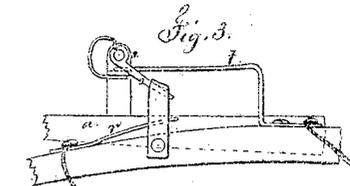


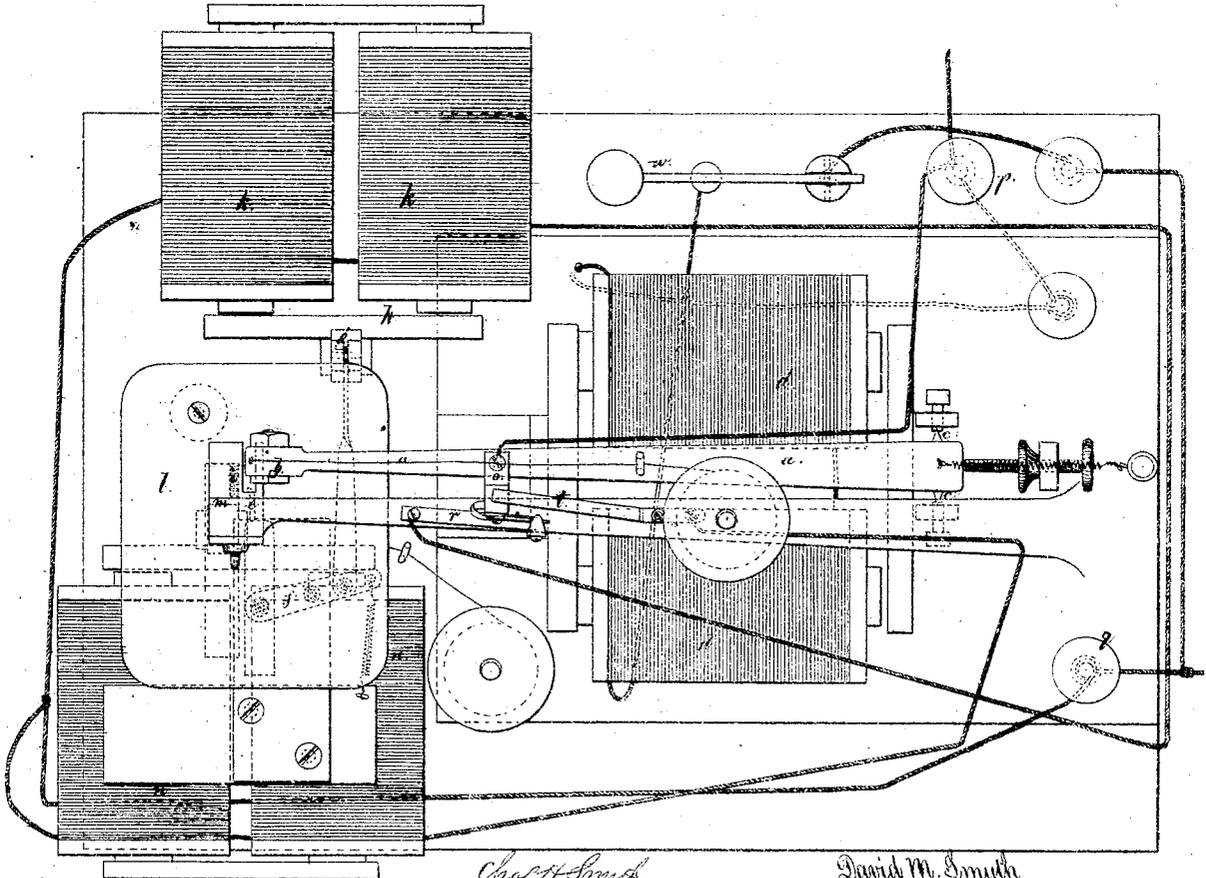
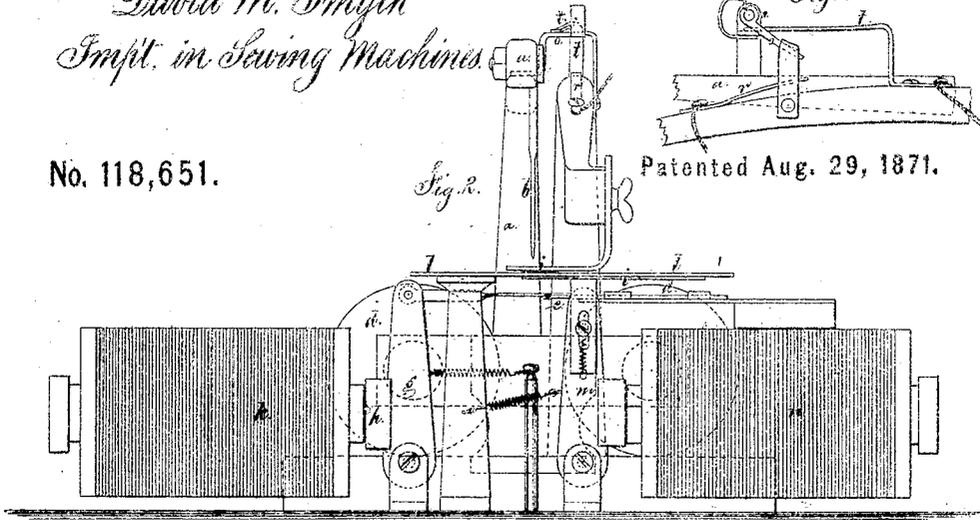
[97.]

David M. Smyth  
Impt. in Sewing Machines.

No. 118,651.



Patented Aug. 29, 1871.



Witness,  
Chas. A. Smith  
Geo. D. Walker

David M. Smyth  
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# UNITED STATES PATENT OFFICE.

DAVID M. SMYTH, OF ORANGE, NEW JERSEY, ASSIGNOR TO HENRY G. THOMPSON, OF MILFORD, CONNECTICUT.

## IMPROVEMENT IN ELECTRO-MAGNETIC SEWING-MACHINES.

Specification forming part of Letters Patent No. 118,651, 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 Sewing-Machines; and the following is declared to be a correct description of the same.

Sewing-machines have heretofore been made in which the needle-arm has been actuated by the direct action of an electro-magnet without intervening mechanism.

My invention consists in applying an electro-magnet directly to move the feeding mechanism, independent of the means that drive the needle-bar, and I also apply a spring-arm to the needle-bar or arm to automatically make and break the electric circuit, at the proper times, to the magnets that actuate the feeding and looping or shuttle mechanism, and to move the respective parts in harmony.

In the drawing, Figure 1 is a plan of a sewing-machine actuated by magnets, and Fig. 2 is a side view of the same.

The needle-arm *a*, carrying the needle *b*, is mounted upon the centers *c*, or said needle may be mounted in any of the well-known modes employed in sewing-machines and receive its motion from a lever, the shorter end of the lever being contiguous to an electro-magnet, *d*, so that the needle will be moved to perforate the fabric when the circuit is closed through *d*. The looping device *e* is shown in the drawing as set to slide and operate by the levers *f* and *g* and armature *h* to the magnet *k*. The peculiar construction of this looping device does not constitute my invention, and I remark that the electro-magnet *k* is to be applied to actuate any desired character of looping instrument, or a shuttle or shuttle-carrier, either reciprocating or oscillating. The feeding device is shown as a roughened surface, *i*, upon the under side of the bed *l*, and the same is actuated by the lever *m* and armature of the magnet *n*, and I remark that the magnet *n* is to be employed to give motion to any desired character of feeding device. The electrical connections, as before mentioned, are to be arranged so that the circuits will be closed automatically to the respective magnets in the proper order to effect the

movements of the parts in harmony. I have shown connections that effect this. The arm or spring *o* upon the needle-arm *a* is in connection with the battery binding-screw *p*, and when the needle is through the fabric this arm *o* comes in contact with the spring *r*, closing the circuit, through the looper-magnet *k* and wire, to the binding-screw *q* to the battery.

When the needle-arm *a* rises, the spring or finger *o* breaks the circuit to the looper-magnet and then comes in contact with the spring *t*, closing the circuit, through the feed-magnet *n* and wire, to the binding-screw *q*. These parts are shown more clearly in Fig. 3. The connection to the magnet *d* that moves the needle-bar may be through the binding-screws *p* and *q*, and in that case said circuit will require to be opened and closed by a clock-movement to produce the pulsations. The finger-key or switch *w*, when introduced, acts to break or close the circuit and stop or start the machine.

I remark that the armatures that move the respective parts and also the electro-magnets may be of any desired character, and two electro-magnets may be used to move the needle-bar, the armatures being polarized so that one will act by repulsion and the other by attraction, and the connections being made so that positive and negative currents are directed through such magnets at the proper period to give the necessary movements, and I remark that the rising of the needle to form the loop of thread is effected by a momentary pause or breaking of the circuit in the magnet that depresses said needle.

The finger-key *w* may be employed to give slow pulsations by hand to operate the sewing-machine in going over seams or difficult places in the fabric.

I claim as my invention—

1. An electro-magnet and armature, applied directly to and in combination with the feeding mechanism of a sewing-machine for communicating to such feeding mechanism a direct movement derived from the armature of an electro-magnet, substantially as set forth.

2. A finger-key arranged in the electric circuit to the magnet of a sewing-machine, in com-

ination with such sewing-machine, substantially as and for the purposes specified.

3. A circuit-closing and breaking-arm or spring, combined with the needle-arm or lever in a sewing-machine, for closing or breaking electric circuits to electro-magnets that actuate the feeding mechanism or shuttle or looper, substantially as set forth.

Signed by me this 3d day of November, A. D. 1870.

D. M. SMYTH.

Witnesses:

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