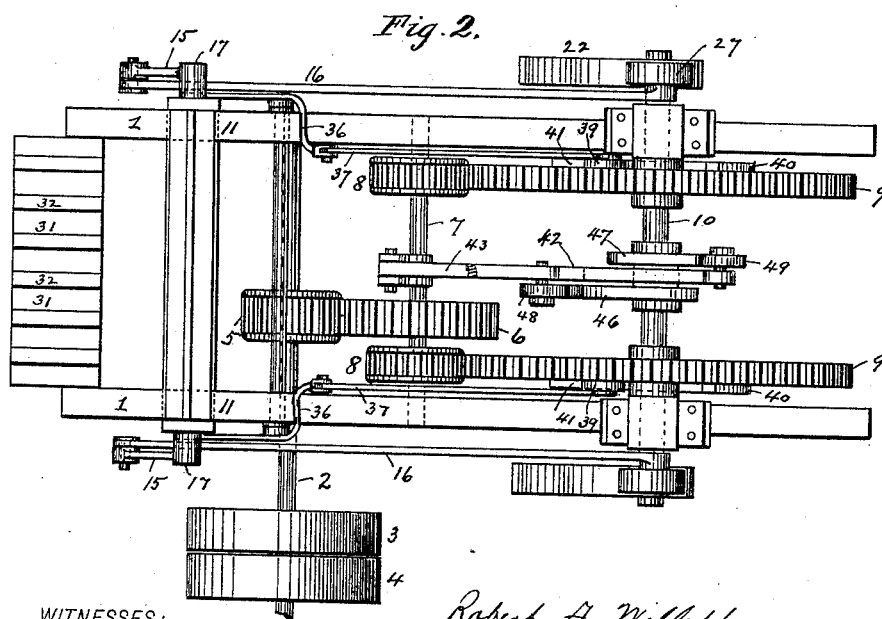
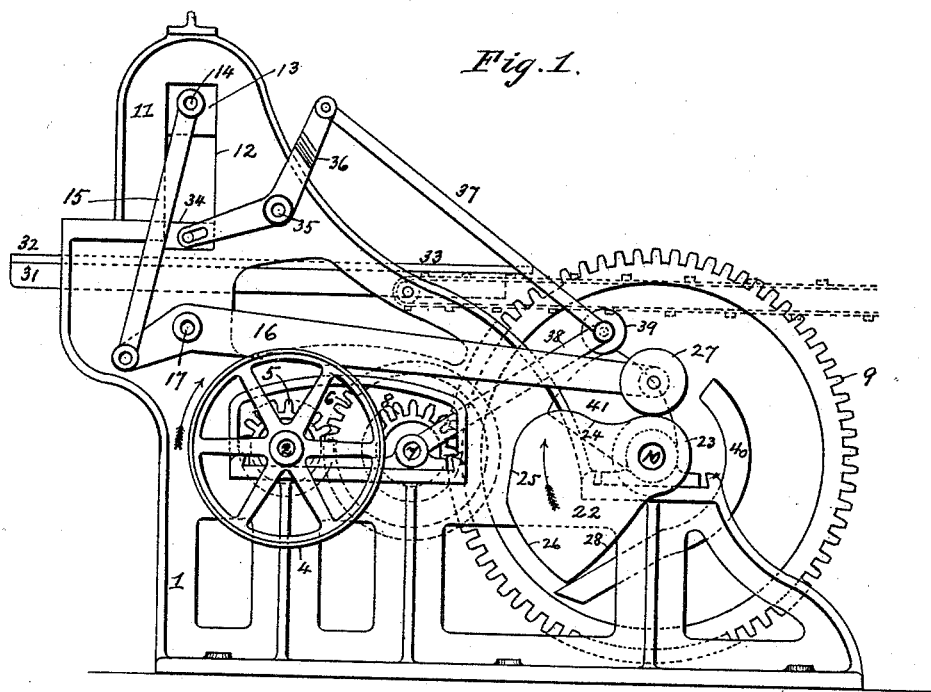


2 Sheets—Sheet 1.

No. 423,401.

Patented Mar. 11, 1890.



WITNESSES:
F. C. F. Knack
H. W. Doolittle

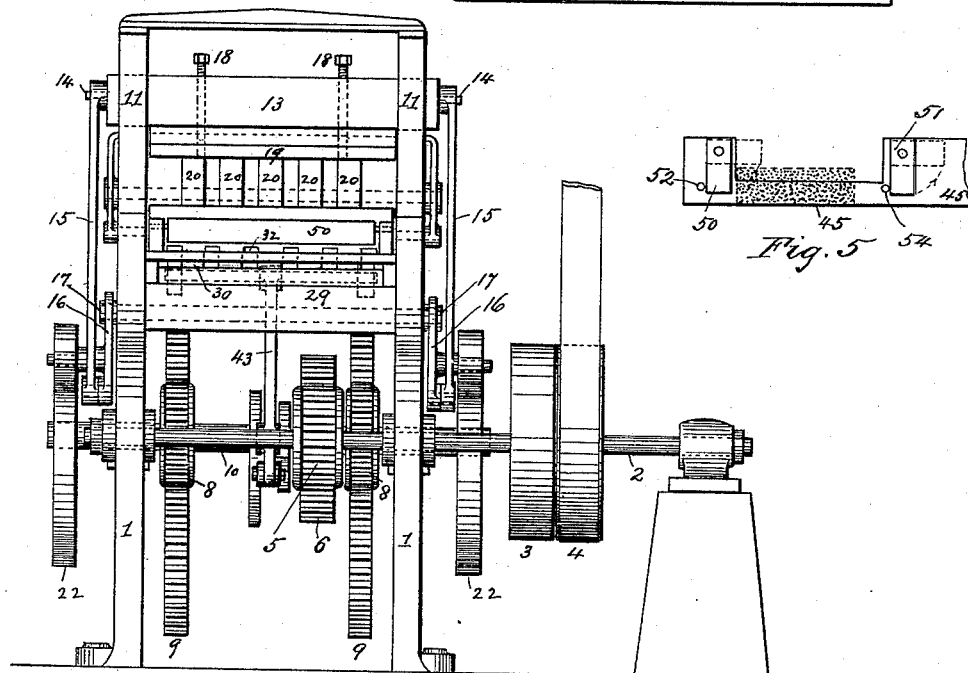
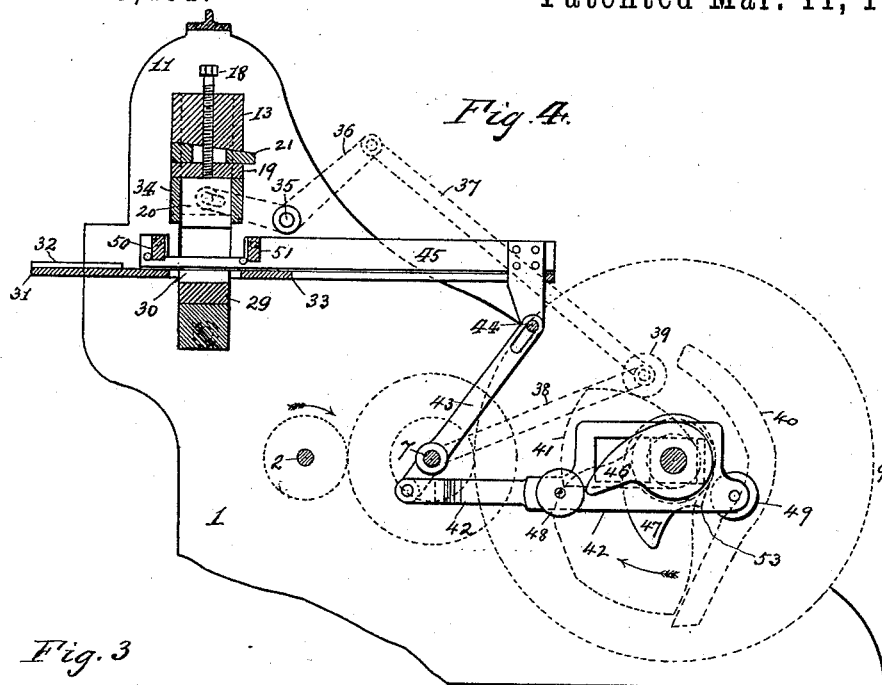
Robert A. Willett, INVENTOR:

BY
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R. A. WILLETT.
REPRESS BRICK MACHINE.

No. 423,401.

Patented Mar. 11, 1890.



WITNESSES:
F. C. F. Knaack.
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UNITED STATES PATENT OFFICE.

ROBERT A. WILLETT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO ISRAEL COOK, OF SAME PLACE.

REPRESS-BRICK MACHINE.

SPECIFICATION forming part of Letters Patent No. 423,401, dated March 11, 1890.

Application filed December 4, 1889. Serial No. 332,578. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. WILLETT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Repress-Brick Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the construction of that class of brick-machines which are designed for use in repressing bricks which have been molded either by hand or machine, and are generally formed from previously-puddled clay, the object of the invention being to, in a simple and automatic manner, accomplish the feeding of the bricks in gangs into the machine, repress them, and automatically deliver them therefrom in a finished condition.

The invention consists in the construction and combination of parts and devices substantially as hereinafter fully described and claimed.

In the drawings which form part of this specification, Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation taken at the feeding end. Fig. 4 is a longitudinal sectional detail showing the repressing-plungers and means for adjusting the same, as also the brick-feeding and delivery devices. Fig. 5 is a detail showing the manner in which the bricks are fed into and delivered from the machine.

I construct two massive side frames 1, which are connected at suitable points by braces and cross-bars, according to the requirements, for any particular use. In the said side bars I journal the main driving-shaft 2, which may be provided with fast and loose pulleys 3 and 4, respectively. Between the frames 1 the shaft 2 carries the pinion 5, and this meshes with a spur-wheel 6, mounted, on a parallel shaft 7, which is also journaled in the side frames 1. This shaft 7 serves as the intermediate, and is provided near the frames 1 with the corresponding pinions 8 8, which mesh with the two large gear-wheels 9 9, keyed

on a shaft 10, which is also journaled in the side frames 1, as shown.

From the front of the frames 1 rise the housings 11, which are built strongly, so as to readily resist strains of operation of the machine. In these housings are formed slots 12, which constitute the slideways for the reciprocating transverse head 13, whose ends are fitted in the slots 12 and are provided with projecting pins 14 for the adjustment of the link 15, whose lower end is connected by a wrist-pin with the power-lever 16, which is pivoted in the frame 1 at the pin 17 as a fulcrum, the link and lever being duplicated on both sides of the frame, and being preferably arranged on the outside thereof. The adjusting-bolts 18 are passed through the head 13 and into the cross-bar 19, to which are attached the plungers 20, whose horizontal section corresponds accurately with the size and form of the finished brick which is to be the product of the machine.

Between the head 13 and the cross-bar 19 is inserted the adjusting-wedge 21, which is suitably slotted for the passage of the adjusting-bolts 18, and to correspond with the upper inclined surface of the wedge 21 the lower surface of the transverse head 13 is inclined to a similar degree. Obviously, therefore, assuming the head 13 to be stationary for the moment, the lower end of the plungers 20 can be within sufficient limits raised or lowered, thereby determining the extent of pressure which is to be brought to bear upon the molded bricks in the act of repressing the same.

Cams 22 on the outer ends of shaft 10 and keyed thereto are arranged for the purpose of causing the desired movements of the pressure-levers 16. These cams have the concentric portion 23, the rise 24, the final pressure-plane 25, and the retaining-plane 26, which is concentric with the axis of the cam.

The lever 16 has a roller 27 bearing on the face of cam 22, and the operation will be as follows: As the cam moves around along with the shaft 10 and gear-wheels 9 in the position shown in Fig. 1, the cross-head carrying the plungers is at its uppermost position. As the cam rotates in the direction of the arrow, the end of lever 16 is elevated at first

rapidly by the rise 24 of the cam, this movement causing the rapid depression of the plungers, gradually diminishing in speed until the roller 27 reaches the pressure-plane 25 of the cam, which corresponds with the moment of contact of the plungers with the bricks in the molds. The further movement of the cam causes a slow but very powerful movement downward of the plungers in the molds, and effects the desired repressing action on the bricks until such pressure has reached a maximum; and then the concentric face 26 of the cam holds this pressure for a moment until the brick is thoroughly compressed. The further movement of the cam allows the roller 27 and that end of the lever to suddenly drop by its own weight along the fall-plane 28 of the cam 22 until it reaches the face 23 of the cam. This fall-plane 28 causes the sudden rise of the head 13 and plungers, so as to elevate them out of the way for the convenient removal of the now repressed row of bricks.

The press-table consists of a heavy single or compound beam 29, standing across under the plungers, and on the upper face is fitted with the wearing-plates 30, which correspond precisely in vertical position with the plungers and are of the same size.

The feed-table 31 is arranged with ribs 32, between which the bricks are caused to slide by the automatic operation of my machine, and the feed-table is cut open at the press-table 29 30, the upper surface of the wearing-plates 30, and the feed-table 31, as well as of the delivery-table 33, being on the same general level, so that the bricks may slide along freely from the feed-table onto the wearing-plates of the press-table, and thence onto the delivery-table 33. The opening in the table 31 is just wide enough to permit the mold-box 34 to pass down slightly over the wearing-plates 30, and as the mold-box is divided with internal partitions into a number of compartments, each corresponding to the finished brick, the wearing-plates constitute the bottoms of these several compartments in the mold-box when the latter is depressed to its lowest position, and when in such position the descent of the plungers 20 causes the latter to enter the said compartments from above.

In the operation of my machine it is obviously desirable to have the mold-box pass down over the several bricks of the gang, which has been fed onto the press-plate 30 before the plungers begin fresh movement and remain in such position until the bricks have been compressed and the plungers withdrawn, at which time the mold-box should be raised up, in order to leave the bricks free for the operation of the automatic feed and delivery devices. These operations are performed in the following manner: At a suitable point in the frames 1—as, for instance, point 35—are pivoted the levers 36 on the sides of the machine, one end of these levers being connected to the ends of the mold-box

34 and the other end connected to a link 37, which in turn is connected to a pivoted arm 38, centered conveniently on shaft 7, the pivotal junction of the link 37 with the arm 38 being provided with a roller 39, by whose movements, as controlled by the cams 40 and 41 on the faces of the larger gear-wheels 9, the required motions of the mold-box 34 are accomplished, as will be observed by inspection of the drawings. The cam 41 first causes the roller 39 to rise, which brings about a sudden depression of the mold-box 34 to its lowest position, the concentric face of the cam 41 then holding it in such position for a brief time, and, as the wheel 9 passes around the cam 40, strikes the roller 39 on the outside and forces it downwardly at a rapid rate, thereby lifting the mold-box 34, and the inwardly-curved end of the cam 40 holds the mold-box in its elevated position until the force of gravity and the distribution of the weights brings it again into contact with the rise on the cam 41, a concentric portion of the cam 40 in the meantime holding the mold-box in a stationary position when elevated.

The automatic feed and delivery of the bricks are accomplished in the following manner: The shaft 10 is fitted with a stationary slide or cross-head, on which, as a guide, the reciprocating yoke 42 may be moved freely back and forth horizontally. The yoke is extended in the direction of shaft 7 and is pivoted to a lever 43, which is conveniently fulcrumed on shaft 7, and at its upper end the lever 43 is slotted and fitted to a pin 44, attached to the sliding frame 45, which rests upon the table 31 33 of the machine, or, if desired, may be arranged with friction-roller contact thereon. The frame 45 is given a reciprocating movement by means of the two cams 46 and 47, which are keyed on shaft 10 and bear on the respective rollers 48 and 49. Cam 46 in striking roller 48 causes the movement of frame 45 toward the feed-table, and cam 47, striking roller 49, causes the return movement of the frame 45. Two swinging gates 50 and 51 are respectively pivoted in the frame 45 and extend transversely thereof, the longitudinal distance between gates 50 and 51 being somewhat greater than the length of the brick to be operated upon. Assuming, now, that a row of bricks has been deposited on the feed-table 31 at a point within the range of movement of the frame 45, on the forward movement of the frame the gate 50 strikes the ends of the bricks and tilts into a horizontal position, as shown by broken lines in Fig. 5, and after passing the row of bricks the gate falls into its vertical position, as shown by the full lines in the same figure. A pin 52, extending from the frame 45, prevents the swinging of the gate 50 in the other direction, and as the frame 45 moves backwardly the gate 50 engages the row of bricks and draws them along the feed-table and onto the press-table 30. This movement of the bricks is brought

about by the action of the main portion of the cam 47. It is necessary to bring the row of bricks to exact position under the plungers, so that the mold-box 34 in descending will not damage the form of the bricks; but it is also necessary to move the frame 45 forward a slight distance to permit the downward movement of the mold-box. This is accomplished by the projection 53 on the cam 47, which effects the slight retrograde movement of the frame 45. After this movement the cams 46 and 47 have no effect on the frame 45 until the pressure has been completed and the mold-box 34 again lifted. Thereupon the cam 46 begins to act on roller 48, and the row of now finished bricks is drawn backwardly onto the delivery-table 33 by the gate 50, and on the next forward movement of the frame 45 the gate 51 tilts upwardly, as indicated in Fig. 5, and passes freely over the row of finished bricks and falls between them and the operating-table of the machine, so that on the next backward movement of the frame 45 in drawing in a fresh row of bricks to the press-table the gate 51, by reason of the pin 54, is caused to pull the finished bricks along the delivery-table 33, and these operations are continuously repeated in the aforesaid automatic manner so long as the machine is kept in operation.

For continuous operation the finished bricks may be eventually delivered by the movements of the frame 45 and gate 51 onto an endless table, as indicated in Fig. 1 by the broken lines.

By driving the shaft 2 at a moderately high rate of speed a machine constructed in accordance with the foregoing description may be operated at a rate of from ten to fifteen strokes per minute of the repressing-plungers, and as these may consist of any number up to ten or twelve within reasonable limits of strength of the machine the total capacity of the machine can be easily brought up to from thirty to forty thousand bricks per day of ten hours, and throughout this vast amount of work on the part of the machine the operations are entirely automatic, the pressure is precisely the same on every brick passed through the machine, and no manual labor is necessary further than to arrange for the delivery of the bricks in rows corresponding approximately to the transverse line of the table and the final feeding of the bricks into the machine proper. The operation of repressing and the delivery of the finished bricks are all done automatically.

I claim as my invention—

1. In a repress-brick machine, the combination, with a stationary press-table, of a gang of vertically-reciprocating plungers

above the same having means of reciprocation, a gang of vertically-movable molds having open tops and bottoms, means for moving said molds vertically to permit the introduction of the bricks under the plungers, and a feed-table in front of the press-table provided with longitudinally-arranged guiding-ribs adapted to guide a number of bricks simultaneously into position on the press-table.

2. In a repress-brick machine, the combination of a gang of vertically-reciprocating plungers having means of reciprocation, a stationary press-table, a gang of vertically-movable molds having open tops and bottoms, a feed-table having longitudinal guiding-ribs, and a horizontally-reciprocating feed-drag comprising a swinging gate adapted on its movement toward said feed-table to tilt and ride over the bricks thereon, and on its movement in the other direction to engage a row of bricks and draw them along to a position under the plungers.

3. In a repress-brick machine, the combination, with a stationary press-table, of a gang of vertically-reciprocating plungers above the same having means of reciprocation, a gang of vertically-movable molds having open tops and bottoms, means for moving said molds vertically to permit the introduction of the bricks under the plungers, a feed-table in front of the press-table provided with longitudinally-arranged guiding-ribs adapted to receive between them and guide a number of bricks simultaneously into position on the press-table, and a horizontally-reciprocating feed-drag, comprising an open frame wide enough to embrace the row of bricks and having a swinging gate adapted on its movement toward said feed-table to tilt and ride over the row of bricks thereon and on its reverse movement to engage the row of bricks and draw them along between the guiding-ribs to a position under the plungers, substantially as described.

4. In a repress-brick machine, the combination of the press-table 29, having a gang of wearing-plates 30, longitudinally-ribbed feed-table 31, and delivery-table 33, all on the same level, with a reciprocating head provided with the row of plungers 20, coinciding vertically with the plates 30, and the vertically-movable mold-box 34, apertured to surround and receive the plungers 20, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT A. WILLETT.

Witnesses:

ISRAEL COOK,
T. J. McTIGHE.