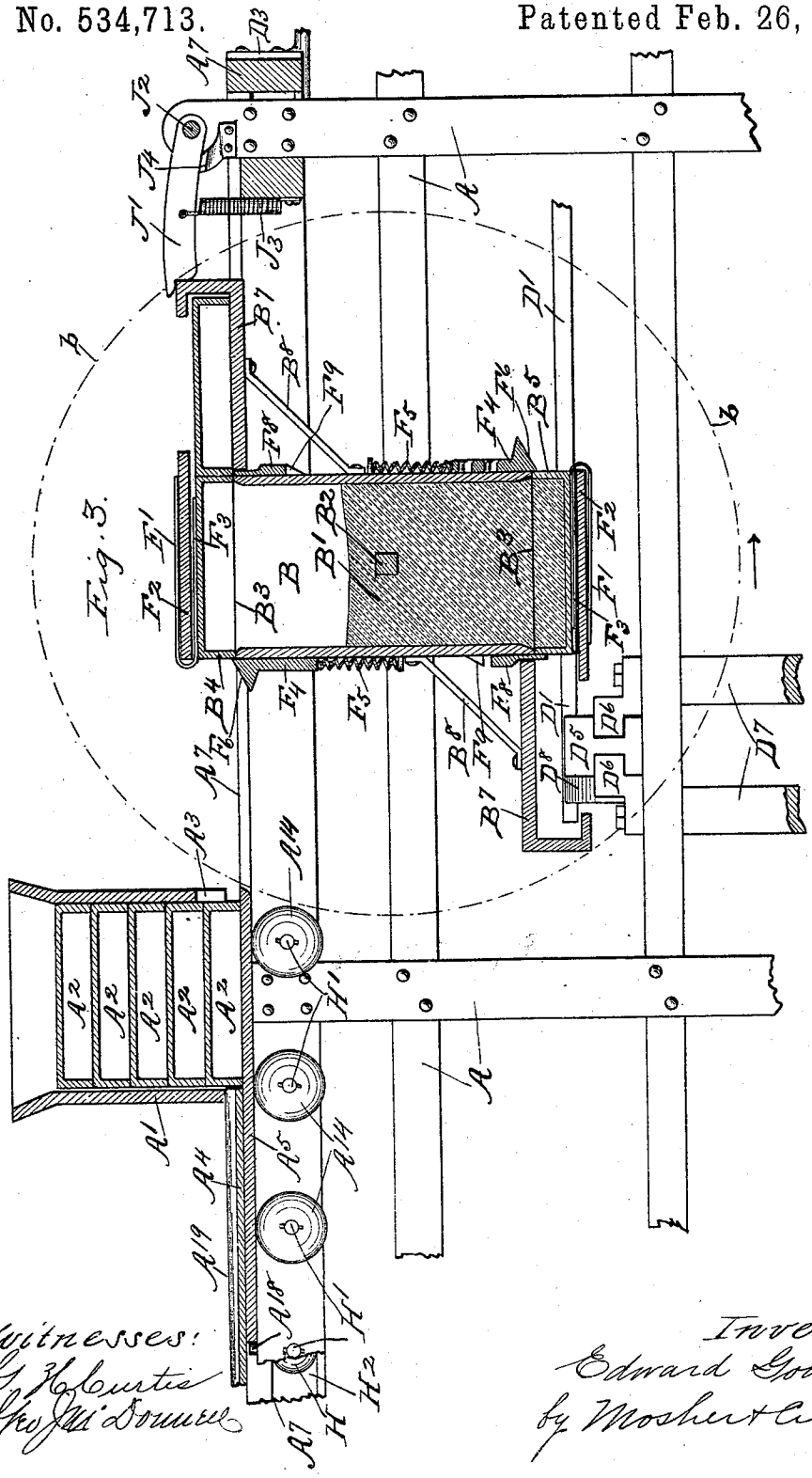

Fig. 3.

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4 Sheets—Sheet 4.

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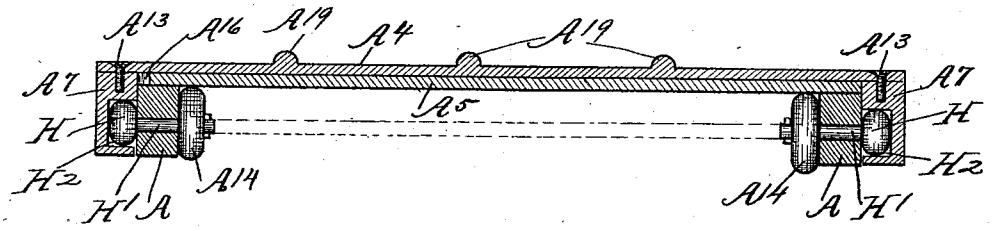
BRICK MOLD SANDING MACHINE.

No. 534,713. Patented Feb. 26, 1895.

Fig. 4.



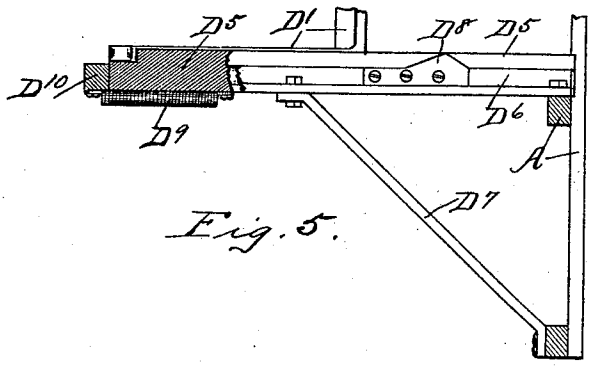
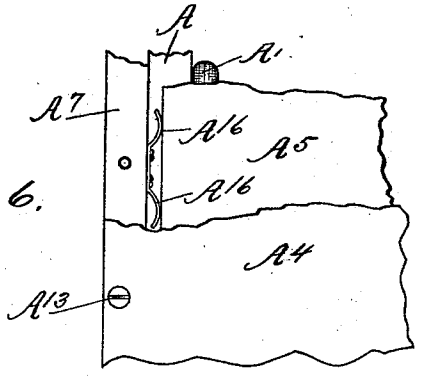


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD GORMAN, OF TROY, NEW YORK.

BRICK-MOLD-SANDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,713, dated February 26, 1895.

Application filed May 18, 1894. Serial No. 511,683. (No model.)

To all whom it may concern:

Be it known that I, EDWARD GORMAN, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Brick-Mold-Sanding Machines, of which the following is a specification.

My invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved brick-mold sanding machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal section of a portion of the machine taken on the broken line 3—3, in Fig. 1. Fig. 4 is a vertical cross-section taken on the broken line 4—4, in Fig. 1. Fig. 5 is a vertical section on the broken line 5—5, in Fig. 2, showing the slideway for the discharging-plunger, in elevation, with the left-hand end broken away and the exposed end of the plunger in vertical central longitudinal section. Fig. 6 is a top plan view of various parts, showing the frictional connection between the carrier and movable frame. Figs. 3, 4 and 6 are drawn on an enlarged scale.

A is a stationary frame which supports the operating parts of my improved machine.

B is the sand-box partially filled with sand B′ and fixed upon the central shaft B^2 rotary in bearings in the stationary frame. The upper and lower sides of the box, as seen in Fig. 3, are each provided with an opening B^3 approximately the size of the box, and the edges of the box surrounding these openings form seats for the brick-molds B^4 and B^5. The upper mold B^4 is inverted with the edges of the vertical sides resting upon its seat surrounding the opening in the box. The lower mold B^5 is shown right-side up and filled with sand, having the edges of its vertical sides in alignment with the open mold-seat on the lower side of the box. Neighboring each open mold-seat, and in the same plane with it is a mold-support B^7 fixed upon the box by brackets B^8 as shown. As the mold box is revolved, these mold-supports travel around with the box and their corners farthest removed from the box-supporting shaft describe a circle indicated by the dotted circle *b*.

The brackets B^9 secured to the stationary frame, one on each side at B^{10} support the hopper A′ above the stationary frame in the same horizontal plane with the upper mold-seat and support, as seen in Fig. 2, and just without the dotted circle *b*. The hopper is shown containing five inverted brick-molds A^2 and provided on the side facing the rotary box with the egress opening A^3 adapted to permit the egress therethrough of the bottom mold. The opposite side of the hopper is provided with an opening sufficiently large to permit the feed-plunger A^4 to pass freely therethrough. The bottom mold in the hopper rests upon a movable carrier A^5 which is movable on the stationary frame, its side edges resting thereon, and adapted to travel from the position shown in Fig. 2 without the circular path of the box and mold-support, across the intervening space between the hopper and box, to carry the bottom mold thereon.

As a means for imparting reciprocating movements to the feed-plunger and carrier, I provide a movable frame A^7 adapted to slide back and forth on the stationary frame. The movable frame is reciprocated by means of the crank-shaft A^8 having fast and loose pulleys A^9 and A^{10}, and connected with the frame by means of the link A^{12}. The feed-plunger is fixed to the slide-frame as by screws A^{13}.

The carrier rides upon the stationary frame, or upon friction-rolls A^{14} rotary in suitable bearings supported by such frame, and is connected with the movable frame by means of friction springs A^{16} inserted between the outer vertical sides of the carrier, and the inner vertical sides of the movable frame, as seen in Figs. 1, 4 and 6. The upper surfaces of the carrier and movable frame are in approximately the same horizontal plane, and the rear end of the carrier projects rearwardly beneath the plunger, as shown in Fig. 2. Stops on the stationary frame limit the forward and return movements of the carrier, the forward stops A^{17} being shown in Fig. 1, and the return stop A^{18} being shown in Fig. 3. The up-

per side of the feed-plunger is provided with strengthening and mold-engaging ribs A^{19}.

As a means for communicating rotary movements to the box, I secure to one side of the movable frame, a plate-gear C by screws C′ in position to engage with the gear-wheel C^2. The gear-wheel is loose upon the box-shaft and provided with one section C^3 of a clutch-mechanism, the other section C^4 being secured to rotate with the shaft by spline C^5 and slide longitudinally thereon in a well known manner. The coil-spring C^6 compressed between the section C^4 and the strap C^7 secured to the stationary frame by bolts C^8 tends to keep the two sections in engagement with each other. When the movable frame travels in one direction, the teeth of the clutch-sections engage each other to rotate the box, and when the frame travels in the opposite direction the spring C^6 yields sufficiently to permit the teeth of section C^4 to slip past the teeth of the other section, whereupon the sand-box remains at rest.

Pivoted upon the bracket D projecting from the stationary frame, is the lever D′, the short end of which is engageable by the actuating fingers D^2 projecting from the attaching-plate D^3 fixed upon the movable frame by screws D^4. The long end of the lever is engageable with the discharge-plunger D^5 movable lengthwise in the slideway-guides D^6 secured to the stationary frame and supported by the braces D^7. The lever bears against the tail end of the plunger, and by its inward vibratory movement urges the plunger forward until the lever mounts the inclined surface of the trip D^8 (see Fig. 5), which releases the plunger from engagement with the lever, whereupon the retracting-spring D^9 secured one end to the cross-bar D^{10} connecting the outer ends of the guides D^6, and the other end to the plunger, returns the plunger to the position shown in the drawings.

In operating my improved machine, the lower opening in the sand-box is closed by inserting beneath the opening a brick-mold, and the box supplied with sand through the upper opening, sufficient to nearly fill the box. The hopper is supplied with brick-molds in an inverted position, as shown in Fig. 3. Power is then applied to start the machine from the position shown in Fig. 1. A forward movement being imparted to the movable frame, the feed-plunger forces the bottom mold from the hopper and off the carrier to its open seat on the upper side of the box, the carrier being carried by frictional engagement with the movable frame to the mold-seat on the box and stopped by stops A^{17}. The return movement of the frame acts through the gear-and-clutch mechanism to rotate the box in the direction of the arrow in Fig. 3, through one hundred and sixty degrees, which inverts the box. The mold which was beneath the box and filled with sand is now inverted and empty, the sand having fallen into the box when the mold reached the upper side. The mold which started from the upper side of the box inverted and empty, is now filled with sand. The carrier at once partook of the return movement of the movable frame, and was stopped beneath the hopper by the return stops A^{18}, the plunger accompanying the movable frame on its return movement and continuing until it returned past the bottom mold in the hopper and allowed such mold to rest upon the carrier in front of the plunger. The next forward movement of the plunger not only feeds a mold from the hopper to the open mold-seat on the box but forces the mold last sanded from the open seat to the neighboring support B^7. The next rotary movement of the box not only carries the empty unsanded mold to the lower side of the box to be filled with sand, as before explained, but carries the empty sanded mold in the upper support to the position of the lower support in front of the discharge-plunger, whereupon the movement of the latter plunger forces the sanded mold from its support along the chute F, shown in Fig. 1, to the brick-machine, not shown.

As a means for pressing the molds firmly against their open seats on the box, I provide U-shaped springs each having one leg F′ fixed to the bridge F^2 and the other leg F^3 in position to engage the bottom of the molds and force them to their seats on the box.

To prevent the several molds from slipping off their seats as they pass from the upper to the under position, I provide a slide F^4 having a controlling spring F^5 and an inclined face F^6 adapted to be engaged by a mold and its carrier while passing from the hopper to the box. The carrier upon striking the inclined face causes the slide to retreat until the mold is seated, after which the slide is forced by its controlling spring past the edge of the mold, thereby locking it in place on its seat. As a means for locking the mold in its seat while passing from the under to the upper position, I provide the gravity-actuated slides F^8. The lower slide falls down behind the under mold and prevents it from slipping from its seat in passing from the under to the upper position. When the mold reaches the upper position, the gravity actuated slide falls down against the stop F^9 as shown in Fig. 3, leaving the way free for the mold to be forced from its open seat on the box onto the neighboring support, as before explained.

The movable frame is supported by rollers H, severally mounted upon a spindle H′ contained in bearings in the stationary frame, as shown in Fig. 4. The rollers are inserted in grooves H^2 in the movable frame so that the frame is supported at one end against the downward pressure of the molds, and at the other end against the upward pressure of the gear-connection, the frame bearing against either the upper or lower side of the rollers.

When desired the spindle may extend the whole width of the frame as indicated by the dotted lines in Fig. 4.

The rollers which support the carrier are mounted upon the spindles of the frame-supporting rollers, being loose thereon.

The object of the frictional connection between the carrier and movable frame is to remove the carrier from the path of the rotary box and its attachments before a sufficient rotary movement is communicated to the box to bring the box or any of its attachments into collision with the carrier. Since the frictional engagement causes the carrier to move with the frame during the first part of its reciprocating movements in either direction, as before explained, it is only necessary to provide for sufficient lost-motion in the gear or clutch-connection between the frame and box to permit the carrier to recede before the rotary movement commences. I accomplish this by making the gear-wheel of such a size relatively to the reciprocating movement of the movable frame that the loose clutch-section has a rotary movement of more than one hundred and sixty degrees, its teeth moving backward past the teeth on the other clutch-section, so that the movement is through just one hundred and sixty degrees while the clutch-sections are in operative engagement with each other. The same result will be accomplished by removing some of the teeth from the plate-gear. By removing the teeth J, as indicated by the dots across their roots, the lost motion would be mostly transferred from the loose clutch-section to the movable frame.

As a means for counteracting the inertia of the sand-box at the end of its rotary movements, and stopping the box in a uniform position, I provide the yielding spring-controlled stops J′ pivoted at J^2 upon the stationary frame and projecting across the path of the box.

If inertia carries the box a little too far the springs act through the yielding stops to restore the box to its proper position, the yielding stops being drawn by the springs J^3 against the fixed stops J^4. The spring-controlled stops yield sufficiently to permit the succeeding rotary movements of the box.

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

1. In a brick-mold sander, the combination with a rotary sand-box; a mold-seat surrounding a lateral opening in the box; a neighboring mold-support on the box; and means for rotating the box; of a mold-carrier; means for transferring a mold from the carrier to the open seat, and from the open seat to the mold-support; and means for removing the mold from the support, substantially as described.

2. In a brick-mold sander, the combination with a rotary sand-box provided on one of its sides with an open mold-seat; and means for rotating the box; of a stationary mold-hopper; a mold-carrier movable to and fro between the hopper and the mold-seat on the box; means for communicating reciprocating movements to the carrier; and a feed-plunger for transferring a mold from the hopper and carrier to the mold-seat on the box, substantially as described.

3. In a brick-mold sander, the combination with a rotary sand-box provided on one side with an open mold-seat, and means for communicating to the box intermittent rotary movements; of a mold-carrier; a feed-plunger for transferring a mold from the carrier to its seat on the box; and a beveled spring-controlled catch on the box in the path of the mold for locking the mold on its seat, substantially as described.

4. In a brick-mold sander, the combination with a rotary sand-box provided on one side with an open mold-seat; and means for communicating to the box intermittent rotary movements; of a projection on the box; and a spring-controlled stop in the path of such projection, substantially as described.

5. In a brick-mold sander, the combination with a rotary sand-box provided on one side with an open mold-seat; and means for communicating to the box intermittent rotary movements; of a feed-plunger; a reciprocating frame with means for reciprocating such frame; a mold-carrier; a frictional connection between the frame and carrier; and stops stationed in the path of the carrier, whereby the carrier partakes of the forward and return movements of the plunger during the first part of such movements, and is held at rest during the last part of such movements by means of the respective stops, substantially as described.

6. In a brick-mold sander, the combination with a rotary sand-box provided on one side with an open mold-seat; and means for communicating to the box intermittent rotary movements; of a discharge-plunger; a guideway for the plunger parallel with the axial line of the box; and means for communicating reciprocating movements to the plunger, substantially as described.

7. In a brick-mold sander, the combination with a rotary sand-box provided with an open mold-seat; and means for communicating intermittent rotary movements to the box; of a discharge-plunger; a spring for controlling the movement of the plunger; an operating lever engageable with the plunger; and a trip in the path of the lever for releasing the plunger, substantially as described.

8. In a brick-mold sander, the combination with a rotary sand-box provided on opposite sides each with an open mold-seat and a contiguous mold-support in approximately the same plane with the open seat; and means for communicating to the box intermittent rotary movements; of a feed-plunger by which a mold is forced upon the open seat on the upper side of the box and a preceding mold is forced from such open seat upon the support contiguous thereto; a discharge-plunger by which a mold is discharged from the support on the lower side of the box; and means

for communicating reciprocating movements to the plungers, substantially as described.

9. In a brick-mold sander, the combination with a rotary sand-box mounted upon a shaft rotary in fixed bearings; of a reciprocating frame; clutch-and-gear connections between the frame and shaft; and means for communicating reciprocating movements to the frame, substantially as described.

10. In a brick-mold sander, the combination with a rotary sand-box provided on one side with an open mold-seat; a mold-hopper; a movable actuating frame; a mold-carrier; and frictional connections between the frame and carrier; of a clutch-and-gear connection between the frame and box arranged to operatively connect during the latter part of the return movement of the frame, whereby sufficient lost motion of the frame is permitted to force the mold-carrier beyond the path of the rotary box before the operative connection between the frame and box is made, substantially as described.

In testimony whereof I have hereunto set my hand this 30th day of April, 1894.

EDWARD GORMAN.

Witnesses:
FRANK C. CURTIS,
FRANK HAGEMANN.