E. SALOMON. 2 Sheets—Sheet 1.

APPARATUS FOR FORMING HEEL-COUNTERS FOR BOOTS AND SHOES.

No. 195,845. Patented Oct. 2, 1877.

Fig. 1.

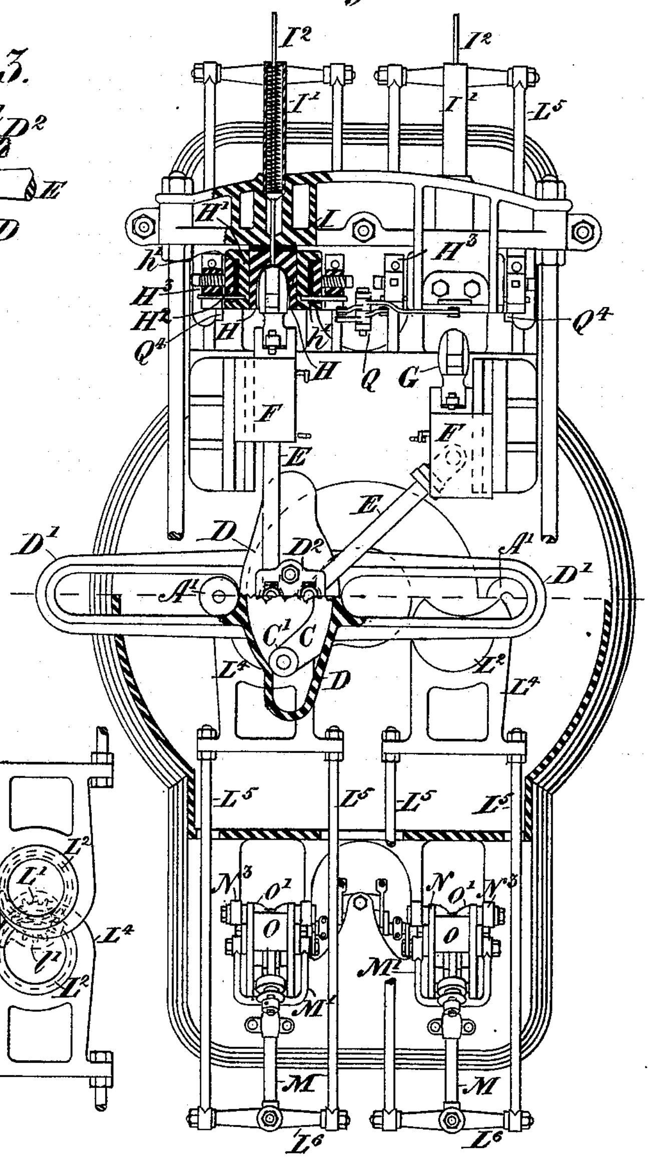


Fig. 3.

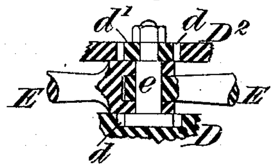
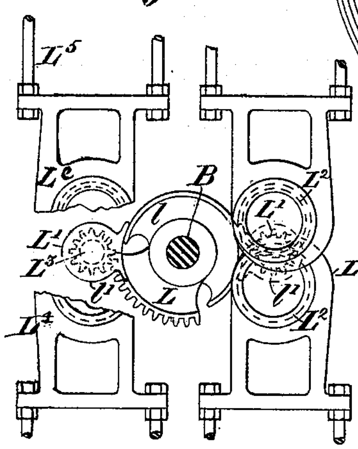
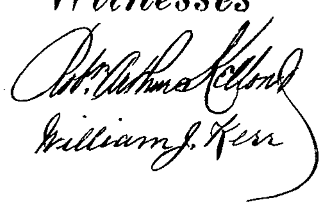


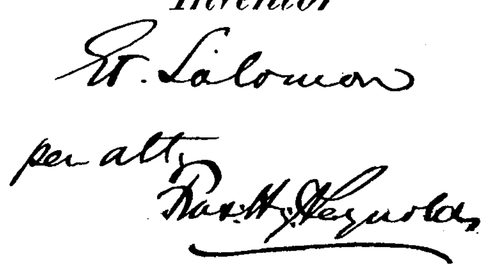
Fig. 2



Witnesses



Inventor



2 Sheets—Sheet 2.

E. SALOMON.

APPARATUS FOR FORMING HEEL-COUNTERS FOR BOOTS AND SHOES.

No. 195,845. Patented Oct. 2, 1877.

Fig. 4.

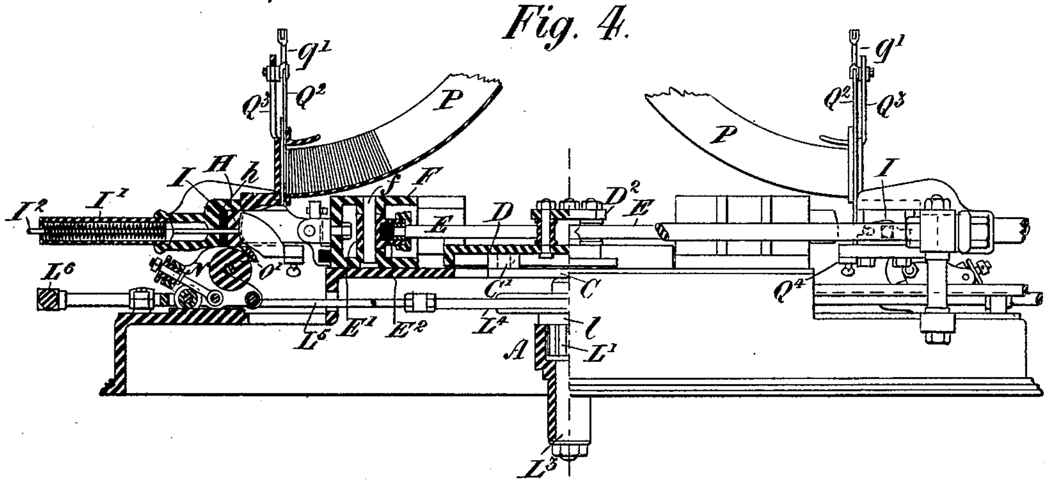


Fig. 5.

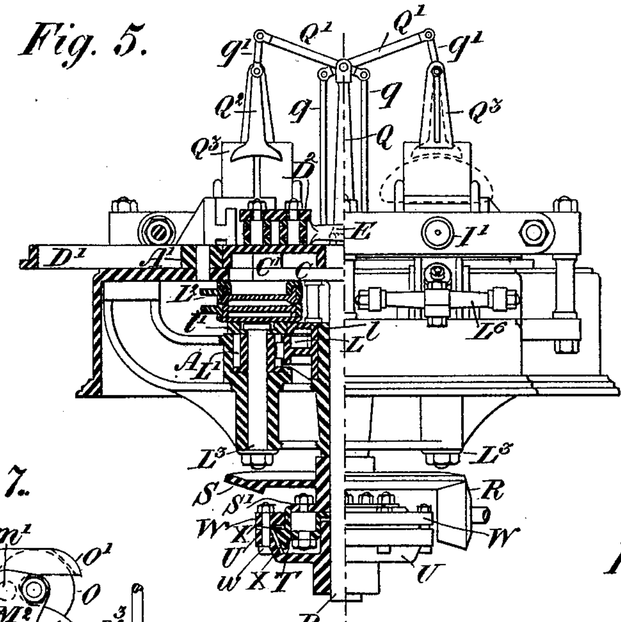


Fig. 7.

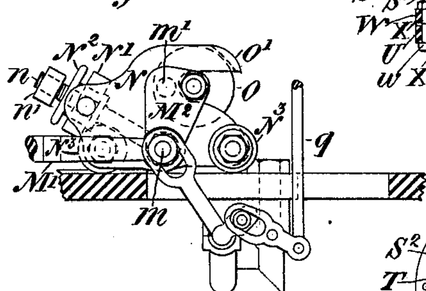


Fig. 8.

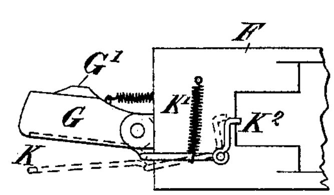
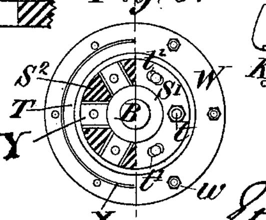


Fig. 6.



Witnesses

Robt. Arthur Holland

William J. Kerr

Inventor

E. Salomon

per atty Rao H. Reynolds

UNITED STATES PATENT OFFICE.

ETIENNE SALOMON, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF ONE-HALF HIS RIGHT TO FRANÇOIS MARTIAL PEPIN AND N. JOSEPH CÔTÉ, OF SAME PLACE; SAID CÔTÉ ASSIGNOR OF ONE-HALF HIS RIGHT TO ELIZABETH HYNES, OF SAME PLACE.

IMPROVEMENT IN APPARATUS FOR FORMING HEEL-COUNTERS FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **195,845**, dated October 2, 1877; application filed May 26, 1877.

To all whom it may concern:

Be it known that I, ETIENNE SALOMON, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Apparatus for Forming Heel-Counters; and I do hereby declare that the following is a full, clear, and exact description, sufficient to enable any one skilled in the art to manufacture the same.

The principal features of my invention are as follows: I give to the dies or punches (which, working in the molds, shape the sides of the counter) their backward and forward movement by means of arms operating through knee-joints, and this in contradistinction to the other usual means, such as crank-handles, cams, eccentrics, or a rack and pinion. I use a friction-clutch arrangement between the main shaft of the machine and the loose driven wheel thereon, so that in case of any unusual resistance or jam of the machine the said driven wheel may rotate without transmitting motion to the machine. Damage to the machine is thus in great measure avoided.

I further propose to form the "upturn" by the action of rollers operated by means of eccentrics. I also provide, in addition to the means for discharging the finished counters from the molds, a device which throws the counter from off the punch or die as soon as this latter has issued from the mold.

For full comprehension of my invention reference must be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan, partly in section, of the machine. Fig. 2 is a plan view of the eccentrics, &c. Fig. 3 is a detail section of knee-joints, enlarged. Fig. 4 is a part side elevation and part longitudinal section through molds. Fig. 5 is a part end view and part transverse section. Fig. 6 is a part plan and part horizontal section through frictional driving-gear. Fig. 7 is a side elevation of roller-carriage, showing feed-motion. Fig. 8 is a detail of device for detaching counter from punch.

Similar letters of reference indicate like parts.

A is the frame of the machine, of any desired form and suitable strength, in it being formed a bearing for the main shaft, to which motion is imparted, as shown more particularly in Fig. 5, and as will be hereinafter more particularly described. Secured to the top of this shaft is an arm, C, having on its end a roller, C′, which, moving in a covered cam, D, gives motion to it backward and forward, the guides D^1 running either side of the roller A^1, secured by a pin to the upper part of the frame, insuring the accuracy of the movement. D^2 is an upper plate, secured to D by any number of bolts and distance-pieces, or in any usual way.

Between these pieces D D^2 are pivoted, as shown in detail in Fig. 3, the ends of the arms E, which actuate the dies, *d d* being slots formed in the plates D D^2; *d′*, a filling-piece of somewhat smaller size, through which passes the pivot-pin *e*, securing together each pair of arms E E. The other ends of these arms are, as shown in detail in Fig. 4, screwed into the heads E^2, a cushion of elastic material being, as at E^2, preferably interposed between them. F F are the blocks to which the heads E^1 are secured, preferably by pins *f*, or in any suitable way.

G G are the dies, pivoted or otherwise adjustably connected to the die-blocks F, provided with means, such as springs, elastic cushions, &c., for slightly elevating their free ends.

H is the mold, formed either of soft metal or cast in two parts, and having its upper part formed so that, when the die has completely entered therein, the projection G′ on the top of the die will correspond exactly thereto.

These molds have interposed between them and the castings I in rear of them, and which form part of the frame, elastic cushions *h*, and are held in mold-blocks H^1, which may be tightened up or slackened by means of plates H^2, operated by set-screws working in lugs H^3, cast on the frame, elastic cushions *h′* being arranged as shown.

I I are spring-cases formed on the casting,

in which are contained rods I^2, acting, by means of spiral or other springs, to throw the finished counter out of the mold.

To detach the formed counter from the die as it returns from the mold, I pivot to the side of the die-block F a bent lever-arm, K, which lies in a groove formed in the under side of the die, and is held in place by a spring or corresponding device, K^1, the short arm K^2 of this lever being arranged, as the die-block recedes, to come in contact with any projections formed on the frame, so as to overcome the action of the spring, and bring down the outer end of the lever, thus throwing off from the die the formed counter, openings being left in the frame through which they can drop into proper receptacles.

I will now proceed to describe the means by which I propose to operate the roller or similar mechanism for giving the upturn.

Upon the main shaft B, I mount a toothed arc, L, which intermeshes with two pinions, L^1, placed at opposite points in the line of the center of the guides D^1. (It may be observed that, by preference, I cut at the meeting-point the first tooth of either the arc or pinion, so as to allow the corresponding tooth of the other to pass it, and take a firm bearing on the second in order.) Guard-plates *l* and *l'*, mounted, respectively, on the axes of the arc L and pinions L^1, hold the pinions in the proper place, so that they will be in the exact position required when the arc begins to operate them.

L^2 L^2 are two pairs of eccentrics, pivoted, respectively, to the pinions L^1, revolving on spindles L^3, and giving motion to the eccentric-straps L^4, connected by rods L^5 to the bar L^6, which operates the driving-rod M, at its end terminating in a fork, M^1. Each end of this fork M^1 is, by a spindle, *m*, connected with the carriage N, to which is secured a rocker, M^2, pivoted at *m'* thereto, and having formed on it bearings for the spindle of the roller O, this part of the apparatus acting to raise the roller to the horizontal plane in which it will exercise pressure to form the upturn.

N^1 is a bush, carried between the two sides of the carriage N, through which passes a pin, *n*, pressing on the spindle *m*, (which joins the two forked ends M^1,) and having on its outer end a nut, *n'*, which, as the driving-rod M presses in, comes in contact with the nut N^2, screwed into the bush N^1, stopping the upward movement of the roller, and pressing it in a forward direction. The distance between the nuts *n'* and N^2, which is, of course, capable of adjustment, governs the amount of lift given to the pressing-roller O.

The carriage N moves back and forth along the frame on rollers N^3, either or all of which may be grooved to run on ridges, or otherwise guided, to insure their accuracy of motion.

O' O' are small angle-pieces formed on the carriage in advance of the roller O, and serving to bend up the mill-board, or other material of which the counter is made, so as to partly form the upturn, which is to be finished by the roller.

The roller, having been, as described, raised to the proper height, presses in its forward motion with great force against the partially-formed upturn, (the blank having been previously prepared by creasing or cutting,) leaving it perfect as the roller, by the reverse action of the machine, recedes.

P P are the troughs or reservoirs (for greater clearness shown only in Fig. 4) containing the blanks from which the counters are to be formed. These are fed to the machine by apparatus which I will now proceed to describe.

Between each pair of dies is placed, as shown in the drawing, a standard, Q, to the head of which are pivoted levers Q^1 Q^1, operated by lifting-rods *q q*, connected at the lower ends by any suitable system of cranks or levers, such as that shown in Fig. 7, with ends M^1 of the driving-bar M. To the free ends of these levers are attached, by pivoted links *q'*, arms Q^2, having their lower ends curved to correspond with the outline of the blank, and moving up and down in slotted guides Q^3, to catch and press down in succession the blanks as they come to the mouth of the reservoir. Q^4 Q^4 show rests, which stop the downward motion of the blanks at the point at which they will come under the action of the dies.

The device of which I make use to give motion to the main shaft will now be described. R is a bevel friction-pinion, rotated by any suitable means, hand or power, as desired, and acting upon a horizontal wheel, S, mounted loosely upon the shaft B, and having on its lower side a flange, S^1, which has, as shown at S^2, downwardly-projecting pieces formed upon it, and fitting in the groove of the ring T, which is bolted loosely to the flange S^1. U is a friction-piece keyed on and rotating the shaft B. W is the friction-ring surrounding the ring T, and resting upon the upper surface of the friction-piece U, to which it is secured by any number of screw-bolts *w*. Between these pieces U and W may be interposed a ring of leather or other like substance, X, and between the beveled surfaces of T and U a similar ring, X.

From this it will be seen that, so long as the machine is working smoothly, the action of the pinion R is transmitted through the wheel S and intermediate ring T to the friction-piece U, keyed on and rotating the shaft B, and thus operating the machine, the degree of hold of the respective parts on each other being regulated by the bolts *w*, connecting the friction-ring and friction-piece. Should, however, any sudden stoppage of the machine take place, the intermediate ring T, driven as just mentioned, will revolve freely inside the friction-piece U without imparting any motion to it, and consequently will stop the machine, thus avoiding the breakage of any of the parts.

To obviate any sudden jerk of the parts in starting the machine, I propose to fill the

spaces between the pieces S^2, in the groove of the ring T, with any elastic substance, as shown at Y, the bolts *t* connecting the flange S^1 with the ring T, passing through slots *t'* in the flange, as shown in Fig. 6, and pressing against the sides of the pieces S^2.

When the machine is started, the bolts *t*, moving a little in the slots *t'*, and pressing against the pieces S^2, will compress the rubber or elastic substance on the other side of them until it is thoroughly tightened up, when the ring T will begin to move, thus gradually and slowly starting the apparatus.

The nature of my invention, and the operation of the several parts, will be so clearly understood from the foregoing description and the drawings that I need only remark that the stroke of the roller C' in the cam D is so arranged as to be divided into four parts—the first part operating one-half the dies, and pressing them into corresponding molds. The cam then remains for a time stationary, during which period the machinery for that purpose is operated by the main axle to form the upturn and complete the counters. The cam then moves, withdrawing from the molds the dies previously pressed in, and forcing into the other half of the molds the corresponding dies. The cam then, in the last part of its stroke, remains almost stationary, while the eccentrics operated by the main axle act to bring in front of the first half of the molds the blanks from which the counters are to be formed, and at the same time, as before mentioned, to finish the upturns of the counters in the second half of the molds, thus at the same time pressing in and withdrawing from the molds the dies, finishing the counters, and bringing fresh blanks in front of the molds.

Having thus described my invention, I beg to state that I do not confine myself to the exact mechanism herein described for accomplishing the several purposes,

What I claim being as follows:

1. In a machine for making heel-counters, the combination, substantially as specified, of the reciprocating slide for driving the die-block, the die-block arranged to move transversely to the line of motion of the slide, and the intermediate connecting-link or toggle-bar.

2. In a machine for making heel-counters, the combination, substantially as specified, of the reciprocating slide, one or more lineally-disposed pairs of die-blocks arranged to move at an angle to the line of motion of the slide, and rods which connect each pair of die-blocks to the slide, so as to operate like toggle-joints between them.

3. In a machine for making heel-counters, the combination, substantially as specified, of the toothed arc on the main shaft, the pinion intermittently rotated thereby, the eccentric on the pinion-shaft, the eccentric rod or rods, and the carriage bearing the mechanism for forming the upturn.

4. The combination, substantially as specified, of the reciprocating carriage N, the roller for forming the upturn, the bell-cranks on which it is hung, and the yoke for connecting the bell-cranks to the eccentric-rods which move the carriage.

5. The combination, substantially as specified, of the driving-wheel on the counter-shaft, the loose driven wheel on the main shaft of the machine, the main shaft, and a friction-clutch between the said main shaft and the said loose driven wheel thereon.

6. The combination, substantially as specified, of the die, the cast-off, the spring for holding the cast-off in its normal position, and the lever for operating the cast-off.

7. The combination, substantially as specified, of the reciprocating die-block, the die pivoted thereto, and the spring for holding the die in a slightly turned-up position until it enters the mold.

8. In a machine for forming heel-counters, the combination, substantially as specified, of the following instrumentalities, viz: first, a mechanism for automatically feeding the blanks to the molds; second, a die for pressing the counter into shape; third, means for forming the upturn; fourth, a cast-off for discharging the finished counter.

ET. SALOMON.

Witnesses:
FRAS. HY. REYNOLDS,
ROBT. ARTHUR KELLOND.