(No Model.) 3 Sheets—Sheet 1.

T. T. MARSHALL.

CRIMPING MACHINE FOR BOOTS AND SHOES.

No. 346,055. Patented July 20, 1886.

Fig. 1.

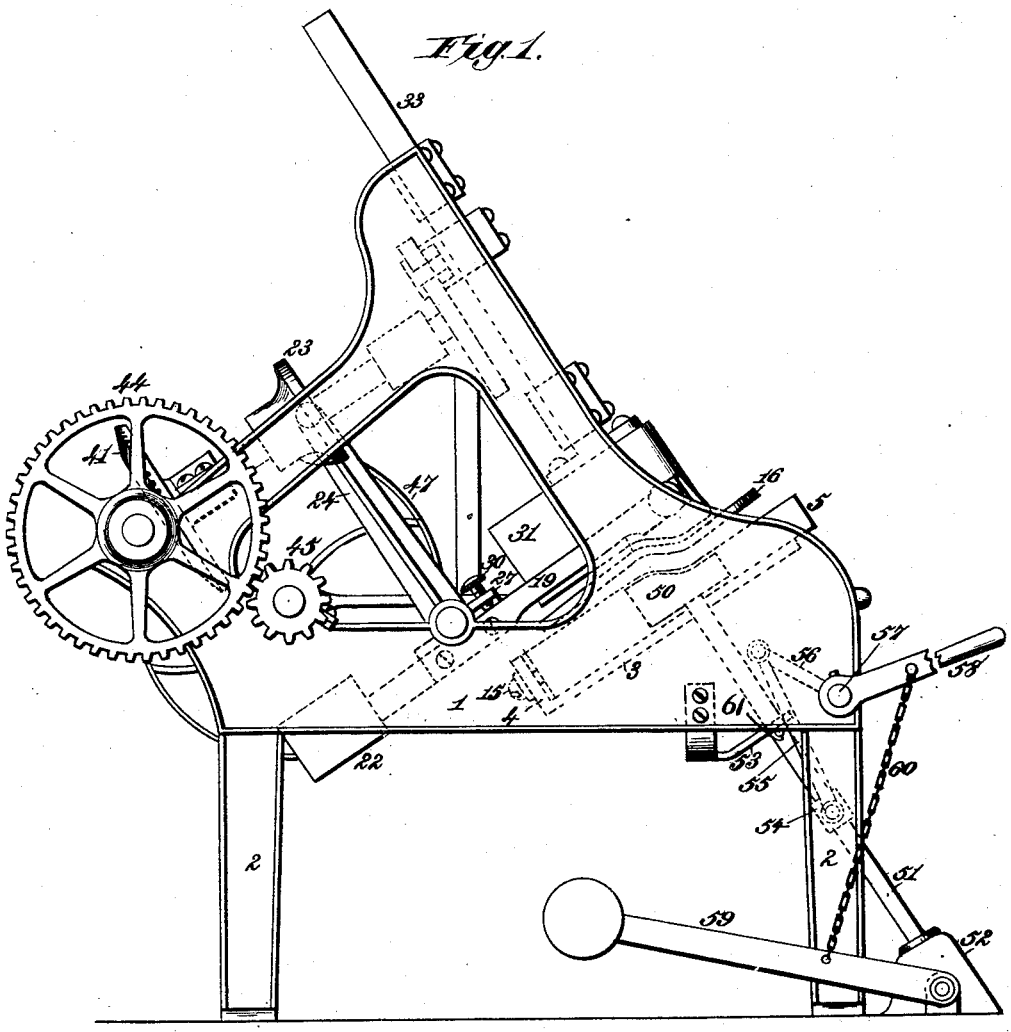

Fig. 1a

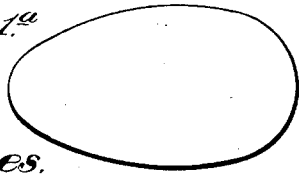

Fig. 1b

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(No Model.) 3 Sheets—Sheet 2.

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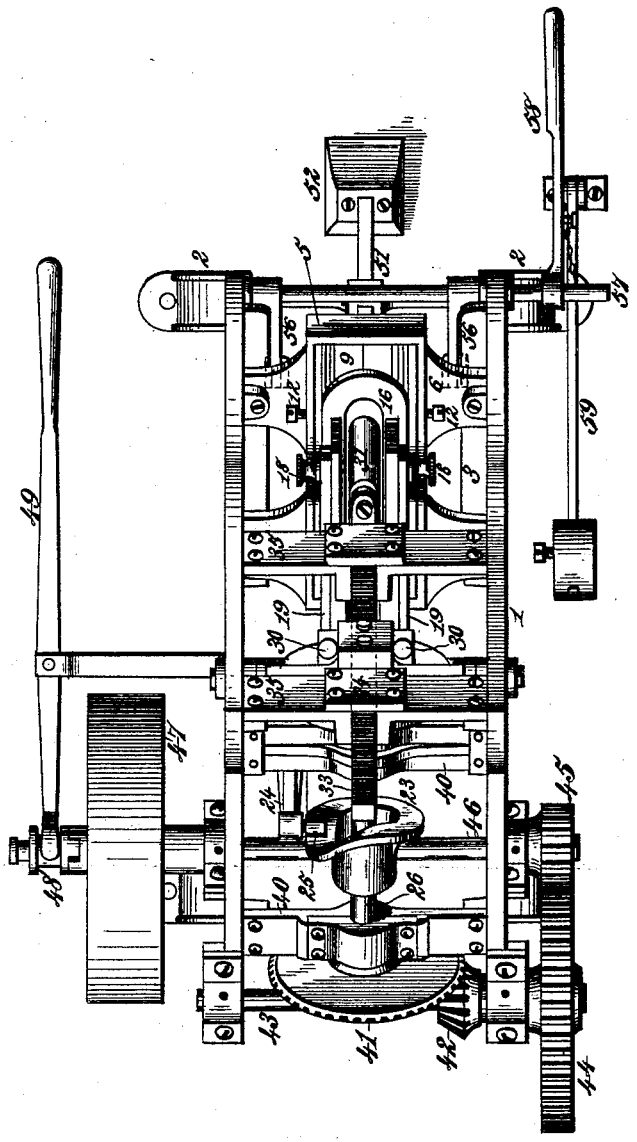

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

T. T. MARSHALL.

CRIMPING MACHINE FOR BOOTS AND SHOES.

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Fig. 3.

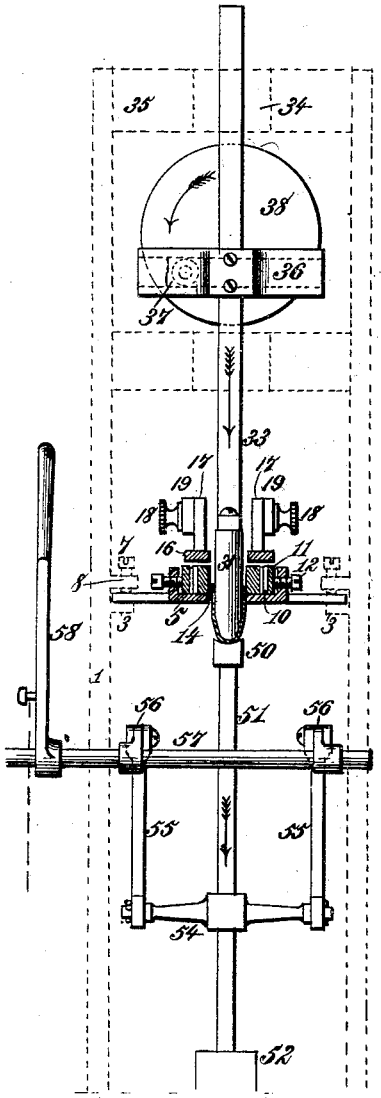


Fig. 4.

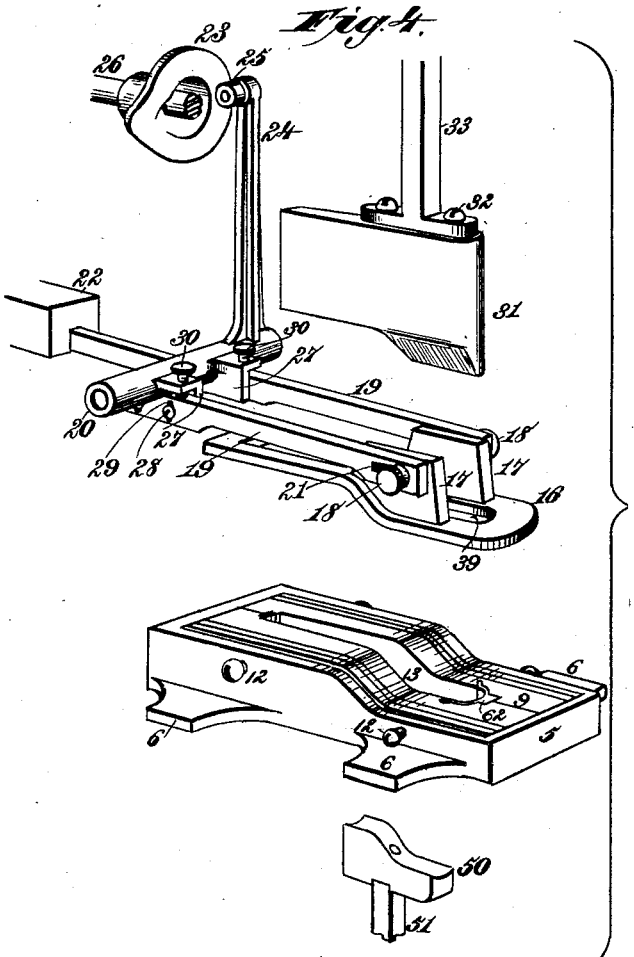
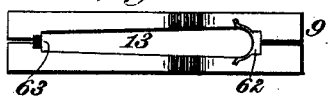


Fig. 5.



Witnesses.
Robert Everett.
Jo. L. Coombs

Inventor
Thomas T. Marshall.
By James L. Norris.
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UNITED STATES PATENT OFFICE.

THOMAS TINNOCK MARSHALL, OF HAMILTON, ONTARIO, CANADA, ASSIGNOR TO JOHN A. McRAE, OF MONTREAL, CANADA.

CRIMPING-MACHINE FOR BOOTS AND SHOES.

SPECIFICATION forming part of Letters Patent No. 346,055, dated July 20, 1886.

Application filed February 20, 1886. Serial No. 192,671. (No model.)

To all whom it may concern:

Be it known that I, THOMAS TINNOCK MARSHALL, a subject of the Queen of Great Britain, residing at Hamilton, in the Province of Ontario and Dominion of Canada, have invented new and useful Improvements in Boot and Shoe Crimping Machines, of which the following is a specification.

This invention relates to machines in which a single continuous piece of leather is crimped to make a continuous seamless upper for boots and shoes, said crimped upper-leather being afterward slitted or cut out for the admission of the foot.

My present invention consists in an improved construction and combination of removable and adjustable parts in a crimping-machine, whereby said machine is readily adapted to crimp various sizes of boot and shoe uppers in a rapid, economical, and satisfactory manner.

The machine comprises a stationary mold-bed and its contained mold made adjustable and yielding to crimp leather of different thicknesses, an oscillatory cam-actuated pressure-plate arranged above the mold to keep the leather smooth while being crimped, and a continuously-reciprocating upper die or former, to which may be added an adjustable lower die or grip block to assist in supporting the leather during the operation of crimping.

In the annexed drawings, illustrating the invention, Figure 1 is a side elevation of my improved boot or shoe crimping machine. Fig. 1ª is a plan of the uncrimped upper leather or blank. Fig. 1ᵇ is a view of the upper-leather after crimping. Fig. 2 is a plan or top view of the crimping-machine. Fig. 3 is a front view of the machine, showing the crimping mechanism in the act of shaping a boot or shoe upper, the driving mechanism being removed, while the mold, pressure-plate, and upper-leather are shown in section and the frame of the machine represented in dotted lines. Fig. 4 represents in perspective detail the upper reciprocating die or former, the oscillating pressure-plate and its immediate actuating mechanism, the adjustable mold, and the lower movable die, clamp, or grip-block, said parts constituting the crimping mechanism whereby the proper or desired form is imparted to a seamless boot or shoe upper. Fig. 5 is a plan of the halved mold-block.

The frame of the machine consists of side pieces, 1, supported on legs 2 and securely braced. In the front end of the machine-frame, on the inner surface of each side piece 1, is an inclined ledge, 3, and at the lower inner ends of these ledges is a cross bar or brace, 4, which serves also as a stop to assist in supporting a removable mold-bed, 5, that rests on said inclined ledges. The mold-bed 5 is provided on each side with lugs or flanges 6, and is held in place by set-screws 7, that are supported in lugs 8 on the inside of the frame, and adapted to force the flanges or lugs 6 in close contact with the inclined supporting-ledges. The mold-bed 5 is recessed to receive the halved mold-block 9, on either side of which is arranged an elastic packing-strip, 10, of rubber or like material, and beyond this a rigid packing or bearing strip, 11, of metal or other hard substance. Set-screws 12 are inserted through the sides of the mold-bed 5, and bear on the outer sides of the rigid strips 11, to adjust the halved mold-block to varying thicknesses of leather. Each half of the adjustable mold-block 9 is provided with a coinciding recess, 13, and a corresponding slot, 14, is made in the bottom of the mold-bed 5, to permit the passage of the crimped upper-leather and the accompanying forming mechanism. The upper surfaces of the mold-bed, with its halved mold-block and packing-strips, are curved horizontally to correspond with a similar conformation of the other parts of the crimping mechanism, as shown in Figs. 1 and 4, for the purpose of imparting the proper relative curves to the instep and heel portions of the upper-leather. Besides the set-screws 7, for clamping the removable mold-bed 5 to its supporting-ledges 3, there is a set-screw, 15, passed through the cross-bar 4, to assist in supporting the rear end of the mold-bed when adjusted forward or when a smaller mold-bed is in use.

For the purpose of holding the leather smoothly while being crimped a curved and slotted pressure-plate, 16, is arranged above

the mold-bed. This pressure-plate 16 is provided with ears 17 for the passage of thumb-screws 18, by which said plate is detachably secured to the forward ends of arms or levers 19, that are secured to a rock-shaft, 20, which is journaled in the machine-frame. The thumb-screws 18 are engaged in slots 21 at the forward ends of the arms or levers 19, so as to permit a longitudinal adjustment of the pressure-plate. At the rear end of one or both plate-carrying arms 19 is a weight, 22, which serves to normally hold the plate 16 away from the mold-bed, so as to permit the insertion of the blank to be crimped. After the blank has been placed in position on the mold-bed the plate 16 is forced down upon said blank by the action of the cam 23, in contact with the end of an arm, 24, carried by the rock-shaft 20. The arm 24 is preferably provided with a friction-roller, 25, for engagement with the cam 23, and the latter is carried by a rotary shaft, 26, actuated by power, as will be presently explained.

By reference to Fig. 4 it will be seen that the rock-shaft 20 is cast with forward and downward projecting lugs 27, to which the plate-carrying arms 19 are detachably and adjustably secured by means of screws 28, passed through slots 29 in said arms, and by screws 30 arranged to exert a pressure on the upper surface of the arms in front of the rock-shaft. By this means the arms 19 can be readily detached, when necessary, and are made adjustable to any desired angle, according to the required position of the pressure-plate 16 with relation to the adjustable mold-bed.

The upper die or former, 31, is detachably secured by means of screws 32 to the lower end of a reciprocating bar or rod, 33, which moves in a vertically-inclined direction in guides 34, formed in cross-pieces 35 at the forward end of the machine. To this rod or bar 33 is adjustably secured a grooved cross-head, 36, which engages an eccentric sliding block, 37, on a disk, 38, secured to the forward end of the rotary shaft 26, which also carries the cam 23, for actuating the pressure-plate 16. The cam 23 and the eccentric and cross-head for actuating the die or former 31 are so constructed and arranged that during the continuous operation of the machine the pressure-plate 16 is brought in pressing-contact with the leather on the mold-bed before the die 31 commences to force the said leather into the mold in the act of crimping. The pressure-plate 16 thus serves to hold the leather smooth, and regulates its admission to the mold while being crimped. The arrangement of the pressure-plate 16 and its actuating mechanism is also such that under the influence of the weight 22 said plate 16 is oscillated away from the leather as soon as the pressure of the cam 23 on the arm 24 is relieved, which occurs while the die or former 31 is being withdrawn from the mold after the operation of crimping is completed. On the upward movement or withdrawal of the die or former 31 the crimped upper will fall through and beneath the mold-bed, and may be received in any convenient receptacle.

It will be observed that the lower edge of the die or former 31 is convexed laterally and curved horizontally, to conform to the required curve of the instep and quarter, its forward edge being also convexed laterally, to correspond to the counter or heel portion of the upper. The oscillating pressure-plate 16 has a longitudinal slot, 39, to permit the passage of the die or former 31, which also passes through the recess 13 of the mold-block 9, and through the slot 14 in the bottom of the mold-bed. It will be observed that the horizontal curvature of the pressure-plate and the upper surface of the mold serves to bend the interposed leather blank to a proper predetermined curvature before it is acted on by the descending die.

The rotary shaft 26 is journaled in bearings formed in the cross-pieces or braces 40, and occupies a vertically-inclined position at right angles with the reciprocating die-carrying bar 33, and parallel with the sides of the machine-frame. To the rear end of this shaft 26 is secured a bevel-gear, 41, meshing with a bevel-pinion, 42, on a transverse shaft, 43, that is journaled in the frame of the machine. A spur-gear, 44, on one end of the shaft 43, meshes with a pinion, 45, on another transverse shaft, 46, also journaled in the frame of the machine, and on the opposite end of this shaft 46 is a loose driving-pulley, 47, and a sliding clutch-jaw, 48, adapted to engage with a corresponding clutch-jaw formed on the pulley-hub. The sliding clutch-jaw 48 has a hand-lever, 49, by which the power for actuating the oscillating pressure-plate 16 and reciprocating die 31 can be controlled at will.

In order to afford a firm support for the leather while being crimped, and thereby obviate any liability of its becoming disengaged from the mold-bed and pressure-plate 16 under the action of the upper die, 31, I prefer to arrange beneath the mold-bed 5, a movable lower die, 50, which also serves as a clamp or grip-block to support the leather and prevent its displacement in case one side of the blank should be thinner and therefore less firmly engaged by the pressure-plate and mold-bed. This lower die, former, or block, 50, has its upper surface curved horizontally, to correspond with the similar curvature of the mold-block 9, pressure-plate 16, and upper die or former, 31; and it is also grooved or concaved to correspond with the laterally-convexed lower edge of said upper die. The lower die, 50, although not indispensable, is therefore adapted to assist in the formation of the instep and quarter with their proper relative curves.

The lower die, 50, is detachably secured to the upper end of a vertically-inclined rod or bar, 51, arranged to reciprocate in suitable guides, one of which, as 52, may be secured to the floor, while the other, as 53, is supported by the machine-frame. To the reciprocating

bar 51 is secured an adjustable cross-head, 54, provided at its ends with pivoted links 55, which in turn are pivoted to arms 56, secured to a rock-shaft, 57, journaled in the front of the machine-frame. By means of a hand-lever, 58, secured to one end of the rock-shaft 57, the lower die, 50, can be raised to its proper location within the mold before the operation of crimping is commenced. The die 50 may be held in this elevated position by means of a weighted lever, 59, connected to the hand-lelever 58 by a chain, 60, or the weighted lever 59 and chain 60 can be dispensed with, and the outer end of the hand-lever 58 made sufficiently heavy to maintain the lower die, 50, in place until it is forced down by the advancing upper die. In order to limit the upward movement of the lower die, 50, its carrying-bar 51 is provided, below the guide 53, with a stop, 61, which impinges against the under side of said guide when the die 50 is adjusted to its elevated position within the mold.

It is obvious that by employing interchangable molds and dies of proper dimensions and configuration, various sizes and styles of boot and shoe uppers can be produced with the same crimping-machine.

For the purpose of enabling the leather to slip smoothly through the mold, and to obviate any liability of abrasion or creasing by contact with the joints of the yielding mold-blocks, the heel-joint should be covered, as shown in Fig. 5, by a curved and flanged metal plate, 62, the vertical edges of which slide into cuts formed in said blocks, which are recessed at top to receive flush the flanged or bent-over portion of said plate. The mold-blocks may also be recessed to receive a rubber cushion, 63, to prevent abrasion of the leather under pressure. Thus while the mold yields laterally to different thicknesses of leather, all liability of creasing or abrasion is avoided, and the upper is crimped smoothly and uniformly.

It will be seen that the machine is continuously acting and requires no attention, except to place the dampened leather blanks, Fig. 1[a], upon the upper surface of the mold when the pressure-plate 16 is in its raised position, as shown in Figs. 1 and 2, and then throw the hand-lever 58 down, to elevate the lower die, 50, before the upper die, 31, begins to force the leather through the mold. After cam-actuated pressure-plate 16 has engaged the oval-shaped leather blank, the descending upper die, 31, presses the leather in gripping-contact with the counterbalanced lower die, 50, which gradually recedes while the leather is carried through the mold and crimped, as shown in Fig. 3. When the upper die has passed down through the mold and reached its lowest point, the continuous rotation of the shaft 26 with the connected eccentric and sliding cross-head gradually withdraws said upper die from the mold, and the crimped upper, Fig. 1[b], becomes disengaged and drops beneath the machine.

What I claim as my invention is—

1. In a crimping-machine, the combination of a halved and recessed mold-block, an oscillatory pressure-plate having a longitudinal slot and a reciprocating die or former, said parts being horizontally curved to correspond to the curves of a boot or shoe upper, substantially as described.

2. The combination of an adjustable mold-bed, a halved and recessed mold-block, elastic packing-strips, and rigid bearing-strips placed in the mold-bed on each side of the halved block, set-screws for adjusting the halved block, said mold bed and block being horizontally curved, a slotted and horizontally-curved pressure-plate, and a reciprocating die or former curved to correspond with the mold and pressure-plate, substantially as described.

3. The combination of a recessed mold, a slotted oscillating pressure-plate, a reciprocating upper die or former, and an adjustable lower die or former, substantially as described.

4. The combination of a yielding and recessed mold, an oscillatory cam-actuated pressure-plate having a longitudinal slot, and a continuously-reciprocating die or former, substantially as described.

5. The combination of a recessed and horizontally-curved mold, a slotted and horizontally-curved oscillating pressure-plate, and a horizontally-curved die, substantially as described.

6. The combination of a yielding and recessed mold, an oscillatory cam-actuated pressure-plate having a longitudinal slot conforming to said mold, a continuously-reciprocating upper die or former, and an adjustable lower die, substantially as described.

7. The combination of an adjustable mold, an oscillatory cam-actuated pressure-plate, a continuously-reciprocating upper die or former, and an adjustable counterbalanced lower die, substantially as described.

8. The combination of an adjustable mold, an adjustable oscillatory pressure-plate mounted on arms connected to a rock-shaft, a cam and intermediate connections for forcing said pressure-plate into contact with the material upon the mold, a weight for returning said plate to its normal position when the cam-pressure is relieved, and a continuously-reciprocating die for crimping the material held by the mold and pressure-plate, substantially as described.

9. The combination of an adjustable mold-bed, a yielding and recessed mold adjustably supported therein, a weighted and cam-actuated oscillating pressure-plate, a reciprocating upper die, and a movable counterbalanced lower die, said mold, pressure-plate, and dies being formed with corresponding horizontal curvatures, substantially as described.

10. The combination of the frame having inclined ledges 3 and cross-bar 4, an adjustable mold-bed supported by said ledges and cross-bar, a yielding mold arranged in the adjustable mold-bed, an oscillatory pressure-plate slotted

and shaped to conform to said mold, and a reciprocating die, substantially as described.

11. The combination of an adjustable mold, a rock-shaft, 20, having arm 24, the arms or levers 19, detachably and adjustably secured to said rock-shaft, the oscillatory pressure-plate 16, adjustably attached to the forward ends of said levers, a weight, 22, at the rear end of said levers, and a cam, 23, engaged with the rock-shaft arm 24, to actuate the oscillatory pressure-plate, substantially as described.

12. The combination of an adjustable mold, a rock-shaft, 20, having arms 19 and 24, an adjustable pressure-plate, 16, carried by the arms 19, a reciprocating rod, 33, having a detachable die, 31, and adjustable cross-head 36, and the rotary shaft 26, having a cam, 23, to actuate the oscillatory pressure-plate, and an eccentric disk, 38, engaging the cross-head to actuate the reciprocating die, substantially as described.

13. The combination of a mold, an oscillatory pressure-plate, a reciprocating die or former, the shaft 26, a cam, 23, located on said shaft for actuating the pressure-plate through intermediate connections, an eccentric disk, 38, also located on said shaft, to actuate the reciprocating die, and gearing to drive the shaft 26, substantially as described.

14. The combination of a mold, a pressure-plate, an upper die, 31, a lower die, 50, mounted on a reciprocating rod, 51, provided with cross-head 54, a rock-shaft, 57, having a weighted lever, 58, and arms 56, and the links 55, for connecting the rock-shaft arms to the cross-head, substantially as described.

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

THOMAS TINNOCK MARSHALL.

Witnesses:

JAMES L. NORRIS,

JOS. L. COOMBS.