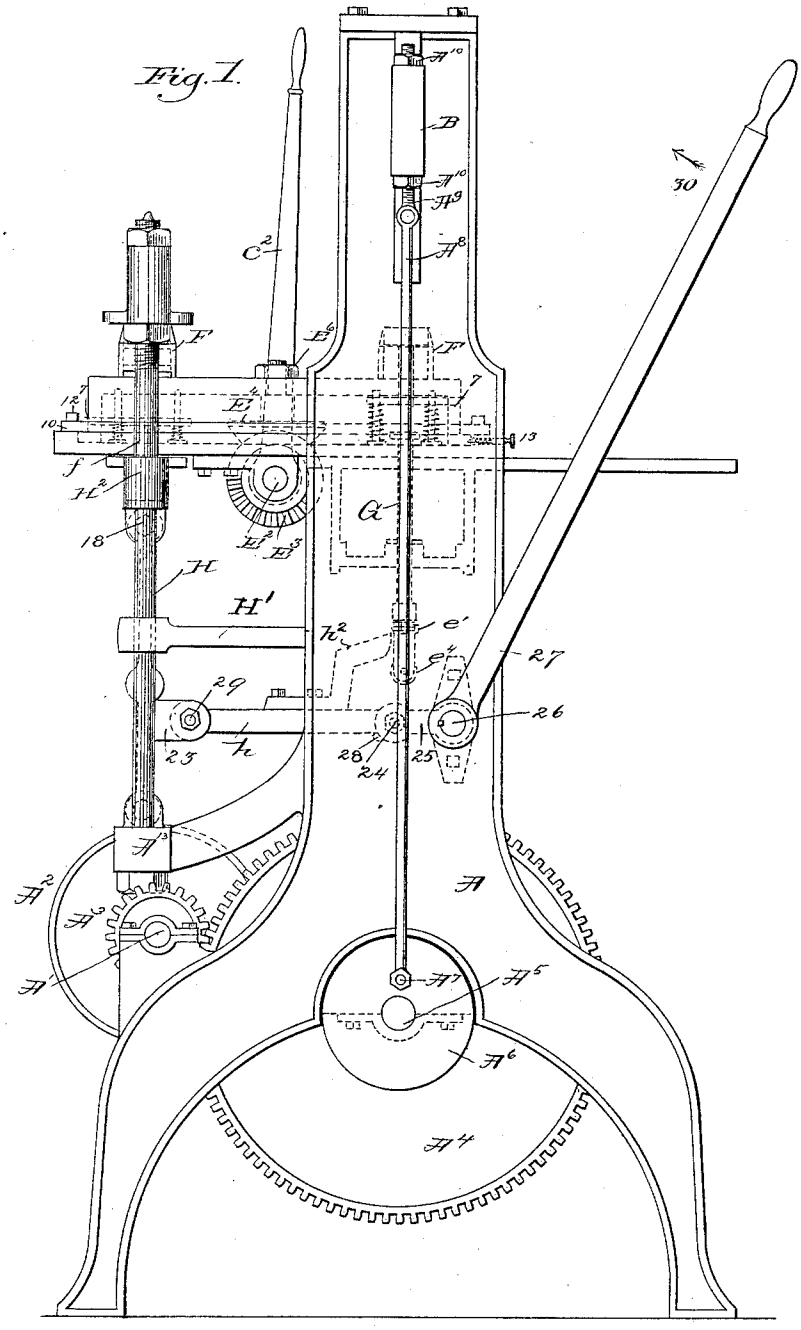
(No Model.) 3 Sheets—Sheet 1.

J. V. ABBOTT & C. E. LUCE.

LEATHER CUTTING AND PILING MECHANISM.

No. 325,037. Patented Aug. 25, 1885.

Fig. 1.



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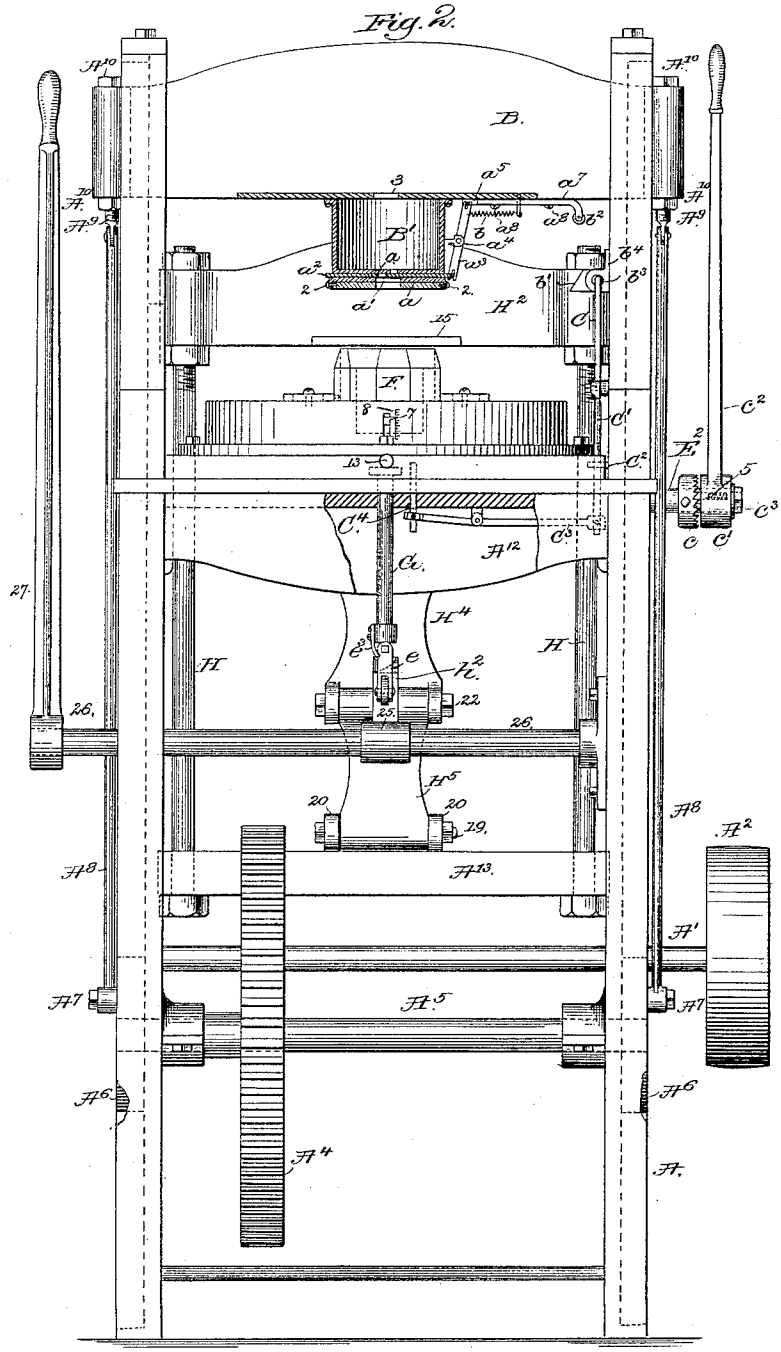
(No Model.) 3 Sheets—Sheet 2.

J. V. ABBOTT & C. E. LUCE.

LEATHER CUTTING AND PILING MECHANISM.

No. 325,037. Patented Aug. 25, 1885.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

J. V. ABBOTT & C. E. LUCE.

LEATHER CUTTING AND PILING MECHANISM.

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Fig. 3.

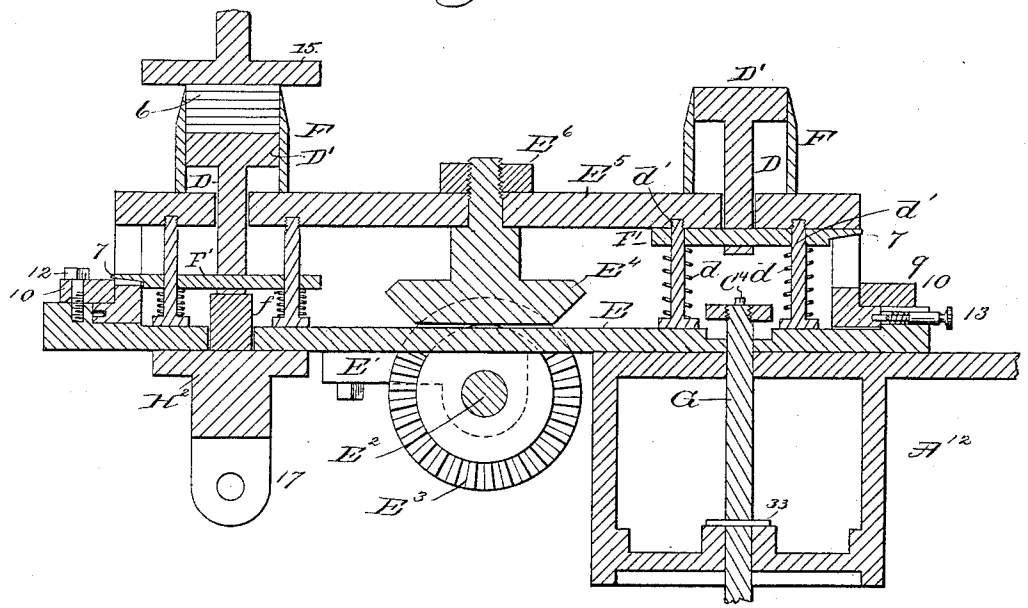


Fig. 4.

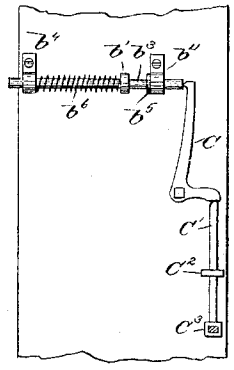


Fig. 5.

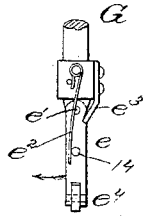


Fig. 6.

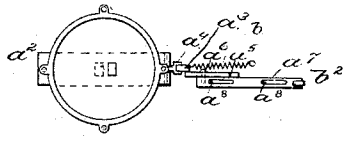


Fig. 8.

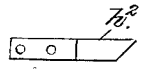
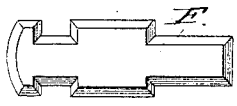


Fig. 7.



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UNITED STATES PATENT OFFICE.

J. VARNUM ABBOTT AND CHARLES E. LUCE, OF DEDHAM, MASS.

LEATHER CUTTING AND PILING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 325,037, dated August 25, 1885.

Application filed May 18, 1885. (No model.)

To all whom it may concern:

Be it known that we, J. VARNUM ABBOTT and CHARLES E. LUCE, of Dedham, county of Norfolk, State of Massachusetts, have invented an Improvement in Leather Cutting and Piling Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of mechanism for cutting leather and other kindred or suitable material into shapes suitable, among other things, to the manufacture of pickers for looms and heels for boots and shoes, the said articles being composed of two or more layers of leather or other material laid in pile and compressed closely together, the said layers being preferably cemented or pasted together.

Our invention in cutting mechanism for leather, &c., consists, essentially, in a plate or carrier and two or more cutting-dies thereon, and a reciprocating block to cause the material resting on the cutters to be cut into shape corresponding with and to be pushed into the said dies, combined with a molding plate or abutment, and followers located one in each of the said dies, and with means to lift the followers at the proper times to compress the material in the die in which it was placed when cut, substantially as will be described; also in a movable plate, a cutting-die attached thereto, and a follower provided with a stem, and a supporting-bar combined with springs to sustain the said bar in a yielding manner, as will be described; also in a movable block, a movable plate, a cutting-die attached thereto, and a spring-supported follower located in the said die, combined with a bed-plate and with an ejector to lift the follower and eject from the die the material forced into it by the block, as will be described.

Figure 1 in side elevation represents a leather-cutting machine embodying our improvements; Fig. 2, a front elevation thereof, the combined cutting-block and paste holder being shown in section. Fig. 3 is an enlarged detail in vertical section, chiefly to show the bed, the cutting-dies thereon, and the molding plate or heel. Fig. 4 is a detail showing part of the die-clearer. Fig. 5 is a detail of the lower end of the ejector. Fig. 6 is a detail of the hollow block to contain paste or cement and the devices to move the valve therein. Fig. 7 shows a top view of the cutting-die shaped for the production of a loom-picker, and Fig. 8 is a top view of the cam h^2 detached.

The frame-work A, of suitable shape to support the working parts, has bearings or boxes to support the power-shaft A′, provided with usual driving pulley or pulleys, A^2, and with a pinion, A^3. The pinion A^3 engages a toothed gear, A^4, on and rotates the main shaft A^5 of the machine, it having at its opposite ends two disks, A^6 A^6, provided with crank-pins A^7 A^7, which are connected by links A^8 A^8 with the adjusting-bolts A^9, held by nuts A^{10} in ears at the ends of the cross-head B, the said links and pins constituting cranks to reciprocate the said cross-head.

The cross-head B has a cutting-block, B′, attached to its lower side by suitable bolts or screws, the said cutting-block being herein shown as made available for applying usual paste or cement to the layers of material cut out by the die, to be described.

The block referred to is herein shown as a metal shell open at its upper end and provided with a bottom plate, a, having an outlet, a', which is alternately opened and closed by means of a gate or valve, a^2, shown as a slide extended through suitable openings in the shell, and having connected with it at one end a lever, a^3, having its fulcrum on a stud or pin of a bracket or lug, a^4, extended from the shell.

The upper end of the lever a^3 will preferably be slotted, as shown in Fig. 2, to be engaged by a lug or projection of a finger, a^5, connected adjustably by a screw, a^6, with a slide-bar, a^7, slotted to receive screws a^8 a^8, the latter supporting the slide-bar so that it may be reciprocated horizontally, this being done in one direction by a spring, b, and in the opposite direction by a cam, b', against which strikes the friction-roll b^2 when the gate is to be opened.

The cam b' is secured to the sliding shaft b^3, mounted in bearings b^4, attached to the main frame, the said shaft having a collar, b^5, which is normally kept pressed against one of the bearings b^4 by a spiral or other suitable spring,

b^6, the normal position of the said cam b' being in the range of movement of the roller b^2, to thus operate the gate a^2 at each descent of the cross-head, thus temporarily opening the hole in the bottom of the block B′ and permitting the escape of a small portion of paste or cement upon the material with which the block comes in contact, in order that the next layer of material laid thereon may be caused to adhere to the pasted or cemented surface of the layer next below it. The last or top layer should not be pasted, and to avoid this we have provided shaft-sliding mechanism, which, as herein shown, is composed of a pivoted lever, C, one end of which rests against one end of the said sliding shaft, as shown in Fig. 4, the opposite end of the said lever being acted upon by a link or pin, C′, held in a suitable guide, C^2, and operated by a lever, C^3, which derives its motion through the shank D of the follower D′ in the cutting-die F, the end of the said shank, as the follower is forced into the said die by the accumulation of layers of leather or other material, then acting upon a screw, C^4, made adjustable in the lever C^3 to accommodate the apparatus to the thickness desired for the picker or heel or other article to be made.

The lower end of the block B′ will in practice be provided with a face-plate of lead, wood, rawhide, Babbitt metal, composition, or other material, commonly used in cutting mechanism in opposition to the edge of a cutter. This face-plate may be attached in any suitable manner, the attachment herein shown being effected by means of bolts 2, extended through ears of the block, the latter having, as obviously is necessary, a hole for the passage of the paste or cement used in the block, the said paste or cement being introduced either through a hole, 3, in the cross-head, or, if desired, through a hole at the side of the block.

The frame-work has a cross beam, A^{12}, upon which is suitably bolted a base-plate, E, at the under side of which, at one side of the cross-beam, are bearings E′, which receive the shaft E^2, provided with the bevel-gear E^3, that engages and rotates the bevel-gear E^4, which is fixed to the turn-table E^5, as herein shown, by the nut E^6, which is screwed down upon the end of a stud-like prolongation of the hub of the said gear, rotation of the gear E causing the rotation of the said turn-table.

The shaft E^2 at one end is provided, as herein shown, with a toothed hub, c, fixed thereto, which hub is engaged by a tooth, 5, shown as a spring-pressed sliding tooth carried by the hub c' of the hand-lever c^2, mounted loosely on the shaft E^2 and held thereon by a nut, c^3, the said hub c and the hub c' and its tooth constituting a clutch mechanism by which the shaft E^2 and the turn-table may be rotated by hand at suitable times.

The turn-table is provided with one or more cutting-dies, F, of a shape to correspond with the shape desired for the article to be made from the material being cut up, the turn-table or movable carrying-plate for the dies enabling the material to be cut and placed in each of the said dies, layer by layer, until of the proper thickness, and thereafter, by a movement of the said plate or carrier E^5, the layers previously laid in one cutter or die may be pressed to the proper degree, while another cutter or die is being filled, and the compressed blank is thereafter ejected.

Each cutter or die has placed in it a follower, D′, having a shank or stem, D, which, at its lower end, extended through the plate or carrier E^5, rests upon a supporting-bar, F′, sustained by springs d, surrounding studs d', screwed into the plate or carrier E^5, the said springs supporting the bar and follower in a yielding manner, so that as the dies are filled with layers 6 of material the follower and die will descend, as shown at the left of Fig. 3, one end of each bar being preferably provided with a finger, 7, which is extended through a slot in the rim of the plate or carrier and co-operates with a suitable index, 8, on the said flange, thus enabling the operator to see exactly the thickness of the superimposed layers 6 placed in the said dies.

The flange of the plate or carrier E^5 is provided with an annular projection, 9, which is extended under a ring, 10, attached by screws 12 to the bed-plate E, the said annular projection having suitable holes, to be engaged by a locking device, herein shown as a spring-actuated pull pin or bolt, 13, it acting to hold the plate or carrier in place, except when the latter is to be moved to bring a die into position.

The bed-plate E has extended through it an ejector, G, made as a rod guided in the cross-beam A^{12}, the lower end of the ejector being provided with a finger, e, pivoted to the rod e', and acted upon by a spring, e^2, the spring near one end resting preferably against a pin, 14, and acting to normally retain the finger in the position shown in Figs. 1 and 5, the stop e^3 determining the extent of movement of the finger under the action of the spring, the finger normally standing in substantially vertical position and being free to be moved against the spring in the direction of the arrows thereon in Fig. 5. The lower end of the finger has an anti-friction roller, e^4.

The frame-work has suitable rigid extensions, A^{13}, which receive the lower ends of the rods H, extended through suitable guides or bearings, H′. The upper ends of these rods H support the beam H^2, that carries the molding-plate 15, which constitutes an abutment against which the pile of layers in the die is forced by the plunger f, attached to the sliding head or beam H^2, having at its ends ears which embrace and slide upon the rods H H.

The plunger f enters a slot or hole in the bed-plate E, and when elevated, as at the left of Fig. 3 acts against the stem D of the follower D′, lifting it to compress the layers of material solidly together, the compression of the ma-

terial 6 being, it will be noticed, done in the same die into which it is forced by the block B′, the top of the die being also a cutter. While compressing the material, as stated, in one die, another die on the same plate or carrier will be in position to receive layers of material 6, and after the said material has been compressed the plate or carrier E^5 is moved to place the said block in position above the ejector, in order that it may be removed from the said die preparatory to refilling it.

The beam H^2 is provided near its center with an ear, 17, with which is jointed by pin 18 the upper member or link H^4 of a toggle-jointed lever composed of the two links H^4 H^5, the lower end of the latter being connected by bolt 19 to suitable ears, 20, of the frame part A^{13}, the free ends of the said links being jointed together by the bolt or pin 22.

The link H^5 has an ear, 23, (see Fig. 1,) to which is pivoted the link *h*, jointed at 24 to the short arm 25 of a rock-shaft, 26, the latter having attached to it a hand-lever, 27, by which to turn the rock-shaft and, by the link *h*, break or straighten the toggle-jointed lever to lower or to raise the plunger.

The short arm 25 has a stop or projection, 28, which, when the parts are as in Fig. 1, comes against the link *h* and prevents the center of the joint 24 from passing a line drawn to intersect both the center of the rock-shaft 26 and the pin 29 joining the link *h* with the ear 23.

In Fig. 1 the toggle-jointed lever is shown as straight to lift the plunger and raise the follower D′, as in Fig. 3. Before the plate or table E^5 can be rotated the toggle-joint H^4 H^5 must be broken, and to do this the lever 27 may be turned in the direction of the arrow 30, causing the pivotal point 24 to be moved downward, the ejector-moving cam h^2, attached to the link *h*, then moving in the arc of a circle or in an elliptical path, the side-pointed end (best seen in Fig. 8) striking against the finger *e*, so as to turn it aside about the pivot *e′* against the spring e^2, the side swinging of the finger obviating moving the ejector, and as soon as the cam h^2 passes from contact with the finger the latter, acted upon by the spring e^2, is thrown back into position above the path of movement of the cam h^2.

After rotating the plate or carrier to bring the compressed blank into position to be removed from the die by the ejector, the lever 27 is moved in the direction opposite the arrow 30, thus turning the rock-shaft and moving the link *h* and its attached cam h^2 upward and forward to straighten the toggle-jointed lever; and during such movement of the link *h* and cam h^2, the inclined face of the latter strikes the anti-friction roller e^4 in line with the center of the finger *e* and lifts the said finger and the ejector vertically, removing the compressed material from the die preparatory to refilling it, and as soon as the cam h^2 passes from under the roller e^4 the ejector falls by gravity and is stopped by the collar 33. As the ejector is being so lifted, the material previously placed in another of the dies is compressed.

I claim—

1. In a machine for cutting leather or other material, a plate or carrier, and two or more cutting-dies thereon, and a reciprocating block to cause the material resting on the cutters to be cut into shape corresponding with and to be pushed into the said dies, combined with a molding plate or abutment, and followers located one in each of the said dies, and with means to lift the followers at the proper times to compress the material in the die in which it was placed when cut, substantially as described.

2. The movable plate, and a cutting-die attached thereto, combined with a follower and supporting-bar, upon which the shank of the follower is permitted to rest, the said bar having or moving a pointer or finger to cooperate with an index to show the thickness of the material in the die, substantially as described.

3. The movable plate, a cutting-die attached thereto, and the follower provided with a stem, and the supporting-bar, combined with springs to sustain the said bar in a yielding manner, substantially as described.

4. The movable block, the movable plate, a cutting-die attached thereto, and the spring-supported follower located in the said die, combined with the bed-plate and with the ejector to lift the follower and eject from the die the material forced into it by the block, substantially as described.

5. The cutting-block, the plate or carrier, and two or more cutting-dies mounted thereon, and the vertically-movable followers located in the said dies, and the plunger, its carrying-beam, and toggle-lever, combined with means, substantially as described, to operate the said toggle-lever, as set forth.

6. The cutting-block, the plate or carrier, and two or more cutting-dies mounted thereon, and the vertically-movable followers located in the said dies, and the plunger, its carrying-beam, and toggle-lever, and ejector, combined with the rock-shaft and its arm, link, and cam, and with the pivoted finger, whereby the ejector and toggle-lever may be moved by the rock-shaft, substantially as described.

7. The plate or carrier and its attached cutting-die, and the vertically-movable follower therein, and the ejector having a spring-held pivoted finger at its lower end, combined with the link *h* and its cam portion h^2, and with means, substantially as described, to operate the said link and ejector, as and for the purposes set forth.

8. The plate or carrier, its attached cutting-die, and follower therein, and the cross-head, and the hollow block to receive paste or cement and open at its lower end, combined with a gate to open and close the opening in the said block, substantially as described.

9. The plate or carrier, its attached cutting-die, and follower therein, and the cross-head, and the hollow block to receive paste or cement and open at its lower end, combined with a gate to open and close the opening in the said block, and with means, substantially as described, to operate the said gate automatically, as set forth.

10. The cross-head, its attached hollow block open at its lower end, and the gate therein, combined with the lever a^3, the slide-bar, and the cam to operate the said slide-bar, substantially as described.

11. The cross-head, its attached hollow block open at its lower end, and the gate therein, combined with the lever a^3, the slide-bar, and the cam to operate the said slide-bar, and with the slide-rod and means, substantially as described, to move it to place the said cam out of operative position and prevent the opening of the gate, substantially as described.

12. A cross-head, a hollow cutting-block connected therewith, and a gate or valve to control the flow of paste or cement from the said block, and a lever and slide-bar to open the said gate, and the plate or carrier, and two or more cutting-dies connected therewith, and their contained followers, having shanks, and a cam to operate the slide which is connected with the said slide-bar, combined with means, substantially as described, to move the said cam out of operative position with relation to the said slide-bar to prevent the opening of the said gate, as set forth.

13. The cross-head, and its attached hollow block to contain paste or cement and open at its lower end, and a gate, and a lever, and slide-bar to move the said lever, combined with an adjusting plate or device, a^5, whereby the quantity of paste or cement leaving the block may be regulated according to the requirements of the work, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

J. VARNUM ABBOTT.
CHAS. E. LUCE.

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