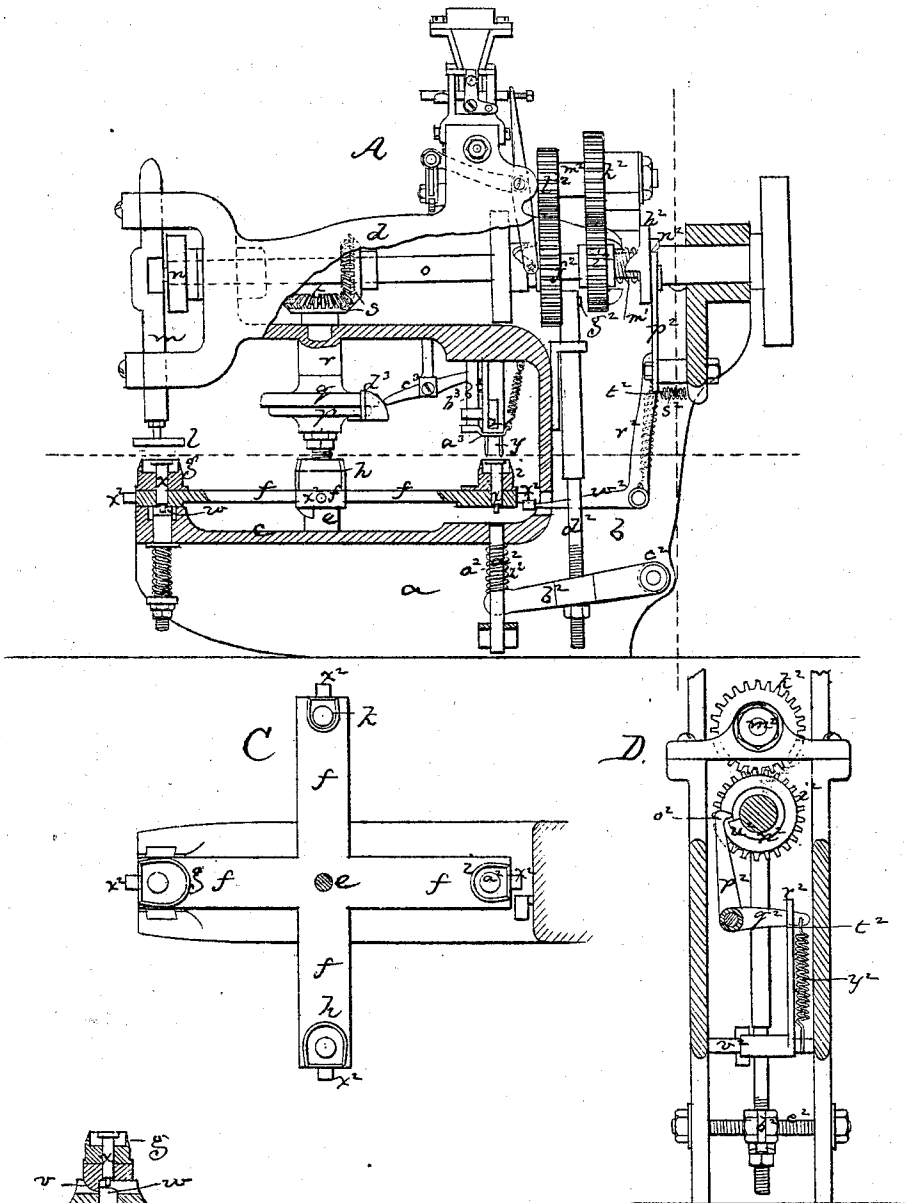


A. KNOWLTON.

Machines for Making Boot and Shoe Heels.

No. 134,899.

Patented Jan. 14, 1873.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALBION KNOWLTON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING BOOT AND SHOE HEELS.

Specification forming part of Letters Patent No. 134,899, dated January 14, 1873.

To all whom it may concern:

Be it known that I, ALBION KNOWLTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Machine for Making Boot and Shoe Heels; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

The invention relates to the manufacture of boot and shoe heels; and consists primarily in an organization of mechanism by which heel-lifts of graduated sizes and varying thickness are automatically punched out by a series of punches, are automatically assembled or piled in conformity with their respective sizes, and are automatically fastened together to form the heel or heel-blank.

The drawing represents a machine embodying my improvements. A shows the machine in side and sectional elevation; B is a sectional view of one of the punches, &c.; C, a plan of the punch; D, a sectional elevation.

a denotes a bed having an upright, *b*, and two horizontal arms, *c d*. Extending up from the arm *c* is a vertical spindle, *e*, journaled in the bed, and having extending from it a number of radial arms, *f*, there being preferably four of these arms, arranged right-angulantly, and each having at its end a punch, the four punches *g h i k* being of respective size to punch four sizes of lifts, which, when assembled and of proper thickness, will form a regularly-tapered heel, the leather being introduced over the front punch, and being forced against the punch by a plunger, *l*, at the end of a slide-bar, *m*, which bar is reciprocated vertically by a crank-pin extending from a crank-wheel, *n*, on the driving-shaft *o*. The punch-arm spindle *e* carries at its top a friction wheel or disk, *p*, against which bears a friction-wheel, *q*, on a shaft, *r*, which shaft *r* is driven by a bevel-wheel, *s*, on the driving-shaft, meshing into a bevel-wheel, *t*, on the shaft *r*, the frictional contact of the wheel being sufficient to cause the spindle *e* to be turned by the shaft *r*, when said spindle is free to turn, the shaft *r* turning without rotating the spindle *e* if either of the punches be locked in position. At the bottom of each punch-arm under the punch is

a projection, *v*, which, when the punch comes under the plunger *l*, brings up against a catch, *w*, and arrests the punch in position for the action of the plunger in pressing the leather upon the punch to cut a lift. Within the punch is a slide-pin, *x*; and when one or more lifts may have been cut by the punch such lift or lifts will be pressed down into the punch by the plunger, and will force down the pin *x*, causing said pin to depress the catch *w*, and freeing the punch so that it will be moved on by the continued movement of the shaft *r*, the punch not being released until a certain thickness or extent of thickness is attained. As each punch moves forward, after being thus charged with a lift or lifts, it comes, after two quarter rotations, to a position opposite to that it had when cutting the leather, and at this point it comes under two stationary impaling-pins, *y*, extending down from a block, *z*. When the punch comes under these pins a piston, *a*², is forced up against the pin *x*, and, pushing said pin up, presses the lift or lifts up against and upon the pins *y*, leaving such lift or lifts there impaled. This piston is jointed to a lever, *b*², fulcrumed at *c*², and connected, by a link, *d*², with a cam-groove in one face of a gear-wheel, *f*², on the driving-shaft, a pin, *g*², extending from the link into said groove. The gear *f*² turns loosely upon the driving-shaft and is rotated by a sliding clutch-wheel, *h*², upon and turning with the shaft, the clutch-wheel being forced into connection with another gear-wheel, *i*², loose upon the shaft, this gear *i*² being connected to and driving the gear *f*² by means of gears *k*² *l*² on an intermediate shaft, *m*², the clutch-wheel being thrown into connection with the gear *i*² to drive it, and being thrown from such a connection by a spring, *m*¹. The clutch-wheel has on its outer end a scroll-cam, *n*², the face of which lies against a hook, *o*², by which the clutch-wheel is forced in as the cam-face rotates against it. The hook *o*² is on the end of a lever, *p*², against the lower arm *q*² of which an arm, *r*², presses, being held there by the stress of the spring *s*². The arm *r*² has a shoulder, *t*², and when the cam *n*² acts on the lever *p*² it carries the hook *o*² of the lever into the path of movement of a wiper or cam, *u*², which as it strikes the hook moves the lever-arm back and raises

the arm q^2 , permitting the shoulder t^2 to be drawn under the arm q^2 , thereby locking the hook back. When the hook is thus thrown back, it passes the face of the cam n^2 , and the clutch-wheel is then thrown back and will rotate without effecting movement of the gear-wheel, the clutch engaging with the gear-wheel when thrown forward, and turning the gear-wheel with it. The arm r^2 , that carries the shoulder t^2 , is one arm of a lever turning on a fulcrum, v^2 , the outer end of a horizontal arm, w^2 , of said lever standing in the path of rotative movement of a pin, x^2 , extending from each punch. When either punch comes into position under the pins y , its pin x^2 strikes the arm w^2 and depresses it, thereby dislodging the lever-arm r^2 from the shoulder t^2 , the spring y^2 then drawing down the arm q^2 , so that as the shoulder t^2 of the clutch-wheel cam n^2 passes the hook o^2 the hook will be thrown in front of the cam-face. As the clutch-wheel then continues to rotate, the hook will force the wheel in and into engagement with the gear-wheel i^2 , the gear-wheel then turning and its cam actuating the lever b^2 , and causing the piston a^2 to throw up the pin x , and impale the punched lift upon the pins y , the piston being drawn back by a spring, z^2 , when free to move back. The heel is made of the lifts from the four punches thus punched, assembled, and impaled upon the pins y , and when the last and smallest lift has been impaled a stripper, a^3 , is thrown down and strips the blank from the pins, this stripper or stripper-plate extending from a vertical slide, b^3 , to which is jointed the front arm of a lever, c^3 , whose rear arm lies in the path of movement of a lifter, d^3 , extending from the friction-wheel p , the action of this lifter depressing the stripper, (through which the impaling-pins pass,) and, of course, throwing off the blank or assembled lifts from the pins y . After the lifts are punched and assembled upon the pins y , and before they are stripped therefrom, they may be united by slight nails to retain them together, so as to form a heel-blank. For this purpose any suitable nailing mechanism and any suitable nail-forming material may be employed, using nails contained in a loose assemblage, with a selecting mechanism

that will present the nails successively in position to be driven or to be conveyed to the driving mechanism, or a wire-like material with mechanism to sever nail-forming lengths therefrom, or a strip from which nails are cut, as in pegging-machines using peg-wood strips, such mechanism being so arranged that one or more nails are driven through the lifts every time the whole number of lifts are assembled upon the impaling-pins.

I claim—

1. In combination with a vertically-moving die or plunger, a series of punches automatically brought in succession under the plunger, substantially as described.
2. In combination with an automatic vertically-moving die or plunger, a series of punches graded to cut lifts of variable size to form heel-blanks, substantially as described.
3. In combination with a series of lift-cutting punches moved under a vertical plunger, and mechanism for detaining each punch under the plunger, as described, the mechanism, substantially as described, by which the punch is released by the pressure of the lifts punched by it.
4. In combination with the mechanism for punching heel-lifts, as described, the mechanism, substantially as described, for automatically discharging the punched lifts.
5. In combination with the series of punches, the mechanism, substantially as described, that automatically discharges each punch under each punch in succession and assembles the lifts from all the punches.
6. In combination with the mechanism described for assembling the lifts, the mechanism, substantially as described, for discharging the assembled lifts.
7. The combination of the mechanism described for punching heel-lifts, the mechanism, substantially as described, for assembling such punched heel-lifts, and the mechanism for fastening them together to form a heel or heel-blank.

Executed this 8th day of April, A. D. 1872.
ALBION KNOWLTON.

Witnesses:

FRANCIS GOULD,
M. W. FROTHINGHAM.