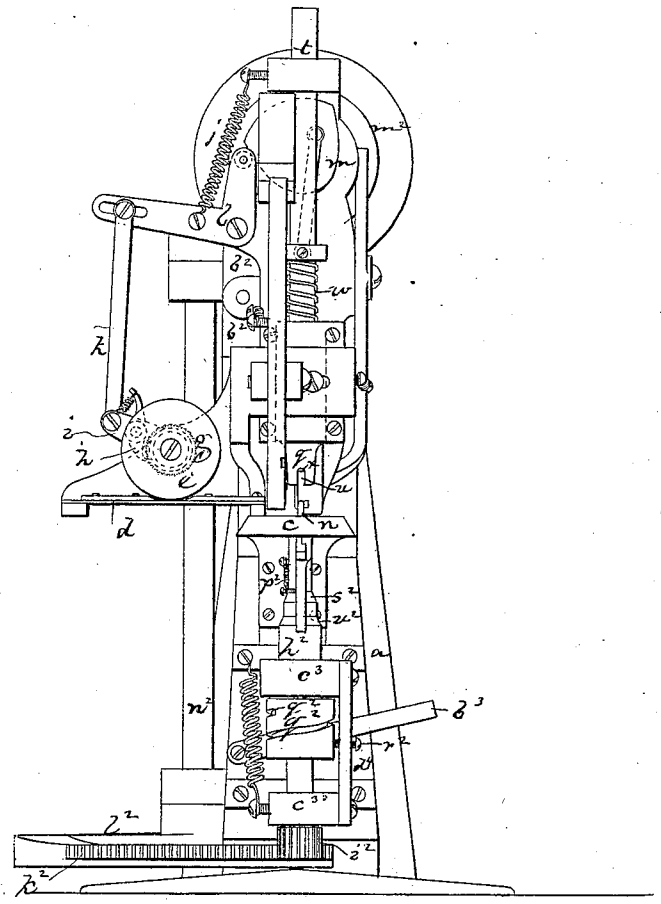
2 Sheets--Sheet 1.

S. W. SHOREY.

Machines for Forming Staple-Seams in Leather.

No. 136,340. Patented Feb. 25, 1873.

Fig. 1.



Witnesses:
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Inventor.
Samuel W. Shorey
By his Attys.
Crosby & Gould

2 Sheets--Sheet 2.

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Fig. 2.

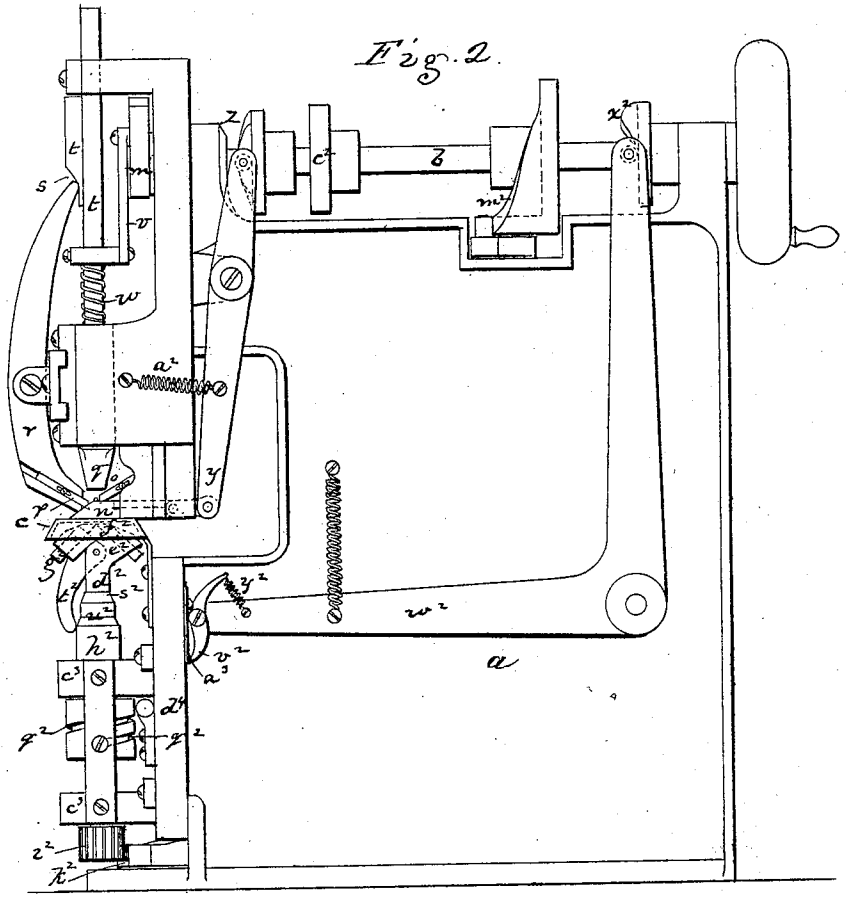
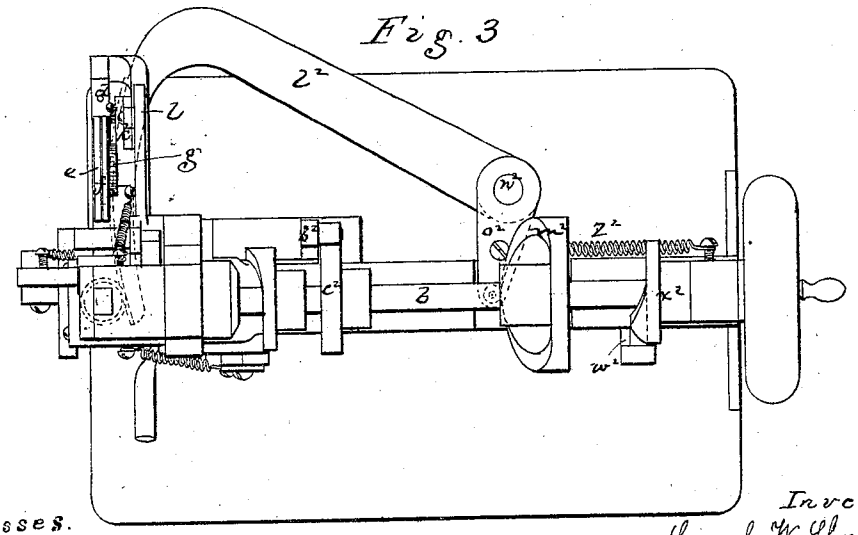


Fig. 3



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M. W. Frothingham.
L. H. Latimer.

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Samuel W. Shorey.
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Crosby & Gould

UNITED STATES PATENT OFFICE.

SAMUEL W. SHOREY, OF BOSTON, ASSIGNOR TO ARZA B. KEITH, OF BRAINTREE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FORMING STAPLE-SEAMS IN LEATHER.

Specification forming part of Letters Patent No. **136,340**, dated February 25, 1873.

To all whom it may concern:

Be it known that I, SAMUEL W. SHOREY, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Machine for Forming Staple-Seams in Leather-Work; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms a 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 an organization of mechanism for uniting leather-work by means of staples, or the formation of staple-seams, such as are described in United States Letters Patent No. 131,308, the machine being designed to cut the wire into staple-forming lengths, to form and drive the staples, to twist together the driven and protruded points of each, to cut off the excess of metal at the point, and to feed the work for insertion of successive staples in the formation of a continuous seam.

The drawing represents a machine embodying the invention.

Figure 1 shows the machine in front elevation. Fig. 2 is a side elevation of it. Fig. 3 is a plan of it.

a denotes a stand, at the top of which are bearings for a horizontal driving-shaft, *b*. *c* denotes a suitable work-supporting plate, upon which the material rests. On one side of this plate is a guide, *d*, upon which the wire rests, and over which it is fed to the machine. Above this guide is a feed-wheel, *e*, having a wire-entering groove, *f*, or a peripheral surface roughened, grooved, or otherwise formed for feeding forward the wire, the guide being cut away or so formed as to permit the wheel to bear upon the wire. This wheel has an intermittent rotative movement imparted by means of a ratchet, *g*. On the inner face of the wheel *e* is a pawl, *h*, jointed to a rocker-arm, *i*, which, by a link, *k*, is connected to one arm of a lever, *l*, whose other arm is actuated by a cam, *m*, on the shaft *b*, to throw down the pawl and turn the feed-wheel, and by a spring, *j*, to raise the pawl. The inner end of the guide stands at some distance above the work-plate *c;* and the forward part of the wire, after the wire is fed, projects beyond the guide and over a rest or anvil, *n*, the wire passing between two cutter-blades, *o p*, located just beyond the end of the guide. After the wire is fed forward a bender, *q*, descends against it and holds it, while the cutters sever a staple-forming length. The cutter *o* is stationary and the cutter *p* movable, the latter cutter being attached to the lower arm of a vertical lever, *r*, the upper arm of the lever being thrown forward (as the bender descends) by an incline, *s*, on a bar, *t*, extending from the driver-bar, thereby bringing the cutters together and causing the wire to be severed by them, the cutter being drawn back when the bar *t* ascends by a suitable spring. The rest *n* is of a thickness equal to or about equal to the width of the staple between its prongs, and the bender has a fork or bifurcation, *u*, the two prongs of which, as the bender descends, bend the wire over the rest, which is located so as to come centrally under the staple wire or blank, carrying the two parts of the wire down to the sides of the rest, and thereby forming the staple-prongs, the top of the rest being rounded to form the bow or top of the staple. The bender is at the foot of a driver-bar, *t*, that slides vertically in suitable bearings in the head of the standard *a*, and the bar *t* is reciprocated by a link, *v*, connecting the bar to a crank-pin extending from the cam-wheel *m*.

The pieces of leather to be united are laid upon the work-plate *c* beneath the rest *n* and the guide *d*, and through the work-plate is cut a slot for the passage of the staple-prongs. The bender slides on the bar *t*, and is pressed downward by the stress of a spring, *w*, a suitable stop limiting its motion. As the bar *t* descends the bender forces the wire down over the rest or former *n*, and then strikes the top of the work and acts as a presser-foot, the bar descending or continuing to descend against the stress of the spring *w*. At the foot of the bar *t* is the driver *x*, that drives the staple, and when the bender has reached the work the driver follows down and striking the staple forces the staple down with it. If the staple were unsupported the action of the driver would tend to bend or cripple it; and to furnish proper support for the staple as the driver descends, the anvil rest or former *n* is kept in

the staple, supporting it until its head reaches or nearly reaches the work, the rest for this purpose being made inclined or tapering, as seen at Fig. 2, and having a positive retreating motion as the driver advances, the advance motion of the driver and the retreat motion of the rest coinciding so that the supporting-surface always bears a fixed relation to the position of the driver. For this purpose the rest is made as a slide, and is jointed at its rear end to the lower arm of a vertical lever, y, whose upper arm is actuated by a cam, z, on the driving-shaft b to draw the rest back, the rest being thrown forward by a spring, a^2.

With the arrangement of mechanism as shown the feed of the work is effected before the staple is wholly driven, and as follows: The bender, resting upon the work, straddles the head of the staple, and, before the driver has completed its descent, the head is swung laterally, (the bender, driver, and rest or former swinging with it,) and the bender, (or the former,) being in connection with the staple, moves the staple with it, and thereby effects the feed of the work, the descent of the driver being completed as the feed is effected. The head is swung by means of a lever, b^2, one arm of which has a slot, in which moves a slide jointed to the lever-arm, and the other arm of which has a pin resting against a cam, c^2, on the driving-shaft, the cam producing the feed movement of the head and a suitable spring its back movement. The staple being driven through the work, its points protrude through the work-plate, and these points are twisted together and trimmed as follows: Beneath the work-plate is a spindle, d^2, having fixed to an arm, e^2, at its top, a stationary nipper, f^2, (stationary with respect to the spindle,) and a movable nipper, g^2. The spindle extends through a vertical sleeve, h^2, and at its foot carries a gear-pinion, i^2, by a geared engagement with which the spindle is moved rotatively, either continuously or reciprocatively. The pinion is shown as engaging with a gear-rack, k^2, on a rocker-arm, l^2, which arm is actuated by a cam, m^2, on the driving-shaft, (to rotate the pinion in one direction,) and by a suitable spring to rotate the spindle in the opposite direction, the arm being fixed on the foot of a shaft, n^2, at whose top is an arm, o^2, carrying a pin which is held against the cam by the stress of the spring. The spindle slides vertically in the sleeve h^2, but the spindle and sleeve rotate together, the sleeve turning in suitable bearings. When the staple is driven the nippers are stationary, and their jaws are far enough apart to let the staple-prongs pass between them, the two jaws and the staple-points being in parallel planes and the movable jaws being held by a spring, p^2. The staple-prongs being in this position, the cam m^2 begins to rotate the nipper-spindle, and, as the spindle and sleeve rotate, a spiral or cam-groove, q^2, on the sleeve, by connection with a stationary pin, r^2, that enters the groove, causes the sleeve to rise and forces an incline, s^2, against the arm t^2 of the movable nipper, causing the nipper-jaw to gripe the protruding staple ends and twist them together. As the rotation of the spindle and sleeve continues the sleeve is raised still higher, bringing another incline, u^2, against the arm e^2, thereby forcing the movable nipper-jaw g^2 against the other jaw f^2, and clipping off the ends of the staples not twisted together, or the excess of staple-points. The spring z^2 then draws back the rack k^2, reverses the motion of the pinion, and restores the nippers, spindle, and sleeve to their normal position. The bearings c^3 and work-plate are fixed to a vertical slide, and while the twisting operation is progressing a pawl, v^2, pushes down the slide, thereby dropping the work-plate and leaving the swinging head and bender free to move back over the work. The pawl is jointed to the horizontal arm of a lever, w^2, the vertical arm of which is actuated by a cam, x^2, on the driving-shaft, to throw the pawl down, the horizontal lever-arm being raised by the stress of a suitable spring. The tooth of the pawl is pressed forward by a spring, y^2, and engages with a toothed plate, a^3, at the back of the slide a^4. A suitable guard-plate may be used to determine the point at which the pawl shall engage with the toothed plate. The slide is pressed upward by the stress of a suitable spring, and a suitable stop limits its upward movement to bring the work-supporting plate into proper position. To drop the work-plate for entrance of the work a lever, b^3, may be employed.

I claim—

1. The combination with the work-supporting plate, the mechanism for intermittently feeding the wire, the mechanism for cutting the wire into staple-forming lengths, the mechanism for bending each length into staple form, and the mechanism for driving the staples, as combined and arranged, and operating substantially as shown and described.

2. In combination with the wire-feeding and presenting mechanism, the bifurcated foot q and rest or anvil n for bending the wire, substantially as described.

3. In combination with the bender-foot q and driver x, the inclined and retreating anvil n, operating substantially as described.

4. In combination with the work-plate c and the mechanism for driving the staple, the rotating nippers g^2, as arranged to twist the staple-points, substantially as described.

5. In combination with the twisting-nippers, the mechanism for actuating the nippers to trim off the points of the staples, substantially as shown and described.

6. In combination with the mechanism for feeding the work, driving the staple, and twisting the staple-points, the work-plate having a downward movement previous to back movement of the swinging head, substantially as and for the purpose described.

Witnesses: SAML. W. SHOREY..

FRANCIS GOULD,

M. W. FROTHINGHAM.