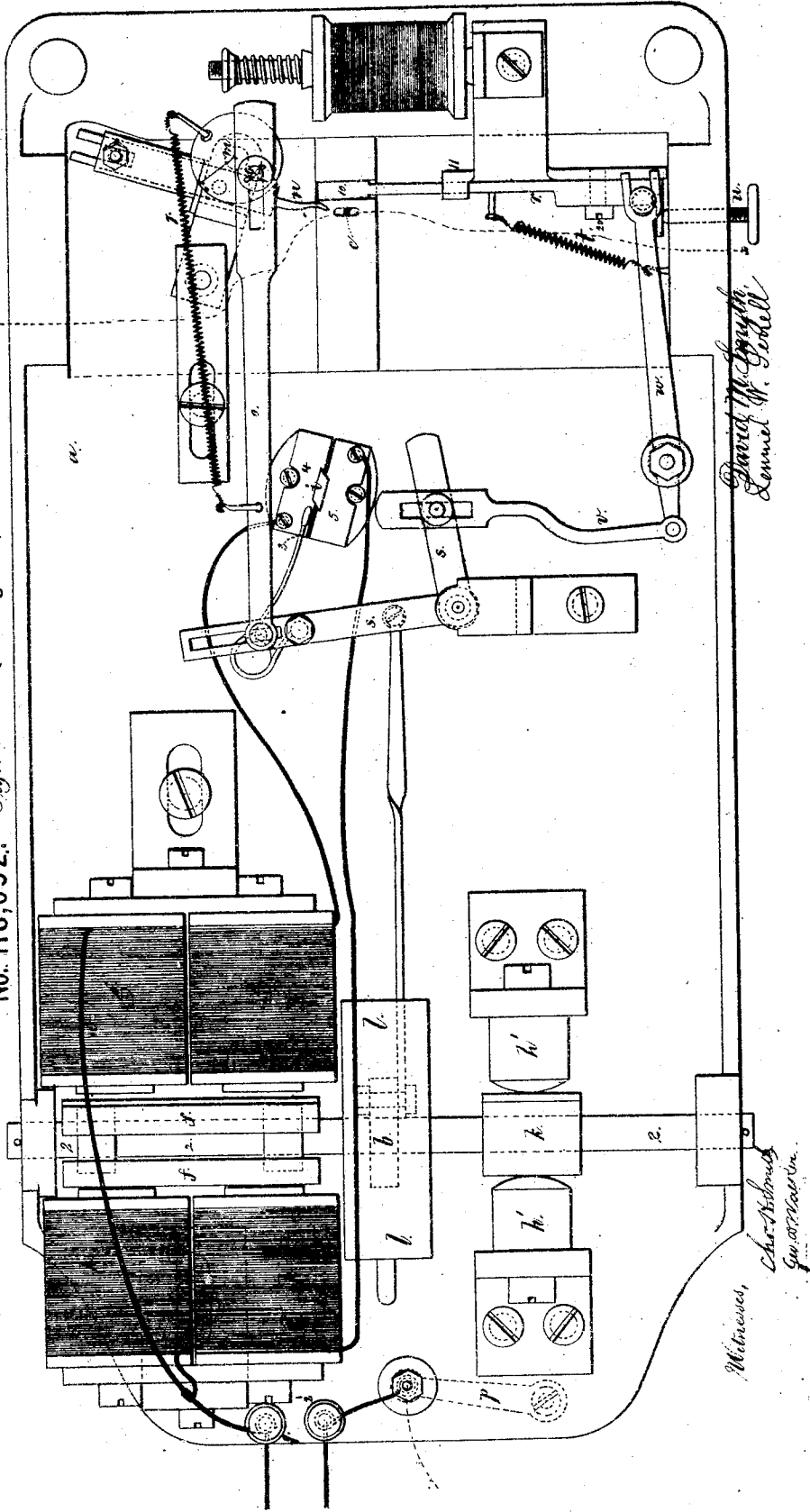


David M. Smyth. Magnetic Sewing Machine.

No. 118,652. Fig. 1. Patented Aug. 29, 1871.

[97.]

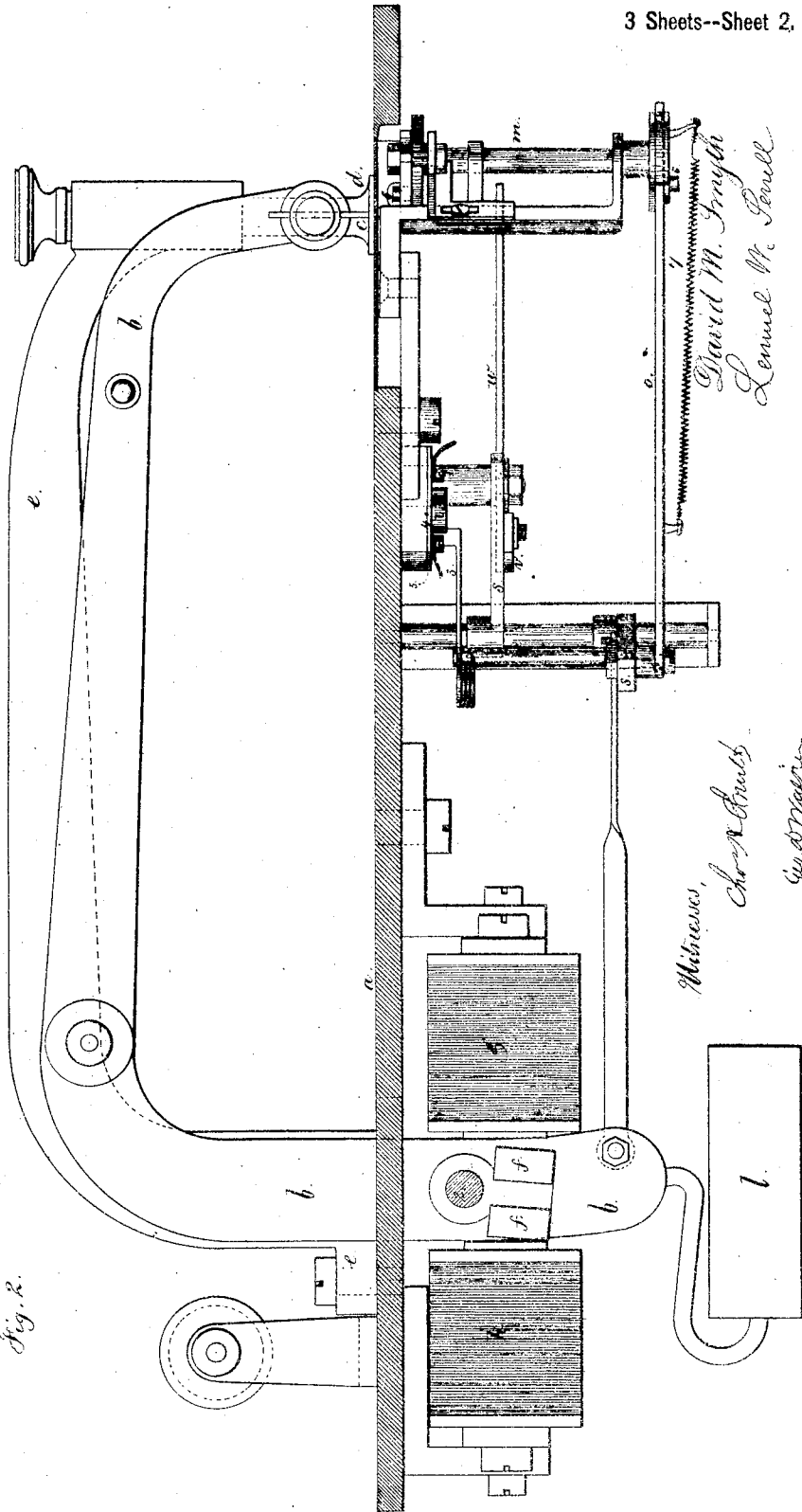


Smyth's Magnetic Sewing Machine. [97.]

Patented Aug. 29, 1871.

No. 118,652.

Fig. 2.



*David M. Smyth
Lemuel W. Sewell*

*Witnesses,
Chas. A. Smith
Geo. W. Mason*

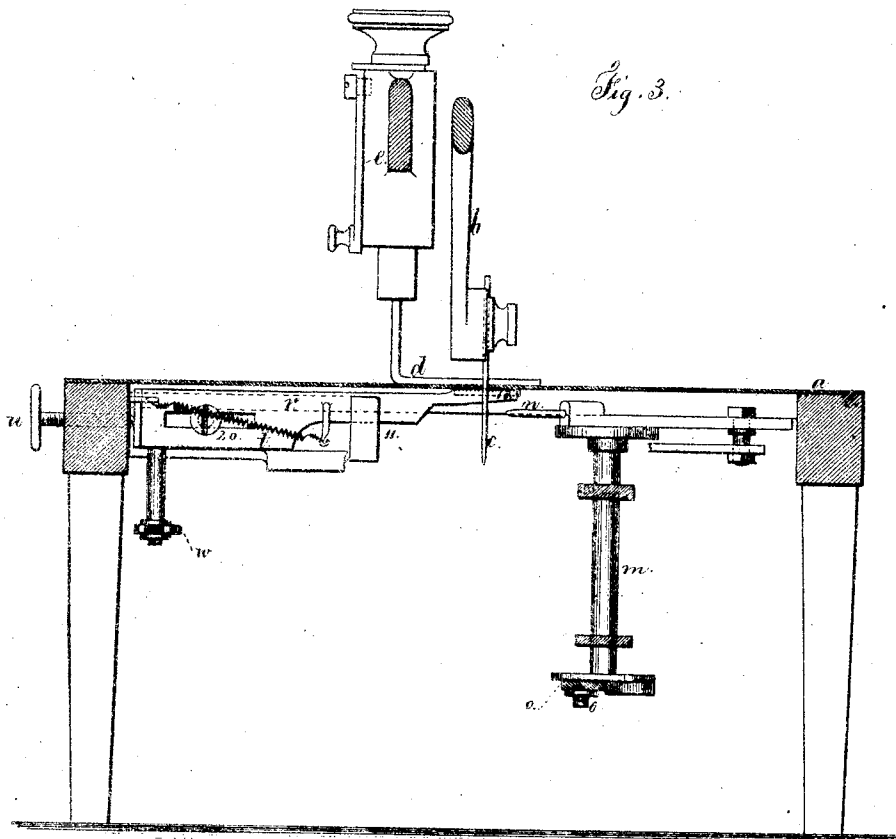
Smyth, Magnetic Sewing Machine

3 Sheets--Sheet 3.

[97.]

No. 118,652.

Patented Aug. 29, 1871.



Witnesses,

Chas. A. Smith

Jas. A. Morse

David M. Smyth,

Lemuel W. Sewell
att'y

UNITED STATES PATENT OFFICE.

DAVID M. SMYTH, OF ORANGE, ASSIGNOR TO JOSEPH W. STICKLER AND THEODORE C. ELLIOTT, OF ORANGE, AND WILLIAM H. WILSON, OF MONTCLAIR, NEW JERSEY.

IMPROVEMENT IN ELECTRO-MAGNETIC SEWING-MACHINES.

Specification forming part of Letters Patent No. 118,652, dated August 29, 1871.

To all whom it may concern:

Be it known that I, DAVID M. SMYTH, of Orange, in the county of Essex and State of New Jersey, have invented an Improvement in Magnetic Sewing-Machines; and I do hereby declare the following to be a correct description thereof.

Sewing-machines have been driven by electro-magnetism, but the operation of such magnet is rapid but not powerful; hence it frequently happens that the needle is not driven through the fabric its full stroke.

My invention is made for the purpose of augmenting the power of the electro-magnet in its operation upon the needle; and consists in a weight connected with the needle-bar or arm, in combination with an electro-magnet, the parts being arranged in such a manner that the power of the electro-magnet will be exerted to give the weight and needle-arm a very rapid movement at the time that the needle is not in the cloth; hence, the inertia of the vibrating weight causes the penetration of the needle through the fabric; and I have discovered that a sewing-machine cannot be driven alone by an ordinary electro-magnet and battery either economically or advantageously, because the continuous attractive power to drive the needle through the cloth would require a very powerful battery, whereas a very much less battery-power will be more effective in giving a rapid movement to a weight that acts by its inertia to propel the needle. I construct the looping-and-feeding mechanism so that they do not come into action except near the extreme movements of the needle after the fabric has been perforated or the needle withdrawn.

In the drawing, Figure 1 is an inverted plan of the sewing-machine with my improvement. Fig. 2 is a side view of the same, and Fig. 3 is a section at the line *x x*.

The bed *a*, needle-arm or bar *b*, needle *c*, presser-foot *d* and its supporting-arm *e* are of the usual character. The arm that actuates the needle swings upon centers 2, and is provided with an armature, *f*, between the two electro-magnets *g* and *h*, as the circuit is closed alternately to the one and to the other. The movement given to the needle may be limited by the stops or buffers *h' h'* at opposite sides of the arm *k*. If these parts only were employed there would not be

force enough to operate the needle with an ordinary battery. I therefore make use of a weight, *l*, attached upon or connected with the needle-bar or arm, so that said weight acts as a hammer to give a blow upon the needle and drive it through the fabric, the instantaneous action of the electro-magnets giving to the parts the movement required to produce the necessary power from the accelerated velocity and inertia of the vibrating weight. The switch *p* is employed to make or break the electric circuit, and hence stop or start the machine. The current passes from the binding-screw 2', through the bed of the machine, to the vibrating spring-arm 3, and through the plate 4 to the magnet *g*, or through the plate 5 to the magnet *h* and binding-screw 9. The spring-arm 3, moving with the needle-arm, continues the connection to the operative magnet until the end of the arm 3 clears the cam *z*, and springs across to close the circuit through the plate 4 or 5. This device, however is not claimed by me.

The looping instrument *n* is mounted upon a sliding stock and actuated by a crank-pin, 6, upon a disk or arm of the shaft *m*, and the spring 7 tends to turn this shaft and keep the looper in position for the descending needle to take a loop of the under thread from said looper. The sliding link *o* is connected directly or immediately with the needle-arm *b*, and has a slot for the crank-pin 6 of the shaft *m*, and the length of this slot is such that the bar simply slides until the needle has penetrated the fabric and taken the loop of second thread. Then the end of the slot, taking the crank-pin, moves the looper back, and as the needle rises the looper again goes forward, by the action of the spring 7, and takes a loop of needle-thread. In this manner the looping instrument is actuated at the close of the perforating movement of the needle, and when the magnetism has to exert but little power in moving the needle.

The feeding mechanism is a slide, *r*, with teeth at the end 10, and this slide *r* has a slot for the fulcrum 20, and a guide at 11. The power is applied at the right-angle lever *s* to strike the teeth against the fabric, and then the further movement causes the slide to feed the cloth. The reverse movement tends to relieve the pressure of the

teeth on the cloth, before the return of the parts to the point of beginning, by the action of the spring *t*. The set-screw *v* determines the length of movement and of the stitch.

The slotted link *v*, intervening between the parts that are connected to and move with the needle-arm, communicates motion to the feeding mechanism through the lever *w* when the needle has risen above the fabric; hence, the electro-magnetism and the inertia of the weight are sufficient to move the fabric, they having no other operation to perform at that time.

I claim as my invention—

1. A needle-bar or arm and an armature, in combination with an electro-magnet and a vibrating weight, substantially as and for the purposes specified.

2. A looping instrument connected to the needle-bar or arm by means of a sliding link that

allows the needle to penetrate the material before the looper is operated, substantially as set forth, in combination with an electro-magnet and armature to give motion to the needle-bar or arm, as specified.

3. A feeding mechanism connected by a slot with the needle-bar or arm, in combination with the electro-magnet and armature, substantially as set forth.

4. The feeding-slide actuated by a right-angle lever, substantially as set forth, in combination with the adjusting-screw and actuating mechanism, substantially as specified.

Signed by me this 30th day of May, A. D. 1871.

DAVID M. SMYTH.

Witnesses:

CHAS. H. SMITH,
GEO. T. PINCKNEY.