

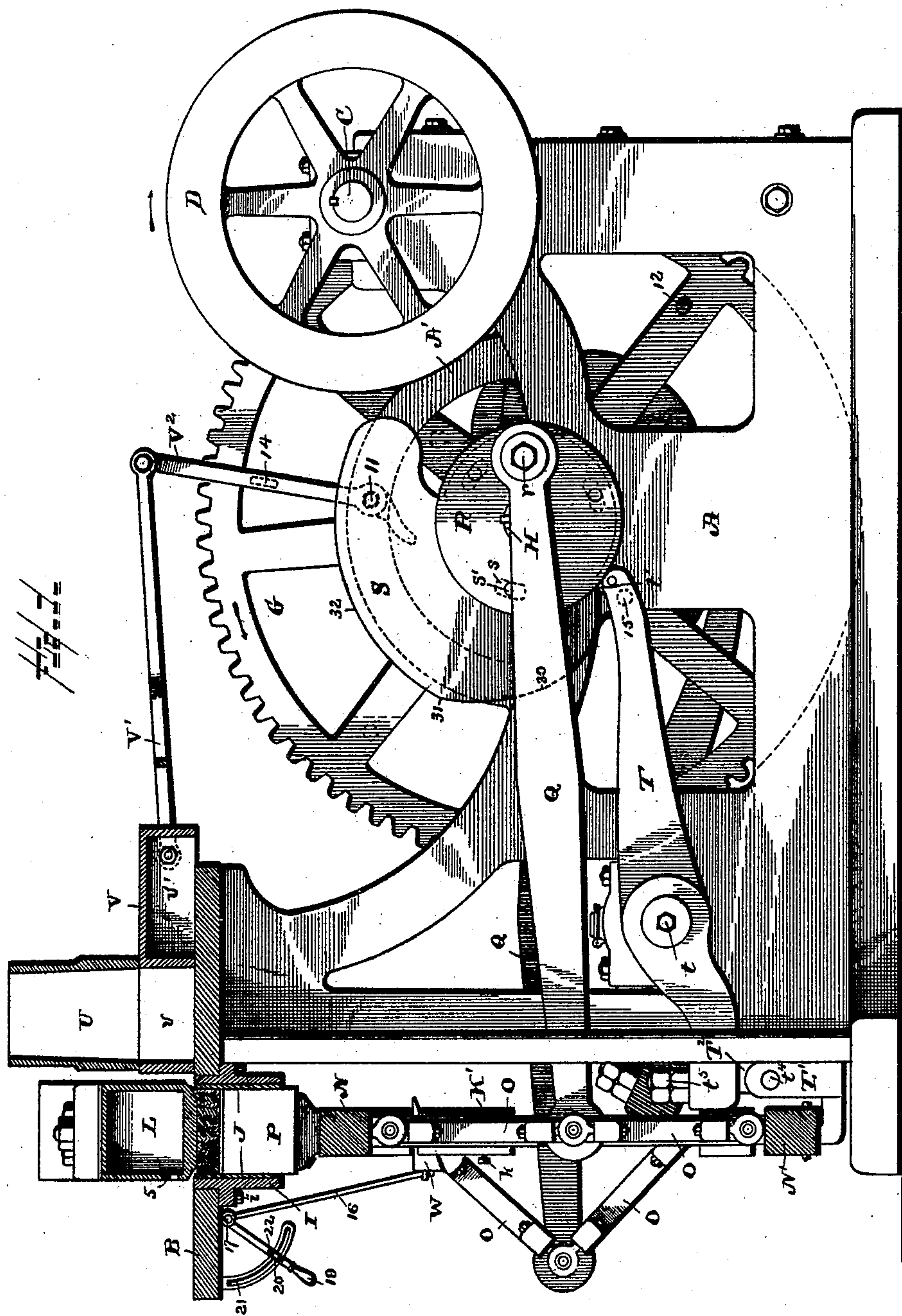
(No Model.)

3 Sheets—Sheet 1.

M. B. ATKINSON.  
BRICK MACHINE.

No. 434,230.

Patented Aug. 12, 1890.



## Witnesses

Albert Spiden.  
Chas. E. Brock.

Inventor

Mahlon B. Atkinson.  
 By his Attorney,  
 Wm Hunter Myers.

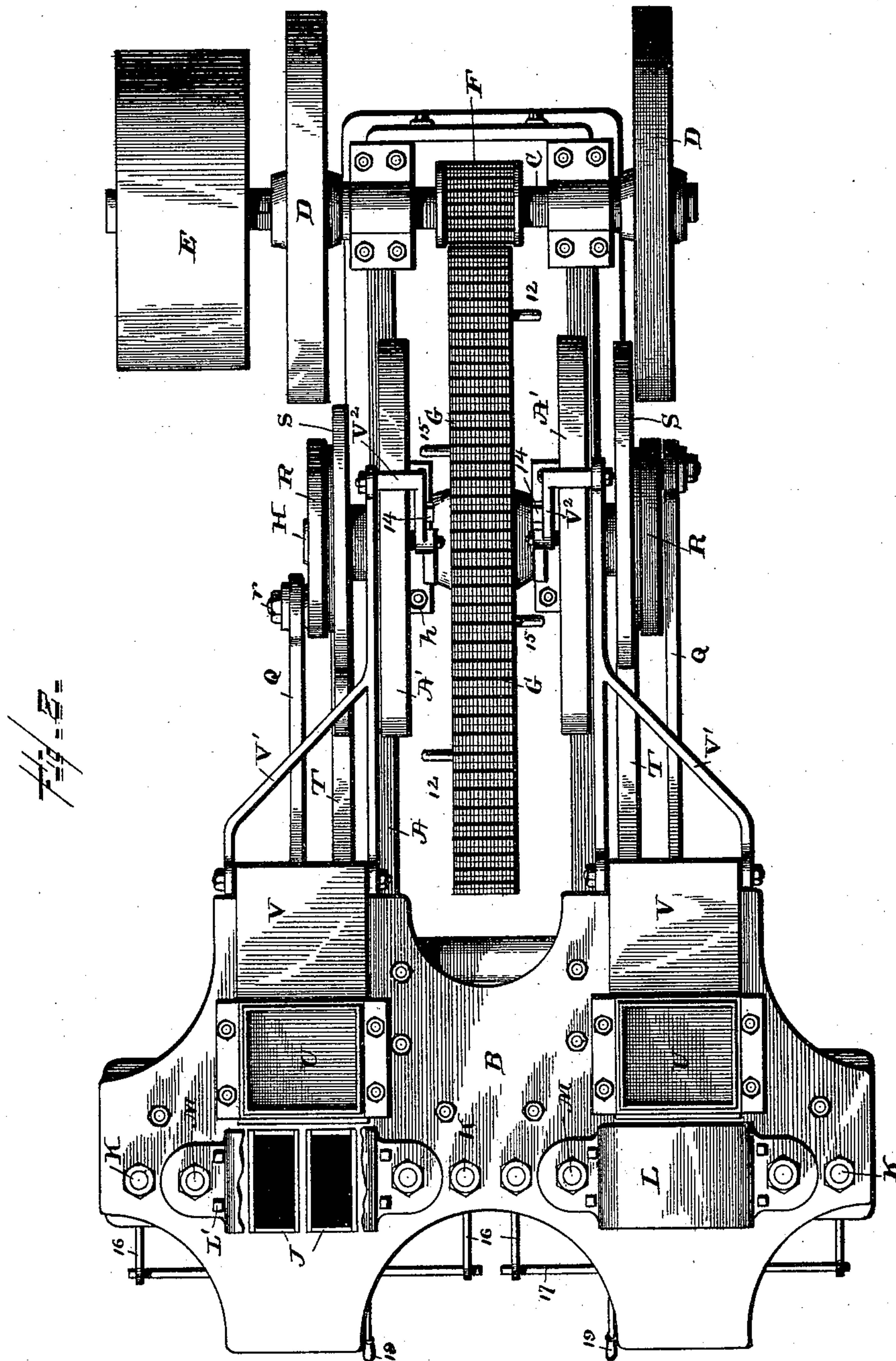
(No Model.)

3 Sheets—Sheet 2.

M. B. ATKINSON.  
BRICK MACHINE.

No. 434,230.

Patented Aug. 12, 1890.



Witnesses

*Albert Speiden.*  
*Chas. C. Brock.*

Inventor

*Maxton B. Atkinson*  
By his Attorney,  
*Wm. Hunter Meyer*



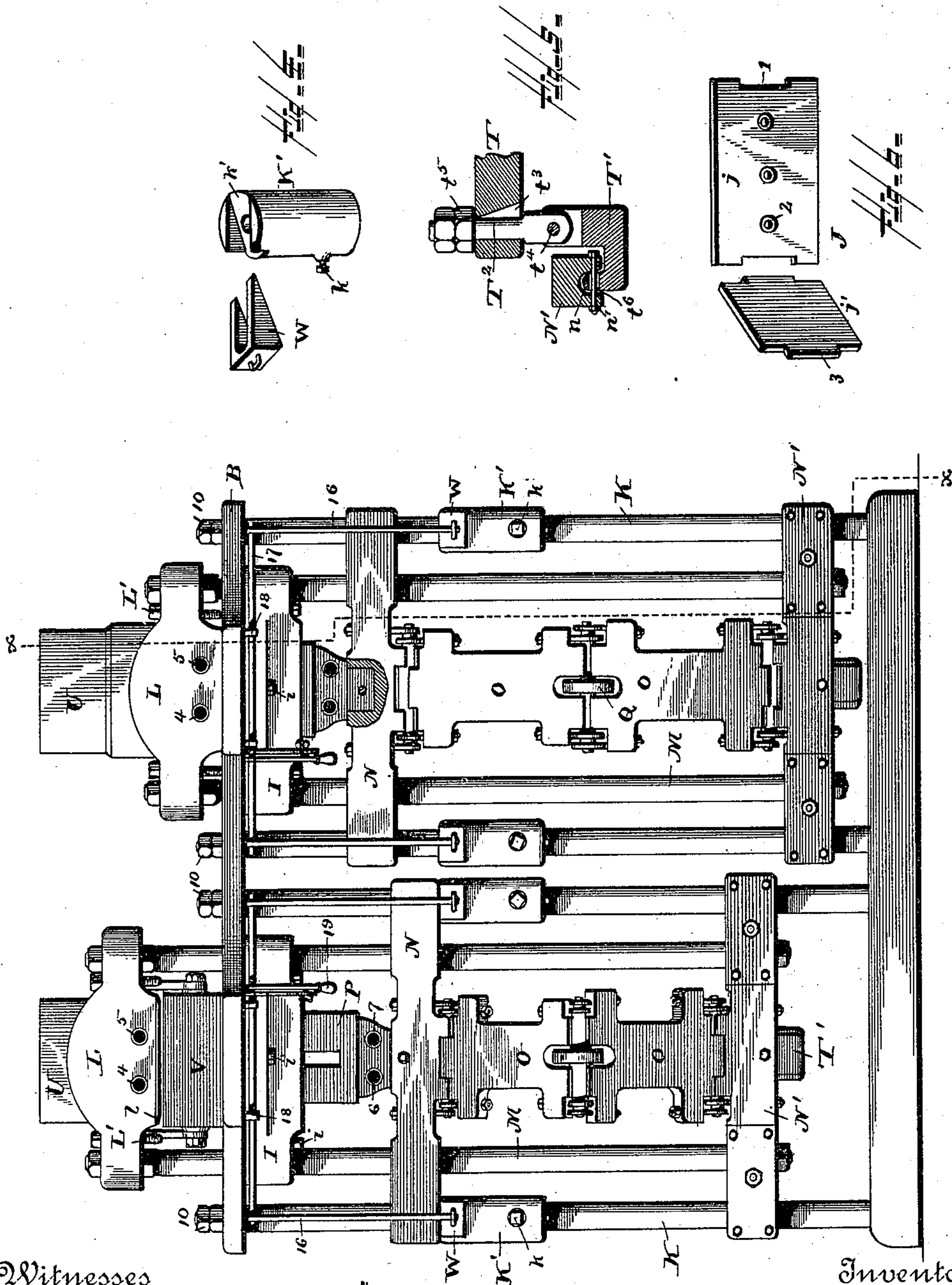
(No Model.)

3 Sheets—Sheet 3.

M. B. ATKINSON.  
BRICK MACHINE.

No. 434,230.

Patented Aug. 12, 1890.



Witnesses

*Albert Speiden,*  
*Chas. E. Brock,*

Inventor

*Mahlon B. Atkinson*  
By *his* Attorney,  
*Wm. Hunter Myers*



# UNITED STATES PATENT OFFICE.

MAHLON B. ATKINSON, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
OF ONE-HALF TO DAVID W. STOCKSTILL, OF SAME PLACE.

## BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 434,230, dated August 12, 1890.

Application filed November 9, 1889. Serial No. 329,716. (No model.)

*To all whom it may concern:*

Be it known that I, MAHLON B. ATKINSON, a citizen of the United States of America, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in brick-machines; and it consists in the peculiar construction, combination, and arrangement of parts hereinafter described and claimed.

The invention has special reference to the following features: First, mounting certain portion of the machine outside of the frame-work, whereby the important advantages hereinafter mentioned are obtained; second, compressing the clay in the mold-box entirely from the bottom against a platen whose face is beveled at the edges, whereby the air as it is driven upward will be forced outward and escape under the edges of the platen, and whereby, also, a slight depression will be formed in the upper face of the brick, affording a hold for the mortar; third, means for adjusting the platen with relation to the upper end of the mold-box, in order to compensate for the wear of parts; fourth, means for adjustably limiting the downward movement of the plunger within the mold-box, so as to regulate the capacity of the box in accordance with the quantity of clay necessary to form the brick; and, fifth, a reversible lining for the mold-box, whereby the lining, when one portion of it is worn, can be reversed to present an unworn surface.

Figure 1 of the drawings is a side elevation of the machine, partly in section, on the line  $x x$ , Fig. 3. Fig. 2 is a plan view of the machine, one of the platens being broken away to show the mold-box. Fig. 3 is a front elevation of so much of the machine as is necessary to show the working of the plungers and the platens. Fig. 4 is a detail view of the device for regulating the descent of the plungers. Fig. 5 is a detail view of a portion of the mechanism for raising the toggles and the plunger to eject the brick from the mold-

box. Fig. 6 is a detail view of the reversible lining for the mold-box.

While I have shown a double machine—a mere duplication of many of the parts—I shall, for brevity, confine the description as nearly as possible to a single machine.

A represents the frame-work of the machine, and B the table bolted thereon.

C is the power-shaft, mounted on the rear end of the frame. This shaft carries two balance-wheels D, a band-wheel E, and a driving-pinion F, the latter engaging with a large gear-wheel G on the main shaft H, journaled in boxes  $h$  on the frame.

I represents the mold-box, the upper end of which passes through an opening in table B, and is flush with the top thereof, the box being secured to the table by means of screws  $i$ , as shown. The mold-box is provided with a reversible lining J, made in the form shown in Fig. 6, wherein it will be seen that the side plates  $j$  are formed with a recess 1 in each end equidistant from top and bottom, and with countersunk screw-holes 2, also equidistant from top and bottom, as well as from the ends, so that, no matter which edge of the lining is up, the holes 2 will occupy the same position relative to the screw-holes in the box. The end plates  $j'$  have no screw-holes, they being held in place by a tongue 3, formed on each end, midway between the top and bottom, which tongues fit neatly in the recesses in the side pieces. Thus it will be seen that when one portion of the lining becomes worn, on removing the screws from the side pieces, the entire lining can be lifted out, turned upper edge down, and secured in the mold-box in that position, or the different pieces of the lining may be turned inner side out, and then secured in the box, with a suitable backing behind the worn portion to true up the face, in which case the screw-holes 2 will of course be countersunk on both faces of the side plates  $j$ .

K represent round metal standards, whose lower ends are rigidly secured in the forward end of frame A, and whose upper ends pass through the table B, and are secured in position by nuts 10, and K' are sleeves on these standards for limiting the descent of the up-



per cross-head, they being adjustably held in place thereon by means of set-screws *k*.

*L* represents the platen, which is hollow, and is provided with an inlet 4 and an outlet 5 for the steam employed in heating it. As it is intended that the clay in the mold-box to form the brick is to be pressed entirely from below by the plunger, the face only of the platen enters the mold-box, and instead of forming holes in the platen to provide for the escape of air as the clay is being pressed, which holes are objectionable on account of their liability to become stopped up by the clay, I bevel the face edges of the platen, as at *l*, whereby the air is afforded free exit all around these beveled edges, it being understood that the platen does not enter the mold-box to the full depth of the beveled portion.

It is highly important that the platen should be made adjustable with relation to the table of the machine, in order to prevent it from entering the mold-box so far as to shut off the exit of the air from the clay, which might result from wear of the parts. For this purpose I provide the platen with set-screws *L'*, which pass vertically through it, as seen in Fig. 3. The platen is secured on the upper ends of the two rods *M*, said rods being passed through the table, the ends of the mold-box, and upper cross-head *N*, and a lower cross-head *N'*, in which latter the lower ends of the rods are rigidly secured.

*O* represents toggles hinged to the upper and lower cross-heads, the ends of the cross-heads being fitted over and adapted to slide freely on the standards *K*.

*P* is the plunger secured to the upper cross-head, and, like the platen, having an inlet 6 and an outlet 7 for the steam, with which it is to be heated. In this instance the plunger is shown as bifurcated, (seen at left hand of Fig. 3,) which form is used when the mold-box is divided, so as to produce two bricks at once, as seen in Fig. 2.

As will be seen in Figs. 1 and 2, the mechanisms hereinafter described for operating the toggles and for raising the cross-heads, toggles, and plunger to eject the bricks from the mold-box are all located outside the frame-work, which results in a great saving of time and labor in setting up and taking down the machine, and also admits of the frame-work being made considerably narrower and consequently much lighter than would be necessary were these parts mounted within the frame-work.

*Q* is a crank-arm, the forward end of which is pivoted to the toggles, its rear end being journaled on a crank-pin *r* on a disk *R*, keyed on the end of the main shaft.

*S* is a cam mounted on the main shaft next to the disk *R*. It is adjustable with relation to said disk by means of slots *s*, (seen in dotted lines,) through which pass bolts *s'*, se-

cured in the disk, the inner ends of said bolts being provided with a screw-threaded nuts. (Not seen.)

The cross-heads, toggles, plunger, and platen are raised to eject the brick from the mold-box by means of a lever *T*, pivoted at *t* to the frame, its rear end bearing a friction-roll *t'*, which engages with the cam *S*, the front end of said lever being provided with a hook *T'*, the latter being connected with the former by means of a rod *T<sup>2</sup>*, which passes through an orifice *t<sup>3</sup>* in the lever, and is pivoted to the hook at *t<sup>4</sup>*, the rod being held in place in the lever by a screw-threaded nut *t<sup>5</sup>*, and in order that this rod may have the necessary play in the lever, the orifice *t<sup>3</sup>* is enlarged toward the bottom, as seen in Fig. 5. The hook enters a recess *n* in the under side of the lower cross-head *N'*, and is prevented from leaving said recess by means of a bolt *n'*, passed through the cross-head and through a slot *t<sup>6</sup>* in the hook, this slot permitting the necessary play of the hook.

*U* is the hopper mounted on the top of the table *B* at such height as to permit the mold-filler to reciprocate under it. It is of the ordinary box-like form, except that on the inside it is wider at bottom than at top, in order that the clay may pass through it freely.

*V* is the mold-filler, which is also of common construction, being open at top and bottom at one end to form a chamber *v* for the reception of the clay from the hopper, and closed at top at the other end, this closed portion serving as a cut-off *v'* to the hopper when the mold-filler is in its forward position. The forward end of a branched arm *V'* is pivoted to the sides of the rear end of the mold-filler, and its rear end is pivoted to the upper end of a lever *V<sup>2</sup>*, the lever being pivoted at 11 to the inner side of an arched portion *A'* of the frame-work of the machine. The lower end of this lever—that portion below the pivotal point—is bent at an obtuse angle to the upper portion and is curved slightly forward, as seen in dotted lines in Fig. 1. This lever is rocked on its pivot to move the mold-filler forward by means of a pin 12, projecting inward from one of the spokes of the gear-wheel *G* coming into contact with a lug 14, projecting outward from the lever. Another pin 15 on one of the spokes of wheel *G* near the hub contacts with the lower end of the lever to rock it in the opposite direction, thereby drawing the mold-filler back to its original position.

While the sleeves *K'* on the standards *K* ordinarily serve to limit the descent of the upper cross-head, and consequently the descent of the plunger within the mold-box, whereby the capacity of said box is regulated, it sometimes happens that frequent adjustments are required owing to varying conditions of the clay to be worked. When this is the case, considerable time would be lost in adjusting the sleeves themselves, and to avoid the ne-



cessity of moving the sleeves for every adjustment is the purpose of the mechanism now to be described.

Referring to Fig. 4, W represents a metallic wedge, straight upon its upper side but sloping to an edge upon its under side. This is designed to fit within a sloping recess  $k'$  cut in the upper end of sleeve  $K'$ , the wedge being bifurcated, as shown, to pass the standard upon which the sleeve is mounted. There are two of these wedges—one for each sleeve. To each wedge is attached the lower end of a rod 16, whose upper end is attached to a horizontal rock-shaft 17, mounted in bearings 18, secured to the under side of the forward end of the table B, the rock-shaft being operated by means of a handle 19, which is held in any desired position by a bolt 20, passing through a slotted segment 21, secured to the table, and through the handle, said bolt being provided with a thumb-nut 22.

The operation of the machine is as follows: We will assume that the cross-heads, toggles, plunger, and platen are in the positions seen at the left side of Fig. 3, and that the mold-box is filled with clay. At this time the cam leaves the lever, allowing the lower cross-head to fall, drawing the platen down, with its face barely inside of the mold-box. Then in the continued revolution of the main shaft in the direction indicated by the arrow on gear-wheel G in Fig. 1, the toggles are gradually straightened, pressing upward the upper cross-head and the plunger. As the clay is being pressed against the platen by the plunger, the air in the clay is driven upward to the platen, making its exit at the beveled edges of the latter, it being understood that, as before stated, the platen does not enter the mold-box to the full depth of the bevel; but the portion of the platen which does enter is sufficient to cause a slight depression in the upper side of the brick. The parts of the machine now being in the positions shown on the near side of Fig. 1, the cam S comes into contact with the rear end of lever T, thereby gradually depressing it, and consequently raising the cross-head, toggles, plunger, and platen. By the time the point 30 on the cam reaches the lever the platen will have been raised sufficiently high to permit of the passage thereunder of the mold-filler V, and the plunger will have come flush with the upper surface of the table and pushed the brick out of the mold-box; but meanwhile the crank-pin  $r$  on disk R has made a partial revolution and the toggles have been half-bowed, which of course would have lowered the plunger to that extent were it not for the fact that the pitch of the cam up to the point 30 is sufficient to overcome that tendency by continuing to raise the cross-heads, toggles, and plunger. Now as it is desired to simply hold the plunger up momentarily without raising it any farther, the eccentricity of the cam from the point 30 to the point 31 is just suffi-

cient for that purpose. During the time that that portion of the cam between these points is in contact with the lever the platen is raised to its full height, and the pin 12 comes into engagement with the lug 14 on lever  $V^2$ , and rocks said lever forward on its pivot, thereby pushing the mold-filler V, filled with clay from the hopper, forward against the brick. The pin keeps in engagement with the lug until the lever  $V^2$  has assumed such a radial position as to permit the pin to pass over the top of the lug, by which time the mold-filler has pushed the brick out onto the table. While this movement is taking place the concentric portion 32 of the cam reaches the lever T, when, owing to the continued forward bowing of the toggles, the upper cross-head descends, drawing down the plunger, so that by the time the brick is entirely out onto the table the plunger has dropped to its lowest position. Now the pin 15 comes into contact with the lower end of lever  $V^2$  and rocks it in the opposite direction, thereby drawing back the mold-filler when the clay will fall into the mold-box. By the time the mold-filler has been drawn back under the hopper the concentric portion 32 of the cam has passed clear of lever T, allowing the lower cross-head and the platen to drop ready for the next operation.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a brick-machine of the class described, the combination, with the frame-work, the cross-heads, the toggles, the plunger, and the platen, of the main shaft, a crank-arm pivoted at one end to the toggles and at the other end to a disk on said shaft, a cam on the shaft, and a lever pivoted to the frame, one end of which lever is in engagement with the lower cross-head, the other end lying in the path of the cam, said crank-arm, disk, lever, and cam being mounted on the outer side of the frame-work, substantially as described.

2. In a brick-machine, the combination, with the mold-box and a vertically-movable plunger, of an imperforate platen of greater area on its upper side than the interior of said box, but having its lower edges beveled, so that its face is of less area than the interior of the box, and mechanism for operating the platen in such manner that while its face will enter the mold-box the beveled portion will not come into contact with the box, whereby as the clay is pressed from below the air will be forced out through the opening left by the bevel of the platen, substantially as described.

3. In a brick-machine of the class described, the combination, with the mold-box, the toggles, and connected cross-heads, mechanism for operating the toggles, and the vertically-reciprocating plunger secured to the upper cross-head, of an imperforate platen of greater area on its upper side than the interior of the



- box, but having its lower edges beveled, so that its face is of less area than the interior of said box, the platen being so connected with the lower cross-head that while its face 5 will enter the mold-box as said cross-head reaches its extreme lower position the beveled portion will not come into contact with the box, substantially as described, and for the purposes set forth.
- 10 4. In a brick-machine, the combination, with the machine-table, a mold-box secured therein, the toggles and connected cross-heads, mechanism for operating the toggles, and the plunger secured to the upper cross- 15 head, of a platen having its face edges beveled provided with adjusting-screws which bear upon the table and being so connected with the lower cross-head that normally only its face will enter the mold-box as said cross-head reaches its extreme lower position, sub- 20 stantially as described, and for the purposes set forth.
5. In a brick-machine, the combination, with the mold-box, of a reversible lining for said box, said lining comprising the side 25 plates having screw-holes equidistant from top and bottom edges and from end to end, and a recess in each end equidistant from the top and bottom edges, and the end plates hav- 30 ing a tongue at each end adapted to fit said recesses in the side plates, substantially as described, and for the purposes set forth.
- In testimony whereof I affix my signature in presence of two witnesses.
- MAHLON B. ATKINSON.
- Witnesses:  
G. W. BALLOCH,  
WM. HUNTER MYERS.