

G. STEVENS & J. HENDY.  
ELECTROMAGNETIC SEWING MACHINE.

No. 111,488.

Patented Jan. 31, 1871.

Sheet N<sup>o</sup> 1

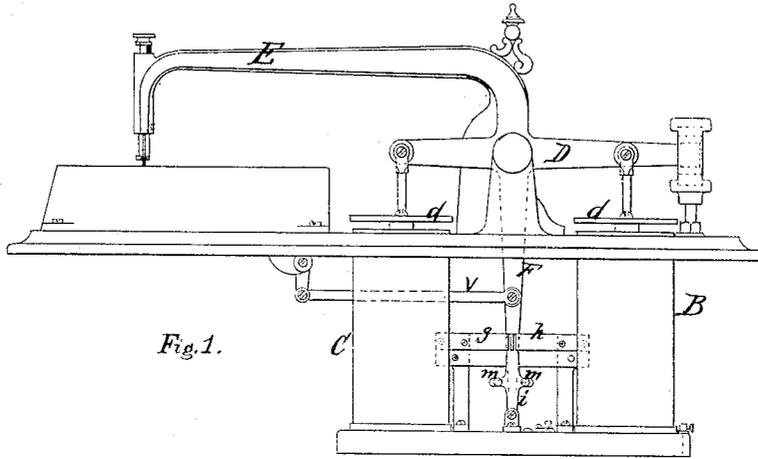


Fig. 1.

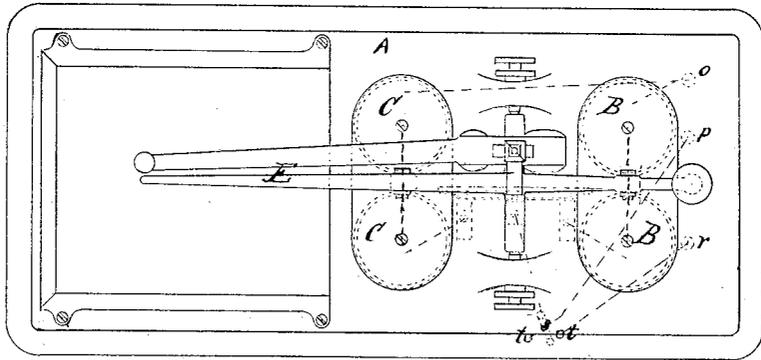


Fig. 2.

Witnesses

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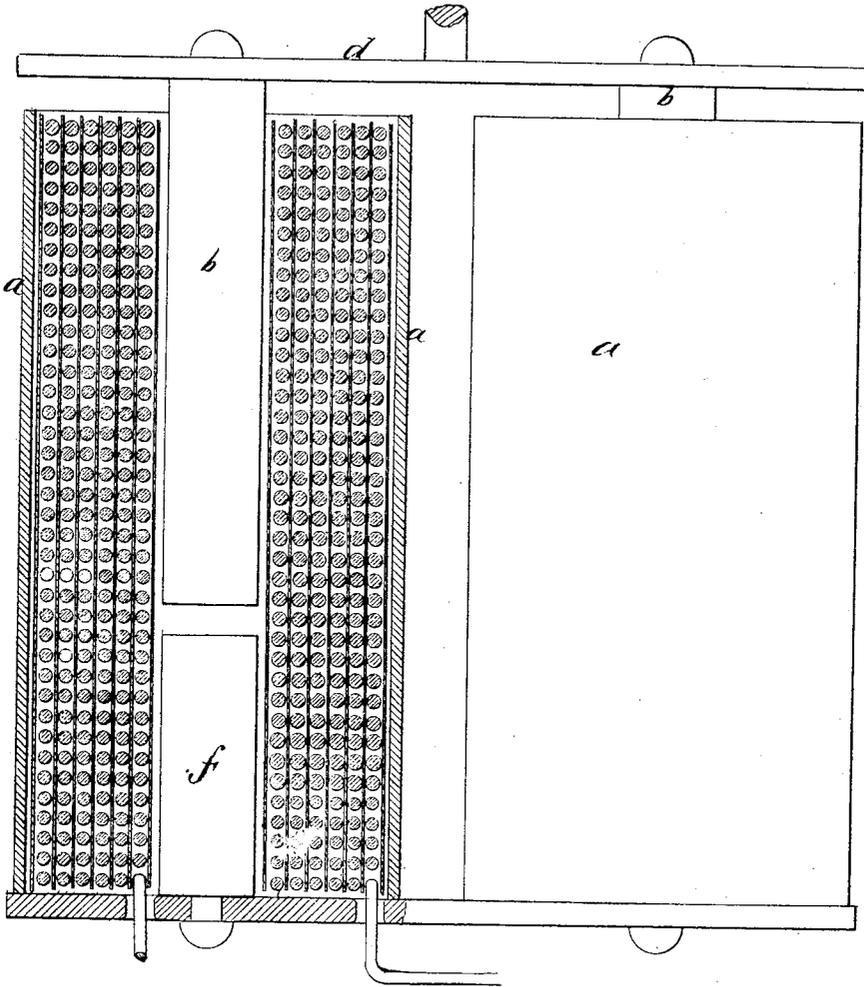
Inventor

*Geo. Stevens*  
*Joshua Hendy*  
*By their Attys*

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# UNITED STATES PATENT OFFICE.

GEORGE STEVENS AND JOSHUA HENDY, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN ELECTRO-MAGNETIC SEWING-MACHINES.

Specification forming part of Letters Patent No. **111,488**, dated January 31, 1871.

*To all whom it may concern:*

Be it known that we, GEORGE STEVENS and JOSHUA HENDY, of the city and county of San Francisco, State of California, have invented an Electro-Magnetic Sewing-Machine; and we do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use our said invention or improvements without further invention or experiment.

Our invention relates to an improved method of driving sewing-machines; and it consists in a novel arrangement of apparatus which forms the electro-motor, by which greater power is attained from the coils.

It also consists in a device for regulating the power and speed of the machine, which is very important, as it brings it completely under control.

The invention also consists in constructing the machine so that the needle-bar is driven directly from the armatures or coils without the intervention of cranks or wheels of any sort.

Referring to the accompanying drawings for a more complete explanation of our invention, A is a base-board, conveniently arranged to support the apparatus; or it might be placed directly upon the table of the sewing-machine, if more convenient. Two pairs of coils, B and C, are placed upon this board, standing vertically, and far enough apart to admit an oscillating beam, D, between the pairs. This beam is balanced so that the magnets or armatures of one pair of coils are attached to one end and those of the other pair to the other end. The coils are constructed, as shown in Sheet 2, Fig. 3, with an iron cylinder inclosing them, this form giving greater power to the magnets with a given length of wire. Outside the cylinder another coil may be placed, and a cylinder outside this, alternating; but the additional power after the first cylinder is not in the same position.

The magnets *b* and *c* are made, as usual, of soft iron, and each pair of bars are united at the top by a plate, *d*; or they may be formed in one piece, as an ordinary U-magnet. The magnets extend down into the coil about two-

thirds of their depth, and the armatures *f* rise from the bottom about one-third of the height of the coil, this construction adding greatly to their power.

The oscillating beam D has one end connected to each of the plates *d*, and from some convenient point in its length the needle-bar E arises and extends forward to the table of the sewing-machine, over which the work passes.

From the center of the beam D an arm, F, depends, and as the beam oscillates the bar vibrates from side to side, striking alternately the pins *m* and *n*. These pins are fastened to a vibrating bar, *i*, which is pivoted at the bottom, and which is caused to move from side to side, thus alternately forming and breaking contact with the two pole-changers *g* and *h*. This causes the pairs of coils B and C to act alternately, and by them the magnets, with the beam D and the needle-bar, are caused to move. By means of a connecting-rod, V, the feed-motion may also be operated.

In order to regulate and vary the power so as to have it completely under control, one pole of the battery is connected with the cup *o* and the other extreme connects with the cup *p*. Between the extremes of the battery one or more wires lead out at different points and connect with cups, as at *r*. A switch, S, is so placed that by connecting it with one of the buttons *t* the whole power of the battery will be employed, and by connecting it with another a less power will be used. The wires are arranged in any of the well-known modes, as partially indicated in dotted lines on Fig. 2.

Although but three cups are shown for the connections, yet it will be manifest that any number may be employed to suit convenience. In the arrangement of the coils, also, if it were desired, more than one pair might be connected with each end of the oscillating bar, but we have found one pair sufficient with our improved manner of constructing them.

The manner of constructing the pole-changers may be much varied without material difference in the result.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. Constructing the machine so that the needle-bar shall be operated directly from the electro-magnets, either with or without the intervention of levers, so that the oscillation of the armatures between two or more electro-magnets shall cause a similar movement to the needle.

2. In an electro-magnetic sewing-machine, the cups *o p r* and switch *s*, connected with the battery, so as to vary the power, substantially as herein specified.

In witness that the above-described invention is claimed by us we have hereunto set our hands and seals.

GEORGE STEVENS. [L. s.]  
JOSHUA HENDY. [L. s.]

Witnesses:  
M. MEAGHER,  
V. CUSHING.