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SOLOMON JONES.

Electro-Motors for Sewing Machines.

No. 118,537.

Patented Aug. 29, 1871.

Fig. 2.

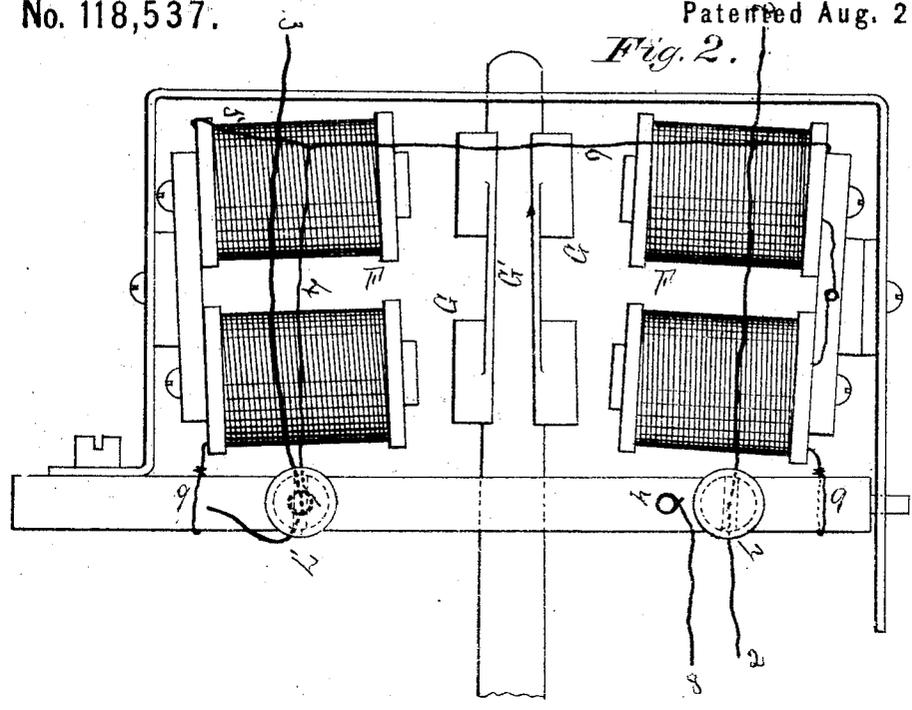
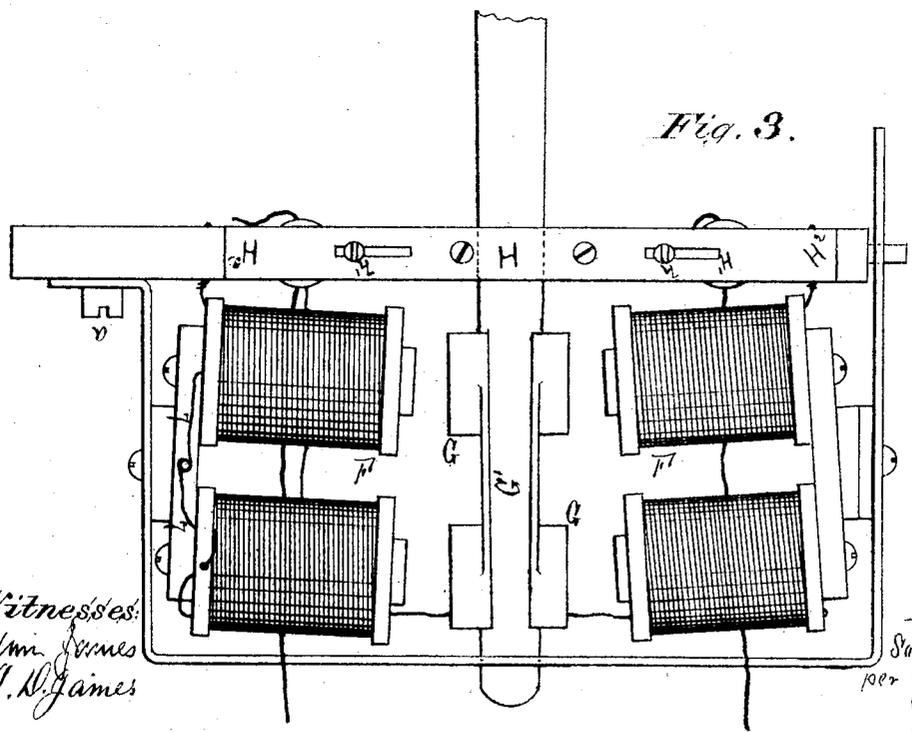


Fig. 3.



Witnesses:
 Edm. Jones
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UNITED STATES PATENT OFFICE.

SOLOMON JONES, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO HIMSELF AND
E. D. LAWRENCE.

IMPROVEMENT IN ELECTRO-MOTORS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 118,537, dated August 29, 1871.

To all whom it may concern:

Be it known that I, SOLOMON JONES, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Electro-Motors for Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a side view of a sewing-machine with my electro-motor attached. Fig. 2 is a side view of the electro-magnets and armatures. Fig. 3 is a reverse view of Fig. 2. Fig. 4 is a side view of the non-conducting plate, current-breaker bar, and their attachments.

The object of my present improvement is to furnish a sewing-machine that shall be driven or operated by the direct application of electricity to its needle-bar.

The great advantages of my combination are found in its simplicity and cheapness, avoiding as it does all complicated mechanism, and rendering entirely unnecessary the ordinary heavy and expensive castings, such as crank-shafts, treadles, fly or balance-wheels, &c., which have heretofore been invariably used in connection with all sewing-machine motors, and which to avoid is a great desideratum.

My invention consists in arranging in a frame suitably supported on the rear section of the stationary arm of the sewing-machine two sets of electro-magnets. Between these magnets oscillates a motor-lever that is directly connected with the needle-bar of the sewing-machine. This lever is provided with armatures so arranged that one shall be opposite each magnet and secured in such relative position thereto that, at the proper instant, it shall be acted on by its magnet. These magnets are connected with the battery, by means of the positive and negative wires, through connecting-screws in the usual manner. These electro-magnets being arranged in two sets, as stated, are so connected with each other that the magnets of each set are simultaneously excited, and are further so connected by a cross-current wire that, when the sliding current-breaker interrupts the circuit with one set, it shall instantly be completed with the other or opposite set, and thus, by the action of the magnets through the armatures on the lever, impart to

the same a continuous oscillating or vibratory movement. This sliding current-breaker travels over a bar to and fro on a vertical line, and is retained in its proper position by means of stationary guide and bearing-pins, which pass through slots on its face, and is provided with bearings on its inner surface, against which at proper intervals, through the action of the magnets, the lever is driven. This action carries the sliding current-breaker so as to cause it, by its direct action, to interrupt the positive connection with one set of magnets, and thus, through the connections hereinafter described, so complete it with the other, that instantaneously they shall be in condition to exert their full power, which causes the immediate return of the lever. Thus a continuous vibratory or oscillating movement is imparted to the lever, and it in return, acting on the sliding current-breaker, causes it so to interrupt and complete the connections at the desired moment with the different sets of magnets as to secure a mechanism uniform, reliable, and entirely automatic in operation.

The construction and operation of my invention are as follows: A is the bed-plate of the ordinary sewing-machine; A', the stationary arm; B, the work-plate; and B', the presser, all constructed and arranged in the usual manner; but about these as well as the feed mechanism, &c., I lay no claim to novelty, as my invention relates to nothing except the motor and its connection directly with the needle-bar C, and which is completed and effected simply through the agency of a pivoted or hinged link, *c*, and is equally applicable to all machines, no matter what their distinctive characteristics may be. This link *c* unites the needle-bar C, and the motor-lever D being attached to the upper section of the former and at the extreme end of the latter. This lever D is of any suitable material, and is of the form distinctly illustrated in the drawing—that is, slightly tapering from the point of its fulcrum or bearing to its outer end, and recessed on the upper and lower faces of a portion of its rear section in order to receive and properly secure the plates G' G', to which are attached the armatures G G G. This lever D is secured in the slotted or socket-head of an upright post, D', by means of a fulcrum-pin, *d*, in which it freely oscillates or vibrates. This post D' is firmly attached to the stationary arm A'.

E is a rectangular frame, and is connected to the rear section of the arm A' by means of a screw, *a*, or other equivalent attachment. This frame may be constructed of any desired substance, except its front wall E', which must be of some suitable non-conducting material, as on it travels the sliding current-breaker bar. F F are the electro-magnets, and are secured in sets at the upper and lower section of the frame E. Each set of magnets consists of a pair, which is arranged on suitable bearing-plates F' F', and which is secured, by wedge-shaped pieces *f f* and screws *e e*, to the frame E. These wedge-shaped pieces are interposed between the plates F' F' and the horizontal walls of the frame E, and serve to hold the electro-magnets F F in a position best calculated to enable them in the most effective manner to exert their force on the armatures G G. H is a sliding current-breaker, and is constructed of any material which will permit of its acting as a conductor. This plate is provided with two oblong slots, H¹ H¹, through which run the guide-posts *h h*¹. The ends of the sliding bar H are curved, which provides two current-breaker keys H² H²—one at each end of the bar. On the under side of the bar H, and traveling on the bar E', are two projections or bearing-points, *h*² *h*², which, through the action of the lever, drives the breaker-bar backward and forward on the plate E'. On this plate E' are two plates of silver or platinum plates, 1 1, as clearly shown in Fig. 4. L L' are the connecting-screws or binding-posts that connect the positive and negative wires to the magnets F F.

L receives and secures the positive wire 2, and L' the negative wire 3. The wire 4, through its forked arms 5 6, completes the negative connection between the battery and the two sets of magnets F F. 7 7 are the wires that unite the magnets that compose each set. 8 is a wire that is connected to the post *h* of the current-breaker, and, like the positive wire 2, projects through its post. These two wires 2 and 8 run together and are united by a key on a table or other convenient platform. The key is not shown, as its operation is well understood, and there are many forms of accomplishing the same result. When these two wires are in contact the circuit is closed and the positive current from the battery is, through the wire 8, communicated to the post *h* and thence to the sliding bar H, and by it transmitted to either set of the magnets F F through the action of the keys H² H² on the plates 1 1 and the wires 9 9. K is an ordinary brake-bar, and regulates the stroke of the machine through a set-screw, pressure-band, or rod, or other equivalent device. K' is a screw, shown resting in a socket in the rear of the machine. It is used to fasten the machine to a table or other platform, being inserted in a screw-socket bearing under the bed-piece or plate A. M M are water-tubes that are inserted through the bar E' and in immediate contact with the rear face of platinum plates 1 1. The object of these cold-water tubes is to prevent the plates 1 1 becoming unduly heated by the action of the electrical sparks.

The operation is as follows: The wire 3, being

connected to the negative pole of the battery, conveys its current to the wire 4 through the binding-post L', and which, by aid of the forked wires 5 and 6, is communicated to each of the sets of magnets F F. This leaves each set in condition to act the moment the positive wire completes the circuit therewith. 2 is the wire that is attached to the positive pole of the battery, and projects through the binding-screw L. This wire 2 and the wire 8 are so connected by a key that at any moment they can be brought instantly together or separated. When the wires 2 and 8 are in contact the positive current is instantly conveyed through the post *h* to the sliding bar H, from which it is communicated to the magnets, and completes and interrupts the circuits in the following manner: When the key H² of the sliding bar H is on one of the platinum plates 1 this bar, being or acting as a conductor, communicates its power to the plate 1, from which it is transmitted to one of the set of magnets F F, which instantly exerts its power on the armatures G G, drawing the lever D in direct contact with this set of magnets; but this movement of the lever through its pressure on one of the bearing-points *h*² has carried the sliding bar to such a position that the key H², which has just been described as in connection with the plate 1, now rests on a non-conducting surface, and the positive contact with its set of magnets is consequently interrupted. This same movement, however, conveyed the other key H² on the opposite plate 1, which causes its relative magnets, through the wire 9, now to exert their force. This causes the lever to return, which, striking against the bearing *h*², carries the sliding bar back in the reverse direction from that in which it has just traveled. This relieves the key that had been in contact, and brings the other into action. Thus a rapid oscillating or vibratory movement is imparted to the lever, and it, through its action on the sliding current-breaker, automatically completing and interrupting the current, and which brings the opposite magnets into action.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The electro-magnets F F, lever D provided with armatures G G, needle-bar C, insulator-bar E', and sliding conductor-bar H, when combined and arranged so as to operate substantially as described.

2. The non-conducting plate E', having conductor-plates 1 1 attached, and the sliding current-breaker bar H, when the same are so constructed and arranged as to act in connection with the battery and magnets, substantially as described.

3. The water-tubes M M, so arranged as to prevent the plates 1 1 being unduly heated and burned by the electrical sparks.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

Witnesses: SOLOMON JONES,
EDWIN JAMES,
T. J. GARDNER.