

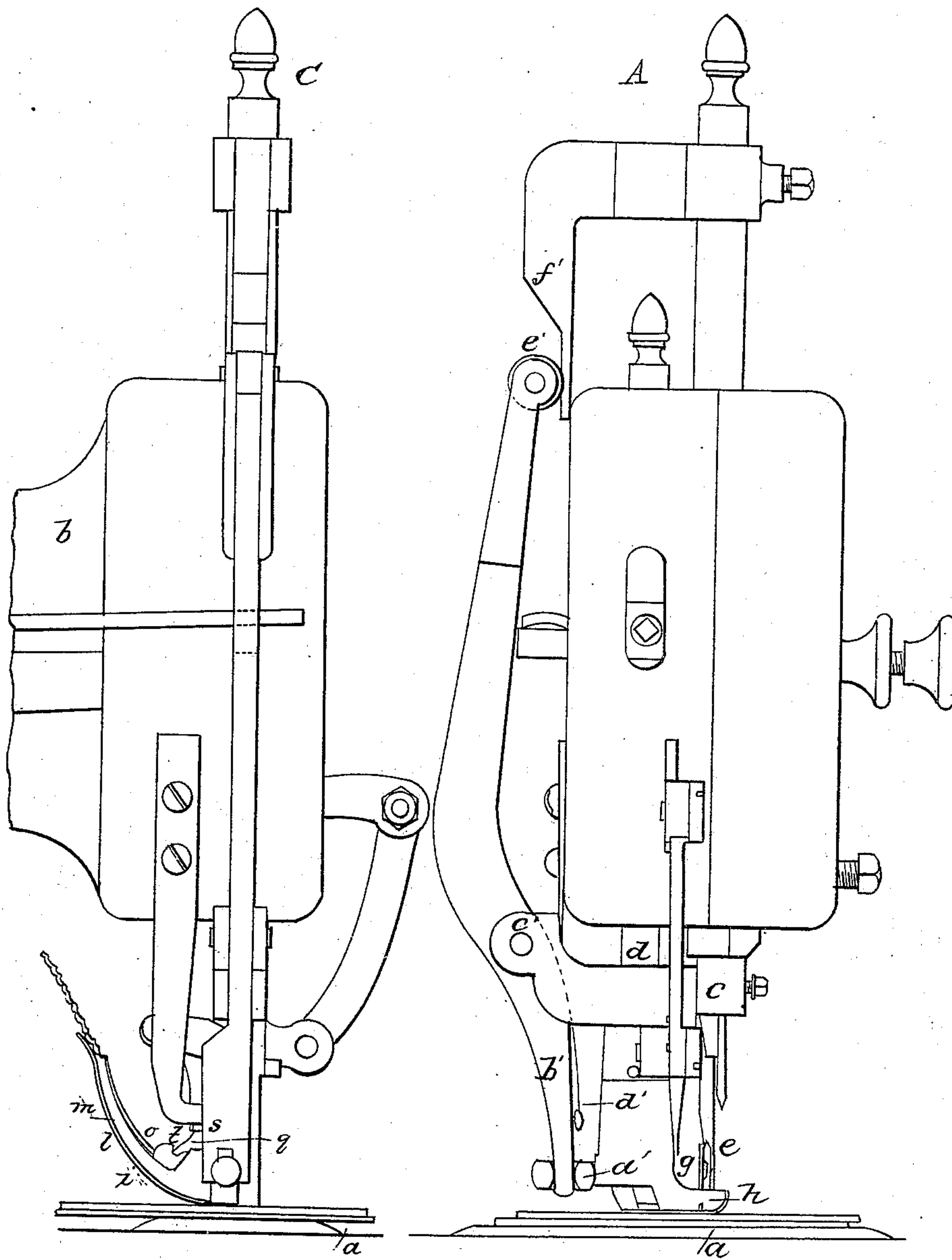
2 Sheets—Sheet 1.

T. K. REED.

Machine for Forming Stitched Seams.

No. 86,592.

Patented Feb. 2, 1869.



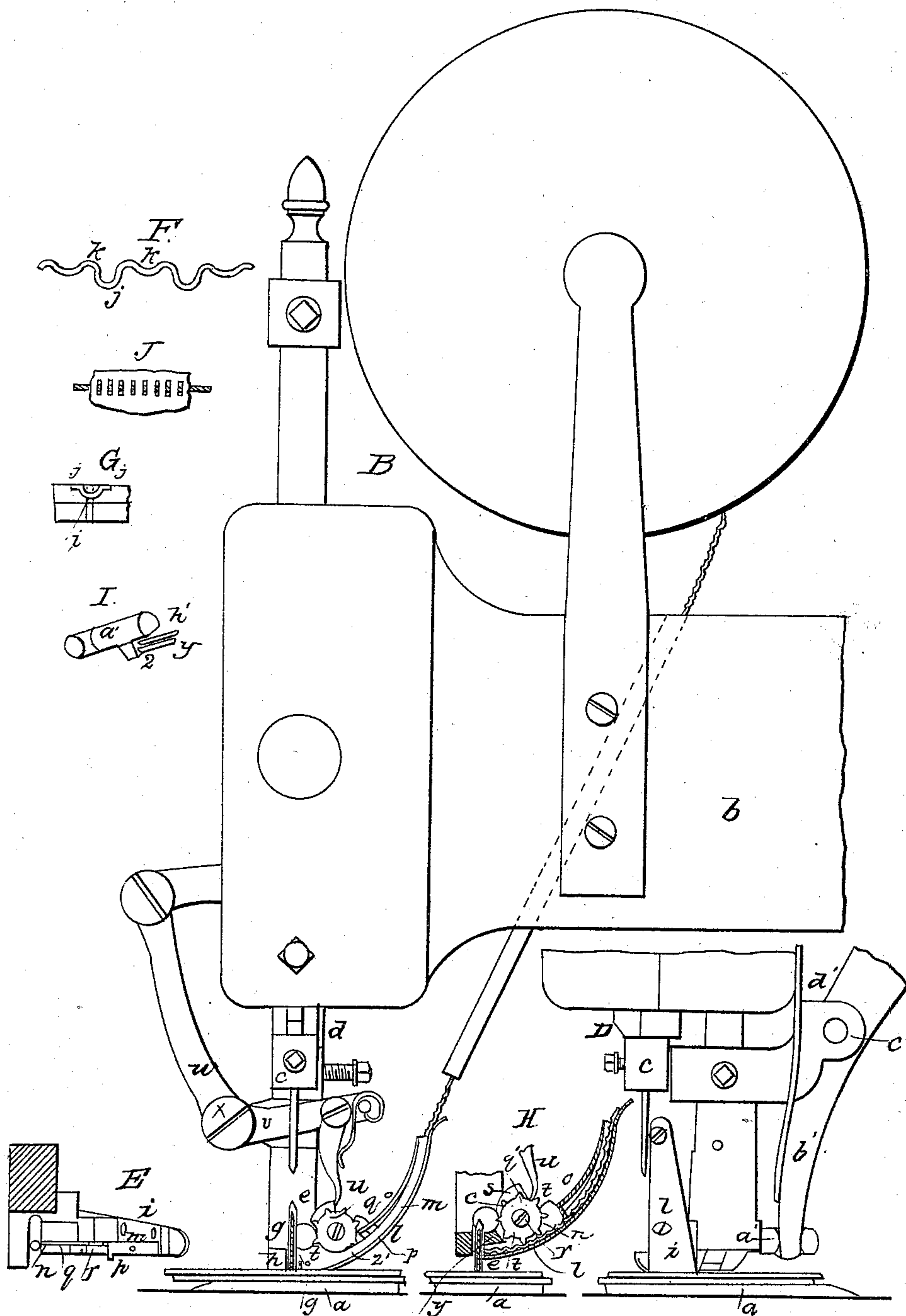
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2 Sheets—Sheet 2.

No. 86,592.

Patented Feb. 2, 1869.



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UNITED STATES PATENT OFFICE.

TIMOTHY K. REED, OF EAST BRIDGEWATER, MASSACHUSETTS.

IMPROVEMENT IN PROCESS OF AND MECHANISM FOR FORMING STITCHED SEAMS.

Specification forming part of Letters Patent No. 86,592, dated February 2, 1869.

To all whom it may concern:

Be it known that I, TIMOTHY K. REED, of East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Forming Machine-Stitched Seams; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

In the stitch made by the mechanism to be herein described I secure each loop of a single thread by means of a wire bolt, the loop formed by the thread constituting a sort of staple on one side of the stock, into the bow of which a bolt of fine wire is introduced, the series of loops or stitches formed of a continuous thread being thus held by a corresponding series of short wires. By this means I not only secure each stitch by a very strong locking device, but form stitches not liable to be worn by abrasion, the stitches being also formed in such manner as not to impair the flexibility of the seam in the direction of the length of the seam.

It is in the process and mechanism by which such stitches are formed that my invention consists.

The drawings represent a mechanism for producing stitches in accordance with my invention.

A shows a front elevation of the head or goose-neck of the machine and the work-supporting plate; B, an elevation of one side of the mechanism directly connected with and including the wire feeding and cutting mechanism; C, an elevation of the opposite side thereof; D, a rear view thereof; E, a plan of chute through which the wire is fed.

a denotes the table or work-supporting plate; *b*, the goose-neck or hollow arm, which contains the levers for working the awl-stock *c* and presser-foot bar *d*.

e denotes the needle, fixed in the top of a needle-bar, (below the table,) and working upward through the table and through the hole in the work made by the previous descent of the awl. The needle is eye-pointed, and carries the thread *g* up through the work in precisely the same manner as most eye-pointed needles carry their threads down through the work, the resistance of the thrust being against

the presser-foot instead of against the table, while, instead of a looper seizing the loop formed by the needle and holding it for entrance of the next loop or portion of thread next carried up by the needle, the wire is carried into the loop and secures the stitch, or, with the thread, forms the stitch; and, so far as the needle and its operative mechanism are concerned, there is nothing new, and such mechanism need not be further described.

The work is fed by the awl, which, after it has penetrated the stock to form the hole for passage of the needle and thread, and while in the stock, has a lateral movement imparted to it, carrying the cloth with it, the presser-foot being raised to allow the work to move, said foot descending after such movement of the work, and the awl then rising from the work and moving back to its normal position. Just after the awl leaves the work the point of the needle rises through the awl-hole, coming up between the toe *h* of the presser-foot and the mouth of a chute, *i*, (through which the wire passes,) as seen at B and H. This chute is attached to and moves with the presser-foot and through it.

The wire is fed at the beginning of each descent of the needle, the end of the wire being projected into the loop on one side of the needle, and being cut off and left in such loop after the needle has left the work. The wire, before introduction into the machine, is preferably bent into the shape shown (enlarged) at F, each bolt-forming section being composed of a bow-formed center-piece, *j*, (which sinks down into the needle-hole,) and two hooks or arms, *k*, which lie against but sink into the surface of the leather on opposite sides of the hole, as seen at G, which represents a section of one of the bolts in position to receive the thread-loop in a piece of sewed work. The wire so bent or formed is wound upon a suitable spool or reel, from which it passes through the goose-neck and through a conducting-tube into the chute *i*. The chute is curved, so that while the upper part of it stands in a nearly vertical position its lower end is nearly horizontal, the end of the wire being thus brought, as it were, into a plane corresponding to the plane it occupies when forming part of the stitch.

The chute is constructed as follows: *l* de-

notes a bottom plate, upon which one edge of the wire—namely, the edge formed by the projecting bows—rests. On this plate is another thick plate, *m*, in which is a slot or groove, *n*, through which the wire runs, the side walls of this groove maintaining the wire in position in a vertical plane at right angles to the plate *l*. Fixed to the plate *m* is one end of a spring, *o*, at whose opposite end is a detainer or tooth, *p*, which projects down into the hollow of the adjacent bow, as seen at H, which is a section taken lengthwise through the chute. Beyond this spring is a feed-wheel, *q*, turning on a pin, *r*, screwed into a wall, *s*, against which wall the wire is supported laterally. This wheel has sprocket-teeth *t*, set at distances apart corresponding to the distance between each two adjacent bow-recesses of the wire.

Above the feed-wheel is the pawl *u*, which works the wheel, the movement of the pawl being imparted as follows: The pawl is hung upon a pawl-lever, *v w*, fulcrumed at *x*, and worked by a suitable lever connected from a cam on the main driving-shaft.

After the needle has risen, and just before it commences its descent, the presser-foot is raised, as seen at H, and the lever-arm *v* is depressed, causing the pawl *u* to descend, and in its descent to act against a tooth of the feed-wheel and impart rotative movement to the wheel, the movement of the tooth of the pawl engaged with the wire causing the end of the wire to be fed forward, and thrusting the bow at the end into the loop, as seen at H. When this is accomplished the rotative movement of the feed-wheel ceases and the presser-foot descends, the descent of the needle causing the loop through which the wire has been thrust to draw the bow of the wire down into the needle-hole, and when the needle is below the table a cutter comes forward and severs the wire at the point between the end bolt and the next adjacent one. This cutter or punch is shown at *y*, it being formed of the end of a bar, *z*, fixed to a reciprocating carrier, *a'*, which plays horizontally in ways or grooves formed in the bottom part of the presser-foot bar.

The carrier is reciprocated by a lever, *b'*, fulcrumed at *c'*, and a spring, *d'*, the lower end of the lever being connected with the carrier, and its upper end bearing a roll, *e'*, by which the lever is thrown outward by an incline, *f'*, connected with the awl-stock.

As the awl-stock descends the upper end of the lever is thrown outwardly by the incline, causing the cutter to be thrown inward, the movement of the cutter carrying it in against and severing the wire, and the cutter being thrown back by the action of the spring *d'*, when the awl-stock ascends, and the incline rises above the lever-roll *e'*.

The cutter travels in a cross-groove, *g'*, made through the upper plate, *m*, of the chute, and the wire lies in its path in the groove *n*, where the groove *g'* crosses it, the wall of the groove

n acting as a bed-surface, against which the wire rests under the action of the cutter, the cutter acting as a punch, and removing a chip from the wire, which chip is pushed out from the chute through the slot by the movement of the cutter.

To insure the action of the cutter at the exact point of the wire where the severing is to be effected—that is to say, at the center of each small bend or notch in the wire—the carrier *a'* has, besides the cutter, a guide-rod, *h'*, the end of which projects a little farther than the cutter, as seen at I, which shows a sketch of the carrier. This rod travels in a hole bored through the chute-foot, and, its end being made pointed, it enters the bow in rear of the notch where the wire is to be cut, and, if necessary, moves the wire very slightly in either direction to bring the notch exactly in line with the cutter.

The continuous operation of the machine is as follows: The awl first descends and punctures the leather, (or other work,) lateral motion being imparted to the awl while in the leather, causing the latter to be fed, the presser-foot rising (as the awl penetrates the leather) to allow such feed-movement of the leather, and dropping down upon the work when the feed is effected. The lateral movement of the awl brings it into vertical line with the needle, and as the awl next rises the point of the needle follows through the awl-puncture with the thread to form the loop, the awl springing back to its normal vertical line, (when it has risen from the work,) in position to make the next puncture at its next descent. The needle having risen, the feed-foot again rises and stops, and the needle descends a short distance and stops, the movement of the needle causing the thread to bow from its side, as is well understood. While the needle and presser-foot are stationary the wire is fed, as before set forth. The end of the wire having been thrust into the bow or loop of thread, the presser-foot drops and the needle descends. The cutter then comes forward and cuts off the end section of wire, the descent of the needle pulling the bow of the wire down into the needle-hole and the hook upon each side thereof down into the surface of the leather. The action of the cutter in removing a piece from the wire leaves each arm projecting from the bow with a turned-down hook, the point of which sinks into the surface of the leather, leaving said surface free from any projecting spurs. As the needle descends the awl also descends and punctures another hole, and the operation just described is successively repeated, forming the series of stitches.

Instead of forming the wire with the curved arms or hooks at opposite sides of each bow, the union between the bows may be of straight wire; or the wire may be straight throughout, and cut into short straight loop-fastenings.

Where the wire is laid crosswise of the

seam, as seen in the drawing at J, it will be obvious that the seam is much more flexible than a common machine-sewed seam, where the interlocking of the thread or threads tends to make the seam unyielding.

It will be obvious that the construction and arrangement of mechanism shown may be materially modified without departure from the essence of my invention.

I claim—

1. The process of forming a sewed seam with thread and wire combined by introducing wire into each loop of thread, substantially as described.

2. I also claim, in combination with a work-supporting surface and a needle playing through the same, a mechanism, substantially as described, for feeding wire into each loop formed at the side of the needle.

3. I also claim, in combination with the wire-feeding mechanism, a mechanism for cutting off the wire to lock each loop of thread, substantially as described.

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Witnesses:

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